

**EA02-027**

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**APPENDIX A**

**5 BOXES**

**BOX 2 OF 5**

**PART 3 OF 4**

# Nitrogen-added Al rare-earth alloys for thin film transistors

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## Abstract

The effects of nitrogen addition to aluminum-rare-earth alloys were investigated. Yttrium and gadolinium were employed as respective alloy components. The electrical properties and hillock densities of alloy films were investigated, and their nanostructures were studied by cross-sectional transmission electron microscopy. Nitrogen effectively decreases the grain size, and causes the columnar structure, that is generally present in aluminum-based alloys, to disappear. Nitric aluminum-rare-earth alloys have a strong resistance to hillock formation, and formed no micro-voids even after annealing at 350°C. As an  $N_2$  flow rate of 1.3–10% in the sputtering gas gives a low hillock density of  $2.0E+1-7.7E-1$  pcs/mm<sup>2</sup> after annealing at 350°C in both nitric Al-rare-earth alloys, in the case of patterned nitric aluminum-yttrium alloys, an  $N_2$  flow rate of less than 1.3% causes large side-hillocks after annealing at over 350°C. As an optimum value, an  $N_2$  flow rate of 2.5% results in a low hillock density of  $1.9E+1$  pcs/mm<sup>2</sup> and a low resistivity of 8.6  $\mu\Omega$ /cm after annealing at 350°C. © 1999 Published by Elsevier Science S.A. All rights reserved.

**Keywords:** Aluminum-rare-earth alloy; Nitrogen; Void; Hillock

## 1. Introduction

Bottom-gate thin-film transistors (TFTs) have been widely investigated for use in active-matrix liquid crystal displays (AMLCDs). In recent years, the panel size and resolution of AMLCDs have increased dramatically, and much effort has been devoted to developing low-resistivity gate bus lines [1,2]. Aluminum (Al) and its alloys are remarkably good materials for gate bus lines, due to their low resistivity, low cost, high adhesion and superior patternability. However, under thermal processes such as the formation of films by chemical vapor deposition (CVD), aluminum is susceptible to stress migration phenomena such as hillocks and whiskers, which cause defects as a result of short-circuits and current leakage between the gate and the upper electrodes. Voids also occur as stress migration phenomena, and result in open defects of the lines or on-current (I<sub>on</sub>) defects of TFTs. The thermal expansion mismatch between Al and the glass substrate produces large compressive stress in the Al film upon heating, and results in the stress migration, relaxing the stress [3–5]. The alloying of Al has been studied with the aim of increasing its hillock resistance, and it is known that Al-rare-earth alloys have high hillock resistance [6–9]. The hillock density of 1–2 at.% Al-Y, Al-Gd, or Al-Nd alloy after annealing at 350°C has been measured at  $1E+$

$1-1E+2$  pcs/mm<sup>2</sup> [9]. This value is not low enough for the fabrication of AMLCDs, but may be suitable if a thermal protective structure such as an oxidized or metal-capped structure is used [9]. In a previous paper on the anodic oxidation of nitric Al-rare-earth alloys, we reported that the addition of nitrogen reduces the surface roughness [10]. Kam et al. have also reported that the nitric Al-boron (B) alloy or nitric Al-nickel (Ni) alloy reduces hillock formation [11]. In the work described in this paper, we employed yttrium (Y) or gadolinium (Gd) as a rare-earth alloy element, and investigated the electrical properties and the resistance of nitric Al-rare-earth alloys to void and hillock formation; such alloys were found to have superior properties for our purpose. We also investigated the nanostructure of the films by transmission electron microscopy (TEM).

## 2. Experiment

Aluminum alloys were deposited on 5-inch-square LCD grade glass substrates by means of a DC magnetron sputtering apparatus (Tokuda System-512) at a pressure of 0.4 Pa and a substrate temperature of 100°C. The base pressure was lower than  $1.0E-4$  Pa at a temperature of 100°C. Argon (Ar) gas or a mixture of Ar and nitrogen ( $N_2$ ) was used as the sputtering gas, and the total flow rate was kept constant (the  $N_2$  flow rates in the sputtering gas were 0, 0.6, 1.3, 2.5, 5.0, 10 and 15%). Yttrium (Y) and gadolinium (Gd) were

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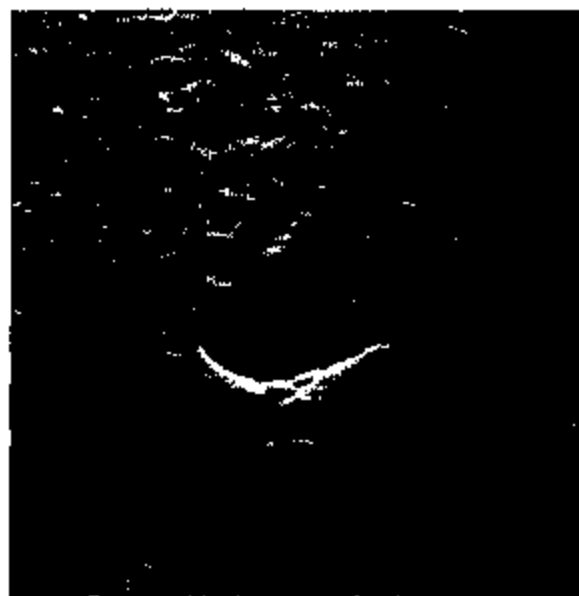


Fig. 1. SEM view of a void formed by annealing of an Al-Y (1 at.%) alloy at 350°C.

employed as respective alloy components, and each alloy with a composition of 1 at.% was sputtered from an alloy target. As a reference, pure Al was also sputtered from a pure Al (5N) target. The film thicknesses of the sputtered samples were determined by the step height measuring system (Tencor P-1), and ranged from 190 to 320 nm. The compositions of the films were determined by electron spectroscopy for chemical analysis (ESCA; SSI M-probe ESCA) after a few periods of surface etching with Ar plasma.

The samples were annealed at 250, 350 and 450°C in a nitrogen atmosphere for 1.0 h, and cooled in air at room temperature. This annealing temperature was determined according to the maximum temperature of the AMLCD fabrication. The sheet resistance of the films was measured

with a four-point-probe resistance-testing system (Napson RT-8S), and the resistivity was calculated from the sheet resistance and the film thickness. The numbers of hillocks in areas ranging from 0.003 to 8 mm<sup>2</sup> were counted by polarized optical microscopic examination.

Voids and hillocks in Al-Y and nitric Al-Y alloys were observed by SEM (Hitachi S-800), and cross-sectional views of Al-Y and nitric Al-Y alloys were observed by TEM after a sample had been prepared by focused ion beam (FIB) etching.

Lines of Al-Y and nitric Al-Y alloys 5–100 µm wide were patterned by a photolithographic method. All these alloys were etched with a mixture of phosphoric acid, nitric acid, and acetic acid. The samples were also annealed in the conditions mentioned above. Hillocks in the area of 0.003–5 mm<sup>2</sup> were counted by polarized optical microscopic examination.

### 3. Results and discussion

The resistance of Al-rare-earth alloys to hillock formation is superior to that of pure Al. For example, the hillock density of Al-Y (1 at.%) or Al-Nd (2 at.%) alloy after 350°C annealing was  $1E + 1-1E + 2$  pcs/mm<sup>2</sup> [9]. This value is suitable for TFT-LCD manufacturing if a thermal protective structure such as an anodized or metal-capped structure is used [9].

However, we found that conventional Al-rare-earth alloys such as Al-Y (1 at.%) or Al-Gd (1 at.%) alloys form microvoids after annealing at temperatures higher than 350°C. The voids formed several days after annealing. Fig. 1 shows an SEM micrograph of a void formed in an Al-Y (1 at.%) alloy after annealing at 350°C. The voids were mostly smaller than 0.5 µm in diameter, and only rarely larger than 1 µm in diameter. The void densities of Al-Y (1 at.%) after annealing at 350 and 450°C were about  $3E + 4$  and  $5E + 4$  pcs/mm<sup>2</sup>, respectively. The microvoids look

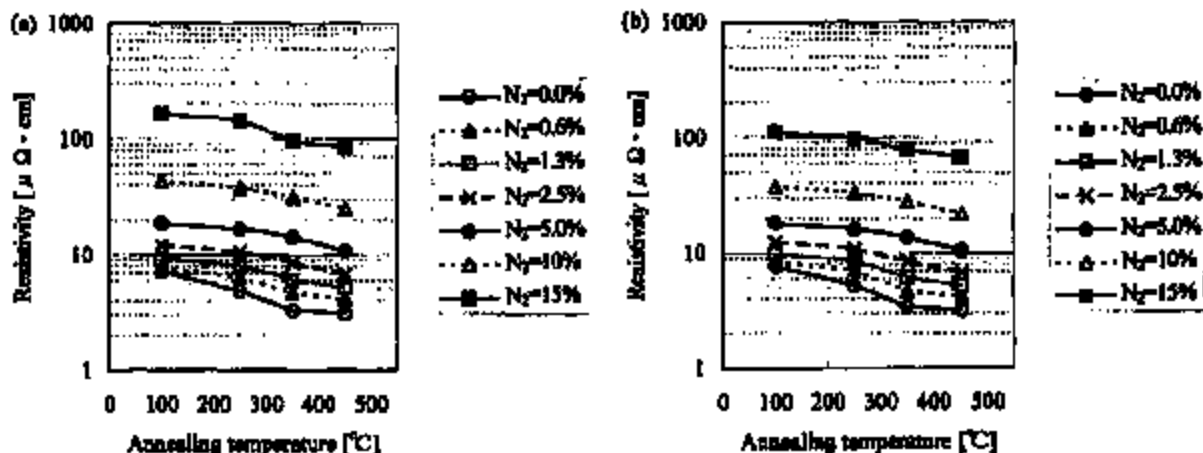


Fig. 2. Resistivity versus annealing temperature: (a) nitric Al-Y (1 at.% Y) alloy, (b) nitric Al-Gd (1 at.% Gd) alloy.

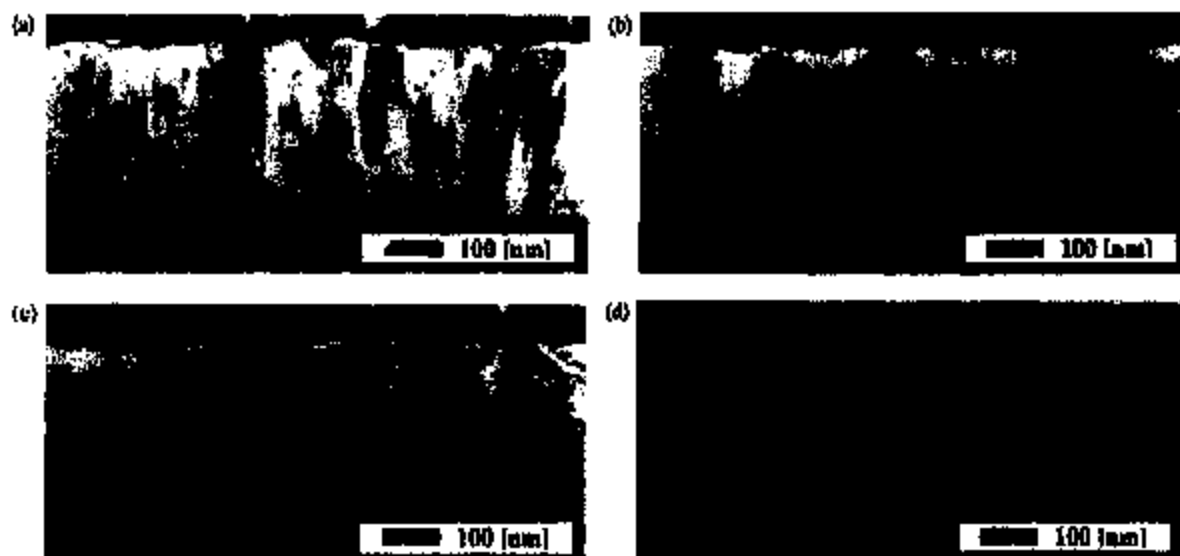


Fig. 3. Cross-sectional TEM views: (a) as-deposited Al-Y (1 at.% Y) alloy, (b) 350°C-annealed Al-Y (1 at.% Y) alloy, (c) as-deposited nitric Al-Y (1 at.% Y, 4.6 at.% N) alloy, (d) 350°C-annealed nitric Al-Y (1 at.% Y, 4.6 at.% N) alloy.

as if some grains are missing. It is known that high-temperature annealing of Al alloys leaves high tensile stress in the film after annealing [5,7]. We think that the tensile stress causes vacancy migration to the grain boundaries or grain triple points and creates voids. The formation of voids may be related to the base pressure of the sputtering or the environmental conditions of the clean room in which the sputtered substrates were deposited. Since it is necessary to manufacture fine TFT-LCDs even in difficult conditions, we decided to investigate the effects of nitrogen to Al, predicting that it would reduce the grain size, change the structure from columnar to granular, and make it resistant to the formation of voids.

We formed nitric Al-based alloys by the reactive sputtering method. When pure Al was used as a sputtering target, nitrogen roughened the film surface and colored it to brown.

However, when an alloy target was used, a smooth film surface was obtained [10]. Fig. 2 shows the resistivities of the Al-based alloys before and after annealing. As can be seen, the resistivities of the films were decreased by annealing. This phenomenon is considered to be caused by the segregation of the alloying elements as a second-phase precipitate at the Al grain boundaries [5]. Low resistivity of the gate metal is required for AMLCDs, because the gate pulse transmitted to the gate line is distorted as it travels down the line [12]. Our target for the resistivity of large, high-resolution displays is less than  $10 \mu\Omega/\text{cm}$ . In the fabrication of AMLCDs, high temperature in the deposition of gate insulator, which is usually performed by chemical vapor deposition (CVD), decreases the resistivity of Al-based alloys. The temperature of the CVD is about 350°C in plasma-enhanced CVD (PE-CVD), and about 450°C in

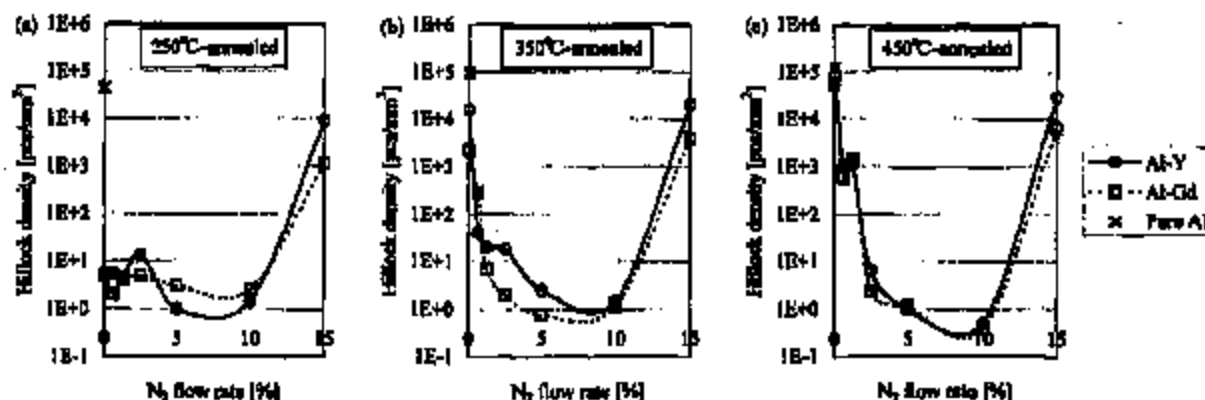


Fig. 4. Hilllock density versus  $N_2$  flow rate: (a) 250°C-annealed, (b) 350°C-annealed, (c) 450°C-annealed.



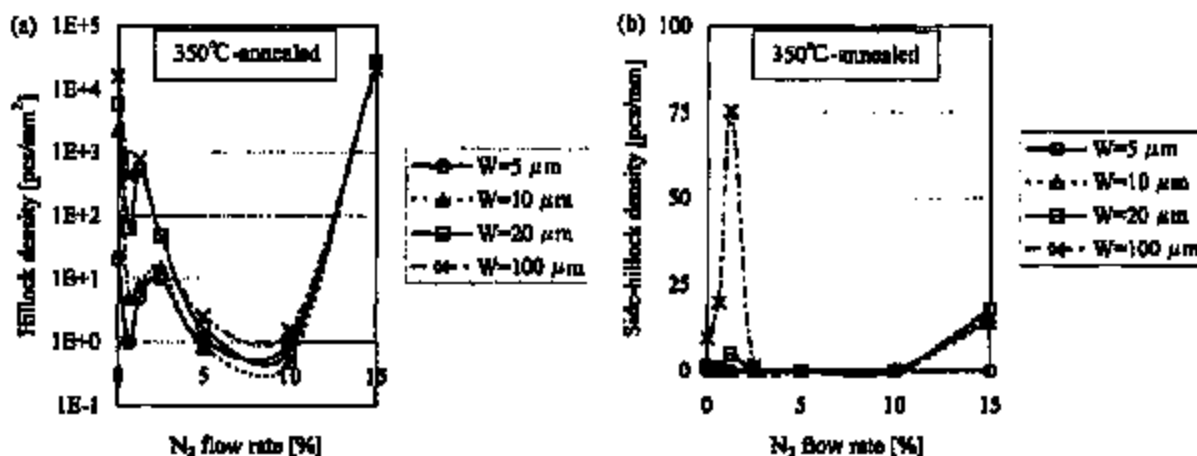


Fig. 5. Hillock density of nitrid Al-Y alloy versus line width.

atmospheric pressure CVD (AP-CVD). Therefore, an  $N_2$  flow rate of less than 2.5% will be suitable for the fabrication of AMLCDs as regards the resistivity.

Fig. 3 shows cross-sectional TEM views of Al-Y (1 at.%) and nitric Al-Y (1 at.% Y, 4.6 at.% N) alloys. The nitrogen content of 4.6 at.% was determined by ESCA examination. In the case of Al-Y (1 at.%) alloy, both films (Fig. 3a,b) have columnar structures, and the grain size was increased by the annealing. In the case of nitric Al-Y (1 at.% Y, 4.6 at.% N) alloy, the grain boundary was difficult to distinguish in comparison with that in the Al-Y (1 at.%) alloy, but became well defined with annealing, and a grain-like structure smaller than 50 nm in diameter was observed. This indicates that segregation and growth of the matrix Al by means of high-temperature annealing decreases the resistivity. Moreover, the nitric Al-based alloy did not form any voids even after annealing at 450°C. We consider that this granular (not columnar) structure may prevent nitric Al-based alloys from forming voids.

Fig. 4 shows the hillock density of the annealed films.

Nitric Al-Y alloys and nitric Al-Gd alloys showed almost the same tendency with regard to the formation of hillocks in relation to the nitrogen content and annealing temperature. The hillock densities after annealing at 250°C were low enough when the  $N_2$  flow rate was less than 10%. However, the hillock density increased abruptly as a result of annealing at over 350°C, indicating that the structural change shown in TEM views occurs mainly at temperatures between 250 and 350°C. The hillock densities after annealing at 450°C were lower than after annealing at 350°C. This may mean that it is possible to decrease the hillock density by quickly passing the yield point (i.e. the temperature at which hillocks are formed), which would be between 250 and 350°C in these nitric Al-based alloys. The target for the hillock density after annealing at 350°C is lower than  $1E+2$  pcs/mm². This value is satisfied by the hillock density of Al-rare-earth (1–2 at.%) alloys [9]. In AMLCD fabrication at a maximum temperature of over 350°C, an  $N_2$  flow rate of 0.6–10% for nitric Al-Y alloys or 1.3–10% for nitric Al-Gd alloys seemed suitable for the fabrication of AMLCDs.

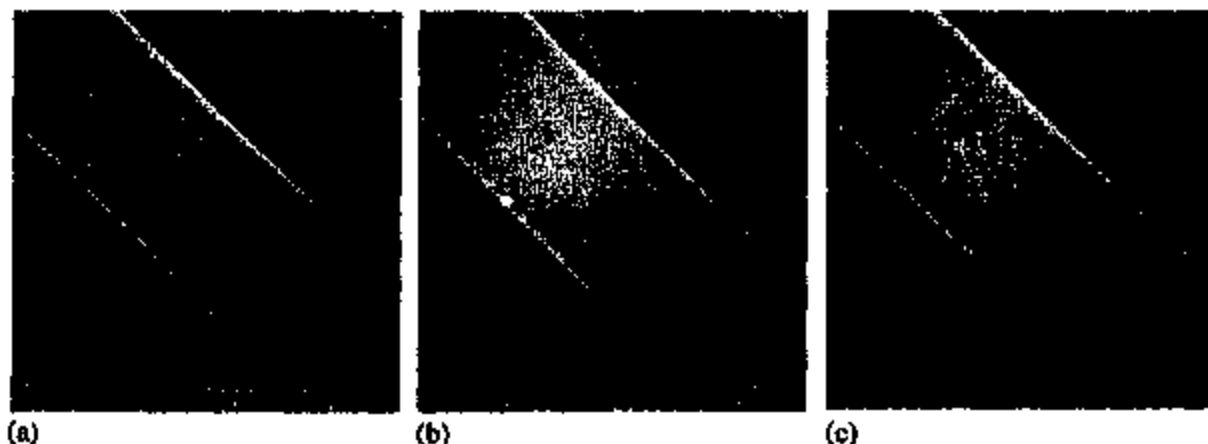


Fig. 6. SEM views of 350°C-annealed lines: (a) Al-Y (1 at.%) alloy, (b) nitric Al-Y (1 at.% Y, 2.3 at.% N) alloy, (c) nitric Al-Y (1 at.% Y, 4.6 at.% N) alloy.

Next, we patterned 5- to 100- $\mu\text{m}$  wide lines, and investigated the relationship between the hillock density and line width. Fig. 5a shows the total hillock density of 5- to 100- $\mu\text{m}$ -wide Al-Y and nitric Al-Y alloys after annealing at 350°C. Narrow lines of, say, 5–10  $\mu\text{m}$  coincided with very low hillock density, whereas lines wider than 20  $\mu\text{m}$  coincided with higher hillock densities, as shown in Fig. 4b, especially at a low  $\text{N}_2$  flow rate. The higher density results from the formation of side-hillocks. Fig. 5b shows the side-hillock density of the lines, and Fig. 6 shows SEM micrographs of the 20  $\mu\text{m}$ -wide Al-Y and nitric Al-Y (2.3 and 4.6 at.% N) alloys. The nitrogen contents of 2.3 at.% and 4.6 at.% were determined by ESCA examination. Side-hillocks occur mainly at an  $\text{N}_2$  flow rate of 0.0–1.3%. The side-hillocks (see Fig. 6b) are larger than the surface-hillocks (see Fig. 6a), and it is predicted that the incidence of cross-short defects of gate lines to upper electrodes drastically increases. Therefore, an  $\text{N}_2$  flow rate of 2.5% is the most suitable value for nitric Al-Y alloy, and the resistivity in this condition is 8.6  $\mu\Omega\text{ cm}$  in 350°C manufacturing, and 6.9  $\mu\Omega\text{ cm}$  in 450°C manufacturing.

#### 4. Conclusion

We investigated the electrical properties and hillock densities of plane surfaces and patterned lines, and the nanostructures of Al-Y and Al-Gd alloys and their nitric alloys. Nitrogen effectively decreased the grain size, and caused the columnar structure to disappear. Nitric Al-rare-earth alloys, which were formed at an  $\text{N}_2$  flow rate of 1.3–10%, had a strong resistance to hillock formation, and formed no micro-voids even after annealing at 450°C. However, in the case of patterned nitric Al-Y alloys, a  $\text{N}_2$  flow rate of less than 1.3% caused large side-hillocks after annealing at over 350°C. Therefore, an  $\text{N}_2$  flow rate of 2.5%

is the most suitable value for nitric Al-Y alloy, and the resistivity in this condition is 8.6  $\mu\Omega\text{ cm}$  after annealing at 350°C, and 6.9  $\mu\Omega\text{ cm}$  after annealing at 450°C.

#### Acknowledgements

We are grateful to S. Tsuji, K. Furuta and G. Tanaka of IBM Display Technology for their valuable advice. We would also like to thank K. Tsujimoto of IBM Display Technology for his TEM observations, M. Sakouchi of IBM Materials Laboratory for his ESCA measurement, and M. McDonald of IBM Yamato Laboratory for his contributions to this paper.

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## INFLUENCE OF THERMAL HEATING EFFECT ON PULSED DC ELECTROMIGRATION

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**Abstract:** Pulsed DC Electromigration (EM) tests up to 1MHz have been performed on single level Al-0.5%Cu metallization. The results are in good agreement with an Average Current Model when the thermal heating effect has been corrected with an original thermal model. Thus, Median Time to Failure (MTF) increase in the MHz region also reported by some authors, appears as a thermal effect. Furthermore, SEM observations showed very large metal accumulations and hillocks which were not seen in DC experiments.

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### INTRODUCTION

Electromigration failure in aluminum interconnects is an issue of continuing interest due to current efforts to increase the integration of circuits. In order to approach the real stress conditions in the circuits and to relax the design rules, many people have investigated pulsed (PDC) EM tests [2-6]. In this perspective, we performed series of tests at frequencies up to 1MHz and for different duty cycles,  $r$ , in order to validate the Average Current Model (ACM) [2]. This model predicts that the sample is stressed by an efficient current density averaged over the period  $J_{eff} = J \cdot r$ , where  $J$  is the peak current density. The use of the generalized Black's equation  $MTF = A J^{-n} r^{-m} \exp(E_a/kT)$  [1-4] allowed us to extract the current density and duty cycle accelerating factors,  $n$  and  $m$ , using a global exploitation, and to display the difference between experiment and ACM model. Hereafter, on one hand, we demonstrate (in our case) that the MTF increase in the MHz region already reported [5], results from a pure thermal effect [6], and, on the other hand, we show that very large hillocks can be obtained with these stress conditions before failure of the line.

### EXPERIMENTAL

The tests were performed on single level AlCu NIST structures [7]. Figure 1 shows a cross-section of the metallization. The thickness of the layers is as follows :

Si/SiO<sub>2</sub>(600nm)/Ti(40nm)/TiN(60nm)/AlCu(440nm)/Ti(10nm)/TiN(40nm)/SiO<sub>2</sub>(700nm)

The 800µm long and 3µm wide lines are connected to the pads via a 6µm wide current access line.



Figure 1 Cross-section of the test structure

The PDC temperature ( $T_{pdc}$ ) is the mean temperature during the on-time of the cycle and is calculated with a thermal model [8] using the measurement of thermal time constant ( $\tau_h$  close to  $1\mu s$ ) and  $T_{dc}$ .

### THERMAL MODEL

A purely resistive line, described as a first order system, is submitted to a periodic Joule heating. The power  $P(t)$  dissipated during the time interval  $dt$  is equal to the accumulated heat added to thermal losses (Equation 1).

$$P(t)dt = C_h dT + \frac{T - T_s}{R_h} dt \quad (1)$$

$T_s$ ,  $C_h$ ,  $R_h$ : respectively substrate temperature, thermal capacitance and thermal resistance.

From Equation 1 and by using the Laplace transformation, we can calculate  $T_1$  and  $T_2$  corresponding respectively to the steady state minimum and maximum values of the sample temperature during the pulsed EM test. We can then extract the temperature  $T_{pdc}$ , which is the average temperature of the sample during the application of an unidirectional power pulse (Equation 2). This value will be used for the exploitation of pulsed EM results.

$$\frac{T_{pdc} - T_s}{\Delta T} = 1 - \frac{f \times \tau_h}{r} \cdot \frac{T_2 - T_1}{\Delta T} \quad (2)$$

$\Delta T$ ,  $f$ ,  $r$ ,  $\tau_h$ : respectively DC Joule heating, frequency, duty cycle and thermal time constant.

### RESULTS

From DC tests at two different oven temperatures (200°C and 250°C), we extracted the usual Black's equation parameters. The results are as follows:  $E_{a,dc}=0.66eV$  and  $n_{dc}=2.6$ . The tests achieved at a frequency of 10kHz allowed us to extract the activation energy in the PDC case. We found  $E_{a,pdc}=0.67eV$ . The MTFs for DC and PDC tests as well as the temperatures are summarized in Table 1.

Table 1 Test conditions - Calculated temperatures - MTFs

| freq.                 | DC  |      |     | 100 kHz |      |     | 10 kHz |     |     | 1 MHz |     |     |
|-----------------------|-----|------|-----|---------|------|-----|--------|-----|-----|-------|-----|-----|
| r (%)                 | -   | -    | -   | 50      | 80   | 80  | 20     | 50  | 80  | 80    | 80  | 80  |
| J (MA/cm²)            | 2   | 4    | 8   | 4       | 8    | 4   | 8      | 4   | 8   | 4     | 8   | 4   |
| T <sub>dc</sub> (°C)  | 205 | 222  | 253 | 225     | 233  | 224 | 235    | 236 | 242 | 231   | 224 | 253 |
| T <sub>pdc</sub> (°C) | -   | -    | -   | 225     | 233  | 234 | 235    | 234 | 236 | 231   | 230 | 212 |
| MTF (%)               | 677 | 78,7 | 8,1 | 480     | 38,8 | 153 | 5,2    | 606 | 478 | 47,7  | 10  | 837 |

We studied the ratio  $MTF_{pdc}/MTF_{dc}$  by using the PDC activation energy to correct some temperature differences. By fitting the plot  $\ln(MTF_{pdc}/MTF_{dc})$  vs  $\ln(r)$ , we could extract the slope which represents the parameter  $m$  (See Figure 2).

Table 2  $n$  and  $m$ : linear regression -  $T_{pdc}$

$m'$ : slope of the fit -  $T_{pdc}$

$m''$ : slope of the fit -  $T_{dc}$

|        | Lin. Regress. |             | $T_{pdc}$ | $T_{dc}$ |
|--------|---------------|-------------|-----------|----------|
|        | $n$           | $m$         |           |          |
| 100 Hz | 3.2           | 3.1         | 2.8       | 2.8      |
| CI 80% | [2.7 - 3.8]   | [2.5 - 3.5] |           |          |
| 10 kHz | 3.0           | 2.8         | 2.9       | 2.8      |
| CI 80% | [2.8 - 3.4]   | [2.6 - 3.3] |           |          |
| 1 MHz  | 2.5           | 2.8         | 2.7       | 2.8      |
| CI 80% | [2.0 - 3.0]   | [2.1 - 3.4] |           |          |

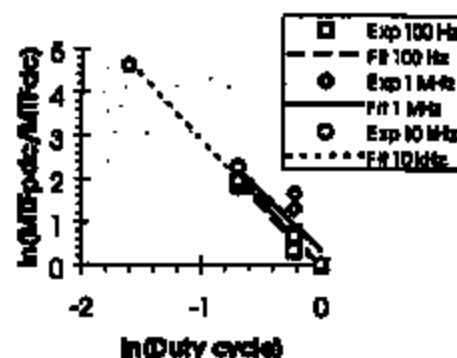


Figure 2 Normalized MTF vs Duty cycle

Depending on the temperature used,  $T_{pdc}$  or  $T_{dc}$ , we obtain different results, respectively  $m'$  and  $m''$ . These results are summarized in Table 2. Furthermore, a multilinear regression over  $J$  and  $r$  after temperature correction ( $T_{pdc}$ ) allowed us to extract simultaneously  $n$  and  $m$  for the different frequencies (See Table 2).

All of the plots Resistance vs Time present a linear decrease until failure and the slopes are directly correlated to the stress conditions (See Figure 3).

Figure 3 Resistance vs Time -  $f=10\text{kHz}$

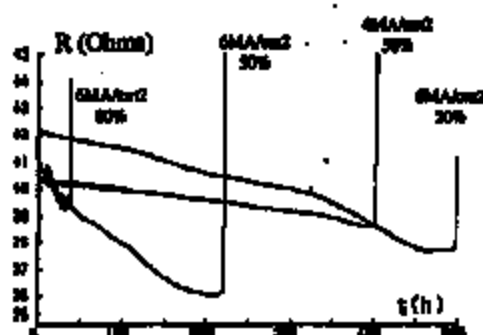


Figure 4 SEM view of a slit-void

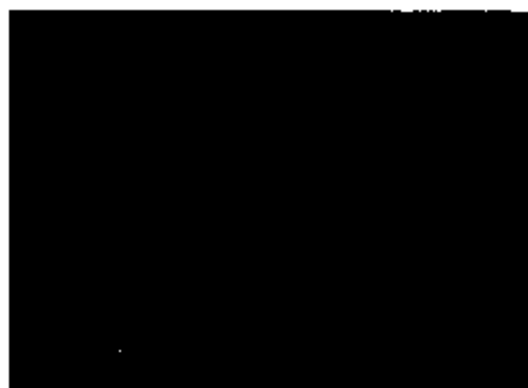


Figure 5 SEM view of an accumulation



Furthermore, many SEM observations have been performed after test and removal of the passivation layer. All the failures are slit-void failures (See Figure 4) and are randomly located in the half part of the line near the cathode in both DC and PDC cases. We found also a lot of metal accumulations and large hillocks all along the line (See Figure 5). Some hillocks are single crystals grown out of the line by cracking the ARC layer and the passivation and, can be up to 10  $\mu\text{m}$  long. We did not find any large depletion on the line and AFM measurements showed that the whole accumulated matter comes from the current access line.

## ANALYSIS

We found the same activation energy in both DC and PDC cases. So we can suppose the diffusion mechanisms to be the same in both cases. As shown in Table 2,  $m'$  displays a large increase for high frequencies, whereas  $m$  is quite constant. This increase of  $m'$  is due to a pure thermal effect: the actual operating temperature of the sample doesn't reach  $T_{\text{eff}}$  during the on-time for these frequencies.

Seeing that the 95% confidence intervals are quite large, it appears that the multilinear regression calculated parameters  $n$  and  $m$  are almost equal (See Table 2) and close to the DC value. This result validates the ACM Model, for which the sample is subject to an efficient current density  $J_{\text{eff}} = \overline{irf}$  averaged over the period. The obtained value of  $n$  appears as a result of the competition between structural induced ( $n=1$ ) and thermal induced ( $n=3$ ) failures [9].

The main difference between DC and PDC results concerns the SEM observations. Indeed, the number and size of the accumulations and hillocks are strongly correlated to the test time and the pulsed stress conditions because this phenomenon was much less pronounced on DC-tested samples. A measurement of the accumulation dimensions allowed us to correlate perfectly the local line section increase to the resistance decrease shown in Figure 2, which is not only due to the usual Al<sub>2</sub>Cu precipitation. In some cases, this decrease can reach up to 20% of the initial value  $R_0$ .

On one hand, we suspect the thermal Joule cycling, due to current pulse stresses, to reduce the mechanical resistance of the passivation. On the other hand, the Ti/AlCu interface seems to be a very easy diffusion path. Then, the metal coming from the pad and travelling along the interface is blocked by a perpendicular grain boundary crossing the line and cracks the weakened passivation layer. So, a very large amount of matter can be accumulated without failure in the PDC-tested single level samples. In structures without large reservoir of matter (eg lines with via access), interfacial diffusion would probably lead to earlier failure. Investigations of PDC EM in such structures are under progress.

## CONCLUSION

The PDC test results on single level AlCu metallization are in agreement with the ACM model because we found  $n$ ,  $m$  and  $m'$  almost equal. In opposition to some authors, the MTF values are quite high and reflect probably the interface diffusion depleting the 6µm wide current access line. We also showed that for frequencies close to  $1/\tau_{\text{th}}$ , the calculation of the real sample temperature, provided by the thermal model, is needed. Microstructural characterisation of the samples has shown extremely large hillocks without electrical failure of the line.

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# Enhanced optical performance of aluminum films by copper inclusion

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Received 25 July 1998; accepted 4 September 1998

## Abstract

The aluminum film is a standard coating material for optics. It yields a high reflectance over a broad wavelength region, and films can be made sufficiently smooth for high quality optical applications. However, it suffers from a high sensitivity to hillock formation and severe degradation of its low light scattering properties, already at temperatures of 70–80°C. In order to raise the temperature for onset of hillock formation we have co-evaporated a slight amount (5 at.%) of Cu into the Al film. The anti-hillocking performance was indeed confirmed by raising this temperature to ~130°C. But, we also greatly reduced the surface roughness of the co-deposited 3600 Å films to the outstanding values of 1–3 Å rms as measured by the ASTM F 1048-87 total integrated scattering (TIS) method. This yields very low light scattering films despite their thickness. Also, the specular reflectance was coming out just as high as for a pure Al film over a wide wavelength range. The enhanced optical performance is attributed to less light scattering of the co-evaporated film and to the strengthening effect in the film. © 1999 Elsevier Science S.A. All rights reserved.

**Keywords:** Aluminum; Light scattering; Optical properties; Surface roughness

## 1. Introduction

Aluminum films have been used for a long time as broad band front reflecting surfaces on high quality optics like mirrors and gratings [1]. For low light scattering optics special care has to be taken in depositing these films, but evaporated under good conditions very high quality films can be obtained with a roughness of a few Å rms. Normally, the thicker the film the rougher the surface will be [2]. Typical roughness values obtained by the ASTM F 1048-87 approved total integrated scattering (TIS) technique [3] for high quality films evaporated in ultra high vacuum are 2 Å for about 800 Å thick films and 4–5 Å for about 2300 Å thick films. However, one drawback of the Al film is its sensitivity to hillocking at temperatures higher than about 75°C [4]. This is particularly cumbersome when dielectric top coatings requiring elevated temperatures, well above 100°C, for good densification are to be deposited as protective layers. The hillocking phenomenon that is due to the thermal mismatch between the film and the substrate causes surface protrusions in the Al film that raises the light scat-

tering level by orders of magnitude. Thus, by being subject to heating at moderate temperatures, a super polished high quality mirror may easily turn into a low performance reflector. As the hillocking is an irreversible deterioration of the film surface there are no other means than stripping and recoating the mirror blank to regain its former low light scattering properties. In earlier investigations we have shown that the formation of the first hillocks is associated with a compressive stress maximum in the film which is subject to a constant heating rate [5]. This is followed by an overall relaxation in the film while simultaneously a great number of hillocks are being formed. One way to reduce the number of hillocks is to use a low heating rate [6], but that is not a cost efficient way for a manufacturing process. The ideal way would be to strengthen the Al film to withstand a higher stress before hillocking occurs, and thereby also withstand higher temperatures.

In this paper we present a technique that shows great promise of achieving that goal without sacrificing the optical quality of the Al film. Rather, it reduces the surface roughness and yields very low light scattering surfaces even for films of thickness in the range of 3000–4000 Å. The key to the improved quality is the introduction of a few per cent copper as an alloying element in the Al film. The reason for adding Cu is that it has shown improving effects on hillocking of very thick Al films (11.2 µm) [7]. Also, the

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discovery of the beneficial effect of Cu additions on the lifetimes of Al metallization layers subject to electromigration [8] was a major breakthrough for the microelectronics development. Since then lots of work have been done in the microelectronics field. On the contrary, we found only two papers referring to dilute Cu alloying in high optical quality Al films in the literature [9,10]. The early paper by Beaglehole and Wihl [9] reports on a thorough experimental investigation and analysis of bulk electronic structure of Al films co-evaporated with Cu. In the letter by Rieck et al. [10] they report the reflectance of a magnetron sputtered 600 Å thick Al-4% Cu film to be better than for the pure Al film. This observation was made at 780 nm wavelength only and no analysis or attempt of explanation for the enhanced reflectance was given. Other works reporting on reflectance properties have been made at substrate temperatures far too high to yield low light scattering high quality films [7,11].

In an initial work for improving the optical quality of Al films we used an interface layer of Cu and found that the temperature for onset of hillock formation was raised by approximately 20°C [12]. The present work presents the advantage of co-evaporating Cu and Al and its effect on the optical quality. After the experimental presentations, results are given that show the improved hillocking suppression, the low light scattering and the generally better optical performance over a wide wavelength range. A short discussion is given on the analysis of the films.

## 2. Experimental

### 2.1. Sample preparation

Two batches of samples were used in this investigation. One batch of pure Al films was evaporated onto one set of silicon wafers, and an other batch of Al-Cu films was co-evaporated onto a second set of silicon wafers. In both cases the wafers were sitting close to the periphery of a rotary mount spinning at approximately 60 rev/min at a distance of 40 cm above the evaporation sources. The Al that was evaporated by an e-beam gun had a purity of 99.999% (Balzers) and the Cu had a similar purity. The ultra high vacuum (UHV) system used for the evaporation has one electron beam gun and one thermal source. The Al was evaporated from the e-beam gun and the Cu from the thermal source. Prior to the evaporation thickness calibration was made by checking the actual film thickness with our Talystep surface profilometer and adjusting the quartz crystal balance to be showing the correct deposition rate. After deposition of the samples the final film thickness was measured by the Talystep, confirming the final film thickness to be about 3400 Å for the Al films and 3600 Å for the Al-Cu films. The films were deposited onto the polished side of 0.5 mm thick, 3" (100) oriented silicon wafers (Virginia semiconductors). The wafers, coming straight out of wafer boxes and having a native oxide, were kept at room

temperature during the film deposition. The background pressure in the vacuum chamber was  $< 10^{-8}$  Pa. During the deposition the pressure rose by one order of magnitude. The deposition rate was approximately 20 Å/s for the Al batch and 18 Å/s for the Al-Cu batch. The deposition rate between the Al and the Cu in the co-evaporation was balanced so that the final Al-Cu film should contain about 3 at.% (6 wt.%) of Cu. The composition of Al relative to Cu was checked by energy dispersive X-ray (EDX) technique installed in a scanning electron microscope (SEM). It was found that the Al-Cu composition of the samples did not differ significantly from each other.

### 2.2. Characterization

The as-deposited samples were analyzed by several methods. The light scattering and surface roughness of the films were characterized by total integrated scattering (TIS) [4,13]. TIS is an ASTM F 1048-87 approved [3] non-contact, non-destructive method for measuring the effective surface roughness of optical components. It is extremely sensitive to microtopography having surface spatial frequency components in the range of  $0.07$ – $1.5 \mu\text{m}^{-1}$ , i.e. the frequencies that mainly determine the light scattering losses of optical components. The measured surface roughness thus depends on the surface spatial frequencies that can be detected by the TIS instrument, but averaged from several measurement spots (each  $1 \text{ mm}^2$ ) on the surface. The TIS value is defined as the ratio between the scattered light and the total reflected light, expressed in reflectance ratio as  $R_d/R_0$ .

$$\text{TIS} = \frac{R_d}{R_0} = \left( \frac{4\pi\sigma\cos\theta}{\lambda} \right)^2 \quad (1)$$

The scalar scattering theory relates the measured TIS value to the root mean square (rms) surface roughness  $\sigma$ , the incident wavelength  $\lambda$  (633 nm) and the angle of incidence of light  $\theta$  on the surface [14]. The TIS measured rms roughness according to ASTM F 1048-87 can act be directly compared with the roughness obtained by e.g. an atomic force microscope, as the instrumental footprints of these two techniques are indeed different. (The AFM measures much higher spatial frequencies and is limited to areas of only  $0.01 \mu\text{m}^2$ .) For the assessment of the optical performance the TIS roughness is therefore preferred and used in the results section. Nevertheless, for a better understanding of the results the microtopography was examined by a Dimension 3000 atomic force microscope (AFM) operated in tapping mode both with and without the "phase contrast" image enhancement. A direct measurement of the specular reflectance ratio of the two batches of films was made in a Lambda 9 spectrophotometer after the first heat treatment, in order to confirm the overall optical properties over a wide wavelength range.

The onset of hillock formation was revealed in real time by the vacuum compatible partial integrated scattering and



Table 1  
Summary of the total integrated scattering (TIS) investigation

| Sample #     | Initial total integrated scattering | Initial root mean square (rms) roughness (Å) |
|--------------|-------------------------------------|----------------------------------------------|
| 1 (Pure Al)  | $3.3\text{--}4.4 \times 10^{-4}$    | 9.2–10.6                                     |
| 2 (Pure Al)  | $3.5\text{--}4.4 \times 10^{-4}$    | 9.4–10.6                                     |
| 3 (Pure Al)  | $3.2\text{--}4.3 \times 10^{-4}$    | 9.0–10.4                                     |
| 4 (Al–Cu)    | $0.8\text{--}2.0 \times 10^{-3}$    | 1.4–2.2                                      |
| 5 (Al–Cu)    | $0.7\text{--}3.3 \times 10^{-3}$    | 1.3–2.9                                      |
| 6 (Al–Cu)    | $0.7\text{--}2.6 \times 10^{-3}$    | 1.3–2.6                                      |
| 7 (Si-wafer) | $2.4\text{--}4.7 \times 10^{-3}$    | 0.8–1.1                                      |

deflection (VeCPISD) instrument [15] yielding a light scattering profile of the surface vs. time and temperature while the samples were radiatively heated in air using a temperature ramp of  $3^\circ\text{C/s}$  up to a temperature well exceeding the temperature for onset of hillock formation. Our thermal treatments were done within the two-phase  $\text{Al}_2\text{Cu}$ –Al region in the phase diagram of Al–Cu, i.e. well below the solvus temperature, and were expected to cause  $\text{Al}_2\text{Cu}$  ( $\theta$ ) phase

precipitates at aluminum grain boundaries to grow and precipitates within aluminum grains to diminish [16,17].

### 3. Results and discussion

#### 3.1. Light scattering, surface roughness and grain size

Table 1 shows the TIS values (= diffuse reflectance divided by total reflectance) and the corresponding TIS measured surface roughness  $B$  for the Al and Al–Cu film batches after the deposition, but before any thermal treatment. For comparison a typical Si wafer used for the film deposition is also included in the same table. We can see that all the pure 3400 Å thick Al films have TIS values less than  $5 \times 10^{-4}$  and the 3600 Å thick Al–Cu films have TIS values less than  $4 \times 10^{-3}$ . These TIS values correspond to surface roughness of  $<11$  Å rms and  $<3$  Å rms, respectively, over the TIS sensitive surface wavelength range of 0.7–15  $\mu\text{m}$ . From previous experience the 9–11 Å rms roughness is in the high end of where we expect such a thick Al film to be. Typical roughness would have been 7–8 Å rms. However, the 1–3 Å rms for the Al–Cu film is by far better than we have ever seen for any Al films with a thickness of 3600 Å. The surface quality is thus considerably improved by the inclusion of the Cu atoms.

Within each batch only small variations in TIS values were observed. This confirms that the sample position in the rotary mount was not critical for the final surface quality of the films, i.e. they had almost identical as-deposited surface roughness. The main contribution to the roughness comes from the film, since the roughness of the silicon wafers was in the 1 Å range. Earlier studies have shown that the as-deposited surface roughness of the films depends on both the film thickness and the deposition conditions such as background pressure and deposition pressure [1]. Since surface roughness increases with film thickness as a result of increasing grain size [18,19], the Al–Cu films were purposely chosen to be slightly thicker (3600 Å) than the Al films (3400 Å) to exclude this thickness effect. Already at this point of our investigation, with the low TIS values and surface roughness numbers, we can make a guess that the grain size is considerably smaller in the Al–Cu film.

Other parameters known to be influencing the grain size are deposition rate and substrate temperature. A higher deposition rate and a lower substrate temperature will create smaller grains. As both substrate temperature and deposition rate were about the same for the two batches, we conclude that the Cu atoms played an important role in the grain development, making the grains smaller. The final proof of that was obtained by AFM investigations that revealed the mean grain size of the Al–Cu film to be about 50 nm, only half of the grain size of the Al film. This is shown in the  $1 \times 1 \mu\text{m}^2$  AFM “phase contrast” images of Fig. 1. Knowledge from the literature combined with our present results thus confirm that alloying has the effect of producing small-

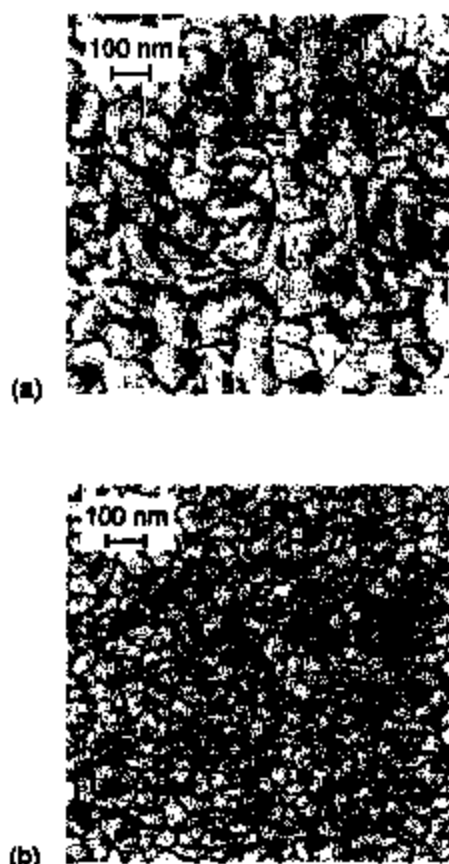


Fig. 1.  $1 \times 1 \mu\text{m}^2$  AFM images of: (a) the pure Al film and (b) the Al-3 at.% Cu film obtained in the phase sensitive tapping mode.

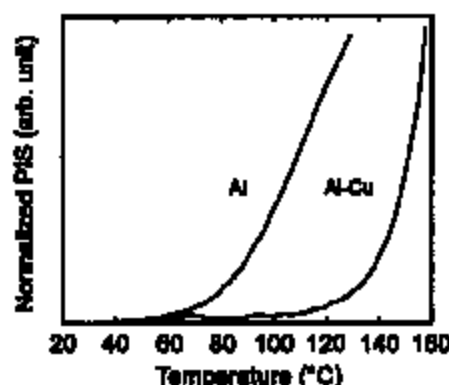


Fig. 2. Real-time partial integrated scattering (PIS) obtained at 633 nm wavelength from the pure Al film and the Al-Cu film versus sample temperature when subject to a temperature ramp of 3°C/s. Note that the low PIS curve for Al-Cu is magnified by 100  $\times$  in the vertical direction to be comparable with the PIS curve for the pure Al film.

ler grain sizes and thereby a surface that scatters a lot less light than the pure Al film surface. But, will it also increase the yield strength of the film [20] and thereby make it more resistant to hillocking?

### 3.2. Strengthening effect

In order to answer that question the samples were positioned one at a time in the VACPISD instrument [15] and were subject to identical thermal treatments, a continuous temperature ramp of 3°C/s, starting from room temperature.

During the heating process there is a build up of compressive stress due to the expansion of the film relative to the much less expanding silicon wafer and therefore no voids were expected to be formed. Only a few growth hillocks were observed on the samples prior to the heat treatment.

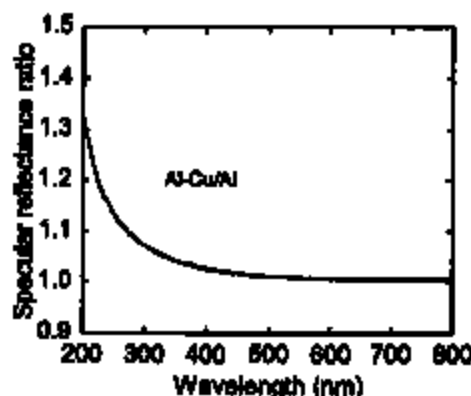


Fig. 3. Specular reflectance ratio (Al-Cu film/pure Al film) versus wavelength for samples that have been heated to 130°C (Al) and 180°C (Al-3 at.% Cu). The enhanced reflectance of the Al-Cu film at the shorter wavelengths is attributed to less light scattering losses from hillocks.

The experimental results from this investigation appear as partial integrated scattering (PIS) versus the sample temperature, where the PIS is a relative measure of the number and size of hillocks apparent within the approximately 1 mm<sup>2</sup> area irradiated by the laser beam in the instrument. Two representative PIS curves (averages from each batch) are shown in Fig. 2, one for the pure Al film and one for the Al-Cu film. They have been set to the same initial scattering level and magnified for a more easy visualization of the differences. It is obvious that the Al-Cu film withstands hillock formation up to a much higher temperature ~130°C as compared to ~75°C for the pure Al film. Analogously with the discussion of film thickness and grain size, the film strength is known to increase when the film is getting thinner. As the pure Al film is thinner this can not be the explanation for the higher strength and hillocking resistance for the Al-Cu film. Again, the strength of the Al-Cu film must be an effect of the Cu atoms. So far we have achieved a three times smoother film with much improved anti-hillocking performance up to about 130°C, by adding 3 at.% Cu into the Al film. But what about its optical performance as a reflector material? Has the copper content reduced the reflectance in the blue region as could be expected from the fact that copper has a lower reflectance than aluminium at wavelengths shorter than about 650 nm [1] and as indicated in early optical studies of the electronic structure of Al-Cu alloys [9].

### 3.3. Reflectance

To get the answer to that question a direct measurement of the specular reflectance ratio of Al-Cu film/Al film was made in the Lambda 9 spectrophotometer, using the pure Al film as the reference surface. The measurement was performed in the wavelength region 200–800 nm. The result of such a measurement after the samples had been subject to a thermal treatment is shown in Fig. 3. In this graph the specular reflectance ratio of Al-Cu film/Al film is plotted versus the wavelength. Again we see that the Al-Cu film has a better performance over the entire spectrum. In particular it shows a better performance for short wavelengths. This can be explained by the higher light scattering losses in the rougher Al film having a considerable larger number of hillocks on its surface after the heat treatment. The smaller grain size of the Al-Cu film also reduces the surface roughness and thereby the light scattering losses, but not to the amount that it is revealed in the specular reflectance ratio. Absolute reflectance was also measured at 633 nm, using a laser power meter. Within a 0.5% error limit, both films had a reflectance of 90%.

Our reflectance results seem to contradict the early work of Beaglehole and Whil [9], who found the reflectance to drop by 1–3% for a 3000 Å thick Al-1.4 at.% Cu alloy at wavelengths shorter than ~750 nm. However, there is a reasonable explanation for this difference. As we have ramped our films up to temperatures of ~180°C for the Al

Cu film and  $\sim 130^\circ\text{C}$  for the Al film before making the reflectance measurements, we got a much higher number of hillocks in the pure Al film for reasons given above. We therefore attribute the enhanced specular reflectivity at shorter wavelengths for our alloy samples to the fact that they have less number of scattering sites than the pure Al film. Other differences that also might influence a comparison are the effect of residual gases in the vacuum chamber. Our system operated at residual gas pressures roughly two orders lower than that of the system used by Beaglehole and Whil, and our absolute reflectance results agree better at 633 nm with the *in situ* data of Bennett [21] than the original data of Beaglehole and Whil.

#### 4. Conclusions

Al-Cu films with approximately 3 at.% Cu content were co-evaporated onto silicon wafers. The optical performance of the films was superior to pure Al films of similar thickness. The Cu content had reduced the grain size and thereby reduced the surface roughness to 1-3 Å rms as measured by total integrated scattering. The light scattering was strongly reduced and was exceedingly low despite a film thickness of 3600 Å. The Cu content had also strengthened the films so that hillock formation on heating was prevented up to about  $130^\circ\text{C}$  as compared to  $75^\circ\text{C}$  for a pure Al film. Although 3 at.% Cu was incorporated in the film the specular reflectance property was as good as or better than the pure Al film after it had been heated. This investigation has shown that the optical and mechanical performance of metal film reflectors can be considerably improved by using alloying elements in the film growth.

#### Acknowledgements

Laurent Krümmenacher at the Surface Evaluation Laboratory, Institute of Optical Research, is greatly acknowledged for the deposition of the samples and for performing the AFM and spectrophotometer measurements. The authors would like to thank Anders Möller at the Division of Fusion Plasma Physics, Alfvén laboratory, Royal

Institute of Technology for performing the BDX analysis. This work has been supported by the Swedish Research Council for Engineering Sciences (TPR) and the Göran Gustafsson Foundation.

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# A study of hillock formation on Al-Ta alloy films for interconnections of TFT-LCDs

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## Abstract

The relationship between hillock formation and microstructure was studied in Al-Ta alloy films for interconnections of thin-film transistor-liquid-crystal displays. In-situ scanning electron microscopy observation of hillock formation, transmission electron microscopy studies of microstructures of both the hillock and film, and in-situ stress measurements during isothermal annealing were carried out on Al-2at.%Ta alloy films deposited on glass substrates by d.c. magnetron sputtering. Hillock size increased with annealing temperature and time during variable temperature and isothermal annealing, respectively. Macroscopic hillock number density saturated soon after the appearance of hillocks. New hillocks were observed on the outer perimeter of old hillocks. The distance between hillocks ranged from 20  $\mu\text{m}$  to 100  $\mu\text{m}$ , an extremely large distance in comparison with the grain size. The relationship between hillock formation and microstructures on Al-Ta alloy films can be explained by a model in which hillock formation due to lateral diffusion, i.e. diffusion in the film plane, results in compressive stress relaxation in a large area around the hillock. The fine-grained film structure caused by the addition of Ta plays an important role in reducing hillock density.

**Keywords:** Aluminium; Tantalum

## 1. Introduction

Hillock formation in thin films during annealing has been known for many years and has been observed in several materials [1,2]. It is believed that microstructure plays an important role in hillock formation. Transmission electron microscopy (TEM) studies have revealed that hillocks form preferentially on grain boundaries or triple points due to diffusion creep [3-5]. It is also reported that grain size and crystallographic orientation affect hillock formation [6,7]. It is possible to control such microstructures by the addition of a small amount of alloying elements; some additives in Al can result in a decrease of hillock size and density [8-10]. However, the relationship between microstructure and hillock formation, or the mechanism of hillock suppression by alloying is not yet well understood.

Hillock formation, which can lead to electrical shorts during annealing, is one of the most important problems for the interconnections of liquid-crystal displays (LCDs). Aluminium and Al alloy films have recently been applied to interconnections of higher resolution and larger size LCDs with thin-film transistors (TFT). However, most Al alloy films, for instance Al-Cu alloy films which are typical interconnections of large-scale integrated circuits (LSIs), undergo higher temperature processes, and therefore form hillocks during

LCD fabrication. Therefore, development of new Al alloy films with high hillock-formation resistance has been a significant important industrial problem.

Al-Ta alloy films have high hillock suppression and low electrical resistivity [11], hence Al-Ta alloy films have begun to be employed for interconnections of TFT-LCDs. In a previous paper, it was shown that atoms which comprised hillocks and whiskers were supplied from inside the film, and there is little Ta content in hillocks [12].

In this study, in-situ scanning electron microscopy (SEM) observation of hillock formation, TEM studies of microstructures of both the hillock and film, and stress measurements during isothermal annealing were carried out on Al-2at.%Ta alloy films in order to understand the effect of Ta addition upon hillock formation. The relationship between hillock formation and microstructures is also discussed.

## 2. Experimental procedure

Al-2at.%Ta alloy films were deposited by d.c. magnetron sputtering on BaO-B<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> glass (Corning No. 7059). The substrates were water cooled during deposition. The base chamber pressure was below  $1.0 \times 10^{-6}$  Torr. The Ar gas pressure during deposition was  $2.0 \times 10^{-3}$  Torr. The sputter-

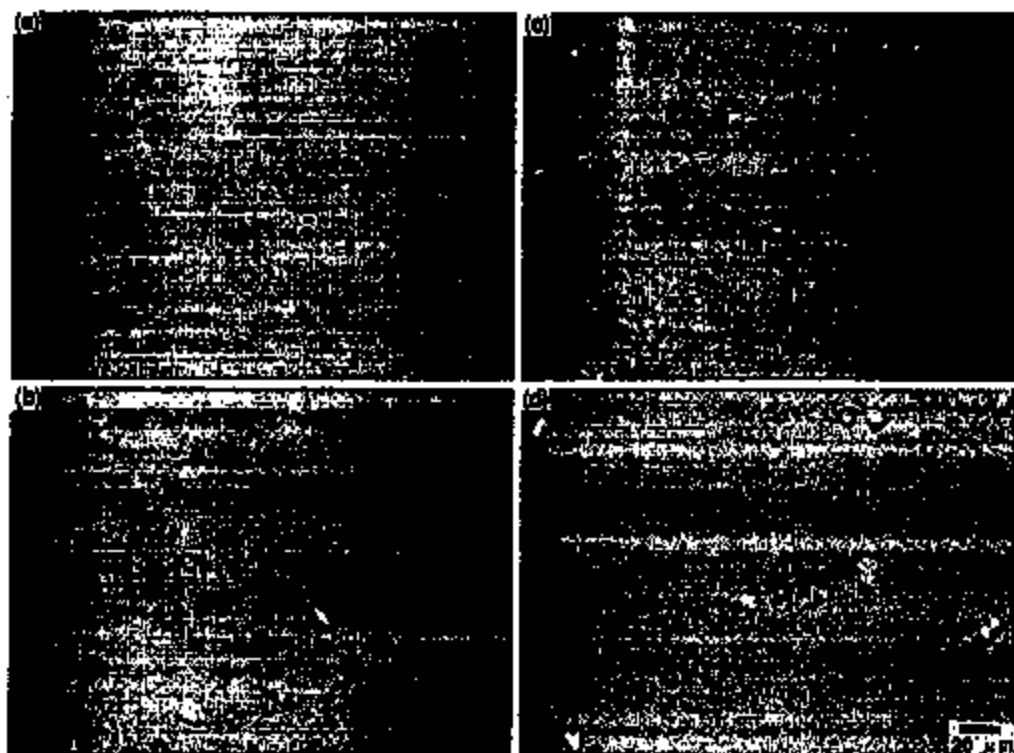


Fig. 1. SEM micrographs of the hillock formation sequence while elevating the temperature: (a) 523 K, (b) 545 K, (c) 573 K, (d) 673 K. The heating rate was  $0.067 \text{ K s}^{-1}$ .

ing power density was  $3.2 \text{ W cm}^{-2}$ . The deposition rate was  $2.5 \text{ nm s}^{-1}$ . 1- $\mu\text{m}$ -thick films were examined by SEM and TEM, while 400-nm-thick films were used for stress measurements.

Hillock formation on as-deposited films was observed in-situ in a SEM microscope while raising the temperature at a rate of  $0.067 \text{ K s}^{-1}$  and during annealing at 533 K for 10.8 ks. Samples were mounted on a stage made of stainless steel and heated with a Mo heater, and temperatures were measured by a thermocouple attached on the film side of the specimen. For isothermal annealing, the samples were heated up to 473 K at a rate of  $0.17 \text{ K s}^{-1}$  and held for 1.6 ks. The heating time from 473 K to 533 K was about 3.6 ks.

Plane-view TEM observations of an as-deposited film, films annealed at 533 K for 14.4 ks and at 673 K for 3.6 ks in a vacuum below  $1 \times 10^{-6} \text{ Torr}$  were carried out. The cross-section microstructure of a hillock was also observed for the sample annealed at 533 K for 14.4 ks.

The film stresses as a function of isothermal annealing time were measured in-situ by using the substrate-curvature technique [13]. The isothermal annealing for 28.8 ks were carried out after heating up to the temperature 10 K higher than isothermal annealing temperature at a rate of  $0.33 \text{ K s}^{-1}$  and held for 0.6 ks. The annealing was conducted in a  $\text{N}_2$  ambient.

### 3. Experimental results

#### 3.1. Hillock formation

Fig. 1(a)-(d) show the sequence of hillock formation while elevating the temperature. No hillocks were observed

on the film surface at 523 K as shown in Fig. 1(a). Hillocks began to form when the temperature was raised up to about 450 K. Fig. 1(b) was taken soon after the hillocks were identified. The hillock size increased from about 2- $\mu\text{m}$  diameter at 543 K to about 4- $\mu\text{m}$  diameter at 573 K as shown in Fig. 1(c). On further heating, the hillocks grew larger and new hillocks indicated with arrows in Fig. 1(d) were formed at the edge of old hillocks, i.e. hillocks which have already formed. However, no new hillocks were observed among the hillocks. Thereby, the macroscopic hillock density did not change during the annealing. The distance between hillocks ranged from about 20  $\mu\text{m}$  to 100  $\mu\text{m}$ . The position of each hillock also did not change.

Fig. 2(a)-(d) show the sequence of hillock formation during isothermal annealing at 533 K. The first outgrowths as shown in Fig. 2(a) were identified immediately after isothermal treatment started. The hillock number, which is thirteen in Fig. 2, was saturated within less than 0.6 ks as shown in Fig. 2(b). Fig. 2(c) and (d) show the hillock size increased as the annealing time increased. New hillocks were formed at the edge of old hillocks such that the hillock density was constant as shown in Fig. 1(d).

#### 3.2. Microstructures of film and hillock

Fig. 3(a) shows a plan-view TEM micrograph of the as-deposited film. Average grain size of the film was 0.06  $\mu\text{m}$ . Grain growth occurred after annealing as shown in Fig. 3(b) and (c). The average grain size increased to 0.1  $\mu\text{m}$  and 0.21

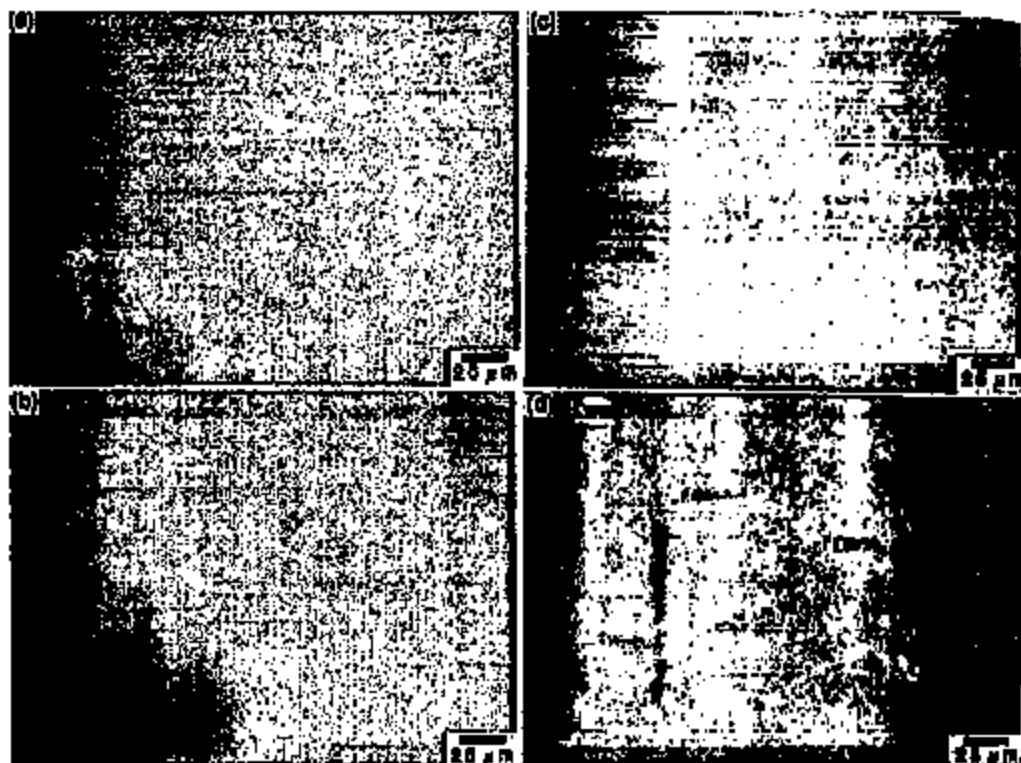


Fig. 2. SEM micrographs of the hillock sequence during isothermal annealing at 533 K: (a) 68 s, (b) 0.5 ks, (c) 2.1 ks, (d) 10.8 ks.



Fig. 3. Plan-view TEM micrographs of Al-2at.%Ta alloy films: (a) as-deposited, (b) annealed at 533 K for 14.4 ks, (c) annealed at 673 K for 3.6 ks.

$\mu\text{m}$  after annealing at 533 K for 14.4 ks and 673 K for 3.6 ks, respectively. Precipitates which were identified as  $\text{Al}_3\text{Ta}$  by X-ray diffraction [14] were observed as shown in Fig. 3(b) and (c) with arrows.

Fig. 4(a) shows a cross-section TEM micrograph of a hillock formed by annealing at 533 K for 14.4 ks and the selected-area-electron-diffraction pattern (SADP) from one of the grains in the hillock. This film corresponds to that of Fig. 3(b). The size of the hillock was about  $3.4 \mu\text{m}$  in width and  $1.6 \mu\text{m}$  in height. The hillock was composed of a number of crystallites. SADP indicated the crystallites were Al. The grain size in the hillock ranged from  $0.1 \mu\text{m}$  to  $0.8 \mu\text{m}$ . The microstructure of the hillock, i.e. grain size and shape, was

different from that of the film. The film had a semi-columnar structure with small grain size. Fig. 4(b) schematically illustrates the hillock and film geometry. The original film surface (indicated with a dashed line) which should be beneath the hillock disappeared. Some grains in the hillock seemed to grow out into the film underneath the hillock. In particular, the grains in the middle of the hillock incorporate smaller grains in the film. This incorporation extended deep into the film and is indicated with a bold line.

### 3.3. Stress relaxation

Fig. 5 shows the change of film stress during isothermal annealing at 533 K as a function of annealing time. Con-

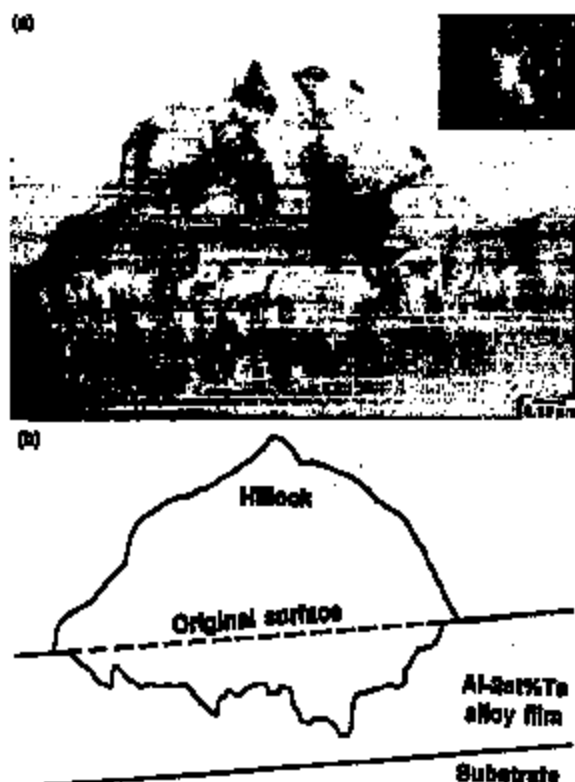


Fig. 4. (a) Cross-section TEM micrograph and (b) schematic drawing showing a hillock on a film annealed at 533 K for 14.4 ks. The inset to (a) shows the SADP of a grain in the hillock.

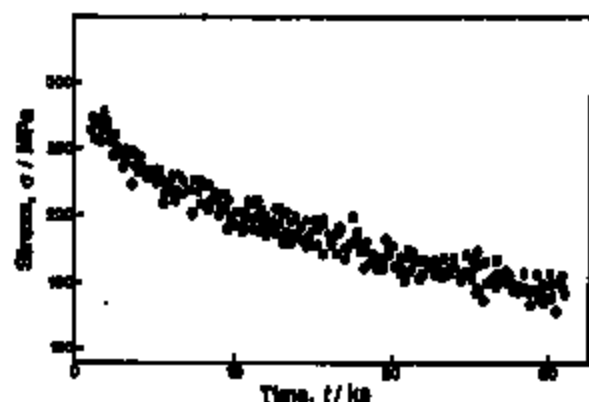


Fig. 5. Annealing-time dependence of compressive stresses for a Al-2at.%Ta alloy film held at 533 K.

compressive stress was about 720 MPa when isothermal annealing started. The stress decreased gradually as the annealing progressed. The change of film stress as a function of time can be described by the standard exponential stress decay expression.

$$\frac{\sigma - \sigma_0}{\sigma_1 - \sigma_0} = \exp(-t/\tau)$$

where  $\sigma$  is the stress at time  $t$ ,  $\sigma_0$  is the remnant stress,  $\sigma_1$  is the initial stress and  $\tau$  is the stress-relaxation time constant.

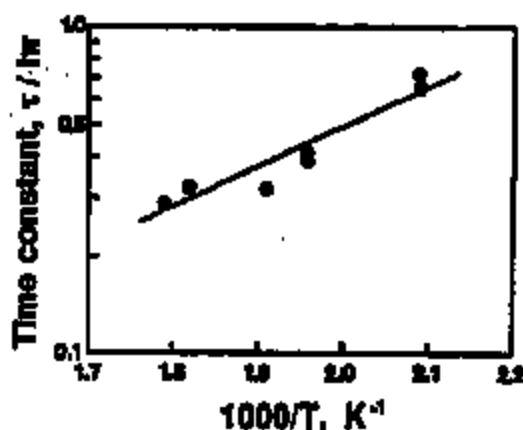


Fig. 6. Temperature dependence of the relaxation-time constant for compressive stress relaxation during isothermal annealing.

Fig. 6 shows the temperature dependence of the stress-relaxation time constant which was obtained by isothermal annealing at various temperature ranging from 473 K to 547 K. This plot gave an activation energy range from 0.3 eV to 0.4 eV. This value is smaller than that reported for the Al thin film, 0.43 eV [15].

#### 4. Discussion

It is generally believed that hillocks form to relieve compressive stress in a film [2,16]. Grain growth [17] and precipitation [18] can also relieve compressive stress. If it is assumed that each of the hillocks which are observed in Fig. 2(d) is hemispherical with a 3.2  $\mu\text{m}$  diameter, the volume ratio between hillocks and film in the area corresponds to 0.2%. The compressive stress  $\sigma_c$ , which is relieved by the negative volume change is described by

$$\sigma_c = \frac{E\Delta V}{3(1-\nu)}$$

where  $E/(1-\nu)$  is the biaxial elastic modulus of the film and  $\Delta V$  is  $V_{\text{hillock}}/V_{\text{film}}$ . Using the value of  $E/(1-\nu) = 1.143 \times 10^9 \text{ Pa}$  for Al with a (111) orientation, the negative volume change by 0.2% results in a stress of about 76 MPa. In Fig. 5, the film stress dropped from about 270 MPa to about 200 MPa during the annealing for 10.4 ks, hence about 70 MPa was relieved. Therefore, it is reasonable that hillock formation is the dominant stress-relaxation mechanism.

The distance between each hillock ranged over several ten  $\mu\text{m}$ , which is much larger than the grain size of the film even after grain growth took place by annealing. There are a large number of grain-boundary triple points that could serve as hillock nucleation sites, however, only a small number of hillocks were observed, and hillock density was saturated in the early stages of the appearance. New hillocks did not form among the hillocks, even though old hillocks grew to huge size with stress relaxation during the annealing.

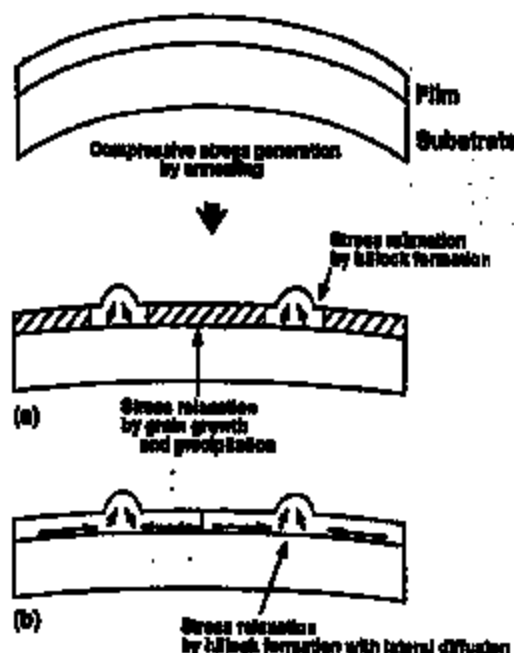


Fig. 7. Schematic drawings of two models relating to the hillock formation behavior on Al-2at.%Ta alloy films.

The question is why hillocks formed with such a low density on the film, even though there are considerable nucleation sites on the film surface.

It is reported that an natural oxide layer on a film and defects in it can influence hillock formation [19,20]. However, the oxide appears to be too pillable to suppress hillock formation [21] and reduce the hillock density. Electron spectroscopy for chemical analysis (ESCA) revealed that the thickness of the oxide layer of Al-2at.%Ta alloy films was almost the same as that of Al-2at.%Cu alloy films on which hillocks can be formed with high density.

Two stress relaxation models are possible to explain this phenomena. One is that hillocks relieve stress only locally around the hillocks, while grain growth and precipitation dominate stress relaxation elsewhere as shown schematically in Fig. 7(a). The other is that hillock formation due to lateral diffusion, i.e. diffusion within the film plane, dominates stress relaxation in a large area around the hillock as shown in Fig. 7(b).

For the former model to hold, there must be a significant difference in microstructures between the near-hillock and inter-hillock regions. However, such a distinct difference was not observed in this study. Furthermore, the hillock also observed in this study is large enough to relieve stress only in the immediate area.

Fig. 8(a)-(c) show schematic drawings of hillock formation based on the latter model comparing the film with fine grains to that with large grains. The former case, corresponding to Al-Ta alloy films in this study, is shown in Fig. 8(a). When hillocks form on the film surface, the atoms diffuse from film into hillock, which gives rise to lateral diffusion

through the film around the hillock. In the film with a fine grain structure, lateral diffusion occurs easily along grain boundaries. Thus, the diffusion due to hillock formation may relieve stress in a large area around the hillocks, and hillock formation is suppressed in the neighborhood of the hillock. It is believed that the driving force of the lateral diffusion is a gradient of stress, which can be caused locally due to stress relaxation during hillock formation. It is probable that the compressive stress near hillock becomes lower than that in the neighbor, which results in a stress gradient that may induce the lateral diffusion.

The incorporation of microstructures between a hillock and the film can be responsible for new hillock formation on the outer perimeter of old hillocks. The incorporation causes a change in the diffusion path by which atoms are supplied to hillocks along grain boundaries. Therefore, new nucleation sites may form at the edge of the old hillocks as shown in Fig. 8(b). It has been shown that underlying grains in Al films grew into the hillocks in some cases [4]. The incorporation may occur via coalescence, however this cannot be proven without clarifying the sequence of the incorporation.

The case of a film with large grain size with columnar structure is shown in Fig. 8(c). The lateral diffusion through bulk is more difficult in comparison with that along lateral grain boundary in the film with fine grains. Vertical diffusion, i.e. diffusion through the film thickness, can be enhanced by vertical grain boundaries, and brings atoms to the film surface. In this case, each grain-boundary triple point on the film

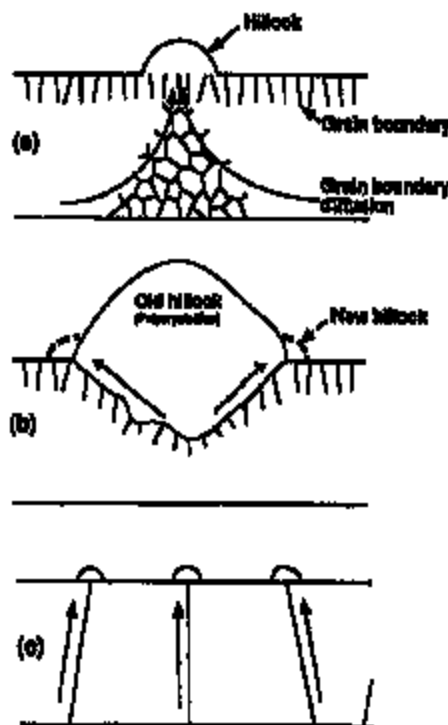


Fig. 8. Schematic drawings of hillock formation comparing a film with fine grains to a film with large grains.



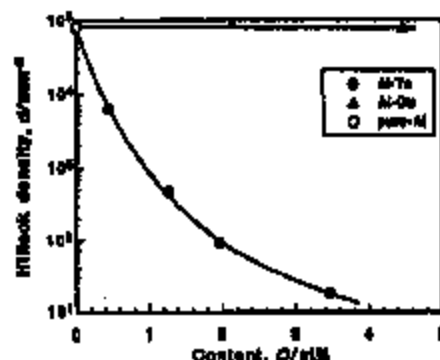


Fig. 9. Alloy-content dependence of hillock density for Al, Al-Cu, Al-Ta alloy films with 400-nm thickness annealed at 573 K for 3.6 ks [14].

surface easily results in a nucleation site of hillock formation as shown in Fig. 8(c).

On this model, larger hillocks with low density and smaller hillocks with higher density can be expected to form in films with fine grains and with large grains, respectively, when the hillocks relieve the same value of compressive stress in the films. The films with large grain size can be applied to Al or Al-Cu alloy films. The grain size of Al and Al-Cu alloy films with strong grain growth during annealing at more than about 400 K ranges from 0.5  $\mu\text{m}$  to several  $\mu\text{m}$ , with a strongly columnar structure. Fig. 9 shows hillock density of Al, Al-Cu and Al-Ta alloy films with 400-nm-thickness annealed at 573 K for 3.6 ks as a function of alloy content. The hillock density in Al and Al-Cu is significantly higher than in Al-Ta alloy films.

## 5. Summary

Hillock formation, microstructures of both hillock and matrix, and compressive stress relaxation behavior during isothermal annealing were studied on Al-2at.%Ta alloy films for interconnections of TFT-LCDs. The following results were obtained.

- Hillock size increased with increasing temperature or annealing time. Although new hillocks were observed on the outer perimeter of old hillocks, the macroscopic hillock number density reached a saturated value soon after the initial appearance of the old hillocks.
- The distance between each hillock ranged from 20  $\mu\text{m}$  to 100  $\mu\text{m}$ , which is extremely large in comparison with grain size of the films, which was about 0.06  $\mu\text{m}$  on an as-deposited film and about 0.2  $\mu\text{m}$  even after annealing at 573 K for 3.6 ks.
- The microstructure of hillocks was polycrystalline Al. The incorporation of microstructure was observed between a hillock and the film.

- The time constant for compressive stress relaxation during isothermal annealing ranging from 478 K to 538 K had an activation energy of range between 0.3 eV and 0.4 eV.
- The relationship between hillock formation and microstructure on Al-Ta alloy films can be explained by a model in which hillock formation with lateral diffusion, i.e. diffusion in the film plane, causes stress relaxation in a large area around the hillock. The film structure with fine grains due to the addition of Ta plays an important role in reducing hillock density.

## Acknowledgements

The authors wish to express their gratitude to Professor Robert Sinclair at Stanford University for his help in TBM observation. Thanks are also due to Masao Kinoshita and Yasuo Minokata and Mechanical Engineering Research Laboratory, Kobe Steel, Ltd. for their help in the in-situ SEM observation.

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## Application of high temperature deposited aluminum gate electrode to the fabrication of a-Si:H TFT

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### Abstract

Aluminum is a good candidate for low resistivity metal used on TFT-LCD panels as the gate electrode of a-Si:H TFTs. The characteristics of a-Si:H TFTs device are strongly dependent on the morphology of the aluminum film. However, the thermal and mechanical stability of aluminum are inferior. In this work, hot aluminum was firstly used as the gate electrode of a-Si:H TFTs. Effects of aluminum deposition temperature on the surface roughness were investigated. The fraction of Al(111) texture increases with increasing deposition temperature. The surface roughness due to hillock formation decreases with increasing deposition temperature of aluminum films. Therefore, increasing the deposition temperature of aluminum films can suppress hillock formation. The field effect mobility of a-Si:H TFTs increases with the deposition temperature of aluminum gate. The subthreshold swing of a-Si:H TFTs decreases with the deposition temperature of aluminum gate. © 1998 Elsevier Science S.A. All rights reserved.

**Keywords:** Al; A-Si:H TFT; Hillock; Gate electrode

### 1. Introduction

Active-matrix liquid crystal displays, especially thin film transistor liquid-crystal displays (TFT-LCDs), are in great demand recently because of their high resolution and contrast. As TFT-LCDs are developed to larger sizes with higher resolution, lower electrical resistivity and higher resistance to hillock formation are required for the interconnections of TFT-LCDs.

So far, refractory metals, such as Ti, Cr, Mo, Ta, etc., have been used as the interconnections of TFT-LCDs because of their high thermal stability and hence a high resistance to hillock formation. However, a disadvantage of these interconnection materials is their high electrical resistivity that causes a delay of address pulses. Al alloy films deposited by sputtering have properties of high hillock suppression and lower electrical resistivity [1,2]. However, it will still be difficult to employ them for advanced TFT-LCDs because of their significantly high electrical resistivity of about 10  $\mu\Omega\text{-cm}$ . Adding group

VIII transition elements [3] or rare-earth metal elements [4] can further reduce resistivity. However, the resistivity is still large compared with that of pure Al.

On the other hand, Al films have a lower electrical resistivity of 2.7  $\mu\Omega\text{-cm}$ , but their thermal and mechanical stability are inferior. Hillocks sometimes form on the Al film surface, which lead to excessive surface roughness and can cause problems, such as short circuits [5,6]. In addition, hillock formation on the Al gate electrode of a-Si:H TFT will degrade SiN<sub>x</sub>/a-Si interface and thus deteriorate the a-Si:H TFT performances.

In the VLSI technologies, Al deposited at high temperature is widely used as interconnections. It has higher surface migration and larger grain size than Al deposited at room temperature. The microstructure of hot Al differs from that of room temperature-deposited Al. The formation of hillocks is strongly dependent on the microstructure of the Al film. Therefore, we expect that the deposition temperature of Al will play a dominant role in hillock formation.

In this work, effects of Al deposition temperature on hillock formation were investigated. Atomic force microscopy (AFM) was utilized to determine the roughness of as-deposited and annealed films. In addition, a hot Al gate electrode has been successively applied to the fabrication

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of  $\alpha$ -Si:H TFTs to study the correlation between Al surface morphology and electrical characteristics of  $\alpha$ -Si:H TFTs.

## 2. Experimental

The Al films were sputter deposited at room temperature (RT), 200 and 300°C for this study. All the as-deposited films were annealed at 400°C for 30 min.

The  $\alpha$ -Si:H TFTs configuration used in this study has an inverted staggered structure, as shown in Fig. 1. A 150-nm silicon wafer coated with a 500-nm thick thermal oxide was used as the starting substrate. The TFT fabrication process is as follows. First, the 500-nm thick Al layers were sputter deposited at RT, 200 and 300°C, respectively. For comparison, 70-nm thick  $\text{Al}_2\text{O}_3$  layers were grown on some of the samples by anodic oxidation method [7]. Then the Al ( $\text{Al}/\text{Al}_2\text{O}_3$ ) layers were defined by photolithography and chemical etching to form gate electrodes. After that, a 250-nm thick and 150-nm thick  $\text{SiN}_x$  were deposited with a standard parallel plate-type plasma CVD reactor to form the insulating layer on Al and  $\text{Al}/\text{Al}_2\text{O}_3$  layers, respectively. These, along with a 200-nm thick undoped  $\alpha$ -Si:H film and 50-nm thick  $n^+$   $\alpha$ -Si:H film were deposited successively without breaking vacuum. The gas mixtures for  $\text{SiN}_x$ , undoped  $\alpha$ -Si:H and  $n^+$   $\alpha$ -Si:H were  $(\text{SiH}_4 + \text{NH}_3 + \text{N}_2)$ ,  $\text{SiH}_4$  and  $(\text{SiH}_4 + \text{PH}_3 + \text{H}_2)$ , respectively. The  $\text{SiN}_x$  film was deposited under conditions of 300°C, 50 W and 500 mTorr. The  $\alpha$ -Si:H film was deposited under conditions of 250°C, 15 W and 300 mTorr. The  $n^+$   $\alpha$ -Si:H was deposited under conditions of 250°C, 70 W and 650 mTorr. Then active region was defined by dry chemical etching. Finally the Al metal was evaporated by thermal coater and patterned to form the source and drain electrodes. The unwanted  $n^+$  layer between two electrodes was removed by dry chemical etching.

AFM was utilized to determine the roughness of as-deposited and annealed films. The texture of Al electrodes was measured by X-ray diffraction (XRD). The electrical characteristics of the  $\alpha$ -Si:H TFTs were measured by an HP4145B semiconductor parameter analyzer.

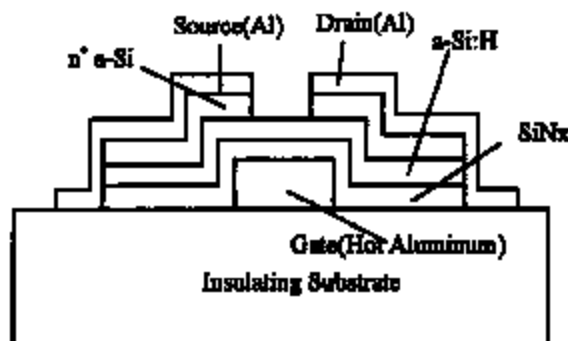


Fig. 1.  $\alpha$ -Si:H TFT configuration.

## 3. Results and discussion

Fig. 2a shows the RMS surface roughness of as-deposited and annealed Al films as a function of deposition temperature. The Al films were deposited at RT, 200 and 300°C. All the as-deposited films were annealed at 400°C for 30 min. The surface roughness of as-deposited Al films decreases with increasing deposition temperature. The surface roughness of as-deposited films dramatically reduces from 5.8 to 4.2 nm as the deposition temperature of Al films increases from RT to 300°C. In addition, the surface roughness of annealed Al films also decreases with increasing deposition temperature. The surface roughnesses of annealed Al films are 9.1 and 6.3 nm for Al films deposited at RT and 300°C, respectively.

The reduction of surface roughness of Al films deposited at high temperature is due to the increase of surface migration. The adsorbed Al atoms can quickly move along

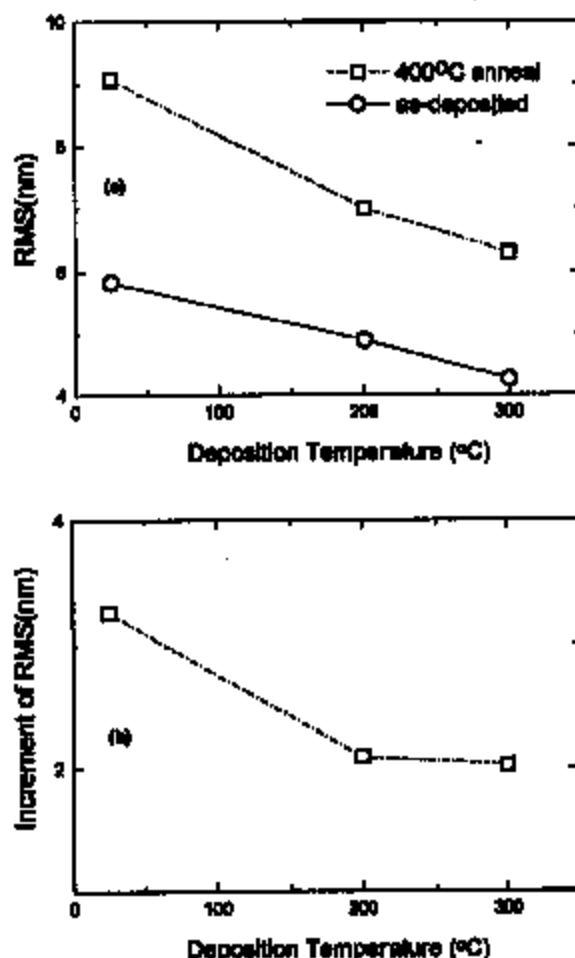


Fig. 2. (a) Surface roughness of as-deposited and annealed Al film as a function of deposition temperature, (b) increment of surface roughness of Al film before and after thermal annealing.

the wafer surface at 300°C. Therefore, a smoother Al film can be deposited at high temperature. On the other hand, the adsorbed Al atoms move slowly at room temperature and may pile up locally on the surface, resulting in a rougher surface.

Fig. 2b shows the increment of surface roughness of an Al film before and after thermal annealing. The roughness increments are 3.3 and 2.1 nm for the sample deposited at RT and 300°C, respectively. The roughness increment of Al films rapidly decreases with increasing deposition temperature. Hillock formation can lead to excessive surface roughness. A smaller increment of surface roughness after thermal annealing indicates higher resistance against hillock formation. Therefore, high-temperature deposition of Al films tends to increase hillock resistance. The experimental results can be interpreted as follows. A temperature excursion is necessary to produce the compressive thermal stress to cause hillock formation. Therefore, minimizing the temperature difference between the Al deposition step and subsequent high-temperature processing steps is expected to reduce hillock formation. In our experiment, the SiN<sub>x</sub> film is deposited at 300°C which is the highest process temperature for fabricating a-Si:H TFT devices. Therefore, the temperature difference between the Al deposition step and subsequent high-temperature processing steps is the smallest for Al film deposited at 300°C. On the other hand, the Al film deposited at RT encounters the largest temperature difference during process. It is thus reasonable that an Al film deposited at 300°C has higher hillock resistance than that deposited at room temperature. Furthermore, it is believed that grain orientation of Al can affect hillock formation [8–10]. An earlier study reported that a correlation between increasing (111) film texture and decreasing hillock density was observed [11]. Process conditions which enhance (111) texture formation are expected to suppress hillock formation. Fig. 3 shows the X-ray diffraction spectra of Al films

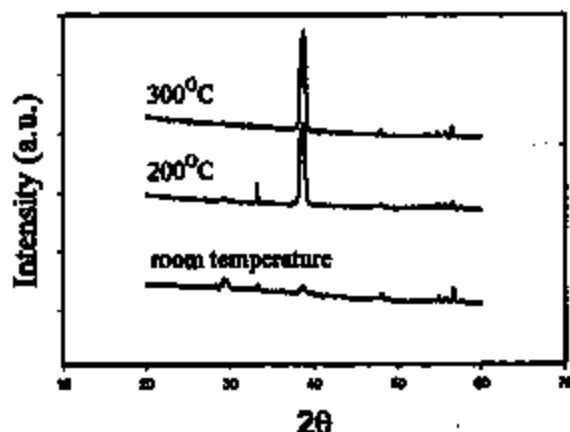


Fig. 3. X-ray diffraction spectra of Al films deposited at various temperatures.

deposited at various temperatures. From the X-ray diffraction analysis, the intensity of the (111) peak increases with increasing deposition temperature of the Al film. This result indicates that Al films with a higher deposition temperature have a better capability to suppress hillock formation. Therefore, the result of X-ray diffraction well agrees with AFM measurement.

Fig. 4a shows the transfer characteristics of a-Si:H TFTs with single-layered insulator (SiN<sub>x</sub>) and Al gate electrodes deposited at various temperatures. The applied drain voltage is 10 V for this measurement. The ON current increases with increasing deposition temperature of the Al gate. Fig. 4b shows the field effect mobility of a-Si:H TFTs as a function of the deposition temperature of the Al gate. The field effect mobility is determined from the characteristics in the saturation region by plotting (drain current)<sup>1/2</sup> versus gate voltage. The field effect mobility increases almost linearly with the deposition temperature of the Al gate. TFTs with the Al electrode gate deposited at 300°C have the highest ON current and highest field effect mobility. This phenomenon can be interpreted in terms of surface roughness scattering effect. The SiN<sub>x</sub> morphology is directly affected by the morphology of the Al electrode gate. The a-Si:H/SiN<sub>x</sub> interface roughness is affected by the morphology of the SiN<sub>x</sub>. Therefore, a rougher Al gate results in a rougher a-Si:H/SiN<sub>x</sub> interface which will cause the reduction of both ON current and mobility. In the case of the Si-SiO<sub>2</sub> interface, the mobility due to surface roughness scattering has been observed [12]. Similar mobility and stability reduction due to roughness scattering was also observed in the case of SiN<sub>x</sub>/a-Si interface [13].

Fig. 4c shows the subthreshold swing of a-Si:H TFTs as a function of the deposition temperature of the Al gate. The subthreshold swing reduces linearly with increasing deposition temperature of the Al gate. The subthreshold swing of a-Si:H TFTs with the Al gate deposited at RT and 300°C are 0.83 V/decade and 0.32 V/decade, respectively. The improvement of the subthreshold swing is also very significant. The result can be interpreted as follows. Rougher SiN<sub>x</sub> surface prevents surface diffusion of SiH<sub>4</sub> precursor during a-Si:H deposition. As a result, the rougher SiN<sub>x</sub> will degrade the a-Si:H quality at the a-Si:H/SiN<sub>x</sub> interface layer. The a-Si:H film grows on rough SiN<sub>x</sub> substrate forms many defects near the SiN<sub>x</sub>/a-Si:H interface, which will dominate midgap defect states in material. The subthreshold swing relates to gap states as following equation:

$$S_{\text{sub}} = \frac{kT}{q} \cdot \ln 10 \cdot \left( 1 + \frac{C_d + C_i}{C_i} \right)$$

where  $C_d$  is the depletion layer capacitance,  $C_i$  is the interfacial layer capacitance and  $C_s$  is the insulator capacitance. Gap states due to a rough SiN<sub>x</sub>/a-Si:H interface lead to the increase of interfacial layer capacitance and thus increase subthreshold swing.

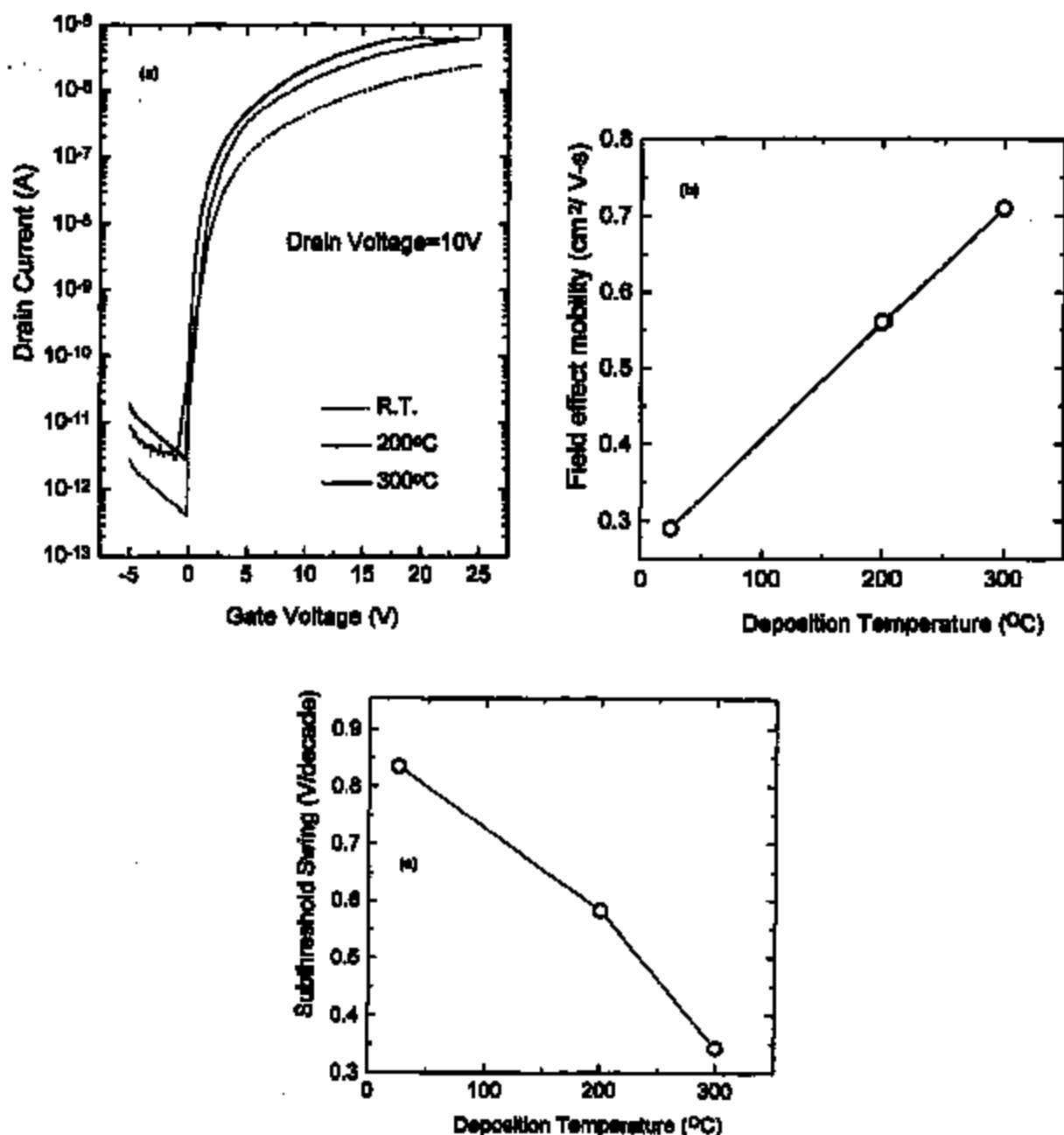


Fig. 4. Device characteristics of single-layered insulator a-Si:H TFTs with the Al gate deposited at various temperatures: (a) transfer characteristics measured at a drain voltage of 10 V, (b) field effect mobility, (c) subthreshold swing.

In addition, we also investigated the a-Si:H TFT with a double-layered insulator ( $\text{SiN}_x/\text{Al}_2\text{O}_3$ ). Fig. 5a-c shows the transfer characteristics, field effect mobility and subthreshold swing of a-Si:H TFT with a double-layered insulator ( $\text{SiN}_x/\text{Al}_2\text{O}_3$ ), respectively. The dependence of transfer characteristics, field effect mobility and subthreshold

swing on Al gate deposition temperature is similar to that of a-Si:H TFTs with a single-layered insulator. Both the ON current and field effect mobility increase with increasing deposition temperature of the Al gate. The subthreshold swing decreases with increasing deposition temperature of the Al gate. The field effect mobility

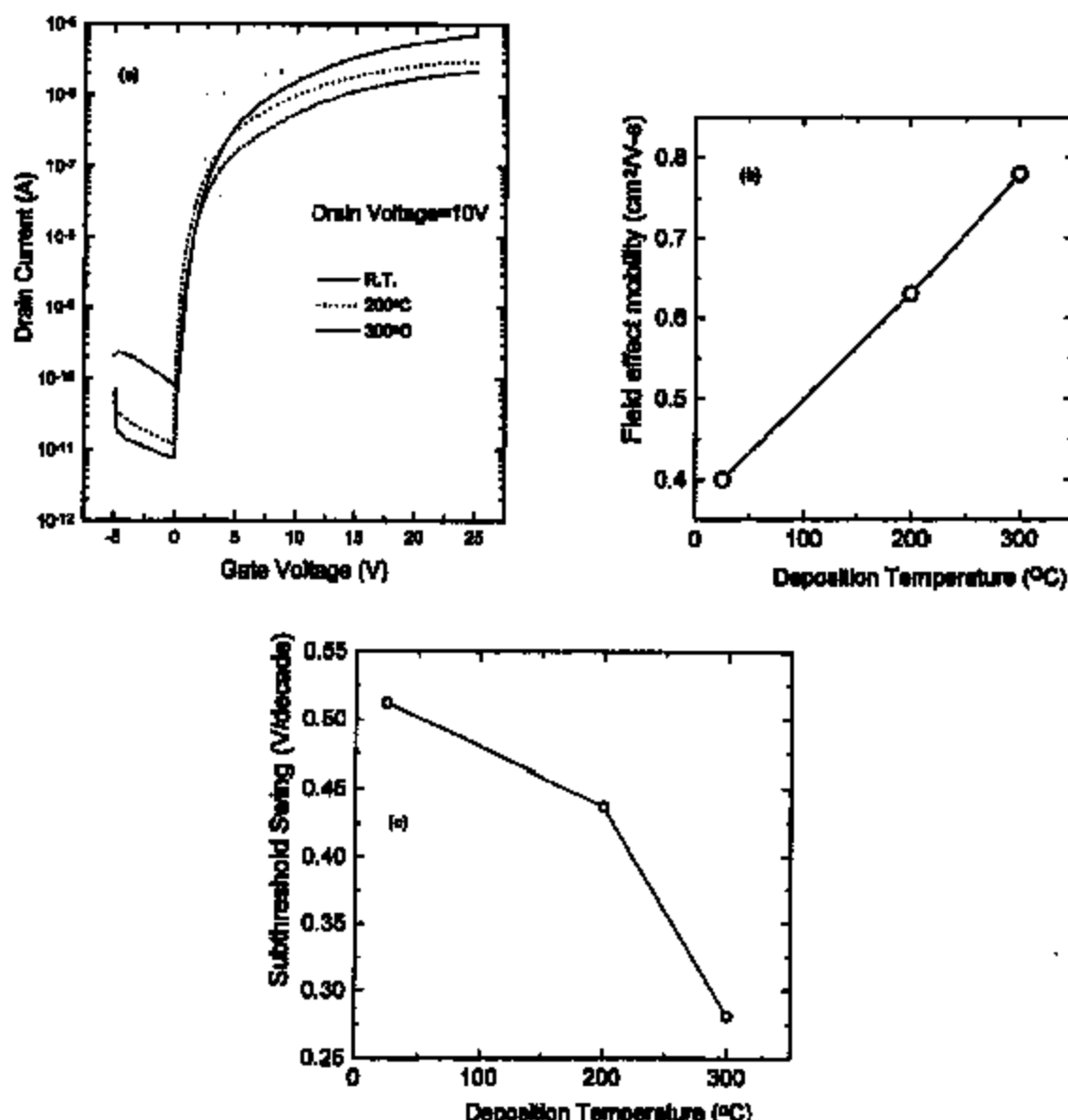


Fig. 5. Device characteristics of double-layered insulator a-Si:H TFTs with the Al gate deposited at various temperatures: (a) transfer characteristics measured at a drain voltage of 10 V, (b) field effect mobility, (c) subthreshold swing.

increases from 0.4 to  $0.78 \text{ cm}^2/\text{V}\cdot\text{s}$  as the deposition temperature of Al gate increases from RT to  $300^{\circ}\text{C}$ . In addition, the subthreshold swing reduces from 0.51 to 0.28 V/decade. It should be noted that the double-layered insulator ( $\text{Al}_2\text{O}_3/\text{SiN}_x$ ) a-Si:H TFTs show better electrical performances than their counterparts with single-layered insulators ( $\text{SiN}_x$ ) a-Si:H TFTs. This result is reasonable because  $\text{Al}_2\text{O}_3$  can further suppress hillock formation on the Al gate of a-Si:H TFTs [7].

#### 4. Conclusions

Hot Al is very effective in suppressing hillock formation and has been successfully applied to the fabrication of a-Si:H TFTs. The intensity of the Al(111) texture increases with increasing deposition temperature. The surface roughness decreases with increasing deposition temperature of the Al gate. An Al layer deposited at  $300^{\circ}\text{C}$  has the smoothest surface. Therefore, a-Si:H TFTs with the Al

gate deposited at 300°C have the best electrical performances. In addition, we also investigated a-Si:H TFTs with double-layered insulators ( $\text{SiN}_x/\text{Al}_2\text{O}_3$ ). The dependence of transfer characteristics, field effect mobility and sub-threshold swing on the Al gate deposition temperature is similar to that of a-Si:H TFTs with a single-layered insulator.

#### Acknowledgements

The authors would like to express their appreciation to all the staff of the Semiconductor Research Center, National Chiao Tung University for their technical support. This work is supported by the National Science Council of the Republic of China (NSC87-2215-E317-002 and NSC-87-2721-2317-200).

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## Microstructure of thermal hillocks on blanket Al thin films

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Received 9 October 1999; received in revised form 11 February 2000; accepted 11 April 2000

### Abstract

The microstructure of thermal hillocks on blanket Al thin films has been studied for the first time by several techniques, including sectioning and imaging in a focused ion beam system. It is found that the new material in the hillock area lifts the original film up and in some cases penetrates it. The micrographs also reveal the grain structures and give valuable insight into the mechanisms of hillock growth. © 2000 Elsevier Science S.A. All rights reserved.

**Keywords:** Aluminum; Hillock formation; Microstructure; Focused ion beam; Creep deformation; Stress relaxation

### 1. Introduction

Thin metallic films are widely used as components in microdevices. Because of their potential limitations on device reliability, mechanical stresses in such thin-film systems have been studied extensively [1]. It is generally found that thin films support much higher stresses than bulk materials of similar composition; this observation has been attributed to constraints on lattice defects due to the fine microstructures and the influence of the substrate. Consequently, stress relaxation, which requires the movement of dislocations is more difficult than in large-scale materials and is, despite recent modeling attempts, not fully understood.

An important source of mechanical stress in thin films is the thermal mismatch between the film and the

substrate material. Depending on the sign of the mismatch and of the temperature change, tensile or compressive stresses can develop in the film. One mechanism of compressive stress relaxation which is specific to thin films is the formation of hillocks, i.e. extrusions of material out of the plane of the film. Such hillocking, which results in considerable roughening of the film surface, has frequently been reported in the literature [2–6]. However, the structure of the hillocks has not been investigated in detail. Also the exact mechanism of hillock growth, apart from some suggestions involving condensation of atoms along dislocation lines, remains unclear.

The purpose of this paper is to report the microstructure of thermal hillocks on Al films. The micrographs were obtained by several methods, i.e. side-view scanning electron microscopy (SEM) and cross-sectional transmission electron microscopy (TEM). The most detailed insight resulted from sectioning and viewing selected hillocks with a focused ion beam (FIB). Based on the microstructural information, a possible

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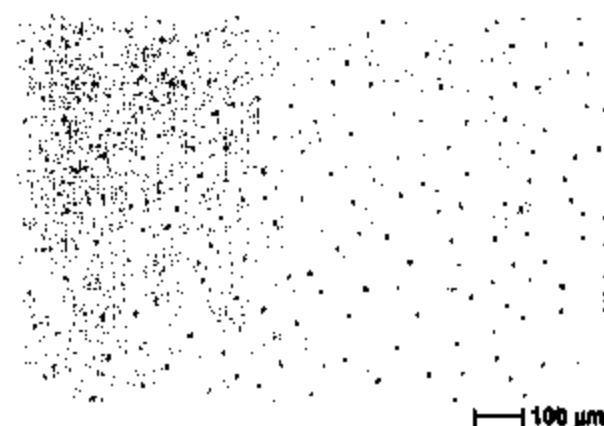


Fig. 1. Optical micrograph of a film after annealing in plan view.

mechanism for the growth of these hillocks is suggested. A more thorough quantitative analysis which includes a mathematical modeling will be published elsewhere [7].

## 2. Experimental

Pure Al films of 1  $\mu\text{m}$  thickness were magnetron sputter-deposited at room temperature onto Si (100) wafers coated with 0.2  $\mu\text{m}$  LPCVD  $\text{SiO}_2$ . The Al films were first passivated with a 0.3- $\mu\text{m}$  thick TiW layer, which was subsequently removed by plasma etching. The purpose of the TiW films was to suppress hillock formation in the experiment that we originally planned (not described here). The films were annealed for 2 h at 450°C in forming gas which is composed of 5%  $\text{H}_2$  and 95%  $\text{N}_2$ . Because of the higher coefficient of thermal expansion of the film relative to the substrate, this anneal produced a compressive stress in the film which amounted to several hundred MPa (Fig. 6). Following the anneal, the films were cooled in air. Stress measurement was made by measuring wafer curvature during thermal cycling; thermal cycle includes a 2 h hold at 450°C.

The microstructure of the films was examined by plan view optical and side view scanning electron microscopy using a Hitachi S-800. For closer inspection of individual hillocks, TEM cross-section specimens were prepared in the following way [8]: the Si wafers, containing Al films, were cut and glued together. The glued specimen was cut into thin slices using a diamond saw and 3-mm-diameter disks were cut from the slice. The disks were thinned on a grinding wheel, dimpled, and ion milled to electron transparency. TEM micrographs were taken with a Philips CM20 at an accelerating voltage of 200 kV and typical magnifications of 13000–17500.

The additional use of a focused ion beam (FIB) system offers the advantage of sectioning selected

hillocks with high precision. The cross-section can then be imaged by collecting the secondary electrons; because the ions are subjected to a strong channeling effect, the resulting micrographs exhibit clear grain orientation contrast and hence allow thorough analysis of the grain structures. In this study, an FEI FIB 200 workstation with 30 kV accelerating voltage was used; sectioning was performed with an ion current of 1 nA, followed by cleaning at 150 pA and imaging at 70 pA.

## 3. Results and discussion

Whereas the as-deposited films were planar, the annealing resulted in extensive hillocking as can be seen by optical and scanning electron microscopy (Figs. 1 and 2). The hillocks are homogeneously distributed and have a typical spacing of approximately 70  $\mu\text{m}$ . Typical dimensions of a hillock are 4  $\mu\text{m}$  in width and in height. Cross-sectional TEM reveals the microstructure of the film between the hillocks and of an individual hillock (Fig. 3). Note that the film consists of columnar grains (Fig. 3b), which have grown during the anneal from an initial size of approximately 69 nm to a final size of 90 nm. These values are unusually small in comparison to other studies where grain sizes of the order of the film thickness are commonly found [3,6,9]. This can be attributed to the room-temperature sputtering process and subsequent grain boundary pinning during the annealing by sizeable contents of O, Ti and W impurities which were found to be present by EDS measurements. Small amounts of Ti and W seem to have been incorporated into the Al film, due to the TiW layer which has been removed before the anneal. At the site of the hillock, new material has been deposited between the film and the substrate, displacing the original film upward (Fig. 3a).

While the exact location of the cross-section with respect to the hillock cannot be inferred in the TEM micrograph, some hillocks were sectioned along their central axis by FIB (Fig. 4). Fig. 4a is an example of a hillock in which the original film has been lifted in a similar way to Fig. 3a; it is remarkable that the hillock has an almost perfectly conical shape and that the original film appears to be largely intact. A more extreme case is illustrated in Fig. 4b where the newly deposited material has penetrated the original film and formed a nearly spherical cap. Of particular interest is the grain structure of the new material: Fig. 4 reveal that the grains in this region are not all columnar and their size greatly exceeds that in the original film. Note also that the grain size increases from the film/substrate interface to the top of the hillock; in Fig. 4b new grains even seem to have nucleated in the 'cap' region.

The unexpected microstructures of the hillocks visible in Figs. 3 and 4 have not been reported in the literature before. They provide insight into possible

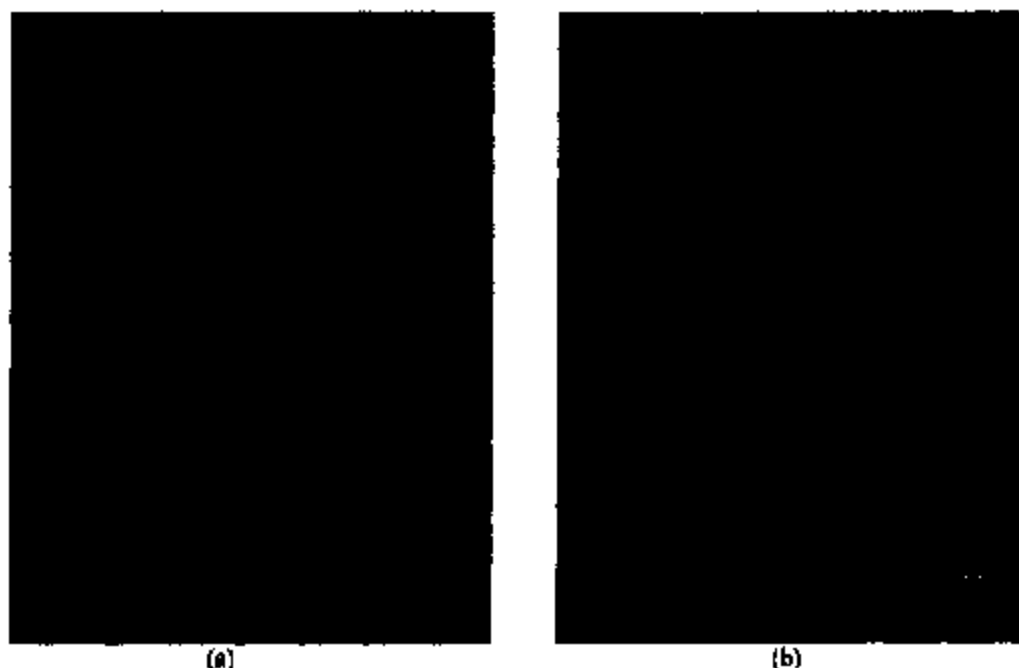


Fig. 2. Scanning electron micrographs of (a) a single hillock, (b) an unusually big hillock.

mechanisms of hillock growth. We propose the following sequence of events (Fig. 5):

1. Preferred nucleation sites for thermal hillocks are locations at the weakly bonded film/substrate interface, where delamination occurs due to very high compressive stresses in these films. This allows
2. Hillock growth occurs by diffusion of atoms, under the action of the compressive stress, from the vicinity of a nucleation site to the site of the hillock.

the interface to act initially as a sink for atoms. The regularity of the arrangement of hillocks may be associated with the stress relaxation zones surrounding each hillock.

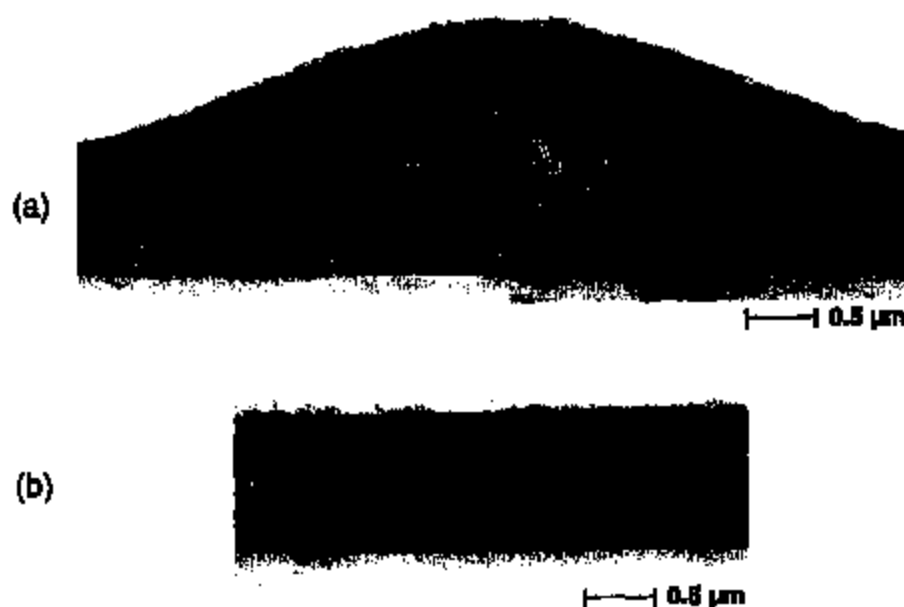


Fig. 3. Cross-sectional TEM images of (a) a hillock, (b) the film remote from a hillock.

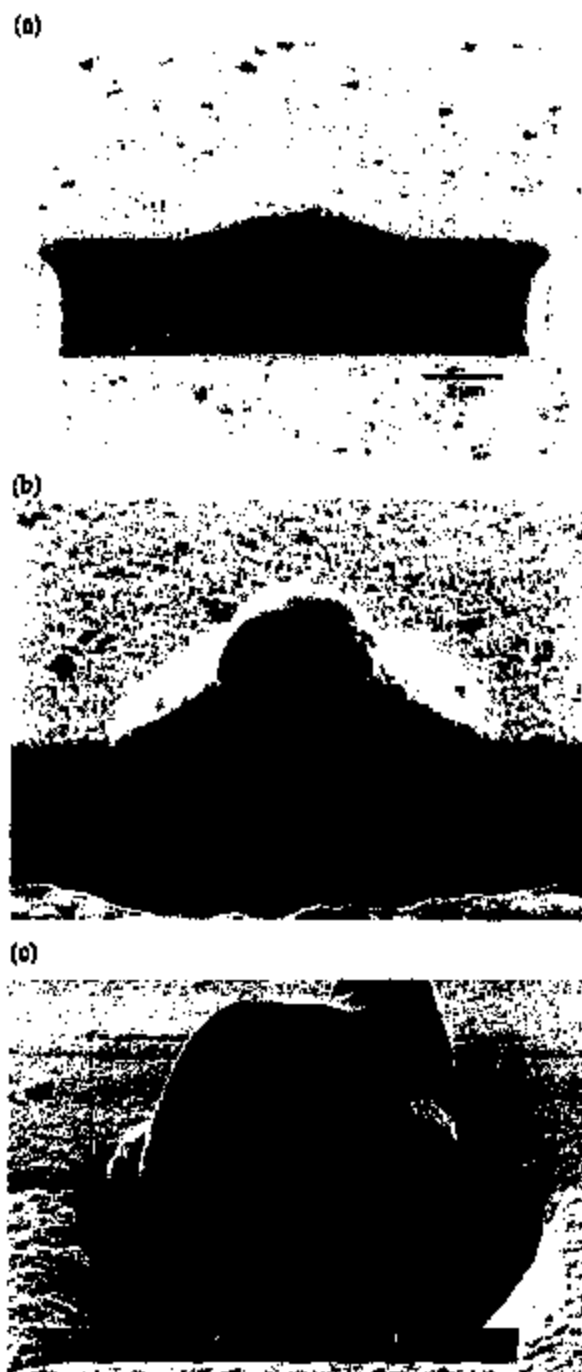


Fig. 4. Focused ion beam (FIB) images of hillock cross-sections: (a) cone-shaped hillock, (b) hillock with spherical 'cap', (c) hillock which has completely penetrated through the original Al film.

The most likely atom sources are the columnar grain boundaries of the original film, where the chemical potential for atoms is raised due to the compressive stress. The diffusion path is, depending on the temperature, the grain boundary, the film/substrate interface or the lattice. The first-

arriving atoms are deposited at the film/substrate interface where new grains are nucleated. Subsequently-arriving atoms are deposited at the interface between the original film and the hillock material. In this way the grain size can increase in the direction normal to the film surface. Alternatively, the arriving atoms may have been plated at the film/substrate interface and grain growth may have occurred in-situ to adjust the grain size to the new film thickness.

3. During deposition of the atoms, the original film is displaced upward and stays intact at first. It is likely that the bending of the film is controlled by creep deformation and exerts a back stress on the material beneath. Once the film deformation exceeds a critical value, it fractures and new material penetrates to the top. To minimize the surface area, it forms a spherical cap.

One of the most striking observations is the grain structure in the hillock region which differs substantially from that of the original film. The large grains are believed to result from the combination of two factors: first, growth of these regions occurs at an elevated temperature of 450°C at which atom mobility is high; and, second, the material there is much purer than the original film because the diffusion process has left behind the impurities present in the film. It is not clear how the new grains in the cap region of Fig. 4b have nucleated.

Finally, we attempt to estimate the amount of stress relief caused by the formation of the hillocks in these films. The stress relief can be approximated by

$$\Delta\sigma = M \frac{\Delta V/A}{2t_f} = M \frac{(A_{\text{base}} \times h)/A}{2t_f} \quad (1)$$

where  $M$  is the biaxial modulus and  $t_f$  the thickness of the film,  $\Delta V$  the excess volume of a hillock assumed to be cylinder-shaped with base area  $A_{\text{base}}$  and height  $h$ .  $A$  is the film area per hillock, which is assumed to be  $70^2 = 4900 \mu\text{m}^2$  using the average hillock spacing  $70 \mu\text{m}$  (Fig. 1). Using a value of 100 GPa for the biaxial modulus, we obtain a theoretical stress relief of approximately 510 MPa. This value is reasonable in view of the total stress relief (approx. 700 MPa), inferred from the stress measurements during thermal cycling, as shown in Fig. 6. The dominant stress relief mechanism in the Al film under study appears to be hillock formation.



Fig. 5. Schematic of the likely mechanism of hillock growth.

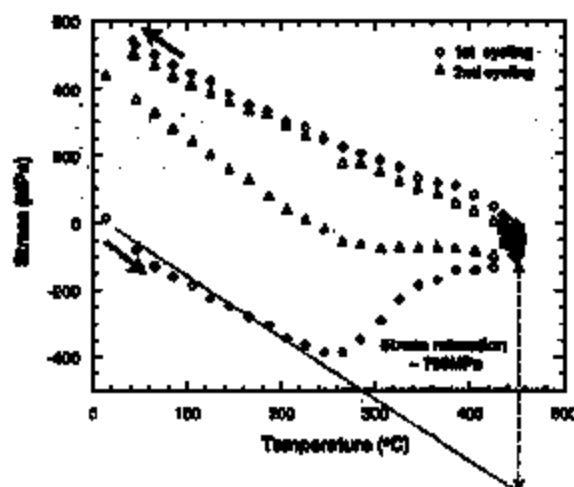


Fig. 6. Stresses vs. temperature during the first and the second thermal cycling of the Al film.

#### 4. Conclusion

We have characterized the microstructure of thermal hillocks in Al films which had been annealed at 450°C. At the sites of the hillocks, the original films are found to be displaced by material inserted under them to give hillocks with a conical shape. The micrographs also reveal the grain structures and give valuable new insight into mechanisms of hillock growth. Based on the microstructural observations, we propose that the hillocks grow by diffusion of atoms from the vicinity to

the interface between the original film and the newly-deposited material. The stress relief due to hillock growth is estimated from the size and spacing of the hillocks and found to amount to reasonable values. Hillock formation appears to be the dominant stress relief mechanism in the Al film under study. The proposed hillock model may not be applicable to all kinds of hillocks, but seems to describe the experimentally observed hillock formation in these small-grained films.

#### Acknowledgements

This work was funded by Semtech, SIA, and DARPA under the MARCO Interconnect Focus Center Program.

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## Residual stress and in-situ thermal stress measurement of aluminum film deposited on silicon wafer

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### Abstract

Residual stresses in aluminum film deposited on a silicon wafer were measured after annealing and quenching. In all cases, residual stresses were tensile, but slow cooling produced larger stresses than quenching. Residual stresses of slow-cooled samples became relaxed after annealing above 300 °C. Film passivation by carbon deposition retarded the relaxation of residual stress. In-situ X-ray stress measurement revealed that compressive stresses developed in a heating stage and tensile stresses in a cooling stage. From a scanning electron microscopy observation, it becomes clear that the former contribute to nucleation of hillocks and the latter to void formation and growth.

**Keywords:** Aluminum; Internal stress; Stress migration; X-ray stress measurement

### 1. Introduction

Residual stresses in thin films deposited on substrates [1-5] are an important yardstick on the reliability of film/substrate systems. Large residual stresses cause cracks in the film or delamination of the film from the substrate. If the temperature changes in these systems, thermal stresses develop in the film because of a mismatch in the coefficient of thermal expansion between film and substrate [6-10]. A large temperature change produces large stresses which may induce plastic deformation as well as creep deformation in the film. With large scale integration (LSI) technologies, on the other hand, aluminum film is used in the electronic circuits and the width of interconnect line structures becomes progressively smaller, e.g. less than half a micrometer. Breaking of the fine line as well as short circuits between the adjacent lines have been observed under the application. Voids and hillocks that have developed by applied stress and electronic current are the reason of these phenomena [11-14]. The phenomena of these faults based on the stresses in film or lines are called stress migration [15,16]. Knowledge on the internal stresses in thin structures is important to understand the mechanism of formation of such faults.

The purpose of this study is to investigate a basic mechanism of stress migration. A two-tilt X-ray method is proposed for the measurement of stress in aluminum film with {111} orientation. Residual stresses in the aluminum film deposited on a silicon wafer were measured after annealing and quench-

ing at various temperatures. The effect of passivation by carbon film was also investigated. In-situ X-ray stress measurement was made to investigate a change in thermal stresses during heating and cooling processes. Voids and hillocks that had developed in the aluminum film were observed in the process of heat treatment by scanning electron microscopy.

### 2. X-ray stress measuring method for aluminum film

In general, the so-called  $\sin^2 \psi$  method is used in X-ray stress measurement. In this method, it is assumed that the material is composed of fine crystals with random orientation and that the stress state is biaxial and homogeneous through the X-ray penetrating region. Under these assumptions, the lattice strains at any angle  $\psi$ , which is defined by the angle between the normal of the specimen surface and the normal of the  $hkl$  plane, relate linearly against  $\sin^2 \psi$ . The stress is calculated from the gradient of  $\epsilon_p - \sin^2 \psi$  relation with the help of X-ray stress constants. However, as we will see precisely in the following, the Al films deposited on a thermally oxidized Si substrate has a strong preferred orientation; {111} of Al crystal becomes parallel to the macroscopic surface. The  $\sin^2 \psi$  method cannot be adopted in such a case.

For an Al film with a {111} preferred orientation, we make the following assumptions:

1. the stress state is equiaxial plane stress;
2. the <111> plane of aluminum crystal is perpendicular to the film surface; and

3. the film is composed of small crystals with  $2\pi$  rotational freedom about the  $\langle 111 \rangle$  axis.

On the basis of these conditions, the lattice strain  $\epsilon_{\text{ML}}$  is represented by the following equation:

$$\epsilon_{\text{ML}} = \left( s_{12} + \frac{1}{3}s_{11} \right) \sigma + \frac{1}{2}s_{44} \sigma \sin^2 \psi \quad (1)$$

where  $s_{11} = s_{11} - s_{12} - s_{44}/2$ ,  $s_{ij}$  are the elastic compliances of a single crystal. From the differentiation of Eq. (1) by  $\sin^2 \psi$ , stress  $\sigma$  is represented by

$$\sigma = \frac{1}{s_{44}/2 \sin^2 \psi} \frac{d\epsilon_{\text{ML}}}{d\sin^2 \psi} \quad (2)$$

However,  $\epsilon_{\text{ML}}$  values cannot be measured at an arbitrary  $\psi$  angle but at particular angles defined by crystal orientation and crystal structure. When  $\{111\}$  lies parallel to the surface, we obtain a strong 111 diffraction at  $\psi_1 = 0^\circ$ . Another 111 diffraction can be obtained at  $\psi_2 = 70.5^\circ$  because two crystallographic planes of  $\{111\}$  intercept each other at  $70.5^\circ$  in the cubic lattice. In this case we use the following equation instead of the  $\sin^2 \psi$  method for the evaluation of residual stress  $\sigma$ :

$$\sigma = \frac{1}{s_{44}/2 \sin^2 \psi_1 - \sin^2 \psi_2} \frac{\epsilon_{\psi_1} - \epsilon_{\psi_2}}{\sin^2 \psi_1 - \sin^2 \psi_2} \quad (3)$$

where we use  $s_{44} = 3.5336 \times 10^{-11} \text{ Pa}^{-1}$  [17].

### 3. Experimental procedure

#### 3.1. Specimen and heat treatment

The Al film was deposited in vacuum on a thermally oxidized silicon (111) wafer. The conditions of Al film preparation are summarized in Table 1. Carbon-passivated films 0.02  $\mu\text{m}$  in thickness were deposited on the aluminum film on some places. This deposition was performed in a vacuum chamber ( $1 \times 10^{-3} \text{ Pa}$ ) at room temperature.

For X-ray stress measurement, small pieces each measuring  $10 \times 10 \text{ mm}^2$  were cut out from the wafer. These pieces were then heat-treated in a vacuum furnace. Five levels of temperature were selected in order to investigate the effects of heating temperature on the alteration of residual stresses in the aluminum film. After heating to the desired temperature, the specimen was kept at this temperature for 1 h and

Table 1  
Conditions of depositing Al films

|                                     |                                 |
|-------------------------------------|---------------------------------|
| Purity of aluminum                  | 99.999%                         |
| Thickness of aluminum film          | 1.0 $\mu\text{m}$               |
| Substrate                           | $\text{SiO}_2/\text{Si}$ (111)  |
| Thickness of $\text{SiO}_2$ film    | 0.1 $\mu\text{m}$               |
| Thickness of Si wafer               | 430 $\mu\text{m}$               |
| Substrate temperature               | 200 $^\circ\text{C}$            |
| Evaporating temperature of Al films | 35 $\text{cm s}^{-1}$           |
| Vacuum condition during evaporation | $1.5 \times 10^{-4} \text{ Pa}$ |

Table 2  
Conditions of heat treatment

|                         |                                                        |
|-------------------------|--------------------------------------------------------|
| Annealing temperature   | 200, 300, 400, 500 $^\circ\text{C}$                    |
| Vacuum level            | $1 \times 10^{-2} \text{ Pa}$                          |
| Heating rate            | about 0.07 $^\circ\text{C s}^{-1}$                     |
| Cooling rate:           |                                                        |
| slow cooling to furnace | about $8 \times 10^{-2} \text{ }^\circ\text{C s}^{-1}$ |
| quenching into water    | about 200 $^\circ\text{C s}^{-1}$                      |

then cooled down to room temperature with slowly in the furnace or quickly in water (quenching). The conditions are summarized in Table 2.

#### 3.2. X-ray lattice strain measurement and its conditions

The X-ray equipment for residual stress measurement is based on parafocusing optics. A  $\psi$  diffractometer was used for the measurement of diffraction that appeared at  $\psi = 0^\circ$  and  $70.5^\circ$ . For the measurement of in-situ thermal stress in a high-temperature vacuum furnace, parallel beam optics were used in order to avoid an experimental error occurring because of a small change in the position of the specimen surface by heating. Table 3 shows the conditions of stress measurement. Cr K $\alpha$  characteristic X-rays were used for measuring 222 diffraction that appeared at  $2\theta = 157^\circ$ . Diffraction intensities were measured by fixed time counting and corrected by Lorentz polarization and absorption factors. From the corrected intensity distribution, K $\alpha_1$  component was separated by Rachinger's method and then the Gaussian function was fitted to the measured data by the least-squares method to determine the peak position of diffraction.

In order to measure in-situ thermal stresses during heat cycles, a small vacuum furnace was set on the diffractometer. After reaching the desired temperature, we waited for 15 min to stabilize the sample temperature before starting the measurement. The temperature deviation was within  $\pm 10^\circ\text{C}$  at 200  $^\circ\text{C}$ ,  $\pm 5^\circ\text{C}$  at 300  $^\circ\text{C}$  and  $\pm 2^\circ\text{C}$  at 400 and 500  $^\circ\text{C}$  throughout the measurement. Temperature cycles were controlled by the computer programming, repeating heat-cool cycles with a successive increase in the maximum heating temperature. The measurement was made in both heating and cooling stages.

Table 3  
Condition of X-ray stress measurements

|                               |                                                                                  |
|-------------------------------|----------------------------------------------------------------------------------|
| Diffractometer                | $\psi$ diffractometer                                                            |
| X-ray optics                  | Parafocusing for residual stresses<br>Parallel beam for in-situ thermal stresses |
| Characteristic X-rays         | Cr K $\alpha$                                                                    |
| Tube voltage and current      | 35 kV and 20 mA                                                                  |
| Divergent angle               | $1^\circ$                                                                        |
| Revolving slit                | 0.6 mm                                                                           |
| Scattering angle              | $1^\circ$                                                                        |
| Irradiation area              | $4 \times 5 \text{ mm}^2$                                                        |
| Diffraction and Bragg's angle | Al 222, $157^\circ$ (in $2\theta$ )                                              |

## 4. Experimental results

### 4.1. Structural evaluation of the deposited Al film

In order to make a quick search for the structure of Al film, a diffraction pattern was taken from the sample. Fig. 1 shows an example measured by Cr K $\alpha$  characteristic radiation at an angle of  $\psi = 0^\circ$ . It shows that only two diffraction peaks, i.e. 111 at  $2\theta = 58.6^\circ$  and 222 at  $2\theta = 156.7^\circ$ , appear in the whole  $2\theta$  range. This means the (111) plane of the aluminum crystal is parallel to the surface of the Al film. An additional observation at any orientation of the film surface revealed that the Al film is composed of small crystals and that each crystal has  $2\pi$  rotational freedom about the  $\langle 111 \rangle$  orientation which is the same to the normal of the film surface as has been assumed previously.

### 4.2. Measurement of lattice spacing

Fig. 2 shows the experimental results of  $d_\psi$  against  $\sin^2 \psi$ . Measurement at each of the five  $\psi$  angles shows that the scatter among the data points is very small. The standard deviation of stress value calculated from a set of five measurements is estimated to be  $\pm 4$  MPa. The data from the as-received specimen show a very small gradient but those from the heat-treated specimens have a large positive gradient from which large tensile residual stress is expected.

### 4.3. Residual stress alteration by heat treatment

Initial residual stresses measured from the as-received samples were small tensile stresses within 30 MPa.

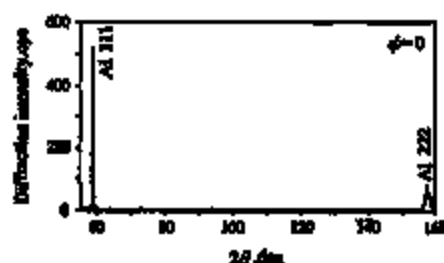


Fig. 1. Diffraction pattern of Al film deposited on a thermally oxidized (111) Si substrate.

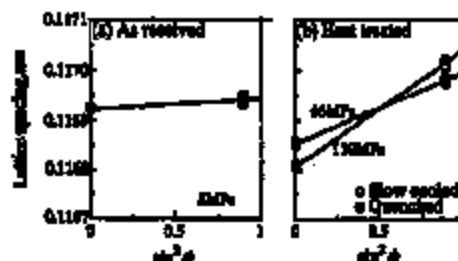


Fig. 2.  $d_\psi$  vs.  $\sin^2 \psi$  relations of Al films for evaluating residual stresses: (a) as-received and (b) heat-treated samples.

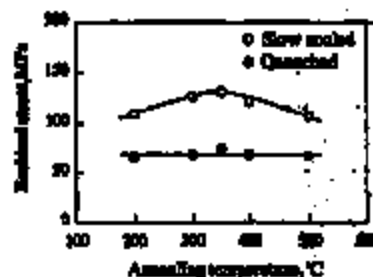


Fig. 3. Alteration of residual stress in unannealed Al films by heat treatment.

Fig. 3 shows a residual stress alteration by heat treatment: one is slow cooling in a furnace and the other is quenching in water from a desired temperature. Heating and furnace cooling treatments were made in a vacuum chamber but quenching was performed by unsealing the chamber and picking out the specimen from it.

Residual stresses in the Al film after each treatment were tensile; those in the slow-cooled samples are larger than those in the quenched samples. It is not yet clear why residual stresses in slow-cooled Al film are larger than those in quenched Al film. Tensile residual stresses are anyway produced by the treatment of heat and cool cycles. As the coefficient of thermal expansion (CTE) for aluminum is much greater than that for silicon, the heating process creates compressive stress in aluminum film. However, most of this compressive stress may relax at high temperature due to decreasing yield strength and creep effects. In the cooling stage, tensile stress develops in aluminum film due to the difference in CTEs between the film and the substrate and, finally, tensile residual stresses will be observed in the film. This behavior in thermal stresses will be precisely investigated by in-situ stress measurement in the Section 4.5.

Residual stresses in Al film for the slow-cooled specimens increased with increasing annealing temperature and then decreased as annealing temperature further increased. The maximum residual stress was attained at about 350 °C. On the other hand, residual stresses in Al film for the quenched specimens were independent of the annealing temperature.

The main reason for internal stresses that have developed in a film/substrate system is thermal potential, i.e. the product of the difference in CTEs between the film and the substrate,  $\Delta\alpha$ , and temperature change,  $\Delta T$ . Therefore, tensile residual stress grows large with increasing the annealing temperature, which is kept for 1 h before cooling, because of large thermal potential. This may be the reason why residual stresses in Al film gradually increase with increasing the annealing temperature up to 350 °C.

As will be shown in the later section, when temperature increases beyond 400 °C, small voids begin to develop in the film, growing in number as well as in size. The void growth may affect the relaxation of thermal stresses developing in Al film.

#### 4.4. Effect of carbon passivation on residual stress formation

Carbon-passivated film 0.02  $\mu\text{m}$  in thickness was deposited on the surface of Al/Si sample pieces. These specimens were heated to the same temperatures as those investigated in the previous section, kept at those temperatures for 1 h before cooling down to room temperature in the vacuum furnace. The results of residual stress measurement are shown in Fig. 4. The behavior of residual stress alteration with heating temperature is almost the same as that for the slow-cooled specimens without passivation. However, there is a clear difference between the two; the maximum tensile residual stress develops in the passivated films at 400 °C instead of at 350 °C for the unpassivated films. Carbon passivation of 0.02  $\mu\text{m}$  may not be sufficient to completely prevent void formation, but the effective prevention of void formation is observed by such thin passivation (see Section 4.6), demonstrating the retardation of residual stress relaxation.

#### 4.5. In-situ thermal stress measurement of Al film

To investigate the development of thermal stress in Al film, an in-situ X-ray measurement was made with specimens set in a vacuum furnace attached on a diffractometer with parallel beam optics. Fig. 5 shows typical  $d_p$  vs.  $\sin^2 \psi$  diagrams during heating and cooling cycles between room temperature and 300 °C. In the heating stage, a positive gradient measured at room temperature changes to a slight negative gradient at 100 °C followed by successive parallel transitions leading to the maximum temperature of 300 °C. In the cooling stage, a slight negative gradient observed at 300 °C changes to a

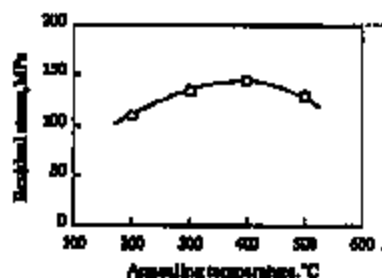


Fig. 4. Alteration of residual stresses in passivated Al films by heat treatments.

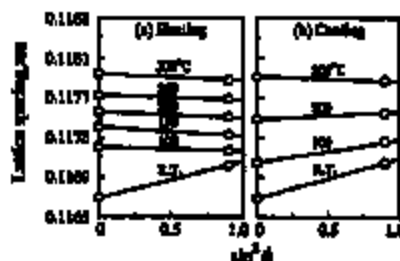


Fig. 5.  $d_p$  vs.  $\sin^2 \psi$  relations during heat and cool cycle between room temperature and 300 °C: (a) heating stage; (b) cooling stage.

positive one at 200 °C; the gradient increases until the end of the thermal cycle to a level almost the same as that in the initial state.

Figs. 6-8 show the results of the thermal stress measurement of aluminum film during a series of heating and cooling cycles. Fig. 6 shows thermal stress alterations between room temperature and 200 °C. The initial residual stress is almost zero. As temperature increases, a small compressive stress develops from 100 °C to 200 °C. In the cooling stage, stresses due to a thermal mismatch increase almost linearly with decreasing temperatures. The specimen was then again heated to 300 °C (Fig. 7). The initial high tensile stress of 160 MPa rapidly drops to zero at 100 °C (the first stage) and then the rate of decrease becomes small (the second stage).

The stress originating from the temperature change  $\Delta T$  of the Al film/Si substrate system is calculated by the following equation:

$$\Delta \sigma = \frac{E_{\text{Al}}}{1 - \nu_{\text{Al}}} \Delta \alpha \Delta T \quad (4)$$

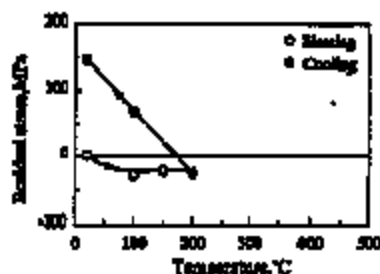


Fig. 6. In-situ thermal stress measurement of Al film during heat cycle from room temperature to 200 °C.

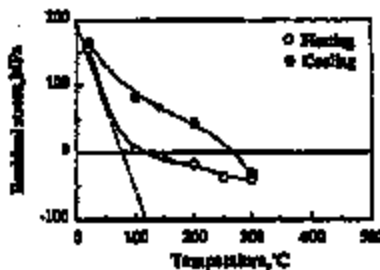


Fig. 7. In-situ thermal stress measurement of Al film during heat cycle from room temperature to 300 °C.

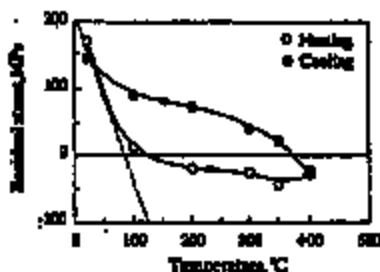


Fig. 8. In-situ thermal stress measurement of Al film during heat cycle from room temperature to 400 °C.



Table 4

Coefficients of thermal expansion and elastic constants of aluminum and silicon

| Properties                                                                  | Aluminum  | Silicon    |
|-----------------------------------------------------------------------------|-----------|------------|
| Coefficient of thermal expansion ( $10^{-6} \text{ } ^\circ\text{C}^{-1}$ ) | 23.9 [18] | 9.6 [18]   |
| Young's modulus (GPa)                                                       | 70 [19]   | 132.7 [20] |
| Poisson's ratio                                                             | 0.33 [20] |            |

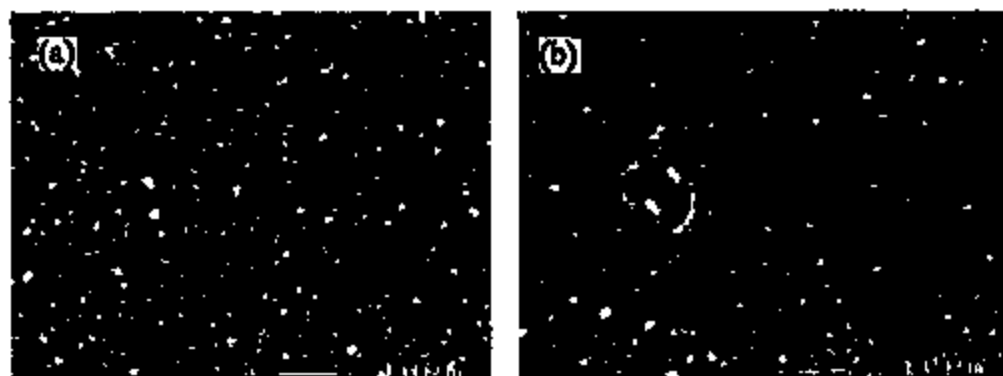


Fig. 9. SEM observation showing surface topographies of the samples: (a) quenched and (b) slow cooled from 500 °C.

where  $\Delta\alpha$  is the difference in CTEs between silicon ( $\alpha_{\text{Si}}$ ) and aluminum ( $\alpha_{\text{Al}}$ ),  $E_{\text{Al}}$  is Young's modulus and  $\nu_{\text{Al}}$  is Poisson's ratio of aluminum. The values are summarized in Table 4.

The broken line drawn through the data points of initial stress has the gradient  $\Delta\sigma/\Delta T$  ( $\approx 2.50 \text{ MPa } ^\circ\text{C}^{-1}$ ) calculated by the above equation. Although the measurement involves only two data points, i.e. room temperature and 100 °C, the real stress reducing behavior seems to be along this line. Above 100 °C, the data points deviate from this line due to decreased yield strength as well as creep phenomenon of aluminum crystal in a high temperature range.

The cooling stage can be divided into three stages. In the first stage, stresses rapidly increase to about 50 MPa, then the rate of increase slow down in the second stage. The last stage is from 100 °C to room temperature, during which the increase rate again picks up.

These changes in behavior in the heating and the cooling stages are qualitatively the same in the next heat cycle between room temperature and 400 °C as shown in Fig. 8.

#### 4.6. SEM observation of Al film surface after heat treatments

An SEM observation was made to investigate the surface configuration of Al film after heat treatments. Fig. 9(a) and 9(b) show the surfaces of quenched and furnace-cooled samples which have been kept at 500 °C for 1 h. From a surface analysis of silicon and aluminum components, it has been cleared that a bright part means a silicon-rich region and a dark part an aluminum-rich region, the former with hillocks and the latter with voids.

We have observed from a series of these photographs that the formation of hillocks begins in an early stage of the heating cycle. However, void formation is delayed until temperature is sufficiently high. The detailed observation of hillock and void formations and their development will be reported in the near future.

Fig. 10 shows the area fraction of hillocks counted in the photographs as a function of annealing temperature. Area fraction gradually increases with annealing temperature. Further, it is larger in the quenched samples than in the slow-cooled samples, meaning that the hillocks once formed at high temperature partly disappear during a furnace cooling stage.

Fig. 11 shows void formation and development as a function of annealing temperature. There is a clear difference between quenched and slow-cooled samples. Void formation is very scarce in the quenched samples even during quenching from 500 °C, the maximum temperature in this experiment. However, the area fraction in the slow-cooled samples increases as the annealing temperature increases, meaning that the voids are formed and have developed in size mainly in the furnace cooling stage.

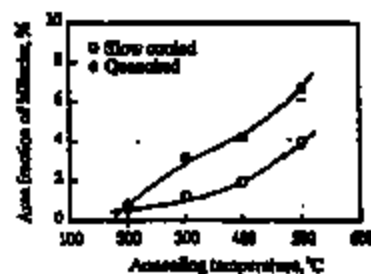


Fig. 10. Development of hillocks by increasing the annealing temperature.

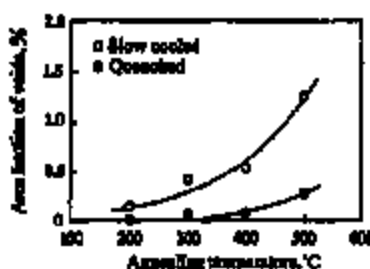


Fig. 11. Development of voids by increasing the annealing temperature.

From the in-situ thermal stress observation, we have seen that tensile stresses are formed in the cooling stage. Voids are formed and have developed when the Al film is subjected to tensile stresses. In the second stage of cooling, void formation relaxes thermal stresses and keeps them almost at a constant level. However, in the third stage (from 100 °C to room temperature), there may be no further void formation or development so that tensile stresses rapidly increase due to a thermal contraction mismatch between Al film and Si substrate.

Hillock formation develops in the second heating stage probably because the stress in the Al film is compressive. In the cooling stage, tensile stresses in the film tend to cause the aluminum atoms to flow out from the hillocks which have been formed as small eruptions or prominences on the surface, resulting in a decrease in the area fraction of hillocks.

The reason why the residual stress in the sample, which was slowly cooled from 500 °C, decreases may be due to relaxation by the increasing area fraction of voids as shown in Fig. 11.

## 5. Conclusion

Residual stresses and in-situ thermal stresses in Al film deposited on a thermally oxidized silicon substrate were observed by X-ray diffraction. Further, microscopic surface morphology of Al film was inspected by SEM observation. The results obtained are as follows.

1. Residual stresses are tensile after annealing at high temperatures. Residual stresses are larger in slow-cooled samples than in quenched samples, reaching the maximum value at 350 °C.
2. Passivation by carbon film prevents void formation which delays of residual stress relaxation at higher temperatures.
3. In-situ observation reveals that compressive stresses are formed in the heating stage and tensile stresses in the cooling stage due mainly to a thermal expansion and con-

traction mismatch between aluminum film and silicon substrate.

4. From an SEM observation it is found that hillocks are formed in a heating cycle due to compressive stresses in the film while voids develop in a cooling cycle due to tensile stresses in the film.

## Acknowledgements

The authors would like to thank Mr. H. Hanaki for taking the experimental data.

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## CORRELATION BETWEEN SPECIAL GRAIN BOUNDARIES AND ELECTROMIGRATION BEHAVIOR OF ALUMINUM THIN FILMS

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(Received 4 August 1994; in revised form 13 December 1994)

**Abstract**—The texture in thin films develops during processing steps such as deposition and annealing. Recent studies show that texture plays an important role in stress voiding, thermal hillock formation, grain collapse and electromigration failure. Specifically, electromigration failure depends on the grain misorientation distribution, which describes the probability of different grain boundaries and, therefore, links the grain boundary structure to the mass transport that takes place primarily along the grain boundaries. To understand the relationship between the grain misorientation and electromigration lifetime in aluminum thin films, the texture was measured on three sets of films from different manufacturing conditions. The frequency of occurrence of coincidence site lattice (CSL) grain boundaries, which represent special misorientations between grains, was obtained, and electromigration tests were done for all three conditions. Experimental results show that the lifetime of patterned films increases as the amount of {111} texture and the frequency of CSL boundaries increased.

**Résumé**—La texture des couches minces se développe pendant des étapes de traitement telles que le dépôt et le recuit. Des études récentes démontrent que la texture joue un rôle important dans l'annulation de la fatigue, la formation de pic thermique, la déformation des grains et la rupture par électromigration. Spécifiquement, la rupture par électromigration dépend de la distribution de mésoorientations des grains laquelle décrit la probabilité de différents joints de grains et, donc, relie la structure des joints de grains au transport massif qui a lieu le long des joints de grains. Pour comprendre la relation entre la mésoorientation des grains et la durée de vie de l'électromigration dans des couches minces d'aluminium, on mesure la texture de trois couches fabriquées dans des conditions différentes. Nous avons obtenu une fréquence de l'occurrence de joints de grains à réseau de coïncidence (CSL) qui représente des mésoorientations spéciales entre les grains, et nous avons fait des tests sur l'électromigration dans les trois conditions. Les résultats expérimentaux démontrent que la durée de vie des couches modelées augmente quand la quantité de texture {111} et la fréquence des joints CSL augmentent.

### 1. INTRODUCTION

Because of the increasing sophistication in multilayer interconnect structures of silicon integrated circuit chips, thin film multilayers are becoming smaller and more complex, which induces various types of failure. One of the important mechanisms of failure in thin films is electromigration failure. Many factors influence the electromigration lifetime of thin films, including texture [1-4]. Texture in thin films develops during deposition processes such as evaporation, sputtering, chemical vapor deposition, and electrochemical deposition. In fact, it is rather difficult to deposit a sample without texture. Recent studies show that the activation energy for electromigration is

texture dependent and that a strong {111} texture in aluminum thin film improves the electromigration lifetime [5, 6].

During the last few years, the research on properties of coincidence site lattice (CSL) grain boundaries has intensified, because these boundaries are linked to special physical properties of materials [7-9]. Few systematic studies have investigated the effect of CSL boundaries on electromigration failure of thin films. Pionova [10] showed that a large number of special grain boundaries (CSL boundaries) in annealed films may increase the electromigration lifetime of thin films; however, it is not clearly understood what role the CSL boundaries play in electromigration failure. The main objective of this study is to improve the understanding of the influence of

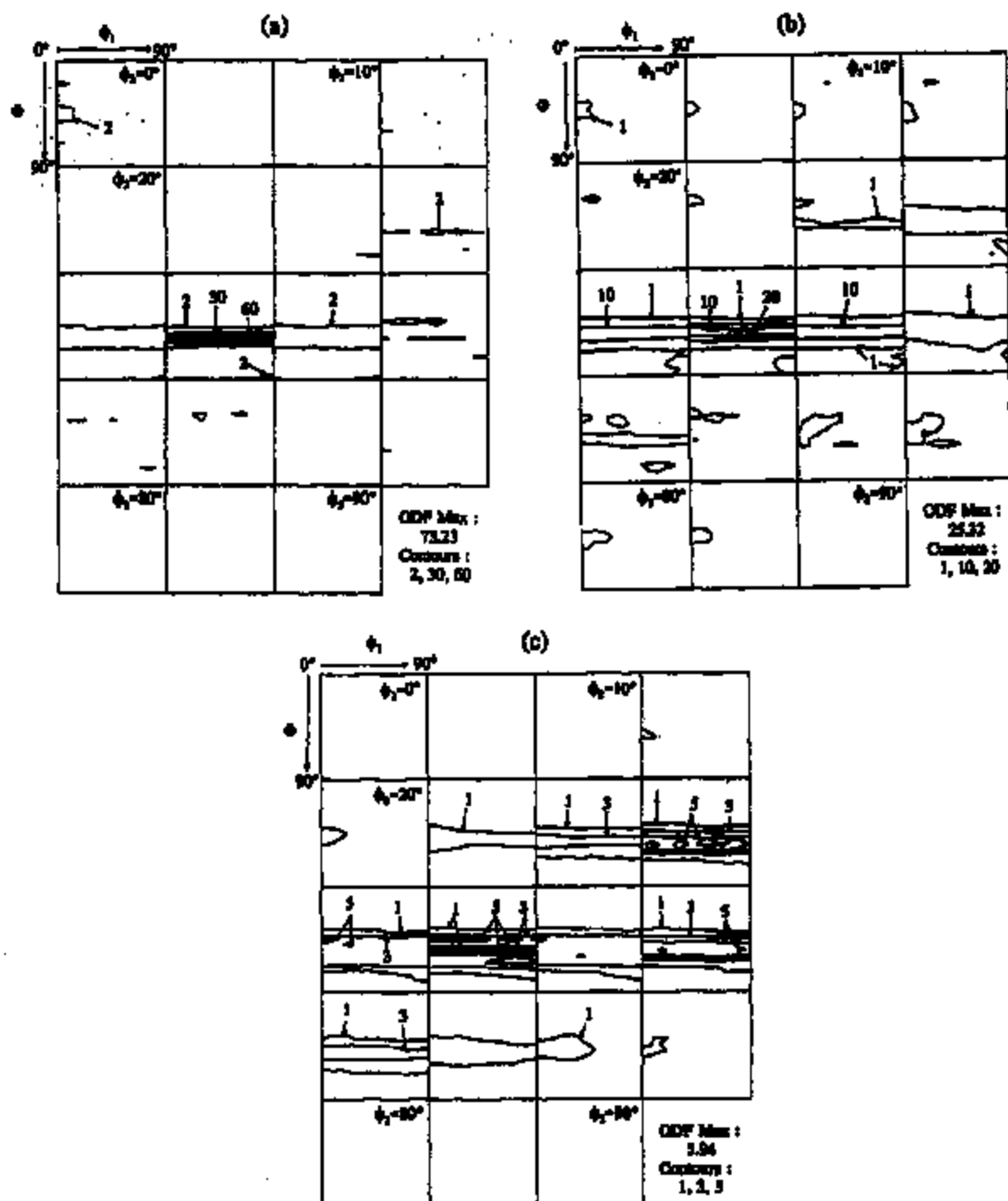


Fig. 1. Orientation distribution function (ODF) for specimens (a) FIB-2/1, (b) FIB-2/2, (c) SP-2.

CSL boundaries in electromigration failure in aluminum thin films.

## 2. EXPERIMENTAL PROCEDURE

Pure aluminum films were deposited on oxidized silicon by partially ionized beam (PIB) deposition [11] and by sputtering. During PIB deposition, a small fraction of evaporated aluminum atoms was ionized while a potential was applied to the substrate. Both neutral aluminum atoms and self-ions were deposited on the substrate simultaneously. The energetic ions provided enhanced surface mobility during deposition and effective in-situ cleaning. The substrate bias potential (ion energy) was fixed at 2 kV. Two specimens were deposited using the PIB technique with two different ion contents: PIB-2/1 with 1% ion content and PIB-2/2 with 2%. The substrate was held at room temperature, background pressure was  $10^{-4}$  Pa during deposition, and deposition rate was approximately  $10 \text{ Å/s}$ . The sputtered film, SP-2, was deposited at 2 kV. The aluminum films were  $1 \mu\text{m}$  thick. The samples obtained using the three different processing conditions were annealed at  $400^\circ\text{C}$  for an hour in forming gas (90%  $\text{N}_2$ -10%  $\text{H}_2$ ).

The texture of the films was measured using a Siemens texture measuring system, consisting of a computer controlled horizontal diffractometer with an Eulerian cradle. A molybdenum x-ray source was used. Texture data were collected by step-scanning every 5 degrees over the range  $0^\circ \leq \alpha \leq 85^\circ$  and  $0^\circ \leq \beta \leq 355^\circ$  for the  $\{111\}$  pole figure. Counting time for adequate counting statistics was 2 s/step. The raw data were corrected for defocusing, background, and absorption effects, and then plotted in the form of a pole figure. The corrected data were used as input to calculate the coefficients of the orientation distribution function (ODF).

The ODF data were used to calculate the distribution of CSL boundaries. The computer program for this calculation picks two orientations with probability determined by the ODF, calculates their misorientation and checks if this misorientation is close to given sigma misorientation. The accuracy of coincidence is defined by Brandon's criterion [12],  $\Delta\theta = 1.5^\circ \Sigma^{-1/2}$ . The calculation of the frequency of occurrence of CSL boundaries is based on the assumption that the material is spatially disordered, i.e. features such as correlation between orientation

of neighbouring grains, inhomogeneities, clustering and grain size effects are not taken into account. The only fact that influences this calculation is the orientation distribution. The calculation is also carried out under the assumption that all of the grains are same size, according to which the frequency obtained represents either the numbers of grain boundaries of a certain misorientation or the total area of such boundaries. Details of this method are described in another paper [13]. Ten thousand pairs of orientations were generated from the ODF and their misorientations were classified as CSL or non-CSL boundaries. The frequency of occurrence of E3-E27 CSL boundaries was calculated.

For an electromigration analysis, thin films were patterned into test structures by standard silicon processing techniques. At least ten unpassivated lines  $1.8 \mu\text{m}$  wide were tested at a current density of  $1 \times 10^6 \text{ A/cm}^2$  and at temperatures of 150, 175, 200, 225 and  $253^\circ\text{C}$ . Data for  $225^\circ\text{C}$  tests are used in this study.

## 3. RESULTS AND DISCUSSION

The results of the texture measurements for the PIB-2/1, PIB-2/2 and SP-2 are shown in Fig. 1. All three conditions have a strong  $\{111\}$  fibre texture as seen along the  $\gamma$  fibre ( $\phi = 35.4^\circ$ ,  $0 < \phi_1 < 90^\circ$ ,  $\phi_2 = \phi_1 = 45^\circ$ ). To clarify the shape of the  $\{111\}$  fibres, the  $\phi = 45^\circ$  sections of the ODF are presented in Fig. 2 for each specimen. Figures 1 and 2 show that PIB-2/1 has the sharpest  $\{111\}$  fibre texture and that the maximum intensity, which is 73 times random, is located in the centre of the fibre. PIB-2/2 also has a maximum intensity of 25 in the centre, although this maximum is much weaker than that for specimen PIB-2/1. For specimen SP-2, the fibre texture is weak and spread out where the maximum intensity of 6 is located about  $10^\circ$  from the centre of the  $\{111\}$  fibre ( $\phi = 35.4^\circ$ ,  $\phi_2 = 45^\circ$ ). This type of texture is referred to as near  $\{111\}$  [14].

Figure 3 illustrates the distribution of CSL boundaries up to E27 for all three specimens. In all specimens, the frequency of occurrence of the E3 and E7 boundaries is relatively higher than other CSL boundaries. In addition, the thin films deposited by the partially ionized beam technique (PIB-2/1, PIB-2/2) have higher frequencies of E3, E7, E13b, E19b and E21a boundaries than the sputtered film (SP-2). PIB 2/1 has a higher frequency of these specific CSL boundaries than PIB-2/2, especially for

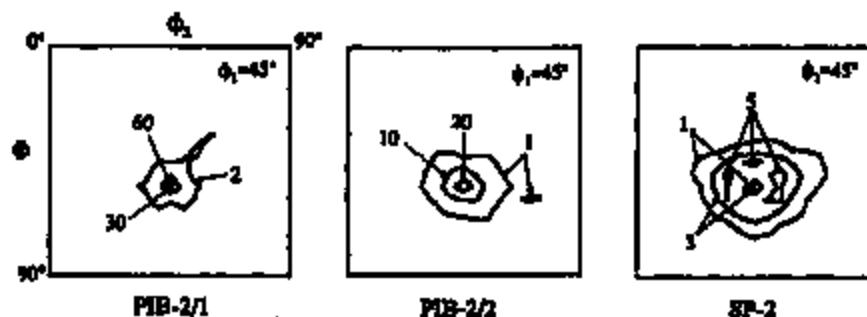


Fig. 2.  $\phi_1 = 45^\circ$  sections of the orientation distribution function (ODF) for each specimen.

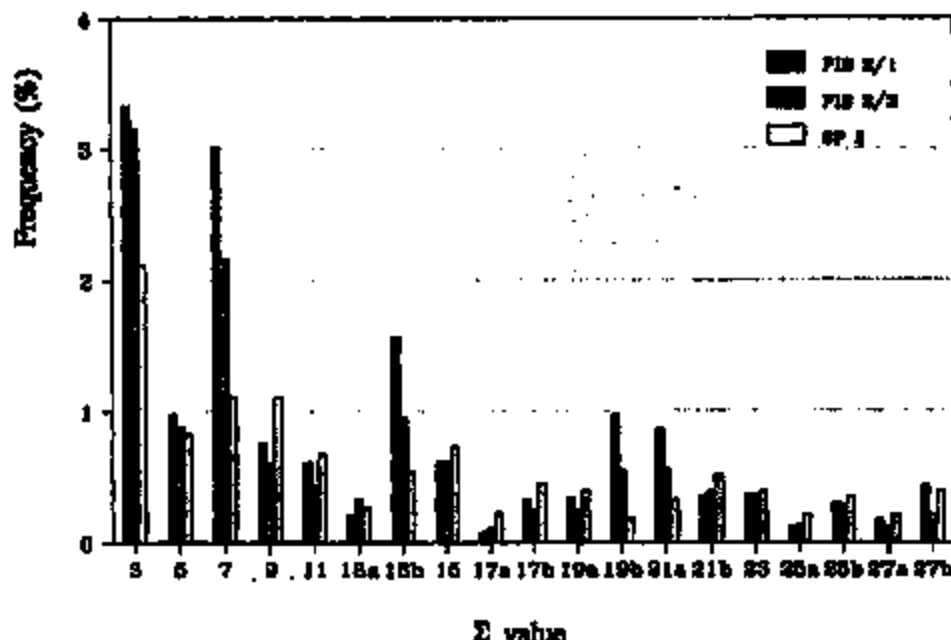


Fig. 3. Distribution of  $\Sigma$ 3- $\Sigma$ 27 CSL boundaries in each specimen.

the  $\Sigma$ 7 and  $\Sigma$ 19b boundaries. Specimen SP-2 has a higher frequency of  $\Sigma$ 9,  $\Sigma$ 13,  $\Sigma$ 17a,  $\Sigma$ 17b and  $\Sigma$ 21b boundaries.

Figure 4 shows the frequency of occurrence of the most prevalent CSL boundaries as a function of the maximum ODF intensity found for the  $\{111\}$  texture component of each specimen. Figure 4(a)-(c) shows the changes in frequency of occurrence of CSL boundaries having a common  $\langle 111 \rangle$ ,  $\langle 110 \rangle$  and  $\langle 100 \rangle$  rotation axis, respectively. The frequency of the  $\langle 111 \rangle$ -type grain boundaries ( $\Sigma$ 3,  $\Sigma$ 7,  $\Sigma$ 13b,  $\Sigma$ 19b and  $\Sigma$ 21a) increases as the intensity of the  $\{111\}$  fibre texture increases [Fig. 4(a)]. The increase of the  $\Sigma$ 7 boundaries is the most significant. The frequency of the  $\Sigma$ 3 boundaries in the specimen PIB-2/2 was much higher than that in specimen SP-2; however, there is only a small difference between specimens PIB-2/1 and PIB-2/2. In specimen SP-2, which has the weakest  $\{111\}$  texture, there is a higher amount of  $\langle 110 \rangle$ -type CSL boundaries, such as  $\Sigma$ 9,  $\Sigma$ 11,  $\Sigma$ 19a and  $\Sigma$ 27a boundaries [Fig. 4(b)]. In the specimen PIB-2/2, the frequency of these boundaries decreases as the maximum intensity of  $\{111\}$  fibre texture increases. However, it increases slightly for the specimen PIB-2/1. The frequency changes of  $\langle 100 \rangle$ -type CSL boundaries are shown in Fig. 4(c). As the maximum intensity of the  $\{111\}$  texture increases, the frequency of the  $\Sigma$ 3 CSL boundaries increases, while the frequencies of some other boundaries decrease.

The results of the electromigration tests are shown as a cumulative failure distribution in Fig. 5 and the frequency of occurrence of prevalent CSL boundaries having  $\langle 111 \rangle$ ,  $\langle 110 \rangle$  and  $\langle 100 \rangle$  rotation axis is illustrated as a function of the median time-to-failure ( $t_{50}$  value) in Fig. 6(a)-(c). The frequency change of CSL boundaries as a function of  $t_{50}$  value is very similar to the frequency change as a function of intensity of  $\{111\}$  texture

component (Fig. 3). The results of the electromigration test are compared to the total frequency of CSL boundaries in Fig. 7. Specimen PIB-2/1 has the highest percentage of CSL boundaries, 14.9%, as well as the longest median time-to-failure,  $t_{50} = 736$  h. Specimen PIB-2/2 has 11.9% of CSL boundaries and a  $t_{50}$  value of 235 h. Specimen SP-2 has the shortest lifetime,  $t_{50} = 106$  h, and the lowest percentage of CSL boundaries, 10.4%. Several studies [12, 15, 16] have calculated the frequency of CSL boundaries in materials with a random grain orientation [ $f(g) = 1$ ]. A total of 9.2% of the boundaries were found to be  $\Sigma$ 3- $\Sigma$ 27. This result indicates that the grain boundary texture in SP-2 deviates only slightly from the distribution expected in a random material. Modelling of  $\{111\}$  fibre textures [17] shows that the proportion of CSL boundaries continues to increase as the  $\{111\}$  distribution tightens beyond the levels in PIB-2/1. The trend of an increasing fraction of  $\Sigma$ 3,  $\Sigma$ 7,  $\Sigma$ 13,  $\Sigma$ 19 and  $\Sigma$ 21 boundaries develops further. Electromigration results on very tightly textured aluminium alloy films [18] demonstrate the continuing trend of substantially longer times to failure with increasing fraction of CSL boundaries.

It is clear from this comparison that there is an association between the time-to-failure and the frequency of occurrence of CSL boundaries; a higher percentage of CSL boundaries correlates with longer lifetime in patterned films. It is known that the diffusivity along the large-angle grain boundaries depends on the misorientation of grains [19, 20] and that the diffusivity of grain boundaries with special misorientation (CSL boundaries) is less than that for general grain boundaries by several orders of magnitude [19]. It seems that a relatively large frequency of CSL boundaries in the specimen PIB-2/1 has contributed to improvement of its electromigration lifetime. The

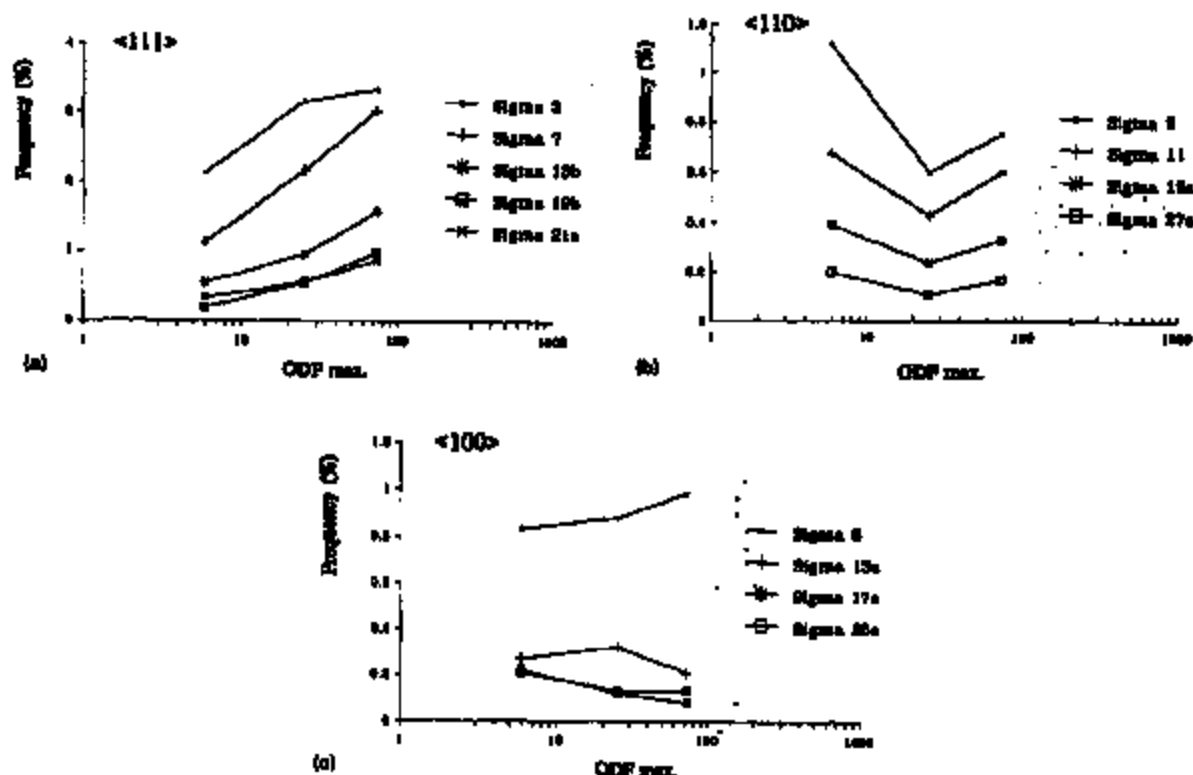


Fig. 4. Frequency of selected CSL boundaries as a function of ODF maximum for: (a) <111>-type CSL boundaries; (b) <110>-type CSL boundaries; (c) <100>-type CSL boundaries.

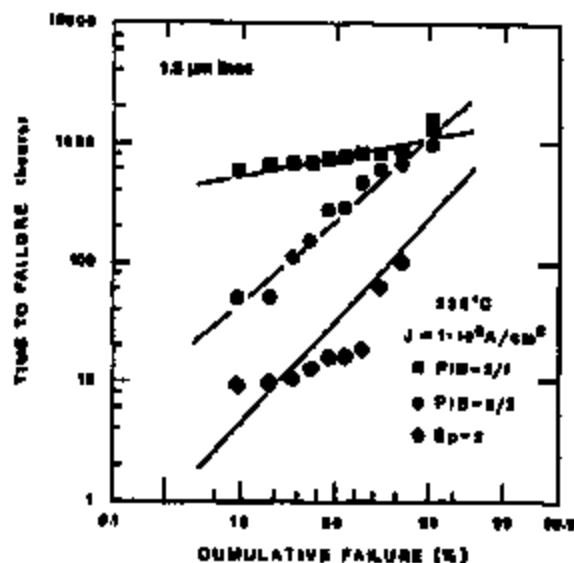


Fig. 5. Electromigration results for three specimens.

specific role of particular grain boundaries is not known. Detailed analyses of the grain orientation from many failure sites and the diffusivity along CSL boundaries are required.

#### 4. CONCLUSIONS

The role of special grain boundaries in electromigration behaviour of aluminium thin films was investigated for three thin film specimens with different textures.

The following conclusions are drawn from this study:

1. Thin films deposited using the PFB technique have a stronger {111} fibre texture and their median time-to-failure is longer than in the thin film deposited by sputtering.
2. The frequency of occurrence of CSL boundaries for specimen PIB-2/1 is higher than that in specimen PIB-2/2, and lowest in specimen SP-2. It seems that the lifetime of thin films increases as the number of special boundaries and the strength of {111} texture increases.
3. As the intensity of the {111} texture increases, the frequency of occurrence of CSL boundaries increases. The electromigration failure in aluminium thin films is correlated with

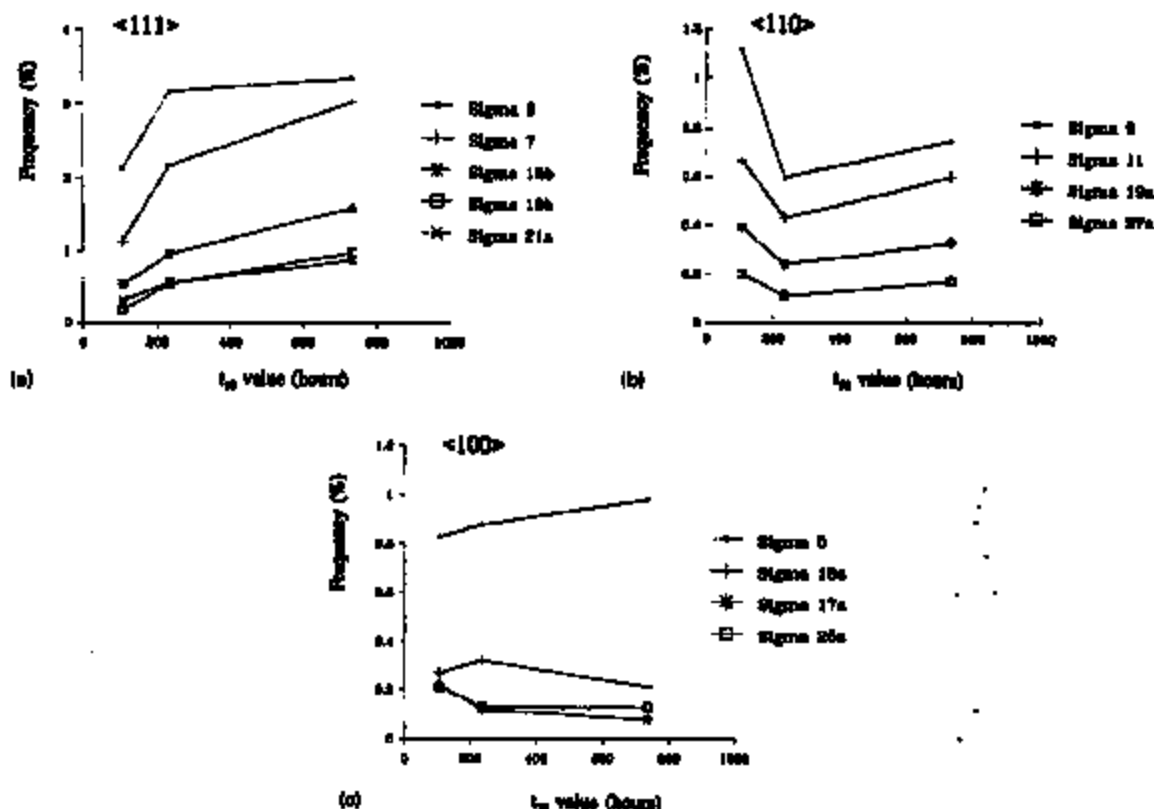


Fig. 6. Frequency of CSL boundaries as a function of median time-to-failure ( $t_m$  value) for: (a)  $\langle 111 \rangle$ -type CSL boundaries; (b)  $\langle 110 \rangle$ -type CSL boundaries; (c)  $\langle 100 \rangle$ -type CSL boundaries.

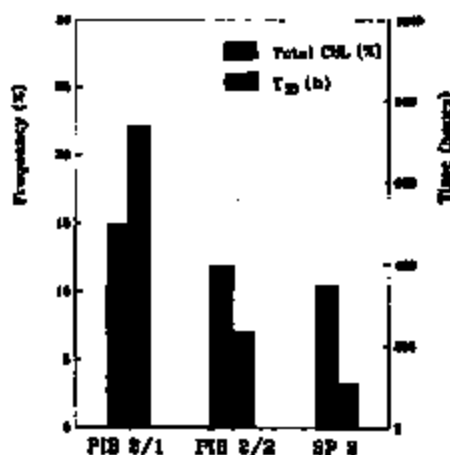


Fig. 7. Comparison of the total frequency of CSL boundaries with the  $t_m$  value of each specimen.

the frequency of occurrence of CSL boundaries and the strength of  $\{111\}$  texture.

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# A comparative study of hillock formation in aluminum films

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Received 2 December 1994; accepted 12 July 1995

## Abstract

Studies were conducted to evaluate the performance of a variety of aluminum alloys with respect to hillock formation. Specifically, the effects of film composition, deposition temperature, and underlayer on hillock formation were investigated. The film compositions included pure Al, Al with 1.5 wt.% Cu (or AlCu), AlCu with 0.2 wt.% W, and AlCu with 0.4 wt.% W. These films were sputter deposited at 300 °C and 450 °C on either oxide- or Ti-W-coated Si substrates. Following deposition, the films were annealed in air for 20 min at 450 °C. For all film compositions, the deposition temperature had the most significant effect on the hillock density. For a given deposition temperature, the addition of Cu to pure Al drastically reduced the hillock density, but the addition of W to AlCu increased the hillock density. The effect of the underlayer on the hillock density was negligible. Cross-sections of the hillocks showed that they were solid from the bottom interface to the top surface, and no voids were found near the hillocks. The grain size did not have a significant effect on the hillock density. However, a correlation between increasing (111) film texture and decreasing hillock density was observed.

**Keywords:** Alloys; Aluminum; Stress

## 1. Introduction

In recent years, attempts to improve the performance and reliability of aluminum interconnect materials have motivated studies of a variety of alloying elements [1-7]. The performance of a new alloy material is often measured in terms of its resistance to stress-induced void formation and electromigration failure. Another commonly encountered problem in metallization is hillock formation. Hillocks can lead to excessive surface roughness and interfere with photolithography steps. They can also crack the dielectric film isolating the metal lines and result in interlevel electrical short circuits [8]. Additionally, hillocks can protrude from the sides of metal lines and cause intralevel short circuits among adjacent metal lines [9].

Hillocks form because of large thermal stresses in the metal films, arising from the large difference in the coefficients of thermal expansion (CTEs) of the metal and the underlayer. The CTE of Al is approximately 10 times larger than the CTE of Si; and consequently, when an Al film is deposited on Si and heated, a compressive stress is produced in the Al film. Hillock formation is one mechanism whereby this thermally-induced compressive stress is relieved.

A number of mechanisms have been proposed for the formation of hillocks in thin metal films, including grain bound-

ary diffusion, diffusional creep, and interfacial diffusion [10-25]. Because hillock formation is a stress relaxation mechanism which occurs in localized regions in a polycrystalline metal film, one might expect inhomogeneities in the metal microstructure, such as the mean grain size and grain size distribution, and the grain orientations and their distribution about a reference direction, to play dominant roles. Experimental data will be presented to show the effects of the film composition, deposition temperature, and underlayer on the metal film microstructure, and the effects of the microstructure on hillock formation.

## 2. Experimental details

Two full 2<sup>3</sup> factorial experiments were run to determine the contributions due to each of the three independent variables (film composition, deposition temperature, and underlayer). Two-variable interactions were also examined. Control sets comprising pure Al films and commonly used Al with 1.5 wt.% Cu (AlCu) films were included for comparison. The two levels of film compositions in the factorial experiments were AlCu with 0.2 wt.% W, and AlCu with 0.4 wt.% W (or 0.2 W and 0.4 W films, respectively). Metal deposition was carried out at 300 °C and 450 °C. The two types of underlayers were Si (100) wafers coated with Ti-

W or plasma-enhanced silicon oxide prepared from a tetraethoxysilicate (TEOS) precursor.

Four-inch Si (100) wafers were first coated with either TEOS or Ti-W. The TEOS films were approximately 300 nm thick, and the Ti-W, 150 nm. Following underlayer deposition, metal films of varying compositions were sputter deposited to a nominal thickness of 750 nm. The AlCuW and pure Al films were deposited in the Verian 9180 sputter deposition system in the Materials Technology Center (Motorola, Mesa) at a rate of 18.5 nm s<sup>-1</sup>. The AlCuW films were prepared from homogeneous targets. Argon was the sputtering gas in all depositions. The chamber base pressure was typically 10<sup>-2</sup> Pa, and during deposition, the chamber was backfilled with Ar to approximately 0.9 Pa. Substrate heating during sputter deposition was accomplished by Ar-gas-coupled backside heating. The AlCu films were sputter deposited in an MRC Bellips sputter deposition system in the Advanced Technologies Center (Motorola, Mesa).

Following blanket metal film deposition, the wafers were annealed in air in a Flexus F2300 thin film stress measuring apparatus. All isothermal anneals were performed at 450 °C for 20 min. Wafers were brought from room temperature to 450 °C in 35 min, held at 450 °C for 20 min, then cooled to room temperature.

Following anneal, the wafers were characterized by seven different methods to determine the hillock density, hillock size distribution, hillock morphology, mean grain size and grain size distribution, grain and hillock orientations, and compositional variations. Results will be presented from scanning electron microscopy, transmission electron microscopy, profilometry, Auger electron spectroscopy, focused ion beam cross-sectioning, reflection high-energy electron diffraction, and X-ray/pole figure analysis.

### 3. Results

#### 3.1. Compositional analysis

A 0.2 W film was analyzed using Auger electron spectroscopy (AES) to compare the elemental compositions of the matrix and hillocking regions. The film was deposited at 300 °C on TEOS then annealed at 450 °C for 20 min prior to analysis by AES. Spectra were acquired on regions inside grains, on grain boundaries, and on hillocks. The Auger beam diameter was approximately <25 nm (much smaller than the typical hillock diameter of 1 000-2 000 nm), and the detection limit for W and Cu were approximately 1 at.%.

Tungsten was not detected in any of the areas analyzed either before or after a slight sputtering to remove approximately 30 nm of the surface material. Copper was detected in some grain boundaries, suggesting the presence of Cu-rich Al<sub>2</sub>Cu precipitates in the grain boundaries. A Cu distribution map using the most intense Cu LMM Auger signal confirmed the presence of Al<sub>2</sub>Cu precipitates in many grain boundaries.

The small concentration of W in the analyzed sample, 0.2 wt.%, is below the detection limit of AES (0.1-1 at.%, depending on the element). Segregation of W to the grain boundaries or hillocks may increase the local concentration of W enough to be detected by AES. However, additional analysis on the hillocks using long acquisition times did not detect W (nor Cu), and it was concluded that there was no significant compositional difference between the matrix and the hillocking regions in the 0.2 W film.

#### 3.2. Microstructural analysis

Plan-view transmission electron microscopy (PTM) was used to determine the mean grain sizes and size distributions of as-deposited and annealed metal films. Several trends were noted. The addition of W to AlCu alloy films decreased the mean grain size. Films deposited on Ti-W had smaller mean grain sizes than compared with films deposited on TEOS, for a given composition and deposition temperature. The grain sizes follow a log-normal distribution, and the plots of log of grain size versus cumulative probability fall along straight lines.

The morphologies of hillocks in annealed samples of different compositions were examined in a Cambridge scanning electron microscope without any sample preparation. The various hillock morphologies found on annealed samples of different compositions can be seen in the SEM micrographs in Figs. 1-3. In some cases, a moat can be seen around the outer edges of the hillocks. These moats probably formed during the cooling cycle, when the films were stressed in tension above their yield strengths. Terraces can also be seen on a number of hillocks, suggesting slip and/or that the hillocks formed in incremental steps.

Cross-sections of hillocks were obtained by using a focused beam of Ga<sup>+</sup> ions to gradually sputter away the material. The analysis was performed in a Micron 908 focused ion beam (FIB) system in the Materials Characterization Laboratory (Motorola, Mesa). Fig. 4 and Fig. 5 are



Fig. 1. SEM micrograph of a hillock with a relatively smooth, rounded appearance.

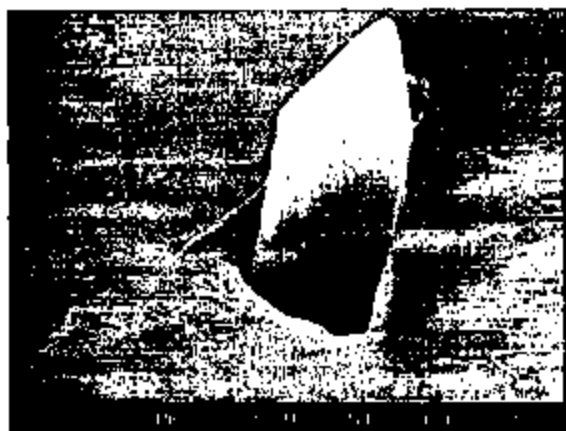


Fig. 2. SEM micrograph of a spire-like hillock with significant protrusion out of the film surface.



Fig. 3. SEM micrograph of a hillock with a flat top and striations/terraces on the left side.

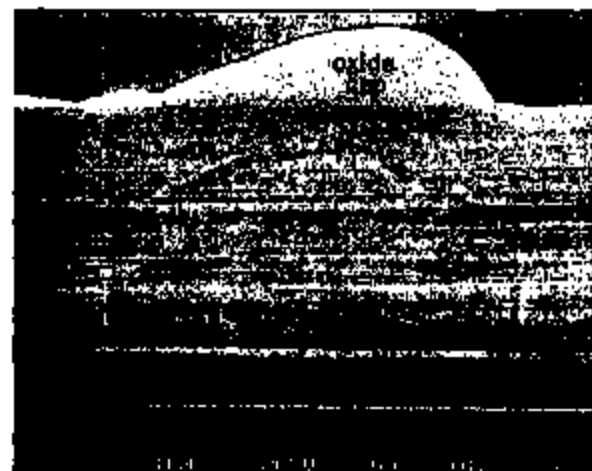


Fig. 4. FIB cross-section of a hillock formed in an annealed 0.4 W film which was deposited at 300 °C on TEOS.

secondary electron micrographs of two different hillocks from the same annealed 0.4 W, 300 °C film. A low-temperature PECVD oxide cap was deposited on the metal surface



Fig. 5. FIB cross-section of a rounded hillock formed in an annealed 0.4 W film which was deposited at 300 °C on TEOS.

to prevent erosion of surface features during sputtering. After cross-sectioning in the FIB system, the hillocks were delineated in a mixture of 4:1  $\text{NH}_4\text{PF}_6\text{:HF}$  for 5 s prior to SEM inspection. In all cases, the hillocks were solid from the bottom interface to the top surface, and no voids were seen near the hillocks. Grain boundaries can be seen, sometimes near or at the center of a hillock, but more often 1 000–2 000 nm from the center of the hillock. Because grain growth occurred during the 20 min anneal at 450 °C it is not possible to determine the original positions of the hillocks with respect to the grain boundaries. However, it cannot be excluded that a hillock has formed inside a grain.

Reflection high energy electron diffraction (RHEED) was used to determine the orientations of 8 hillocks in a 0.4 W film which was deposited at 300 °C on TEOS then annealed at 450 °C for 20 min in air. The diffraction patterns were generated using a 200 kV incident beam. The RHEED beam diameter was approximately 10 nm, much less than the mean hillock distance and the mean hillock diameter. Analysis of the diffraction patterns (not shown) generated from the reflection of the beam from the hillocks' surfaces showed that all the hillocks were randomly oriented and deviated from all major crystal axes, such as  $\langle 100 \rangle$ ,  $\langle 110 \rangle$ , and  $\langle 111 \rangle$ . Additionally, the orientations of 9 matrix grains surrounding one hillock were analyzed in the standard electron diffraction mode (transmission through a thinned specimen). It was found that the orientations of the matrix grains were very similar to each other, but they deviated significantly from the orientation of the hillock.

The  $\langle 111 \rangle$  film texture was characterized as a function of deposition temperature, film composition, and anneal treatment by means of X-ray/pole figure analysis. Because the  $\langle 111 \rangle$  peak intensities were a function of both the degree of texture and the film thickness, corrections were made to account for differences in the film thickness. Several important trends were noted.

1. For a given film composition and deposition temperature, annealing increased the amount of  $\langle 111 \rangle$  texture. How-

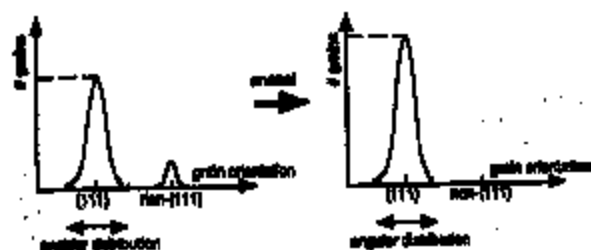


Fig. 6. Schematic representation of changes in the grains' orientations as a result of annealing and increased deposition temperature.

- ever, the (111) angular distributions (the diameter of the pole diagram) remained unchanged.
- Increasing the deposition temperature increased the (111) texture but exerted no significant effect on the (111) distribution.
  - Pure Al films were more textured in (111) than the 0.4 W films deposited at the same temperature.
  - There was no evidence of secondary texturing (no film texture other than (111)).

The physical interpretation of the observed change in (111) intensity and lack of change in (111) distribution as a result of annealing and increased deposition temperature is believed to be as follows. The distribution of grain orientations in these as-deposited metal films is believed to be mainly (111) grains with a small population of non-(111) grains. However, not all of the (111) grains were oriented perfectly parallel to the (111) pole, and there existed a finite distribution about the (111) pole. Upon annealing at 450 °C for 20 min, grain growth occurred, and the (111) grains grew at the expense of the non-(111) grains. The driving force for this process is the minimization of surface energy. However, the grains which deviated only slightly from the (111) pole remained unaffected, perhaps because the energy difference was not great enough to drive the grain growth process described above (see the schematic representation in Fig. 6).

### 3.3. Hillock density

All annealed metal films were characterized by profilometry to obtain the hillock densities and size distributions. To account for film surface roughness, only protrusions larger than 20 nm were counted as hillocks. For a given film composition, the deposition temperature had the most significant effect on the hillock density (Fig. 7). In AlCuW films, increasing the W concentration increased the hillock density, but the effect due to W was much smaller than that due to deposition temperature. Differences in the hillock densities due to the substrate material (TEOS vs. Ti-W) were statistically insignificant. Two-variable interactions (for instance, the interaction between film composition and deposition temperature) were also insignificant.

The hillock size distribution was a function of the deposition temperature only and was similar across all film compositions and substrate materials. For the 300 °C deposition, approximately 30 to 50% of the total hillock population were

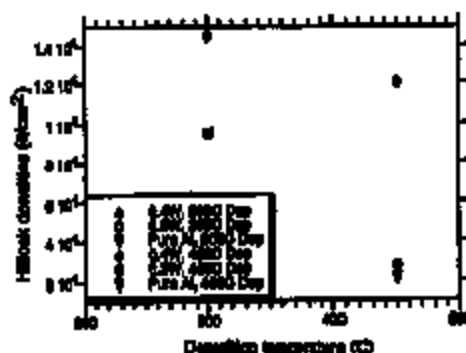


Fig. 7. Hillock densities as a function of deposition temperature for pure Al, 0.2 W, and 0.4 W films. Increasing the deposition temperature resulted in significantly lower hillock densities.

at least 100 nm in height; approximately 10% were at least 200 nm; and less than 1% were equal to or greater than 500 nm. For the 450 °C deposition, virtually all hillocks were less than 100 nm in height.

The addition of Cu to pure Al significantly decreased the hillock density, but the addition of W to AlCu films increased the hillock density. Indeed, no hillocks were observed in AlCu films. However, there was an abundance of Al<sub>2</sub>Cu precipitates on the annealed AlCu wafers. For this reason, the hillock densities of AlCu films are not reported.

### 4. Discussion

Film texture appeared to have the most significant effect on the hillock density, under the conditions studied in this work. Review of the pole figure and hillock density data revealed a correlation between increasing (111) film texture and decreasing hillock density (see Fig. 8). AlCu films had virtually no hillocks and the highest (111) texture. Additionally, for all film compositions, increasing the deposition temperature resulted in an increase in (111) texture and a decrease in hillock density (Fig. 7 and Fig. 8). Pure Al films were more strongly textured in (111) than 0.4 W films deposited at the same temperature, and the hillock densities in the

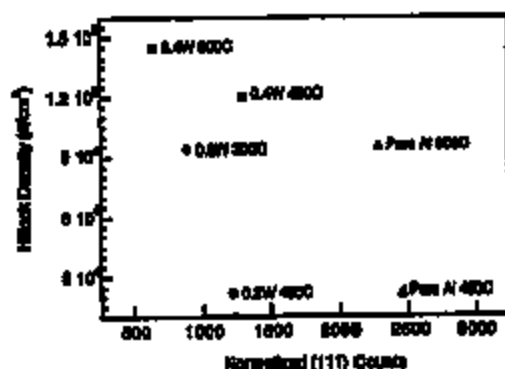


Fig. 8. Hillock density plotted as a function of (111) texture for pure Al, 0.2 W, and 0.4 W films. Films with greater (111) texture formed fewer hillocks.

# Novel prevention method of stiction using silicon anodization for SOI structure

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*Received 25 June 1998; revised 27 August 1998; accepted 4 September 1998*

## Abstract

Silicon anodization process has been applied to prevent both 'after-rinse stiction' and 'in-use stiction' for the sensors with SOI structure. The anodization process roughened the silicon surface causing hillocks of a few tens of nanometer in height and a few hundreds of nanometer in diameter, resulting in increment of water contact angle above 100° as expected from a theory of fractal structure. Prevention effect for 'after-rinse stiction' was evaluated with silicon cantilever beam array fabricated by SOI structure. The maximum detachment length became three times longer than that of the beam on usual silicon surface. The roughening of silicon surface reduces the actual contact area, and hence, it is effective in preventing 'in-use stiction'. The anodization process was also performed using 73% HF solution without causing attack for aluminum metallization. © 1999 Elsevier Science B.V. All rights reserved.

**Keywords:** Silicon anodization; Stiction; Fractal; Water contact angle; SOI; 73% HF

## 1. Introduction

Surface micromachining devices using SiO<sub>2</sub> sacrificial etching have advantages of integration with different type sensors, actuators and IC circuits with batch fabrication process [1]. Recently, micromachining sensors using SOI structure have been reported because the silicon structures above 10 µm thickness can be used with SDB-SOI structure [2–4]. The thick silicon structure results higher sensor capacitance, and the beams with single crystal silicon raises reliability because it does not have hysteresis and creep.

However, stiction is one of the most serious problem for the fabrication of surface micromachining devices and their long-term reliability [5]. The stiction is well known as 'after-rinse stiction' occurring in rinse/dry process after sacrificial wet etching process, and 'in-use stiction' caused by over-range shock or electrostatic force of static electricity etc. Many research groups made an effort to prevent stiction and carried out an analysis of the phenomenon [6]. For 'after-rinse stiction', techniques such as sublimation drying [7], supercritical carbon dioxide [8], photoresist-assisted release [9], SAM (Self-Assembled Mono layer) [10]

and Vapor HF etching [11] have been reported, whereas for preventing 'in-use stiction', methods namely, using dimple [7], fluorocarbon film [12,17], SAM [10], roughening silicon surface [14] have been reported.

The present paper shows the systematic study made on the application of silicon anodization process to prevent both 'after-rinse stiction' and 'in-use stiction' for SOI sensors. The anodized process roughened the silicon surface so that its water contact angle was increased to 100° from a theory of fractal structure. The prevention effect for 'after-rinse stiction' was evaluated, and the method was applied to the fabrication process of sensors.

## 2. Prevention of stiction

### 2.1. Theory of stiction

The 'after-rinse stiction' occurred in rinse/dry process after the sacrificial SiO<sub>2</sub> wet etching process is shown in Fig. 1. The phenomenon is divided into two processes, namely attracting process and adhesion process.

The attracting process is caused by capillary force of rinse liquid. Surface energy of liquid on solid can be divided to three components as illustrated in Fig. 2, where  $\alpha_{12}$ ,  $\alpha_{13}$  and  $\alpha_{23}$  denotes the interfacial tensions of the

<sup>\*</sup> Corresponding author.

pure Al films were lower (they were comparable with the 0.2 W densities).

Surprisingly, the film grain size did not have a significant effect on the hillock density. Unannealed films deposited on Ti-W consistently had smaller mean grain sizes than compared with those deposited on TEOS, but the difference in hillock densities was negligible.

Of the three process variables studied, the deposition temperature had the most significant effect on the hillock density and size distribution. From a processing standpoint, a few but very large hillocks can potentially cause more problems than a large number of hillocks of size  $\sim 20$  nm steps. For the compositions studied, increasing the deposition temperature from 300 °C to 450 °C eliminated all hillocks in the 500 nm range in height. This difference in size distribution may be due to different stress relaxation mechanisms which are operative in the 300 °C and the 450 °C films.

Schwarzer, Gerth and coworkers [14,16-18] have studied the effect of grain orientation on hillock formation. They used electron diffraction to determine the orientations of over 1 100 matrix grains and 80 hillocks in Al-1% Si films and found that while the matrix grains were strongly textured in (111), the orientations of the hillocks were quite different from that of the matrix grains.

Although the RHEED analysis in our study was much less extensive, we found results similar to those reported above. We were able to determine that the orientations of nine grains surrounding a hillock were very similar, but they differed significantly from that of the hillock's. We also analyzed the orientations of eight hillocks and found them to be random.

### 5. Conclusions

In conclusion, for Al-based alloys, process conditions which enhance (111) texture formation, such as higher deposition temperature, are expected to suppress hillock formation. In addition, a temperature excursion is necessary to produce the compressive thermal strain/stress leading to hillock formation. Therefore, minimizing the temperature difference between the metal deposition step and subsequent high-temperature processing steps is also expected to be advantageous. Finally, characterization of the film texture by X-ray/pole figure has been shown to be a useful analytical method for predicting the susceptibility of a material to hillock formation.

### Acknowledgements

The authors are grateful to the Materials Characterization Laboratory (Motorola, Mesa) for performing the various materials analyses and to Dan Sullivan, Materials Technology Center (Motorola, Mesa), for depositing the films. The X-ray/pole figure data were acquired by Dr. Anna Yates, Department of Chemistry (Arizona State University, Tempe).

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Fig. 1. Schematic diagram of stiction.

solid to liquid, the solid to air, and air to liquid interface, respectively [15].

The water contact angle  $\theta$  is derived from Young's equation as:

$$\cos \theta = \frac{\alpha_{12} - \alpha_{13}}{\alpha_{23}} \quad (1)$$

The capillary force  $F_p$  is derived from the stiction theory [3,6].

$$F_p = \frac{2\alpha_{23} \cos \theta}{h} \quad (2)$$

where  $h$  is gap of silicon structure and substrate. Eq. (2) implies that the capillary force becomes zero at  $\theta = 90^\circ$  and turns out to be negative for  $\theta > 90^\circ$ . Therefore, the attracting process does not occur on hydrophobic surface. In other words, if solid to air interfacial tension  $\alpha_{13}$  is smaller than solid to liquid interfacial tension  $\alpha_{12}$ , the structure is not attracted to the substrate.

The adhesion process is considered as the following process [5]. At first, hydrogen terminals are formed on silicon surface after HF etching process. However, these terminals are broken during rinse process by de-ionized water or upon exposure to atmospheric air. Then, hydroxyl groups are adhered by Van der Waals forces on silicon surface. If the structure get contacted to substrate by capillary force or over-range shock, etc., the structure get stuck to substrate by hydrogen bonding. The strength of hydrogen bonding is 2–5 kg/cm<sup>2</sup> at room temperature, which is enough to make permanent adhesion to substrate.

## 2.2. Roughening surface and its water contact angle

As mentioned above, the capillary force becomes zero at  $\theta = 90^\circ$ , and for values of  $\theta$  greater than  $90^\circ$ , it turns out to be negative for values of  $\theta$  greater than  $90^\circ$  in accordance with Eq. (2). Although complete hydrogen terminated silicon surface is thought to be hydrophobic with a contact angle of around  $90^\circ$  [5], silicon surface after rinse and exposure to atmospheric air is slightly hy-

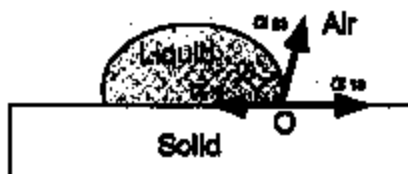


Fig. 2. Diagram of contact angle of liquid on solid.



Fig. 3. Illustration of water contact angle for mirror surface and roughening surface. (a) For mirror surface, (b) for roughening surface.

drophilic with water contact angle of around  $60^\circ$  because of the attachment of hydroxyl groups. Hence, formation of hydrophobic surface such as SAM or fluorocarbon film is one of the effective methods to prevent stiction although these methods require additional fabrication process or specific equipment.

The water contact angle also can be increased with roughening surface from the theory of fractal structure (roughening surface) as illustrated in Fig. 3 [16]. The water contact angle on roughening surface is given by the following equation [15,17]:

$$\cos \theta_r = r \cos \theta \quad (3)$$

where  $\theta_r$  is the water contact angle on roughening surface and  $r$  is a coefficient giving the ratio of the actual area of a roughening surface to the projected area. Usually, the coefficient  $r$  is very large on roughening surface, so that hydrophobic surface becomes ultrahydrophobic (super-water repellent) on roughening surface [16]. Therefore, if contact angle of roughening silicon surface after rinse/dry process becomes greater than  $90^\circ$ , the capillary force becomes negligible. This situation will be effective to prevent 'after-rinse stiction'.

## 2.3. Silicon anodization and its water contact angle

There are many methods to roughen silicon surface such as etch-back [11], making dimples [4] or chemical etching by  $\text{NH}_4\text{F}$  [2], etc. In the present study, silicon anodization process has been applied to roughen the silicon surface, because the process is simple and can be carried out in HF solution as shown in Fig. 4. HF solution is used in  $\text{SiO}_2$  sacrificial etching process, and the HF solution enters under SOI structure during the etching process, therefore, silicon anodization process can be continuously performed after sacrificial etching. The method

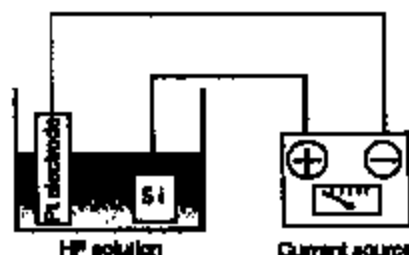


Fig. 4. Principle of silicon anodization.

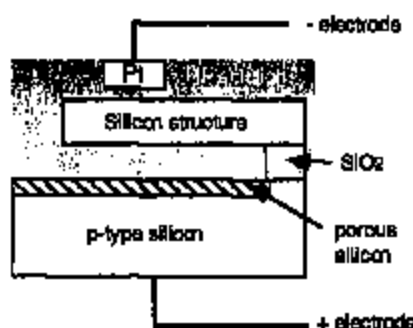


Fig. 5. Electrode contact to SOI structure for anodization process.

is also considered to be effective especially for high trench SOI sensors because entire liquid substitution in chemical treatment is usually difficult for the high aspect ratio SOI structures [19].

It is important to note that an electrode is connected to silicon p-type substrate as illustrated in Fig. 5. Therefore, current does not flow to silicon structure since it is isolated by  $\text{SiO}_2$  layer. As a result, the silicon structure is not getting anodized during the process of anodization.

The anodization process is dependent on the doping level of silicon wafer, concentration of HF solution and current density, etc. [20]. In our case, the p-type ( $10^{18}/\text{cm}^3$ ) silicon was anodized in 16% HF ( $\text{HF}:\text{H}_2\text{O} = 1:5$ ) solution with a current density  $20 \text{ mA}/\text{cm}^2$  for 60 min. Fig. 6 shows the SEM photograph of the anodized silicon surface. Small holes of size around a few tens of nanometer to a few hundreds of nanometer were formed on silicon surface. The surface profile was evaluated using AFM measurement. Fig. 7 shows the profile of anodized silicon surface. Many holes (hillocks) in the range of around a few hundreds of nanometer in diameter and a few tens of nanometer in height were formed on silicon surface.

The hydrophobicity of anodized silicon surface was evaluated with contact angle of water droplet. The varia-

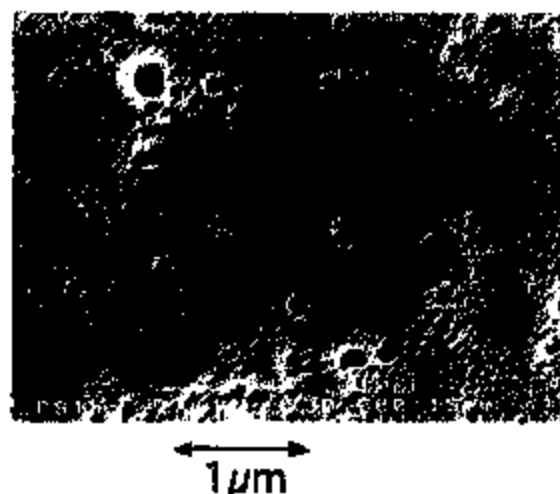


Fig. 6. SEM photograph of anodized silicon surface.

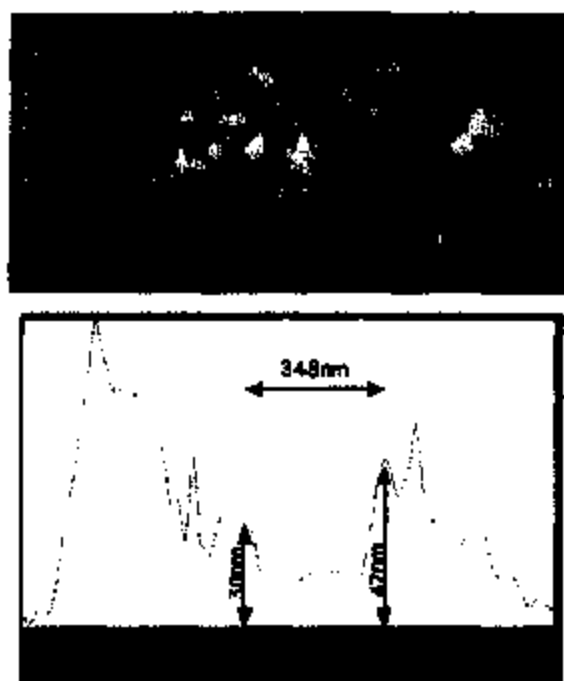


Fig. 7. Surface profile of anodized silicon surface by AFM measurement.

tion of the measured water contact angle in the relation of anodization time is shown in Fig. 8. As can be seen, the water contact angle increased with anodization time, and about  $100^\circ$  was attained over a 30-min duration. Fig. 9 shows the photograph of the water contact angle on silicon surface as well as on anodized silicon surface, where in the water contact angle of about  $100^\circ$  was clearly observed. The observed value satisfies the condition at which the capillary force can be negligible.

#### 2.4. Evaluation with cantilever beams

The effect of anti-stiction was evaluated using cantilever beam array fabricated by SOI structure. Figs. 10 and 11 show the structure and SEM photograph of silicon

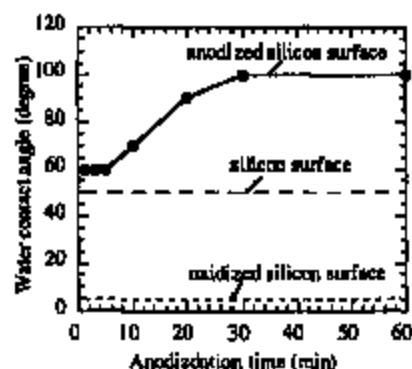


Fig. 8. Relation between water contact angle and anodization time.



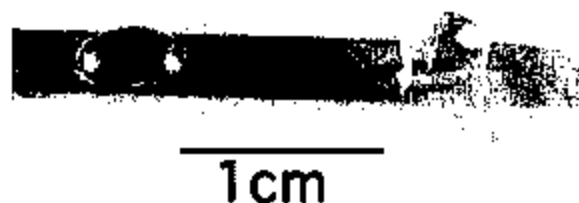


Fig. 9. Photograph of water contact angle on silicon surface (left) and on anodized silicon surface (right).

cantilever beams. The thickness of top silicon layer was 6  $\mu\text{m}$ , and thickness of  $\text{SiO}_2$  intermediate layer was 1  $\mu\text{m}$ . The width of beams was 20  $\mu\text{m}$ , and length was in range of 100  $\mu\text{m}$  to 2000  $\mu\text{m}$ . The substrate was high doped p-type ( $10^{19}/\text{cm}^3$ ) silicon and beams was low doped p-type ( $10^{15}/\text{cm}^3$ ) silicon. First, the silicon dioxide was sacrificial etched in 16% HF solution. Then, the sample was anodized with current density 20  $\text{mA}/\text{cm}^2$  in the same 16% HF solution. Further, the sample was rinsed in DI water, and dried in atmospheric air. The sticking probability was measured by SEM as shown in Fig. 12, or laser displacement measurement equipment. Fig. 13 shows the typical example of laser displacement measurement. The displacement between the substrate and beam's surface was measured by the equipment, so that gap between silicon beams and substrate can be calculated by subtracting the silicon thickness from the measured displacement.

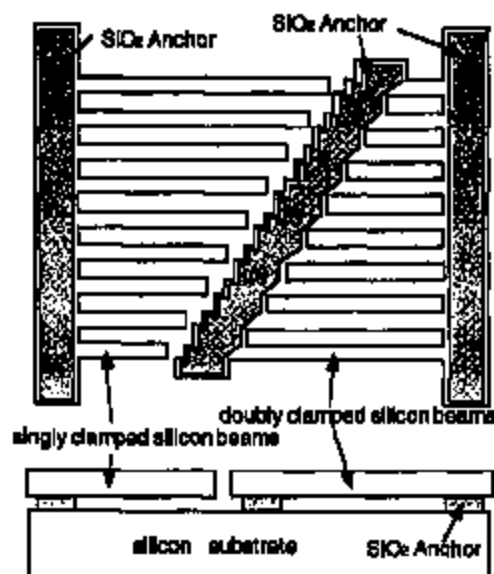


Fig. 10. Structure of SOI singly clamped cantilever beams and doubly clamped cantilever beams.



Fig. 11. SEM photograph of SOI cantilever beams.

Fig. 14 shows the relation between gap and beam's length for doubly clamped cantilever beams. From the results, it is evident that the maximum detachment length increases on anodized silicon surface.

The maximum detachment length of beams is calculated by the equations derived by Mastrangelo [6] as follows: For singly clamped cantilever beams:

$$N_p = \frac{3}{8} \frac{Eh^3t^3}{\gamma_s L^4} \quad (4)$$

where  $N_p$  is peeling number,  $E$  is the Young modulus of silicon,  $h$  is gap between beams and substrate,  $t$  and  $L$  are thickness and length of beams, and  $\gamma_s$  is adhesion energy of silicon surface.

For doubly clamped cantilever beams:

$$N_p = \frac{128}{5} \frac{Eh^3t^3}{\gamma_s L^4} \left[ 1 + \frac{4\sigma_s L^2}{21t^2} + \frac{256}{2205} \left( \frac{h}{t} \right)^2 \right] \quad (5)$$

where  $\sigma_s$  is the strain of beams.

By substituting  $N_p = 1$  in above the equation, maximum detachment length is calculated. The theoretical maximum detachment length on the usual silicon surface and measured maximum detachment length on anodized surface are summarized in Table 1. The maximum detachment length for each cantilever beams was increased with anodized time. For singly clamped beams, it increases 2 times compared to the beams on normal silicon surface with 30 min anodization treatment, and increases 3 times with 60 min anodization treatment.

From Fig. 8, the water contact angle of silicon wafer was maintained at the same value of  $100^\circ$  over 30 min, but

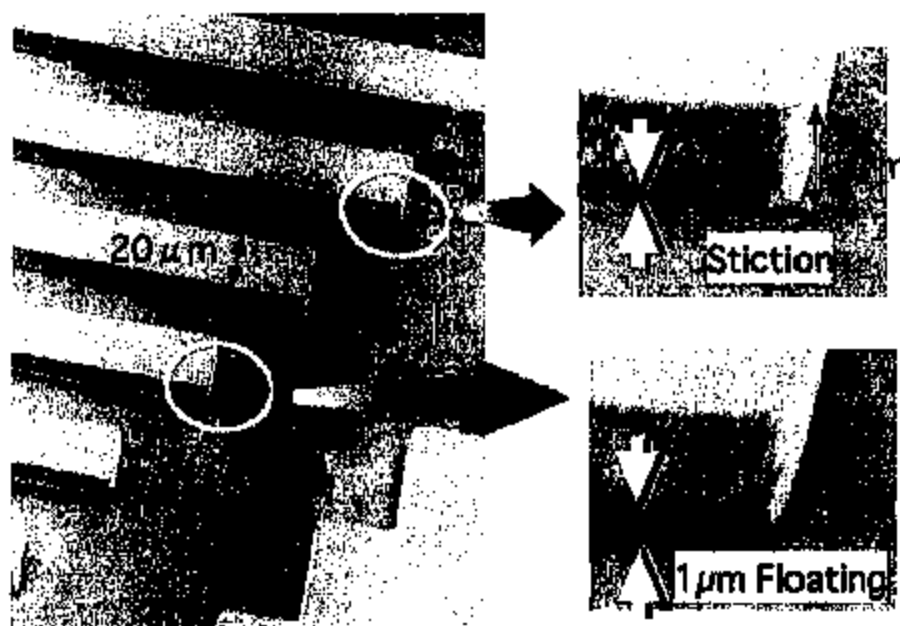


Fig. 12. Evaluation of stiction for SOI cantilever beams using SEM measurement method.

maximum detachment length of cantilever beams was increased with time over 30 min. Its difference was explained that the anodization speed was probably slow under cantilever beams structure because the substitution of HF solution was slow in the narrow gap between beams and substrate. However, it is evident that the maximum detachment length for each cantilever beams increases to about 3 times compared to the beams on normal silicon surface. From Eqs. (4) and (5), adhesion energy  $\gamma_s$  was calculated and found to be about a factor of 2 smaller than on normal silicon surface.

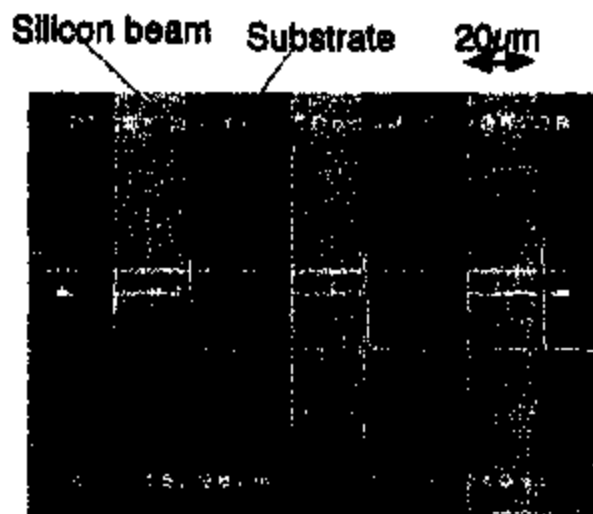


Fig. 13. Photograph of SOI cantilever beams under Laser displacement measurement equipment.

### 2.3. Long-term stability and thermal stability

The long-term stability of anodized silicon surface was evaluated. The anodized sample was exposed to atmosphere at room temperature for 3 months, and its water contact angle was evaluated. It was found that the water contact angle decreased from  $100^\circ$  to  $90^\circ$ . The slight decrease was probably caused by incomplete thin natural silicon di-oxide formation on anodized silicon surface.

The thermal stability of anodized silicon surface was also evaluated. The sample was placed on hot plate maintained at  $300^\circ\text{C}$  in atmosphere for 30 min duration, and its water contact angle was evaluated. The water contact angle decreased from  $100^\circ$  to  $5^\circ$  because of the formation of thick silicon di-oxide on anodized silicon surface. However, after dipping the sample in HF solution in a few

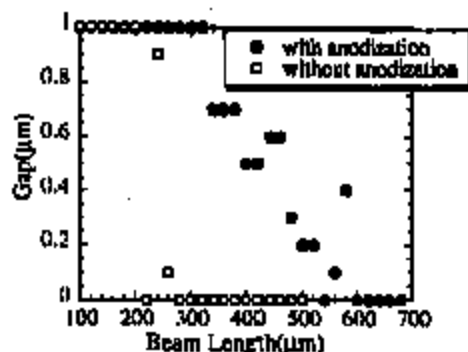


Fig. 14. Relation between gap and beam's length after raise and drying process for doubly clamped cantilever beams.

Table 1  
Maximum detachment length for the different treatments

| Maximum detachment length | For singly stamped cantilever beams | For doubly stamped cantilever beams |
|---------------------------|-------------------------------------|-------------------------------------|
| Theoretical length        | 94 $\mu\text{m}$                    | 270 $\mu\text{m}$                   |
| Normal surface            | less than 100 $\mu\text{m}$         | less than 200 $\mu\text{m}$         |
| Anodized (30 min)         | 180 $\mu\text{m}$                   | 260 $\mu\text{m}$                   |
| Anodized (60 min)         | 380 $\mu\text{m}$                   | 480 $\mu\text{m}$                   |

seconds, the water contact angle was recovered to  $100^\circ$  because silicon dioxide was removed by HF solution and anodized fractal structure was not broken at  $300^\circ\text{C}$ . Further, the sample was annealed in ambient of nitrogen gas at  $450^\circ$  for 30 min duration. The annealing process results in the decrease of water contact angle to  $5^\circ$  due to formation of silicon di-oxide on anodized silicon surface with the remained oxygen gas or water in the anodized structure. However, the water contact angle also recovered to  $100^\circ$  with a dipping in HF solution. It indicates that the anodized fractal structure was not broken at high temperature  $450^\circ\text{C}$ . It is in contrast with SAM or fluorocarbon film which were broken at high temperature of over  $300^\circ$  [5,13].

### 3. Application for sensor

#### 3.1. Compatibility of anodization process with 73% HF solution

Recently, sacrificial etching methods without causing attack to aluminum metallization using 73% HF was reported by Gemmisen and French [18]. If the anodized process can be performed with 73% HF without causing attack to aluminum, it is useful in view of the process compatibility for IC factory. Therefore, silicon anodization process with 73% HF (FLUKA Product #47610) was examined.

As mentioned before, the anodization process has to be carried out after  $\text{SiO}_2$  sacrificial etching process of over 30 min. However, the etching rate of silicon di-oxide is conc.

73% HF solution was too fast ( $1.5 \mu\text{m}/\text{min}$ ), it causes the attack to 'anchor' structure in SOI sensors. Therefore, 73% HF solution was diluted with IPA to 16% in order to reduce etching rate of silicon dioxide in which aluminum was not attacked [18]. The anodized process was performed for p-type ( $10^{19}/\text{cm}^3$ ) silicon with current density  $20 \text{ mA}/\text{cm}^2$  for 60 min duration. As the results, holes with sizes of around a few tens of nanometer were observed, and also, an increase in the water contact angle was noticed.

#### 3.2. Sensor fabrication and durability for in-use stiction

The capacitive SOI accelerometers using SOI structure have been fabricated by adopting anodization process to prevent stiction. The thickness of top single-crystal silicon is  $6 \mu\text{m}$  with a sacrificial silicon di-oxide layer of  $1 \mu\text{m}$ . The substrate was p-type ( $10^{19}/\text{cm}^3$ ), and aluminum was used for metallization [21]. After removing silicon dioxide in 73% HF solution, the sample was anodized with current density  $20 \text{ mA}/\text{cm}^2$  in the same 73% HF solution. It was possible to prevent 'after-rinse stiction', and yield of sensor can be increased using anodization method.

The anodized methods is considered to be effective in preventing 'in-use stiction' because the contact area is drastically decreased on roughened surface. Therefore, durability for in-use stiction was evaluated. Fig. 15 shows the relation between sensor capacitance of anodized sample and DC bias voltage applied to sensor. It was observed that the sensor capacitance was square proportional to bias voltage because of electro static force. The capacitance was saturated above 0.6 V because sensor structure come in contact with the substrate. The bias voltage of 3 V which was equivalent about 800 G was applied to sensor 50 times. After that, the initial capacitance was measured and found to be as of the same value. Further, it was changed by DC bias voltage almost in the same relation before contact test as shown in Fig. 15. The above observation confirms that the sensor structure was not stuck to substrate because of the decrement of contact area.

### 4. Conclusion

Silicon anodization process has been successfully applied to prevent both of 'after-rinse stiction' and 'in-use

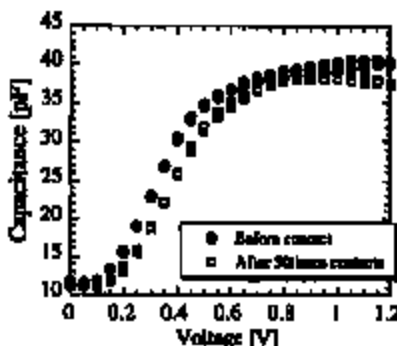


Fig. 15. C-V characteristics of SOI accelerometer using anodization method.

stiction' for SOI structure. The anodization process roughens silicon surface around a few tens of nanometer in height, so that water contact angle was increased over 100° after rinse process from fractal theory. The anodized process was also performed using 73% HF solution and IPA without causing attack to aluminum metallization. Prevention effect for 'after-rinse stiction' was evaluated with silicon cantilever beam array fabricated by SOI structure. The maximum detachment length becomes 3 times longer than that of on normal silicon surface. The reduction of actual contact area on roughening silicon surface made it effective in preventing 'in-use stiction'. Although it is difficult to prevent the formation of silicon di-oxide at high temperature, the anodized fractal structure was not broken at high temperature 450°C in ambient of nitrogen gas. The water contact angle was easily recovered to 100° with a few seconds dipping in HF solution.

#### Acknowledgements

This work has been partly supported by Japanese Ministry of Education, Science, Sports and Culture under a Grant-in-Aid for Encouragement of Young Scientists No. 10750065, and also partly supported by the Micromachine Technology Research Grant of Micromachine Center, Japan.

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## Material Safety Data Sheet

### IDENTIFICATION

Product Number: QMI 536

Product Name: Organic Die Attach

Synonyms: Non-Conductive Thermoset Adhesive

### INGREDIENT DISCLOSURE

| CAS number | Name                     | %    | Potential Hazard                                             |
|------------|--------------------------|------|--------------------------------------------------------------|
| 9002-84-0  | Proprietary Filler       | ≤ 50 | Instant evolution at temperatures greater than 300°C (572°F) |
| none       | Proprietary Bismaleimide | ≤ 50 | polymerization                                               |
| none       | Proprietary Polymer      | ≤ 20 | polymerization                                               |

**TSCA Status:** The product is a mixture and therefore listing on the TSCA registry is not required. Each of these ingredients are listed, or covered by a low volume exemption under section 5(h) (4).

### PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure: N/E

Density g/ml: 1.26

Water Solubility: Insoluble

Boiling Pt °C: N/A.

Vapor Pressure: Negligible

Polymerization Temp: 150°C

**Physical State, Appearance and Odor:** A viscous white paste with mild odor.

### FIRE AND EXPLOSION HAZARD DATA

Flash Point °F: > 200 °F

**Extinguishing Media:** carbon dioxide, dry chemical, water fog

**Special Fire Fighting Procedures:** Wear self-contained breathing apparatus and protective clothing to prevent inhalation or contact of combustion products.

**Unusual Fire and Explosion Hazards:** Hazardous polymerization will not occur.

|                        |
|------------------------|
| <b>REACTIVITY DATA</b> |
|------------------------|

Material is stable under normal storage and recommended use conditions (-40°C, and < 35°C, respectively)

**Incompatibilities:** Strong Oxidizers, acids, and bases.

**Hazardous Combustion or Decomposition Products:** CO<sub>2</sub>, CO, HF, NO<sub>x</sub>, hydrocarbons from incomplete combustion.

|                                        |
|----------------------------------------|
| <b>TOXICITY AND HEALTH HAZARD DATA</b> |
|----------------------------------------|

**Potential Routes of entry:** Ingestion, skin and eye exposure.

Is material listed in National Toxicology Program, Third Annual Report on Carcinogens? No

Has the material been found to be a potential carcinogen by the International Agency for Research on Cancer? No

**Acute Effects:** May cause eye and skin irritation on contact. Inhalation of fumes evolved during the product's cure may irritate the respiratory tract. Ingestion may cause irritation to the gastrointestinal tract.

To the best of our knowledge, the chemical, physical and toxicological properties of this material have not been thoroughly investigated.

**First Aid:**

**Inhalation -** Remove to fresh air and consult a physician. If not breathing give artificial respiration. If breathing is difficult give oxygen. Call a physician.

**Eyes -** Flush with water for at least 15 minutes and contact a physician.

**Skin -** Remove contaminated clothing as needed. Wash affected area with soap and water.

**Ingestion -** Drink large quantities of water. Do not induce vomiting. Contact a physician. Never give liquids to an unconscious person.

Product Number: QMI 536

Product Name: Organic Die Attach

#### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

**Protective equipment:** Safety glasses and chemical resistant gloves.

**Handling protocols:** Good personal hygiene must be maintained. Do not allow eating, smoking, or drinking in storage or use areas. Avoid ingestion and contact with skin and eyes. Use product in a well ventilated area.

**Storage conditions:** Store at -40°C until required for use.

#### SPILL OR LEAK PROCEDURES

**Steps to be taken if material is released or spilled:**

Small spills: Wipe up spilled material and package in storage drums for disposal.

Large spills: Shovel material in to storage drums for disposal.

**Waste disposal method:** Destructive Incineration in a permitted facility is the preferred method of disposal. Observe all federal, state and local laws.

#### TRANSPORT INFORMATION

|                               |               |
|-------------------------------|---------------|
| DOT/IATA Proper shipping Name | Not Regulated |
| DOT/IATA Packing Group        | Not Regulated |
| DOT/IATA Label                | Not Regulated |
| DOT/IATA UN Number            | Not Regulated |

#### REGULATORY INFORMATION

This product contains a toxic chemical(s) subject to the reporting requirements of SARA 313 (40CFR372).

#### OTHER INFORMATION

The information contained herein relates only to the specific material identified. Loctite Corporation believes that such information is accurate and reliable as of the date of this material safety data sheet, but no representation, guarantee or warranty, express or implied, is made as to the accuracy, reliability, or completeness of the information. Loctite Corporation urges persons receiving this information to make their own determination as to the information's suitability and completeness for their particular application.

Latest Revision By Bill Wood, Dated 04/08/02

Loctite Corporation  
9938 Via Pasar, San Diego, CA 92126  
Phone: (858) 695-1716 fax: (858) 695-0951

A  Company

Tel.: (313) 594-7645

-----Original Message-----

From: Ewell, Fred (F.)  
Sent: Thursday, August 29, 2002 2:15 PM  
To: Freeland, Mark (M.)  
Cc: Power, James (J.H.)  
Subject: Spark plug resistance checks

I was unable to pry Jim McCoy away from the vehicle long enough to get the plugs removed and checked for resistance. Please make arrangements with Jim Power and/or me next week after the labor day holiday. Have a good weekend.



---

**From:** Freeland, Mark (M.)  
**Sent:** Friday, August 30, 2002 1:48 PM  
**To:** Hargas, Jon (.)  
**Subject:** SRL test data base



All Data SRL Test  
Data.xls

**Regards**

**Mark Freeland**

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mlfreel1@ford.com  
Tel.: (313) 594-7645

From: Freeland, Mark (M.)  
Sent: Wednesday, July 10, 2002 12:29 PM  
To: Hanges, Jon (.)  
Subject: FW: Analysis of Exhaust Gas Condensate



Exhaust Gas  
Condensate.PDF

John,

I am not sure if I forwarded this to you before or not. Thought you would want this data.

Regards

Mark Freeland

> 6-Sigma Black Belt  
> Engine Research Department  
> Ford Research Laboratory  
> P.O. Box 2053  
> MD 2629 - SRL - Room 1517  
> Dearborn, MI 48121-2053 USA  
email: mfreelal@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Park, Kyong [mailto:KPark@kavlico.com]  
Sent: Thursday, June 27, 2002 12:59 PM  
To: mfreelal@ford.com  
Subject: Analysis of Exhaust Gas Condensate

Dear Mark,

For your information, I attached the copy of the analysis of exhaust gas condensate. The material was supplied by Ford, and the analysis was done by the outside laboratory, WCAS, Santa Fe Springs, CA in 1997.

Truly,  
Kyong

<<Exhaust Gas Condensate.PDF>>

**From:** Freeland, Mark (M.)  
**Sent:** Wednesday, June 05, 2002 10:45 AM  
**To:** Janda, Jon (J.M.); Kyong Park (E-mail); Brady Davies (E-mail)  
**Cc:** Jeff Helms (E-mail); Plants, Paul (P.G.); Maurer, James (J.B.); Hanges, Jon (.); Galea, Freeman (F.C.); Bryant, Bruce (B.D.); Kotwicki, Allen (A.J.)  
**Subject:** FW: American Express Itinerary

Attached is my itinerary for next weeks visit to Kavlico.

The focus of my trip is to review the parts from the High Current Acid, H2O2 and HO2 tests conducted to date and to plan next steps in the quest to recreate all of the field failure symptoms with lab tests.

I would propose that I plan to be at the plant at 8:30 am to give you time to take care of you're email etc.. Jon will let us know by tomorrow morning if he will be joining me.

Regards

Mark Freeland

> 6-Sigma Black Belt  
> Engine Research Department  
> Ford Research Laboratory  
> P.O. Box 2053  
> MD 2629 - SRL - Room 1517  
> Dearborn, MI 48121-2053 USA  
email: mfreelal@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

**From:** mschindo [mailto:amexusa@mindspring.com]  
**Sent:** Wednesday, June 05, 2002 11:34 AM  
**To:** mfreelal@ford.com  
**Subject:** American Express Itinerary

ITINERARY

PAGE NO. 1  
PNE: 1P-2LRAG5

FREELAND/MARK-FORD MOTOR CO  
PSGR 1-313-5947645  
ETKT EMAIL

NAME : FREELAND/MARK

| CO | DATE     | CITY-AIRPORT     | TIME | FLIGHT NBR/CLASS | ST SERV/AMNT |
|----|----------|------------------|------|------------------|--------------|
| A  | SU 09JUN | LV DETROIT/METRO | 605P | UNITED           | 1905M OK     |
|    |          | AR DENVER        | 709P |                  | 08STOP 737   |
|    |          | UA CONFO *XJTHDQ |      |                  |              |

SEAT 11-B \*\*RESERVED\*\*  
FRELAND/MARK

A SU 09JUN LV DENVER 800P UNITED 1285M OK  
AR BURBANK 919P OSTOP 737  
UA CONFO \*KJTHDQ  
CA1285-SEAT ASSIGNMENT IS AIRPORT CHECK IN

C SU 09JUN HERTZ CONFO-B8432744615  
HOLLYWOOD-BURBANK-TERMINAL PICKUP-09JUN SUN/2119  
BURBANK CALIFORNIA RETURN-12JUN WED/0616  
PHONE-818-569-3570  
RATE-(QUOTED) USD 52.50 DAILY UNLIMITED MILEAGE  
EXTRA HOUR CHARGE 27.00 UNLIMITED MILEAGE  
APPROX TTL USD170.49 INC TAX-OTH CHGS  
1 INTERMEDIATE CAR  
CORPORATE ID-25501

H SU 09JUN HYATT WESTLAKE PLAZA CHECK IN- 09JUN SUN/300PM  
880 S WESTLAKE VILLAGE BLVD CHECK OUT-11JUN TUE/1200PM  
WESTLAKE VILLAGE CA 91361 GUARANTEED TO CREDIT CARD-VI  
PHONE-805-557-1234  
FAX-805-379-9392  
CONFO-HY0021502555  
RATE GUARANTEED-USD  
PREFERRED RATE GUESTROOM  
RATE INFO-EFF 09JUN02 185.00  
CANCEL RQMTS-CANCEL 24 HOURS PRIOR TO ARRIVAL  
PERSONS INCLUDED IN RATE-1 CORPORATE ID-CR12642  
NSRM

H TU 11JUN HILTON BURBANK AIRPORT CHECK IN- 11JUN TUE/1500  
2500 HOLLYWOOD WAY CHECK OUT-12JUN WED/1200  
BURBANK CALIFORNIA 91505 GUARANTEED TO CREDIT CARD-VI  
PHONE-818 843-6000 FREE SHUTTLE SERVICE  
FAX-818 842-9720  
CONFO-3145442668NSCONF  
RATE GUARANTEED-USD  
AMERICAN EXPRESS TRAVEL

ITINERARY  
PAGE NO. 2  
PNR: 1P-2LRAG5

| CO   | DATE  | CITY-AIRPORT                                       | TIME  | FLIGHT NBR/CLASS      | ST SERV/AMNT  |
|------|-------|----------------------------------------------------|-------|-----------------------|---------------|
| H TU | 11JUN | HILTON BURBANK AIRPORT                             |       |                       | CONTINUED     |
|      |       | RATE INFO-169.00                                   |       |                       |               |
|      |       | CANCEL RQMTS-BY 0000 11JUN2002 LOCAL PROPERTY TIME |       |                       |               |
|      |       | 1 NIGHT STAY                                       |       |                       |               |
|      |       | PERSONS INCLUDED IN RATE-1                         |       | CORPORATE ID-N0002690 |               |
|      |       | NSRM                                               |       |                       |               |
| A WE | 12JUN | LV BURBANK                                         | 616A  | UNITED                | 574M OK SNACK |
|      |       | AR DENVER                                          | 925A  |                       | OSTOP 737     |
|      |       | UA CONFC *KJTHDQ                                   |       |                       |               |
|      |       | SEAT                                               |       | 11-E **RESERVED**     |               |
|      |       |                                                    |       | FREELAND/MARK         |               |
| A WE | 12JUN | LV DENVER                                          | 1005A | UNITED                | 1405M OK      |
|      |       | AR DETROIT/METRO                                   | 240P  |                       | OSTOP 757     |
|      |       | UA CONFC *KJTHDQ                                   |       |                       |               |
|      |       | UA1406 SEAT ASSIGNMENT AIRPORT CHECK IN            |       |                       |               |

FOR ALL US RESERVATION ASSISTANCE PLEASE CALL  
DIALNET 313-33-75100 OR 800-441-9705  
WHEN TRAVELING IN EUROPE PLEASE CALL  
EMERGENCY CENTER IN THE UK-44-208-774-7351  
OPEN FROM 4PM-9AM MON-FRI AND 24 HRS SAT AND SUN  
AFTER HOURS ASSISTANCE IN THE US CALL 800-354-2400  
OUTSIDE THE US OR CANADA CALL COLLECT 713-260-8713  
YOUR ACCESS CODE IS - W-NOF

THIS RESERVATION HAS BEEN MADE FOR YOU BY PCTO  
THIS IS AN ELECTRONIC TICKET.  
THE AIRLINE CONFIRMATION APPEARS BELOW THE FLIGHT SEGMENT.  
A PASSENGERS RECEIPT MAY BE REQUESTED AT THE AIRPORT  
FOR EXPENSE PURPOSES.

PLEASE CALL TO PROCESS A REFUND OR EXCHANGE.

\*\*\*\*\* POLICY REMARKS \*\*\*\*\*

ACCEPTED FARE WITHIN TRAVEL POLICY OF \$586.00

DIRECTORY HOTEL NOT APPLICABLE

\*\*\*\*\*

FORM OF PAYMENT IS VISA.

YOUR UNITED TICKET NUMBER IS 1531025030.

HAVE A PLEASANT TRIP

\*\*\*\*\*KEEP TO USE FOR EXPENSE REPORT\*\*\*\*\*

---

**From:** Freeland, Mark (M.)  
**Sent:** Wednesday, December 05, 2001 3:41 PM  
**To:** Donald Ayers (E-mail)  
**Cc:** Akins, Mary (M.); Brady Davies (E-mail); Hengas, Jon (.)  
**Subject:** Process Map

Don,

Could you please provide me with a detailed process map for the Gold Room processes.

Thanks

Regards

Mark Freeland

6-Sigma Black Belt Candidate  
Physics Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 3028 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

---

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, November 29, 2001 10:43 AM  
**To:** Hanges, Jon (.)  
**Subject:** FW: UPAD meeting papers for today

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, November 29, 2001 10:39 AM  
**To:** Randy Ray (E-mail); Aldra, Mary (M.); Donald Ayers (E-mail); Kyong Park (E-mail); Gates, Freeman (F.C.); Grant Heiler (E-mail); Owens, Karen (K.E.)  
**Subject:** UPAD meeting papers for today



Which Pads on  
which dies



UPAD Report 1.doc Blackbelt Freeland  
Plotter 10-...



Regards

Mark Freeland

6-Sigma Black Belt Candidate  
Physics Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 3028 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

---

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, November 27, 2001 7:08 PM  
**To:** Grant Helker (E-mail)  
**Cc:** Hengas, Jon (.); Kyong Park (E-mail)  
**Subject:** Potting Gel

Grant,

Could you please let me and "jhengas@ford.com" know what the name and product designation is for the potting gel used in the chimney over the die is.

We would like this information to be available in the morning if that is possible.

Many thanks

Regards

Mark Freeland

6-Sigma Black Belt Candidate  
Physics Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 3028 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreel1@ford.com  
Tel.: (313) 594-7645

---

**From:** Freeland, Mark (M.)  
**Sent:** Monday, November 19, 2001 9:53 AM  
**To:** Hengas, Jon (.)  
**Subject:** RE: Unprotected Area Damage Investigation:

Thanks Jon,

Are you sure they were ridges, not valleys in the TiW. My perception were that they were places where the TiW had separated exposing the overlying gold during the wire bonding operation?

Hope you are having a good vacation. See you on Monday week.

Regards

Mark



---

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, November 15, 2001 4:57 PM  
**To:** White-Johnson, Patrice (P.); Owens, Karen (K.E.); Gates, Freeman (F.C.); Kotwicki, Allan (A.J.); Johnson Jr., Joseph (J.L.)  
**Cc:** Akina, Mary (M.); Helms, Jeffrey (J.H.)  
**Subject:** Unprotected Area Damage



UPAD Report 1.doc

Please see the attached document

Regards

Mark Freeland

6-Sigma Black Belt Candidate  
Physics Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 3028 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

---

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, November 15, 2001 4:57 PM  
**To:** White-Johnson, Patrice (P.); Owens, Karen (K.E.); Gates, Freeman (F.C.); Kotwicki, Allan (A.J.); Johnson Jr., Joseph (J.L.)  
**Cc:** Atkins, Mary (M.); Helms, Jeffrey (J.H.)  
**Subject:** Unprotected Area Damage



UPAD Report 1.doc

Please see the attached document

Regards

Mark Freeland

6-Sigma Black Belt Candidate  
Physics Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 3028 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mtfreel1@ford.com  
Tel.: (313) 594-7645

---

**From:** Kevin R.J. Ellwood [kellwood@ford.com]  
**Sent:** Friday, July 19, 2002 2:17 PM  
**To:** Mark Freeland (MFREELA1)  
**Cc:** Jon Hanges (JHANGAS)  
**Subject:** VIN number for my Focus

Hi Guys,

I was told that you need my VIN number. Here it is:

1FAPP34362W147490

CU  
Kevin

-----  
Kevin R.J. Ellwood  
Materials Science Dept.  
Scientific Research Lab  
Dearborn, MI 48121-2153 MD3182

Phone: (313) 322-5535  
Fax: (313) 322-1129

From: Maurer, James (J.B.)  
Sent: Monday, June 10, 2002 4:33 PM  
To: Hengsa, Jon (.)  
Subject: FW: PDFE FA report



666\_add1.pdf

Jon,  
Here is the addendum to the report.

Regards,  
Jim Maurer  
James B. Maurer  
V-Engine 6-Sigma Team Leader  
Fuel Metering Dept. V Engine Engineering  
Phone (313) 390-3672, Fax (313) 390-4084  
Text Page: (313) 795-5219  
Email: jmaurer@ford.com

-----Original Message-----

From: Park, Kyong [mailto:KPark@kavlico.com]  
Sent: Thursday, June 06, 2002 3:18 PM  
To: pplante@ford.com; mfreelal@ford.com; mawad@ford.com;  
apomaz@ford.com; jmaurer@ford.com; Davies, Brady; makins@ford.com  
Cc: mstriz@analyticalsol.com; Tackman, Bruce  
Subject: FW: PDFE FA report

Team;  
I just received a report from Mr. Mike Strizich of Analytical Solutions.  
I have not even glanced at the report yet.  
We will discuss on this report in our meeting on coming Tuesday.

Analytical Solutions:

Dear Mike  
I thank you for the report, and I will get back to you after the meeting.

Yours,  
Kyong

> -----Original Message-----

> From: MIKE STRIZICH [SMTP:mstriz@analyticalsol.com]  
> Sent: Thursday, June 06, 2002 11:45 AM  
> To: 'Park, Kyong'; ktackman@kavlico.com  
> Subject: RE: PDFE FA report

>  
> Dr. Park,  
> Here is my second attempt at sending the report. I also cleaned up the  
> first  
> report, and will send it to you shortly.

> Thank you,  
> Mike  
>  
> -----Original Message-----  
> From: Park, Kyong [mailto:KPark@kavlico.com]  
> Sent: Monday, June 03, 2002 9:50 AM  
> To: jmaurer@ford.com; pplante@ford.com; mfreelal@ford.com;  
> fgates@ford.com; apoma2@ford.com; mawad@ford.com; Davies, Brady; Akins,  
> Mary  
> Cc: metrize@analyticalsol.com; Tackman, Bruce; Hubbard, Rick  
> Subject: FW: PDFF FA report  
>  
>  
> FYI  
>  
> > -----Original Message-----  
> > From: MIKE STRIZICH [SMTP:metrize@analyticalsol.com]  
> > Sent: Monday, June 03, 2002 8:35 AM  
> > To: 'Park, Kyong'  
> > Subject: RE: PDFF FA report  
> >  
> > Kyong,  
> > Should be done by Wed this week. I am sure there will be a lot of  
> > questions  
> > generated by the current report. Just have people email me relative to  
> > the  
> > questions, and I will get them into a report addendum.  
> > Regards,  
> > Mike  
> >  
> > -----Original Message-----  
> > From: Park, Kyong [mailto:KPark@kavlico.com]  
> > Sent: Monday, June 03, 2002 9:10 AM  
> > To: metrize@analyticalsol.com; jmaurer@ford.com; pplante@ford.com;  
> > mfreelal@ford.com; fgates@ford.com; apoma2@ford.com; mawad@ford.com;  
> > Davies, Brady; Akins, Mary  
> > Cc: Tackman, Bruce; Hubbard, Rick  
> > Subject: FW: PDFF FA report  
> >  
> >  
> > Dear Mike,  
> > I am distributing your report to the concerned people, and I like to ask  
> > when we should expect your report on next phase analysis?  
> > Thank you very much for your report.  
> > Yours,  
> > Kyong  
> >  
> > > -----Original Message-----  
> > > From: MIKE STRIZICH [SMTP:metrize@analyticalsol.com]  
> > > Sent: Sunday, June 02, 2002 8:42 AM  
> > > To: 'Park, Kyong'  
> > > Cc: "Kevin Berger"; Clifton Aldridge  
> > > Subject: PDFF FA report  
> > >  
> > >  
> > > Dear Mr. Park,  
> > > Please find the attached failure analysis report for your review. An  
> > > addendum with mainly photos showing damage on remaining samples will  
> > > follow

> > > shortly. Please pass along to FORD participants and Brady.  
> > > I look forward to your feedback, and hope we can continue to service  
> > your  
> > failure analysis needs.  
> > > Regards,  
> > > Michael Strizich  
> > >  
> > > -----Original Message-----  
> > > From: Park, Kyong [mailto:KPark@kavlico.com]  
> > > Sent: Friday, May 31, 2002 8:34 AM  
> > > To: mstriz@analyticalsol.com  
> > > Subject: Report & Passcode  
> > >  
> > >  
> > > Dear Mike,  
> > > Hello.  
> > > I am not rushing you, but I am just wondering whether I should expect  
> > > to  
> > > receive any report from you today. Ford people asked about a passcode  
> > > to  
> > > your data base, the passcode that you had mentioned about during our  
> > > visit  
> > > to your company.  
> > > Please, let me know.  
> > > Thank you.  
> > > Kyong <<02F686PRELIM.pdf>>  
> > > <<686\_add1.pdf>>

**From:** Mike Boneaver [MBoneaver@MicroSi.com]  
**Sent:** Wednesday, November 28, 2001 12:24 PM  
**To:** 'Jhanges@ford.com'  
**Cc:** Mark Neuber (E-mail)  
**Subject:** SIFEL 807 MSDS



SIFEL 807A-XX.doc SIFEL 807B-XX.doc

Dear John;

It was nice talking to you today; Here are the MSDS sheets for SIFEL 807A and B.

Mark Neuber is the gentleman at Shin-Etsu Silicones of America who would handle your needs.  
His number is (505) 856-0988.

I'll also send your request for a solvent to our team in Japan, and will get back to you as soon as I have an answer.

Thx

Mike <<SIFEL 807A-XX.doc>> <<SIFEL 807B-XX.doc>>



## Material Safety Data Sheet

### IDENTIFICATION

Product Number: QMI 536

Product Name: Organic Die Attach

Synonyms: Non-Conductive Thermoset Adhesive

### INGREDIENT DISCLOSURE

| CAS number | Name                     | %    | Potential Hazard                                              |
|------------|--------------------------|------|---------------------------------------------------------------|
| 9002-84-0  | Proprietary Filler       | ≤ 50 | Irritant evolution at temperatures greater than 300°C (572°F) |
| none       | Proprietary Bismaleimide | ≤ 50 | polymerization                                                |
| none       | Proprietary Polymer      | ≤ 20 | polymerization                                                |

**TSCA Status:** The product is a mixture and therefore listing on the TSCA registry is not required. Each of these ingredients are listed, or covered by a low volume exemption under section 5(h) (4).

### PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure: N/E

Density g/ml: 1.26

Water Solubility: Insoluble

Boiling Pt °C: N/A

Vapor Pressure: Negligible

Polymerization Temp: 150°C

**Physical State, Appearance and Odor:** A viscous white paste with mild odor.

### FIRE AND EXPLOSION HAZARD DATA

**Flash Point °F:** > 200 °F

**Extinguishing Media:** carbon dioxide, dry chemical, water fog

**Special Fire Fighting Procedures:** Wear self-contained breathing apparatus and protective clothing to prevent inhalation or contact of combustion products.

**Unusual Fire and Explosion Hazards:** Hazardous polymerization will not occur.



Product Number: QMI 536

Product Name: Organic Die Attach

|                        |
|------------------------|
| <b>REACTIVITY DATA</b> |
|------------------------|

Material is stable under normal storage and recommended use conditions (-40°C. and < 35°C. respectively)

**Incompatibilities:** Strong Oxidizers, acids, and bases.

**Hazardous Combustion or Decomposition Products:** CO<sub>2</sub>, CO, HF, NO<sub>x</sub>, hydrocarbons from incomplete combustion.

|                                        |
|----------------------------------------|
| <b>TOXICITY AND HEALTH HAZARD DATA</b> |
|----------------------------------------|

**Potential Routes of entry:** Ingestion, skin and eye exposure.

Is material listed in National Toxicology Program, Third Annual Report on Carcinogens? No

Has the material been found to be a potential carcinogen by the International Agency for Research on Cancer? No

**Acute Effects:** May cause eye and skin irritation on contact. Inhalation of fumes evolved during the product's cure may irritate the respiratory tract. Ingestion may cause irritation to the gastrointestinal tract.

To the best of our knowledge, the chemical, physical and toxicological properties of this material have not been thoroughly investigated.

**First Aid:**

**Inhalation -** Remove to fresh air and consult a physician. If not breathing give artificial respiration. If breathing is difficult give oxygen. Call a physician.

**Eyes -** Flush with water for at least 15 minutes and contact a physician.

**Skin -** Remove contaminated clothing as needed. Wash affected area with soap and water.

**Ingestion -** Drink large quantities of water. Do not induce vomiting. Contact a physician. Never give liquids to an unconscious person.

Product Number: GMI 536

Product Name: Organic Die Attach

#### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

**Protective equipment:** Safety glasses and chemical resistant gloves.

**Handling protocols:** Good personal hygiene must be maintained. Do not allow eating, smoking, or drinking in storage or use areas. Avoid ingestion and contact with skin and eyes. Use product in a well ventilated area.

**Storage conditions:** Store at -40°C until required for use.

#### SPILL OR LEAK PROCEDURES

**Steps to be taken if material is released or spilled:**

Small spills: Wipe up spilled material and package in storage drums for disposal.

Large spills: Shovel material in to storage drums for disposal.

**Waste disposal method:** Destructive Incineration in a permitted facility is the preferred method of disposal. Observe all federal, state and local laws.

#### TRANSPORT INFORMATION

DOT/IATA Proper shipping Name Not Regulated

DOT/IATA Packing Group Not Regulated

DOT/IATA Label Not Regulated

DOT/IATA UN Number Not Regulated

#### REGULATORY INFORMATION

This product contains a toxic chemical(s) subject to the reporting requirements of SARA 313 (40CFR372).

#### OTHER INFORMATION

The information contained herein relates only to the specific material identified. Lactite Corporation believes that such information is accurate and reliable as of the date of this material safety data sheet, but no representation, guarantee or warranty, express or implied, is made as to the accuracy, reliability, or completeness of the information. Lactite Corporation urges persons receiving this information to make their own determination as to the information's suitability and completeness for their particular application.

Latest Revision By Bill Wood, Dated 04/08/02

Lactite Corporation  
9938 Via Pajar, San Diego, CA 92126  
Phone: (858) 695-1716 fax: (858) 695-0951



-----Original Message-----

From: Varner, Carol (C.J.)  
Sent: Thursday, July 18, 2002 5:23 PM  
To: Hanges, Jon (.)  
Subject: RE: Used good sensor for Raman

Jon,

Ask Tim Potter if he is willing to take the sensor off his Focus. If so, I can give him a replacement. If you have a dpfe on your vehicle are you willing to take it off and use for the test.

Let me know.

Carol

-----Original Message-----

From: Hanges, Jon (.)  
Sent: Thursday, July 18, 2002 5:08 PM  
To: Varner, Carol (C.J.); Uy, Dairene (D.)  
Cc: Freeland, Mark (M.); Aldins, Mary (M.); 'Kyong Park (B-mail)' (E-mail)  
Subject: Used good sensor for Raman

Carol,

Dairene Uy presented data on her Raman analysis at today's meeting. It was requested that she look at a used sensor that was still good to see if there was anything in the exhaust gas that was dissolved in the gel. It would be desirable to have the results reported next week, but Mark is in Ireland and he's our normal source for parts.

Do you have any good used parts? I think it would actually be more appropriate to take a sensor off a vehicle and give it to her, condensate and all. There's a better chance that a more volatile chemical will be present in a sensor directly off a vehicle than one sitting in a parts bin for months. We have to break the case open for Dairene to do Raman, so a replacement would have to be available.

Jon Hanges  
Materials Science Dept.  
x31088

---

**From:** Simko, Steven (S.J.)  
**Sent:** Friday, February 22, 2002 8:23 AM  
**To:** Hargus, Jon (.)  
**Subject:** RE: 036 Ref

Jon,

I just looked at 036 HI in the optical microscope. The features that were were seeing yesterday in the unprotected area are DEFINITELY due to grain structure in the Al. Other areas with aluminum are visible on the chip and they show the same structure that we saw in the unprotected area. Different crystal faces of aluminum sputter at different rates. With the extensive sputtering that was done on this specimen, the different sputter rates translate into the topography differences we observed.

Best Regards,

Steve

---

**From:** Simko, Steven (S.J.)  
**Sent:** Friday, February 22, 2002 8:23 AM  
**To:** Hengas, Jon (.)  
**Subject:** RE: 036 Ref

Jon,

I just looked at 036 H1 in the optical microscope. The features that were were seeing yesterday in the unprotected area are DEFINITELY due to grain structure in the Al. Other areas with aluminum are visible on the chip and they show the same structure that we saw in the unprotected area. Different crystal faces of aluminum sputter at different rates. With the extensive sputtering that was done on this specimen, the different sputter rates translate into the topography differences we observed.

Best Regards,

Steve

---

**From:** Simko, Steven (S.J.)  
**Sent:** Tuesday, February 12, 2002 10:48 AM  
**To:** Hanges, Jon (.)  
**Subject:** FIB Lab

Jon,

Check out the attached web site. This company does excellent work, primarily in surface analysis, with an emphasis on secondary ion mass spectrometry (SIMS). I looked at their web site and they do perform FIB work. <http://www.csa.com/>

Steve

From: Hargas, Jon (.)  
Sent: Monday, July 29, 2002 10:48 AM  
To: Uy, Dairene (D.); Carter, Roscoe (R.O.)  
Cc: Kyong Park (E-mail) ' (E-mail)  
Subject: FW: QMI 536 MSDS

Hi Dairene, Roc,  
Kyong Park from Kavlico wanted to distribute the latest MSDS for the die attach adhesive.  
Jon

-----Original Message-----  
From: Park, Kyong [mailto:KPark@kavlico.com]  
Sent: Saturday, July 27, 2002 1:35 PM  
To: jhargas@ford.com  
Subject: FW: QMI 536 MSDS

Dear Jon,  
I received the e-file of Loctite QMI 536 MSDS that we use as die attachment. Ms. Uy may want to have a copy this file.  
Would you please, forward a copy of it? I do NOT have her address.  
Thanks.  
Kyong

-----Original Message-----  
From: Melanie.donovan@loctite.com [mailto:Melanie.donovan@loctite.com]  
Sent: Friday, July 26, 2002 4:38 PM  
To: Park, Kyong  
Subject: QMI 536 MSDS

Mr. Park,

Attached find the latest revision of our MSDS for QMI 536.

Best Regards,

Melanie Donovan  
Quality Assurance Administrator  
Henkel Loctite  
Phone: 858-895-1716 x 653  
Fax: 858-895-0951

---

**From:** Uy, Dalrene (D.)  
**Sent:** Friday, July 18, 2002 8:50 AM  
**To:** Verner, Carol (C.J.); Hanges, Jon (.)  
**Subject:** RE: Used good sensor for Raman

Carol,

I just got one this morning. We took one off somebody's Focus and put another one in. Thank you.

Jon,

Can I ask you to depot the sample for me when you have time? I will be in the lab looking at it in the meantime.

Dalrene

-----Original Message-----

**From:** Verner, Carol (C.J.)  
**Sent:** Thursday, July 18, 2002 5:48 PM  
**To:** Hanges, Jon (.); Uy, Dalrene (D.)  
**Subject:** RE: Used good sensor for Raman

Dalrene,

I am working on getting a sensor for you. If you get the sensor by Monday, noon will that be enough time for you to perform the necessary analysis?

Carol  
x07180

-----Original Message-----

**From:** Hanges, Jon (.)  
**Sent:** Thursday, July 18, 2002 5:08 PM  
**To:** Verner, Carol (C.J.); Uy, Dalrene (D.)  
**Cc:** Freeland, Mark (M.); Atkins, Mary (M.); 'Kyong Park (E-mail)' (E-mail)  
**Subject:** Used good sensor for Raman

Carol,

Dalrene Uy presented data on her Raman analysis at today's meeting. It was requested that she look at a used sensor that was still good to see if there was anything in the exhaust gas that was dissolved in the gel. It would be desirable to have the results reported next week, but Mark is in Ireland and he's our normal source for parts.

Do you have any good used parts? I think it would actually be more appropriate to take a sensor off a vehicle and give it to her, condense and all. There's a better chance that a more volatile chemical will be present in a sensor directly off a vehicle than one sitting in a parts bin for months. We have to break the case open for Dalrene to do Raman, so a replacement would have to be available.

Jon Hanges  
Materials Science Dept.  
x31088



---

**From:** Uy, Dalrene (D.)  
**Sent:** Thursday, July 18, 2002 5:03 PM  
**To:** Hengas, Jon (.)  
**Subject:** RE: Analytical solutions

thanks, Jon.  
dalrene

-----Original Message-----

**From:** Hengas, Jon (.)  
**Sent:** Thursday, July 18, 2002 4:50 PM  
**To:** Uy, Dalrene (D.)  
**Subject:** Analytical solutions

<< File: 888\_add1.pdf >> << File: 02F888PRELIM.pdf >> << File: corrosion notes.doc >> Dalrene,  
Here are the three reports from analytical solutions.  
Jon

---

**From:** Uy, Dalrene (D.)  
**Sent:** Friday, July 12, 2002 10:06 AM  
**To:** Carter, Roscoe (R.O.); Hengas, Jon (.)  
**Cc:** Freeland, Mark (M.)  
**Subject:** RE: silicone -IDENTIFIED

Thanks, Roc. I didn't know that the gel in the chimneys had a silicone copolymer. Anyhow, the silicone I found within the perfluoropolyether was in the form of "flat" bubbles, and their spectra exactly matched the spectrum of the gel outside the chimneys, which is an exact match for polydimethylsiloxane. (I realize I forgot to put the "di" in polydimethylsiloxane in my previous email.)

Dalrene

-----Original Message-----

**From:** Carter, Roscoe (R.O.)  
**Sent:** Friday, July 12, 2002 9:51 AM  
**To:** Uy, Dalrene (D.); Hengas, Jon (.)  
**Cc:** Freeland, Mark (M.)  
**Subject:** RE: silicone -IDENTIFIED

Dalrene,

The gel in the chimneys does contain a silicone copolymer but you are like correct that some cross contamination can inadvertently occur. ROC

-----Original Message-----

**From:** Uy, Dalrene (D.)  
**Sent:** Friday, July 12, 2002 9:36 AM  
**To:** Hengas, Jon (.); Carter, Roscoe (R.O.)  
**Cc:** Freeland, Mark (M.)  
**Subject:** RE: silicone -IDENTIFIED

The silicone I found is polymethylsiloxane, which is the gel material outside the chimneys.

The gel covering the sensor dies is a perfluoropolyether.

I guess there was some contamination of the two gels when Jon was removing them and the chimney.

| ---Original Message---

From: Hengas, Jon (.)  
Sent: Thursday, July 11, 2002 6:46 PM  
To: Carter, Roscoe (R.O.)  
Cc: Freeland, Mark (M.); Uy, Dalrene (D.)  
Subject: silicone

Roc,  
Dalrene found some silicones in Raman. It might be best for you to discuss with her your findings about the gel and what is produced when it is overheated.

The gel over the hybrid is different than the gel over the die.

There may be some possibility of cross contamination of the gels.

To get the gel off the scalpel I was using I did have to wipe it onto the nitrile gloves on my hand. I don't know if the nitrile has silicone.

I don't think I have any silicones in the area that I removed the gel. I have vacuum grease and diffusion pump oil in the room, but don't use them on that bench.

Jon

---

From: Uy, Dalrene (D.)  
Sent: Friday, July 12, 2002 9:38 AM  
To: Hengas, Jon (.); Carter, Roscoe (R.O.)  
Cc: Freeland, Mark (M.)  
Subject: RE: silicone -IDENTIFIED

The silicone I found is polymethylsiloxane, which is the gel material outside the chimneys.

The gel covering the sensor dies is a perfluoropolyether.

I guess there was some contamination of the two gels when Jon was removing them and the chimney.

| ---Original Message---

From: Hengas, Jon (.)  
Sent: Thursday, July 11, 2002 6:46 PM  
To: Carter, Roscoe (R.O.)  
Cc: Freeland, Mark (M.); Uy, Dalrene (D.)  
Subject: silicone

Roc,  
Dalrene found some silicones in Raman. It might be best for you to discuss with her your findings about the gel and what is produced when it is overheated.

The gel over the hybrid is different than the gel over the die.

There may be some possibility of cross contamination of the gels.

To get the gel off the scalpel I was using I did have to wipe it onto the nitrile gloves on my hand. I don't know if the nitrile has silicone.

I don't think I have any silicones in the area that I removed the gel. I have vacuum grease and diffusion pump

## AVX Multilayer Ceramic Transient Voltage Suppressors

### PART NUMBER IDENTIFICATION

#### Surface Mount Devices

**Important:** For part number identification only, not for construction of part numbers.  
The information below only defines the numerical value of part number digits, and cannot be used to construct a desired set of electrical limits. Please refer to the TransGuard part number data (blue sections, pages 3-8 & 14, 15 & 22) for the correct electrical ratings.

VC 1208 05 D 150 R P

#### TERMINATION FINISH:

X = Pt/Pd/Ag (Non-Plated)  
P = Ni/Sn Alloy (Plated)

#### PACKAGING (Pcs/Reel):

| STYLE   | "D"   | "R"   | "T"    |
|---------|-------|-------|--------|
| VC0402* | N/A   | 4,000 | 10,000 |
| VC0603  | 1,000 | 4,000 | 10,000 |
| VC0805  | 1,000 | 4,000 | 10,000 |
| VC1206* | 1,000 | 4,000 | 10,000 |
| VC1210* | 1,000 | 2,000 | 10,000 |

#### CLAMPING VOLTAGE:

|        |             |              |
|--------|-------------|--------------|
| Where: | 100 = 10.0V | 500 = 50.0V  |
|        | 150 = 15.5V | 650 = 56.0V  |
|        | 200 = 20.0V | 580 = 58.0V  |
|        | 250 = 25.0V | 520 = 52.0V  |
|        | 300 = 30.0V | 850 = 65.0V  |
|        | 350 = 35.0V | 101 = 100.0V |
|        | 400 = 40.0V | 121 = 120.0V |

#### ENERGY:

|        |          |           |
|--------|----------|-----------|
| Where: | A = 0.1J | H = 1.2J  |
|        | C = 0.3J | J = 1.5J  |
|        | D = 0.4J | P = 3.0J  |
|        | F = 0.7J | V = 0.02J |
|        | G = 0.9J | X = 0.05J |

#### WORKING VOLTAGE:

|        |               |               |
|--------|---------------|---------------|
| Where: | 03 = 3.3 VDC  | 18 = 18.0 VDC |
|        | 05 = 5.6 VDC  | 25 = 25.0 VDC |
|        | 09 = 9.0 VDC  | 30 = 30.0 VDC |
|        | 12 = 12.0 VDC | 48 = 48.0 VDC |
|        | 14 = 14.0 VDC | 50 = 50.0 VDC |

#### CASE SIZE DESIGNATOR:

| SIZE | LENGTH                      | WIDTH                      |
|------|-----------------------------|----------------------------|
| 0402 | 1.00±0.10mm (0.040"±0.004") | 0.5±0.10mm (0.020"±0.004") |
| 0603 | 1.60±0.15mm (0.063"±0.006") | 0.8±0.15mm (0.032"±0.006") |
| 0805 | 2.01±0.2mm (0.079"±0.008")  | 1.25±0.2mm (0.049"±0.008") |
| 1206 | 3.20±0.2mm (0.126"±0.008")  | 1.60±0.2mm (0.063"±0.008") |
| 1210 | 3.20±0.2mm (0.126"±0.008")  | 2.49±0.2mm (0.098"±0.008") |

#### CASE STYLE:

C = Chip

#### PRODUCT DESIGNATOR:

V = Varistor

\*Contact Factory for Availability

#### MARKING:

All standard surface mount TransGuard chips will not be marked. Marked chips will be considered a special; contact factory for minimum order requirement and price adder.

#### Axial Leaded Devices

**Important:** For part number identification only, not for construction of part numbers.  
The information below only defines the numerical value of part number digits, and cannot be used to construct a desired set of electrical limits. Please refer to the TransGuard part number data (blue section, page 9) for the correct electrical ratings.

V A 1000 05 D 150 R L

#### LEAD FINISH:

Copper clad steel, solder coated

#### PACKAGING (Pcs/Reel):

| STYLE  | "D"   | "R"   | "T"   |
|--------|-------|-------|-------|
| VA1000 | 1,000 | 3,000 | 7,500 |
| VA2000 | 1,000 | 2,500 | 5,000 |

#### CLAMPING VOLTAGE:

|        |             |              |
|--------|-------------|--------------|
| Where: | 100 = 10.0V | 580 = 58.0V  |
|        | 150 = 15.5V | 850 = 65.0V  |
|        | 300 = 30.0V | 101 = 100.0V |
|        | 400 = 40.0V | 121 = 120.0V |

#### ENERGY:

|        |          |
|--------|----------|
| Where: | A = 0.1J |
|        | D = 0.4J |
|        | K = 2.0J |

#### WORKING VOLTAGE:

|        |               |               |
|--------|---------------|---------------|
| Where: | 03 = 3.3 VDC  | 25 = 25.0 VDC |
|        | 05 = 5.6 VDC  | 30 = 30.0 VDC |
|        | 14 = 14.0 VDC | 48 = 48.0 VDC |
|        | 18 = 18.0 VDC | 60 = 60.0 VDC |

#### CASE SIZE DESIGNATOR:

| SIZE | LENGTH          | DIAMETER        |
|------|-----------------|-----------------|
| 1000 | 4.32mm (0.170") | 2.54mm (0.100") |
| 2000 | 4.83mm (0.190") | 3.58mm (0.140") |

#### CASE STYLE:

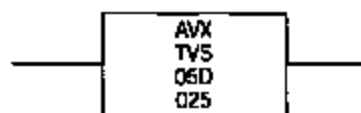
A = Axial

#### PRODUCT DESIGNATOR:

V = Varistor

#### MARKING:

All axial TransGuards are marked with vendor identification, product identification, voltage/energy rating code and date code (see example below):



Where: AVX = Always AVX (Vendor Identification)  
TVS = Always TVS (Product Identification - Transient Voltage Suppressor)  
05D = Working VDC and Energy Rating (Joules)  
Where: 05 = 5.6 VDC, D = 0.4J  
025 = Three Digit Date Code  
Where: 0 = Last digit of year (2000)  
25 = Week of year

## AVX Multilayer Ceramic Transient Voltage Suppressors

**VOLTAGES = 5.6, 9, 14 OR 18 VDC**

**0402 SURFACE MOUNT**

**Dimensions:**

**Actual Size:**

|                        |                                                                                          |
|------------------------|------------------------------------------------------------------------------------------|
| Length                 | 1.0 ± 0.10mm (0.040" ± 0.004")                                                           |
| Width                  | 0.5 ± 0.10mm (0.020" ± 0.004")                                                           |
| Thickness              | 0.6mm Max. (0.024")                                                                      |
| Termination Band Width | 0.25 ± 0.15mm (0.010" ± 0.006")                                                          |
| Termination Separation | 0.3mm Min. (0.012")                                                                      |
| Termination Finish     | X = Pt/Pd/Ag (Non-Plated)<br>P = Ni/Sn Alloy (Plated) - Contact Factory for Availability |

| AVX Part Number | Working Voltage | Breakdown Voltage | Clamping Voltage | Peak Current | Transient Energy | Capacitance        | Inductance       |
|-----------------|-----------------|-------------------|------------------|--------------|------------------|--------------------|------------------|
| Symbol          | $V_{WM}$        | $V_B$             | $V_C$            | $I_{PM}$     | $E_{TMS}$        | C                  | L                |
| Units           | Volts (max.)    | Volts             | Volts (max.)     | Amp (max.)   | Joules (max.)    | pF (typ.)          | nH (typ.)        |
| Test Condition  | <50µA           | 1mA DC            | 8/20µs†          | 8/20µs       | 10/1000µs        | 0.5Vrms @:<br>1MHz | di/dt = 100mA/ns |
| VC040205X150_   | 5.6             | 7.6 - 8.3         | 15.5             | 20           | 0.05             | 360                | <1.0             |
| VC040209X200_   | 9.0             | 11.0 - 14.0       | 20.0             | 20           | 0.05             | 230                | <1.0             |
| VC040214X300_   | 14.0            | 16.5 - 20.3       | 30.0             | 20           | 0.05             | 120                | <1.0             |
| VC040218X400_   | 18.0            | 22.9 - 28.0       | 40.0             | 20           | 0.05             | 80                 | <1.0             |

Termination Finish: X = Pt/Pd/Ag (Non-Plated)  
P = Ni/Sn Alloy (Plated) Contact Factory for Availability

Packaging (Pcs/Reel): see page 2

### StaticGuard

| AVX Part Number | Working Voltage | Breakdown Voltage | Clamping Voltage | Peak Current | Transient Energy | Capacitance         | Inductance          |
|-----------------|-----------------|-------------------|------------------|--------------|------------------|---------------------|---------------------|
| Symbol          | $V_{WM}$        | $V_B$             | $V_C$            | $I_{PM}$     | $E_{TMS}$        | C                   | L                   |
| Units           | Volts (max.)    | Volts             | Volts (max.)     | Amp (max.)   | Joules (max.)    | pF (typ.)           | nH (typ.)           |
| Test Condition  | <10µA           | <1µA DC           | 8/20µs†          | 8/20µs       | 10/1000µs        | 0.5Vrms @:<br>1 MHz | di/dt =<br>100mA/ns |
| VC04LC18V500_   | ≤18.0           | N/A               | <50.0            | 15           | 0.02             | 40                  | <1.0                |

Termination Finish: X = Pt/Pd/Ag (Non-Plated)  
P = Ni/Sn Alloy (Plated) Contact Factory for Availability

Packaging (Pcs/Reel): see page 2

Note: Details of Performance Curves shown on page 4.

$V_{WM}$ —Maximum steady-state DC operating voltage the varistor can maintain and not exceed 50µA leakage current

$V_B$ —Voltage across the device measured at 1mA DC current

$V_C$ —Maximum peak voltage across the varistor measured at a specified pulse current and waveform

†Transient Energy Rating  
<0.05 Joule

Pulse Current & Waveform  
1A 8/20µs

$I_{PM}$ —Maximum peak current which may be applied with the specified waveform without device failure

$E_{TMS}$ —Maximum energy which may be dissipated with the specified waveform without device failure

C—Device capacitance measured with zero volt bias 0.5Vrms and 1MHz

L—Device inductance measured with a current edge rate of 100 mA/ns

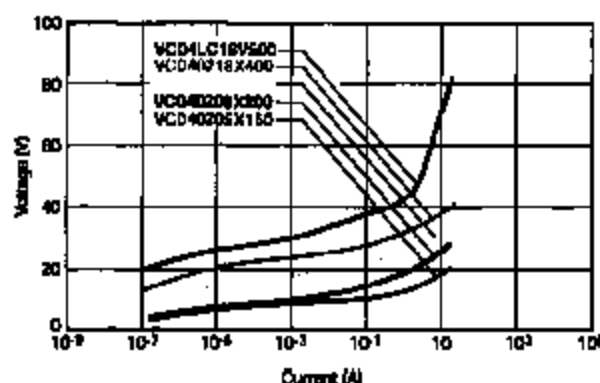
Dimensions: Millimeters (Inches)

## AVX Multilayer Ceramic Transient Voltage Suppressors

### TYPICAL PERFORMANCE CURVES (0402 CHIP SIZE)

#### VOLTAGE/CURRENT CHARACTERISTICS

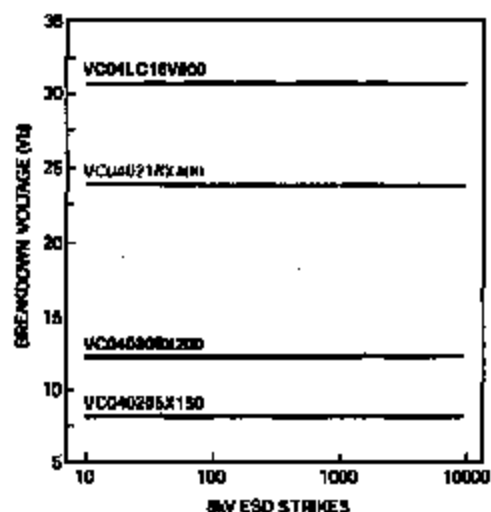
Multilayer construction and improved grain structure result in excellent transient clamping characteristics up to 20 amps peak current, while maintaining very low leakage currents under DC operating conditions. The VI curves below show the voltage/current characteristics for the 5.6V, 9V, 14V, 18V and low capacitance StaticGuard parts with currents ranging from parts of a micro amp to tens of amps.



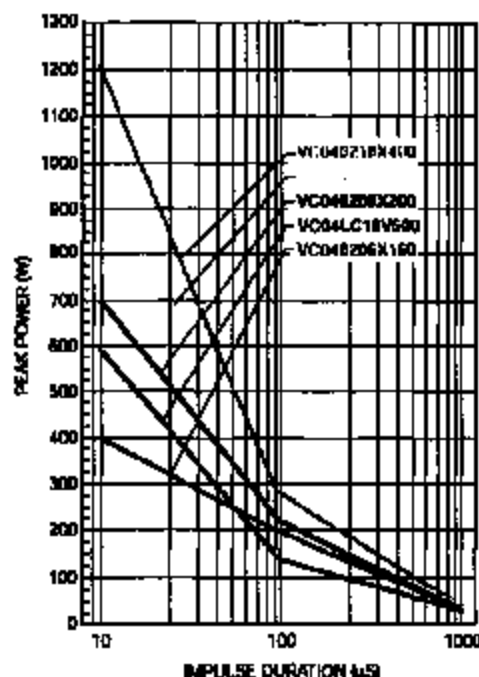
#### PULSE DEGRADATION

Traditionally varistors have suffered degradation of electrical performance with repeated high current pulses resulting in decreased breakdown voltage and increased leakage current. It has been suggested that irregular intergranular boundaries and bulk material result in restricted current paths and other non-Schottky barrier paralleled conduction paths in the ceramic. Repeated pulsing of TransGuard transient voltage suppressors with 150Amp peak  $8 \times 20\mu\text{s}$  waveforms shows negligible degradation in breakdown voltage and minimal increases in leakage current. This does not mean that TransGuard suppressors do not suffer degradation, but it occurs at much higher current.

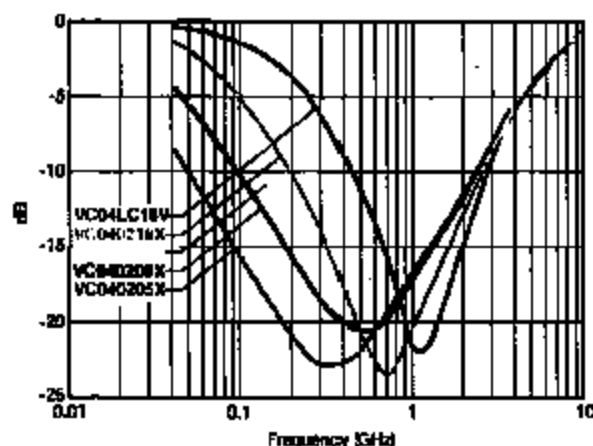
#### ESD TEST OF 0402 PARTS



#### PEAK POWER VS PULSE DURATION



#### INSERTION LOSS CHARACTERISTICS



## AVX Multilayer Ceramic Transient Voltage Suppressors

**VOLTAGES = 3.3, 5.6, 9, 14, 18, 26 OR 30 VDC**

**0603 SURFACE MOUNT**

| Dimensions:            | Actual Size:                                          |  |
|------------------------|-------------------------------------------------------|--|
| Length                 | 1.6 ± 0.15mm (0.063" ± 0.006")                        |  |
| Width                  | 0.80 ± 0.15mm (0.032" ± 0.006")                       |  |
| Thickness              | 0.9mm Max. (0.035")                                   |  |
| Termination Band Width | 0.35 ± 0.15mm (0.014" ± 0.006")                       |  |
| Termination Separation | 0.7mm Min. (0.028")                                   |  |
| Termination Finish     | X = Pt/Pd/Ag (Non-Plated)<br>P = Ni/Sn Alloy (Plated) |  |

| AVX Part Number | Working Voltage                                            | Breakdown Voltage | Clamping Voltage | Peak Current | Transient Energy | Capacitance              | Inductance       |
|-----------------|------------------------------------------------------------|-------------------|------------------|--------------|------------------|--------------------------|------------------|
| Symbol          | $V_{WS}$                                                   | $V_B$             | $V_C$            | $I_{PM}$     | $E_{PM}$         | C                        | L                |
| Units           | Volts (max.)                                               | Volts             | Volts (max.)     | Amp (max.)   | Joules (max.)    | pF (typ.)                | nH (typ.)        |
| Test Condition  | <50µA                                                      | 1mA DC            | 8/20µs†          | 8/20µs       | 10/1000µs        | 0.5Vrms @:<br>1kHz 1 MHz | di/dt = 100mA/nS |
| VC060303A100    | 3.3#                                                       | 4.1 - 6.0         | 10               | 30           | 0.1              | 1800 1230                | <1.0             |
| VC060305A150    | 5.6                                                        | 7.6 - 9.3         | 15.5             | 30           | 0.1              | 1000 825                 | <1.0             |
| VC060309A200    | 9.0                                                        | 11.0 - 14.0       | 20               | 30           | 0.1              | 650 550                  | <1.0             |
| VC060314A300    | 14.0                                                       | 18.5 - 20.3       | 30               | 30           | 0.1              | 500 424                  | <1.0             |
| VC060318A400    | 18.0                                                       | 22.9 - 28.0       | 40               | 30           | 0.1              | 275 225                  | <1.0             |
| VC060326A580    | 26.0                                                       | 31.0 - 38.0       | 58               | 30           | 0.1              | 200 160                  | <1.0             |
| VC060330A650    | 30.0                                                       | 37.0 - 46.0       | 65               | 30           | 0.1              | 175 150                  | <1.0             |
| VC06LC18X500    | See pages 14-15 for specification and performance details. |                   |                  |              |                  |                          |                  |

†Termination Finish: X = Pt/Pd/Ag (Non-Plated)  
P = Ni/Sn Alloy (Plated)

Packaging: (Pcs/Reel) see page 2

$V_{WS}$ —Maximum steady-state DC operating voltage the varistor can maintain and not exceed 50µA leakage current

$V_B$ —Voltage across the device measured at 1mA DC current

$V_C$ —Maximum peak voltage across the varistor measured at a specified pulse current and waveform

†Transient Energy Rating  
0.1 Joule

Pulse Current & Waveform  
2A 8/20µs

$I_{PM}$ —Maximum peak current which may be applied with the specified waveform without device failure

$E_{PM}$ —Maximum energy which may be dissipated with the specified waveform without device failure

C—Device capacitance measured with zero volt bias 0.5Vrms and 1kHz

L—Device inductance measured with a current edge rate of 100 mA/nS

Dimensions: Millimeters (Inches)

#Test condition <100µA

## AVX Multilayer Ceramic Transient Voltage Suppressors

**VOLTAGES = 3.3, 5.6, 9, 12, 14, 18, 26 OR 30 VDC**

**0805 SURFACE MOUNT**

| Dimensions:        | Actual Size:                                          |  |
|--------------------|-------------------------------------------------------|--|
| Length             | 2.01 ± 0.2mm (0.079" ± 0.008")                        |  |
| Width              | 1.25 ± 0.2mm (0.049" ± 0.008")                        |  |
| Thickness          | 1.02mm Max. (0.040")                                  |  |
| Land Length        | 0.71mm Max. (0.028")                                  |  |
| Termination Finish | X = Pt/Pd/Ag (Non-Plated)<br>P = Ni/Sn Alloy (Plated) |  |

| AVX Part Number | Working Voltage                                            | Breakdown Voltage | Clamping Voltage | Peak Current | Transient Energy | Capacitance              | Inductance       |
|-----------------|------------------------------------------------------------|-------------------|------------------|--------------|------------------|--------------------------|------------------|
| Symbol          | $V_{WM}$                                                   | $V_B$             | $V_C$            | $I_{PM}$     | $E_{PM}$         | C                        | L                |
| Units           | Volts (max.)                                               | Volts             | Volts (max.)     | Amp (max.)   | Joules (max.)    | pF (typ.)                | nH (typ.)        |
| Test Condition  | <50 $\mu$ A                                                | 1mA DC            | 8/20 $\mu$ s     | 8/20 $\mu$ s | 10/1000 $\mu$ s  | 0.5Vrms @:<br>1kHz 1 MHz | dV/dt = 100mA/nS |
| VC080503A100    | 3.3#                                                       | 4.1 - 6.0         | 10               | 40           | 0.1              | 1300 930                 | <1.5             |
| VC080503C100    | 3.3#                                                       | 3.7 - 5.6         | 10               | 120          | 0.3              | 5500 4000                | 1.5              |
| VC080505A150    | 5.6                                                        | 7.6 - 9.3         | 15.5             | 40           | 0.1              | 1250 880                 | <1.5             |
| VC080505C150    | 5.6                                                        | 7.1 - 8.7         | 15.5             | 120          | 0.3              | 3500 2400                | 1.5              |
| VC080509A200    | 9                                                          | 11.0 - 14.0       | 20               | 40           | 0.1              | 780 585                  | <1.5             |
| VC080512A250    | 12                                                         | 14.0 - 18.3       | 25               | 40           | 0.1              | 525 400                  | <1.5             |
| VC080514A300    | 14                                                         | 18.5 - 20.3       | 30               | 40           | 0.1              | 375 280                  | <1.5             |
| VC080514C300    | 14                                                         | 15.9 - 19.4       | 30               | 120          | 0.3              | 1100 820                 | 1.5              |
| VC080518A400    | 18*                                                        | 22.9 - 28.0       | 40               | 30           | 0.1              | 350 275                  | <1.5             |
| VC080518C400    | 18*                                                        | 22.5 - 27.5       | 40               | 100          | 0.3              | 650 500                  | 1.5              |
| VC080526A580    | 26                                                         | 31.0 - 37.8       | 58               | 30           | 0.1              | 140 110                  | <1.5             |
| VC080526C580    | 26                                                         | 30.5 - 37.3       | 58               | 100          | 0.3              | 250 190                  | 1.5              |
| VC080530A650    | 30                                                         | 37.0 - 46.0       | 65               | 30           | 0.1              | 100 80                   | <1.5             |
| VC08LC18A500    | See pages 14-15 for specification and performance details. |                   |                  |              |                  |                          |                  |

Termination Finish: X = Pt/Pd/Ag (Non-Plated)  
P = Ni/Sn Alloy (Plated)

Packaging (Pcs/Reel): see page 2

$V_{WM}$ —Maximum steady-state DC operating voltage the varistor can maintain and not exceed 50 $\mu$ A leakage current

$V_B$ —Voltage across the device measured at 1mA DC current

$V_C$ —Maximum peak voltage across the varistor measured at a specified pulse current and waveform

Transient Energy Rating

0.1 Joule  
0.2 - 0.3 Joules

Pulse Current & Waveform

2A 8/20 $\mu$ s  
5A 8/20 $\mu$ s

$I_{PM}$ —Maximum peak current which may be applied with the specified waveform without device failure

$E_{PM}$ —Maximum energy which may be dissipated with the specified waveform without device failure

C—Device capacitance measured with zero volt bias 0.5Vrms and 1kHz

L—Device inductance measured with a current edge rate of 100 mA/nS

\*Withstands 24.5 VDC for 5 minutes (automotive applications)

Dimensions: Millimeters (Inches)

#Test condition <100 $\mu$ A

## AVX Multilayer Ceramic Transient Voltage Suppressors

**VOLTAGES = 3.3, 5.6, 14, 18, 26, 30 OR 48 VDC**

**1206 SURFACE MOUNT**

**Dimensions:**

**Actual Size:**

|                    |                                                                                          |
|--------------------|------------------------------------------------------------------------------------------|
| Length             | 3.20 ± 0.2mm (0.126" ± 0.008")                                                           |
| Width              | 1.60 ± 0.2mm (0.063" ± 0.008")                                                           |
| Thickness          | 1.02mm Max. (0.040")                                                                     |
| Lead Length        | 0.71mm Max. (0.028")                                                                     |
| Termination Finish | X = Pt/Pd/Ag (Non-Plated)<br>P = Ni/Sn Alloy (Plated) - Contact Factory for Availability |

| AVX Part Number | Working Voltage                                            | Breakdown Voltage | Clamping Voltage | Peak Current | Transient Energy | Capacitance | Inductance |                  |
|-----------------|------------------------------------------------------------|-------------------|------------------|--------------|------------------|-------------|------------|------------------|
| Symbol          | $V_{WM}$                                                   | $V_B$             | $V_C$            | $I_{PM}$     | $E_{PM}$         | C           | L          |                  |
| Units           | Volts (max.)                                               | Volts             | Volts (max.)     | Amp (max.)   | Joules (max.)    | pF (typ.)   | nH (typ.)  |                  |
| Test Condition  | <50µA                                                      | 1mA DC            | 8/20µs†          | 8/20µs       | 10/1000µs        | 0.5Vrms @:  |            | di/dt = 100mA/nS |
|                 |                                                            |                   |                  |              |                  | 1kHz        | 1 MHz      |                  |
| VC120603A100 __ | 3.3#                                                       | 4.1 - 6.0         | 10               | 40           | 0.1              | 2000        | 1500       | <1.7             |
| VC120603D100 __ | 3.3#                                                       | 3.7 - 5.6         | 10               | 150          | 0.4              | 4700        | 3800       | 1.7              |
| VC120605A150 __ | 5.6                                                        | 7.6 - 9.3         | 15.5             | 40           | 0.1              | 1200        | 870        | <1.7             |
| VC120605D150 __ | 5.6                                                        | 7.1 - 8.7         | 15.5             | 150          | 0.4              | 3000        | 2300       | 1.7              |
| VC120614A300 __ | 14                                                         | 16.5 - 20.3       | 30               | 40           | 0.1              | 600         | 500        | <1.7             |
| VC120614D300 __ | 14                                                         | 15.9 - 19.4       | 30               | 150          | 0.4              | 1200        | 900        | 1.7              |
| VC120618A400 __ | 18*                                                        | 22.8 - 28.0       | 40               | 30           | 0.1              | 350         | 270        | <1.7             |
| VC120618D400 __ | 18*                                                        | 22.5 - 27.5       | 40               | 150          | 0.4              | 800         | 635        | 1.7              |
| VC120626D580 __ | 26                                                         | 30.5 - 37.3       | 58               | 120          | 0.4              | 550         | 450        | 1.7              |
| VC120630D650 __ | 30                                                         | 36.0 - 45.0       | 65               | 120          | 0.4              | 500         | 400        | 1.7              |
| VC120648D101 __ | 48                                                         | 58.0 - 68.0       | 100              | 100          | 0.4              | 225         | 185        | 1.7              |
| VC12LC18A500 __ | See pages 14-15 for specification and performance details. |                   |                  |              |                  |             |            |                  |

†Termination Finish: X = Pt/Pd/Ag (Non-Plated)  
P = Ni/Sn Alloy (Plated) Contact Factory for Availability

— Packaging (Pcs/Reel): see page 2

$V_{WM}$ —Maximum steady-state DC operating voltage the varistor can maintain and not exceed 50µA leakage current

$V_B$ —Voltage across the device measured at 1mA DC current

$V_C$ —Maximum peak voltage across the varistor measured at a specified pulse current and waveform

†Transient Energy Rating

0.1 Joules

20.4 Joules

Pulse Current & Waveform

2A 8/20µs

10A 8/20µs

$I_{PM}$ —Maximum peak current which may be applied with the specified waveform without excessive leakage

$E_{PM}$ —Maximum energy which may be dissipated with the specified waveform without device failure

C—Device capacitance measured with zero volt bias 0.5Vrms and 1kHz

L—Device inductance measured with a current edge rate of 100 mA/nS

\*Withstands 24.5 VDC for 5 minutes (automotive applications)

Dimensions: Millimeters (Inches)

#Test condition <100µA



## AVX Multilayer Ceramic Transient Voltage Suppressors

**VOLTAGES = 18, 26, 30, 48 OR 60 VDC**

**1210 SURFACE MOUNT**

**Dimensions:**

**Actual Size:**



Length

3.20 ± 0.2mm (0.126" ± 0.008")

Width

2.49 ± 0.2mm (0.098" ± 0.008")

Thickness

1.70mm Max. (0.067")

Land Length

0.71mm Max. (0.028")

Termination Finish

X = Pt/Pd/Ag (Non-Plated)

P = Ni/Sn Alloy (Plated) - Contact Factory for Availability

| AVX Part Number | Working Voltage | Breakdown Voltage | Clamping Voltage | Peak Current | Transient Energy | Capacitance              | Inductance       |
|-----------------|-----------------|-------------------|------------------|--------------|------------------|--------------------------|------------------|
| Symbol          | $V_{WM}$        | $V_B$             | $V_C$            | $I_{PM}$     | $E_{PM}$         | C                        | L                |
| Units           | Volts (max.)    | Volts             | Volts (max.)     | Amp (max.)   | Joules (max.)    | pF (typ.)                | nH (typ.)        |
| Test Condition  | <50µA           | 1mA DC            | 8/20µs†          | 8/20µs       | 10/1000µs        | 0.5Vrms @:<br>1kHz 1 MHz | dl/dt = 100mA/nS |
| VC121018J390 __ | 18*             | 21.5 - 26.5       | 39               | 500          | 1.5              | 3100 2400                | 2.0              |
| VC121026H560 __ | 26              | 29.7 - 36.3       | 56               | 300          | 1.2              | 2150 1675                | 2.0              |
| VC121030G620 __ | 30              | 35.0 - 43.0       | 62               | 220          | 0.9              | 1900 1530                | 2.0              |
| VC121030H620 __ | 30              | 35.0 - 43.0       | 62               | 280          | 1.2              | 1975 1575                | 2.0              |
| VC121048G101 __ | 48              | 54.5 - 66.5       | 100              | 220          | 0.9              | 500 430                  | 2.0              |
| VC121048H101 __ | 48              | 54.5 - 66.5       | 100              | 250          | 1.2              | 525 450                  | 2.0              |
| VC121060J121 __ | 60              | 67.0 - 83.0       | 120              | 250          | 1.5              | 450 375                  | 2.0              |

† Termination Finish: X = Pt/Pd/Ag (Non-Plated)  
P = Ni/Sn Alloy (Plated) Contact Factory for Availability

— Packaging (Pcs/Reel): see page 2

$V_{WM}$ —Maximum steady-state DC operating voltage the varistor can maintain and not exceed 50µA leakage current

$V_B$ —Voltage across the device measured at 1mA DC current

$V_C$ —Maximum peak voltage across the varistor measured at a specified pulse current and waveform

† Transient Energy Rating  
20.4 Joules

Pulse Current & Waveform  
10A 8/20µs

$I_{PM}$ —Maximum peak current which may be applied with the specified waveform without device failure

$E_{PM}$ —Maximum energy which may be dissipated with the specified waveform without device failure

C—Device capacitance measured with zero volt bias 0.5Vrms and 1kHz

L—Device inductance measured with a current edge rate of 100 mA/nS

\*Withstands 24.5 VDC for 5 minutes (automotive applications)

Dimensions: Millimeters (Inches)

## AVX Multilayer Ceramic Transient Voltage Suppressors

**VOLTAGES = 3.3, 5.6, 14, 18, 26, 30, 48, 60 VDC**

**AXIAL LEADED**

### Dimensions:

|               | VA1000                           | VA2000                       |
|---------------|----------------------------------|------------------------------|
| Body Length   | (L) = 4.32mm Max. (0.170")       | 4.83mm Max. (0.190")         |
| Body Diameter | (D) = 2.54mm Max. (0.100")       | 3.56mm Max. (0.140")         |
| Lead Diameter | = 0.51 ± .05mm (0.020 ± 0.002)   | 0.51 ± .05mm (0.020 ± 0.002) |
| Lead Length   | = 25.4mm Min. (1")               | 25.4mm Min. (1")             |
| Lead Finish   | Copper Clad Steel, Solder Coated |                              |

| AVX Part Number | Working Voltage                                            | Breakdown Voltage | Clamping Voltage | Peak Current | Transient Energy | Capacitance              | Inductance       |
|-----------------|------------------------------------------------------------|-------------------|------------------|--------------|------------------|--------------------------|------------------|
| Symbol          | $V_{WM}$                                                   | $V_B$             | $V_C$            | $I_{PM}$     | $E_{PM}$         | C                        | L                |
| Units           | Volts (max.)                                               | Volts             | Volts (max.)     | Amp (max.)   | Joules (max.)    | pF (typ.)                | nH (typ.)        |
| Test Condition  | <50 $\mu$ A                                                | 1mA DC            | 8/20 $\mu$ s†    | 8/20 $\mu$ s | 10/1000 $\mu$ s  | 0.5Vrms @:<br>1kHz 1 MHz | dI/dt = 100mA/nS |
| VA100003A100 _L | 3.3#                                                       | 4.1 - 6.0         | 10               | 40           | 0.1              | 1500 1100                | 3.5              |
| VA100003D100 _L | 3.3#                                                       | 3.7 - 5.6         | 10               | 150          | 0.4              | 4700 3800                | 3.5              |
| VA100005A150 _L | 5.6                                                        | 7.6 - 9.3         | 15.5             | 40           | 0.1              | 1000 750                 | 3.5              |
| VA100005D150 _L | 5.6                                                        | 7.1 - 8.7         | 15.5             | 150          | 0.4              | 2800 2150                | 3.5              |
| VA100014A300 _L | 14                                                         | 16.5 - 20.3       | 30               | 40           | 0.1              | 400 300                  | 3.5              |
| VA100014D300 _L | 14                                                         | 15.9 - 19.4       | 30               | 150          | 0.4              | 1200 900                 | 3.5              |
| VA100018A400 _L | 18                                                         | 22.9 - 28.0       | 40               | 40           | 0.1              | 350 270                  | 3.5              |
| VA100018D400 _L | 18                                                         | 22.5 - 27.5       | 40               | 150          | 0.4              | 900 700                  | 3.5              |
| VA100026D580 _L | 26                                                         | 30.5 - 37.3       | 58               | 120          | 0.4              | 700 550                  | 3.5              |
| VA100030D650 _L | 30                                                         | 38.0 - 45.0       | 65               | 120          | 0.4              | 600 500                  | 3.5              |
| VA100048D101 _L | 48                                                         | 56.0 - 68.0       | 100              | 100          | 0.4              | 200 165                  | 3.5              |
| VA200060K121 _L | 60                                                         | 67.0 - 83.0       | 120              | 300          | 2.0              | 400 340                  | 3.5              |
| VA10LC18A500 _L | See pages 14-15 for specification and performance details. |                   |                  |              |                  |                          |                  |

† Lead Finish: L - Copper Clad Steel, Solder Coated  
 † Packaging (Pcs/Reel): see page 2

$V_{WM}$ —Maximum steady-state DC operating voltage the varistor can maintain and not exceed 50 $\mu$ A leakage current

$V_B$ —Voltage across the device measured at 1mA DC current

$V_C$ —Maximum peak voltage across the varistor measured at a specified pulse current and waveform

† Transient Energy Rating  
 0.1 Joule  
 10.4 Joules

Pulse Current & Waveform  
 2A 8/20 $\mu$ s  
 10A 8/20 $\mu$ s

$I_{PM}$ —Maximum peak current which may be applied with the specified waveform without device failure

$E_{PM}$ —Maximum energy which may be dissipated with the specified waveform without device failure

C—Device capacitance measured with zero volt bias 0.5Vrms and 1kHz

L—Device Inductance measured with a current edge rate of 100 mA/nS

Dimensions: Millimeters (Inches)

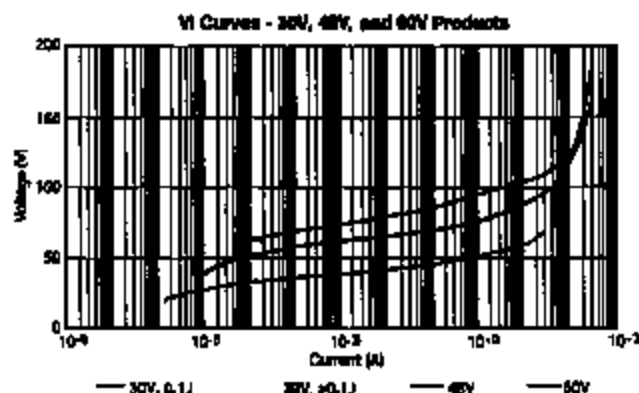
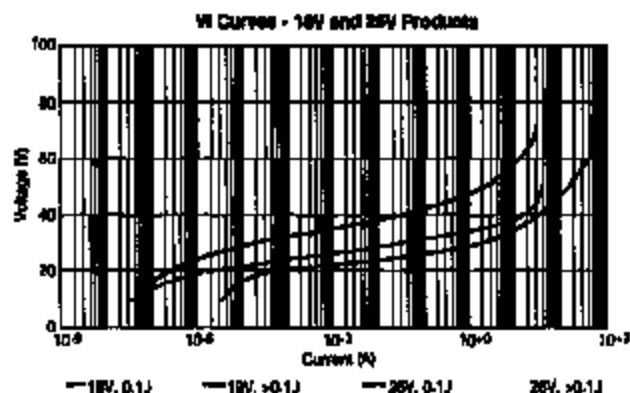
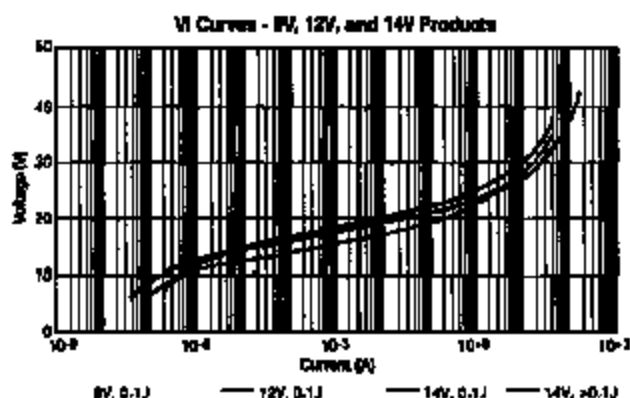
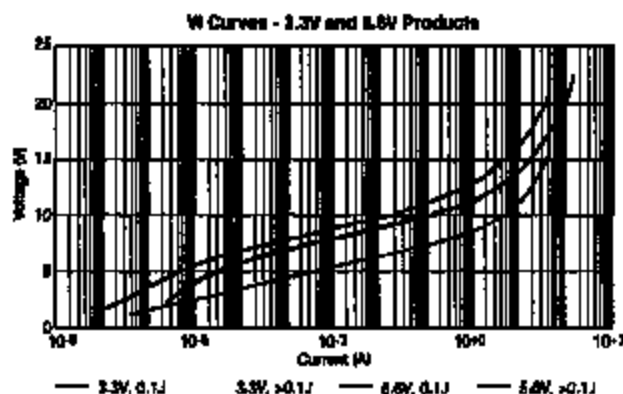
#Test condition <100 $\mu$ A

## AVX Multilayer Ceramic Transient Voltage Suppressors

### TYPICAL PERFORMANCE CURVES (0603, 0805, 1206 & 1210 CHIP SIZES)

#### VOLTAGE/CURRENT CHARACTERISTICS

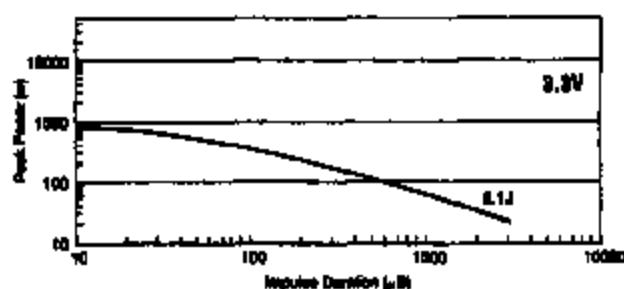
Multilayer construction and improved grain structure result in excellent transient clamping characteristics up to 500 amps peak current, depending on case size and energy rating, while maintaining very low leakage currents under DC operating conditions. The VI curve below shows the voltage/current characteristics for the 3.3V, 5.6V, 12V, 14V, 18V, 26V, 30V, 48V and 60VDC parts with currents ranging from parts of a micro amp to tens of amps.



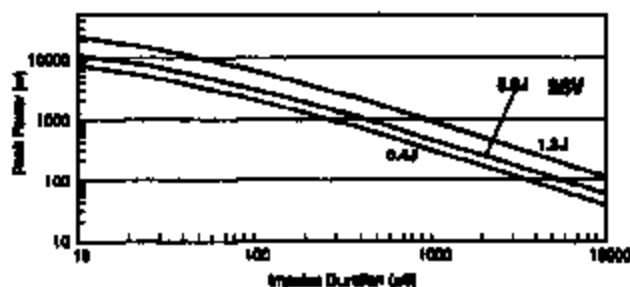
## AVX Multilayer Ceramic Transient Voltage Suppressors

### TYPICAL PERFORMANCE CURVES (0603, 0805, 1206 & 1210 CHIP SIZES)

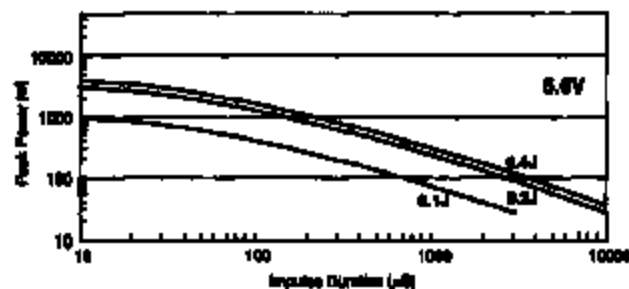
TYPICAL PULSE RATING CURVE  
3.3V MULTILAYER TRANSQUARD®



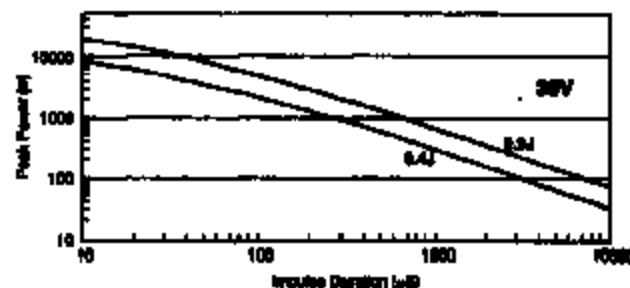
TYPICAL PULSE RATING CURVE  
28V MULTILAYER TRANSQUARD®



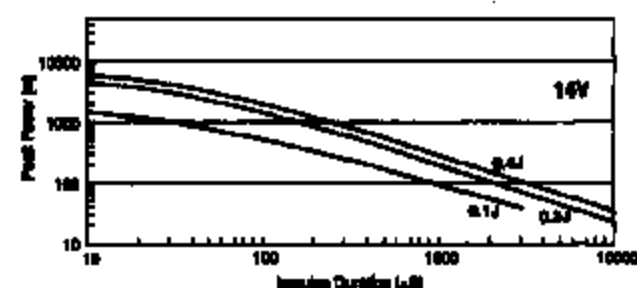
TYPICAL PULSE RATING CURVE  
5.6V MULTILAYER TRANSQUARD®



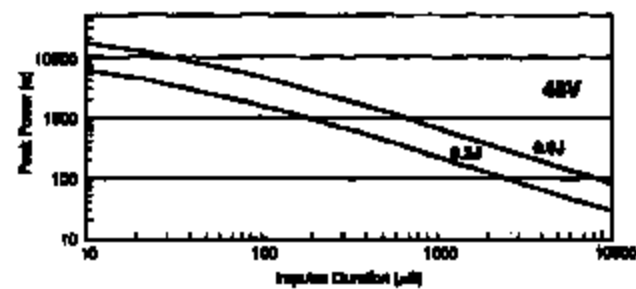
TYPICAL PULSE RATING CURVE  
30V MULTILAYER TRANSQUARD®



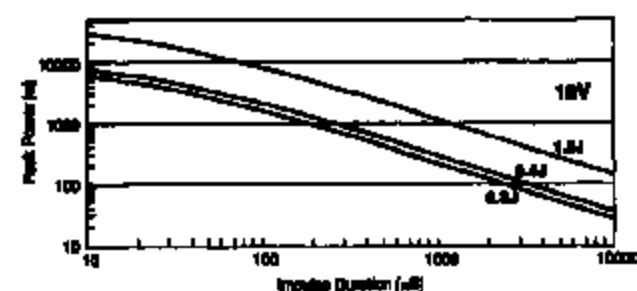
TYPICAL PULSE RATING CURVE  
14V MULTILAYER TRANSQUARD®



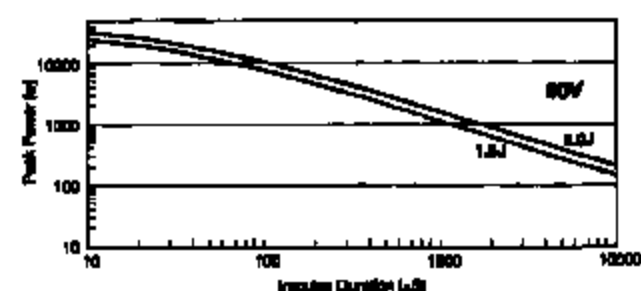
TYPICAL PULSE RATING CURVE  
48V MULTILAYER TRANSQUARD®



TYPICAL PULSE RATING CURVE  
18V MULTILAYER TRANSQUARD®



TYPICAL PULSE RATING CURVE  
60V MULTILAYER TRANSQUARD®

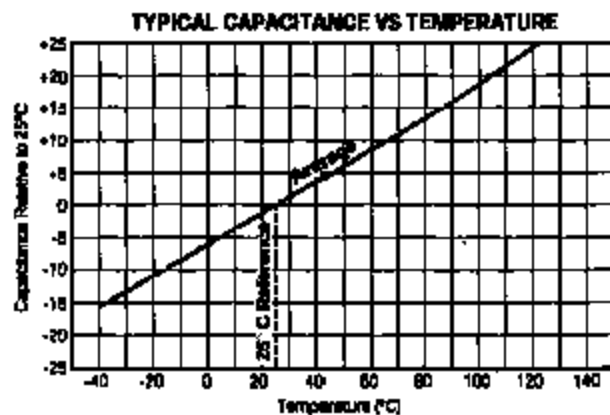
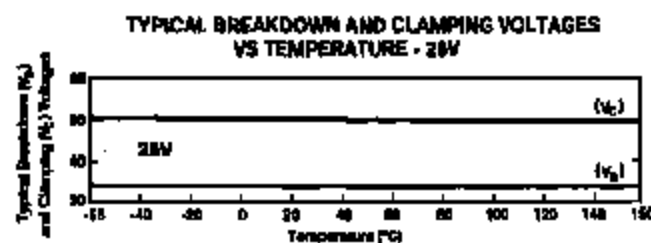
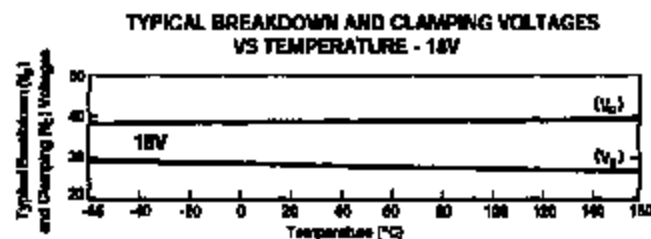
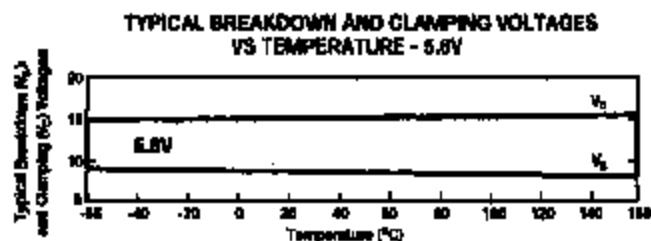
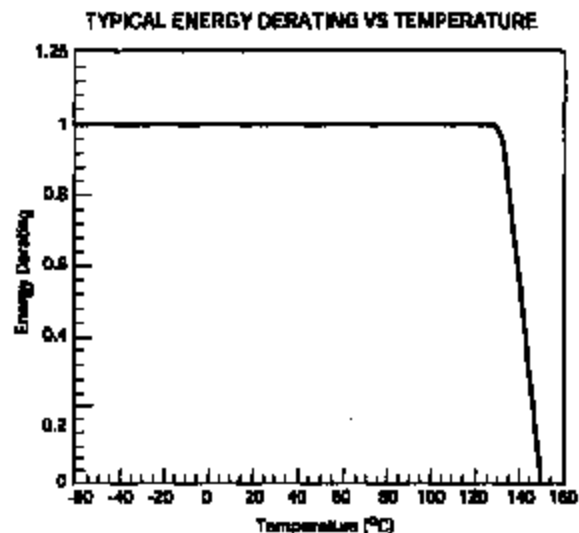
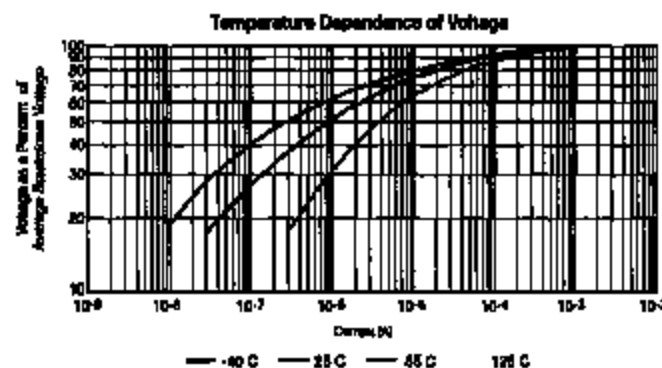


## AVX Multilayer Ceramic Transient Voltage Suppressors

### TYPICAL PERFORMANCE CURVES (0603, 0805, 1206 & 1210 CHIP SIZES)

#### TEMPERATURE CHARACTERISTICS

TransGuard® suppressors are designed to operate over the full temperature range from -55°C to +125°C. This operating temperature range is for both surface mount and axial leaded products.



### TYPICAL PERFORMANCE CURVES (0603, 0805, 1206 & 1210 CHIP SIZES)

#### PULSE DEGRADATION

Traditionally varistors have suffered degradation of electrical performance with repeated high current pulses resulting in decreased breakdown voltage and increased leakage current. It has been suggested that irregular intergranular boundaries and bulk material result in restricted current paths and other non-Schottky barrier paralleled conduction paths in the ceramic. Repeated pulsing of both 5.8 and 14V TransGuard transient voltage suppressors with

150Amp peak 8 x 20µs waveforms shows negligible degradation in breakdown voltage and minimal increases in leakage current. This does not mean that TransGuard suppressors do not suffer degradation, but it occurs at much higher current. The plots of typical breakdown voltage vs number of 150A pulses are shown below.

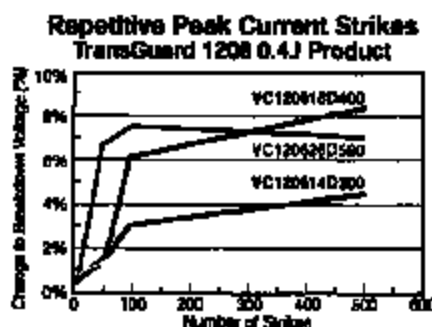


Figure 1

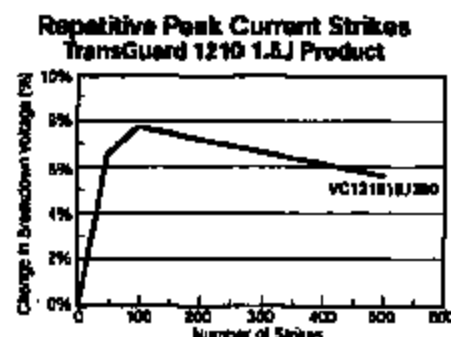


Figure 3

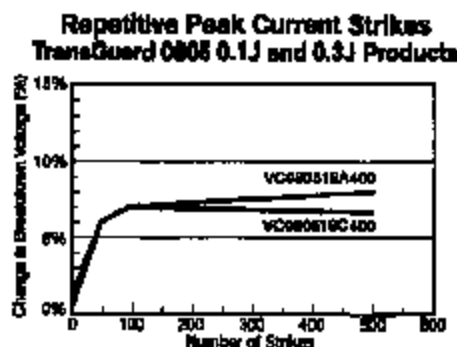


Figure 2

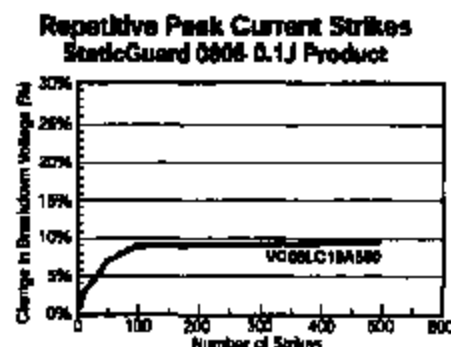
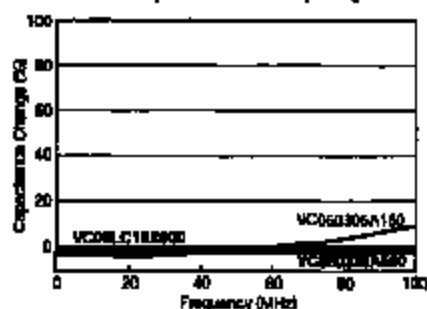


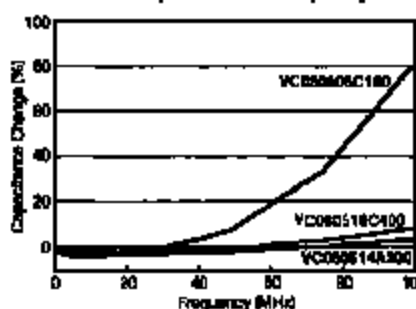
Figure 4

#### CAPACITANCE/FREQUENCY CHARACTERISTICS

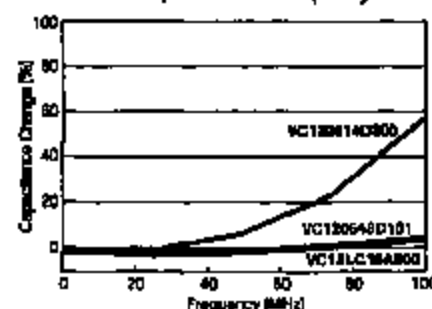
TransGuard Capacitance vs Frequency 0603



TransGuard Capacitance vs Frequency 0805



TransGuard Capacitance vs Frequency 1206



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**From:** jheltier [jheltier@msn.com]  
**Sent:** Monday, March 11, 2002 7:35 AM  
**To:** 'Hansas, Jon (.)'  
**Subject:** RE: Sivel 807 bproducts during curing

Dear Mr. Hansas,

Mark is no longer with Shin-Etsu. Your new Sales Rep. is Steve Craig. He handles North Penn, Tech. Cir., etc.

To answer your question, there are no other hydrocarbon solvents in Sivel807A/B except for that small amount of toluene which is the carrier for the catalyst necessary to cure the gel.

You can find Steve Craig at 330-630-9660 X202.

Best regards

John Heltier

-----Original Message-----

**From:** Hansas, Jon (.) [mailto:jhansas@ford.com]  
**Sent:** Friday, March 08, 2002 7:45 PM  
**To:** 'Neuber, Mark'  
**Subject:** Sivel 807 bproducts during curing

Mark,

Does Sivel 807 give off any bproducts other than hydrocarbon solvents during curing, similar to acetic acid given off when RTV cures?

I realize there is some toluene in one component according to the MSDS sheet, and I'm not concerned with pH neutral solvents.

Regards,  
Jon Hansas  
Materials Science Dept.  
Ford Motor Co.  
313-323-1068

---

**From:** Freeland, Mark (M.)  
**Sent:** Wednesday, January 09, 2002 4:16 PM  
**To:** 'Randy Ray (E-mail)'; 'Donald Ayers (E-mail)'  
**Co:** Akins, Mary (M.); Hengas, Jon (.)  
**Subject:** RE: Which wafers to dig out for us

Randy & Don,

In addition I would like to see the carcasses from 11/27/2000, 12/1/2000, 3/9/2001, 6/19/2001 & 6/25/2001, based on the data Mary sent this morning.

I will also probably want to see the probe data for some of the wafers from the dates. I assume Grant will be able to help me with that when he returns from SMI on Monday.

Thanks

Regards

Mark Freeland

6-Sigma Black Belt Candidate  
Physics Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 3028 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreel1@ford.com  
Tel.: (313) 594-7645

---

**From:** Freeland, Mark (M.)  
**Sent:** Wednesday, January 09, 2002 4:03 PM  
**To:** Randy Ray (E-mail); Donald Ayers (E-mail)  
**Co:** Akins, Mary (M.); Hengas, Jon (.)  
**Subject:** Which wafers to dig out for us

Randy & Don,

Please have available for Jon & I all wafer carcasses which were or may have been used to produce sensors with the European Part Number with EOL date coded of 8/11/00, 8/17/00, 8/22/00, 8/24/00, 9/1/00, 9/7/00, 9/19/00, 11/22/00 & 1/19/01.

I will also be looking for additional dates in July 2001 after I have looked at the data Mary sent me this morning.

Thanks

Regards

Mark Freeland

6-Sigma Black Belt Candidate



Physics Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 3028 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreelal@ford.com  
Tel.: (313) 594-7645

---

From: Freeland, Mark (M.)  
Sent: Thursday, December 06, 2001 7:02 PM  
To: Hanges, Jon (.)  
Subject: FW: Process Map

-----Original Message-----

From: Don Ayers [mailto:DAyers@kavlico.com]  
Sent: Thursday, December 06, 2001 5:01 PM  
To: Freeland, Mark (M.)  
Cc: Akins, Mary (M.); Brady Davies; Hanges, Jon (.)  
Subject: RE: Process Map

Mark -

The process run cards for the gold fab process, in addition to MSDS' for the chemicals used, have been Fedex'd to Mary.

Thanks.  
Don

> -----Original Message-----

> From: Freeland, Mark (M.) [SMTP:mfreelal@ford.com]  
> Sent: Wednesday, December 05, 2001 12:41 PM  
> To: Donald Ayers (E-mail)  
> Cc: Akins, Mary (M.); Brady Davies (E-mail); Hanges, Jon (.)  
> Subject: Process Map

>  
> Don,

>  
> Could you please provide me with a detailed process map for the Gold Room  
> processes.

>  
> Thanks

>  
> Regards

>  
> Mark Freeland

>  
> > 6-Sigma Black Belt Candidate  
> > Physics Department  
> > Ford Research Laboratory  
> > P.O. Box 2053  
> > MD 3028 - SRL - Room 1517  
> > Dearborn, MI 48121-2053 USA  
> > email: mfreelal@ford.com

> Tel.: (313) 594-7645

---

From: Freeland, Mark (M.)  
Sent: Thursday, December 06, 2001 6:07 PM  
To: Gates, Freeman (F.C.); Hanges, Jon (.)  
Subject: FW: UAD Evaluation Test Plan Status

Freeman & Jon

I asked Kavlico yesterday for a daily status report on the UPAD work plan progress. Here is a copy of the first report.

Regards

Mark

-----Original Message-----

From: Jay Caffee [mailto:JCaffee@kavlico.com]  
Sent: Thursday, December 06, 2001 5:13 PM  
To: Mary Akins; Mark Freeland  
Cc: Brady Davies; Kyong Park; Don Ayers; Mark Miller  
Subject: UAD Evaluation Test Plan Status

We have completed inspection of 28 wafers (consisting of 14 wafer lots) from Sept. & Oct. of '00. No UAD damage could be detected on these wafers. We have located wafers from 12 lots manufactured in Aug. of '00, we are in the process of visually inspecting these wafers at this time and will have the results by the end of the day tomorrow.

Jay Caffee

---

From: Freeland, Mark (M.)  
Sent: Thursday, December 06, 2001 9:33 AM  
To: Hanges, Jon (.)  
Subject: FW: more SEM of 242

Jon,

I understand. That sounds like a good idea. Can you keep track of where each section you photograph is in a planer view as you walk down into the part. That way we can "map" the damage and anything we find at the Passivation to Conductor (or void) interface.

I will come back late in the afternoon after the 14D meeting at POEE. (probably after 5:00)

Thanks

Mark

-----Original Message-----  
From: Hanges, Jon (.)

Santa  
To:  
Subject:

Wednesday, December 05, 2001 7:59 PM  
Freeland, Mark (M.)  
more SEM of 242

Mark,

I just got done doing some SEM of 242. Hout has some undercut areas on the gold pad, but the registration of the pad looks good, with good sidewalks.

When I section it, I might want to do so from a corner, rather than parallel to a given side. That way I might be able to see what's going on with 2 sides of the pad at once.

Jon

---

**From:** Freeland, Mark (M.)  
**Sent:** Monday, March 04, 2002 2:50 PM  
**To:** Terry Tameshiro (E-mail)  
**Cc:** Hanges, Jon (-); Blenko, Steven (S.J.); Maurer, James (J.B.); Gates, Freeman (F.C.); Pianta, Paul (P.G.)  
**Subject:** Low mileage UPAD part

Terry,

I would like to have one or two of the very low mileage UPAD parts for Auger analysis.

Specifically, there is one in the data base RML No. 8780-184 which was one of two sensors replaced on a 3.8L Mustang for the complaint of Stalling at 8 miles. The vehicle had not been delivered to the customer at the time the sensor was replaced.

Another part which would be of interest if you can locate it, would be RML 8900-080, which came from a Focus with 54 miles.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreels1@ford.com  
Tel.: (313) 594-7645

---

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, July 30, 2002 4:58 PM  
**To:** Hanges, Jon (.); Uy, Dalrene (D.)  
**Cc:** Potter, Timothy (T.J.)  
**Subject:** RE: Elwood Focus sensor

Jon & Dalrene,

I have assigned a SRL tracking number of SRL931 to this part. If you have the part could you please inscribe this number on the part and associate all records with this number. I have noted the info that I have in the master log, but please advise me of any info & findings you have on the part.

When you are done then the remains should be stored in a plastic bag clearly labeled with the tracking number and deposited in the 900 series box in my office.

Thanks

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreel1@ford.com  
Tel: (313) 594-7645

-----Original Message-----

**From:** Hanges, Jon (.)  
**Sent:** Friday, July 19, 2002 1:25 PM  
**To:** Freeland, Mark (M.); Uy, Dalrene (D.)  
**Subject:** Elwood Focus sensor

Mark,

Tim Potter got a sensor from Kevin Elwood's Focus. It has some clear bubbles by the base of the wire bonds. Dalrene wrote down the mileage.

The date stamp on the sensor is 1K19B. I have not assigned it an SRL number. There are images in the Kavlico directory on the optical lab computer.

Jon

---

**From:** Freeland, Mark (M.)  
**Sent:** Friday, July 12, 2002 10:45 AM  
**To:** Hengas, Jon (.)  
**Subject:** RE: 308

Thanks for the status Jon.

Next week can you get with Steve and explain what needs done with it. Hopefully he can get it finished by the time I get back from vacation.

Thanks

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

**From:** Hengas, Jon (.)  
**Sent:** Thursday, July 11, 2002 6:50 PM  
**To:** Freeland, Mark (M.)  
**Subject:** 308

Mark,  
Dairene gave me 308, the part you latched and drove, and it's on the bench in my sample prep area in case you need to look at it.  
Jon

---

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, July 11, 2002 8:47 AM  
**To:** Kyong Park (E-mail); Gates, Freeman (F.C.)  
**Cc:** Hengas, Jon (.); Carter, Roscoe (R.O.)  
**Subject:** Exhaust Gas Condensate Acidity

I measured the condensate in the tubes of the dPFE on my Mountaineer this morning with high resolution paper (thanks Jon or Rosco, not sure which one left me the present last night). The value I observed was 4.5.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517

Dearborn, MI 48121-2053 USA  
email: mfreelal@ford.com  
Tel.: (313) 594-7645

---

**From:** Poma, Amy (A.)  
**Sent:** Wednesday, July 24, 2002 10:07 AM  
**To:** Akins, Mary (M.)  
**Subject:** Questions Kyong to discuss with Analytical Solutions

Mary,

July 18, Paul P. sent Kyong some questions from Sheran that Kyong was suppose to discuss with Analytical Solutions. At yesterday's meeting, Kyong advised his computer has been down for long time and he has not seen the questions. Sheran advised him in the meeting of what things they wanted him to discuss with Analytical Solutions. Can you please follow up with Kyong and see if he needs the email faxed (don't have it anymore) and have him work with Analytical Solutions on this? Please advise, thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com



---

**Subject:** Voltage measurements during coil charging  
**Location:** POEE, FMEI dept or DI-198 near pillar G-17

**Start:** Tue 8/6/2002 1:00 PM  
**End:** Tue 8/6/2002 2:30 PM  
**Show Time As:** Tentative

**Recurrence:** (none)

**Meeting Status:** Not yet responded

**Required Attendees:** Poma, Amy (A.); Freeland, Mark (M.); McCoy, James (J.D.); Allee, Sheren (S.A.); Maurer, James (J.B.); 'jshahan@viateon.com'

Jim Maurer has requested your attendance at the above referenced meeting for Tuesday, August 6th. Please advise if you are unable to attend.

Mark Freeland-Per Jim's request, please bring your vehicle so the team can look at it. Thanks.

---

**From:** Poma, Amy (A.)  
**Sent:** Monday, August 12, 2002 8:42 AM  
**To:** Meurer, James (J.B.)  
**Subject:** checking in on Kevlco status

Morning Jim,

Just checking in to see if there is any update on the status of Ford/Kevlco regarding the direction and meeting status for this week. Please advise, thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEi Cube CO182  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

---

**From:** Poma, Amy (A.)  
**Sent:** Monday, August 12, 2002 12:56 PM  
**To:** Maurer, James (J.B.)  
**Subject:** RE: checking in on Kavlico status

Thanks for the update. I'll wait to hear from you.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

-----Original Message-----  
**From:** Maurer, James (J.B.)  
**Sent:** Monday, August 12, 2002 12:50 PM  
**To:** Poma, Amy (A.)  
**Subject:** RE: checking in on Kavlico status

Jim O'Neill is going to call Kyong and see about setting up the first meeting. He thought either tomorrow in the 1:00-2:30 time slot or on Thursday in the 1:00 - 3:00 time, but was not sure. I'll let you know when he tells me. He will be the new Ford team leader.

Regards,  
Jim Maurer  
James B. Maurer  
V-Engine 6-Sigma Team Leader  
Fuel Metering Dept. V Engine Engineering  
Phone (313) 390-3672, Fax (313) 390-4084  
Text Page: (313) 795-5219  
Email: jmaurer@Ford.com

-----Original Message-----  
**From:** Poma, Amy (A.)  
**Sent:** Monday, August 12, 2002 8:42 AM  
**To:** Maurer, James (J.B.)  
**Subject:** checking in on Kavlico status

Morning Jim,

Just checking in to see if there is any update on the status of Ford/Kavlico regarding the direction and meeting status for this week. Please advise, thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

---

**From:** Poma, Amy (A.)  
**Sent:** Monday, August 12, 2002 2:27 PM  
**To:** Maurer, James (J.B.)  
**Subject:** RE: checking in on Kavlico status

Jim,

My Monday 1:00 timeslot is getting a conflict from Throttle Body. I know you said Jim O'Neill is taking over, but I wanted to know if you had any idea if this timeslot would still be used in the future. I could use that conference room too if we will no longer will be having an "Issues Resolution" meeting. Please advise, thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

-----Original Message-----

**From:** Maurer, James (J.B.)  
**Sent:** Monday, August 12, 2002 12:50 PM  
**To:** Poma, Amy (A.)  
**Subject:** RE: checking in on Kavlico status

Jim O'Neill is going to call Kyong and see about setting up the first meeting. He thought either tomorrow in the 1:00-2:30 time slot or on Thursday in the 1:00 - 3:00 time, but was not sure. I'll let you know when he tells me. He will be the new Ford team leader.

Regards,

Jim Maurer  
James B. Maurer  
V-Engine 6-Sigma Team Leader  
Fuel Metering Dept. V Engine Engineering  
Phone (313) 390-3872, Fax (313) 390-4084  
Text Page: (313) 795-5219  
Email: jmaurer@Ford.com

-----Original Message-----

**From:** Poma, Amy (A.)  
**Sent:** Monday, August 12, 2002 8:42 AM  
**To:** Maurer, James (J.B.)  
**Subject:** checking in on Kavlico status

Morning Jim,

Just checking in to see if there is any update on the status of Ford/Kavlico regarding the direction and meeting status for this week. Please advise, thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

---

**From:** Poma, Amy (A.)  
**Sent:** Wednesday, August 14, 2002 2:22 PM  
**To:** Bachor, Ruth (R.A.)  
**Cc:** Poma, Amy (A.)  
**Subject:** next week follow up

Ruth,

Gary advised me of the following assignments that he would like to be checked on next week while he is gone, to make sure they get started, etc.

Stack up meeting

Tom Miller-TMILLER6 is to check with VSA people to have a person work with Visteon on stack up.

Mark Semeyn-MSEMEYN 744-1388 is to determine what stack up should be. **MAKE SURE HE GETS STARTED WHILE GARY IS OUT.**

Visteon Blue Prints- Tom Miller is to be getting access to detailed blue prints from Eazter Pettantys-Visteon (here at POEE). Eazter is checking with Louise Bailey-Rawsonville to verify what agreement is on reviewing prints. I am following up on this tomorrow. I will send you a note if the prints are not here by then, etc.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax 313-390-4084  
apoma2@ford.com

---

**From:** Poma, Amy (A.)  
**Sent:** Thursday, August 15, 2002 7:30 AM  
**To:** Bachor, Ruth (R.A.)  
**Co:** Poma, Amy (A.)  
**Subject:** RE: next week follow up

Ruth,

Visteon Blue Prints-Eazter Pattantyus is out in training today and tomorrow and I did not receive any note or anything from her that the prints are here and ready for Tom Miller to start reviewing. She probably has not connected with Louise Bailey at Rawsonville yet to verify the agreement.

I will ask her to send you a note when they are here so Tom Miller/Gary can be notified that he can meet with her to get and study them.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

-----Original Message-----

**From:** Poma, Amy (A.)  
**Sent:** Wednesday, August 14, 2002 2:22 PM  
**To:** Bachor, Ruth (R.A.)  
**Co:** Poma, Amy (A.)  
**Subject:** next week follow up

Ruth,

Gary advised me of the following assignments that he would like to be checked on next week while he is gone, to make sure they get started, etc.

**Stack up meeting**

Tom Miller-TMILLER6 is to check with VSA people to have a person work with Visteon on stack up.

Mark Semeyn-MSEMEYN 744-1388 is to determine what stack up should be. **MAKE SURE HE GETS STARTED WHILE GARY IS OUT.**

Visteon Blue Prints- Tom Miller is to be getting access to detailed blue prints from Eazter Pattantyus-Visteon (here at POEE). Eazter is checking with Louise Bailey-Rawsonville to verify what agreement is on reviewing prints. I am following up on this tomorrow. I will send you a note if the prints are not here by then, etc.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

---

**From:** Poma, Amy (A.)  
**Sent:** Monday, August 26, 2002 7:58 AM  
**To:** Bachor, Ruth (R.A.)  
**Subject:** RE: Ask Gary about support of Wettsch meeting

I would not be able to support this meeting. Because of my kids school schedule I will not be starting work until 9:00 a.m. beginning tomorrow, 8/27.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

-----Original Message-----

**From:** Bachor, Ruth (R.A.)  
**Sent:** Tuesday, August 20, 2002 5:05 PM  
**To:** Poma, Amy (A.)  
**Subject:** Ask Gary about support of Wettsch meeting

Hi -

Wanted to mention that this week Swami Subramanian (ETB Engineer, on Gary's team) talked to me about a meeting he attends at could use our support. Swami goes to a meeting every Thursday from 7:30 - 9:00 am on Idle Air Control. He tells me that the meetings have been going on for some time (months, maybe years) and the leader, Bill Wettsch, has no formal system to track timing / issues. Sound familiar?

Anyway, Idle Air Control is part of Gary's responsibilities and Bill is/will be on Gary's team (whenever the transfer "officially" happen).

I don't know what Gary has in mind for your workload/priorities vs. what your workload will be from other FMEI supervisors, but I suggest you bring this up with Gary and see what his take on it is. I can give you more details when we get a chance to talk.

P.S. I don't want to make Bill look bad, I assume up until this time he didn't have (or maybe didn't want) FMA support.

Ruth A. Bachor  
Program Management  
POEE, cube CG070  
e-mail: rbachor@ford.com  
phone: 313-390-3703 fax: 313-322-9265

---

**From:** Poma, Amy (A.)  
**Sent:** Monday, August 26, 2002 8:27 AM  
**To:** Maurer, James (J.B.)  
**Subject:** Kevlco update

Hi Jim,

Just returning from vacation today and wanted to know what's going on with Ford/Kevlco team meetings, etc. I did not get any emails regarding meetings or anything so if you could fill me in that would be great. Our we still having the Bill McCarty call in meeting at 4:00 today? Please advise. Thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8848, fax: 313-390-4084  
apoma2@ford.com



---

**Subject:** Rescheduled Monday mtg.  
**Location:** POEE, call in

**Start:** Wed 8/28/2002 4:00 PM  
**End:** Wed 8/28/2002 5:00 PM  
**Show Time As:** Tentative

**Recurrence:** (none)

**Meeting Status:** Not yet responded

**Required Attendees:** Poma, Amy (A.); Akine, Mary (M.); Ayers, Don; beason, G.; castelinas, J.; Gates, Freeman (F.C.); Gillespie, S.; Johnson, Joe (J.H.); Maurer, James (J.B.); McCarty, Bill (W.D.); O'Neill, Jim (J.D.); Poma, Amy (A.); Reddy, Srikanth

Please plan to attend/call in at 4:00 on Wednesday to go over the Ford/Kavlico action items. Same call in numbers used for Monday mtg.

---

**From:** Poma, Amy (A.)  
**Sent:** Tuesday, August 27, 2002 11:44 AM  
**To:** Reddy, Srikanth (S.C.)  
**Subject:** RE: Rescheduled Monday mtg.

Inside: 9-1-954-1195  
outside: 9-1-888-406-3572  
password: 7174497

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

-----Original Message-----

**From:** Reddy, Srikanth (S.C.)  
**Sent:** Tuesday, August 27, 2002 10:56 AM  
**To:** Poma, Amy (A.)  
**Subject:** RE: Rescheduled Monday mtg.

Hi Amy,

Can you give me the phone no. and passcode?

Thanks

SR

-----Original Appointment-----

**From:** Poma, Amy (A.)  
**Sent:** Tuesday, August 27, 2002 9:59 AM  
**To:** Alden, Mary (M.); Ayers, Don; beeson, G.; costafra, J.; Gates, Freeman (F.C.); Gillespie, S.; Johnson, Joe (J.H.); Maurer, James (J.B.); McCarty, Bill (W.D.); O'Neill, Jim (J.D.); Poma, Amy (A.); Reddy, Srikanth  
**Subject:** Rescheduled Monday mtg.  
**When:** Wednesday, August 28, 2002 4:00 PM-5:00 PM (GMT-05:00) Eastern Time (US & Canada).  
**Where:** POEE, call in

Please plan to attend/call in at 4:00 on Wednesday to go over the Ford/Kavlico action items. Same call in numbers used for Monday mtg.

---

**From:** Poma, Amy (A.)  
**Sent:** Tuesday, August 27, 2002 11:44 AM  
**To:** Gillespie, Stuart  
**Subject:** RE: Rescheduled Monday mtg.

Great, thanks for the reply.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube C0162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

-----Original Message-----

**From:** Gillespie, Stuart [mailto:SGillespie@kavlico.com]  
**Sent:** Tuesday, August 27, 2002 10:56 AM  
**To:** Poma, Amy (A.)  
**Subject:** RE: Rescheduled Monday mtg.

Amy,  
I am okay for that call.  
Stu

-----Original Message-----

**From:** Poma, Amy (A.) [mailto:apoma2@ford.com]  
**Sent:** Tuesday, August 27, 2002 6:59 AM  
**To:** Mary Akins; Ayers, Don; Beason, Gary; Costeines, John; Gates, Freeman (F.C.); Gillespie, Stuart; Johnson, Joe (J.H.); Maurer, James (J.B.); McCarty, Bill (W.D.); O'Neill, Jim (J.D.); Poma, Amy (A.); Reddy, Srikanth  
**Subject:** Rescheduled Monday mtg.

**When:** Wednesday, August 28, 2002 4:00 PM-5:00 PM (GMT-05:00) Eastern Time (US & Canada).  
**Where:** POEE, call in

\*\*\*\*\*

Please plan to attend/call in at 4:00 on Wednesday to go over the Ford/Kavlico action items. Same call in numbers used for Monday mtg.

---

**From:** Poma, Amy (A.)  
**Sent:** Monday, August 26, 2002 9:58 AM  
**To:** McCarty, Bill (W.D.)  
**Subject:** Call in at 4:00 today??

Bill,

Just checking to make sure we are still having the 4:00 call in meetings with Kavlico. I didn't see any updates since I've been out on vacation and I wanted to make sure. Please advise, thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-380-8849, fax: 313-380-4084  
apoma2@ford.com

---

**From:** Poma, Amy (A.)  
**Sent:** Tuesday, August 27, 2002 2:14 PM  
**To:** 'MAKINWORK@aol.com'  
**Subject:** RE: FW: rescheduled 4:00 Ford/Kavlico Call in mtg.

yes.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube C0162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

-----Original Message-----

**From:** MAKINWORK@aol.com [mailto:MAKINWORK@aol.com]  
**Sent:** Tuesday, August 27, 2002 2:05 PM  
**To:** apoma2@ford.com  
**Subject:** Re: FW: rescheduled 4:00 Ford/Kavlico Call in mtg.

Amy,  
Wed., Aug. 28th at 4:00pm ET will work for me...same call in numbers?

Mary Akins

---

**From:** Panaretos, Christine (C.M.)  
**Sent:** Tuesday, September 10, 2002 10:13 AM  
**To:** Poma, Amy (A.)  
**Subject:** RE: Generic timing plans

No problem. How "generic" does he want to get? I have the template for Intake Systems, but it covers an entire program and consists of 500+ tasks. Don't let this scare you though - I can help you with whatever you need. We also did a small plan for ETB's on the U204 program. I am attaching both files - you may want to print and show them to him and ask what he wants. Then, let me know and we can sit down and put it together.



SDF Template  
Intakes.mpp



U204 Throttle Body  
Recovery.mpp...

**Chris Panaretos**  
Account Manager, Project Solutions at Ford Powertrain  
POEE Building, Cube CG-071  
(313) 24-89337; Fax: (313) 32-29285  
cpanaret@ford.com

-----Original Message-----

**From:** Poma, Amy (A.)  
**Sent:** Tuesday, September 10, 2002 9:48 AM  
**To:** Panaretos, Christine (C.M.)  
**Subject:** Generic timing plans

Chris,

Gary needs a "generic timing plan" for ETB. Ruth hadn't started anything so can you please advise me, I haven't done one here. Do I use a PSC template? Is there templates on the web we are suppose to use. I might need a little help with this to get started. Any info you could provide would be most helpful. Thanks.

**Amy Poma**  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

---

**From:** Panaretos, Christine (C.M.)  
**Sent:** Wednesday, September 04, 2002 1:49 PM  
**To:** Poma, Amy (A.)  
**Subject:** Blank Issues\_051502.zip



Blank  
Issues\_051502.zip

Try this one.....If it doesn't work, let me know.

Blank Issues\_051502.zip

---

**From:** Gundry, Rob (R.C.)  
**Sent:** Wednesday, August 28, 2002 2:03 PM  
**To:** Poma, Amy (A.)  
**Subject:** Bill Goodwin file



High Speed  
spactive Spark.mp.

Here is the file that I work on for Bill Goodwin. He also is in our department and reports to shari finn. Please contact Bill for further directions.

Thanks again.

*Rob Gundry  
Project Management PMA  
FMEI Department  
Phone: 313-84-58066  
CDSid: rgundry  
rgundry@ford.com*



---

**From:** Gundry, Rob (R.C.)  
**Sent:** Wednesday, August 28, 2002 1:45 PM  
**To:** Poma, Amy (A.)  
**Subject:** timing plan for C.O.P.



COP Housing  
Design Change.mpp

I supported Shari Finn on this project, so I would get with her to make sure she wants you to continue support on this project. Again I will e-mail all my new information so that you can contact me whenever you have questions. good luck and I'm sorry.

Thanks :

*Rob Gundry  
Project Management PMA  
FMEI Department  
Phone: 313-84-58066  
CDSid: rgundry  
rgundry@ford.com*

---

**Subject:** Canceled: PROTOTYPE CONTAINMENT STEERING COMMITTEE  
**Location:** VOGO Conference Room 3

**Start:** Fri 5/24/2002 8:00 AM  
**End:** Fri 5/24/2002 9:00 AM  
**Show Time As:** Free

**Recurrence:** Weekly  
**Recurrence Pattern:** every 2 week(s) on Friday from 8:00 AM to 9:00 AM

**Meeting Status:** Not yet responded

**Required Attendees:** Bushey, Dave (D.R.); Mulrenin, Timothy (T.); Pinta, Thomas (T.J.); Elliott, Frederick (F.P.); Eupizi, Anthony (A.); Poma, Amy (A.); Roske, Paul (P.W.); Chun, Vold (V.L.); Gordon, Michael (L.); Harris Jr., David (D.); Coscia, Rick (R.A.); Jaskolski, Bob (R.M.); Sheldon, Pat (P.); Mitchell, Bernie (B.A.); Perkovich, John (J.F.); Mallick, Bob (R.A.); Reith, Mark (M.R.); Sayles, Bob (R.A.); Hardick, Richard (R.A.); Osterman, Dave (D.M.); Mosakowski, Martin (M.M.); Anger, Dave (D.K.); Green, Bill (B.); Weaver, Greg (G.A.); Dila, Julie (J.L.)

**Optional Attendees:** VOGO CR3 (35); Stewnik, Mike (M.J.)

**Importance:** High

**FRIDAY'S MEETING IS CANCELLED.**  
**Have a Good Holiday.**

Please forward agenda items to Dave Bushey (DBUSHEY) or Tim Mulrenin (TMULRENI) by Wednesday afternoon.

---

**From:** Plants, Paul (P.G.)  
**Sent:** Tuesday, May 14, 2002 10:55 AM  
**To:** Poma, Amy (A.)  
**Subject:** FW: Issues Resolution Meeting Minutes May 13, 2002

You got all the right stuff I rearranged and contained in one page. I will use this for today's summary on Tuesday Agenda. Thanks.



apoma.doc

-----Original Message-----

**From:** Poma, Amy (A.)  
**Sent:** Tuesday, May 14, 2002 9:59 AM  
**To:** Plants, Paul (P.G.)  
**Subject:** Issues Resolution Meeting Minutes May 13, 2002

Paul,

Attached please find my first crack at tracking/assigning yesterday's meeting. Please advise of changes and/or revisions and then I will send out.



VehicleIssuesmtg  
041302.doc

Thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CQ-158  
phone-313-390-8848, fax 313-390-4084  
apoma2@ford.com

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**From:** Hanges, Jon (.)  
**Sent:** Tuesday, May 14, 2002 10:48 AM  
**To:** Poma, Amy (A.)  
**Subject:** RE: Agenda and Issues Deck for Tuesday, May 14, 2002 1-2:30 p.m.

Amy,  
I think it's very useful to have the list of presenters in the email.  
Thanks,  
Jon Hanges

-----Original Message-----

**From:** Poma, Amy (A.)  
**Sent:** Tuesday, May 14, 2002 8:21 AM  
**To:** Alda, Mary (M.); Alkhar, Shrikant (S.V.); Albrecht, Guenter (G.K.); Allen, Sharon (S.A.); Arnold, Kenneth (K.M.); Auler, Jim (J.E.); Awad, Mahmoud (M.I.); Ayers, Don; Bandoles, Pete (P.F.); Bensek, Catherine (C.K.); Bersuder, Lee (L.C.); Black, Gerry (G.); Bronni, Mark (M.J.); Bugel, Barry; Deneb, Adam (A.V.); Davies, Brady; Deeb, Joe (J.S.); Douglass, Jim (J.B.); Friesland, Mark (M.); Galante, Chris (C.R.); Gates, Freeman (F.C.); Giordano, Mike (M.A.); Godlewski, Ed (E.V.); Hanges, Jon (.); Jafarian, John; Janda, Jon (J.M.); Johnson, Joe (J.H.); Kered, Karen (K.L.); Koszynski, John (J.J.); Kunde, Olaf (O.); Maure, Gordon (G.P.); Maurer, James (J.B.); McCarthy, Bill (W.D.); Muter, Doreen (D.L.); Nielson, Christian (C.A.); O'Neill, Jim (J.D.); Oswald, Greg (G.G.); Park, Kyong; Pascany, Ken (K.M.); Perry, Brian (B.J.); Plante, Paul (P.G.); Poma, Amy (A.); Popoff, Daniel (D.M.); Raquetou, Alden (A.P.); Rossi, Roberto (R.A.); Schieding, Kurt (K.J.); Shore, John (J.); Tamashiro, Tarry; Trujillo, Thomas (T.G.); Verner, Carol (C.J.); White-Johnson, Petrice (P.); Williamson, Richard (E.)  
**Subject:** Agenda and Issues Deck for Tuesday, May 14, 2002 1-2:30 p.m.

Team-

Attached please find the Agenda and Issues Deck for the Kavlico dPFE Sensor core team meeting for today May 14 from 1:00-2:30 p.m. in conference room DI-196 (POEE FMEI dept.) If you are a presenter on the Agenda, please bring 15 copies of your handouts and forward your presentation updates to me, apoma2, via email no later than 1 hour before the meeting. Also, please review the Issues, as these correlate to the Agenda, to prepare to talk to your responsible items.

The following are listed on the Agenda for today's meeting:

Jim Maurer  
Don Ayers  
Bill McCarty  
Kyong Park  
Paul Plante  
Mary Akina

<< File: Kavlico Meeting Agenda\_051402.doc >>

<< File: Rpt\_IssuesStatus1.051002pdf.pdf >>

Thanks and have a great day!

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CQ-156  
Phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

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**From:** Poma, Amy (A.)  
**Sent:** Friday, May 10, 2002 12:50 PM  
**To:** Plante, Paul (P.G.)  
**Subject:** RE: Electrical Testing on Vehicles 5/8/02 meeting notes

Thank you very much.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CQ-156  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

-----Original Message-----

**From:** Plante, Paul (P.G.)  
**Sent:** Friday, May 10, 2002 12:31 PM  
**To:** Poma, Amy (A.)  
**Subject:** RE: Electrical Testing on Vehicles 5/8/02 meeting notes

Thanks, nice notes!

-----Original Message-----

**From:** Poma, Amy (A.)  
**Sent:** Friday, May 10, 2002 12:21 PM  
**To:** Maurer, James (J.B.); McCoy, James (J.D.); Plante, Paul (P.G.); Potter, Timothy (T.J.); Allen, Sheran (S.A.)  
**Cc:** Poma, Amy (A.)  
**Subject:** Electrical Testing on Vehicles 5/8/02 meeting notes

VI-

Attached please find notes taken from the May 8 meeting as referenced above.

<< File: Kavlico.doc-electricaltesting 050802.doc >>

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CQ-156  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

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**From:** Panaretos, Christine (C.M.)  
**Sent:** Thursday, May 02, 2002 3:38 PM  
**To:** Poma, Amy (A.)  
**Subject:** Trying another thing

This way, it will only send over the files individually. Here are a few to download to your "Kavlico" directory in your personal folders in outlook.



RE: Agenda for  
Tuesday



RE: DPFE Current  
Status



Out of Office  
AutoReply: Agend...



Agenda and Issues  
for 4/23 Kav...



DPFE Current  
Status



Parts for outside  
lab handout



RE: Focus Zetec  
DPFE and PCM r...



Agenda and Issues  
for Kavlico ...

**Chris Panaretos**  
Account Manager, Project Solutions at Ford Powertrain  
POEE Building, Cube CG-071  
(313) 24-88337; Fax: (313) 32-28285  
cpanaret@ford.com

---

**From:** Maurer, James (J.B.)  
**Sent:** Monday, April 26, 2002 9:17 AM  
**To:** Panaretos, Christine (C.M.)  
**Subject:** RE: Agenda for Tuesday

I wouldn't change the priorities because then you will have to remember to update the high-medium-low before each meeting or after each meeting. Not much is really happening on the service parts issue (#16), but I know it is one of the most important items to get done. Considering that the team needs to get other things accomplished first related to root cause, the issue could be reclassified, but then we would make it high priority later. Same thing applies to issue #12.

Regards,  
**Jim Maurer**  
James B. Maurer  
V-Engine 6-Sigma Team Leader  
Fuel Metering Dept. V Engine Engineering  
Phone (313) 390-3672, Fax (313) 390-4084  
Text Page: (313) 796-5219  
Email: jmaurer@Ford.com

—Original Message—

**From:** Panaretos, Christine (C.M.)  
**Sent:** Friday, April 26, 2002 3:49 PM  
**To:** Maurer, James (J.B.)  
**Subject:** Agenda for Tuesday

Jim,  
Please take a look at the agenda for Tuesday and let me know if you have any changes. I will send it out on Monday by 10:00, unless I hear back from you.

I have also included the latest issues. As I was going through them, I realized if we are not going to cover all of the "high priority" issues in the meeting, then they should be changed to "medium" priority. The ones that brought this to my attention are issues #12 and #16. If you agree, then I will change them before the next issues update is sent out.

Have a good weekend!

<< File: Kavlico Meeting Agenda\_043002.doc >> << File: Kavlico14D\_issues\_042502.PDF >>

**Chris Panaretos**  
Account Manager, Project Solutions at Ford Powertrain  
POEE Building, Cube CG-071  
(313) 24-89337; Fax (313) 32-29265  
cpanaret@ford.com

---

**From:** Poma, Amy (A.)  
**Sent:** Friday, September 13, 2002 3:39 PM  
**To:** Limatta, Gary (G.D.)  
**Subject:** Supporting documentation requested from Visteon

Gary,

FYI, I emailed and followed up with a voicemail to Louise Bally requesting the supporting documentation on that Deviation you gave me today and that you need it for cab 9/17 for mtg. on Wed 9/18. Called in to the 3:00 today hoping to mention it to Louise, but as of 3:15 there was no one else calling in. I will follow up with her again on Monday morning.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO182  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com



---

**From:** Poma, Amy (A.)  
**Sent:** Wednesday, September 11, 2002 2:33 PM  
**To:** Srinaman, Rom (R.)  
**Subject:** RE: Gary Limatta's Section meeting

No I had to resend this meeting to Gary. The original mtg. notice shows the cancellation of just the September 4 mtg. because of Gary not being here. Monday's from 1-3 are the Reliability Council mtgs. and Wednesday's from 1-2 are the Section mtgs. Sorry if it was confusing.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

-----Original Message-----

**From:** Srinaman, Rom (R.)  
**Sent:** Wednesday, September 11, 2002 2:18 PM  
**To:** Poma, Amy (A.)  
**Subject:** RE: Gary Limatta's Section meeting

Amy,  
Sorry ofr the confusion. Are you cancelling (see the subject) or confirming the section meetings?

-----Original Appointment-----

**From:** Poma, Amy (A.)  
**Sent:** Wednesday, September 11, 2002 2:04 PM  
**To:** Poma, Amy (A.); Srinaman, Rom (R.); Schwager, Bryce (B.A.); Subramanian, Sureshkrishnan (S.); Wetlach, Bill (B.); Pettit, Chuck (C.W.); Liberty, Susan (S.A.)  
**Subject:** Canceled: Gary Limatta's Section meeting  
**When:** Occurs every Wednesday effective 9/4/02 until 12/18/02 from 1:00 PM to 2:00 PM (GMT-05:00) Eastern Time (US & Canada).  
**Where:** POEE conf. rm. CU-105 near pillar G-10  
**Importance:** High

Please plan to attend Gary's recurring Section Meeting beginning **Wednesday, September 4, 2002** from 1:00-2:00 p.m through **December 18, 2002**.

---

**Subject:** Updated: Gary Limatta's Section meeting  
**Location:** POEE conf. rm. CU-105 near pillar G-10  
  
**Start:** Wed 9/4/2002 1:00 PM  
**End:** Wed 9/4/2002 2:00 PM  
**Show Time As:** Tentative  
  
**Recurrence:** Weekly  
**Recurrence Pattern:** every Wednesday from 1:00 PM to 2:00 PM  
  
**Meeting Status:** Not yet responded  
  
**Required Attendees:** Poma, Amy (A.); Limatta, Gary (G.D.)

Please plan to attend Gary's recurring Section Meeting beginning Wednesday, September 4, 2002 from 1:00-2:00 p.m through December 18, 2002.

---

**Subject:** Updated: Gary Limatta's Section meeting  
**Location:** POEE conf. rm. CU-106 near pillar G-10  
**Start:** Wed 9/4/2002 1:00 PM  
**End:** Wed 9/4/2002 2:00 PM  
**Show Time As:** Tentative  
**Recurrence:** Weekly  
**Recurrence Pattern:** every Wednesday from 1:00 PM to 2:00 PM  
**Meeting Status:** Not yet responded  
**Required Attendees:** Poma, Amy (A.); Limatta, Gary (G.D.)

Please plan to attend Gary's recurring Section Meeting beginning Wednesday, September 4, 2002 from 1:00-2:00 p.m through December 18, 2002.

---

**From:** Poma, Amy (A.)  
**Sent:** Wednesday, September 11, 2002 9:58 AM  
**To:** Linette, Gary (G.D.)  
**Subject:** Today's Section meeting

Gary,

Please advise if you would like an Agenda put together for today's 1:00 Section mtg. Thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.  
POEE Building, FMEI Cube CO162  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

**2000-2002 Kavlico TM dPFE Sensor**  
Team Roster by Organization/Department

Revision Date: 2/4/2003

ER02-027 2002

| Kavlico TM dPFE Sensor     |            |           |                |                                         |                |            |        |            |
|----------------------------|------------|-----------|----------------|-----------------------------------------|----------------|------------|--------|------------|
| Team Roster                |            |           |                |                                         |                |            |        |            |
| * Denotes Core Team Member |            |           |                |                                         |                |            |        |            |
| LAST NAME                  | FIRST NAME | PHONE NO. | ORG./Dept.     | TITLE/FUNCTION                          | COMPANY        | LOCATION   | E-MAIL | FAX NUMBER |
|                            |            |           | V-Engine       | FMEI Tech Spec./Technical Lead          | Ford           | POEE       |        |            |
|                            |            |           | V-Engine       | FMEI Supervisor/OA team leader          | Ford           | POEE       |        |            |
|                            |            |           | V-Engine       | Proj. Mgt. Analyst                      | Proj. Solution | POEE       |        |            |
|                            |            |           | V-Engine       | Campaign Prevent Specialist             | Ford           | POEE       |        |            |
|                            |            |           | V-Engine       | FMEI Engineer                           | Ford           | POEE       |        |            |
|                            |            |           | V-Engine       | Service Engineer                        | Ford           | POEE       |        |            |
|                            |            |           | V-Engine       | FMEI CPMT Eng./WERs concerns            | Ford           | POEE       |        |            |
|                            |            |           | V-Engine       | FMEI Section Supv.                      | Ford           | POEE       |        |            |
|                            |            |           | V-Engine       | FMEI AWS Analyst                        | Ford           | POEE       |        |            |
|                            |            |           | V-Engine       | FMEI Dept. Mgr.                         | Ford           | POEE       |        |            |
|                            |            |           | Quality Office | Reliability Engineer/ Field Data Leader | Ford           | ATNPC      |        |            |
|                            |            |           | Quality Office | Reliability Supervisor                  | Ford           | POEE       |        |            |
|                            |            |           | Purchasing     | STA Engineer (Leader)                   | Ford           | PTE        |        |            |
|                            |            |           | Purchasing     | Production Buyer                        | Ford           | Purchasing |        |            |
|                            |            |           | Purchasing     | Service Buyer                           | Ford           | FCSD       |        |            |
|                            |            |           | Purchasing     | STA Site Manager                        | Ford           | AVTS       |        |            |
|                            |            |           | PT Elec Appl   | 4.6 F150 Supv./Leader                   | Ford           | POEE       |        |            |
|                            |            |           | PT Elec Appl   | 2.0L Zetec Focus/Escapa Supv.           | Ford           | POEE       |        |            |
|                            |            |           | PT Elec Appl   | 3.0L 4V Esc/Taurus Supv.                | Ford           | POEE       |        |            |
|                            |            |           | PCSE           | Chief Engineer                          | Ford           | POEE       |        |            |
|                            |            |           | CAPE           | AVT Chief Engineer                      | Ford           | POEE       |        |            |
|                            |            |           | APTE           | PT CP8                                  | Ford           | APTE       |        |            |
|                            |            |           | Motorola       | On-Site Rep.                            | Motorola       | POEE       |        |            |
|                            |            |           | Kavlico        | On-Site Rep.                            | Kavlico        | POEE       |        |            |
|                            |            |           | Kavlico        | Program Manager/Technical Leader        | Kavlico        | CA         |        |            |
|                            |            |           | Kavlico        | Director MEMS Technology                | Kavlico        | CA         |        |            |
|                            |            |           | Kavlico        | VP Research and Dev't                   | Kavlico        | CA         |        |            |

**2000-2002 Kavlico TM dPFE Sensor  
Team Roster by Organization/Department**

Revision Date: 2/4/2003

2002-027 20/03

| Kavlico TM dPFE Sensor     |            |           |            |                                    |         |          |        |            |
|----------------------------|------------|-----------|------------|------------------------------------|---------|----------|--------|------------|
| Team Roster                |            |           |            |                                    |         |          |        |            |
| * Denotes Core Team Member |            |           |            |                                    |         |          |        |            |
| LAST NAME                  | FIRST NAME | PHONE NO. | ORG./Dept. | TITLE/FUNCTION                     | COMPANY | LOCATION | E-MAIL | FAX NUMBER |
|                            |            |           | Kavlico    | Warranty Analysts                  | Kavlico | CA       |        |            |
|                            |            |           | FRL        | 6-Sigma Black Belt                 | Ford    | FRL      |        |            |
|                            |            |           | FRL        | Scan Elec Microscope-Expert        | Ford    | FRL      |        |            |
|                            |            |           | Focus      | C&P Supervisor                     | Ford    | VPC      |        |            |
|                            |            |           | Focus      | PT Focus Program Mgr.              | Ford    | VPC      |        |            |
|                            |            |           | Focus      | C&P Quality Eng (Leader)           | Ford    | VPC      |        |            |
|                            |            |           | FCSD       | Recall Program Manager             | Ford    | DSCI     |        |            |
|                            |            |           | FCSD       | Recall Coordinator-Pete Bandoska   |         |          |        |            |
|                            |            |           | FCSD       | FQE Supervisor                     | Ford    | TWCTDR   |        |            |
|                            |            |           | FCSD       | ECI Supervisor                     | Ford    | TWCTDR   |        |            |
|                            |            |           | FCSD       | PS&L Recall Mgr./Parts costs & buy | Ford    | FCSD     |        |            |
|                            |            |           | FCSD       | ECI Prod.Con.Anal.                 | Ford    | FCSD     |        |            |
|                            |            |           | EPRC       | Leader                             | Ford    | FPB4     |        |            |
|                            |            |           | EPRC       | Critical Con. Mgr.                 | Ford    | FCSD     |        |            |
|                            |            |           | EESE       | #NAME?                             | Ford    | Bldg. #1 |        |            |
|                            |            |           | EESE       | Chief Engineer                     | Ford    | AVT5     |        |            |
|                            |            |           | EESE       | AVT Wiring Specialist              | Ford    | AVT5     |        |            |
|                            |            |           | OGC        | Lawyer                             | Ford    | PDC      |        |            |
|                            |            |           |            |                                    |         |          |        |            |
|                            |            |           |            |                                    |         |          |        |            |
|                            |            |           |            |                                    |         |          |        |            |
|                            |            |           |            |                                    |         |          |        |            |

Kavlico TM dPFE Sensor  
Technical Offsite Meeting  
FTDC - Room  
March 14, 2002  
8:30-5:00

### Agenda

|                                                   |                                      |            |
|---------------------------------------------------|--------------------------------------|------------|
| Historical Summary of Corrosion Investigation     | <i>Freeman Gates</i>                 | .5 hour    |
| Discussion of UPAD - Results from FRL             | <i>Mark Freeland</i>                 | 1 hour     |
| Break                                             |                                      | 15 minutes |
| Analysis from Kavlico Returns                     | <i>Loay Saliaeh, Mahmoud Awad</i>    | .5 hour    |
| Discussion of Outside help and Management Support | <i>Jim O'Neill</i>                   | .5 hour    |
| Break for Lunch - FTDC Cafeteria                  |                                      | 1 hour     |
| Is/Is Not and Fishbone                            | <i>Shri Akolkar, Jon Janda, Team</i> | 1.5 hours  |
| Break                                             |                                      | 15 minutes |
| Cause/Effect Analysis                             | <i>Team</i>                          | 2.5 hours  |
| Final Summary                                     |                                      | .5 hours   |

Kavlico TM dPFE Sensor  
 Technical Offsite Meeting  
 FTDC - Room  
 March 14, 2002  
 8:30-5:00

# Meeting Minutes

|                                                   |                                      |              |
|---------------------------------------------------|--------------------------------------|--------------|
| Introductions                                     | <i>All</i>                           | 8:30-8:45    |
| Historical Summary of Corrosion Investigation     | <i>Freeman Gates</i>                 | 8:45 - 9:30  |
| Discussion of UPAD - Results from FRL             | <i>Mark Freeland</i>                 | 9:30 - 10:30 |
| Break                                             |                                      | 10:30-10:45  |
| Discussion of UPAD - Results from FRL (cont'd)    | <i>Mark Freeland</i>                 | 10:45 - noon |
| Break for Lunch - FTDC Cafeteria                  |                                      | noon - 12:45 |
| Discussion of UPAD - Results from FRL (cont'd)    | <i>Mark Freeland</i>                 | 12:45 - 1:00 |
| Discussion of Outside help and Management Support | <i>Jim O'Neill</i>                   | 1:00 - 1:15  |
| Analysis from Kavlico Returns                     | <i>Loay Saliaeh, Mahmoud Awad</i>    | 1:15 - 1:45  |
| Break                                             |                                      | 1:45 - 2:00  |
| Is/Is Not and Fishbone                            | <i>Shri Aholkar, Jon Janda, Team</i> | 2:00 - 4:00  |
| Cause/Effect Analysis                             | <i>Team</i>                          | 4:00 - 5:30  |
| Final Summary                                     |                                      | 5:30 - 5:45  |



Kavlico dPFE Sensor  
Technical Office  
February 1, 2002  
8:00 - 5:00  
FTDC - Room 161 South

Attendees: Mary Akino, Sheron Allen, Mahmoud Awad, Don Ayers (Kavlico), Brady Davies (Kavlico), Mark Freeland, Freeman Gates, Jon Hanges, Jim O'Neill, Chris Panaretos, Kyong Park (Kavlico), Anup Patel, Brian Perry, Paul Plante, Kurt Schieding, Carol Verner, Loay Salhi (Student), Barry Bugaj (Kavlico), Gary Danhoff, Jim Maurer.

Introductions: 8:15-8:30

1. EGR System Overview - Freeman Gates 8:30-9:30
  - Assignment: Does vehicle temperature information of silicon exist for applications with high dPFE warranty? (R. Resal)
2. Conventional dPFE EGR Sensor - Gary Danhoff 9:00-9:40
  - Assignment: Provide team with pictures of each functional failure mode. (Mark Freeland)
  - Assignment: File compare for 21 vehicles 2001 MY calibration assoc. w/turns for voltage trip values. (Gary Danhoff)
  - Assignment: Provide team with a parse of the AWS EGR codes for the "S" applications - 2001 MY. (Gary Danhoff)

Break: 9:40 - 10:00

3. PCM Discussion - Anup Patel, Brian Perry 10:00 - 10:40
  - Assignment: For all 21 applications: Identify PCM part number and current draw required, incremental to normal, to put PCM into reset. Include standard deviation (5 platforms to study: measurement on 5 and best vehicles, start with Focus). Collect data on power spike, then do more in depth analysis. (Brian Perry, Anup Patel)
  - Parking Lot: Sheron give more detail with regard to wiring to PCM at Thursday's meeting (next week).

3. Sensor Overview - Don Ayers 10:40 - 12:00

- Assignment: Identify date of change from extended gold one to extended gold two design. (Brady Davies)
- Assignment: Give Mahmoud Awad exact dates for Kavlico changes. (Don Ayers)

Lunch Break 12-1:00

3. Sensor Overview - Don Ayers (continued) 1:00 - 2:20
  - Assignment: Compare failure mechanism of the current production acid tested parts vs. warranty UFAD parts. (Brady Davies)
  - Assignment: Provide Mark Freeland 6 parts with corrosion from pre-An parts. (Brady Davies)
  - Parking Lot: Paralys coating: Root cause determination

Break: 2:20-2:30

4. Warranty Summary - Tawfik Mahmoud Awad 2:30 - 2:45  
- by application and Focus: Mark Freeland 2:45 - 3:05

5. Technical Presentation - Mark Freeland 3:05 - 3:35

Transient Voltage  
UPAD

6. Technical Presentation - John Hanges 3:45 - 4:15

UAD

- Freeman asked if he could replicate the testing that he has done.

7. Wrap-up:

Notes: Presenters need to send out copies of all presentations to Chris. Before sending documents, please mark 'confidential'. Paul Plante asked that if you want a copy of everything, to e-mail CPANABET.

Freeman added that the objectives of the technical presentations were met; focus of core team should be to cover UPAD root cause and bench and vehicles. Keep in mind that Kavlico is switching suppliers from SMI to Zarfink.

Assignment: Provide DV Plan for new Tier-2 Supplier (Mary Atkins). Need reliability engineer dedicated from Ford to work with Mary.

Will continue discussions at Tuesday/Thursday meetings.

Kavlico TM dPFB Sensor  
14D Core Team Meeting  
Tuesday, January 8, 2002  
Time: 1-2:30 p.m.  
Conf. Room: DL-196

**Agenda**

1. Introduce new members
2. Overview discussion of issue for new members from Summary One Pager (attached)
3. Bob Dalbo review of 3.0L Escape stalls concern. Discussion of generic documents such as "Is-Is Not", Fishbone etc
4. Follow Up from 1/3/02 agenda:
  - A) Pick "best of best" comparator vehicle (Mahmoud)
  - B) Kavlico field return parts analysis/binning (Mark/Mary)
  - C) Other
5. Leaders issues
6. Walk In Issues
7. Next meeting agenda items



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

### Meeting Logistics

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** January 29, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POEB, DI-196 (FMBI War Room)  
**Called By:** Karen Owens, Team Leader: (313) 84-55770  
**Next Meeting (s):** January 31, 2002, Technical Offsite - FTDC  
 February 5, 2002, DI-196  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#

### Core Team Participants

|                    |                |                 |                       |              |                   |
|--------------------|----------------|-----------------|-----------------------|--------------|-------------------|
| <b>Black Belt</b>  | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>RRSE</b>  | <b>Purchasing</b> |
| Mark Freeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Allen | Joe Smythe        |
|                    | Don Ayers      | Freeman Gates   | Kurt Schieding        | Robert Rossi | Chris Nielsen     |
| <b>Team Leader</b> |                | Chris Panaretos |                       |              |                   |
| Karen Owens        |                | Paul Plante     |                       | <b>PCSE</b>  |                   |
|                    |                | Carol Verner    |                       | Ken Arnold   |                   |
|                    |                |                 |                       | Brian Perry  |                   |

### Meeting Agenda - 1/29/02

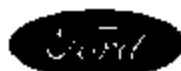
| <u>Order of Agenda Items</u>                                | <u>Person(s)</u>    | <u>Time</u> |
|-------------------------------------------------------------|---------------------|-------------|
| 1. Introductions                                            | All                 | 2 minutes   |
| 2. Agenda Review                                            | All                 | 3 minutes   |
| 3. Production and Field Service parts capacity update       | Kavlico             | 5 minutes   |
| 4. Kavlico sensor D&R responsibility                        | Jim O'Neill         | 5 minutes   |
| 5. Data Mining and Analysis - personnel and approach update | Kurt Schieding      | 5 minutes   |
| 6. Field Returns analysis at Kavlico - update               | Terry Tamashiro     | 10 minutes  |
| 7. Wiring Harness noise concerns update                     | S. Allen/R. Rossi   | 10 minutes  |
| 8. Thursday Technical Offsite updates - finalize agenda     | Freeman Gates       | 10 minutes  |
| 9. STA Trip overview / issues                               | C. Verner/J. Smythe | 20 minutes  |
| 10. Open Issues/Assignments list items                      | All                 | 10 minutes  |
| 11. Walk-in's                                               | All                 | 5 minutes   |
| 12. Next Meeting (2/5/02) Agenda Items                      | All                 | 5 minutes   |

### Notes

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET  
 Please be on time as we have a full agenda

K. Owens/cp: 2/4/2003  
 Kavlico dPFE Sensor Core Team

8902-027 200-46



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

### Meeting Logistics

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** February 5, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POBR, DI-196 (FMEI War Room)  
**Called By:** Jim Manrer, Team Leader: (313) 39-03672  
**Next Meeting (s):** February 7, 2002, DI-196  
                                     February 12, 2002, DI-196  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#

### Core Team Participants

|                    |                |                 |                       |               |                   |
|--------------------|----------------|-----------------|-----------------------|---------------|-------------------|
| <b>Black Belt</b>  | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>   | <b>Purchasing</b> |
| Mark Freeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sherrin Alles | Joe Smytho        |
|                    | Don Ayers      | Freeman Gates   | Kurt Schleding        | Robert Road   | Chris Nilsen      |
| <b>Team Leader</b> |                | Chris Panaretos |                       |               |                   |
| Karen Owens        |                | Paul Plante     |                       | <b>PCSE</b>   |                   |
|                    |                | Carol Verner    |                       | Ken Arnold    |                   |
|                    |                |                 |                       | Brian Perry   |                   |

### Meeting Agenda - 2/5/02

| <u>Order of Agenda Items</u>                                    | <u>Person(s) Responsible</u>      | <u>Time Allocated</u> |
|-----------------------------------------------------------------|-----------------------------------|-----------------------|
| 1. Introductions                                                | All                               | 5 minutes             |
| 2. Shared Drive / Web Access                                    | All                               | 5 minutes             |
| 3. EPRC Review 3:00 p.m. / CARB George Londy                    | Paul Plante                       | 5 minutes             |
| 4. STA Trip Overview / Issues                                   | Joe Smytho                        | 15 minutes            |
| 5. Fleet Test Plan                                              | Mahmoud Awad                      | 5 minutes             |
| 6. Customer Failure Modes-Data Mining                           | Rick Williamson                   | 15 minutes            |
| 7. Dave Kulp meeting Tuesday 2/5 overview (Emission Compliance) | Freeman Gates                     | 5 minutes             |
| 8. Metallization damage by sensor manufacturing and technology  | Freeman Gates                     | 10 minutes            |
| 9. Data Mining and Analysis Update                              | Mark Freeland / Mahmoud Awad      | 5 minutes             |
| 10. Field Returns Analysis at Kavlico                           | Chris Panaretos (for Mary Atkins) | 2 minutes             |
| 11. Offsite Follow-up items: Assignments                        | All                               | 5 minutes             |
| 12. Walk-in's                                                   | All                               | 5 minutes             |
| 13. Next Meeting (2/7/02) Agenda Items                          | All                               | 5 minutes             |

### Notes

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CFANARET  
 Please be on time as we have a full agenda

Kavlico Team/op: 2/4/2003  
 Kavlico dPFE Sensor Core Team

EP02-027 25047



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                   |                                                                                              |
|-------------------|----------------------------------------------------------------------------------------------|
| <b>Objective:</b> | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b> |
|-------------------|----------------------------------------------------------------------------------------------|

|                                      |                                                                                  |
|--------------------------------------|----------------------------------------------------------------------------------|
| <b><u>Meeting Logistics</u></b>      |                                                                                  |
| <b>Subject:</b>                      | Kavlico TM dPFE Sensor Core Team                                                 |
| <b>Date:</b>                         | February 12, 2002                                                                |
| <b>Time:</b>                         | 1-2:30 p.m.                                                                      |
| <b>Location:</b>                     | POBE, DI-196 (FMEI War Room)                                                     |
| <b>Called By:</b>                    | Jim Maurer, Team Leader: (313) 39-03672                                          |
| <b>Next Meeting (s):</b>             | February 14, 2002, DI-196, 1-3:00 p.m.<br>February 19, 2002, DI-196, 1-2:30 p.m. |
| <b>Conference Call-in Number(s):</b> | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#            |

|                                      |                |                  |                       |              |                   |
|--------------------------------------|----------------|------------------|-----------------------|--------------|-------------------|
| <b><u>Core Team Participants</u></b> |                |                  |                       |              |                   |
| <b>Black Belt</b>                    | <b>Kavlico</b> | <b>V-Bearing</b> | <b>Quality Office</b> | <b>EBSE</b>  | <b>Purchasing</b> |
| Mark Freeland                        | Mary Atkins    | Jim O'Neel       | Mahmoud Awad          | Sharon Allen | Joe Smythe        |
|                                      | Don Ayers      | Freeman Gates    | Kurt Schieding        | Robert Rossi | Chris Nielsen     |
| <b>Team Leader</b>                   |                | Chris Panaretos  |                       |              |                   |
| Jim Maurer                           |                | Paul Plante      |                       | <b>PCSE</b>  |                   |
|                                      |                | Carol Verner     |                       | Ken Arnold   |                   |
|                                      |                |                  |                       | Brian Perry  |                   |

| <b><u>Meeting Agenda - 2/12/02</u></b>                          |                             |                                     |                              |
|-----------------------------------------------------------------|-----------------------------|-------------------------------------|------------------------------|
| <b><u>Order of Agenda Items</u></b>                             | <b><u>Corr. Issue #</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |
| 1. Introductions                                                |                             | All                                 | 5 minutes                    |
| 2. Proposed J. Koszewnik Review 2/22/02 and Tech Review 2/28/02 | 11, A4                      | Paul Plante                         | 5 minutes                    |
| 3. Component bench test results: Low failure rate               | 15, A8                      | Kyong Park                          | 10 minutes                   |
| 4. Field return analysis at Kavlico                             | 13, A3                      | Terry Tamaschiro                    | 10 minutes                   |
| 5. DV/PV Test Plan, Bench and Fleet Vehicles                    | 16, A2                      | Mahmoud Awad / Terry Tamaschiro     | 10 minutes                   |
| 6. Wiring Harness Noise concerns, OA work plan and conclusions  | 12, A6                      | S. Allen/R. Rossi                   | 15 minutes                   |
| 7. Metalization damage by sensor manufacturing and technology   | 13, A8                      | Freeman Gates                       | 10 minutes                   |
| 8. Pareto of failure symptoms - Leader and approach             |                             | Paul Plante / Mahmoud Awad          | 5 minutes                    |
| 9. Open Issues / Assignments List                               |                             | Chris Panaretos                     | 5 minutes                    |
| 10. Walk-in's                                                   |                             | All                                 | 10 minutes                   |
| 11. Next Meeting (2/14/02) Agenda Items                         |                             | All                                 | 5 minutes                    |

| <b><u>Proposed Next Meeting Agenda 2/14/02</u></b> |                              |                       |
|----------------------------------------------------|------------------------------|-----------------------|
| <b>Data Mining and Analysis Update</b>             | <b>Person(s) Responsible</b> | <b>Time Estimated</b> |
| Offsite Follow-up assignments                      | Mahmoud Awad / Mark Freeland | 10 minutes            |
| Align all Kavlico actions with R/1000 Stack Charts | Paul Plante / Jim Maurer     | 20 minutes            |
|                                                    | Mahmoud Awad / Don Ayers     | 10 minutes            |

| <b><u>Notes</u></b>                                                                                |  |
|----------------------------------------------------------------------------------------------------|--|
| Bring handouts (paper copies) for all presentations                                                |  |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |  |
| Please be on time as we have a full agenda                                                         |  |

Jim Maurer/cpc 2/4/2003  
Kavlico dPFE Sensor Core Team



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                    |                                                                                              |                                |                       |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------------------------|-----------------------|
| <b>Objective:</b>                                                                                  | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b> |                                |                       |
| <b><u>Meeting Logistics</u></b>                                                                    |                                                                                              |                                |                       |
| <b>Subject:</b>                                                                                    | Kavlico TM dPFE Sensor Core Team                                                             |                                |                       |
| <b>Dates:</b>                                                                                      | February 14, 2002                                                                            |                                |                       |
| <b>Time:</b>                                                                                       | 1-3:00 p.m.                                                                                  |                                |                       |
| <b>Location:</b>                                                                                   | POHE, DI-196 (FMEI War Room)                                                                 |                                |                       |
| <b>Called By:</b>                                                                                  | Jim Maurer, Team Leader: (313) 39-03672                                                      |                                |                       |
| <b>Next Meeting (s):</b>                                                                           | February 19, 2002, DI-196, 1-2:30 p.m.<br>February 21, 2002, DI-196, 1-3:00 p.m.             |                                |                       |
| <b>Conference Call-in Number(s):</b>                                                               | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Pasacode: 6881436#                        |                                |                       |
| <b><u>Core Team Participants</u></b>                                                               |                                                                                              |                                |                       |
| <b>Black Belt</b>                                                                                  | <b>Kavlico</b>                                                                               | <b>V-Engine</b>                | <b>Quality Office</b> |
| Mark Freeland                                                                                      | Mary Atkins                                                                                  | Jim O'Neill                    | Mahmoud Awad          |
|                                                                                                    | Don Ayers                                                                                    | Freeman Gates                  | Kurt Schioding        |
| <b>Team Leader</b>                                                                                 |                                                                                              | Chris Panaretos                |                       |
| Jim Maurer                                                                                         |                                                                                              | Paul Plante                    |                       |
|                                                                                                    |                                                                                              | Carol Verner                   |                       |
|                                                                                                    |                                                                                              |                                | <b>EESE</b>           |
|                                                                                                    |                                                                                              |                                | Sheran Alles          |
|                                                                                                    |                                                                                              |                                | Robert Rossi          |
|                                                                                                    |                                                                                              |                                | <b>PCSE</b>           |
|                                                                                                    |                                                                                              |                                | Ken Arnold            |
|                                                                                                    |                                                                                              |                                | Brian Perry           |
|                                                                                                    |                                                                                              |                                | <b>Purchasing</b>     |
|                                                                                                    |                                                                                              |                                | Joe Smythe            |
|                                                                                                    |                                                                                              |                                | Chris Nielsen         |
| <b><u>Meeting Agenda - 2/14/02</u></b>                                                             |                                                                                              |                                |                       |
| <b>Order of Agenda Items</b>                                                                       | <b>Corr. Issue #</b>                                                                         | <b>Person(s) Responsible</b>   | <b>Time Allocated</b> |
| 1. Introductions                                                                                   |                                                                                              | All                            | 5 minutes             |
| 2. Open Issues and Assignments                                                                     | High                                                                                         | All                            | 30 minutes            |
| 3. Data Mining and Analysis Update                                                                 |                                                                                              | Mahmoud Awad,<br>Mark Freeland | 20 minutes            |
| 4. Align all Kavlico actions with R/1000 Stack Charts                                              |                                                                                              | Mahmoud Awad /<br>Don Ayers    | 10 minutes            |
| 5. Pareto of failure symptoms - Approach to look at warranty data                                  |                                                                                              | Mahmoud Awad                   | 15 minutes            |
| 6. Walk-in's                                                                                       |                                                                                              | All                            | 20 minutes            |
| 7. Next Meeting (2/14/02) Agenda Items                                                             |                                                                                              | All                            | 10 minutes            |
| <b><u>Proposed Next Meeting Agenda 2/19/02</u></b>                                                 |                                                                                              |                                |                       |
|                                                                                                    | <b>Person(s) Responsible</b>                                                                 | <b>Time Estimated</b>          |                       |
|                                                                                                    |                                                                                              |                                |                       |
| <b><u>Notes</u></b>                                                                                |                                                                                              |                                |                       |
| Bring handouts (paper copies) for all presentations                                                |                                                                                              |                                |                       |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |                                                                                              |                                |                       |
| Please be on time as we have a full agenda                                                         |                                                                                              |                                |                       |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

Dr. Ford

|                   |                                                                                              |
|-------------------|----------------------------------------------------------------------------------------------|
| <b>Objective:</b> | <b>Establish and implement corrective and containment actions for Kaviten TM dPFE Sensor</b> |
|-------------------|----------------------------------------------------------------------------------------------|

### Meeting Location

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** February 28, 2002  
**Time:** 1-3:00 p.m.  
**Location:** POBB, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader. (313) 39-03672  
**Next Meeting (s):** March 5, 2002, DI-196, 1-2:30 p.m.  
March 7, 2002, DI-196, 1-3:00 p.m.  
**Conference Call-In Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Pmcocod: 6881436#

### Core Team Participants

|                           |                      |                       |                              |                    |                          |
|---------------------------|----------------------|-----------------------|------------------------------|--------------------|--------------------------|
| <b><u>Black Belt</u></b>  | <b><u>Kaylco</u></b> | <b><u>V-Rings</u></b> | <b><u>Quality Office</u></b> | <b><u>HRSE</u></b> | <b><u>Purchasing</u></b> |
| Mark Freedland            | Mary Atkins          | Jim O'Neill           | Mahmoud Awad                 | Sharon Allee       | Joe Smythe               |
| Shri Akolkar              | Don Ayers            | Freeman Gates         | Kurt Schieding               | Robert Roehl       | Chris Nielsen            |
| Jon Janda                 |                      | Chris Perreton        |                              |                    |                          |
|                           |                      | Paul Pianto           |                              | <b><u>PCSE</u></b> |                          |
| <b><u>Team Leader</u></b> |                      | Carol Verner          |                              | Ken Arnold         |                          |
| Jim Munroe                |                      |                       |                              | Brian Perry        |                          |

## Meeting Agenda - 2/26/92

| <u>Order of Agenda Items</u>                                                                         | <u>Cont.<br/>Issue #</u> | <u>Person(s)<br/>Responsible</u> | <u>Time<br/>Allocated</u> |
|------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------|---------------------------|
| 1. Introductions                                                                                     |                          | All                              | 5 minutes                 |
| 2. Review of Kavlico work plan for UPAD                                                              | I3, A1&3                 | Jay Caffee                       | 10                        |
| 3. Overlay of Kavlico and Ford changes on stock chart                                                | I8, A4                   | Mahmoud Awad                     | 10                        |
| 4. Rick Williamson's analysis of F150 stall repairs                                                  | I1, A1                   | All                              | 10                        |
| 5. Analysis of recently returned parts from vehicle assembly plants                                  | I3, A3                   | All                              | 30                        |
| 6. Update on obtaining fleet vehicles from buy-back lists/discussion of car requirements for testing | I6, A3 &<br>I10, A6,7    | Carol Verner                     | 5                         |
| 7. Pressure/voltage data for Zerlink and SMI sensors                                                 | I12, A4                  | All                              | 5                         |
| 8. Walk-in's (including Latchup on BSD Test)                                                         |                          | Paul Plante                      | 15                        |
| 9. Next meeting (3/3) agenda                                                                         |                          |                                  | 5                         |

| Proposed Next Meeting Agenda 3/5/02 | Person(s) Responsible | Time Estimate |
|-------------------------------------|-----------------------|---------------|
|-------------------------------------|-----------------------|---------------|

|                                          |              |            |
|------------------------------------------|--------------|------------|
| Analysis of data from Kavlico returns    | Loay Salaish | 20 minutes |
| Pareto of customer symptoms              | Mahmoud Awad | 10 minutes |
| Update on vehicles for fleet/engineering | Carol Verner | 10 minutes |
| Offsite assignments                      | All          | 30 minutes |
| Vehicle electrical testing               | Rob Ross     | 20 minutes |

### Notes

Bring handouts (paper copies) for all presentations  
Provide electronic copies of presentations to CPANARHT (no later than 1 hour prior to the meeting)  
Please be on time as we have a full agenda

Jim Maurer/op: 2/4/2003  
Kristen JPEB Sensor Core Team

EMD-427 20052





## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                      |                                                                                                                  |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>Objective:</b>                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>                     |
| <b><u>Meeting Logistics</u></b>      |                                                                                                                  |
| <b>Subject:</b>                      | Kavlico TM dPFE Sensor Core Team                                                                                 |
| <b>Date:</b>                         | March 5, 2002                                                                                                    |
| <b>Time:</b>                         | 1-2:30 p.m.                                                                                                      |
| <b>Location:</b>                     | POEE, DI-196 (FMHI War Room)                                                                                     |
| <b>Called By:</b>                    | Jim Maurer, Team Leader: (313) 39-03672                                                                          |
| <b>Next Meeting (s):</b>             | March 7, 2002, DI-196, 1-3:00 p.m.<br>March 12, 2002, DI-196, 1-2:30 p.m.<br>March 14, 2002, Technical Office #2 |
| <b>Conference Call-in Number(s):</b> | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-531-6574               |

| <b><u>Core Team Participants</u></b> |                |                 |                       |              |                   |
|--------------------------------------|----------------|-----------------|-----------------------|--------------|-------------------|
| <b>Black Belt</b>                    | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EPSE</b>  | <b>Purchasing</b> |
| Mark Freeland                        | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Alles | Joe Smyth         |
| Shri Aholkar                         | Don Ayers      | Freemsa Gates   | Kurt Schieding        | Robert Rossi | Chris Nielsen     |
| Jon Janda                            |                | Chris Panaretos |                       |              |                   |
|                                      |                | Paul Plante     |                       | <b>PCSE</b>  |                   |
| <b>Team Leader</b>                   |                | Carol Verner    |                       | Ken Arnold   |                   |
| Jim Maurer                           |                |                 |                       | Brian Perry  |                   |

| <b><u>Meeting Agenda - 3/5/02</u></b>                                                                |                            |                                     |                              |
|------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------|------------------------------|
| <b><u>Order of Agenda Items</u></b>                                                                  | <b><u>Core Issue #</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |
| 1. Introductions                                                                                     |                            | All                                 | 5 minutes                    |
| 2. Analysis of data from Kavlico returns                                                             | I1, A1                     | Loay Salaleh                        | 20 minutes                   |
| 3. Update on obtaining fleet vehicles from buy-back lists/discussion of car requirements for testing | I6, A3 & I10, A6           | Carol Verner                        | 10 minutes                   |
| 4. Pressure/voltage data for Zerlink and SMI sensors                                                 | I12, A4                    | Kavlico                             | 5 minutes                    |
| 5. Update on Vehicle Electrical Testing                                                              | I6, A1 & I12, A6           | R. Rossi                            | 20 minutes                   |
| 6. Offsite Assignments (from 2/1 Technical Office)                                                   | Various                    | C. Panaretos                        | 10 minutes                   |
| 7. Agenda for 2-Day Technical Review (3/14 Offsite)                                                  |                            | All                                 | 10 minutes                   |
| 8. Walk-in's                                                                                         |                            | All                                 | 5 minutes                    |
| 9. Next meeting (3/5) agenda                                                                         |                            | All                                 | 5 minutes                    |

|                                                    |                                     |                              |
|----------------------------------------------------|-------------------------------------|------------------------------|
| <b><u>Proposed Next Meeting Agenda 3/7/02</u></b>  | <b><u>Person(s) Responsible</u></b> | <b><u>Time Estimated</u></b> |
| Overlay of Kavlico and Ford changes on stock chart | Mahmoud Awad                        | 10 minutes                   |

| <b><u>Notes</u></b>                                                                                |  |
|----------------------------------------------------------------------------------------------------|--|
| Bring handouts (paper copies) for all presentations                                                |  |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |  |
| Please be on time as we have a full agenda                                                         |  |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

E1002-027 2/26/03

*CONFIDENTIAL*

## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                    |                                                                                                    |                                                                                              |                       |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------|
| <b>Objective:</b>                                                                                  |                                                                                                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b> |                       |
| <b><u>Meeting Logistics</u></b>                                                                    |                                                                                                    |                                                                                              |                       |
| <b>Subject:</b>                                                                                    | Kavlico TM dPFE Sensor Core Team                                                                   |                                                                                              |                       |
| <b>Date:</b>                                                                                       | March 7, 2002                                                                                      |                                                                                              |                       |
| <b>Time:</b>                                                                                       | 1-3:00 p.m.                                                                                        |                                                                                              |                       |
| <b>Location:</b>                                                                                   | POEE, DI-196 (FMBI War Room)                                                                       |                                                                                              |                       |
| <b>Called By:</b>                                                                                  | Jim Maurer, Team Leader: (313) 39-03672                                                            |                                                                                              |                       |
| <b>Next Meeting (s):</b>                                                                           | March 12, 2002, DI-196, 1-2:30 p.m.<br>March 14, 2002, Technical Office #2                         |                                                                                              |                       |
| <b>Conference Call-In Number(s):</b>                                                               | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-531-6574 |                                                                                              |                       |
| <b><u>Core Team Participants</u></b>                                                               |                                                                                                    |                                                                                              |                       |
| <b>Black Belts</b>                                                                                 | <b>Kavlico</b>                                                                                     | <b>V-Engine</b>                                                                              | <b>Quality Office</b> |
| Mark Preeland                                                                                      | Mary Akips                                                                                         | Jim O'Neill                                                                                  | Mahmoud Awad          |
| Shri Akolkar                                                                                       | Don Ayers                                                                                          | Freeman Gates                                                                                | Kurt Schilling        |
| Jon Janda                                                                                          |                                                                                                    | Chris Panaretos                                                                              |                       |
|                                                                                                    |                                                                                                    | Paul Plante                                                                                  |                       |
| <b>Team Leader</b>                                                                                 |                                                                                                    | Carol Verner                                                                                 |                       |
| Jim Maurer                                                                                         |                                                                                                    |                                                                                              |                       |
|                                                                                                    |                                                                                                    |                                                                                              | <b>ERSE</b>           |
|                                                                                                    |                                                                                                    |                                                                                              | Sheran Alles          |
|                                                                                                    |                                                                                                    |                                                                                              | Robert Rossi          |
|                                                                                                    |                                                                                                    |                                                                                              | <b>Purchasing</b>     |
|                                                                                                    |                                                                                                    |                                                                                              | Joe Smythe            |
|                                                                                                    |                                                                                                    |                                                                                              | Chris Nielsen         |
|                                                                                                    |                                                                                                    |                                                                                              | <b>PCSE</b>           |
|                                                                                                    |                                                                                                    |                                                                                              | Kew Arnold            |
|                                                                                                    |                                                                                                    |                                                                                              | Brian Perry           |
| <b><u>Meeting Agenda - 3/7/02</u></b>                                                              |                                                                                                    |                                                                                              |                       |
| <b>Order of Agenda Items</b>                                                                       | <b>Corr. Issue #</b>                                                                               | <b>Person(s) Responsible</b>                                                                 | <b>Time Allotted</b>  |
| 1. Introductions                                                                                   |                                                                                                    | All                                                                                          | 5 minutes             |
| 2. Overlay of Kavlico and Ford changes on stack chart                                              | I6, A2                                                                                             | Mahmoud Awad                                                                                 | 20 minutes            |
| 3. Update from Kavlico on part RML8760-184; Pull report/matrix update of teardown analysis         | I3, A1, A4                                                                                         | Terry Tamashiro                                                                              | 20 minutes            |
| 4. Status on Norfolk and St. Thomas returns                                                        | I3, A3                                                                                             | Terry Tamashiro                                                                              | 10 minutes            |
| 5. Comparison report of UPAD to Acid Test                                                          | I5, A6                                                                                             | Kyong Park                                                                                   | 10 minutes            |
| 6. Update on Vehicle Electrical Testing                                                            | I6, A1 & I12, A6                                                                                   | R. Rossi                                                                                     | 20 minutes            |
| 7. Kavlico service part capacity/Motorola coordination                                             | I16, all                                                                                           | All                                                                                          | 10 minutes            |
| 8. Agenda for 2-Day Technical Review (3/14 Offsite) - Revise                                       | I3, A7                                                                                             | All                                                                                          | 10 minutes            |
| 9. Walk-in's                                                                                       |                                                                                                    | All                                                                                          | 10 minutes            |
| 10. Next meeting (3/12) agenda                                                                     |                                                                                                    | All                                                                                          | 5 minutes             |
| <b><u>Prepared Next Meeting Agenda 3/12/02</u></b>                                                 |                                                                                                    |                                                                                              |                       |
|                                                                                                    | <b>Person(s) Responsible</b>                                                                       | <b>Time Estimated</b>                                                                        |                       |
|                                                                                                    |                                                                                                    |                                                                                              |                       |
| <b><u>Notes</u></b>                                                                                |                                                                                                    |                                                                                              |                       |
| Bring handouts (paper copies) for all presentations                                                |                                                                                                    |                                                                                              |                       |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |                                                                                                    |                                                                                              |                       |
| Please be on time as we have a full agenda                                                         |                                                                                                    |                                                                                              |                       |

Jim Maurer/op: 2/4/2003  
Kavlico dPFE Sensor Core Team

E002-027 20034

*Seal*

## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

### Meeting Logistics

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Dates:** March 12, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POER, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (a):** March 14, 2002, Technical Office #2

**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 803-531-6574

### Core Team Participants

|                    |                |                 |                       |              |                   |
|--------------------|----------------|-----------------|-----------------------|--------------|-------------------|
| <b>Black Belts</b> | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b> |
| Mark Freeland      | Mary Alden     | Jim O'Neill     | Mahmond Awad          | Sheran Allen | Joe Smythe        |
| Shri Abolkar       | Don Ayers      | Freeman Gates   | Kurt Schieding        | Robert Ross  | Chris Nielsen     |
| Jon Janda          |                | Chris Pinarotos |                       |              |                   |
|                    |                | Paul Plantie    |                       | <b>PCSE</b>  |                   |
| <b>Team Leader</b> |                | Carol Verner    |                       | Ken Arnold   |                   |
| Jim Maurer         |                |                 |                       | Brian Perry  |                   |

### Meeting Agenda - 3/12/02

| <u>Order of Agenda Items</u>                                                                      | <u>Corr. Issue #</u> | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|---------------------------------------------------------------------------------------------------|----------------------|------------------------------|-----------------------|
| 1. Introductions                                                                                  |                      | All                          | 5 minutes             |
| 2. Kavlico needs to verify what Pirana-etch does to aluminum.                                     |                      | Kyeong Park                  | 10 minutes            |
| 3. Status on Norfolk and St. Thomas returns.                                                      |                      | Terry T                      | 10 minutes            |
| 4. Complete teardowns analysis for five platforms including Focus                                 |                      | Terry T                      | 10 minutes            |
| 5. Capacity for service.                                                                          |                      | Chris Nielsen                | 10 minutes            |
| 6. Update on Vehicle Electrical Testing                                                           | 16, A1 & 112, A6     | R. Rossi                     | 20 minutes            |
| 7. Compare failure mechanism of the current production acid tested parts vs. warranty UPAD parts. |                      | Kyeong Park                  | 15 minutes            |
| 8. Affect of the gold process on warranty                                                         |                      | Kyeong Park                  | 15 minutes            |
| 9. Update on fleet vehicles                                                                       |                      | Carol Verner                 | 10 minutes            |
| 10. Walk-in's                                                                                     |                      | All                          | 10 minutes            |
| 11. Next meeting (3/19) agenda                                                                    |                      | All                          | 5 minutes             |

| <u>Proposed Next Meeting Agenda 3/19/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|---------------------------------------------|------------------------------|-----------------------|

### Notes

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/ep: 2/4/2003  
 Kavlico dPFE Sensor Core Team

15002-027 20003

## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dFFE Sensor

**Meeting Location**

**Subject:** Kavlico TM dFFE Sensor Core Team  
**Date:** March 21, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POKE, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** March 25, 2002, Technical Review (CCRG)  
 March 26, 2002, Core Team Meeting  
 March 28, 2002, Core Team Meeting  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436W  
 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                  |                       |              |                   |
|--------------------|----------------|------------------|-----------------------|--------------|-------------------|
| <b>Black Belt</b>  | <b>Kavlico</b> | <b>V-Essence</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b> |
| Mark Freeland      | Mary Atkins    | Jim O'Neill      | Mahmoud Awad          | Sheran Allec | Joe Smythe        |
| Shri Akolkar       | Don Ayers      | Freeman Gates    |                       | Robert Rossi | Chris Nielsen     |
| Jon Janda          |                | Chris Panaretos  |                       |              |                   |
|                    |                | Paul Plants      |                       | <b>PCSE</b>  |                   |
| <b>Team Leader</b> |                | Carol Verner     |                       | Ken Arnold   |                   |
| Jim Maurer         |                |                  |                       | Brian Perry  |                   |

**Meeting Agenda - 3/21/02**

| <u>Order of Agenda Items</u>                                                    | <u>Corr. 14D #</u> | <u>Person(s) Responsible</u>   | <u>Time Allocated</u> |
|---------------------------------------------------------------------------------|--------------------|--------------------------------|-----------------------|
| 1. Introductions                                                                |                    | All                            | 5 minutes             |
| 2. Update from FCSD (Julie Mercer)                                              | 1, c               | Carol Verner                   | 10 minutes            |
| 3. Supporting Documents to Explain Root Cause (P-Diag, Is/Is Not, Cause/Effect) | 2, a               | Jon Janda, Shri Akolkar        | 10 minutes            |
| 4. Transient Voltage Test Results                                               | 3, a               | Mark Freeland                  | 20 minutes            |
| 5. AWS Results / Additional Graphs                                              | 3, d               | Mahmoud Awad                   | 10 minutes            |
| 6. SREA number and date from Kavlico                                            | 4, a               | Mary Atkins                    | 5 minutes             |
| 7. Body Electric Actions - Findings to Date                                     | 4, a               | Robert Rossi                   | 15 minutes            |
| 8. Acid Test Results: Overview document in percto or spreadsheet format         | 5, ii              | Kyung Park<br>Terry Terasahiro | 15 minutes            |
| 9. Comment from Kavlico on capacity issue                                       | 10                 | Berry Bugej                    | 10 minutes            |
| 10. New Financial Figures based on Carol's findings                             | 12                 | Jim Maurer                     | 5 minutes             |
| 11. Finalize presentation to Technical Review                                   |                    | All                            | 15 minutes            |

| <u>Proposed Next Meeting Agenda 3/26/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |

**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/ep: 2/4/2003  
 Kavlico dFFE Sensor Core Team

5.7.7

## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                    |                                                                                                    |                                     |                              |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|
| <b>Objective:</b>                                                                                  | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>       |                                     |                              |
| <b><u>Meeting Logistics</u></b>                                                                    |                                                                                                    |                                     |                              |
| <b>Subject:</b>                                                                                    | Kavlico TM dPFE Sensor Core Team                                                                   |                                     |                              |
| <b>Dates:</b>                                                                                      | March 26, 2002                                                                                     |                                     |                              |
| <b>Time:</b>                                                                                       | 1-2:30 p.m.                                                                                        |                                     |                              |
| <b>Location:</b>                                                                                   | POER, DI-196 (FMEI War Room)                                                                       |                                     |                              |
| <b>Called By:</b>                                                                                  | Jim Maurer, Team Leader: (313) 39-03672                                                            |                                     |                              |
| <b>Next Meeting (s):</b>                                                                           | March 28, 2002, Core Team Meeting<br>April 2, 2002, Core Team Meeting                              |                                     |                              |
| <b>Conference Call-in Number(s):</b>                                                               | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-531-6374 |                                     |                              |
| <b><u>Core Team Participants</u></b>                                                               |                                                                                                    |                                     |                              |
| <b>Black Belts</b>                                                                                 | <b>Kavlico</b>                                                                                     | <b>V-Engine</b>                     | <b>Quality Office</b>        |
| Mark Freeland                                                                                      | Mary Atkins                                                                                        | Jim O'Neill                         | Mahmoud Awad                 |
| Shri Akolkar                                                                                       | Don Ayers                                                                                          | Freeman Gates                       |                              |
| Jim Janda                                                                                          |                                                                                                    | Chris Panaretos                     |                              |
|                                                                                                    |                                                                                                    | Paul Plante                         |                              |
| <b>Team Leader</b>                                                                                 |                                                                                                    | Carol Verner                        |                              |
| Jim Maurer                                                                                         |                                                                                                    |                                     |                              |
|                                                                                                    |                                                                                                    |                                     | <b>EESE</b>                  |
|                                                                                                    |                                                                                                    |                                     | Sheran Allen                 |
|                                                                                                    |                                                                                                    |                                     | Robert Rossi                 |
|                                                                                                    |                                                                                                    |                                     | <b>PCSE</b>                  |
|                                                                                                    |                                                                                                    |                                     | Ken Arnold                   |
|                                                                                                    |                                                                                                    |                                     | Brian Perry                  |
|                                                                                                    |                                                                                                    |                                     | <b>Purchasing</b>            |
|                                                                                                    |                                                                                                    |                                     | Chris Nielsen                |
|                                                                                                    |                                                                                                    |                                     | Bill McCarty                 |
|                                                                                                    |                                                                                                    |                                     | Patrice White-Johnson        |
| <b><u>Meeting Agenda - 3/26/02</u></b>                                                             |                                                                                                    |                                     |                              |
| <b><u>Order of Agenda Items</u></b>                                                                | <b><u>Corr. Issue #</u></b>                                                                        | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |
| 1. Introductions                                                                                   |                                                                                                    | All                                 | 5 minutes                    |
| 2. Results / Comments from Technical Review                                                        | II, A4                                                                                             | Jim Maurer, Paul Plante             | 10 minutes                   |
| 3. Discussion of Outside Sources to use for analysis                                               | IS, A5                                                                                             | Jim Maurer                          | 10 minutes                   |
| 4. Update from EESE on testing / establish date when findings available.                           | Various                                                                                            | R. Rossi, S. Allen                  | 20 minutes                   |
| 5. Review of High-Priority open issues                                                             | Various                                                                                            | All                                 | 15 minutes                   |
| 6. Walk-in's                                                                                       |                                                                                                    | All                                 | 15 minutes                   |
| 7. Next Agenda Items / Discussion                                                                  |                                                                                                    | All                                 | 10 minutes                   |
| <b><u>Proposed Next Meeting Agenda 3/28/02</u></b>                                                 |                                                                                                    |                                     |                              |
|                                                                                                    | <b><u>Person(s) Responsible</u></b>                                                                | <b><u>Time Estimated</u></b>        |                              |
|                                                                                                    |                                                                                                    |                                     |                              |
| <b><u>Notes</u></b>                                                                                |                                                                                                    |                                     |                              |
| Bring handouts (paper copies) for all presentations                                                |                                                                                                    |                                     |                              |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |                                                                                                    |                                     |                              |
| Please be on time as we have a full agenda                                                         |                                                                                                    |                                     |                              |

Jim Maurer/op: 2/4/2003  
Kavlico dPFE Sensor Core Team

ENR2-627 2003

CONFIDENTIAL

# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                    |                                                                                                    |                                     |                              |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|
| <b>Objective:</b>                                                                                  | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>       |                                     |                              |
| <b><u>Meeting Logistics</u></b>                                                                    |                                                                                                    |                                     |                              |
| <b>Subject:</b>                                                                                    | Kavlico TM dPFE Sensor Core Team                                                                   |                                     |                              |
| <b>Date:</b>                                                                                       | March 28, 2002                                                                                     |                                     |                              |
| <b>Time:</b>                                                                                       | 1-2:30 p.m.                                                                                        |                                     |                              |
| <b>Location:</b>                                                                                   | POHE, DI-196 (FMRI War Room)                                                                       |                                     |                              |
| <b>Called By:</b>                                                                                  | Jim Maurer, Team Leader: (313) 39-03672                                                            |                                     |                              |
| <b>Next Meeting (s):</b>                                                                           | April 4, 2002, Core Team Meeting                                                                   |                                     |                              |
| <b>Conference Call-In Number(s):</b>                                                               | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-531-6574 |                                     |                              |
| <b><u>Core Team Participants</u></b>                                                               |                                                                                                    |                                     |                              |
| <b>Black Belts</b>                                                                                 | <b>Kavlico</b>                                                                                     | <b>V-Engines</b>                    | <b>Quality Office</b>        |
| Mark Freeland                                                                                      | Mary Atkins                                                                                        | Jim O'Neill                         | Mahmond Awad                 |
| Shri Akolkar                                                                                       | Don Ayers                                                                                          | Freeman Gates                       |                              |
| Jon Janda                                                                                          |                                                                                                    | Chris Panaretos                     |                              |
|                                                                                                    |                                                                                                    | Paul Plante                         |                              |
| <b>Team Leader</b>                                                                                 |                                                                                                    | Carol Verner                        |                              |
| Jim Maurer                                                                                         |                                                                                                    |                                     |                              |
|                                                                                                    |                                                                                                    | <b>EBSE</b>                         | <b>Purchasing</b>            |
|                                                                                                    |                                                                                                    | Sheran Allec                        | Chris Nielsen                |
|                                                                                                    |                                                                                                    | Robert Rossi                        | Bill McCarty                 |
|                                                                                                    |                                                                                                    |                                     | Patrice White-Johnson        |
|                                                                                                    |                                                                                                    | <b>PCSE</b>                         |                              |
|                                                                                                    |                                                                                                    | Ken Arnold                          |                              |
|                                                                                                    |                                                                                                    | Brian Perry                         |                              |
| <b><u>Meeting Agenda - 3/28/02</u></b>                                                             |                                                                                                    |                                     |                              |
| <b><u>Order of Agenda Items</u></b>                                                                | <b><u>Cont. Issue #</u></b>                                                                        | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |
| 1. Introductions                                                                                   |                                                                                                    | All                                 | 5 minutes                    |
| 2. Results / Comments from Technical Review                                                        | 11, A4                                                                                             | Paul Plante                         | 10 minutes                   |
| 3. Discussion w/Kavlico of Outside Sources to use for analysis                                     | 15, A5                                                                                             | Jim Maurer                          | 10 minutes                   |
| 4. Discussion of PCM J1 Connector warranty issues                                                  | 13, A5                                                                                             | John Johnson                        | 10 minutes                   |
| 5. Update on obtaining Fleet Vehicles                                                              | 16, A4                                                                                             | Carol Verner                        | 10 minutes                   |
| 6. Review of High-Priority open issues                                                             | Various                                                                                            | All                                 | 25 minutes                   |
| 7. Walk-ins                                                                                        |                                                                                                    | All                                 | 15 minutes                   |
| 8. Next Agenda Items / Discussion                                                                  |                                                                                                    | All                                 | 10 minutes                   |
| <b><u>Proposed Next Meeting Agenda 4/4/02</u></b>                                                  |                                                                                                    |                                     |                              |
|                                                                                                    | <b><u>Person(s) Responsible</u></b>                                                                | <b><u>Time Estimated</u></b>        |                              |
|                                                                                                    |                                                                                                    |                                     |                              |
| <b><u>Notes</u></b>                                                                                |                                                                                                    |                                     |                              |
| Bring handouts (paper copies) for all presentations                                                |                                                                                                    |                                     |                              |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |                                                                                                    |                                     |                              |
| Please be on time as we have a full agenda                                                         |                                                                                                    |                                     |                              |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

CONFIDENTIAL

# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**  
**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** April 4, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POER, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** April 9, 2002, Core Team Meeting  
 April 11, 2002, Core Team Meeting  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                 |                       |              |                   |
|--------------------|----------------|-----------------|-----------------------|--------------|-------------------|
| <b>Black Belt</b>  | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b> |
| Mark Freeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Allen | Chris Nielsen     |
| Shri Akolkar       | Don Ayers      | Freeman Gates   |                       | Robert Ross  | Bill McCarty      |
| Jon Janda          |                | Chris Panaretos |                       |              | Patricio White-   |
|                    |                | Paul Plante     |                       | <b>PCSE</b>  | Johnson           |
| <b>Team Leader</b> |                | Carol Verner    |                       | Ken Arnold   |                   |
| Jim Maurer         |                |                 |                       | Brian Perry  |                   |

**Meeting Agenda - 3/28/02**

| <u>Order of Agenda Items</u>                                                     | <u>Corr. Issue #</u> | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|----------------------------------------------------------------------------------|----------------------|------------------------------|-----------------------|
| 1. Introductions                                                                 |                      | All                          | 5 minutes             |
| 2. FRL Scientific Evaluation of UPAD - update                                    | I3, A2               | Mark Freeland                | 10 minutes            |
| 3. Results of Analysis of outstanding Plant returns                              | I3, A3               | Terry Tamashiro              | 10 minutes            |
| 4. Update on Wiring Harness Root Cause / findings                                | various              | Sheran Allen, Robert Ross    | 15 minutes            |
| 5. Investigation of Stalls - Status                                              | I3, A9               | Jon Janda, Mahmoud Awad      | 15 minutes            |
| 6. Outside Source Assistance - discuss legal status with Kavlico                 | I5, A5               | Kyong Park                   | 10 minutes            |
| 7. Results of "in process testing" of current production vs. warranty UPAD parts | I5, A6               | Kyong Park                   | 15 minutes            |
| 8. Update from Service Purchasing on component sourcing                          | I16, A3,4            | Chris Nielsen                | 10 minutes            |
| 9. Walk-ins                                                                      |                      | All                          | 10 minutes            |
| 10. Next Meeting Agenda Items                                                    |                      | All                          | 10 minutes            |

| <u>Proposed Next Meeting Agenda 4/11/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |

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 Please be on time as we have a full agenda

Jim Maurer/ep: 2/4/2003  
 Kavlico dPFE Sensor Core Team

# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Dates:** April 9, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POBB, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** April 11, 2002, Core Team Meeting  
 April 16, 2002

**Conference Call-In Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Password: 68H1436#  
 Kavlico Fax: 805-531-6574

## Core Team Participants

|                                                                 |                                            |                                                                                                   |                                       |                                             |                                                                             |
|-----------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------|
| <b>Black Belt</b><br>Mark Freeland<br>Shri Akolkar<br>Jon Janda | <b>Kavlico</b><br>Mary Atkins<br>Don Ayers | <b>V-Engine</b><br>Jim O'Neill<br>Freeman Gates<br>Chris Panaretos<br>Paul Plante<br>Carol Verner | <b>Quality Office</b><br>Mahmoud Awad | <b>EESE</b><br>Sharon Altes<br>Robert Rosal | <b>Purchasing</b><br>Chris Nielsen<br>Bill McCarty<br>Patrice White-Johnson |
| <b>Team Leader</b><br>Jim Maurer                                |                                            |                                                                                                   |                                       | <b>PCSE</b><br>Ken Arnold<br>Brian Perry    |                                                                             |

## Meeting Agenda - 4/9/02

| <u>Order of Agenda Items</u>                                     | <u>Corr. Issue #</u> | <u>Person(s) Responsible</u>  | <u>Time Allocated</u> |
|------------------------------------------------------------------|----------------------|-------------------------------|-----------------------|
| 1. Introductions                                                 |                      | All                           | 5 minutes             |
| 2. Service Part Volume Projections - Kit vs. One part            | I16, A2              | John Shore                    | 10 minutes            |
| 3. Update on Wiring Harness Root Causes / findings               | various              | Sharon Altes,<br>Robert Rosal | 15 minutes            |
| 4. STA Update                                                    | I20                  | Patrice White-Johnson         | 10 minutes            |
| 5. Update on FRL Scientific Evaluation - progress to date        | I3, A2               | Mark Freeland                 | 10 minutes            |
| 6. GQRS Data on 21 platforms - Status                            | I3, A9               | Jon Janda,<br>Mahmoud Awad    | 10 minutes            |
| 7. Outside Lab - Non disclosure agreement, work plan, objectives | I5, A5               | Kyong Park<br>Freeman Gates   | 10 minutes            |
| 8. Update on Body and Assembly plant failures                    | I3, A3               | Terry Tannehill               | 10 minutes            |
| 9. Walk-ins                                                      |                      | All                           | 10 minutes            |
| 10. Next Meeting Agenda Items                                    |                      | All                           | 10 minutes            |

| <u>Proposed Next Meeting Agenda 4/11/02</u>                                | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|----------------------------------------------------------------------------|------------------------------|-----------------------|
| PCM solder crack issues (J1 connector) & current draw to stall the vehicle | John Jasha                   | 10 minutes            |

## Notes

Bring handouts (paper copies) for all presentations  
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 Please be on time as we have a full agenda

Jim Maurer/cp: 2/4/2003  
 Kavlico dPFE Sensor Core Team





## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                      |                                                                                                    |  |  |
|--------------------------------------|----------------------------------------------------------------------------------------------------|--|--|
| <b>Objective:</b>                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor .</b>     |  |  |
| <b><u>Meeting Logistics</u></b>      |                                                                                                    |  |  |
| <b>Subject:</b>                      | Kavlico TM dPFE Sensor Core Team                                                                   |  |  |
| <b>Date:</b>                         | April 11, 2002                                                                                     |  |  |
| <b>Time:</b>                         | 1-3:00 p.m.                                                                                        |  |  |
| <b>Location:</b>                     | POHE, DI-196 (FMEI War Room)                                                                       |  |  |
| <b>Called By:</b>                    | Jim Maurer, Team Leader: (313) 39-03672                                                            |  |  |
| <b>Next Meeting (s):</b>             | April 15, 2002, Core Team Meeting<br>April 18, 2002                                                |  |  |
| <b>Conference Call-In Number(s):</b> | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 803-531-6374 |  |  |

| Core Team Participants |                |                 |                       |              |                       |
|------------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belt</b>      | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b>     |
| Mark Freeland          | Mary Atkins    | Jim O'Neall     | Mahmoud Awad          | Sheran Allee | Chris Nielsen         |
| Shri Akolkar           | Don Ayers      | Freeman Gates   |                       | Robert Rossi | Bill McCarty          |
| Jon Janda              |                | Chris Panaretos |                       |              | Patrice White-Johnson |
|                        |                | Paul Plante     |                       | <b>PCSE</b>  |                       |
| <b>Team Leader</b>     |                | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer             |                |                 |                       | Brian Perry  |                       |

| Meeting Agenda - 4/11/02                                                     |                      |                               |                       |  |
|------------------------------------------------------------------------------|----------------------|-------------------------------|-----------------------|--|
| <u>Order of Agenda Items</u>                                                 | <u>Corr. Issue #</u> | <u>Person(s) Responsible</u>  | <u>Time Allocated</u> |  |
| 1. Introductions                                                             |                      | All                           | 5 minutes             |  |
| 2. Update on Body and Assembly plant failures                                | I3, A3               | Terry Tamashiro               | 10 minutes            |  |
| 3. Update on Wiring Harness Root Causes / findings                           | I3, A4               | Sheran Allee,<br>Robert Rossi | 15 minutes            |  |
| 4. PCM solder crack issue (J1 connector) & current draw to stall the vehicle | I3, A5               | John Johnson,<br>Brian Perry  | 15 minutes            |  |
| 5. AWS Data on 21 platforms - Status                                         | I3, A9               | Jon Janda,<br>Mahmoud Awad    | 10 minutes            |  |
| 6. Update to Stack Charts & Correlation Studies                              | I3 & I16             | Mahmoud Awad                  | 20 minutes            |  |
| 7. Outside Lab - Non disclosure agreement, work plan, objectives             | I5, A5               | Kyong Park<br>Freeman Gates   | 15 minutes            |  |
| 8. Walk-ins                                                                  |                      | All                           | 20 minutes            |  |
| 9. Next Meeting Agenda Items                                                 |                      | All                           | 10 minutes            |  |

| <u>Proposed Next Meeting Agenda 4/16/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |

| Notes                                                                                              |  |
|----------------------------------------------------------------------------------------------------|--|
| Bring handouts (paper copies) for all presentations                                                |  |
| Provide electronic copies of presentations to CFANARET (no later than 1 hour prior to the meeting) |  |
| Please be on time as we have a full agenda                                                         |  |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

0302-027 20002



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                    |                                                                                                    |                                     |                              |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|
| <b>Objective:</b>                                                                                  | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>       |                                     |                              |
| <b><u>Meeting Location</u></b>                                                                     |                                                                                                    |                                     |                              |
| <b>Subject:</b>                                                                                    | Kavlico TM dPFE Sensor Core Team                                                                   |                                     |                              |
| <b>Date:</b>                                                                                       | April 16, 2002                                                                                     |                                     |                              |
| <b>Time:</b>                                                                                       | 1-2:30 p.m.                                                                                        |                                     |                              |
| <b>Location:</b>                                                                                   | POEE, DI-196 (PMEI War Room)                                                                       |                                     |                              |
| <b>Called By:</b>                                                                                  | Jim Maurer, Team Leader: (313) 39-03672                                                            |                                     |                              |
| <b>Next Meeting (s):</b>                                                                           | April 18, 2002, Core Team Meeting<br>April 23, 2002                                                |                                     |                              |
| <b>Conference Call-In Number(s):</b>                                                               | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-531-6574 |                                     |                              |
| <b><u>Core Team Participants</u></b>                                                               |                                                                                                    |                                     |                              |
| <b>Black Belts</b>                                                                                 | <b>Kavlico</b>                                                                                     | <b>V-Engine</b>                     | <b>Quality Office</b>        |
| Mark Friesland                                                                                     | Mary Atkins                                                                                        | Jim O'Neill                         | Mahmoud Awad                 |
| Shel Akofor                                                                                        | Don Ayers                                                                                          | Freeman Gates                       |                              |
| Jon Janda                                                                                          |                                                                                                    | Chris Pacarotoc                     |                              |
|                                                                                                    |                                                                                                    | Paul Plante                         |                              |
| <b>Team Leader</b>                                                                                 |                                                                                                    | Carol Verner                        |                              |
| Jim Maurer                                                                                         |                                                                                                    |                                     |                              |
|                                                                                                    |                                                                                                    |                                     | <b>BESE</b>                  |
|                                                                                                    |                                                                                                    |                                     | Sheran Allos                 |
|                                                                                                    |                                                                                                    |                                     | Robert Rosai                 |
|                                                                                                    |                                                                                                    |                                     | <b>PCSE</b>                  |
|                                                                                                    |                                                                                                    |                                     | Ken Arnold                   |
|                                                                                                    |                                                                                                    |                                     | Brian Perry                  |
|                                                                                                    |                                                                                                    |                                     | <b>Purchasing</b>            |
|                                                                                                    |                                                                                                    |                                     | Chris Nielsen                |
|                                                                                                    |                                                                                                    |                                     | Bill McCarty                 |
|                                                                                                    |                                                                                                    |                                     | Patrice White-Johnson        |
| <b><u>Meeting Agenda - 4/16/02</u></b>                                                             |                                                                                                    |                                     |                              |
| <b><u>Order of Agenda Items</u></b>                                                                | <b><u>Corr. Issue #</u></b>                                                                        | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |
| 1. Introductions                                                                                   |                                                                                                    | All                                 | 5 minutes                    |
| 2. Update on Body and Assembly plant failures                                                      | I3, A3                                                                                             | Terry Tamashiro                     | 10 minutes                   |
| 3. Update on Wiring Harness Root Cause / findings                                                  | I3, A4                                                                                             | Sheran Allos,<br>Robert Rosai       | 15 minutes                   |
| 4. PCM solder crack issue (J1 connector) & current draw to stall the vehicle                       | I3, A5                                                                                             | John Jahshan,<br>Brian Perry        | 15 minutes                   |
| 5. Outside Lab - Non disclosure agreement, work plan, objectives                                   | I5, A5                                                                                             | Kyong Park<br>Freeman Gates         | 15 minutes                   |
| 6. Walk-ins                                                                                        |                                                                                                    | All                                 | 20 minutes                   |
| 7. Next Meeting Agenda Items                                                                       |                                                                                                    | All                                 | 10 minutes                   |
| <b><u>Forecast Next Meeting Agenda 4/18/02</u></b>                                                 |                                                                                                    |                                     |                              |
|                                                                                                    | <b><u>Person(s) Responsible</u></b>                                                                | <b><u>Time Estimated</u></b>        |                              |
|                                                                                                    |                                                                                                    |                                     |                              |
| <b><u>Notes</u></b>                                                                                |                                                                                                    |                                     |                              |
| Bring handouts (paper copies) for all presentations                                                |                                                                                                    |                                     |                              |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |                                                                                                    |                                     |                              |
| Please be on time as we have a full agenda                                                         |                                                                                                    |                                     |                              |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

E002-627 20003

# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** April 18, 2002  
**Time:** 1:30:00 p.m.  
**Location:** POEB, DI-196 (FMBI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** April 23, 2002, Core Team Meeting  
 April 25, 2002  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                 |                       |              |                       |
|--------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belt</b>  | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b>     |
| Mark Freelant      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Alles | Chris Nielsen         |
| Shel Akolkar       | Don Ayers      | Freeman Gates   |                       | Robert Roel  | Bill McCarty          |
| Jon Janda          |                | Chris Panaretos |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante     |                       | <b>PCSE</b>  |                       |
| <b>Team Leader</b> |                | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer         |                |                 |                       | Brian Perry  |                       |

**Meeting Agenda - 4/18/02**

| Order of Agenda Items                                             | Corr. Issue # | Person(s) Responsible     | Time Allocated |
|-------------------------------------------------------------------|---------------|---------------------------|----------------|
| 1. Introductions                                                  |               | All                       | 5 minutes      |
| 2. Update on Body and Assembly plant failures                     | I3, A3        | Terry Tamashiro           | 10 minutes     |
| 3. Update on Wiring Harness Root Causes / findings                | I3, A4        | Sheran Alles, Robert Roel | 15 minutes     |
| 4. Update on FRL testing / evaluation of UPAD parts               | I3, A2        | Mark Freelant             | 15 minutes     |
| 5. Investigation of Stalls - Update on Pareto, Parser Report data | I3, A9        | Mahmoud Awad, Mary Atkins | 15 minutes     |
| 6. Outside Lab - Ncm disclosure agreement, work plan, objectives  | I5, A5        | Kyong Park, Jim Maurer    | 15 minutes     |
| 7. Update on analyzing acid tested parts vs. warranty UPAD parts  | I5, A6        | Freeman Gates             | 10 minutes     |
| 8. Status of Concern to commonize parts                           | I16, A2       | Jon Janda                 | 5 minutes      |
| 9. Status of Supplier order for field service parts               | I16, A4       | Bill McCarty              | 5 minutes      |
| 10. Walk-ins                                                      |               | All                       | 15 minutes     |
| 11. Next Meeting Agenda Items                                     |               | All                       | 10 minutes     |

| Proposed Next Meeting Agenda 4/23/02 | Person(s) Responsible | Time Estimated |
|--------------------------------------|-----------------------|----------------|
|                                      |                       |                |

**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/cp: 2/4/2003  
 Kavlico dPFE Sensor Core Team

ES02-027 20034



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Dates:** April 23, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POEE, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** April 25, 2002, Core Team Meeting  
 April 30, 2002, Core Team Meeting

**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                 |                       |              |                       |
|--------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belts</b> | <b>Kavlico</b> | <b>V-Engins</b> | <b>Quality Office</b> | <b>ERSE</b>  | <b>Purchasing</b>     |
| Mark Freeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Alles | Chris Nielsen         |
| Shri Akolkar       | Don Ayers      | Freeman Gates   |                       | Robert Rossi | Bill McCarty          |
| Jon Janda          |                | Chris Penarcton |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante     |                       | <b>PCSB</b>  |                       |
| <b>Team Leader</b> |                | Carol Verner    |                       | Kon Arnold   |                       |
| Jim Maurer         |                |                 |                       | Brian Perry  |                       |

**Meeting Agenda - 4/23/02**

| <u>Order of Agenda Items</u>                                     | <u>Corr. Issue #</u> | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|------------------------------------------------------------------|----------------------|------------------------------|-----------------------|
| 1. Introductions                                                 |                      | All                          | 5 minutes             |
| 2. Update on Body and Assembly plant failures                    | I3, A3               | Don Ayers, Mark Freeland     | 10 minutes            |
| 3. Correlation of wiring and dPFE Warranty                       | I3, A4               | Robert Rossi, Mahmoud Awad   | 10 minutes            |
| 4. Update on FRL testing / evaluation of UPAD parts              | I3, A2               | Mark Freeland                | 10 minutes            |
| 5. Investigation of Stalls - Update on Pareto                    | I3, A9               | Mahmoud Awad                 | 10 minutes            |
| 6. Outside Lab - Non disclosure agreement, work plan, objectives | I5, A5               | Kyong Park, Jim Maurer       | 10 minutes            |
| 7. Update on analyzing acid tested parts                         | I5, A6               | Freeman Gates                | 10 minutes            |
| 8. Update on obtaining buy-back vehicles for testing             | I10, A6              | John Firo                    | 5 minutes             |
| 9. Status of Supplier order for field service parts              | I16, A4              | Bill McCarty                 | 5 minutes             |
| 10. Walk-ins                                                     |                      | All                          | 10 minutes            |
| 11. Next Meeting Agenda Items                                    |                      | All                          | 5 minutes             |

| <u>Proposed Next Meeting Agenda 4/25/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |

**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/op: 2/4/2003  
 Kavlico dPFE Sensor Core Team

EM02-027 28063



# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** April 23, 2002  
**Time:** 1-3:00 p.m.  
**Location:** POEE, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** April 30, 2002, Core Team Meeting  
 May 2, 2002, Core Team Meeting

**Conference Call-In Number(s):** 9-1-934-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                 |                       |              |                       |
|--------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belts</b> | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b>     |
| Mark Freeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Allen | Chris Nielsen         |
| Shel Akolkar       | Don Ayers      | Freeman Gates   |                       | Robert Rossi | Bill McCarty          |
| Jon Janda          |                | Chris Panaretos |                       |              | Patrick White-Johnson |
|                    |                | Paul Plante     |                       | <b>PCSE</b>  |                       |
| <b>Team Leader</b> |                | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer         |                |                 |                       | Brian Perry  |                       |

**Meeting Agenda - 4/23/02**

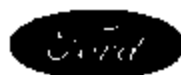
| <b><u>Order of Agenda Items</u></b>                              | <b><u>Corr. Item #</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allotted</u></b> |
|------------------------------------------------------------------|----------------------------|-------------------------------------|-----------------------------|
| 1. Introductions                                                 |                            | All                                 | 5 minutes                   |
| 2. Update on Body and Assembly plant failures                    | I3, A3                     | Don Ayers, Mark Freeland            | 10 minutes                  |
| 3. PCM update on how much current it takes to stall vehicle      | I3, A5                     | Brian Perry                         | 10 minutes                  |
| 4. Outside Lab - Non disclosure agreement, work plan, objectives | I5, A5                     | Kyeong Park<br>Jim Maurer           | 10 minutes                  |
| 5. Update on "In Process" acid tested parts                      | I5, A6                     | Freeman Gates                       | 10 minutes                  |
| 6. Update on installing "lab induced" failed sensors in vehicles | I6, A1                     | Jim Maurer<br>(Larry Sturz)         | 10 minutes                  |
| 7. Update on obtaining high-mileage parts for FRL analysis       | I6, A6                     | Jim Maurer<br>(John Fier)           | 10 minutes                  |
| 8. Update on obtaining buy-back vehicles and parts for testing   | I6, A5                     | John Fier                           | 10 minutes                  |
| 9. Update on PV Failures                                         | I12, A10                   | Patrick White-Johnson               | 10 minutes                  |
| 10. Status of Supplier order for field service parts             | I16, A4                    | Bill McCarty                        | 5 minutes                   |
| 11. Walk-ins                                                     |                            | All                                 | 10 minutes                  |
| 12. Next Meeting Agenda Items                                    |                            | All                                 | 5 minutes                   |

| <b><u>Forecast Next Meeting Agenda 4/30/02</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Estimated</u></b> |
|----------------------------------------------------|-------------------------------------|------------------------------|
|                                                    |                                     |                              |

**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/op: 2/4/2003  
 Kavlico dPFE Sensor Core Team



# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**  
**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** April 30, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POEB, DI-196 (PMBI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** May 2, 2002, Core Team Meeting  
 May 7, 2002, Core Team Meeting  
**Conference Call-in Number(s):** 9-1-934-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 803-331-6574

**Core Team Participants**

| Black Belts        | Kavlico     | V-Engine        | Quality Office | EESE         | Purchasing            |
|--------------------|-------------|-----------------|----------------|--------------|-----------------------|
| Mark Freeland      | Mary Atkins | Jim O'Neill     | Mahmoud Awad   | Sharon Allen | Chris Nielsen         |
| Shri Akolkar       | Don Ayers   | Froeman Gates   |                | Robert Rossi | Bill McCarty          |
| Jon Janda          |             | Chris Panaretos |                |              | Patrice White-Johnson |
|                    |             | Paul Plante     |                | <b>PCSE</b>  |                       |
| <b>Team Leader</b> |             | Carol Verner    |                | Ken Arnold   |                       |
| Jim Maurer         |             |                 |                | Brian Perry  |                       |

**Meeting Agenda - 4/30/02**

| Order of Agenda Items                                                                | Corr. Item # | Person(s) Responsible     | Time Allotted |
|--------------------------------------------------------------------------------------|--------------|---------------------------|---------------|
| 1. Introductions                                                                     |              | All                       | 5 minutes     |
| 2. FRL Update of UPAD                                                                | I3, A2       | Mark Freeland             | 15 minutes    |
| 3. Update on Body and Assembly plant failures                                        | I3, A3       | Don Ayers                 | 10 minutes    |
| 4. PCM update: Voltage drop between v-out and signal return                          | I3, A5       | Brian Perry, John Johnson | 10 minutes    |
| 5. Outside Lab / Non disclosure agreement - status                                   | I5, A5       | Bill McCarty              | 5 minutes     |
| 6. Update on "In Process" acid tested parts; Discussion of chemical analysis of gel. | I5, A6, A8   | Kyong Park, Mark Freeland | 15 minutes    |
| 7. Update on obtaining vehicles and high-mileage parts for FRL analysis              | I6, A5, A6   | Jim Maurer (John Fira)    | 10 minutes    |
| 8. Walk-ins                                                                          |              | All                       | 10 minutes    |
| 9. Next Meeting Agenda Items                                                         |              | All                       | 5 minutes     |

| Proposed Next Meeting Agenda 5/2/02 | Person(s) Responsible | Time Estimated |
|-------------------------------------|-----------------------|----------------|
|                                     |                       |                |

**Notes**  
 Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/cpx 2/4/2003  
 Kavlico dPFE Sensor Core Team

EM02-027 29067



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                      |                                                                                                    |  |  |
|--------------------------------------|----------------------------------------------------------------------------------------------------|--|--|
| <b>Objective:</b>                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>       |  |  |
|                                      | <b><u>Meeting Logistics</u></b>                                                                    |  |  |
| <b>Subject:</b>                      | Kavlico TM dPFE Sensor Core Team                                                                   |  |  |
| <b>Date:</b>                         | May 9, 2002                                                                                        |  |  |
| <b>Time:</b>                         | 1-2:30 p.m.                                                                                        |  |  |
| <b>Location:</b>                     | POEE, DI-196 (FMEI War Room)                                                                       |  |  |
| <b>Called By:</b>                    | Jim Maurer, Team Leader: (313) 39-03672                                                            |  |  |
| <b>Next Meeting (s):</b>             | May 14, 2002, Core Team Meeting<br>May 16, 2002, Core Team Meeting                                 |  |  |
| <b>Conference Call-In Number(s):</b> | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-331-6574 |  |  |

|                                      |                |                 |                       |              |                       |
|--------------------------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b><u>Core Team Participants</u></b> |                |                 |                       |              |                       |
| <b>Black Belts</b>                   | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b>     |
| Mark Freeland                        | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Allee | Chris Nielsen         |
| Shri Akolkar                         | Don Ayers      | Fredman Gates   |                       | Robert Roach | Bill McCarty          |
| Jon Janda                            |                | Chris Panaretos |                       |              | Patrice White-Johnson |
|                                      |                | Paul Plante     |                       | <b>ECSE</b>  |                       |
| <b>Team Leader</b>                   |                | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer                           |                |                 |                       | Brian Perry  |                       |

|                                                  |                             |                                     |                              |  |
|--------------------------------------------------|-----------------------------|-------------------------------------|------------------------------|--|
| <b><u>Meeting Agenda - 5/9/02</u></b>            |                             |                                     |                              |  |
| <b><u>Order of Agenda Items</u></b>              | <b><u>Corr. Issue #</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |  |
| 1. Introductions                                 |                             | All                                 | 5 minutes                    |  |
| 2. Review and discuss proposed Workplan          |                             | Jim Maurer                          | 30 minutes                   |  |
| 3. Update on Body and Assembly plant failures    | I3, A3                      | Don Ayers                           | 10 minutes                   |  |
| 4. Outside Lab/Non disclosure agreement - status | I5, A5                      | Bill McCarty                        | 5 minutes                    |  |
| 5. Update on "In Process" acid tested parts.     | I5, A6                      | Jim Maurer, Mark Freeland           | 15 minutes                   |  |
| 6. Update from May 2, Staff meeting              |                             | Paul Plante                         | 15 minutes                   |  |
| 7. Walk-ins                                      |                             | All                                 | 10 minutes                   |  |
| 8. Next Meeting Agenda Items                     |                             | All                                 | 5 minutes                    |  |

|                                                    |                                     |                              |
|----------------------------------------------------|-------------------------------------|------------------------------|
| <b><u>Proposed Next Meeting Agenda 5/14/02</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Estimated</u></b> |
|                                                    |                                     |                              |
|                                                    |                                     |                              |
|                                                    |                                     |                              |

|                                                                                                    |  |
|----------------------------------------------------------------------------------------------------|--|
| <b><u>Notes</u></b>                                                                                |  |
| Bring handouts (paper copies) for all presentations                                                |  |
| Provide electronic copies of presentations to CPANARKT (no later than 1 hour prior to the meeting) |  |
| Please be on time as we have a full agenda                                                         |  |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

E002-027 20003



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                      |                                                                                                       |  |  |
|--------------------------------------|-------------------------------------------------------------------------------------------------------|--|--|
| <b>Objective:</b>                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>          |  |  |
| <b><u>Meeting Logistics</u></b>      |                                                                                                       |  |  |
| <b>Subject:</b>                      | Kavlico TM dPFE Sensor Core Team                                                                      |  |  |
| <b>Dates:</b>                        | May 9, 2002                                                                                           |  |  |
| <b>Time:</b>                         | 1-2:30 p.m.                                                                                           |  |  |
| <b>Location:</b>                     | POEH, DI-196 (FMEI War Room)                                                                          |  |  |
| <b>Called By:</b>                    | Jim Maurer, Team Leader: (313) 39-03672                                                               |  |  |
| <b>Next Meeting (s):</b>             | May 14, 2002, Core Team Meeting<br>May 16, 2002, Core Team Meeting                                    |  |  |
| <b>Conference Call-In Number(s):</b> | 9-1-954-1149 (inside Ford); 847-619-6158 (outside)    Passcode: 6881436#<br>Kavlico Fax: 805-531-6574 |  |  |

|                                      |                       |                        |                              |                    |                          |
|--------------------------------------|-----------------------|------------------------|------------------------------|--------------------|--------------------------|
| <b><u>Core Team Participants</u></b> |                       |                        |                              |                    |                          |
| <b><u>Blank Bolt</u></b>             | <b><u>Kavlico</u></b> | <b><u>V-Engine</u></b> | <b><u>Quality Office</u></b> | <b><u>EESE</u></b> | <b><u>Purchasing</u></b> |
| Mark Froeland                        | Mary Atkins           | Jim O'Neill            | Mahmoud Awad                 | Sheran Alles       | Chris Nielsen            |
| Shri Akolkar                         | Don Ayers             | Freeman Gates          |                              | Robert Rossi       | Bill McCarty             |
| Jon Janda                            |                       | Chris Panaretos        |                              |                    | Patrice White-Johnson    |
|                                      |                       | Paul Plante            |                              | <b><u>PCSE</u></b> |                          |
| <b><u>Team Leader</u></b>            |                       | Carol Verner           |                              | Ken Arnold         |                          |
| Jim Maurer                           |                       |                        |                              | Brian Perry        |                          |

|                                                  |                             |                                     |                              |  |
|--------------------------------------------------|-----------------------------|-------------------------------------|------------------------------|--|
| <b><u>Meeting Agenda - 5/9/02</u></b>            |                             |                                     |                              |  |
| <b><u>Order of Agenda Items</u></b>              | <b><u>Corr. Issue #</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |  |
| 1. Introductions                                 |                             | All                                 | 5 minutes                    |  |
| 2. Review and discuss proposed Workplan          |                             | Jim Maurer                          | 30 minutes                   |  |
| 3. Update on Body and Assembly plant failures    | 13, A3                      | Don Ayers                           | 10 minutes                   |  |
| 4. Outside Lab/Non disclosure agreement - status | 15, A5                      | Bill McCarty                        | 5 minutes                    |  |
| 5. Update on "In Process" acid tested parts      | 15, A6                      | Jim Maurer, Mark Froeland           | 15 minutes                   |  |
| 6. Update from May 2, Staffs meeting             |                             | Paul Plante                         | 15 minutes                   |  |
| 7. Walk-ins                                      |                             | All                                 | 10 minutes                   |  |
| 8. Next Meeting Agenda Items                     |                             | All                                 | 5 minutes                    |  |

|                                                    |                                     |                              |
|----------------------------------------------------|-------------------------------------|------------------------------|
| <b><u>Proposed Next Meeting Agenda 5/14/02</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Estimated</u></b> |
|                                                    |                                     |                              |
|                                                    |                                     |                              |
|                                                    |                                     |                              |

|                                                                                                    |  |
|----------------------------------------------------------------------------------------------------|--|
| <b><u>Notes</u></b>                                                                                |  |
| Bring handouts (paper copies) for all presentations                                                |  |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |  |
| Please be on time as we have a full agenda                                                         |  |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

EPR2-627 20000





# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** May 16, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POEE, DL-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** May 16, 2002, Core Team Meeting  
 May 21, 2002, Core Team Meeting

**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6681436#  
 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                 |                       |              |                       |
|--------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belts</b> | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EBSE</b>  | <b>Purchasing</b>     |
| Mark Fretland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sharon Allen | Chris Nielsen         |
| Shir Akofkar       | Don Ayers      | Freeman Gates   |                       | Robert Roast | Bill McCarty          |
| Jon Janda          | Kyong Park     | Chris Panaratos |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante     |                       | <b>ECSE</b>  |                       |
| <b>Team Leader</b> | <b>Vision</b>  | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer         | John Johnson   |                 |                       | Brian Perry  |                       |

**Meeting Agenda - 5/16/02**

| <u>Order of Agenda Items</u>                                  | <u>Coor. Issue #</u> | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|---------------------------------------------------------------|----------------------|------------------------------|-----------------------|
| 1. Outside consultant's participation at Analytical Solutions | E3, A5               | Bill McCarty                 | 10 minutes            |
| 2. Update on Body and Assembly plant failures at Norfolk      | E3, A3               | Don Ayers                    | 10 minutes            |
| 3. Update from May 13, 1-3:00 p.m. Issue Resolution Mtg.      |                      | Paul Plante                  | 10 minutes            |
| 4. Supplier Technical Asst. (STA) weekly update               |                      | Patrice White-Johnson        | 10 minutes            |
| 5. Kavlico/Ford travel to Analytical Solutions Status         |                      | Jim Maurer                   | 10 minutes            |
| 6. Walk-ins                                                   |                      | All                          | 20 minutes            |

| <u>Proposed Next Meeting Agenda 5/21/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |

**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to apona2 (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/op: 2/4/2003  
 Kavlico dPFE Sensor Core Team

EM2-527 20571

*Secret*

# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** May 23, 2002  
**Time:** 1-2:30 p.m.  
**Location:** FOER, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** May 28, 2002, Core Team Meeting  
 May 30, 2002, Core Team Meeting  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                 |                       |              |                       |
|--------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belt</b>  | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>HESB</b>  | <b>Purchasing</b>     |
| Mark Froeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sharan Allos | Chris Nielsen         |
| Shri Akolkar       | Don Ayers      | Freeman Gates   |                       | Robert Rossi | Bill McCarty          |
| Jon Janda          | Kyong Park     | Chris Panarelos |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante     |                       | <b>PCSB</b>  |                       |
| <b>Team Leader</b> | <b>Visteon</b> | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer         | John Johnson   |                 |                       | Brian Perry  |                       |

**Meeting Agenda - 5/16/02**

| <u>Order of Agenda Items</u>                                       | <u>Cont. Issue #</u> | <u>Person(s) Responsible</u>             | <u>Time Allocated</u> |
|--------------------------------------------------------------------|----------------------|------------------------------------------|-----------------------|
| 1. Update on Kavlico/Ford May 20, 2002 mtg. W/ Analytical Sol.     |                      | Jim Maurer, Mark Froeland, Freeman Gates | 20 minutes            |
| 2. Update on Body and Assembly plant failures at Norfolk           | 13, A3               | Don Ayers                                | 10 minutes            |
| 3. STA weekly update.                                              |                      | Patrice White-Johnson                    | 5 minutes             |
| 4. Post transient voltage parts-what to do w/parts once inspected. |                      | Mark Froeland                            | 10 minutes            |
| 5. May 2 Staffs mtg. Assignments update.                           |                      | Paul Plante                              | 10 minutes            |
| 6. Update from May 20 Issue Resolution mtg.                        |                      | Paul Plante                              | 10 minutes            |
| 7. Walk-ins                                                        |                      | All                                      | 20 minutes            |

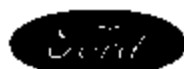
| <u>Forecast Next Meeting Agenda 5/28/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |

**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to spoma2 (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/cp: 2/4/2003  
 Kavlico dPFE Sensor Core Team

ES02-827 28672

**MEETING ANNOUNCEMENT / WORKING TEAM MEETING**

|                                                                          |                                                                                                    |                                     |                              |                   |                       |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|-------------------|-----------------------|
| <b>Objective:</b>                                                        | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>       |                                     |                              |                   |                       |
| <b><u>Meeting Logistics</u></b>                                          |                                                                                                    |                                     |                              |                   |                       |
| <b>Subject:</b>                                                          | Kavlico TM dPFE Sensor Core Team                                                                   |                                     |                              |                   |                       |
| <b>Date:</b>                                                             | May 28, 2002                                                                                       |                                     |                              |                   |                       |
| <b>Time:</b>                                                             | 1-2:30 p.m.                                                                                        |                                     |                              |                   |                       |
| <b>Location:</b>                                                         | POEB, DI-196 (FMEI War Room)                                                                       |                                     |                              |                   |                       |
| <b>Called By:</b>                                                        | Jim Maurer, Team Leader: (313) 39-03672                                                            |                                     |                              |                   |                       |
| <b>Next Meeting (s):</b>                                                 | May 30, 2002, Core Team Meeting<br>June 4, 2002, Core Team Meeting                                 |                                     |                              |                   |                       |
| <b>Conference Call-in Number(s):</b>                                     | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6831436#<br>Kavlico Fax: 805-531-6574 |                                     |                              |                   |                       |
| <b><u>Core Team Participants</u></b>                                     |                                                                                                    |                                     |                              |                   |                       |
| <b>Black Belts</b>                                                       | <b>Kavlico</b>                                                                                     | <b>V-Engine</b>                     | <b>Quality Office</b>        | <b>EESE</b>       | <b>Purchasing</b>     |
| Mark Freeland                                                            | Mary Atkins                                                                                        | Jim O'Neill                         | Mahmoud Awad                 | Sharon Allen      | Chris Nielsen         |
| Shri Alolkar                                                             | Don Ayers                                                                                          | Freeman Gates                       |                              | Robert Rossi      | Bill McCarty          |
| Jon Janda                                                                | Kyong Park                                                                                         | Chris Panaretos                     |                              |                   | Patrice White-Johnson |
|                                                                          |                                                                                                    | Paul Plante                         |                              | <b>PCSE</b>       |                       |
| <b>Team Leader</b>                                                       | <b>Visitor</b>                                                                                     | <b>Carol Verner</b>                 |                              | <b>Ken Arnold</b> |                       |
| Jim Maurer                                                               | John Jahshan                                                                                       |                                     |                              | Brian Perry       |                       |
| <b><u>Meeting Agenda - 5/28/02</u></b>                                   |                                                                                                    |                                     |                              |                   |                       |
| <b><u>Order of Agenda Items</u></b>                                      | <b><u>Corr. Issue #</u></b>                                                                        | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |                   |                       |
| 1. Update on Analytical Solutions Workplan                               | I5, A5                                                                                             | Kyong Park                          | 10 minutes                   |                   |                       |
| 2. Update on Body and Assembly plant failures at Norfolk.                | I3, A3                                                                                             | Don Ayers                           | 10 minutes                   |                   |                       |
| 3. STA weekly update.                                                    |                                                                                                    | Patrice White-Johnson               | 10 minutes                   |                   |                       |
| 4. Vehicle testing update/status if differential input to signal needed. | I6, A7                                                                                             | Jim McCoy,<br>Sharon Allen          | 15 minutes                   |                   |                       |
| 5. Issues Resolution mtg. Update.                                        |                                                                                                    | Jon Janda                           | 15 minutes                   |                   |                       |
| 6. Walk-ins.                                                             |                                                                                                    | All                                 |                              |                   |                       |

|                                                    |                                     |                              |
|----------------------------------------------------|-------------------------------------|------------------------------|
| <b><u>Proposed Next Meeting Agenda 5/28/02</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Estimated</u></b> |
|                                                    |                                     |                              |
|                                                    |                                     |                              |

|                                                        |                                             |
|--------------------------------------------------------|---------------------------------------------|
| <b><u>Notes</u></b>                                    |                                             |
| Bring handouts (paper copies) for all presentations    |                                             |
| Provide electronic copies of presentations to sponsor2 | (no later than 1 hour prior to the meeting) |
| Please be on time as we have a full agenda             |                                             |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

EHS2-627 28673



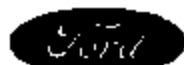
## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                             |                                                                                                    |                                                                                              |                         |                   |                       |
|---------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------|-------------------|-----------------------|
| <b>Objective:</b>                           |                                                                                                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b> |                         |                   |                       |
| <b><u>Meeting Logistics</u></b>             |                                                                                                    |                                                                                              |                         |                   |                       |
| <b>Subject:</b>                             | Kavlico TM dPFE Sensor Core Team                                                                   |                                                                                              |                         |                   |                       |
| <b>Date:</b>                                | June 4, 2002                                                                                       |                                                                                              |                         |                   |                       |
| <b>Time:</b>                                | 1-2:30 p.m.                                                                                        |                                                                                              |                         |                   |                       |
| <b>Location:</b>                            | POEE, DI-196 (FMEI War Room)                                                                       |                                                                                              |                         |                   |                       |
| <b>Called By:</b>                           | Jim Maurer, Team Leader: (313) 39-03672                                                            |                                                                                              |                         |                   |                       |
| <b>Next Meeting (s):</b>                    | June 6, 2002, Core Team Meeting<br>June 11, 2002, Core Team Meeting                                |                                                                                              |                         |                   |                       |
| <b>Conference Call-In Number(s):</b>        | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-831-6574 |                                                                                              |                         |                   |                       |
| <b><u>Core Team Participants</u></b>        |                                                                                                    |                                                                                              |                         |                   |                       |
| <b>Black Belts</b>                          | <b>Kavlico</b>                                                                                     | <b>V-Engine</b>                                                                              | <b>Quality Office</b>   | <b>EESE</b>       | <b>Purchasing</b>     |
| Mark Freeland                               | Mary Atkins                                                                                        | Jim O'Neill                                                                                  | Mahmoud Awad            | Sheran Afies      | Chris Nielsen         |
| Shri Akolkar                                | Don Ayers                                                                                          | Freeman Gates                                                                                |                         | Robert Rossi      | Bill McCarty          |
| Jon Janda                                   | Kyong Park                                                                                         | Amy Poma                                                                                     |                         |                   | Patrice White-Johnson |
|                                             |                                                                                                    | Paul Plante                                                                                  |                         | <b>PCSE</b>       |                       |
| <b>Team Leader</b>                          | <b>Visteon</b>                                                                                     | <b>Carol Verner</b>                                                                          |                         | <b>Ken Arnold</b> |                       |
| Jim Maurer                                  | John Johnson                                                                                       |                                                                                              |                         | Brian Perry       |                       |
| <b><u>Meeting Agenda - 6/4/02</u></b>       |                                                                                                    |                                                                                              |                         |                   |                       |
| <b><u>Order of Agenda Items</u></b>         | <b><u>Corr.</u></b>                                                                                | <b><u>Person(s)</u></b>                                                                      | <b><u>Time</u></b>      |                   |                       |
|                                             | <b><u>Issue #</u></b>                                                                              | <b><u>Responsible</u></b>                                                                    | <b><u>Allocated</u></b> |                   |                       |
| 1. Passcode confirmation to view reports.   | IS, A5                                                                                             | Kyong Park                                                                                   | 5 minutes               |                   |                       |
| 2. Update on Norfolk and St. Thomas parts.  | I3, A3                                                                                             | Don Ayers                                                                                    | 10 minutes              |                   |                       |
| 3. Update on decomposition testing.         | IS, A8                                                                                             | Mark Freeland                                                                                | 10 minutes              |                   |                       |
| 4. Update on Vehicle testing                | I6, A7                                                                                             | Jim McCoy/Amy                                                                                | 5 minutes               |                   |                       |
| 5. STA update                               |                                                                                                    | Patrice White-Johnson                                                                        | 10 minutes              |                   |                       |
| 6. Report out on 6/3 Issues Resolution mtg. |                                                                                                    | Jon Janda                                                                                    | 10 minutes              |                   |                       |
| 7. Walkin                                   |                                                                                                    | All                                                                                          | 20 minutes              |                   |                       |

|                                                    |                                     |                              |
|----------------------------------------------------|-------------------------------------|------------------------------|
| <b><u>Proposed Next Meeting Agenda 6/11/02</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Estimated</u></b> |
|                                                    |                                     |                              |

|                                                      |                                             |
|------------------------------------------------------|---------------------------------------------|
| <b><u>Notes</u></b>                                  |                                             |
| Bring handouts (paper copies) for all presentations  |                                             |
| Provide electronic copies of presentations to spoma2 | (no later than 1 hour prior to the meeting) |
| Please be on time as we have a full agenda           |                                             |

Jim Maurer/op: 2/4/2003  
Kavlico dPFE Sensor Core Team



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** June 4, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POEB, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** June 6, 2002, Core Team Meeting  
                                 June 11, 2002, Core Team Meeting

**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
                                 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                 |                       |              |                       |
|--------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belt</b>  | <b>Kavlion</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>HESB</b>  | <b>Purchasing</b>     |
| Mark Froeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Allen | Chris Nielsen         |
| Shri Akolkar       | Don Ayers      | Freeman Gates   |                       | Robert Rossi | Bill McCarty          |
| Jon Janda          | Kyong Park     | Amy Poma        |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante     |                       | <b>PCSE</b>  |                       |
| <b>Team Leader</b> | <b>Vision</b>  | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer         | John Jahshan   |                 |                       | Brian Perry  |                       |

**Meeting Agenda - 6/4/02**

| <u>Order of Agenda Items</u>                                                                                                                          | <u>Corr. Issue #</u> | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------|-----------------------|
| 1. Discussion of Questions, team is to ask Mike Strich of Analytical Solutions at Thursday mtg. (Mary A. to arrange for Mike to call in for 6/6 mtg.) | I5, A5               | All                          | 15 minutes            |
| 2. Update on Norfolk and St. Thomas parts.                                                                                                            | I3, A3               | Don Ayers                    | 10 minutes            |
| 3. Update on decomposition testing.                                                                                                                   | I5, A8               | Mark Froeland                | 10 minutes            |
| 4. Report out of Issues Resolution 6/3 mtg.                                                                                                           |                      | Jon Janda                    | 10 minutes            |
| 5. STA update                                                                                                                                         |                      | Patrice White-Johnson        | 10 minutes            |
| 6. Walk ins                                                                                                                                           |                      | All                          | 10 minutes            |

| <u>Proposed Next Meeting Agenda 6/11/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |
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**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to apoma2 (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/op: 2/4/2003  
 Kavlico dPFE Sensor Core Team

E002-027 25675



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** June 6, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POEE, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** June 11, 2002, Core Team Meeting  
                                 June 13, 2002, Core Team Meeting

**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
                                 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                 |                       |              |                       |
|--------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belt</b>  | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b>     |
| Mark Froeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Alles | Chris Nielsen         |
| Shri Akolkar       | Don Ayers      | Freeman Gates   |                       | Robert Ruel  | Bill McCarty          |
| Jon Janda          | Kyong Park     | Amy Poma        |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante     |                       | <b>ECSE</b>  |                       |
| <b>Team Leader</b> | <b>Visteon</b> | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer         | John Jahshan   |                 |                       | Brian Perry  |                       |

**Meeting Agenda - 6/6/02**

| <u>Order of Agenda Items</u>                                                                                  | <u>Corr. Issue #</u> | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|---------------------------------------------------------------------------------------------------------------|----------------------|------------------------------|-----------------------|
| 1. Team discussion of questions from review of 2 <sup>nd</sup> AS report.<br>Mike S. to call in for 6/11 mtg. | 15, A5               | All                          | 15 minutes            |
| 2. Update on Norfolk and St. Thomas parts                                                                     | 13, A3               | Don Ayers                    | 10 minutes            |
| 3. Report out of Issues Resolution 6/10 mtg.                                                                  |                      | Jon Janda                    | 15 minutes            |
| 4. STA update-Patrice/Walid to call in from Kavlico                                                           | 15, A10              | Patrice White-Johnson        | 10 minutes            |
| 5. Instrumentation/electrical testing of vehicles update.                                                     | 16, A7               | Jim McCoy                    | 10 minutes            |
| 6. Walk ins                                                                                                   |                      | All                          | 10 minutes            |

| <u>Proposed Next Meeting Agenda 6/11/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |

**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to spoma2 (as later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda



# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**  
**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** June 11, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POEB, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** June 13, 2002, Core Team Meeting  
 June 18, 2002, Core Team Meeting  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-531-6574

**Core Team Participants**

| Black Belt         | Kavlico       | V-Engine      | Quality Office | HESE         | Purchasing            |
|--------------------|---------------|---------------|----------------|--------------|-----------------------|
| Mark Freeland      | Mary Akina    | Jim O'Neill   | Mahmoud Awad   | Sherm Allen  | Chris Nielsen         |
| Shri Akolkar       | Don Ayers     | Freeman Gates |                | Robert Rossi | Bill McCarty          |
| Jon Janda          | Kyong Park    | Amy Poma      |                |              | Patrice White-Johnson |
|                    |               | Paul Plante   |                | PCSE         |                       |
| <b>Team Leader</b> | <b>Vision</b> | Carol Verner  |                | Ken Arnold   |                       |
| Jim Maurer         | John Johnson  |               |                | Brian Perry  |                       |

**Meeting Agenda - 6/11/02**

| Order of Agenda Items                                                                                      | Corr. Issue # | Person(s) Responsible | Time Allocated |
|------------------------------------------------------------------------------------------------------------|---------------|-----------------------|----------------|
| 1. Team discussion of questions from review of 2 <sup>nd</sup> AS report. Mike S. to call in for 5/13 mtg. | I5, A5        | All                   | 15 minutes     |
| 2. Update on Norfolk and St. Thomas parts.                                                                 | I3, A3        | Don Ayers             | 10 minutes     |
| 3. Ford visit to Kavlico - discuss mid July dates/draft Agenda                                             |               | All                   | 15 minutes     |
| 4. STA update                                                                                              | I5, A10       | Patrice White-Johnson | 10 minutes     |
| 5. Walk Ins                                                                                                |               | All                   | 20 minutes     |

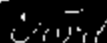
| Proposed Next Meeting Agenda 6/13/02 | Person(s) Responsible | Time Estimated |
|--------------------------------------|-----------------------|----------------|
|                                      |                       |                |

**Notes**  
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 Please be on time as we have a full agenda

Jim Maurer/cp: 2/4/2003  
 Kavlico dPFE Sensor Core Team

ENG-427 20077





## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

### Meeting Logistics

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** June 13, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POER, DI-196 (FMHI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** June 18, 2002, Core Team Meeting  
 June 20, 2002, Core Team Meeting  
**Conference Call-In Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 803-531-6574

### Core Team Participants

|                    |                |                  |                       |              |                       |
|--------------------|----------------|------------------|-----------------------|--------------|-----------------------|
| <b>Black Belt</b>  | <b>Kavlico</b> | <b>V-Engine</b>  | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b>     |
| Mark Freeland      | Mary Atkins    | Jim O'Neill      | Mahmoud Awad          | Sharon Allen | Chris Nielsen         |
| Shri Akolkar       | Don Ayers      | Freeman Galloway |                       | Robert Rossi | Bill McCarty          |
| Jon Janda          | Kyoung Park    | Amy Poma         |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante      |                       | <b>PCSE</b>  |                       |
| <b>Team Leader</b> | <b>Visteon</b> | Carol Verner     |                       | Ken Arnold   |                       |
| Jim Maurer         | John Jakobsen  |                  |                       | Brian Perry  |                       |

### Meeting Agenda - 6/13/02

| <u>Order of Agenda Items</u>                            | <u>Corr. Issue #</u> | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|---------------------------------------------------------|----------------------|------------------------------|-----------------------|
| 1. Update on Norfolk and St. Thomas parts               | I3, A3               | Don Ayers                    | 10 minutes            |
| 2. Issue Resolution Report out                          | I3, A12              | Jon Janda                    | 20 minutes            |
| 3. Parser Data                                          | I5, A11              | Mary Atkins                  | 10 minutes            |
| 4. Update repeat repairs data                           | I6, A9               | Mahmoud Awad                 | 15 minutes            |
| 5. Instrumentation/Settings and update on test vehicles | I6, A7               | Jim McCoy                    | 15 minutes            |
| 6. STA update                                           | I5, A10              | Patrice White-Johnson        | 10 minutes            |
| 7. Ford visit to Kavlico-tentative date/agenda update   |                      | Jim O'Neill                  | 10 minutes            |
| 8. Walk In                                              |                      | All                          | 15 minutes            |

### Proposed Next Meeting Agenda 6/13/02

### Person(s) Responsible

### Time Estimated

### Notes

Bring handouts (paper copies) for all presentations  
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Jim Maurer/cp: 2/4/2003  
 Kavlico dPFE Sensor Core Team

E882-027 20078



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** June 18, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POEE, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** June 20, 2002, Core Team Meeting  
 June 25, 2002, Core Team Meeting

**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6156 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-523-7125

**Core Team Participants**

|                    |                |                 |                       |              |                       |
|--------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belts</b> | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>HESE</b>  | <b>Purchasing</b>     |
| Mark Freeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Alles | Chris Nielsen         |
| Sheri Alonkar      | Don Ayers      | Freeman Gates   |                       | Robert Rossi | Bill McCarty          |
| Jon Janda          | Kyong Park     | Amy Poma        |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante     |                       | <b>PCSE</b>  |                       |
| <b>Team Leader</b> | <b>Vision</b>  | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer         | John Jabahan   |                 |                       | Brian Perry  |                       |

**Meeting Agenda - 6/13/02**

| <u>Order of Agenda Items</u>                                   | <u>Corr. Issue #</u> | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|----------------------------------------------------------------|----------------------|------------------------------|-----------------------|
| 1. Update/review of repeat repair data                         | 16, A9               | Mahmoud Awad                 | 15 minutes            |
| 2. Management Review at Kavlico-tentative date of visit/agenda |                      | Jim O'Neill                  | 5 minutes             |
| 3. STA update. Transition of Patrice's function.               | 15, A10              | Patrice White-Johnson        | 10 minutes            |
| 4. Update -test plan for dynamometer-schematic & diagram.      |                      | Freeman Gates                | 10 minutes            |
| 5. Walk Ins                                                    |                      | All                          |                       |

| <u>Proposed Next Meeting Agenda 6/13/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |

**Notes**

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Jim Maurer/ep: 2/4/2003  
 Kavlico dPFE Sensor Core Team

E002-027 20079

5/24/02

## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**  
**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** June 20, 2002  
**Time:** 1-3:00 p.m.  
**Location:** POER, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** June 25, 2002, Core Team Meeting  
 June 27, 2002, Core Team Meeting  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
**Kavlico Fax:** 803-523-7125

**Core Team Participants**

| Black Bolt         | Kavlico        | V-Engine      | Quality Office | ERSE         | Purchasing            |
|--------------------|----------------|---------------|----------------|--------------|-----------------------|
| Mark Freeland      | Mary Akins     | Jim O'Neill   | Mahmoud Awad   | Sheran Allos | Chris Nielsen         |
| Shri Akolkar       | Don Ayers      | Freeman Gates |                | Robert Rossi | Bill McCarty          |
| Jon Janda          | Kyong Park     | Amy Poma      |                |              | Patrice White-Johnson |
|                    |                | Paul Pianta   |                | PCSE         |                       |
| <b>Team Leader</b> | <b>Virtcon</b> | Carol Verner  |                | Ken Arnold   |                       |
| Jim Maurer         | John Jabshan   |               |                | Brian Petry  |                       |

**Meeting Agenda - 6/20/02**

| Order of Agenda Items                                                                      | Corr. Issue # | Person(s) Responsible | Time Allocated |
|--------------------------------------------------------------------------------------------|---------------|-----------------------|----------------|
| 1. Continued review/discussion of Repeat Repairs Data                                      | I6, A9        | Mahmoud Awad          | 30 minutes     |
| 2. Plan for use of outside lab for Nitric Acid Test and High Temperature Test- in process. | I5, A8        | Freeman Gates         | 20 minutes     |
| 3. Accelerated Exhaust Condensate Exposure test on vehicle.                                | I5, I6, A10   | Mark Freeland         | 10 minutes     |
| 4. Update on Norfolk and St. Thomas parts.                                                 | I3, A3        | Don Ayers             | 10 minutes     |
| 5. Update for test plan for dynamometer - schematic & diagram                              |               | Freeman Gates         | 10 minutes     |
| 6. Issues Resolution report out.                                                           |               | Jon Janda             | 10 minutes     |
| 7. Management Review at Kavlico - travel dates/agenda                                      |               | Jim O'Neill           | 10 minutes     |
| 8. Driver for PCM J1 Tests                                                                 |               | Mark Freeland         | 5 minutes      |
| 9. Walk Ins                                                                                |               | All                   | 5 minutes      |

| Proposed Next Meeting Agenda 6/26/02 | Person(s) Responsible | Time Estimated |
|--------------------------------------|-----------------------|----------------|
|                                      |                       |                |

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Jim Maurer/cp: 2/4/2003  
 Kavlico dPFE Sensor Core Team

0202-027 2003



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                     |                                                                                                    |                                                                                              |                       |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------|
| <b>Objective:</b>                                                                                   |                                                                                                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPPE Sensor</b> |                       |
| <b><u>Meeting Logistics</u></b>                                                                     |                                                                                                    |                                                                                              |                       |
| <b>Subject:</b>                                                                                     | Kavlico TM dPPE Sensor Core Team                                                                   |                                                                                              |                       |
| <b>Date:</b>                                                                                        | June 25, 2002                                                                                      |                                                                                              |                       |
| <b>Time:</b>                                                                                        | 1-3:00 p.m.                                                                                        |                                                                                              |                       |
| <b>Location:</b>                                                                                    | POEE, DI-196 (FMEI War Room)                                                                       |                                                                                              |                       |
| <b>Called By:</b>                                                                                   | Jim Maurer, Team Leader: (313) 39-03672                                                            |                                                                                              |                       |
| <b>Next Meeting (s):</b>                                                                            | June 27, 2002, Core Team Meeting<br>July 2, 2002, Core Team Meeting                                |                                                                                              |                       |
| <b>Conference Call-in Number(s):</b>                                                                | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-323-7125 |                                                                                              |                       |
| <b><u>Core Team Participants</u></b>                                                                |                                                                                                    |                                                                                              |                       |
| <b>Black Belts</b>                                                                                  | <b>Kavlico</b>                                                                                     | <b>Y-Busings</b>                                                                             | <b>Quality Office</b> |
| Mark Freeland                                                                                       | Mary Atkins                                                                                        | Jim O'Neill                                                                                  | Mahmoud Awad          |
| Shri Alolkar                                                                                        | Don Ayers                                                                                          | Freeman Gates                                                                                | Robert Rosal          |
| Jon Janda                                                                                           | Kyeong Park                                                                                        | Amy Potts                                                                                    |                       |
|                                                                                                     |                                                                                                    | Paul Plapette                                                                                |                       |
| <b>Team Leader</b>                                                                                  | <b>Visitor</b>                                                                                     | <b>Carol Verner</b>                                                                          | <b>PCSE</b>           |
| Jim Maurer                                                                                          | John Jabben                                                                                        |                                                                                              | Ken Arnold            |
|                                                                                                     |                                                                                                    |                                                                                              | Brian Perry           |
| <b><u>Meeting Agenda - 6/20/02</u></b>                                                              |                                                                                                    |                                                                                              |                       |
| <b>Order of Agenda Items</b>                                                                        | <b>Corr. Issue #</b>                                                                               | <b>Person(s) Responsible</b>                                                                 | <b>Time Allocated</b> |
| 1. Analytical Solutions 3 <sup>rd</sup> report on 2-test temperature tested parts.                  |                                                                                                    | Kyeong Park/All                                                                              | 30 minutes            |
| 2. Management Review dates/agenda                                                                   |                                                                                                    | Jim O'Neill                                                                                  | 5 minutes             |
| 3. Test vehicle status/update.                                                                      |                                                                                                    | Jim McCoy                                                                                    | 15 minutes            |
| 4. Accelerated Exhaust Condensate Exposure test on vehicle results.                                 |                                                                                                    | Mark Freeland                                                                                | 20 minutes            |
| 5. Nitric Acid and High Temperature test update.                                                    |                                                                                                    | Freeman Gates                                                                                | 20 minutes            |
| 6. Walk Ins                                                                                         |                                                                                                    | All                                                                                          |                       |
| <b><u>Proposed Next Meeting Agenda 6/27/02</u></b>                                                  |                                                                                                    |                                                                                              |                       |
|                                                                                                     | <b>Person(s) Responsible</b>                                                                       | <b>Time Estimated</b>                                                                        |                       |
|                                                                                                     |                                                                                                    |                                                                                              |                       |
| <b><u>Notes</u></b>                                                                                 |                                                                                                    |                                                                                              |                       |
| Bring handouts (paper copies) for all presentations                                                 |                                                                                                    |                                                                                              |                       |
| Provide electronic copies of presentations to sponsors2 (no later than 1 hour prior to the meeting) |                                                                                                    |                                                                                              |                       |
| Please be on time as we have a full agenda                                                          |                                                                                                    |                                                                                              |                       |

Jim Maurer/cpc 2/4/2003  
Kavlico dPPE Sensor Core Team

E982-027 25001



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                     |                                                                                                    |                                                                                              |                              |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------------------|
| <b>Objective:</b>                                                                                   |                                                                                                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b> |                              |
| <b><u>Meeting Logistics</u></b>                                                                     |                                                                                                    |                                                                                              |                              |
| <b>Subject:</b>                                                                                     | Kavlico TM dPFE Sensor Core Team                                                                   |                                                                                              |                              |
| <b>Date:</b>                                                                                        | June 27, 2002                                                                                      |                                                                                              |                              |
| <b>Time:</b>                                                                                        | 1-3:00 p.m.                                                                                        |                                                                                              |                              |
| <b>Location:</b>                                                                                    | POHE, DI-196 (FMEI War Room)                                                                       |                                                                                              |                              |
| <b>Called By:</b>                                                                                   | Jim Maurer, Team Leader: (313) 39-03672                                                            |                                                                                              |                              |
| <b>Next Meeting (s):</b>                                                                            | June 2, 2002, Core Team Meeting<br>July 9, 2002, Core Team Meeting                                 |                                                                                              |                              |
| <b>Conference Call-in Number(s):</b>                                                                | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6581436#<br>Kavlico Fax: 805-523-7125 |                                                                                              |                              |
| <b><u>Core Team Participants</u></b>                                                                |                                                                                                    |                                                                                              |                              |
| <b>Black Belts</b>                                                                                  | <b>Kavlico</b>                                                                                     | <b>V-Engine</b>                                                                              | <b>Quality Office</b>        |
| Mark Freeland                                                                                       | Mary Atkins                                                                                        | Jim O'Neill                                                                                  | Mahmoud Awad                 |
| Shri Akolkar                                                                                        | Don Ayers                                                                                          | Freeman Gates                                                                                |                              |
| Jon Janda                                                                                           | Kyong Park                                                                                         | Amy Potts                                                                                    |                              |
|                                                                                                     |                                                                                                    | Paul Plants                                                                                  |                              |
| <b>Team Leader</b>                                                                                  | <b>Visitor</b>                                                                                     | <b>PCSE</b>                                                                                  |                              |
| Jim Maurer                                                                                          | John Johnson                                                                                       | Ken Arnold                                                                                   |                              |
|                                                                                                     |                                                                                                    | Brian Perry                                                                                  |                              |
| <b><u>Meeting Agenda - 6/27/02</u></b>                                                              |                                                                                                    |                                                                                              |                              |
| <b><u>Order of Agenda Items</u></b>                                                                 | <b><u>Corr. Issue #</u></b>                                                                        | <b><u>Person(s) Responsible</u></b>                                                          | <b><u>Time Allocated</u></b> |
| 1. Continued discussions of 6/15 Analytical Sol. Ltr. M. Freeland's feedback from 6/26 Sol Lab mtg. |                                                                                                    | Mark Freeland/All                                                                            | 20 minutes                   |
| 2. Parser Data update                                                                               |                                                                                                    | Mary Atkins                                                                                  | 5 minutes                    |
| 3. Vehicle instrumentation/test status                                                              |                                                                                                    | Jim McCoy                                                                                    | 5 minutes                    |
| 4. Test plan for Norfolk DP field return part.                                                      |                                                                                                    | Brady Davies                                                                                 | 5 minutes                    |
| 5. Walk Ins                                                                                         |                                                                                                    | All                                                                                          | 30 minutes                   |
| <b><u>Proposed Next Meeting Agenda 6/27/02</u></b>                                                  |                                                                                                    |                                                                                              |                              |
|                                                                                                     | <b><u>Person(s) Responsible</u></b>                                                                | <b><u>Time Estimated</u></b>                                                                 |                              |
|                                                                                                     |                                                                                                    |                                                                                              |                              |
| <b><u>Notes</u></b>                                                                                 |                                                                                                    |                                                                                              |                              |
| Bring handouts (paper copies) for all presentations                                                 |                                                                                                    |                                                                                              |                              |
| Provide electronic copies of presentations to spoma2                                                |                                                                                                    | (no later than 1 hour prior to the meeting)                                                  |                              |
| Please be on time as we have a full agenda                                                          |                                                                                                    |                                                                                              |                              |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

EP002-027 2003.2



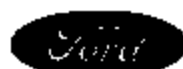
## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                                            |                                         |                                                                                                    |                         |              |                   |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------|--------------|-------------------|
| <b>Objective:</b>                                                                                                          |                                         | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>       |                         |              |                   |
| <b><u>Meeting Logistics</u></b>                                                                                            |                                         |                                                                                                    |                         |              |                   |
| <b>Subject:</b>                                                                                                            | Kavlico TM dPFE Sensor Core Team        |                                                                                                    |                         |              |                   |
| <b>Date:</b>                                                                                                               | July 25, 2002                           |                                                                                                    |                         |              |                   |
| <b>Time:</b>                                                                                                               | 1-3:00 p.m.                             |                                                                                                    |                         |              |                   |
| <b>Location:</b>                                                                                                           | POER, DI-196 (FMEI War Room)            |                                                                                                    |                         |              |                   |
| <b>Called By:</b>                                                                                                          | Jim Maurer, Team Leader: (313) 39-03672 |                                                                                                    |                         |              |                   |
| <b>Next Meeting (s):</b>                                                                                                   | August 1, 2002                          |                                                                                                    |                         |              |                   |
| <b>Conference Call-In Number(s):</b>                                                                                       |                                         | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-523-7125 |                         |              |                   |
| <b><u>Core Team Participants</u></b>                                                                                       |                                         |                                                                                                    |                         |              |                   |
| <b>Black Belt</b>                                                                                                          | <b>Kavlico</b>                          | <b>V-Engine</b>                                                                                    | <b>Quality Office</b>   | <b>EESE</b>  | <b>Purchasing</b> |
| Mark Frootland                                                                                                             | Mary Atkins                             | Jim O'Neill                                                                                        | Mahmoud Awad            | Sheran Alias | Chris Nielsen     |
| Shri Akolkar                                                                                                               | Don Ayers                               | Freeman Gates                                                                                      |                         | Robert Rossi | Bill McCarty      |
| Jon Janda                                                                                                                  | Kyong Park                              | Amy Poma                                                                                           |                         |              | Shri Reddy        |
|                                                                                                                            |                                         | Paul Plante                                                                                        |                         | <b>ECSE</b>  |                   |
| <b>Team Leader</b>                                                                                                         | <b>Vision</b>                           | Carol Verner                                                                                       |                         | Ken Arnold   |                   |
| Jim Maurer                                                                                                                 | John Jabshan                            |                                                                                                    |                         | Brian Perry  |                   |
| <b><u>Meeting Agenda - 7/25/02</u></b>                                                                                     |                                         |                                                                                                    |                         |              |                   |
| <b><u>Order of Agenda Items</u></b>                                                                                        | <b><u>Corr.</u></b>                     | <b><u>Person(s)</u></b>                                                                            | <b><u>Time</u></b>      |              |                   |
|                                                                                                                            | <b><u>Issue #</u></b>                   | <b><u>Responsible</u></b>                                                                          | <b><u>Allocated</u></b> |              |                   |
| 1. Ramon spectroscopy conclusions.                                                                                         | 13, A13                                 | Dahene Uy                                                                                          | 15 minutes              |              |                   |
| 2. Analytical Solutions Failure Analysis report questions (July 18 email from Paul Plant to Kyong, Sheran and Ed Sickafus. |                                         | Sheran Alias                                                                                       | 15 minutes              |              |                   |
| 3. Confirm Kavlico's visit to Ford 8/8-8/9.                                                                                |                                         | All                                                                                                | 5 minutes               |              |                   |
| 4. Issue Resolution overview.                                                                                              |                                         | Jon Janda                                                                                          | 10 minutes              |              |                   |
| 5. Vehicle Testing updates.                                                                                                | 16, A7                                  | Jim McCoy                                                                                          | 10 minutes              |              |                   |
| 6. Parylene Coating for fleet testing update                                                                               |                                         | Carol Verner                                                                                       | 5 minutes               |              |                   |

| <u>Proposed Next Meeting Agenda 7/25/02</u> | <u>Person(s) Responsible</u> | <u>Time Estimated</u> |
|---------------------------------------------|------------------------------|-----------------------|
|                                             |                              |                       |

|                                                      |                                             |
|------------------------------------------------------|---------------------------------------------|
| <b><u>Notes</u></b>                                  |                                             |
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| Provide electronic copies of presentations to spoma2 | (no later than 1 hour prior to the meeting) |
| Please be on time as we have a full agenda           |                                             |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                                             |                                         |                                                                                                    |                       |
|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------|
| <b>Objective:</b>                                                                                                           |                                         | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>       |                       |
| <b><u>Meeting Logistics</u></b>                                                                                             |                                         |                                                                                                    |                       |
| <b>Subject:</b>                                                                                                             | Kavlico TM dPFE Sensor Core Team        |                                                                                                    |                       |
| <b>Dates:</b>                                                                                                               | July 25, 2002                           |                                                                                                    |                       |
| <b>Time:</b>                                                                                                                | 1-3:00 p.m.                             |                                                                                                    |                       |
| <b>Location:</b>                                                                                                            | POEE, DI-196 (FMEI War Room)            |                                                                                                    |                       |
| <b>Called By:</b>                                                                                                           | Jim Maurer, Team Leader: (313) 39-03671 |                                                                                                    |                       |
| <b>Next Meeting (s):</b>                                                                                                    | August 1, 2002                          |                                                                                                    |                       |
| <b>Conference Call-In Number(s):</b>                                                                                        |                                         | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-523-7125 |                       |
| <b><u>Core Team Participants</u></b>                                                                                        |                                         |                                                                                                    |                       |
| <b>Black Belt</b>                                                                                                           | <b>Kavlico</b>                          | <b>V-Engine</b>                                                                                    | <b>Quality Office</b> |
| Mark Preeland                                                                                                               | Mary Atkins                             | Jim O'Neill                                                                                        | Mahmoud Awad          |
| Shri Akolkar                                                                                                                | Don Ayers                               | Freeman Gates                                                                                      | Sharan Allos          |
| Jon Janda                                                                                                                   | Kyong Park                              | Amy Poma                                                                                           | Robert Rossi          |
|                                                                                                                             |                                         | Paul Plante                                                                                        |                       |
| <b>Team Leader</b>                                                                                                          | <b>Visteon</b>                          | <b>FCSE</b>                                                                                        | <b>Purchasing</b>     |
| Jim Maurer                                                                                                                  | John Jahshan                            | Ken Arnold                                                                                         | Chris Nielsen         |
|                                                                                                                             |                                         | Brian Perry                                                                                        | Bill McCarty          |
|                                                                                                                             |                                         |                                                                                                    | Shri Roddy            |
| <b><u>Meeting Agenda - 7/25/02</u></b>                                                                                      |                                         |                                                                                                    |                       |
| <b>Order of Agenda Items</b>                                                                                                | <b>Corr. Issue #</b>                    | <b>Person(s) Responsible</b>                                                                       | <b>Time Allocated</b> |
| 1. Ramam spectroscopy conclusions.                                                                                          | B, A13                                  | Dakota Uy                                                                                          | 15 minutes            |
| 2. Analytical Solutions Failure Analysis report questions (July 18 email from Paul Plant to Kyong, Sharan and Ed Slickafus. |                                         | Sharan Allos                                                                                       | 15 minutes            |
| 3. Confirm Kavlico's visit to Ford tentative dates 8/8-8/9.                                                                 |                                         | All                                                                                                | 5 minutes             |
| 4. Issues Resolution overview.                                                                                              |                                         | Jon Janda                                                                                          | 10 minutes            |
| 5. Vehicle Testing updates.                                                                                                 | I6, A7                                  | Jim McCoy                                                                                          | 10 minutes            |
| 6. Parylene Coating for fleet testing update                                                                                |                                         | Carol Verner                                                                                       | 15 minutes            |
| 7. Walk In                                                                                                                  |                                         | All                                                                                                |                       |
| <b><u>Proposed Next Meeting Agenda 7/25/02</u></b>                                                                          |                                         |                                                                                                    |                       |
|                                                                                                                             | <b>Person(s) Responsible</b>            | <b>Time Estimated</b>                                                                              |                       |
|                                                                                                                             |                                         |                                                                                                    |                       |
| <b><u>Notes</u></b>                                                                                                         |                                         |                                                                                                    |                       |
| Bring handouts (paper copies) for all presentations                                                                         |                                         |                                                                                                    |                       |
| Provide electronic copies of presentations to apoma2 (no later than 1 hour prior to the meeting)                            |                                         |                                                                                                    |                       |
| Please be on time as we have a full agenda                                                                                  |                                         |                                                                                                    |                       |

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

EP02-027 20024

Kavlico TM dPFE Sensor  
14D Core Team Meeting  
Friday, December 14, 2001  
Time: 9-11:00 a.m.  
Conf. Room: POEE, CF087

**Agenda**

1. Establish Technical Leader.....Karen Owens
2. Establish Black Belt Assignee to Team.....All
3. Establish Team Meeting Dates and Times for 2002.....All
4. Discuss 1/4 Day Offsite / Technical Review Meeting..... All
5. Review Open Issues / add any if necessary.....All
6. Review Warranty Data / Stack Chart.....Mahmoud Awad



**Kavlico TM dPFE Sensor  
14D Core Team Meeting  
Tuesday, December 18, 2001  
Time: 1-3:00 p.m.  
Conf. Room: POEE, CF087**

**Agenda**

- 1. Finalize Technical Interfaces with Kavlico.....Mary Akins**
- 2. Review Warranty / Stack Chart.....Mahmoud Awad**
- 3. Review Open Issues and Action Items.....All**
- 4. Walk-ins / Additional Issues..... All**

## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                                                    |                                                                                              |                              |                       |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------------------|-----------------------|
| <b>Objective:</b>                                                                                  | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b> |                              |                       |
| <b><u>Meeting Logistics</u></b>                                                                    |                                                                                              |                              |                       |
| <b>Subject:</b>                                                                                    | Kavlico TM dPFE Sensor Core Team                                                             |                              |                       |
| <b>Date:</b>                                                                                       | February 26, 2002                                                                            |                              |                       |
| <b>Time:</b>                                                                                       | 1-3:00 p.m.                                                                                  |                              |                       |
| <b>Location:</b>                                                                                   | POHE, DI-196 (FMRI War Room)                                                                 |                              |                       |
| <b>Called By:</b>                                                                                  | Jim Maurer, Team Leader: (313) 39-03672                                                      |                              |                       |
| <b>Next Meeting (a):</b>                                                                           | March 5, 2002, DI-196, 1-2:30 p.m.<br>March 7, 2002, DI-196, 1-3:00 p.m.                     |                              |                       |
| <b>Conference Call-In Number(s):</b>                                                               | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#                        |                              |                       |
| <b><u>Core Team Participants</u></b>                                                               |                                                                                              |                              |                       |
| <b>Black Belts</b>                                                                                 | <b>Kavlico</b>                                                                               | <b>V-Engine</b>              | <b>Quality Office</b> |
| Mark Froeland                                                                                      | Mary Akins                                                                                   | Jim O'Neill                  | Mahmoud Awad          |
| Shri Akolkar                                                                                       | Don Ayers                                                                                    | Freeman Gates                | Kurt Schieding        |
| Jim Janda                                                                                          |                                                                                              | Chris Pasaretos              |                       |
|                                                                                                    |                                                                                              | Paul Plante                  |                       |
| <b>Team Leader</b>                                                                                 |                                                                                              | Carol Verner                 |                       |
| Jim Maurer                                                                                         |                                                                                              |                              |                       |
|                                                                                                    |                                                                                              |                              | <b>EESE</b>           |
|                                                                                                    |                                                                                              |                              | Sheran Allee          |
|                                                                                                    |                                                                                              |                              | Robert Roasi          |
|                                                                                                    |                                                                                              |                              | <b>PCSE</b>           |
|                                                                                                    |                                                                                              |                              | Ken Arnold            |
|                                                                                                    |                                                                                              |                              | Brian Perry           |
|                                                                                                    |                                                                                              |                              | <b>Purchasing</b>     |
|                                                                                                    |                                                                                              |                              | Joe Smythe            |
|                                                                                                    |                                                                                              |                              | Chris Nielsen         |
| <b><u>Meeting Agenda - 2/26/02</u></b>                                                             |                                                                                              |                              |                       |
| <b>Order of Agenda Items</b>                                                                       | <b>Corr. Item #</b>                                                                          | <b>Person(s) Responsible</b> | <b>Time Allocated</b> |
| 1. Introductions                                                                                   |                                                                                              | All                          | 5 minutes             |
| 2. Review of Kavlico work plan for UPAD                                                            | I3, A1                                                                                       | Jay Caffee                   | 10                    |
|                                                                                                    | I3, A3                                                                                       |                              |                       |
| 3. Overlay of Kavlico and Ford changes on stock chart                                              | I3, A1                                                                                       | Mahmoud Awad                 | 10                    |
| 4. Rick Williamson's analysis of F150 stall repairs                                                | I3, A1                                                                                       | All                          | 10                    |
| 5. Analysis of recently returned parts from vehicle assy. plants                                   |                                                                                              | All                          | 30                    |
| 6. Update on obtaining fleet vehicles from buy-back                                                | I6, A3 &                                                                                     | Carol Verner                 | 5                     |
| list/discussion of car requirements for testing                                                    | I10, A6,7                                                                                    |                              |                       |
| 7. Pressure/voltage data for Zedlink and SMI sensors                                               |                                                                                              | All                          | 5                     |
| 8. Walk-in's                                                                                       |                                                                                              |                              | 15                    |
| 9. Next meeting (3/5) agenda                                                                       |                                                                                              |                              | 5                     |
| <b><u>Proposed Next Meeting Agenda 3/5/02</u></b>                                                  |                                                                                              |                              |                       |
|                                                                                                    | <b>Person(s) Responsible</b>                                                                 | <b>Time Estimated</b>        |                       |
| Analysis of data from Kavlico returns                                                              | Louy Salalah                                                                                 | 20 minutes                   |                       |
| Parade of customer symptoms                                                                        | Mahmoud Awad                                                                                 | 10 minutes                   |                       |
| Update on vehicles for fleet/engineering                                                           | Carol Verner                                                                                 | 10 minutes                   |                       |
| Offsite assignments                                                                                | All                                                                                          | 30 minutes                   |                       |
| Vehicle electrical testing                                                                         | Rob Roasi                                                                                    | 20 minutes                   |                       |
| <b><u>Notes</u></b>                                                                                |                                                                                              |                              |                       |
| Bring handouts (paper copies) for all presentations                                                |                                                                                              |                              |                       |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |                                                                                              |                              |                       |

Jim Maurer/op: 2/4/2003  
Kavlico dPFE Sensor Core Team



Please be on time as we have a full agenda

8002-027 2000

Jim Maurer/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Meeting Logistics**

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Dates:** April 4, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POEE, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** April 9, 2002, Core Team Meeting  
 April 11, 2002, Core Team Meeting

**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-531-6574

**Core Team Participants**

|                    |                |                  |                       |              |                       |
|--------------------|----------------|------------------|-----------------------|--------------|-----------------------|
| <b>Black Belts</b> | <b>Kavlico</b> | <b>V-Engine</b>  | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b>     |
| Mark Freeland      | Mary Atkins    | Jim O'Neill      | Mahmoud Awad          | Sheran Alles | Chris Nielsen         |
| Shri Akolkar       | Don Ayers      | Freeman Gates    |                       | Robert Rossi | Bill McCarty          |
| Jon Janda          |                | Chris Pascarella |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante      |                       | <b>ECSE</b>  |                       |
| <b>Team Leader</b> |                | Carol Verner     |                       | Ken Arnold   |                       |
| Jim Maurer         |                |                  |                       | Brian Perry  |                       |

**Meeting Agenda - 4/04/02**

| <b>Order of Agenda Items</b>                                                      | <b>Corr. Issue #</b> | <b>Person(s) Responsible</b> | <b>Time Allocated</b> |
|-----------------------------------------------------------------------------------|----------------------|------------------------------|-----------------------|
| 1. Introductions                                                                  |                      | All                          | 5 minutes             |
| 2. VOQ data update & EPRC paper                                                   |                      | Paul Plante                  | 10 minutes            |
| 3. Results of Analysis of outstanding Plant returns                               | I3, A3               | Terry Tanashiro              | 10 minutes            |
| 4. Update on Wiring Harness Root Causes / findings                                | various              | Sheran Alles, Robert Rossi   | 15 minutes            |
| 5. Investigation of Stalls - Status                                               | I3, A9               | Jon Janda, Mahmood Awad      | 15 minutes            |
| 6. Outside Lab - Non disclosure agreement, work plan, objectives                  | I5, A5               | Kyong Park                   | 10 minutes            |
| 7. Results of "in process testing" of current production vs. warranty UPAD parts. | I5, A6               | Freeman Gates                | 15 minutes            |
| 8. One pager on MRB wafer usage for production                                    |                      | Kyong Park                   | 10 minutes            |
| 9. Walk-ins                                                                       |                      | Freeman Gates                | 10 minutes            |
| 10. Next Meeting Agenda Items                                                     |                      | All                          | 10 minutes            |

| <b>Proposed Next Meeting Agenda 4/09/02</b>                | <b>Person(s) Responsible</b> | <b>Time Estimated</b> |
|------------------------------------------------------------|------------------------------|-----------------------|
| Service part volume projections                            | John Shore                   | 10                    |
| PCM solder crack issue & current draw to stall the vehicle | John Joshua                  | 10                    |

**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/cp: 2/4/2003  
 Kavlico dPFE Sensor Core Team

E002-027 2/003



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                                                      |                                                                                                         |                       |                       |              |             |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|--------------|-------------|
| <b>Objective:</b>                                                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>            |                       |                       |              |             |
| <b>Meeting Logistics</b>                                             |                                                                                                         |                       |                       |              |             |
| <b>Subject:</b>                                                      | Kavlico TM dPFE Sensor Core Team                                                                        |                       |                       |              |             |
| <b>Date:</b>                                                         | January 10, 2002                                                                                        |                       |                       |              |             |
| <b>Time:</b>                                                         | 1:00 - 3:00 p.m.                                                                                        |                       |                       |              |             |
| <b>Location:</b>                                                     | POEE, DI-196 (FMEI War Room)                                                                            |                       |                       |              |             |
| <b>Called By:</b>                                                    | Karen Owens, Team Leader: (313) 84-55770                                                                |                       |                       |              |             |
| <b>Next Meeting (s):</b>                                             | January 15, 2002, 12:00-2:00 p.m., POEE DI-196 (War Room)<br>January 17, 2002, 1-3:00 p.m., POEE DI-196 |                       |                       |              |             |
| <b>Core Team Participants</b>                                        |                                                                                                         |                       |                       |              |             |
| <b>Black Belt</b>                                                    | <b>Kavlion</b>                                                                                          | <b>V-Engine</b>       | <b>Quality Office</b> | <b>EESE</b>  | <b>PTSE</b> |
| Mark Freeland                                                        | Mary Akina                                                                                              | Jim O'Neill           | Mahmoud Awad          | Sheran Alles | Ken Arnold  |
|                                                                      | Don Ayers                                                                                               | Freeman Gates         | Kurt Schieding        | Robert Rossi |             |
| <b>Team Leader</b>                                                   |                                                                                                         | Chris Penaratos       | Joe Smythe            |              |             |
| Karen Owens                                                          |                                                                                                         | Paul Plante           |                       |              |             |
|                                                                      |                                                                                                         | Carol Verner          |                       |              |             |
| <b>Meeting Agenda - 1/10/02</b>                                      |                                                                                                         |                       |                       |              |             |
| <b>Order of Agenda Items</b>                                         | <b>Person(s) Responsible</b>                                                                            | <b>Time Allocated</b> |                       |              |             |
| 1. Corrections to last meeting minutes                               | All                                                                                                     | 5 minutes             |                       |              |             |
| 2. Kavlico field return parts analysis/binning                       | Mark Freeland, Mary Akina                                                                               | 15 minutes            |                       |              |             |
| 3. Clean Data/Part No. for Transient Voltage Spike Protection Sensor | Mary Akina                                                                                              | 10 minutes            |                       |              |             |
| 4. "Best of the Best: 2002 MY 4.0L Explorer and Staffs               | Mahmoud Awad                                                                                            | 10 minutes            |                       |              |             |
| 5. Technical Offsite Date (1/24/02 or 1/31/02)                       | All                                                                                                     | 10 minutes            |                       |              |             |
| 6. Website Information                                               | Dave Tyler, Karen Owens                                                                                 | 5 minutes             |                       |              |             |
| 7. John Koznewak Agenda review: 1/15/02, 12-2:00 pm., War Room       | All                                                                                                     | 15 minutes            |                       |              |             |
| 8. Walk Ins                                                          | All                                                                                                     | 15 minutes            |                       |              |             |
| 9. Next Meeting Agenda Items                                         | All                                                                                                     | 10 minutes            |                       |              |             |
| <b>Notes</b>                                                         |                                                                                                         |                       |                       |              |             |
| Bring handouts (paper copies) for all presentations                  |                                                                                                         |                       |                       |              |             |
| Provide electronic copies of presentations to CPANARET               |                                                                                                         |                       |                       |              |             |

K. Owens/op: 2/4/2003  
Kavlico dPFE Sensor Core Team

ES10-427 23000

*CONFIDENTIAL*

## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

### Meeting Logistics

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** January 10, 2002  
**Time:** 1:00 - 3:00 p.m.  
**Location:** POEE, DI-196 (FMEI War Room)  
**Called By:** Karen Owens, Team Leader: (313) 84-55770  
**Next Meeting (s):** January 15, 2002, 12:00-2:00 p.m., POEE DI-196 (War Room)  
 January 17, 2002, 1-3:00 p.m., POEE DI-196

### Core Team Participants

|                    |                |                  |                       |              |             |
|--------------------|----------------|------------------|-----------------------|--------------|-------------|
| <b>Black Belt</b>  | <b>Kavlion</b> | <b>V-Engine</b>  | <b>Quality Office</b> | <b>RHSB</b>  | <b>PTSB</b> |
| Mark Freeland      | Mary Akins     | Jim O'Neill      | Mahmoud Awad          | Sheran Altes | Ken Arnold  |
|                    | Don Ayers      | Freeman Gates    | Kurt Schmieding       | Robert Rosal |             |
| <b>Team Leader</b> |                | Chris Panaristos | Joe Smythe            |              |             |
| Karen Owens        |                | Paul Plante      | Carol Verner          |              |             |

### Meeting Agenda - 1/10/02

| <u>Order of Agenda Items</u>                                         | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|----------------------------------------------------------------------|------------------------------|-----------------------|
| 1. Corrections to last meeting minutes                               | All                          | 5 minutes             |
| 2. Kavlico field return parts analysis/binning                       | Mark Freeland, Mary Akins    | 15 minutes            |
| 3. Clean Data/Part No. for Transient Voltage Spike Protection Sensor | Mary Akins                   | 10 minutes            |
| 4. "Best of the Best" 2002 MY 4.0L Explorer and Stalls               | Mahmoud Awad                 | 10 minutes            |
| 5. Technical Office Date (1/24/02 or 1/31/02)                        | All                          | 10 minutes            |
| 6. Website Information                                               | Dave Tyler, Karen Owens      | 5 minutes             |
| 7. John Koszewnik Agenda review: 1/15/02, 12-2:00 pm., War Room      | All                          | 15 minutes            |
| 8. Walk Ins                                                          | All                          | 15 minutes            |
| 9. Next Meeting Agenda Items                                         | All                          | 10 minutes            |

### Notes

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET

K. Owens/cp: 2/4/2003  
 Kavlico dPFE Sensor Core Team

1002-027 20001



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

### Meeting Logistics

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** January 15, 2002  
**Time:** Noon-2:00 p.m.  
**Location:** POBE, DI-196 (PMH War Room)  
**Called By:** Karen Owens, Team Leader: (313) 84-55770  
**Next Meeting (s):** January 17, 2002, 1-3:00 p.m., POBE DI-196  
January 22, 2002, 1-3:00 p.m., POBE DI-196

### Core Team Participants

|                    |                |                 |                       |              |             |
|--------------------|----------------|-----------------|-----------------------|--------------|-------------|
| <b>Black Belt</b>  | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>ERSE</b>  | <b>PTSE</b> |
| Mark Freeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sharon Allen | Ken Arnold  |
|                    | Don Ayers      | Freeman Gates   | Kurt Schieding        | Robert Rossi |             |
| <b>Team Leader</b> |                | Chris Panaritis | Joe Smyth             |              |             |
| Karen Owens        |                | Paul Plante     |                       |              |             |
|                    |                | Carol Verner    |                       |              |             |

### Meeting Agenda - 1/15/02

| <u>Order of Agenda Items</u>                                                                  | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|-----------------------------------------------------------------------------------------------|------------------------------|-----------------------|
| 1. Introduction                                                                               | All                          | 5 minutes             |
| 2. Agenda Review                                                                              | All                          | 5 minutes             |
| 3. Corrections to last meeting minutes                                                        | All                          | 5 minutes             |
| 4. Reliability: 5 Worst Applications and "Best of the Best: 2002 MY 4.0L Explorer and Stille" | Mahmoud Awad                 | 20 minutes            |
| 5. Review Updates to 14D                                                                      | Karen Owens                  | 10 minutes            |
| 6. Update One-page Overview                                                                   | Paul Plante                  | 10 minutes            |
| 7. One-page Technical Paper                                                                   | Freeman Gates                | 15 minutes            |
| 8. Kavlico Update                                                                             | Mark Freeland                | 20 minutes            |
| 9. Walk-in's                                                                                  | All                          | 10 minutes            |
| 10. Next Meeting Agenda Items                                                                 | All                          | 10 minutes            |

### Notes

Bring handouts (paper copies) for all presentations  
Provide electronic copies of presentations to CPANARET

# MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPPE Sensor

## Meeting Logistics

**Subject:** Kavlico TM dPPE Sensor Core Team  
**Date:** January 17, 2002  
**Time:** 1-3:00 p.m.  
**Location:** POHE, DI-196 (FMEI War Room)  
**Called By:** Karen Owens, Team Leader: (313) 84-55770  
**Next Meeting (s):** January 22, 2002, 1-3:00 p.m., POHE DI-196  
 January 24, 2002, 1-3:00 p.m., POHE DI-196  
**Conference Call-in Number:** 9-1-954-1149 (inside Ford); 847-619-6158 (outside)

## Core Team Participants

|                                    |                                            |                                                                                                   |                                                         |                                            |                                                  |
|------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|--------------------------------------------------|
| <b>Black Belt</b><br>Mark Freeland | <b>Kavlico</b><br>Mary Atkins<br>Don Ayers | <b>V-Engine</b><br>Jim O'Neill<br>Freeman Gates<br>Chris Panaretos<br>Paul Plante<br>Carol Verner | <b>Quality Office</b><br>Mahmond Awad<br>Kurt Schieding | <b>RESE</b><br>Sherm Allen<br>Robert Roest | <b>Purchasing</b><br>Joe Smythe<br>Chris Nielsen |
| <b>Team Leader</b><br>Karen Owens  |                                            |                                                                                                   |                                                         | <b>PCSE</b><br>Ken Arnold<br>Brian Perry   |                                                  |

## Meeting Agenda - 1/17/02

| <u>Order of Agenda Items</u>                                            | <u>Person(s) Responsible</u> | <u>Time Allocated</u> |
|-------------------------------------------------------------------------|------------------------------|-----------------------|
| 1. Introductions                                                        | All                          | 5 minutes             |
| 2. Agenda Review                                                        | All                          | 5 minutes             |
| 3. Corrections to last meeting minutes                                  | All                          | 5 minutes             |
| 4. STA Issues and Kavlico Trip (1/22-1/25/02) Overview                  | Joe Smythe                   | 30 minutes            |
| 5. Technical Offsite 1/31/02: Agenda and Facilities                     | Freeman Gates                | 30 minutes            |
| 6. Kavlico Update: Return parts analysis                                | Don Ayers                    | 10 minutes            |
| 7. Engine Fleet Issue: 1/7/02 sensor release procedure                  | Joe Johnson                  | 5 minutes             |
| 8. Open Issues and Assignments timing due Friday 1/18 (for 1/22 agenda) | Paul Plante                  | 5 minutes             |
| 9. Walk-in's                                                            | All                          | 20 minutes            |
| 10. Next Meeting Agenda Items                                           | All                          | 5 minutes             |

## Notes

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET





## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                   |                                                                                              |  |  |  |  |
|-------------------|----------------------------------------------------------------------------------------------|--|--|--|--|
| <b>Objective:</b> | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b> |  |  |  |  |
|-------------------|----------------------------------------------------------------------------------------------|--|--|--|--|

|                                      |                                                                                          |  |  |  |  |
|--------------------------------------|------------------------------------------------------------------------------------------|--|--|--|--|
| <b><u>Meeting Logistics</u></b>      |                                                                                          |  |  |  |  |
| <b>Subject:</b>                      | Kavlico TM dPFE Sensor Core Team                                                         |  |  |  |  |
| <b>Date:</b>                         | January 22, 2002                                                                         |  |  |  |  |
| <b>Time:</b>                         | 1-2:30 p.m.                                                                              |  |  |  |  |
| <b>Location:</b>                     | POEE, DI-196 (FMET War Room)                                                             |  |  |  |  |
| <b>Called By:</b>                    | Karen Owens, Team Leader: (313) 84-55770                                                 |  |  |  |  |
| <b>Next Meeting (s):</b>             | January 24, 2002, 1-3:00 p.m., POEE DI-196<br>January 29, 2002, 1-2:30 p.m., POEE DI-196 |  |  |  |  |
| <b>Conference Call-In Number(s):</b> | 9-1-954-1149 (inside Ford); 847-619-6158 (outside)    Passcode: 6881436#                 |  |  |  |  |

|                                      |                |                 |                       |              |                   |
|--------------------------------------|----------------|-----------------|-----------------------|--------------|-------------------|
| <b><u>Core Team Participants</u></b> |                |                 |                       |              |                   |
| <b>Black Belt</b>                    | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b> |
| Mark Freeland                        | Mary Akins     | Jim O'Neill     | Mahmoud Awad          | Sheran Allen | Joe Smythe        |
|                                      | Don Ayers      | Freeman Gates   | Kurt Schieding        | Robert Rossi | Chris Nielsen     |
| <b><u>Team Leader</u></b>            |                | Chris Panaretos |                       |              |                   |
| Karen Owens                          |                | Paul Plante     |                       | <b>PCSE</b>  |                   |
|                                      |                | Carol Verner    |                       | Ken Arnold   |                   |
|                                      |                |                 |                       | Brian Perry  |                   |

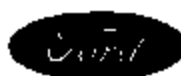
|                                                                               |                             |                    |
|-------------------------------------------------------------------------------|-----------------------------|--------------------|
| <b><u>Meeting Agenda - 1/22/02</u></b>                                        |                             |                    |
| <b><u>Order of Agenda Items</u></b>                                           | <b><u>Person(s)</u></b>     | <b><u>Time</u></b> |
| 1. Introductions                                                              | All                         | 1 minute           |
| 2. Agenda Review                                                              | All                         | 1 minute           |
| 3. Corrections to last meeting minutes                                        | All                         | 3 minutes          |
| 4. Purchasing issues and overview                                             | John Shore                  | 25 minutes         |
| 5. J. Padilla review summary                                                  | Freeman Gates               | 10 minutes         |
| 6. Field returns analysis                                                     | Mark Freeland,<br>Don Ayers | 10 minutes         |
| 7. Wiring Harness noise concerns                                              | Brian Perry, Sheran Allen   | 15 minutes         |
| 8. Technical Office agenda (1/31/02)                                          | Freeman Gates               | 5 minutes          |
| 9. Kavlico sensor field service parts availability and old stock purge status | All                         | 5 minutes          |
| 10. Open Issues/Assignments list items                                        | All                         | 5 minutes          |
| 11. Walk-in's                                                                 | All                         | 5 minutes          |
| 12. Next Meeting Agenda Items                                                 | All                         | 5 minutes          |

|                                                        |
|--------------------------------------------------------|
| <b><u>Notes</u></b>                                    |
| Bring handouts (paper copies) for all presentations    |
| Provide electronic copies of presentations to CPANARET |
| Please be on time as we have a full agenda             |

K. Owens/cp: 2/4/2003  
Kavlico dPFE Sensor Core Team

E062-027 2003-1



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                   |                                                                                              |
|-------------------|----------------------------------------------------------------------------------------------|
| <b>Objective:</b> | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b> |
|-------------------|----------------------------------------------------------------------------------------------|

|                                      |                                                                                         |
|--------------------------------------|-----------------------------------------------------------------------------------------|
| <b><u>Meeting Logistics</u></b>      |                                                                                         |
| <b>Subject:</b>                      | Kavlico TM dPFE Sensor Core Team                                                        |
| <b>Date:</b>                         | January 24, 2002                                                                        |
| <b>Time:</b>                         | 1-3:00 p.m.                                                                             |
| <b>Location:</b>                     | POEE, DI-196 (FMEI War Room)                                                            |
| <b>Called By:</b>                    | Karen Owens, Team Leader: (313) 84-35770                                                |
| <b>Next Meeting (s):</b>             | January 29, 2002, 1-2:30 p.m., POEE DI-196<br>January 31, 2002, Technical Office - FTDC |
| <b>Conference Call-In Number(s):</b> | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#                   |

|                                      |                       |                        |                              |                    |                          |
|--------------------------------------|-----------------------|------------------------|------------------------------|--------------------|--------------------------|
| <b><u>Core Team Participants</u></b> |                       |                        |                              |                    |                          |
| <b><u>Black Belt</u></b>             | <b><u>Kavlico</u></b> | <b><u>V-Engine</u></b> | <b><u>Quality Office</u></b> | <b><u>EESE</u></b> | <b><u>Purchasing</u></b> |
| Mark Froeland                        | Mary Akina            | Jim O'Neill            | Mahmoud Awad                 | Sharan Alles       | Joe Smythe               |
|                                      | Don Ayers             | Freeman Gates          | Kurt Schieding               | Robert Rossi       | Chris Nielsen            |
| <b><u>Team Leader</u></b>            |                       | Chris Panaretos        |                              |                    |                          |
| Karen Owens                          |                       | Paul Plants            |                              | <b><u>PCSE</u></b> |                          |
|                                      |                       | Carol Verner           |                              | Ken Arnold         |                          |
|                                      |                       |                        |                              | Brian Perry        |                          |

|                                                                       |                                     |                              |  |
|-----------------------------------------------------------------------|-------------------------------------|------------------------------|--|
| <b><u>Meeting Agenda - 1/24/02</u></b>                                |                                     |                              |  |
| <b><u>Order of Agenda Items</u></b>                                   | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |  |
| 1. Introductions                                                      | All                                 | 1 minute                     |  |
| 2. Agenda Review                                                      | All                                 | 1 minute                     |  |
| 3. Purchasing issues and overview                                     | John Shore                          | 20 minutes                   |  |
| 4. Kavlico overproduction available for service fix                   | J. Costines (Kavlico)               | 5 minutes                    |  |
| 5. Technical Office agenda (1/31/02)                                  | Freeman Gates                       | 20 minutes                   |  |
| 6. Motorola implementation status for J. Koszewski/D. Szczepak review | Joe Johnson                         | 10 minutes                   |  |
| 7. 01/02 sensor release process update and service purge stock        | Karen Owens                         | 5 minutes                    |  |
| 8. Kavlico sensor D&R responsibility                                  | Jim O'Neill                         | 5 minutes                    |  |
| 9. Black-belt help for Mark Froeland (data mining and analysis)       | Jim O'Neill                         | 3 minutes                    |  |
| 10. Open Issues/Assignments list items                                | All                                 | 25 minutes                   |  |
| 11. Walk-in's                                                         | All                                 | 20 minutes                   |  |
| 12. Next Meeting Agenda Items                                         | All                                 | 5 minutes                    |  |

|                                                        |
|--------------------------------------------------------|
| <b><u>Notes</u></b>                                    |
| Bring handouts (paper copies) for all presentations    |
| Provide electronic copies of presentations to CPANARET |
| Please be on time as we have a full agenda             |

K. Owens/op: 2/4/2003  
Kavlico dPFE Sensor Core Team

E002-027 20003

Kavlico TM dPFE Sensor  
14D Core Team Meeting  
Tuesday, January 8, 2002  
Time: 1-2:30 p.m.  
Conf. Room: DI-196

**Attendees:** M. Akins, S. Alles, M. Awad, M. Freeland, F. Gates, J. Johnson, D. Muter, J. O'Neill, K. Owens, C. Panaretos, P. Plante, D. Popoff, R. Rossi, J. Smythe, C. Verner, J. Jahsan, K. Arnold, B. Perry, J. Deeb, B. Bugaj, L. Williams

**Meeting Minutes:**

1. **Introduce new members (all):** New team members/presenters attended are: Doreen Muter, Dan Popoff, Joe Smythe, John Jahshan, Ken Arnold, Brian Perry, Joseph Deeb, Barry Bugaj (Kavlico) and Les Williams. Paul Plante gave a brief overview of project status. Reviewed roster to ensure the key players are involved.
2. **Overview discussion of issue for new members from Summary One Pager (Paul Plante):** One page Field Action Summary Paper was reviewed by team. Mark Freeland gave overview, 30% of problem is still TBD. Some items could still be in "catch all". Meeting with Kavlico took place last Friday at FRL to review transient damage.
3. **Pick "best of best" comparator vehicle (Mahmoud Awad):** 2002 MY 4.0L SOHC Explorer/Mountaineer is "best of best". Presented overheads on EGR Sensor Risk Assessments: All dPFE Sensor Warranty by Application (R/1000 @ 3 MIS; Correlation between 2.0L zetec Focus stalls and sensors; 3.0L stalls and no starts and sensor repairs; 2.0L stalls and no starts and sensor repairs; D21 Engine Stalls Study; 2.0L Zetec Focus concerns; F150 4.6L concerns; 3.0L Escape concerns.
4. **Bob Dalbo (Les Williams) review of 3.0L Escape stalls concern.** Electrical actions with calibration were reviewed and implemented successfully. Les shared the Is-Is Not and Fishbone diagrams that showed Phantom Stall (EEC, Wiring Harness, EVAP Assembly) and addressed work in progress. Anything that can cause stall was put on chart.
5. **Leaders Issues:** (1) Karen Owens: Meeting minutes will contain assignments. We will manage the meetings and project to issues deck. Please submit data to Chris, subject to Karen's review. (2) Chris Panaretos: Would like to put all documents on a shared drive; (3) Need to know exact day of offsite. Will discuss both at next meeting.

**Next meeting (1/10/02, 1-3:00 p.m., D196 Conf. Room) preliminary agenda items:**

- Kavlico field return parts analysis/binning (Mark Freeland/Mary Akins): All Focus analyzed (except 8/01). Now having problem matching to part. Take parts and see if we can find to fit into category.
- Discussion of shared drive access and offsite date (Karen Owens)

***\*\* NOTE: Please bring handouts to meeting if you are planning to present***

**Assignments:**

- **All:** Review open issues and return updates with estimated action item completion dates to Chris Panaretos by 1/11/02.
- **Mary Akins:** Provide a clean date (e-mail from Kavlico Ca. office) and part numbers for transient voltage spike protection sensor.

Kavlico dPFE Sensor Meeting Minutes  
February 12, 2002  
1-2:30 p.m.  
POEB, CR DI-196 (FMEI War Room)

**Attendees:** Brady Davison, Kyong Park, Terry Tamashiro, Don Ayers (Kavlico). Mary Akina, Sheran Allen, Ken Arnold, Mahmoud Awad, Freeman Gates, John Jabotian, Jim Maurer, Chris Panaretos, Brian Perry, Paul Plante, Robert Rossi, Carol Verner, Mike Pickett (Engine Systems).

**Proposed J. Koszwnik Review 2/22/02 and Tech Review 2/28/02 - Paul Plante:** The 14D will be used as the key document for the tech review. Paul will meet with Jim Maurer and Freeman Gates to update in preparation for this. We will also refer to the "open issues deck" that Chris Panaretos has been working on. **Assignment:** Chris Panaretos will send an updated issues deck to the team, including Kavlico, when changes are received. The team is to get changes to Chris by noon on Friday, 2/15/02.

**Component bench test results: Low failure rate - Kyong Park (Kavlico):** Kavlico was asked to give test results based on Jim Maurer and Freeman Gates discussion of in-process containment and bond pad corrosion. Looking for signs of corrosion and what is the accept/reject criteria. Tests to date at Kavlico indicate no evidence of corrosion w/gel. They have been shipping tested out UPAD wafers to Freeman for inspection. Freeman needs to know when change/issues occurred at SMI. Need to know all changes with respective dates to overlay on stack chart and see where Kavlico actions align with our data. **Assignment:** Kavlico to provide revised test procedures, discuss with Freeman offline. Freeman to set up meeting. Mahmoud Awad to send Kavlico copy of meeting discussion of Fleet Test Plan.

**Field returns analysis at Kavlico - Terry Tamashiro (Kavlico):** Terry walked through the "Visual Inspection Plan at the end of Fleet Tests" flow chart and "14D Ford TMDI Investigation". **Assignment:** Kavlico should be completed with testing up through step 13 (Submit to S Lab) by 2/22/02. He will report out on his findings at that time. Mary Akina to provide AWS reports to Kavlico today or tomorrow.

**DV/FV Test Plan, Bench and Fleet Vehicles - Mahmoud Awad, Terry Tamashiro:** A mini-meeting already took place this week to talk about the test plan; Mahmoud provided minutes. Another meeting will be held later this week based on bench test plan that Freeman Gates and Jim Maurer worked on with Kavlico. **Assignment:** The team will summarize their findings at next Tuesday's team meeting (2/19/02).

**Wiring Harness Noise concerns, OA work plan and conclusions - Sheran Allen, Robert Rossi:** Mark Froeland and Robert Rossi met as follow-up to offsite. Took vehicle measurements, tried duplicate test - not able to see any differences. Conclusion: Noise not of sufficient energy to cause damage to parts. Still question of high frequency. **Assignment:** Still need to look at Escape and other vehicles w/warranty returns. Test parts for transient duration to latch-up sensor and compare to Kavlico tests. Robert Rossi will generate a work plan and send to critical team members (including Kavlico); get agreement on the plan; come up with results and conclusions based on the plan. Will be completed in 2 weeks. Will have workplan by 2/19; findings by 2/26.

**Next Agenda (preliminary):**

Open Issues / Assignments List Updates - All

Data Mining and Analysis Update - Mahmoud Awad, Mark Froeland

Align all Kavlico actions with R1000 Stack Charts - Mahmoud Awad, Don Ayers

Pareto of Failure Symptoms - Approach to look at warranty data - Mahmoud Awad

Kavlico TM dPFE Sensor  
14D Core Team Meeting  
Friday, December 14, 2001  
Time: 9-11:00 a.m.  
Conf. Room: POBE, CF087

*Ford Motor Company*

Attendees: Mahmoud Awad, Mark Freeland, Freeman Gates, Karen Owens, Chris Panaretos, Paul Plante, Carol Verner, Joe Johnson

#### Meeting Minutes

1. **Establish Technical Leader:** Team Leader: Karen Owens. Freeman is expert in total EGR system design and function. Mark Freeland will be communicator. Focal Point should be area of responsibility for Sensor. Freeman would be micro level vs. macro level. Mark Freeland dedicated to Focus (8% of total). Mike Giordano, supervisor to engineer Dan Popov (will be Focus rep to our team). *Freeman lead, Mark support.*
2. **Establish Black Belt Assignee to Team:** Karen and Paul met with several people; Adam Denev will coordinate, *Basem El-Haik is manager who will make decision with Karen in January. She will put proposal out to the team for feedback. Put on agenda in January.*
3. **Establish Team Meeting Dates and Times for 2002:** *Tuesday, from 1-2:00, War Room. Thursday, from 1-2:00 will be scheduled by Chris in the CF087. She will see Annette Cowans to arrange. Reserve rooms for 2 hours vs. 1. Send out notice after changing book and confirming with Sandra King. Keep 1-2:30 for Tuesdays, or check with Raoul ? (scheduled at 2:30). See Paul to move him. JJK requested report out on January 15 (big/first meeting on this issue). Currently set up from 12:00 - 2:00. Will go over details of 14D, key assignments, help from John, tie into other organizations. Need to talk to Mary Akins to tie Kavlico into this meeting: Don Ayers (technical interface?). He should be on the audio conference. Chris will get call in number and passcode for Tuesdays - see Karen for instructions. Chris will rearrange Tuesday the 8<sup>th</sup> meeting. Refer to Paul if problem (#1 campaign issue).*
4. **Discuss ½ Day Offsite / Technical Review Meeting:** Brainstorming, Fishbone, Is/Is Not. Freeman will introduce the total EGR system to the team, Karen should lead. Intended audience will learn how the system functions from a technical standpoint. Look at some of the noise factors around the dPFE sensor that caused us to fail under certain conditions. Will set the groundwork or brainstorming for fresh eyes review. Mark added that afterward we need to get into detail to understand the different failures. Need to have Kavlico and failure analysis personnel. Do Pareto of parts returned. Freeman will do introduction of the system, Mark can follow with analysis of failure modes. Mahmoud can then review the data analysis. *Chris will arrange for room at FTDC (get contacts from Paul). Freeman and Mark need to meet to discuss all parameters. Bob Dalbo should be invited to first Tuesday meeting of next year. Will be talking about 3.0 L Escape/Tribute intermittent stall. Need to assign the Black Belt and technical support*

*before we have this offsite. Right now it looks like 1/24. Confirmed date will be set when we meet first Thursday back (January 3).*

5. **Update Roster:** Assign full-time Kavlico technical lead: John Koszewnik. *Karen will take to Jim O'Neill for John's approval. See updated roster (attendance/spreadsheet) for Kavlico adds. Chris will go back over and identify core working group (put asterisk next to names in main spreadsheet), put in org chart format (by organization: V-Engine, Quality Office, EESE, PTSE, Kavlico -- send Paul the list for identification). Send copy of excel roster to Paul for distribution. Set up distribution lists and send him those.*
6. **Review Open Issues / add any if necessary:** Mark questioned filtering out or putting the closed action items at the end. Question of responsibility: should it be the core team responsible person, or the ultimate decision maker? Ran out of time to review issues and action items. *Will review at next Tuesday's meeting.*
7. **Review "One Pager": Field Action Summary Paper:** Freeman commented on customer feedback: Check Engine light will come on with no symptoms of breakdown. Paul recommended that Pareto be done from AWS or CQIS. Mahmoud responsible, contact Rick Williamson to figure out how to get the best data. Mark Freeland recommended we add "frequency" to replace "priority". Joe added the avg. cost per repair was incorrect. Sensor replacement only? Does not include mark-up of price. *Paul will add/change the document per today's discussions.*
8. **Review Warranty Data / Stack Chart:** Mahmoud Awad: Leader for analysis. Ran out of time; *put on agenda for Tuesday.*

---

**Full Name:** John Jahshan  
**Last Name:** Jahshan  
**First Name:** John  
**Company:** Visteon  
  
**Business:** (734) 886-2759  
  
**E-mail:** jjahshan@visteon.com  
  
**PalmPilot Category:** Section

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**From:** Perry, Brian (B.J.)  
**Sent:** Monday, January 14, 2002 3:16 PM  
**To:** Gates, Freeman (F.G.); Owens, Karen (K.E.); Panaretos, Christine (C.M.); Freeland, Mark (M.); Plante, Paul (P.G.)  
**Cc:** Alles, Sheran (S.A.); Pascany, Ken (K.M.); Arnold, Kenneth (K.M.); Rosal, Roberto (R.A.); John Jahahan (E-mail)  
**Subject:** RE: Kavlico TM dPFE Sensor Meeting Agenda 1/15/02

Sharon Alles and I would like to discuss noise measurements on the Focus (per my previous questions to the team). I would like this subject added to the agenda for 1/15.

I would like to establish

- Is there a noise concern on particular vehicles (Implication is yes, I would like data to confirm)
- What is the required noise immunity for the improved DPFE
- What wiring improvements are required

If beneficial, we can use the Motorola noise fingerprinting facility to help with the capture of this data.

Regards,

**Brian J. Perry**

Supervisor - C170, U231 & Outsourced Control Systems  
GCE-PCSE-Powertrain Electronic Applications  
Phone/Fax (313) 39-04170 POEE Bldg MD 75, Cube AP-062

-----Original Message-----

**From:** Panaretos, Christine (C.M.)  
**Sent:** Monday, January 14, 2002 11:40 AM  
**To:** Koszewnik, John (J.J.); Paschl, Frank (F.); Alina, Mary (M.); Albrecht, Guenter (G.K.); Alles, Sheran (S.A.); Arnold, Kenneth (K.M.); Auler, Jim (J.E.); Awad, Mahmoud (M.I.); Ayers, Don; Bandozka, Pete (P.F.); Bansek, Catherine (C.K.); Bersuder, Lee (L.C.); Bied, Gerry (G.); Bronni, Mark (M.J.); Davies, Brady; Deeb, Joe (J.S.); Freeland, Mark (M.); Gates, Freeman (F.G.); Giordano, Mike (M.A.); Johnson, Joe (J.H.); Kapp, Dan (Daniel R.); Karsal, Karen (K.J.); Kunde, Olf (O.); Masura, Gordon (G.P.); McCarty, Bill (W.D.); Nielsen, Christian (C.A.); O'Neill, Jim (J.D.); Oswald, Greg (G.G.); Owens, Karen (K.E.); Panaretos, Christine (C.M.); Park, Kyong; Perry, Brian (B.J.); Plante, Paul (P.G.); Popoff, Daniel (D.M.); Rosal, Roberto (R.A.); Schieding, Kurt (K.J.); Shore, John (J.); Smythe, Joseph (J.M.); Tameshiro, Terry; Verner, Carol (C.J.); White-Johnson, Patrice (P.); Williamson, Richard (E.); Wilson, Cary (C.A.)  
**Subject:** Kavlico TM dPFE Sensor Meeting Agenda 1/15/02

Attached please find the agenda for the Kavlico dPFE Sensor team meeting, which will be held tomorrow, 1/15/02, from noon-2:00 p.m. in the DI-198 Conference Room. This is the "war room" located at the far south-end of the building.

If you have any questions, please do not hesitate to contact me.

<< File: Kavlico Meeting Format\_011502.doc >>

*Chris Panaretos*

Project Manager, Project Solutions, LLC.  
Ford POEE, Components "B"  
(313) 24-88337  
Fax: (313) 32-29265



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**From:** Perry, Brian (B.J.)  
**Sent:** Thursday, January 10, 2002 2:48 PM  
**To:** Stoltz, Thomas (T.J.)  
**Subject:** PCM specifications/SDS questions

What are the levels of transient noise spike immunity we specify for PCM inputs to prevent damage? I don't see anything on the SDSs, it may be in the ES (which I have not looked at).

VREF SDS indicates the circuit must be buffered. However, it is only the BVREF that is buffered. VREF usage in EEC is not buffered. We need to change this specification.

These both relate to the DPFE VREF latch issue (I can explain further if you are unaware of this).

Regards,

**Brian J. Perry**

Supervisor - C170, U231 & Outsourced Control Systems

GCE-PCSE-Powertrain Electronic Applications

Phone/Fax (313) 38-04170 POEE Bldg MD 75, Cube AP-082

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From: Perry, Brian (B.J.)  
Sent: Thursday, May 16, 2002 12:08 PM  
To: Gates, Freeman (F.C.); APOMA2 was deleted 20030215; Piarra, Paul (P.G.); Freedland, Mark (M.)  
Cc: 'Jahshan, John (J.H.)'  
Subject: RE: Issues resolution meeting data

I do not see it as our responsibility to champion gathering environmental data on the DFFE system. We have no expertise in this since we have never been even remotely involved on any other programs.

This needs to be coordinated between EGR systems, Engine systems and the program PT team.

We are not part of the PT that everyone is referencing here. These are application specific teams that work in the CBG's. We do not work for the CBGs.

I don't want to give the impression we are not a team players, however we can't absorb tasks that our activity has no involvement or prior experience in.

Brian J. Perry  
Supervisor - C170, U231 & Outsourced Control Systems  
GCE-PCSE-Powertrain Electronic Applications  
Phone/Fax: (313) 39-04170  
Cube AP-062 POEE MailDrop 75

-----Original Message-----

From: Poma, Amy (A.) [mailto:apoma2@ford.com]  
Sent: Wednesday, May 15, 2002 9:18 AM  
To: Gates, Freeman (F.C.); 'jjahshan@vistec.com'  
Subject: Issues resolution meeting data

John, Brian, Freeman:

John, I advised Paul of our conversation at yesterday's meeting in that you spoke with Brian regarding getting the pressure, pulsation and temperature information requested. Please see his response noted below: Please advise if there is still a problem. Thanks.

\*Amy pass on to these (3). If they need further explanation, ask at Thursday team meeting or call Me.

Brian/John/Freeman: The issue was getting pressure and temperature data associated with the sensor. PT traditionally has that data thru vehicle testing in Arizona (APG) or other sites. We are trying to make use of existing data to minimize the work. John is the ONLY PT rep at our meetings. I need John or Brian to lead and coordinate this work. It is NOT electronic work, but again it is PT. Can you get the right PT people to supply this data ASAP?"

John, can you please forward this to Brian, I'm unsure of his email address. Thanks.

Amy Poma  
V-Engine Engineering-Project Mgmt.

EP02-027 20021

POKE Building, FMEI Cube CQ-156  
phone-313-390-8849, fax: 313-390-4084  
apoma2@ford.com

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**From:** Sebald, Lynn (L.A.)  
**Sent:** Thursday, December 13, 2001 9:58 AM  
**To:** Perry, Brian (B.J.)  
**Cc:** Orris Sr., Steve (S.J.)  
**Subject:** FW: Kavlico VREF Latchdown

FYI, new news.

-----Original Message-----

**From:** Benz, Greg (G.H.)  
**Sent:** Thursday, December 13, 2001 9:46 AM  
**To:** Matysiewicz, Edwin (E.J.)  
**Cc:** Williams, Les (LHW.); Kostermann, Eric (E.); Fournelle, Gilbert (G.); Delbo, Bob (R.J.); Sebald, Lynn (L.A.)  
**Subject:** RE: Kavlico VREF Latchdown

No, I'm not familiar with that issue. Ed, what's the background on C170? Is it a likely cross-carline problem?

-----Original Message-----

**From:** Delbo, Bob (R.J.)  
**Sent:** Wednesday, December 12, 2001 6:44 PM  
**To:** Benz, Greg (G.H.)  
**Cc:** Williams, Les (LHW.); Kostermann, Eric (E.); Fournelle, Gilbert (G.)  
**Subject:** Kavlico VREF Latchdown

Greg,

Are you familiar with the Focus issue where Ignition coil pulses couple onto the DPFE sensor and latch VREF to ground (killing the EEC)? If so, what is the 2001/2 3.0L Escape's exposure to this issue?

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, North American Truck  
Phone: (313)24-84947 Fax: (313)32-31788  
Pager: (313)786-2859 E-mail: [rdalbo@ford.com](mailto:rdalbo@ford.com)

**Subject:** FW: Kavlico DPFE EGR Sensor Pre-Review (for 3/28 Tech Review)  
**Location:** J. Kozewnik's Conf. Rm. (AA140, POEE)  
**Start:** Fri 3/22/2002 1:00 PM  
**End:** Fri 3/22/2002 2:00 PM  
**Show Time As:** Tentative  
**Recurrence:** (none)  
**Meeting Status:** Not yet responded  
**Required Attendees:** Perry, Brian (B.J.); Patel, Anup (A.M.)  
**Optional Attendees:** Aulter, Jim (J.E.); Schram, Tim (T.D.); Figurski, Patrick (P.M.); Onie Sr., Steve (S.J.); Allen, Bill (William R.)

Anup and I have been requested to support this DPFE 14D Tech review. Basically there are two categories of customer issues that are associated with the DPFE failure issue;

1. MIL and stumble
2. No start/stall

#### High Level Root Cause for #1

##### 1. DPFE sensor failure CAUSED BY;

- Lack of robustness to transient voltage spikes (although within Ford spec)
- Mask misalignment
- Unprotected area damage
- Sensor corrosion

Containment actions have been implemented or identified for the root causes above, however detailed root causes are not established for some items.

Long term correction involves switching to a Motorola sensor.

#### High Level Root cause for #2

##### 2. PCM resets CAUSED BY;

- VREF short to ground CAUSED BY
  - DPFE sensor internal VREF short to ground CAUSED BY;
  - root causes from #1

We do not feel a containment action is needed for #2. Long term corrective action is to move to BVREF on PowerPC application.

The team continues to bring up that the PCM SDS guidelines were not followed in this product. The VREF or BVREF SDS indicates this circuit is buffered and that a short to VREF shall not inhibit module operation. I have told them that this SDS was really intended for PowerPC products and that the SDS did not exist when the EEC families were designed, but it does not indicate that in the SDSs.

#### -----Original Appointment-----

**From:** Porcely, Sue (S.E.) On Behalf Of Kozewnik, John (J.J.)  
**Sent:** Friday, March 15, 2002 11:09 AM  
**To:** Kozewnik, John (J.J.); O'Neill, Jim (J.D.); Maurer, James (J.S.); Gates, Freeman (F.C.); Prestland, Mark (M.); Plante, Paul (P.G.); Kozewnik, John (J.J.)  
**Subject:** DPFE EGR Sensor Pre-Review (for 3/28 Tech Review)  
**Where:** Friday, March 22, 2002 1:00 PM-2:00 PM (GMT-05:00) Eastern Time (US & Canada).  
**Where:** J. Kozewnik's Conf. Rm. (AA140, POEE)

**Subject:** FW: Kavlico TM dPFE Sensor Technical Offsite  
**Location:** FTDC (Room 161 - South Building)  
**Start:** Thu 1/31/2002 8:00 AM  
**End:** Thu 1/31/2002 5:00 PM  
**Show Time As:** Tentative  
**Recurrence:** (none)  
**Meeting Status:** Not yet responded  
**Required Attendees:** Orris Sr., Steve (S.J.); Schram, Tim (T.D.)

Please provide someone from module configuration for this DPFE meeting. The team is asking some module specific questions that I cannot adequately answer:

- Possibilities for making the EEC more robust to VREF shorts
- Reasons for varying levels of max VREF current the module can sustain before reset (design, internal VREF load,...)

The team has been meeting twice a week T/Th 1-3, the Thursday meeting is an all day session to help determine the remaining root causes and containment actions. Thanks.

—Original Appointment—

**From:** Panaretos, Christine (C.M.)  
**Sent:** Thursday, January 24, 2002 4:10 PM  
**To:** Panaretos, Christine (C.M.); Alins, Mary (M.); Alins, Sharon (S.A.); Awad, Mahmoud (M.I.); Freeland, Mark (M.); Gates, Freeman (F.G.); O'Neill, Jim (J.D.); Owens, Karen (K.E.); Panaretos, Christine (C.M.); Perry, Brian (B.J.); Pianta, Paul (P.G.); Rosol, Roberto (R.A.); Smythe, Joseph (J.M.); Varner, Carol (C.L.); Johnson, Joe (J.H.); Hengas, Jon (.); Popoff, Daniel (D.M.); Schiading, Kurt (K.I.); Denhoff, Gary (G.L.)  
**Subject:** Updated: Kavlico TM dPFE Sensor Technical Offsite  
**Where:** Thursday, January 31, 2002 8:00 AM-5:00 PM (GMT-05:00) Eastern Time (US & Canada),  
**Where:** FTDC (Room 161 - South Building)

This is the final confirmation for the Kavlico dPFE Technical Offsite. It will be held at the FTDC, South Building, in room 161. There will be an overhead projector, "flip charts", and a TV w/VCR available for use. Please provide an electronic copy of your presentation to CPANARET no later than c.o.b. on Tuesday, January 29, if you are a presenter.

Attached is the agenda for your review. If you have any questions regarding the agenda, please contact Freeman Gates.



Kavlico TM DPFE  
Systems Techni...



## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                      |                                                                                                    |  |  |
|--------------------------------------|----------------------------------------------------------------------------------------------------|--|--|
| <b>Objective:</b>                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>       |  |  |
| <b><u>Meeting Logistics</u></b>      |                                                                                                    |  |  |
| <b>Subject:</b>                      | Kavlico TM dPFE Sensor Core Team                                                                   |  |  |
| <b>Dates:</b>                        | April 30, 2002                                                                                     |  |  |
| <b>Time:</b>                         | 1-2:30 p.m.                                                                                        |  |  |
| <b>Location:</b>                     | POBR, DI-196 (FMBI War Room)                                                                       |  |  |
| <b>Called By:</b>                    | Jim Maurer, Team Leader: (313) 39-03672                                                            |  |  |
| <b>Next Meeting (s):</b>             | May 2, 2002, Core Team Meeting<br>May 7, 2002, Core Team Meeting                                   |  |  |
| <b>Conference Call-In Number(s):</b> | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-531-6574 |  |  |

|                                      |                |                 |                       |               |                       |
|--------------------------------------|----------------|-----------------|-----------------------|---------------|-----------------------|
| <b><u>Core Team Participants</u></b> |                |                 |                       |               |                       |
| <b>Black Belt</b>                    | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>   | <b>Purchasing</b>     |
| Mark Freeland                        | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sherran Alles | Chris Nielsen         |
| Shri Akolkar                         | Don Ayers      | Freeman Gates   |                       | Robert Rossi  | Bill McCarty          |
| Jon Janda                            |                | Chris Panaretos |                       |               | Patrice White-Johnson |
|                                      |                | Paul Plante     |                       | <b>PCSE</b>   |                       |
| <b>Team Leader</b>                   |                | Carol Verner    |                       | Ken Arnold    |                       |
| Jim Maurer                           |                |                 |                       | Brian Perry   |                       |

| <b><u>Meeting Agenda - 4/30/02</u></b>                                              |                            |                                     |                              |  |
|-------------------------------------------------------------------------------------|----------------------------|-------------------------------------|------------------------------|--|
| <b><u>Order of Agenda Items</u></b>                                                 | <b><u>Corr. Item #</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Allocated</u></b> |  |
| 1. Introductions                                                                    |                            | All                                 | 5 minutes                    |  |
| 2. FRL Update of UPAD                                                               | I3, A2                     | Mark Freeland                       | 15 minutes                   |  |
| 3. Update on Body and Assembly plant failures                                       | I3, A3                     | Don Ayers                           | 10 minutes                   |  |
| 4. PCM update: Voltage drop between v-out and signal return                         | I3, A5                     | Brian Perry, John Jahshan           | 10 minutes                   |  |
| 5. Outside Lab / Non disclosure agreement - status                                  | I5, A5                     | Bill McCarty                        | 5 minutes                    |  |
| 6. Update on "In Process" acid tested parts; Discussion of chemical analysis of gel | I5, A6, A8                 | Kyong Park, Mark Freeland           | 15 minutes                   |  |
| 7. Update on obtaining vehicles and high-mileage parts for FRL analysis             | I6, A5, A6                 | Jim Maurer (John Fira)              | 10 minutes                   |  |
| 8. Walk-ins                                                                         |                            | All                                 | 10 minutes                   |  |
| 9. Next Meeting Agenda Items                                                        |                            | All                                 | 5 minutes                    |  |

| <b><u>Proposed Next Meeting Agenda 5/2/02</u></b> | <b><u>Person(s) Responsible</u></b> | <b><u>Time Estimated</u></b> |
|---------------------------------------------------|-------------------------------------|------------------------------|
|                                                   |                                     |                              |
|                                                   |                                     |                              |
|                                                   |                                     |                              |

| <b><u>Notes</u></b>                                                                                |  |
|----------------------------------------------------------------------------------------------------|--|
| Bring handouts (paper copies) for all presentations                                                |  |
| Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting) |  |
| Please be on time as we have a full agenda                                                         |  |

Jim Maurer/op: 3/3/2003  
Kavlico dPFE Sensor Core Team

EVS2-627 20000

**From:** King, Robert (R.F.)  
**Sent:** Monday, May 06, 2002 11:26 AM  
**To:** Dripps, David (D.S.)  
**Cc:** Rosignol, Oscar (O.); Roberson, Tefee (T.L.); Suarez, Rhoe (R.); Altoonian, Don (D.J.); Corbett, Sandra (S.M.)  
**Subject:** RE: Escape stalling

If the entire TSB & ISM have been done, I have no additional technical suggestions. Why has this dealer not been in contact with the TSO National Hotline? I cannot find a report in CQIS. Has this concern ever been verified?

CSQ15D3                      CQIS Report Retrieval                      05/06/02 11:19:19

Vehicle Identification Number (VIN): 1FMYU03182KB01074  
Indicator type: T

F1 Help F2 Print-Detail Report F3 Exit F10 Print-Detail Report F12 Return  
With Warranty  
E0210-NO REPORTS FOUND FOR THE GIVEN VIN.                      LPENJB12

Don or Sandy, does your team have any additional suggestions/recommendations?

Rhoe, Does the stall team have any additional recommendations?

*Ford* "The Most Wanted Car on the American Road" since 1952

Robert King  
LHD Escape/Maverick PCSD Program Manager  
PVT & Field Support, Vehicle Service & Programs  
Kansas City Assembly Plant (816) 459-1872, fax 459-1726

-----Original Message-----

**From:** Dripps, David (D.S.)  
**Sent:** Monday, May 06, 2002 10:07 AM  
**To:** King, Robert (R.F.)  
**Cc:** Rosignol, Oscar (O.); Roberson, Tefee (T.L.)  
**Subject:** Escape stalling

We discussed several weeks ago an Escape with an intermittent stall. You advised to replace the flapper valve and clear out the vapor lines. The customer has called back and said it has cut off again on him and no longer wants the vehicle.

Here is a list of the parts replaced:

- 1) PCM reprogrammed
- 2) Power relay is the design specified in TSB.
- 3) Mass air flow (twice) 1L2Z-12B579-BARM
- 4) Purge Valve (twice) YL8Z-9C916-AB
- 5) Separator Valve XF2Z-9B328-AA
- 6) Regulator valve YL8Z-9C916-AA
- 7) DFPE YF1Z-9J460-AC
- 8) Throttle body YL8Z-9E926-DA
- 9) IAC YF1Z-9F715-AA
- 10) Ignition switch YS4Z-11672-CA

The vin is: 1FMYU03182KB01074; Miles: 3600.



Do you have any suggestions on what may be making this thing cut out? I think the customer is beyond working with us on this one, but we would still like to see it resolved. Let me know what you think. You can call me at 678-358-8458.

**From:**  
**Sent:**  
**To:**

Lerta, A ( )  
Wednesday, January 09, 2003 8:13 AM  
Amin, Mike (M.J.); Ashburn, Paul (P.J.); Bambenek, Chuck (C.L.); Baughman, Thomas (T.D.); Beckers, Willy (W.); Bejune, Daniel (D.C.); Benedict, Andy (A.J.); Bennett, Mike (M.L.); Bersuder, Lee (L.C.); Bethell, Dave (D.); Beuckelmann, Philip (P.R.); Biekup, Robert (R.T.); Bissel, Garry (G.); Blackburn, Thomas (T.J.); Boddie Jr., Will (W.W.); Boerger, Jim (J.G.); Bradley, Joe (J.C.); Breenihan Jr., Terry (T.J.); Buczkowski, Jim (J.A.); Charlick, Peter (P.C.); Christensen, Kris (K.S.); Clatti, Carlos (C.A.); Cieglo, David (D.V.); Clachka, Sue (Susan M.); Claudeplaire, Dale (D.); Clayton, Chris (C.N.); Clemens, Roger (R.D.); CMAZZORI was deleted 20021130; Conrad, James (J.A.); Cosgrove, Bill (W.J.); Cupka, Richard (R.D.); Curran, Judith (J.M.); Dahne, Susan (S.M.); Dierker Jr., Joseph (J.B.); Douglass, Jim (J.B.); Edwards, Sherry (S.D.); Eisenhower, Gary (G.D.); Emerson, Ashley (A.); English, Rob (R.E.); Eum, James (J.S.); Falahee, Tom (T.M.); Fash, James Jay (J.W.); Ferrence, Mike (M.L.); Garrett, Dave (D.M.); Geraghty, Brian (B.J.); Giola, Nancy (N.L.); Goerling, Kimberly (K.L.); Gossler, Louise (L.K.); Gomez-Mesquita, Art (A.B.); Grandinett, Dave (D.H.); Gubert, Keith (K.W.); Harrigan Sr., Mike (M.J.); Hafner, Rachel (R.E.); Heyman, Skip (S.J.); Hilborn, Theresa (T.O.); Hines, Bob (R.S.); Hoewener, Todd (T.H.); Holland, Shirlene (S.); Holmes, Keith (K.E.); Hotta, Mark-Tami (M.T.); Houlander, Bron (B.A.); Ickes, Bill (B.K.); Ingls, Martin (I.M.); Jandrusch, Tom (T.D.); Jeshurun, David (D.R.); JZYCHOWI was deleted 20021203; Kapadia, Mahendra (M.A.); Kapur, Dee (D.T.); Kattinas, Dana (D.J.); Kirkish, Sarah (S.L.); Kleer, Kurt (K.W.); Krafcik, John (J.F.); Krygier, Roman (R.J.); Kurze, Rudolf (R.J.); Kuzak, Derrick (D.M.); Leach, Martin (M.); Leffert, Kyle (K.R.); Ligon, Frank (F.M.); Liu, Jane (J.); Lyek, Kevin (K.M.); Masloff, Bruce (B.J.); Mahaffey, Jo (J.L.); Main, Jeremy (J.J.); Marecki, Michael (M.F.); Martens, Phil (P.R.); Masura, Gordon (G.P.); Mazzillo, Marco Aurelio (M.A.); McCloskey, Lori (L.A.); McInerney, John (J.T.); Merdeth, Marcus (M.E.); Nacowicz, Roy (R.A.); Nowka, Erich (E.J.); Oakwood, Chris (J.C.); Oldfield, James (J.H.); Osborne, William (W.H.); Oswald, Greg (G.G.); Parry-Jones, Richard (R.); Patel, Bharat (B.J.); Perri, Ron (R.J.); Plantie, Paul (P.G.); Plaud, Zaida (Z.); Powers, Ken (K.W.); Randle, Paul (P.R.); Raquepau, Aiden (A.P.); Ray, Glenn (G.E.); Ridenour Jr., Jack (J.); Rintamaki, John (J.M.); Ritter, Suzanne (S.M.); Ross, Dennis (Dennis E.); Rosal, Roberto (R.A.); Ruth, Richard (R.R.); Sabatle, Christine (C.R.); Saleg, John (J.R.); Sakloka Jr., John (J.K.); Saybolt, Tom (T.L.); Schmidt, Norm (N.G.); Schramek, Joseph (J.E.); Shawver, Kim (K.A.); Shipp, Terri (T.L.); Sime, Michael (M.A.); Smith, Bernie (B.E.); Smith, Jana (J.L.); Sole, Fred (F.L.); Stevenson II, Robb (A.R.); Svenson, Thomas (T.E.); Szalay, Michael (M.A.); Tatge, John (J.F.); Theodore, Chris (C.P.); Thomas, Malcolm (M.C.); Trout, Brooke (B.L.T.); Trujillo, Thomas (T.G.); Tummonds, Paul (P.A.); Valle, Dan (D.J.); Van Dorn, Scott (J.S.); VanDecaveye, Andrew (A.); Vegh, Paul (P.F.); Vert, Nancy (N.B.); Voelker, Martin (M.C.); Vondalis, James (J.P.); Vought, Brian (B.K.); White, Douglas (D.B.); Whitens, Mike (M.J.); Williams, Michael (M.T.); Wilyard, Dan (D.J.); Witkowski, Paul (P.C.); Woodring, Chris (C.A.); Wright, Mary Ann (M.A.); Yeager, Debbe (D.); Zane, Jim (J.E.); Zevalkink, Mike (M.R.); Zimmerman, Martin (M.B.)  
**Subject:** Alerts for the month of December



december 02.doc

Please find attached Alerts for the month of December 2002. Thanks.

In December, 2002 no new safety investigations involving Ford vehicles were opened by the National Highway Traffic Safety Administration (NHTSA). No existing investigations were upgraded, and one current investigation was closed. No new non-compliance investigations were initiated.

**NEW SAFETY DEFECT INVESTIGATIONS:**

None

**UPGRADED SAFETY DEFECT INVESTIGATIONS:**

None

**CLOSED SAFETY DEFECT INVESTIGATIONS:**

1. EA02-008 – 1997 Ford Escort and Mercury Tracer – Water Ingestion Into the Integrated Air Bag Monitor
  - Alleged defect: Water from the air conditioning system, engine coolant from the heater core, or other liquids may contaminate the IABM which may result in air bag readiness light illumination; In very rare instances, unintended airbag deployment, melted wiring, or fire may occur.
  - Number of allegedly related complaints received by NHTSA: 229 reports possibly related to contamination of the IABM, including 208 submitted by Ford, were identified
  - Number of alleged accidents/injuries/fatalities: No accidents, six injuries and no fatalities related to the condition are alleged
  - Number of vehicles potentially affected: Approximately 398,217 in the US, with a total of 441,422 world-wide
  - Other:
    - NHTSA closed the investigation based on Ford's voluntary safety recall 02S44 that will install a shield over the IAMB and apply nyogel grease to the electrical connector on all 1997 Escort and Tracer vehicles

**OPEN NHTSA SAFETY DEFECT INVESTIGATIONS:**

For your reference, the following is a listing of NHTSA investigations open as of December 31, 2002:

| Investigation Number | Vehicle                                | Model Year              | Subject/<br>Alleged Defect                                                       |
|----------------------|----------------------------------------|-------------------------|----------------------------------------------------------------------------------|
| <b>- Car -</b>       |                                        |                         |                                                                                  |
| EA01-012             | Lincoln Continental                    | 1999-00                 | Inadvertent Side Air Bag Deployment                                              |
| EA02-017             | Focus                                  | 2000-01                 | Air Bag Burn Injuries/Vehicle Fires                                              |
| EA02-022             | Focus                                  | 2000-01                 | Engine Stalling                                                                  |
| EA02-023             | Focus                                  | 2000-02                 | Front Suspension Lower Control Arm Failure                                       |
| EA02-025             | Town/Cr Vio Grand Mq                   | 1992-1994               | Engine Compartment Fire                                                          |
| PE02-071             | Crown Victoria                         | All OEM CNG Fuel System | Compressed Natural Gas (CNG) Tank Bursting                                       |
| PE02-080             | Taurus/Sable                           | 1999                    | Front Suspension Coil Spring Failure                                             |
| PE02-085             | Windstar                               | 1998-00                 | Wheel Lug Bolt Breakage                                                          |
| RQ02-011             | Windstar                               | 1995-98                 | Fuel Tank Fatigue Cracking                                                       |
| <b>- Truck -</b>     |                                        |                         |                                                                                  |
| AQ01-002             | F-650/F-750/<br>F-Super Duty Motorhome | 1999-00                 | TRW 20-EDL Ball Socket Assembly Used in Certain Tie Rod and Drag Link Assemblies |
| EA01-009             | Super Duty F-Series                    | 1999                    | Steering Sector Shaft Fracture                                                   |
| EA02-001             | F-150/F-250                            | 1997-98                 | Steering Intermediate Shaft Separation                                           |
| EA02-010             | Explorer/<br>Mountaineer               | 2002                    | Clockspring Wiring Assembly                                                      |
| EA02-011             | Explorer                               | 1995                    | Safety Belt Assembly Failure                                                     |

|          |                                     |           |                                         |
|----------|-------------------------------------|-----------|-----------------------------------------|
| EA02-018 | E-Series/<br>F-Series/<br>Excursion | 1999-01   | Tire Valve Stem Failure                 |
| EA02-027 | Escape/<br>Tribute                  | 2001-02   | Engine Stalling                         |
| PE02-070 | E-350                               | 1996-1997 | Brake Hose Failures                     |
| PE02-078 | Aerostar Van                        | 1992-1994 | Rear Hatch Strut and<br>Mounting System |

## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

**Objective:** Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Dates:** March 21, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POBE, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** March 25, 2002, Technical Review (CCRG)  
 March 26, 2002, Core Team Meeting  
 March 28, 2002, Core Team Meeting  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-531-6574

## Core Team Participants

|                    |                |                 |                       |              |                   |
|--------------------|----------------|-----------------|-----------------------|--------------|-------------------|
| <b>Black Belts</b> | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b> |
| Mark Freeland      | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sheran Allos | Joe Smythe        |
| Shri Akolkar       | Don Ayers      | Freeman Gates   |                       | Robert Rossi | Chris Nielsen     |
| Jon Janda          |                | Chris Panaretos |                       |              |                   |
|                    |                | Paul Plants     |                       | <b>PCSE</b>  |                   |
| <b>Team Leader</b> |                | Carol Verner    |                       | Ken Arnold   |                   |
| Jim Maurer         |                |                 |                       | Brian Perry  |                   |

## Meeting Agenda - 3/21/02

| <u>Order of Agenda Items</u>                                                    | <u>Corr. 14D #</u> | <u>Person(s) Responsible</u>  | <u>Time Allocated</u> |
|---------------------------------------------------------------------------------|--------------------|-------------------------------|-----------------------|
| 1. Introductions                                                                |                    | All                           | 5 minutes             |
| 2. Update from FCSD (Julie Mercer)                                              | 1, c               | Carol Verner                  | 10 minutes            |
| 3. Supporting Documents to Explain Root Cause (P-Diag, Is/Is Not, Cause/Effect) | 2, a               | Jon Janda, Shri Akolkar       | 10 minutes            |
| 4. Transient Voltage Test Results                                               | 3, a               | Mark Freeland                 | 20 minutes            |
| 5. AWS Results / Additional Graphs                                              | 3, d               | Mahmoud Awad                  | 10 minutes            |
| 6. SREA number and date from Kavlico                                            | 4, a               | Mary Atkins                   | 5 minutes             |
| 7. Body Electric Actions - Findings to Date                                     | 4, a               | Robert Rossi                  | 15 minutes            |
| 8. Acid Test Results: Overview document in pareto or spreadsheet format         | 5, ii              | Kyong Park<br>Terry Tamashiro | 15 minutes            |
| 9. Comment from Kavlico on capacity issue                                       | 10                 | Barry Bugaj                   | 10 minutes            |
| 10. New Financial Figures based on Carol's findings                             | 12                 | Jim Maurer                    | 5 minutes             |
| 11. Finalize presentation to Technical Review                                   |                    | All                           | 15 minutes            |

## Proposed Next Meeting Agenda 3/26/02

## Person(s) Responsible

## Time Estimated

**TOM TRUJIALLO Q.G.C.**

## Notes

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/cp: 3/21/02  
 Kavlico dPFE Sensor Core Team

**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, April 10, 2002 11:31 AM  
**To:** 'Chuck Fugate'; Bauer, Scott (S.C.)  
**Cc:** Munoz, Kathleen (K.); Souchock, Peter (P.D.); Dalbo, Bob (R.J.)  
**Subject:** RE: Escape VINs

These are all customers with stalling complaints, correct?

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Chuck Fugate [[mailto:Chuck\\_Fugate@polk.com](mailto:Chuck_Fugate@polk.com)]  
**Sent:** Wednesday, April 10, 2002 11:23 AM  
**To:** [sbauer@ford.com](mailto:sbauer@ford.com)  
**Cc:** [kmunoz2@ford.com](mailto:kmunoz2@ford.com); [psouchoc@ford.com](mailto:psouchoc@ford.com); [rdalbo@ford.com](mailto:rdalbo@ford.com)  
**Subject:** Escape VINs

To all:

Attached is the Escape file with appended name, address and phone numbers, where available.

I have sent you only the VINs with phone numbers - around 700 records.

Please contact me if you have any questions.

Chuck Fugate  
Account Executive  
248.728.7459  
[chuck\\_fugate@polk.com](mailto:chuck_fugate@polk.com)

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\*\*\*\*\*

**From:** Williams, Lee (LHW.)  
**Sent:** Wednesday, January 30, 2002 8:35 PM  
**To:** Alkoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhattacharj, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Ranuka (R.V.); Hansen, George (G.C.); Harr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ishikawa, Jyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanel, Shihji (S.); King, Robert (R.F.); Koestermann, Eric (E.); Kwon, Soon (S.K.); Limtaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehnen, Eric (E.A.); Marck, Edmond (E.C.); Mateos, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Navsed Khan; Nematollahi, Sorya (S.); Nikolai, Bernie; Notsboom, Jim (J.E.); Orman, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquapau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kian (K.C.); Shirahshi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhas (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vacchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Young, Lam (L.)  
**Subject:** Staff Meeting Minutes 1/29/02

SSM# 15589 is released. Great Job Rhas Suarez and Team.  
Marty Price is putting finishing touches on ISM. Nice work!  
Les Williams editing TSB currently.

**Items for next meeting**

1. Don Jordan: Hella Relay issue and Suspect wiring update.
2. Scott Moorhouse: Info on ICCD and on-line test inquiry with Pete Lindy
3. Cary Powell: Air leak test quantitative data, Control plan and 8D from Standt, weighing of dust boxes.

  
Vehicle Staff  
Meeting Minutes...

Regards,  
Lee Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786



DATE

PRIORITY

8/14/00

3

8/17/00

3

8/22/00

3

8/23/00

3

8/24/00

3

9/6/00

3

9/7/00

3

9/18/00

3

9/19/00

3

9/20/00

3

11/22/00

3

11/27/00

3

11/28/00

3

5/4/01

3

6/17/01

6/18/01

6/19/01

6/25/01

3

$$\begin{array}{r} 6 \overline{) 22} \\ 6 \overline{) 19} \end{array}$$

6/25/01  
6/19/01  
3/9/01  
12/1/00  
11/27/00

1 19 01  
11 22 00

9/19/50

9/7/00

2110

2/24/90

$$\frac{1}{2} \left( \frac{1}{2} \right) = \frac{1}{4}$$

8 | 17 | 00

६१.५१ / १००

①

**Freeland, Mark (M.)**

---

**From:** Naushad Hossain [N-Hossain@kavlico.com]  
**To:** Tuesday, September 18, 2001 6:54 PM  
**cc:** mfreeland1@ford.com  
**Subject:** Kyong Park; Don Ayers; Grant Heilker; Roger Houston; Mark Clifford  
Status of Transient Test

Mark:

We will be done with the Transient test of two TNI groups (date coded aug-sep/2000 and feb-april/2001) by tomorrow and will email you the data by Thursday morning. You will receive the data of the other two groups (current production and the new hybrid layout) by Friday. Mark Clifford is done with the ceramic sensor transient test. Either Don or Mark will forward you the data.

I will email you the data for the gage R&R study by Thursday. Talk to you tomorrow.

Regards,  
Naushad

Freeland, Mark (M.)

---

From: Terry Tamashiro [TTamashiro@kavlico.com]  
Sent: Friday, September 07, 2001 11:40 AM  
To: Freeland, Mark (M.)  
Subject: RE: Normal values

10PC\_NORMAL.xls

Sorry Mark, here's the sequence:  
Input to Gnd, Output to Gnd, Input to Output

Raw data

<<10PC\_IMPEDANCE.xls>>

> -----Original Message-----

> From: Freeland, Mark (M.) [SMTP:mfreelal@ford.com]  
> Sent: Friday, September 07, 2001 6:09 AM  
> To: Terry Tamashiro (E-mail)  
> Cc: Donald Ayers (E-mail)  
> Subject: FW: Normal values

> Terry,

> Which result is for which test? (I am guessing that the last one is the

> Vref to Gnd test, but can't guess on the other two).

> I would like to see the raw data as well, as I am interested in the  
> means/range of the samples tested, as well as the variances.

> Regards

> Mark Freeland

> > 6-Sigma Black Belt Candidate  
> > Physics Department  
> > Ford Research Laboratory  
> > P.O. Box 2053  
> > MD 3028 - SRL - Room 1517  
> > Dearborn, MI 48121-2053 USA  
> email: mfreelal@ford.com  
> Tel.: (313) 594-7645

> -----Original Message-----

> From: Don Ayers [mailto:DAyers@kavlico.com]  
> Sent: Thursday, September 06, 2001 8:54 PM  
> To: Freeland, Mark (M.); Terry Tamashiro  
> Cc: Naushad Hossain; Grant Haliker; Atkins, Mary (M.)  
> Subject: RE: Normal values

> Mark -

> I gave some new production sensors to Terry to perform a Gage R&R on

the

> impedance testing. Attached are the test results. I couldn't immediately

> locate the impedance data but will attempt to do so tomorrow.

> Thanks,

> Don

> <<FW: Normal values>>

> > -----Original Message-----

> > From: Freeland, Mark (M.) [SMTP:mfreelal@ford.com]

> > Sent: Thursday, September 06, 2001 1:10 PM

> > To: Donald Ayers (E-mail); Terry Tamashiro (E-mail)

> > Cc: Naushad Hossain (E-mail); Grant Heliker (E-mail); Akins, Mary (M.)

> > Subject: Normal values

> >

> > Don,

> > Can you please provide me with raw data or the statistics (mean and std

> > dev.) for all the measurements taken in Terry's lab for new production

> > sensors. I am particularly interested in the three resistances.

> > Also, has a gage R&R been done on these measurement systems? If not,

> > then

> > please do so and forward me the data from the R&R studies.

> > I am trying to develop a series of signatures which may lead us to identify if a part had been damaged by Electrical Overstressing the output

> > vs. the Vref line. To do this I need to know the degree of uncertainty

> > in

> > our measurements, and what is normal.

> > Please call me to discuss this further.

> > Regards

> > Mark Freeland

> > > 6-Sigma Black Belt Candidate

> > > Physics Department

> > > Ford Research Laboratory

> > > P.O. Box 2053

> > > MD 3028 - SRL - Room 1517

> > > Dearborn, MI 48121-2053 USA

> > email: mfreelal@ford.com

> > Tel.: (313) 594-7545

> << Message: FW: Normal values >>

**Freeland, Mark (M.)**

---

**From:** Naushad Hossain [NHossain@kavlico.com]  
**Sent:** Tuesday, July 24, 2001 2:49 PM  
**To:** Maurer, James (J.B.)  
**Cc:** Akina, Mary (M.); 'bwaikal@kavlico.com'; 'tamishiro@kavlico.com'; 'kpark@kavlico.com'; Freeland, Mark (M.); 'dayers@kavlico.com'; Brady Davies; Grant Heltner  
**Subject:** RE: Latest Data for All Returns

Jim;

Recently we have added columns for current, TPI, impedance etc. in our database. You will see these columns in the next updated file.

We will start to add detailed description of internal mechanical damage and housing damage (i.e. broken ports, melted housing, capacitor broken etc.) in the database from this week.

On Monday of next week, I will get back to you about failure mode section (column K) of the database and an engineer's involvement about correlating the failed parts and the data. Please let me know if this is acceptable to you or not.

Regards,  
Naushad

> -----Original Message-----

> From: Maurer, James (J.B.) [SMTP:jmaurer@ford.com]  
> Sent: Tuesday, July 24, 2001 10:31 AM  
> To: 'NHossain@kavlico.com'  
> Cc: Akina, Mary (M.); 'bwaikal@kavlico.com';  
> 'tamishiro@kavlico.com';  
> 'kpark@kavlico.com'; Freeland, Mark (M.); 'dayers@kavlico.com'  
> Subject: FW: Latest Data for All Returns

> Naushad,

> I reviewed the information from the sheet that is being provided to Mark.

> There is a lot of good information in the sheet, particularly in the comments section (which is column M) as well as the failure mode section

> (column K). However it is difficult to tell if some of the failures are

> the same failure mode with a different description and how many of each

> type of failure there are.

> I would like the electrical tests that were added per Mark Freeland's request to have a result in a separate column for each test. (a column for

> current, a column for TP1, etc.)

>

> I would like a more detailed description of the mechanical failures.

> There are several different types of internal mechanical damage as well as

> housing damage.

> At a minimum I would like to distinguish between broken ports, melted

> housings, cover welds broken or missing, hybrid damage, capacitor broken,

> and pickup damage to the ICs. More failure categories could be added if

> there are a significant number other types of failures.

>

> After the failure analysis lab has done their tests, an engineer is needed

> to look at each piece and the data from that piece to determine if there

> are any abnormalities, and categorize the failures that have been found.

> This would eliminate the problem of different people categorizing or

> describing the same failure in different ways. It will also bring more

> knowledge about the function of the part to the analysis and help bring

> more depth to the analysis.

>

> Let me know when you can do the above or what you would like to change

> about the proposal, if there is anything objectionable. The goal of this

> is to identify specific items to change in order to eliminate the failures.

> Regards,

> Jim Maurer

> James B. Maurer

> V-Engine 5-Sigma Team Leader

> Fuel Metering Dept. V Engine Engineering

> Phone (313) 390-3672, Fax (313) 390-4084

> Text Page: (313) 795-5219

> Email: jmaurer@Ford.com

> -----Original Message-----

> From: Naushad Hossain [mailto:KHossain@kavlico.com]

> Sent: Monday, July 23, 2001 2:37 PM

> To: jmaurer@Ford.com

> Co: Kyong Park; Bob Waikal; Mary Atkins

> Subject: FW: Latest Data for All Returns

> Jim:

> Attached please find the data. Please let me know if you cannot open the

> file.

> Regards,

> Naushad

> > -----Original Message-----  
> > From: Don Ayers  
> > Sent: Tuesday, July 17, 2001 1:29 PM  
> > To: Mark Freeland (E-mail)  
> > Cc: Naushad Hossain  
> > Subject: Latest Data for All Returns  
> >  
> > <<Blackbelt Freeland All Data past 2-15-00 to 7-01.zip>>  
> > << File: Blackbelt Freeland All Data past 2-15-00 to 7-01.zip >>



Subj: Tier 123 at Kavlico on 4/23 & 4/24/01  
Date: 4/17/01 12:39:41 PM Eastern Daylight Time  
From: rkeaney@ford.com (Keeney, Robert (R.))  
To: mfkopwith@cs.com

The workshop will start at 8:00AM on 4/23/01 and 4/24/01. It sounds like we have a talented team. I believe we will generate some improvements! Please let me know if you have any questions.

Go Take The Day!

Bob Keeney  
Lean Mfg. Specialist  
TCMC Total Cost Management Center  
15011 Commerce Park South  
Dearborn, MI 48120  
Tel/Fax 313-390-1358

Subj: Travel arrangements to Kerville  
Date: 4/17/01 1:18:26 PM Eastern Daylight Time  
From: jmaurer@ford.com (Maurer, James (J.B.))  
To: info@pwh@cs.com

Sorry I missed your calls on Thursday. I presume that you have your travel arrangements such as they are. I am going on the identical itinerary. We leave earlier on Sunday than I wanted on the company plane and return on Spirit airlines, but it saves lots of money to do it this way, so the travel office made it that way. The biggest issue I see is that we will get back at 6:00AM at a different terminal than we left from. According to the travel office, we can call security at the Ford terminal and get a courtesy shuttle to take us from the main terminal to the other.

Let me know if you did not get your arrangements.

Regards,  
Jim Maurer  
James B. Maurer  
V-Engine 6-Sigma Team Leader  
Fuel Metering Dept. V Engines Engineering  
Phone (313) 390-3672, Fax (313) 390-4084  
Text Page: (313) 795-5219  
Email: jmaurer@Ford.com

Subj: RE: Tier 123 at Kavlico on 4/23 & 4/24/01  
Date: 4/17/01 3:28:29 PM Eastern Daylight Time  
From: tzuraw@ford.com (Zuraw, Timothy (T.))  
To: mflapwith@ca.com

Bob,

FYI, I will be leaving Kavlico on the afternoon of the 24th in order to make it to another supplier on the 25th.

Regards,

Timothy Zuraw  
Powertrain STA Engineer  
Ford Automotive Operations  
Parklane Towers East, 5th flr  
Phone: (313) 621-1794  
Fax: (313) 337-2804

10  
Subj: FRL Participation -Take Our Children to Work Day

Date: 4/18/01 12:03:12 PM Eastern Daylight Time

From: rschelp@ford.com (Research Help)

Reply-to: cnagi@ford.com

To: mmoosaw@ford.com, merverson@ford.com, mflory@ford.com, mfinder1@ford.com,  
mfreal1@ford.com, mgehrle4@ford.com, mgoebels@ford.com, mgonzalez@ford.com,  
mgreenfi@ford.com, mgrukov@ford.com, mhaghighi@ford.com, mharamouni@ford.com,  
mharrill0@ford.com, mharrill1@ford.com, mhattie@ford.com, mhunnske@ford.com,  
mhurley3@ford.com, mijaz@ford.com, mjaeger@ford.com

Title: FRL Participation in Take Our Children to Work Day  
on April 26th

Please note that there are NO planned activities for your  
children at FRL on April 26th for Ford Motor Company's Take Our  
Children to Work Day.

The Ford Research Laboratory Operating Committee, however, does  
endorse this event.

Note, too, that the Ford Parenting Network (FPN) will offer Take  
Our Children To Work Day ideas for activities that your child  
can do in your office, as well as an interactive event for you and  
your child to visit during the afternoon at Ford. Visit the FPN  
website at <http://www.dearborn3.ford.com/resource/fpn> for  
additional information.

General guidelines for the event are as follows:

- \* Children must be a minimum of 6 years old.
- \* Complete SAFETY for children on the premises MUST be  
maintained at all times. Parents are always responsible for  
participating children.

Web Page: <http://www.dearborn3.ford.com/resource/fpn>

Contact: Chuck Nagi  
313-39-01376  
cnagi@ford.com

FRL Announcements: <http://www.ar1.ford.com/films/pages/1852.html>

**Subj:** Kavlico Trip  
**Date:** 4/20/01 8:17:23 AM Eastern Daylight Time  
**From:** cbasack2@ford.com (Basack, Catharine (C.K.))  
**To:** mflorwith@ca.com

**Hello Jim & Mark,**

During next week's trip to Kavlico, I will be participating in the TCM, but I want to also work with you both to look into Kavlico's quality and process methods. We should also make Don Ayer's (or another Kavlico person) aware of what the rough agenda is also so that he can prepare.

Do you have an agenda outlined of what you plan to see and review while you are there? Let me know and I'll be able to go between both the TCM and your reviews.

I will be at Kavlico all day on Monday and Tuesday. I would open to Wednesday if you feel that it is necessary.

Thanks,  
Catherine Kooy Basack  
Product Design Engineer  
BGR Valve, V-Engine Engineering  
Tel: 313-323-8101  
Fax: 313-390-4084  
Email: <mailto:cbasack2@ford.com> cbasack2@ford.com  
Text Pager: cbasack2 (313-796-5245)

**Freeland, Mark (M.)**

---

**From:** Don Ayers [DAyers@kavlico.com]  
**Sent:** Monday, July 30, 2001 7:30 PM  
**To:** Naushad Hossain; Maurer, James (J.B.)  
**Cc:** Kyong Park; Brady Davies; Bob Weikal; Grant Heliker; Mary Akins; 'mfree1@ford.com'  
**Subject:** RE: Six Sigma

I received the CQIS data on the Florida return and turned the sensor and paperwork over to the failure analysis lab. I also denoted on the part that it was an urgent return.

Don

> -----Original Message-----

> **From:** Naushad Hossain  
> **Sent:** Monday, July 30, 2001 1:57 PM  
> **To:** Maurer, James (J.B.)  
> **Cc:** Kyong Park; Brady Davies; Don Ayers; Bob Weikal; Grant Heliker; Mary Akins; mfree1@ford.com  
> **Subject:** Six Sigma

> Jim:

> Following are the status of the returned sensors Mark Freeland has been

> working on:

> 1) Shit hot part (RML # 8884-001): This sensor failed due to Electrical Overstress. We did physical damage to the part when we were testing. The part was also inadvertently subjected to high currents at least once. Mark Freeland is aware of this damage. There is no need to test this part further because anything we find may not give us real clue.

> 2) 3 returns selected by Mark Freeland (RML # 8856-464, RML # 8856-534 and RML # 8893-001): Currently we are doing failure analysis on these sensors and I will let you know the status by end of this week.

> 3) 3 Lima Engine Plant returns (RML # 8861-001, RML # 8861-005 and RML # 8861-012): Failure mode for the 8861-012 sensor is "C8 capacitor is removed". We have an SD for this failure mode and the SD # is 16T901. We are still analysing the other 2 sensors and I will let you know the status by end of this week.

> 4) Florida Vehicle Sensor: We have received the sensor but we are waiting to receive the CQIS data to start the analysis. I am sure you know.

that  
> this sensor was damaged when Mark Freeland was doing the bench test.  
>  
> 5) Sensor from Mark Freeland's car: We haven't received the sensor  
> yet.  
>  
> On Thursday we have discussed the failure mode column (column K) of  
> the  
> database. We have decided to add a "note section" next to the failure  
> mode column so that the failure modes are clear to you and Mark.  
Grant  
> Beliker is now responsible for correlating the failure modes and the  
> data  
> of the returned sensors. Should you have any questions, please let me  
> know.  
>  
> Regards,  
> Naushad

-----Original Message-----

From: Maurer, James (J.B.) [SMTP:jmaurer@ford.com]  
Sent: Wednesday, July 25, 2001 6:29 AM  
To: 'Naushad Hossain'  
Subject: RE: Latest Data for All Returns

Naushad,  
This sounds good to me. If you have any better ideas, let me  
now.

Regards,  
Jim Maurer  
James B. Maurer  
V-Engine 6-Sigma Team Leader  
Fuel Metering Dept. V Engine Engineering  
Phone (313) 390-3672, Fax (313) 390-4084  
Text Page: (313) 795-5219  
Email: jmaurer@Ford.com

-----Original Message-----

From: Naushad Hossain [mailto:NHossain@kavlico.com]  
Sent: Tuesday, July 24, 2001 2:49 PM  
To: Maurer, James (J.B.)  
Cc: Akins, Mary (M.); 'bweikal@kavlico.com';  
'ttamishiro@kavlico.com';  
'kpark@kavlico.com'; Freeland, Mark (M.); 'dayars@kavlico.com';

Brady  
Davies; Grant Beliker  
Subject: RE: Latest Data for All Returns

Jim:

Recently we have added columns for current, TPI, impedance etc.

in

> our  
 > database. You will see these columns in the next updated file.  
 >  
 > We will start to add detailed description of internal mechanical  
 > damage and  
 > housing damage (i.e. broken ports, melted housing, capacitor  
 > broken  
 > etc.) in  
 > the database from this week.  
 >  
 > On Monday of next week, I will get back to you about failure  
 > mode  
 > section  
 > (column K) of the database and an engineer's involvement about  
 > correlating  
 > the failed parts and the data. Please let me know if this is  
 > acceptable to  
 > you or not.

> Regards,  
 > Naushad

> -----Original Message-----

> From: Maurer, James (J.B.) [SMTP:jmaurer@ford.com]  
 > Sent: Tuesday, July 24, 2001 10:31 AM  
 > To: 'NHossain@kavlico.com'  
 > Cc: Atkins, Mary (M.); 'bweikal@kavlico.com';  
 > 'ttamishiro@kavlico.com';  
 > 'kpark@kavlico.com'; Freeland, Mark (M.); 'dayers@kavlico.com'  
 > Subject: FW: Latest Data for All Returns

> Naushad,

> I reviewed the information from the sheet that is being  
 > provided  
 > to Mark.

> There is a lot of good information in the sheet, particularly  
 > in  
 > the

> > comments section (which is column M) as well as the failure  
 > mode

> section

> > (column K). However it is difficult to tell if some of the  
 > failures are

> > the same failure mode with a different description and how  
 > many of

> each

> > type of failure there are.

> I would like the electrical tests that were added per Mark  
 > Freeland's

> request to have a result in a separate column for each test.

(a

> column for

> > current, a column for TP1, etc.)

> I would like a more detailed description of the mechanical



> failures.  
> > There are several different types of internal mechanical  
damage as  
> well as  
> > housing damage.  
> > At a minimum I would like to distinguish between broken ports,  
> melted  
> > housings, cover welds broken or missing, hybrid damage,  
capacitor  
> broken,  
> > and pickup damage to the ICs. More failure categories could  
be  
> added if  
> > there are a significant number other types of failures.  
> >  
> > After the failure analysis lab has done their tests, an  
engineer  
> is needed  
> > to look at each piece and the data from that piece to  
determine if  
> there  
> > are any abnormalities, and categorize the failures that have  
been  
> found.  
> > This would eliminate the problem of different people  
categorizing  
> or  
> > describing the same failure in different ways. It will also  
bring  
> more  
> > knowledge about the function of the part to the analysis and  
help  
> bring  
> > more depth to the analysis.  
> >  
> > Let me know when you can do the above or what you would like  
to  
> change  
> > about the proposal, if there is anything objectionable. The  
goal  
> of this  
> > is to identify specific items to change in order to eliminate  
the  
> > failures.  
> >  
> > Regards,  
> > Jim Maurer  
> > James B. Maurer  
> > V-Engine 6-Sigma Team Leader  
> > Fuel Metering Dept. V Engine Engineering  
> > Phone (313) 390-3672, Fax (313) 390-4084  
> > Text Page: (313) 795-5219  
> > Email: jmaurer@Ford.com  
> >  
> >  
> > -----Original Message-----  
> > From: Naushad Hossain [mailto:NHossain@kavlico.com]  
> > Sent: Monday, July 23, 2001 2:37 PM  
> > To: jmaurer@ford.com

> > Co: Kyong Park; Bob Weikal; Mary Akins  
> > Subject: FW: Latest Data for All Returns  
> >  
> >  
> > Jim:  
> >  
> > Attached please find the data. Please let me know if you  
cannot  
> open the  
> > file.  
> >  
> > Regards,  
> > Naushad  
> >  
> > > -----Original Message-----  
> > > From: Don Ayers  
> > > Sent: Tuesday, July 17, 2001 1:29 PM  
> > > To: Mark Freeland (E-mail)  
> > > Cc: Naushad Kossain  
> > > Subject: Latest Data for All Returns  
> > >  
> > > <<Blackbelt Freeland All Data past 2-15-00 to 7-01.zip>>  
> > > << File: Blackbelt Freeland All Data past 2-15-00 to 7-01.zip  
>>

**Freeland, Mark (M.)**

---

From: Naushad Hossain [N-Hossain@lowellco.com]  
Sent: Thursday, August 08, 2003 6:18 PM  
To: Freeland, Mark (M.)  
Cc: Kyong Park; Brady Davies; Don Ayers; Bob Welkal; Grant Heliker  
Subject: Odd Wafers

Mark:

We were holding all the odd wafers you have mentioned in your following email for MRB. Before we were rejecting wafers if the yield was lower than 70%. Now we are rejecting it if the yield is less than 55%. The yield of all these odd wafers are between 55% and 70%. That's why they were released from MRB.

Grant has already sent you an email regarding the 4F23605 & 4F23621 lots and further analysis of the shit hot part (RML 8884-001).

Should you have any questions, please let me know.

Regards,  
Naushad

> -----Original Message-----

> From: Freeland, Mark (M.) [SMTP:mfreelal@ford.com]  
> Sent: Wednesday, August 08, 2003 9:51 AM  
> To: Naushad Hossain (E-mail); Grant Heliker (E-mail)  
> Cc: Robert Welkal (E-mail); Brady Davies (E-mail); Kyong Park (E-mail)  
> Subject:

> Grant & Naushad,

> I have reviewed the Probe & August data provided for the weekly report dated 7/27, and have noted some strange things.

> Firstly, in this weeks data there are a lot of odd wafers from earlier lots (up to 11 weeks behind the bulk of their lots). Looks like spring

> clear out time for old material. Could you please let me know what the

> reason is for the influx of a large number of odd wafers is?

> <<...OLE\_Obj...>>

> <<...OLE\_Obj...>>

> Second, two wafer lots in particular has very poor probe yield (4F23605 &

> ), do you know what is up with these wafer lots?

> Probe yield data from 7/27 report, (last col is the Good Die Count)

> <<...OLE\_Obj...>>

> <<...OLE\_Obj...>>

> Regards

> Mark Freeland

> > 6-Sigma Black Belt Candidate

> > Physics Department

> > Ford Research Laboratory

> > P.O. Box 2053

> > MD 3028 - SRL - Room 1517

> > Dearborn, MI 48121-2053 USA

> email: mfreela1@ford.com

> Tel.: (313) 594-7645

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, December 03, 2002 10:25 AM  
**To:** Williamson, Richard (E.)  
**Subject:** FW: DPFE Sensor stalls

**Importance:** High

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Rick,  
Yes I am still interested.

Would it be possible to try and get the dPFE sensor AND the Spark Plugs (labeled to indicate which cylinder each plug came from) from this vehicle. I understand that if it has been returned to the owner it may be difficult to get the spark plugs. (I have been looking into Low Resistance Spark Plugs being a source of an electrical signal which upsets the dPFE and other systems on the vehicle).

It is interesting that this is the second dealer visit for stalls. On Sept. 8th it had the Ignition coils, one injector and the PCM replaced for the same complaint.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel: (313) 594-7643

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, December 03, 2002 10:14 AM  
**To:** Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
**CC:** Kotwold, Allen (A.J.); Allen, Sheran (S.A.); O'Neill, Jim (J.D.)  
**Subject:** FW: DPFE Sensor stalls  
**Importance:** High

Freeman, Jim & Jim,

Please read the attached from Rick Williamson of ECI. I will ask Rick to obtain the part if he can.

A couple of questions:

- 1) Which dPFE sensor will this vehicle have, Kavlico TM, Motorola Dash Mount or Siemens (Kavlico) ECM?
- 2) What current draw does it take to shut down a 2003 MY Town Car?

Regards

Mark Freeland

6-Sigma Black Belt

Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mrfreel1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Williamson, Richard (E.)  
Sent: Wednesday, November 27, 2002 7:57 AM  
To: Freeland, Mark (M.)  
Subject: DPFE Sensor stalls  
Importance: High

Hi Mark,  
How have you been?  
Are you still interested in the DPFE sensor?  
I have a CQIS report that you might be interested in:

CSCI002                      CQIS Indicator Summary                      11/27/02 07:50:39  
=> 1 of 1  
Rpt#: 2KTAC415 EDSR -or- Q 200200039171 Rpt: 11/21/2002 Odom: 3,439 M  
Rvw: File: Folder: Attachments: 0 Print Smy/Disp Detail(P/D):  
Vehicle: 2003 TOWN CAR, EXEC , SEDAN 1LNHM81W73Y626636 Bld: 07/29/2002  
Engine: 4.6L ROM B Cylb: Trans: Axle: A/C:  
Dealer Id: 06910 Columbia Ford Lincoln-Mercury Ph#: (800) 228-2888  
State: Connecticut City: Columbia Orig/Caller: PAUL DANIELUK  
Symptom: 6 07 6 93 DRVABL, STALL/QUITS, AT CRUISE, ALL ENGINE TEMP  
Add Sym: St: CCRG/EPRC: 8 Rvw: A Dt: 11/25/2002  
Fix: Y Caus. Comp: EGR ASSEMBLY - RPL Condition Code:  
Region Code: 11 Region Name: Boston -11

CONCER VEHICLE STALLS WHILE DRIVING SOMETIMES, SOMETIMES IT RESTARTS AND  
SOMETIMES IT WON'T CRANK AFTER IT STALLS.  
TECH/C NGS SELF TEST NO CODES, WHEN CAR WON'T CRANK YOU LOSE COMMUNICATION  
WITH PCM, THEFT LIGHT DOES NOT PROVE OUT WHEN KEY IS TURNED ON,  
UNPLUGGED DPFE AND CONCERN IS CORRECTED. REPLACED SHORTED DPFE ERG  
VALVE ASSEMBLY AND RETEST.

I am going to try and get the part back, let me know if you would like it .....

Take care,

**RICK WILLIAMSON**  
Product Concern Analyst  
Enhanced Concern Identification  
313-248-6348  
rwill110@ford.com

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, December 03, 2002 10:33 AM  
**To:** Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
**Cc:** Kotwold, Alan (A.J.); Allen, Sheran (S.A.); O'Neel, Jim (J.D.); Crawley, Ian (I.A.); Williamson, Richard (E.); Jefford, Bob (R.D.)  
**Subject:** RE: DPFE Sensor stalls

For info:

I just looked up the vehicle in AWS. It was also in for stalls on 9/9/02 and had the ignition coils replaced, the PCM replaces and one injector replaced on that visit.

**Tech. Comments:** EXSTENCIVE TIME R R TRIM PANLES TO OPEN AND INSPECT WIRING HARNESS.REPLACE ALL RIGHT COIL PACKS PER HOTLINE.

**Customer Comments:** CUSTOMER STATES VECH WANTS TO STALL OUT AT STOPS

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mrfreela1@ford.com  
Tel: (313) 594-7645

-----Original Message-----

**From:** Gates, Freeman (F.C.)  
**Sent:** Tuesday, December 03, 2002 10:29 AM  
**To:** Freeland, Mark (M.); Maurer, James (J.B.); McCoy, James (J.D.)  
**Cc:** Kotwold, Alan (A.J.); Allen, Sheran (S.A.); O'Neel, Jim (J.D.); Crawley, Ian (I.A.); Williamson, Richard (E.); Jefford, Bob (R.D.)  
**Subject:** RE: DPFE Sensor stalls

This vehicle will have the ESM. This sounds like it may even be an EVR concern i.e. vacuum on EGR valve continually. We have seen this on some EVR applications if the filter is not installed correctly or contamination exists on the disc (internal to EVR). We have seen this at least 1 time this year. When you disconnect the DPFE, you also disconnect, EVR and MAP sensor through the common connector.

Thanks Mark/Richard.

Anyway the answer is YES , we want the part !

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**Cc:** Kotwold, Alan (A.J.); Allen, Sheran (S.A.); O'Neel, Jim (J.D.)  
**Subject:** FW: DPFE Sensor stalls  
**Importance:** High

Freeman, Jim & Jim,

Please read the attached from Rick Williamson of ECI. I will ask Rick to obtain the part if he can.

A couple of questions:

- 1) Which DPFE sensor will this vehicle have, Kavlico TM, Motorola Dash Mount or Siemens (Kavlico) ECM?
- 2) What current draw does it take to shut down a 2003 MY Town Car?

Regards

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-----Original Message-----

From: Williamson, Richard (E.)  
Sent: Wednesday, November 27, 2002 7:57 AM  
To: Freeland, Mark (M.)  
Subject: DPFE Sensor stalls  
Importance: High

Hi Mark,

How have you been?

Are you still interested in the DPFE sensor?

I have a CQIS report that you might be interested in:

CSQI002                      CQIS Indicator Summary                      11/27/02 07:50:39                      1 of 1

---

Rpt#: 2KTAC415 EDSR --or-- Q 200200039171 Rpt: 11/21/2002 Odom: 3,439 M  
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Dealer Id: 08910 Columbia Ford Lincoln-Mercury Ph#: (880) 228-2586  
State: Connecticut City: Columbia Orig/Caller: PAUL DANIELUK  
Symptom: 6 07 6 93 DRVABL,STALL/QUITS,AT CRUISE,ALL ENGINE TEMP  
Addl Sym: St: CCRG/EPRC: 8 Rvw: A Dt: 11/25/2002  
Fix Y Caus. Comp: EGR ASSEMBLY -- RPL Condition Code:

Region Code: 11 Region Name: Boston -11

CONCER VEHICLE STALLS WHILE DRIVING SOMETIMES, SOMETIMES IT RESTARTS AND  
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Enhanced Concern Identification  
313-248-6348  
rwill110@ford.com

**Freeland, Mark (M.)**

**From:** Williamson, Richard (E.)  
**Sent:** Tuesday, December 03, 2002 3:28 PM  
**To:** Freeland, Mark (M.)  
**Subject:** RE: DPFE Sensor stalls

Mark,  
I personally talked to the shop foreman. He was assigned the vehicle after the first tech couldn't fix it. He stated that he let the vehicle idle in his stall and eventually the vehicle would stall. He would try to start it and the vehicle would not start and there was no check engine light on the dash. He would unplug the DPFE and cycle the key, the MIL would be on and the vehicle would start. He repeated this twice and then replaced the part. He has promised to ship me the part and I will bring it to you. If I haven't recieved the part by the end of the week I will call him back.  
Rick

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**To:** Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
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**Subject:** RE: DPFE Sensor stalls

For info:

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**Tech. Comments:** EXSTENCIVE TIME R R TRIM PANLES TO OPEN AND INSPECT WIRING HARNESS.REPLACE ALL EIGHT COIL PACKS PER HOTLINE.

**Customer Comments:** CUSTOMER STATES VECH WANTS TO STALL OUT AT STOPS

Regards

Mark Freeland

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Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
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**Subject:** RE: DPFE Sensor stalls

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DPFE, you also disconnect, EVR and MAP sensor through the common connector.

Thanks Mark/Richard.

Anyway the answer is YES , we want the part !

-----Original Message-----

From: Freeland, Mark (M.)  
Sent: Tuesday, December 03, 2002 10:14 AM  
To: Gates, Freeman (F.C.); Maurer, James (J.S.); McCoy, James (J.D.)  
Cc: Kohnick, Allen (A.J.); Allen, Sharon (S.A.); O'Neil, Jim (J.D.)  
Subject: FW: DPFE Sensor status  
Importance: High

Freeman, Jim & Jim,

Please read the attached from Rick Williamson of ECI. I will ask Rick to obtain the part if he can.

A couple of questions:

- 1) Which DPFE sensor will this vehicle have, Kavlico TM, Motorola Dash Mount or Siemens (Kavlico) ECM?
- 2) What current draw does it take to shut down a 2003 MY Town Car?

Regards

Mark Freeland

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MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Williamson, Richard (R.)  
Sent: Wednesday, November 27, 2002 7:37 AM  
To: Freeland, Mark (M.)  
Subject: DPFE Sensor status  
Importance: High

Hi Mark,

How have you been?

Are you still interested in the DPFE sensor?

I have a CQIS report that you might be interested in:

C5Q1002      CQIS Indicator Summary      11/27/02 07:50:39  
1 of 1  
Rpt#: 2KTAC415 EDBR --or-- Q: 200200039171 Rpt: 11/21/2002 Odom: 3,458 M  
Rvw: File: Folder: Attachments: 0 Print Stry/Disp Detail(P/D):  
Vehicle: 2003 TOWN CAR, EXEC, SEDAN 1LNHM81W73Y828898 Bld: 07/29/2002  
Engine: 4.6L ROM B Calif: Trans: Axle: A/C:  
Dealer Id: 08910 Columbia Ford Lincoln-Mercury Ph#: (860) 228-2888  
State: Connecticut City: Columbia Orig/Caller: PAUL DANIELUK  
Symptom: 8 07 6 93 DRVABL,STALL/QUITS,AT CRUISE,ALL ENGINE TEMP  
Addl Sym:  
St: CCRG/EPRC; S Rvw: A Dt: 11/25/2002  
Fbc Y Caus. Comp: EGR ASSEMBLY -- RPL Condition Code:

Region Code: 11 Region Name: Boston -11

CONCERN VEHICLE STALLS WHILE DRIVING SOMETIMES, SOMETIMES IT RESTARTS AND  
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VALVE ASSEMBLY AND RETEST.

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Take care,

**RICK WILLIAMSON**  
Product Concern Analyst  
Enhanced Concern Identification  
313-248-6848  
rwill110@ford.com

**Freeland, Mark (M.)**

---

**From:** Crawley, Ian (I.A.)  
**Sent:** Wednesday, December 04, 2002 8:51 AM  
**To:** Freeland, Mark (M.); Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
**Cc:** Koblicki, Allan (A.J.); Ailes, Sheran (S.A.); O'Neill, Jim (J.D.); Williamson, Richard (E.); Jefford, Bob (R.D.)  
**Subject:** RE: DPFE Sensor stalls

Chances are this part has the resistor, based on a production date 29-JUL-2002. You can tell by the part number if the resistor was incorporated or not. The latest part number is 3W7E-9Y458-B3C. We have a Town Car in our department to evaluate this part, once it is returned.

Thank you,

*Ian Crawley*  
BGR Systems  
FMEI Dept.  
Phone: 313-390-5575  
Fax: 313-390-4054  
email: [lcrawley@ford.com](mailto:lcrawley@ford.com)  
text pager: 313-795-7251 or  
3137957251@alphapage.alrtouch.com  
V-Engine Engineering - Ford Motor Co.

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, December 03, 2002 6:28 PM  
**To:** Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
**Cc:** Koblicki, Allan (A.J.); Ailes, Sheran (S.A.); O'Neill, Jim (J.D.); Crawley, Ian (I.A.); Williamson, Richard (E.); Jefford, Bob (R.D.)  
**Subject:** FW: DPFE Sensor stalls

Info from Rick Williamson

Freeman,

How does one ascertain from part number or other markings if a specific ESM module was manufactured before or after the 10 ohm resistor was incorporated, or did the 10 ohms go in before Job 1?

Regards

Mark Freeland

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Ford Research Laboratory  
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Dearborn, MI 48121-2053 USA  
email: [mfreela1@ford.com](mailto:mfreela1@ford.com)  
Tel.: (313) 594-7645

-----Original Message-----

**From:** Williamson, Richard (E.)

Sent: Tuesday, December 03, 2002 3:28 PM  
To: Freeland, Mark (M.)  
Subject: RE: DPFE Sensor stalls

Mark,  
I personally talked to the shop foreman. He was assigned the vehicle after the first tech couldn't fix it. He stated that he let the vehicle idle in his stall and eventually the vehicle would stall. He would try to start it and the vehicle would not start and there was no check engine light on the dash. He would unplug the DPFE and cycle the key, the MIL would be on and the vehicle would start. He repeated this twice and then replaced the part. He has promised to ship me the part and I will bring it to you. If I haven't received the part by the end of the week I will call him back.  
Rick

-----Original Message-----

From: Freeland, Mark (M.)  
Sent: Tuesday, December 03, 2002 10:33 AM  
To: Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
Cc: Kowicki, Alan (A.J.); Allen, Sheron (S.A.); O'Neill, Jim (J.D.); Crowley, Ian (I.A.); Williamson, Richard (R.); Jefford, Bob (B.D.)  
Subject: RE: DPFE Sensor stalls

For info:

I just looked up the vehicle in AWS. It was also in for stalls on 9/9/02 and had the Ignition coils replaced, the PCM replaces and one injector replaced on that visit.

Tech. Comments: EXSTENCIVE TIME R R TRIM PANLES TO OPEN AND INSPECT WIRING HARNESS.REPLACE ALL EIGHT COIL PACKS PER HOTLINE.

Customer Comments: CUSTOMER STATES VECH WANTS TO STALL OUT AT STOPS

Regards

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Dearborn, MI 48121-2053 USA  
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Sent: Tuesday, December 03, 2002 10:29 AM  
To: Freeland, Mark (M.); Maurer, James (J.B.); McCoy, James (J.D.)  
Cc: Kowicki, Alan (A.J.); Allen, Sheron (S.A.); O'Neill, Jim (J.D.); Crowley, Ian (I.A.); Williamson, Richard (R.); Jefford, Bob (B.D.)  
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This vehicle will have the ESM. This sounds like it may even be an EVR concern i.e. vacuum on EGR valve continually. We have seen this on some EVR applications if the filter is not installed correctly or contamination exists on the disc (internal to EVR). We have seen this at least 1 time this year. When you disconnect the DPFE, you also disconnect, EVR and MAP sensor through the common connector.

Thanks Mark/Richard.

Anyway the answer is YES , we want the part !

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Sent: Tuesday, December 03, 2002 10:14 AM  
To: Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
Cc: Koblick, Alan (A.J.); Affes, Sheran (S.A.); O'Neill, Jim (J.D.)  
Subject: F4H DPFE Sensor stalls  
Importance: High

Freeman, Jim & Jim,

Please read the attached from Rick Williamson of ECI. I will ask Rick to obtain the part if he can.

A couple of questions:

- 1) Which dPFE sensor will this vehicle have, Kavlico TM, Motorola Dash Mount or Siemens (Kavlico) ECM?
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-----Original Message-----

From: Williamson, Richard (R.)  
Sent: Wednesday, November 27, 2002 7:57 AM  
To: Freeland, Mark (M.)  
Subject: DPFE Sensor stalls  
Importance: High

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I have a CQIS report that you might be interested in:

CSQI002                      CQIS Indicator Summary                      11/27/02 07:50:39  
-----  
Rpt#: 2KTAC415 EDSR    --or-- Q 20020009171    Rpt: 11/21/2002    Odom: 3,439 M                      1 of 1  
Rvwrd: File:    Folder:                      Attachments: 0 Print Smy/Disp Detail(P/D):  
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Engine: 4.6L ROM B    Calb:                      Trans:                      Axle:                      A/C:  
Dealer Id: 08910    Columbia Ford Lincoln-Mercury    Ph#: (860) 228-2886  
State: Connecticut    City: Columbia                      Orig/Callr: PAUL DANIELUK  
Symptom: 6 07 8 83    DRVABL,STALL/QUITS,AT CRUISE,ALL ENGINE TEMP  
Add Sym:                      St: CCRG/EPRC: 6    Rvwrd: A    Dt: 11/25/2002  
Ftc Y Caus. Comp: EGR ASSEMBLY                      -- RPL    Condition Code:

Region Code: 11    Region Name: Boston -11

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**Mark Freeland**

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Symptom: 6 07 6 93 DRVABL, STALL/QUITS, AT CRUISE, ALL ENGINE TEMP  
Add'l Sym: St: CCRG/EPRC: S Rvw'd: A Dt: 11/25/2002  
Fix Y Caus. Comp: EGR ASSEMBLY - RPL Condition Code:

Region Code: 11 Region Name: Boston -11

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**RICK WILLIAMSON**  
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Enhanced Concern Identification  
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rwill110@ford.com

**Freeland, Mark (M.)**

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**To:** Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
**Cc:** Kotwold, Alan (A.J.); Altes, Sharan (S.A.); O'Neill, Jim (J.D.); Crawley, Ian (I.A.); Williamson, Richard (E.); Jefford, Bob (R.D.)  
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**To:** Freeland, Mark (M.)  
**Subject:** RE: DPFE Sensor stalls

Mark,

I personally talked to the shop foreman. He was assigned the vehicle after the first tech couldn't fix it. He stated that he let the vehicle idle in his stall and eventually the vehicle would stall. He would try to start it and the vehicle would not start and there was no check engine light on the dash. He would unplug the DPFE and cycle the key, the MIL would be on and the vehicle would start. He repeated this twice and then replaced the part. He has promised to ship me the part and I will bring it to you. If I haven't received the part by the end of the week I will call him back.

Rick

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, December 03, 2002 10:33 AM  
**To:** Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
**Cc:** Kotwold, Alan (A.J.); Altes, Sharan (S.A.); O'Neill, Jim (J.D.); Crawley, Ian (I.A.); Williamson, Richard (E.); Jefford, Bob (R.D.)  
**Subject:** RE: DPFE Sensor stalls

For info:

I just looked up the vehicle in AWS. It was also in for stalls on 9/9/02 and had the ignition coils replaced, the PCM replaced and one injector replaced on that visit.

Tech. Comments: EXSTENCIVE TIME R R TRIM PANLES TO OPEN AND INSPECT WIRING

**HARNESS/REPLACE ALL EIGHT COIL PACKS PER HOTLINE.**

**Customer Comments: CUSTOMER STATES VECH WANTS TO STALL OUT AT STOPS**

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Gates, Freeman (F.C.)  
Sent: Tuesday, December 03, 2002 10:29 AM  
To: Freeland, Mark (M.); Maurer, James (J.B.); McCoy, James (J.D.)  
Cc: Kotwicki, Allen (A.J.); Allen, Sharon (S.A.); O'Neill, Jim (J.D.); Crawley, Ian (I.A.); Williamson, Richard (E.); Jafford, Bob (R.D.)  
Subject: RE: DPFE Sensor stalls

This vehicle will have the ESM. This sounds like it may even be an EVR concern i.e. vacuum on EGR valve continually. We have seen this on some EVR applications if the filter is not installed correctly or contamination exists on the disc (internal to EVR). We have seen this at least 1 time this year. When you disconnect the DPFE, you also disconnect, EVR and MAP sensor through the common connector.

Thanks Mark/Richard.

Anyway the answer is YES , we want the part !

-----Original Message-----

From: Freeland, Mark (M.)  
Sent: Tuesday, December 03, 2002 10:14 AM  
To: Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
Cc: Kotwicki, Allen (A.J.); Allen, Sharon (S.A.); O'Neill, Jim (J.D.)  
Subject: FW: DPFE Sensor stalls  
Importance: High

Freeman, Jim & Jim,

Please read the attached from Rick Williamson of ECI. I will ask Rick to obtain the part if he can.

A couple of questions:

- 1) Which dPFE sensor will this vehicle have, Kavlico TM, Motorola Dash Mount or Siemens (Kavlico) ECM?
- 2) What current draw does it take to shut down a 2003 MY Town Car?

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
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MD 2629 - SRL - Room 1517

Dearborn, MI 48121-2053 USA  
email: mfrsals1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Williamson, Richard (E.)  
Sent: Wednesday, November 27, 2002 7:57 AM  
To: Freedland, Mark (M.)  
Subject: DPFE Sensor stalls  
Importance: High

Hi Mark,  
How have you been?  
Are you still interested in the DPFE sensor?  
I have a CQIS report that you might be interested in:

CQIS002                      CQIS Indicator Summary                      11/27/02 07:50:39                      1 of 1  
Rpt#: 2KTAC416 EDSR -or- Q 200200039171 Rpt: 11/21/2002 Odom: 3,439 M  
Rvwrd: File: \_ Folder: \_ Attachmnts: 0 Print Smy/Disp Detail(P/D): \_  
Vehicle: 2003 TOWN CAR,EXEC ,SEDAN 1LNHM61W73Y626638 Bld: 07/29/2002  
Engine: 4.6L ROM B Calb: Trans: Axle: A/C:  
Dealer Id: 08910 Columbia Ford Lincoln-Mercury Ph#: (800) 228-2886  
State: Connecticut City: Columbia Orig/Caller: PAUL DANIELUK  
Symptom: 8 07 6 93 DRIVABL,STALL/QUITS,AT CRUISE,ALL ENGINE TEMP  
Addl Sym: St: CCRG/EPRC: S Rvwrd: A Dt: 11/25/2002  
Fix: Y Cause: Comp: EGR ASSEMBLY -- RPL Condition Code:

Region Code: 11 Region Name: Boston -11

CONCER VEHICLE STALLS WHILE DRIVING SOMETIMES, SOMETIMES IT RESTARTS AND  
SOMETIMES IT WON'T CRANK AFTER IT STALLS.  
TECH/C NGS SELF TEST NO CODES, WHEN CAR WON'T CRANK YOU LOSE COMMUNICATION  
WITH PCM, THEFT LIGHT DOES NOT PROVE OUT WHEN KEY IS TURNED ON,  
UNPLUGGED DPFE AND CONCERN IS CORRECTED. REPLACED SHORTED DPFE EGR  
VALVE ASSEMBLY AND RETEST.

I am going to try and get the part back, let me know if you would like it .....

Take care,

**RICK WILLIAMSON**  
Product Concern Analyst  
Enhanced Concern Identification  
313-248-6348  
rwill110@ford.com

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Wednesday, December 04, 2002 10:50 AM  
**To:** Gates, Freeman (F.C.)  
**Subject:** RE: TmDPFE/ESM Bench Testing/Data analysis summary

Freeman,

Thank you for keeping me in the loop. I appreciate that.  
I have read the attached documents, and have no issue with the data presented.  
However, for the record, I have to say that I do not concur with the conclusions drawn. The data does not support the conclusions, and many other factors have not been considered.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----  
**From:** Gates, Freeman (F.C.)  
**Sent:** Tuesday, December 03, 2002 10:43 AM  
**To:** Kibnick, Allen (A.J.); Freeland, Mark (M.)  
**Subject:** FW: TmDPFE/ESM Bench Testing/Data analysis summary

Info...

-----Original Message-----  
**From:** Grandee, Joseph (J.M.)  
**Sent:** Tuesday, December 03, 2002 7:59 AM  
**To:** Sventickas, Ed (E.); Mazzella, Brian (B.R.); Ross, Robert (R.A.)  
**Cc:** King II, Lennar (L.L.); Gates, Freeman (F.C.); Young, Len (L.); Moore, Donald (D.R.); Johnson, Jon (J.M.)  
**Subject:** RE: TmDPFE/ESM Bench Testing/Data analysis summary

FYI, ESM good news...  
Latest ESM warranty & results from key life testing.  
KL Testing shows failures are induced under acid pressure(simulates TmdPFE config) & no failures to date under acid vacuum conditions(simulates ESM config.).  
Also see warranty performance to date in the Summary1 doc...

<< File: TMDPFE Summary1.doc >> << File: EDP\_TEST.ppt >>  
FYI...

-----Original Message-----  
**From:** Gates, Freeman (F.C.)  
**Sent:** Monday, December 02, 2002 1:07 PM  
**To:** Kaput, Barb (B.J.)  
**Subject:** TmDPFE/ESM Bench Testing/Data analysis summary

Hi Barb,

On 10/14/02 you called a meeting to discuss warranty trends based upon hazard plots of TmDPFE and ESM. The outcome of that meeting was in conclusive based upon the immaturity of the data.

Since then, the attached report (s) will reveal the following:

- Definitive root cause of TmDPFE failures.
- Definitive Bench Test evidence of ESM robustness
- Definitive Vehicle warranty data that verifies ESM robustness Vs Kavlico Tm DPFE

Please let me know if you would care to discuss further

Thanks

*Frank Galar*

Senior EGR Systems Technical Specialist  
Tel (318)98-84807 Fax (318)98-84084  
POB Rm D-188 OMA-178



## **Freeland, Mark (M.)**

---

**From:** Williamson, Richard (E.)  
**Sent:** Tuesday, December 03, 2002 3:28 PM  
**To:** Freeland, Mark (M.)  
**Subject:** RE: DPFE Sensor stalls

Mark,

I personally talked to the shop foreman. He was assigned the vehicle after the first tech couldn't fix it. He stated that he let the vehicle idle in his stall and eventually the vehicle would stall. He would try to start it and the vehicle would not start and there was no check engine light on the dash. He would unplug the DPFE and cycle the key, the MIL would be on and the vehicle would start. He repeated this twice and then replaced the part. He has promised to ship me the part and I will bring it to you. If I haven't received the part by the end of the week I will call him back.

Flick

### **-----Original Message-----**

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, December 03, 2002 10:33 AM  
**To:** Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
**Cc:** Koznick, Allen (A.J.); Allen, Sheron (S.A.); O'Neal, Jim (J.D.); Crowley, Ian (I.A.); Williamson, Richard (E.); Jefford, Bob (B.D.)  
**Subject:** RE: DPFE Sensor stalls

For info:

I just looked up the vehicle in AWS. It was also in for stalls on 9/9/02 and had the Ignition coils replaced, the PCM replaced and one injector replaced on that visit.

**Tech. Comments: EXTENSIVE TIME R R TRIM PANELS TO OPEN AND INSPECT WIRING HARNESS. REPLACE ALL EIGHT COIL PACKS PER HOTLINE.**

**Customer Comments: CUSTOMER STATES VEH WANTS TO STALL OUT AT STOPS**

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

### **-----Original Message-----**

**From:** Gates, Freeman (F.C.)  
**Sent:** Tuesday, December 03, 2002 10:29 AM  
**To:** Freeland, Mark (M.); Maurer, James (J.B.); McCoy, James (J.D.)  
**Cc:** Koznick, Allen (A.J.); Allen, Sheron (S.A.); O'Neal, Jim (J.D.); Crowley, Ian (I.A.); Williamson, Richard (E.); Jefford, Bob (B.D.)  
**Subject:** RE: DPFE Sensor stalls

This vehicle will have the EBM. This sounds like it may even be an EVR concern i.e. vacuum on EGR valve continually. We have seen this on some EVR applications if the filter is not installed correctly or contamination exists on the disc (internal to EVR). We have seen this at least 1 time this year. When you disconnect the

DPFE, you also disconnect, EVR and MAP sensor through the common connector.

Thanks Mark/Richard.

Anyway the answer is YES , we want the part !

---Original Message---

From: Freeland, Mark (M.)  
Sent: Tuesday, December 03, 2002 10:14 AM  
To: Gates, Freeman (F.C.); Maurer, James (J.B.); McCoy, James (J.D.)  
Cc: Kozwicki, Allen (A.J.); Allen, Sheron (S.A.); O'Neill, Jim (J.D.)  
Subject: FW: DPFE Sensor stalls  
Importance: High

Freeman, Jim & Jim,

Please read the attached from Rick Williamson of ECI. I will ask Rick to obtain the part if he can.

A couple of questions:

- 1) Which dPFE sensor will this vehicle have, Kavlico TM, Motorola Dash Mount or Siemens (Kavlico) ECM?
- 2) What current draw does it take to shut down a 2003 MY Town Car?

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

---Original Message---

From: Williamson, Richard (R.)  
Sent: Wednesday, November 27, 2002 7:57 AM  
To: Freeland, Mark (M.)  
Subject: DPFE Sensor stalls  
Importance: High

Hi Mark,

How have you been?

Are you still interested in the DPFE sensor?

I have a CQIS report that you might be interested in:

CSQI002

CQIS Indicator Summary

11/27/02 07:50:39

1 of 1

Rpt#: ZKTAC415 EDSR -or- Q 200200039171 Rpt: 11/21/2002 Odom: 3,439 M  
Rvw: File: Folder: Attachments: 0 Print Rmy/Diag Detail(P/D):  
Vehicle: 2003 TOWN CAR,EXEC ,SEDAN 1LNHM81W73Y626636 Bld: 07/29/2002  
Engine: 4.6L ROM B Calb: Trans: Axle: A/C:  
Dealer Id: 08910 Columbia Ford Lincoln-Mercury Ph#: (860) 228-2888  
State: Connecticut City: Columbia Orig/Caller: PAUL DANIELUK  
Symptom: 6 07 6 93 DRVABL,STALL/QUITS,AT CRUISE,ALL ENGINE TEMP  
Addl Sym: St: CORQ/EPRC: S Rvw: A Dt: 11/25/2002  
Flc Y Caus. Comp: EGR ASSEMBLY - RPL Condition Code:

Region Code: 11 Region Name: Boston -11

CONCERN VEHICLE STALLS WHILE DRIVING SOMETIMES, SOMETIMES IT RESTARTS AND SOMETIMES IT WON'T CRANK AFTER IT STALLS.

TECH/NGS SELF TEST NO CODES, WHEN CAR WON'T CRANK YOU LOSE COMMUNICATION WITH PCM, THEFT LIGHT DOES NOT PROVE OUT WHEN KEY IS TURNED ON, UNPLUGGED DPFE AND CONCERN IS CORRECTED. REPLACED SHORTED DPFE ERG VALVE ASSEMBLY AND RETEST.

I am going to try and get the part back, let me know if you would like it .....

Take care,

**RICK WILLIAMSON**

Product Concern Analyst

Enhanced Concern Identification

313-248-6348

rwill110@ford.com

**Freeland, Mark (M.)**

---

From: Power, James (J.H.)  
Sent: Monday, November 18, 2002 10:48 AM  
To: Freeland, Mark (M.); Rutkowski, Brian (B.D.)  
Subject: FW: LVR latest information on Vehicle testing

Info

-----Original Message-----

From: Goodwin, William (W.R.)  
Sent: Monday, November 18, 2002 10:45 AM  
To: Power, James (J.H.); Pietta, Sheri Finn (S.F.)  
Subject: LVR latest information on Vehicle testing

Jim and Sheri,

I wanted to update you on a few items regarding the LVR issue:

1. Yellow Escape--This has 3 100 ohm spark plugs in right bank and 0 ohm plugs in left bank. No issues noted to date on this vehicle.
2. Red Escape--This has 6 0 ohm plugs in it and just returned from Ypsilanti pencil coil development testing. No issues noted
3. 2002 Mazda MPV--3 0 ohm spark plugs placed in lh bank (with non ferrite coils). We had no issues which were directly attributable to the 0 ohm plugs, but we do have a transmission shift issue at 3000 RPM at high vehicle speeds that needs to be investigated further. The vehicle is currently apart to put 3 0 ohm plugs in the right bank and install non ferrite coils.
4. Discussions with Jaguar--I contacted Steve Large to discuss the LVR issue that they observed a few years ago. He noted that this was associated with a standalone throttle control module, which is no longer in their production vehicles. They did a lessons learned assessment of prior program issue and decided that they should start to do some vehicle evaluation with 0 Ohm plugs. They have been running a car around with 0 ohm plugs with no issues.

Looking forward, here are the next steps as I see them:

- A. We still need an understanding of the RFI characteristics of the 100ohm spark plug compared to a 0 ohm (Clapr box work at Honeywell)
- B. I will be attempting to contact a Mazda MPV person to get similar detail as I received from Jaguar.
- C. As Jim and I discussed this morning, we should have a more substantial review of Coef of Thermal expansion for the glass and alumina material sets. This might help determine if we might be generating a propensity to cracking in the glass that creates a path for nickel conductivity.

Regards,

Bill Goodwin

Product Design Engineer, Ignition Systems  
V Engine Engineering, Ford Motor Company  
Tel: 313 337-8679 Fax: 313 330-4064  
email: wgoodwin@ford.com  
telpage mailto:3137960571@alphapage.alfatouch.com

**Freeland, Mark (M.)**

---

**From:** Park, Kyong [KPark@kavlico.com]  
**Sent:** Wednesday, November 20, 2002 1:00 PM  
**To:** O'Neill, Jim (J.D.); Freeland, Mark (M.); Gates, Freeman (F.C.); King, Sandra (S.M.)  
**Cc:** Tackman, Bruce; Hubbard, Rick; Koszewnik, John (J.J.)  
**Subject:** RE: Hybrid Circuit Layout for Transient Voltage Protection

Jim,  
I made my recommendation based on who would be the right person in my opinion,  
and I also understand that the decision is yours.  
Have a nice trip.  
Kyong

-----Original Message-----

**From:** O'Neill, Jim (J.D.) [mailto:joneall@ford.com]  
**Sent:** Wednesday, November 20, 2002 3:45 AM  
**To:** Freeland, Mark (M.); Park, Kyong; Gates, Freeman (F.C.); King, Sandra (S.M.)  
**Cc:** Tackman, Bruce; Hubbard, Rick; Koszewnik, John (J.J.)  
**Subject:** RE: Hybrid Circuit Layout for Transient Voltage Protection

Mark - Under these circumstances then I will ask Freeman to attend and have him  
contact Jarek Tracz to ensure that he is available. I will also plan on attending  
if I can. We can always request an audio conference if necessary.  
Kyong, Freeman - please coordinate the best time for this travel. I would like to  
suggest that we fly out on Monday, 11-25 and leave on Tuesday PM. Is this  
sufficient time to get the reviews completed?  
Sandra - please note my intentions to travel with Freeman.

J. D. O'Neill  
Manager, Fuel Metering, Emissions, and Ignition Dept  
V-Engine Engineering, Ford Motor Company  
joneall@ford.com, 313-322-6839

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, November 19, 2002 2:37 PM  
**To:** O'Neill, Jim (J.D.)  
**Cc:** Davis, George (G.C.)  
**Subject:** FW: Hybrid Circuit Layout for Transient Voltage Protection

Jim,

If you need my help I will be happy to assist as best I can. However, travel  
will be difficult for me as I have some personal plans which I can not change.  
My mother is in hospital, following a double bypass operation last week. I am  
planning to fly home on Monday evening next week to help her get out of hospital  
and look after her. Also, I will have my children this weekend from Friday  
evening until Sunday evening.

Regards

Mark Freeland

> 6-Sigma Black Belt  
> Engine Research Department  
> Ford Research Laboratory  
> P.O. Box 2053  
> MD 2629 - SRL - Room 1517  
> Dearborn, MI 48121-2053 USA  
email: mfreel1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Park, Kyong [mailto:KPark@kavlico.com]  
Sent: Tuesday, November 19, 2002 2:25 PM  
To: J. D. (Jim) O'Neill (E-mail)  
Cc: Mark Freeland (E-mail); Tackman, Bruce; Hubbard, Rick  
Subject: Hybrid Circuit Layout for Transient Voltage Protection

Dear Jim,

As I briefed to you during my visit to Detroit last Thursday, November 14, 2002, the new hybrid circuit layout is completed. We had squeezed in all the components that Ford asked to add, on the same size of the hybrid as the existing design. In order to do so, the number of cross-overs and layers were increased, which brings to my concerns. We have to see if those layers would survive through the thermal cycles during the tests.

Jim,

I recommend strongly that Mr. Freeland and Ford expert on hybrid circuit should come to Kavlico to review if the layout is done to Ford's satisfaction. Mr. Freeland is involved in the circuit, so he should be one of the people to come here. The best time is in the later part of this week or in the early part of the next week.

I did make the final checks on the hybrid yesterday, and we will send out an order for photos for the layouts within a couple of days. Once we get the photos, we will make screens and produce prototype hybrids for EMC testing and thermal cycle testing.

Please, let me know who and when will come to Kavlico.  
Yours,  
Kyong

**Freeland, Mark (M.)**

---

**From:** Power, James (J.H.)  
**Sent:** Friday, November 22, 2002 12:22 PM  
**To:** Maurer, James (J.B.); Goodwin, William (W.R.)  
**Co:** Freeland, Mark (M.)  
**Subject:** FW: LVR latest information on Vehicle testing

Jim, is that vehicle still available for evaluation? Bill, maybe we should look at this one instead of the Escape.

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Monday, November 18, 2002 6:05 PM  
**To:** Power, James (J.H.)  
**Co:** Altes, Sheran (S.A.)  
**Subject:** RE: LVR latest information on Vehicle testing

Jim,

Do you know if the red and yellow vehicles have ferrites in their coil springs? Also, have either of these vehicles ever stalled in their history?

I would suggest that a better vehicle to test the effect of low LVR plugs would be one which has a history of stalling, like the green Focus which Jim Maurer has at MPG. It was towed in to Allen Ford on 4/1/2002 with high current failed DPFE sensor, and has failed a second DPFE after about a month of driving at MPG. I suspect that this vehicle has the "path" to conduct the RF noise to the 5 volt subsystem.

If you want data to substantiate that low LVR can cause current production Ford vehicles a problem, you should talk with Sheran Altes from ESE. He diagnosed a LVR as being root cause for control module resets and stalls on an alternative fuel F150 a few months back.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2055  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

**From:** Power, James (J.H.)  
**Sent:** Monday, November 18, 2002 10:45 AM  
**To:** Freeland, Mark (M.); Rothowski, Brian (B.D.)  
**Subject:** FW: LVR latest information on Vehicle testing

Info

-----Original Message-----

**From:** Goodwin, William (W.R.)  
**Sent:** Monday, November 18, 2002 10:45 AM  
**To:** Power, James (J.H.); Pletts, Sheri Ann (S.F.)  
**Subject:** LVR latest information on Vehicle testing

Jim and Sharl,

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Looking forward, here are the next steps as I see them:

- A. We still need an understanding of the RFI characteristics of the 100ohm spark plug compared to a 0 ohm (Clappr box work at Honeywell)
- B. I will be attempting to contact a Mazda MPV person to get similar detail as I received from Jaguar.
- C. As Jim and I discussed this morning, we should have a more substantial review of Coef of Thermal expansion for the glass and alumina material sets. This might help determine if we might be generating a propensity to cracking in the glass that creates a path for nickel conductivity.

Regards,

Bill Goodwin

Product Design Engineer, Ignition Systems  
V Engine Engineering, Ford Motor Company  
Tel: 313 897-8679 Fax: 313 890-4084  
email: wgoodwin@ford.com  
homepage mailto:3137980671@alphapage.aitouch.com



**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Monday, November 25, 2002 10:40 AM  
**To:** Adams, Jim (J.A.)  
**Subject:** RE: AWS Reports page

Jim,

I am also aware that the Fuel Rail Pressure sensor is a CMOS device. It is connected to the same 5.0V Reference line and signal return line that the dPFE is. Thus, it is another candidate for a possible SCR latch condition. Also, it gets its connections from the "C80" connector, which is a known problem (Intermittents caused by it not being fully seated) at Wayne Assembly Plant. Intermittents could aggravate the possibility of a CMOS device going into an SCR latch.

If any other device were to pull the Vref voltage low, then even if the dPFE were correctly operating, its output should go lower than normal as it is a ratio-metric device. Thus you could monitor the dPFE sensor and see an abnormality if anything takes the Vref low. The only caveat is that the connectors on the instrumentation I lent you will not fit the Kavlico Ceramic Capacitive Dash Mount dPFE which is in your vehicle.

If you wish to monitor the vehicle's 5 Volt system I will be glad to help you when I return from the UK next Tuesday.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

**From:** Adams, Jim (J.A.)  
**Sent:** Monday, November 25, 2002 8:45 AM  
**To:** Freeland, Mark (M.)  
**Subject:** RE: AWS Reports page

Mark,

Thanks for talking with George and I on Friday and providing the web sites.

I found the correct VIN for my Focus (1FAFP38582W219335) and it was produced on 02-18-02, so it should have the replacement dip switch. However, the two cases where the instrument readings went out on my Focus suggest that there may be other problems that could be generated by excessive electrical noise.

Regards,

Jim



**Freeland, Mark (M.)**

---

From: Freeland, Mark (M.)  
Sent: Wednesday, November 20, 2002 9:11 AM  
To: Gates, Freeman (F.C.)  
Cc: O'Neill, Jim (J.D.); Tracz, Jarek (J.A.); Hermann, Thomas (T.J.)  
Subject: FW: Hybrid Circuit Layout for Transient Voltage Protection

Freeman,

I got you're telephone message this morning. As you will be going to Kavlico, we need to spend several hours together with Jarek Tracz so that I may brief you on what to look for in the layout. Please schedule times which will work for you in my calendar. I will cancel any other mtgs. I can to accommodate you. I would suggest a minimum of four hours, including some electrical lab time.

Regards

Mark Freeland

> 6-Sigma Black Belt  
> Engine Research Department  
> Ford Research Laboratory  
> P.O. Box 2053  
> MD 2629 - SRL - Room 1517  
> Dearborn, MI 48121-2053 USA  
email: mfreelal@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: O'Neill, Jim (J.D.)  
Sent: Wednesday, November 20, 2002 6:45 AM  
To: Freeland, Mark (M.); 'kpark@kavlico.com'; Gates, Freeman (F.C.); King, Sandra (S.H.)  
Cc: 'btackman@kavlico.com'; 'rhubbard@kavlico.com'; Koszewnik, John (J.J.)  
Subject: RE: Hybrid Circuit Layout for Transient Voltage Protection

Mark - Under these circumstances then I will ask Freeman to attend and have him contact Jarek Tracz to ensure that he is available. I will also plan on attending if I can. We can always request an audio conference if necessary.  
Kyong, Freeman - please coordinate the best time for this travel. I would like to suggest that we fly out on Monday, 11-25 and leave on Tuesday PM. Is this sufficient time to get the reviews completed?  
Sandra - please note my intentions to travel with Freeman.

J. D. O'Neill  
Manager, Fuel Metering, Emissions, and Ignition Dept  
V-Engine Engineering, Ford Motor Company  
joneall@ford.com, 313-322-6839

-----Original Message-----

From: Freeland, Mark (M.)  
Sent: Tuesday, November 19, 2002 2:37 PM

To: O'Neill, Jim (J.D.)  
Cc: Davis, George (G.C.)  
Subject: FW: Hybrid Circuit Layout for Transient Voltage Protection

Jim,

If you need my help I will be happy to assist as best I can. However, travel will be difficult for me as I have some personal plans which I can not change. My mother is in hospital, following a double bypass operation last week. I am planning to fly home on Monday evening next week to help her get out of hospital and look after her. Also, I will have my children this weekend from Friday evening until Sunday evening.

Regards

Mark Freeland

> 6-Sigma Black Belt  
> Engine Research Department  
> Ford Research Laboratory  
> P.O. Box 2053  
> MD 2629 - SRL - Room 1517  
> Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Park, Kyong [mailto:KPark@kavlico.com]  
Sent: Tuesday, November 19, 2002 2:25 PM  
To: J. D. (Jim) O'Neill (E-mail)  
Cc: Mark Freeland (E-mail); Tackman, Bruce; Hubbard, Rick  
Subject: Hybrid Circuit Layout for Transient Voltage Protection

Dear Jim,

As I briefed to you during my visit to Detroit last Thursday, November 14, 2002, the new hybrid circuit layout is completed. We had squeezed in all the components that Ford asked to add, on the same size of the hybrid as the existing design. In order to do so, the number of cross-overs and layers were increased, which brings to my concerns. We have to see if those layers would survive through the thermal cycles during the tests.

Jim,

I recommend strongly that Mr. Freeland and Ford expert on hybrid circuit should come to Kavlico to review if the layout is done to Ford's satisfaction. Mr. Freeland is involved in the circuit, so he should be one of the people to come here. The best time is in the later part of this week or in the early part of the next week.

I did make the final checks on the hybrid yesterday, and we will send out an order for photos for the layouts within a couple of days. Once we get the photos, we will make screens and produce prototype hybrids for EMC testing and thermal cycle testing.

Please, let me know who and when will come to Kavlico.

Yours,  
Kyong

**Freeland, Mark (M.)**

---

From: Freeland, Mark (M.)  
Sent: Tuesday, November 19, 2002 2:37 PM  
To: O'Neill, Jim (J.D.)  
Cc: Davis, George (G.C.)  
Subject: FW: Hybrid Circuit Layout for Transient Voltage Protection

Jim,

If you need my help I will be happy to assist as best I can. However, travel will be difficult for me as I have some personal plans which I can not change. My mother is in hospital, following a double bypass operation last week. I am planning to fly home on Monday evening next week to help her get out of hospital and look after her. Also, I will have my children this weekend from Friday evening until Sunday evening.

Regards

Mark Freeland

> 6-Sigma Black Belt  
> Engine Research Department  
> Ford Research Laboratory  
> P.O. Box 2053  
> MD 2629 - SRL - Room 1517  
> Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7545

-----Original Message-----

From: Park, Kyong [mailto:KPark@kavlico.com]  
Sent: Tuesday, November 19, 2002 2:25 PM  
To: J. D. (Jim) O'Neill (E-mail)  
Cc: Mark Freeland (E-mail); Tackman, Bruce; Hubbard, Rick  
Subject: Hybrid Circuit Layout for Transient Voltage Protection

Dear Jim,

As I briefed to you during my visit to Detroit last Thursday, November 14, 2002, the new hybrid circuit layout is completed. We had squeezed in all the components that Ford asked to add, on the same size of the hybrid as the existing design. In order to do so, the number of cross-overs and layers were increased, which brings to my concerns. We have to see if those layers would survive through the thermal cycles during the tests.

Jim,

I recommend strongly that Mr. Freeland and Ford expert on hybrid circuit should come to Kavlico to review if the layout is done to Ford's satisfaction. Mr. Freeland is involved in the circuit, so he should be one of the people to come here. The best time is in the later part of this week or in the early part of the next week.

I did make the final checks on the hybrid yesterday, and we will send out an

\*order for photos for the layouts within a couple of days. Once we get the photos, we will make screens and produce prototype hybrids for EMC testing and thermal cycle testing.

Please, let me know who and when will come to Kavlico.

Yours,  
Kyong

**Freeland, Mark (M.)**

---

**From:** Koszewnik, John (J.J.)  
**Sent:** Saturday, November 30, 2002 1:45 PM  
**To:** Russell, Lori (L.B.); Freeland, Mark (M.)  
**Co:** Davis, George (G.C.); O'Neill, Jim (J.D.)  
**Subject:** RE: Test results from bench testing the Kavlico TM dPFE sensor and Filter 2.0 with spark generated RF

Mark,

I'm anxious to talk to you about your results. I didn't understand everything I was looking at... but it seems you are on to something important.

Lori,

Please schedule a half hour meeting with Mark and me for sometime this week or next. Thanks in advance.

*John Koszewnik*  
Chief Engineer  
V-Engine Engineering  
Ph. 32-28973  
Fx. 39-09670  
jkoszewn@ford.com

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Monday, November 25, 2002 11:49 AM  
**To:** Koszewnik, John (J.J.)  
**Co:** Davis, George (G.C.); O'Neill, Jim (J.D.); Maurer, James (J.B.); Gates, Freeman (F.C.); McCoy, James (J.D.); Ales, Sheran (S.A.); Kotwinski, Allan (A.J.)  
**Subject:** Test results from bench testing the Kavlico TM dPFE sensor and Filter 2.0 with spark generated RF

John,

As we have been unable to meet to discuss the results of the bench testing you requested, I am forwarding you a PowerPoint presentation of the results I have obtained.

In short I was able to cause failures of the original sensor and the current production sensor, but was unable to cause failure of a sensor protected with the prototype Filter Rev. 2.0.

I am leaving the country for the next week to look after my mother who has just had a double bypass operation. I expect to return to the office on 12/3/02, and will be available to discuss the testing and results at your convenience thereafter.

<< File: 20021118 Bench Testing of Filter 20 with open spark gap.ppt >>

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517



Dearborn, MI 48121-2053 USA  
email: mrfreela1@ford.com  
Tel.: (313) 594-7645

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Friday, November 01, 2002 10:02 AM  
**To:** Gearhart, Chris (C.)  
**Cc:** Bryant, Bruce (B.D.); Helms, Jeffrey (J.H.)  
**Subject:** RE: Off Program

Chris,

I am still working full time on my OPFE projects. I will advise when I should become inactive.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mifreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

**From:** Gearhart, Chris (C.)  
**Sent:** Friday, November 01, 2002 9:49 AM  
**To:** Freeland, Mark (M.); Davis, Michael (M.E.)  
**Subject:** Off Program

Mark and Mike,

I assume both of you have moved into your next assignments. I would like to have your status in the PTS switched to inactive. Is this a correct assessment, or are you still considered full time Black Belts by your home organization?

Chris Gearhart  
Six Sigma Master Black Belt  
Ford Research Laboratory  
(813)-590-5709

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Friday, November 08, 2002 9:27 AM  
**To:** O'Neill, Jim (J.D.); Maurer, James (J.B.); Gates, Freeman (F.C.)  
**Cc:** Kotwicki, Alan (A.J.); Alles, Sheran (S.A.)  
**Subject:** High TCR Resistors

Al Kotwicki has identified a potential source for high TCR resistors.  
Can you please pass this information on to Dr. Kyong Park:

K-tronics, Inc.  
P.O. Box 4398  
Bisbee,  
AZ 85803

Tel. (520) 432-5358

Sales Representative:  
James J. Majewski  
Tel (317) 894-1414 and (248) 306-7123  
email: [jjmajewski@electronoreps.com](mailto:jmajewski@electronoreps.com)  
Internet: <http://www.electronoreps.com>

K-tronics advertises:

SM Series wire wound resistors Type SMH, power rating 0.5 W, Std. resistances 0.1 - 400 ohms, Tolerance 0.1% to 5%.

Any of our standard resistors can be specified with a special TCR. They have a selection of TCRs to choose from, one of interest is -55 deg. C to 25 deg. C +3700 +/-300; 25 deg. C to 125 deg. C +3800 +/-300.

Package size is 0.21 long, 0.13 wide and 0.11 high.

Thanks Al

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: [mfreela1@ford.com](mailto:mfreela1@ford.com)  
Tel.: (313) 594-7645

## **Freeland, Mark (M.)**

---

**From:** Hermann, Thomas (T.J.)  
**Sent:** Tuesday, December 10, 2002 10:45 AM  
**To:** O'Neill, Jim (J.D.)  
**Cc:** Maurer, James (J.B.); Altes, Sheran (S.A.); Kotwicki, Alan (A.J.); Gates, Freeman (F.C.); Freeland, Mark (M.)  
**Subject:** FW: EMC review of Kavlico DPFE module layouts

Jim, we spoke about this a few weeks ago when you requested our support. Is Kavlico implementing the recommendations?

-----Original Message-----

**From:** Tracz, Jarek (J.A.)  
**Sent:** Monday, December 09, 2002 11:11 AM  
**To:** Freeland, Mark (M.); O'Neill, Jim (J.D.)  
**Cc:** Gates, Freeman (F.C.); Maurer, James (J.B.); Altes, Sheran (S.A.); Kotwicki, Alan (A.J.); Hermann, Thomas (T.J.)  
**Subject:** EMC review of Kavlico DPFE module layouts

Gentlemen,

I've completed the EMC review of the subject, and my findings are summaries in the attached document.

Having received no feedback regarding the function of such signals as RO, Vout, Vbuf, I've assumed the worst case (i.e. they are low impedance signals susceptible to crosstalk).

Please let me know if you have any questions.



Kavlico drive module  
EMC review...

Best Regards,

Jarek A. Tracz  
EMC Engineer  
RVT/EESE  
Bldg. #8, Cube 2D101  
tel: (313) 323-1919  
fax: (313) 390-5327  
[mailto: jtracz@ford.com](mailto:jtracz@ford.com)

**Freeland, Mark (M.)**

---

**From:** Akins, Mary (M.)  
**Sent:** Friday, October 12, 2001 2:08 PM  
**To:** Freeland, Mark (M.)  
**Subject:** RML#'s for CARB Emission Testing

Mark,

Here are the RML#'s. I have given the 10 parts to Karen Owens along with Kavlico's Single Record Report (SRR).

↓  
8841-422 ✓  
8841-458 ✓  
✓8858-179 ✓  
8858-440 ✓  
✓8858-472 ✓  
✓8858-591 ✓  
✓8858-601 ✓  
8858-828 ✓  
✓8858-848 ✓  
8858-988 ✓

TO KEN T 10/15/01

Regards,

Mary Akins

Kavlico Corp.

Ford Phone: 313.248.1989

Ford Fax: 313.845.3169

makins@ford.com

makins@kavlico.com

messages/pager 248.848.9670

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, October 03, 2002 3:24 PM  
**To:** Antone, Jennifer (M.)  
**Subject:** RE: check engine light project

Jennifer,

Thanks for the feedback, wise choice I think.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----  
**From:** Antone, Jennifer (M.)  
**Sent:** Thursday, October 03, 2002 1:59 PM  
**To:** Freeland, Mark (M.)  
**Subject:** check engine light project

Mark, I appreciate you taking the time to explain your project to me this morning. As it turns out, I think we're going to stay away from discussing any engine-related projects with the media at this time. Thanks again for your help.

Regards,  
Jennifer Antone  
Consumer Driven 6-Sigma Communications  
1-313-337-2613  
Jantone@ford.com

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, October 03, 2002 4:05 PM  
**To:** Maurer, James (J.B.); Gates, Freeman (F.C.); Verner, Carol (C.J.); Alice, Sheran (S.A.); McCoy, James (J.D.); Kotwicki, Allan (A.J.)  
**Subject:** Test plan for design change evaluation

I have started to sketch out a test plan to evaluate the proposed design change against the original and current production DPFE's.

Please take a look at the attached workbook, and give me your suggestions for any additional items which we should look at for the "DV" prior to releasing the changes to Kevlar layout and prototyping.



Thanks

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

**Freeland, Mark (M.)**

---

**From:** Mike Sparhawk [msparhawk@ctparts.com]  
**Sent:** Friday, September 20, 2002 2:03 PM  
**To:** Freeland  
**Subject:** Re: Shopping Cart Order

Mr. Freeland,

For tracking purposes, do you have a name of a project that you are working on? I will have your request processed today, thank you for your interest in Central Technologies inductive components.

Cordially,

Michael Sparhawk  
Regional Business Development Manager  
Central Technologies  
800-684-5322  
888-812-0281 Direct  
949-735-6217 Cellular  
msparhawk@ctparts.com

"Check Out Our New Products at [www.CTFPARTS.com](http://www.CTFPARTS.com) !"

----- Original Message -----

**From:** Freeland <mfreela1@ford.com>  
**To:** CTFparts.com <weborders@ctparts.com>  
**Sent:** Friday, September 20, 2002 5:18 PM  
**Subject:** Shopping Cart Order

> Merchant Notification of Sale  
>  
> Order Number: 1603  
> Order amount: \$0.00  
> ShippingCost: \$0.00  
> Shipping Method: UPS Ground  
> Tax: \$0.00  
> Discount: \$0.00  
> Handling: \$0.00  
>  
> Payment Type: No payment required  
> Date of Order: Sep 20 2002  
> Phone: (313) 594-7645  
> E-mail: mfreela1@ford.com  
>  
> Ford Motor Company  
>  
> The Customer is:  
> Ford Motor Company  
> Mark Freeland  
> SRL Rm.1517, 2101 Village Road  
> Dearborn, MI 48121-2053  
> USA  
>  
> Products Ordered:



>  
 >  
 > CT KIT 14  
 >  
 > CTLL1005FH Series (Multi-Layer Chip)  
 >  
 > Inductance: 1.0nH - 120nH  
 >  
 > Current: 100mA - 300mA  
 >  
 > 6 Values (10 each)  
 > 1005 Package Size  
 > : 1  
 >  
 > CT KIT 12  
 >  
 > CTMC1210 Series (Molded Chip)  
 > Inductance: 0.005  $\mu$ H - 470  $\mu$ H  
 > Current: 25mA - 450mA  
 > 12 Values (5 each)  
 > 1210 Package Size  
 >  
 > CTMC1812 Series (Molded Chip)  
 > Inductance: 0.1  $\mu$ H - 1,000  $\mu$ H  
 > Current: 30mA - 800mA  
 > 12 Values (5 each)  
 > 1812 Package Size  
 > : 1  
 >  
 >  
 >  
 >

# Vehicle Information Report

## GENERAL VEHICLE INFORMATION: (Related Claims)

|                     |                   |                  |                                     |               |                          |
|---------------------|-------------------|------------------|-------------------------------------|---------------|--------------------------|
| VIN                 | 1FMYU72E21UC74887 | Vehicle Line     | TU7 - EXPLORER SPORT (US07) (01-03) | Eng Serial No | 2800009975               |
| Model Year          | 2001              | Market Derivates | TIF - FORD DIVISION DERIVATIVE      | Body Style    | *                        |
| Vehicle Type        | T                 | Drive Code       | DE - 4 WHL LH PART TIME DRIVE       | Engine        | DME - CDOLOH 4.0L SOHC   |
| Inv. Dealer         | 0804              | Body Color Style | TWC - 2 DOOR WAGON                  | Transmission  | UTC - 5 SPD AT BAO ASIDE |
| Vehicle Status Code | RD                | Version/Serial   | TIF - FORD SERIES                   |               |                          |

## BUILD INFORMATION:

Region: NA - 000000000 Plant: AN - LOUISVILLE PLANT BUILD  
Country: USA - 000000000 Prod Date: 15-MAY-2001

## SALE INFORMATION:

Region: NA - 000000000 Selling Dealer: 15160 - \*  
Country: USA - 000000000 Selling Dtr-Prv: IL  
Buyer-Prv: IL

Arrival Date: 20-MAY-2001 End Carpet Lot: 1  
Sale Date: 30-JUN-2001 Fleet/Total/Co. Lease: R  
Warranty Start Date: 30-JUN-2001 Modified Vehicle: \* Vehicle Credit Flag: Y  
Orig Warranty Date: 23-MAY-2001 Resequenced Vehicle: \* Vehicle Export Flag: N

## VOCE/EOC:

070100710071001701 X 2 00000001 30 00 000000 0001 210000 0 5 010100 1 00 0000 1 01  
PRT 1 1 0000 1

## INSTALLED OPTION INFORMATION:

|                        |                                    |                      |                                       |
|------------------------|------------------------------------|----------------------|---------------------------------------|
| Air Conditioning:      | YES - MANUAL AIR CONDITIONER       | GVW Code:            | * - [N/A]                             |
| Alternator Amp Rating: | 85                                 | GVW Class Code:      | Y                                     |
| Audio Data:            | * - [N/A]                          | Entertainment:       | * - [N/A]                             |
| Axle Ratio:            | EQ400 - 5.75 FINAL DRIVE RATIO     | Mirror(Driver Side): | AW - DRIVER HD SET SAIL CHROME MIRROR |
| Axle Type:             | EQ400 - NON-LIMITED SLIP REAR AXLE | Mirror(Passg Side):  | AW - PASS HAND SET SAIL MIR-CONVEX    |
| Battery Amp Rating:    | 85                                 | Paint:               | FMHQ - HARVEST GOLD CC                |
| Brake Code:            | * - [N/A]                          | Power Windows:       | * - [N/A]                             |
| Brake Code(Servic):    | * - [N/A]                          | Radios:              | MS - AM/FM STEREO CHANGEOVER          |
| Calibration Code:      | 1071A00A                           | Sound System:        | AS - AUDIO/CD SOUND SYSTEM            |
| Color(Access):         | * - [N/A]                          | Suspension/Steering: | * - [N/A]                             |
| Color(Trim):           | * - [N/A]                          | Tire Manufacturer:   | AG - GOODYEAR                         |
| Delivery Type:         | T                                  | Tire Brand:          | 48CUC6WR1701 - WRANGLER STD 1000      |
| Electrical Code:       | 0                                  | Tire Size:           | D31WA - P155/70R-16 OWL A/T           |
| Front Seat:            | * - [N/A]                          | Traction Control:    | * - [N/A]                             |
| Front Type:            | * - [N/A]                          | Wheel Name:          | * - [N/A]                             |

## TIRE DOT INFORMATION:

LF: 48CUC6WR1701 HP 48CUC6WR1701  
LR: 48CUC6WR1701 HR 48CUC6WR1701  
LI: \* RD \*  
SPARE: 48CUC6WR1701 DOT Plant Manufacturer: 48 - GOODYEAR CANADA; INC.; NAPANEE; ONTARIO

## ESP INFORMATION: EMISSIONS INFORMATION:

|                     |                          |            |
|---------------------|--------------------------|------------|
| ESP Code:           | • Emission Code:         | TR - TR    |
| ESP Coverage(Mile): | • Emission Cert Type:    | 3          |
| ESP Coverage(Ton):  | • Emission Label Suffix: | HPL        |
| ESP Plan Year:      | • Engine Family:         | 1PMXT04M14 |
| ESP Signature Date: |                          |            |

---

Any comments? You can contact



webmaster

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Friday, September 20, 2002 4:36 PM  
**To:** Giordano, Mike (M.A.); Johnson, Joe (J.H.); Surti, P. J. (P.J.); MacDonald, George (G.F.); Shopp, James (J.J.); Lizotte, Brian (B.W.)  
**Cc:** DiAngelo, Rinaldo (R.); Nobeboom, Jim (J.E.); Pepitone, Gil (J.); Gates, Freeman (F.C.); Whitworth, Rudy (A.R.); Stump, Steven (S.M.); Dhaliwal, Dave (D.S.); Malloy, Gene (E.E.); Thomas, Ken (K.C.)  
**Subject:** RE: TWO DIFFERENT DPFE CONCERNS FOR DTC P0401

Mike, is it the 2.0L SPI or is it the 2.0L Zetec that has the high level of PCV failure. The wording in your note leaves me in some doubt. Also, if it is the Zetec that has the high PCV failure rate, is that on all 2.0 L Zetec applications, i.e. Focus and Escape?

Thanks

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

**From:** Giordano, Mike (M.A.)  
**Sent:** Friday, September 20, 2002 4:23 PM  
**To:** Johnson, Joe (J.H.); Surti, P. J. (P.J.); MacDonald, George (G.F.); Shopp, James (J.J.); Lizotte, Brian (B.W.); Freeland, Mark (M.)  
**Cc:** DiAngelo, Rinaldo (R.); Nobeboom, Jim (J.E.); Pepitone, Gil (J.); Gates, Freeman (F.C.); Whitworth, Rudy (A.R.); Stump, Steven (S.M.); Dhaliwal, Dave (D.S.); Malloy, Gene (E.E.); Thomas, Ken (K.C.)  
**Subject:** RE: TWO DIFFERENT DPFE CONCERNS FOR DTC P0401

Joe, et.al.

I was wondering if the higher concentration of "acidic aqueous condensates" in I-4's (vs 6 and 8 cylinder) as discussed in Pam Lee's 8D on PCV elbow deterioration) has a significant impact higher failure rate on Focus for DPFE ? (Reference Global 8D # 22223.) According to failures on PCV components, 2.0L SPI (Zetec ?) have significantly more failures than other engines. Any thoughts ?

Mike Giordano  
Focus Powertrain Quality  
32-20826

"If you plan to fail, it will be easy to accomplish your goals!"

-----Original Message-----

**From:** Johnson, Joe (J.H.)  
**Sent:** Thursday, September 19, 2002 6:59 AM  
**To:** Surti, P. J. (P.J.); MacDonald, George (G.F.); Shopp, James (J.J.); Lizotte, Brian (B.W.); Freeland, Mark (M.)  
**Cc:** DiAngelo, Rinaldo (R.); Nobeboom, Jim (J.E.); Pepitone, Gil (J.); Gates, Freeman (F.C.); Whitworth, Rudy (A.R.); Giordano, Mike (M.A.); Stump, Steven (S.M.); Dhaliwal, Dave (D.S.); Malloy, Gene (E.E.); Thomas, Ken (K.C.)  
**Subject:** RE: TWO DIFFERENT DPFE CONCERNS FOR DTC P0401

The moisture will be in the sensor of all vehicles and is to be expected.

The issue is that the sensor manufacturing process is not robust enough to insure that the protective layers are applied in a uniform manner so that the acid, which is always present in the moisture, will not attack the sensitive electronics underneath. The Focus gets a double whammy, we believe, because of the grounding issues and other things that are still not understood. Drying out the sensor will not result in a fix .... It is best to replace it.

Kavlico has resourced the die and processing of same in what we believe is a positive step for quality. The new sensor part number is 2F1E-9J480-AB and was P8W'd 5/1/02. An earlier version which had the latch-up protection against voltage spikes was implemented 1/7/02 carrying PN 2F1E-9J480-AA.

There is a team still working on service fixes.

PJ, I won't need that sensor back since it is before the corrective action dates listed above; however, I would like to get back any of the 2F1E-AB level parts.

**Joe Johnson**

Supervisor, EGR Systems, FMEI Dept  
V-Engine Engineering, Powertrain Operations  
POEE Bldg, Mall Drop 88  
21500 Oakwood Blvd  
Dearborn, Mich 48124-4081

Ph: (313) 845-8282  
Fax: (313) 390-4084  
e-mail: jjohnson@ford.com

-----Original Message-----

From: Surt, P. J. (P.J.)  
Sent: Thursday, September 18, 2002 4:05 AM  
To: MacDonald, George (G.F.); Shopp, James (J.J.); Lizotte, Brian (B.W.); Freeland, Mark (M.)  
Cc: DiAngelo, Ronald (R.); Nolasco, Jim (J.E.); Papitone, Gil (J.); Johnson, Joe (J.H.); Gebas, Freeman (F.C.); Whitworth, Rudy (R.); Gloriano, Mike (M.A.); Stamp, Steven (S.M.); Dhaliwal, Dave (D.S.); Malloy, Gene (E.E.); Thomas, Ken (K.C.)  
Subject: RE: TWO DIFFERENT DPFE CONCERNS FOR DTC P0401

George - The concern I had described in the attached CQIS report is different than what you are referring to for EVR hose melting. My concern had DPFE sensor reading of less than 0.1 volt (normal reading should be around 1.0 Volt at KOEO or KOER at idle). This indicates that it has the concern in the internal electronics interface of the sensor itself. My concern is very well described by Joe Johnson in his earlier note of water from the exhaust, carrying acid into the sensor electronics interface, causing the concern. Also, I have been surveying the water migration issue with dealers and I am finding that it is going on Explorers, Mustangs, Expeditions and other applications too. I feel that the repeat repairs of DPFE sensors due to MIL is a big concern. Rudy - This can be a good project for your High MIL repair rates prevention task. You probably may be already involved on this ongoing issue. The real problem is that the warranty data may not tell us the clear picture as most of times, the techs. do not mention the cause of the failure mode.

i.e. water migration in the sensor. So, it may be difficult to isolate this data from the original defective sensors data.

Joe - I still have the sensor and will be happy to ship it to you, Freeman or Mark Freeland for further test analysis. Pl. let me know. Thanks...

**P. J. Sarti**

Powertrain PGE  
T. No. (714) 983-2227  
Fax No. (714) 982-4448

-----Original Message-----

From: MacDonald, George (G.F.)  
Sent: Tuesday, September 17, 2002 1:25 PM  
To: Sarti, P. J. (P.J.); Shoop, James (J.J.); Lizotte, Brian (B.W.)  
Cc: DiAngelo, Renato (R.); Nobsboom, Jim (J.E.); Peppone, Gil (G.); Johnson, Joe (J.H.); Gates, Freeman (F.C.); Whitworth, Rudy (A.R.); Giordano, Mike (M.A.); Stump, Steven (S.M.); Dhaliwal, Dave (D.S.); Malloy, Gene (E.E.); Thomas, Ken (K.C.)  
Subject: RE: REPEAT REPAIRS OF DPFE SENSOR FOR MILCONCERN

PJ,  
One additional comment. . .At WSAP, with the help of Gil Peppone, we discovered a routing issue that creates a tough condition of the EVR vacuum hose to the EGR. This melts the hose, creates a vacuum leak & a p0401 insufficient EGR flow MIL code. In looking at the data (Zetec only concern) and our past DPFE history, dealers are swapping out good Motorola sensors. This accounts for a good portion of the latest DPFE warranty for vehicles with the Motorola DPFE's.

Brian Lizotte's group is working on a message to the field highlighting this special cause.

Brian, Jim,  
Any comment on the status of the message on EVR hose routing issue?

**George F. MacDonald**

Wayne Stamping & Assembly Plant - Powertrain Resident Engineer  
Phone: 734-46-70198  
Mobile: 734-730-8174  
Textpager: 313-796-7969 [mailto:3137957969@alphapage.airtouch.com](mailto:mailto:3137957969@alphapage.airtouch.com)  
gmacdona@ford.com

-----Original Message-----

From: Sarti, P. J. (P.J.)  
Sent: Tuesday, September 17, 2002 10:53 AM  
To: Johnson, Joe (J.H.); Gates, Freeman (F.C.); Whitworth, Rudy (A.R.); Giordano, Mike (M.A.); MacDonald, George (G.F.); Stump, Steven (S.M.); Dhaliwal, Dave (D.S.); Malloy, Gene (E.E.); Thomas, Ken (K.C.)  
Cc: DiAngelo, Renato (R.); Nobsboom, Jim (J.E.); Peppone, Gil (G.); Sarti, P. J. (P.J.)  
Subject: REPEAT REPAIRS OF DPFE SENSOR FOR MILCONCERN

Hello Joe - I know you are not involved with Focus EGR system, but the attached CQIS report concern can happen to other vehicle lines too. We have seen this concern in past, but I like to know what to advise the techs. In this type of case. The DPFE was replaced due to the inside electronics issue more than year ago. So, the current sensor is better design sensor. But the vehicle came back due to water in the sensor. If this sensor would have been dried and cleaned, it probably would have worked. Although, due to the bad reputation of the sensor, the techs., just replace them. And this is happening on other applications too. One of the biggest MIL concerns at dealerships is the DPFE sensor MIL. And unfortunately, the concern repeats again.. It seems that this past big concern does not seem to go away. Any advice/suggestion on such repeat repairs will be appreciated. Thanks...

CSQ1002

CQIS Indicator Summary

09/17/02 10:28:24

1 of 1

Rpt#: 2IQIV001 PTOFSE Rpt: 09/17/2002 Odom: 36,598 M  
Rvw: File: \_ Folder: Images: 0 Print Smy/Disp Detail(P/D): \_  
Vehicle: 2001 FOCUS ZX3 COUPE 3FAFP31341R108239 Bid: 09/07/2000  
Engine: 2.0L ZTECH Calb: Trans: MTX-75 E Axle: FWD 3.82 A/C: YES  
Dealer Id: 05517 Sunset Ford Ph#: (714) 372-4520  
State: California City: Westminster Orig/Caller: P. J. SURTI  
Symptom: 6 88 2 00 DRVABL,INDICATOR,CHECK ENGINE,OTHER-CODE NA  
Addl Sym: St CCRG/EPRC: \_ Rvw: Dt  
Fix: Caus. Comp: SENSOR ASY EGR PR VL -- RPL Condition Code: 42  
PSURTI (714) 982-3227 FAX: MIL? Y ABA? Symp V? Survey? N  
EO: EC: Pri St: 0  
ER: CB: Intmit? N

CONCERN CHECK ENGINE LIGHT STAYS ON.

REPAIR HOOKED UP WDS AND RAN EEC SELF TEST. RETRIEVED THE KOEO-C DTC P0401.

RAN DOL DISPLAY. MONITORED THE EGR SYSTEM. DPFE SENSOR WAS READING  
0.1 VOLT WITH KOEO AND ALSO WHILE RUNNING AT IDLE. AS PER PREVIOUS  
EXPERIENCE, THE TECH. REMOVED THE DPFE SENSOR AND FOUND WATER IN  
THE SENSOR. THE SENSOR HAD BEEN REPLACED ABOUT ONE YEAR AGO. AND  
NOW IT WAS ACTING UP AGAIN DUE TO WATER IN THE SENSOR. THE TECH.  
REPLACED THE SENSOR. THE MIL CONCERN IS RESOLVED AFTER THE REPAIR.

*P. J. Surti*

Powertrain PDI

T. No. (714) 982-3227

Fax No. (714) 982-4446

**Freeland, Mark (M.)**

---

**From:** Frazier, Keith (R.K.)  
**Sent:** Thursday, September 05, 2002 12:42 PM  
**To:** Freeland, Mark (M.)  
**Subject:** RE: Another DPFE question

Mark,

Thanks for the quick feedback. Got your other note and your suggestions are being reviewed. With respect to your suggestions regarding sweeping the pressure - this is not really possible for EMC testing. A compromise might be to use two different pressure values. Your comments?

Keith

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, September 05, 2002 11:13 AM  
**To:** Frazier, Keith (R.K.)  
**Cc:** Maurer, James (J.B.); Gates, Freeman (F.C.); Verner, Carol (C.J.); Alles, Sheran (S.A.)  
**Subject:** FW: Another DPFE question

Keith,

There is evidence from testing on my Mountaineer that the sensor will respond to "noise" on the power supply/ground lines differently with different differential pressures. For example, when the output voltage is at the maximum voltage caused by a differential pressure (which is 4.665 V spec.) and there is a dip in the Vref voltage at the sensor's input pin to say 4.2 V for 2 - 4 usec, the output will dip by more than 2 volts and take about 200 usec to recover.

So, my experience of discovering these anomalies in behavior would make me suggest that the ambient pressure level should be swept from high altitude atmospheric (equivalent to say 10,000 ft) through the maximum vehicle pressure, (see Jim Maurer for data), and that the delta pressure should be swept from 0 to 100 in H2O.

Does any one have any alternative suggestions?

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

9/5/02

EA82-827-A 2877



From: Frazier, Keith (R.K.)  
Sent: Thursday, September 05, 2002 8:29 AM  
To: Freeland, Mark (M.)  
Subject: Another DPPE question

I have yet another question about this part. Is there any evidence that failures are related to the pressure that the part is operating in. In the current EMC test plan, all tests are performed at room ambient pressure. My gut tells me that the test conditions should be changed such that a nominal ambient pressure typical in the vehicle be used. Regulated air pumps could be used without affecting testing.

*Keith Frazier*

9/5/02

5002-027-A 2878

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, September 26, 2002 2:14 PM  
**To:** Gates, Freeman (F.C.)  
**Cc:** Kotwold, Allen (A.J.); Allee, Sheran (S.A.); McCoy, James (J.D.); Maurer, James (J.B.)  
**Subject:** Output Clamping

Freeman,

We need your input regarding a possible solution for the Vref dipping issue from the PTEC.

The concept under consideration would limit the output of the sensor from 0.4 volts to a maximum of 4.8 volts. These would be hard limits, with tight tolerances, regardless of any calibration offset/slope error of the sensor, and regardless of any failure mode of the sensor.

Would this create any new problems for the system, particularly for the OBD II fault diagnostics?

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

**Freeland, Mark (M.)**

---

**From:** Freeland, Mark (M.)  
**Sent:** Friday, September 27, 2002 2:04 PM  
**To:** Gates, Freeman (F.C.)  
**Subject:** RE: Output Clamping

Freeman,

Thanks for the feedback. With the current production sensor, if the Hout is shorted to ground the PCM will see 63 mV because of the two 30 ohm resistors, is that a problem? If the Hout is open, then the PCM will see Vref.

Field experience is that we never see failed parts with an output lower than 0.11 V, or higher than 4.6x volts.

With my mod under consideration, if the Hout were shorted to ground you would see 0.4 V and if it were open you would see 4.6 V at the PCM.

Can we discuss further when you come over with the ESM parts. Thanks

Regards

Mark Freeland

6-Sigma Black Belt  
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MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mrfreela1@ford.com  
Tel: (313) 594-7645

-----Original Message-----

**From:** Gates, Freeman (F.C.)  
**Sent:** Friday, September 27, 2002 10:47 AM  
**To:** Freeland, Mark (M.)  
**Cc:** Kobnicki, Allen (A.J.); Allen, Sheron (S.A.); McCoy, James (J.D.); Maurer, James (J.B.)  
**Subject:** RE: Output Clamping

Mark,

If we did limit the output to 0.4 - 4.6 Volts, we would not have a problem as far as EGR functionality is concerned, assuming slope is transparent. We also need to insure that we still have at least that .050 Volt or greater than 4.95 Volt for the open/short circuit OBD test( P1400 and P1401) which is part of the comprehensive component monitor requirements of the OBD II regulation.

We also could possibly limit the MAX EGR allowable for a sensor that is biased on the high side if we had an upper set limit of 4.6V. This is a function of orifice size and calibration requirements for EGR delivery.

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, September 26, 2002 2:14 PM  
**To:** Gates, Freeman (F.C.)  
**Cc:** Kobnicki, Allen (A.J.); Allen, Sheron (S.A.); McCoy, James (J.D.); Maurer, James (J.B.)

Subject: Output Clamping

Freeman,

We need your input regarding a possible solution for the Vref clamping issue from the PTEC.

The concept under consideration would limit the output of the sensor from 0.4 volts to a maximum of 4.6 volts. These would be hard limits, with tight tolerances, Irregardless of any calibration offset/slope error of the sensor, and Irregardless of any failure mode of the sensor.

Would this create any new problems for the system, particularly for the OBD II fault diagnostics?

Regards

Mark Freeland

6-Sigma Black Belt  
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Ford Research Laboratory  
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email: mtfreel1@ford.com  
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## *Ford Motor Company*

**Subject: WPRC Part Pilot Program**

**Objective:**

- Majority of WPRC pilot review will be concentrating on component analysis relating to customer concern and tech comments. If you plan to bench test any parts, please let us know prior to review.

**Outcome:**

- Confirmation of problem statement [if possible]
- Agreed timing for testing [one week]
- If testing doesn't identify root cause. 8D timing plan will be initiated by team
- Ford D&R Engineer to ensure completion of assignments
- Identify if additional parts are required
- Follow up reviews will be scheduled at this time [if required]

**Note:**

- D&R Ford Engineer are encouraged invite additional team members
- Warranty parts status to be reviewed at the PST meeting on a rotational basis

**Freeland, Mark (M.)**

**From:** Rossi, Roberto (R.A.)  
**Sent:** Friday, June 28, 2002 8:30 AM  
**To:** Freeland, Mark (M.); Akins, Mary (M.); Alles, Sheran (S.A.); Awad, Mahmoud (M.I.); Gates, Freeman (F.C.); 'Jahshan, John'; Janda, Jon (J.M.); Maurer, James (J.B.); O'Neill, Jim (J.D.); 'Park, Kyong'; Plante, Paul (P.G.); Poma, Amy (A.); McCoy, James (J.D.); Czekala, Michael (M.D.); Frazier, Keith (R.K.)  
**Subject:** RE: Sample Waveform Showing Noise Coupled Into Test Wiring

Mark,

I think the various levels of high frequency noise that you are seeing might be due to changes with the ignition system. I have seen this before but I can not explain what changes in the coil, spark plug or cylinder that causes this change.

I do know that I did previously work on an issue with the aluminum DPFE sensor from Kavlico that caused the PCM to intermittently reset. The issue found here was that the DPFE sensor had a capacitor connected directly to the case of the sensor and the PCM inputs. The case of the sensor was grounded to the engine block.

The capacitor directly connected to the engine block and the PCM input is a low impedance path at high frequencies. The noise generated by the ignition system would couple a significant amount of energy into the PCM through the capacitor and cause it to reset. The present DPFE sensor design does not have this problem because the sensor is isolated from the engine block.

Possibly Mike Czekala, Jim McCoy, Jim Maurer or Keith Frazier might be able to explain what changes in the ignition system to cause the amount of noise generated by the ignition system to change significantly.

Additionally, the previous waveform that I sent was with coaxial cable. The signals were unshielded for approximately 5 inches which was just enough to connect the wires.

Thanks,

Robert

-----Original Message-----

**From:** Freeland, Mark (M.)  
**To:** Rossi, Roberto (R.A.); Akins, Mary (M.); Alles, Sheran (S.A.); Awad, Mahmoud (M.I.); Gates, Freeman (F.C.); 'Jahshan, John'; Janda, Jon (J.M.); Maurer, James (J.B.); O'Neill, Jim (J.D.); 'Park, Kyong'; Plante, Paul (P.G.); Poma, Amy (A.); McCoy, James (J.D.)  
**Sent:** 6/27/02 6:22 PM  
**Subject:** RE: Sample Waveform Showing Noise Coupled Into Test Wiring

Roberto,

Thank you for the cautionary information regarding being careful when looking at high frequency signals.

The wiring between the sensor and the DVM's is a screened cable, and between the DVM & the scope was a twisted pair. I am replacing the twisted pairs with coax and adding a Pearson ring tonight. Any other

suggestions to improve the instrumentation set up on the Vout. If you had such a thing as an optical isolator available which would isolate the scope relative to the dFFE signals that might also improve the signal. If you do not have such a beast, do you have one that I might use? Can you offer an explanation as to why the Vout signal recorded on page 5 might be so different to the Vout signal recorded at idle on page six (about one hour later). The scope settings, and Vout wiring been the same undisturbed.

Regards

Mark Freeland

>6-Sigma Black Belt  
>Engine Research Department  
>Ford Research Laboratory  
>P.O. Box 2053  
>MD 2629 - SRL - Room 1517  
>Dearborn, MI 48121-2053 USA  
email: mfreeland@ford.com  
Tel.: (313) 594-7645

>-----Original Message-----

>From: Rossi, Roberto (R.A.)  
>Sent: Thursday, June 27, 2002 5:29 PM  
>To: Akins, Mary (M.); Alles, Sheran (S.A.); Awad, Mahmoud (M.I.);  
>Gates, Freeman (F.C.); 'Jahshan, John'; Janda, Jon (J.M.); Maurer,  
>James (J.B.); O'Neill, Jim (J.D.); 'Park, Kyong'; Plante, Paul (P.G.);  
>Poma, Amy (A.); Freeland, Mark (M.); McCoy, James (J.D.)  
>Subject: Sample Waveform Showing Noise Coupled Into Test Wiring

>As a follow-up from the meeting today, the following waveform is a  
>recording from a vehicle being instrumented by Jim McCoy. The peak to  
>peak voltage is approximately 40 Volts. The signal being monitored is  
>the Scope Reference signal (not connected to anything except the scope  
>ground). The object of the test was to demonstrate that when trying to  
>capture high frequencies signals (>1 MHz) great care must be taken with  
>respect to shielding oscilloscope measurement wires.

><< OLE Object: Microsoft Photo Editor 3.0 Picture >>

>An additional comment is that if the sensor on Mark's vehicle was  
>actually seeing the 13 Volts (10 MHz) noise on the sensor Vout the  
>current flowing in the circuit should be Amperes because of the 220 nF  
>capacitor that is on the Vout circuit of the sensor (impedance of Vout  
>is very low at high frequencies  $X=1/(2\pi \text{Frequency} \times \text{Capacitance})$ ).

>Thanks,

>Robert Rossi  
>Electrical/Electronic Systems Campaign Prevention Specialist  
>North American Car Lifestyle Vehicles  
>Phone/Fax: 84-51436

**Freeland, Mark (M.)**

From: Park, Kyong [KPark@kavlico.com]  
Sent: Friday, June 28, 2002 12:42 PM  
To: pplante@ford.com  
Cc: mawad@ford.com; mfreeia1@ford.com; Davies, Brady  
Subject: FW: DPFE Resistance Assessment

Date: After 12-30-01.xls    Stack charts-May  
cut.xls

Paul,

After yesterday's 14D meeting, I received a couple of files from Mr. M. Awad which are still attached to this memo for your convenience. I think that you also received the same files. I heard that Mr. Awad would be out of office for a while. So, I am asking you do me a favor. Please, teach me how I find the returns of Motorola parts from the file. I am not familiar with your platforms in regards to which platform uses which sensors. I thank you for your help.

Kyong

> -----Original Message-----

> From: Awad, Mahmoud (M.I.) [SMTP:mawad@ford.com]  
> Sent: Friday, June 28, 2002 6:25 AM  
> To: Mary Akins (E-mail); Freeland, Mark (M.); Gates, Freeman (F.C.);  
> Maurer, James (J.B.); McCliment, Greg (G.A.); Plante, Paul (P.G.); Poma,  
> Amy (A.); Brady Davis; Dan Ayers; Dr Park; Mary  
> Cc: McCliment, Greg (G.A.)  
> Subject: DPFE Resistance Assessment  
>  
> Dr. Park and Jim,  
> As promised, enclosed please find a file includes all the claims reported  
> after Dec. 01 month of production. Please keep in mind that the "abstract"  
> number of claims reported is not a good measure to assess a new change  
> like the resistance protection, the more appropriate way to do that is to  
> use the stack charts where these claims are normalized by production  
> volumes. I did enclose another file that has the stack charts for several  
> platforms that still have the Kavlico TM DPFE sensor. I'll leave the  
> assessment for you, since I think it is too early to make the call.  
>  
> <<Data After 12-30-01.xls>> <<Stack charts-May cut.xls>>  
>  
> > Best Regards  
> > Mahmoud Awad  
> > Reliability Implementation Engineer  
> > FMEI Department Support  
> > Phone: (313) 24-83869  
> > e-mail: mawad@ford.com  
> >  
> > <<Data After 12-30-01.xls>> <<Stack charts-May cut.xls>>



**Akolkar, Shrikant (S.V.)**

**Subject:** Kevico DPFE Noise Factor/Keylife Tests on Eng. CR-B093 (15); POEE-AC06 (15); CR "B"  
**Location:** POEE-8093 (15); POEE-AC06 (15); CR "B"  
**Start:** Fri 6/7/02 1:00 PM  
**End:** Fri 6/7/02 2:30 PM  
**Recurrence:** Weekly  
**Recurrence Pattern:** every Friday from 1:00 PM to 2:30 PM  
**Meeting Status:** Meeting organizer  
**Required Attendees:** Akolkar, Shrikant (S.V.); Maurer, James (J.B.); Frestland, Mark (M.); Gatus, Freeman (F.C.); Fablen, Phil (P.A.); Duncan, Jack (J.L.); POEE-8093 (15); Herr, Mike (M.B.); POEE-AC06 (15); Petty, Neal (N.E.)

Gentlemen,

Thanks Jack bringing to my attention that CR-B093 is not showing for this meeting. I have now booked CR "B" (not on computer) which is next Henry Ford's glass enclosed office at POEE. Our office assistance checked my meeting & she confirmed that it's a computer screw up. I am booking some other available rooms here for next 2 meetings if required. Let's see if it works. If future 6/14 & 6/21 meetings are required & CRs still conflict, I will sent another meeting notice. Also, pl. note revision in agenda.

**Agenda:** Determine the details of the following items so that the engine & vehicle tests can be started before July 1st 2002. No standard test exists. Determine the parameters for starting the test quickly & modify test as we learn more.

- EGR-Sensor accelerated test environment-Shri, Freeman
- Accelerated test cycles with heating, cooling, condensation, electrical impulses etc-Shri
- Any existing dyno/chassis roll/proving ground tests can be used?-Neal, Jack, Mike
- Discussion on bench or engine/vehicle test- Neal Petty, Mike
- Discussion on testing at Ford or outside
- Mechanical Instrumentation-Shri
- Electrical Instrumentation & monitoring-Mark
- Intermittent inspection
- Test duration/Anticipated failure period/Testing to failure
- Multiple sensor mounting & testing on one engine/vehicle, start with single sensor
- Any other items missed:

Considering the gravity of the Kevico sensor failure situation on all vehicle lines, your attendance is necessary. The engine & vehicle have been identified & are being prepared. Only key people have been invited to speed up the process. A rough draft for the purpose of start of discussion is attached.

OFFICE OF THE CHIEF OF POLICE

**Freeland, Mark (M.)**

From: amexpl [amexusa@mindspring.com]  
Int: Monday, June 10, 2002 2:18 PM  
To: mrfreela1@ford.com  
Subject: American Express Itinerary

**ITINERARY**

PAGE NO. 1  
PNR: 1P-2LRAG5

FREELAND/MARK-FORD MOTOR CO  
PSGR 1-313-5947645  
ETKT EMAIL

NAME : FREELAND/MARK

CUSTOMER NO. ACCOUNT NO. DATE  
5100 000037438 0000601850 10JUN02

| CO   | DATE  | CITY-AIRPORT     | TIME | FLIGHT NBR/CLASS | ST    | SERV/AMNT |
|------|-------|------------------|------|------------------|-------|-----------|
| A SU | 09JUN | LV DETROIT/METRO | 605P | UNITED           | 1905M | OK        |
|      |       | AR DENVER        | 709P |                  |       | 0STOP 737 |
|      |       | UA CONFO *XJTHDQ |      |                  |       |           |

SEAT 11-B \*\*RESERVED\*\*  
FREELAND/MARK

|      |       |                  |      |        |       |           |
|------|-------|------------------|------|--------|-------|-----------|
| A SU | 09JUN | LV DENVER        | 800P | UNITED | 1285M | OK        |
|      |       | AR BURBANK       | 919P |        |       | 0STOP 737 |
|      |       | UA CONFO *XJTHDQ |      |        |       |           |

SEAT 15-C \*\*RESERVED\*\*  
FREELAND/MARK

UA1285-SEAT ASSIGNMENT IS AIRPORT CHECK IN

C SU 09JUN HERTZ CONFO-B8432744615  
HOLLYWOOD-BURBANK-TERMINAL PICKUP-09JUN SUN/2119  
BURBANK CALIFORNIA RETURN-12JUN WED/0616  
PHONE-818-569-3570  
RATE-(QUOTED) USD 52.50 DAILY UNLIMITED MILEAGE  
EXTRA HOUR CHARGE 27.00 UNLIMITED MILEAGE  
APPROX TPL USD170.49 INC TAX-OTH CHGS  
1 INTERMEDIATE CAR  
CORPORATE ID-25501

H SU 09JUN HYATT WESTLAKE PLAZA CHECK IN- 09JUN SUN/300PM  
880 S WESTLAKE VILLAGE BLVD CHECK OUT-11JUN TUE/1200PM  
WESTLAKE VILLAGE CA 91361 GUARANTEED TO CREDIT CARD-VI  
PHONE-805-557-1234  
FAX-805-379-9392  
CONFO-HY0021502555

RATE GUARANTEED-USD

PREFERRED RATE GUESTROOM  
RATE INFO-EFF 09JUN02 185.00  
CANCEL RQMTS-CANCEL 24 HOURS PRIOR TO ARRIVAL

PERSONS INCLUDED IN RATE-1  
NSRM

CORPORATE ID-CR124

W TU 11JUN HILTON BURBANK AIRPORT  
2500 HOLLYWOOD WAY  
BURBANK CALIFORNIA 91505  
PHONE-818 843-6000  
FAX-818 842-9720  
CONF-3145442668NSCONF

CHECK IN- 11JUN 11/1500  
CHECK OUT-12JUN 12/1200  
GUARANTEED TO CREDIT CARD-VI  
FREE SHUTTLE SERVICE

| CO | DATE | CITY-AIRPORT | TIME | FLIGHT NBR/CLASS | ST SERV/AMNT |
|----|------|--------------|------|------------------|--------------|
|----|------|--------------|------|------------------|--------------|

H TO 11JUN HILTON BURBANK AIRPORT

CONTINUED  
RATE GUARANTEED-USD

AMERICAN EXPRESS TRAVEL

RATE INFO-169.00

CANCEL RQMTS-BY 0000 11JUN2002 LOCAL PROPERTY TIME

1 NIGHT STAY

PERSONS INCLUDED IN RATE-1 CORPORATE ID-N0002690

NSRM

|            |            |      |        |               |
|------------|------------|------|--------|---------------|
| A WE 12JUN | LV BURBANK | 626A | UNITED | 574M OK SNACK |
|            | AR DENVER  | 935A |        | OSTOP 737     |

UA CONFO \*XJTHDQ

SEAT 11-E \*\*RESERVED\*\*  
FREELAND/MARK

|            |                  |       |        |           |
|------------|------------------|-------|--------|-----------|
| A WE 12JUN | LV DENVER        | 1005A | UNITED | 1406M OK  |
|            | AR DETROIT/METRO | 240P  |        | OSTOP 757 |

UA CONFO \*XJTHDQ

UA1406 SEAT ASSIGNMENT AIRPORT CHECK IN

FOR ALL US RESERVATION ASSISTANCE PLEASE CALL

1-800-331-7510 OR 800-441-9705

WHEN TRAVELING IN EUROPE PLEASE CALL

EMERGENCY CENTER IN THE UK-44-208-774-7351

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AFTER HOURS ASSISTANCE IN THE US CALL 800-354-2400

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\*\*\*\*\* POLICY REMARKS \*\*\*\*\*

ACCEPTED FARE WITHIN TRAVEL POLICY OF \$586.00

DIRECTORY HOTEL NOT APPLICABLE

\*\*\*\*\*

FORM OF PAYMENT IS VISA.

YOUR UNITED TICKET NUMBER IS 1531025050.

HAVE A PLEASANT TRIP

\*\*\*\*\*KEEP TO USE FOR EXPENSE REPORT\*\*\*\*\*

**Freeland, Mark (M.)**

**From:** Freeland, Mark (M.)  
**Sent:** Thursday, June 08, 2002 1:02 PM  
**To:** Maurer, James (J.B.); McCoy, James (J.D.)  
**Subject:** FW: Escape Stalls

Jim & Jim, Per you're request Jim.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

**From:** Hermann, Thomas (T.J.)  
**Sent:** Wednesday, June 05, 2002 11:49 AM  
**To:** Freeland, Mark (M.)  
**Subject:** RE: Escape Stalls

No link to the dPFE. It sounds like some RF noise getting onto the IAC sensor lines to the PCM. Just adding (or changing the value of) an RF bypass cap in the PCM to clean it up.

-----Original Message-----

**From:** Freeland, Mark (M.)  
**Sent:** Tuesday, June 04, 2002 4:56 PM  
**To:** Hermann, Thomas (T.J.)  
**Cc:** McCoy, James (J.D.); Maurer, James (J.B.); Plante, Paul (P.G.); Janda, Jon (J.M.); John Jahshan (E-mail)  
**Subject:** Escape Stalls

Tom,

I came across this from the Escape Stalls Team.

**Status of Concern C11371349 (Tim Veenstra)**

**2:30-2:35**

- o Concern Desc: 3.0L Escape experiences engine stalls between 6-12MHZ and 20-25MHZ as low as 73 V/M. The root cause was determined to be the EBC interface to the IAC. By fixing the EBC the anomaly went away completely.
- o Concern is for implementing the "EEC w/a capacitor change".

What do you know about the capacitor change, is this a filter cap or what, could there be any link to dPFE going into an SCR latch?

Regards

Mark Freeland

6-Sigma Black Belt

Engine Research Department  
Ford Research Laboratory  
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MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreelal@ford.com  
Tel.: (313) 594-7645

**Freeland, Mark (M.)**

**From:** Freeland, Mark (M.)  
**Sent:** Wednesday, June 05, 2002 10:45 AM  
**To:** Janda, Jon (J.M.); Kyong Park (E-mail); Brady Davies (E-mail)  
**Cc:** Jeff Helms (E-mail); Plante, Paul (P.G.); Maurer, James (J.B.); Hargas, Jon (.); Gates, Freeman (F.C.); Bryant, Bruce (B.D.); Kotwicki, Allan (A.J.)  
**Subject:** FW: American Express Itinerary

Attached is my itinerary for next weeks visit to Kavlico.

The focus of my trip is to review the parts from the High Current Acid, H2O2 and H02 tests conducted to date and to plan next steps in the quest to recreate all of the field failure symptoms with lab tests.

I would propose that I plan to be at the plant at 8:30 am to give you time to take care of you're email etc.. Jon will let us know by tomorrow morning if he will be joining me.

Regards

Mark Freeland

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email: mfreelal@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

**From:** sashindo [mailto:amexusa@mindspring.com]  
**Sent:** Wednesday, June 05, 2002 11:34 AM  
**To:** mfreelal@ford.com  
**Subject:** American Express Itinerary

**ITINERARY**

PAGE NO. 1  
PNR: 1P-2LRAG5

FREELAND/MARK-FORD MOTOR CO  
PSGR 1-313-5947645  
ETKT EMAIL

NAME : FREELAND/MARK

CUSTOMER NO. ACCOUNT NO. DATE  
5100 000037438 0000601850 05JUN02

| CO | DATE     | CITY-AIRPORT                  | TIME         | FLIGHT NBR/CLASS | ST       | SERV/AMNT |
|----|----------|-------------------------------|--------------|------------------|----------|-----------|
| A  | SU 09JUN | LV DETROIT/METRO<br>AR DENVER | 605P<br>709P | UNITED           | 1905M OK | 0STOP 737 |

UA CONFO \*XJTHDQ

SEAT 11-B \*\*RESERV  
FREELAND/MARK

SU 09JUN LV DENVER 800P UNITED  
AR BURBANK 919P  
UA CONFO \*XJTHDQ

UA1285-SEAT ASSIGNMENT IS AIRPORT CHECK IN

C SU 09JUN HERTZ CONFO-B8432744615  
HOLLYWOOD-BURBANK-TERMINAL PICKUP-09JUN SUN/2119  
BURBANK CALIFORNIA RETURN-12JUN WED/0616  
PHONE-818-569-3570  
RATE-(QUOTED) USD 52.50 DAILY UNLIMITED MILEAGE  
EXTRA HOUR CHARGE 27.00 UNLIMITED MILEAGE  
APPROX TTL USD170.49 INC TAX-OTH CHGS  
1 INTERMEDIATE CAR  
CORPORATE ID-25501

H SU 09JUN HYATT WESTLAKE PLAZA CHECK IN- 09JUN SUN/300PM  
880 S WESTLAKE VILLAGE BLVD CHECK OUT-11JUN TUE/1200PM  
WESTLAKE VILLAGE CA 91361 GUARANTEED TO CREDIT CARD-VI  
PHONE-805-557-1234  
FAX-805-379-9392  
CONFO-HY0021502555

RATE GUARANTEED-USD

PREFERRED RATE GUESTROOM  
RATE INFO-EFF 09JUN02 185.00  
CANCEL RQRTS-CANCEL 24 HOURS PRIOR TO ARRIVAL  
PERSONS INCLUDED IN RATE-1 CORPORATE ID-CR12642  
NSRM

H TU 11JUN HILTON BURBANK AIRPORT CHECK IN- 11JUN TUE/1500  
2500 HOLLYWOOD WAY CHECK OUT-12JUN WED/1200  
BURBANK CALIFORNIA 91505 GUARANTEED TO CREDIT CARD-VI  
PHONE-818 843-6000 FREE SHUTTLE SERVICE  
FAX-818 842-9720  
CONFO-3145442668NSCONF

RATE GUARANTEED-USD

AMERICAN EXPRESS TRAVEL



ITIP  
PA  
PN

| CO   | DATE  | CITY-AIRPORT                                       | TIME  | FLIGHT NBR/CLASS      | ST SERV/AMNT  |
|------|-------|----------------------------------------------------|-------|-----------------------|---------------|
| H TU | 11JUN | HILTON BURBANK AIRPORT                             |       |                       | CONTINUED     |
|      |       | RATE INFO-169.00                                   |       |                       |               |
|      |       | CANCEL RQRTS-BY 0000 11JUN2002 LOCAL PROPERTY TIME |       |                       |               |
|      |       | 1 NIGHT STAY                                       |       |                       |               |
|      |       | PERSONS INCLUDED IN RATE-1                         |       | CORPORATE ID-N0002690 |               |
|      |       | NSRM                                               |       |                       |               |
| A WE | 12JUN | LV BURBANK                                         | 616A  | UNITED                | 574M OK SNACK |
|      |       | AR DENVER                                          | 925A  |                       | OSTOP 737     |
|      |       | UA CONFO *XJTHDQ                                   |       |                       |               |
|      |       | SEAT                                               |       | 11-E **RESERVED**     |               |
|      |       |                                                    |       | FREELAND/MARK         |               |
| A WE | 12JUN | LV DENVER                                          | 1005A | UNITED                | 1406M OK      |
|      |       | AR DETROIT/METRO                                   | 240P  |                       | OSTOP 757     |
|      |       | UA CONFO *XJTHDQ                                   |       |                       |               |
|      |       | UA1406 SEAT ASSIGNMENT AIRPORT CHECK IN            |       |                       |               |

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HAVE A PLEASANT TRIP

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**Freeland, Mark (M.)**

From: Freeland, Mark (M.)  
Sent: Wednesday, June 05, 2002 12:14 PM  
To: Plante, Paul (P.G.)  
Subject: RE: American Express Itinerary

Paul,

Yes I will ask Kyong for a summary spreadsheet of bench testing at Moorpark to be brought to the team next week.

I will forward you a copy of the revised presentation material, should be done tomorrow morning. (and thanks for the complement).

I understand the need to keep the ESE activity coordinated through a central focal point, however, I have to be able to talk directly with Tom, he is a green belt on my project, and has been working with me since long before Roberto came to the team, it was Tom that first got Sheran started even before Sheran was a Ford employee! I have no problem keeping Roberto in that loop.

Regards

Mark Freeland

> 6-Sigma Black Belt  
> Engine Research Department  
> Ford Research Laboratory  
> P.O. Box 2053  
> MD 2629 - SRL - Room 1517  
> Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Plante, Paul (P.G.)  
Sent: Wednesday, June 05, 2002 11:00 AM  
To: Freeland, Mark (M.)  
Subject: RE: American Express Itinerary

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FYI, I see a note from you to Tom Hermann. I would like to get to a point where we have a single ESE point of contact to direct all questions and follow up on issues. R. Rossi is assigned that position. Can we make the concept work? Can we direct thru Monday Vehicle Meeting?

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From: Freeland, Mark (M.)  
Sent: Wednesday, June 05, 2002 10:45 AM  
To: Janda, Jon (J.M.); Kyong Park (E-mail); Brady D. (E-mail);  
Cc: Jeff Helms (E-mail); Plante, Paul (P.G.); Maurer, James (J.B.);  
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will be joining me.

Regards

Mark Freeland

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ITINERARY

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PSGR 1-313-5947645  
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NAME : FREELAND/MARK

CUSTOMER NO. ACCOUNT NO.  
5100 000037438 0000601850

DATE  
05JUN02

| CO | DATE     | CITY-AIRPORT     | TIME | FLIGHT NBR/CLASS | ST SERV/AMNT |
|----|----------|------------------|------|------------------|--------------|
| A  | SU 09JUN | LV DETROIT/METRO | 605P | UNITED           | 1905M OK     |

AR DENVER 709P  
UA CONFO \*XJTHDQ

SEAT 11-B \*\*RESER  
FREELAND/MARK

A SU 09JUN LV DENVER 800P UNITED 1285M OK  
AR BURBANK 919P 08TOP 737  
UA CONFO \*XJTHDQ

UA1285-SEAT ASSIGNMENT IS AIRPORT CHECK IN

C SU 09JUN HERTZ CONFO-B8432744615  
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|      |       | RATE INFO-169.00                                   |       |                       |               |
|      |       | CANCEL RQMTS-BY 0000 11JUN2002 LOCAL PROPERTY TIME |       |                       |               |
|      |       | 1 NIGHT STAY                                       |       |                       |               |
|      |       | PERSONS INCLUDED IN RATE-1                         |       | CORPORATE ID-N0002690 |               |
|      |       | NSRM                                               |       |                       |               |
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|      |       | AR DENVER                                          | 925A  |                       | OSTOP 737     |
|      |       | UA CONFO *XJTHDQ                                   |       |                       |               |
|      |       | SEAT                                               |       | 11-E **RESERVED**     |               |
|      |       |                                                    |       | FREELAND/MARK         |               |
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|      |       | AR DETROIT/METRO                                   | 240P  |                       | OSTOP 757     |
|      |       | UA CONFO *XJTHDQ                                   |       |                       |               |
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**Freeland, Mark (M.)**

---

From: Freeland, Mark (M.)  
Sent: Wednesday, June 05, 2002 3:30 PM  
To: Plants, Paul (P.G.)  
Subject: RE: American Express Itinerary

Paul,

OK, agreed.

Keith Frazier just spent an hour and half with me getting up to speed. His personal vehicle may have a failing dPFM, and he would like to install the "simple" instrumentation set up in his vehicle. I will have Tim Potter make up a set for him.

Regards

Mark Freeland

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email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Plants, Paul (P.G.)  
Sent: Wednesday, June 05, 2002 12:16 PM  
To: Freeland, Mark (M.)  
Subject: RE: American Express Itinerary

Go to lunch, your as bad as Me. Thanks for the explanation on Tom, if you keep Roberto in the loop and make him the Monday interface for the answers that would help.

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Mark Freeland

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| CO | DATE     | CITY-AIRPORT     | TIME | FLIGHT NBR/CLASS | ST    | SERV/AMNT |
|----|----------|------------------|------|------------------|-------|-----------|
| A  | SU 09JUN | LV DETROIT/METRO | 605P | UNITED           | 1905M | OK        |
|    |          | AR DENVER        | 709P |                  |       | 0STOP 737 |
|    |          | UA CONFO *XJTHDQ |      |                  |       |           |
|    |          | SEAT             | 11-B | **RESERVED**     |       |           |
|    |          |                  |      | FREELAND/MARK    |       |           |

|                                            |          |                  |      |        |       |           |
|--------------------------------------------|----------|------------------|------|--------|-------|-----------|
| A                                          | SU 09JUN | LV DENVER        | 800P | UNITED | 1285M | OK        |
|                                            |          | AR BURBANK       | 919P |        |       | 0STOP 737 |
|                                            |          | UA CONFO *XJTHDQ |      |        |       |           |
| UA1285-SEAT ASSIGNMENT IS AIRPORT CHECK IN |          |                  |      |        |       |           |

|   |          |                                                 |                       |
|---|----------|-------------------------------------------------|-----------------------|
| C | SU 09JUN | HERTZ                                           | CONFO-B8432744615     |
|   |          | HOLLYWOOD-BURBANK-TERMINAL                      | PICKUP-09JUN SUN/2119 |
|   |          | BURBANK CALIFORNIA                              | RETURN-12JUN WED/0616 |
|   |          | PHONE-818-569-3570                              |                       |
|   |          | RATE-(QUOTED) USD 52.50 DAILY UNLIMITED MILEAGE |                       |
|   |          | EXTRA HOUR CHARGE 27.00 UNLIMITED MILEAGE       |                       |



APPROX TTL USD170.49 INC TAX-OTH CHGS  
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|      |       |                                                     |       | FREELAND/MARK         |               |
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|      |       | UA CONFO *XJTHDQ                                    |       |                       |               |
|      |       | UA1406 SEAT ASSIGNMENT AIRPORT CHECK IN             |       |                       |               |

FOR ALL US RESERVATION ASSISTANCE PLEASE CALL  
DIALNET 313-33-75100 OR 800-441-9705

WHEN TRAVELING IN EUROPE PLEASE CALL

EMERGENCY CENTER IN THE UK-44-208-774-7351

OPEN FROM 4PM-9AM MON-FRI AND 24 HRS SAT AND SUN

AFTER HOURS ASSISTANCE IN THE US CALL 800-354-2400

OUTSIDE THE US OR CANADA CALL COLLECT 713-260-8713

YOUR ACCESS CODE IS - W-NOF

THIS RESERVATION HAS BEEN MADE FOR YOU BY FCTO

THIS IS AN ELECTRONIC TICKET.

THE AIRLINE CONFIRMATION APPEARS BELOW THE FLIGHT SEGMENT.

A PASSENGERS RECEIPT MAY BE REQUESTED AT THE AIRPORT

FOR EXPENSE PURPOSES.

PLEASE CALL TO PROCESS A REFUND OR EXCHANGE.

\*\*\*\*\* POLICY REMARKS \*\*\*\*\*

ACCEPTED FARE WITHIN TRAVEL POLICY OF \$586.00

DIRECTORY HOTEL NOT APPLICABLE

\*\*\*\*\*

FORM OF PAYMENT IS VISA.

YOUR UNITED TICKET NUMBER IS 1531025050.

HAVE A PLEASANT TRIP

\*\*\*\*\*KEEP TO USE FOR EXPENSE REPORT\*\*\*\*\*

**Freeland, Mark (M.)**

---

**From:** Awad, Mahmoud (M.I.)  
**Sent:** Monday, December 09, 2002 11:01 AM  
**To:** Freeland, Mark (M.)

  
From: Jan2002  
WAC.sle

**Best Regards**  
**Mahmoud Awad**  
*Reliability Implementation Engineer*  
*FMEI Department Support*  
**Phone: (313) 24-63889**  
**e-mail: mawad@ford.com**

**Freeland, Mark (M.)**

---

From: Akolkar, Shrikant (S.V.)  
Sent: Tuesday, June 04, 2002 4:13 PM  
To: Maurer, James (J.B.)  
Cc: Gates, Freeman (F.C.); Freeland, Mark (M.); Janda, Jon (J.M.)  
Subject: RE: LatchUp Hybrid Testing

Jim,

After meeting several engineers in 2 EGR sections, I found one excel spread sheet with Bill Boughner which I think has all info we need. It contains all engine EGR tube part#s, tube OD/ID info & orifice sizes. According to his spread sheet, the delta mm difference between the tube ID & orifice ID is between 6.85 to 7.1mm across all engines which is very insignificant. This is just based on physical dimension data. The quantity of gas flow, temp, pressure data is not available in the spread sheet.

I will give you the hard copy of the dimension sheet during our 1:1. Pl. let me know if you need anything more from this issue.

-----Original Message-----

From: Maurer, James (J.B.)  
Sent: Thursday, May 30, 2002 12:37 PM  
To: Akolkar, Shrikant (S.V.)  
Subject: FW: LatchUp Hybrid Testing

Shri,

I found this note among some old notes that I inherited from Karen Owens. It indicates that the size of the pressure fluctuations is inversely proportional to the size of the orifice. Please investigate what size orifices are used on the various applications. It may turn out that the Focus has a smaller orifice and therefore worse pressure fluctuations. Also, for the bench/dyno test, maybe we can get worst case fluctuations of pressure just by putting a smaller orifice in the EGR tube.

Regards,

Jim Maurer  
James B. Maurer  
V-Engine 6-Sigma Team Leader  
Fuel Metering Dept. V Engine Engineering  
Phone (313) 390-3672, Fax (313) 390-4084  
Text Page: (313) 795-5219  
Email: jmaurer@Ford.com

-----Original Message-----

From: Don Ayers [mailto:DAyers@kavlico.com]  
Sent: Thursday, September 20, 2001 12:28 PM  
To: Gates, Freeman (F.C.); Freeland, Mark (M.)  
Cc: Akina, Mary (M.); Bansek, Catherine (C.K.); Owens, Karen (K.E.); Randy Ray  
Subject: RE: LatchUp Hybrid Testing

Freeman -

ENTIRE PAGE

You mention that the size of the flow orifice is inversely related to the magnitude of the fluctuations. Do you know that the Explorer has a larger orifice than the 3.0L Taurus? If so, we can definitely say that was the issue. Just to reiterate, the Explorer current was rock steady and the Taurus bounced around by 2 mA. My concern is that I would've expected to see the Explorer current draw fluctuate somewhat during the test (indicating that the valve was open) no matter the size of the orifice. However, it never wavered from the initial reading.

Thanks,  
Don

DISCREPANCY  
RED Latching

> -----Original Message-----

> From: Gates, Freeman (F.C.) [SMTP:fgates@ford.com]  
> Sent: Wednesday, September 19, 2001 9:58 AM  
> To: Freeland, Mark (M.); 'Don Ayers'; 'mfsopwith@cs.com'  
> Cc: Akins, Mary (M.); Bansek, Catherine (C.K.); Owens, Karen (K.E.);  
> 'Randy Ray'  
> Subject: RE: LatchUp Hybrid Testing

> The erratic nature of the current is due to the change in output voltage  
> of the DPFE sensor as a function of delta pressure (EGR FLOW ACROSS  
> ORIFICE). If you couple this output to a 4.7K pull-up resistor, there will  
> be a fluctuation. The smaller the control orifice is, the more fluctuation  
> you will see. I had Don verify this on the bench last Thursday.

> Freeman Gates  
> Senior EGR Systems Technical Specialist  
> Tel (313)32-24807 Fax (313)39-04084  
> POEE Rm D-138 CM-173

> -----Original Message-----

> From: Freeland, Mark (M.)  
> Sent: Wednesday, September 19, 2001 10:55 AM  
> To: 'Don Ayers'; Gates, Freeman (F.C.); mfsopwith@cs.com  
> Cc: Akins, Mary (M.); Bansek, Catherine (C.K.); Owens, Karen (K.E.);  
> Randy Ray  
> Subject: RE: LatchUp Hybrid Testing

> Don,

> I just got back from vacation this morning. Please use my business email,  
> as I check it more often than the personal one.

> The current "jumpiness" is significant to me, we need to understand what  
> is going on. I would expect to see a slow change in current caused by a  
> temperature change of the sensor. The current should reduce as the  
> temperature goes up. From room temperature to 125 deg. C the current  
> should fall by as much as 2.2 mA, so if the initial current were 7.5 mA  
> then it would be OK to see a current of 5.3 mA if the sensor is at 125  
> deg. C. But if the current goes lower than that there is something  
> unusual going on. Also, these changes should be relative slow, not jumpy.

> Please keep me in the loop on this one.

> Regards

>  
> Mark Freeland  
>  
(5) > 6-Sigma Black Belt Candidate  
> Physics Department  
> > Ford Research Laboratory  
> > P.O. Box 2053  
> > MD 3028 - SRL - Room 1517  
> > Dearborn, MI 48121-2053 USA  
> email: mfreela1@ford.com  
> Tel.: (313) 594-7545  
>

**Freeland, Mark (M.)**

---

**From:** Plants, Paul (P.G.)  
**Sent:** Thursday, June 06, 2002 11:58 AM  
**To:** Hoare, Graham (G.)  
**Cc:** Freeland, Mark (M.); Plants, Paul (P.G.); O'Neill, Jim (J.D.); Maurer, James (J.B.); Gates, Freeman (F.C.)  
**Subject:** RE: FW: Kevico dPFE Sensor

Graham, thanks for your interest in this project. It is the #1 concern in V Engine. We have a large crossfunctional team already working on it, and meeting daily. Mark has been doing an outstanding job supporting and contributing to us. His assistance, and that of all your FRL staff, have been much appreciated.

Jim Maurer (DPFÉ Team Leader), myself (VEE CPS), Mark and FRL master BB reviewed the presentation Tuesday, 6/4/02. We are in agreement on it's content. If there are questions for V Engine after the review please contact Jim or I for follow up.

I do think it would be advantageous for FRL and V Engine management to meet and discuss alignment of our activities on this project. Mark's BB project affects Focus Stalls. The Focus represents only 8% of total engine failures. Stalls represent only a small part of that. Stalls are a particularly sensitive issue currently since Ford has (2) NHTSA safety inquiries just opened as pilots on the generic issue. I recommend using existing forums such as Tuesday or Thursday 1:00-3:00 PM team meetings or setting up a single (1) hour overview meeting to discuss our cooperation and issues.

-----Original Message-----

**From:** Hoare, Graham (G.)  
**Sent:** Thursday, June 06, 2002 7:30 AM  
**To:** Plants, Paul (P.G.); Mickel, Lori (L.L.)  
**Subject:** RE: FW: Kevico dPFE Sensor

Lori,

Can you pls confirm with Mark that we have enough & the right attendees coming to set direction on this project.

Thanks

Graham

-----Original Appointment-----

**From:** Plants, Paul (P.G.)  
**Sent:** Tuesday, June 04, 2002 12:14 PM  
**To:** Hoare, Graham (G.)  
**Subject:** Declined: FW: Kevico dPFE Sensor  
**Where:** Thursday, June 06, 2002 4:00 PM-5:30 PM (GMT-05:00) Eastern Time (US & Canada).  
**Where:** FPC-B #35 Exec Conf Rm

Mark, I will not attend. I will review the presentation w/ Jim and you Tuesday. Per my other E mail, John Koczewnik and Jim O'Neill have approved your presentation in concept. In the future advise us who to invite from FRL to generic management reviews to keep FRL aligned with the team. Good luck with this review, I know your well prepared as usual. Let Me know the outcome.

**Ford**

## MEETING ANNOUNCEMENT / WORKING TEAM MEETING

|                                      |                                                                                                    |  |  |
|--------------------------------------|----------------------------------------------------------------------------------------------------|--|--|
| <b>Objective:</b>                    | <b>Establish and implement corrective and containment actions for Kavlico TM dPFE Sensor</b>       |  |  |
| <b><u>Meeting Logistics</u></b>      |                                                                                                    |  |  |
| <b>Subject:</b>                      | Kavlico TM dPFE Sensor Core Team                                                                   |  |  |
| <b>Dates:</b>                        | April 30, 2002                                                                                     |  |  |
| <b>Time:</b>                         | 1-2:30 p.m.                                                                                        |  |  |
| <b>Location:</b>                     | POEE, DI-196 (FMEI War Room)                                                                       |  |  |
| <b>Called By:</b>                    | Jim Maurer, Team Leader: (313) 39-03672                                                            |  |  |
| <b>Next Meeting (s):</b>             | May 2, 2002, Core Team Meeting<br>May 7, 2002, Core Team Meeting                                   |  |  |
| <b>Conference Call-in Number(s):</b> | 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#<br>Kavlico Fax: 805-531-6574 |  |  |

| Core Team Participants |                |                 |                       |              |                       |
|------------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Bolts</b>     | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b>     |
| Mark Freeland          | Mary Atkins    | Jim O'Neill     | Mahmoud Awad          | Sharan Allen | Chris Nielsen         |
| Shri Akolkar           | Don Ayers      | Freeman Gates   |                       | Robert Rossi | Bill McCarty          |
| Jon Janda              |                | Amy Poon        |                       |              | Patrice White-Johnson |
|                        |                | Paul Plante     |                       | <b>PCSE</b>  |                       |
| <b>Team Leader</b>     |                | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer             |                |                 |                       | Brian Perry  |                       |

| Meeting Agenda - 4/30/02                                                             |              |                           |                |  |
|--------------------------------------------------------------------------------------|--------------|---------------------------|----------------|--|
| Order of Agenda Items                                                                | Corr. Item # | Person(s) Responsible     | Time Allocated |  |
| 1. Introductions                                                                     |              | All                       | 5 minutes      |  |
| 2. FRL Update of UPAD                                                                | 13, A2       | Mark Freeland             | 15 minutes     |  |
| 3. Update on Body and Assembly plant failures                                        | 13, A3       | Don Ayers                 | 10 minutes     |  |
| 4. PCM update: Voltage drop between v-out and signal return                          | 13, A5       | Brian Perry, John Jahshan | 10 minutes     |  |
| 5. Outside Lab / Non disclosure agreement - status                                   | 13, A5       | Bill McCarty              | 5 minutes      |  |
| 6. Update on "In Process" acid tested parts; Discussion of chemical analysis of gel. | 13, A6, A8   | Kyong Park, Mark Freeland | 15 minutes     |  |
| 7. Update on obtaining vehicles and high-mileage parts for FRL analysis              | 16, A5, A6   | Jim Maurer (John Fira)    | 10 minutes     |  |
| 8. Walk-ins                                                                          |              | All                       | 10 minutes     |  |
| 9. Next Meeting Agenda Items                                                         |              | All                       | 5 minutes      |  |

| Proposed Next Meeting Agenda 5/2/02                                                                     | Person(s) Responsible | Time Estimated |
|---------------------------------------------------------------------------------------------------------|-----------------------|----------------|
| Still waiting for JDA, to be finalized before SRL get F.B. work done & continue to work with Ed Sieber. |                       |                |

| Notes                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bring handouts (paper copies) for all presentations<br>Provide electronic copies of presentations to CPANARET (no later than 1 hour prior to the meeting)<br>Please be on time as we have a full agenda |

T.M. Shopping List For Bits to INST. JAMES Jim Maurer/cp: 4/30/02  
Kavlico dPFE Sensor Core Team

E002-027-A 3100



**Freeland, Mark (M.)**

---

From: Davies, Brady [BDavies@kavlico.com]  
Sent: Friday, June 07, 2002 8:07 PM  
To: Park, Kyong; 'Freeland, Mark (M.)'  
Subject: RE: New Raman results

Mark,

Of course you recall that Analytical Solutions attributed the "mud cracking" to ALOH.

> -----Original Message-----

> From: Park, Kyong  
> Sent: Friday, June 07, 2002 2:27 PM  
> To: Freeland, Mark (M.)  
> Cc: Davies, Brady  
> Subject: RE: New Raman results

>  
> Mark  
> Thank you.  
> We will discuss further here.  
> Kyong

> -----Original Message-----

> From: Freeland, Mark (M.) [SMTP:mfreela1@ford.com]  
> Sent: Friday, June 07, 2002 1:35 PM  
> To: Kyong Park (E-mail); Brady Davies (E-mail); Kangas, Jon (.)  
> Cc: Uy, Dairene (D.); Gonzalez, Lebzy (L.)  
> Subject: New Raman results

> Dairene and Lebzy has been working with a UPAD sample which was  
> mechanically depotted, and saw no chemistry.  
> Today she examined the residue under a bond pad using a UV laser,  
> and compared the spectra to samples of Al Hydroxide and Al Nitrate that  
> she had also measured with the equipment.  
> The results indicate that the residue is Al Nitrate, and not Al  
> Hydroxide, as previously suggested by Analytical Solutions.  
> I will share the spectra with you on Monday when I arrive. (I only  
> have paper copies at this time).

> Also, it was interesting to note that after the mechanical  
> depotting, the residue did not have the mud cracked appearance as  
> previously observed.

> The sample used for this work was SRL647, from the data base.

> Regards

> Mark Freeland

>  
> > 6-Sigma Black Belt  
> > Engine Research Department  
> > Ford Research Laboratory  
> > P.O. Box 2053  
> > MD 2629 - SRL - Room 1517  
> > Dearborn, MI 48121-2053 USA  
> email: mfreela1@ford.com

Tel.: (313) 594-7645

# Vehicle Information Report

## GENERAL VEHICLE INFORMATION: (Related Claims)

|                        |                                                   |                                         |
|------------------------|---------------------------------------------------|-----------------------------------------|
| VIN: 1FAFP52B91G272541 | Vehicle Line: C/D - TAURUS/EABLE (D186) (00-01)   | Eng Serial No: 587994077                |
| Model Year: 2001       | Market Derivative: C/P - FORD DIVISION DERIVATIVE | Body Style: *                           |
| Vehicle Type: C        | Drive Codes: C/A - 2 WHL L/N FRONT DRIVE          | Engine: C/LD - MOD 3.0L DOHC EFI N      |
| Inv. Dealer: 02741     | Body Cab Style: C/P - 4 DOOR SEDAN 4 LITE         | Transmission: C/DX - 4 SPD AUTO TRANS N |
|                        | Version/Version: C/P - TAURUS B VERSION           |                                         |

## BUILD INFORMATION:

Region: NA - 0000000000 Plant: AD - CHICAGO PLANT BUILD  
Country: USA - 0000000000 Prod Date: 25-JUL-2001

## SALE INFORMATION:

Region: NA - 0000000000 Selling Dealer: 140038 - \*  
Country: USA - 0000000000 Selling Dtr 20/Prov: MI  
Buyer 20/Prov: MI

Arrival Date: 31-JUL-2001 Red Carpet Lease: 1  
Sale Date: 16-AUG-2001 Fleet/Lease/PC/Less: R  
Warranty Start Date: 16-AUG-2001 Modified Vehicle: \*  
Orig Warranty Date: 16-AUG-2001 Homologated Vehicle: \* Vehicle Export Flag: N

## YQC/EOC:

-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10-----  
D610272542Y01 ? A1 5425402 ME 8 L8E 32 7 P2 UNC JB 68C026 2 UN Jack AL  
PAPS 1 NEXE

## INSTALLED OPTION INFORMATION:

|                        |                                |                      |                                     |
|------------------------|--------------------------------|----------------------|-------------------------------------|
| Air Conditioning:      | C/C - AYC AIR CONDITIONER      | GVW Code:            | * - [N/A]                           |
| Alternator Amp Rating: | *                              | GVW Class Code:      | F                                   |
| Audio (Disc):          | AC - AUDIO DMC CH/ANCER PLAYER | Instrumentation:     | * - [N/A]                           |
| Audio Radio:           | * - [N/A]                      | Mirror(Driver Side): | BA - DRIVER POWER/HEATED MIRROR     |
| Audio Type:            | * - [N/A]                      | Mirror(Pass Side):   | BA - PASS POWER/HEATED CONVEX MIRR  |
| Battery Amp Rating:    | RO                             | Paint:               | PNAAA - EBONY SOLID CC              |
| Brake Code:            | PBAAB - 4 WHL ANTI-LOCK BRAKES | Power Antenna:       | * - [N/A]                           |
| Brake Code(Garage):    | * - [N/A]                      | Radio:               | AE - ELECTRONIC AM/FM STRO/CASSETTE |
| Calibration Code:      | IDD14N0A                       | Sound System:        | AE - AUDIOPHILE SOUND SYSTEM        |
| Color(Accent):         | * - [N/A]                      | Steep Tandem Axle:   | * - [N/A]                           |
| Color(Trim):           | * - [N/A]                      | Tire Manufacturer:   | AP - CONTINENTAL                    |
| Delivery Type:         | F                              | Tire Brand:          | ACX44P - TOURINGCONTACT AS 947      |
| Drivetrain Code:       | *                              | Tire Size:           | D41E - P215/60R-16 BSW ALL SEASON   |
| Front Seat:            | * - [N/A]                      | Traction Control:    | * - [N/A]                           |
| Fuel Type:             | * - [N/A]                      | Wheel Base:          | * - [N/A]                           |

## TIRE DOT INFORMATION:

|     |            |     |            |
|-----|------------|-----|------------|
| LF: | ACX44P1801 | RF: | ACX44P1801 |
| LR: | ACX44P1801 | RR: | ACX44P1801 |
| LI: | *          | RI: | *          |

SPARE: PCW7H922501 DOT Plant Manufacturer: AC - GENERAL TIRE CO.; CHARLOTTE; NORTH CAROLINA; UNITED

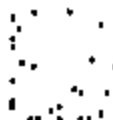
## ESP INFORMATION: EMISSIONS INFORMATION:

# Vehicle Information Report

Page 2 of 2

|                      |             |                        |              |
|----------------------|-------------|------------------------|--------------|
| ESP Code:            | N           | Emission Code:         | C/B - C/B    |
| ESP Coverage(Miles): | 046         | Emission Cert Type:    | S            |
| ESP Coverage(Time):  | 056         | Emission Decal Suffix: | W/H          |
| ESP Plan Year:       | 2001        | Engine Family:         | IFMCKV030VF3 |
| ESP Signature Date:  | 16-AUG-2001 |                        |              |

Any comments? You can contact



webmaster

**Freeland, Mark (M.)**

---

From: Freeland, Mark (M.)  
Sent: Thursday, June 13, 2002 12:38 PM  
To: Lovelace, Maria (M.E.)  
Subject: RE: Assignment # 02-58 - DPFE Sensor

Thank you for the info, will look forward to receiving the parts.

PS I received the two parts from Mark Hayduk in Pittsburgh this morning when I got back from Kavlico.  
Thanks

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

-----Original Message-----

From: Lovelace, Maria (M.E.)  
Sent: Thursday, June 13, 2002 11:01 AM  
To: Freeland, Mark (M.)  
Subject: FW: Assignment # 02-58 - DPFE Sensor

Information for you

-----Original Message-----

From: Dionisi, Anthony (A.J.)  
Sent: Thursday, June 13, 2002 10:59 AM  
To: Lovelace, Maria (M.E.)  
Cc: Bersuder, Lee (L.C.); Dionisi, Anthony (A.J.)  
Subject: Assignment # 02-58 - DPFE Sensor

Maria - FYI. Entered three CQIS reports (#s 2FMIO001, 2FMIO002, 2FMIO003) related to Assignment # 02-58. Parts will be returned directly to Mark Freeland per assignment directions. On CQIS # 2FMIO003, I entered it as a "S" (potential safety concern) since vehicle lost all power while driving. DPFE sensor (data code: 0J08C) replaced - resolved concern (this DPFE sensor qualifies to problem 2 listed on assignment form).

Total of three parts being returned.

Tony Dionisi  
Ford Motor Company  
Enhanced Concern Identification  
Denver Field Quality Engineer  
Office: 303-348-4788  
Cell: 303-921-2517  
Fax: 303-348-4798  
adionisi@ford.com

*Sord*

## MEETING ANNOUNCEMENT / WORKING TEA

**Objective:** Establish and implement corrective actions for Kavlico TM dPFE Sensor

**Subject:** Kavlico TM dPFE Sensor Core Team  
**Date:** June 13, 2002  
**Time:** 1-2:30 p.m.  
**Location:** POBB, DI-196 (FMEI War Room)  
**Called By:** Jim Maurer, Team Leader: (313) 39-03672  
**Next Meeting (s):** June 18, 2002, Core Team Meeting  
 June 20, 2002, Core Team Meeting  
**Conference Call-in Number(s):** 9-1-954-1149 (inside Ford); 847-619-6158 (outside) Passcode: 6881436#  
 Kavlico Fax: 805-331-6574

**Core Team Participants**

|                    |                |                 |                       |              |                       |
|--------------------|----------------|-----------------|-----------------------|--------------|-----------------------|
| <b>Black Belts</b> | <b>Kavlico</b> | <b>V-Engine</b> | <b>Quality Office</b> | <b>EESE</b>  | <b>Purchasing</b>     |
| Mark Froeland      | Mary Akias     | Jim O'Neill     | Mahmoud Awad          | Sheran Alies | Chris Nielsen         |
| Shri Akolkar       | Don Ayers      | Freetman Gates  |                       | Robert Rosal | BIM McCarty           |
| Jon Janda          | Kyong Park     | Amy Poma        |                       |              | Patrice White-Johnson |
|                    |                | Paul Plante     |                       | <b>PCSE</b>  |                       |
| <b>Team Leader</b> | <b>Visteon</b> | Carol Verner    |                       | Ken Arnold   |                       |
| Jim Maurer         | John Jahuan    |                 |                       | Brian Perry  |                       |

**Meeting Agenda - 6/13/02**

| Order of Agenda Items                                   | Corr. Issue # | Person(s) Responsible | Time Allocated |
|---------------------------------------------------------|---------------|-----------------------|----------------|
| 1. Update on Norfolk and St. Thomas parts               | 13, A3        | Don Ayers             | 10 minutes     |
| 2. Issues Resolution Report out                         | 13, A12       | Jon Janda             | 20 minutes     |
| 3. Parser Data                                          | 15, A11       | Mary Akias            | 10 minutes     |
| 4. Update repeat repairs data                           | 16, A9        | Mahmoud Awad          | 15 minutes     |
| 5. Instrumentation/Settings and update on test vehicles | 16, A7        | Jim McCoy             | 15 minutes     |
| 6. STA update                                           | 15, A10       | Patrice White-Johnson | 10 minutes     |
| 7. Ford visit to Kavlico-tentative date/agenda update   |               | Jim O'Neill           | 10 minutes     |
| 8. Walk Ins                                             |               | All                   | 15 minutes     |

| Promoted Next Meeting Agenda 6/13/02 | Person(s) Responsible | Time Estimated |
|--------------------------------------|-----------------------|----------------|
|                                      |                       |                |

**Notes**

Bring handouts (paper copies) for all presentations  
 Provide electronic copies of presentations to sporn2 (no later than 1 hour prior to the meeting)  
 Please be on time as we have a full agenda

Jim Maurer/cp: 6/12/02  
 Kavlico dPFE Sensor Core Team

EM02-027-A 3127

**Freeland, Mark (M.)**

From: Hargas, Jon (.)  
Sent: Tuesday, June 11, 2002 12:52 PM  
To: 'Park, Kyong'  
Cc: Simko, Steven (S.J.); Freeland, Mark (M.)  
Subject: SIMS experiment for Fluorine

Kyong,

When I asked Steve Simko if there was a method to detect whether there was a method to detect whether the fluorine he detected was associated with aluminum, and not a Freon or gel residue, he suggested doing SIMS. Steve Kaberline is willing to look at a sample, but his SIMS has poor sputtering performance through the overlying gold. He will have to look at UFAD already exposed to the aluminum hydroxide layer by Auger, or an area from my attempted cross section. Alternatively, we could send the sample to University of Western Ontario, which got our old Cameca SIMS with better sputtering performance. Apparently they owe Steve Kaberline many favors.

Jon

-----Original Message-----

From: Park, Kyong [mailto:KPark@kavlico.com]  
Sent: Tuesday, June 11, 2002 12:35 PM  
To: Hargas, Jon (.); Gates, Freeman (F.C.); Freeland, Mark (M.); 'Ed Sickafus (E-mail)'; Simko, Steven (S.J.); Uy, Dairene (D.)  
Cc: Maurer, James (J.B.); Plante, Paul (P.G.); O'Neill, Jim (J.D.);  
Park, Kyong; Davies, Brady; mstriz@analyticalsol.com  
Subject: RE: Discrepancy between Auger and Raman results

Jon,

I still think the corrosion initiator is HF and agree that Al Hydroperoxide, and Al Nitrate are the Al corrosion byproducts. All of these materials would not be generated without the high temperature and with the protection by the gel's initial good condition.

Without the HF, the passivation layer protects the device with the help of the gel, without the high temperature, NOx from the exhaust, even as it might turned into H2NO3, will not attack the device, that we had tested in the laboratory test, and would create Al Nitrate.

Without the high temperature, which is caused by the electric 'Latch up', if you are able to create corrosion of Al and other degradation of materials, all these fine details may be significant, yet the importance of HF will be still valid.

We have the results of 'Latch up' with uncontrolled currents and various liquids for two weeks. Most parts had lost gel turned into black, the device dies were not attacked very much.

The on-and-off 'slow cooking' due to the intermittence of the electrical latch up in the vehicles may also play very important, the gel may hold those HF created by the degradation of the die attachment and from the gel itself, and provides the essential time for these gas to attack the die, otherwise, the gas will be evaporated before it can attack the die.

Yours,  
Kyong

> -----Original Message-----

> From: Hanges, Jon (.) [SMTP:jhangas@ford.com]  
> Sent: Tuesday, June 11, 2002 8:50 AM  
> To: Gates, Freeman (F.C.); Freeland, Mark (M.); 'Ed Sickafus (E-mail)';  
> Simko, Steven (S.J.); Uy, Dairene (D.)  
> Cc: Maurer, James (J.B.); Plante, Paul (P.G.); O'Neill, Jim (J.D.);  
> 'kpark@kavlico.com'; 'bdavies@kavlico.com'  
> Subject: Discrepancy between Auger and Raman results  
>  
> Dairene's Raman results are exciting, and give an insight into the initial  
> compounds that form in PAD or UPAD.  
>  
> Steve Simko found no nitrogen in the samples he looked at except the  
> passivation. He suggested electron beam damage as a cause if the nitrate  
> existed. EDX in SEM is not very sensitive to nitrogen, and I would have  
> to compare an aluminum nitrate standard to whatever unknown I was looking  
> at before drawing conclusions on any spectra I have stored before claiming  
> there was a nitrate present.  
>  
> The enthalpy of formation or Gibbs Free Energies for aluminum nitrate or  
> aluminum nitrate nonahydrate are not listed in the CRC, but aluminum  
> hydrates ( $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$  or  $\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ ) have a higher free energy of formation  
> than aluminum oxide (of course their formation will depend on the partial  
> pressure of water and temperature). Other tables mention  $\text{Al}(\text{NO}_3)_3$   
> decomposes, but not the temperature, and that  $\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$  decomposes at  
> 135 degrees Centigrade.  
>  
> I wonder if in further latch up and heating in high current events may  
> convert any aluminum nitrate formed to aluminum hydrate. Perhaps aluminum  
> nitrate or aluminum nitrate nonahydrate forms in the presence of exhaust  
> condensate.

> Jon

> > -----Original Message-----

> > From: Gates, Freeman (F.C.)  
> > Sent: Tuesday, June 11, 2002 9:15 AM  
> > To: Freeland, Mark (M.); 'Ed Sickafus (E-mail)'  
> > Cc: Maurer, James (J.B.); Plante, Paul (P.G.); O'Neill, Jim (J.D.);  
> > 'kpark@kavlico.com'; 'bdavies@kavlico.com'; Hanges, Jon (.); Gates,  
> > Freeman (F.C.)  
> > Subject: RE: New Raman results  
> >  
> > Mark,  
> >  
> > As per our conversation last night(6/10/02), my research did show the  
> > following:  
> >  
> > Aluminium Hydroxide + Nitric Acid (exhaust) -----> Aluminium Nitrate +  
> > Water  
> >  
> > ref. [www.wpbschoolhouse.btinternet.co.uk/index.htm](http://www.wpbschoolhouse.btinternet.co.uk/index.htm)



ENTIRE

Disregard  
Red  
lettering

> > So perhaps Analytical Solutions was not completely off, but  
> they just did not account for the subsequent reaction in the  
> environment that transforms Aluminium Hydroxide to Aluminium Nitrate.

> > Thanks

> > -----Original Message-----

> > From: Freeland, Mark (M.)  
> > Sent: Friday, June 07, 2002 4:53 PM  
> > To: Ed Sickafus (E-mail)  
> > Cc: Maurer, James (J.B.); Gates, Freeman (F.C.); Plante, Paul (P.G.)  
> > Subject: FW: New Raman results

> > Ed,

> > New information of the residue material left after the Al is  
> transformed. We should discuss this next week.

> > Regards

> > Mark Freeland

> > 6-Sigma Black Belt  
> > Engine Research Department  
> > Ford Research Laboratory  
> > P.O. Box 2053  
> > MD 2629 - SRL - Room 1517  
> > Dearborn, MI 48121-2053 USA  
> > email: mfreela1@ford.com  
> > Tel.: (313) 594-7645

> > -----Original Message-----

> > From: Freeland, Mark (M.)  
> > Sent: Friday, June 07, 2002 4:35 PM  
> > To: Kyong Park (E-mail); Brady Davies (E-mail); Hargas, Jon (.)  
> > Cc: Uy, Dairene (D.); Gonzalez, Lebzy (L.)  
> > Subject: New Raman results

> > Dairene and Lebzy has been working with a UPAD sample which was  
> mechanically depotted, and saw no chemistry.  
> > Today she examined the residue under a bond pad using a UV laser, and  
> compared the spectra to samples of Al Hydroxide and Al Nitrate that she  
> had also measured with the equipment.  
> > The results indicate that the residue is Al Nitrate, and not Al  
> Hydroxide, as previously suggested by Analytical Solutions.  
> > I will share the spectra with you on Monday when I arrive. (I only have  
> paper copies at this time).

> > Also, it was interesting to note that after the mechanical depotting,  
> the residue did not have the mud cracked appearance as previously  
> observed.

> > The sample used for this work was SRL647, from the data base.

> > Regards

> > Mark Freeland

> > 6-Sigma Black Belt

> > Engine Research Department  
> > Ford Research Laboratory  
> > P.O. Box 2053  
> > MD 2629 - SRL - Room 1517  
> > Dearborn, MI 48121-2053 USA  
> > email: mfreela1@ford.com  
> > Tel.: (313) 594-7645  
> >

**Subject:****INTERMITTENT ENGINE QUIT OR IDLE DIP****Bulletin No:** 01-014/02R**Last issued:** 10/01/2002**BULLETIN NOTE**

- This bulletin supersedes Last issued: 09/10/2002. The vehicle built date under step a. of No. 3 PCM Reflashing has been updated.

**APPLICABLE MODEL(S)/VINS**

2001-2003 Tributes with 3.0L Duratec engine only.

**DESCRIPTION**

Some vehicles equipped with a 3.0L Duratec engine may exhibit an intermittent engine quit condition. This is usually a one time event during closed throttle deceleration with no Diagnostic Trouble Codes (DTCs) and no Malfunction Indicator Lamp (MIL). The engine will restart immediately.

When normal diagnosis cannot pinpoint the root cause, refer to the following Drivability Checklist for details.

**REPAIR PROCEDURE**

1. Verify customer concern.
2. Inspection of Idle Air Control (IAC) Valve
  - a. With the transmission in Park, the engine should idle at approximately 750 RPM, and the engine temperature should be at least 88°C (190°F). All accessories and the engine cooling fan should be off.
  - b. Using WDS version B20.12 or later, verify that Idle Air Control (IAC) duty cycle is within specification (between 32-40% with no purge flow).
  - c. If the Idle Air Control (IAC) duty cycle is within specification, proceed to Step 3. If IAC duty cycle is out of specification, replace IAC with part number AJ03-20-860A.
  - d. If IAC duty cycle is within specification after replacing with a new IAC, then proceed to Step 3. If IAC duty cycle is still out of specification, replace throttle body with part number AJ08-13-840A.
  - e. Verify corrective action, then proceed to Step 3.

**NOTE:** Engine RPM will slowly ramp up. It is extremely important to check the IAC duty cycle when the RPM is at 750 RPM. Even 800 RPM is too high for checking IAC duty cycle under these conditions.

3. PCM Reflashing
  - a. Perform the following: If the vehicle was built on or after 8/13/2002, then proceed to Step 4 now. If not, reprogram the PCM with WDS version B20.12 or later. Only use WDS version B20.12 or later during this reprogramming.
  - b. Some 2001 model year PCMs cannot be reprogrammed and must be replaced. Replacement is determined by the MPC # located in the upper left corner of the barcode on the PCM. If the PCM is an MPC 160, then replace with part number AJ08-18-861F and reprogram with WDS version B20.12 or later. If the PCM is MPC 161, then just reprogram with WDS version B20.12 or later.

**CONSUMER NOTICE:** The information and instructions in this bulletin are intended for use by skilled technicians. Mazda technicians utilize the proper tools/equipment and take training to correctly and safely maintain Mazda vehicles. These instructions should not be performed by "do-it-yourselfers." Customers should not assume this bulletin applies to their vehicle or that their vehicle will develop the described concern. To determine if the information applies, customers should contact their nearest authorized Mazda dealership.

- c. Verify the latest calibration was successfully reprogrammed. WDS should show latest calibration level 1U7A-12A850-AYD if PCM tear tag # SJC0, SJC1, or SJC2. For PCM tear tag HQP1, HQP2, HQP3 or RK00, the latest calibration level is 2U7A-12A850-CRB. For tear tag BAR0 or BAR1, the latest calibration level is 3L8A-12A850-BC.

**NOTE:** For additional details on PCM reflashing, refer to the attached **PCM REFLASH PROCEDURE SUPPLEMENT**. Then proceed to Step 4.

**4. Inspection of Evaporative Vapor (EVAP) Management Valve**

- With the transmission in Park, the engine should idle at approximately 750 RPM, and the engine temperature should be at least 88°C (190°F). All accessories and the engine cooling fan should be off.
- With WDS version B20.12 (U.S.) or later, determine if the Evaporative Vapor Management (EVAPVM) duty cycle stops increasing and remains at 85-100% while Fuel Tank Pressure (FTP) holds at approximately 2.6 volts. Monitor these parameters using PIDs - EVAPVM # (in percent) and FTP (in volts). If this occurs, replace the EVAPVM valve with part number AJ03-16-741A.
- If EVAPVM is functioning correctly, the duty cycle should increase to 84-100% with the FTP decreasing to approximately 2.2 volts and then recycle back to 0% duty cycle while FTP hold at approximately 2.6 volts. Do not replace the EVAPVM valve.
- Verify corrective action, then proceed to Step 5.

**5. Inspection of EVAP System Vent Line**

- With the transmission in Park, the engine should idle at approximately 750 RPM, and the engine temperature should be at least 88°C (190°F). All accessories and the engine cooling fan should be off.
- With WDS version B20.12 (U.S.) or later, if EVAPVM drops to 0% from 80-85% (premature purge shut-off), check for an obstructed vent line. This condition may be accompanied by a sudden RPM drop while idling. The premature purge shutoff is caused by the tank not reaching a pre-specified vacuum state.
- To clear the possible obstructed vent line, disconnect the vent line in the evaporative emissions system from the check valve side (check valve part number is AJ03-42-810). This connection is located just forward of the evaporative emissions canister assembly, underneath the vehicle in the area of the driver side rear seat.
- Using shop air, blow the vent line from the check valve side forward (towards the brake booster). In the past, spiders have been known to construct webs in vent lines, so handle with caution. Possible obstructions in the vent line can prevent the evaporative emissions system from purging properly, and in some cases, stalling occurs.
- Verify corrective action, then proceed to Step 6.

**6. Inspection of Electronic Engine Control (EEC) Relay**

- If the Electronic Engine Control (EEC) relay has stamped lettering, proceed to Step 7. If the EEC relay has white lettering printed on the top surface, replace with a new Hella service relay part number BTDA-67-740 that is all black and has stamped lettering on the top surface. Make sure the relay you are installing has stamped lettering.
- Confirm EEC relay female terminal tightness on the battery junction box side using tester P/N 49-L085-QA2-020 from the Mazda terminal repair kit. If loose, adjust terminals as needed. If okay, then proceed to Step 7.

**NOTE:** For location of the EEC relay, use 2001 Wiring Diagram sections Z-52 / Connector X1016 and Z-154 / Battery Junction Box.

**7. Inspection of Key Ring Weight**

- Ask the customer if they have significant weight (approximately 8 oz or more) hanging from the key ring while the keys are in the ignition. If they do, and the engine quits while traveling over bumps, the key ring may move the ignition out of the Run position and stop the engine. When this occurs, all gauges immediately shut off (fuel reads "E", tachometer goes to zero, speedometer goes to zero immediately).

- b. It is recommended that the customer attach fewer keys to the key ring that retains the vehicle ignition key.
- c. Proceed to Step 8.
- 8. Road Test
  - a. Road test the vehicle long enough to experience 3 closed throttle decelerations from approximately 40 mph down to 10 mph. Ensure overdrive is ON. Use scan tool to examine engine RPM during test.
  - b. Ensure that there are no engine RPM dips below 800 RPM. Then proceed to Step 9.
- 9. Obtain an Authorized Modification PCM Label through M-Net (part number 9999-95-AMDC-97) and list the date, dealer number, and summary of modifications performed. Select a prominent place adjacent to the Vehicle Emission Control Information Decal suitable for installing the Authorized Modifications Label. Clean the area, install the decal, and cover it with a clear plastic decal shield.

## PART(S) INFORMATION

| Part Number  | Description              | Qty. | Notes                                                                   |
|--------------|--------------------------|------|-------------------------------------------------------------------------|
| AJ03-20-860A | Valve, idle air          | 1    |                                                                         |
| AJ03-13-840A | Throttle Body            | 1    |                                                                         |
| AJ03-18-741A | Valve, solenoid          | 1    |                                                                         |
| BTDA-87-740  | Relay, Coolant fan       | 1    | Electronic Engine Control (EEC) Relay                                   |
| AJ08-18-881F | Reman, control unit, ECU | 1    | Powertrain Control Module (PCM)<br>Replaces JYB2, JYB3 test tag<br>PCMs |

## WARRANTY INFORMATION

**Note:** This information applies to verified customer complaints on vehicles covered under normal warranty. Refer to the BRT microsite for warranty term information.

|                                |                                                                                                                                                          |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Warranty Type                  | A                                                                                                                                                        |
| Symptom Code                   | 05                                                                                                                                                       |
| Damage Code                    | 9W                                                                                                                                                       |
| Part Number Main Cause         | AJ08-18-881F                                                                                                                                             |
| Quantity                       | 0 or 1                                                                                                                                                   |
| Operation Number / Labor Hours | YY280XRX / 1.2 (includes reflashing of the PCM and vehicle repair)<br>YY290XRX / 1.4 (includes replacement and reflashing of the PCM and vehicle repair) |

**PCM REFLASH PROCEDURE SUPPLEMENT**

(All 2001 Model and early 2002 Model with PCM tear tag of "SJC0, SJC1, or SJC2", 2002 Model with PCM tear tag of HQP1, HQP2, HQP3, or RKG0, and 2003 Model with PCM tear tag BAR0 or BAR1)

**NOTE:**

- WDS shows the calibration part number after programming the PCM.
- Please be aware that PCM calibration part numbers and file names listed in any Service Bulletin may change due to future releases of WDS software and additional revisions made to those calibrations for service related concerns. When reprogramming a PCM, WDS will always display the "latest" calibration P/N available for that vehicle. If any calibration has been revised/updated to contain new information for a new service concern/issue, it will also contain all previously released calibrations.

Connect WDS to the vehicle and perform the below PCM calibration re-flash procedure. Please pay special attention to the following Vehicle PCM information **BEFORE** beginning this procedure:

- If vehicle PCM tear tag # is JYB2, JYB3 (MPC-160 level) you must first replace PCM with a later style PCM with Tear Tag # of SJC0, SJC1, SJC2, or SJA3 (MPC-161 level) by performing the PROGRAMMABLE MODULE INSTALLATION (PMI) PROCEDURE (See Procedure 1).
- If vehicle PCM tear tag # is SJC0, SJC1, SJC2, HQP1, HQP2, HQP3, RKG0, BAR0, or BAR1 use WDS B20.12 or later and re-flash PCM by performing the "module reprogramming" procedure. (See Procedure 2)

The latest calibration PCM P/N for tear tag SJC0, SJC1, or SJC2 is 1U7A-12A550-AYD. File name is DOAR63W.

If vehicle PCM tear tag is HQP1, HQP2, HQP3, or RKG0, the latest calibration PCM P/N is 2U7A-12A550-CRB. File name is DOAR63Y.

If vehicle PCM tear tag is BAR0 or BAR1, the latest calibration PCM P/N is 3LBA-12A550-BC. File name is DOAV63F.

**Procedure 1**

(For 3.0L vehicles with PCMs that have tear tag numbers of JYB2 or JYB3. For all other PCM tear tag numbers, refer to Procedure 2.)

**Note:** When replacing a powertrain control module (PCM), the following items are required:

- WDS with B20.12 or later software loaded.
- Minimum two ignition keys for reprogramming PATS (be sure to ask customer for ALL spare keys).
- Obtain new PCM part number AJ08-18-881F.
- With old PCM still in vehicle follow procedure below.

**Note:** When performing this procedure, if the WDS PTU is not docked and connected to 115V-120V, we recommend that a battery charger be installed on the vehicle battery and turned ON to a maximum charge of no more than 20 AMPS to keep the vehicle battery up to capacity. If you exceed 20 AMPS it will damage the WDS PTU.

1. Connect WDS DLC cable to vehicle's DLC connector (lower portion of dash in front of driver).
2. Press "16 PIN", "All except those below", and then press tick.
3. Screen shows cable hookup. Turn ignition switch to ON. Press Tick.
4. Screen shows WDS communicating with PCM "progress bar" and "Operation in progress".
5. Wait until WDS finishes collection of PCM information. (hard drive light quite flashing). Then the "Vehicle Specification" screen appears with VIN # information. It asks you "Is this correct? Press "Yes" if information is correct.

6. Screen appears to fill out R.O. information and mileage. Fill out information and then press tick. Or skip this by pressing tick.
7. With screen showing "Vehicle Specification", press "Tool Box".
8. Another menu appears. Select "Module programming" then press tick. "Please Wait" appears.
9. Then another menu appears. Select "Programmable module installation" then select "PCM" then press Tick.
10. Screen shows "Set ignition switch to OFF (position 0)". Do this and press tick.
11. Screen shows "Install a new module in vehicle". Replace the PCM with the new unit, then press tick.
12. Screen shows "Remove the fuses for fuel pump and additional fans as this may cause interference and battery drain during the programming process". Do this and press tick.  
**Note:** There are two 50 amp fuses (on 3.0L) labeled "Main Fan" and "Add Fan". Remove only the 50 Amp fuses to deactivate the fans. Fuel pump is a mini fuse 20 amp (position 6) at front end of fuse box.
13. Screen shows "Set ignition switch to the ON position". Do this and press tick.
14. Screen shows "Downloading data" box with "progress bar". Please wait 2-3 minutes.
15. Screen now shows "Set ignition switch to the OFF position". Do this and press tick.
16. Screen now shows "Set ignition switch to the ON position". Do this and press tick.
17. Screen shows "Set the ignition switch to OFF (position 0)". Do this and press tick.
18. Screen shows "Calibration has been loaded and checked". Press tick.
19. Screen shows "Re-install fuses for fuel pump and additional fans". Do this, then press tick.
20. Screen shows "Obtain a PCM label and fill in the PCM data shown with the data on the WDS screen. Install in the appropriate position. (New label should be in the new PCM part box) **DO NOT FILL OUT PCM LABEL AT THIS TIME!** Press tick.
21. Screen shows "start engine. Do not depress throttle". **THIS IS INCORRECT!!!!!!** You must follow the below procedure to start the vehicle:
  - Turn Ignition OFF, Turn KEY ON (Count 3 secs. security light is ON solid) Turn key OFF, remove key.
  - Insert 2nd key, turn key ON, (security light stays ON for 3 secs. goes out) then start engine. Turn OFF engine, remove key.
  - both keys programmed.
22. Now with Key OFF, press "Select Systems Options" or "Menu" ICON (at the upper right hand side of screen). Press "EXIT" and push the green tick. This will return you to the "Vehicle Specifications" screen.
23. Now press the "Close session" ICON (lower left hand side of screen, 3rd ICON) and press "delete (delete session)". Press tick.
24. Now, Press "16 PIN", "All except those below", and then tick.
25. Screen shows cable hookup. Turn Ignition switch to ON. Press tick.
26. Screen shows WDS communicating with PCM "progress bar" and "Operation in progress".
27. Wait until WDS finishes collection of PCM information (hard drive light quits flashing). Then the "Vehicle Specification" screen appears with VIN # information. It asks you "Is this correct?" Press NO.
28. Then the "Vehicle Specification" screen appears again and asks: "Is this correct?" Press NO again.

29. Screen shows "Incorrect Calibration Programmed." Press tick.
30. Screen shows "To enable WDS to identify PCM, please enter one of the following information:
- PCM part number or
  - Calibration number (7, 10, or 15 digits) or
  - Tear tag number
- Press tick.
31. Press the light blue box area next to "tear tag" and enter "BJC0, BJC1, BJC2, or BJAS" (whatever the tear tag number of the new PCM is) and press tick.
32. Vehicle specification screen appears asking "Is this correct?" Now press YES.
33. Screen shows "Turn ignition switch OFF". Do this and press tick.
34. Screen shows "Remove the fuses for fuel pump and additional fuse as this may cause interference and battery drain during the programming process". Do this and press tick.
35. Screen shows "Turn ignition switch ON". Do this.
36. Screen shows "Downloading Data" box with progress bar. It takes approx. 2-3 minutes.
37. Screen shows "Turn ignition switch OFF". Do this. Press tick.
38. Screen shows "Turn ignition switch ON". Do this. Press tick.
39. Screen changes to "progress bar" and then changes to "Vehicle Specifications" with VIN # and asks "Is this correct?" Press Yes.
40. Screen to fill out R.O. information appears. Press tick.
41. "Vehicle Specifications" screen appears. Now Re-install fan and fuel pump fuses.
42. Now select "Tool Box", then "Module Programming", then press tick. "Please wait" appears.
43. Now select "Module Reprogramming" and "PCM". Then press tick.
44. Screen should say "No later calibration is available on the system for this PCM. The latest level for this vehicle: 1U7A-12A850-AYD. Obtain a PCM label and fill in the PCM data shown with the date on the WDS screen. Install it next to the vehicle emissions label on the hood.
45. Now press tick.
46. Now turn Key OFF, press "Select Systems Options" or "Menu" ICON (at the upper right hand side of screen). Press "EXIT" and push the green tick. This will return you to the vehicle specifications screen.
47. Now press the "Close session" ICON (lower left hand side of screen, 3rd ICON) and press "delete (delete session)". Press tick.
48. Disconnect WDS cable. PCM is now programmed with the latest calibration. Roadtest vehicle to release Keep Alive Memory (KAM).
49. Go back to REPAIR PROCEDURE Step 4.



**Procedure 2**

(For 3.0L vehicles with PCMs that have tear tag numbers of SJC0, SJC1, SJC2, HQP1, HQP2, HQP3, RKG0, BAR0, or BAR1)

**Note:** When performing this procedure, if the WDS PTU is not docked and connected to 115V-120V, we recommend that a battery charger be installed on the vehicle battery and turned ON to a maximum charge of no more than 20 AMPS to keep the vehicle battery up to capacity. If you exceed 20 AMPS it will damage the WDS PTU.

1. Connect WDS DLC cable to vehicle's DLC connector (lower portion of dash in front of driver).
2. Press "16 PIN", "All except those below", and then press tick.
3. Screen shows cable hookup. Turn ignition switch to ON. Press Tick.
4. Screen shows WDS communicating with PCM "progress bar" and "Operation in progress".
5. Wait until WDS finishes collection of PCM information. (hard drive light quits flashing). Then the "Vehicle Specification" screen appears with VIN # information. It asks you "Is this correct? Yes or No?" Press "Yes" if information is correct.
6. Screen appears to fill out R.O. information and mileage. Fill out information and then press tick. Or skip this by pressing tick.
7. On certain tear tag PCM's ONLY, screen will appear showing the "Standard Equipment Module". Press "Exit", then tick.
8. For all other PCM tear tag numbers, screen now return to the "Vehicle Specification".
9. Now press the "tools" tab on the top, then "Module Programming". Then press tick.
10. Screen will show "Please Wait." then another menu appears:
  - Programmable Module Installation
  - Module Reprogramming
  - Programmable Parameters
11. Press "Module Reprogramming" then PCM, then press tick.
12. Screen shows "A later calibration is available, P/N 1U7A-12A850-AYD Filename: DOAR63W OR it will show 2U7A-12A850-CRB Filename: DOAR63Y OR it will show 3L5A-12A850-BC Filename: DOAV535. Do you want to program the PCM with it. Press YES.
13. Screen will say to ensure battery is good to run test. Then press Tick.
14. Screen will now say that KOEO test will be run before reprogramming to check for hard faults. Press tick.
15. Screen now shows self test preparation screen. Insure that all parameters are met then press tick.
16. Screen now shows "Performing test-Please Wait"
17. Screen will now show if any codes are stored.

**NOTE:** If any codes are stored they need to be addressed before recalibration. If no codes are stored proceed to next line.
18. If No Codes are stored press "EXIT". Then the tick mark.
19. Screen now shows "Set ignition switch to the OFF position". Do this and press tick.

20. Screen shows "Remove the fuses for fuel pump and cooling fans as this may cause interference and battery drain during the programming process". Do this and press Tick.

**Note:** There are two 50 amp fuses (on 3.0L) labeled "Main Fan" and "Add Fan". Remove only the 50 Amp fuses to deactivate the fans. Fuel pump is a mini fuse 20 amp (position #6) at front end of fuse box.

21. Screen shows "Set Ignition switch to the ON position". Do this.

22. Screen shows "Downloading data" box with "progress bar". Please wait 2-3 minutes.

23. Screen now shows "Set Ignition switch to the OFF position". Do this and press tick.

24. Screen now shows "Set Ignition switch to the ON position". Do this and press tick.

25. Screen now shows "Set Ignition switch to the OFF position". Do this and press tick.

26. Screen shows "Calibration has been loaded and checked". Press tick.

27. Screen shows "Re-install fuses for fuel pump and cooling fans". Do this, then press tick.

28. Screen shows "Obtain a PCM label and fill in the PCM data shown with the data on the WDS screen. Calibration P/N is: 1U7A-12A650-AYD, 2U7A-12A650-CRB, or 3L8A-12A650-BC. Install PCM label next to the vehicle emission label on the hood.

29. Screen shows "Start engine. Do not depress throttle". Do this and press tick.

30. Screen shows "operation successful- procedure complete". Press Tick.

31. Screen now shows "Turn key off" - Do this then press tick.

32. Vehicle PCM calibration is now updated.

33. Disconnect WDS cable. Roadtest vehicle to relearn Keep Alive Memory (KAM).

34. Go back to REPAIR PROCEDURE Step 4.

**Suarez, Rhas (R.)**

**From:** Ferriss, Sam (S.J.)  
**Sent:** Friday, December 13, 2002 7:51 AM  
**To:** Suarez, Rhas (R.)  
**Cc:** Fournelle, Gilbert (G.); Dalbo, Bob (R.J.); Altoonian, Don (D.J.); Jensen, Ted (T.E.); Lawler, Dave (D.A.)  
**Subject:** RE: IAC Parts

The IAC valve (1L8Z 9F715 AA) is on backorder because of the label issue (the label regarding reflashing). There were 3624 pcs. sent from PRC to Howard Ternos Packaging to add these labels. It took longer than it should have to get this done. This inventory is currently being transferred to the PDC's.

Also, Mazda ordered an additional 2098 pcs. (beyond the launch quantity). Hitachi seems to be having overall capacity issues with valves and is usually unable to expedite additional quantities without adequate leadtime. We added this part to the Constraint Report in attempt to get a greater allocation for service.

Regards,  
Sam Ferriss, QSF/Recall Parts Specialist  
Ford Customer Service Division  
CDS ID: sferriss Ph: 734-528-8184  
E-Mail: sferriss@ford.com

-----Original Message-----  
**From:** Suarez, Rhas (R.)  
**Sent:** Wednesday, December 11, 2002 1:31 PM  
**To:** Ferriss, Sam (S.J.)  
**Cc:** Fournelle, Gilbert (G.); Dalbo, Bob (R.J.); Altoonian, Don (D.J.); Jensen, Ted (T.E.); Lawler, Dave (D.A.)  
**Subject:** IAC Parts

Sam,

I just off the phone with one of our FSE's working on a potential stall buyback vehicle. They have gone through the entire TSB and made sure the vehicle had all the latest and greatest components. When they got to the IAC they notice that we are backorder. He even mentioned that in one system it said parts were being moved for re-work. I am not sure what that means. I pulled up an MMP screen and this is the information I got. Does this mean we are OK for parts? we are on back order but we are expecting 3672? Please let me know if there is an issue with getting parts to the depot. Any idea what the FSE meant when he saw re-work?

Thanks.

*Rhas M. Suarez*

Rhas Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FC80  
D&C # (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-798-8242  
Fax: 313-33-78337  
Email: rsuarez@ford.com

SERVICE PART: 1L8Z- 9F715-AA VALVE ASY - THROTTLE AIR BY-PASS  
ENGINEERING PART: 1L8E 9F715 AA ORIGIN: WERS  
SUPPLIER LOC: FINIS: 4448202  
Vendor Part:

Motorcraft Part: CX- 1911-

Prime Suplr: H388P

Role: T

| Inventory           | Stocking Demand        | Backcast:            |
|---------------------|------------------------|----------------------|
| PCSD Available: 15  | Current Month: 1785    | Max Ord Qty: 0       |
| Pkgr Available: 0   | Prior Month: 655       | Volume Group: C      |
| In-Trans Pkgr: 0    | Prior Month 2: 2194    | Last Release: 672-2A |
| In-Trans PCSD: 0    | Prior Month 3: 22      | Lead Time: 30        |
| Transfers: 3672     | Curr Forecast: 1316    | Procure Cd: 1        |
| Back Ord Pos: 2205  | 6-Mo Forecast: 9101    | Sales Restr: N       |
| Tot Inventory: 1482 | Out of Tolerance: N    | Last ASN Qty: 48     |
|                     | Last ASN: 11/22/02     |                      |
| Tot Curr Pos: 7625  | Back Ord Lines: 192    | Last Rcpt Pkg:       |
| Est'd Max Pos: 6714 | Off B/O Date: 12/13/02 | Abnormal Cat: 7      |
| Firm Release: Y     | Unit Issue: 1          | Design Style:        |
| AIMS Inventory: 25  | Prod Obs:              | Stock Exhaust:       |

**Suarez, Rhea (R.)**

**From:** Suarez, Rhea (R.)  
**Sent:** Thursday, September 05, 2002 8:01 AM  
**To:** Suarez, Rhea (R.)  
**Subject:** RE: 02 Escape Calibration Concern

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, September 04, 2002 6:10 PM  
**To:** Veerstra, Tim (T.W.); Piazza, Joanne (J.)  
**Cc:** Russ, Jessica (J.L.); Takasawa, Keith (K.D.); Corbett, Sandra (S.M.); Suarez, Rhea (R.)  
**Subject:** RE: 02 Escape Calibration Concern

Joanne/Tim,

With these new calibrations, this valve should be used for service of all model years. FCSD will release part information indicating that recalibration is required for 2001/2002 vehicles and the part packaging will also be labelled to inform customers that recalibration is necessary with this part. This is part of the stall fix.

Thanks again for your prompt assistance,

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 798-2559 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Veerstra, Tim (T.W.)  
**Sent:** Wednesday, September 04, 2002 5:11 PM  
**To:** Piazza, Joanne (J.)  
**Cc:** Russ, Jessica (J.L.); Dalbo, Bob (R.J.); Takasawa, Keith (K.D.); Corbett, Sandra (S.M.); Takasawa, Keith (K.D.)  
**Subject:** FW: 02 Escape Calibration Concern  
**Importance:** High

Please approve C11390555 for 2003RC service only. Does not affect Hofu or KCAP and you should be able to raise to A. I have already added my approval to the d-screen. Thanks.

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, September 04, 2002 4:47 PM  
**To:** Harris, Lisa (L.A.); Suarez, Rhea (R.); Limbaco, Steven (S.); Rothweiler, Daniel (D.); Moorhouse, Scott (S.R.); Corbett, Sandra (S.M.); Alcorn, Don (D.J.); Kari, Shirji (S.); Shirahiti, Masaru (M.); Nohlsom, Jim (J.E.); Veerstra, Tim (T.W.)  
**Cc:** Baltes, Paul (P.S.); Derluk Sr., John (J.J.); Bullard, Dawn (D.); Corlew, Randall (R.L.); Tarzan, Laura (L.D.); Hoffman, Michael (M.V.); Peters, Robin (R.S.); Takasawa, Keith (K.D.); Marinas, Tom (T.E.); Bob Pascati  
**Subject:** RE: 02 Escape Calibration Concern  
**Importance:** High

Thanks to extraordinary efforts by the multitude of people involved in the release process:

- 2003 MY NA market calibrations will go into production 9/10.
- 2003 MY market calibrations were released on Fordstar 8/30 and are currently available (WDS version B20.11)
- 2001/2002 MY NA market service calibrations are just now available on Fordstar (WDS B20.12).
- 2001/2002 MY service calibrations will be available via Internet by 9/6.

Tim,

Please approve concern C11390555 (with Keith's concurrence) to release the finned-plate IACV for service

as the necessary calibrations are now available.

**Bob Dalbo**

**3.0L Calibration Supervisor**

**Outfitters Calibration, NAT**

**Phone: (313) 24-84947 Fax: (313) 32-31788**

**Pager: (313) 795-2858 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)**

**Suarez, Rhae (R.)**

---

**From:** Marianne, Tom (T.E.)  
**Sent:** Thursday, September 19, 2002 5:29 PM  
**To:** Dalbo, Bob (R.J.); Suarez, Rhae (R.); Jordan, LeBron (L.)  
**Subject:** RE: Service Calibration Decoder

Bob,

There is a 1:1:1 relationship between filename, part number and catchword.

The sample below is cut out of the release notes that we get from power train (Peter DeBrule) when I file is released onto the VAX system so that we can go pull them to incorporate into our weekly field update releases. I have highlighted filename, part number and catchword.

**THIS IS NOT AN OFFICIAL RELEASE DOCUMENT.  
SEE WERS NOTICE FOR OFFICIAL DATA.**

|                            |                                                 |
|----------------------------|-------------------------------------------------|
| Model Year                 | 2003                                            |
| Calibration Number         | 3M11A30511                                      |
| Vehicle Line               | U204                                            |
| Engine Size / Applications | 3.0L / 2003 U204 3.0L,4-SPEED-AUTO,LEV,UNLEADED |
| Notice Number              | APED B11402381 000                              |
| Hex File Name              | DOAV535.HEX                                     |
| Chip ID                    | 1EDF                                            |
| Module Type                | MPC-161                                         |
| Part Number                | 3L8A-12A650-BC                                  |
| Catchword                  | BAR2                                            |
| EPROM Base Number          | N770005BFWCA18                                  |
| Gasket Required            |                                                 |
| TFPC App. File Name        |                                                 |
| E-Q App. File Name         |                                                 |
| E-Q App. Sequence No.      |                                                 |
| Transmission File Name     |                                                 |
| Transmission Chip ID       |                                                 |
| Release Date               | 8/21/02                                         |
| Comments                   | 216K/VISTEON/MAZDA PART NUMBER AJ71-18881-B     |

I hope that this helps.

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Thursday, September 19, 2002 5:11 PM  
**To:** Suarez, Rhae (R.); Jordan, LeBron (L.); Marianne, Tom (T.E.)  
**Subject:** Service Calibration Decoder

LeBron/Rhae/Tom,

This web site: <http://www.msc.ford.com/fcad/vsp/dsp/ngs/fishfile/calidid.htm> has the service calibrations for WDS on it. However, I don't understand how to tie these calibration numbers/file names to part numbers, catchwords or the certification calibration numbers. Can one of you enlighten me on how to decode them?

*Bob Dalbo*

3.0L Calibration Supervisor

Outfitters Calibration, NAT

Phone: (313) 24-84847 Fax: (313) 32-31788

Pager: (313) 795-2558 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

**ENTIRE PAGE  
CONFIDENTIAL**



Jim Ortner

②

**Danes, Adam (A.V.)**

**Subject:** IAC Blitz Task Force Kickoff  
**Location:** POEE, LC1 (Center Hallway of POEE, just past the Oak Cafe)

**Start:** Tue 3/20/2001 8:00 AM  
**End:** Tue 3/20/2001 4:00 PM  
**Show Time As:** Tentative

**Recurrences:** (none)

**Meeting Status:** Not yet responded

**Required Attendees:** Armitage, John (J.F.); Ball, James (J.C.); Bumberston, Mike (M.); Chick, John (J.); Cvetkovski, Peter (P.); Duclos, Jeffrey (J.A.); El-Hak, Bassem (B.S.); Griffes, Jeff (J.R.); Guilan, Gayle (G.D.); Harris, Stephen (S.J.); Hubbard, Peter (P.H.); Hunt, Laurie (L.A.); Inard, Jane (J.B.); Islam, Keel (K.); Kahau, Daniel (D.); Keiser, E.W. (E.W.); Kiput, Michael (M.R.); Kerezi, Karen (K.); Lint, Brandon (B.D.); Mandzuk, Roger (R.S.); Marquis, Raymond (R.E.); Merone, Rob (R.B.); McBride, James (J.R.); Neddel, Fred (F.M.); O'Neil, Michael (M.W.); Oslip, Sandra (S.D.); Ozden, Michael; Pandolfi, Pete (P.G.); Resume, Alan (A.G.); Revilock, Theodore (T.J.); Sage, Sean; Sita, Bethany (B.J.); Slindee, Carl; Sun, Baocheng (B.); Swann, Patricia (P.A.); Wetsch, Bill (B.); Zaghal, (Z.)

**Agenda**  
8-11:00

**Background**  
**Introduction of Team Members**

**Danes/Kosko**  
**AI**

**Team goals and urgency**

**Danes**

**Roles/Responsibilities discussion**  
**Other team requirements for success**  
**Warranty overview**  
**Progress to date**  
**Valve operation**

**AI**  
**AI**  
**Danes**  
**Danes/Kosko/Wetsch**  
**Wetsch**

**Agenda**  
1-4 PM

**Chemistry discussion**  
**Is it Not chart if applicable**  
**Next Steps/Testing and data required**

**Led by Resume and Sol Lab with participation by all**  
**Danes**  
**AI**

*Electronic File*

*Miss - Fuel Capstan Chart*

*Tapper*

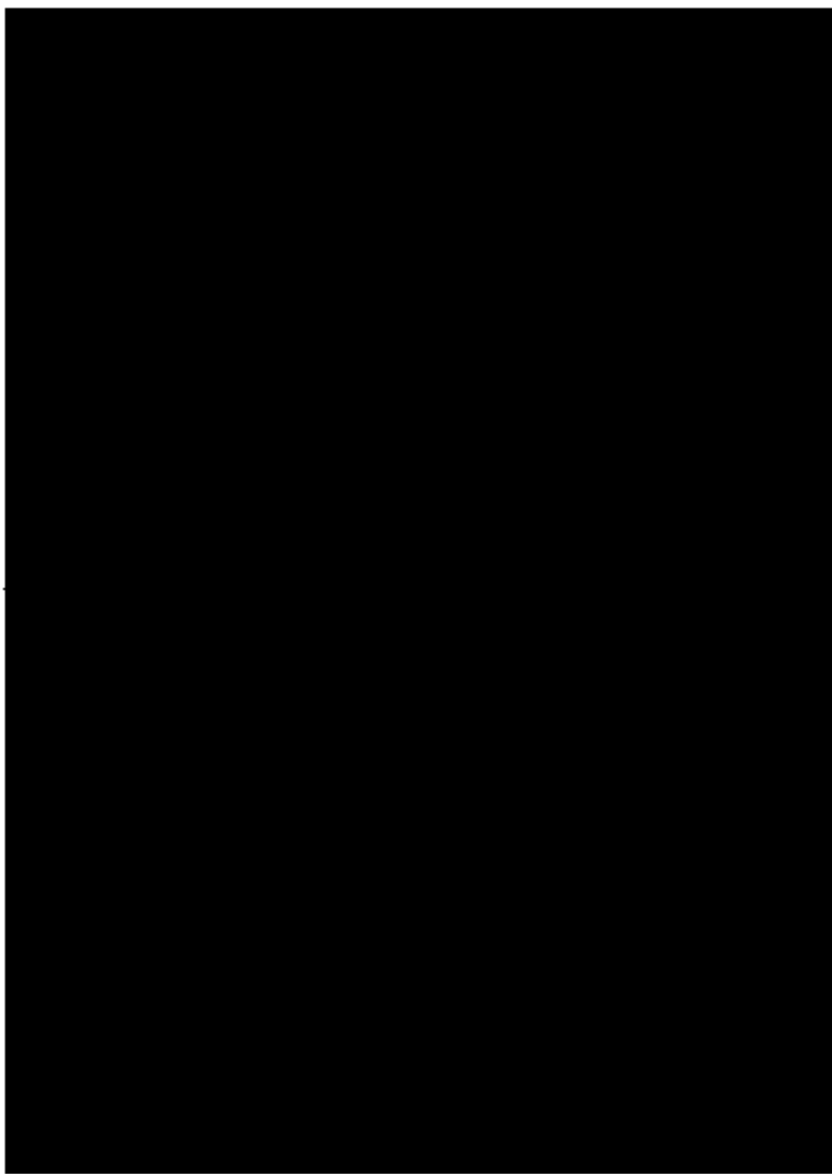
*Plt Warranty by spot - Cavaretta/Danes*

*Chemt/Kramer/Wetlands/Kosko/Chick*

Dance, Adam (A.V.)

Distribution List Name: IAC members

Members:



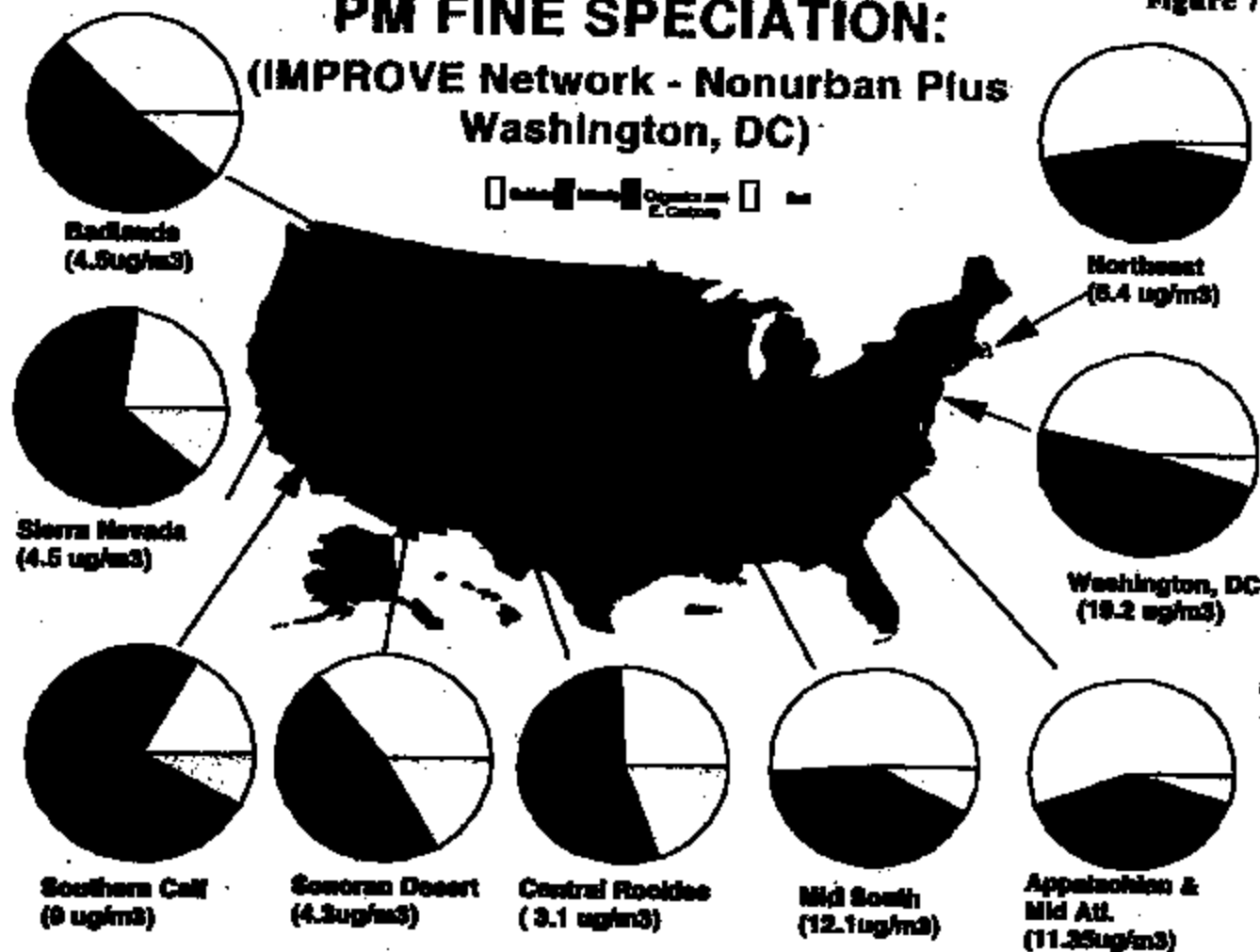
## **PM-2.5 COMPOSITION AND SOURCES**

**Prepared for  
FACA National and Regional Strategies Workgroup**

**June 16, 1997  
Prepared by Emissions, Monitoring and Analysis Division  
Office of Air Quality Planning and Standards**

# PM FINE SPECIATION: (IMPROVE Network - Nonurban Plus Washington, DC)

Figure 7



Data from the IMPROVE network (July 1996, ISSN:0737-5352-32)



### III.3.1.2 Cycling

A number of reactions occur in the atmosphere, which involve consumption of a free radical, with simultaneous formation of another, different free radical. This amounts to a cycling of reactive species, without net consumption. Examples include



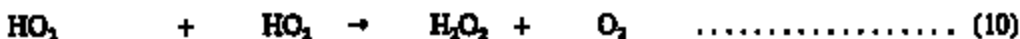
and reaction of the hydroxyl radical with an organic molecule (denoted by RH)



followed by organic peroxy radical formation by reaction (7). This rapid interconversion of free radicals means that a source of OH is a source of  $HO_2$ , and vice versa. It also means that the introduction of just one free radical into a polluted air parcel will lead to the formation of a considerable amount of  $NO_2$  and other secondary pollutants.

### III.3.1.3 Removal

Offsetting the cycling processes discussed briefly above, are those processes which remove free radicals without forming replacements. These include physical processes, such as deposition to the surface of the earth, and attachment to particulate matter, as well as a number of chemical processes, e.g.,



The concentrations of reactive species in any air parcel will depend on their relative rates of formation and removal, and thus on the concentrations of other chemical species involved in these processes (noting that sunlight is also to be considered as a reactant in this context). Typically, in moderately polluted air, one might expect to find about  $10^6$  OH radicals per cubic centimetre, and about  $10^8$   $HO_2$  radicals per cubic centimetre. These are very small concentrations;  $10^6$  per cubic centimetre is equivalent to about 0.1 ppt (parts per trillion). However, the effect of these free radicals is very important, because they react very rapidly, and because of the cycling effect referred to in Section 1.2.

## III.3.2 Reactions of Sulphur Dioxide

In the gas phase sulphur dioxide reacts with the hydroxyl radical as follows



The intermediate species  $\text{HSO}_3$  reacts rapidly with water vapour to produce sulphuric acid ( $\text{H}_2\text{SO}_4$ ). Although all details of this reaction are not clear, it is believed that a further free radical is produced.

Sulphuric acid has low volatility. Thus, it will form as an aerosol, even in the absence of other material in the atmosphere. If other materials are present, the newly formed sulphuric acid will often react or combine very rapidly with trace components of the atmosphere, such as water droplets, dust particles, ammonia, etc., producing aerosols of varying composition.

Sulphur dioxide may also be oxidised to sulphuric acid in the aqueous phase, e.g., in cloud droplets. The oxidising agent may be hydrogen peroxide or ozone, or atmospheric oxygen in the presence of iron or manganese acting as catalysts. Under typical conditions the reaction with hydrogen peroxide is the most important one, though for pH values above about 6 the reaction with ozone may be dominant. Typically, however, the production of sulphuric acid by this reaction leads to reduction of the pH, which reduces the importance of the ozone reaction relative to that with hydrogen peroxide.

The conversion rates for sulphur dioxide to sulphuric acid obviously depend on the concentrations of the various reactants present in the atmosphere. Typically the gas phase reaction (1) will convert  $\text{SO}_2$  to sulphuric acid at up to about 1 per cent per hour (with the highest rates being found only within plumes), while the aqueous phase reactions will be about an order of magnitude faster at 10 per cent per hour.

### III.3.3 Reactions of Oxides of Nitrogen

The oxides of nitrogen are emitted to the atmosphere mainly in the form of nitric oxide ( $\text{NO}$ ). This species is readily converted to nitrogen dioxide ( $\text{NO}_2$ ) by reaction with ozone or with the hydroperoxy radical ( $\text{HO}_2$ ) or various organic peroxy radicals of the general formula  $\text{RO}_2$



As is well known, nitrogen dioxide may be photolysed during daylight hours, resulting in the production of ozone and reformation of nitric oxide



The reactions (12), (14) and (15) constitute a stationary state, producing essentially no change.

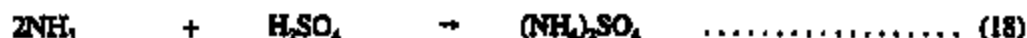
Some of the  $\text{NO}_2$  may react with hydroxyl radicals to produce nitric acid

of the VOC involved, the rates may be even higher.

### III.3.5 The Role of Other Species

#### III.3.5.1 Ammonia

Ammonia is the predominant basic, gaseous species in the atmosphere. It reacts rapidly with sulphuric acid to produce ammonium sulphate or ammonium bisulphate, depending on the relative amounts of ammonia and sulphuric acid that are present



These sulphates exist as solid particles, unless the relative humidity is very high. In this case, they may have a liquid phase surface layer. Since they are very soluble they will readily be incorporated into water droplets if any are present.

Ammonia will also react rapidly with nitric acid



to form ammonium nitrate, which will also tend to form solid particles. However, unlike the formation of sulphates, this reaction is reversible, and the ammonium nitrate can dissociate, giving back ammonia and nitric acid

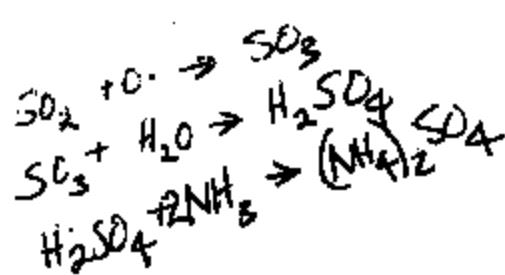


An equilibrium state is achieved, in which formation of ammonium nitrate is favoured by low temperatures and/or high concentrations of ammonia and nitric acid, with the opposite conditions (high temperatures or low concentrations of nitric acid and ammonia) favouring the dissociation of ammonium nitrate.

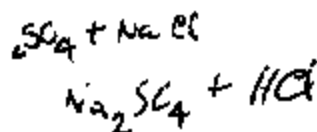
#### III.3.5.2 Other Chemical Species

Both sulphuric acid and nitric acid will react with other basic chemical species in the atmosphere. Besides ammonia, the most important of these are basic soil derived dusts, composed mainly of oxides or carbonates of magnesium and calcium. Reaction with these dust particles is irreversible, and leads to the incorporation of the acid with formation of sulphate or nitrate salts.

Near the ocean it is also possible for sulphuric and nitric acids to react on the surface of sea salt







particles. The result of this reaction is liberation of volatile chlorides (especially hydrochloric acid) with formation again of sulphate or nitrate salts.

### III.3.6 The Role of Water

Water vapour is present in the atmosphere at concentrations ranging from a few tenths of a per cent at low temperatures to as much as 4 % at 30 °C and relative humidities approaching saturation. Liquid water can also be present in the form of cloud, fog or mist droplets, or as rain drops.

Many of the fine particles in the atmosphere are able to take up water vapour from the atmosphere if they move to a regime of increased water concentration. The effect of this is to increase the size of the particles, which, in turn affects all of the properties which depend on the particle size, including dry deposition, respiratory system uptake and visibility of the particulate matter. Conversely, if the particles move to a regime of lower water vapour concentration, as a result of transport, or temperature change, they will tend to lose water, and become smaller.

In addition, if liquid water droplets are present, they may take up gas phase species, especially the more soluble ones like nitric acid, thus effecting a gas to particle conversion. They can also incorporate already formed particles. If the droplet is part of a cloud which subsequently produces precipitation, the result is wet deposition of the original pollutant. The direct interactions of particulate matter and falling precipitation are less important because the fall times of precipitation are quite short. However, a certain amount of scavenging by rain, with wet deposition to the surface of the earth, can occur.

### III.3.7 Discussion

#### III.3.7.1 Uncertainties

In the scientific assessment of inhalable and respirable particulate matter, uncertainties exist in both the state of scientific knowledge and in the data required to support that knowledge.

Much of the science of fine particles is common to the study of acid rain and to tropospheric ozone. The formation of sulphates and nitrates are exactly the processes that are of concern in acid deposition, while the atmospheric oxidants which are required to form these sulphates and nitrates from the precursor compounds are intimately involved in the reaction sequences which lead to ozone. The uncertainties in knowledge are therefore common to all of these areas. In particular, considerable work is still required to improve our understanding of the reactions of the volatile organic compounds. This is a huge task. Literally hundreds of VOC species are present in the urban atmosphere, and each of these can produce other VOC species after the initial reaction step.

Understanding the rates and mechanisms of VOC reactions is of direct importance in understanding

the formation of organic aerosol. The situation is actually worse for these reactions, since it is the higher molecular weight compounds (generally those containing at least seven carbon atoms) which are important in the production of aerosols. However, these VOC react more slowly in the production of ozone than do the lighter compounds, and have therefore been less studied to date.

Major data uncertainties exist in our knowledge of the emissions of aerosol precursors. Emissions data for  $\text{SO}_2$  are considered to be the most reliable (perhaps within 25%), followed by  $\text{NO}_x$  (50%), and VOC (factor of two). Emissions data for ammonia are currently very uncertain.

### III.3.7.2 Non-linearity

In developing control strategies for fine particles, it is very important to understand the linearity, or lack thereof, of the chemical systems involved. In other words, if the system is linear, a 50% reduction in  $\text{SO}_2$  will lead to a 50% reduction in ambient sulphate concentrations. However, if the system is non-linear, the sulphate reduction will be less (or more) than 50%. Most of these systems are actually non-linear, often to a substantial extent, and the benefit realised from emission reductions is less than the amount of the reduction. This non-linearity can arise for a number of reasons all related to the complexity of the chemical process involved, as will be summarised briefly below.

The gas phase production of sulphuric acid is inherently linear in sulphur dioxide, because it is dominated by reaction with the hydroxyl radical, as shown in Reaction xx. However, if there are concurrent changes in  $\text{NO}_x$  or VOC emissions, the situation is complicated by the fact that the concentration of the hydroxyl radical will be changed, thus introducing non-linearity.

If clouds or fog are present, the oxidation of sulphur dioxide to sulphates will usually be dominated by reactions taking place in the aqueous phase. The most important reactant is hydrogen peroxide, which is often present in lower concentrations than the sulphur dioxide. This leads to non-linearity of response to emission reductions, as may be illustrated by the following example.

Assume that the  $\text{SO}_2$  emissions are such that a concentration of  $\text{SO}_2$  of 2 ppb enters a cloud, which contains 0.5 ppb of hydrogen peroxide. All of the hydrogen peroxide will be consumed in reacting with 0.5 ppb of the  $\text{SO}_2$ , and about  $2 \mu\text{g m}^{-3}$  of sulphuric acid will be produced. If the emissions are halved, the concentration of  $\text{SO}_2$  entering the cloud will be halved, to 1 ppb. However, the hydrogen peroxide concentration will be essentially unchanged at 0.5 ppb, so that only 0.5 ppb of the  $\text{SO}_2$  will be reacted. Again, about  $2 \mu\text{g m}^{-3}$  of sulphuric acid will be produced. In this slightly simplified example the response to emission changes is highly non-linear, to the extent that the final concentration of aerosol sulphate is not reduced at all by a halving of emissions.

The important difference between the gas- and aqueous-phase processes is that the hydroxyl radical in the gas phase is replenished at a very rapid rate by the reactions of  $\text{NO}_x$  and VOC (during daylight hours, anyway), and is therefore essentially unchanged by reaction with  $\text{SO}_2$ . Hydrogen peroxide, on the other hand, is formed and transported into cloud water at a much slower rate, and is thus consumed by reaction with  $\text{SO}_2$ .

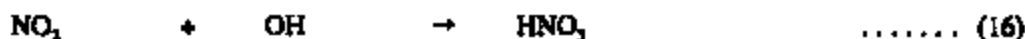
The non-linearity of the atmospheric reaction sequences leading to production of ozone and nitric acid is well known. The situation is further complicated by the fact that other products than aerosols are possible, including PAN and organic nitrate. In addition, some of the reactions are reversible, with a substantial temperature dependence, including the very important reaction between nitric acid and ammonia, which results in the formation of nitrate particles.

Other non-linearities result from the coupling of the sulphate and nitrate systems through ammonia. In an ammonia rich regime, additional sulphuric acid will be converted to ammonium sulphate. Ammonium nitrate will also be present. In this regime addition of  $1 \mu\text{g m}^{-3}$  of sulphuric acid will lead to the production of about  $1.4 \mu\text{g m}^{-3}$  of aerosol mass. Conversely, a similar reduction would be realized for a  $1 \mu\text{g m}^{-3}$  reduction in sulphuric acid, and the system is essentially linear.

However, the situation is more complicated in an ammonia poor regime. In this case, because the reaction of ammonia with sulphuric acid is preferred over that with nitric acid, the atmospheric mixture will contain ammonium sulphate or bisulphate, ammonium nitrate and nitric acid (since there is not enough ammonia present to react with all of the acid, and it reacts first with the sulphuric acid). If the amount of sulphuric acid is reduced, by reducing  $\text{SO}_2$  emissions, some ammonia will be freed up. This will react with the nitric acid to form more ammonium nitrate. Thus the reduction in sulphate aerosol mass will be somewhat offset by an increase in nitrate aerosol, leading to a smaller than expected reduction, constituting non-linearity.

### III.3.8 References

- Finlayson-Pitts, Barbara J. and Pitts, James N., Jr. (1986), "Atmospheric Chemistry: Fundamentals and Experimental Techniques". New York: Wiley.
- Seinfeld, John H. and Pandis, Spyros N. (1997), "Atmospheric Chemistry and Physics: From Air Pollution to Climate Change". New York: Wiley.



Nitric acid has a relatively high vapour pressure, and unlike sulphuric acid will remain in the gas phase. However, it will react readily with other trace components of the atmosphere, such as ammonia, dust particles, etc. to form aerosols.

At night  $\text{NO}_x$  may be converted to nitric acid by processes involving the nitrate radical ( $\text{NO}_3$ ). This pathway is not available during the day because  $\text{NO}_3$  is photolysed very rapidly, and is therefore unable to exist in sunlight.

The gas phase conversion of  $\text{NO}_x$  to nitric acid is substantially more rapid than the corresponding conversion of  $\text{SO}_2$  to sulphuric acid, and may occur at a rate of several per cent per hour, to as high as about 10 per cent per hour. On the other hand, it is accepted that there is no significant aqueous phase pathway for the conversion of  $\text{NO}_x$  to nitric acid.

### III.3.4 Reactions of Volatile Organic Compounds

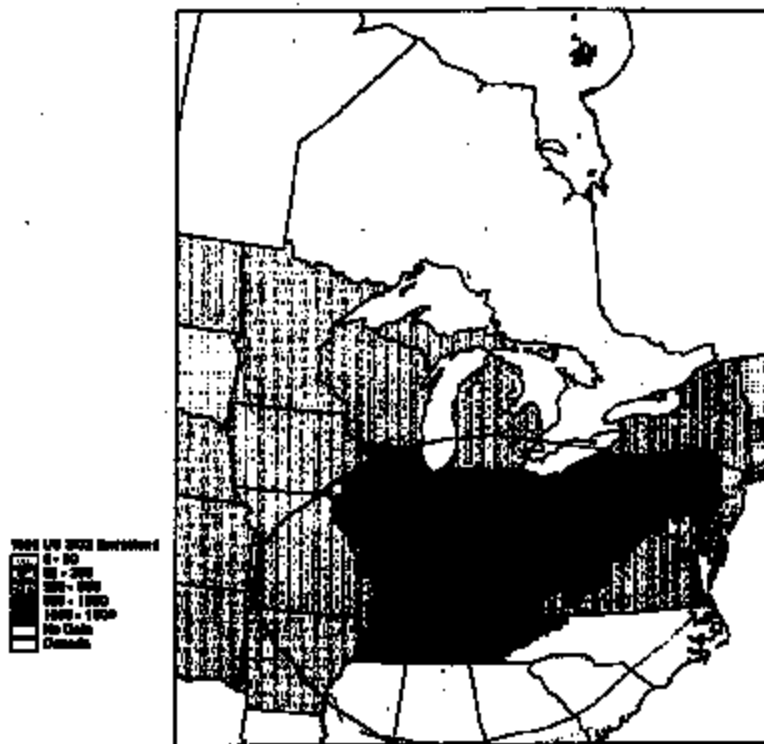
Although considerable work is still required to unravel the details of the rates and mechanisms of the reactions, it is well established that some organic compounds in the atmosphere can react to produce fine particles. The alkenes and aromatics are particularly important in this regard. The amount of starting material that is converted to aerosol increases significantly with the molecular mass.

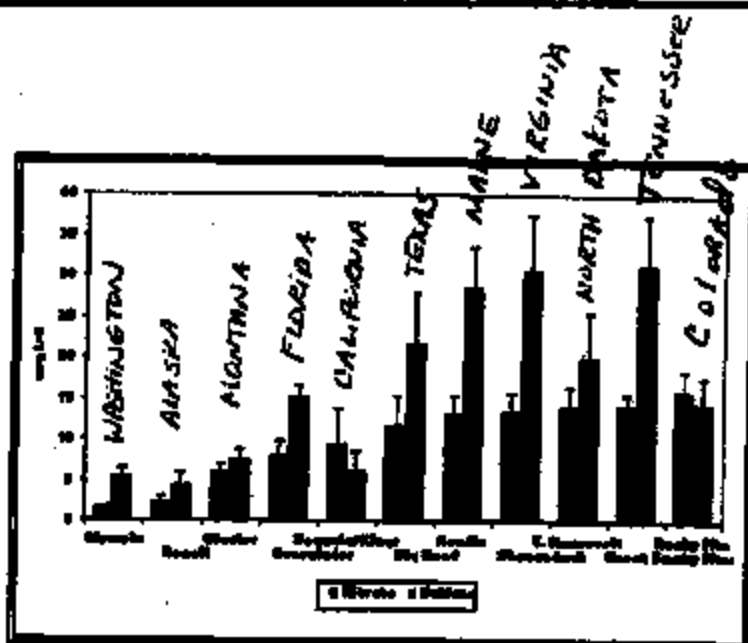
Thus, it has been shown that only hydrocarbons containing at least seven carbon atoms are able to contribute to aerosol formation. Further, it has been established that aerosol production from gasoline vapour may be completely accounted for by the aromatic components of the vapour. These aerosols are believed to be produced from the ring-opening products resulting mainly from initial attack by hydroxyl radicals. These results may also be considered to be largely representative of the VOC found in urban atmospheres, since the urban mix generally looks (qualitatively at least) very much like gasoline.

As far as alkenes are concerned, isoprene is converted to particles to an insignificant extent, and 1-octene and 1-decene to only a few per cent, whereas  $\beta$ -pinene and limonene were found to have yields of 30 to 40 %, and heavier alkenes such as *trans*-caryophyllene produce particles with yields of essentially 100 % (realising that these yields depend to some extent on the concentrations of reactive species in the atmosphere). The major reaction leading to formation of aerosols from alkenes is that with ozone, and it is noteworthy that it is the biogenic alkenes that are the major contributors. The absence of a significant contribution to aerosol production by light alkenes (6 carbon atoms or less) explains why it is only the aromatics which are converted in the case of gasoline.

The rates of production of fine particles by the atmospheric reaction of VOC are not well established. However, it is not unreasonable to expect that they should be at least as fast as the rate of conversion of  $\text{SO}_2$  to aerosol, i.e., a few per cent per hour. Depending on the conditions, and the exact structure

**FIGURE III.1.7 1995 SO<sub>2</sub> Emissions for US States Affecting Ontario  
(kilotonnes)**





Volume-weighted mean concentrations  
of nitrate and sulfate in 11 National Park System units.  
back

0202-027-A 4187

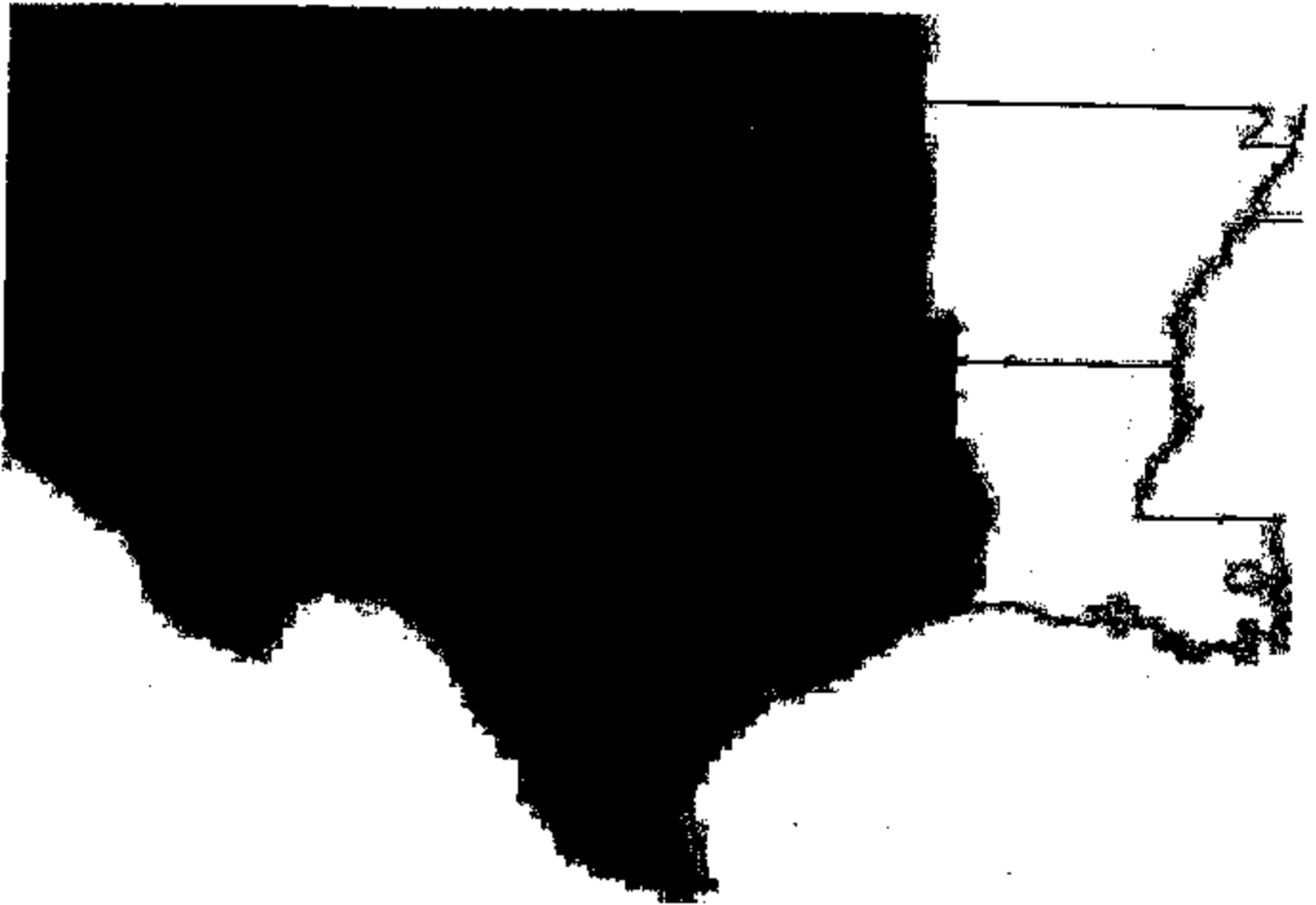
MAPS



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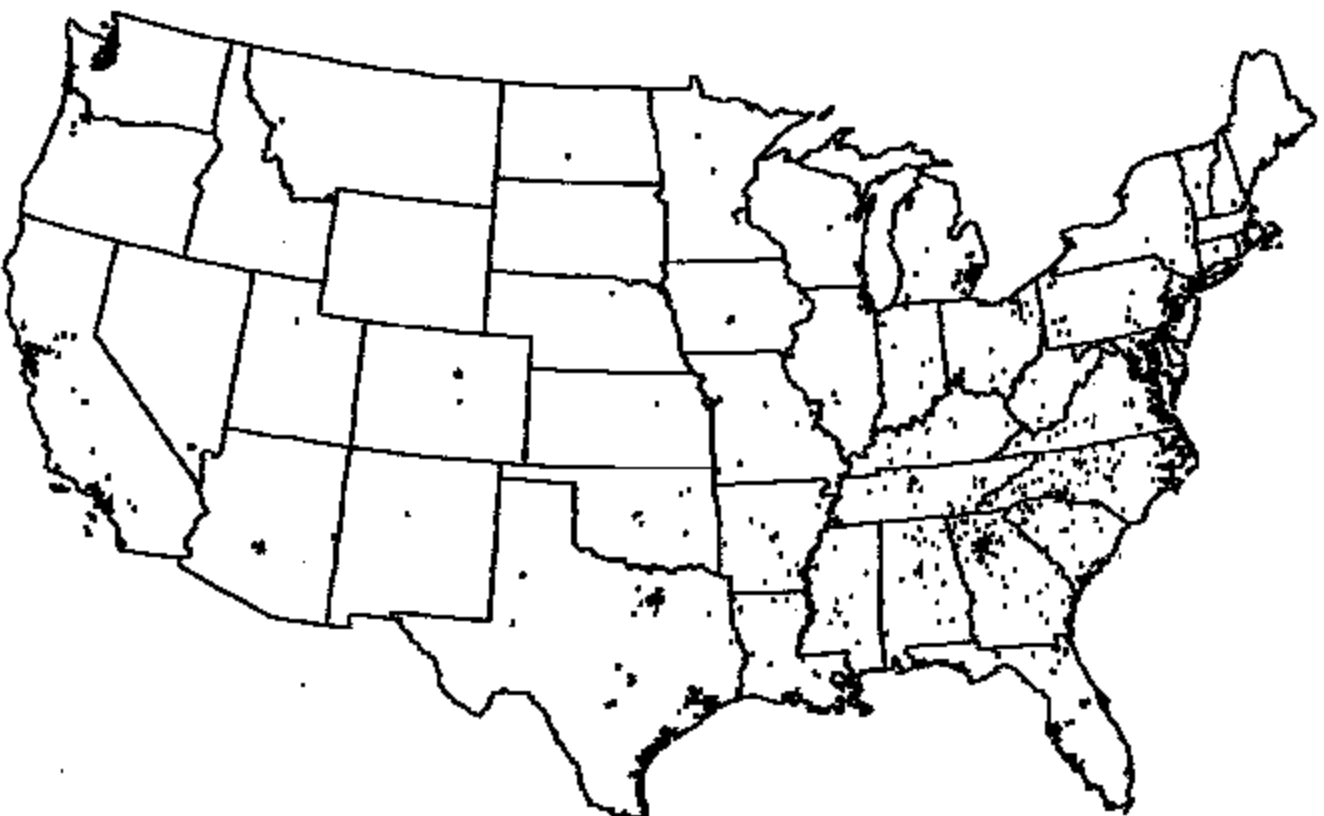








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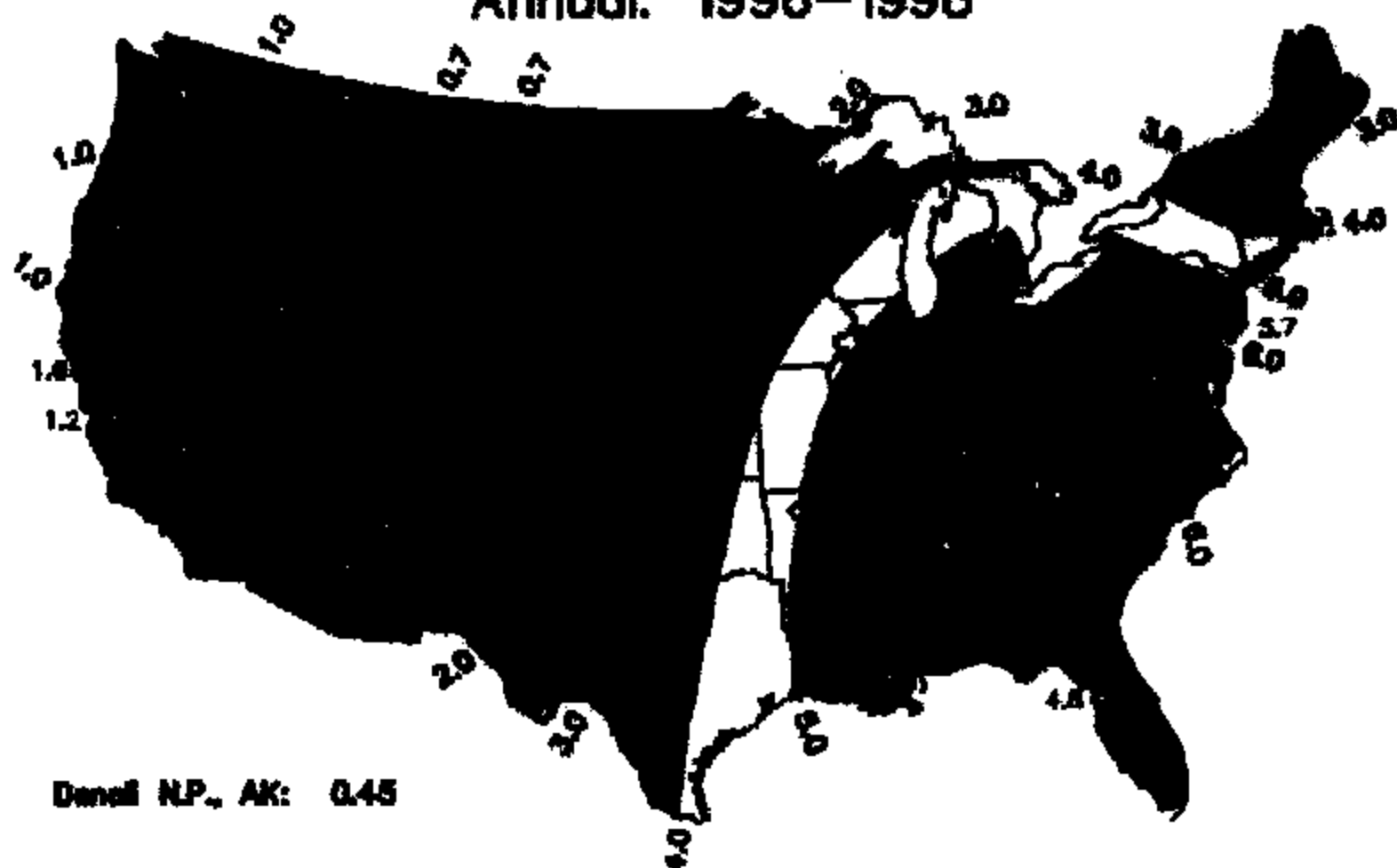


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ERG2-027-A 4203

# Ammonium Sulfate Annual: 1996-1998



## **Danes, Adam (A.V.)**

From:  
Sent:  
To:

Danes, Adam (A.V.)

Wednesday, July 11, 2001 2:41 PM

Amelago, John (J.P.); Arnesen, Cathin (C.B.); Bell, James (J.C.); Barmann, Katherine (K.); Barmann, John (J.);  
Coryea, Kevin (K.W.); Danes, Adam (A.V.); Devey, Christopher (C.K.); Di Paolo, Renato (R.); Dutton, Jeffrey (J.A.);  
Hak, Susan (S.B.); Elliott, Sherman (S.E.); Grubbs, Kenneth (K.A.); Gustin, Gary (G.D.); Harris, Stephen (S.J.);  
Hernandez, Ed (E.O.); Hunt, Laurie (L.A.); Innes, Jane (J.B.); Jensen, Ted (T.E.); Kahle, Daniel (D.); Kaler, E.W. (E.);  
Kerel, Karen (K.L.); Kosko, Jeff (J.P.); Kramer, Michael (M.T.); Lint, Brandon (B.D.); Mandzhat, Roger (R.B.); Marquis,  
Raymond (R.E.); Marone, Rob (R.B.); McBride, James (J.R.); O'Neil, Michael (M.W.); Opat, Sandra (S.D.); Pandolfi,  
P.G.; Resuma, Alan (A.O.); Raylock, Theodore (T.J.); Sears, Renee (R.T.); Simko, Steven (S.J.); Sincato, Paul (P.A.);  
Schnae, Brian (B.); Sun, Baocheng (B.); Swann, Patricia (P.A.); Wetach, Bill (B.); White-Johnson, Patricia (P.); Zurek,  
Timothy (T.); Amick, Chick, John (J.); Kelly, sage; Sinden  
Task Force Meeting Reentry and Agenda for 7/12 Meeting

Subject:

### **Agenda**

- ☐ Prioritize Walkins
- ☐ Team Status to objectives
- ☐ BB project update
- ☐ XR part status - McBride/Sage
  - ☐ XR expedited test plan
- ☐ Hitachi test status - Chick
  - Updated timeline
  - When will the KLT be ready?
  - Chemical Analysis on "Stuck Valves"
  - Flow Test Results from "Stuck Valves/Sticking Valves"
  - What has taken place over the past 2-4 weeks?
  - Flow charts that demonstrate the procedure for falling valves
  - Data from Flow testing
  - What are the next steps?
  - How will test procedure be altered to remove water from block?
  - How will the cleaning of the block be performed?
- ☐ Warranty review - Danes
- ☐ field return teardown analysis - Chick
- ☐ V&A follow up items
- ☐ Friction finger update - Jensen/Kramer/Hitachi
- ☐ MIL DOE results - Hubbard
- ☐ Status of 3 region good/bad valve study - Danes/Jensen

- ☐ Updated timeline
  - When will the KLT be ready?
  - Chemical Analysis on "Stuck Valves"
  - Flow Test Results from "Stuck Valves/Sticking Valves"
  - What has taken place over the past 2-4 weeks?
  - Flow charts that demonstrate the procedure for falling valves
  - Data from Flow testing
  - What are the next steps?
  - How will test procedure be altered to remove water from block?
  - How will the cleaning of the block be performed?

Adam Danes

(adanes@ford.com)

V-Engine Engineering - Ford Motor Company

6th Sigma Black Belt

Phone 313 922-6898

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# IAC Sign In Sheet

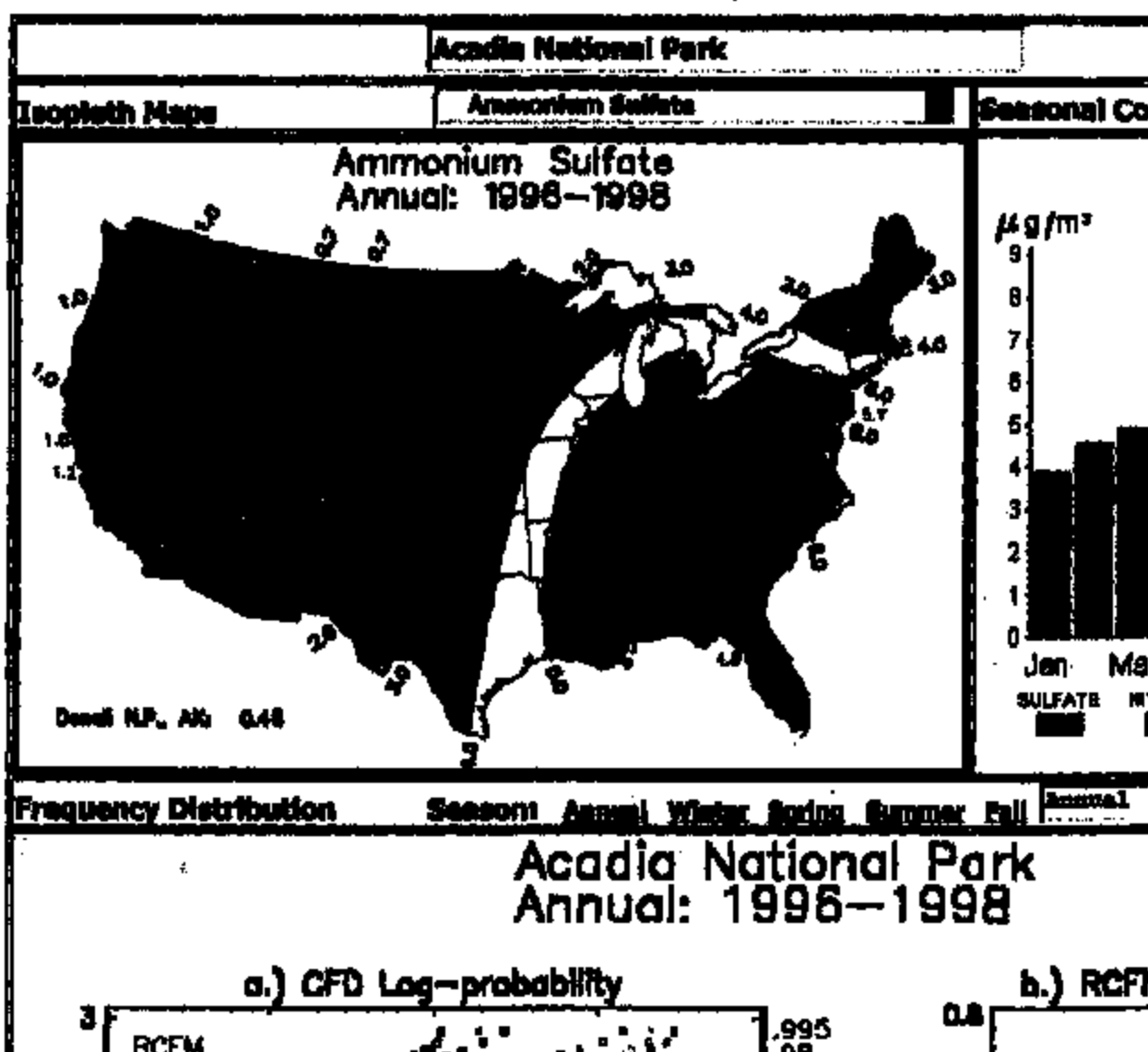
|                    |                |           |                |
|--------------------|----------------|-----------|----------------|
| Adam Davis         | V Engine BB    | ADAMES    | x28698         |
| John Chick         | Hitachi        | FSS       | x14465         |
| Carl Stedre        | Hitachi        |           | 248 477-6788   |
| Mike Kramer        | Block belt     | MKramer I | (313) 890-8757 |
| Rob Marme          | "              | Emoria I  | " 248-8687     |
| John Armitage      | BB             | JARMITAG  | 39-08694       |
| SANDRA CRIP        | BB             | SCRP      | 32-32236       |
| Alan Reame         | Materials Eng. | AREAME    | 33-72877       |
| Tom Gribble        | "              | KGribble  | 38657          |
| BILL KAISER        | Research       | EKAISER   | 55318          |
| Ted Jones          | Research       | tiensun 2 | 24597          |
| Peter Hubbard      | VE BB          | phubbard  | 03054          |
| Katherine Benboudi | V Engine       | Kbendow   | x02499         |
| Brian Stidham      | GCE            | BSTIDHAM  | x85654         |
| DALE OWINGS        |                | HITACHI   |                |



## Spatial and Seasonal Pattern

The annual spatial pattern of PM<sub>2.5</sub>, light extinction and the contributions of the addition, seasonal bar charts of the PM<sub>2.5</sub> and light extinction and the relative at the major aerosol types. Last, frequency distributions of all aggregated values a

Note: All calculations were performed using the NPS/CIRA methodologies. It is methodologies will be different and these figures will be updated after the EPA m



4/25/01

## Sources of Ambient Ammonia – James Ball x50634

**Objective:** Examine sources of ammonia for any sharp increases in ammonia releases that might explain the increase in repairs for idle air control valves.

### Sources of Ammonia Emissions:

- 1) Emissions from industry.
- 2) Emissions from the use of anhydrous ammonia as a fertilizer.
- 3) Emissions from motor vehicles.
- 4) Emissions from livestock as the decomposition of urine.

### 1) Emissions of ammonia from industry.

[Reference: <http://www.epa.gov/ttn/t97/fac/index.htm>]

The Toxic Release Inventory for ammonia was reviewed by state from 1997 to 1999. The data by state in the Southeast and the Northwest are shown below. There are only minor changes from year to year. In no case do the emissions even double from year to year.

**Conclusion:** Ammonia from industrial emissions cannot account for the increase in the failures of these valves.

| State                        | Emissions of Ammonia in millions of pounds |              |      |
|------------------------------|--------------------------------------------|--------------|------|
|                              | 1997                                       | 1998         | 1999 |
| <b>Southeast and Midwest</b> |                                            |              |      |
| GA                           | 6.9                                        | 8.7          | 9.1  |
| TN                           | 7.2                                        | 8.1          | 6.8  |
| SC                           | 3.2                                        | 2.9          | 2.6  |
| AL                           | 4.0                                        | 3.4          | 3.8  |
| NC                           | 6.1                                        | 4.3          | 4.5  |
| FL                           | 9.8                                        | 7.0          | 9.3  |
| MS                           | 4.5                                        | 4.9          | 4.7  |
| KY                           | Not in top 5                               | Not in top 5 | 1.7  |
| WV                           | Not in top 5                               | 0.9          | 0.8  |
| VA                           | 6.2                                        | 8.3          | 8.2  |
| MD                           | Not in top 5                               | 0.5          | 0.5  |
| PA                           | Not in top 5                               | 3.3          | 2.9  |
| OH                           | 13.4                                       | 13.2         | 12.9 |
| MI                           | Not in top 5                               | 2.1          | 2.3  |
| IN                           | 6.6                                        | 5.2          | 3.4  |
| IL                           | 11.7                                       | 7.3          | 5.0  |
| MO                           | Not in top 5                               | 1.9          | 1.7  |

|                          |              |      |      |
|--------------------------|--------------|------|------|
| AR                       | 4.5          | 4.9  | 5.4  |
| LA                       | 32.2         | 27.6 | 26.0 |
| OK                       | 6.5          | 5.7  | 5.7  |
| TX                       | 27.3         | 25.6 | 25.8 |
| Northwest                |              |      |      |
| ID                       | 3.2          | 3.5  | 3.7  |
| OR                       | 2.2          | 2.0  | 1.9  |
| WA                       | 2.1          | 2.2  | 1.9  |
| MT                       | Not in top 5 | 0.6  | 0.8  |
| Other States of Interest |              |      |      |
| CA                       | 9.9          | 7.6  | 8.3  |
| NY                       | Not in top 5 | 1.4  | 1.3  |
| NJ                       | Not in top 5 | 0.8  | 1.0  |

**Conclusion:** The emissions of ammonia from industry have in general gone down over the last few years and cannot account for the rapid increase in valve repairs.

2) The use of ammonia as a fertilizer is not documented by state. The use of anhydrous ammonia as a fertilizer is not considered a "reportable item or event" by the EPA. Hence, the EPA does not keep track of ammonia when used as a fertilizer. However, the US Dept. of Agriculture keeps track of the use of fertilizers in general. I have attached a summary table of the use of different kinds of fertilizers in each state. Anhydrous ammonia is a common and relatively cheap fertilizer. As can be seen in this table, no state shows a even a doubling of the number of farms that use commercial fertilizers. While these data are not perfect - they do not include the years 1997-99 or do they directly measure ammonia usage - they do seem to indicate that fertilizer use has not gone up in recent times. In addition, fertilizers contribute only a small fraction of the ammonia inventory from the State of North Carolina (see number 3 & 4 below for a CRC reference).

[Reference: [http://www.nass.usda.gov/census/census97/volume1/us-51/us2\\_10.pdf](http://www.nass.usda.gov/census/census97/volume1/us-51/us2_10.pdf)]

**Conclusion:** The use of anhydrous ammonia as a fertilizer does not explain the rapid increase in valve repairs.

### 3) Emissions from Motor vehicles.

While motor vehicles equipped with three-way catalyst can emit ammonia, the total VMT (vehicle miles traveled) has not doubled from 1997-1999. In addition vehicles are significant contributors of ammonia emissions in cities while livestock emissions are the dominate source of rural ammonia emissions and dominates all source in statewide inventories. [Reference - a recent CRC report entitled "Evaluation and Improvement of Ammonia Emission Inventories" available as a PDF file upon request]

**Conclusion:** There has not been a sufficient increase in VMT to account for a dramatic increase in ammonia emissions.

4) Emissions from livestock as the decomposition of urine to ammonia and carbon monoxide/dioxide.

A recent CRC report (see above and attached graph) examined the ammonia inventories from North Carolina and the San Joaquin Valley. In both cases the emissions of ammonia from livestock dominate (60-80%) the sources of ammonia emissions. It is reasonable to assume that this is generally true for the rest of the SE United States. The question becomes: Have livestock industries increased in the last few years to account for an increase in ammonia?

I have looked at the official estimates of cattle and calves, chickens, and hogs and pigs produced in Georgia from 1992-1998. The number of chickens produced in the state has increased slightly from year to year - at about a 4% increase (see attached table, reference:

<http://www.nass.usda.gov/ga/ivaknaga/allchxna.tga>). The number of milk cows, beef cows, and calves have remained constant over the period of 1992-1999 ( see reference:

<http://www.nass.usda.gov/ga/charts/cattle.gif>). The number of hogs and pigs produced in the state of Georgia has trended lower since 1992 (see reference:

<http://www.nass.usda.gov/ga/charts/hogs.gif>).

Conclusion: An increase in livestock in the State of Georgia does not suggest an increase in ammonia emissions for this state, and by extrapolation, to other nearby states.

Summary and Final Conclusion: The data presented here suggests that there have been no unusual increases in ammonia concentrations from any source that could account for the rapid rise in failing idle control valves. This conclusion is further reinforced by plots of monthly levels of ammonium sulfate concentrations measured at National Parks & wildlife Refuges (Charts sent to Daves previously) that show a dramatic fluctuation in concentrations between summer and winter but no general trends upwards or downwards in the yearly mean concentrations. While there is a regional correlation of measured ambient levels of ammonium sulfate with the zip codes of the individuals needing repairs there is no general trend of increasing ammonia sulfate concentrations found in ambient air.

**Table 10. Agricultural Chemicals Used, Including Fertilizer: 1987 and 1982**

Values are in thousands of pounds. For units of distribution and weight, see footnote 1.

| Item                                                | 1987      | 1982      | 1987      | 1982      | 1987      | 1982      | 1987      | 1982      |
|-----------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Commercial fertilizer .....                         | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Commercial fertilizer, except potassium .....       | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Commercial and regulated fertilizer .....           | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Other, such as granules, fungicides, etc., in ..... | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Intermediate in crops .....                         | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Chemicals in crops and animals .....                | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Woods, grass, or brush in crops and .....           | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Chemicals used on crops to control growth, .....    | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| herbicide, or disinfectant .....                    | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Commercial fertilizer .....                         | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Commercial fertilizer, except potassium .....       | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Commercial and regulated fertilizer .....           | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Other, such as granules, fungicides, etc., in ..... | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Intermediate in crops .....                         | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Chemicals in crops and animals .....                | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Woods, grass, or brush in crops and .....           | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Chemicals used on crops to control growth, .....    | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| herbicide, or disinfectant .....                    | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| on which used .....                                 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |

Table 10. Agricultural Chemicals Used, Including Fertilizer: 1957 and 1922—Con.

**Data not based on a sample of buyers. For purposes of administration and marketing, we intend also to sell**

| Item                                                                     | 1940                  | 1941   | 1942   | 1943   | 1944   | 1945   | 1946   | 1947   | 1948   | 1949   | 1950   |
|--------------------------------------------------------------------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Commercial fertilizer .....                                              | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Cropseed (barley, except potatoes) .....                                 | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Feedstuffs and vegetable fertilizers .....                               | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Hay, straw, manure, garbage, etc., in<br>bales .....                     | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Manure in bags .....                                                     | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Manure in bags and cartons .....                                         | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Manure, grain, or trash in bags and<br>cartons .....                     | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Composts used on crops in normal growth,<br>for feed, or otherwise ..... | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Item                                                                     | 1940                  | 1941   | 1942   | 1943   | 1944   | 1945   | 1946   | 1947   | 1948   | 1949   | 1950   |
| Commercial fertilizer .....                                              | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Cropseed (barley, except potatoes) .....                                 | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Feedstuffs and vegetable fertilizers .....                               | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Hay, straw, manure, garbage, etc., in<br>bales .....                     | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Manure in bags .....                                                     | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Manure in bags and cartons .....                                         | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Manure, grain, or trash in bags and<br>cartons .....                     | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Composts used on crops in normal growth,<br>for feed, or otherwise ..... | Value                 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| .....                                                                    | Amount on which taxed | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

**Table 10. Agricultural Chemicals Used, including Fertilizer: 1937 and 1932—Con.**

(Data are based on a sample of farms. For specifics of abbreviations and symbols, see 17502-0001-1002)

[illegible]

Table 10. Agricultural Chemicals Used, Including Fertilizer, 1937 and 1932—Con.

**Data are based on a survey of firms. For measures of efficiency and growth, see [Bridges and Hall \(2003\)](#).**

[illegible]



**Table 10. Agricultural Chemicals Used, Including Fertilizer: 1997 and 1992—Con.**

These are human-made joints of bones. For purposes of identifying and writing, you should mark them

[illegible]

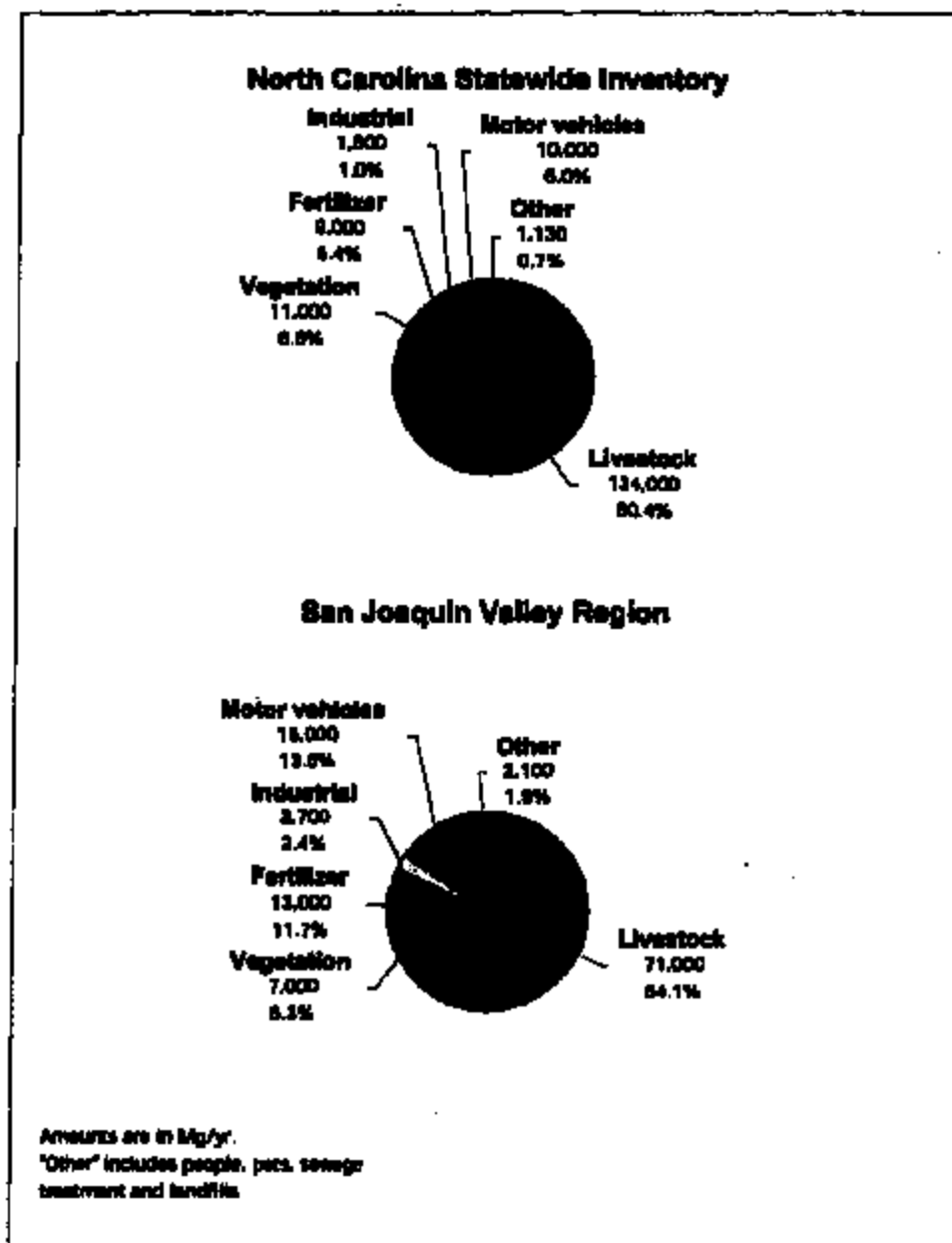
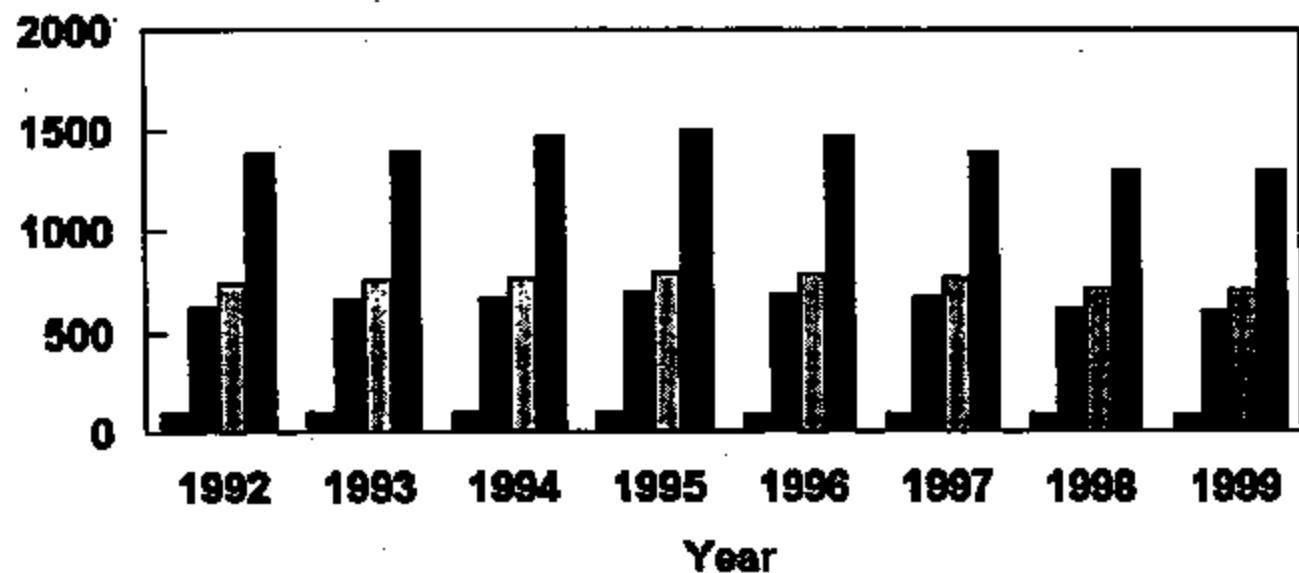


**Figure S-4. Distribution of Ammonia Emissions Among Major Source Categories in the Case Study Inventories**

# **CATTLE AND CALVES - GEORGIA** **JANUARY 1, 1992-1999**

Thousands



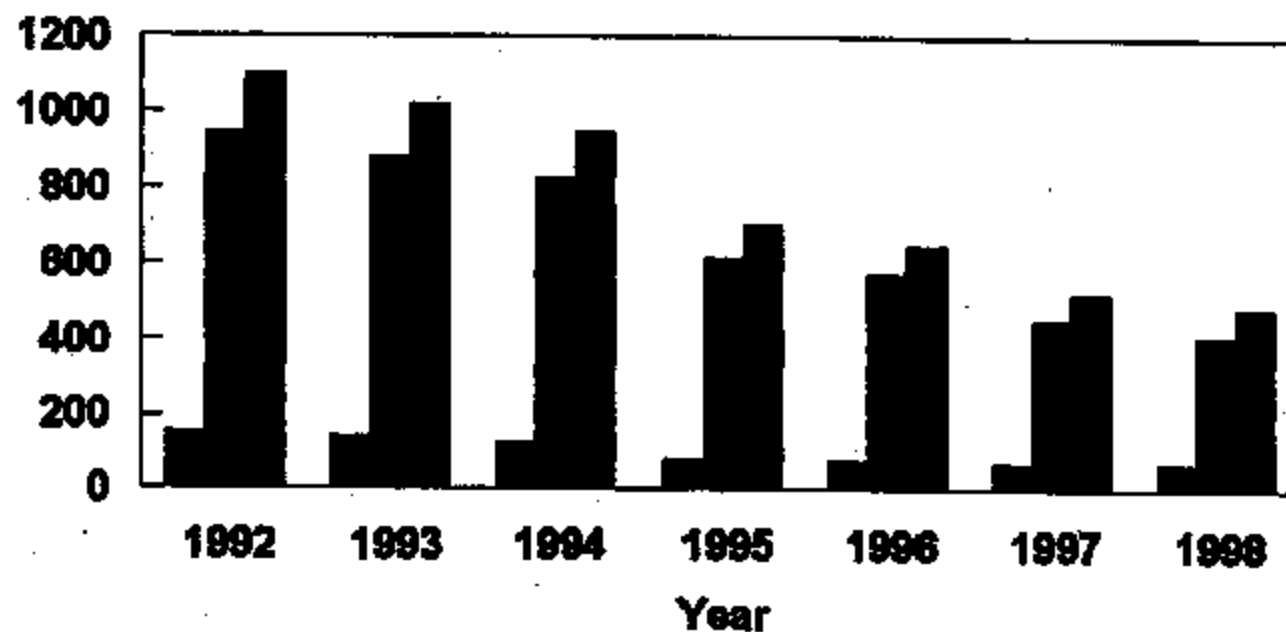
Milk Cows
  Beef Cows
  All Cows
  Total Cattle & Calves

Data compiled by Georgia Agricultural Statistics Service

1992-99-2-2000

# **HOGS AND PIGS - GEORGIA** **DECEMBER 1, 1992-1998**

Thousands



■ Breeding ■ Market ■ Total

Data compiled by Georgia Agricultural Statistics Service

2002-07-11 10:03

# OFFICIAL GEORGIA ESTIMATES - ALL CHICKENS

NOTE: Production year Dec. 1 through Nov. 30.

| YEAR | NUMBER<br>PRODUCED<br>THOUSANDS | POUNDS<br>PRODUCED | VALUE OF<br>PRODUCTION<br>THOUSAND DOLLARS |
|------|---------------------------------|--------------------|--------------------------------------------|
| 1934 |                                 | 35198              | 4794                                       |
| 1935 |                                 | 38155              | 5556                                       |
| 1936 |                                 | 42932              | 6700                                       |
| 1937 |                                 | 39300              | 7043                                       |
| 1938 |                                 | 43178              | 6437                                       |
| 1939 |                                 | 48077              | 7020                                       |
| 1940 |                                 | 47386              | 7120                                       |
| 1941 |                                 | 51852              | 9386                                       |
| 1942 |                                 | 73140              | 13632                                      |
| 1943 |                                 | 105787             | 27425                                      |
| 1944 |                                 | 114926             | 33594                                      |
| 1945 |                                 | 130169             | 38870                                      |
| 1946 |                                 | 104415             | 34472                                      |
| 1947 |                                 | 118120             | 37385                                      |
| 1948 |                                 | 125879             | 42442                                      |
| 1949 |                                 | 162544             | 43710                                      |
| 1950 |                                 | 213231             | 54761                                      |
| 1951 |                                 | 285456             | 78272                                      |
| 1952 |                                 | 350536             | 97961                                      |
| 1953 |                                 | 389859             | 102715                                     |
| 1954 |                                 | 499951             | 109028                                     |
| 1955 |                                 | 547681             | 132807                                     |
| 1956 | 228040                          | 713762             | 134372                                     |
| 1957 | 266761                          | 859396             | 154449                                     |
| 1958 | 298680                          | 961025             | 168746                                     |
| 1959 | 311785                          | 1039393            | 158515                                     |
| 1960 | 326238                          | 1086765            | 177892                                     |
| 1961 | 355107                          | 1226703            | 164003                                     |
| 1962 | 383842                          | 1223080            | 175337                                     |
| 1963 | 371872                          | 1207214            | 177187                                     |
| 1964 | 387707                          | 1343324            | 182448                                     |
| 1965 | 417677                          | 1445442            | 207003                                     |
| 1966 | 471686                          | 1631622            | 233846                                     |
| 1967 | 467309                          | 1629548            | 199601                                     |
| 1968 | 452354                          | 1606648            | 207740                                     |
| 1969 | 482244                          | 1643884            | 229481                                     |
| 1970 | 477650                          | 1700292            | 207263                                     |
| 1971 | 457024                          | 1671003            | 209645                                     |
| 1972 | 463458                          | 1733264            | 223565                                     |
| 1973 | 434287                          | 1621772            | 381511                                     |
| 1974 | 452662                          | 1695494            | 344627                                     |
| 1975 | 434441                          | 1621705            | 423553                                     |
| 1976 | 469131                          | 1749865            | 412048                                     |
| 1977 | 504557                          | 1878835            | 437162                                     |

1982-027-4 4833

<http://www.nass.usda.gov/georgia/estimates/allchickens.html>

4/24/01 -

|      |         |         |         |
|------|---------|---------|---------|
| 1978 | 551797  | 2114746 | 938980  |
| 1979 | 585266  | 2252818 | 573733  |
| 1980 | 597399  | 2295966 | 602848  |
| 1981 | 636984  | 2510994 | 649723  |
| 1982 | 632178  | 2556588 | 621394  |
| 1983 | 644556  | 2603431 | 692525  |
| 1984 | 655596  | 2712398 | 856286  |
| 1985 | 694745  | 2938954 | 812972  |
| 1986 | 713864  | 3018029 | 964381  |
| 1987 | 749487  | 3240471 | 843708  |
| 1988 | 790025  | 3489870 | 1080526 |
| 1989 | 825064  | 3647312 | 1265359 |
| 1990 | 864700  | 3839320 | 1175876 |
| 1991 | 881100  | 3892020 | 1132738 |
| 1992 | 909802  | 4113872 | 1279118 |
| 1993 | 976557  | 4518709 | 1515306 |
| 1994 | 1021069 | 4826342 | 1663509 |
| 1995 | 1083420 | 5224572 | 1780334 |
| 1996 | 1169805 | 5763655 | 2216527 |
| 1997 | 1198300 | 6020950 | 2294002 |
| 1998 | 1218090 | 6001430 | 2404825 |
| 1999 | 1239643 | 6316164 | 2306388 |
| 2000 |         |         |         |

Data Compiled by Georgia Agricultural Statistics Service

BA02-027-A 4834

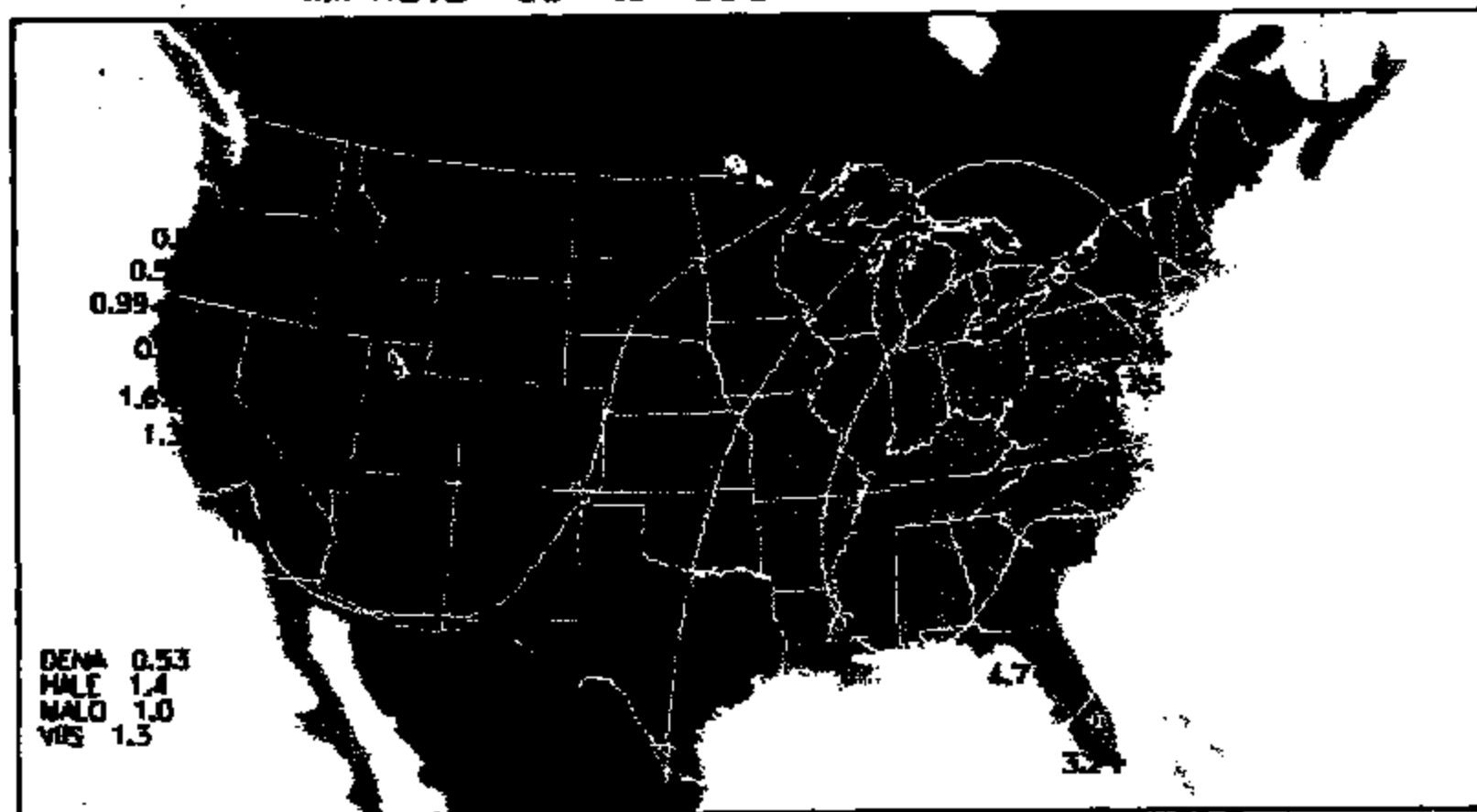




EN02-827-A 4548



# IMPROVE 1994 to 1998 Annual Sulfate Mean



NPS ARD Fort Collins CO, Mon Aug 30 17:45:00 1999

ES02-027-A 0240

Chris Davey CDAVEY2

Prioritize Walk Ins and Agenda  
Status to Team Objectives - Dames  
STA Visit to HAP Summary - Zurew/White-Johnson  
When is next visit scheduled?  
HAP Farmington Testing Update - Mitchell  
Build Data Analysis - Kramer  
Does it correlate to Hitachi EOL rejects  
Good/Bad Part Retrieval Update - Dames/Chemists  
Design Guide Update - Dames/Lint  
4.6L/5.4L/4.0L are violators, maybe others  
3D Design Guide BB Project  
IEL Testing Update - Hubbard/Hitachi  
Non Functional IEL Part Analysis - Hubbard/Hitachi  
Alignment Update - Jensen  
Reconciliation of hysteresis specifications  
Ammonia measurements on 5.4L - Jensen  
New Team Members - Avanesian/Davey

Correlate Air Temp to IAC warranty  
Plaste to AI to ZAC warranty  
 $\frac{\Delta T}{E}$  by Ted Jensen

Don Mitchell

Options - does ACV get sampled?

Hubbard

Patrice

4.6L  
~~Partials~~ returns  
96% 4%  
Build  
60% 90%

And Std all variability

(5) 4.0L Explains ran failed values from field

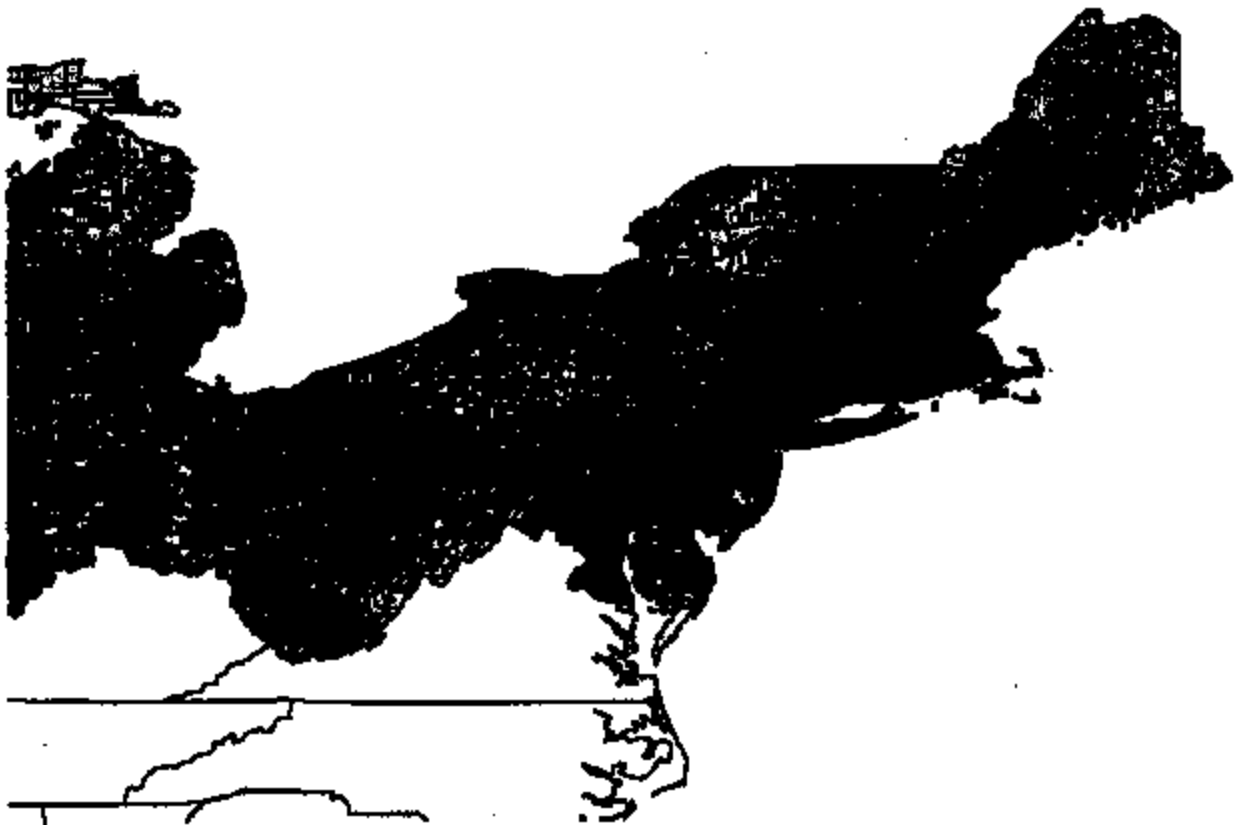
PPAP Data Hook on parts

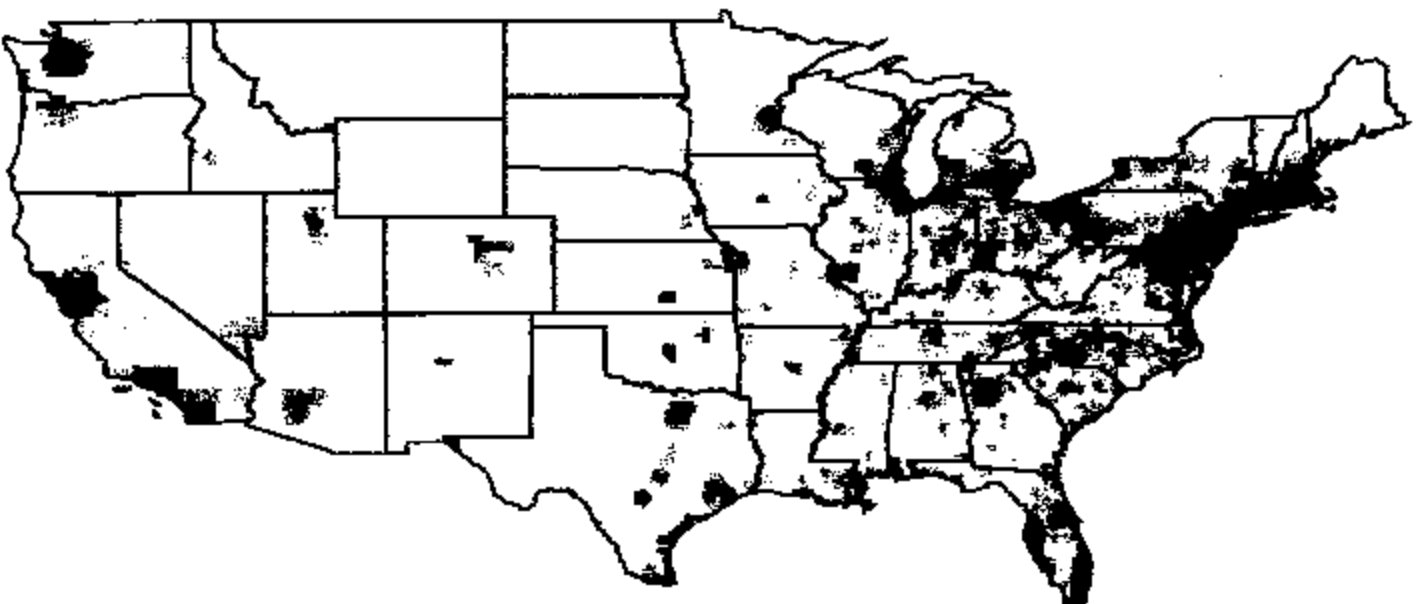
Schematics for Patrice

In process future data

Repairs Per Zip Code

99 4.0L SOHC

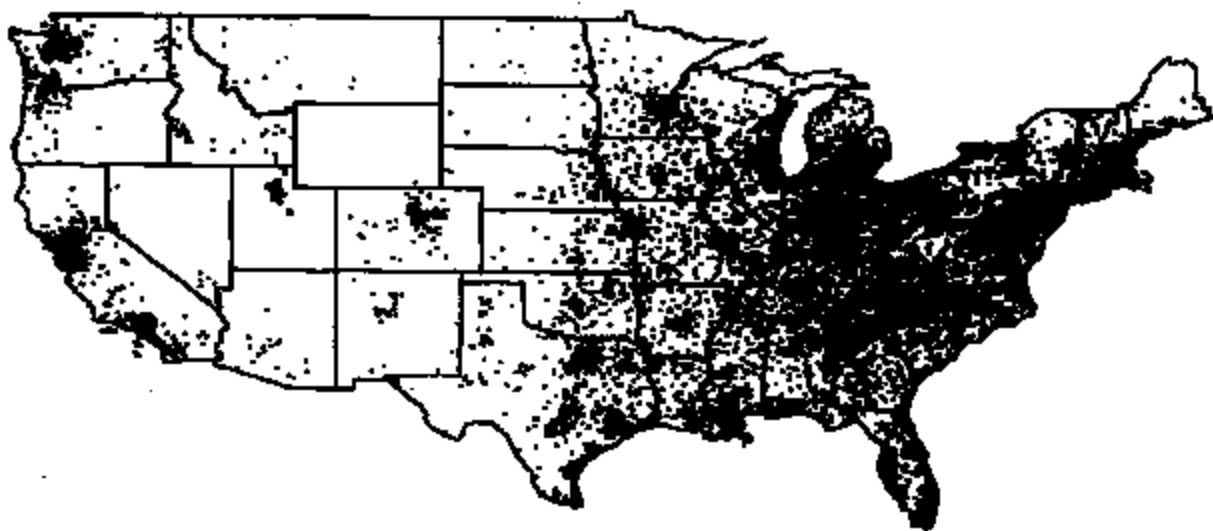






5082-927-4 4577

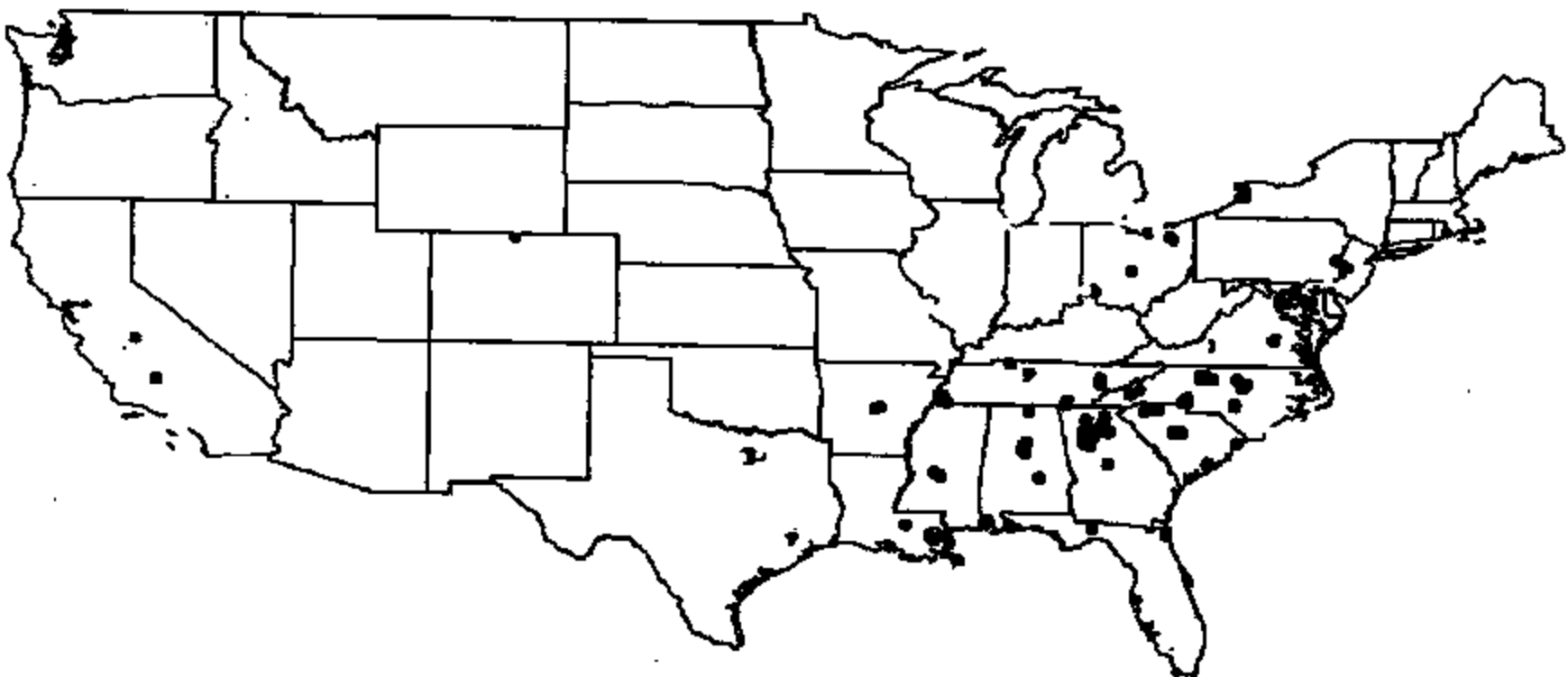






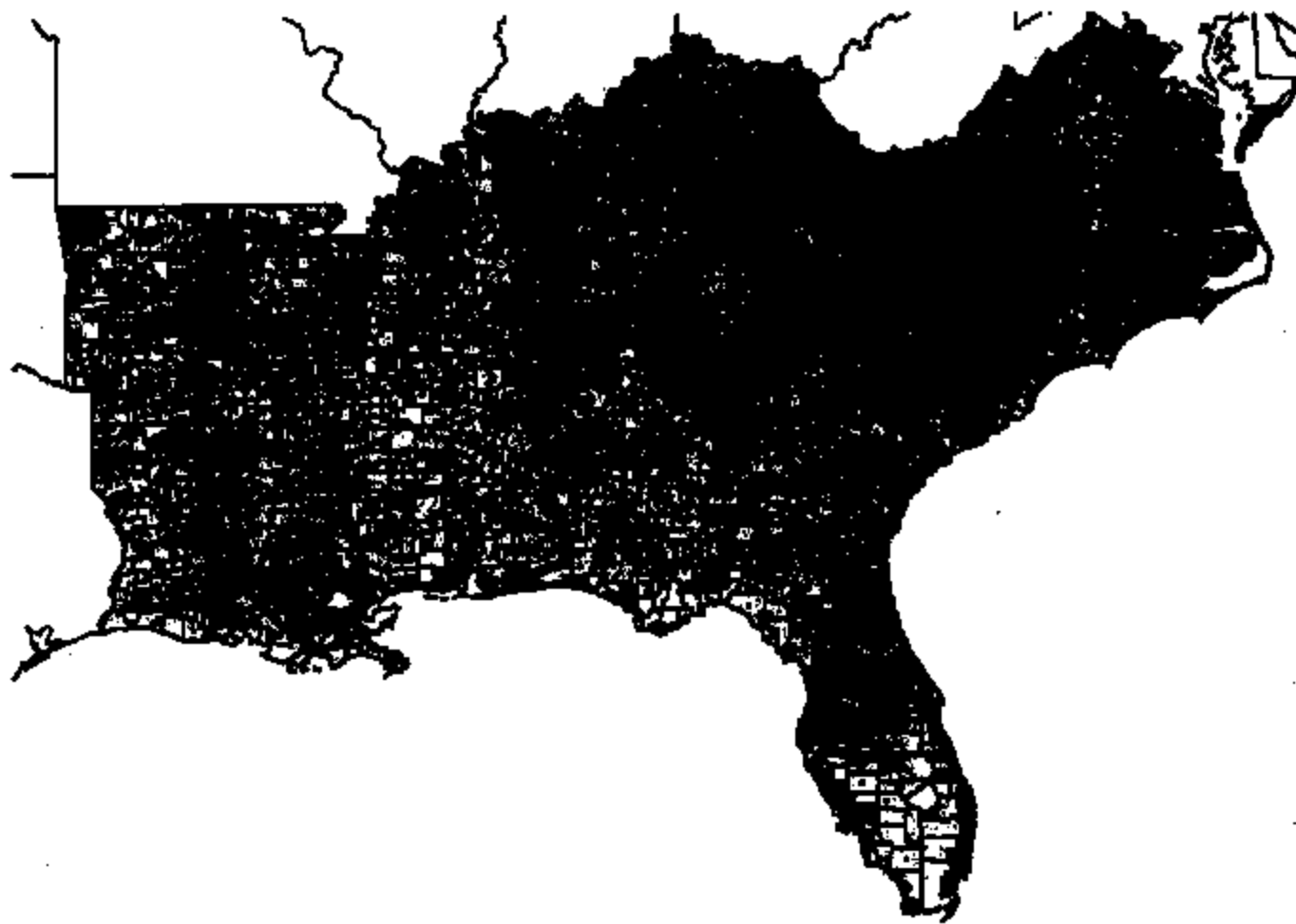
FM02-027-A 4882





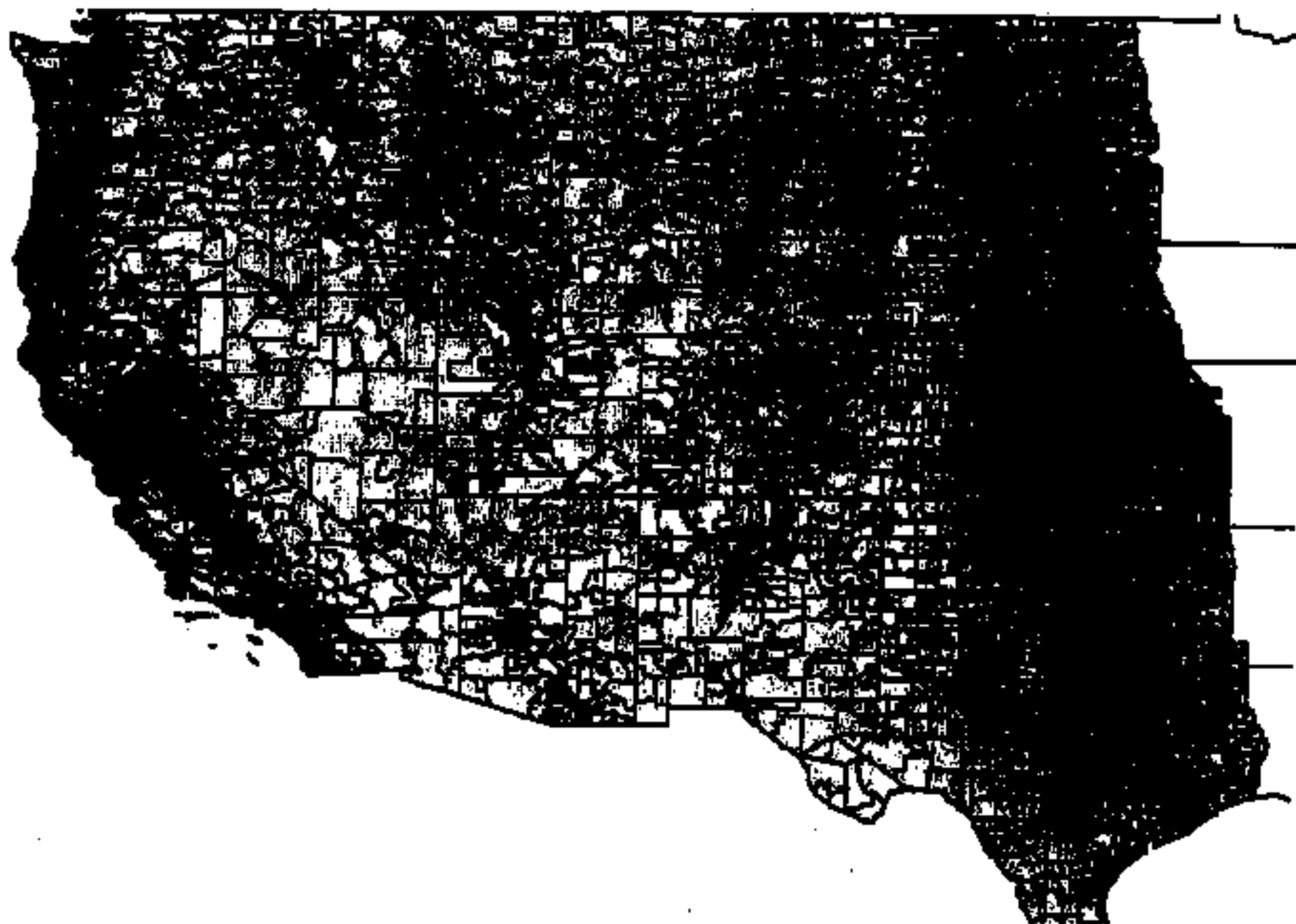
Depan Per Zip Code

99 402 50HC



# Repairs Per Zip Code

99 4.02 504C



IAC Task Force 2002

1002-021-A 4003

## **Danes, Adam (A.V.)**

**From:** Danes, Adam (A.V.)  
**Sent:** Wednesday, September 25, 2002 2:14 PM  
**To:** Armitage, John (J.F.); Bushman, Thomas (T.B.); cast; Chick, John (J.); Conroy, Jerry (J.R.); Coryea, Kevin (K.W.); Danes, Adam (A.V.); dare amold; Delaroderie, Jim (J.A.); Dible, Ken (K.M.); Dixon, Mark (M.R.); Gelfos, Theodore (T.T.); Harp, Ken (K.); Janakraman, Ram (V.); Jensen, Ted (T.E.); Jones, Shiela (S.M.); Kaput, Barb (B.J.); kelly.clamons@hap.com; lee aho; Linatta, Gary (G.D.); Marrone, Rob (R.B.); O'Neill, Jim (J.D.); Pandolfi, Pete (P.G.); Robinson, John (J.W.); Stidham, Brian (B.); Subramanian, Swaminathan (S.); Wanat, Richard (R.L.); Watson, Gerald (G.L.); Wettach, Bill (B.); Yagley, Barb (B.A.); Zammitt, Joe (J.)  
**Subject:** Agenda for IAC Team Mtg 9/25/02

7:30  
LC1

## **Agenda**

Prioritize Walkins

Re-Present FSEL/Hitachi correlation flow data - Gelfos

Flow Adjustment Study - Dixon/Ram

Coil resistance out of spec - Janakraman/Clamons

Update on F150 4.6L - All

Update on Mustang 4.6L - All

Open Issue List

Adam Danes  
V-Engine Engineering  
Master Black Belt  
Phone (313) 32-26688  
Fax (313) 39-02513  
ADANES / Adanes@ford.com

Danes, Adam (A.V.)

From: Dixon, Mark (M.R.)  
Sent: Wednesday, September 04, 2002 7:39 AM  
To: Danes, Adam (A.V.)  
Subject: RE: Open Issues for IAC Mtg

Adam, key open issues on the calibration side are:

- Workplan and timing for generation of "full resolution" flow data on 30 piece production sample for all 2003 MY Hitachi and Denso valves (M. Dixon/Hitachi Rep./Denso Rep.) ①
- Proposal for "calibration driven" IAC flow specification/Vendor response to proposal (M. Dixon/Hitachi/Denso) ②

I'd like to get 20-30 minutes of agenda time at tomorrow's session for these items. Thanks.

-----Original Message-----

From: Danes, Adam (A.V.)  
Sent: Tuesday, September 03, 2002 4:59 PM  
To: car; Chick, John (J.); Coryea, Kevin (K.W.); Danes, Adam (A.V.); dave amold; Delarodilla, Jira (J.A.); Dible, Ken (K.M.); Dixon, Mark (M.R.); Gellies, Theodore (T.T.); Jankiraman, Ravi (V.); Jensen, Ted (T.E.); Kelly.danese@hp.com; lee shu; Limotia, Gary (G.D.); Marrone, Rob (R.B.); O'Neill, Jim (J.D.); Pendergill, Pete (P.G.); Siddons, Brian (B.); Subramanian, Sureshkrishnan (S.); Wrool, Richard (R.L.); Wollach, Bill (B.)  
Subject: Open Issues for IAC Mtg

We are attempting to compile all our open issues into a document that we can use to run our meeting. I have many of our open issues captured in our meeting notes but would like to know what other open issues you may have. Please forward them to me via Email.

Adam Danes  
V-Engine Engineering  
Master Black Belt  
Phone (313) 32-26698

Fax (313) 39-02513  
ADANES / Adanes@ford.com

CR Thought End of Year?

Need Room for:

Sep 12 }  
Oct 3 } POE-E Cafeteria CR?  
Oct 10 } LCI  
Oct 24 } 20

## Quality Steering Team

I am sure many of you have heard something about the "V-Engine Quality Steering Team" by now. I've mentioned it in the All Employee Meetings and also in the May Quality Standdown. I'd like to spend some time giving you some general information about the V-Engine Quality Steering Team and how it benefits our organization.

The Quality Steering Team started back in January (2002) as a cross-functional team formed to improve alignment with existing 'Quality' groups within V-Engine. The core team currently consists of members from Quality Systems, Quality and Reliability, Master Black Belts, Program Administration, and the P/T Quality Office. The core team was expanded in April to include members from all of our On-Going Product Development (Current/Past) engine programs, PTPRP, Campaign Prevention, and Service Engineering.

### Objectives of the Quality Steering Team are:

- Define the current V-Engine quality state map, address gaps, and eliminate redundancies.
- Review/Communicate/Align and provide feedback (positive and negative) on new processes or initiatives developed internally or presented from outside organizations.
- Align resources on major quality tasks.
- Develop the V-Engine balanced Single Agenda for Quality. Focus as an organization on top quality issues in the field and deploy resources accordingly (Black Belt Projects, DFSS Projects, etc.).
- Address emerging issues.

V-Engine's Quality Steering Team's current efforts are centered around deploying the V-Engine Single Agenda for Quality.

### Single Agenda for Quality (SAQ)

What is a Single Agenda for Quality? And what are the benefits? The V-Engine Single Agenda for Quality is part of a company wide plan to focus on identifying and fixing our top quality issues in the field. *(The benefit is that the SAQ provides a means to highlight areas where current model problem solving resources are required in support of the V-Engine quality objectives.)*

The raw data that populates the Single Agenda for Quality comes directly from the corporate Analytical Warranty System (AWS) and GQRS. Data is pulled by part number and engine application. Time in service for the agenda is currently 3MIS but will be expanded to include 3YIS data. The three quality indicators within the Single Agenda for Quality are:

- Number of Repairs and Repair % Contribution to V-Engine.
- Warranty Cost and Cost % Contribution to V-Engine.
- Things Gone Wrong (TGW/1000) and TGW % Contribution to V-Engine.

In addition to the above the SAQ also considers input from the matched pair PRT (Problem Resolution Teams)/CPL's (Concern Priority Lists) when determining how resources will be allocated. The V-Engine Quality Steering Team reviews this data at bi-monthly meetings. The team bundles common issues together, determines where

*SAQ  
priorities  
Current model  
issues of concern  
attention of resources*

*SAQ!*

Black Belt/DFSS resources are needed, tracks issue status (open, in progress, closed, or monitor mode), and reviews emerging issues. The result is a focused organizational V-Engine Single Agenda for Quality.

You can view the posted V-Engine Single agenda for Quality on the Walls of Quality located around the POEE building. Please take the time to familiarize yourself with the Agenda.

### *Alternative Work Schedule*

Earlier this summer V-Engine introduced an Alternative Work Schedule (AWS) pilot program that was approved for our employees during the months of July and August. Of the three Corporate AWS options the one we chose for the pilot was the Four-Nine Hour/One-Four Hour Work Schedule in which the normal work period consists of four 9-hour days, one 4-hour day, with 4 hours regularly scheduled off, during a one-week period (Monday-Friday only).

Thank you for all the feedback - both ideas and issues - that has been communicated to the V-Engine Culture Team. The Culture Team used that feedback to formulate a proposal to management for ongoing implementation and expansion of AWS in our organization. This proposal was presented to the V-Engine supervisors on August 15, and was approved by a significant margin.

In addition to the option rolled out for the AWS pilot program here, I am happy that the supervisors supported The Culture Team's recommendation to offer you the other two AWS options. One of the newly offered options is the Four-Day/Forty-Hour Work Schedule - The normal work period consists of four days, 10 hours per day, with one regularly scheduled day off, during a one-week period (Monday-Friday only). The other is the Nine-Day/Eighty-Hour Work Schedule - The normal work period consists of eight 9-hour days, one 8-hour day, and one regular day off within a consecutive two-week period (Monday-Friday only).

The V-Engine management team recognizes that the AWS program provides our employees with an additional degree of flexibility in managing their time. This flexibility is important, because it can improve work-life balance and reduce workplace stress. At the same time, I know you appreciate that we cannot afford to let AWS adversely affect our business. I want you to know that I trust in your professionalism and your sense of responsibility. Now, as always, I am counting on you to maintain a high level of commitment and a sense of urgency - and I am confident that you will deliver.

If you are interested in the AWS program, contact your supervisor to discuss the eligibility of your position and the potential option that might work for you as well as the specific expectations and guidelines of participation. In addition, you should read the AWS policy on HR Online.

John Koszewnik



From: O'Neal, Jim (J.D.)  
Sent: Monday, January 14, 2002 7:03 AM  
To: Foster Jr., Elmer (E.S.); Finn, Sheri (S.I.); Johnson, Joe (J.H.)  
Subject: FW: NHTSA Investigation PE01-043  
Info

*J. D. O'Neal*

Manager, Fuel Metering, Emissions, and Ignition Dept  
V-Engine Engineering  
joneal@ford.com, 313-322-8839

-----Original Message-----

From: Koczewnik, John (J.J.)  
Sent: Sunday, January 13, 2002 3:24 PM  
To: Swartz, Ed (E.); Arnold, Jim (J.D.); Feuchl, Frank (F.); O'Neal, Jim (J.D.); Sears, Renee (R.T.)  
Subject: FW: NHTSA Investigation PE01-043

Heads up.

*John Koczewnik*

Chief Engineer  
V-Engine Engineering  
Ph. 32-28873  
Fx. 24-88087  
jkoczewn@ford.com

-----Original Message-----

From: Novak, Ray (R.A.)  
Sent: Tuesday, January 08, 2002 6:51 PM  
To: Hines, Bob (R.S.); Claudepierre, Dale (D.E.); Takasawa, Keith (K.D.); Kerr, Jerry (G.T.); Koczewnik, John (J.J.)  
Cc: Bradley, Joe (J.C.); Swartz, Ed (E.); O'Neill, Ann (A.R.); Sabatka, Christine (C.R.); Florio, Paul (P.G.); Cawalt, Greg (G.G.); Bauer, Scott (S.C.)  
Subject: NHTSA Investigation PE01-043

The National Highway Traffic Safety Administration has opened a Preliminary Evaluation Investigation (PE01-043) to determine if 2001-02 MY Ford Escape/Mazda Tribute vehicles equipped with the optional 3.0L Duratec engine are experiencing stalls without warning while being driven. The Agency opened this investigation based on 49 reports involving Escape vehicles and 51 reports involving Tribute vehicles, none of which allege accidents. A copy of the resume is attached.

Once the inquiry is received, a kick-off meeting will be scheduled with representatives from your activity to obtain information necessary to complete our response to the inquiry.

\*\*\*\*\*  
\*\*\*\*\*

PE01-043 Resume.doc

BP02-127-A 0039

**R. A. Newl**  
**Car Safety Investigations Manager**  
**Production Vehicle Safety and Compliance**  
**Automotive Safety Office**

**☎ (313) 594-7686    📠 (313) 594-2288**  
**🌐 RNEVI@FORD.COM**

**D62-627-A 6551**

From: Steven Limtiaco [SLimtiac@mazdausa.com]  
Sent: Tuesday, March 26, 2002 5:33 PM  
To: Verner, Carol (C.J.); Powers, Marty (M.L.)  
Cc: Chris Capuzzo; Dan Rothweiler; Maurer, James (J.B.); Firu, John (J.J.); 'meander@ford.com'  
Subject: RE: DPFE sensor evaluation: Mazda Tribute

Marty and John,

In addition to the shipping address, please provide phone numbers where we can reach you both. Thank you for the reply Carol, and thank you all.

Steve Limtiaco  
Mazda North American Operations  
Technical Product Support  
949-442-6514 (phone)  
949-442-6599 (fax)  
e-mail: slimtiac@mazdausa.com

-----Original Message-----

From: Verner, Carol (C.J.) [mailto:cverner@ford.com]  
Sent: Tuesday, March 26, 2002 2:24 PM  
To: Limtiaco, Steven (S.); Powers, Marty (M.L.)  
Cc: Capuzzo, Chris (C.); Rothweiler, Daniel (D.); Maurer, James (J.B.); Firu, John (J.J.)  
Subject: RE: DPFE sensor evaluation: Mazda Tribute

Afternoon Steve,

- 1) VIN # 4F2CU081X1KM42319
- 2) Marty Powers (mpowers1@ford.com) or John Firu (jfiru@ford.com) will contact you and provide the address the vehicle will be shipped to.
- 3) Marty Powers or John Firu. They are vehicle coordinators here in the FMEI Department, V-Engine @ POEE.
- 4) Engineering evaluation by FMEI Engineering to analyze the tube mounted DPFE sensor for root cause failure.
- 5) Length of time: 120 days
- 6) Marty Powers or John Firu

If you have any more question let me know.

Thank you and Mazda for your support in helping us with our evaluation.  
Carol

-----Original Message-----

From: Steven Limtiaco [mailto:SLimtiac@mazdausa.com]  
Sent: Tuesday, March 26, 2002 12:49 PM  
To: 'Verner, Carol (C.J.)'  
Cc: Chris Capuzzo; Dan Rothweiler  
Subject: RE: DPFE sensor evaluation

Carol,

Please provide the following directly to my attention:

- 1) VIN confirmation
- 2) address that the vehicle will be going
- 3) your contact information
- 4) a brief description stating purpose of vehicle request
- 5) estimated length of time vehicle will be borrowed
- 6) who will be arranging vehicle transportation

I will need this information to make the proper arrangements with our consumer compliance group that is in charge of the buyback vehicles. Thank you,

Steve Limtiaco  
Mazda North American Operations  
Technical Product Support  
949-442-6514 (phone)  
949-442-6599 (fax)  
e-mail: slimtiac@mazdausa.com

-----Original Message-----

From: Dan Rothweiler  
Sent: Tuesday, March 26, 2002 6:44 AM  
To: 'Verner, Carol (C.J.)'  
Cc: Steven Limtiaco; Chris Capuzzo  
Subject: RE: DPFE sensor evaluation

Carol, Here is Steve's contact information.

Steve Limtiaco  
MNAO North American Product support  
1444 McGaw Ave.  
Irvine, California 92614-5570  
slimtiac@mazdausa.com

Here is the address of where the vehicle resides. Please let me know when the transportation will arrive as the vehicle is currently being driven.

MNAO Northeast Regional office  
200 Cottontail Lane  
Somerset, New Jersey 08873

Daniel H. Rothweiler  
Mazda North American Operations  
Fixed Operations Technical Specialist  
Office: 732-868-2135  
Fax: 214-442-5222  
Cellular: 732-547-8578

-----Original Message-----

From: Verner, Carol (C.J.) [mailto:cverner@ford.com]  
Sent: Friday, March 22, 2002 8:16 AM

To: Rothweiler, Daniel (D.)  
Subject: FW: DPFE sensor evaluation

Good Morning Dan,

I work with Mark on this current Kavlico tm-dpfe issue and yesterday in our regular team meeting it was decided that we would like to get this vehicle over to our technician here in the FMEI department of V-Engine in POEE. I am sending this note because I would like to know if the Mazda Tribute is still around and who should I talk to in order to begin the process of transferring over to our department.

Thank you for your assistance  
Carol Verner  
313-390-7180

-----Original Message-----

From: Freeland, Mark (M.)  
Sent: Thursday, March 21, 2002 6:44 PM  
To: Verner, Carol (C.J.)  
Subject: FW: DPFE sensor evaluation

-----Original Message-----

From: Dan Rothweiler [mailto:DRothwei@mazdausa.com]  
Sent: Friday, March 08, 2002 3:24 PM  
To: 'Freeland, Mark (M.)'  
Cc: Steven Limtiaco; 'Don Altoonian'  
Subject: DPFE sensor evaluation

Mark, I received today 4 DPFE's from 2 different Tributes from New Hampshire.

2 of them are off of Customer Accetta VIN # 4F2CU081X1KM06730. They are the most recent 2 replacements of 4 total. Copies of the RO's are included with the parts.

Here is the text from the hotline file.

|                                   |                          |                      |
|-----------------------------------|--------------------------|----------------------|
| S20CCM1                           | HOTLINE RECORD (REVIEW1) | 03/08/02             |
| 12:10:42                          |                          |                      |
| P296                              |                          | NOEP137              |
| Hotline Ref No.: 0250034          | Status: SG SUGGESTED     | Customer Contacts: 2 |
| PQI Ref No.....:                  | Caller: MANNY            | Time Zone: ET        |
| Job Code.....: D331               | TECHNICIAN               | Branded...: N        |
| Location.....: 51516 TULLEY MAZDA | Phone: 503 888 - 0550    | Ext:                 |
| VIN.....: 4F2CU081X1KM06730       | MDL/YR: TRX ES A /01     | Prod Dt:             |
| 09/11/00                          |                          |                      |
| Repair Mileage.: 23858            | Cust: ACCETTA, JUNE      | In Srvc:             |
| 10/24/00                          |                          |                      |

Hotline Subject: 1/10 BK MIL ON P-0401

Category Code...: F FUEL AND EMISSION

Symptom Codes...: 620 DOES NOT TURN OFF/WA 640 IMPROPER OPERATION

Condition Codes: 401 DTC 402 DTC

Symptom Freq...: C CONSTANT C CONSTANT

Did you duplicate symptoms?: Y (Y or N) Number of Repair Attempts: 3

Describe Symptoms and Conditions:

MIL ON P-0401

S20CDM1 HOTLINE RECORD (REVIEW2) 03/08/02  
12:12:57  
P296 NOEP137

Hotline Ref No.: 0250034 Status: SG SUGGESTED MDL/YR: TRX ES A /01

PQI Ref No.....: Caller: MANNY

Location.....: 51516 TULLEY MAZDA Phone: 603 888 - 0550 Ext:

Hotline Subject: 1/10 BK MIL ON P-0401

RI No for prior repair attempts:

Describe attempted repairs.....:

THIS THE THIRD TIME BACK WITH THIS CODE, REPAIR SEEMS TO BE EFFECTIVE FOR  
FOUR MONTHS. WATER WAS FOUND INSIDE SENSOR.

| RI Ref No | Suggested Repairs                        | Try | Eff |
|-----------|------------------------------------------|-----|-----|
| 0003529   | P0401/P0402 - MIL ON DUE TO DPFE SENSORS |     |     |

S20CEM1 HOTLINE RECORD (REVIEW3) 03/08/02  
12:13:28  
P296 NOEP137

Hotline Ref No.: 0250034 Status: SG SUGGESTED MDL/YR: TRX ES A /01

PQI Ref No.....: Caller: MANNY

Location.....: 51516 TULLEY MAZDA Phone: 603 888 - 0550 Ext:

Hotline Subject: 1/10 BK MIL ON P-0401

Other suggested repairs:

REPLACE DPFE SENSOR.

Callback Date.....:

Entered By: KULP

01/10/02

Last Rev By: KULP

01/10/02

The 2nd set of 2 is off of another Tribute customer Hammond that had 2 DPFE replacements. VIN # 4F2CU081X1KM42319. This Tribute we don't have any hotline information on but the RO's are included as well.

I need an address to send these parts to you so if you can get it to me soon I will ship them to you.

Thanks,

Daniel H. Rothweiler  
Mazda North American Operations  
Fixed Operations Technical Specialist  
Office: 732-868-2135  
Fax: 214-442-5222  
Cellular: 732-547-8578

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**From:** Akins, Mary (M.)  
**Sent:** Tuesday, March 28, 2002 4:12 PM  
**To:** Sanders, Muriel (M.S.)  
**Subject:** Kavlico 8D

Muriel,  
Jim Maurer forwarded your request to me. I will have an updated 8D with the start and stop dates for the white dotted sensors.

When and where is the meeting Jim is referring to? Please call me tomorrow at my Southfield office and let me know the date, time and place of the meeting. (248) 263-8757.

Regards,  
Mary Akins

Ford phone: (313) 248-1989  
Ford fax: (313) 845-3169  
makins@ford.com  
makinwork@aol.com  
Cell Phone/Messages: (810) 942-9606  
Kavlico phone: (248) 263-8757



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**From:** Hansen, George (G.C.)  
**Sent:** Tuesday, March 26, 2002 3:35 PM  
**To:** Senders, Muriel (M.S.)  
**Co:** Corbett, Sandra (S.M.)  
**Subject:** Stalls Claims Data



Stalls OFF Claims.xls

George Hansen  
Escape, PTQRT  
2H-D63, PDC  
(313) 84-51800  
ghansen4

---

**From:** Sventickas, Ed (E.)  
**Sent:** Tuesday, December 18, 2001 10:23 AM  
**To:** Koeko, Jeff (J.R.)  
**Cc:** Yeung, Lam (.); Fascetti, Bob (R.J.)  
**Subject:** U204 Production Intake

Jeff.... I had a chance to chst with Bob Fascetti on a U204 stalls issue. Bob raise a question .... Is there anything in the design that may contribute to or aggravate the sensitivity to contamination in the U204 Intake ...the major thing that crossed my mind was .... are all the fitting relationships to design guide... is PCV the correct distance from throttle body and Idle speed control ports .... etc. etc.

Can you ple look at these items ..thanks

***Ed Sventickas***

Manager of 2.5/3.0L V6  
Duratec Engines  
V-Engine Engineering  
Phone - 313 846 5080  
Fax - 313 594 7328  
esventic@ford.com  
Text Pager:313-851-0826

**Edwards, Lynn (L.M.)**

---

**From:** Bandooske, Pete (P.F.)  
**Sent:** Monday, August 27, 2001 11:10 AM  
**To:** Sweeney, Stephanie (S.L.); Edwards, Lynn (L.M.); Hilding, Robert (R.J.)  
**Cc:** Oswalt, Greg (G.G.)  
**Subject:** RE: Update Engine Stall Concern, Tribute 2001

I also received this letter from Bob King this morning. For your records.

**Pete Bandooske, PBANDOSK@FORD.COM,**  
Program Manager, Recall and Service Programs,  
FCSD, Ph. 313-33-72791, FAX 313-34-51024, Rm. 806, D8C2

-----Original Message-----  
**From:** Sweeney, Stephanie (S.L.)  
**Sent:** Friday, August 24, 2001 4:49 PM  
**To:** Edwards, Lynn (L.M.); Hilding, Robert (R.J.)  
**Cc:** Bandooske, Pete (P.F.); Oswalt, Greg (G.G.)  
**Subject:** RE: Update Engine Stall Concern, Tribute 2001

Lynn and Bob -- Have ECI pull the data on this concern. Let's make sure this is on next week's CCRG Agenda. Let me know what I can do to help get this one moving. Thanks.

*Stephanie L. Sweeney*  
Manager, Compliance Engineering  
Production Vehicle Safety and Compliance  
Automotive Safety Office

(313) 33-72860 (phone)  
(313) 34-42366 (fax)  
(313) 790-8778 (text pager)  
ssweeney@ford.com

-----Original Message-----  
**From:** Bandooske, Pete (P.F.)  
**Sent:** Friday, August 24, 2001 1:32 PM  
**To:** Edwards, Lynn (L.M.); Sweeney, Stephanie (S.L.); Oswalt, Greg (G.G.)  
**Subject:** FW: Update Engine Stall Concern, Tribute 2001

The attached notes from Mazda refer item B1 on our main agenda. Note the 20 VOQs Mazda has against this concern.

**Pete Bandooske, PBANDOSK@FORD.COM,**  
Program Manager, Recall and Service Programs,  
FCSD, Ph. 313-33-72791, FAX 313-34-51024, Rm. 806, D8C2

-----Original Message-----  
**From:** Ballint, Gary (G.S.)

Sent: Friday, August 24, 2001 10:21 AM

To: Goering, Kimberly (K.L.); Bradley, Joe (J.C.)

Cc: Ballint, Gary (G.S.); Bandoska, Pete (P.F.); Oswalt, Greg (G.G.)

Subject: FW: Update Engine Stall Concern, Tribute 2001

Pete and I spoke to Laura about this today. Pete says this issue is on the CCRG agenda but was not discussed at the last meeting.

-----Original Message-----

From: Terzas, Laura (L.D.)

Sent: Friday, August 24, 2001 7:08 AM

To: Ballint, Gary (G.S.)

Cc: Bradley, Joe (J.C.); King, Robert (R.F.); Goering, Kimberly (K.L.); Vecchio, Anna Marie (A.)

Subject: FW: Update Engine Stall Concern, Tribute 2001

Gary this is the same issue that I gave you the Mazda customer letters on 2 weeks ago. The issue is being reviewed/investigated within the PTQRT. The PVT did not open a QSF. Bob King or Ann Marie Vecchio can provide latest status to you from PTQRT. Wk of 8/6 or 8/13, Mazda N.A. Operations was transferring buyback units (3) to Ford Dearborn engineers for investigation purposes. There seems to be considerably more cases on Tribute vs. Escape.

Can you provide status? Is the issue on CCRG agenda?

-----Original Message-----

From: Fumihiko Aoyama [mailto:aoyama.f@ev.mazda.co.jp]

Sent: Thursday, August 23, 2001 10:21 PM

To: 'PPMO No.4 Mr.Kawasaki'; '7777B7777(Mr.Yokomachi)'; '777B77A7(A.Okada)'; '7777777(Mr.Imada)'; '7777777(Mr.Oha)'; '7777777(Mr.Mito)'

Cc: '777777777(Mr.Hirano)'; 'C.S.Div. Mr.Terry Moore'; 'MCExecutiveMr.D.Thomas'; 'PCSDMr.JoeBradley'; 'PCSDRecall/SPMs.K.Goelling'; 'FORDCSDMs.L.Terzas'

Subject: FW: Update Engine Stall Concern, Tribute 2001

This is the issue we have been working with Ford / KCAP PVT as an important QAS and MNAO has asked special help to Mr.Martens. Please study what kind of action we can take to protect our markets of Tribute 3 litre. Best regards, Aoyama

-----Original Message-----

From: Jose Aleman [mailto:JoseAN@pmotors.com]

Sent: Friday, August 24, 2001 5:31 AM

To: Jose Tosado; F. Aoyama, Manager OSD, OSQI

Cc: 'Steven Limtiaco, Product Support Engineer (Tribute)'; 'Ryu SHIMIZUGAWA'; 'M. Gible, Manager MNAO TSD'; 'E. Mark, MNAO'; 'Randy Marster, PS Engineer B-Truck'; Jimmy Pibernus; Yukio Takeuchi; Kei Inagaki

Subject: RE: Update Engine Stall Concern, Tribute 2001

Dear Mr. Aoyama:

Regarding this issue, this morning we were reviewing about 20 similar complaints related to Mazda Tribute that were reported to the "Office of Defects Investigation" of the National Highway Safety Administration.

This problem is a safety related issue and require immediate action and prompt solution.

Best regards,

J. Alemán  
Service Manager

—Original Message—

From: Jose Tzucda

Sent: Wednesday, August 22, 2001 12:33 PM

To: 'F. Aoyama, Manager OSD, OSC'

Cc: 'Steven Lindero, Product Support Engineer (Tribute)'; Ryu SHIMIZU@NAO'; 'M. Gbille, Manager MNAO TEE'; 'E. Mark, MNAO'; Randy Nester, PE Engineer B-Truck; Jimmy Pibarnus; Jose Aleman; Yutaka Takeuchi; Kai Inagaki

Subject: Update Engine Stall Concern, Tribute 2001

Aoyama san,

As we have indicated in our communication in the past and last QMD meeting in Washington we have more complaint of engine stall in Tributes. Right now the customers are coming more often to service with this complaint. We have been performing the diagnostic routing and inspecting the areas suggested by MNAO, such as the connector X270d, ground #15 and #16, PVC hose loose, fuel pump filter with no result. We can not duplicate the concern but the customers indicated the vehicles are stalling and they are very disappointed with then.

We have performed the procedure indicated by MNAO. We tested the vehicles and tried to capture the data with the WDS (set the trigger point at 400 RPM), but the concern does not reappear during test. Today, I personally tested one vehicle and used the WDS to capture the data if the vehicle stalls. During the test the vehicle performs good, but when we returned to service and explained the customer about our finding she told us that her Tribute stalled and she is unsecured with the vehicle. She states that the vehicle stall suddenly during down hill at heavy traffic in six occasions when the stalling occurs neither the brakes and steering perform in the vehicle. She indicated she is terrified to drive the vehicle.

This complaint is similar to the customer explanations when this concern happens. Engine stalls during down hill the brakes and steering system do not work.

Also please find the list of vehicles that has been complaint and has been test with no problem duplication.

| Customer Name | Vehicle Serial Number  | Mileage |
|---------------|------------------------|---------|
|               | 4F2YU06121KM54212      | 1,900   |
|               | 4F2YU091X1KM37057      | 3,400   |
|               | 4F2YU08131KM11109      | 15,214  |
|               | 4F2YU07121KM17972      | 7,974   |
|               | 4F2CU09191KM17981      | 16,582  |
|               | 4F2YU09191KM31560      | 2,301   |
|               | 4F2YU09171KM37050      | 5,652   |
|               | 4F2YU07111KM366522,991 |         |
|               | 4F2YU071X1KM48208      | 2,547   |
|               | 4F2YU07181KM48224887   |         |

Your prompt action will be appreciated because the customer satisfaction and sense of safety are being affected.

8/28/2001

EA02-027-C 0019

Please inform the latest technical information regarding this issued.

**José Torado**  
**Assistant Service Manager**  
**Plaza Motors Corporation**  
**Mazda de Puerto Rico**  
**787.841.8300 x 715**  
**joset@pmotors.com**

**Jordan, Donald (D.E.)**

---

From: Altoonian, Don (D.J.)  
Sent: Tuesday, April 23, 2002 4:38 PM  
To: Jordan, Donald (D.E.)  
Subject: RE: The Escape I Told You About

Thanks Don. Let me know when and where.

-----Original Message-----

From: Jordan, Donald (D.E.)  
Sent: Tuesday, April 23, 2002 3:56 PM  
To: Powers, Ken (K.W.); Altoonian, Don (D.J.)  
Cc: Jordan, Donald (D.E.)  
Subject: RE: The Escape I Told You About

Yes. I've gotten ahold of one owner and have a message from other & both have agreed. Trying to coordinate Lear engineer, Don, veh's.  
Will update you after investigation.  
Thanks,

Donald E. Jordan  
U204 OPD E/E Systems & EDS  
(313), 32-25147  
Pager: T (djordan1) or 313-795-4342

-----Original Message-----

From: Powers, Ken (K.W.)  
Sent: Tuesday, April 23, 2002 2:03 PM  
To: Jordan, Donald (D.E.)  
Subject: RE: The Escape I Told You About

Don, I assume that Don Altoonian is going to join you?

Ken Powers  
Escape/Tribute PVT Manager, KCAP  
Ph: 816-459-1729; Fax: -1726

-----Original Message-----

From: Ford, Jeri (J.A.)  
Sent: Tuesday, April 23, 2002 11:22 AM  
To: Jordan, Donald (D.E.); Powers, Ken (K.W.)  
Cc: Takasawa, Keith (K.D.); Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.)  
Subject: RE: The Escape I Told You About

Can you let me know what we find out on these two? Thanks.

-----Original Message-----

From: Jordan, Donald (D.E.)  
Sent: Friday, April 19, 2002 4:57 PM  
To: Ford, Jeri (J.A.); Powers, Ken (K.W.)  
Cc: Takasawa, Keith (K.D.); Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.)

Subject: RE: The Escape I Told You About

Will do.  
Thanks,

Donald E. Jordan  
U204 OPD M/E Systems & EDS  
(313) 32-25147  
Pager: T (djordan1) or 313-795-4342

-----Original Message-----

From: Ford, Jeri (J.A.)  
Sent: Friday, April 19, 2002 2:06 PM  
To: Powers, Ken (K.W.); Jordan, Donald (D.E.)  
Cc: Takasawa, Keith (K.D.)  
Subject: RE: The Escape I Told You About

fyi...

From: Crawford, Tom (.)  
Sent: Friday, April 19, 2002 2:00 PM  
To: Ford, Jeri (J.A.)  
Subject: RE: The Escape I Told Your About

Jeri -

Here's info.

Jennifer Gustitus (w)313-248-6659 1FMYU04122KB38720 built 12/4/01  
Heather O'Brien (w)313-248-6697 1FMYU04132KB59789 built 12/5/01

*Yonkers in Recent Court*  
Both were traveling approx. 40 mph when event happened. Both vehicles are under 4,500 miles. And both are located in Dearborn and have not had service done yet.

-----Original Message-----

From: Powers, Ken (K.W.)  
Sent: Friday, April 19, 2002 12:04 PM  
To: Ford, Jeri (J.A.)  
Cc: Jordan, Donald (D.E.); Takasawa, Keith (K.D.)  
Subject: RE: The Escape I Told Your About

I think I'd like Don Jordan in Dearborn to talk to them and have a first-hand look.

Don, can you call these two people (Jeri Ford can get the contact info) and ask them about the failure mode and arrange to look at the trucks? (possibly visible corrosion in the PD Box. Not sure.)

Ken Powers  
Escape/Tribute PVT Manager, KCAP  
Ph: 816-459-1729; Fax: -1726

-----Original Message-----



From: Ford, Jeri (J.A.)  
Sent: Friday, April 19, 2002 10:34 AM  
To: Powers, Ken (K.W.); Takasawa, Keith (K.D.)  
Subject: FW: The Escape I Told Your About

This was the first of the two vins that had the power failure. I know that they were able to get it off the road and eventually restart and it was okay.

How would you like to proceed - Vins, contact names/numbers, etc? I assume that we want to follow these two units. I believe the two people are in Dearborn.

-----Original Message-----

From: Crawford, Tom (.)  
To: Ford, Jeri (J.A.)  
Sent: 4/16/02 4:13 PM  
Subject: The Escape I Told Your About

VIN 1FMYU04122KB38720

Thanks,  
Tom Crawford  
Aviator Finance Supervisor  
P: 313.322.0885  
F: 313.322.0885

## 08/16/01 MEETING MINUTES

Attendees: (please let me know if I left anyone out)

Kamal Bhojwani (3.0L PT Calibration)  
Sandra Corbett (PT QRT)  
Gary Mazzella (Black Belt)  
Scott Moorhouse (KCAP)  
Shinji Kanai (KCAP)  
Bob King (FCSD)  
Sonya Nematollahi (Electrical)  
Ed Marek (MNAO)  
John McDonald (Visteon)  
Don Jordan (Lear)  
John Hayden (Relays)  
John Matassa (3.0L PT Calibration)  
Gilbert Fournelle (3.0L PT Calibration)  
Joel Badgley  
Steve Lintisco (MNAO)

### Meeting Minutes:

- Preliminary vehicle checklist discussed.
  - Concern about the recommendation to change DPFE sensors and IAC valves needs to be addressed before providing checklist to dealer hotline.
  - Feedback needed from scramble teams at dealerships to finalize checklist.
- Vehicle status
  - Don Altoonian evaluated 3 units, 2 at dealerships in Pennsylvania (area described as having rolling hills) and 1 buy back.
    - First unit, 2 stalls in 1000 miles. Stall not reproduced. Dealer replaced Omron Relay with Hella EBC Relay. (Service is receiving Hella relays). Don went through checklist on unit. Vehicle returned to customer.
    - Second unit, 2 stalls in 1400 miles. Stall not reproduced. Noticed one dip in rpm, nothing else. Went through checklist and returned to customer.
    - Buyback unit returned to Dearborn. No stall reproduced. Being evaluated.
  - Scott Moorhouse evaluated 2 units, 1 dealer in Jackson City, MO and 1 in Lake Ozark, MO (both areas described as having rolling hills)
    - Jackson City Unit, 5 stalls in 5000 miles (Ford buy back). Customer claims stalls occur when coasting down steep hill (relatively old vehicle). Scott noticed rpm drop to ~600-650, but no stall reproduced. Went through checklist, nothing found.
    - Lake Ozark, MO Unit, 3 stalls in 5000 miles. Stall not reproduced. Went through checklist, nothing found.
  - Kamal Bhojwani evaluated 4 units, 1 customer unit (Jorgensen Ford) and 3 MNAO buy back's
    - Jorgensen Ford Unit, 10+ stalls, some at Highway speeds. Unit driven around for 2 days with VDR. No stalls recurrence. Went through everything on checklist, replaced EBC relay (to Hella) and changed MAF sensor also. Unit returned to customer. Dealer will follow up with customer.
    - MNAO buy back's. No stalls reproduced while driving. All being driven with VDR.

- One unit stalled numerous times while shifting from drive to reverse. This, however, was not the reason for buy back. No mention of this by customer or dealer. Stall appears to be gone after going through checklist. Still being driven with VDR.
- Of the two remaining buy back's, one had the checklist updates. Both being driven with VDR to recreate stall.
- Other Notes:
  - Electrical is gathering data on Omron vs Hella relay (John Hayden, Don Jordan).
  - Visteon and Lear have returned PCM and Wiring Harness for evaluation (John McDonald, Don Jordan).
  - Consider putting buyback's on chassis roll for coast down simulation (Kamal Bhojwani).
- Tasks for Tuesday
  - Updated Vehicle Checklist (Kamal Bhojwani, Scott Moorhouse, Don Altomian)
  - 8D Initiated (Kamal Bhojwani, Sandy Corbett)
  - Evaluated Vehicle Summary Sheet (Kamal Bhojwani, Joel Badgley)
  - Ford Customer Survey?? (Sandy Corbett)
- Next meeting: Tuesday, August 21, 2001, 12:00 - 1:00pm, TEE Bld Conf Room #2  
 Dial In: 1 (800) 559-1235  
 FordNet # and International Participants #: 954-1129, 1 (630) 424-2078  
 Passcode: 75105768

**From:** Grimes, Jeff (J.R.)  
**Sent:** Wednesday, October 23, 2002 11:18 AM  
**To:** Thompson, Richard (R.T.)  
**Subject:** RE: 2003MY Hazardous Material Reporting (GMIR/IMDS)

There is also a PCV Tube (last Entry I believe...)  
Sealing was addressed to answer to the fill cap...Your on for PCV

Jeff Grimes  
OPD & Value Engineering  
Duratec Engine Programs, U204  
Ford Motor Company  
ph: (313) 322-5237 fax: (313) 594-7323  
e-mail: jgrimes1@ford.com

-----Original Message-----

**From:** Thompson, Richard (R.T.)  
**Sent:** Wednesday, October 23, 2002 10:40 AM  
**To:** Grimes, Jeff (J.R.)  
**Cc:** Thompson, Richard (R.T.)  
**Subject:** FW: 2003MY Hazardous Material Reporting (GMIR/IMDS)

<< File: pic23743.pcx >> << File: pic14411.pcx >> Jeff: I know the part was not my responsibility, but since I deal with MPC I passed the information on. I believe this satisfies your request. Let me know if it doesnot. Thanks.

-----Original Message-----

**From:** bjg@mpc-inc.com [mailto:bjg@mpc-inc.com]  
**Sent:** Wednesday, October 23, 2002 10:15 AM  
**To:** rthomp11@ford.com; jgrimes1@ford.com  
**Subject:** FW: 2003MY Hazardous Material Reporting (GMIR/IMDS)

I have entered the MDS for XW4E-6766-AB. I was not able to locate past records of certifying to the Ford Standard and the system allowed me to do it again. I have provided the following print screens for your records.

Please call me if you have any questions or concerns.

Thank You

(Embedded image moved to file: pic23743.pcx)  
(Embedded image moved to file: pic14411.pcx)  
Brian Giese  
Employee Relations Supervisor  
(262) 275-5791 Ext. 2224

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**To:** rthomp11@ford.com; jgrimes1@ford.com  
**Subject:** FW: 2003MY Hazardous Material Reporting (GMIR/IMDS)

I have entered the MDS for XW4R-6756-AB. I was not able to locate past records of certifying to the Ford Standard and the system allowed me to do it again. I have provided the following print screens for your records.

Please call me if you have any questions or concerns.

Thank You

(Embedded image moved to file: pic23743.pcx)  
(Embedded image moved to file: pic14411.pcx)  
Brian Giese  
Employee Relations Supervisor  
(262) 275-5791 Ext. 2224

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**From:** Grimes, Jeff (J.R.)  
**Sent:** Thursday, October 24, 2002 2:32 PM  
**To:** Fournelle, Gilbert (G.); Suarez, Rhea (R.)  
**Subject:** Latest SSM/TSB planned for stalls

Can someone forward me the latest verbage on the new TSB/SSM being drafted...

Internally, we are having some discussion about removing IAC and DPFE from the "default replacement"

Some verbage clarifying a part # check may be suitable...but I want to take a look...

*Jeff Grimes*  
OPD & Value Engineering  
Duratec Engine Programs, U204  
Ford Motor Company  
ph: (313) 322-6237 fax: (313) 594-7323  
e-mail: jgrimes1@ford.com

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*Jeff Grimes*  
OPD & Value Engineering  
Duratec Engine Programs, U204  
Ford Motor Company  
ph: (313) 322-5237 fax: (313) 594-7323  
e-mail: jgrimes1@ford.com

**From:** Grimes, Jeff (J.R.)  
**Sent:** Thursday, October 24, 2002 1:54 PM  
**To:** 'John.Chick@hap.com'; Grimes, Jeff (J.R.); Danee, Adam (A.V.)  
**Cc:** Wettach, Bill (B.); Carl.Slindes@hap.com; Tim.Sabourin@hap.com  
**Subject:** RE: 6-panel information

This stuff is a good start...what do you have on the task force...

All this tells me is that the guide will help the warranty...but we know it won't fix it...what's are plan to address the TNI's???

Jeff Grimes  
OPD & Value Engineering  
Duratec Engine Programs, U204  
Ford Motor Company  
ph: (313) 322-5237 fax: (313) 594-7323  
e-mail: jgrimes1@ford.com

-----Original Message-----

**From:** John.Chick@hap.com [mailto:John.Chick@hap.com]  
**Sent:** Wednesday, October 23, 2002 11:03 AM  
**To:** jgrimes1@ford.com  
**Cc:** wwettach@ford.com; Carl.Slindes@hap.com; Tim.Sabourin@hap.com  
**Subject:** 6-panel information

<< File: fishbone.pdf >> << File: P-diagram.xls >> << File: IAC Vavle - Hitachi.ppt >> << File: YF1E-AB warranty data.xls >> << File: pie chart.xls >>

Jeff,

Please see the attached files to be used for your 3.0L Escape 6-panel presentation.

Regards,

John Chick  
FSS Engineer  
Hitachi Automotive  
248 473-6749

(See attached file: fishbone.pdf) (See attached file: P-diagram.xls) (See attached file: IAC Vavle - Hitachi.ppt) (See attached file: YF1E-AB warranty data.xls) (See attached file: pie chart.xls)



## 08/16/01 MEETING MINUTES

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    - Lake Ozark, MO Unit, 3 stalls in 5000 miles. Stall not reproduced. Went through checklist, nothing found.
  - Kamal Bhojwani evaluated 4 units, 1 customer unit (Jorgensen Ford) and 3 MNAO buy back's
    - Jorgensen Ford Unit, 10+ stalls, some at Highway speeds. Unit driven around for 2 days with VDR. No stalls recurrence. Went through everything on checklist, replaced EEC relay (to Hella) and changed MAF sensor also. Unit returned to customer. Dealer will follow up with customer.
    - MNAO buy back's. No stalls reproduced while driving. All being driven with VDR.

- One unit stalled numerous times while shifting from drive to reverse. This, however, was not the reason for buy back. No mention of this by customer or dealer. Stall appears to be gone after going through checklist. Still being driven with VDR.
  - Of the two remaining buy back's, one had the checklist updates. Both being driven with VDR to recreate stall.
- Other Notes:
  - o Electrical is gathering data on Omron vs Hella relay (John Hayden, Don Jordan).
  - o Visteon and Lear have returned PCM and Wiring Harness for evaluation (John McDonald, Don Jordan).
  - o Consider putting buyback's on chassis roll for coast down simulation (Kamal Bhojwani).
- Tasks for Tuesday
  - o Updated Vehicle Checklist (Kamal Bhojwani, Scott Moorhouse, Don Altonian)
  - o 8D Initiated (Kamal Bhojwani, Sandy Corbett)
  - o Evaluated Vehicle Summary Sheet (Kamal Bhojwani, Joel Badgley)
  - o Ford Customer Survey?? (Sandy Corbett)
- Next meeting: Tuesday, August 21, 2001, 12:00 – 1:00pm, TEE Bld Conf Room #2  
 Dial In: 1 (800) 559-1235  
 FordNet # and International Participants #: 954-1129, 1 (630) 424-2078  
 Passcode: 7510576#

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**From:** Przybylo, Ken (K.)  
**Sent:** Wednesday, August 07, 2002 9:22 AM  
**To:** Peters, Robin (R.S.); Dalbo, Bob (R.J.); Corbett, Sandra (S.M.); Fascetti, Bob (R.J.)  
**Cc:** Brown, Jennifer (J.); Kreuter, Richard (R.B.); 'Alan Trilling (E-mail)'  
**Subject:** RE: U204 Status

cert wire is out.....

-----Original Message-----

**From:** Peters, Robin (R.S.)  
**Sent:** Wednesday, August 07, 2002 9:16 AM  
**To:** Dalbo, Bob (R.J.); Corbett, Sandra (S.M.); Fascetti, Bob (R.J.)  
**Cc:** Przybylo, Ken (K.); Brown, Jennifer (J.); Kreuter, Richard (R.B.); Alan Trilling (E-mail)  
**Subject:** U204 Status

2003:

The Tribute cert. wire just went out from Joe Hazime to Ken Przybylo. We should have build and ship issued shortly. This will complete all certification.

Orders have been placed with North Penn for the 2003 U.S. calibration (3L8A-BB) directing Tuesday, 8/13 incorporation.

Separate release to North Penn for the 2003 Mexico calibration (3L8A-CB) issued yesterday requesting incorporation later next week.

I am unable to address 2003 foreign market calibration incorporation date(s).

2002/2001:

Received confirmation that all calibrations will be available to service via Fordstar on Friday 8/9 less the 2001 Japan (should follow 1 week later).

Robin Peters  
Truck PCM Timing Coordinator  
Emissions Compliance Dept.  
Phone: 313-39-01555

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**From:** Veeratra, Tim (T.W.)  
**Sent:** Friday, November 08, 2002 1:23 PM  
**To:** Faumella, Gilbert (G.)  
**Cc:** Corbett, Sandra (S.M.)  
**Subject:** Just FYI

**Source:** Automotive News (<http://www.autonews.com/news.cms?newsId=3833>)  
**Dated:** November 06, 2002

Separately, NHTSA said it had also upgraded an investigation into thousands of complaints about engines stalling without warning on Ford's Escape compact sport utility vehicle and the Tribute SUV sold by Ford's Mazda subsidiary.

The complaints involve vehicles from the 2001 and 2002 model years, NHTSA said.

**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, March 06, 2002 1:37 PM  
**To:** Altoonian, Don (D.J.)  
**Cc:** Moorhouse, Scott (S.R.); Hofman, Michael (M.V.); Corbett, Sandra (S.M.)  
**Subject:** RE: U204 stall vehicle in Tennessee

Don,  
This sounds like a power relay issue (which it shouldn't be - should already have Hella) or a fuel supply issue (leaking regulator, intermittent fuel pump relay, bad fuel pump connection).  
Let us know what you find.

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 795-2858 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Altoonian, Don (D.J.)  
**Sent:** Tuesday, March 05, 2002 6:36 PM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** Moorhouse, Scott (S.R.); Hofman, Michael (M.V.); Corbett, Sandra (S.M.)  
**Subject:** RE: U204 stall vehicle in Tennessee

Bob, build date 1/18/02, complaint date 1/27/02, 60-70 miles, accelerating uphill it shut off. Started backup ok. I plan to look at the car on 3/21/02, and then go on to pick up our new RAV in Allentown Pa.  
I talked to the customer tonight, I will call the dealer on Wed. This is another typical deal where the customer went 50 miles away to get the vehicle he wanted, and couldn't get one at his local dealer, and now he takes it back to his local dealer, and it sounds like he is getting a little run around. I will know more on Wed.

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Tuesday, March 05, 2002 9:55 AM  
**To:** Altoonian, Don (D.J.); Hofman, Michael (M.V.); Moorhouse, Scott (S.R.)  
**Cc:** Corbett, Sandra (S.M.)  
**Subject:** RE: U204 stall vehicle in Tennessee

Don/Mike/Scott,  
What are the particulars (build date, complaint date, mileage, etc.) on this vehicle? They would help focus the investigation.

Don,  
When do you plan to leave?

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 795-2858 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Altoonian, Don (D.J.)  
**Sent:** Tuesday, March 05, 2002 7:57 AM  
**To:** Hofman, Michael (M.V.)  
**Cc:** Dalbo, Bob (R.J.); Moorhouse, Scott (S.R.); Corbett, Sandra (S.M.)  
**Subject:** RE: U204 stall vehicle in Tennessee

Mike, I could fit it in with picking up our new 2002 RAV in Penn. I can get a flight to Nashville, and then after checking out the car in Tn, flight on to Allentown, Pa and pickup our new Rav and drive it back. I played around online , American Express, and got a \$206 dollar fair. The one way from Detroit to Allentown is \$497.00. The customer in Tn. is 45 miles from the dealer, I am trying to get it set up so he can get it to the local Ford dealer. If it is ok I will get Scott to send the required parts.

-----Original Message-----

From: Hoffman, Michael (M.V.)  
Sent: Monday, March 04, 2002 6:17 PM  
To: Moorhouse, Scott (S.R.); Fessold, Bob (R.J.); Dalbo, Bob (R.J.); Corbett, Sandra (S.M.); Altoonian, Don (D.J.)  
Subject: RE: U204 stall vehicle in Tennessee

OK with me -

Bob / Bob - Do you have a preference in sending anyone from your team? (either with Don or solo - your call)

Don - Are you able to go?

Sandra - Info

Thanks - Mike

-----Original Message-----

From: Moorhouse, Scott (S.R.)  
Sent: Monday, March 04, 2002 5:43 PM  
To: Hoffman, Michael (M.V.)  
Subject: U204 stall vehicle in Tennessee

Mike, we have identified our first U204 stall vehicle in ICCD which had the calibration revisions for idle air robustness. KCAP was interested in this, of course. We didn't expect the calibration to correct everything, but wonder if it is not in the best interest to all if Altoonian reviewed this vehicle. What do you think?

**From:** Corbett, Sandra (S.M.)  
**Sent:** Tuesday, July 03, 2001 10:00 AM  
**To:** Altoonian, Don (D.J.); Boardley, Brian (B.A.); Dalbo, Bob (R.J.); Hale, Tony (A.S.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hashino, Jun (J.); Inoue, Takashi (T.); Katinas, Dana (D.J.); King, Robert (R.F.); Kiar, Jerry (G.T.); Kwon, Soon (S.K.); Miller, Brian (B.J.); Moorhouse, Scott (S.R.); Ondrejko, Rick (R.T.); Plattenberger, Karl (K.J.); Rusek, Ron (R.J.); Shirahashi, Masaru (M.); Vecchio, Anne Marie (A.); Williamson, David (D.E.); Wineland, Richard (R.J.)  
**Subject:** 6/28 U204 P/T QRT Meeting Minutes

**6/28 U204 P/T QRT Meeting Minutes**  
**Thursday, 10:00am-11:00am Call-In**

**Introduction:** Don Altoonian (DALTOONI) will be joining the Escape QRT on July 9th. His extensive calibration and QRT experience will be very valuable to our team and quick issue resolution. Please include both him and I on QRT correspondence so that he can be brought up to speed on all Escape powertrains concerns/ect. Thanks.

**Quality Items Reviewed**

1. Engine Hes/Surge Update                      Bob Dalbo
  - tip in torque can be reduced to approx midpoint between today and zero to avoid clunk; cannot reduce further w/o introducing knock
  - accel feel is improved although hesitation could not be replicated; calibration will be given to Jeff Holmes in trans calibration for further evaluation
  - this change will appear in the '02 Job2 release which included catalyst changes (a service fix for old catalysts will also be introduced)
  - we need to utilize all possible avenues for verifying the Job 2 cal changes; PVT trucks and M10s
  - team agreed that a TSB would not be released, hotline will continue to inform dealers of R12 cal
2. EGR valve/catalyst                      QAS Karl Plattenberger
  - team discussed shelving findings thus far and moving on to higher priority customer satisfaction issues given that warranty drops off after December
  - KP will hold another review on July 10th to finalize testing and changes required to close properly
3. Spark Plug QAS                      David Williamson
  - Final review is scheduled with Mazda on July 2
4. Sticking Throttle System                      Janine Boksha & team
  - not reviewed
5. New QSF: G5M Shifter Rattle/Buzz Noise-LHD 2.0L Zetec 4x4                      Yasuhara-san
  - ownership was again questioned since the Mazda team will be returning to Japan in July; Scott Moorhouse is talking with Ken Powers to understand process for these Mazda owned releases/designs
  - 75 CQIS claims exist, next step is to check the build dates
6. Slow to Start                      Waheed Alasha/Scott Moorhouse
  - not reviewed
7. Stalls
  - EEC power relay loose (mounted horizontally) was discussed as a contributor
  - electrical team is working on a relocation that mounts the relay in a side to side fashion; need to understand timing for changes and contribution of stall issue expected
  - a Windstar QSF was opened on stalls related to evaporative system leaks/hot fuel handling; it is

thought that we may share the QSF concern...Windstar team is evaluating possible problem population

**Sandy Corbett**  
**Escape P/T QRT**  
Phone/Fax: (313)59-44351  
West Park Center 426-C



From: Steward Jr., Gene (E.A.)  
Sent: Tuesday, December 04, 2001 2:10 PM  
To: King, Robert (R.F.)  
Cc: Steward, Gene (E.A.)  
Subject: Escape Stall Concern - Garnet Ford

Bob... Here is the report and WDS archive file containing the event. Please let me know of any suggestions you may have as the vehicle is currently at the dealer and the customer refuses to drive it unless we correct the condition.

CSQ1002      CQIS Indicator Summary      12/04/01 14:07:41      1 of 1

Rpt#: 1KOBK004 NHL      Rpt: 11/15/2001 Odom: 700 M  
Rvwd: File: Folder:      Images: 0 Print Smy/Disp Detail(P/D):  
Vehicle: 2002 ESCAPE 4X4,XLT ,WAGON      1FMCU041X2KA39251 Bld: 09/14/2001  
Engine: 3.0L DUR      Calb: 0M11A30A Trans: CD4E E      Axle: 3800F2,73L A/C: YES  
Dealer Id: 01373      Garnet Ford Inc      Ph#: (610) 358-5800  
State: Pennsylvania City: Chadds Ford      Orig/Caller: JIM LEAVENS  
Symptom: 6 07 6 93 DRVABL,STALL/QUITS,AT CRUISE,ALL ENGINE TEMP  
Addl Sym: ALLEGE STALL ON A CRUISE      St: CCRG/EPRC:      Rvwd: Dt:  
Fix: Caus. Comp:      Condition Code:  
Hotliner: SRIVERA5      Phone: 313 317-8354      Regn Cd: 16 Philadelphia -16  
Engineering:      Phone:      TAR:  
Dir Contact:      Phone:      Title Cde: T  
REPAIR TECH STATES THE CUSTOMER ALLEGES THE VEHICLE STALLS AT A CRUISE  
INTERMITTENTLY. HE HAS ALREADY REPLACED THE IAC AND EEC RELAY TO  
NO AVAIL. NO CODES IN THE PCM. SEEKING FOR ANY KNOWN OR ADVICE.  
RECOMM ADVISE TECH TO CHECK C270 FOR LOOSE OR WATER INTRUSION. CHECK G104/105  
FOR LOOSENESS. CHECK THE BASE HARD STOP AS WELL. CHECK THE EEC CASE  
GRN 100 ALSO.  
ADD-ON 12/04/2001 02:05PM GENE STEWARD(FSE)      MSS - FCSD - REG - PHILADELPH  
DEALER REQUESTED FSE ASSISTANCE IN DIAGNOSIS AND REPAIR.  
AUDIT 12/04/2001 02:06PM GENE STEWARD(FSE)      MSS - FCSD - REG - PHILADELPH  
APPROVED FOR TECH ASSIST REFERRAL PROCESSING BY GSTEWARD  
ADD-ON 12/04/2001 02:08PM GENE STEWARD(FSE)      MSS - FCSD - REG - PHILADELPH  
FSE DIRECTED TO CAPTURE WITH VDR. CUSTOMER RETURNED WITH RECORDING  
THAT SHOWED STALL AT SPEED. NOTED IN GRAPH THAT TP VOLTAGE WAS AT  
CLOSED THROTTLE. RECORDING TO BE FORWARDED TO ENGINEERING FOR  
ANALYSIS.



WDS\_SessionArchiv  
~#1#####~0.

**E. A. (Gene) Steward**  
*Ford Motor Company*  
Field Service Engineer - Philly Region

D/N-396-3633 / Phone/Fax 856 727-3633

Cell Phone 856 952-9399

Text Page: 8569529399@mobile.att.net

E-mail: gateway@ford.com

**From:** Shinji Kanai [kanai.sh@sv.mazda.co.jp]  
**Sent:** Friday, May 25, 2001 2:48 PM  
**To:** Lintiac, Steven (S.); 'Kimiaki Inooka'  
**Cc:** King, Robert (R.F.)  
**Subject:** RE: Engine Intermittent Stall Vehicle - #235968



stall

YU08121K0442529.

Please see attachment for vehicle check result at Sunflower Mazda.

I am sorry for late submission of report.

Note: In this case, driver did not attempt to restart when concern happen and call her husband to assist. Therefore, 45 minutes past from stall to restart due to wait husband arrival.

Please record this case on your tracking record. If necessary we need to call back this customer in future.

Shinji Kanai  
Manager, Tribute Plant QA  
Mazda North American Operations

Ford Kansas City Assembly Plant  
Plant Vehicle Team  
8121 N.E. Hwy. 89, Claycomo, MO 64119 USA  
Tel: 816-469-1623/ Fax: -1726/ e-mail: kanai.sh@sv.mazda.co.jp  
Local Text Pager: 91366771566@alphapage.airtouch.com

-----Original Message-----

**From:** Steven Lintiac [mailto:SLintiac@mazdausa.com]  
**Sent:** Friday, May 18, 2001 3:27 PM  
**To:** Shinji Kanai; Kimiaki Inooka  
**Cc:** 'rking9@ford.com'  
**Subject:** RE: Engine Intermittent Stall Vehicle - #235968  
**Importance:** High

Mr. Kanai,

Your request for visiting the dealer on Monday is okay. Larry Smith, the technician, confirmed no parts have been replaced yet. He has only inspected X-270d and pcm main relay but did not find anything wrong. I have faxed him the Tribute stall questionnaire to fill out prior to your visit this coming Monday afternoon. The vehicle is on hold and waiting for your visit.

Steve Lintiac  
Mazda North American Operations  
Tribute Product Support  
949-442-6514 (phone)  
949-442-6699 (fax)  
e-mail: slintiac@mazdausa.com

-----Original Message-----

From: Shinji Kanai [mailto:kanai.sh@av.mazda.co.jp]  
Sent: Friday, May 18, 2001 12:21 PM  
To: 'Kimiaki Inooka'  
Cc: 'Steven Lintiac'  
Subject: RE: Engine Intermittent Stall Vehicle - #235968

What kind of inspection did Hotline suggested and what items did dealer inspected ?

Please send stall-question to dealer to fill out.

I and Bob King would like to visit Sunflower Mazda on Monday probably afternoon. Would you arrange to do that ?

Today, PT engineer is out of office.

Shinji Kanai

-----Original Message-----

From: Kimiaki Inooka [mailto:KInooka@mazdausa.com]  
Sent: Friday, May 18, 2001 1:47 PM  
To: Shinji Kanai  
Cc: Steven Lintiac  
Subject: RE: Engine Intermittent Stall Vehicle - #235968  
Importance: High

Kanai-san, we can make a conference with the dealer if Engineering needs further information to make decision. I quit doing this as I thought it may be better to do this after we get information from you. As this is the customer vehicle, we need to decide quickly. Please reply us.

-----Original Message-----

From: Steven Lintiac  
Sent: Friday, May 18, 2001 11:36 AM  
To: Shinji Kanai  
Cc: Kimiaki Inooka; 'rking9@ford.com'; 'rdalbo@ford.com'  
Subject: Engine Intermittent Stall Vehicle - #235968  
Importance: High

Mr. Kanai,

Would anyone from KCAP be interested in inspecting this vehicle and/or installing a flight recorder? I believe it is a 1/2 hour drive from the plant. Please let me know ASAP. We have vehicle on hold now.....

(dealer address)  
34546 SUNFLOWER MAZDA  
15500 W. 117TH

OLATHE KS 66062  
09137803500

Steve Lintiac  
Mazda North American Operations  
Tribute Product Support  
949-442-8514 (phone)  
949-442-8599 (fax)  
e-mail: slintiac@mazdausa.com

-----Original Message-----

From: Chuck Coates  
Sent: Friday, May 18, 2001 11:08 AM  
To: David Breaux; Mark Chevens; Diane May; Mike Fleming  
Cc: Steven Lintiac  
Subject: REF. #235968

S20C2M1 HOTLINE CALL RECORD (ENTRY1)  
05/18/01 11:01:55  
P361  
CRPP723  
Hotline Ref No.: 0235968 Status: NF NO FIX  
Customer Contacts: 0  
Caller.....: LARRY SMITH  
Time Zone: CT  
Job Code.....: D331 TECHNICIAN  
Branded..: N  
Location.....: 34546 SUNFLOWER MAZDA Phone: 913 780  
- 3500 Ext:  
VIN.....: 4F2YU08121KM42529 MDL/YR: TRX LX A /01  
Prod Dt: 01/31/01  
Repair Mileage.: 2708 Cust: WRIGHT, CHRISTOPHER K.  
In Srvc: 02/24/01  
Hotline Subject: F 1X CC 05-18-01 DIED WHILE DRIVING  
Category Code.: F FUEL AND EMISSION

Symptom Codes.: 060 ENG. STALLS DRIVING-W

Condition Codes: XXX DOES NOT DEPEND ON C

Symptom Freq...: I INTERMIT.

Attempts: 1  
Did you duplicate symptoms?: N (Y or N) Number of Repair

Describe Symptoms and Conditions:

CALLER STATES THE CUSTOMER SAID THE ENGINE DIES WHILE  
DRIVING AND RE-STARTS  
WITH NO PROBLEMS. NO DTCS STORED.

HERE IS ANOTHER ONE FYI. WE ARE TRACKING THESE AND NOTIFYING THE REGION WHEN  
WE GET ONE. THANKS. C. COATES @ T. A.

# **Tribute Intermittent Engine Stall Customer Questions:**

Customer name:

Phone #:

VIN: 4F2YU08121KM42529

- |                                                                                        |                                   |
|----------------------------------------------------------------------------------------|-----------------------------------|
| 1. Current mileage?                                                                    | 2708 miles                        |
| 2. Outside temperature (approximate)?                                                  | 70°F                              |
| 3. Weather (dry, rainy, cloudy, sunny)?                                                | High humidity                     |
| 4. Fuel octane used?                                                                   | 87                                |
| 5. Fuel level when stall occurred?                                                     | 1/2                               |
| 6. How many times did vehicle stall? 1                                                 | Most recent stall (date)? 5/15/01 |
| a. Able to restart? Approx. 45 min after stall. Did not attempt to start when stalled. |                                   |
| 7. Daytime or nighttime?                                                               | Daytime                           |
| 8. Shift lever position (1,2, D, or R)?                                                | D                                 |
| 9. 4WD (on or off)?                                                                    | OFF                               |
| 10. Approximate time from engine start to when stall occurs?                           | 6 ~ 7 minutes (no sense; Kanai)   |
| 11. Vehicle speed when incident(s) occurred?                                           | 45 MPH                            |
| 12. Road condition (flat, uphill, downhill, or on a hill)?                             | Downhill                          |
| 13. Power steering (during right turn, left turn, or straight)?                        | Straight                          |
| 14. Brake pedal depressed or free?                                                     | Free Coasting                     |
| 15. Cruise control (on or off)?                                                        | OFF                               |
| 16. Accessory load (see below)....                                                     |                                   |
| - Climate control (a/c on or off, blower speed 1, 2, 3, or 4)?                         | Not ON                            |
| - Exterior lighting (headlights on or off, low or high beam)?                          | OFF                               |
| - Radio ON before stall? Yes / No                                                      | YES                               |
| - If yes, did radio stay ON after stall?                                               | Continuously ON                   |
| - Wipers (on or off)?                                                                  | OFF                               |
| - Rear wipers (on or off)?                                                             | OFF                               |
| - Rear Defrost (on or off)?                                                            | OFF                               |

Comments: Bob King and Shinji Kanai inspected vehicle on 5/21/01 at Sunflower Mazda. Temp 65°F.

Visual check: Harness, coupler and relays are fine. No DTC (No P1000). No Freeze-frame or Pending codes. No problem KOEO + KOED on demand. Before we arrive at dealer, they checked MAF and EEC main relay according to H/L's suggestion and they are NTF.

Test drive about one hour (about 40 miles) with various driving condition: No concern duplicate and PID result looks fine. No Trouble found. We recommended dealer to return vehicle to customer with NTF.

Strange values (ECT 13°F(3.28V) and IAT 20°F (2.98V)) were showed NGS. Kanai checked this NGS tester and card on the other vehicle and found similar result. This NGS tester or software has problem.

CR hotline #: 800-222-5500

stall 4F2YU08121KM42529.doc

02/05/2003

ER02-027-C 2372

From: Koszewnik, John (J.J.)  
Sent: Sunday, June 30, 2002 3:54 PM  
To: Sventickas, Ed (E.); Maurer, James (J.B.); Denee, Adam (A.V.); Gates, Freeman (F.C.); Johnson, Joe (J.H.); King II, Lamar (L.L.)  
Cc: O'Neill, Jim (J.D.); Feadri, Frank (F.)  
Subject: FW: Escape Stalls  
For your info.

*John Koszewnik*  
Chief Engineer  
V-Engine Engineering  
Ph. 32-28979  
Fx. 24-88087  
jkoszewn@ford.com

-----Original Message-----

From: Fascetti, Bob (R.J.)  
Sent: Friday, June 28, 2002 2:46 PM  
To: Kapp, Dan (Daniel R.)  
Cc: Szczepak, Dave (D.T.); Karr, Jerry (G.T.); Koszewnik, John (J.J.)  
Subject: Escape Stalls

Dan,  
per your request, attached is the Escape Stalls one-pager we reviewed at the Escape VQR on Thursday. We will be having a detailed review with Bennie Fowler at next Wednesday's Outfitters PDQOR. We will go over the evidence of each root cause and the respective implementation plans.

Please contact me with any questions on x83149.

Thanks,  
Bob Fascetti

  
This VQR shall  
be destroyed.

EP82-027-A 0004



From: Dalbo, Bob (R.J.)  
Sent: Wednesday, June 19, 2002 10:58 AM  
To: Kanai, Shinji (S.); Sanders, Muriel (M.S.); Altoonian, Don (D.J.); Aynessazian, Kam (K.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell, Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Rothweiler, Daniel (D.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fasoetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald, Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Mandziuk, Roger (R.S.); Marok, Edmond (E.C.); Matesa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Shah, Kiran (K.C.); Shiraiishi, Masaru (M.); Stilgenbauer, Jeffrey (J.R.); Suarez, Rhas (R.); Takasawa, Keith (K.D.); Takubo, Hiroichi (H.); Veenstra, Tim (T.W.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (LHW.); Yeung, Lam (.)  
Subject: RE: One example of Engine quit

Kanai-san,  
This is the exact problem we have been working on. If your dealer services your vehicle per the TSB and ISM we have released, we believe your issue should be resolved.

Mr. Limtiaco,  
Can you please help ensure Kanai-san's vehicle is properly serviced?

Bob Dalbo  
3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 795-2859 Email: rdalbo@ford.com

-----Original Message-----

From: Shinji Kanai [mailto:kanai.sh@sv.mazda.co.jp]  
Sent: Wednesday, June 19, 2002 10:05 AM  
To: 'Sanders, Muriel (M.S.)'; 'Altoonian, Don (D.J.)'; 'Aynessazian, Kam (K.)'; 'Badgley, Joel (J.K.)'; 'Bauer, Scott (S.C.)'; 'Bhojwani, Kamal (K.)'; 'Blackburn, Thomas (T.J.)'; 'Bogema, John (P.)'; 'Cary Powell'; 'Chick, John (J.)'; 'Chih, Ming-Niu (M.N.)'; 'Chin, Darrel (D.)'; 'Corbett, Sandra (S.M.)'; 'Dalbo, Bob (R.J.)'; 'Dan Rothweiler'; 'De Pena, Juan (J.E.)'; 'Diaz, Timothy (T.P.)'; 'Fasoetti, Bob (R.J.)'; 'Fournelle, Gilbert (G.)'; 'Freeland, Mark (M.)'; 'Giles, Stuart (S.)'; 'Gokhale, Renuka (R.V.)'; 'Grewal, Bill (B.S.)'; 'Grimes, Jeff (J.R.)'; 'Hansen, George (G.C.)'; 'Herr, George (G.J.)'; 'Hofman, Michael (M.V.)'; 'Holmes, Jeffrey (J.R.)'; 'Ichikawa, Jiyunichiro (J.)'; 'Jensen, Ted (T.E.)'; 'John McDonald'; 'Jones, Andy'; 'Jordan, Donald (D.E.)'; 'Kanai, Shinji (S.)'; 'King, Robert (R.F.)'; 'Kosko, Jeff (J.R.)'; 'Kwon, Soon (S.K.)'; 'Limtiaco, Steven (S.)'; 'Linde, Peter (P.A.)'; 'Liu, Jane (J.)'; 'Mandziuk, Roger (R.S.)'; 'Marok, Edmond (E.C.)'; 'Matesa, John (J.)'; 'Maurer, James (J.B.)'; 'Mazzella, Gary (G.R.)'; 'Mooney, Larry (L.)'; 'Moorhouse, Scott (S.R.)'; 'Morgan, Tom'; 'Morishima, Shigeki (S.)'; 'Naveed Khan'; 'Nematollahi, Sonya (S.)'; 'Nikolai, Bernie'; 'Noteboom, Jim (J.E.)'; 'Orman, James (J.W.)'; 'Powers, Ken (K.W.)'; 'Price, Martin (M.)'; 'Raquepau, Alden (A.P.)'; 'Shah, Kiran (K.C.)'; 'Shiraiishi, Masaru (M.)'; 'Stilgenbauer, Jeffrey (J.R.)'; 'Suarez, Rhas (R.)'; 'Takasawa, Keith (K.D.)'; 'Takubo, Hiroichi (H.)'; 'Veenstra, Tim (T.W.)'; 'Wakenell, Ray (R.A.)'; 'Wettach, Bill (B.)'; 'Williams, Lee (LHW.)'; 'Yeung, Lam (.)'  
Subject: One example of Engine quit

EA82-827-A 8888

My lease vehicle 2002MY Tribute experienced engine quit last night.

>Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.);  
>Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.);  
>'John McDonald'; 'Jones, Andy'; Jordan, Donald (D.E.); Kanai, Shinji  
>(S.); King, Robert (R.F.); Klostermann, Eric (E.); Kosko, Jeff (J.R.);  
>Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu,  
>Jane (J.); Marck, Edmond (E.C.); Matesa, John (J.); Maurer, James  
>(J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott  
>(S.R.); 'Morgan, Tom'; Morishima, Shigeki (S.); 'Naveed Khan';  
>Nematollahi, Sonya (S.); 'Nikolai, Bernie'; Ortman, James (J.W.);  
>Powers, Ken (K.W.); Price, Martin (M.); Raquespau, Alden (A.P.); Shah,  
>Kiran (K.C.); Shiraishi, Masaru (M.); Stilgenbauer, Jeffrey (J.R.);  
>Suarez, Rhae (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.);  
>Takubo, Hiroichi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.);  
>Wettach, Bill (B.); Williams, Les (LHW.); Williamson, David (D.E.);  
>Yeung, Lem (.)

>Subject: RE: U204 Stall Meeting Agenda - 5/9/02

>Inspection results of '02 Escape VIN: 1FMYU0414KC19492

>LOCATION: John Elway West, Denver

>OWNER: [REDACTED]

>MILEAGE: 3342

>BUILD DATE: 1-29-02

>COMPLAINT: Stalled while driving approx. 50 mph. Noticed dash lights

>came on and steering became stiff; coasted to side of

> road, went to crank (did not turn key off) and the engine

>restarted. Occured at around 2500 miles and has not

> happened since.

>DIAGNOSTICS: Went through the latest TSB/ISM draft; no concerns were

>found except for the following:

>\* There was battery acid in the batt. tray that had seeped down

>onto grounds G-104 and 105; some corrosion was evident.

>\* The customer's key chain contained several oz. of additional

>weight.

>

>

>Jim Noteboom

>Powertrain Field Quality Specialist/Denver

>Phone: 303.674.4015 FAX: 303.674.5730

>Page: 1.888.375.1980

>

4F2YU08172KM28336 Build 12/11/2001, Retail 1/11/2002  
Mileage: 7360 miles Event: 6/18/2002

After 25 minutes Freeway driving, I exited and stopped traffic signal.  
About 30 sec. later I started moving to left turn and stopped at traffic signal again about 50m later.  
About 30 sec. later I started moving 20m and right turn.  
Then I gave throttle accelerating vehicle up to 35 MPH - 40MPH at slight up hill about 200m.  
Then road switched down hill, I released throttle. Usually vehicle slight increase speed up to 45MPH about 200m.  
I applied throttle gently after changing road up hill. Few seconds later I realized that vehicle kept down speed and three warning lamp illuminated about 40MPH.  
I did not calm enough.  
I turned key to start position, but engine did not start because shifter was stayed D range.  
I cycled key OFF and ON again, all warning lamp illuminated about 25MPH.  
I applied brake to reduce speed and turned vehicle to left.  
I shifted N range and cranked. Small gear noise (starter engagement ?) was heard but Engine started normally about 10 MPH.

I remember engine rpm dropped twice on this vehicle during last 6 month.  
Possibly engine rpm drop might happen more than two, but I recognized twice.  
One is same location same direction, another one was opposite direction almost same location.  
No ECM like building or equipment near there, as far as I know.  
This is my first V6-4WD model. Previous Tribute was I4-4WD.  
I will bring this vehicle to dealer for usual scheduled (7,500 miles) maintenance this week.  
I will ask dealer to reflash PCM calibration and continue to monitor.

If you have any question or comment, please feel free to contact to me.

Shinji Kanai  
Manager, Tribute Plant QA  
Mazda North American Operations

Ford Kansas City Assembly Plant  
Plant Vehicle Team  
8121 N.E. Hwy. 69, Claycomo, MO 64119 USA  
Tel: 816-459-1623/ Fax: -1726/ e-mail: kanai.sh@sv.mazda.co.jp  
Local Text Pager: 9135677156@alphapage.airtouch.com

ER02-027-A 0007

From: Jordan, Donald (D.E.)  
Sent: Thursday, May 16, 2002 10:36 AM  
To: Ponder, Ray (R.L.)  
Cc: Jordan, Donald (D.E.); Sanders, Muriel (M.S.); Gokhale, Renuka (R.V.)  
Subject: FW: U204 Stall Meeting Agenda - 5/9/02

Veh talking about, leaky battery. Please keep me posted.  
thanks,

Donald E. Jordan  
U204 OPD E/E Systems & EDS  
(313) 32-25147  
Pager: T (djordan1) or 313-795-4342

-----Original Message-----

From: Noteboom, Jim (J.E.)  
Sent: Thursday, May 16, 2002 9:57 AM  
To: Jordan, Donald (D.E.)  
Cc: Sanders, Muriel (M.S.); Altoonian, Don (D.J.)  
Subject: RE: U204 Stall Meeting Agenda - 5/9/02

We inspected the batt but could not see any evidence of leakage except for some light residue on the top.

I can get the batt. if you would like to inspect it or get me details for a thorough inspection at the dealer.

-----Original Message-----

From: Jordan, Donald (D.E.)  
To: Noteboom, Jim (J.E.)  
Cc: Sanders, Muriel (M.S.); Altoonian, Don (D.J.); Jordan, Donald (D.E.)  
Sent: 5/14/02 5:23 PM  
Subject: RE: U204 Stall Meeting Agenda - 5/9/02

Jim, you list battery acid in the tray had seeped down onto grounds G-104 & 105 w/some corrosion evident. Low mileage veh shouldn't have acid in tray. Was battery taken out of tray and looked at, crack, puncture on bottom from sitting on an object, etc.. Talking with FSS battery engineer and have seen battery installed on screw, bolt, etc. in tray and that would crack case and get leaking, but other than that.....

Can you get veh to look at, was the battery crack on the bottom or was there acid expelled from vent caps and running down?

Thanks,

Donald E. Jordan  
U204 OPD E/E Systems & EDS  
(313) 32-25147  
Pager: T (djordan1) or 313-795-4342

> -----Original Message-----

> From: Noteboom, Jim (J.E.)  
> Sent: Thursday, May 09, 2002 3:46 PM  
> To: Sanders, Muriel (M.S.); Altoonian, Don (D.J.); Badgley, Joel  
> (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas  
> (T.J.); Bogema, John (P.); 'Cary Powell'; Chick, John (J.); Chih,  
> Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob  
> (R.J.); 'Dan Rothweiler'; De Pena, Juan (J.E.); Diez, Timothy (T.P.);  
> Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.);  
> Giles, Stuart (S.); Gokhale, Renuka (R.V.); Grimes, Jeff (J.R.);

EA02-027-A 0054

My mentor, John, said I should e-mail regarding a problem with my new Tribute. Since its purchase in November, it has cut-off twice while in the process of making a turn. There were no warning indicators prior to either occurrence. The engine falls during the turn and the oil light and engine light comes on. There is no problem with restarting the vehicle after this instance; however, I have been fortunate that there was no on-coming traffic.

Perhaps, you have come across this problem or know whom I should contact to get this problem resolved. I took the vehicle to the dealership after the first incident, but the problem does not occur regularly and there appears to be no pattern for easy duplication. Any help would be appreciated. Thanks!

*Regards,*

*Shatanaice McGill  
Research Engineer  
Distributed Intelligence Technology  
SRL-Ford Motor Company  
Phone: 313.322.6458  
E-mail: smcgill1@ford.com*

1982-827-A 8563

**From:** Nematollahi, Sonya (S.)  
**Sent:** Tuesday, April 02, 2002 11:32 PM  
**To:** McGill, Shatannica (S.)  
**Cc:** Maczek-Carver, Laurie (L.A.); Gokhale, Renuka (R.V.); Jordan, Donald (D.E.); Sanders, Muriel (M.S.); Dalbo, Bob (R.J.)  
**Subject:** RE: Problem with 02 Mazda Tribute

Shatannica,

Your problem has been seen on other Escape/Tribute vehicles, a cross functional team has been put in place to investigate this issue. The team has identified number of root causes. Muriel Sanders/Bob Dalbo from Powertrain are leading the engine stall issue. Perhaps they can provide more detailed info to you.

Bob, can someone from Powertrain examine Shatannica's vehicle to see if we can duplicate the stall issue? We have taken some actions such as EEC relay change from Omron to Hella and DPFE change from Kavlico to Motorola, MAF sensor change, Calibration update.....and some other actions are planned for the 2003MY. Can we update Shatannica's vehicle to resolve the issue?

*Sonya Nematollahi*

Escape/Tribute/Maverick Electrical Team Leader  
Phone: 33-79969  
Pager: Text, 313-795-8332  
email: anematol@ford.com

-----Original Message-----

**From:** Gokhale, Renuka (R.V.)  
**Sent:** Tuesday, April 02, 2002 3:17 PM  
**To:** Jordan, Donald (D.E.)  
**Cc:** Maczek-Carver, Laurie (L.A.); Nematollahi, Sonya (S.)  
**Subject:** FW: Problem with 02 Mazda Tribute

Don,  
I would appreciate it, if you could forward the name of the person who is leading the engine stall issue to Shatannica. Thanks.

*Renuka Gokhale*

U204 - E/E Engineering Supervisor  
NAT-EESE  
Phone: 313-322-1275

-----Original Message-----

**From:** Maczek-Carver, Laurie (L.A.)  
**Sent:** Tuesday, April 02, 2002 3:12 PM  
**To:** Nematollahi, Sonya (S.); Gokhale, Renuka (R.V.)  
**Subject:** FW: Problem with 02 Mazda Tribute

This is for you - thank goodness

*Laurie Maczek-Carver*

Job 1 & Job 2 222/226 Electrical PMT leader  
Exposition Nameplate Lead - Electrical  
30-08260 lmaczek@ford.com  
cell phone (784)260-8502

-----Original Message-----

**From:** McGill, Shatannica (S.)  
**Sent:** Tuesday, April 02, 2002 2:15 PM  
**To:** Maczek-Carver, Laurie (L.A.)  
**Cc:** Jablonski, Gary (G.F.); Chado, John (J.M.)  
**Subject:** Problem with 02 Mazda Tribute

ERR2-027-A 0004

**From:** Williams, Les (LHW.)  
**Sent:** Tuesday, February 19, 2002 4:39 PM  
**To:** Altoonlan, Don (D.J.); Amende, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chih, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Goldsate, Renuka (R.V.); Hansen, George (G.C.); Harr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostmann, Eric (E.); Kwon, Soon (S.K.); Lintiac, Steven (S.); Linde, Peter (P.A.); Liu, Jana (J.); Luehnen, Eric (E.A.); Marck, Edmond (E.C.); Matias, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Notaboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Requepau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shiralehi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroichi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** U204 Staff Meeting Minutes 2/19/02

**Items for next meeting:**

1. **Cary Powell:** STA Engineer (Visteon) for Stant
2. **Sandy Corbett:** Sta Engineer (Ford) for Stant
3. **Scott Moorhouse:** status of QR of check valves at plant



Vehicle Staff Meeting  
Minutes...

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AB20  
Phone: (313)33-72503  
Fax: (313) 32-31786

6282-627-A 8568

**From:** Williams, Les (LHW.)  
**Sent:** Wednesday, February 13, 2002 2:53 PM  
**To:** Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Harr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klosternann, Eric (E.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matassa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moomouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kian (K.C.); Shirasahi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takeasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Co:** Ortman, James (J.W.); Bosle, Sandra (S.L.)  
**Subject:** U204 Staff meeting minutes 2/12/02

Items for Thursday 2/14/02 meeting

1. Jim Ortman: Status of PCV Valve Testing.
2. Cary Powell: APG status/Visteon STA Engineer @ Stant
3. Don Altoonian: Ford STA Engineer
4. Les Williams/Don Altoonian: locating Ignition Key Engineers.
5. Dan Rothweiler: Update on Philly Staller
6. Steve Lintaco: Update on West Coast staller (one where IAC/TB/VMV were due to be replaced)
7. Ming Chih: Update on revised evap system testing @ KCAP.



Watch Mail Meeting  
Minutes...

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786



- Implementation timing for actions at KCAP (Jamie Sullivan & All)

10:50-10:55

| KCAP Actions                                             | Concern # | Revised Part # | Implementation Timing |
|----------------------------------------------------------|-----------|----------------|-----------------------|
| 1. Ommen to Hella Relays                                 | C11293441 | No Change      | 07/27/01              |
| 2. Updated production calibration                        | C11299149 |                | 1/16/02 (3 out of 7)  |
| 3. Inverted delta items for all 4 ground wires           | KANAI     |                | 1/16/02 on trans      |
| 4. Implementation of robust MAP                          | C11299286 | 1L2F-12B579-BA |                       |
| 5. LAC change from Guide A to Finned Pinle (CEP3 action) | C11252737 | 1L8E-9F715-AA  |                       |
| 6. 3.0L dPPH change from Kavlico to Motorola             | C11262413 | 2L3E-9J433-BA  |                       |
| 7. 2.0L dPPH change from Kavlico to Motorola             | C11274132 | 2L3E-9J433-BA  |                       |
| 8. Revised vent line location                            | MTNG      |                | 04/02/01              |

- Open Issues (AK)

10:55-11:00

Thursday February 7, 2002  
 Time: 10:00am - 11:00am (EST)  
 THE Building, Conference Room 2  
 Dial in: 1-866-250-3175 or Fordnet: 9-1-954-1163  
 International Participants # 1 (630) 827-6733  
 Passcode: 7354080#

**From:** Nematollahi, Sonya (S.)  
**Sent:** Monday, August 05, 2002 8:09 PM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** Hoffman, Michael (M.V.); Fascetti, Bob (R.J.); Altonen, Don (D.J.); Corbett, Sandra (S.M.); Jordan, Donald (D.E.); Fournelle, Gilbert (G.)  
**Subject:** RE: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

Bob, are KCAP folks planning to examine the vehicle/fuse box or should the Dearborn team get involved? We certainly don't need duplication of efforts. Don Jordan is on vacation this week, but I can put someone else on this right away if needed. Please advise. Thanks.

*Sonya Nematollahi*

Escape/Tribute/Maverick Electrical Team Leader  
Phone: 313-799889  
Pager: Text, 313-795-8332  
email: snematol@ford.com

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Monday, August 05, 2002 4:59 PM  
**To:** Altonen, Don (D.J.); Corbett, Sandra (S.M.); Nematollahi, Sonya (S.); Jordan, Donald (D.E.); Gilbert Fournelle  
**Cc:** Hoffman, Michael (M.V.); Bob Fascetti  
**Subject:** FW: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

New wiring issues.

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-81788  
Pager: (313) 795-2858 Email: rdsalbo@ford.com

-----Original Message-----

**From:** Moorhouse, Scott (S.R.)  
**Sent:** Friday, August 02, 2002 4:58 PM  
**To:** Aherada, OJ (O.J.); New, Michael (M.D.); Stigenbauer, Jeffrey (J.R.); Ray, Charles (C.)  
**Cc:** Dalbo, Bob (R.J.); Linda, Peter (P.A.)  
**Subject:** CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

I discussed vehicle with Mathew Razzo, service manager. Vehicle was not the typical "stall" claim. At times vehicle would be electrically dead and have no-start condition. Other times it would die in decel. Slamming door sometimes resulted in vehicle dying. Dealer has determined problem to be with under dash fuse box. He has been able to repeat the no start condition by tapping on the fuse panel.

Dealer intention is to replace the fuse box. I have asked him to hold the part for our review.

Scott Moorhouse  
U204 PTSE Resident Engineer  
Kansas City Assembly Plant  
(ph) 816-459-1985 (fax) 816-459-1728  
smoorhou@ford.com

ENG2-827-A 8548

From:  
Sent:  
To:

Williams, Lee (LHW.)  
Wednesday, February 08, 2002 4:48 PM  
Altoonien, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunohiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Koestermann, Eric (E.); Kwon, Soon (S.K.); Lintleco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Lushreen, Eric (E.A.); Marok, Edmond (E.C.); Matoss, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematoofah, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shiraishi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anna Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Yeung, Lam (.)

Subject:

Stall Meeting Minutes 2/5/02

Action Item For Next Meeting:

1. Cary Powell: 8D/Control Plan from Standt, Dust Box results, APG timing.



Vehicle Stall Meeting  
Minutes...

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**From:** Sanders, Muriel (M.S.)  
**Sent:** Thursday, May 09, 2002 8:19 AM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** Hansen, George (G.C.); Jordan, Donald (D.E.)  
**Subject:** RE: Stalls Action Chart

Here's the PDB information that Don sent me for the NHTSA response.

"Muriel, in response to question from today's meeting for NHTSA report out; PDB pin push-out, Lear's containment action which involved 1-tooling adjustment and 2-Process changes was dated 08/01/01 with 8-D addressing Pin Push-out completed 08/20/01.  
Anything else, please give me a call."

*Muriel Sanders*  
U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, May 08, 2002 4:33 PM  
**To:** Jordan, Donald (D.E.)  
**Cc:** Sanders, Muriel (M.S.); Hansen, George (G.C.)  
**Subject:** FW: Stalls Action Chart

Don,  
Do you remember when the PDB terminal insertion issue was resolved? I believe there was an 8D done by Lear on it. I'd like to add it to George's chart. If you could provide the implementation date tomorrow AM.

Thanks,

*Bob Dalbo*  
3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 796-2859 Email: rdalbo@ford.com

-----Original Message-----

**From:** Hansen, George (G.C.)  
**Sent:** Wednesday, May 08, 2002 3:57 PM  
**To:** Dalbo, Bob (R.J.); Corbett, Sandra (S.M.)  
**Subject:** Stalls Action Chart

Bob,  
Here is the graph that I was referring to in the phone message.

Please review this to make sure that it is accurate and up to date. If you know of any further actions please let me know so that I can make the appropriate changes.

<< File: STALLS ACTION CHART.xls >>

George Hansen  
Escape, PTQRT  
2H-Q63, PDC  
(313) 84-61800  
ghansen4

From: McCarthy, Fran (F.)  
Sent: Wednesday, November 06, 2002 10:40 AM  
To: Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Chappell, Jonathan (J.D.); Altoonien, Don (D.J.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell (E-mail); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duval, Allen (A.W.); Fescotti, Bob (R.J.); Frestland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Goodwin, William (W.R.); Grewel, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shini (S.); Khan, Naveed; Koeko, Jeff (J.R.); Lawler, Dave (D.A.); Le, Dzong (D.H.); Limitaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Marlanos, Tom (T.E.); Matassa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McDonald, John; McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tomiko (T.T.); Morishima, Shigeki (S.); Nakano, Hideki (H.); Nemotohara, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquapau, Alden (A.P.); Rothweller, Daniel (D.); Shah, Kiran (K.C.); Shirahshi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veestra, Tim (T.W.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (L.H.W.)  
Cc: Fiorini, John (J.J.); Abbasi, Basel (B.A.); McCarthy, Fran (F.)  
Subject: RE: 3.0L U204 Phantom stall meeting minutes 10/31/01

Bob,

1. What is the Escape plastic fuel tank package location? Front-to-back? Side-to-Side?
2. When was your calibration released into production? When was it fully released into service?
3. What was changed on the calibration?
4. When does the newly designed IAC really get released into production and service?

Fran McCarthy St. Clair (fmccarth)  
VMV & EVMV  
Outfitter Stationary Components  
Phone: (313) 32-25718  
Fax: (313) 84-50578  
E-Mail: fmccarth@ford.com

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Tuesday, November 05, 2002 11:17 PM  
To: McCarthy, Fran (F.); Fournelle, Gilbert (G.); Chappell, Jonathan (J.D.); Altoonien, Don (D.J.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell (E-mail); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duval, Allen (A.W.); Fescotti, Bob (R.J.); Frestland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Goodwin, William (W.R.); Grewel, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shini (S.); Khan, Naveed; Koeko, Jeff (J.R.); Lawler, Dave (D.A.); Le, Dzong (D.H.); Limitaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Marlanos, Tom (T.E.); Matassa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McDonald, John; McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tomiko (T.T.); Morishima, Shigeki (S.); Nakano, Hideki (H.); Nemotohara, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquapau, Alden (A.P.); Rothweller, Daniel (D.); Shah, Kiran (K.C.); Shirahshi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veestra, Tim (T.W.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (L.H.W.)  
Cc: Fiorini, John (J.J.); Abbasi, Basel (B.A.)  
Subject: RE: 3.0L U204 Phantom stall meeting minutes 10/31/01

Fran,  
Please recall that this issue has the attention of the highest levels of management and is the subject of a NHTSA investigation. The team is convinced that the VMV is one of the contributors to Escape stalling and has spent a lot of time to develop a diagnostic test for the part in the TSB. Since we do not understand what in the VMV design contributes to stalling and we cannot assess the magnitude of the VMV contribution, we must leave the VMV diagnostic test in the TSB.

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 785-2858 Email: rdalbo@ford.com

-----Original Message-----

From: McCarthy, Fran (F.)  
Sent: Monday, November 04, 2002 9:44 AM

ENG-027-A 8582

**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, April 03, 2002 11:11 AM  
**To:** Nematollahi, Sonya (S.); McGill, Shatannica (S.)  
**Cc:** Macsek-Carver, Laurie (L.A.); Gokhale, Renuka (R.V.); Jordan, Donald (D.E.); Sanders, Muriel (M.S.)  
**Subject:** RE: Problem with 02 Mazda Tribute

Shatannica,  
Muriel Sanders will arrange to update your vehicle with the latest fixes. Please let us know how effective they are.

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 786-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Nematollahi, Sonya (S.)  
**Sent:** Tuesday, April 02, 2002 11:32 PM  
**To:** McGill, Shatannica (S.)  
**Cc:** Macsek-Carver, Laurie (L.A.); Gokhale, Renuka (R.V.); Jordan, Donald (D.E.); Sanders, Muriel (M.S.); Dalbo, Bob (R.J.)  
**Subject:** RE: Problem with 02 Mazda Tribute

Shatannica,

Your problem has been seen on other Escape/Tribute vehicles, a cross functional team has been put in place to investigate this issue. The team has identified number of root causes. Muriel Sanders/Bob Dalbo from Powertrain are leading the engine stall issue. Perhaps they can provide more detailed info to you.

Bob, can someone from Powertrain examine Shatannica's vehicle to see if we can duplicate the stall issue? We have taken some actions such as EEC relay change from Omron to Hella and DPFE change from Kavlico to Motorola, MAF sensor change, Calibration update,.....and some other actions are planned for the 2003MY. Can we update Shatannica's vehicle to resolve the issue?

*Sonya Nematollahi*

Escape/Tribute/Maverick Electrical Team Leader  
Phone: 33-78869  
Pager: Text, 313-795-8332  
email: [snematol@ford.com](mailto:snematol@ford.com)

-----Original Message-----

**From:** Gokhale, Renuka (R.V.)  
**Sent:** Tuesday, April 02, 2002 3:17 PM  
**To:** Jordan, Donald (D.E.)  
**Cc:** Macsek-Carver, Laurie (L.A.); Nematollahi, Sonya (S.)  
**Subject:** FW: Problem with 02 Mazda Tribute

Don,  
I would appreciate it, if you could forward the name of the person who is leading the engine stall issue to Shatannica. Thanks.

*Renuka Gokhale*

U204 - E/E Engineering Supervisor  
NAT -EESE  
Phone: 313-322-1275

-----Original Message-----

**From:** Macsek-Carver, Laurie (L.A.)  
**Sent:** Tuesday, April 02, 2002 3:12 PM  
**To:** Nematollahi, Sonya (S.); Gokhale, Renuka (R.V.)  
**Subject:** FW: Problem with 02 Mazda Tribute

This is for you - thank goodness

ENG2-827-A 8563

**Laurie Macak-Carver**

Job 1 & Job 2 222/228 Electrical PMT leader  
Exposition Nanoplate Lead - Electrical  
38-03289 lmacak@ford.com  
cell phone (734)260-8502

—Original Message—

From: McGill, Shatannica (S.)  
Sent: Tuesday, April 02, 2002 2:15 PM  
To: Macak-Carver, Laurie (L.A.)  
Cc: Jablonski, Gary (G.F.); Chacko, John (J.M.)  
Subject: Problem with 02 Mazda Tribute

My mentor, John, said I should e-mail regarding a problem with my new Tribute. Since its purchase in November, it has cut-off twice while in the process of making a turn. There were no warning indicators prior to either occurrence. The engine falls during the turn and the oil light and engine light comes on. There is no problem with restarting the vehicle after this instance; however, I have been fortunate that there was no on-coming traffic.

Perhaps, you have come across this problem or know whom I should contact to get this problem resolved. I took the vehicle to the dealership after the first incident, but the problem does not occur regularly and there appears to be no pattern for easy duplication. Any help would be appreciated. Thanks!

*Regards,*

**Shatannica McGill**  
**Research Engineer**  
**Distributed Intelligence Technology**  
**SRL Ford Motor Company**  
**Phone: 313.322.8858**  
**E-mail: smcgill1@ford.com**

**From:** Williams, Lee (LHW.)  
**Sent:** Wednesday, February 20, 2002 12:06 PM  
**To:** Altoonien, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Goldshtein, Renuka (R.V.); Hansen, George (G.C.); Hart, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kistemann, Eric (E.); Kwon, Soon (S.K.); Limbaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marck, Edmond (E.C.); Meless, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquetpau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirahashi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakanell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Young, Lem (.)  
**Cc:** Hermann, Thomas (T.J.); Diez, Timothy (T.P.)  
**Subject:** Meeting Minutes: EMC PSW Results for current production Kavlico DPFE

#### Meeting Minutes

##### Attendees:

Bob Dalbo (U204 V6 Calibration Supervisor)  
Gilbert Fournelle (U204 V6 Calibration)  
Lee Williams (U204 Calibration)  
Tom Hermann (EMC Supervisor)  
Tim Diez (EMC)

On Friday February 15, 2002 EMC PSW test data for current production Kavlico DPFE sensor was reviewed. Thomas Hermann has independently investigated the behavior of this sensor. Based on his investigations and this data, he concluded that the current production Kavlico DPFE sensor should not contribute to U204 stalling in the field due to RFI and coupled noise from the wiring harness.

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786



1994

PAGE 2

3720 Wadsworth Way • Vista, Calif. 92081  
Phone 619/591-5300

**SERVICE ADVISOR: 1716 RUSSELL SINDAS**

[illegible]

|     |      |      |         |
|-----|------|------|---------|
| 17  | 14.2 | 1016 | NO LOAD |
| 57  | 14.0 | 11   | LOAD    |
| 108 | FE   |      |         |

FP Transducer  
C-263 Hot panel

NOTE: Arrived in Boston  
again

2000

C-263 2nd period - NFE  
C-134 (4:20) under bath  
- NFE  
C-133 - NFE

[illegible]

**BA02-027-9 8300**

|                |           |                   |            |
|----------------|-----------|-------------------|------------|
| Lab Location   | CAT       | R.O. DATE         | REC'D DATE |
| REQUEST NO     | CAT-1041  | DATE OF ANALYSIS  | GARAGE     |
| ID NO          | 406       | DATE OF VEH SALE  | CONTACT    |
| GROUP SIZE     | ONE       | VIN NO            | CONTACTS   |
| CCA            | 2.0       | VEH YEAR/TYPE     | 1983 FORD  |
| MPG DATE CODE  | 2.0/10/83 | VEH MILES         | 5000       |
| SHIP DATE CODE | 2.0/10/83 | MONTHS OF SERVICE |            |
| VENDOR         | 2.0/1     | DISCREPANCY CODE  |            |
| PLANT          |           |                   |            |

Find return for  
John Elway  
Ford

**EXPOSURE:** YES \_\_\_\_\_ NO \_\_\_\_\_  
**COVER BY CODE CONDITION** 10  
**FIBER CONDITION** POSITIVE WET \_\_\_\_\_ NEGATIVE WET \_\_\_\_\_  
 DRY \_\_\_\_\_ DRY \_\_\_\_\_  
**CORROSION** CORROSION \_\_\_\_\_  
**HIGH AND LOW ALL OVER** 1 2 3 4 5 6 AND OVER YELLOWING ALL OVER 1 2 3 4 5 6  
**HANDS DESCRIPTION TOP BOTTOM FRONT BACK LEFT END RIGHT END HOLD DOWN AREA**  
**EYE CONDITION** ORANGE YELLOW RED BLACK GREEN MIL

[illegible][illegible]

EYE COORDINATION & TIME MOUNT GREEN \_\_\_\_\_ YELLOW \_\_\_\_\_ RED \_\_\_\_\_ BLACK \_\_\_\_\_ 104 \_\_\_\_\_  
 RECORDING CAPACITY INITIAL TIME \_\_\_\_\_ ACTUAL MESSAGES \_\_\_\_\_ SPECIFICATION \_\_\_\_\_  
 NO TEST \_\_\_\_\_ INITIAL TIME \_\_\_\_\_ CORRECTED TIME \_\_\_\_\_ NO TEST \_\_\_\_\_

|                                                                                        |                                             |                                     |                 |
|----------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------|-----------------|
| BOMBING TEST AS CUA TEST<br>AREA DISCHARGED @ 30 DEG F<br>APPROXIMATE TEST<br>END E.C. | IS SEC VOLT _____<br>DCV _____              | IS SEC VOLT _____<br>SEC VOLT _____ | SPEC VOLT _____ |
| INITIAL TEMP _____<br>FINAL TEMP _____                                                 | ACTUAL MINUTES _____<br>ESTIMATED MIN _____ | SPEC MINUTES _____                  |                 |

**COMMENTS:** RAN FROM TO-DO  
1968 DEALERSHIP  
1001 CLARKSON  
BROOK LN  
WALZ

**12.15 Good Buick**

|     |     |     |     |
|-----|-----|-----|-----|
| AGE | AGE | HTC | HTC |
|     |     |     |     |

TRACK \_\_\_\_\_  
 INFO \_\_\_\_\_  
 DOWNGRADED CASE = HOLE IN CARPET  
 LEAVE CARPET. APPROX. TO BE A SMALL CUT  
 OF THE CARPET

From: Shinji Kanai [kanai.sh@ev.mazda.co.jp]  
Sent: Wednesday, June 19, 2002 10:06 AM  
To: Sanders, Muriel (M.S.); Altoonlan, Don (D.J.); Ayneessazian, Kam (K.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Gary Powell'; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Rothweiler, Daniel (D.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Faecetti, Bob (R.J.); Fournelle, Gilbert (G.); Freelend, Mark (M.); Giles, Stuart (S.); Goldsala, Renuka (R.V.); Grewel, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Hart, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); 'John McDonald'; 'Jones, Andy'; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Lintisco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Mandziuk, Roger (R.); Marck, Edmond (E.C.); Metess, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); 'Morgan, Tom'; Morishima, Shigeki (S.); 'Naveed Khan'; Nematollahi, Sonya (S.); 'Nikolai, Barnie'; Noteboom, Jim (J.E.); Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquespau, Aiden (A.P.); Shah, Kian (K.C.); Shirakahi, Masaru (M.); Stillerbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Veenstra, Tim (T.W.); Wakenell, Ray (R.A.); Wettsch, Bill (B.); Williams, Lee (L.H.W.); Young, Lem (.)

Subject: One example of Engine quit

My lease vehicle 2002MY Tribute experienced engine quit last night.

4F2YU0B172KM28336 Build 12/11/2001, Retail 1/11/2002  
Mileage: 7360 miles Event: 6/18/2002

After 25 minutes Freeway driving, I exited and stopped traffic signal.  
About 30 sec. later I started moving to left turn and stopped at traffic signal again about 50m later.  
About 30 sec. later I started moving 20m and right turn.  
Then I gave throttle accelerating vehicle up to 35 MPH - 40MPH at slight up hill about 200m.  
Then road switched down hill, I released throttle. Usually vehicle slight increase speed up to 45MPH about 200m.  
I applied throttle gently after changing road up hill. Few seconds later I realized that vehicle kept down speed and three warning lamp illuminated about 40MPH.  
I did not calm enough.  
I turned key to start position, but engine did not start because shifter was stayed D range.  
I cycled key OFF and ON again, all warning lamp illuminated about 25MPH.  
I applied brake to reduce speed and turned vehicle to left.  
I shifted N range and cranked. Small gear noise (starter engagement ?) was heard but Engine started normally about 10 MPH.

I remember engine rpm dropped twice on this vehicle during last 6 month.  
Possibly engine rpm drop might happen more than two, but I recognized twice.  
One is same location same direction, another one was opposite direction almost same location.  
No ECM like building or equipment near there, as far as I know.  
This is my first V6-4WD model. Previous Tribute was I4-4WD.  
I will bring this vehicle to dealer for usual scheduled (7,500 miles) maintenance this week.  
I will ask dealer to reflash PCM calibration and continue to monitor.

If you have any question or comment, please feel free to contact to me.

Shinji Kanai  
Manager, Tribute Plant QA

2002-027-4 0002

Mazda North American Operations

Ford Kansas City Assembly Plant

Plant Vehicle Team

8121 N.E. Hwy. 69, Claycomo, MO 64119 USA

Tel: 816-459-1623/ Fax: -1726/ e-mail: kanai.shs@v.mazda.co.jp

Local Text Pager: 9135677156@alphapage.airtouch.com

---

**From:** Duvall, Allen (A.W.)  
**Sent:** Thursday, August 01, 2002 12:11 PM  
**To:** Sanders, Muriel (M.S.)  
**Cc:** Le, Dzong (D.H.); Dalbo, Bob (R.J.)  
**Subject:** Latest U204 Stall AWS Analysis

Hi Muriel: This is the latest. Please forward to Ford Personnel only!

Thank!

  
cape\_Stalls\_latest  
df

Regards:

*Allen DuVall*  
RIE, Outfitters Chassis Quality  
✉ PDC, 1D-E57, MD-172  
☎ (313)-84-84714

ER62-627-A 8288

Approved For Release

?

Approved For Release

?

Escape\_Stalls\_latest.pdf

ER02-027-A 0201

<< File: Gusumano\_STKXT03.0FLC\_D.doc >>

**From:** Williams, Lee (LHW.)  
**Sent:** Monday, December 17, 2001 3:13 PM  
**To:** Altoonian, Don (D.J.); Amanda, Harry (H.F.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chio, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Ranuka (R.V.); Hansen, George (G.C.); Hart, George (G.J.); Holman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); JBADGLE2 was deleted 20011213; Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limtaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marok, Edmond (E.C.); Matasa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematoolehi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Price, Martin (M.); Raquetau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirahel, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Subject:** Staff Meeting Minutes 12/11/01

  
Vehicle Staff Meeting  
Minutes...

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786



**From:** Williams, Lee (LHW.)  
**Sent:** Thursday, December 20, 2001 4:30 PM  
**To:** Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Bhojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chih, Ming-Nlu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (B.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Facchetti, Bob (B.J.); Fournelle, Gilbert (G.); Glee, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Iohikawa, Jiyunohiro (J.); JBADGLE2 was deleted 20011213; Jansen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shiro (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Linteco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Lushraen, Eric (E.A.); Marok, Edmond (E.C.); Matese, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquesau, Alden (A.P.); Rothweller, Daniel (D.); Shah, Kiran (K.C.); Shirahishi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anna Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Yeung, Lem (L.)  
**Subject:** Stall Meeting Minutes 12/18/01

Important Reminders for Jan 3, 2002 meeting:

1. Ming Chih will provide Lee Williams with pertinent test data on the evap system.
2. Tom Morgan will be picking up blue Escape pool car from Mark Lass upon returning from holiday.
3. Dave Williamson will update team on MAF sensor status
4. Inverted delta items at KCAP, all grounds... Scott Moorhouse and/or Bob King.
5. Status of 17 PCMs being shipped to KCAP... Scott Moorhouse and Bernie Nikolai.

  
Vehicle stall meeting  
minutes...

Happy Holidays Everyone!

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

ESB2-627-A 9284

**From:** Williams, Les (LHW.)  
**Sent:** Thursday, January 17, 2002 8:04 PM  
**To:** Altoonlan, Don (D.J.); Amende, Harry (H.F.); Badgley, Joel (J.K.); Bhojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gilles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jyunichiro (J.); Jenean, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanel, Shiril (S.); King, Robert (R.F.); Klotzmann, Eric (E.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Lushreen, Eric (E.A.); Marok, Edmond (E.C.); Metasas, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nemastollahi, Sonya (S.); Nikolai, Bernie; Notaboom, Jim (J.E.); Ortman, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Aiden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shiralahi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** Phantom Stall Meeting Minutes 1/17/02

**No stalls meeting this Tuesday Jan 22, 2002. Les, Don, and Gilbert will be assisting Dan Rothweiler (MNAO) in NJ with vehicles.**

**Items for Thursday Jan 24 Meeting:**

1. Cary Powell: Air Leak Test Data (ASAP)
2. Don Jordan: Inverted delta items at KCAP
3. Scott Moorhouse: Timing for other 4 calibration implementations at KCAP
4. Steve Lintaco: Reinstating old calibration into buyback status.
5. Les Williams: R/1000 for Escapes
6. Don Jordan: Info regarding electrical wiring issues

  
Vehicle Stall Meeting  
Minutes....

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

EA82-827-A 8285

**Subject:** Canceled: Update: U204 Phantom Stall Meeting  
**Location:** TEE Conference room #2

**Start:** Tue 1/22/02 12:00 PM  
**End:** Tue 1/22/02 1:00 PM  
**Show Time As:** Free

**Recurrence:** Weekly  
**Recurrence Pattern:** every Tuesday from 12:00 PM to 1:00 PM

**Meeting Status:** Not yet responded

**Required Attendees:** Altonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bopama, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Nku (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fasoetti, Bob (R.J.); Fournelle, Gilbert (G.); Gilee, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Iohikawa, Jiyunichiro (J.); Jansen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shini (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Lushraen, Eric (E.A.); Marok, Edmond (E.C.); Matasa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Navsed Khan; Namatollahi, Sonya (S.); Nikotal, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquespau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kren (K.C.); Shimishi, Masaru (M.); Stijnenbauer, Jeffrey (J.R.); Suarez, Rhas (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakanell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Young, Lem (.)

**Optional Attendees:** Suarez, Rhas (R.); Klostermann, Eric (E.); Jordan, Donald (D.E.)

**Importance:** High

**Hello All:** The meeting this Tuesday has been Cancelled. I will be in NJ assisting MNAO. See you on Thursday Jan 24 at 10 AM

5002-021-A 0200

**From:** Williams, Lee (LHW.)  
**Sent:** Monday, January 28, 2002 5:44 PM  
**To:** Altonian, Don (D.J.); Amanda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Parg, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Ranuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Iohikawa, Jyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shuji (S.); King, Robert (R.F.); Klostmann, Eric (E.); Kwon, Soon (S.K.); Limtson, Steven (S.); Linds, Peter (P.A.); Liu, Jane (J.); Lushsen, Eric (E.A.); Mark, Edmond (E.C.); Matea, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Navsed Khan; Nemakofski, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquetpau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kian (K.G.); Shirahishi, Masaru (M.); Stippenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Young, Lem (.)  
**Subject:** U204 Stall Meeting Minutes 1/24/01

Items for Tuesday 1/29/02 Meeting.

1. **Scott Moorhouse:** ON-line testing at KCAP (the remaining 4 calibrations).
2. **Don Jordan:** Suspect wiring and inverted delta item grounds
3. **Cary Powell:** Air Leak test data from Ray and dust box weighing procedures.

  
vehicle stall meeting  
minutes...

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**From:** Williams, Les (LHW.)  
**Sent:** Wednesday, January 30, 2002 6:35 PM  
**To:** Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chih, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (B.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fasotti, Bob (B.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Holman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ishikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Lintloo, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehnen, Eric (E.A.); Marck, Edmond (E.C.); Matea, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Namatollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirahishi, Masaru (M.); Silgenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Subject:** Staff Meeting Minutes 1/28/02

SSM# 15589 is released. Great Job Rhea Suarez and Team.  
Marty Price is putting finishing touches on ISM. Nice work!  
Les Williams editing TSB currently.

**Items for next meeting**

1. Don Jordan: Hella Relay issue and Suspect wiring update.
2. Scott Moorhouse: Info on ICCD and on-line test inquiry with Pete Lindy
3. Cary Powell: Air leak test quantitative data, Control plan and 8D from Standt, weighing of dust boxes.

  
Vehicle Staff Meeting  
Minutes...

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

ESB2-027-A 0200

**From:** Williams, Lea (LHW.)  
**Sent:** Monday, February 04, 2002 8:18 PM  
**To:** Altonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chik, John (J.); Chin, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (B.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (B.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanel, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limlaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marck, Edmond (E.C.); Matesa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Navsed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Requepau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirakahi, Masaru (M.); Stippenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Lea (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Subject:** Stall meeting minutes 1/31/02

  
Vehicle Stall Meeting  
Minutes...

Regards,  
Lea Williams  
For More, Count on Lea  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

---

**From:** Williams, Les (LHW.)  
**Sent:** Monday, February 04, 2002 8:31 PM  
**To:** Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kernal (K.); Blackburn, Thomas (T.J.); Bopama, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chih, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gilles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Holman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Iohikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostmann, Eric (E.); Kwon, Soon (S.K.); Limtiao, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marok, Edmond (E.C.); Matasa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquesau, Alden (A.P.); Rothweller, Daniel (D.); Shah, Kiran (K.C.); Shiraishi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Subject:** Location for stalls meeting 2/5/02

If you are attending the Stalls meeting tomorrow at the TEE bldg, we will be using Conference Room #1.

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**From:** Williams, Lee (LHW.)  
**Sent:** Wednesday, February 06, 2002 4:48 PM  
**To:** Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowhani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chin, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Faacetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kostermann, Eric (E.); Kwon, Soon (S.K.); Limitaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marok, Edmond (E.C.); Matesa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nemotohahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquapsu, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kran (K.C.); Shirahishi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veochio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Young, Lem (L.)  
**Subject:** Stall Meeting Minutes 2/5/02

**Action Item For Next Meeting:**

1. **Cary Powell:** 8D/Control Plan from Standt, Dust Box results, APG timing.



Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786



**From:** Williams, Les (LHW.)  
**Sent:** Monday, February 11, 2002 5:57 PM  
**To:** Altoonian, Don (D.J.); Amende, Harry (H.F.); Badgley, Jost (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kostmann, Eric (E.); Kwon, Soon (S.K.); Limlaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marck, Edmond (E.C.); Matessa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Navsed Khan; Nematollahi, Sonya (S.); Nikolai, Benita; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquetpau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shiraiishi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Subject:** U204 Stall Meeting Agenda 2/7/02

Items for Next meeting:

1. Don Altoonian/Cary Powell: Info on Ford/Visteon STA engineers at Standt.
2. Cary Powell: Dust Box weight results/APG testing info

Thx.



Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**From:** Williams, Lee (LHW.)  
**Sent:** Wednesday, February 13, 2002 2:53 PM  
**To:** Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.G.); Bhowmik, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Facchetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Harr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Lintisco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehnen, Eric (E.A.); Marck, Edmond (E.C.); Matea, John (J.); Meurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Navsed Khan; Namatollahi, Sonya (S.); Nikolai, Boris; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquetpau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirahishi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhas (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Co:** Ortmann, James (J.W.); Boale, Sandra (S.L.)  
**Subject:** U204 Stall meeting minutes 2/12/02

**Items for Thursday 2/14/02 meeting**

1. Jim Ortmann: Status of PCV Valve Testing.
2. Cary Powell: APG status/Viateon STA Engineer @ Stant
3. Don Altoonlan: Ford STA Engineer
4. Lee Williams/Don Altoonlan: locating Ignition Key Engineers.
5. Dan Rothweiler: Update on Philly Staller
6. Steve Lintisco: Update on West Coast staller (one where IAC/TB/VMV were due to be replaced)
7. Ming Chih: Update on revised evap system testing @ KCAP.

  
Vehicle Stall Meeting  
minutes...

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Subject:** Updated: Update: U204 Phantom Stall Meeting  
**Location:** TEE Conference Rm 2

**Start:** Thu 2/28/02 2:00 PM  
**End:** Thu 2/28/02 3:00 PM  
**Show Time As:** Tentative

**Recurrence:** Weekly  
**Recurrence Pattern:** every Thursday from 10:00 AM to 11:00 AM

**Meeting Status:** Not yet responded

**Required Attendees:** Aitounian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chik, John (J.); Chih, Ming-Niu (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fasce, Bob (R.J.); Fournelle, Gilbert (G.); Glase, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Holman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Iohikawa, Jiyunichiro (J.); Jeneen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanel, Shihji (S.); King, Robert (R.F.); Klostarmann, Eric (E.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marok, Edmond (E.C.); Matea, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Boris; Noteboom, Jim (J.E.); Orman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Sanders, Muriel (M.B.); Shah, Kiran (K.C.); Shirahishi, Masaru (M.); Stappenberg, Jeffrey (J.R.); Suarez, Rhao (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (L.H.W.); Williamson, David (D.E.); Yeung, Lem (L.)

**Optional Attendees:** Klostarmann, Eric (E.); Williamson, David (D.E.)

I will be out of the office this Thursday morning 2/28/02, therefore the stalls meeting is moved to 2 PM EST. Thank you, I will send a follow-up email in case my calendar update does not reach everyone in a timely manner.

Dial in: 1-866-250-3175 or Fordnet: 9-1-954-1163  
International Participants # 1 (630) 827-6733  
Passcode: 7354080#

**From:** Williams, Les (LHW.)  
**Sent:** Tuesday, February 28, 2002 9:51 AM  
**To:** Atoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chio, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gilles, Stuart (S.); Gokhale, Ranuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Iohikawa, Jiyunohiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanel, Shihji (S.); King, Robert (R.F.); Kostermann, Eric (E.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marok, Edmond (E.C.); Matasa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Samie; Notaboom, Jim (J.E.); Orman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquesau, Alden (A.P.); Rothweller, Daniel (D.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirahishi, Masaru (M.); Stippenbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Young, Lem (.)  
**Cc:** 'cpowell3@viatecn.com'  
**Subject:** Stall meeting 2/28/02 moved to 2 PM EST

I will be out of the office this Thursday morning 2/28/02, therefore the stalls meeting is moved to 2 PM EST. Thank you, this message was sent in addition to a calendar update as a precaution.

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Subject:** Updated: Update: U204 Phantom Stall Meeting  
**Location:** TEE CConference Rm 2

**Start:** Thu 1/17/02 2:00 PM  
**End:** Thu 1/17/02 3:00 PM  
**Show Time As:** Tentative

**Recurrences:** Weekly  
**Recurrence Pattern:** every Thursday from 2:00 PM to 3:00 PM

**Meeting Status:** Not yet responded

**Required Attendees:** Altonian, Don (D.J.); Amende, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chik, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pens, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Goldale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Koestermann, Eric (E.); Koeko, Jeff (J.R.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Lushness, Eric (E.A.); Marok, Edmond (E.C.); Matea, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nemstollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquesau, Alden (A.P.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirahshi, Masaru (M.); Stippenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (L.H.W.); Williamson, David (D.E.); Yeung, Lem (.)

**Optional Attendees:** Koestermann, Eric (E.); Williamson, David (D.E.)

Dial in: 1-866-250-3175 or Fordnet: 9-1-954-1163  
International Participants # 1 (630) 827-6733  
Passcode: 7354080#

**From:** Williams, Les (LHW.)  
**Sent:** Tuesday, March 05, 2002 9:25 AM  
**To:** Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Koeko, Jeff (J.R.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehnen, Eric (E.A.); Marck, Edmond (E.C.); Mates, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirahishi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakanell, Ray (R.A.); Wettsch, Bill (B.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Subject:** U204 Stall Meeting moved to 2-3 PM on Thursdays

**Hello Team:**

My last day on this assignment is 3/15/02. The Stalls meetings have been moved to 2-3 PM EST on Thursdays. Muriel Sanders will be taking over the stalls issue after I am departed. Thanks!

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**From:** Sullivan, Jamie (J.P.)  
**Sent:** Wednesday, February 06, 2002 4:52 PM  
**To:** Chin, Ming-Niu (M.N.); Nematollahi, Sonya (S.)  
**Co:** Williams, Lee (LHW.)  
**Subject:** RE: Stall Meeting Minutes 2/5/02

Ming, please forward your vent line concern information and implementation timing to Lee.

Sonya, FYI, please look at the "Hella" portion of the attached minutes.

  
Vehicle Stall Meeting  
Minutes...

Jamie Sullivan (jsull18@ford.com)  
Ford Motor Company North American Truck  
"Outfitters" Project Management Supervisor  
Phone/Fax:(313)337-1350; Page (313)788-8894  
PDC 2H-G44, MD-402  
*"Every job is a self portrait of the person who did it.  
Autograph your work with Quality."*

-----Original Message-----

**From:** Williams, Lee (LHW.)  
**Sent:** Wednesday, February 06, 2002 4:48 PM  
**To:** Alcorn, Don (D.J.); Amende, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhogwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chin, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fasoldt, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Goldsale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanel, Shing (S.); King, Robert (R.P.); Koelermann, Eric (E.); Kwon, Soon (S.K.); Limbaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matosa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Navsed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Notsboom, Jim (J.E.); Ortmann, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquetan, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shimada, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anna Marie (A.); Wakeland, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Young, Lem (L.)  
**Subject:** Stall Meeting Minutes 2/5/02

Action Item For Next Meeting:

1. Cary Powell: BD/Control Plan from Standt, Dust Box results, APG timing.

<< File: Vehicle Stall Meeting Minutes for 2\_5\_02.doc >>

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**From:** Stiggenbauer, Jeffrey (J.R.)  
**Sent:** Wednesday, August 07, 2002 3:49 PM  
**To:** Namatollahi, Sonya (S.)  
**Subject:** RE: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

Sonya, I have contacted the dealer and arranged for the fuse panel to be delivered to me tomorrow. I had planned on trying to duplicate the issue here in KCAP prior to sending the part to Lear for analysis. Let me know if this plan is acceptable. I will be on vacation Thursday and Friday and will return Monday. The VQR is next week, I am not sure how this will impact my investigation. I have tentatively planned to work on it Monday.

-----Original Message-----  
**From:** Namatollahi, Sonya (S.)  
**Sent:** Tuesday, August 06, 2002 4:40 PM  
**To:** Stiggenbauer, Jeffrey (J.R.)  
**Subject:** FW: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

Jeff, are you involved on this? Please let me know. Thanks.

-----Original Message-----  
**From:** Dalbo, Bob (R.J.)  
**Sent:** Tuesday, August 06, 2002 5:38 PM  
**To:** Namatollahi, Sonya (S.)  
**Cc:** Hoffman, Michael (M.V.); Fascetti, Bob (R.J.); Altonen, Don (D.J.); Corbett, Sandra (S.M.); Jordan, Donald (D.E.); Fournelle, Gilbert (G.)  
**Subject:** RE: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

Sonya,  
If your team has someone in KCAP or you want to work through the Lear resident, that's fine. I assume from Scott's note that he intended to look into it at KCAP, but he is on vacation this week and I can't confirm it with him. I didn't want you to get blindsided with this issue, that's all.

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-31788  
Pager: (313) 785-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----  
**From:** Namatollahi, Sonya (S.)  
**Sent:** Monday, August 05, 2002 6:09 PM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** Hoffman, Michael (M.V.); Fascetti, Bob (R.J.); Altonen, Don (D.J.); Corbett, Sandra (S.M.); Jordan, Donald (D.E.); Fournelle, Gilbert (G.)  
**Subject:** RE: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

Bob, are KCAP folks planning to examine the vehicle/fuse box or should the Dearborn team get involved? We certainly don't need duplication of efforts. Don Jordan is on vacation this week, but I can put someone else on this right away if needed. Please advise. Thanks.

**Sonya Namatollahi**

Escape/Tribute/Maverick Electrical Team Leader  
Phone: 313-788869  
Pager: Text, 313-785-8332  
email: [snematol@ford.com](mailto:snematol@ford.com)

2002-027-A 0302



-----Original Message-----

From: Dalbo, Bob (R.L.)  
Sent: Monday, August 05, 2002 4:59 PM  
To: Alcorn, Don (D.J.); Corbett, Sandra (S.M.); Nematollahi, Sonya (S.); Jordan, Donald (D.E.); Gilbert, Fournelle  
Cc: Hoffman, Michael (M.V.); Bob Pascetti  
Subject: FW: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

New wiring issues.

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 796-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

From: Moorhouse, Scott (S.R.)  
Sent: Friday, August 02, 2002 4:58 PM  
To: Averado, CJ (C.J.); New, Michael (M.D.); Stigenbauer, Jeffrey (J.R.); Ray, Charles (C.)  
Cc: Dalbo, Bob (R.L.); Unde, Peter (P.A.)  
Subject: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

I discussed vehicle with Mathew Fazzo, service manager. Vehicle was not the typical "stall" claim. At times vehicle would be electrically dead and have no-start condition. Other times it would die in decel. Slamming door sometimes resulted in vehicle dying. Dealer has determined problem to be with under dash fuse box. He has been able to repeat the no start condition by tapping on the fuse panel.

Dealer intention is to replace the fuse box. I have asked him to hold the part for our review.

Scott Moorhouse  
U204 PTSE Resident Engineer  
Kansas City Assembly Plant  
(ph) 816-459-1985 (fax) 816-459-1728  
[smoorhou@ford.com](mailto:smoorhou@ford.com)

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**Full Name:** Simmons, Paul (P.)  
**Last Name:** Simmons  
**First Name:** Paul  
**Job Title:** Supervisor EECAE/TVC  
**Department:** 5100T408 - E/E CAE - Truck Applicati  
**Company:** .

**Business Address:** 2A042  
5D16  
DEARBORN, MI 48121

**Business:** 8455501  
**Business 2:** 1-313-8455501

**E-mail:** psimmons@ford.com

**Subject:** U204 Phantom Stall Meeting  
**Location:** TEE Conf. Rm. 2 (see note below for 3/21/02)

**Start:** Thu 3/21/02 2:00 PM  
**End:** Thu 3/21/02 3:00 PM  
**Show Time As:** Tentative

**Recurrence:** Weekly  
**Recurrence Pattern:** every Thursday from 2:00 PM to 3:00 PM

**Meeting Status:** Not yet responded

**Required Attendees:** Altonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Cary Powell'; Chick, John (J.); Chih, Ming-Miu (M.N.); Chln, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Rothweiler, Daniel (D.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fasoetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); 'John McDonald'; Jones, Andy; Jordan, Donald (D.E.); Karal, Shiril (S.); King, Robert (R.F.); Klosternann, Eric (E.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehreen, Eric (E.A.); Marok, Edmond (E.C.); Matosa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); 'McDonald, John'; Mooney, Larry (L.); Moorhouse, Scott (S.R.); 'Morgan, Tom'; Morishima, Shigeki (S.); 'Naveed Khan'; Nematollahi, Sonya (S.); 'Nikolai, Bernie'; Notaboom, Jim (J.E.); Ortman, James (J.W.); 'Powell, Cary'; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Sanders, Muel (M.S.); Shah, Kiran (K.C.); Shiralehi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhas (R.); Sullivan, Jamie (J.P.); Takesawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (L.H.W.); Williamson, David (D.E.); Yeung, Lam (.)

**Please note the new dial-in information.**

Dial in: 1-877-870-3431 or Fordnet: 9-1-954-1143  
International Participants # 1 (630) 693-1703  
Passcode: 7865386#

**For 3/21/2002 Only:**

Location is TEE Conference Rm 1

**From:** Sanders, Muriel (M.S.)  
**Sent:** Monday, March 18, 2002 10:14 AM  
**To:** Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chih, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Dan Rothwell; De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Goldhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Iohikawa, Jyunichiro (J.); Jensen, Ted (T.E.); John McDonald; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostmann, Eric (E.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marok, Edmond (E.C.); Matsa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Notboom, Jim (J.E.); Ortmann, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquapau, Alden (A.P.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirasahi, Masaru (M.); Stippenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Watach, Bill (B.); Williams, Lee (L.H.W.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** U204 Phantom Stall Meeting 3/21/02

Here is the updated meeting information for this week. A meeting notice will follow.

**New dial-in information:**

Dial in: 1-877-870-3431 or Fordnet: 9-1-954-1143  
International Participants # 1 (630) 693-1703  
Passcode: 7865386#

**For 3/21/2002 Only:**

Location is TRE Conference Rm 1

Meeting time remains the same as Thursdays, 2-3pm.

Have a good day.

***Muriel Sanders***

U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

**From:** Sanders, Muriel (M.S.)  
**Sent:** Friday, May 03, 2002 1:30 PM  
**To:** Akoonian, Don (D.J.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhotwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chik, John (J.); Chih, Ming-Niu (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Dan Rothweller; De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Faschetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giloe, Stuart (S.); Golchale, Renuka (R.V.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kostermann, Eric (E.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Lintleco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Marok, Edmond (E.C.); Matasa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sorya (S.); Nikolai, Bernie; Notsboom, Jim (J.E.); Ortmann, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Sanders, Muriel (M.S.); Shah, Kian (K.C.); Shirahhi, Masaru (M.); Stijpenbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Wetsch, Bill (B.); Williams, Lee (L.H.W.); Williamson, David (D.E.); Yeung, Lam (L.)  
**Subject:** New Dial-in No. for Stalls Meeting

The dial-in information has changed for the weekly stalls meeting. Please note the new information below. This will be effective next Thursday (May 9, 2002).

**New Dial-in Numbers & Passcode**

Dial in: 1-877-870-3529 or Fordnet: 9-1-954-1144

International Participants # 1 (630) 693-1704

Passcode: 7673538#

***Muriel Sanders***

U204 3.0L Calibration

Ford Motor Company

Phone: 313-32-27307

Fax: 313-32-31786

E-mail: msander6@ford.com

**Subject:** Updated: U204 Phantom Stall Meeting  
**Location:** TEE Conf. Rm. 2

**Start:** Thu 3/21/02 2:00 PM  
**End:** Thu 3/21/02 3:00 PM  
**Show Time As:** Tentative

**Recurrence:** Weekly  
**Recurrence Pattern:** every Thursday from 2:00 PM to 3:00 PM

**Meeting Status:** Not yet responded

**Required Attendees:** Altonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bholwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Cary Powell'; Chik, John (J.); Chih, Ming-Niu (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Rothweiler, Daniel (D.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fasoetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Harr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Iohikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); 'John McDonald'; 'Jones, Andy'; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kostermann, Eric (E.); Koeko, Jeff (J.R.); Kwon, Soon (S.K.); Limtiao, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marok, Edmond (E.C.); Matasa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); 'McDonald, John'; Mooney, Larry (L.); Moorhouse, Scott (S.R.); 'Morgan, Tom'; Morishima, Shigeki (S.); 'Navsed Khan'; Nematollahi, Soma (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortman, James (J.W.); 'Powell, Cary'; Powers, Ken (K.W.); Price, Martin (M.); Raquetou, Alden (A.P.); Sanders, Muriel (M.S.); Shah, Kuran (K.C.); Shiraishi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhaz (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (L.H.W.); Williamson, David (D.E.); Yeung, Lem (.)

**New Dial-in Numbers & Passcode (Effective 5/9/02)**  
**Dial in:** 1-877-870-3529 or Fordnet: 9-1-954-1144  
**International Participants #** 1 (630) 693-1704  
**Passcode:** 7673538#

**From:** Noteboom, Jim (J.E.)  
**Sent:** Tuesday, August 06, 2002 5:12 PM  
**To:** Sanders, Murkel (M.S.); Dalbo, Bob (R.J.)  
**Subject:** FW: U204 Stall Investigation, 7-26-02--Signal return wiring issues.

You probably are already aware of this but I noticed you were not on the distribution of this note.

FYI

Jim Noteboom  
Powertrain Field Quality Specialist/Denver  
Phone: 303.674.4015 FAX: 303.674.6730  
Cell: 303.921.2076

-----Original Message-----

**From:** Goodwin, William (W.R.)  
**Sent:** Tuesday, July 30, 2002 3:21 PM  
**To:** Noteboom, Jim (J.E.); Moorhouse, Scott (S.R.)  
**Cc:** Yeung, Lam (L.); Benz, Greg (G.H.)  
**Subject:** RE: U204 Stall Investigation, 7-26-02--Signal return wiring issues.

We have data from Kelvin Dobbins in advanced controls suggesting that there is a wiring harness error on the signal return circuit on U204 production vehicles. This could be part of some field issues you are experiencing on the vehicle. The intended configuration is for the signal return is supposed to be a clean ground circuit. On the U204, I am told that this circuit is grounded to both engine block and the PCM ground location. This basically couples significant ignition noise (and other noise sources) into any device using signal return.

I do not know enough about your control system to speculate on the potential problems of this design. If nothing else, this should be corrected for all production harnesses as soon as it can be reasonably implemented. I have no information that this is related to the problems below, but I believe there should be an assessment a potential interaction effect.

Here is Kelvin Dobbins note:

We have also checked this out on a vehicle. Although we see the common mode noise problem on the cid signal on the vehicle as well, we are only getting one simultaneous fuel pulse before the start of sefl.



vehicle checkbook.doc

The tiff preview images in the Word file are a little crude. If you want a higher resolution image, you can either print it out on a postscript printer or create a pdf file using adobe distiller.

Kelvin Dobbins  
Senior Technical Specialist  
Powertrain Controls Research and Development  
Ford Research Laboratories  
Gas Turbine Laboratory, Rm. 1115  
Phone: 313-322-0457  
Fax: 313-317-7404  
email: kdobbins@ford.com

Please contact me if you would like to discuss further.

Regards,

**Bill Goodwin**

Product Design Engineer, Ignition Systems  
V Engine Engineering, Ford Motor Company  
Tel: 813 337-8579 Fax: 813 390-4084  
email: wgoodwin@ford.com  
textpage mailto:3137960671@alphapage.airtouch.com

**Original Message**

From: Noteboom, Jim (J.E.)  
Sent: Tuesday, July 30, 2002 11:27 AM  
To: Sanders, Muriel (M.S.); Altonen, Don (D.J.); Bauer, Scott (S.C.); Bhogwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell, Chick, John (J.); Chiu, Ming-Niu (M.N.); Chin, Darral (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Dan Rothweiler; De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duval, Allen (A.W.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Fredlund, Mark (M.); Giles, Stuart (S.); Goldsate, Ramuka (R.V.); Goodwin, William (W.R.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Junichiro (J.); Jensen, Ted (T.E.); John McDonald; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shing (S.); King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Seon (S.K.); La, Dzang (D.H.); Limfeco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Mandzuk, Roger (R.S.); Mardk, Edmond (E.C.); Matias, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McEne, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquetpau, Aiden (A.P.); Shah, Kian (K.C.); Shirashi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veenstra, Tim (T.W.); Wakenell, Ray (R.A.); Wetbach, Bill (B.); Williams, Les (L.H.W.); Young, Lam (L.)  
Subject: RE: U204 Stall Investigation, 7-26-02

VEH: '02 Escape VIN: 1FMCU04112KD11749 BUILT: 4-11-02 MILES: 1850

CUSTOMER: Carol Segety / 303-252-8278 (home) LOCATION: Northglenn, Colo.  
COMPLAINT: Stalls in slow traffic. Note: the stall occurs in the same location (80th between Wadsworth and 36) as the previous vehicle; checked this out and there are high tension lines crossing the road there.

**TSB and SSM results:**

- IAC=34%
- EVAP system passed.
- DPFE and EEC relay are the latest.
- Keys do not have excessive weight.
- All related grounds were secure.

Based on the stall location and the possibility of RFI, the MAF was updated to a 112Z-BA.

Also on this vehicle the battery was leaking from the seam on the corner opposite the negative post (see photos). The customer stated that when the vehicle was purchased, the original batt. was dead and was replaced. This batt. was not a service piece but looked like original equipment so it's history is in question. A new service batt. was installed.

<< File: MVC-038F.JPG >>  
Serial no.

<< File: MVC-040F.JPG >>  
Add drip from seam.

Jim Noteboom  
Powertrain Field Quality Specialist/Denver  
Phone: 303.674.4015 FAX: 303.674.5730  
Cell: 303.821.2078



---

**From:** Ohland, Jon (J.E.)  
**Sent:** Thursday, August 15, 2002 9:49 AM  
**To:** Lindbauer, Kenneth (K.J.); Nematollahi, Sonya (S.); Goldale, Renuka (R.V.); 'tmorgen@lear.com'  
**Cc:** Liu, Qun (Q.)  
**Subject:** Actions from stall meeting

Ken,

I called into the stall meeting today. They are pretty much stuck on what could be causing the problem. Qun has asked for someone with knowledge of the wiring to call in and help troubleshoot the wiring. Right now they are looking at both fuel and electrical for the source of the problem. Given the large number of part swaps and as much troubleshooting as has been done, there may be some damaged wiring.

Qun wanted to set up a call in at 11:30. Please coordinate with him and let me know also if that will work. He is in APG, so email is probably the best way to get a hold of him.

*Jon Ohland*  
U204 Electrical Systems

5082-827-A 8331

1/14/03

**From:** O'Donohue, Garrett (G.M.)  
**Sent:** Thursday, May 09, 2002 3:53 PM  
**To:** Cardone, Wesley (W.M.)  
**Cc:** Tom Morgan (E-mail); Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Makk, Assad (A.); Taleb, Mahmoud (M.); 'reid.erickson@us.bosch.com'; Los, Roman (R.J.); Jordan, Donald (D.E.); 'Ali Hamieh (E-mail)'  
**Subject:** RE: Cooling Fan Stall Protection

Wee,

The left and right motors for a given assembly are identical. However they have different fans attached to them. For all the assemblies you have, you can identify the fans by the number of blades

- Left Fan (driver's side) has 5 blades
- Right Fan (passenger's side) has 6 blades

There were also colored dots placed on the shrouds to identify the different assemblies

- Red Dots: 14 Manual
- White Dots: 14 Auto
- No Dots: V6

Garrett

-----Original Message-----

**From:** Cardone, Wesley (W.M.)  
**Sent:** Thursday, May 09, 2002 3:20 PM  
**To:** Los, Roman (R.J.); Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamieh (E-mail)'  
**Cc:** Tom Morgan (E-mail); Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Makk, Assad (A.); Taleb, Mahmoud (M.)  
**Subject:** RE: Cooling Fan Stall Protection

I have completed laboratory measurements on YL84-88807-AK. We could have it released by Tuesday. I would like to know though how to identify between the two motors for model construction. I assume that one is commonly called passenger side and the other driver. Please identify how to identify which is which.

The other two I should have done by Wednesday, May 22.

Wee

-----Original Message-----

**From:** Los, Roman (R.J.)  
**Sent:** Thursday, May 09, 2002 3:13 PM  
**To:** Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamieh (E-mail)'  
**Cc:** Tom Morgan (E-mail); Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Cardone, Wesley (W.M.)  
**Subject:** RE: Cooling Fan Stall Protection

I have not received even a phone call or email about physical schematics. Please advise, it's been over another week since my last request, and 3 weeks since our meeting on the aforementioned issue.

Wee, could you please give the team approximate timing on the Cooling Fan models you're creating and/or if you need some other information.

Thank you

Roman Los (rlos) PH#: (313) 59-43845  
Truck CAE Applications FAX#: (313) 39-05011  
RVT-EESE, ECC Bldg., Cubes: 2B-H03, Maildrop: 4  
<<mailto:rlos@ford.com>>

ER62-627-A 9332

-----Original Message-----

From: Los, Roman (R.J.)  
Sent: Wednesday, May 01, 2002 2:23 PM  
To: Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); All Hamieh (E-mail); 'reid.erickson@us.bosch.com'  
Cc: Tom Morgan (E-mail); Gokhale, Renuka (R.V.)  
Subject: RE: Cooling Fan Stall Protection

Reid dropped off 9 motor/fan assemblies this afternoon (thank you). I will obtain timing from Wes (our modeling guy) for creating the models.

I am still awaiting the physical schematics from Lear. Cecil posted logicals last Thursday. I sent him and All an email informing them that they are not physicals. I called Cecil on Monday. He informed me that Jack Rowe had the physicals. I left a phone message with Jack yesterday. Jack called this morning during our PMT meeting, that he needed clarification on which physicals, so I called back after lunch clarifying that it is current model. Jack's voice mail said he is out today, so I'm not sure who else to contact and or how to proceed further for current model physical schematic information.

Tom, All, If there is anybody else at Lear that can help expedite this, it would be greatly appreciated.

Thank you

Roman Los (rlos) PH#: (313) 59-49845  
Truck CAE Applications FAX#: (313) 39-05011  
RVT-EESE, ECC Bldg., Cube#: 2BH03, Maildrop: 4  
<<mailto:rlos@ford.com>>

-----Original Message-----

From: Jordan, Donald (D.E.)  
Sent: Thursday, April 18, 2002 4:03 PM  
To: O'Donohue, Garrett (G.M.); Los, Roman (R.J.); All Hamieh (E-mail); 'reid.erickson@us.bosch.com'  
Cc: Jordan, Donald (D.E.); Tom Morgan (E-mail); Gokhale, Renuka (R.V.)  
Subject: Cooling Fan Stall Protection

- Review proposal to reduce the U204 engine cooling fan fuse ratings to enhance stall protection
- Determine the necessary steps to assess (and potentially implement) the lower rated fuses
- veh @ 18v what see @ fan
- Simulation(w/ & w/o resistor(drop in) /or,
- 24v jmp start req
- CAE analysis results

Minutes:

Attendees: Roman Los, Garrett O'Donohue, Reid Erickson, All Hamieh, Don Jordan

Stall protection has been added to fan SDS(Future Model), but protect for 03MY....

U204 03MY:

CAE Analysis Info to Roman

Motor Modeling

- 1) Torque vs current & transient current data, either hardware or curves- Bosch(Reid)
- 2) Electrical schematics, Lear(All)
- 3) Considerations
  - a) Cooling system 3 to 2 speed
  - current-inrush & Steady State change

Timing

As Soon As Possible

Donald E. Jordan  
U204 OPD E/E Systems & EDS  
(313) 32-25147  
Pager: T (djordan1) or 313-795-4342

**From:** Noteboom, Jim (J.E.)  
**Sent:** Thursday, May 09, 2002 3:46 PM  
**To:** Sanders, Muriel (M.S.); Alkonian, Don (D.J.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Cary Powell'; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); 'Dan Rothweiler'; De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Gilee, Stuart (S.); Gokhale, Renuka (R.V.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Harr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); 'John McDonald'; Jones, Andy; Jordan, Donald (D.E.); Karel, Shinji (S.); King, Robert (R.F.); Klostmann, Eric (E.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Matasa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); 'Morgan, Tom'; Morishima, Shigeki (S.); Naveed Khan; Nemetollahi, Sonya (S.); 'Nikolai, Bernie'; Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquetau, Alden (A.P.); Shah, Kiran (K.C.); Shiralahi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakensell, Ray (R.A.); Wettach, Bill (B.); Williams, Les (L.H.W.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** RE: U204 Stall Meeting Agenda - 5/9/02

Inspection results of '02 Escape VIN: 1FMYU0414KC19492

**LOCATION:** John Elway West, Denver  
**OWNER:** Mike Cochran (JEW Service Mgr.)  
**MILEAGE:** 3342  
**BUILD DATE:** 1-29-02

**COMPLAINT:** Stalled while driving approx. 50 mph. Noticed dash lights came on and steering became stiff; coasted to side of

road, went to crank (did not turn key off) and the engine restarted. Occured at around 2500 miles and has not happened since.

**DIAGNOSTICS:** Went through the latest TSB/ISM draft; no concerns were found except for the following:

- There was battery acid in the batt. tray that had seeped down onto grounds G-104 and 105; some corrosion was evident.
- The customer's key chain contained several oz. of additional weight.

Jim Noteboom  
Powertrain Field Quality Specialist/Denver  
Phone: 303.874.4015 FAX: 303.874.6730  
Page: 1.888.375.1990

**From:** Noteboom, Jim (J.E.)  
**Sent:** Tuesday, July 30, 2002 11:27 AM  
**To:** Sanders, Muriel (M.S.); Altonian, Don (D.J.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Cary Powell'; Chik, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); 'Dan Rothweiler'; De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duvall, Allen (A.W.); Fasostil, Bob (R.J.); Fournella, Gilbert (G.); Freeland, Mark (M.); Glise, Stuart (S.); Goldhale, Renuka (R.V.); Goodwin, William (W.R.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Jyunichiro (J.); Jensen, Ted (T.E.); 'John McDonald'; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Le, Dzong (D.H.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Mandzuk, Roger (R.S.); Marok, Edmond (E.C.); Matassa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); 'Morgan, Tom'; Morishima, Shiroki (S.); 'Naveed Kharr'; Nemstollahi, Sonya (S.); 'Nikolai, Bernie'; Ortmann, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquesau, Alden (A.P.); Shah, Kiran (K.C.); Shiraishi, Masaru (M.); Stippenbauer, Jeffrey (J.R.); Suarez, Phae (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veenstra, Tim (T.W.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (LHW.); Young, Lem (L.)  
**Subject:** RE: U204 Stall Investigation, 7-26-02

**VEH:** '02 Escape **VIN:** 1FMCU04112KD11749 **BUILT:** 4-11-02 **MILES:** 1650  
**CUSTOMER:** Carol Segely / 303-252-8278 (home) **LOCATION:** Northglenn, Colo.  
**COMPLAINT:** Stalls in slow traffic. Note: the stall occurs in the same location (80th between Wadsworth and 38) as the previous vehicle; checked this out and there are high tension lines crossing the road there.

**TSB and SSM results:**

- IAC=84%
- EVAP system passed.
- DPFE and EEC relay are the latest.
- Keys do not have excessive weight.
- All related grounds were secure.

Based on the stall location and the possibility of RFI, the MAF was updated to a 112Z-BA.

Also on this vehicle the battery was leaking from the seam on the corner opposite the negative post (see photos). The customer stated that when the vehicle was purchased, the original batt. was dead and was replaced. This batt. was not a service piece but looked like original equipment so it's history is in question. A new service batt. was installed.



Serial no.



Acid drip from seam.

Jim Noteboom

ESP2-827-A 8338

Powertrain Field Quality Specialist/Denver  
Phone: 303.874.4015 FAX: 303.874.5730  
Cell: 303.821.2076

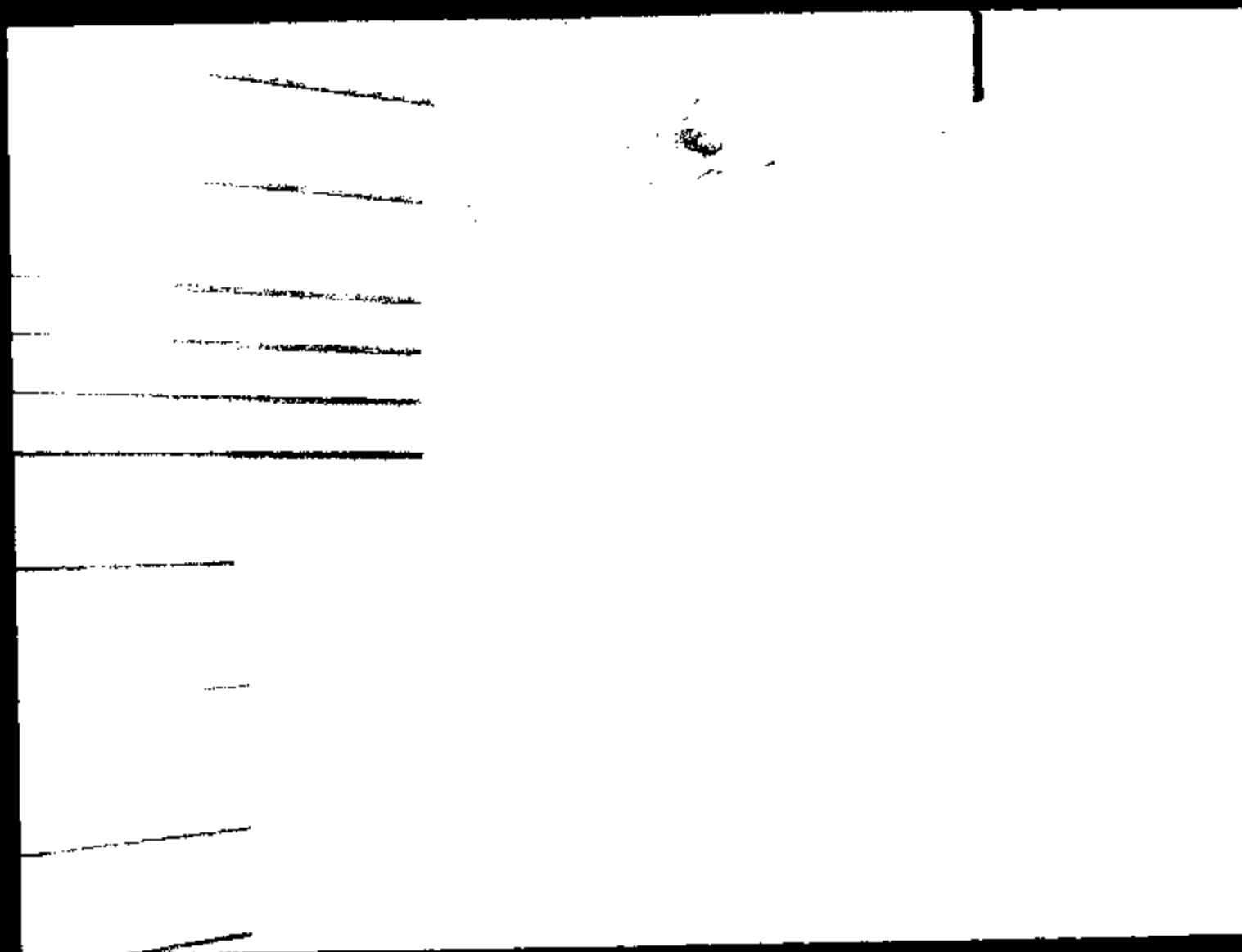
EA02-027-A 0337

RECHERCHER

  
 EL  
 ER  
 CAL HELP FAST  
 OF THE BEACH  
 FROM  
 THE VIBRANT  
 1981-1982

 **DANGER / PO**  
 SE  
 PROTÉGER    
 LES VEHICULES GAZ / AUCUNE F  
 EXPLOSIONS PEUVENT / - ETINCELLE / F  
 PROVOQUER LA CROIX / FLAMME / L





**From:** Moorhouse, Scott (S.R.)  
**Sent:** Tuesday, July 30, 2002 11:58 AM  
**To:** Noteboom, Jim (J.E.)  
**Cc:** Stilgenbauer, Jeffrey (J.R.); Nematollahi, Sonya (S.); Hansen, George (G.C.)  
**Subject:** RE: U204 Stall Investigation, 7-26-02

Jim, In regards to the leaking battery....if KCAP installed a battery tray for a 2.0L in a 3.0L vehicle....there are two small tabs that would put stress on the larger battery. This could be the reason why the same vehicle had two leaking batteries (potentially). This was just recently identified as a potential concern here by our Electrical PVT Resident, Jeff Stilgenbauer. It may be worth review.

KCAP is pursuing a method to pokepoke this issue at present.

Scott Moorhouse  
U204 PTSE Resident Engineer  
Kansas City Assembly Plant  
(ph) 816-459-1965 (fax) 816-459-1728  
smoorhou@ford.com

-----Original Message-----

**From:** Noteboom, Jim (J.E.)  
**Sent:** Tuesday, July 30, 2002 10:27 AM  
**To:** Sanders, Muriel (M.S.); Altoonien, Don (D.J.); Bauer, Scott (S.C.); Bhujani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Cary Powell'; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); 'Dan Rothweiler'; De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duveill, Allen (A.W.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Goldhale, Renuka (R.V.); Goodwin, William (W.R.); Grewel, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Hary, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); 'John McDonald'; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shintji (S.); King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Le, Daung (D.H.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Mandeluk, Roger (R.S.); Marck, Edmund (E.C.); Matsa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); 'Morgan, Tom'; Morishima, Shigeki (S.); 'Naveed Khan'; Nematollahi, Sonya (S.); 'Nikolai, Bernis'; Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Shah, Kiran (K.C.); Shirahshi, Masaru (M.); Stilgenbauer, Jeffrey (J.R.); Suarez, Rhys (R.); Takasawa, Keith (K.D.); Takubo, Hiroichi (H.); Vaenstra, Tim (T.W.); Wakenell, Ray (R.A.); Waltach, Bill (B.); Williams, Lee (L.H.W.); Yeung, Lam (.)  
**Subject:** RE: U204 Stall Investigation, 7-26-02

VEH: '02 Escape VIN: 1FMCU04112KD11749 BUILT: 4-11-02 MILES: 1850  
CUSTOMER: Carol Sagaty / 303-252-8278 (home) LOCATION: Northglenn, Colo.  
COMPLAINT: Stalls in slow traffic. Note: the stall occurs in the same location (80th between Wadsworth and 36) as the previous vehicle; checked this out and there are high tension lines crossing the road there.

TSB and SSM results:

- IAC=34%
- EVAP system passed.
- DPFE and EEC relay are the latest.
- Keys do not have excessive weight.
- All related grounds were secure.

Based on the stall location and the possibility of RFI, the MAF was updated to a 1L2Z-BA.

Also on this vehicle the battery was leaking from the seam on the corner opposite the negative post (see photos). The customer stated that when the vehicle was purchased, the original batt. was dead and was

replaced. This batt. was not a service piece but looked like original equipment so it's history is in question. A new service batt. was installed.

<< File: MVC-039F.JPG >>  
Serial no.

<< File: MVC-040F.JPG >>  
Acid drip from seam.

Jim Noteboom  
Powertrain Field Quality Specialist/Denver  
Phone: 303.674.4015 FAX: 303.674.5730  
Cell: 303.921.2078

**From:** masuyama.s@mazda.co.jp  
**Sent:** Friday, August 30, 2002 5:59 AM  
**To:** jbotterb@ford.com; tsoderqu@ford.com; takubo.h@mazda.co.jp; yamamoto.n@mazda.co.jp; okida.m@mazda.co.jp; maruyama.a@mazda.co.jp; yamasaki.m@mazda.co.jp  
**Cc:** kiowa2@ford.com; mhofman@ford.com; seavento@ford.com; kmille10@ford.com; mharis6@ford.com; ktakasaw@ford.com; agalhot@ford.com; dboxeth@ford.com; hveung@ford.com; anemato1@ford.com; gblackfo@viateon.com; ishaneri@ford.com; dmorgan@ford.com; kodama.ma@dev.mazda.co.jp; kawasaki.sh@mazda.co.jp; inoue.hiro@dev.mazda.co.jp; inoue.y@mazda.co.jp; hametan.t@mazda.co.jp; dmengel@ford.com; shiralehl.m@pt.mazda.co.jp; okino.y@mazda.co.jp; santo.c@mazda.co.jp; umeda.t@mazda.co.jp; dboxe@ford.com; runolan.t@mazda.co.jp; jwebber@ford.com; ebodjack@ford.com; ynakahir@ford.com; agoyal1@ford.com; foort@ford.com; rdaibo@ford.com; gldur@ford.com; mhofman@ford.com; aoki.mo@mazda.co.jp; ichikawa.t@mazda.co.jp; gadhikar@ford.com; dmengel@ford.com; shigeoka.t@mazda.co.jp  
**Subject:** J14 New Duratec Installation Work Sharing Draft and Issue List

J14 New Workshare      Issue List New Duratec  
FordMazda 20...      20020831...

Please find the updated work sharing draft as of Aug. 27.

I would like to have your feed back by Sept. 04 to prepare final draft for management sign off on the week of Sept. 9.

Your comments would be very much appreciated.

Also, updated issue list is attached.

Please feel free to give some feed back and/or suggestions.

Thank you very much for your understanding and support

Best regards

Setoshi Masuyama

---

**From:** Los, Roman (R.J.)  
**Sent:** Thursday, May 09, 2002 3:13 PM  
**To:** Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamieh (E-mail)'  
**Cc:** Tom Morgan (E-mail); Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Cardone, Wesley (W.M.)  
**Subject:** RE: Cooling Fan Stall Protection

I have not received even a phone call or email about physical schematics. Please advise, it's been over another week since my last request, and 3 weeks since our meeting on the aforementioned issue.

Wee, could you please give the team approximate timing on the Cooling Fan models you're creating and/or if you need some other information.

Thank you

Roman Los (rlos) PH#: (313) 59-43845  
Truck CAE Applications FAX#: (313) 39-05011  
RVT-EESE, ECC Bldg., Cube#: 2BH03, Maildrop: 4  
[rlos@ford.com](mailto:rlos@ford.com)

—Original Message—

**From:** Los, Roman (R.J.)  
**Sent:** Wednesday, May 01, 2002 2:23 PM  
**To:** Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamieh (E-mail)'; 'reid.ericson@us.bosch.com'  
**Cc:** Tom Morgan (E-mail); Gokhale, Renuka (R.V.)  
**Subject:** RE: Cooling Fan Stall Protection

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Tom, Ali, if there is anybody else at Lear that can help expedite this, it would be greatly appreciated.

Thank you

Roman Los (rlos) PH#: (313) 59-43845  
Truck CAE Applications FAX#: (313) 39-05011  
RVT-EESE, ECC Bldg., Cube#: 2BH03, Maildrop: 4  
[rlos@ford.com](mailto:rlos@ford.com)

—Original Message—

**From:** Jordan, Donald (D.E.)  
**Sent:** Thursday, April 18, 2002 4:03 PM  
**To:** O'Donohue, Garrett (G.M.); Los, Roman (R.J.); Ali Hamieh (E-mail); 'reid.ericson@us.bosch.com'  
**Cc:** Jordan, Donald (D.E.); Tom Morgan (E-mail); Gokhale, Renuka (R.V.)  
**Subject:** Cooling Fan Stall Protection

- Review proposal to reduce the U204 engine cooling fan fuse ratings to enhance stall protection
- Determine the necessary steps to assess (and potentially implement) the lower rated fuses
- veh @16v what see @ fan

- Simulation(w/&wo resistor(drop in) /or,
- 24v jmp start req
- CAE annalysis results

**Minutes:**

Attendees: Roman Los, Garrett O'Donohue, Reid Erickson, Ali Hasmlah, Don Jordan

Stall protection has been added to fan SDS(Future Model), but protect for D3MY....

U204 D3MY:

**CAE Analysis Info to Roman**

**Motor Modeling**

- 1) Torque vs current & transient current data, either hardware or curves- Bosch(Reid)
- 2) Electrical schematics, Lear(All)
- 3) Considerations
  - a)Cooling system 3 to 2speed
  - current-Inrush & Steady State change

**Timing**

As Soon As Possible

Donald E. Jordan

U204 OPD E/E Systems & EDS

(313) 32-25147

Pager: T (djordan1) or 313-795-4342

---

**From:** Lindbauer, Kenneth (K.J.)  
**Sent:** Thursday, August 16, 2002 7:25 AM  
**To:** Nematollahi, Sonya (S.)  
**Cc:** Bottenberg, John (J.A.)  
**Subject:** Declined: Updated: 2.3L New (4 Stall Issue at APG)

Sonya,  
I cannot attend due to the table layout today. Maybe Jon or Harry can cover.  
Ken

**From:** Hamieh, Ali [AHamieh@lear.com]  
**Sent:** Thursday, May 09, 2002 8:02 PM  
**To:** Los, Roman (R.J.); Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.)  
**Cc:** Morgan, Thomas; Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Cardone, Wesley (W.M.)  
**Subject:** RE: Cooling Fan Stall Protection

Roman, I just talked to our CAD guys right now, and we are going to clean up this schematics, we are targeting for next week to FTP the 2003 U204 physicals to Ford.

If you have an question please let me know!

Thank you

Ali Hamieh

Lear Corporation, LEED  
Senior Systems Engineer  
Ford Truck Product, U204  
Phone: (313) 593-9281  
Pager: (313) 714-1138  
Fax: (313) 240-3520  
e-mail: AHamieh@Lear.com

> -----Original Message-----

> **From:** Los, Roman (R.J.) [SMTP:rlos@ford.com]  
> **Sent:** Thursday, May 09, 2002 3:13 PM  
> **To:** Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamieh  
> (E-mail)'  
> **Cc:** 'Tom Morgan (E-mail)'; Gokhale, Renuka (R.V.); Nematollahi, Sonya  
> (S.); Simmons, Paul (P.); Cardone, Wesley (W.M.)  
> **Subject:** RE: Cooling Fan Stall Protection  
>  
> I have not received even a phone call or email about physical schematics.  
> Please advise, it's been over another week since my last request, and 3  
> weeks since our meeting on the aforementioned issue.  
>  
> Wes, could you please give the team approximate timing on the Cooling Fan  
> models you're creating and/or if you need some other information.  
>

> Thank you  
> Roman Los (rlos) PH#: (313) 59-43845  
> Truck CAE Applications FAX#: (313) 39-05011  
> RVT-EZSE, ECC Bldg., Cube#: 2BH03, Maildrop: 4  
> <mailto:rlos@ford.com>  
>  
>

> > -----Original Message-----

> > **From:** Los, Roman (R.J.)  
> > **Sent:** Wednesday, May 01, 2002 2:23 PM  
> > **To:** Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamieh  
> > (E-mail)'; 'reid.erickson@us.bosch.com'  
> > **Cc:** 'Tom Morgan (E-mail)'; Gokhale, Renuka (R.V.)  
> > **Subject:** RE: Cooling Fan Stall Protection  
> >  
> > Reid dropped off 9 motor/fan assemblies this afternoon (thank you). I  
> > will obtain timing from Wes (our modeling guy) for creating the models.



> >  
> > I am still awaiting the physical schematics from Lear. Cecil posted  
> > logicals last Thursday. I sent him and Ali an email informing them that  
> > they are not physicals. I called Cecil on Monday. He informed me that  
> > Jack Rowe had the physicals. I left a phone message with Jack  
> yesterday.  
> > Jack called this morning during our PMT meeting, that he needed  
> > clarification on which physicals, so I called back after lunch  
> clarifying  
> > that it is current model. Jack's voice mail said he is out today, so  
> I'm  
> > not sure who else to contact and or how to proceed further for current  
> > model physical schematic information.  
> >  
> > Tom, Ali, If there is anybody else at Lear that can help expedite this,  
> it  
> > would be greatly appreciated.  
> >  
> > Thank you  
> > Roman Los (rlos) PH#: (313) 59-43845  
> > Truck CAE Applications FAX#: (313) 39-05011  
> > RVT-EESE, ECC Bldg., Cube#: 2BH03, Maildrop: 4  
> > <mailto:rlos@ford.com>  
> >  
> >  
> > -----Original Message-----  
> > From: Jordan, Donald (D.E.)  
> > Sent: Thursday, April 18, 2002 4:03 PM  
> > To: O'Donohue, Garrett (G.M.); Los, Roman (R.J.); Ali Hameh (E-mail);  
> > 'reid.erickson@us.bosch.com'  
> > Cc: Jordan, Donald (D.E.); Tom Morgan (E-mail); Gokhale, Renuka (R.V.)  
> > Subject: Cooling Fan Stall Protection  
> >  
> > - Review proposal to reduce the U204 engine cooling fan fuse ratings to  
> > enhance stall protection  
> > - Determine the necessary steps to assess (and potentially implement)  
> the  
> > lower rated fuses  
> > - veh @16v what see @ fan  
> > - Simulation(w/swo resistor(drop in) /cr,  
> > - 24v jmp start req  
> > - CAE annalysis results  
> >  
> > Minutes:  
> > Attendees: Roman Los, Garrett O'Donohue, Reid Erickson, Ali  
> Hameh,  
> > Don Jordan  
> >  
> > Stall protection has been added to fan SDS(Future Model), but protect  
> for  
> > 03MY....  
> >  
> > U204 03MY:  
> >  
> > CAE Analysis info to Roman  
> > Motor Modeling  
> > 1) Torque vs current & transient current data, either hardware  
> or  
> > curves- Bosch(Reid)

> > 2) Electrical schematics, Lear(Alf)  
> > 3) Considerations  
> > a)Cooling system 3 to 2speed  
> > current-inrush & Steady State change  
> >  
> > Timing  
> > As Soon As Possible!  
> >  
> >  
> > Donald E. Jordan  
> > U204 OPD E/E Systems & EDS  
> > (313) 32-25147  
> > Pager: T (djordan1) or 313-795-4342  
> >

**From:** Fournelle, Gilbert (G.)  
**Sent:** Tuesday, September 03, 2002 3:27 PM  
**To:** Altoonien, Don (D.J.); Bauer, Scott (S.C.); Bhowari, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell (E-mail); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duval, Allen (A.W.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Gilles, Stuart (S.); Gokhale, Renuka (R.V.); Goodwin, William (W.R.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Harr, George (G.J.); Holman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Jiyunichiro (J.); Jenean, Ted (T.E.); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); Khan, Naveed; Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Lawler, David (D.A.); Le, Dzong (D.H.); Limlaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Marok, Edmond (E.C.); Metess, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McDonald, John; McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tomiko (T.T.); Morishima, Shigeki (S.); Nematollahi, Sorya (S.); Nikolai, Samie; Notaboom, Jim (J.E.); Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquesau, Alden (A.P.); Rothweller, Daniel (D.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shiralshi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veenastra, Tim (T.W.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Les (L.H.W.)  
**Subject:** Phantom stall meeting agenda 9/5/02

There will be a stall meeting this Thursday at 2:00pm (normal scheduled time).



U204 Stall Issues  
Meeting Agenda

dial in info:

toll free: 1-866-227-7015

Ford net: 954-1206

International: 1-630-693-6145

pass code: 8402370#

***Gilbert Fournelle***

V6 U204 Calibration Engineering

1AE27 Truck Engine Engineering (TEE)

Phone:(313)3904968 Fax:(313)3231786

ER82-627-A 8349

**Subject:** U204 phantom stall meeting  
**Location:** TEE CR-1

**Start:** Thu 9/5/02 2:00 PM  
**End:** Thu 9/5/02 3:00 PM  
**Show Time As:** Tentative

**Recurrence:** Weekly  
**Recurrence Pattern:** every Thursday from 2:00 PM to 3:00 PM

**Meeting Status:** Not yet responded

**Required Attendees:** Alconian, Don (D.J.); Bauer, Scott (S.C.); Bhotwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell (E-mail); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duvall, Allen (A.W.); Fasoetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Gilles, Stuart (S.); Gokhale, Renuka (R.V.); Goodwin, William (W.R.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoehne, Jun (J.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); Khan, Naveed; Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Lawler, David (D.A.); Le, Dzong (D.H.); Limfaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Marok, Edmond (E.C.); Matosa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McDonald, John; McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tomiko (T.T.); Morishima, Shigeki (S.); Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortnan, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirakishi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veensma, Tim (T.W.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Les (L.H.W.)

toll free: 1-888-227-7015  
Ford net: 954-1206  
International: 1-830-883-8145

pass code: 8402370#

From: Erickson Reid (AB/EAS4) [Reid.Erickson@us.bosch.com]  
Sent: Friday, May 10, 2002 3:13 PM  
To: 'Cardone, Wesley (W.M.)'  
Cc: 'Tom Morgan (E-mail)'; Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); O'Donohue, Garrett (G.M.); Makki, Asaad (A.); Taleb, Mahmoud (M.); Los, Roman (R.J.); Jordan, Donald (D.E.); 'Ali Hamieh (E-mail)'  
Subject: RE: Cooling Fan Stall Protection

Wes,

The red and white dots are on the outside of the shroud (lower left corner). The green dot is likely on the inside surface of the shroud, and I believe that this mark is a certification that the part has been function tested on the assembly line.

-- Reid

Reid Erickson

Robert Bosch Corporation (248) 848-2842  
Airflow Systems Engineering FAX (248) 848-2880  
38000 Tech Hills Drive Mobile (734) 646-6627  
Farmington Hills, MI 48331 USA mailto:reid.erickson@us.bosch.com

-----Original Message-----

From: Cardone, Wesley (W.M.) [mailto:wcardone@ford.com]  
Sent: Friday, May 10, 2002 1:44 PM  
To: O'Donohue, Garrett (G.M.)  
Cc: 'Tom Morgan (E-mail)'; Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Makki, Asaad (A.); Taleb, Mahmoud (M.); 'reid.erickson@us.bosch.com'; Los, Roman (R.J.); Jordan, Donald (D.E.); 'Ali Hamieh (E-mail)'  
Subject: RE: Cooling Fan Stall Protection

At least one of the assemblies has a green dot. What does that mean?

> -----Original Message-----

> From: O'Donohue, Garrett (G.M.)  
> Sent: Thursday, May 09, 2002 3:53 PM  
> To: Cardone, Wesley (W.M.)  
> Cc: 'Tom Morgan (E-mail)'; Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Makki, Asaad (A.); Taleb, Mahmoud (M.); 'reid.erickson@us.bosch.com'; Los, Roman (R.J.); Jordan, Donald (D.E.); 'Ali Hamieh (E-mail)'  
> Subject: RE: Cooling Fan Stall Protection

>

> Wes,

> The left and right motors for a given assembly are identical. However they have different fans attached to them. For all the assemblies you have, you can identify the fans by the number of blades

> - Left Fan (driver's side) has 5 blades

> - Right Fan (passenger's side) has 6 blades

>

> There were also colored dots placed on the shrouds to identify the different assemblies

> - Red Dots: I4 Manual  
> - White Dots: I4 Auto  
> - No Dots: V6  
>  
> Garrett  
>  
> -----Original Message-----  
> From: Cardone, Wesley (W.M.)  
> Sent: Thursday, May 09, 2002 3:20 PM  
> To: Los, Roman (R.J.); Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamieh (E-mail)'  
> Cc: 'Tom Morgan (E-mail)'; Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Makki, Asaad (A.); Taleb, Mahmoud (M.)  
> Subject: RE: Cooling Fan Stall Protection  
>  
> I have completed laboratory measurements on YL84-86607-AK. We could have it released by Tuesday. I would like to know though how to identify between the two motors for model construction. I assume that one is commonly called passenger side and the other driver. Please identify how to identify which is which.  
>  
> The other two I should have done by Wednesday, May 22.  
>  
> Wes  
>  
> -----Original Message-----  
> From: Los, Roman (R.J.)  
> Sent: Thursday, May 09, 2002 3:13 PM  
> To: Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamieh (E-mail)'  
> Cc: 'Tom Morgan (E-mail)'; Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Cardone, Wesley (W.M.)  
> Subject: RE: Cooling Fan Stall Protection  
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> I have not received even a phone call or email about physical schematics. Please advise, it's been over another week since my last request, and 3 weeks since our meeting on the aforementioned issue.  
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> Thank you  
> Roman Los (rlos) PH#: (313) 59-43845  
> Truck CAE Applications FAX#: (313) 39-05011  
> RVT-EESE, ECC Bldg., Cube#: 2BH03, Maildrop: 4  
> <mailto:rlos@ford.com>  
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> -----Original Message-----  
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> Sent: Wednesday, May 01, 2002 2:23 PM  
> To: Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamieh (E-mail)'; 'reid.ericson@us.bosch.com'  
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> Tom, Ali, If there is anybody else at Lear that can help expedite this, it would be greatly appreciated.

>  
> Thank you  
> Roman Los (rlos) PH#: (313) 59-43845  
> Truck CAE Applications FAX#: (313) 39-05011 >  
> RVT-EESE, ECC Bldg., Cube#: 2BH03, Maildrop: 4  
> <mailto:rlos@ford.com>

>  
>  
> -----Original Message-----  
> From: Jordan, Donald (D.E.)  
> Sent: Thursday, April 18, 2002 4:03 PM  
> To: O'Donohue, Garrett (G.M.); Los, Roman (R.J.); Ali Hasmieh (E-mail); 'reid.erickson@us.bosch.com'  
> Cc: Jordan, Donald (D.E.); Tom Morgan (E-mail); Gokhale, Renuka (R.V.)  
> Subject: Cooling Fan Stall Protection

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> - Review proposal to reduce the U204 engine cooling fan fuse ratings to enhance stall protection  
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> - CAE annalysis results

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> Minutes:  
> Attendees: Roman Los, Garrett O'Donohue, Reid Erickson, Ali Hasmieh, Don Jordan

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> Stall protection has been added to fan SDS(Future Model), but protect for 03MY....

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> U204 03MY:

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> CAE Analysis info to Roman  
> Motor Modeling  
> 1) Torque vs current & transient current data, either hardware or curves- Bosch(Reid)  
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> a)Cooling system 3 to 2speed  
> current-inrush & Steady State change

>  
> Timing  
> As Soon As Possible!

>  
>

> Donald E. Jordan  
> U204 OPD E/E Systems & EDS  
> (313) 32-25147  
> Pager: T (djordan1) or 313-795-4342  
>



**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, July 31, 2002 5:27 PM  
**To:** Benz, Greg (G.H.); Gould, Robert (R.M.); Deeb, Joe (J.S.); Bernie Nikolai (E-mail); Andy Jones (E-mail); Bodnar, Les (L.R.); Maxwell, Jerry (J.F.); Lindbauer, Kenneth (K.J.); Moorhouse, Scott (S.R.); Nemakolehl, Sonya (S.); Goodwin, William (W.R.)  
**Cc:** Andrew Woodings; Gilbert Fournelle; Hookaday Jr., John (J.C.); John Bogema; John Meless; Mikota, Dennis (D.P.); Muriel Sanders; Robert Hurley; Roger Mandzuk  
**Subject:** RE: U204 Stall Investigation, 7-26-02—Signal return wiring issues.

Don/Greg,

When we reviewed the wiring harness drawings against the Ford wiring guidelines, I don't recall discussion of this issue. In fact, just by searching through the service manual we couldn't find the engine block/PCM ground loop discussed in this paper.

We have seen noisy cam position sensor signals on multiple (non-stalling) vehicles. If there is an opportunity to clean up these signals with a simple wiring change, I'd like to include it in the Job #2 release, if possible.

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31766  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

—Original Message—

**From:** Benz, Greg (G.H.)  
**Sent:** Wednesday, July 31, 2002 8:08 AM  
**To:** Gould, Robert (R.M.); Deeb, Joe (J.S.); Bernie Nikolai (E-mail); Andy Jones (E-mail); Bodnar, Les (L.R.); Maxwell, Jerry (J.F.); Lindbauer, Kenneth (K.J.); Dalbo, Bob (R.J.)  
**Subject:** FW: U204 Stall Investigation, 7-26-02—Signal return wiring issues.

—Original Message—

**From:** Goodwin, William (W.R.)  
**Sent:** Tuesday, July 30, 2002 5:21 PM  
**To:** Noteboom, Jim (J.E.); Moorhouse, Scott (S.R.)  
**Cc:** Young, Leon (.); Benz, Greg (G.H.)  
**Subject:** RE: U204 Stall Investigation, 7-26-02—Signal return wiring issues.

We have data from Kelvin Dobbins in advanced controls suggesting that there is a wiring harness error on the signal return circuit on U204 production vehicles. This could be part of some field issues you are experiencing on the vehicle. The intended configuration is for the signal return is supposed to be a clean ground circuit. On the U204, I am told that this circuit is grounded to both engine block and the PCM ground location. This basically couples significant ignition noise (and other noise sources) into any device using signal return.

I do not know enough about your control system to speculate on the potential problems of this design. If nothing else, this should be corrected for all production harnesses as soon as it can be reasonably implemented. I have no information that this is related to the problems below, but I believe there should be an assessment a potential interaction effect.

Here is Kelvin Dobbins note:

We have also checked this out on a vehicle. Although we see the common mode noise problem on the old signal on the vehicle as well, we are only getting one simultaneous fuel pulse before the start of self.

<< File: vehicle checkout.doc >>

The tiff preview images in the Word file are a little crude. If you want a higher resolution image, you can either print it out on a postscript printer or create a pdf file using adobe distiller.

Kelvin Dobbins  
Senior Technical Specialist  
Powertrain Controls Research and Development  
Ford Research Laboratories

Gas Turbine Laboratory, Rm. 1115  
Phone: 313-322-0457  
Fax: 313-317-7404  
email: kdobbins@ford.com

Please contact me if you would like to discuss further.

Regards,

Bill Goodwin

Product Design Engineer, Ignition Systems  
V Engine Engineering, Ford Motor Company  
Tel: 313 337-0679 Fax: 313 380-4084  
email: wgoodwin@ford.com  
faxpage mailto:3137980571@alphapage.airtouch.com

—Original Message—

From: Noteboom, Jim (J.E.)  
Sent: Tuesday, July 30, 2002 11:27 AM  
To: Sanders, Muriel (M.S.); Alcorn, Don (D.J.); Bauer, Scott (S.C.); Bhajwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell, Chick, John (J.); Chin, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (B.J.); Dan Rothweiler; De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duvall, Allen (A.W.); Fawcett, Bob (B.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Ranuka (R.V.); Goodwin, William (W.R.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Hart, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Jyunichiro (J.); Jensen, Ted (T.E.); John McDonald; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shing (S.); King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); La, Dzung (D.H.); Lumbico, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Mandzik, Roger (R.S.); Marck, Edmond (E.C.); Matase, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nemakolahi, Sonya (S.); Nikolai, Bamie; Ortman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Aiden (A.P.); Shah, Kian (K.C.); Shirahishi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Takasawa, Keith (K.D.); Tekubo, Hirochi (H.); Veenstra, Tim (T.W.); Wakanell, Ray (R.A.); Weltach, Bill (B.); Williams, Les (L.H.W.); Young, Lem (L.)  
Subject: RE: U204 Stall Investigation, 7-26-02

VEH: '02 Escape VIN: 1FMCU04112KD11749 BUILT: 4-11-02  
MILES: 1650

CUSTOMER: [REDACTED] LOCATION: Northglenn, Colo.

COMPLAINT: Stalls in slow traffic. Note: the stall occurs in the same location (80th between Wadsworth and 36) as the previous vehicle; checked this out and there are high tension lines crossing the road there.

TSB and SSM results:

- IAC=34%
- EVAP system passed.
- DPFE and EEC relay are the latest.
- Keys do not have excessive weight.
- All related grounds were secure.

Based on the stall location and the possibility of RFI, the MAF was updated to a 1L2Z-BA.

Also on this vehicle the battery was leaking from the seam on the corner opposite the negative post (see photos). The customer stated that when the vehicle was purchased, the original batt. was dead and was replaced. This batt. was not a service piece but looked like original equipment so it's history is in question. A new service batt. was installed.

<< File: MVC-039F.JPG >>  
Serial no.

<< File: MVC-040F.JPG >>  
Acid drip from seam.

Jim Noteboom  
Powertrain Field Quality Specialist/Denver  
Phone: 303.674.4015 FAX: 303.674.5730  
Cell: 303.921.2076

---

**From:** Dalbo, Bob (R.J.)  
**Sent:** Monday, August 05, 2002 4:59 PM  
**To:** Altoonlan, Don (D.J.); Corbett, Sandra (S.M.); NemotoMahl, Sonya (S.); Jordan, Donald (D.E.);  
Gilbert Fournelle  
**Cc:** Hoffman, Michael (M.V.); Bob Fascetti  
**Subject:** FW: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

New wiring issues.

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Moorhouse, Scott (S.R.)  
**Sent:** Friday, August 02, 2002 4:58 PM  
**To:** Alvarado, CJ (C.J.); New, Michael (M.D.); Stigantbauer, Jeffrey (J.R.); Ray, Charles (C.)  
**Cc:** Dalbo, Bob (R.J.); Linda, Peter (P.A.)  
**Subject:** CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

I discussed vehicle with Mathew Razzo, service manager. Vehicle was not the typical "stall" claim. At times vehicle would be electrically dead and have no-start condition. Other times it would die in decel. Slamming door sometimes resulted in vehicle dying. Dealer has determined problem to be with under dash fuse box. He has been able to repeat the no start condition by tapping on the fuse panel.

Dealer intention is to replace the fuse box. I have asked him to hold the part for our review.

Scott Moorhouse  
U204 PTSE Resident Engineer  
Kansas City Assembly Plant  
(ph) 816-459-1985 (fax) 816-459-1728  
[smoorhou@ford.com](mailto:smoorhou@ford.com)

**From:** Dalbo, Bob (R.J.)  
**Sent:** Tuesday, August 06, 2002 5:38 PM  
**To:** Nematollahi, Sonya (S.)  
**Cc:** Hoffman, Michael (M.V.); Fascetti, Bob (R.J.); Altoonian, Don (D.J.); Corbett, Sandra (S.M.); Jordan, Donald (D.E.); Fournelle, Gilbert (G.)  
**Subject:** RE: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

Sonya,  
if your team has someone in KCAP or you want to work through the Lear resident, that's fine. I assume from Scott's note that he intended to look into it at KCAP, but he is on vacation this week and I can't confirm it with him. I didn't want you to get blindsided with this issue, that's all.

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Nematollahi, Sonya (S.)  
**Sent:** Monday, August 05, 2002 6:09 PM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** Hoffman, Michael (M.V.); Fascetti, Bob (R.J.); Altoonian, Don (D.J.); Corbett, Sandra (S.M.); Jordan, Donald (D.E.); Fournelle, Gilbert (G.)  
**Subject:** RE: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

Bob, are KCAP folks planning to examine the vehicle/fuse box or should the Dearborn team get involved? We certainly don't need duplication of efforts. Don Jordan is on vacation this week, but I can put someone else on this right away if needed. Please advise. Thanks.

*Sonya Nematollahi*

Escape/Tribute/Maverick Electrical Team Leader  
Phone: 313-799889  
Pager: Text, 313-795-8332  
email: [snematol@ford.com](mailto:snematol@ford.com)

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Monday, August 05, 2002 4:59 PM  
**To:** Altoonian, Don (D.J.); Corbett, Sandra (S.M.); Nematollahi, Sonya (S.); Jordan, Donald (D.E.); Gilbert Fournelle  
**Cc:** Hoffman, Michael (M.V.); Bob Fascetti  
**Subject:** FW: CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

New wiring issues.

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Moorhouse, Scott (S.R.)  
**Sent:** Friday, August 02, 2002 4:58 PM  
**To:** Alvarado, OJ (O.J.); New, Michael (M.D.); Stigenbauer, Jeffrey (J.R.); Ray, Charles (C.)  
**Cc:** Dalbo, Bob (R.J.); Unde, Peter (P.A.)  
**Subject:** CUSTOMER VEHICLE EXHIBITING "STALLS", SUNFLOWER MAZDA

I discussed vehicle with Mathew Razzo, service manager. Vehicle was not the typical "stall" claim. At times vehicle would be electrically dead and have no-start condition. Other times it would die in decel. Slamming door sometimes resulted in vehicle dying. Dealer has determined problem to be with under dash fuse box. He has been able to repeat the no start condition by tapping on the fuse panel.

Dealer intention is to replace the fuse box. I have asked him to hold the part for our review.

Scott Moorhouse  
U204 PTSE Resident Engineer  
Kansas City Assembly Plant  
(ph) 816-459-1965 (fax) 816-459-1728  
[smoorhou@ford.com](mailto:smoorhou@ford.com)

**From:** Cardone, Wesley (W.M.)  
**Sent:** Thursday, May 09, 2002 3:20 PM  
**To:** Los, Roman (R.J.); Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamleh (E-mail)'  
**Cc:** Tom Morgan (E-mail); Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Makki, Assad (A.); Teleb, Mahmoud (M.)  
**Subject:** RE: Cooling Fan Stall Protection

I have completed laboratory measurements on YL84-86807-AK. We could have it released by Tuesday. I would like to know though how to identify between the two motors for model construction. I assume that one is commonly called passenger side and the other driver. Please identify how to identify which is which.

The other two I should have done by Wednesday, May 22.

Wes

-----Original Message-----

**From:** Los, Roman (R.J.)  
**Sent:** Thursday, May 09, 2002 3:13 PM  
**To:** Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamleh (E-mail)'  
**Cc:** Tom Morgan (E-mail); Gokhale, Renuka (R.V.); Nematollahi, Sonya (S.); Simmons, Paul (P.); Cardone, Wesley (W.M.)  
**Subject:** RE: Cooling Fan Stall Protection

I have not received even a phone call or email about physical schematics. Please advise, it's been over another week since my last request, and 3 weeks since our meeting on the aforementioned issue.

Wes, could you please give the team approximate timing on the Cooling Fan models you're creating and/or if you need some other information.

Thank you

Roman Los (rios) PH#: (313) 59-43845  
Truck CAE Applications FAX#: (313) 39-05011  
RVT-EESE, ECC Bldg., Cube#: 2BH03, Maildrop: 4  
[smallto:rios@ford.com](mailto:smallto:rios@ford.com)

-----Original Message-----

**From:** Los, Roman (R.J.)  
**Sent:** Wednesday, May 01, 2002 2:23 PM  
**To:** Jordan, Donald (D.E.); O'Donohue, Garrett (G.M.); 'Ali Hamleh (E-mail)'; 'reid.ericson@us.bosch.com'  
**Cc:** Tom Morgan (E-mail); Gokhale, Renuka (R.V.)  
**Subject:** RE: Cooling Fan Stall Protection

Reid dropped off 9 motor/fan assemblies this afternoon (thank you). I will obtain timing from Wes (our modelling guy) for creating the models.

I am still awaiting the physical schematics from Lear. Cecil posted logicals last Thursday. I sent him and Ali an email informing them that they are not physicals. I called Cecil on Monday. He informed me that Jack Rowe had the physicals. I left a phone message with Jack yesterday. Jack called this morning during our PMT meeting, that he needed clarification on which physicals, so I called back after lunch clarifying that it is current model. Jack's voice mail said he is out today, so I'm not sure who else to contact and or how to proceed further for current model physical schematic information.

Tom, Ali, if there is anybody else at Lear that can help expedite this, it would be greatly appreciated.

Thank you

Roman Los (rios) PH#: (313) 59-43845  
Truck CAE Applications FAX#: (313) 39-05011  
RVT-EESE, ECC Bldg., Cube#: 2BH03, Maildrop: 4  
[smallto:rios@ford.com](mailto:smallto:rios@ford.com)

-----Original Message-----

E982-827-A 8382

From: Jordan, Donald (D.E.)  
Sent: Thursday, April 18, 2002 4:03 PM  
To: O'Donohue, Garrett (G.M.); Los, Roman (R.J.); Reid Erickson (E-mail); 'reid.erickson@us.bosch.com'  
Cc: Jordan, Donald (D.E.); Tom Morgan (E-mail); Gokhale, Renuka (R.V.)  
Subject: Cooling Fan Stall Protection

- Review proposal to reduce the U204 engine cooling fan fuse ratings to enhance stall protection
- Determine the necessary steps to assess (and potentially implement) the lower rated fuses
- veh @ 16v what see @ fan
- Simulation(w/ & w/o resistor(drop in) /cr,
- 24v jmp start req
- CAE analysis results

**Minutes:**

Attendees: Roman Los, Garrett O'Donohue, Reid Erickson, Ali Hasmieh, Don Jordan

Stall protection has been added to fan SDS(Future Model), but protect for 03MY....

**U204 03MY:**

**CAE Analysis info to Roman**

**Motor Modeling**

- 1) Torque vs current & transient current data, either hardware or curves- Bosch(Reid)
- 2) Electrical schematics, Lear(All)
- 3) Considerations
  - a) Cooling system 3 to 2 speedcurrent-inrush & Steady State change

**Timing**

As Soon As Possible

Donald E. Jordan

U204 OPD E/E Systems & EDS

(313) 32-25147

Pager: T (djordan1) or 313-795-4342

**Subject:** Updated: 2.3L New H Stall issue at APG  
**Location:** Audio Call In  
**Start:** Thu 8/15/02 9:00 AM  
**End:** Thu 8/15/02 10:00 AM  
**Show Time As:** Tentative  
**Recurrence:** (none)  
**Meeting Status:** Not yet responded  
**Required Attendees:** Austin, James (J.E.); Buick, Jeffrey (J.); Diamond, Scott (S.R.); Cianciolo, David (D.A.); 'mh1110@viateon.com'; Pratt, Joe (J.W.); Liu, Qun (Q.); Gould, Robert (R.M.); Lilly, Chris (C.M.); Lindbauer, Kenneth (K.J.); Namatollahi, Sonya (S.); 'ajones8@viateon.com'  
**Importance:** High

**Ford Net:** 9-1-954-1136  
**Toll Free:** 877-870-3247  
**Pass code:** 6653682  
**Moderator:** 2607882

**Team,**  
Need total Team effort to address this issue.  
It seems like we have an intermittent issue - need to Craft an evaluation plan to find out what the issue is.  
**Sonya,**  
Really need electrical support to help understand this issue.

**Issue:**  
AP2 vehicle  
Automatic trans  
Vehicle would stall intermittently at APG  
Has also happened in Dearborn.  
Fuel pressure gauge shows that the vehicle when the fuel pressure on the fuel rail got to below 30 psi  
Veh speed at 75 mph  
Or when you tip in.  
  
Checked fuel pump - Chris Lilly told them to use a U221 fuel pump  
No change.  
Fuel Pressure sensor - when vacuum connection removed, fuel rail pressure increased.  
Also does not stall as much, but still stalls.  
  
Ambient Temp  
Runs better at cool temps but still stalls.  
  
Gas tank Level:  
Varied tank levels revealed the same result.



# User's Manual

## Model 700824 Wide Bandwidth Differential Probe for DL Series

This probe is in compliance with IEC-61010-1, IEC-61010-2-01 CAT: III, Pollution Degree 2.

### Safety Precautions

Make sure to comply with the safety precautions mentioned hereafter when handling the probe.  
YOKOGAWA ELECTRIC assumes no responsibility for any consequences resulting from failure to comply with these safety precautions.  
Also, read the User's Manual of the measuring instrument thoroughly so that you are fully aware of its specifications and handling, before making to use the probe.

#### General definitions of safety symbols and markings



This symbol indicates the risk of injury, death of personnel, or damage to the instrument.  
Be sure to refer to the corresponding explanation in the User's Manual.



Procedures governing removal.



Danger: High voltage.



This symbol calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death of personnel.



This symbol calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part of the product.

#### Note: Be sure to comply with the following safety precautions in order to prevent accidents such as an electric shock which impairs serious health risks to the user and damage to the instrument.



##### Grounding of the measuring instrument

The protective grounding terminal of the measuring instrument must be connected to ground.

##### Earth points of the probe

Make sure to connect the earth cable of the probe to the ground (ground potential).

##### Connecting the subject of measurement

Make sure to avoid an electric shock when separating the probe to the object of measurement. Do not remove the probe from the measuring instrument after the object of measurement is connected.

##### Do not operate with suspended failures

If you suspect that there is damage to this probe, have it repaired by a service personnel.

##### Observe maximum working voltage

To avoid any electric shock, do not use the probe above 1400V peak between each input lead and earth, or between the two inputs. This voltage rating applies to both 1/100 and 1/500 ratings.

##### Must be grounded

This probe must be grounded with the EMC shield and an auxiliary grounding terminal, through the grounding cable of the power cord of the measuring instrument or other appropriate grounding conductor.

Before making connection to the input terminals of the probe, make sure that the signal connector is attached to the EMC connector of the measuring instrument and the auxiliary grounding terminal is connected to a proper ground, while the measuring instrument is properly grounded.

##### Do not operate without cover

To avoid electric shock or fire hazard, do not operate this probe with the cover removed.

##### Do not operate in lightning environment

To avoid electric shock, do not operate this probe in wet or damp conditions.

##### Do not operate in explosive atmosphere

To avoid injury or fire hazard, do not operate this probe in an explosive atmosphere.

##### Avoid improper circuitry

To avoid injury, severe electric shock or fire, avoid using this probe in a circuit with high voltage. Do not touch exposed connections and components when power is present.



##### Maximum input voltage

Do not apply any voltage exceeding the maximum input voltage to the probe.

##### Use proper power source

Use four AA cells or 5VDC/500mA external power supply. Do not operate this probe from a power source that applies more than the voltage specified.

#### Terms appear in this manual



Attached to the instrument, indicating that for safety, the operator should refer to the User's Manual.



Cautionary precautions that should be observed to prevent the danger of injury or death to the user.



Cautionary precautions that should be observed to prevent damage to the instrument.

#### Note

Provides information that is important for proper operation of the instrument.

#### 1 Description

By using this device, oscilloscopes with single-ended input can be easily used as well as scopes with differential inputs.

#### 2 Appearance

The differential probe looks as follows and consists of the following equipment supplied.



#### Supplied equipment

- 1 Probe
- 2 Pinchers (tip)
- 3 Ground extension lead (length 100cm)

#### Accessories

- Pinchers tip black: BNC251B  
Pinchers tip red: BNC251C

### 3 Specifications

|                                                           |                                                                                                              |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Frequency bandwidth                                       | DC - 100kHz (-3dB) in case of a power supply voltage of more than 5V                                         |
| Input type                                                | Balance differential input                                                                                   |
| Attenuation ratio                                         | switched ratio of 100:1 and 1000:1                                                                           |
| Output offset voltage                                     | ±7.5 mV                                                                                                      |
| Input resistance and capacity                             | 40kΩ ± 10% each side to ground                                                                               |
| Differential allowable voltage (between + and - terminal) | ±1400 V (DC + ACpeak) or 1000 Vrms at 1000:1 attenuation                                                     |
| Max common mode voltage                                   | ±150 V (DC + ACpeak) or 250 Vrms at 100:1 attenuation                                                        |
| Max input voltage (to ground)                             | ±1400 V (DC + ACpeak) or 1000 Vrms                                                                           |
| CMRR (typical)                                            | 60dB; less than -60dB; 1kHz; less than -30dB                                                                 |
| Output voltage                                            | ±1.5 V (DC or ACpeak)                                                                                        |
| Output impedance                                          | Using I&D input system coefficients                                                                          |
| Gain accuracy                                             | ±2% (common mode voltage ≤ 400 V)<br>±2% (common mode voltage ≤ 1000 V)                                      |
| Ambient operating temperature                             | 5 to 40°C                                                                                                    |
| Ambient storage temperature                               | -30 to 70°C                                                                                                  |
| Power requirements*                                       | Internal battery: four dry cells (R6P, RUM-1)<br>External power supply: 6 VDC / at least 200 mA, center plus |
| Battery life time                                         | In continuous duty, approx. 2 hours                                                                          |
| Dimensions                                                | 287mm × 83mm × 23mm (excluding rubber case, connector and cable)                                             |
| Weight                                                    | Approx. 300g (excluding battery)                                                                             |
| Withstanding voltage                                      | 2000 VACrms (between input terminal and EMC-ground), for 5 minutes                                           |



\* When the actual load working voltage drops below 4V, the power supply will be automatically interrupted.

### 4 Installing / Replacing the Batteries

Insert the 4 cells at the back side of the probe and install / replace the four dry cells. Batteries are not installed on receipt of the instrument.

### 5 Operation

1. Insert four AA cells.
2. Simply plug-in the BNC output connector to the vertical input of a oscilloscope, and connect the auxiliary grounding terminal to a proper ground. If necessary, use a ground extension lead.
3. Select the proper range setting. For higher resolution and less noise when measuring signals below 150V, switch the attenuation to 1/10. Otherwise, set the attenuation to 1/100 when measuring signals above 350V.
4. Using the appropriate probe accessories, connect the input to the circuit under measurement.



#### CAUTION

- To protect against electric shock, the ground side of the output cable (the shielded side of the EMC connector) must be grounded.
- When disconnecting the BNC connector, always first separate the probe from the high voltage parts of the circuit under measurement.
- When replacing the batteries or connecting the external power supply, always first remove the test lead from the circuit under measurement.



#### CAUTION

- This probe is to carry out differential measurement between two points on the circuit under measurement. This probe is not for electrically insulating the circuit under measurement and the measuring instrument.
- Use a soft cloth to clean the dist. Prevent damage to the probe.
- Avoid inserting the probe.
- Avoid using abrasive cleaners.
- Avoid using chemicals contains benzene or similar solvents.

• Connect the EMC connector to the input terminal of the oscilloscope and for two point measurement (differential measurement), connect both input leads. Because the performance declines in case you carry out measurements with only one input lead connected, make sure to always connect both.

• In order to guarantee its specifications, this probe automatically interrupts the power supply when the actual load working voltage falls below 4V. In such a case, replace the batteries.

• In case you are using the YOKOGAWA DLJ140/110 oscilloscope, the I&D EMC extension adapter (70044670040) is necessary.

#### Note

This device is not specified by any calibration certificate. Its test certificate is provided.

Accessory for YOKOGAWA DL Series Digital Oscilloscopes  
100 MHz band differential probe

YOKOGAWA ◆

700924

NEW

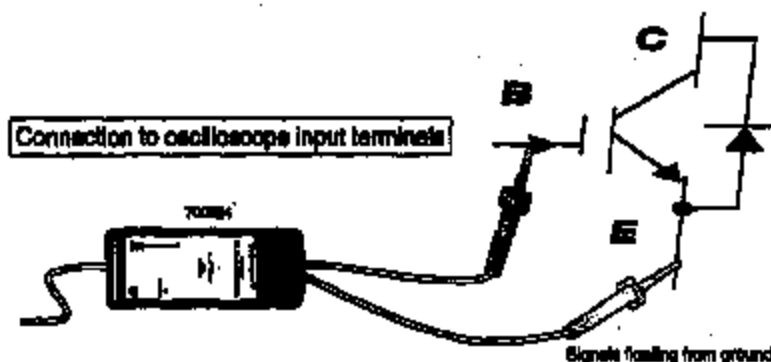


## Differential Probe Capable of Wide-Band, High-Voltage Floating Measurements

Allows you to use a single-end input oscilloscope for wide-band differential input measurements



Waveform observed on oscilloscope



Oscilloscope input amplifiers are normally single-ended. They do not provide accurate measurements when used in combination with a 10:1 passive probe for measuring the gate-to-emitter voltage of a switching power supply, or potential difference with a common mode voltage in elements such as Insulated Gate Bipolar Transistors (IGBTs). Furthermore, there is a risk that current will enter through the oscilloscope's ground line and damage the oscilloscope.

With increases in the speed of measured signals in recent years, it has become necessary to make floating measurements over a wide frequency band. The 700924 differential probe lets you make wide-band (100 MHz) differential input measurements. Just connect the probe to the input of a single-end input digital oscilloscope.

 YOKOGAWA  
Yokogawa Electric Corp. WWW.yokogawa.com  
http://www.yokogawa.com/products/oscilloscopes/700924.html

Bulletin 7009-24E

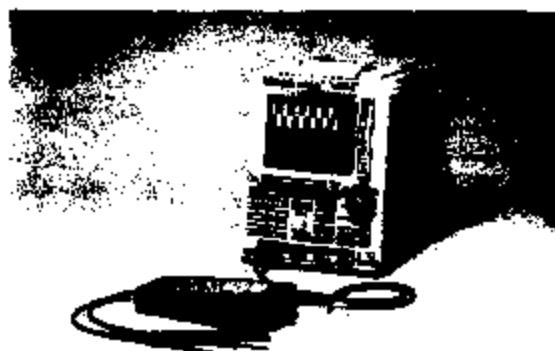
EAS2-827-A 8480

# 100 MHz band differential probe

# 700924



- **Overrange (outside-range) indicator**  
This light turns on when the permitted differential voltage is exceeded. During DC measurements, it turns on as an alert at voltages of 350 V and higher with a 1/100 range setting, and at voltages of 1400 V and higher with a 1/1000 range setting.
- **Power switch**
- **AC/DC adapter connector**  
(on side of probe)  
This DC adapter powers the probe. The probe can also be powered by four dry cells without using an AC/DC adapter.
- **1/100-1/1000 selector switch**  
This switch is used to select the input voltage attenuation ratio.



**Example of probe connection with DL1540CL digital oscilloscope**  
Two or more differential probes can be connected to measure signals with different ground levels on each channel.

## Specifications

|                                              |                                                                                                                       |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Input type:</b>                           | Balanced differential input                                                                                           |
| <b>Frequency band:</b>                       | DC up to 100 MHz (-3 dB)                                                                                              |
| <b>Input attenuation ratio:</b>              | Switched between 1/100 and 1/1000                                                                                     |
| <b>Input impedance:</b>                      | Approximately 4 MΩ, approximately 10 pF parallel                                                                      |
| <b>Gain accuracy:</b>                        | ±2% (common mode voltage ≤ 400 V)<br>±8% (common mode voltage ≤ 1000 V)                                               |
| <b>Maximum allowed differential voltage:</b> | ±350 V (DC + ACpeak) or 350 Vrms (1/100 range)<br>±1400 V (DC + ACpeak) or 1000 Vrms (1/1000 range)                   |
| <b>Maximum common mode input voltage:</b>    | ±1400 V (DC + ACpeak) or 1000 Vrms (both 1/100 and 1/1000 ranges)                                                     |
| <b>Maximum input voltage:</b>                | ±1400 V (DC + ACpeak) or 1000 Vrms (1/1000 range)                                                                     |
| <b>Common Mode Rejection Ratio (CMRR):</b>   | -60 dB (50 Hz), -50 dB (1 MHz)                                                                                        |
| <b>Output voltage:</b>                       | ±0.5 V                                                                                                                |
| <b>Output impedance:</b>                     | Used with 1 MΩ input impedance                                                                                        |
| <b>Power supply:</b>                         | Dry cells, four R6P (5UM-3); when using the AC/DC adapter, use an output voltage of 8 V/500 mA or greater/center plus |
| <b>Dry cell life:</b>                        | Approximately 2 hours under continuous use                                                                            |
| <b>External dimensions (approximate):</b>    | 207 mm × 53 mm × 38 mm <sup>1)</sup>                                                                                  |
| <b>Total length:</b>                         | Approximately 1.8 meters                                                                                              |
| <b>Weight:</b>                               | Approximately 300 grams (excluding dry cells)                                                                         |
| <b>Approved standards:</b>                   |                                                                                                                       |
| EMC:                                         | EN55011: 1001 + A1; 1007 + A2; 1005<br>EN50082-1: 1002                                                                |
| Safety:                                      | EN61010-1: 1008 + A2; 1995<br>EN61010-2-031: 1004                                                                     |

<sup>1)</sup> 68 mm is fitted as the maximum value.

**Note:** Dry cells and AC/DC adapter not included.

## Model and Codes

| Model name         | Code   | Description        |
|--------------------|--------|--------------------|
| Differential probe | 700924 | DC to 100 MHz band |

Each 700924 differential probe comes standard with red and black pincher tips (one each).

## Spares

| Item                | Part No. | Order Qty |
|---------------------|----------|-----------|
| Red pincher clips   | 8808040  | 8         |
| Black pincher clips | 8808048  | 3         |



Use this product in combination with 701888 (high-speed module) when using it with DL7088 or DL716. See the DL Series accessory catalog for information on selecting a connector adapter and other components. (Subject 7009-000)

# YOKOGAWA

YOKOGAWA ELECTRIC CORPORATION

Measurement Sales Dept./Phone: 81-422-63-8814, Fax: 81-422-63-8884

Recording - OAC Sales Dept./Phone: 81-422-63-8785, Fax: 81-422-63-8790

YOKOGAWA CORPORATION OF AMERICA

Phone: 770-853-7000, Fax: 770-851-8208

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YOKOGAWA ENGINEERING ASIA PTE. LTD.

Phone: 65-789-8557, Fax: 65-789-8550

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Printed in Japan. 907(YG)

MS-088

EN62-827-A 8498

# User's Manual

Model 700929

10:1 Probe (Safety Probe Supporting Isolated Input)

## Safety Precautions

Make sure to comply with the safety precautions mentioned hereafter when handling this instrument. YOKOGAWA ELECTRIC Co. assumes no responsibility for any consequences resulting from failure to comply with these safety precautions. Also, read the User's Manual of the measuring instrument thoroughly so that you are fully aware of its specifications and handling, before starting to use the probe.

### • General definitions of safety symbols and markings



This symbol indicates the risk of injury, death of personnel or damage to the instrument. Be sure to refer to the corresponding explanation in the User's Manual.

### WARNING

This symbol calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death of personnel.

### CAUTION

This symbol calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part of the product.

### • Make sure to comply with the following safety precautions in order to prevent accidents such as an electric shock which impose serious health risks to the user and damage to the instrument.



### WARNING

#### • Grounding of the measuring instrument

Make sure to connect the protective grounding of the measuring instrument.

#### • Connecting the object of measurement

Make sure to avoid an electric shock when connecting the probe to the object of measurement. Do not remove the probe from the measuring instrument after the object of measurement is connected.



### CAUTION

#### • Nondestructive input voltage range

Do not apply any voltages exceeding the Nondestructive input voltage range to the probe.

#### • Maximum input voltage

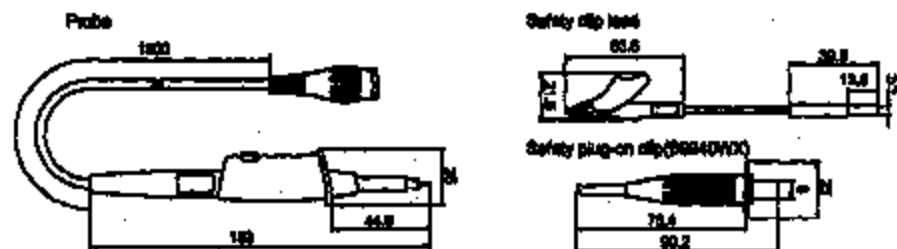
Do not supply any voltages exceeding the maximum input voltage to the probe.

## Overview

The 700929 is a 10:1 probe that provides safer, high-voltage measurement when used together with an isolated input measuring instrument (waveform measuring instrument or amplifier). The probe and BNC connector are isolated so that dangerous voltages are not accidentally exposed when the probe is removed from the measurement terminal. Make sure you also fully understand the correct use of the instrument when using the probe.

## Contents of the Package

The probe, safety clip lead, and safety plug-on clip (SS940W7X) should be included in the package. Check that all contents are present and that they are undamaged.



**YOKOGAWA**  
Yokogawa Electric Corporation

# **Ability**

| Item                                | Specifications                                        | Conditions                                                                                                                                                                                       |
|-------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total length                        | 1.8 in                                                |                                                                                                                                                                                                  |
| Connector type                      | BNC                                                   |                                                                                                                                                                                                  |
| Input impedance/capacitance         | 10 M $\Omega$ $\pm$ 1% approx. 18 pF                  |                                                                                                                                                                                                  |
| Attenuation ratio                   | 10:1                                                  |                                                                                                                                                                                                  |
| Frequency band*                     | DC to 100 MHz<br>(greater than -3 dB)                 |                                                                                                                                                                                                  |
| Rise time*                          | 1.4 ns                                                |                                                                                                                                                                                                  |
| Maximum input voltage (probe alone) | 1000 V(DC + AC peak)                                  | Space between clip and lead, lead and earth.<br>When the input voltage is AC, the maximum allowable input decreases depending on the frequency as shown by the deating curve in the chart below. |
| Safety rating(probe alone)          | IEC 1010-2-031<br>600 Vrms<br>Overvoltage category II |                                                                                                                                                                                                  |

\* | Probe alone



## **CAUTION**

- The actual maximum input voltage is limited to the lesser of either the probe's maximum input voltage or the measuring instrument's input voltage.
- See the specifications of the measuring instrument you are using to determine the maximum input voltage.
- Convert the probe's attenuation ratio, and be sure not to input an excessive voltage to the measuring instrument.
- If a voltage exceeding the maximum input voltage or frequency deating is applied, damage to the instrument may result.



## **CAUTION**

IEC 1010-2-031 is the safety rating for the probe alone.  
During actual use, you should adhere to the safety ratings and usage precautions of your measuring instrument. Failure to comply with the correct safety precautions may result in electric shock or damage to the instrument.

**Maximum Input Voltage Deating Curve**  
Safety rating: IEC 1010-2-031



## **Using the Probe**

Fasten the probe's connector to the instrument you are using (such as an oscilloscope), and connect the probe tip to the CAL or COMP terminal on the instrument. When measuring with the probe, rotate the variable capacitor and adjust it until the correct waveform is generated as shown in the figure below.



Accessory for YOKOGAWA DL Series Digital Oscilloscope  
**DIFFERENTIAL PROBE**

**YOKOGAWA** ◆

# 700925



## Differential Probe 700925 for Digital Oscilloscopes to Transform Its Single-ended Input to Differential Input

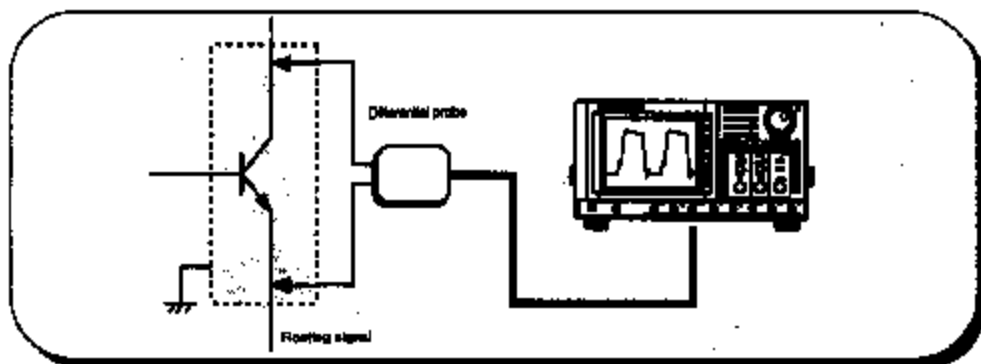


Figure 1

Ordinary digital oscilloscope amplifiers are designed to have single-ended input. If a potential difference superimposed on a certain amount of common-mode voltage is to be measured, such as the voltage across the collector and emitter of a transistor as shown in Figure 1, using a single-ended input digital oscilloscope and a 10:1 passive probe, it may not only be measured incorrectly but the digital oscilloscope may also be damaged. This is because a large current flows into the digital oscilloscope through the ground line of the passive probe. However, there are many situations where

the potential difference superimposed on a common-mode voltage must be measured.

Use the differential probe 700925 in such a situation. This probe allows the single-ended input digital oscilloscope to be used as a differential input one. The differential probe 700925 internally takes off common-mode voltage to get potential difference. Although this necessitates the probe having an active circuit, it can be operated with just four R6P dry cells. The probe is small enough to fit in the palm of your hand, approximately 17 cm long, 8 cm wide, and 2 cm thick.

Bulletin 7009-25E

FA62-827-A 2489

## DIFFERENTIAL PROBE

# 700925

### Example of Power Supply Operation Using the Differential Probe

Figure 2 shows a switching power supply using an FET chopper. This power supply operation was measured using the differential probe 700925 as an optional accessory for the DL series, and the digital oscilloscope DL4000 series or DL5180. As the measurement included that of two potential differences between the FET terminals, the differential probe demonstrated its advantage. Examples of digital oscilloscope display when the circuit shown in Figure 2 is measured are shown below.

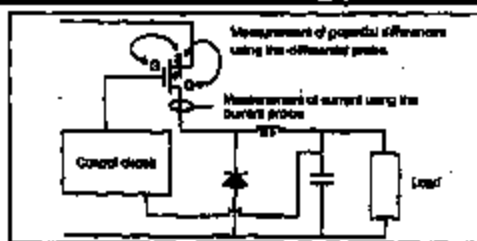


Figure 2

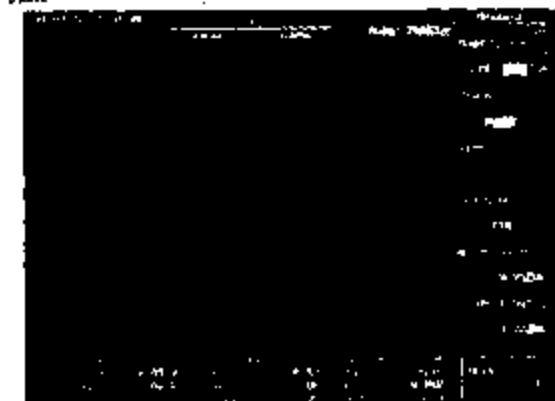
#### (1) Measurement of voltage across the gate and source

This is an example in which the voltage across the gate and source and the drain current were measured using the digital oscilloscope DL4000 series (sampling rate: 100 Msps). It can be seen that pulse width modulation is carried out to control the output voltage variation caused by the load change.



#### (2) Measurement of voltage across the drain and source

The power consumption is observed when the FET is switched at high speed using the digital oscilloscope DL5180 (sampling rate: 1 GSps), by measuring the voltage across the drain and source and the drain current and multiplying them.



### Specifications

|                                   |                                                                                                                                      |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Type of input                     | Differential input                                                                                                                   |
| Frequency band                    | DC and up to 15 MHz ( $\pm 5$ dB) for supply voltage of 5 V or more                                                                  |
| Input attenuation ratio           | 100 : 1/10 : 1 selectable                                                                                                            |
| Input impedance                   | Approximately 5M $\Omega$ , about 10 pF in parallel                                                                                  |
| Permissible differential voltage  | $\pm 500$ V or $\pm 300$ Vrms (DC + ACpeak) (for attenuation ratio of 100:1)                                                         |
| Maximum common-mode input voltage | $\pm 500$ V or $\pm 300$ Vrms (DC + ACpeak)                                                                                          |
| Maximum input voltage             | $\pm 1000$ V (DC + ACpeak) or 700 Vrms                                                                                               |
| Common-mode rejection ratio       | Less than $-60$ dB (50 Hz)                                                                                                           |
|                                   | Less than $-60$ dB (10 kHz)                                                                                                          |
|                                   | Less than $-60$ dB (1 MHz)                                                                                                           |
|                                   | Less than $-40$ dB (1 MHz)                                                                                                           |
| Output voltage                    | Maximum of $\pm 5$ V (DC + ACpeak)                                                                                                   |
| Output impedance                  | Designed for 1 M $\Omega$ input system                                                                                               |
| Power supply                      | Four R6P dry cells (if an AC-DC adapter is used, select one having an output of 5 V, 80 mA or more, and a positive pole center pin.) |
| Service life of dry cell          | Approximately 5 years in continuous operation                                                                                        |
| External dimensions               | Approx. 170 mm x 65 mm x 20 mm (excluding the rubber case)                                                                           |
| Weight                            | Approximately 280 g (excluding the dry cells and rubber case)                                                                        |

(Note) The dry cells and AC-DC adapter are not supplied.

### Model and Suffix Codes

| Model  | Suffix code | Description        |
|--------|-------------|--------------------|
| 700925 | —           | Differential probe |

The standard 700925 probe is supplied with each one of spring hook, red lead block, and a rubber case.

### Options

| Item               | Part number | Order qty |
|--------------------|-------------|-----------|
| Spring hook, red   | 900000      | 5         |
| Spring hook, black | 900001      | 5         |

Spring hook



Spring hook (red/black)

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MS-Q-92



Accessories for Yokogawa's DL Series of Digital Oscilloscopes

YOKOGAWA ◆

# 700937/701930

## Current Probes for DL Series

NEW



700937: Wideband high-sensitivity model



701930: Wideband large-current model

With the addition of model 701930 (large-current model) to our product lineup, Yokogawa probes now support current-measurement applications ranging from extremely small currents to large currents.

Current probe models 700937 and 701930 are designed for measuring cable currents. Simply attach the clamp on the end of the probe to the cable and you can observe the cable's current waveform. Model 701930 works with conductors up to 20 mm diameter, while model 700937 handles diameters up to 5 mm. Model 700937 is a wideband, high-sensitivity model with a DC band range up to 50 MHz and a high signal-to-noise ratio. Model 701930 is a wideband, large-current model with a DC band range up to 10 MHz and maximum measurement current of 150 A. These probes can be directly connected to a DL Series oscilloscope with an input impedance of 1 M $\Omega$ , without any need for a current probe amplifier or 50  $\Omega$  terminator. A probe power supply (model 700936) is also available for use with DL Series oscilloscopes lacking a probe power terminal.



Digital oscilloscope DL1540CL, with 700937 and 701930 connected

#### Measurement applications

Inverter efficiency measurement / Current observation in substations and transmission systems / Power device consumed-current measurement / Switching power supply surge-current measurement / Motor current measurement / Transport vehicle evaluation tests / Breaker characteristic evaluation tests / Power supply current waveform observation

### Main Features

- Wideband: DC up to 50 MHz (700937) or 10 MHz (701930)
- Maximum continuous input ranges: 15 Apeak (700937) or 150 Apeak (701930)
- High signal-to-noise ratio and faint-current signal (milliamp level) observation capability (700937)
- Directly connectable to input terminal (BNC) on Yokogawa's DL Series
- Easy current measurement using clamp attachment

Maximum conductor diameter: 5 mm (700937) or 20 mm (701930)

- Small and lightweight
- Easy to carry

- Demagnetizing switch and zero-adjust dial

The demagnetizing switch is used to demagnetize the magnetic core, which is magnetized by excessive input when the power is turned on or off. The zero-adjust dial is used to compensate for the effects of offset voltage, temperature drift, and other factors.

[www.yokogawa.com/na/](http://www.yokogawa.com/na/)  
... and subscribe to "Newsline,"  
our free e-mail newsletter

Bulletin 7009-37E

EA82-827-A 9/98

### 700837 Specifications (at 20°C, 30 minutes after power-on)

Frequency band: DC up to 80 MHz (-3 dB)  
 Rise time: Maximum 7 nanoseconds\*  
 Maximum continuous input range: 15 A peak (DC + AC peak)  
 \* Derating based on frequency: see Fig. 1.  
 Maximum peak current: 30 A peak (discontinuous)  
 50 A peak for pulse width of 10 µs or less  
 Output voltage rate: 0.1 V/A  
 Amplitude accuracy: ±0.5% + 0.1 mV\* (for DC 45 to 65 Hz, input in maximum continuous input range)  
 Noise: Maximum 2.5 mV rms (at 50 MHz-band instrument)  
 Input impedance: Approximately 500 mΩ (at 1 MHz)  
 Sensitivity temperature characteristic: ±0.5% (in range of 0 to 40°C)\*  
 Maximum rated power: 5 VA max.  
 Supply voltage: ±12 V ±1 V  
 Operating temperature and humidity range: 0 to 40°C, maximum RH 80% (no condensation)  
 Storage temperature and humidity range: -10 to 50°C, maximum RH 80% (no condensation)  
 Impact of external magnetic field: Maximum 50 mA equivalent (for 50 Hz, 400 A/m AC magnetic field)  
 Maximum operating circuit voltage: 300 V, CAT I (isolated conductor)  
 Maximum measured conductor diameter: all sizes  
 Sensor size: Approximately 175 (W) mm x 18 (D) mm x 49 (D) mm  
 Sensor weight: Approximately 320 grams  
 Termination unit size: Approximately 27 (W) mm x 55 (D) mm x 16 (D) mm  
 Sensor cable length: Approximately 1.8 meters (BNC terminal)  
 Power cable length: Approximately 1 meter  
 Included accessories: Soft case  
 \* When combined with waveform measuring instrument with input resistance of 1 MΩ ±1%.

#### Applicable Standards

Safety: EN 61010-1:1994, EN 61010-2-030:1994  
 Overvoltage category II (estimated transient overvoltage: 1500 V), pollution level 2  
 EMC: EN 61326-1:1995, EN 61010-1:1994 +A2:1995

### Power Supply 700838 Specifications

Approved sensors: Current probe 700837 and 701830  
 Number of power connections: 2  
 Output voltage: ±12 V ±1 V  
 Operating temperature and humidity range: 0 to 40°C, maximum RH 80% (no condensation)  
 Storage temperature and humidity range: -10 to 50°C, maximum RH 80% (no condensation)  
 Power supply: 100 VAC, 250VAC, 230VAC, 240VAC (50/60 Hz)  
 Maximum rated power: 55 VA max.  
 Size: Approximately 75 (W) mm x 110 (D) mm x 130 (D) mm  
 Weight: 1.1 kg  
 Included accessories: Power cord, spike lead, grounding adaptor (for Japan-only units only)  
 \* Depending on the measured current value, model 701830 may only work with single input measurement.

#### Applicable Standards

Safety: EN 61010-1:1994 +A2:1995  
 Overvoltage category II (estimated transient overvoltage: 2800 V), pollution level 2  
 EMC: EN 61326-1:1995 +A1:1995  
 EN 61010-2-030:1994 +A1:1995 +A2:1995  
 EN 61010-3-01:1995

### Current probe and power supply model numbers and suffix codes

| Product       | Model Number | Suffix Code | Description                                                                        |
|---------------|--------------|-------------|------------------------------------------------------------------------------------|
| Current probe | 700837       |             | DC up to 80 MHz (telethermal, high-sensitivity measurement model)                  |
|               | 701830       |             | DC up to 18 MHz (telethermal, large-current measurement model)                     |
| Power supply  | 700838       |             | Connects up to two active probes, ±12 V power supply (two power two 700838 probes) |
| Power voltage |              | -1          | 55 to 110 V AC                                                                     |
|               |              | -3          | 100 to 130 V AC                                                                    |
|               |              | -6          | 100 to 240 V AC                                                                    |
|               |              | -7          | 115 to 254 V AC                                                                    |
| Power cable   |              | -D          | UL, CSA Standard                                                                   |
|               |              | -F          | VDE Standard                                                                       |
|               |              | -C          | BS Standard                                                                        |
|               |              | -R          | SAE Standard                                                                       |

### 701830 Specifications (at 20°C, 30 minutes after power-on)

Frequency band: DC up to 80 MHz (-3 dB)  
 Rise time: Maximum 30 nanoseconds\*  
 Maximum continuous input range: 150 A  
 \* Derating based on frequency: see Fig. 2.  
 Maximum peak current: 300 A peak (discontinuous)  
 500 A peak for pulse width of 10 µs or less  
 Output voltage rate: 0.21 V/A  
 Amplitude accuracy: Up to 180 A: ±1.0% + 0.1 mV\*  
 180 to 300 A peak: ±0.5% + 0.1 mV\* (for DC 45 to 65 Hz)  
 Noise: Maximum 25 mV rms (for 50 MHz-band instrument)  
 Input impedance: Approximately 15 mΩ (at 1 MHz)  
 Sensitivity temperature characteristic: ±0.5% (at 50 Hz, 180 A input, in range of 0 to 40°C)\*  
 Maximum rated power: 6.8 VA max. (in maximum continuous input range)  
 Supply voltage: ±12 V ±1 V  
 Operating temperature and humidity range: 0 to 40°C, maximum RH 80% (no condensation)  
 Storage temperature and humidity range: -10 to 50°C, maximum RH 80% (no condensation)  
 Impact of external magnetic field: Maximum 150 mA equivalent (for 50 Hz, 400 A/m AC magnetic field)  
 Maximum operating circuit voltage: 300 V, CAT II (isolated conductor); 300 V, CAT III (isolated conductor)  
 Maximum measured conductor diameter: 600 mm  
 Sensor size: Approximately 175 (W) mm x 55 (D) mm x 27 (D) mm  
 Sensor weight: Approximately 550 grams  
 Termination unit size: Approximately 57 (W) mm x 55 (D) mm x 18 (D) mm  
 Sensor cable length: Approximately 2 meters (BNC terminal)  
 Power cable length: Approximately 1 meter  
 Included accessories: Carrying case  
 \* When combined with waveform measuring instrument with input resistance of 1 MΩ ±1%.

#### Applicable Standards

Safety: EN 61010-1:1994, EN 61010-2-030:1994  
 Overvoltage category II and III (estimated transient overvoltage: 4000 V), pollution level 2  
 EMC: EN 61326-1:1995 +A1:1995  
 EN 61010-2-030:1994 +A1:1995 +A2:1995  
 EN 61010-3-01:1995

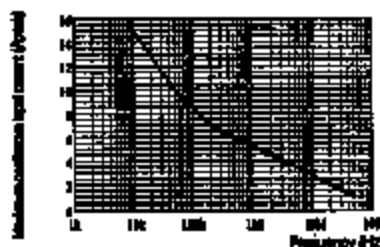


Figure 1. Derating Based on Frequency (700837)



Figure 2. Derating Based on Frequency (701830)

### ⚠ DANGER

1. To avoid short-circuiting or injury, only attach the clamp to equipment that does not exceed the maximum rated current voltage.
2. To avoid short-circuiting or injury when the clamp open lip is opened, do not use the clamp on uninsulated conductors.

**YOKOGAWA** ◆

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ME-03E

EA82-827-A 8582

Accessories for YOKOGAWA's DL Series Digital Oscilloscopes  
**500 MHz Bandwidth Differential Probe**

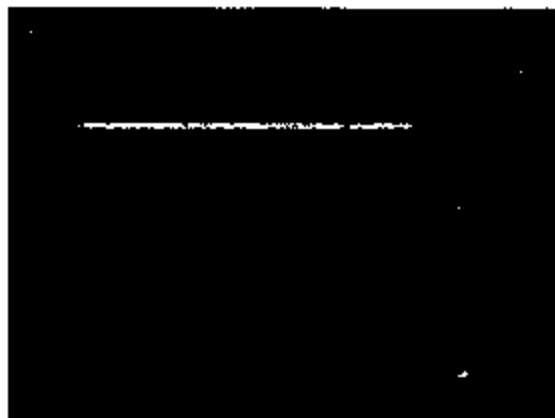
**YOKOGAWA** ◆

**701920**



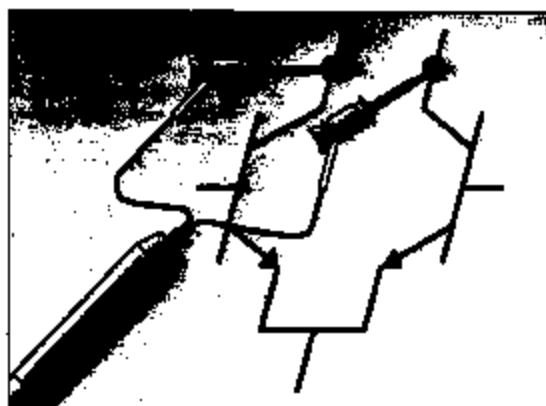
## ***Accurately Observe High-Speed Differential Signals***

***500 MHz Bandwidth Differential Probe***



Waveform observation on an oscilloscope

Signals are getting faster, power supply voltages are getting lower, and the use of noise-resistant differential signals that can precisely transmit other signals is increasing. However oscilloscope input is usually single-end, so in order to observe these differential signals it is necessary to input two separate signals and perform calculations on them. Also



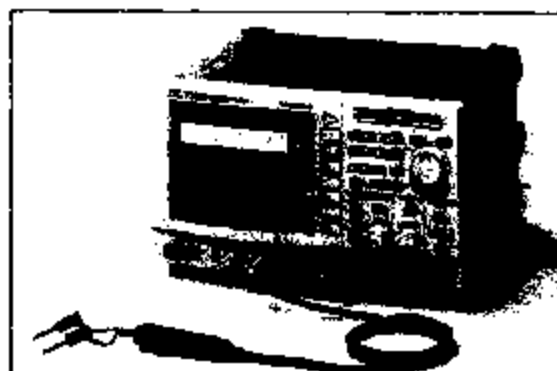
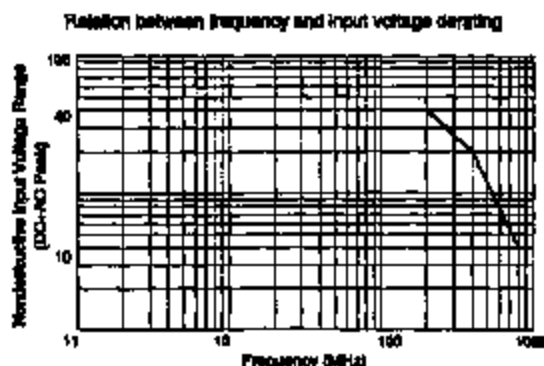
with most oscilloscopes, you cannot activate a trigger using the calculated signals so one of the differential signals must be used. Using our differential probe, you can observe a 500 MHz bandwidth differential signal even with a single-end input oscilloscope.

[www.yokogawa.com/tm/](http://www.yokogawa.com/tm/)  
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Bulletin 7019-20E

EA02-027-A 0503

# 500 MHz Bandwidth Differential Probe (Model 701920)



Example of the probe connected to the DL7200 Digital Oscilloscope

## Specifications

|                                    |                                                                 |
|------------------------------------|-----------------------------------------------------------------|
| Input type                         | Balanced differential input                                     |
| Frequency bandwidth                | DC to 500 MHz for probe <sup>*1</sup>                           |
| Attenuation ratio                  | 10:1±3% when connected to a resistance of 50Ω±1% <sup>*1</sup>  |
| Input resistance (typical value)   | 100 kΩ (relative to ground)                                     |
| Input capacity (typical value)     | 2.5 pF (relative to ground)                                     |
| Differential input voltage range   | ±12V                                                            |
| Common mode input voltage range    | ±50 V                                                           |
| Nondestructive input voltage range | ±40 V (DC+AC peak) <sup>*2</sup>                                |
| Output offset voltage              | ±5 mV (±50 mV when converted into input terminal) <sup>*1</sup> |
| CMPR (typical value)               | 60 dB (1 MHz), 17 dB (500 MHz)                                  |
| Total cable length                 | 1.2 m (probe cable),<br>1 m (power supply cable)                |
| Power supply voltage               | ±12 V ± 1 V (Usable range:<br>11 to 13 V, -11 to -13 V)         |
| Power supply current               | Current of the power supply<br>terminal is less than 125 mA     |
| External dimensions                | 111 mm × 22 mm × 14 mm<br>(excluding cable and accessories)     |
| Operating temperature              | 5 to 40 °C                                                      |
| Operating humidity                 | 25 to 85%RH (no condensation)                                   |
| Storage temperature                | -20 to 60 °C                                                    |
| Storage humidity                   | 25 to 85%RH (no condensation)                                   |
| Weight                             | Approx. 130 g                                                   |

<sup>\*1</sup> Standard operating conditions

Ambient temperature 25±2°C, Ambient humidity 50±10%RH; 30 minutes after the power supply is applied.

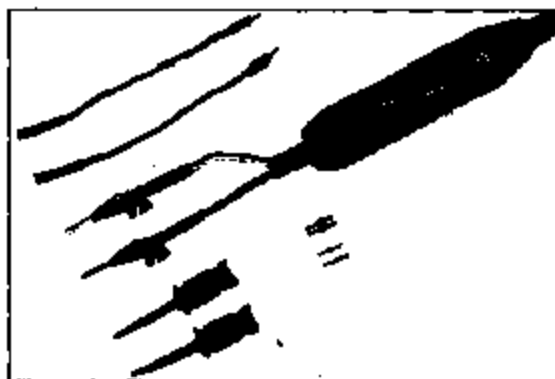
<sup>\*2</sup> For the relation between frequency and input voltage derating see the graph.

## Part name and Model

| Part Name          | Model  | Description             |
|--------------------|--------|-------------------------|
| Differential Probe | 701920 | DC to 500 MHz Bandwidth |

## Standard Accessories

| Part Name                      | Part Number |
|--------------------------------|-------------|
| Differential Probe Accessories | 90M366Z     |



## NOTICE

- ① Before operating the product, read the instruction manual thoroughly for proper and safe operation.
- ② If this product is for use with a system requiring safeguards that directly involve personal safety, please contact the Yokogawa sales offices.

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MS-005

ERS2-627-A 0064

Ellen's mbo 11320 act. ~~when you change~~  
the sensor

VIN 1FAFP38301W196354

Any no starts/hard starts? NO

|                                  |                                                                                                                                                            |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Printable View (89 KB)           |                                                                                                                                                            |
| Article No.<br>02-8-6            | • DRIVEABILITY - INTERMITTENT ENGINE QUIT OR IDLE DIP -<br>NO DIAGNOSTIC TROUBLE CODES (DTCs) PRESENT -<br>VEHICLES EQUIPPED WITH 3.0L DURATEC ENGINE ONLY |
| Publication Date: APRIL 22, 2002 |                                                                                                                                                            |

**FORD:** 2001-2002 ESCAPE

**ISSUE:**

Some vehicles equipped with the 3.0L Duratec engine may exhibit an intermittent engine quit condition. This is usually a one time event during closed throttle deceleration with no Diagnostic Trouble Codes (DTCs) and no Malfunction Indicator Lamp (MIL). The engine will restart immediately.

**ACTION:**

When normal diagnostics cannot pinpoint the root cause, refer to the following Driveability Checklist for details.

**SERVICE PROCEDURE**

1. With the transmission in Park, the engine should be at idle at approximately 750 RPM, and the engine temperature should be at least 88°C (190°F). All accessories and the engine cooling fan should be off. Using only WDS version B17.1 or later, verify that Idle Air Control (IAC) duty cycle is between 32%-40% with no purge flow. If IAC duty cycle is within specification, then proceed to Step 2 now. If IAC duty cycle is out of specification, replace IAC with part YF1Z-9F716-AA. Verify that IAC duty cycle is between 32-40% with no purge flow. If IAC duty cycle is within specification after replacing with a new IAC, then proceed to Step 2 now. If IAC duty cycle is still out of specification, replace throttle body with part YL8Z-9E926-DA. Verify corrective action, then proceed to Step 2.

**NOTE:** ENGINE RPM WILL SLOWLY RAMP UP. IT IS EXTREMELY IMPORTANT TO CHECK THE IAC DUTY CYCLE WHEN THE RPM IS AT 750 RPM. EVEN 800 RPM IS TOO HIGH FOR CHECKING IAC DUTY CYCLE UNDER THESE CONDITIONS.

2. For vehicles sold in the U.S. and Canada perform the following: If the vehicle was built on or after 1/16/2002, then proceed to Step 4 now. If not, reprogram PCM with WDS version B17.1 or later. Only use WDS version B17.1 or later during this reprogramming. Some 2001 model year PCMs cannot be reprogrammed and must be replaced. This is determined by the MPC # located in upper left corner of the barcode on the PCM. If the PCM is an MPC 160, then replace with part 1U7Z-12A850-AXA and reprogram with WDS version B17.1 or later. If the PCM is MPC 161, then just reprogram with WDS version B17.1 or later. Verify latest calibration was successfully reprogrammed. WDS should show latest calibration level as 1U7Z-12A850-AXB. Proceed to Step 4.
3. For vehicles sold in Mexico perform the following: If vehicle was built on or after 1/16/2002 then proceed to Step 4 now. If not, reprogram the PCM with WDS version B17.15 or later. Only use WDS version B17.15 or later during this reprogramming. Some 2001 model year PCMs cannot be reprogrammed and must be replaced. This is determined by the MPC # located in upper left corner of the barcode on the PCM. If the PCM is an MPC 160, then replace with part 1U7Z-12A850-AZA and reprogram with WDS version B17.15 or later. If the PCM is MPC 161, then just reprogram with WDS version B17.15 or later. Verify latest calibration was successfully reprogrammed. WDS should show latest calibration level as 1U7Z-12A850-AZB. Proceed to Step 4.
4. With the transmission in Park, the engine should be at idle at approximately 750 RPM, and the engine temperature should be at least 88°C (190°F). All accessories and the engine cooling fan should be off. With WDS version B17.1 (U.S.) or B17.15 (Mexico) or later, determine if the Evaporative Vapor Management (EVAP/VM) duty cycle stops increasing and remains at 95-100%

WDS  
2002 4.1

- while FTP holds at approximately 2.8 volts. If this occurs, replace the EVAPVM valve with part number YL8Z-9C915-AA. If EVAPVM is functioning correctly, the duty cycle should increase to 84-100% with the FTP decreasing to approximately 2.2 volts and then recycle back to 0% duty cycle while FTP holds at approximately 2.8 volts. Do not replace the EVAPVM valve. Verify corrective action, then proceed to Step 5.
5. With the transmission in Park, the engine should be at idle at approximately 750 RPM, and the engine temperature should be at least 88°C (190°F). All accessories and the engine cooling fan should be off. With WDS version B17.1 (U.S.) or B17.15 (Mexico) or later, if EVAPVM drops to 0% from 80 - 80% (premature purge shutoff), check for an obstructed vent line. This condition may be accompanied by a sudden RPM drop while idling. The premature purge shutoff is caused by the tank not reaching a pre-specified vacuum state. To clear the possible obstructed vent line, disconnect the vent line in the evaporative emissions system from the check valve side (check valve part # is YL8U-9C915-AE). This connection is located just forward of the evaporative emissions canister assembly, underneath the vehicle in the area of the driver side rear seat. Using shop air, blow the vent line from the check valve side forward (towards the brake booster). In the past, spiders have been known to construct webs in vent lines so handle with caution. Possible obstructions in the vent line can prevent the evaporative emissions system from purging properly, and in some cases stalling occurs. Verify corrective action, then proceed to Step 6.
  6. If the Electronic Engine Control (EEC) relay has stamped lettering, proceed to Step 7 now. If the EEC relay has white lettering printed on the top surface, replace with a new Hella service relay that is all black and has stamped lettering on the top surface. Both the new Hella service relay and the old relay have the same part number (FOAZ-14N089-A). Make sure the relay you are installing has stamped lettering. For location, use 2001 Wiring Diagram sections 303-07B-00-1 Connector C1016, 700-08-00-37 Battery Junction Box. Proceed to Step 7.
  7. Ask the customer if they have significant weight (approximately 9 oz or more) hanging from the key ring while the keys are in the ignition. If they do, and the engine quits while traveling over bumps, the key ring may move the ignition cylinder out of the Run position and stop the engine. When this occurs, all gauges immediately shut off (fuel reads "E", tachometer goes to zero, speedometer goes to zero immediately). It is recommended that the customer attach fewer keys to the key ring that retains the vehicle ignition key. Proceed to Step 8.
  8. Road the test vehicle long enough to experience 3 closed throttle decelerations from approximately 40 mph down to 10 mph. Use scan tool to examine engine RPM during test. Ensure there are no engine RPM dips below 650 RPM.

| PCM CALIBRATION INFORMATION |                            |          |                            |                 |                 |                            |
|-----------------------------|----------------------------|----------|----------------------------|-----------------|-----------------|----------------------------|
| Application                 | Old Part Number (-12A680-) | Tear Tag | New Part Number (-12A680-) | Old Calibration | New Calibration | NGS/WDS Qualifier          |
| 2001MY 3.0L ESCAPE - FORD   | 1U7A-AXA                   | ATP1     | 1U7A-AXB                   | 0M11A30511      | 0M11A30512      | WDS B18.4 Release or later |
| 2001MY 3.0L ESCAPE - CAA    | 1U7A-AZA                   | EGG1     | 1U7A-AZB                   | 0M11B30511      | 0M11B30512      | WDS B18.4 Release or later |
| 2002MY 3.0L ESCAPE - FORD   | 2L8A-AC                    | 8U83     | 2L8A-AD                    | 2M11A30506      | 2M11A30510      | WDS B18.4 Release or later |
| 2002MY 3.0L ESCAPE - CAA    | 2L8A-BC                    | ZRZ3     | 2L8A-8D                    | 2M11B30506      | 2M11B30510      | WDS B18.4 Release or later |

Obtain an Authorized Modifications Decal (FP8 B262 - orderable through DCEB II, 25/pkg) and list the date, dealer number, and summary of alterations performed. Select a prominent place adjacent to the Vehicle Emission Control Information Decal suitable for installing the Authorized Modifications Decal. Clean the area, install the decal, and cover it with a clear plastic decal shield.



|                                                                                 |             |
|---------------------------------------------------------------------------------|-------------|
| <b>THE FOLLOWING MODIFICATIONS HAVE BEEN MADE:</b>                              |             |
| Reprogrammed Powertrain Control Module (PCM)<br>Per TSB 02-8-6                  |             |
|                                                                                 |             |
|                                                                                 |             |
|                                                                                 |             |
| <b>THESE MODIFICATIONS HAVE BEEN APPROVED, AS APPROPRIATE, BY EPA AND CARB.</b> |             |
| DEALER NUMBER: _____                                                            | DATE: _____ |
| CHANGE AUTHORITY:                                                               |             |
| FPE 8252 878 FORD MOTOR COMPANY PRINTED IN U.S.A.                               |             |

| PART NUMBER     | PART NAME                             |
|-----------------|---------------------------------------|
| YF1Z-9F715-AA   | Idle Air Control Valve                |
| YL8Z-9E926-DA   | Throttle Body                         |
| YL8Z-9C915-AA   | EVAPVM Valve                          |
| FOAZ-14N069-A   | Electronic Engine Control (EEC) Relay |
| 1U7Z-12A550-AXA | Powertrain Control Module (PCM)       |
| 1U7Z-12A550-AZA | Powertrain Control Module (PCM)       |

**OTHER APPLICABLE ARTICLES:**

NONE

**WARRANTY STATUS:**

INFORMATION ONLY

**QABIS CODES:**

807000, 807400, 807500, 807600, 807700, 811000, 811500, 814000, 814500, 814600



**Suarez, Rhae (R.)**

---

**From:** Duffy, Timothy (T.J.)  
**Sent:** Monday, April 22, 2002 5:38 PM  
**To:** Sanders, Muriel (M.S.); King, Robert (R.F.); Suarez, Rhae (R.)  
**Subject:** RE: Requested Service Record

As Muriel indicated earlier, the dealership has never been able to repeat or verify the concern on either of Mr. Chen's Escapes.

Hope this helps,

**Tim Duffy**  
**FCSD Market Manager**  
**Southwest Region-Austin #2**  
**tduffy1@ford.com**  
**(281) 887-1721**

-----Original Message-----

**From:** Sanders, Muriel (M.S.)  
**Sent:** Monday, April 22, 2002 2:23 PM  
**To:** King, Robert (R.F.); Suarez, Rhae (R.)  
**Cc:** Duffy, Timothy (T.J.)  
**Subject:** RE: Requested Service Record

To my knowledge, the dealer has never been able to repeat a stall on either of Mr. Chen's Escapes. Thanks for your help.

**Muriel Sanders**  
**U204 3.0L Calibration**  
**Ford Motor Company**  
**Phone: 313-32-27307**  
**Fax: 313-32-31786**  
**E-mail: msander6@ford.com**

-----Original Message-----

**From:** King, Robert (R.F.)  
**Sent:** Monday, April 22, 2002 2:43 PM  
**To:** Suarez, Rhae (R.)  
**Cc:** Sanders, Muriel (M.S.); Duffy, Timothy (T.J.)  
**Subject:** RE: Requested Service Record

No CQIS or AWS...nothing we can do. I don't know what the dealers repair to receipt date turn-around is. Has the concern been verified?

**Ford** "The Most Wanted Car on the American Road" since 1992

**Robert King**  
**LHD Escape/Maverick FCSD Program Manager**  
**PVT & Field Support, Vehicle Service & Programs**  
**Kearns City Assembly Plant (816) 459-1872, fax 459-1726**

-----Original Message-----

**From:** Suarez, Rhae (R.)  
**Sent:** Monday, April 22, 2002 12:20 PM  
**To:** Sanders, Muriel (M.S.)

Cc: King, Robert (R.K.)  
Subject: RE: Requested Service Record

Muriel I contacted Tim and Wes on what they knew about the vehicle in question. Hopefully there is some new information for you that Tim gave me. As you can see at the end of Tim's note, Mr. Chen got a copy of the RO with a list of the all the items replaced. I am not sure what else can be done at this time.

Bob - any suggestions?

I already checked the AWS stuff on line and there isn't any reports at this time (probably some lag time) and there are no CQIS reports either.

-----Original Message-----

From: Duffy, Timothy (T.J.)  
Sent: Friday, April 19, 2002 1:40 PM  
To: Suarez, Rhoe (R.)  
Cc: Malik, Wintley (W.K.)  
Subject: RE: Stalls vehicle

Rhoe,

I'll go ahead and pretty much start from the beginning and give you all of the information that I have on this customer--hopefully it will be of some assistance!

The customer, Mr. Chen, brought in his first vehicle with a known stalling concern (one that he knew had no published fix), but we could not verify it. He brought it in multiple times, but knew that there was no published way to identify the concern (and the dealership never could identify the concern, even after driving it for over two weeks at one time), and wanted to get reimbursed for his vehicle. He knew that this would be a candidate for the Lemon Law in the state of Texas--as did we--so we agreed to repurchase it for an exchange unit--any Ford or Lincoln-Mercury product.

The customer was concerned with getting a unit that would be the cheapest (he knew that he would have to pay a mileage charge, and did not want to have to pay more to get into a unit), and really liked the Sport Trac, but thought that it would cost more. He really kept pushing to get a refund, but we indicated that we would only exchange his unit. Even though he liked the Sport Trac better and it would end of costing about the same as the Escape, he decided to ORDER an Escape (because they didn't have the one that he wanted), remaining in the vehicle he claimed was unsafe to drive that stalled many times (he stated). He waited for over 6 weeks for his unit to come in, and although he had multiple concerns within a short time period before the RAV, he never came back with any concerns that the vehicle had been exhibiting the stalling issue. Basically the vehicle had the stalling concern that we couldn't address many times before he was issued the option for a new vehicle, but after he ordered it, the stalling incidents stopped.

On to the second vehicle...

Mr. Chen got his second vehicle, stated that it stalled twice within 5 days, and brought it in immediately. We contacted Muriel Sanders and she gave us the unpublished, but official set of tests to run on the vehicle to determine if a problem existed and where. We ran all the tests she gave us--not once--but twice. The first set of tests was run by one of the dealership's technicians, and the second time was handled personally by the shop foreman. After both tests, the vehicle checked out as normal--nor were there any codes in the PCM that would indicate that there had ever been a stalling issue. After there was no problem found with the vehicle, Mr. Chen again pushed for us to refund his money for the vehicle at MSRP. He said that he would accept nothing else, and that was final (it should be noted that he got his vehicle on the Z Plan--the same price as the A Plan).

As far as when the claim will show up, I am unaware of when that will hit the system. However, the customer was given an RO with the exact items that were performed on his Escape by the service department at the dealership.

I hope that this helps. Hopefully this can be resolved soon.

Take care, and have a great weekend!

## **Tim Duffy**

**FCSD Market Manager**  
**Southwest Region-Austin #2**  
**tduffy1@ford.com**  
**(254) 597-1721**

-----Original Message-----

**From:** Sanders, Muriel (M.S.)  
**Sent:** Monday, April 22, 2002 1:12 PM  
**To:** Suarez, Rhoe (R.)  
**Subject:** Requested Service Record

Hi Rhoe,

I hope you had a good weekend! Did you get the chance to get the service record I spoke with you about on Thursday? This was the customer who had a 2001 that stalled and Ford bought back and now he is saying that the 2002 he has is stalling. He took it in for repairs and I have been asked to verify that all repairs were done. I listed the vehicle info below. Let me know if you need further information or if you can't get the service record. Thanks.

2002 Ford Escape  
VIN: 1FMCU04172KC27712  
Customer: Edwin Chen

### *Muriel Sanders*

U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

**Suarez, Rhas (R.)**

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**From:** Corlew, Randall (R.L.)  
**Sent:** Monday, October 07, 2002 2:38 PM  
**To:** Suarez, Rhas (R.)  
**Subject:** RE: Stall calibration success.

None yet! 21.4 is on line in wds and no problems.

Thank you,

*Randy Corlew*

*Ford Motor Company*  
FSE-Pittsburgh Region

-----Original Message-----

**From:** Suarez, Rhas (R.)  
**Sent:** Friday, October 04, 2002 12:58 PM  
**To:** Corlew, Randall (R.L.); Price, Martin (M.); Notsboom, Jim (J.E.); Limbaco, Steven (S.); Rothweiler, Daniel (D.)  
**Cc:** Fournelle, Gilbert (G.); Dalbo, Bob (R.L.)  
**Subject:** Stall calibration success.  
**Importance:** High

I have been asked by my upper management to get as much field data as possible on the success of the new calibration for the Escape/Tribute stall concern. Could each of you reply back with 1 or 2 sentences saying that you have been involved with a stall vehicle(s) and that it has received the latest and greatest stall calibration with no issues have returned..... Or if you have any return vehicles, that information would be useful as well.

If you know of any other individuals that have been involved with this concern that I have missed, please forward them this email and have them send me a reply.

Thank you for your timely response.

*Rhas M. Suarez*

Rhas Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Falkline Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-768-8242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

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EAB2-827-A 8534

|                                     |                                                                                                                                                            |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Printable View (38 KB)              |                                                                                                                                                            |
| Article No.<br>02-23-1              | • DRIVEABILITY - INTERMITTENT ENGINE QUIT OR IDLE DIP -<br>NO DIAGNOSTIC TROUBLE CODES (DTCs) PRESENT -<br>VEHICLES EQUIPPED WITH 3.0L DURATEC ENGINE ONLY |
| Publication Date: November 12, 2002 |                                                                                                                                                            |

**FORD:****2001-2003 ESCAPE**

Article 02-11-6 is being republished in its entirety to update the Model Year and Calibration Information.

**ISSUE:**

Some vehicles equipped with the 3.0L Duratec engine may exhibit an intermittent engine quit and restart condition. This is usually a one-time event during closed throttle deceleration with no Diagnostic Trouble Codes (DTCs) and no Malfunction Indicator Lamp (MIL). Due to the intermittent nature of the condition and the multiple potential causes of the condition, the complete bulletin checklist and all appropriate part replacements should be performed regardless of whether the condition can be duplicated by the technician. Otherwise, customers may experience the intermittent condition and be forced to return to the dealership. If the vehicle is no longer eligible for warranty coverage, discuss this service with the customer before performing.

**ACTION:**

In addition to normal diagnostics, perform ALL of the following Driveability Checklist. Although the condition may not be possible to duplicate, it is recommended to perform this bulletin checklist in its entirety to resolve the condition.

**SERVICE PROCEDURE**

- NOTE:** THIS CONDITION MAY HAVE SEVERAL CAUSES, AND IT IS VERY IMPORTANT TO THOROUGHLY AND COMPLETELY PERFORM EACH STEP. IF EACH STEP IS NOT PERFORMED COMPLETELY, THE RESULT COULD BE AN INCOMPLETE OR REPEAT REPAIR.
- NOTE:** DUE TO THE INTERMITTENT NATURE OF THE CONDITION AND THE MULTIPLE POTENTIAL CAUSES OF THE CONDITION, THE COMPLETE BULLETIN CHECKLIST AND ALL APPROPRIATE PART REPLACEMENTS SHOULD BE PERFORMED REGARDLESS OF WHETHER THE CONDITION CAN BE DUPLICATED BY THE TECHNICIAN.

Please use the following conditions for all tests described below unless stated otherwise:

- Transmission in Park
  - Engine at idle at approximately 750 RPM
  - Engine temperature should be at least 190° F (88° C)
  - All accessories and the engine cooling fan should be off
1. Determine if the Evaporative Vapor Management (EVAPVM) duty cycle is operating properly. If EVAPVM is functioning correctly, the duty cycle should increase to 54-100% with the FTP decreasing to approximately 2.2 volts and then reset back to 0% duty cycle while FTP holds at approximately 2.8 volts. If the duty cycle does not increase within 5 minutes, turn on the headlights and the AC with the blower on high. The duty cycle should start increasing within 5-10 minutes. Do not replace the EVAPVM valve if the duty cycle functions correctly. If the duty cycle stops increasing and remains at

95-100% while FTP holds at approximately 2.6 volts, replace the EVAPVM valve with part number 1L8Z-9C915-AA. Verify corrective action then proceed to Step 2.

**NOTE:** 2003 VEHICLES BUILT IN LATE 2002 CALENDAR YEAR OR AFTER WILL HAVE A REVISED EVAPORATIVE EMISSIONS SYSTEM THAT REMOVES THE CHECK VALVE. IF THE VEHICLE IS NOT EQUIPPED WITH A CHECK VALVE, IT IS NOT NECESSARY TO PERFORM STEP 2 OF THIS PROCEDURE.

2. Disconnect the vent line in the evaporative emissions system from the check valve side (for reference check valve part # is 1L8U-9C915-AB). This connection is located just forward of the evaporative emissions canister assembly, underneath the vehicle in the area of the driver side rear seat. Using shop air, blow the vent line from the check valve side forward (towards the brake booster). In the past, spiders have been known to construct webs in vent lines so handle with caution. Possible obstructions in the vent line can prevent the evaporative emissions system from purging properly, and in some cases, can cause the condition to occur. Verify corrective action then proceed to Step 3.
3. Inspect the Idle Air Control (IAC) Valve. If the valve is not part number 1L8E-9F715-AA, replace with part number 1L8Z-9F715-AA which will also require latest calibration level given in Step 4 or 5.

**NOTE:** ENGINE RPM WILL SLOWLY RAMP UP. IT IS EXTREMELY IMPORTANT TO CHECK THE IAC DUTY CYCLE WHEN THE RPM IS AT 700 RPM. EVEN 800 RPM IS TOO HIGH FOR CHECKING IAC DUTY CYCLE UNDER THESE CONDITIONS. IF RPM IS OVER 700 RPM, MOMENTARILY OPENING AND CLOSING THE THROTTLE WILL LOWER THE RPM.

Verify that IAC duty cycle is between 32-40% with no purge flow (EVAPVM duty cycle is 0%) and fuel trims (SHRTFT1, SHRTFT2, LONGFT1, LONGFT2) are less than 15%. If IAC duty cycle is within specification proceed to Step 4 now. If IAC duty cycle is out of specification, replace the throttle body with part number 2L8Z-BE825-AB. If the fuel trims are above 15%, disconnect the Mass Air Flow Sensor (MAF) and recheck the fuel trims. If the fuel trims drop to below 15%, replace the MAF sensor with part number 1L2Z-12B579-BARM. If fuel trims stay above 15%, check for vacuum leaks and check the fuel system. Verify corrective action then proceed to Step 4.

4. For vehicles sold in the U.S. and Canada perform the following: Reprogram PCM with WDS. Some 2001 model year PCMs cannot be reprogrammed and must be replaced. This is determined by the MPC # located in upper left corner of the barcode on the PCM. If the PCM is an MPC 160, then replace with part 1U7Z-12A850-AXD. If the PCM is MPC 161, then just reprogram with WDS. Verify latest calibration was successfully reprogrammed. WDS should show latest calibration level as 1U7A-12A850-AXD for 2001, 2U7A-12A850-CZB for 2002 or 3L8A-12A850-BC for 2003. Note that some early 2002 vehicles may have the 2001 calibration. Proceed to Step 5.
5. For vehicles sold in Mexico perform the following: Reprogram PCM with WDS. Some 2001 model year PCMs cannot be reprogrammed and must be replaced. This is determined by the MPC # located in upper left corner of the barcode on the PCM. If the PCM is an MPC 160, then replace with part 1U7Z-12A850-AZD. If the PCM is MPC 161, then just reprogram with WDS. Verify latest calibration was successfully reprogrammed. WDS should show latest calibration level as WDS should show latest calibration level as 1U7A-12A850-AZD for 2001MY, 2U7A-12A850-CPB for 2002MY or 3L8A-12A850-CC for 2003. Note that some early 2002 vehicles may have the 2001 calibration. Proceed to Step 6.
6. If the Electronic Engine Control (EEC) relay has stamped lettering, proceed to Step 7 now. If the EEC relay has white lettering printed on the top surface, replace with a new Hella service relay that is all black and has stamped lettering on the top surface. Both the new Hella service relay and the old relay have the same part number (FOAZ-14N059-A). Make sure the relay you are installing has stamped lettering. For location, use 2001 Wiring Diagram sections 303-07B-00-1 Connector C1016, 700-08-00-37 Battery Junction Box. Proceed to Step 7.
7. For 2001 and 2002 vehicles, inspect the DPFE sensor part number. If DPFE sensor is part number 2F1E-9J450-AA, proceed to Step 8 now. If the DPFE sensor is part number YF1E-9J450-AD, check for a white dot on the sensor housing (Note: White dot can be anywhere on housing). If there is a white dot, proceed to Step 8 now. If there is not a white dot, replace the DPFE with part 2F1Z-9J450-AA. Proceed to Step 8.
8. Ensure the Mass Air Flow (MAF) sensor gasket is properly installed and not blocking the air stream by disconnecting the airbox and looking inside the airbox for the MAF sensor. If gasket is

- damaged, replace with part YL6Z-9E931-CA. Proceed to Step 9.
9. Verify the PCM harness integrity by removing the module from the COWL and moving the PCM harness around while the engine is running. If any abnormalities are observed, repair/replace the harness. Proceed to Step 10.
  10. Inform the customer that significant weight (approximately 2 oz. or more) hanging from the key ring while the keys are in the ignition may move the ignition cylinder out of the Run position and stop the engine. When this occurs, all gauges immediately shut off (fuel reads "E", tachometer goes to zero, speedometer goes to zero immediately). It is recommended that the customer attach fewer keys to the key ring that retains the vehicle ignition key.

| PCM CALIBRATION INFORMATION |                            |          |                            |                 |                 |                            |
|-----------------------------|----------------------------|----------|----------------------------|-----------------|-----------------|----------------------------|
| Application                 | Old Part Number (-12A650-) | Tear Tag | New Part Number (-12A650-) | Old Calibration | New Calibration | NGS/WDS Qualifier          |
| 2001 3.0L - Escape          | 1U7A-AXB                   | ATF3     | 1U7Z-AXD                   | 0M11A30512      | 0M11A30512      | WDS B21.3 Release or Later |
| 2001 3.0L - Escape          | 1U7A-AZB                   | E8G3     | 1U7Z-AZD                   | 0M11B30512      | 0M11B30512      | WDS B21.3 Release or Later |
| 2002 3.0L - Escape          | 2U7A-CZA                   | NSF1     | 2U7Z-CZB                   | 2M11A30510      | 2M11A30510      | WDS B21.3 Release or Later |
| 2002 3.0L - Escape          | 2U7A-CPA                   | PVN1     | 2U7Z-CPB                   | 2M11B30510      | 2M11B30510      | WDS B21.3 Release or Later |
| 2003 3.0L - Escape          | 3L8A-BA                    | BAR2     | 3L8Z-BC                    | 3M11A30510      | 3M11A30511      | WDS B21.3 Release or Later |
| 2003 3.0L - Escape          | 3L8A-CA                    | CAB2     | 3L8Z-CC                    | 3M11B30510      | 3M11B30511      | WDS B21.3 Release or Later |

Obtain an Authorized Modifications Decal (PPS 8292 - orderable through DOES II, 25/pkg) and list the date, dealer number, and summary of alterations performed. Select a prominent place adjacent to the Vehicle Emission Control Information Decal suitable for installing the Authorized Modifications Decal. Clean the area, install the decal, and cover it with a clear plastic decal shield.

|                                                                                     |  |                                 |  |
|-------------------------------------------------------------------------------------|--|---------------------------------|--|
|  |  | <b>AUTHORIZED MODIFICATIONS</b> |  |
| THE FOLLOWING MODIFICATIONS HAVE BEEN MADE:                                         |  |                                 |  |
| Reprogrammed Powertrain Control Module (PCM)                                        |  |                                 |  |
| Per TSB 02-23-1                                                                     |  |                                 |  |
|                                                                                     |  |                                 |  |
|                                                                                     |  |                                 |  |
| THESE MODIFICATIONS HAVE BEEN APPROVED, AS APPROPRIATE, BY EPA AND CARB.            |  |                                 |  |
| DEALER NUMBER: _____                                                                |  | DATE: _____                     |  |
| CHANGE AUTHORITY: _____                                                             |  |                                 |  |
| PPS 8292, 875 FORD MOTOR COMPANY PRINTED IN U.S.A.                                  |  |                                 |  |

| PART NUMBER      | PART NAME                     |
|------------------|-------------------------------|
| 1L8Z-9F718-AA    | IAC - Idle Air Control Valve  |
| 2L8Z-9E828-AB    | Throttle Body                 |
| 1L2Z-12B579-BARM | MAP - Mass Air Flow Sensor    |
| YL8Z-9E931-CA    | Gasket - Mass Air Flow Sensor |
| FOAZ-14N069-A    | EEC Relay                     |
| 2F1Z-8J480-AA    | DPFE Sensor                   |
| YL8Z-9C915-AA    | EVAPVM Valve                  |

**OTHER APPLICABLE ARTICLES:**

NONE

**SUPERSEDES:**

02-11-6

**WARRANTY STATUS:**

INFORMATION ONLY

**OASIS CODES:**

607000, 607400, 607500, 607600, 607700, 611000, 611500, 614000, 614500, 614600

**NOTE:** The information in Technical Service Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers". Do not assume that a condition described affects your car or truck. Contact a Ford, Lincoln, or Mercury dealership to determine whether the Bulletin applies to your vehicle.

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**Suarez, Rhae (R.)**

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**From:** Kaercher, Don (D.F.)  
**Sent:** Wednesday, November 06, 2002 9:24 AM  
**To:** Limtiaco, Steven (S.); Kaercher, Don (D.F.); Terzes, Laura (L.D.)  
**Cc:** Gihlin, Michael (M.); Chin, Darral (D.); Clark, Michael (M.); Lammert, David (D.); Radulovich, Michael (M.); Mooney, Larry (L.); 'tokunaga.mi@sv.mazda.co.jp'; Fournelle, Gilbert (G.); Dalbo, Bob (R.J.); Suarez, Rhae (R.); Lawler, Dave (D.A.)  
**Subject:** RE: Tribute IAC Valve Packaging

This was released in WERs as a single part. If there is to be an IS sheet, then the part has to be released again showing it having the IS sheet. The IS sheet will have a part number. In essence it will be a kit containing two items in the Bill of Material, the valve and an IS sheet. We cannot just throw an IS sheet in the box without WERs stating there is supposed to be that particular one in the box. If we do that it will not pass PPAP. What is in the box must match what is in WERs.

Don Kaercher  
Ford Motor Company  
FCSD PS&L QSF/Recall/Top 100 Dept. Mgr.  
NPDC 1310C Text Paper: (734) 797-5993  
e-mail: dkaerche@ford.com  
\*Phone: (734) 266-9793 \*Fax: (734) 266-1166

-----Original Message-----

**From:** Steven Limtiaco [mailto:SLimtiac@mazdausa.com]  
**Sent:** Tuesday, November 05, 2002 12:40 PM  
**To:** 'dkaerche@ford.com'; 'lterzes@ford.com'  
**Cc:** Michael Gihlin; Darral Chin; Mike Clark; Dave Lammert; Mike Radulovich; Larry Mooney; 'tokunaga.mi@sv.mazda.co.jp'; 'gfournelle@ford.com'; 'rdalbo@ford.com'; 'rsuarez8@ford.com'; 'dlawler1@ford.com'  
**Subject:** FW: Tribute IAC Valve Packaging

Don & Laura,

As discussed in the Contingency meeting, here is the email regarding the IAC valve packaging.

(Everyone else - FYI for now....)

Steve Limtiaco  
Mazda North American Operations  
Tribute Product Support  
949-442-6514 (phone)  
949-442-6599 (fax)  
e-mail: slimtiac@mazdausa.com

-----Original Message-----

**From:** Steven Limtiaco  
**Sent:** Monday, November 04, 2002 11:51 AM  
**To:** 'Fournelle, Gilbert (G.)'

Cc: 'rdalbo@ford.com'; 'rsuarez8@ford.com'; 'dlawler1@ford.com'  
Subject: IAC Valve Packaging

Gilbert,

I received the IAC valves to repair the Mazda buybacks. I opened up 10 boxes and none of them have instructions warning the technician to flash the PCM to the latest calibration before installing. In earlier discussions, I thought this was something that was to be included with the IAC valve packaging. Did this plan change?

Ford p/# 1L8Z-9F715-AA  
Mazda p/# AJ71-20-650

Steve Limtlaco  
Mazda North American Operations  
Tribute Product Support  
949-442-6514 (phone)  
949-442-6599 (fax)  
e-mail: slimtlac@mazdausa.com

**Suarez, Rhas (R.)**

---

**From:** Steven Limtlaco [SLimtlaco@mazdausa.com]  
**Sent:** Monday, September 23, 2002 12:04 PM  
**To:** 'rdalbo@ford.com'; 'rsuarez8@ford.com'; 'gfoumel@ford.com'  
**Subject:** FW: Engine Quit EVAPVM check

Gents,

Here's a suggestion for the EVAPVM procedure from Chris, one of our tech specialists. I'm not sure about the "recycle" change, however, I agree with the "return to" change. Should these changes be incorporated into the TSB?

Steve Limtlaco  
Mazda North American Operations  
Tribute Product Support  
949-442-6514 (phone)  
949-442-6599 (fax)  
e-mail: slimtlaco@mazdausa.com

> -----Original Message-----

> From: Chris Capuzzo  
> Sent: Monday, September 23, 2002 6:34 AM  
> To: Steven Limtlaco  
> Cc: Dan Rothweller  
> Subject: RE: Engine Quit EVAPVM check

> Steve,

> Sounds good, but I think that it maybe be worded a little different. How  
> is this....

> If EVAPVM is functioning correctly, the duty cycle should increase  
> to 84-100% with the FTP decreasing to approximately 2.2 volts and then  
> "reset" (Change to "recycle") back to 0% duty cycle while FTP hold's at  
> (change from hold's at to "return to") approximately 2.6 volts.

> I hope this helps....

> Chris Capuzzo  
> North East Region Technical Specialist  
> 732-868-2154 Office  
> 732-547-8501 Cell  
> 917-464-2358 Fax  
> CCAPUZZO@mazdausa.com

> -----Original Message-----

> From: Steven Limtlaco  
> Sent: Friday, September 20, 2002 6:34 PM  
> To: Alan Johnson; Bob Caughill; Bob Kulp; Brett Stierli; Chris  
> Capuzzo; Chuck (Charles) Coates; Dan Rothweller; Dave Pace; Dave Scott;

> David Breaux; Ed Stechman; George Goffier; Henry Limon; Jim Bready; John  
> Bowers; Kevin Howard; Larry Mooney; Les Hlura; Luis Dangond; Luis  
> Rodriguez; Mark Cheavens; Marty Martinez; Mike Allen; Randy Hatzl; Rod  
> Bremner; Rod Matheson; Roger Tarver; Tony Antunes; toledo, jose  
> Cc: Michael Giblin; Darrel Chin; Chris Riedon  
> Subject: Engine Quit EVAPVM check

> To all hotline and technical specialists:

> This is a better procedure for checking the evaporative vapor  
> management valve and will replace step 4 in the "updated" bulletin. We  
> verified the procedure to work in the shop this afternoon.

> If any technicians are having trouble performing the EVAPVM test  
> recommended in the current bulletin, please recommend the procedure below.

> Steve Limtiaco  
> Mazda North American Operations  
> Tribute Product Support  
> 949-442-6514 (phone)  
> 949-442-6599 (fax)  
> e-mail: slimtiac@mazdausa.com

> Please use the following conditions for all tests described below  
> "unless stated otherwise":

- > . Transmission in Park
- > . Engine at idle at approximately 750 RPM
- > . Engine temperature should be at least 88°C (190°F)
- > . All accessories and the engine cooling fan should be off

> 4. Determine if the Evaporative Vapor Management (EVAPVM) duty  
> cycle is  
> operating properly. If EVAPVM is functioning correctly, the duty  
> cycle  
> should increase to 84-100% with the FTP decreasing to approximately  
> 2.2 volts  
> and then "reset" back to 0% duty cycle while FTP holds at  
> approximately 2.6  
> volts. "If the duty cycle does not increase within 5 minutes, turn  
> on the headlights  
> and the AC with the blower on high. The duty cycle should start  
> increasing within  
> 5-10 minutes". Do not replace the EVAPVM valve if the duty cycle  
> functions  
> correctly. If the duty cycle stops increasing and remains at  
> 95-100% while  
> FTP holds at approximately 2.6 volts, replace the EVAPVM valve with  
> part  
> number AJ03-18-741A. Verify corrective action then proceed to Step  
> 5.

---

**From:** Bonnici, Jerry (J.P.)  
**Sent:** Thursday, April 04, 2002 1:20 PM  
**To:** Jayakumar, Subrahmany (S.)  
**Subject:** U204 Key Ring

Have you had any luck with the people who make the owner's manuals so that the disclaimer about key ring weight can be added?

Thanx In Advance for your Assistance:

***Jerry Bonnici***

phone/fax: 313-20-64908

Global Core Engineering: Looks & Keys

## U204 Key Change to Prevent Phantom Stall

### Background Information

It was reported that one of the janitors from [REDACTED] while driving a U204 over a railroad track (?) experienced engine stall. It appears the ignition key turned itself from the run position to off position. No information is available as to whether this is a unique incident or not.

It was also reported that the key chain of the janitor contained a heavy bunch of keys (over 1 lb ?).

Huf North America is the ignition lock cylinder supplier for this program. The same design is also used on Focus.

The keyhole is offset from the center of rotation of the ignition lock cylinder. This design is used only by Focus and U204/U293. All other vehicles use ignition lock cylinder with keyhole in the center.

The key chain hole in the key is also offset to one side to accommodate the PATS transponder.

Methodo is the supplier of ignition switch. This corporate switch is used across many vehicle programs

The ignition lock cylinder does not provide the detent function for the key. This function is part of the ignition switch.

### Investigation:

The possible reason for the phantom stall is that when the vehicle was driven over the rail road track, a combination of heavy key chain, keyhole offset and key chain hole offset in the key produced enough dynamic torque to cause the key to turn from the "Run" position to "Off" position.

### Possible Solutions:

The program team, backbone engineers and GCE engineers looked at several possible solutions to this issue. Several options were looked at, each one has been found not feasible due to cost and timing implications. The several options looked at are as follows:

1. Change the key design to center the key chain hole: This is a corporate key. Any changes to this would involve expensive tooling cost and timing.
2. Change the detent on the ignition switch. Any change to the detent would increase the torque required to turn the key from off to run position. This will create customer dissatisfaction. Also this is a corporate switch used across several vehicle programs. Any change to this also would require approval by all vehicle programs.
3. Add a detent to the ignition lock cylinder/housing. Currently detent function is not part of the ignition lock cylinder. So adding a detent would require a major tooling change and timing.

4. Change the ignition lock cylinder orientation on the steering column lock (SCL) module so that the keyhole is in a vertical position in the "Run" position. This would involve major tooling change and timing issue. Also this could be an ergonomics issue.
5. Change the keyhole location on the ignition lock cylinder from the offset position to the center of the lock cylinder. This is the common lock cylinder with Focus. This change would involve major tooling change, cost and timing and approval from Focus program.
6. Add a caution note to the Owner's Manual to limit the total weight of the key chain to a TBD value.

---

**From:** Williams, Lee (LHW.)  
**Sent:** Friday, May 31, 2002 9:59 AM  
**To:** Sanders, Muriel (M.S.)  
**Cc:** Jayakumar, Subrahmany (S.)  
**Subject:** RE: John the Janitor--Key Ignition Recap

Thanks Muriel! Yes, the first email was the one I was referring to. [REDACTED] if you scroll down to the bottom of that email it has all the original information on it that will be of interest to you. Just so you know, right now the Janitor has not experienced any more stalls after decreasing the amount of keys on his keyring to a few keys.

-----Original Message-----

**From:** Sanders, Muriel (M.S.)  
**Sent:** Friday, May 31, 2002 9:29 AM  
**To:** Williams, Lee (LHW.)  
**Cc:** Jayakumar, Subrahmany (S.)  
**Subject:** RE: John the Janitor--Key Ignition Recap

Lee, is this the e-mail that you were referring to???

<< Message: RE: IGNITION Design REVIEW #2 -U204 Meeting Minutes 2/6/02 >>

Here is the e-mail from Mark Freeland regarding his Mountaineer. The key chain weight he had was 285grams.

<< Message: RE: U204 Stall Meeting Agenda - 5/2/02 >>

Here's another e-mail that may be of interest on this issue.

<< Message: RBCAP: Key Change to Prevent Phantom Stalls and Ignition Switch. >>

***Muriel Sanders***

U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

-----Original Message-----

**From:** Williams, Lee (LHW.)  
**Sent:** Friday, May 31, 2002 9:01 AM  
**To:** Sanders, Muriel (M.S.)  
**Cc:** Jayakumar, Subrahmany (S.)  
**Subject:** John the Janitor--Key Ignition Recap

Good Morning Muriel!

I'm going to miss my Tribute! Subrahmany was interested in finding out a little bit more information on the Key Ignition problem. There was an email I may have forwarded you a while back about the issue (discussed the incident in detail as well as the actions we were taking regarding replacing the lock cylinder, etc). Do you have that old email on you by any chance? If so, could you send it his/my way?

Subrahmany:

There was an incident of a Mountaineer stalling after an employee yanked on the keychain while driving to see if he could duplicate a stall. His name is Mark Freeland. There were a couple of reports of Tributes doing this



on the west coast. Steve Limtlaco of Mazda has more info on this. Don Attonian investigated this condition on a customer's Escape a couple of months ago in TN. All of these three people can be found on oda. While Muriel and I look for this detailed email, you may try contacting them to get more background info.

As for the Janitor at MI truck, John, his wife also experienced stalls on the vehicle b/c she has a heavy keychain as well. John said there is another janitor who experienced stalls on an Escape but we were never able to verify that source.

**Regards,  
Les Williams  
Cyclone V6 Computer Aided Design  
Tel 313-33-71902  
Fax 313-84-52269  
For More, Count on Les**

---

**From:** Sanders, Muriel (M.S.)  
**Sent:** Friday, May 31, 2002 9:29 AM  
**To:** Williams, Lea (LHW.)  
**Cc:** Jayakumar, Subrahmany (S.)  
**Subject:** RE: John the Janitor--Key Ignition Recap

Lea, is this the e-mail that you were referring to???

  
Re: Customer Design  
Review 11...

Here is the e-mail from Mark Freeland regarding his Mountaineer. The key chain weight he had was 285grams.

  
Re: ODM Stall  
Meeting Agenda ...

Here's another e-mail that may be of interest on this issue.

  
RECAP: Key Chain  
to Freeland ...

***Muriel Sanders***

U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

**-----Original Message-----**

**From:** Williams, Lea (LHW.)  
**Sent:** Friday, May 31, 2002 9:01 AM  
**To:** Sanders, Muriel (M.S.)  
**Cc:** Jayakumar, Subrahmany (S.)  
**Subject:** John the Janitor--Key Ignition Recap

Good Morning Muriel

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Subrahmany:

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As for the Janitor at MI truck, John, his wife also experienced stalls on the vehicle b/c she has a heavy keychain as well. John said there is another Janitor who experienced stalls on an Escape but we were never able to verify that source.

**Regards,  
Les Williams  
Cyclone V6 Computer Aided Design  
Tel: 313-83-71902  
Fax: 313-84-52269  
For More, Count on Les**

---

**From:** Jayakumar, Subrahmany (S.)  
**Sent:** Tuesday, June 04, 2002 2:26 PM  
**To:** Atkinson, Art (A.W.)  
**Subject:** Update: U204 Phantom Stall Issues

Art, Attached is a note I sent to Jim some time ago regarding various possible options to resolve the phantom stall issue. One thing I left out is adding a spacer in the key to center the key ring hole. This was not agreed to by GCE.



U204 Key Change to  
Prevent Pha...

Best regards,

S. Jayakumar  
Outfitters Body Closures  
CDS ID: SJAYAKUM  
Tel: 313-84-66085

---

**From:** Williams, Les (LHW.)  
**Sent:** Friday, May 31, 2002 9:01 AM  
**To:** Sanders, Muriel (M.S.)  
**Cc:** Jayakumar, Subrahmany (S.)  
**Subject:** John the Janitor-Key Ignition Recap

Good Morning Muriel!

I'm going to miss my Tribute! Subrahmany was interested in finding out a little bit more information on the Key Ignition problem. There was an email I may have forwarded you a while back about the issue (discussed the incident in detail as well as the actions we were taking regarding replacing the lock cylinder, etc). Do you have that old email on you by any chance? If so, could you send it his/my way?

Subrahmany:

There was an incident of a Mountaineer stalling after an employee yanked on the keychain while driving to see if he could duplicate a stall. His name is Mark Freeland. There were a couple of reports of Tributes doing this on the west coast. Steve Lintaco of Mazda has more info on this. Don Altoonian investigated this condition on a customer's Escape a couple of months ago in TN. All of these three people can be found on cde. While Muriel and I look for this detailed email, you may try contacting them to get more background info.

As for the Janitor at [REDACTED] his wife also experienced stalls on the vehicle b/c she has a heavy keychain as well. [REDACTED] said there is another Janitor who experienced stalls on an Escape but we were never able to verify that source.

Regards,  
Les Williams  
Cyclone V6 Computer Aided Design  
Tel: 313-33-71902  
Fax: 313-84-52269  
For More, Count on Les



com\_ign-positions-revised

### Positions of the Ignition

1. LOCK, locks the gearshift lever and allows key removal.
2. ACCESSORY, allows the electrical accessories such as the radio to operate while the engine is not running.
3. RUN, all electrical circuits operational and warning lights will illuminate. This is the position the key is in when you're driving.



Figure: 204to311\_a

**Notes** If you're driving the vehicle with a heavy key chain attached to the ignition key, the weight of the key chain may cause the ignition to turn from the RUN position to the LOCK position, which shuts off the engine.

4. START, cranks the engine. Release the key as soon as the engine starts.





cwn\_ign-positions-revised

#### Positions of the Ignition

1. LOCK, locks the gearshift lever and allows key removal.
2. ACCESSORY, allows the electrical accessories such as the radio to operate while the engine is not running.
3. RUN, all electrical circuits operational and warning lights will illuminate. This is the position the key is in when you're driving.



Figure: 204to311\_a

**Note:** If you're driving the vehicle with a heavy key chain attached to the ignition key, the weight of the key chain may cause the ignition to turn from the RUN position to the LOCK position, which shuts off the engine.

4. START, cranks the engine. Release the key as soon as the engine starts.



---

**From:** McIlhargay, Pamela (P.A.)  
**Sent:** Wednesday, May 08, 2002 9:16 AM  
**To:** Jayakumar, Subrahmany (S.)  
**Subject:** RE: U204 Engine phantom stalling

Cool!

-----Original Message-----

**From:** Jayakumar, Subrahmany (S.)  
**Sent:** Wednesday, May 08, 2002 9:12 AM  
**To:** McIlhargay, Pamela (P.A.)  
**Subject:** RE: U204 Engine phantom stalling

Thanks Pam.

Best regards,

S. Jayakumar  
Outfitters Body Closures  
CDS ID: SJAYAKUM  
Tel: 313-84-50085

-----Original Message-----

**From:** McIlhargay, Pamela (P.A.)  
**Sent:** Wednesday, May 08, 2002 8:04 AM  
**To:** Jayakumar, Subrahmany (S.)  
**Cc:** Brach, Margaret (M.M.)  
**Subject:** RE: U204 Engine phantom stalling

Jay

Here are the vehicle that have been Reserved  
for Phantom Stalling.

May 16 & 17

309W975 2KA22731

308W332 2KB39940

pick up time is 9:00 am - return time at 4:00 pm

May 20 - 22

307WB60 2KA00023

590T732 1KB26845

578T466 1KA68920

pick up time is 9:00 am - return time Wed am by 8:00

Thanks

Pam

-----Original Message-----

**From:** Jayakumar, Subrahmany (S.)  
**Sent:** Tuesday, May 07, 2002 3:21 PM  
**To:** McIlhargay, Pamela (P.A.)  
**Cc:** Brach, Margaret (M.M.)  
**Subject:** RE: U204 Engine phantom stalling

Pamela,

See my request for couple of U204 vehicles for two days, preferably this week or next week, to investigate engine phantom stalling. Any configuration is ok. Please let me know when the vehicles are available.



Thanks.

Best regards,

S. Jayakumar  
Outfitters Body Closures  
CDS ID: SJAYAKUM  
Tel: 313-84-56085

-----Original Message-----

From: Brach, Margaret (M.M.)  
Sent: Tuesday, May 07, 2002 3:16 PM  
To: Jayakumar, Subrahmany (S.)  
Cc: McIlhargey, Pamela (P.A.)  
Subject: RE: U204 Engine phantom stalling

My vehicle coordinator (Pam McIlhargey) can best answer that for you. She will need to know when you want them, for how long and if you need any particular configuration.

*Margaret M. Brach*

Ford Escape/Mazda Tribute Vehicle Engineering Supervisor

KCAP: (ph) 816-414-5605 (fax) 816-414-5662

PDC: (ph) 313-248-4078 (fax) 313-322-5272

e-mail: mbrach@ford.com

Pager: 313-851-4005

*A lot of people approach risk as if it's the enemy when it's really fortune's accomplice. - Sting*

-----Original Message-----

From: Jayakumar, Subrahmany (S.)  
Sent: Tuesday, May 07, 2002 2:15 PM  
To: Brach, Margaret (M.M.)  
Subject: U204 Engine phantom stalling

Margaret,

I want couple of U204 vehicles for investigation of the phantom stalling due to heavy key chain bunch attached to the ignition key. Do you have any vehicles I can borrow for this purpose?

Best regards,

S. Jayakumar  
Outfitters Body Closures  
CDS ID: SJAYAKUM  
Tel: 313-84-56085

---

**From:** Takasawa, Keith (K.D.)  
**Sent:** Thursday, September 13, 2001 2:28 PM  
**To:** Hofman, Michael (M.V.)  
**Cc:** Powers, Ken (K.W.); Garrett, Bruce (B.)  
**Subject:** STALLS

Just noticed that ENGINE STALLS are #1 on Taurus Top 25. If you don't know, can you please find out if it's Duratec, and if so, find out more about it and get hooked into their process? Thanks.

Best Regards,

*Keith Takasawa*

Escape/Tribute/Maverick Chief Engineer  
Suite 305, West Park Center  
5111 Auto Club Drive  
Dearborn, MI 48126-2749  
PH: 313-322-5675 FAX: 313-248-8599  
TEXT PAGE: mailto:7346045034@MOBILE.ATT.NET  
E-MAIL: mailto:KTAKASAW@FORD.COM

---

**From:** Williams, Les (LHW.)  
**Sent:** Tuesday, January 15, 2002 2:19 PM  
**To:** Kwon, Soon (S.K.)  
**Cc:** Dalbo, Bob (R.J.); Garrett, Bruce (B.); Noma, Fumie (F.)  
**Subject:** RE: Timeline of hardware change

looks good to me!

-----Original Message-----

**From:** Kwon, Soon (S.K.)  
**Sent:** Tuesday, January 15, 2002 12:22 PM  
**To:** Garrett, Bruce (B.); Noma, Fumie (F.); Williams, Les (LHW.)  
**Cc:** Dalbo, Bob (R.J.)  
**Subject:** RE: Timeline of hardware change

<< File: Timeline2.xls >>  
Oops! Attached. Thanks.

Regards,  
**Soon Kwon**  
Escape/Tribute P/T OPD Supervisor  
Compact Utility PTSE, TVC  
2FB39, MD 406, PDC Dearborn 48126  
Phone (313) 322-6844, Fax  
Pager (313) 796-1536, email: skwon@ford.com

-----Original Message-----

**From:** Kwon, Soon (S.K.)  
**Sent:** Tuesday, January 15, 2002 10:26 AM  
**To:** Williams, Les (LHW.); Garrett, Bruce (B.); Noma, Fumie (F.)  
**Cc:** Dalbo, Bob (R.J.)  
**Subject:** RE: Timeline of hardware change

info you requested. Les, if you have update to the timeline, please let Bruce know.

Thanks.

|

Regards,  
**Soon Kwon**  
Escape/Tribute P/T OPD Supervisor  
Compact Utility PTSE, TVC  
2FB39, MD 406, PDC Dearborn 48126  
Phone (313) 322-6844, Fax  
Pager (313) 796-1536, email: skwon@ford.com

-----Original Message-----

**From:** Williams, Les (LHW.)  
**Sent:** Monday, December 17, 2001 5:09 PM  
**To:** Hansen, George (G.C.)  
**Cc:** Dalbo, Bob (R.J.); Kwon, Soon (S.K.); Fascetti, Bob (R.J.)  
**Subject:** Timeline of hardware change

Here you go George.

<< File: Stalls Timeline.xls >>

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

---

**From:** Williams, Les (LHW.)  
**Sent:** Tuesday, January 15, 2002 2:20 PM  
**To:** Kwon, Soon (S.K.)  
**Co:** Dalbo, Bob (R.J.); Noma, Fumie (F.); Garrett, Bruce (B.)  
**Subject:** RE: Timeline of hardware change

One thing, the MAF and the calibration implementation at KCAP have been delayed due to sign-offs with Mazda Japan (MAF) and waiting for on-line testing at KCAP (calibration).

-----Original Message-----

**From:** Kwon, Soon (S.K.)  
**Sent:** Tuesday, January 15, 2002 12:22 PM  
**To:** Garrett, Bruce (B.); Noma, Fumie (F.); Williams, Les (LHW.)  
**Co:** Dalbo, Bob (R.J.)  
**Subject:** RE: Timeline of hardware change

<< File: Timeline2.xls >>  
Oops I Attached. Thanks.

Regards,  
**Soon Kwon**  
Escape/Tribute P/T OPD Supervisor  
Compact Utility PTSE, TVC  
2FBS9, MD 406, PDC Dearborn 48129  
Phone (313) 322-6844, Fax  
Pager (313) 796-1536, email: skwon@ford.com

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**Sent:** Tuesday, January 15, 2002 10:26 AM  
**To:** Williams, Les (LHW.); Garrett, Bruce (B.); Noma, Fumie (F.)  
**Co:** Dalbo, Bob (R.J.)  
**Subject:** RE: Timeline of hardware change

Info you requested. Les, if you have update to the timeline, please let Bruce know.

Thanks.

I

Regards,  
**Soon Kwon**  
Escape/Tribute P/T OPD Supervisor  
Compact Utility PTSE, TVC  
2FBS9, MD 406, PDC Dearborn 48129  
Phone (313) 322-6844, Fax  
Pager (313) 796-1536, email: skwon@ford.com

-----Original Message-----

**From:** Williams, Les (LHW.)  
**Sent:** Monday, December 17, 2001 5:09 PM  
**To:** Harman, George (G.C.)  
**Co:** Dalbo, Bob (R.J.); Kwon, Soon (S.K.); Pascetti, Bob (R.J.)  
**Subject:** Timeline of hardware change

Here you go George.

<< File: Stalls Timeline.xls >>

Regards,

Lee Williams

For More, Count on Lee

U204 3.0L Powertrain Calibration

Truck Engine Engineering, Suite 1AE20

Phone: (313)33-72503

Fax: (313) 32-31786

---

**From:** Powers, Ken (K.W.)  
**Sent:** Friday, October 18, 2001 2:32 PM  
**To:** Takasawa, Keith (K.D.); Preston, Carla Traci (C.T.); Garrett, Bruce (B.)  
**Co:** Sauer, Robert (R.M.); Loman, Robert (R.W.)  
**Subject:** Meeting Update

Just to keep you updated on meetings we hold throughout the week, I've included what we did this week. We have been following this process since we first had data to look at. Each week is a bit different. Some repeat every week, and others alternate, depending on how much attention is necessary. Bob Loman and Bob Sauer own this process and arrange for the attendees.

We have very good support from the backbone on nearly every issue. FYI.

Mon 10/15 (each issue is 30 minutes)

- Road Noise
- I/P foam over VIN, and Console
- Retractable cargo cover

Tues 10/16

- Other Auto Trans
- Engine Noise
- Engine Stalls

Wed

Concern Monitoring Team -- Hot Lines call in from Ford and Mazda

Thurs 10/18

- Windnoise
- Squeak/Rattle (latches)
- Steering Gear leaks/knocks

Friday 10/19

- Rear Wiper clearing
- Climate Control

*Ken Powers*

Escape/Tribute PVT Manager, KCAP  
Ph: 816-458-1728; Fax: -1728

**From:** Kwon, Soon (S.K.)  
**Sent:** Tuesday, January 15, 2002 12:22 PM  
**To:** Garrett, Bruce (B.); Noma, Fumie (F.); Williams, Lee (LHW.)  
**Cc:** Dalbo, Bob (R.J.)  
**Subject:** RE: Timeline of hardware change

  
Timeline2.xls

Oops I Attached. Thanks.

Regards,  
Soon Kwon  
Escape/Tribute P/T OPD Supervisor  
Compact Utility PTSE, TVC  
2FB39, MD 406, PDC Dearborn 48126  
Phone (313) 322-8844, Fax  
Pager (313) 795-1838, email: skwon@ford.com

-----Original Message-----

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**To:** Williams, Lee (LHW.); Garrett, Bruce (B.); Noma, Fumie (F.)  
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Thanks.

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Regards,  
Soon Kwon  
Escape/Tribute P/T OPD Supervisor  
Compact Utility PTSE, TVC  
2FB39, MD 406, PDC Dearborn 48126  
Phone (313) 322-8844, Fax  
Pager (313) 795-1838, email: skwon@ford.com

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**Sent:** Monday, December 17, 2001 5:09 PM  
**To:** Hansen, George (G.C.)  
**Cc:** Dalbo, Bob (R.J.); Kwon, Soon (S.K.); Pascetti, Bob (R.J.)  
**Subject:** Timeline of hardware change

Here you go George.

<< File: Stalls Timeline.xls >>

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20



Phone: (313)33-72503  
Fax: (313) 32-31786

| Action                                                                        | Date of Action                        |
|-------------------------------------------------------------------------------|---------------------------------------|
| Poke-a-yoke strategy implemented to eliminate D188/U204 IAC valve mbkup @ CEP | Summer Shutdown @ KCAP July 1-19 2001 |
| Initiate use of EEC Hella Relay @ KCAP                                        | 27-Jul-01                             |
| Lear 8D on pin push-out in PDB @ KCAP                                         | 10-Aug-01                             |
| Suspect check valve/clogged vent line identified                              | 10/30/01                              |
| Fordstar updates (service calibration)                                        | 12/14/01                              |
| Production calibration arrives at KCAP                                        | 12/18/01                              |
| Implementation of updated calibration at KCAP                                 | 1/15/02                               |
| Implementation of more robust MAF                                             | 1/15/02                               |
| Change from Guide A IAC to Fin Pintle IAC                                     | 3/2/02                                |
| DPFE Change from Kavlico to Motorola                                          | 3/18/02                               |
| Revised Vent Line location                                                    | 4/2/02                                |

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**From:** Bhojwani, Kamal (K.)  
**Sent:** Monday, September 24, 2001 1:58 PM  
**To:** Bhojwani, Kamal (K.)  
**Subject:** Attention Escape/Tribute Owner's or Lessee's

Attention owners or lessee's of the following vehicles:

Model Year: 2001

Vehicle: Escape  
Tribute

Engine: 3.0L Duratec

If you own or lease any of the above and have experienced any engine stalls while driving, the U204 3.0L Powertrain Calibration Team would like to take a look at your vehicle. We would need to inspect your vehicle for approximately 2 to 3 hours. For your time, you will receive a free car wash.

If your vehicle meets the above requirements, please contact Kamal Bhojwani (KBHOJWAN) via an email reply to this message. Please include a brief description of the concern and your vehicle's VIN number which should be located in one of the following areas:

- your certificate of automobile insurance, which you may have handy
- the driver's side of your vehicle's dash board, as seen looking through the front windshield
- the inside of the driver's side door, the side that mates to the B-pillar

Thank you for your help!

Regards,  
*Kamal Bhojwani*  
U204 3.0L Powertrain Calibration  
TEB, Suite 1A30  
Phone: (313) 39-01969  
Fax: (313) 32-31786

---

**From:** Diez, Timothy (T.P.)  
**Sent:** Monday, November 19, 2001 3:39 PM  
**To:** Namatollahi, Sonya (S.)  
**Cc:** Kwon, Soon (S.K.)  
**Subject:** Summary of EMC results on Powertrain's Engine Stall Issue

Sonya,

At today's meeting, I reported that Radiated Immunity Testing revealed engine stumbles and stalls at the following frequencies:

|           |        |                |
|-----------|--------|----------------|
| 20-22 MHz | 60 V/m | Engine Stumble |
| 7-10 MHz  | 50 V/m | Engine Stall   |

Viateon provided a fixed MAF sensor for the 7-10 MHz issue.

An on-board transmitter which operated at 21 MHz was installed in the vehicle and no vehicle level issues were found. The on board transmitter test provides a real world scenario for something the vehicle might see in its environment.

I would like to reiterate that these EMC issues could NEVER possibly account for the number of engine issues we are seeing in the field. Also, it has been expressed that the team would like to fix the part of the issue that could be attributed to EMC. Our team has accomplished this. We fixed the issue for the 7-10 MHz range and have demonstrated that the anechoic chamber failure at 20-22 MHz is not representative of what the customer might see. The on board test is representative of what the customer might see.

Let me know if I may contribute to this effort in any further way.

Thank you.

Sincerely,  
Timothy Diez  
Cross Vehicle EMC Technology Applications  
313-32-39927, Fax: 313-322-1882  
e-mail: tdiez@ford.com

From: Suarez, Rhae (R.)  
Sent: Tuesday, September 10, 2002 7:53 AM  
To: Lawler, David (D.A.)  
Cc: Powers, Ken (K.W.)  
Subject: RE: Stalling Escape Reflash

The TSB has recently been submitted into the system for approvals. I am guessing (going by the last 2 times) it will be about a month for it to process and released due to all the procedure steps and parts associated. The newest information is the calibration and that is now available.

Here is ISM that informs the availability of the calibration for the stall condition.....

Article #: ISM 02-09-007 Date: 09/05/2002

SOME 2001-2003 ESCAPE WITH 3.0L ENGINES MAY EXHIBIT AN INTERMITTENT STALL.

VERIFY TSB 02-11-06 HAS BEEN PERFORMED THEN REPROGRAM THE PCM WITH WDS

VERSION 20.12 OR LATER. 2001 & EARLY BUILD 2002 MODELS WILL UPDATE TO 1U7A-

AND, ALL OTHER 2002 MODELS WILL UPDATE TO 2U7A-CZB, AND EARLY 2003 MODELS

WILL UPDATE TO 3L8A-BC. FOR '01-'02 MODELS VERIFY LATEST DPFE SENSOR(2F12-

9J460-AA) AND MAP(1L2Z-12B579-BA). TSB TO FOLLOW.

Also, I forwarded an email I received from the Calibration group about the Fordstar release.....

Let me know if you need any other info.

Thanks!!

Rhae M. Suarez

Rhae Michael Suarez

Product Concern Engineer - Escape / Tribute / Maverick

PVT & Field Support / PCSD

DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101

Phone: 313-32-23344 Pager: 313-796-6242

Fax: 313-33-78337

Email: rsuarez8@ford.com

-----Original Message-----

From: Dalbo, Bob (R.J.)

Subject: RE: 02 Escape Calibration Concern

Importance: High

Thanks to extraordinary efforts by the multitude of people involved in the release process:

2003 MY NA market calibrations will go into production 9/10.

2003 MY market calibrations were released on Fordstar 8/30 and are currently available (WDS version B20.11)

2001/2002 MY NA market service calibrations are just now available on Fordstar (WDS B20.12).

2001/2002 MY service calibrations will be available via Internet by 9/6.

Tim,

Please approve concern C11390555 (with Keith's concurrence) to release the finned-pintle IACV for service as the necessary calibrations are now available.

Bob Dalbo

3.0L Calibration Supervisor

Outfitters Calibration, NAT

Phone: (313) 24-84947 Fax: (313) 32-31786

Pager: (313) 795-2859 Email: rdalbo@ford.com

-----Original Message-----

From: Lawler, David (D.A.)

Sent: Monday, September 09, 2002 5:09 PM

To: Suarez, Rhae (R.)

Cc: Powers, Ken (K.W.)

Subject: FW: Stalling Escape Reflash

Rhae,

Ken Powers contacted me 3:50 p. C.S.T. today on the Subject T.S.B. asking when it would be out ...

I showed him the confidential/unapproved draft and told him the Calibration reflash will be in Fordstar soon (Thursday ?).

Please stir the pot and let Ken & I know the date the actual T.S.B will be at Dealers.

Dave Lawler

FCSD Program Manager - L.H.D. Escape/Tribute/Maverick

DLAWLER1 Office: 816-414-5602 Pager: 313-754-1760

-----Original Message-----

From: Suarez, Rhae (R.)

Sent: Wednesday, August 28, 2002 7:53 AM

To: Wrightsman, David (D.B.)

Cc: Lawler, David (D.A.); King, Robert (R.F.)

2002-027-A 0005

Subject: RE: Stalling Escape Reflash

David,

Engineering is working on releasing this new Calibration ASAP. The target time frame is around the week of Sept 9. The new TSB will not be release at the same time. However, an ISM will capture the new calibration information so keep an eye out for that. The new TSB has a few additional steps (versus TSB# 02-11-06) and the approvals and timing will take a little longer.

I hope this helps.

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: King, Robert (R.F.)  
Sent: Wednesday, August 28, 2002 8:42 AM  
To: Wrightsman, David (D.B.)  
Cc: Suarez, Rhae (R.)  
Subject: RE: Stalling Escape Reflash

The TSB should be released soon.

Ford-"The Most Wanted Car on the American Road" circa 1952

Robert King  
LHD Escape/Maverick FCSD Program Manager  
PVT & Field Support, Vehicle Service & Programs  
Kansas City Assembly Plant (816) 459-1872, fax 459-1726

-----Original Message-----

From: Wrightsman, David (D.B.)  
Sent: Tuesday, August 27, 2002 4:26 PM  
To: King, Robert (R.F.)  
Cc: Alexander, Ray (R.B.); Moses III, George (G.C.)  
Subject: Stalling Escape Reflash

Within the notes of the FSE Roundtable discussion from this month, a reflash for the Escape for stalling was mentioned twice.

Do you have any information on this reflash? Is there a due date?  
Will there be a SSM issued?

Any information that you can share would surely be appreciated. I have several of these vehicles that are in the final stages of the "repair or buyback" process. It might buy us some time.

David Wrightsman

Field Service Engineer  
FCSD-Atlanta



From: Cissell, Carrie (C.J.)  
Sent: Friday, August 16, 2002 4:48 PM  
To: Powers, Ken (K.W.)  
Subject: RE: (2) stalls robustness CR's

Stalls trend over Stalls Claims 02  
time.pdf MYTD.pdf Ken,

Sorry for the delay. I have been in and out the last couple of weeks.

Attached is the trend over time for stalls, and the claims that correspond with that trend. If you need anything else, please let me know.

Thanks,  
Carrie J. Cissell  
ICCD - Customer Relations Specialist  
Ford Motor Company  
Kansas City Assembly Plant  
Ph# 816-414-5557  
Fax# 816-459-1970  
Pager# 913-567-1747

-----Original Message-----

From: Powers, Ken (K.W.)  
Sent: Thursday, August 08, 2002 10:51 AM  
To: CWALKR46 was deleted 20020809  
Subject: FW: (2) stalls robustness CR's

Can you update the stall data and send it to me?

Ken Powers  
Escape/Tribute PVT Manager, KCAP  
Ph: 816-459-1729; Fax: -1726

-----Original Message-----

From: Takasawa, Keith (K.D.)  
Sent: Tuesday, August 06, 2002 8:25 PM  
To: Powers, Ken (K.W.)  
Subject: FW: (2) stalls robustness CR's

Do we get enough sample size in ICCD to see if these changes significantly reduce stall rate?

Regards,  
Keith Takasawa  
Escape/Tribute Chief Engineer

PDC 2HJ64  
MD401  
PH: (313) 322-5675  
FAX: (313) 248-8599  
E-MAIL: KTAKASAW@FORD.COM  
TEXT PAGE: 7346045034@mobile.att.net

-----Original Message-----

From: Corbett, Sandra (S.M.)  
Sent: Tuesday, August 06, 2002 4:50 PM  
To: Takasawa, Keith (K.D.)  
Cc: Kreuter, Richard (R.B.); Dalbo, Bob (R.J.)  
Subject: RE: (2) stalls robustness CR's

Keith,  
Sorry for the delay...I was on vacation last week.  
The LEV (North America) calibration will be at KCAP on 8/13/02 and the  
CAA calibration will follow by 8/16/02.  
Capacitor change should already be at KCAP.  
Sandy Corbett  
Escape Powertrain PMT & QRT  
Phone/Fax: (313)59-44351  
Product Development Center 2H-E66

-----Original Message-----

From: Takasawa, Keith (K.D.)  
Sent: Wednesday, July 31, 2002 7:57 AM  
To: Corbett, Sandra (S.M.)  
Subject: FW: (2) stalls robustness CR's

When is implementation at KCAP of the new calibration and capacitor  
change?

Best Regards,  
Keith

-----Original Message-----

From: Veenstra, Tim (T.W.)  
Sent: Wednesday, July 31, 2002 12:34 AM  
To: Takasawa, Keith (K.D.)  
Subject: RE: (2) stalls robustness CR's

Yes!

-----Original Message-----

From: Takasawa, Keith (K.D.)  
Sent: Tuesday, July 30, 2002 6:09 AM  
To: Veenstra, Tim (T.W.)  
Subject: RE: (2) stalls robustness CR's

Are the 2 CRs fully released now?

Regards,  
Keith Takasawa  
Escape/Tribute Chief Engineer  
PDC 2HJ64  
MD401  
PH: (313) 322-5675

ERG2-627-A 8589

FAX: (313) 248-8599  
E-MAIL: KTAKASAW@FORD.COM  
TEXT PAGE: 7346045034@mobile.att.net

-----Original Message-----

From: Corbett, Sandra (S.M.)  
Sent: Wednesday, July 24, 2002 3:48 PM  
To: Inoue, Hiroshi (H.); Fascetti, Bob (R.J.)  
Cc: Veenstra, Tim (T.W.); Moorhouse, Scott (S.R.); Shiraishi, Masaru (M.); Dalbo, Bob (R.J.); Hofman, Michael (M.V.); Ichikawa, Jiyunichiro (J.); Waud, Sachiko (S.); Fujioka, Kenji (K.); Linde, Peter (P.A.); Rusu, Jessica (J.L.); Klarr, Jerry (G.T.); Takasawa, Keith (K.D.)  
Subject: RE: (2) stalls robustness CR's

Both Ichikawa-san and Shiraishi-san are on the invite list for the weekly stalls meeting which occurs on Thursday's at 2pm at TEE and with audio numbers.

Sandy Corbett  
Escape Powertrain PMT & QRT  
Phone/Fax: (313)59-44351  
Product Development Center 2H-E66

-----Original Message-----

From: Inoue, Hiroshi (H.)  
Sent: Wednesday, July 24, 2002 3:46 PM  
To: Fascetti, Bob (R.J.)  
Cc: Veenstra, Tim (T.W.); Moorhouse, Scott (S.R.); Shiraishi, Masaru (M.); Dalbo, Bob (R.J.); Hofman, Michael (M.V.); Ichikawa, Jiyunichiro (J.); Waud, Sachiko (S.); Fujioka, Kenji (K.); Linde, Peter (P.A.); Rusu, Jessica (J.L.); Klarr, Jerry (G.T.); Corbett, Sandra (S.M.); Takasawa, Keith (K.D.)  
Subject: RE: (2) stalls robustness CR's

Bob,  
I expect your information will get understanding of Mazda engineers shortly.

Just for clarification: Kanai-san and Steve Limtiaco are Quality folks and NOT powertrain engineer for this CR. In US, the right contacts is Shiraishi-san in this case.

-----Original Message-----

From: Fascetti, Bob (R.J.)  
To: Inoue, Hiroshi (H.); Takasawa, Keith (K.D.)  
Cc: Veenstra, Tim (T.W.); Moorhouse, Scott (S.R.); Shiraishi, Masaru (M.); Dalbo, Bob (R.J.); Hofman, Michael (M.V.); Ichikawa, Jiyunichiro (J.); Waud, Sachiko (S.); Fujioka, Kenji (K.); Linde, Peter (P.A.); Rusu, Jessica (J.L.); Klarr, Jerry (G.T.); Corbett, Sandra (S.M.)  
Sent: 02/07/24 14:17  
Subject: RE: (2) stalls robustness CR's

We need these concerns approved at this Thursday morning meeting.

Mazda has had the white papers for these concerns for over a week (sent to Ichikawa-san). All of these concerns have been discussed at our weekly stall meeting, that Kanai-san, and MNAO (Steve Lintiac) attend.

Takasawa-san has already directed that these concerns be approved. I understand that Mazda gets some time to approve concerns, and that's why we sent the white paper early.

Please come prepared to approve this concern at this meeting. We have now lost two full days of progress due to waiting.

Please address this matter urgently.

Thank you,

Bob Fascetti

Outfitters Calibration Manager

-----Original Message-----

From: Inoue, Hiroshi (H.)

Sent: Tuesday, July 23, 2002 12:06 PM

To: Takasawa, Keith (K.D.)

Cc: Veenstra, Tim (T.W.); Moorhouse, Scott (S.R.); Shiraishi, Masaru (M.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.); Hofman, Michael (M.V.);

Ichikawa, Jiyunichiro (J.); Waud, Sachiko (S.); Fujioka, Kenji (K.);

Linde, Peter (P.A.); Rusu, Jessica (J.L.); Klarr, Jerry (G.T.); Corbett,

Sandra (S.M.)

Subject: RE: (2) stalls robustness CR's

Takasawa-san,

Per your approval for KCAP, now Hofu change control process starts officially for these CRs.

At this moment, both of C11390580 and C11371349 are "Black Box" for Mazda engineers.

In order to get Hofu approval quickly, please have relating Ford folks give information to Mazda engineers ASAP. Shiraishi-san will set up a engineering meeting in this week.

The major point to be confirmed is any impact on Certification/Homologation in countries out side US. I sincerely don't want make you get problems of regulatory recall.

Hiroshi Inoue

Mazda Tribute Chief Engineer

Phone: 313-845-8179

Fax: 313-248-7059

Cellular: 248-320-7670

-----Original Message-----

From: Takasawa, Keith (K.D.)

Sent: 2002777227 16:28

To: Corbett, Sandra (S.M.)

Cc: Veenstra, Tim (T.W.); Moorhouse, Scott (S.R.); Shiraishi, Masaru (M.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.); Hofman, Michael

(M.V.);  
Ichikawa, Jiyunichiro (J.); Waud, Sachiko (S.); Fujioka, Kenji  
(K.);  
Linde, Peter (P.A.); Rusu, Jessica (J.L.); Inoue, Hiroshi (H.);  
Klarr,  
Jerry (G.T.)  
Subject: RE: (2) stalls robustness CR's

Due to the critical nature of these changes and the need to proceed immediately with next steps, I have directed Tim Veenstra to approve the 2 referent CRs. We will follow-up with further information as required.

Regards,  
Keith Takasawa  
Escape/Tribute Chief Engineer  
PDC 2HJ64  
MD401  
PH: (313) 322-5675  
FAX: (313) 248-8599  
E-MAIL: KTAKASAW@FORD.COM  
TEXT PAGE: 7346045034@mobile.att.net

-----Original Message-----

From: Corbett, Sandra (S.M.)  
Sent: Monday, July 22, 2002 3:59 PM  
To: Shiraishi, Masaru (M.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.);  
Hofman, Michael (M.V.); Ichikawa, Jiyunichiro (J.); Waud,  
Sachiko (S.);  
Fujioka, Kenji (K.)  
Cc: Takasawa, Keith (K.D.); Veenstra, Tim (T.W.); Moorhouse, Scott  
(S.R.)  
Subject: (2) stalls robustness CR's

I am struggling to get these items ready for release. Here is status for the emergency release for stalls robustness actions:

C11390580- calibration change

\* Mazda (Shiraishi-san) indicates they need final white paper, Dalbo will forward  
\* KCAP (John O'Callaghan) indicates that a plant trial is required...we cannot provide parts until the concern is authorized by Prog. Mgmt....Prog Mgmt (Jessica Rusu) indicates that cr cannot be authorized until trial is complete...HELP/NEXT STEPS???

C11371349- capacitor change

\* Mazda (Shiraishi-san) is also requesting white paper-THERE IS NO FUNCTIONAL CHANGE, THEREFORE NO WHITE PAPER WILL BE PROVIDED  
\* Need Mazda (Fujioka-san and Waud-san) to approve (currently rejected by Mazda)  
Tim,  
Will there be change control Tuesday at 8am or will these covered at PST?

Sandy Corbett  
Escape Powertrain QRT  
Phone/Fax: (313)59-44351

Product Development Center 2H-E66

-----Original Message-----

From: Bob Dalbo (1-313-2484947)  
[mailto:viwrk0148drbn004.dearborn.ford.com]  
Sent: Monday, July 22, 2002 3:01 PM  
To: SCORRETT  
Subject: Backup note to the PAGE

Robin Peters postponed the stall fix emergency release meeting until  
concerns  
(C11390580 & C11371349) are approved.

**From:** Peters, Robin (R.S.)  
**Sent:** Wednesday, July 31, 2002 2:14 PM  
**To:** Altoonjan, Don (D.J.); Powers, Ken (K.W.)  
**Subject:** FW: 2003 3.0L U204 R10 Emergency PCM Release Workplan

Robin Peters  
Truck PCM Timing Coordinator  
Emisalone Compliance Dept.  
Phone: 313-39-01658

-----Original Message-----

**From:** Peters, Robin (R.S.)  
**Sent:** Thursday, July 25, 2002 8:52 AM  
**To:** Alan Thilling (E-mail); Alley III, David (D.); Austin, James (J.E.); Belzyt, Roseann (R.); Bogema, John (P.); Buick, Jeffrey (J.); Corbett, Sandra (S.M.); Cusumano, Jacob (J.J.); Dalbo, Bob (R.J.); Dave Godshall (E-mail); DeBartola, Peter (P.E.); Don Marsaweld (E-mail); Ellen Connolly (E-mail); Fagerman, Todd (T.M.); Fascetti, Bob (R.J.); Fortinos, Darryl (D.A.); Fournelle, Gilbert (G.); Gobbs, Linas (L.P.); Gould, Tom (T.); Grzindc, Karen (K.M.); Harrison, Darius (D.A.); Hazima, Joe (J.); Hendricks, Kerry (K.D.); Herr, George (G.J.); Huck, Dave (D.E.); James Walisch (E-mail); Kreuter, Richard (R.B.); Krohn, Maggie (M.M.); Kwon, Soon (S.K.); Lewis, Dennis (D.J.); Loo, Donald (D.C.); Maureen Fermoye (E-mail); Marzella, Stephanie (S.R.); McDonald, John (J.R.); Morgan, Dan (W.D.); Nilolal, Bernie (B.E.); Ostach, Gabrielle (G.); Plattenberger, Karl (K.J.); Przytylo, Ken (K.); Raymond, Dennis (D.J.); Redding, Joe (J.M.); Rich Pad (E-mail); Rusu, Jessica (J.L.); Schlott, Michael (M.D.); Sheeran, William (W.M.); Smith, Steven (S.V.); Stanley, Mark (M.); Sullivan, Todd (T.E.); Trestos, Diane (D.M.); Varlone, Philip (P.D.); Veestra, Tim (T.W.); Weber, Chris (C.R.); Young, Dan (D.G.); Zielinski, Jay (J.A.)  
**Subject:** 2003 3.0L U204 R10 Emergency PCM Release Workplan

The attached file contains the workplan to release the 2003 3.0L U204 R10. A separate workplan will be published for 2001 and 2002 service once the timing has been established (code sign-off estimated for 7/28). If you have any issues or questions regarding the timing plan, please contact me ASAP.

  
U204 7-24-02.doc

Robin Peters  
Truck PCM Timing Coordinator  
Emisalone Compliance Dept.  
Phone: 313-39-01658

# WORKPLAN FOR EMERGENCY RELEASE

Wednesday, July 24, 2002 ~ 9:00 a.m.  
And Thursday, July 25, 2002 ~ 7:00 a.m.

## 2003 3.0L U204 R10 & 2002, 2001 Service Fix Emergency Release

C11390580

|            |         |            |          |                     |
|------------|---------|------------|----------|---------------------|
| 2003       |         | 2002       |          | 2001                |
| 3M11A30510 | 3L8A-BB | 2M11A30510 | 2U7A-CZA | 0M11A30512 1U7A-AXC |
| 3M11B30510 | 3L8A-CB | 2M11B30510 | 2U7A-CPA | 0M11B30512 1U7A-AZC |
|            |         | 2M11C30510 | 2U7A-CRA | 0M11C30512 1U7A-AYC |

Plus additional calibrations for non-US Cert. Markets - see concern.

| TASK                           | PROJ.                          | COMPLETION DATE | RESPONSIBILITY      |
|--------------------------------|--------------------------------|-----------------|---------------------|
|                                | 2003                           | Service         |                     |
| ET-90                          |                                |                 | P. Varlane          |
| Code Sign-off                  | 7/22A                          | 7/26E           | B. Dalbo            |
| Code Sign-off OBD-II           | 7/24A                          | (Service        | D. Huck             |
| SWDV Complete                  | 7/24A                          | timing          | DeBrule/Gould       |
|                                |                                | plan            |                     |
| Notice Raised                  | 7/25A                          | to be           | K. Grzinek          |
| Appl. Engineer Approval        | 7/25 a.m. E                    | developed       | J. Bogema           |
| Module Conf. Engineer Approval | 7/25 a.m. E                    | once            | B. Nikolai          |
| Notice Routed for Telegram     | 7/25 a.m. E                    | code            | K. Grzinek          |
|                                |                                | sign-off        |                     |
|                                |                                | occurs.)        |                     |
| Telegram/Codes:                |                                |                 |                     |
| APD to Supplier                | 7/25 p.m. E                    |                 | T. Gould/P. DeBrule |
| APD Drawings Complete          | 7/26 a.m. E                    |                 | J. Walesch          |
| Notice to Complete Status      | 7/26 p.m. E                    |                 | S. Smith            |
| Notice WERS Released           | 7/26 E                         |                 | WERS Queue          |
| Flash Cards Prepared           | 7/29 if required               |                 | T. Sullivan         |
| Update EOL                     | 8/5E                           |                 | D. Raymond          |
| Certification:                 |                                |                 |                     |
| Testing Complete               | 8/7E                           |                 |                     |
| White Paper to Cert Comp.      | 7/26 E                         |                 | B. Dalbo            |
| White Paper & R/C to VEE       | 7/26 E                         |                 | J. Zielinski        |
| VEE Approval                   | 8/7E                           |                 | D. Harrison         |
| Surv. & Compl. Approval        | N/A                            | TBD             | M. Schlot           |
| Supplier PSW                   | 8/5E                           |                 | A. Trilling         |
| VO Releases to Supplier        | Daily release                  |                 | R. Kruter           |
|                                | needed by 7/30                 |                 |                     |
| Module Ship Date               | 8/8E                           |                 |                     |
| Module MRD                     | 8/9 to support 8/12 production |                 |                     |



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**From:** Fascetti, Bob (R.J.)  
**Sent:** Tuesday, June 25, 2002 5:45 PM  
**To:** Powers, Ken (K.W.); Takasawa, Keith (K.D.)  
**Cc:** Hofman, Michael (M.V.)  
**Subject:** Stall 1 pager for VQR

Ken, Keith,

Per your recommendation, attached is the stall one pager for the VQR. I'll be prepared with backup that will include trend charts, fishbone diagram, p-diagram, and engineering evidence for each of the recommended actions.

My assumption is that this data will be back-up only, and that if we want to go through it in detail, we can do so in Dearborn at PDQOR. However, I'll have it all just in case.

Let me know what you think, please.

Bob F.



U204 VQR1 Stall  
Summary.doc

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**From:** Moorhouse, Scott (S.R.)  
**Sent:** Friday, May 31, 2002 2:25 PM  
**To:** Corbett, Sandra (S.M.); Altoonlan, Don (D.J.)  
**Co:** Dalbo, Bob (R.J.); Sanders, Muriel (M.S.); Powers, Ken (K.W.)  
**Subject:** Stall in Kansas City, after TSB performed

I have been in contact with an Escape Customer in Kansas City that has had three stalls in 2200 miles. I will collect repair history, but according to her, the TSB was performed after the first visit. When it stalled again, the MAF was evaluated/replaced. It has stalled a third time, and is back at the dealership.

[REDACTED] (customer) was cooperative and helpful, and will work with us. She expressed much confidence that if we drove with her in her morning trip to work (it has always occurred on this trip), she can make it re-occur.

Sandy, as Don has looked at more of these vehicles than anyone else, I think his help would be beneficial relative to this vehicle. Let me know what you think.

Scott Moorhouse  
U204 PTSE Resident Engineer  
Kansas City Assembly Plant  
(ph) 816-459-1985 (fax) 816-459-1728  
smoorhou@ford.com

---

**From:** Nematollahi, Sonya (S.)  
**Sent:** Friday, May 17, 2002 1:31 PM  
**To:** Lipa, Jeffrey (J.A.); Sanders, Muriel (M.S.)  
**Cc:** Takasawa, Keith (K.D.); Powers, Ken (K.W.); Bodner, Les (L.R.); Diaz, Timothy (T.P.); Cless, Craig (C.M.); Dalbo, Bob (R.J.)  
**Subject:** FW: Action Req: Escape EMF

Muriel, thanks so much for the note.

Jeff, based on the information from the dealership, we don't believe we have a new issue, vehicles had typical stalling conditions and did not stall in the same area.

*Sonya Nematollahi*

Escape/Tribute/Maverick Electrical Team Leader  
Phone: 313-799689  
Pager: Text, 313-795-8332  
email: snematol@ford.com

—Original Message—

**From:** Sanders, Muriel (M.S.)  
**Sent:** Friday, May 17, 2002 9:56 AM  
**To:** Nematollahi, Sonya (S.); Dalbo, Bob (R.J.)  
**Cc:** Cless, Craig (C.M.)  
**Subject:** RE: Action Req: Escape EMF

I talked to the tech at the dealership that worked on the vehicles. He said there were two Escapes that would stall once a month and were in the dealership at the same time. Both Escapes stalled going downhill at about 30-40mph. To his knowledge they did not stall on the same road. Listed below are more details on the vehicles.

1st Escape

- 1st repair: replaced IAC and re-programmed the PCM
- 2nd repair: replaced the MAF, replaced and re-programmed the PCM. After these repairs the vehicle idled around 740-760 RPM, the ISC duty cycle was approx. 39%, and the throttle position was about 0.91 volts. The tech replaced the throttle body, but increased the size of the two holes on the new throttle body using a 7/64 drill bit. After the modified throttle body was added to the vehicle, the ISC duty cycle dropped to around 29-30%, the idle RPM was still around 740 RPM, and the throttle position was still at 0.91 volts.

2nd Escape

- He made the same modification to the throttle body as on the first vehicle.

Based on my conversation with the tech, I do not think we have a new issue with these vehicles since both vehicles presented with the typical stalling conditions and did not stall in the same area.

*Muriel Sanders*

U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

—Original Message—

**From:** Cless, Craig (C.M.)

6002-827-A 0018

Sent: Friday, May 17, 2002 8:07 AM  
To: Sanders, Muriel (M.S.)  
Subject: FW: Action Req: Escape EMF

Muriel,

The dealership is in New Holland, PA and the 1800 number is 1800-642-8605.  
I do not have any further info at this time. If you want more I can get it from my family in PA. Talk to you later.

*Craig M. Class*

**Ford Motor Company  
GCE - TASE - Heat Management Technical Specialist**

• Location: AMC Cabot 4507, Mail Drop 58  
• Phone : 313-84-54158  
• Fax : 313-32-05082  
• E-Mail : [cmclass@ford.com](mailto:cmclass@ford.com)  
• TASE Web: <http://www-tase.ford.com>  
• ISM Web : <http://www-tase.ford.com/heatmngt>

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Thursday, May 16, 2002 5:54 PM  
To: Sanders, Muriel (M.S.); Class, Craig (C.M.)  
Cc: Takasawa, Keith (K.D.); Powers, Ken (K.W.); Bodnar, Les (L.R.); Diaz, Timothy (T.P.); Class, Craig (C.M.); Nematalahi, Sonya (S.);  
Lipa, Jeffrey (J.A.)  
Subject: RE: Action Req: Escape EMF

Muriel,

Please get the details on the dealer from Craig Class and arrange for the appropriate team members to ensure that the TSB and ISM actions are clear or that there are other issues we need to investigate.

*Bob Dalbo*

**3.0L Calibration Supervisor  
Outfiters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 795-2869 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)**

-----Original Message-----

From: Nematalahi, Sonya (S.)  
Sent: Wednesday, May 15, 2002 3:46 PM  
To: Lipa, Jeffrey (J.A.); Dalbo, Bob (R.J.)  
Cc: Takasawa, Keith (K.D.); Powers, Ken (K.W.); Class, Craig (C.M.); Bodnar, Les (L.R.); Diaz, Timothy (T.P.); Class, Craig (C.M.)  
Subject: RE: Action Req: Escape EMF

Jeff,

There is a Stall team (cross functional) addressing all stall issues, Powertrain is leading those meetings, Electrical have been supporting when needed. Number of root causes have been identified for the stall issues, we have taken some actions and the team is still working on this issue. I have attached a couple of meeting minutes and a note from our EMC engineer regarding this issue.

Bob, can someone from your team contact this dealership and request more information to ensure that this is not a new issue. Please let me know. Thanks.

<< Message: Summary of EMC results on Powertrain's Engine Stall Issue >> << Message: U204 Stalls Meeting Minutes - 4/25/02 >> << Message: U204 Stall Meeting Minutes - 5/09/02 >>

*Sonya Nematollahi*

Escape/Tribute/Maverick Electrical Team Leader

Phone: 313-799669

Pager: Text, 313-795-8332

email: [snematol@ford.com](mailto:snematol@ford.com)

—Original Message—

From: Lips, Jeffrey (J.A.)  
Sent: Monday, May 13, 2002 8:51 AM  
To: Bodnar, Lee (L.R.); Nematollahi, Sonya (S.)  
Cc: Takasawa, Keith (K.D.); Powers, Ken (K.W.); Class, Craig (C.M.)  
Subject: Action Req: Escape EMF

Sonya/Lee,

Can you please investigate these vehicles with the dealer and assess if we have an issue lurking?

*Jeffrey A. Lips*

*Escape Vehicle Engineering Manager*

Phone: 313-59-48010

Pager: 313-813-1468

—Original Message—

From: Class, Craig (C.M.)  
Sent: Monday, May 13, 2002 8:45 AM  
To: Lips, Jeffrey (J.A.)  
Subject: Escape EMF

Jeff,

I got your name from the U204 website and thought that you might like to know about this.

I am sending you this note because a relative of mine informed me that a dealership in New Holland, PA has found that there were several vehicles that they had to tow into the service department because they stalled on the road. The funny thing is that they all stalled in the same area, near a water tower. After looking at the vehicles and having them restart when they got back to the dealership, they believe that there is an EMF near the tower that is shutting the ignition systems down. Just thought that you should know about this. If you have further questions, please let me know and I will get you any information that I can. Thanks for your time and effort.

*Craig M. Class*

Ford Motor Company

GCE - TASE - Heat Management Technical Specialist

- Location: ABC Cube 4507, Mail Drop 69
- Phone : 313-84-54159
- Fax : 313-39-05062
- E-mail : [cmclass@ford.com](mailto:cmclass@ford.com)
- TASE Web: <http://www-tase.ford.com>
- EM Web : <http://www-tase.ford.com/heatmgt>

EP82-027-A 0020

**From:** Sanders, Muriel (M.S.)  
**Sent:** Thursday, May 16, 2002 12:45 PM  
**To:** Altoonlan, Don (D.J.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chio, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Dan Rothweiler; De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Faschetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Harr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kloetemann, Eric (E.); Koeko, Jeff (J.R.); Kwon, Soon (S.K.); Limisoo, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Matea, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquesau, Alden (A.P.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirahahi, Masaru (M.); Stipanbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (LHW.); Yeung, Lem (.)  
**Subject:** FW: stalled warranty graph

See Scott's note below.

***Muriel Sanders***

U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

—Original Message—  
**From:** Moorhouse, Scott (S.R.)  
**Sent:** Thursday, May 16, 2002 11:21 AM  
**To:** Sanders, Muriel (M.S.)  
**Subject:** stalls warranty graph

Please provide to team. I have forwarded to Corbett, Altoonlan.

  
Stalls Graph.doc

Scott Moorhouse  
U204 PTSE Resident Engineer  
Kansas City Assembly Plant  
(ph) 816-459-1985 (fax) 816-459-1728  
smoorhou@ford.com

---

**From:** Nematollahi, Sonya (S.)  
**Sent:** Wednesday, May 15, 2002 3:48 PM  
**To:** Lipa, Jeffrey (J.A.); Dalbo, Bob (R.J.)  
**Cc:** Takasawa, Keith (K.D.); Powers, Ken (K.W.); Cless, Craig (C.M.); Bodnar, Les (L.R.); Diaz, Timothy (T.P.); Cless, Craig (C.M.)  
**Subject:** RE: Action Req: Escape EMF

Jeff,

There is a Stall team (cross functional) addressing all stall issues. Powertrain is leading those meetings. Electrical have been supporting when needed. Number of root causes have been identified for the stall issues. we have taken some actions and the team is still working on this issue. I have attached a couple of meeting minutes and a note from our EMC engineer regarding this issue.

Bob, can someone from your team contact this dealership and request more information to ensure that this is not a new issue. Please let me know. Thanks.

    
Summary of EMC 204 Stall Meeting 204 Stall Meeting  
results on Powe... Minutes - ... Minutes - 5...

*Sonya Nematollahi*  
Escape/Tribute/Maverick Electrical Team Leader  
Phone: 33-79969  
Pager: Text, 313-795-8332  
email: anematol@ford.com

—Original Message—  
**From:** Lipa, Jeffrey (J.A.)  
**Sent:** Monday, May 13, 2002 8:51 AM  
**To:** Bodnar, Les (L.R.); Nematollahi, Sonya (S.)  
**Cc:** Takasawa, Keith (K.D.); Powers, Ken (K.W.); Cless, Craig (C.M.)  
**Subject:** Action Req: Escape EMF

Sonya/Les,  
Can you please investigate these vehicles with the dealer and assess if we have an issue lurking?

*Jeffrey A. Lipa*  
Escape Vehicle Engineering Manager  
Phone: 313-59-43010  
Pager: 313-813-1489

—Original Message—  
**From:** Cless, Craig (C.M.)  
**Sent:** Monday, May 13, 2002 8:45 AM  
**To:** Lipa, Jeffrey (J.A.)  
**Subject:** Escape EMF

ERG2-827-A 0022

Jeff,

I got your name from the U204 website and thought that you might like to know about this.

I am sending you this note because a relative of mine informed me that a dealership in New Holland, PA has found that there were several vehicles that they had to tow into the service department because they stalled on the road. The funny thing is that they all stalled in the same area, near a water tower.

After looking at the vehicles and having them restart when they got back to the dealership, they believe that there is an EMF near the tower that is shutting the ignition systems down. Just thought that you should know about this. If you have further questions, please let me know and I will get you any information that I can. Thanks for your time and effort.

*Craig M. Class*

**Ford Motor Company**

**GCE - TASE - Heat Management Technical Specialist**

- Location: AEC Cube 4507, Mail Drop 68
- Phone : 313-84-54158
- Fax : 313-39-09082
- E-Mail : [cmclass@ford.com](mailto:cmclass@ford.com)
- TASE Web: <http://www-tase.ford.com>
- EM Web : <http://www-emm.ford.com/heatmgt>



**Klostermann, Eric (E.)**

---

**From:** Jensen, Ted (T.E.)  
**Sent:** Friday, February 01, 2002 12:39 PM  
**To:** Klostermann, Eric (E.)  
**Subject:** RE: Flow data for the set of 10 finned pintle valves

All are the new finned pintle valves. The set of ten even have the new part number on them.

-----Original Message-----

**From:** Klostermann, Eric (E.)  
**Sent:** Thursday, January 31, 2002 11:19 AM  
**To:** Jensen, Ted (T.E.)  
**Subject:** RE: Flow data for the set of 10 finned pintle valves

Are these all finned pintle, or just the group of 5?

*Eric N. Klostermann*  
U204 3.0L P/T Calibration  
eklostel@ford.com  
(313) 323-0021  
TBE 1A-E30

-----Original Message-----

**From:** Jensen, Ted (T.E.)  
**Sent:** Wednesday, January 30, 2002 3:56 PM  
**To:** Klostermann, Eric (E.)  
**Subject:** Flow data for the set of 10 finned pintle valves

Eric,

Here is the data for the finned pintle valves. Data in this file includes both the first, 5 valves, and second, 10 valves, sets of valves.

<< File: Evaluation Valves.xls >>

Ted

**Klostermann, Eric (E.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Monday, February 04, 2002 8:18 PM  
**To:** Aitoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournella, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunkhiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limtaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matassa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollah, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortman, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweller, Daniel (D.); Shah, Kiran (K.C.); Shiraiishi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Sullivan, Jarnie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Subject:** Stall meeting minutes 1/31/02



Vehicle Stall Meeting  
Minutes...

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Klostermann, Eric (E.)**

---

**From:** Dalbo, Bob (R.J.)  
**Sent:** Monday, February 04, 2002 10:30 AM  
**To:** Bogema, John; Fournelle, Gilbert; Hockaday Jr., John (J.C.); Hurley, Robert; Klostermann, Eric; Mateasa, John; Mikota, Dennis (D.P.); Mroz, David; Smith, Tony; Williams, Lee; Woodings, Andrew  
**Subject:** FW: Flight Recorders

Eric/Gilbert/Les,  
Let's round up the VDRs the stall team has deployed so we can volunteer them for this issue.

3.0L Calibration Supervisor  
Outfitters Calibration, North American Truck  
Phone: (313)24-84947 Fax: (313)32-31786  
Pager: (313)795-2858 E-mail: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Fascetti, Bob (R.J.)  
**Sent:** Monday, February 04, 2002 7:37 AM  
**To:** Stelmachczak, Robert (R.); Austin, James (J.E.); Dalbo, Bob (R.J.); Miller, Kenneth (K.L.); Shanahan, John (J.L.)  
**Subject:** FW: Flight Recorders

Let me know what we can spare.

-----Original Message-----

**From:** Kier, Jerry (G.T.)  
**Sent:** Sunday, February 03, 2002 5:47 PM  
**To:** Fascetti, Bob (R.J.); Brewer, Gary (G.L.); Auller, Jim (J.E.); Schrant, Tim (T.D.)  
**Cc:** Hoffman, Michael (M.V.); Blair, Mark (M.C.)  
**Subject:** Flight Recorders

We are in immediate need for flight recorders to diagnose intermittent 4x4 codes on the U152 Job#2 program.  
Let me know first thing Monday AM. Thanks.

G. T. Kier (Jerry)  
P/T Chief Engineer: PH: 32-28889/Cuba: 1BA45  
PDC/MD #205/FAX: 82-18083/[gkier@ford.com](mailto:gkier@ford.com)

**Klostermann, Eric (E.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Tuesday, February 05, 2002 1:40 PM  
**To:** Dalbo, Bob (R.J.); Bogema, John (P.); Klostermann, Eric (E.); Faumeile, Gilbert (G.)  
**Subject:** FW: Fax From: "202 223 6490"

FYI Fellas.

-----Original Message-----

**From:** Dan Rothweiler [mailto:DRothwei@mazdausa.com]  
**Sent:** Tuesday, February 05, 2002 12:02 PM  
**To:** 'willi73@ford.com'  
**Subject:** FW: Fax From: "202 223 6490"

FYI. Here is that Automotive News Article.....

Daniel H. Rothweiler  
Mazda North American Operations  
Fixed Operations Technical Specialist  
Office: 732-868-2135  
Fax: 214-442-5222  
Cellular: 732-547-8578

-----Original Message-----

**From:** NetMoves Inbound [mailto:support@netmoves.com]  
**Sent:** Monday, February 04, 2002 4:06 PM  
**To:** drothwei@mazdausa.com  
**Subject:** Fax From: "202 223 6490"

Thank you for using FaxCourier, the inbound fax service from NetMoves.

Attached is a 1 page fax that you received on Mon Feb 04 2002 21:06 GMT.

# Feds investigate Escape, Tribute stalling

By Staffer  
JAY ROYSTER

WASHINGTON — Federal safety officials are investigating complaints that Ford Escape and Honda Tribute sport-utilities with V6 engines stall while motorists are driving.

The National Highway Traffic Safety Administration said it has received 100 complaints, divided almost evenly between the models, even though many more Escapes have been made. More than 180,000 Escapes and 66,000 Tributes were produced in 2001.

The agency said 85 of the complaints made multiple attempts to have the problem corrected.

NIHTSA said its early stage investigation is looking at 2001 and 2002 vehicles.

## They released complaints

NIHTSA, in its monthly report on defect investigations, said it also has opened a case to examine a failure of aluminum alloy wheels on 2000-01 Mitsubishi Eclipse and Eclipse Spyder. The agency did not announce the number of vehicles affected.

NIHTSA has received 34 complaints about wheels that were damaged easily or were broken for going over potholes, railroad crossings or potholes. The complaints covered 72 wheels in two different designs. In four cases cracks oc-

NIHTSA said it has received 100

complaints, divided almost evenly between the models.

curred but without injuries or deaths, NIHTSA said.

Richard Kelley, spokesman for Mitsubishi Motor Sales of America Inc., declined to name the manufacturer of the wheels. He said the company is cooperating with the investigation but said, "We have no information to suggest this is a safety issue."

In a third case, NIHTSA is investigating the collapse of high-back seats in 1992-95 full-sized General Motors sport-utilities. They are the Chevrolet Blazer and Tahoe and GMC Yukon. The agency estimated that 185,000 vehicles would be affected if a recall is necessary.

NIHTSA said GM has collected 62 complaints about the problem, which is related to belts that attach driver and passenger seat backs to rear-axle mechanisms. When a belt loosens or breaks, the seat back reclines unexpectedly, creating a safety hazard, according to federal investigators.

The complaints included six reported crashes with one injury and seven other reported injuries without crashes, NIHTSA said.

The agency said identical belts were used in 1992-94 full-sized, extended-cab GM pickups that were recalled in 1995 and 1999 for similar problems.

The agency said the investigation may be expanded to include 1995 pickups.

## Seat anchor examined

NIHTSA said it is upgrading another early-stage investigation to the more intense category called engineering analysis. It involves nearly 800,000 full-sized GM sport-utilities.

The case is based on a single complaint that a second-row seat belt anchor broke loose in a side-impact crash, causing a passenger to be thrown partially through a rear quarter window and injured.

The investigation covers 1995-99 Chevrolet Tahoe and GMC Yukon, Buick and 1998-2000 GMC Yukon Denali and Cadillac Escalade trucks.

NIHTSA said it had closed several investigations after finding insufficient evidence of safety defects.

They had been opened because of complaints about:

- Poor brake performance in 1995-98 Chevrolet Monte Carlo Z34.
- Brake failure in 1987-92 Cadillac Allante.
- Headlight malfunctions in 1985-90 full-sized GM pickups and sport-utilities.

# Ford of Europe could save Mercury

By Staffer

Bill Ford has ordered his executive staff to fix Mercury — to give the overstocked make a business plan and a brand position. Here are ideas that planners should consider.

Why not make Mercury the cool outfit brand by giving it everything out of Europe can do?

Yeah, I know. One word: Merkur. Not there, done that. But it's a different world at Ford of Europe right now, and the time couldn't be better for this tactic. Here's why.

Every domestic brand is talking

Mark Reardon is  
Mercury's  
New Line  
European business  
officer. He is an  
ex-employee of  
the company.  
In London  
for Atlantic  
Europe.

ER02-027-A 0002

performance versions, too.

As for the new Fiesta, it's too small for America, you say? Well, it has a longer wheelbase and is wider inside than the Hyundai Accent, and the Koreans found 80,000 Americans willing to buy that car last year. The Fiesta looks cooler, drives better, feels safer and costs about the same as the Accent.

Add to the mix the Fusion all-sport vehicle which is based on the Fiesta, and you have the complete mid-range package.

Mercury profits, smaller

# TURN "MANAGERS" INTO LEADERS!

Managers manage. Only leaders break new

NO MULLIGANS PERMITTED

Call today.  
1-888-828-8540

ACECO

## **Klostermann, Eric (E.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Wednesday, February 06, 2002 4:48 PM  
**To:** Altounian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.G.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Nlu (M.N.); Chih, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gilles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Iohkawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matessa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Owens, Karen (K.E.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquapau, Aidan (A.P.); Rothweller, Daniel (D.); Shah, Kiran (K.C.); Shiraishi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** Staff Meeting Minutes 2/6/02

### **Action Item For Next Meeting:**

1. **Cary Powell:** 8D/Control Plan from Standt, Dust Box results, APG timing.



Vehicle Staff Meeting  
Minutes...

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Klostermann, Eric (E.)**

---

**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, February 06, 2002 5:37 PM  
**To:** Moore, Bryan (B.L.); 'opowell3@visteon.com'  
**Co:** McIlhargey, Pamela (P.A.); Fournelle, Gilbert (G.); Williams, Lee (LHW.); Klostermann, Eric (E.)  
**Subject:** RE: Vehicles at APG

Brian,  
Thanks for the opportunity. Do you have a contact at APG to arrange the test schedule so that Visteon can do their dust injection testing?

Cary,  
Who is your APG resident? Is he/she prepared to conduct this testing? Was your plan to use a stuck-open check valve or to remove the existing valve?

3.0L Calibration Supervisor  
Outfiters Calibration, North American Truck  
Phone: (313)24-84947 Fax: (313)32-31788  
Pager: (313)795-2859 E-mail: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Moore, Bryan (B.L.)  
**Sent:** Wednesday, February 06, 2002 10:32 AM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** McIlhargey, Pamela (P.A.)  
**Subject:** RE: Vehicles at APG

Bob:

I'm sure we can work something out. The 4x4 V6 at APG should be finished running the first test relatively soon. If your testing can be done out there and will only take a few days, then we can probably do it. But, I have to have the vehicle back to Pam by March-8th...and my second test will take 14 days to complete.

Give me a call so we can talk.

-----Original Message-----

**From:** McIlhargey, Pamela (P.A.)  
**Sent:** Tuesday, February 05, 2002 5:05 PM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** Moore, Bryan (B.L.)  
**Subject:** Vehicles at APG

Bob;

Please contact Bryan Moore.

He has borrowed these 2 Escape for testing at APG  
Tag: 301W715 (I-4 Manual)  
& 566T135 (Auto. V-6)

His testing will Completed March 8, 2002  
Hopefully you can piggy-back the testing you need.  
If not...contact me & we'll see what we can do.

Jarrett Knew also has vehicle testing at APG..but he's running Durability Testing

Thanks  
Pam

Pamela A. McIlhargey  
U204 /U293 Program Vehicle Coordinator  
PDC - Cube 2H-B44  
Ph: 313-248-9160  
Fax: 313-845-3654  
pamcilh@ford.com  
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**Klostermann, Eric (E.)**

---

**From:** Dalbo, Bob (R.J.)  
**Sent:** Thursday, February 07, 2002 11:28 AM  
**To:** 'cpowell3@visteon.com'; 'bedwell@visteon.com'  
**Cc:** Moore, Bryan (B.L.); Fournelle, Gilbert (G.); Williams, Les (LHW.); Klostermann, Eric (E.)  
**Subject:** RE: Vehicles at APG

Cary/Jack,

Could one of you please contact Bryan ASAP to describe your testing in detail and work out timing to do the testing. We may need this info for a NHTSA investigation into Escape/Tribute engine stalling.

3.0L Calibration Supervisor  
Outfitters Calibration, North American Truck  
Phone: (313)24-84947 Fax: (313)32-31788  
Pager: (313)795-2859 E-mail: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Moore, Bryan (B.L.)  
**Sent:** Thursday, February 07, 2002 8:39 AM  
**To:** Dalbo, Bob (R.J.)  
**Subject:** RE: Vehicles at APG

Bob:

My contact at APG is Steve Bradley (sbradle1). Can I ask what this ingestion testing involves though?? I want to make sure we don't compromise my test results for my Brake Balance test coming up after this. You can call me on x27988.

Thanks.

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, February 06, 2002 5:37 PM  
**To:** Moore, Bryan (B.L.); 'cpowell3@visteon.com'  
**Cc:** McIlhargay, Pamela (P.A.); Fournelle, Gilbert (G.); Williams, Les (LHW.); Klostermann, Eric (E.)  
**Subject:** RE: Vehicles at APG

Brian,  
Thanks for the opportunity. Do you have a contact at APG to arrange the test schedule so that Visteon can do their dust ingestion testing?

Cary,  
Who is your APG resident? Is he/she prepared to conduct this testing? Was your plan to use a stuck-open check valve or to remove the existing valve?

3.0L Calibration Supervisor  
Outfitters Calibration, North American Truck  
Phone: (313)24-84947 Fax: (313)32-31788  
Pager: (313)795-2859 E-mail: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Moore, Bryan (B.L.)  
**Sent:** Wednesday, February 06, 2002 10:32 AM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** McIlhargay, Pamela (P.A.)  
**Subject:** RE: Vehicles at APG

Bob:

I'm sure we can work something out. The 4x4 V6 at APG should be finished running the first test relatively soon. If your testing can be done out there and will only take a few days, then we can probably do it. But, I have to have the vehicle back to Pam by March-8th...and my second test will take 14 days to complete.

Give me a call so we can talk.

-----Original Message-----

From: McIlhargay, Pamela (P.A.)  
Sent: Tuesday, February 05, 2002 5:05 PM  
To: Dalbo, Bob (R.L.)  
Cc: Moore, Bryan (B.L.)  
Subject: Vehicles at APG

Bob;  
Please contact Bryan Moore.  
He has borrowed these 2 Escape for testing at APG  
Tag: 301W715 (I-4 Manual)  
& 566T135 (Auto. V-6)

His testing will Completed March 8, 2002  
Hopefully you can piggy-back the testing you need.  
If not...contact me & we'll see what we can do.

Jarrett Knew also has vehicle testing at APG..but he's running Durability Testing

Thanks

Pam

Pamela A. McIlhargay

U204 /U293 Program Vehicle Coordinator

PDC - Cube 2H-B44

Ph: 313-248-9160

Fax: 313-845-3654

pmcilharg@ford.com

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## Klostermann, Eric (E.)

---

**From:** Sanders, Muriel (M.S.)  
**Sent:** Friday, May 03, 2002 1:30 PM  
**To:** Altkonian, Don (D.J.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Dan Rothweiler; De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Koeko, Jeff (J.R.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Matesa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Aiden (A.P.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirahshi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakeneil, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (L.H.W.); Williamson, David (D.E.); Yeung, Lem (.)  
**Subject:** New Dial-In No. for Stalls Meeting

The dial-in information has changed for the weekly stalls meeting. Please note the new information below. This will be effective next Thursday (May 9, 2002).

U204 3.0L Calibration  
Dial in: 1-877-870-3529 or Fordnet: 9-1-954-1144  
International Participants # 1 (630) 693-1704  
Passcode: 7673538#

U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

## Klostermann, Eric (E.)

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**Subject:** Updated: U204 Phantom Stall Meeting  
**Location:** TEE Conf. Rm. 2

**Start:** Thu 3/21/02 2:00 PM  
**End:** Thu 3/21/02 3:00 PM  
**Show Time As:** Tentative

**Recurrence:** Weekly  
**Recurrence Pattern:** every Thursday from 2:00 PM to 3:00 PM

**Meeting Status:** Not yet responded

**Required Attendees:** Sanders, Muriel (M.S.); Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Cary Powell'; Chick, John (J.); Chih, Ming-Nlu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Rothweiler, Daniel (D.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Gilles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); 'John McDonald'; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Llu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matosa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); 'McDonald, John'; Mooney, Larry (L.); Moorhouse, Scott (S.R.); 'Morgan, Tom'; Morishima, Shigeki (S.); 'Naveed Khan'; Nematollahi, Sonya (S.); 'Nikolai, Bernie'; Noteboom, Jim (J.E.); Ortman, James (J.W.); 'Powell, Cary'; Powers, Ken (K.W.); Price, Martin (M.); Raquelpau, Alden (A.P.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shiraiishi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lea (LHW.); Williamson, David (D.E.); Yeung, Lem (.)

Open House Meeting (Effective 5/9/02)

Dial in: 1-877-870-3529 or Fordnet: 9-1-954-1144

International Participants # 1 (630) 693-1704

Passcode: 7673538#

## Klostermann, Eric (E.)

**From:** Jones, Shiela (S.M.)  
**Sent:** Wednesday, March 27, 2002 12:37 PM  
**To:** Williamson, David (D.E.); Bodnar, Lee (L.R.); Bronni, Mark (M.J.); Cobia, Jared (J.C.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Garrett, Bruce (B.); Grandas, Joseph (J.M.); Huck, Dave (D.E.); Jordan, Donald (D.E.); King, Robert (R.F.); Kotynski, Ronald (R.W.); Kwon, Soon (S.K.); Lear (Tahir Hussain) (E-mail); Lewis, Dennis (D.J.); McCarty, Bill (W.D.); McGee, Brett (B.L.); Miller, Brian (B.J.); Moorhouse, Scott (S.R.); Powers, Ken (K.W.); Reader, Simon (S.); Schneider, Rick (R.A.); Shiraiishi, Masaru (M.); Sturzenegger, Larry (L.W.); Suarez, Rhea (R.); Douglas, Jim (J.); Maurer, James (J.B.); Grimes, Jeff (J.R.)  
**Co:** Klostermann, Eric (E.)  
**Subject:** Updated Timing U204 Duratec DPFE Change

Updated Timing.



3.0L U204  
(Duratec).pdf

### -----Original Appointment-----

**From:** Williamson, David (D.E.)  
**Sent:** Wednesday, March 27, 2002 9:36 AM  
**To:** Williamson, David (D.E.); Bodnar, Lee (L.R.); Bronni, Mark (M.J.); Cobia, Jared (J.C.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Garrett, Bruce (B.); Grandas, Joseph (J.M.); Huck, Dave (D.E.); Jones, Shiela (S.M.); Jordan, Donald (D.E.); King, Robert (R.F.); Kotynski, Ronald (R.W.); Kwon, Soon (S.K.); Lear (Tahir Hussain) (E-mail); Lewis, Dennis (D.J.); McCarty, Bill (W.D.); McGee, Brett (B.L.); Miller, Brian (B.J.); Moorhouse, Scott (S.R.); Powers, Ken (K.W.); Reader, Simon (S.); Schneider, Rick (R.A.); Shiraiishi, Masaru (M.); Sturzenegger, Larry (L.W.); Suarez, Rhea (R.); Douglas, Jim (J.); Maurer, James (J.B.); Grimes, Jeff (J.R.)  
**Co:** Klostermann, Eric (E.)  
**Subject:** Updated: U204 Duratec Only Motorola DPFE Timeline Meeting  
**When:** Wednesday, March 27, 2002 12:00 PM-12:30 PM (GMT-05:00) Eastern Time (US & Canada).  
**Where:** Teleconference  
**Importance:** High

Meeting moved again to today at noon due to holiday.

Need these key players in today:

J. Grandas  
J. Grimes or L. Yeung (Trans-shift cycle teardown completion forecast)  
S. Jones

Toll free: (877) 877-7130  
Int'l: (630) 424-2073  
Ford net: 9-1-954-1124  
Passcode: 8789378#  
Host code: 2712388#

**Klostermann, Eric (E.)**

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**From:** Dalbo, Bob (R.J.)  
**Sent:** Friday, March 22, 2002 4:51 PM  
**To:** Andrew Woodings; David Mroz; Eric Klostermann; Gilbert Fournelle; Hockaday Jr., John (J.C.); John Bogema; John Matesa; Lee Williams; Mikota, Dennis (D.P.); Muriel Sanders; Robert Hurley; Tony Smith  
**Subject:** RE: RHD vehicle engine stall after refuel to brim

We can't do anything about RHD overfilling of the fuel tank, but the strategy Andrew was working with was intended to prevent stalls due to this kind of thing. We should put his changes (more or less) in the Job #2 release.

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Kwon, Soon (S.K.)  
**Sent:** Friday, March 22, 2002 8:43 AM  
**To:** Dalbo, Bob (R.J.)  
**Subject:** FW: RHD vehicle engine stall after refuel to brim

I am sure this has been discussed in your Stalls meeting.

Regards,  
**Soon Kwon**  
Escape/Tribute P/T OPD Supervisor  
Compact Utility PTSE, TVC  
2FB38, MD 405, PDC Dearborn 48126  
Phone (313) 322-6844, Fax  
Pager (313) 795-1536, email: [skwon@ford.com](mailto:skwon@ford.com)

-----Original Message-----

**From:** Hoshino, Jun (J.)  
**Sent:** Friday, March 22, 2002 5:54 AM  
**To:** Kwon, Soon (S.K.); Altonian, Don (D.J.)  
**Cc:** McGee, Brett (B.L.); Linda, Peter (P.A.); King, Robert (R.F.)  
**Subject:** RHD vehicle engine stall after refuel to brim

Soon and Don,

I was asked Brett McGee that to report captioned issue to you.

May be this information is not the same with NA 3.0L engine stall case, but let me inform as "for your information".

Five cases of Engine stall/hesitation have been reported on RHD Australian vehicles, the customers experienced this after refuel to brim.

Dealer technician/Mazda Australia has succeeded to reproduce the engine stall, and liquid fuel has been found from EVAP canister.

Technician suspects liquid fuel run to engine is cause of this issue. Fuel tank supplier is investigating 2 of roll over valves of concerned vehicles.

3.0L-3 cases  
2.0L-2 cases  
Fuel tank: Japan source

I have attached filed quality reports. Photo of EVAP canister is included in attached file NR0006/02A.

Thank you.

*Jun Hoshino*

RHD Escape/Maverick FCSD PVT Program Manager  
PVT & Field Support, Vehicle Service & Programs  
Hiroshima Japan Tel: 81-82-287-4803 Fax: 81-82-287-5220

<< File: N0006\_02.doc >> << File: N000602B.DOC >> << Message: NR0006/02A - TRIBUTE (\*U0\*\*Y) ENGINE STALLING  
AFTER REFUELLING >>

**Klostermann, Eric (E.)**

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**From:** Fournelle, Gilbert (G.)  
**Sent:** Wednesday, March 20, 2002 10:47 AM  
**To:** Klostermann, Eric (E.)  
**Subject:** FW: Guide A vs. Fin Pintle Data For 3.0L Escape



109-38A & 109-38  
Calibration S...

Gilbert Fournelle  
V6 U204 Calibration Engineering  
1A327 Truck Engine Engineering (TEE)  
Phone: (313) 3904968 Fax: (313) 3231786

-----Original Message-----

**From:** Jensen, Ted (T.E.)  
**Sent:** Wednesday, March 20, 2002 9:09 AM  
**To:** Fournelle, Gilbert (G.)  
**Subject:** FW: Guide A vs. Fin Pintle Data For 3.0L Escape

Gilbert,

Here is the data for the valves you requested. I am leaving to deliver the valves now.

Ted

-----Original Message-----

**From:** John.Chick@hap.com [mailto:John.Chick@hap.com]  
**Sent:** Tuesday, March 19, 2002 1:51 PM  
**To:** tjensen2@ford.com  
**Subject:** Guide A vs. Fin Pintle Data For 3.0L Escape

Ted,

Per our conversation please see the attachment below. I will deliver the samples tomorrow at 8:30 am.

Regards,

John Chick

(See attached file: 109-38A & 109-38 Calibration Samples with Finn Pintle



for 3.0L Escape.xls)

## **Klostermann, Eric (E.)**

**From:** Sanders, Muriel (M.S.)  
**Sent:** Monday, March 18, 2002 10:14 AM  
**To:** Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Dan Rothweiler; De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Frøeland, Mark (M.); Giles, Stuart (S.); Gokhale, Ranuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marck, Edmond (E.C.); Matessa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nemstotahl, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shiraiishi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroichi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Les (L.H.W.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** U204 Phantom Stall Meeting 3/21/02

Here is the updated meeting information for this week. A meeting notice will follow.

### **New dial-in information**

Dial in: 1-877-870-3431 or Fordnet: 9-1-954-1143

International Participants # 1 (630) 693-1703

Passcode: 7865386#

### **For 3/21/2002 Only:**

**Location is TEE Conference Rm 1**

Meeting time remains the same as Thursdays, 2-3pm.

Have a good day.

*Muriel Sanders*  
U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

**Klostermann, Eric (E.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Tuesday, February 26, 2002 9:51 AM  
**To:** Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Nlu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunkhiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Lintisco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marck, Edmond (E.C.); Matasa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Aiden (A.P.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirahshi, Masaru (M.); Stifgenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Cc:** 'cpowell3@visteon.com'  
**Subject:** Stall meeting 2/28/02 moved to 2 PM EST

I will be out of the office this Thursday morning 2/28/02, therefore the stalls meeting is moved to 2 PM EST. Thank you, this message was sent in addition to a calendar update as a precaution.

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

## **Klostermann, Eric (E.)**

**From:** Hermann, Thomas (T.J.)  
**Sent:** Wednesday, February 20, 2002 1:03 PM  
**To:** Williams, Les (LHW.); Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Cary Powell'; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matesa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); 'Naveed Khan'; Nematollahi, Sonya (S.); 'Nikolai, Bernie'; Noteboom, Jim (J.E.); Ortmann, James (J.W.); 'Powell, Cary'; Powers, Ken (K.W.); Price, Martin (M.); Raquelapau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirashi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroichi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williamson, David (D.E.); Yeung, Lem (.)  
**Cc:** Diez, Timothy (T.P.)  
**Subject:** RE: Meeting Minutes: EMC PSW Results for current production Kavlico DPFE

Les, to further clarify what I said.

Current production Kavlico DPFE sensor should not contribute to U204 stalling in the field due to RFI.

On the issue of coupled noise from the wiring harness, the component EMC PSW data does not indicate any issues that would contribute to stalls (it passes the tests) however that does not mean a conducted issue could not exist from an unusual circumstance (such as ignition secondary breakdown or static build up on ungrounded parts).

### **---Original Message---**

**From:** Williams, Les (LHW.)  
**Sent:** Wednesday, February 20, 2002 12:06 PM  
**To:** Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matesa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquelapau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirashi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroichi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Cc:** Hermann, Thomas (T.J.); Diez, Timothy (T.P.)  
**Subject:** Meeting Minutes: EMC PSW Results for current production Kavlico DPFE

### **Meeting Minutes**

**Attendees:**  
**Bob Dalbo** (U204 V6 Calibration Supervisor)  
**Gilbert Fournelle** (U204 V6 Calibration)  
**Les Williams** (U204 Calibration)  
**Tom Hermann** (EMC Supervisor)  
**Tim Diez** (EMC)

On Friday February 15, 2002 EMC PSW test data for current production Kavlico DPFE sensor was reviewed. Thomas Hermann has independently investigated the behavior of this sensor. Based on his investigations and this data, he concluded that the current production Kavlico DPFE sensor should not contribute to U204 stalling in the field due to RFI and coupled noise from the wiring harness.

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

## **Klostermann, Eric (E.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Wednesday, February 20, 2002 12:06 PM  
**To:** Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Harr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limlaco, Steven (S.); Linde, Peter (P.A.); Liu, Jene (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matesa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kuran (K.C.); Shirahishi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhae (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroichi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Young, Lem (.)  
**Co:** Hermann, Thomas (T.J.); Diaz, Timothy (T.P.)  
**Subject:** Meeting Minutes: EMC PSW Results for current production Kavlico DPFE

### **Meeting Minutes**

#### **Attendees:**

**Bob Dalbo** (U204 V6 Calibration Supervisor)  
**Gilbert Fournelle** (U204 V6 Calibration)  
**Les Williams** (U204 Calibration)  
**Tom Hermann** (EMC Supervisor)  
**Tim Diaz** (EMC)

On Friday February 15, 2002 EMC PSW test data for current production Kavlico DPFE sensor was reviewed. Thomas Hermann has independently investigated the behavior of this sensor. Based on his investigations and this data, he concluded that the current production Kavlico DPFE sensor should not contribute to U204 stalling in the field due to RFI and coupled noise from the wiring harness.

Regards,

Les Williams

For More, Count on Les

U204 3.0L Powertrain Calibration

Truck Engine Engineering, Suite 1AE20

Phone: (313)33-72503

Fax: (313) 32-31786

**Klostermann, Eric (E.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Tuesday, February 19, 2002 4:38 PM  
**To:** Altoonian, Don (D.J.); Amanda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Shojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournella, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limiaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Lushysen, Eric (E.A.); Marck, Edmond (E.C.); Matasa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Navsed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweller, Daniel (D.); Shah, Kiran (K.C.); Shiralshi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhao (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** U204 Stall Meeting Minutes 2/19/02

Items for next meeting:

1. **Cary Powell:** STA Engineer (Visteon) for Stant
2. **Sandy Corbett:** Sta Engineer (Ford) for Stant
3. **Scott Moorhouse:** status of QR of check valves at plant



Vehicle Stall Meeting  
Minutes...

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Klostermann, Eric (E.)**

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**From:** Matesa, John (J.)  
**Sent:** Tuesday, February 19, 2002 8:16 AM  
**To:** Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Hockaday Jr., John (J.C.); Hurley, Robert (R.E.); John Bogema; Klostermann, Eric (E.); Matesa, John (J.); Mikota, Dennis (D.P.); Smith, Tony (T.R.); Williams, Les (LHW.)  
**Subject:** mtg\_min2-19.xls



mtg\_min2-19.xls

Today's meeting.



**Klostermann, Eric (E.)**

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**From:** Williams, Les (LHW.)  
**Sent:** Monday, February 18, 2002 10:50 AM  
**To:** Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowari, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Nlu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunkhiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matea, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Requespu, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirashi, Masaru (M.); Stillerbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** Tuesday Stall Meetings Cancelled

**Importance:** High

Hello Everyone:

The Tuesday Stall meetings will be cancelled. We will go to 1 meeting every week now (just meet on Thursdays at 10 AM). This is effective immediately.

Thank you,  
Les Williams

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Klostermann, Eric (E.)**

---

**From:** Klostermann, Eric (E.)  
**Sent:** Thursday, February 14, 2002 11:32 AM  
**To:** Luehrs, Eric (E.A.)  
**Cc:** Williams, Lee (LHW.)  
**Subject:** RE: EMC PSW data



Evaluation Valve2.xls



IAC Valves - Finned vs  
Guide A..

The first file shows old finned pintle and new finned pintle. The second shows old finned pintle and Guide A. Pay no attention to the tab which shows a PFSL graph. The test stand at PFSL is different than Hitachi. I'm not sure of the test conditions of the new finned pintle. If these are unclear for what you need, I can try to put together something cleaner, but it may take a while.

*Eric N. Klostermann*

U204 3.0L P/T Calibration  
ekloste1@ford.com  
(313) 323-0021  
TBE 1A-E30

—Original Message—

**From:** Williams, Lee (LHW.)  
**Sent:** Thursday, February 14, 2002 11:16 AM  
**To:** Klostermann, Eric (E.)  
**Cc:** Luehrs, Eric (E.A.)  
**Subject:** RE: EMC PSW data

Eric K, can you send Graphs/data to Eric L regarding old and new finned pintle IACs?

Thx

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Klostermann, Eric (E.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Thursday, February 14, 2002 11:16 AM  
**To:** Klostermann, Eric (E.)  
**Cc:** Luehrsen, Eric (E.A.)  
**Subject:** RE: EMC PSW data

Eric K, can you send Graphs/data to Eric L regarding old and new finned pintle IACs?

Thx

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

## Klostermann, Eric (E.)

---

**From:** Williams, Les (LHW.)  
**Sent:** Wednesday, February 13, 2002 2:53 PM  
**To:** Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Nlu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limlaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matasa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sorya (S.); Nikolai, Bernie; Notaboom, Jim (J.E.); Ortman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shiralshi, Masaru (M.); Stilgenbauer, Jeffrey (J.R.); Suarez, Rhae (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroichi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Cc:** Ortman, James (J.W.); Boaks, Sandra (S.L.)  
**Subject:** U204 Stall meeting minutes 2/12/02

### Items for Thursday 2/14/02 meeting

1. **Jim Ortman:** Status of PCV Valve Testing.
2. **Cary Powell:** APG status/Visteon STA Engineer @ Stant
3. **Don Altoonlan:** Ford STA Engineer
4. **Les Williams/Don Altoonlan:** locating Ignition Key Engineers.
5. **Dan Rothweiler:** Update on Philly Staller
6. **Steve Limlaco:** Update on West Coast staller (one where IAC/TB/VMV were due to be replaced)
7. **Ming Chih:** Update on revised evap system testing @ KCAP.



Vehicle Stall Meeting  
Minutes...

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Klostermann, Eric (E.)**

---

**From:** Dalbo, Bob (R.J.)  
**Sent:** Monday, February 11, 2002 1:24 PM  
**To:** Williams, Les (LHW.); Fournelle, Gilbert (G.); Klostermann, Eric (E.)  
**Subject:** FW: Mazda drawing/part numbers (C11299286)

New MAFS status.

Bob Dalbo  
3.0L Calibration Supervisor  
Outfitters Calibration, North American Truck  
Phone: (313)24-84847 Fax: (313)32-31786  
Pager: (313)795-2859 E-mail: [rdalbo@ford.com](mailto:rdalbo@ford.com)

—Original Message—

**From:** Khan, Naveed (N.A.) [<mailto:nkhan3@visteon.com>]  
**Sent:** Friday, February 08, 2002 6:02 PM  
**To:** 'Boals, Sandra (S.L.)'; Williamson, David (D.E.); Khan, Naveed (N.A.); Suarez, Rhae (R.)  
**Cc:** Oda, Tamaki (T.); Dalbo, Bob (R.J.)  
**Subject:** RE: Mazda drawing/part numbers (C11299286)

Sandy,

I marked up the parts on the drawing that are changing and left my updated BOM with Dave. Basically, YL8U-9800-BE is changing to 2L84-9800-BA and the serviceable assembly, Cover Assembly is changing from YL8U-9861-BA to 2L8U-9861-BA (or 2L84-9861-BA).

Regards,

---

Naveed Khan  
Product Design Engineer  
Truck AIS Product Engineering, Visteon  
Visteon Powertrain Product Development  
Phone: (313)76-57189, Fax: (313)76-52992  
Cube : C164

email: <mailto:nkhan3@visteon.com>

-----Original Message-----

From: Boals, Sandra (S.L.) [mailto:sboals@ford.com]  
Sent: Friday, February 08, 2002 3:16 PM  
To: Williamson, David (D.E.); 'nkhan3@visteon.com'; Suarez, Rhae (R.)  
Cc: Oda, Tamaki (T.); Boals, Sandra (S.L.); Dalbo, Bob (R.J.)  
Subject: RE: Mazda drawing/part numbers (C11299286)

RE: U204 V8 MAFS Change (C11299286)

Naveed- I believe that Mazda needs to know all "servicable" parts that will change as a result of the MAFS changing.

Dave- Is that correct?

Rhae- Dave Williamson suggested we ask you if you could answer this question: If a dealership needs to change the MAFS what are the serviceable parts associated with that? We are trying to determine what service part numbers need to be bummed due to a MAFS component change.

Sandy Boals  
U204 Air Induction System D&R

-----Original Message-----

From: Williamson, David (D.E.)  
To: 'nkhan3@visteon.com'; Boals, Sandra (S.L.)  
Cc: Oda, Tamaki (T.)  
Sent: 2/8/02 10:58 AM  
Subject: RE: Mazda drawing/part numbers (C11299286)  
Importance: High

Sandra, I just remembered I'm out of office Monday & Tuesday. I left

1982-027-A 9709

drawing at Tamaki's desk (2HB52).

Please confirm & mark on print final assy as 2L84-9661-BA and mark up proposed top shell component part # at top of drawing. Tamaki is doing us a favor by talking to Hofu engineer. After she receives your info & comes back with Mazda part #'s, please help her by inputting Mazda info into notices.

Thanks — I'll be back in office Wednesday.

> ---Original Message---

>From: Williamson, David (D.E.)

>Sent: Friday, February 08, 2002 10:54 AM

>To: 'nkhan3@visteon.com'

>Cc: Oda, Tamaki (T.); Boala, Sandra (S.L.)

>Subject: RE: Mazda drawing/part numbers (C11299286)

>Importance: High

>

>Naveed, what is the new Duratec air cleaner top shell component part #

>(top shell)? Please email me ASAP so Mazda can reference. I

>understand new ASSEMBLY part # is 2L84-9661-BA from C11299286. Thanks.

>

>Tamaki, I'll stop by with new info probably Monday, after Naveed sends.

>Thanks.

>

> ---Original Message---

>From: Oda, Tamaki (T.)

>Sent: Friday, February 08, 2002 10:40 AM

>To: Williamson, David (D.E.)

>Subject: Mazda drawing/part numbers

>

>David,

>

>Those Mazda numbers on the print are CORRECT. I got a reply from Mazda

>engineer.

>

>Tamaki Oda ?????

>Escape/Tribute

>PDC 2H-B52

>PH: 313-322-4252

>E-MAIL: toda2@ford.com

>

>



> Thanks  
> Pam  
> Pamela A. McIlhargey  
> U204 /U293 Program Vehicle Coordinator  
> PDC ~ Cube 2H-B44  
> Ph: 313-248-9160  
> Fax: 313-845-3654  
> pmcilhar@ford.com  
> They say....That to Abandon One's Life for a Dream is to Know It's True  
Worth!  
>

## **Klostermann, Eric (E.)**

---

**From:** Williams, Lee (LHW.)  
**Sent:** Monday, February 11, 2002 5:57 PM  
**To:** Altoonlan, Don (D.J.); Amanda, Harry (H.F.); Badgley, Joel (J.K.); Bauer, Scott (S.C.); Bhowani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Harr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Tad (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Lintiac, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marok, Edmond (E.C.); Matasa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sanya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquesau, Aiden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirahshi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhae (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenall, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Young, Lem (.)  
**Subject:** U204 Stall Meeting Agenda 2/7/02

### **Items for Next meeting:**

- 1. Don Altoonlan/Cary Powell: Info on Ford/Visteon STA engineers at Standt.**
- 2. Cary Powell: Dust Box weight results/APG testing info**

Thx.



Vehicle Stall Meeting  
Minutes...

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Geraghty, Brian (B.J.)**

From: Clachke, Sue (Susan M.)  
Sent: Tuesday, January 07, 2003 6:34 PM  
To: Vondale, James (J.P.); Geraghty, Brian (B.J.)  
Subject: FW: Are You aware my Truck is a very ill?

Not sure who should handle this but we need to investigate. Thanks!

*Sue Clachke*  
VP-Environmental & Safety Engineering

-----Original Message-----

From: Rintamaki, John (J.M.)  
Sent: Wednesday, December 18, 2002 6:37 AM  
To: Clachke, Sue (Susan M.)  
Subject: FW: Are You aware my Truck is a very ill?

Help.

-----Original Message-----

From: [REDACTED]  
Sent: Wednesday, December 18, 2002 3:07 AM  
To: John Rintamaki  
Subject: Are You aware my Truck is a very ill?

Mr. John Rintamaki  
Chairman  
Ford Motor Company  
One American Road  
Dearborn, Michigan 48128

Dear Mr. Rintamaki:

I purchased a Ford Escape from Marina Ford about September 16, 2001. I really enjoy driving my truck! I had a hitch added to accommodate the Hollywood bicycle rack to take my bicycle with me on my trip to Seattle, Washington. I took the truck on a trip to Seattle around July 2-7, 2002. Since my return, I was driving home as usual when I could not steer the truck. I was travelling down hill with my foot on the brake (I was preparing to turn left). July 11th, my truck was in the shop! This "stalling", as the mechanic says, has happened THREE times (July 11, 2002, October 15, 2002 and December 10, 2002)!

I'm scared! Steering is almost impossible! I could get rear-ended! I could cause the vehicle to roll over trying to turn a powerless steering wheel. I could have been the cause of a head-on collision. THREE TIMES! All three times I called Ford Assist. They advised me to get the truck to the dealer.

The solutions Ford Motor has offered has not worked the previous two times. Why do I believe the problem has been fixed because they tried again? The Service Department at Marina Ford has done the best they can do. Yet, I do not want to be a statistic, as in dead.

I have said to Ford Assist and to Marina Ford that I would like to have my vehicle **REPLACED!** Why should I wait a forth time! I could die the 4th time. Ford Assist says they will send papers to start the arbitration process. There is no dispute, I could die or cause someone else injury!

Do you get it? I cannot avoid the hills and the slopes in Los Angeles.

There is an urgent need for me to get out of this "particular" truck. Please Mr. Rintamaki, please help me!

*Serve call -  
DAN TAYLOR*

*DSB -  
4/31 - LIGHT  
3 7/11 STALL  
9/4 STALL  
10/10 STALL*

Sincerely Ford Girl,

/s/

[REDACTED]  
Los Angeles, California [REDACTED]

home: [REDACTED]

mobile: [REDACTED]

e-mail: [REDACTED]

Vehicle ID Number: 1FMYU03181KC57288

Ford Escape V6

Dark Blue

Leather Seats

Radio/Cassette/CD

Aftermarket Hitch (\$300)

Purchased a Maintenance Contract

p.s. Did I mention that I got the vehicle because my brother is a Ford Engineer?? My brother advises me there is a problem with that truck. Don't be a statistic, get out of that truck!

cc: NHTSA

\_\_\_\_\_  
NHTSA

U.S. Department of Transportation

400 Seventh Street

Washington, D.C. 20590

**From:** Lapkewych, Michael (M.P.)  
**Sent:** Thursday, November 07, 2002 8:14 AM  
**To:** Kaercher, Don (D.F.); Limtiaco, Steven (S.); Terzes, Laura (L.D.); Grimes, Jeff (J.R.); Yeung, Lam (L.); Wettach, Bill (B.); Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Hightower, Eric (E.); Hayes, April (A.A.); Nielsen, Christian (C.A.)  
**Cc:** Chin, Darrel (D.); Clark, Michael (M.); Lammert, David (D.); Radulovich, Michael (M.); Mooney, Larry (L.); 'tokunaga.mi@sv.mazda.co.jp'; Suarez, Rhae (R.); Lawler, Dave (D.A.); Ferrise, Sam (S.J.); Altoonian, Don (D.J.)  
**Subject:** RE: Finned Pintle Hold-up

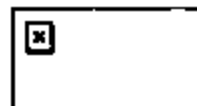
*Greetings , per Steve's suggestion we here in cataloging can add that note "Vehicle PCM must be reflashed to latest calibration available on WDS software B21.7 or later, PRIOR to installation of this part." to the catalog information if that helps MIKE*

—Original Message—

**From:** Kaercher, Don (D.F.)  
**Sent:** Thursday, November 07, 2002 8:04 AM  
**To:** Limtiaco, Steven (S.); Kaercher, Don (D.F.); Terzes, Laura (L.D.); Grimes, Jeff (J.R.); Yeung, Lam (L.); Wettach, Bill (B.); Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Hightower, Eric (E.); Lapkewych, Michael (M.P.); Hayes, April (A.A.); Nielsen, Christian (C.A.)  
**Cc:** Chin, Darrel (D.); Clark, Michael (M.); Lammert, David (D.); Radulovich, Michael (M.); Mooney, Larry (L.); 'tokunaga.mi@sv.mazda.co.jp'; Suarez, Rhae (R.); Lawler, Dave (D.A.); Ferrise, Sam (S.J.); Altoonian, Don (D.J.)  
**Subject:** RE: Finned Pintle Hold-up

Steve, I can reply to some of your suggestions. The first two are really dealing with the TSB service procedure, of which we have no input (we do not normally even see the actual text). Regarding the TSB number on the sticker, I don't have any issue with your suggestion. My only concern is will a wholesale or over-the-counter customer understand the meaning? I want it to be something that a dealer, independent garage or retail customer can understand to the point they realize they may have to have an additional "procedure" done at the dealer.

Regarding the sticker being on the part, you can do that with the stickers we send you, but the agreement we had going in to this was that this was done via a packaging spec versus WERs, so the sticker must be on the box versus the part. To change that would require the sticker to be added to the part in WERs, and you would have to work through Laura Terzes to get that done. Thanks Steve!



**Don Kaercher**

Ford Motor Company

FCSD PS&L QSF/Recall/Top 100 Dept. Mgr.

NPDC 1310C Text Pager: (734) 797-5993

EA82-827-A 8737

1/18/03

**e-mail: dkaerche@ford.com**

**Phone: (734) 266-9793 Fax: (734) 266-1166**

-----Original Message-----

**From:** Steven Limtiaco [mailto:SLimtiaco@mazdausa.com]

**Sent:** Wednesday, November 06, 2002 6:56 PM

**To:** 'Kaercher, Don (D.F.); Terzes, Laura (L.D.); Grimes, Jeff (J.R.); Yeung, Lam (.); Wettach, Bill (B.); Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Hightower, Eric (E.); Lapkewych, Michael (M.P.); Hayes, April (A.A.); Nielsen, Christian (C.A.)'

**Cc:** Darrel Chin; Mike Clark; Dave Lammert; Mike Radulovich; Larry Mooney; 'tokunaga.mi@sv.mazda.co.jp';

**'Suarez, Rhee (R.); Lawler, Dave (D.A.); sferrise@ford.com; daltoni@ford.com'**

**Subject:** RE: Finned Pintle Hold-up

Don,

Some additional items to consider:

- Although the TSB instructs technicians to reflash the PCM, it is not explicit that the reflash be done as a condition to installing the new IAC valve.

- There are many more items in the TSB that may confuse technicians into thinking they need to perform the entire procedure for just an IAC valve replacement.

- Mazda's TSB number is different than Ford's. Will there be separate stickers for IAC valves shipped to Mazda? Suggestion: Rather than referring to the TSB number and to prevent making separate stickers for the Ford and Mazda TSB numbers, we might want the sticker to say, "Vehicle PCM must be reflashed to latest calibration available on WDS software B21.7 or later, PRIOR to installation of this part." I believe this statement covers both Ford and Mazda. Bob Dalbo, will this work?

- Lastly, can we put the sticker on the part itself? There is a chance that the technician is handed a part w/o the box.

Anyway, hope these comments help.

**Steve Limtiaco**

Mazda North American Operations

Technical Product Support

949-442-6514 (phone)

949-442-6599 (fax)

e-mail: slimtiaco@mazdausa.com

-----Original Message-----

**From:** Kaercher, Don (D.F.) [mailto:dkaerche@ford.com]

**Sent:** Wednesday, November 06, 2002 1:28 PM

**To:** Terzes, Laura (L.D.); Sanders, Muriel (M.S.); Grimes, Jeff (J.R.); Yeung, Lam (.); Wettach, Bill (B.);

**Suarez, Rhee (R.); Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Kaercher, Don (D.F.);**

**Hightower, Eric (E.); Lapkewych, Michael (M.P.); Hayes, April (A.A.); Nielsen, Christian (C.A.)**

**Cc:** Limtiaco, Steven (S.); Giblin, Michael (M.); Chin, Darrel (D.); Clark, Michael (M.); Lammert, David (D.);

**Radulovich, Michael (M.); Mooney, Larry (L.); 'tokunaga.mi@sv.mazda.co.jp'; Fournelle, Gilbert (G.); Dalbo,**

**Bob (R.J.); Suarez, Rhee (R.); Lawler, Dave (D.A.)**

**Subject:** Finned Pintle Hold-up

Here is a copy of our agreement. Apparently it was not done. Here is what needs to happen:

ER02-027-A 0738

1/18/03

1. We need the TSB number for our "sticker" and so cataloging can include the info in the catalog.
2. April Hayes in packaging will work with Sam Ferrise to get labels for Hitachi. We will also send labels to Mazda and PRC to sticker the parts already packaged.
3. Purchasing (Chris Nielsen) will probably have to adjust the packaging price to include the cost of the sticker.
4. Mike Lapkewych will have the part cataloged with a message similar to the sticker.

Sorry for all the confusion.....



*Don Kaercher*

*Ford Motor Company*

*FCSD PS&L QSF/Recall/Top 100 Dept. Mgr.*

*NPDC 1310C Text Pager: (734) 797-5993*

*e-mail: [dkaerche@ford.com](mailto:dkaerche@ford.com)*

Phone: (734) 266-9793 Fax: (734) 266-1156

---Original Message---

From: Terzes, Laura (L.D.)

Sent: Thursday, August 08, 2002 11:06 AM

To: Sanders, Muriel (M.S.); Grimes, Jeff (J.R.); Yeung, Lem (.); Wettach, Bill (B.); Suarez, Rhae (R.)

Cc: Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Kaercher, Don (D.F.); Hightower, Eric (E.);

Lapkewych, Michael (M.P.)

Subject: RE: Fined Pintle Hold-up

See below in RED text answers to questions #4 and #8.

Don, Michael and Eric: IAC part for Escape TSB we discussed today.

---Original Message---

From: Sanders, Muriel (M.S.)

Sent: Thursday, August 08, 2002 10:39 AM

To: Grimes, Jeff (J.R.); Yeung, Lem (.); Wettach, Bill (B.); Suarez, Rhae (R.); Terzes, Laura (L.D.)

Cc: Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.)

Subject: RE: Fined Pintle Hold-up

Importance: High

The black text below are the answers to Tom Durfee's (Service Engineering) questions. He is rejecting the concern until these items are addressed. Please let me know when this information has been added to the concern.

ER02-027-A 9739

1/18/03

**Lem/Jeff/Bill** - I do not have WERS access. Will one of you please add the responses to items 1-3 & 7 for me. Thanks!  
**Rhase/Laura** - Please answer items 4 & 6.

1. Other IAC's have had this new fin pintle design and no PCM reflash was required why does this vehicle line need a reflash with an IAC change?

We have data showing that the finned pintle valve is not transparent to the guide A valve. The mean finned pintle ISC duty cycle at idle is 3% higher than with the current production valve.

2. If the new IAC is installed and no reflash is done what is the failure mode?

Possible (low probability) stall at warm startup or engagement.

3. Does the calibration have to be updated with the new IAC?  
Yes, applicable calibration numbers were entered in this concern by John Bogema on 7/25/02.

4. If the calib has to be update with this new IAC, how does the out of warranty customer get notified of this requirement?  
FCSD PS&L (Parts, Supply & Logistics) has agreed to work with their service parts packaging engineering to place a sticker on the Motorcraft box indicating the IAC change may require a calibration update, and refer to TSB XX-xxx-xx. Rhase Suarez will place information in the Parts Request comments section to insure the sticker is produced and fixed to package.

5. number was skipped by Tom

6. In the parts FCSD catalog we can have a flag that calls out a new PCM/Re-flash but this is not a six sigma repair.  
FCSD, PS&L, has agreed to place a flag in the on-line service parts system, GCAT, indicating the new IAC part may require a calibration change. Also, the TSB will list all prior calibrations that must be updated to perform the service procedure and to insure compatibility with the new IAC part.

7. A TSB will need to be issued to the field and there is not enough information in this concern to release a TSB. New PCM part numbers will have to be release in WERS for the new calibration. The stall TSB is written and is waiting for approval of this concern. We cannot get the finned pintle IAC service part number necessary for the TSB until this concern is approved. The calibration part numbers were released in C11390580. They will be available to Fordstar on 8/9/02.

**Muriel Sanders**

U204 3.0L Calibration

Ford Motor Company

Phone: 313-32-27307

Fax: 313-32-31786

E-mail: msander6@ford.com

EP82-027-A 0740

1/18/03



-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Wednesday, August 07, 2002 5:20 PM  
To: Galante, Chris (C.R.); Terzes, Laura (L.D.); Fascetti, Bob (R.J.)  
Cc: Sanders, Muriel (M.S.); Fournelle, Gilbert (G.)  
Subject: Finned Pintle Hold-up  
Importance: High

Chris,

Yes, the finned pintle IACV does require a calibration change on the Escape/Tribute. The service calibrations will be available Friday (8/9). We have a TSB in for review that explains that the calibration update is required for the new IACV.

Who in service engineering is rejecting this concern? We need to bring them up to speed on this change and the urgency to complete it.

Laura,

How does FCSD manage coordinated parts changes like this IACV/calibration combination? Is that process already underway for this change?

**Bob Dalbo**

S.O.L. Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-31786  
Pager: (313) 795-2858 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

From: Galante, Chris (C.R.)  
Sent: Wednesday, August 07, 2002 10:47 AM  
To: Dalbo, Bob (R.J.)  
Subject: calibration change for Escape

Hi Bob.

We spoke earlier about the calibration change for Escape related to stalls, and you gave me a concern number (C11390555) which is related to the finned pintle IAC change. Does the IAC change require the calibration change??

The reason I ask is that service engineering is likely rejecting the concern for, among other reasons, the chance that a customer who has a vehicle out of warranty may change the IAC themselves and not be aware that a TSB exists requiring a reflash. Something I'm curious to know is that on the modular products, we introduced the finned pintle design without any calibration change. Why would the Escape be unique in this regard? If not, should we disassociate the calibration change and IAC change (i.e. have two separate concerns)?

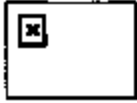
**Christopher R. Galante**  
[cgalante@ford.com](mailto:cgalante@ford.com)

EA82-827-A 8741

1/18/03

 Fax: (313) 337-3813  
 Phone: (313) 845-6067  
Pager: (313) 795-2807

***V-Engine Engineering - Ford Motor Co.***



**From:** Hayes, April (A.A.)  
**Sent:** Thursday, November 07, 2002 4:11 PM  
**To:** Kaercher, Don (D.F.); Terzes, Laura (L.D.); Sanders, Muriel (M.S.); Grimes, Jeff (J.R.); Yeung, Lem (L.); Wettach, Bill (B.); Suarez, Rhae (R.); Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Hightower, Eric (E.); Lapkewych, Michael (M.P.); Nielsen, Christian (C.A.)  
**Cc:** Limitaco, Steven (S.); Giblin, Michael (M.); Chin, Darrel (D.); Clark, Michael (M.); Lammert, David (D.); Radulovich, Michael (M.); Mooney, Larry (L.); 'tokunaga.ml@sv.mazda.co.jp'; Fournelle, Gilbert (G.); Dalbo, Bob (R.J.); Suarez, Rhae (R.); Lawler, Dave (D.A.); Moyer, Douglas (D.C.)  
**Subject:** RE: Finned Pintle Hold-up

Don & Sam -

Attached is the L1792 label for your review. It is a 1" x 3" label, white stock with black type. Please advise if this label is acceptable ASAP. If deemed acceptable, we can have 4500 printed labels available for shipment Monday 11/11/02 using Whitlam Label Co. Additional labels can be purchased via Whitlam or from the Printer of choice. The material specification with details of the L1792 will also be available Monday. Label requirement was added to the Packaging Specification today.

Thank you,

April Hayes  
 Black Belt Candidate  
 FCSO Package Engineering  
 ph: 734-523-3584  
 fax: 734-523-3430  
 email: ahayes14@ford.com

-----Original Message-----

**From:** Kaercher, Don (D.F.)  
**Sent:** Wednesday, November 06, 2002 4:28 PM  
**To:** Terzes, Laura (L.D.); Sanders, Muriel (M.S.); Grimes, Jeff (J.R.); Yeung, Lem (L.); Wettach, Bill (B.); Suarez, Rhae (R.); Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Kaercher, Don (D.F.); Hightower, Eric (E.); Lapkewych, Michael (M.P.); Hayes, April (A.A.); Nielsen, Christian (C.A.)  
**Cc:** Limitaco, Steven (S.); Giblin, Michael (M.); Chin, Darrel (D.); Clark, Michael (M.); Lammert, David (D.); Radulovich, Michael (M.); Mooney, Larry (L.); 'tokunaga.ml@sv.mazda.co.jp'; Fournelle, Gilbert (G.); Dalbo, Bob (R.J.); Suarez, Rhae (R.); Lawler, Dave (D.A.)  
**Subject:** Finned Pintle Hold-up

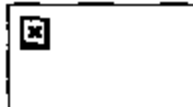
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1. We need the TSB number for our "sticker" and so cataloging can include the info in the catalog.
2. April Hayes in packaging will work with Sam Ferrise to get labels for Hitachi. We will also send labels to Mazda and PRC to sticker the parts already packaged.
3. Purchasing (Chris Nielsen) will probably have to adjust the packaging price to

include the cost of the sticker.

4. Mike Lapkewych will have the part cataloged with a message similar to the sticker.

Sorry for all the confusion.....



**Don Kaercher**

*Ford Motor Company*

*FCSD PS&L QSF/Recall/Top 100 Dept. Mgr.*

*NPDC 1310C Text Pager: (734) 797-5993*

*e-mail: [dkaerche@ford.com](mailto:dkaerche@ford.com)*

Phone: (734) 266-8793 Fax: (734) 266-1166

-----Original Message-----

From: Terzes, Laura (L.D.)

Sent: Thursday, August 08, 2002 11:06 AM

To: Sanders, Muriel (M.S.); Grimes, Jeff (J.R.); Yeung, Lam (.); Wettach, Bill (B.); Suarez, Rhae (R.)

Cc: Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Kaercher, Don (D.F.); Hightower, Eric (E.);

Lapkewych, Michael (M.P.)

Subject: RE: Finned Pintle Hold-up

See below in RED text answers to questions #4 and #6.

Don, Michael and Eric: IAC part for Escape TSB we discussed today.

-----Original Message-----

From: Sanders, Muriel (M.S.)

Sent: Thursday, August 08, 2002 10:39 AM

To: Grimes, Jeff (J.R.); Yeung, Lam (.); Wettach, Bill (B.); Suarez, Rhae (R.); Terzes, Laura (L.D.)

Cc: Fournelle, Gilbert (G.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.)

Subject: RE: Finned Pintle Hold-up

Importance: High

The black text below are the answers to Tom Durfee's (Service Engineering) questions. He is rejecting the concern until these items are addressed. Please let me know when this information has been added to the concern.

**Lam/Jeff/Bill** - I do not have WERS access. Will one of you please add the responses to items 1-3 & 7 for me. Thanks!

**Rhae/Laura** - Please answer items 4 & 6.

1. Other IAC's have had this new fin pintle design and no PCM reflash was required why does this vehicle line need a reflash with an IAC change?

We have data showing that the finned pintle valve is not transparent to the guide A valve. The mean finned pintle ISC duty

cycle at idle is 3% higher than with the current production valve.

2. If the new IAC is installed and no reflash is done what is the failure mode?

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3. Does the calibration have to be updated with the new IAC?

Yes, applicable calibration numbers were entered in this concern by John Bogema on 7/25/02.

4. If the calib has to be update with this new IAC, how does the out of warranty customer get notified of this requirement?

FCSD PS&L (Parts, Supply & Logistics) has agreed to work with their service parts packaging engineering to place a sticker on the Motorcraft box indicating the IAC change may require a calibration update, and refer to TSB XX-xxx-xx. Rhae Suarez will place information in the Parts Request comments section to insure the sticker is produced and fixed to package.

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The stall TSB is written and is waiting for approval of this concern. We cannot get the finned pintle IAC service part number necessary for the TSB until this concern is approved.

The calibration part numbers were released in C11390580. They will be available to Fordstar on 8/9/02.

**Muriel Sanders**

U204 3.0L Calibration

Ford Motor Company

Phone: 313-32-27307

Fax: 313-32-31786

E-mail: msander6@ford.com

—Original Message—

From: Dalbo, Bob (R.J.)

Sent: Wednesday, August 07, 2002 5:20 PM

To: Galante, Chris (C.R.); Terzes, Laura (L.D.); Pascatti, Bob (R.J.)

Co Sanders, Muriel (M.S.); Fournelle, Gilbert (G.)

Subject: Finned Pintle Hold-up

Importance: High

Chris,

Yes, the finned pintle IACV does require a calibration change on the Escape/Tribute. The service calibrations will be available Friday (8/9). We have a TSB In for review that explains that the calibration update is required for the new IACV.

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Laura,

How does FCSD manage coordinated parts changes like this IACV/calibration combination? Is that process already underway for this change?

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

—Original Message—

From: Galante, Chris (C.R.)  
Sent: Wednesday, August 07, 2002 10:47 AM  
To: Dalbo, Bob (R.J.)  
Subject: calibration change for Escape

Hi Bob.

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*Christopher R. Galante*  
[cgalante@ford.com](mailto:cgalante@ford.com)

 Fax: (313) 337-3813  
 Phone: (313) 845-6067  
Pager: (313) 795-2807

V-Engine Engineering - Ford Motor Co.

EA82-827-A 9752

1/18/03

Vehicle PCM must be reflashed to latest calibration available on WDS software B21.7 or later, PRIOR to installation of this part.

L1782

From: Suarez, Rhoe (R.)  
Sent: Thursday, December 12, 2002 8:57 AM  
To: Goering, Kimberly (K.L.)  
Cc: Lawler, Dave (D.A.); Terzes, Laura (L.D.)  
Subject: FW: RI 3529 - P0401/P0402 MIL ON DUE TO DPFE SENSORS

Kim,

Mazda brought up that there is some work in process for a message or program for DPFEs. If there is a message (SEM, TSB, etc...), can you tell me what group is developing it? or if there is a draft can we forward one to Mazda to get there information together. If there is any other information you can provide it would be appreciated.

Thank you,

Rhoe Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: Steven Limtiaco [mailto:SLimtiaco@mazdausa.com]  
Sent: Wednesday, December 11, 2002 7:02 PM  
To: 'rsuarez8@ford.com'  
Cc: Mike Hurley  
Subject: FW: RI 3529 - P0401/P0402 MIL ON DUE TO DPFE SENSORS

Rhoe,

Could you check with Kim Goering on the TSB? Is it possible to get a draft copy as well?

Steve

-----Original Message-----

From: Darrel Chin  
Sent: Wednesday, December 11, 2002 3:01 PM  
To: Steven Limtiaco  
Subject: RE: RI 3529 - P0401/P0402 MIL ON DUE TO DPFE SENSORS

Steve,

It was brought up by Kim Goering during a conference call discussing the plan to extend the DPFE sensor warranty to 2/24. They also plan on doing an owner notification approximately 10 days after the release of their TSB. Time frame is mid-Jan.



Thanks,  
Darrel

-----Original Message-----

From: Steven Lintiacco  
Sent: Wednesday, December 11, 2002 2:30 PM  
To: Darrel Chin  
Subject: FW: RI 3529 - P0401/P0402 MIL ON DUE TO DPFE SENSORS

Darrel,

Are you aware of a Ford service bulletin going out on this issue? If so, who was the person that told you?

Steve

-----Original Message-----

From: Suarez, Rhae (R.) [mailto:rsuarez@ford.com]  
Sent: Wednesday, December 11, 2002 10:53 AM  
To: Lintiacco, Steven (S.)  
Subject: FW: RI 3529 - P0401/P0402 MIL ON DUE TO DPFE SENSORS

Don't know of any TSB being developed for P0401 and P0402. If there is, it's not going through me.

See Marti's email though about an ISM that use to be out. When I saw your message I was searching forever looking for those codes because I thought there was something out there. Now I know why I can't find it.

-----Original Message-----

From: Price, Martin (M.)  
Sent: Wednesday, December 11, 2002 10:37 AM  
To: Suarez, Rhae (R.)  
Subject: RE: RI 3529 - P0401/P0402 MIL ON DUE TO DPFE SENSORS

there was an ISM for awhile, but it talked about the egr valve not the dpfe sensor.

Marti Price  
Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice2@ford.com ph. (313)317-9133

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Wednesday, December 11, 2002 9:51 AM  
To: Price, Martin (M.)  
Subject: FW: RI 3529 - P0401/P0402 MIL ON DUE TO DPFE SENSORS

Did we ever put out a message related to DPFE P0401/402?

Thanks!

Rhae

-----Original Message-----

From: Steven Limtiaco [mailto:SLimtiaco@mazdausa.com]

Sent: Monday, December 09, 2002 1:37 PM

To: Suarez, Rhae (R.)

Cc: Hurley, Michael (M.); Chin, Darrel (D.); Liebling, Douglas (D.)

Subject: RI 3529 - P0401/P0402 MIL ON DUE TO DPFE SENSORS

rhae,

i heard that ford is currently developing a tsb on this concern to address, mainly, dealers overcharging diagnostic time. is this true and do you know when the tsb will be released? please comment. (ps - our mtip below is fyl.)

steve

\*\*\*\*\*

Customers may complain of a check engine light concern. If the diagnostic trouble code (DTC) is confirmed to be either P0401 or P0402, the differential pressure feedback EGR (DPFE) sensor may be the cause. If the sensor was manufactured prior to January 7, 2002, (example)

Date code key for "2A07B":  
2 = 2002 calendar year  
A = January  
07 = 7th day of month

the part may be out of design specification. Use the following procedure below to determine if the DPFE sensor should be replaced.

1. Locate the manufacturing date code stamped on the outside case of the DPFE sensor. (1/7/02 at supplier {Datecode: 2A07B})
2. - If the date code is lower than "2A07B", stop diagnosis, clear codes, and replace sensor with new part from service.  
- If the date code is "2A07B" or higher, do not replace part. Refer to Workshop Manual section 01-01 for further diagnostics of the DPFE sensor.

Part Information

1F22-20-302A switch, vacuum

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**From:** Bandoaks, Pete (P.F.)  
**Sent:** Monday, November 18, 2002 9:58 AM  
**To:** Dalbo, Bob (R.J.); Margeson, Joan (J.E.)  
**Cc:** Lawler, Dave (D.A.); Suarez, Rhea (R.); Terzes, Laura (L.D.)  
**Subject:** RE: Problems with Escape Vehicles in Cincinnati area

Bob, if you can draft a one paragraph notice we can put in "What's New" on FMCDealer.

**Pete Bandoaks**  
**Field Operations Specialist**  
**(313) 24-88395 W / Fax**  
**pbandoak@ford.com**

-----Original Message-----

**From:** Terzes, Laura (L.D.)  
**Sent:** Sunday, November 17, 2002 10:05 PM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** Lawler, Dave (D.A.); Suarez, Rhea (R.); Bandoaks, Pete (P.F.)  
**Subject:** RE: Problems with Escape Vehicles in Cincinnati area

Bob, we don't send e-mails to Service Managers but we could reinforce the TSB release on QCDealer.Com. Rhea or Dave, pls. call Pete Bandoaks or Linda Perry-Lube  
PCSD Communications  
phone: 313.848.5744  
Fax: 313.248.8391  
email: lperrylu@ford.com

Explain the situation concerning trying to reinforce the latest and get the word out on Escape stalls TSB. They will have the final word if they deem our request worthy of QCDealer. Com.

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Thursday, November 14, 2002 11:23 AM  
**To:** Terzes, Laura (L.D.); Pascetti, Bob (R.J.); Kepp, Dan (Daniel R.); Hallauer, Julie (J.A.); Klarr, Jerry (G.T.); Sventickas, Ed (E.)  
**Cc:** Suarez, Rhea (R.)  
**Subject:** RE: Problems with Escape Vehicles in Cincinnati area

Laura,  
Can we email all the US service managers and alert them that this TSB is what should be used to fix Escape stalls?

**Bob Dalbo**

**3.0L Calibration Supervisor**  
**Outfitters Calibration, NAT**  
**Phone: (313) 24-84947 Fax: (313) 32-31786**  
**Pager: (313) 795-2859 Email: rdelbo@ford.com**

-----Original Message-----

**From:** Terzes, Laura (L.D.)  
**Sent:** Thursday, November 14, 2002 10:59 AM  
**To:** Pascetti, Bob (R.J.); Kepp, Dan (Daniel R.); Hallauer, Julie (J.A.); Klarr, Jerry (G.T.); Sventickas, Ed (E.)  
**Cc:** Dalbo, Bob (R.J.); Suarez, Rhea (R.)  
**Subject:** RE: Problems with Escape Vehicles in Cincinnati area

Agree with this approach. Unfortunately there will continue to be a time lag between those dealers with recent knowledge of the Escape stalling issue and their knowledge of the recently released fix. For the next month or so we may continue to hear from dealers whose level of awareness relative to the fix is not up to date. We have received numerous feedback notes, the repair is effective and Mazda confirms as well.

Jerry, we also have agreement from Mazda to monitor the fleet of buybacks they have recently repaired and are offering at a discount to their employees. As Bob Dalbo stated, all the latest info is released including sufficient quantity of service parts. Also the Tech Hotline has all the latest info.

*Laure Terzag*

Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF58  
(313) 32-38572 / fax (313) 24-88181 / [larzas.ford.com](mailto:larzas.ford.com)

—Original Message—

From: Fascetti, Bob (R.J.)  
Sent: Thursday, November 14, 2002 7:32 AM  
To: Kapp, Dan (Daniel R.); Hallauer, Julie (J.A.); Kerr, Jerry (G.T.); Sveticas, Ed (E.)  
Cc: Dalbo, Bob (R.J.); Terzag, Laure (L.D.)  
Subject: FW: Problems with Escape Vehicles in Cincinnati area

Bob Dalbo was able to get a hold of the dealer, and gave them the latest information, including the new TSB release that addresses every known root cause. We will also follow up with FCSD, to double check any communication issues we are having with the dealers.

Also, I would appreciate keeping these communications to a narrow distribution, to avoid confusion, and to avoid getting out of control. We acted swiftly and appropriately to Adam's original note, and that dealer now has the latest information within 24 hours.

This fix works. We just have to make sure everyone who needs it, gets it. That will be our team's focus from here on out.

Thanks,  
Bob Fascetti

—Original Message—

From: Bob Fascetti  
Sent: Wednesday, November 13, 2002 6:28 PM  
To: Fascetti, Bob (R.J.)  
Subject: RE: Problems with Escape Vehicles in Cincinnati area

Bob,

Escape Stall TSB# 2-23-01 was released on 11/12/2002. This TSB is an update of the earlier version and addresses every identified root cause. The latest fixes in this TSB went into production on 8/11/02 and we currently have no CQIS claims for stalling on vehicles built after this date.

I spoke with Dick Barrick, gave him the TSB #, and gave him my phone number in case the dealership has any problems following the TSB. I will follow up with the service manager, Cathy Knauss, to make certain these concerns are being addressed.

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

—Original Message—

From: .)  
Sent: Wednesday, November 13, 2002 4:24 PM  
To: ; McCliment, Greg (G.A.); Pascetti, Bob (R.J.); Dalbo, Bob (R.J.)  
Subject: RE: Problems with Escape Vehicles in Cincinnati area

There have been very well known issues with Escape stalling with multiple root causes and containments put in place along with TSB's, SSM's et. all and regular updates by Jerry at the dealer council so I'm surprised that dealers aren't yet aware of the service fixes. Having said all of that, the feedback I just got from Pascetti is that with the latest fix in place the incidence rate has dropped dramatically. Follow up required is to understand the level of production or service fix these vehicles represented.

-----Original Message-----

From: Hallauer, Julie (J.A.)  
Sent: Wednesday, November 13, 2002 8:33 AM  
To: Kapp, Dan (Daniel R.); Sventickas, Ed (E.); McCliment, Greg (G.A.); Barr, Jerry (G.T.)  
Subject: FW: Problems with Escape Vehicles in Cincinnati area

FYI

*Julie A. Hallauer*

Powertrain PD Quality Engineering Manager  
Phone: 313-32-26870 Fax: 313-24-86400  
Page: 734-651-0796 Cell: 248-982-7010  
Admin: Peggy Yost Ph: 313-39-07383

-----Original Message-----

From: Vahratian, Adam (A.J.)  
Sent: Tuesday, November 12, 2002 5:19 PM  
To: Hallauer, Julie (J.A.); Intrevale, Joseph (J.S.); Pascetti, Bob (R.J.)  
Subject: Problems with Escape Vehicles in Cincinnati area

Julie, Joe, and Bob,

I would like to inform you of some feedback I received from a Local Cincinnati dealer, after I asked him how Escapes were selling yesterday.

There seems to be an engine stall problem when customers drive down a steep hill and backing out of the throttle before going into a turn near the bottom of the hill.

Recently 12 - 15 customers have complained of this problem.

6 of the customers had their cars bought back by the Dealer.

- All were Female.
- 3.0L Escape
- AWD status unknown
- Speed ~35 mph
- The hills had a number of side to side turns
- Sometimes the engine would start right away, other times the customer needed to wait for a period of time before the engine started.

The Dealer I talked to was Dick Barrick

Montgomery Ford  
9280 Montgomery Rd.  
Montgomery, OH 45242  
Phone (513) 891-0500  
Fax (513) 895-5488

I am not sure if you are aware of this type of problem. I would appreciate it if you could have one of your people follow-up with this dealer.

Please give me a call if you have any questions.

Regards,

Adam Vahrallan  
Director CVT Programs  
(619) 732-4245

From: Hayes, April (A.A.)  
Sent: Friday, November 08, 2002 1:52 PM  
To: Lawler, Dave (D.A.); Kaercher, Don (D.F.)  
Cc: Glenn (E-mail)  
Subject: FW: L1792

  
L1792 draft 1.pdf

Dave,

Attached is the revised label per your instructions. Please review and provide approval on the text ASAP to ensure availability of labels for Monday.

Thank you,

April Hayes  
Black Belt Candidate  
PCSD Package Engineering  
ph: 734-523-3584  
fax: 734-523-3430  
email: ahayes14@ford.com

-----Original Message-----

From: Glenn Lafever [mailto:glenn@brownart.com]  
Sent: Friday, November 08, 2002 1:42 PM  
To: April Hayes  
Subject: L1792

Hi April,

Please review asap and we can get to Whitlam.

Thanks,  
Glenn

From: Suarez, Rhae (R.)  
Sent: Friday, November 08, 2002 10:03 AM  
To: Pennington, Clay (C.)  
Cc: Lawler, Dave (D.A.)  
Subject: RE: 97-4373r5

Clay,

The xox part numbers in step 4 and 5 would be the 2001 MY calibration numbers except with the Z in the prefix.

Off my head I think it is:

AXD

AZD

I need to be at my desk to really check though.

-----Original Message-----

From: Pennington, Clay (C.)  
To: Suarez, Rhae (R.)  
Sent: 11/7/02 2:15 PM  
Subject: RE: 97-4373r5

So what part numbers would you like to use in those steps?

Clay Pennington  
Technical Services Publications  
TSB Editor  
Quality Analyst  
(313) 390-8375

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Thursday, November 07, 2002 1:59 PM  
To: Pennington, Clay (C.)  
Subject: RE: 97-4373r5

Hey Clay.

The replacing PCMs are for older vehicles (early 2001 vehicles). We use to have a module that could not be reflashed. That's why it is mentioned in the TSB. In reality you can get any newer PCM and have it reflashed to the latest level. This info was in TSB 2-11-6 as well.

I am almost 100% sure there was a parts request for the VMV but I am in training today and tomorrow to verify.

Rhae

-----Original Message-----

From: Pennington, Clay (C.)  
To: Suarez, Rhae (R.)  
Sent: 11/7/02 1:09 PM



Subject: 97-4373r5

Rhae.

Article 97-4373r5.

What are the replacing PCM part numbers for Steps 4 and 5?

Was there a part request for the EVAPVM Valve YL8Z-9C915-AA in Step 1?

Clay Pennington

Technical Services Publications

TSB Editor

Quality Analyst

(313) 390-8375

From: Kaercher, Don (D.F.)  
Sent: Wednesday, November 06, 2002 11:22 AM  
To: Terzes, Laura (L.D.); Moyer, Douglas (D.C.)  
Cc: Lintiacco, Steven (S.); Lawler, Dave (D.A.); Suarez, Rhae (R.)  
Subject: RE: Tribute IAC Valve Packaging

OK, right. Let me speak w/ Mike.

Don Kaercher  
Ford Motor Company  
FCSD PS&L QSF/Recall/Top 100 Dept. Mgr.  
NPDC 1310C Text Pager: (734) 797-5993  
e-mail: dkaerche@ford.com  
\*Phone: (734) 266-9793 \*Fax: (734) 266-1166

-----Original Message-----

From: Terzes, Laura (L.D.)  
Sent: Wednesday, November 06, 2002 10:55 AM  
To: Kaercher, Don (D.F.); Moyer, Douglas (D.C.)  
Cc: Lintiacco, Steven (S.); Lawler, Dave (D.A.); Suarez, Rhae (R.)  
Subject: RE: Tribute IAC Valve Packaging

Don we had a conversation about this with someone named Lapkewach? or something like that who seemed to know exactly what we wanted to do with a sticker on the box to insure customer's who purchased the Ford IAC at a Murray's or other aftermarket location who be warned they may need to update their PCM calibration? I looked for my note but couldn't find.

-----Original Message-----

From: Kaercher, Don (D.F.)  
Sent: Wednesday, November 06, 2002 9:43 AM  
To: Moyer, Douglas (D.C.)  
Cc: Terzes, Laura (L.D.); Lintiacco, Steven (S.); Lawler, Dave (D.A.); Suarez, Rhae (R.)  
Subject: RE: Tribute IAC Valve Packaging

Doug, this is out of my area of expertise - can you respond to this? Thanks!!

Don Kaercher  
Ford Motor Company  
FCSD PS&L QSF/Recall/Top 100 Dept. Mgr.  
NPDC 1310C Text Pager: (734) 797-5993  
e-mail: dkaerche@ford.com  
\*Phone: (734) 266-9793 \*Fax: (734) 266-1166

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Wednesday, November 06, 2002 9:41 AM  
To: Kaercher, Don (D.F.)  
Cc: Terzes, Laura (L.D.); Lintiacco, Steven (S.); Lawler, Dave (D.A.)  
Subject: RE: Tribute IAC Valve Packaging

Hi Don.

This is the part that required the notice about the need for calibration update. We discussed having a sticker or something in/on the box. Does a sticker on the box require a WERS release?

Thanks!

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: Kaercher, Don (D.F.)  
Sent: Wednesday, November 06, 2002 9:24 AM  
To: Limtiaco, Steven (S.); Kaercher, Don (D.F.); Terzes, Laura (L.D.)  
Cc: Gibling, Michael (M.); Chin, Darrel (D.); Clark, Michael (M.);  
Lammert, David (D.); Radulovich, Michael (M.); Mooney, Larry (L.);  
'tokunaga.mi@sv.mazda.co.jp'; Fournelle, Gilbert (G.); Dalbo, Bob  
(R.J.); Suarez, Rhae (R.); Lawler, Dave (D.A.)  
Subject: RE: Tribute IAC Valve Packaging

This was released in WERS as a single part. If there is to be an IS sheet, then the part has to be released again showing it having the IS sheet. The IS sheet will have a part number. In essence it will be a kit containing two items in the Bill of Material, the valve and an IS sheet. We cannot just throw an IS sheet in the box without WERS stating there is supposed to be that particular one in the box. If we do that it will not pass PPAP. What is in the box must match what is in WERS.

Don Kaercher  
Ford Motor Company  
FCSD PS&L QSF/Recall/Top 100 Dept. Mgr.  
NPDC 1310C Text Pager: (734) 797-5993  
e-mail: dkaerche@ford.com  
\*Phone: (734) 266-9793 \*Fax: (734) 266-1166

-----Original Message-----

From: Steven Limtiaco [mailto:SLimtiac@mazdausa.com]  
Sent: Tuesday, November 05, 2002 12:40 PM  
To: 'dkaerche@ford.com'; 'lterzes@ford.com'  
Cc: Michael Gibling; Darrel Chin; Mike Clark; Dave Lammert; Mike  
Radulovich; Larry Mooney; 'tokunaga.mi@sv.mazda.co.jp';  
'gfournelle@ford.com'; 'rdalbo@ford.com'; 'rsuarez8@ford.com';  
'dlawler1@ford.com'  
Subject: FW: Tribute IAC Valve Packaging

Don & Laura,

As discussed in the Contingency meeting, here is the email regarding the IAC valve packaging.

(Everyone else - FYI for now....)

Steve Limtiaco  
Mazda North American Operations  
Tribute Product Support  
949-442-6514 (phone)  
949-442-6599 (fax)  
e-mail: slimtiac@mazdausa.com

-----Original Message-----

From: Steven Limtiaco  
Sent: Monday, November 04, 2002 11:51 AM  
To: 'Fournelle, Gilbert (G.)'  
Cc: 'rdalbo@ford.com'; 'rsuarez8@ford.com'; 'dlawler1@ford.com'  
Subject: IAC Valve Packaging

Gilbert,

I received the IAC valves to repair the Mazda buybacks. I opened up 10 boxes and none of them have instructions warning the technician to flash the PCM to the latest calibration before installing. In earlier discussions, I thought this was something that was to be included with the IAC valve packaging. Did this plan change?

Ford p/# 1L8Z-9F715-AA  
Mazda p/# AJ71-20-660

Steve Limtiaco  
Mazda North American Operations  
Tribute Product Support  
949-442-6514 (phone)  
949-442-6599 (fax)  
e-mail: slimtiac@mazdausa.com

---

**From:** Suarez, Rhac (R.)  
**Sent:** Monday, October 07, 2002 12:38 PM  
**To:** Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Grzincic, Karen (K.M.); Suetterlin, Terry (T.D.)  
**Cc:** Lawler, Dave (D.A.); Farnes, Sam (S.J.); Jaeter, Daniel (D.C.)  
**Subject:** PCM service information in WERS

I am checking to see if all the WERS information for the service PCMs, has been done so I can re-submit the Parts Request for the Stall concern? Until this is complete, the Parts group cannot sign off on this to get the PCMs parts available and to release the Stall TSB. We are also planning to release a SSM with the calibration information and this will also need a parts request sign off.

Please let me know if any assistance is needed to get this completed.

Thanks!

*Rhac M. Suarez*

Rhac Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / PCSD  
OSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101.  
Phone: 313-32-23344 Pager: 313-786-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

---

**From:** Suarez, Rhae (R.)  
**Sent:** Friday, October 04, 2002 2:03 PM  
**To:** Terzes, Laura (L.D.); Lawler, Dave (D.A.)  
**Subject:** FW: Hitachi info

FYI -

I got the same response from Sam Ferrise. The Strike is hurting the supplier from getting parts to build the IACs.

-----Original Message-----

**From:** Jensen, Ted (T.E.)  
**Sent:** Friday, October 04, 2002 1:58 PM  
**To:** Fournelle, Gilbert (G.)  
**Cc:** Suarez, Rhae (R.); Livitaco, Steven (S.)  
**Subject:** Hitachi info

Gilbert,

I just spoke with Carl Stindee (Hitachi) about our request. He has spoken with Rhae and Hitachi production people. The bottom line is the West Coast Longshoreman Strike has Hitachi production capability at risk. Hitachi will be struggling to keep up with vehicle production. Carl indicated that the November 8th date for the FPSD order is now at risk.

It would seem a prudent move to rapidly get the SSM for the calibration update into place.

Ted

---

**From:** Terzas, Laura (L.D.)  
**Sent:** Thursday, October 03, 2002 5:35 PM  
**To:** Klarr, Jerry (G.T.); Fascetti, Bob (R.J.); Takasawa, Keith (K.D.)  
**Co:** Jaster, Daniel (D.C.); Ferriss, Sam (S.J.); Lawler, Dave (D.A.); Suarez, Rhea (R.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.)  
**Subject:** RE: IAC person

Jerry, Bob: Not acceptable. We have been telling the Ford field personnel, dealers, service managers, we would have the TSB released with the new IAC and PCM changes by last day in October at the latest. Can we siphon some stock from production?!!!

*Laura Terzas*  
Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF56  
(313) 32-36672 / fax (313) 24-66161 / lterzas.ford.com

-----Original Message-----  
**From:** Suarez, Rhea (R.)  
**Sent:** Thursday, October 03, 2002 2:11 PM  
**To:** Dalbo, Bob (R.J.); Fournelle, Gilbert (G.)  
**Cc:** Jaster, Daniel (D.C.); Ferriss, Sam (S.J.); Lawler, Dave (D.A.); Terzas, Laura (L.D.)  
**Subject:** RE: IAC person

Speaking with Sam Ferriss (parts analyst), the supplier said they would not have parts available for Service until mid-late November.

We really need to get some pressure on the supplier or we will never get this TSB released.

*Rhea M. Suarez*

Rhea Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez@ford.com

-----Original Message-----  
**From:** Dalbo, Bob (R.J.)  
**Sent:** Thursday, October 03, 2002 1:58 PM  
**To:** Suarez, Rhea (R.); Fournelle, Gilbert (G.)  
**Subject:** RE: IAC person

Rhea,  
Bill Wettach is the release person. Our understanding is that the concern is approved. All that needs to happen is for FCSD to write the notice and order the parts for service.

The part has been in production since 8/31 at CEP.

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-31786  
Pager: (313) 796-2859 Email: rdaibo@ford.com

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Thursday, October 03, 2002 8:47 AM  
To: Fournelle, Gilbert (G.); Dalbo, Bob (R.J.)  
Subject: IAC person

Is Ted Jensen the IAC - finned pinle release person? I got a FSE that is in need of the new IAC (how he knows about it I don't know) or the customer will demand a buyback.

Any ideas how I can get one? Is it in production?

Thanks!

*Rhae M. Suarez*

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 648) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-28344 Pager: 313-796-8242  
Fax: 313-36-76337  
Email: rsuarez8@ford.com



---

**From:** Suarez, Rhee (R.)  
**Sent:** Thursday, October 03, 2002 2:11 PM  
**To:** Dalbo, Bob (R.J.); Fournelle, Gilbert (G.)  
**Cc:** Jaster, Daniel (D.C.); Ferrise, Sam (S.J.); Lawler, Dave (D.A.); Tarzas, Laura (L.D.)  
**Subject:** RE: IAC person

Speaking with Sam Ferrise (parts analyst), the supplier said they would not have parts available for Service until mid-late November.

We really need to get some pressure on the supplier or we will never get this TSB released.

**Rhee M. Suarez**

Rhee Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DBC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-0242  
Fax: 313-33-78337  
Email: [rsuarez@ford.com](mailto:rsuarez@ford.com)

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Thursday, October 03, 2002 1:58 PM  
**To:** Suarez, Rhee (R.); Fournelle, Gilbert (G.)  
**Subject:** RE: IAC person

Rhee,  
Bill Wettach is the release person. Our understanding is that the concern is approved. All that needs to happen is for FCSD to write the notice and order the parts for service.

The part has been in production since 8/31 at CEP.

**Bob Dalbo**

S.O.L. Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-31788  
Pager: (313) 795-2668 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Suarez, Rhee (R.)  
**Sent:** Thursday, October 03, 2002 8:47 AM  
**To:** Fournelle, Gilbert (G.); Dalbo, Bob (R.J.)  
**Subject:** IAC person

Is Tad Jensen the IAC - pinned pinle release person? I got a FSE that is in need of the new IAC (how he knows about it I don't know) or the customer will demand a buyback.

Any ideas how I can get one? Is it in production?

Thanks!

***Rhac M. Suarez***

Rhac Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1900 Fairlane Dr. / Allen Park, MI 48101  
Phone: 315-32-23344 Pager: 315-796-6242  
Fax: 315-33-78337  
Email: rsuarez8@ford.com

**From:** Lawler, Dave (D.A.)  
**Sent:** Wednesday, October 02, 2002 11:09 AM  
**To:** Young, Dan (D.G.)  
**Co:** Hoshino, Jun (J.); McGee, Brett (B.L.); Woods, Paul (P.); Suarez, Rhae (R.)  
**Subject:** RE: 2.0L engine noise and Poss. calib. effect on

J. Austin said they have No Calib. Changes planned for the 2.0L AT ALL, so I'm hoping that "Eng. Pinking at 3000 RPM" stops growing in CQIS counts! (We know you are working towards the 2.3L Releases - to come out 12/2003). We won't consider it for a QSF till it reached 10 Non-U.S. CQIS reports (UK, etc) so I'm just probing here ... for a pre-emptive action you may be able to think of ...

Dan - On a different subject, we have another noise that may involve you ... James did not know about the possibility of Fuel-Cut on Decel Calib. maybe having an effect on the a Noise we have that seems to be coming from the Eng. thru the trans (among other things).

Jun - Can you elaborate in a note to Dyoung19 on how you think Calib. may be able to help reduce this noise and .CC us all ?

**Dave Lawler**

FCSD Program Manager - L.H.D. Escape/Tribute/Maverick  
DLAWLER1 Office: 816-414-5602 Pager: 313-754-1760

Dave and Rhae,

Here is market SAQ sheet from Paul, please see second item. Symptom is "engine pinking under load at approx 3000 to 4000 RPM".

3 cases have been reported so far.

*Jun Hoshino*

RHD Escape/Maverick FCSD PVT Program Manager  
PVT & Field Support, Vehicle Service & Programs  
Hiroshima Japan Tel: 81-82-287-4803 Fax: 81-82-287-6220

-----Original Message-----

**From:** Wood, Paul (P.)  
**Sent:** Tuesday, October 01, 2002 11:41 PM  
**To:** McGee, Brett (B.L.); Hoshino, Jun (J.)  
**Co:** Wheeler, Russell (R.F.)  
**Subject:** European Maverick SAQS List

Please find attached the European Maverick SAQ List for Thursdays meeting.

  
SAQ\_031002\_FCSD02.  
xls

*Regards Paul Wood*

Ford Motor Company  
Product Concern Engineer - Transit, Transit Connect & Import Vehicles  
FCSD - VS&P, GB-1/389  
Phone: (0) 1277 251654 - Internal: (8)734 1654

Fax: (0) 1277 253287 - Internal: (8)734 3287  
email: pwood2@ford.com

-----Original Message-----

From: Lawler, Dave (D.A.)  
Sent: Wednesday, October 02, 2002 10:09 AM  
To: Austin, James (J.E.)  
Cc: Suarez, Rhea (R.); Hoshino, Jun (J.); McGee, Brett (B.L.); Limtiaco, Steven (S.)  
Subject: FW: 2.0L engine noise

Our Colleagues across the Pond who have much higher use of 2.0Ls have said they've gotten a few reports on this - like our one.

Are there any general calib. improvements that will be going into your next calib. that may have an effect/improve on noise ?

**Dave Lawler**

FCSD Program Manager - L.H.D. Escape/Tribute/Maverick  
DLAWLER1 Office: 816-414-5602 Pager: 313-754-1760

-----Original Message-----

From: Suarez, Rhea (R.)  
Sent: Wednesday, October 02, 2002 8:51 AM  
To: Hoshino, Jun (J.); McGee, Brett (B.L.)  
Cc: Lawler, Dave (D.A.)  
Subject: 2.0L engine noise

This is the only one I have foldered at this time. I will look into it a little deeper to see if any were missed.

Rpt#: 2FNEU009 NHL Rpt: 06/14/2002 Odom: 815 M  
Rvw: Y File: \_ Folder: 02007267 2 Images: 0 Print Smy/Disp Detail(P/D): \_  
Vehicle: 2002 ESCAPE 4X4,XLS ,MPV 1FMYU02B42KC41245 Bid: 03/26/2002  
Engine: 2.0L ZTECH Calb: 0M12A20A Trans: G5M Axle: 3800F2.73L A/C: YES  
Dealer Id: 08502 Courtesy Ford Ph#: (503) 255-1771  
State: Oregon City: Portland Orig/Caller: RUSTY ROBERTS  
Symptom: 4 97 0 00 ENGINE,NOISE,OTHER-CODE NA,OTHER-CODE NA  
Addl Sym: RATTLE NOISE 3000-4000 RPM St: CCRG/EPRC: \_ Rvw: Dt:  
Fix: Caus. Comp: -- Condition Codes:  
Hotliner: KAVERY3 Phone: 313 317-9356 Regn Cd: 74 Northwest - 74  
Engineering: Phone: TAR:  
Dir Contact: Phone: Title Cde: T  
REPAIR TECH STATES RATTLE NOISE 3000-4000 RPM, MORE NOTICABLE IN GEAR WHEN  
DRIVING, CANNOT PINPOINT LOCATION, SEEKING KNOWN.  
RECOMM ADV TECH NO KNOWN, ADV USE CHASSIS EARS TO PINPOINT SOURCE OF  
CONCERN.

**From:** Lawler, Dave (D.A.)  
**Sent:** Wednesday, October 02, 2002 10:09 AM  
**To:** Austin, James (J.E.)  
**Co:** Suarez, Rhee (R.); Hoshino, Jun (J.); McGee, Brett (B.L.); Limtiaco, Steven (S.)  
**Subject:** FW: 2.0L engine noise

Our Colleagues across the Pond who have much higher use of 2.0Ls have said they've gotten a few reports on this - like our one.

Are there any general calib. improvements that will be going into your next calib. that may have an effect/improve on noise ?

We won't consider it for a QSF til it reached 10 or more CQIS reports in the UK, so I'm just probing here ... for a pre-emptive action you may have in the works ...

**Dave Lawler**

FCSD Program Manager - L.H.D. Escape/Tribute/Maverick  
DLAWLER1 Office: 816-414-8602 Pager: 313-784-1760

-----Original Message-----

**From:** Suarez, Rhee (R.)  
**Sent:** Wednesday, October 02, 2002 8:51 AM  
**To:** Hoshino, Jun (J.); McGee, Brett (B.L.)  
**Co:** Lawler, Dave (D.A.)  
**Subject:** 2.0L engine noise

This is the only one I have foldered at this time. I will look into it a little deeper to see if any were missed.

Rpt#: 2FNEU009 NHL Rpt: 06/14/2002 Odom: 815 M  
Rvwd: Y File: \_ Folder: 02007267 2 Images: 0 Print Smy/Disp Detail(P/D): \_  
Vehicle: 2002 ESCAPE 4X4,XLS ,MPV 1FMYU02B42KC41245 Bld: 03/26/2002  
Engine: 2.0L ZTECH Calib: 0M12A20A Trans: GSM Ader: 3800P2.73L A/C: YES  
Dealer Id: 08502 Courtesy Ford Ph#: (503) 255-1771  
State: Oregon City: Portland Orig/Caller: RUSTY ROBERTS  
Symptom: 4 97 0 00 ENGINE,NOISE,OTHER-CODE NA,OTHER-CODE NA  
Addl Sym: RATTLE NOISE 3000-4000 RPM St: OORG/EPRC: \_ Rvwd: Dt:  
Pbc: Caus. Comp: - Condition Code:  
Hotliner: KAVERY3 Phone: 313 317-9356 Regn Cd: 74 Northwest - 74  
Engineering: Phone: TAR:  
Dir Contact: Phone: Title Cde: T  
REPAIR TECH STATES RATTLE NOISE 3000-4000 RPM, MORE NOTICABLE IN GEAR WHEN  
DRIVING, CANNOT PINPOINT LOCATION, SEEKING KNOWNS.  
RECOMM ADV TECH NO KNOWNS, ADV USE CHASSIS BARS TO PINPOINT SOURCE OF  
CONCERN.

**From:** Suarez, Rhas (R.)  
**Sent:** Tuesday, October 01, 2002 2:34 PM  
**To:** Corbett, Sandra (S.M.); Lawler, Dave (D.A.); Jaster, Daniel (D.C.); Ferrise, Sam (S.J.); Dalbo, Bob (R.J.); Terzes, Laura (L.D.)  
**Subject:** RE: 9/19 U204/J14 FORD/MAZDA PT OPD Audio MEETING

I was able to get most of them going by (guessing) the service part number and getting the engineering number. Sort of in reverse order.

  
OEM Service #s  
parts No.s

There are 4 of them that I could not get the info for.

Sam/Dan - any suggestions?

Thank!

*Rhas M. Suarez*

Rhas Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-75337  
Email: rsuarez@ford.com

-----Original Message-----

**From:** Suarez, Rhas (R.)  
**Sent:** Tuesday, October 01, 2002 2:14 PM  
**To:** Corbett, Sandra (S.M.)  
**Cc:** Lawler, Dave (D.A.); Jaster, Daniel (D.C.); Ferrise, Sam (S.J.);  
Dalbo, Bob (R.J.); Terzes, Laura (L.D.)  
**Subject:** FW: 9/19 U204/J14 FORD/MAZDA PT OPD Audio MEETING

Sandy,

here is the last email I got on this PCM part number chart. For some reason the engineering part numbers are not bringing up any equivalent service numbers (see example below). I've also sent this email to our parts group to see what is needed to get the service part numbers available.

I'll try to do it in reverse. I'll guess what the service number is and it should bring up the equivalent Engineering number. If it works, I'll send the chart out shortly.

Thank you,

Rhas Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-75337

Email: rsuarez8@ford.com

SERVICE PART: \_\_\_\_\_  
ENGINEERING PART: 3L8A 12A650 BCMR \_\_\_\_\_ ORIGIN: WERS  
SUPPLIER LOC: FINIS: 4401867  
Vendor Part: Fam Buy:  
Motorcraft Part: Prime Suplr:  
Comparable Part: Packager Cd:  
Replaced Part: Mat Content:  
Replacing Part: Ship Mlt:  
Buyer: NBA Phone:  
Dmnd Anlyst: NDA Phone:  
Prod Anlyst: NPA Phone:  
Price Anlyst: Profa ID:  
Color Name: Pallet Qty:  
Pnd Obs: Svc Disp: Unit Issue: Overpack Qty:  
Obs Not: Mech Ob Cd: Trfc Cd: Max Ord Qty:  
Obs Eff: Procure Cd: Hvy Trk App/Cd: / Min Run Qty:  
Eff In: Rlse Hld: Fab/Hold: Min Ship Qty:  
Eff Out: Final Rlse: Wgt UOM: Package Wgt:  
Ord Dte: Spec Pgm: Dir Ship: Standard Cst:  
Commdty: Volume Grp: Rack/Plt: Dealer Net:  
F1=Help F2=GIMA F4=PrvPart F5=NxtPart F8=PIGA F9=DEEA F10=HIIA F11=ARFA  
INVALID PART NUMBER LPENJC8

or

SERVICE PART: \_\_\_\_\_  
ENGINEERING PART: 3L8A 12A650 BC \_\_\_\_\_ ORIGIN: WERS  
SUPPLIER LOC: FINIS: 4401867  
Vendor Part: Fam Buy:  
Motorcraft Part: Prime Suplr:  
Comparable Part: Packager Cd:  
Replaced Part: Mat Content:  
Replacing Part: Ship Mlt:  
Buyer: NBA Phone:  
Dmnd Anlyst: NDA Phone:  
Prod Anlyst: NPA Phone:  
Price Anlyst: Profa ID:  
Color Name: Pallet Qty:  
Pnd Obs: Svc Disp: Unit Issue: Overpack Qty:  
Obs Not: Mech Ob Cd: Trfc Cd: Max Ord Qty:  
Obs Eff: Procure Cd: Hvy Trk App/Cd: / Min Run Qty:  
Eff In: Rlse Hld: Fab/Hold: Min Ship Qty:  
Eff Out: Final Rlse: Wgt UOM: Package Wgt:  
Ord Dte: Spec Pgm: Dir Ship: Standard Cst:  
Commdty: Volume Grp: Rack/Plt: Dealer Net:  
F1=Help F2=GIMA F4=PrvPart F5=NxtPart F8=PIGA F9=DEEA F10=HIIA F11=ARFA  
NO EQUIVALENT SERVICE PART NUMBER FOR THIS ENGINEERING PART LPENJC8

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Monday, September 23, 2002 4:39 PM  
To: Suarez, Rhae (R.)  
Subject: RE: 9/19 U204/J14 FORD/MAZDA PT OPD Audio MEETING

Rhae,  
Here is the list of 2003MY PCM part numbers (base p/n = -12A650-):  
3L8A-BC  
3L8A-CC  
3L8A-EC

3L8A-AHC  
3L8A-FC  
3L8A-HC  
3L8A-JC  
3L8A-GC

I don't know how service part numbers are assigned. Can you elevate this in your organization to find out?

Bob Dalbo  
3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-91788  
Pager: (313) 795-2859 Email: rdalbo@ford.com

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Monday, September 23, 2002 8:22 AM  
To: Dalbo, Bob (R.J.)  
Subject: FW: 9/19 U204/J14 FORD/MAZDA PT OPD Audio MEETING

FYI -

I'm not getting very far with the PCM Service part numbers.

-----Original Message-----

From: Ferrise, Sam (S.J.)  
Sent: Monday, September 23, 2002 6:58 AM  
To: Suarez, Rhae (R.); Suatterlin, Terry (T.D.)  
Subject: RE: 9/19 U204/J14 FORD/MAZDA PT OPD Audio MEETING

Rhae: 3L8A 12A650 AB has a service part number, 3L8Z 12A650 AB  
3L8A 12A650 BA has a service part number, 3L8Z 12A650 BA  
3L8A 12A650 SF is not released in WERS

Terry: Please advise if the other PCM's (see Rhae's note below) should be serviced. If so, please establish service part numbers.

Thanks.

Regards,  
Sam Ferrise, QSF Parts Specialist  
Ford Customer Service Division  
CDS ID: sferrise Pfx 734-523-3184  
E-Mail: sferrise@ford.com

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Friday, September 20, 2002 3:09 PM  
To: Ferrise, Sam (S.J.)  
Subject: FW: 9/19 U204/J14 FORD/MAZDA PT OPD Audio MEETING  
Importance: High

Sam - I just tried most of these and none of them work (same parts from the attached excel chart)

3L8A 12A650 BC  
3L8A 12A650 CC  
3L8A 12A650 EC



3L8A 12A850 AHC  
3L8A 12A850 FC  
3L8A 12A850 HC  
3L8A 12A850 JC  
3L8A 12A850 GC

3L8A 12A850 AB  
3L8A 12A850 PA  
3L8A 12A850 LA  
3L8A 12A850 SF  
3L8A 12A850 BA

These are all PCM calibrations. Do you think they are released correctly? if you use the -MR you get an "Invalid part number" message. But if you leave the -MR off you get a "no equivalent service part number available" message.

Sorry to keep bother you.

Thanks for your help!  
Rhae

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Thursday, September 19, 2002 10:40 AM  
To: Suarez, Rhae (R.)  
Cc: Corbett, Sandra (S.M.); Ichikawa, Jyunichiro (J.)  
Subject: FW: 9/19 U204/J14 FORD/MAZDA PT OPD Audio MEETING  
Importance: High

Rhae,  
Can you please fill in the requested service part numbers and return the file to the addressees above?

Thanks,  
Bob Dalbo  
3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-81788  
Pager: (313) 785-2859 Email: rdalbo@ford.com

-----Original Message-----

From: Ichikawa, J. @mazda.co.jp [mailto:ichikawa.j@mazda.co.jp]  
Sent: Wednesday, September 18, 2002 5:47 AM  
To: ecorbett@ford.com; rdalbo@ford.com; gfourmel@ford.com;  
lyeung@ford.com; shale7@ford.com; jgrimes1@ford.com; toda2@ford.com;  
kazczepa@ford.com; ahiralehl.m@pt.mazda.co.jp; takubo.h@mazda.co.jp;  
hamano.n@mazda.co.jp; yamada.hid@mazda.co.jp; fujioke.ka@mazda.co.jp;  
ohga.m@mazda.co.jp; yamashita.shig@mazda.co.jp  
Cc: bmogee@ford.com; mfoley8@ford.com; asazu.h@mazda.co.jp  
Subject: 9/19 U204/J14 FORD/MAZDA PT OPD Audio MEETING  
Importance: High

To Team,  
I send the agenda for PT OPD Audio Meeting on 9/19 below.  
If you have any item that should discuss in this meeting, please add this under "4. Walk in".

Thank you.

[Agenda]

1. Engines with new IAC valves Implementation timing at Hofu Plant

1)Shipping Information for Hofu Plant

Mazda generally receive the invoice information from IEO.

Then Mazda and IEO don't know what is tracking# 6388159.

IEO;Miyako Foley -san sent a note to Lem Yeung -san due to confirm.

Mazda and IEO are waiting Lem Yeung -san's reply.

2.PCM Ford Service Part# for 2003MY All Duratec/Zatec

Mazda PCM Engineer; Fujioke-san requested this info. in the last OPD Meeting.

Would you please fill the PCM Ford Service Part# on the attached file.

3.C11383984 Duratec Throttle Body Design Change to Increase Robustness

1)Mazda would like to know the Implementation timing at CEP#2.

2)Mazda would like to get new drawing for this change, if available.

4.Walk In

[ Date/Location ]

USA 19-September-2002 AM 7:00-8:00

JPN 19-September-2002 PM 8:00-9:00 MAZDA Technical Main Bldg. 2F  
# 221 Conference Room

[Audio conference numbers]

Domestic:877-877-7127

Ford Net: ? (Shirajishi-san know...)

International: 630-424-2071

Pass code: 8848917 #

Moderator code: 1888917#

Junichiro Iohikawa

PT Program Develop. Promotion Gr.

E-mail ; iohikawa.j@mazda.co.jp

Phone ; +81-82-287-4832(Ex.28215)

Fax ; +81-82-287-5115

---

**From:** Steckler, Mike (C.M.)  
**Sent:** Monday, September 30, 2002 3:50 PM  
**To:** Feloni, Sandra (S.K.)  
**Cc:** Gwizdz, Brian (B.D.); Suarez, Rhae (R.); Lawler, Dave (D.A.); Terzes, Laura (L.D.)  
**Subject:** RE: INVENTORY REVIEW 9-30-02

Sandy and Brian, hold the unit, we are only a month or so away

Mike Steckler  
Consumer Affairs Operations Manager  
Ford Customer Service Division  
RCB 3NE202  
Phone (313) 390-4236 Fax (313) 845-5444  
msteckl1@ford.com

-----Original Message-----

**From:** Terzes, Laura (L.D.)  
**Sent:** Monday, September 30, 2002 3:40 PM  
**To:** Steckler, Mike (C.M.)  
**Cc:** Gwizdz, Brian (B.D.); Feloni, Sandra (S.K.); Suarez, Rhae (R.);  
Lawler, Dave (D.A.)  
**Subject:** RE: INVENTORY REVIEW 9-30-02

If you can hold the truck a while longer, I would. The new TSB will be avail by mid/end of Oct. (waiting on IAC valve service part availability.) The final calibration with fix is available now.

Laura Terzes  
Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF56  
(313) 32-36572 / fax (313) 24-88161 / lterzes.ford.com

-----Original Message-----

**From:** Steckler, Mike (C.M.)  
**Sent:** Monday, September 30, 2002 12:48 PM  
**To:** Terzes, Laura (L.D.)  
**Cc:** Gwizdz, Brian (B.D.); Feloni, Sandra (S.K.)  
**Subject:** RE: INVENTORY REVIEW 9-30-02

Laura, should we scrap or hold? When are we targeting the new release?

Mike Steckler  
Consumer Affairs Operations Manager  
Ford Customer Service Division  
RCB 3NE202  
Phone (313) 390-4236 Fax (313) 845-5444  
msteckl1@ford.com

-----Original Message-----

From: Gwizdz, Brian (B.D.)  
Sent: Monday, September 30, 2002 12:46 PM  
To: Feloni, Sandra (S.K.)  
Cc: Steckler, Mike (C.M.)  
Subject: RE: INVENTORY REVIEW 9-30-02

Hi, Sandy. I'm not aware of any new TSB on Escapes and stalling concerns. Mike, can you give me some guidance on this one (and future Escape uploads with similar concerns)? Should it be sent to a repair facility or should we salvage it?

I based my decision on the 9 repair attempts for stalling and the truck having over 40,000 miles on it.

I'll notify Vicki to change the disposition to "auction" if Mike knows something on a fix for this concern.

Brian D. Gwizdz  
Reacquired Vehicle Operations Coordinator  
Ford Motor Company  
FCSD - Consumer Affairs  
16800 Executive Plaza Drive  
Suite 3N370, MD 3NE-B  
Dearborn, MI 48126-4207  
313-845-5682 Fax: 313-845-6002  
bgwizdz1@ford.com

-----Original Message-----

From: Feloni, Sandra (S.K.)  
Sent: Monday, September 30, 2002 12:42 PM  
To: Gwizdz, Brian (B.D.)  
Cc: Steckler, Mike (C.M.)  
Subject: RE: INVENTORY REVIEW 9-30-02

Brian, I see that you have 1KE71094 (the 2001 Escape (stalling concern)) as a salvage. I was told that the new (rather newest!!) TSB was to be released with a new part number that SHOULD fix these. Are we not there yet? any back to scrapping Escapes? (extremely costly as everyone knows)

I "cc'd" Mike as he attends the meeting with this group and want him to know that we appear to continue to be in a "no fix" (or the fix isn't working) mode.

thanks  
Sandy

Sandra K. Feloni  
RAV Process Manager  
(248) 848-5933 (office)  
(313) 319-9557 (cell phone)  
FAX: (248) 488-3703  
SFELONI@ford.com

-----Original Message-----

From: Gwizdz, Brian (B.D.)  
Sent: Monday, September 30, 2002 8:40 AM

To: 'vlawton@minacsusa.com'  
Cc: Feloni, Sandra (S.K.); 'mrix@minacsusa.com';  
'edutton@minacsusa.com'; 'dleavy@minacsusa.com'  
Subject: RE: INVENTORY REVIEW 9-30-02

Hello, Vicki. Here are the dispositions to use for today's uploads:

1KE71094 - "salvage"  
2UA64253 - change from "salvage" to "auction"  
2Y605194 - change from "salvage" to "auction"

Please contact me if you have questions or need additional information. Thank you.

Brian D. Gwizdz  
Reacquired Vehicle Operations Coordinator  
Ford Motor Company  
FCSD - Consumer Affairs  
16800 Executive Plaza Drive  
Suite 3N370, MD 3NE-B  
Dearborn, MI 48126-4207  
313-845-5682 Fax: 313-845-6002  
bgwizdz1@ford.com

-----Original Message-----

From: vlawton@minacsusa.com [mailto:vlawton@minacsusa.com]  
Sent: Monday, September 30, 2002 7:53 AM  
To: BGWIZDZ1@ford.com  
Cc: VLAWTON@minacsusa.com  
Subject: INVENTORY REVIEW 9-30-02

Hi Brian, Please review the following:

Vin# 1KE71094 Refund Salvage 01 Escape XLS 4x2 with 40184 miles 9 repair attempts for stall/quits idle all eng temp CSM Bradford Wilson comments; none

Vin# 2UA64253 Replacement Salvage( I picked salvage for purpose of review csm picked other) 02 Explorer XLT 4x2 with 10423 miles 3 repair attempts for stall/quits accel all eng temp CSM Kathryn Sundstrom comments: VEHICLE STALLS AND WILL NOT WORK WHEN THE ENGINE IS COLD. DEALERSHIP CANNOT FIX AND ENGINEERS FOR FORD ARE TRYING TO FIND A FIX AS THIS IS A PROBLEM OCCURING EVERYWHERE. CUSTOMER LOVES FORD BUT WANTS A DIFFERENT EXPLORER.

Vin# 2Y605194 Replacement Salvage (I picked salvage for purpose of review csm picked other) 02 Town Car Signature with 1449 miles 5 repair attempts for auto trans general vibration CSM Janice Gerweck comments: THIS CUSTOMER IS WANTING TO REPLACE HIS CURRENT LINCOLN WITH A 2003 MODEL. REASON: THERE ARE NO 2002 MODELS HE CAN GET WITH ALL OF HIS CURRENT OPTIONS. AS THE CUSTOMER REP. FOR THE MARKET I WOULD LIKE TO WAIVE HIS UPGRADE COST TO THE 2003 AND ALSO WAIVE ANY MILEAGE CHARGES. ALSO THE CUSTOMER HAD AN ESP ON HIS CURRENT LINCOLN IF YOU CAN PLEASE TRANSFER THIS TO HIS NEW LINCOLN. WHEN HE PURCHASED HIS 2002 MODEL HE HAD A \$7,000 REBATE AND HE WANTS TO MAKE SURE THE REBATE MONEY IS PUT TOWARDS HIS NEW CAR. CUSTOMER WANTS TO BE SURE ALL OF THE ABOVE ITEMS WILL HAPPEN BEFORE HE

REAPLACES HIS LINCOLN. PLEASE CONTACT KEITH OLS AT THE DEALERSHIP TO  
PROVIDE HIM WITH THE ANSWERS TO THE CUSTOMERS QUESTIONS. THANK YOU! FOR  
YOUR ASSISTANCE.

Vicki Lawton  
Replacement and Refund Analyst  
Minacs  
34115 West Twelve Mile Road  
Farmington Hills, MI 48311  
T. 1-800-323-6353 option#3 ext 4458  
P. 248-488-3703  
email: vlawton@minacsusa.com

**From:** Mariano, Tom (T.E.)  
**Sent:** Wednesday, September 25, 2002 10:36 AM  
**To:** Myers, Dan (D.P.)  
**Cc:** Price, Martin (M.); Altonian, Don (D.J.); Daibo, Bob (R.J.); Fournelle, Gilbert (G.); Limasco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Hayduk, Mark (M.S.); Suarez, Rhas (R.)  
**Subject:** RE: another wds issue?

Dan,  
I understand the issues and we will fix this ASAP with a B21.3 Update, but I have another question.

Can you go back and verify the part number in the PCM. 2L8A-AA should not be recognized by WDS. It was never WERS released, and should not be in the field.

Thanks,

Tom Mariano  
ACSG/DSP/WDS PCM Reprogramming  
tmarian1@ford.com  
Ph: 313-390-5032  
Fax: 313-248-4370

-----Original Message-----

**From:** Myers, Dan (D.P.)  
**Sent:** Tuesday, September 24, 2002 6:02 PM  
**To:** Suarez, Rhas (R.)  
**Cc:** Price, Martin (M.); Altonian, Don (D.J.); Daibo, Bob (R.J.); Fournelle, Gilbert (G.); Limasco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Hayduk, Mark (M.S.)  
**Subject:** RE: another wds issue?

Rhas,  
FYI

I just updated my WDS with B21.1A from the LAN and it still won't allow me to update 3.0L Escapes to the latest level. It is stating that the 2L8A-AA calibration (what is currently in the vehicle) is the latest level for the 2002 Escape. Not the 2U7A-CZB that I was able to download from WDS version B20.12 last week. How can I get a copy of the calibrations (for 01-03) on disc so I won't have to reschedule any more vehicles?

Thanks,

*Dan Myers*

Field Quality Engineer - Iowa  
Enhanced Concern Identification

[dmyers4@ford.com](mailto:dmyers4@ford.com)

Cell 563-505-9002  
Office 563-289-9991  
Fax 563-289-1364

---

**From:** Marlanos, Tom (T.E.)  
**Sent:** Wednesday, September 25, 2002 10:26 AM  
**To:** Salamon Jr., Peter (P.F.); Dalbo, Bob (R.J.); Suarez, Rhase (R.); Terzes, Laura (L.D.); Stiegel, Mark (M.S.); Fascetti, Bob (R.J.)  
**Co:** Jordan, LeBron (L.); Judson, Roger (R.); Dorony, Kenneth (K.R.); Tieman, Paul (P.D.); Price, Martin (M.); Alkoonian, Don (D.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Hayduk, Mark (M.S.)  
**Subject:** RE: another wds issue?

OK everyone, here is what has happened.

We had a an update for U204 in early August covered by white paper 1891, where a series of service fix part numbers replaced previous running change releases.

We chained all of those together the running changes with the service fixes and released to the field as we were authorized to do.

The very next week, the newly released calibrations were found to create a surge issue, so we were asked by Powertrain to immediately unchain the new from the old. Which we did.

In late August/Early September, white paper 1921 was released, which replaced the first service release calibrations with a new one. We then made our updates and released to the field.

In the process of updating, the 1921 white paper never referenced the previous running calibrations so the chaining of the production calibrations to the service fixes was not made.

We can fix this in B21.3 later this week.

This may sound confusing, so let me try to make more simple.

1. Let's say you have calibration A and you replace it wit calibration B, so

A => B

2. A problem is found and now we are told to change our logic to:

A does not go to B

so you have a stand alone A and a stand alone B (that is not feasible now).

A Stand alone

B Stand alone (although not feasible)

3. Now Calibration C comes out and we are told that it replaces Calibration B, so you now have:

A stand alone

B => C

C is the latest.

In this case, we were not told to point Cal A at Cal C.

We will fix this week, but this is how we got to this point.

I hope that this explains it all.



If you have any questions, feel free to ask.

Tom

-----Original Message-----

From: Salamon Jr., Peter (P.F.)  
Sent: Wednesday, September 25, 2002 8:41 AM  
To: Marianos, Tom (T.E.); Judson, Roger (R.)  
Cc: Tiernan, Paul (P.D.); Jordon, LeBron (L.); Dorony, Kenneth (K.R.)  
Subject: FW: another wds issue?  
Importance: High

Tom / Roger,

I thought that all was OK with the Escape, including instructions to the hotline and the field on how to load the software. Have you heard of any concerns in the field? Is this a one-off?

Regards,  
**Pete**

-----Original Message-----

From: Terzes, Laura (L.D.)  
Sent: Wednesday, September 25, 2002 8:25 AM  
To: Salamon Jr., Peter (P.F.); Dorony, Kenneth (K.R.)  
Subject: FW: another wds issue?

Someone pls. confirm and respond on status.

**Laura Terzes**

Manager, Outfitting Concerns  
FCSD, Customer Service Engineering  
PDC TYC 1JF68  
(313) 32-38572 / fax (313) 24-88181 / [terzes.ford.com](mailto:terzes.ford.com)

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Tuesday, September 24, 2002 6:07 PM  
To: Marianos, Tom (T.E.); Jordon, LeBron (L.)  
Cc: Terzes, Laura (L.D.); Bob Pascati  
Subject: FW: another wds issue?

LeBron/Tom,  
Do we still have a WDS issue?

**Bob Dalbo**

S.O.L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-31788  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

From: Myers, Dan (D.P.)  
Sent: Tuesday, September 24, 2002 6:02 PM  
To: Suarez, Rhoe (R.)  
Cc: Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lymliaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lewler, David (D.A.); Mayduk, Mark (M.S.)  
Subject: RE: another wds issue?

Rhoe,  
FYI

I just updated my WDS with B21.1A from the LAN and it still won't allow me to update 3.0L Escapes to the latest level. It is stating that the 2LBA-AA calibration (what is currently in the vehicle) is the latest level for the 2002 Escape. Not the 2U7A-CZB that I was able to download from WDS version B20.12 last week. How can I get a copy of the calibrations (for 01-03) on disc so I won't have to reschedule any more vehicles?

Thanks,

*Dan Myers*

Field Quality Engineer - Iowa  
Enhanced Concern Identification

dmvers4@ford.com

Cell 563-505-9002  
Office 563-289-9991  
Fax 563-289-1364

-----Original Message-----

From: Suarez, Rhea (R.)  
Sent: Tuesday, September 17, 2002 12:06 PM  
To: Price, Martin (M.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limbaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
Subject: FW: another wds issue?

FYI -

-----Original Message-----

From: Marianos, Tom (T.E.)  
Sent: Tuesday, September 17, 2002 12:46 PM  
To: Suarez, Rhea (R.)  
Subject: RE: another wds issue?

This is already a high priority, We are working on it.

-----Original Message-----

From: Suarez, Rhea (R.)  
Sent: Tuesday, September 17, 2002 12:39 PM  
To: Price, Martin (M.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limbaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
Cc: Myers, Dan (D.P.); Marianos, Tom (T.E.); Lawler, David (D.A.)  
Subject: RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

*Rhea M. Suarez*

Rhea Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PYT & Field Support / FCSO  
DSO II (room 648) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-798-8242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: Price, Martin (M.)  
Sent: Tuesday, September 17, 2002 11:51 AM  
To: Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limbaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhea (R.)

Subject: another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2L8A-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

*Mark Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**From:** Myers, Dan (D.P.)  
**Sent:** Tuesday, September 24, 2002 6:02 PM  
**To:** Suarez, Rhee (R.)  
**Cc:** Price, Martin (M.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Linteco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Hayduk, Mark (M.S.)  
**Subject:** RE: another wds issue?

Rhee,  
FYI

I just updated my WDS with B21.1A from the LAN and it still won't allow me to update 3.0L Escapes to the latest level. It is stating that the 2LBA-AA calibration (what is currently in the vehicle) is the latest level for the 2002 Escape. Not the 2U7A-CZB that I was able to download from WDS version B20.12 last week. How can I get a copy of the calibrations (for 01-03) on disc so I won't have to reschedule any more vehicles?

Thanks,

*Dan Myers*

Field Quality Engineer - Iowa  
Enhanced Concern Identification

[dmyers4@ford.com](mailto:dmyers4@ford.com)

Cell 563-505-9002  
Office 563-289-9991  
Fax 563-289-1364

-----Original Message-----

**From:** Suarez, Rhee (R.)  
**Sent:** Tuesday, September 17, 2002 12:06 PM  
**To:** Price, Martin (M.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Linteco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
**Subject:** FW: another wds issue?

FYI -

-----Original Message-----

**From:** Marianos, Tom (T.E.)  
**Sent:** Tuesday, September 17, 2002 12:46 PM  
**To:** Suarez, Rhee (R.)  
**Subject:** RE: another wds issue?

This is already a high priority. We are working on it.

-----Original Message-----

**From:** Suarez, Rhee (R.)  
**Sent:** Tuesday, September 17, 2002 12:39 PM  
**To:** Price, Martin (M.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Linteco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
**Cc:** Myers, Dan (D.P.); Marianos, Tom (T.E.); Lawler, David (D.A.)  
**Subject:** RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

*Rhee M. Suarez*

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / PCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-83344 Pager: 313-798-8242  
Fax: 313-33-78337  
Email: rsuarez2@ford.com

-----Original Message-----

From: Price, Martin (M.)  
Sent: Tuesday, September 17, 2002 11:51 AM  
To: Alcorn, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limbaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
Subject: another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2L8A-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**From:** Suarez, Rhaz (R.)  
**Sent:** Monday, September 23, 2002 12:34 PM  
**To:** Lintaco, Steven (S.); Altoonlan, Don (D.J.); Price, Martin (M.); Kanai, Shinji (S.); Lawler, David (D.A.)  
**Subject:** FW: another wds issue? (AFFECTS STALLS FIX Calibration)

FYI -

-----Original Message-----

**From:** Terzas, Laura (L.D.)  
**Sent:** Monday, September 23, 2002 11:50 AM  
**To:** Pascetti, Bob (R.J.); Karr, Jerry (G.T.); Takasawa, Keith (K.D.); Powers, Ken (K.W.); Dalbo, Bob (R.J.)  
**CC:** Stiegel, Mark (M.S.); Dorsey, Kenneth (K.R.); Salamon Jr., Peter (P.F.); Suarez, Rhaz (R.); Marlanos, Tom (T.E.)  
**Subject:** RE: another wds issue? (AFFECTS STALLS FIX Calibration)

I just spoke to DSP. You can report the service calibration is available for Ford and Mazda products. The access issue is resolved.

*Laura Terzas*

Manager, Outfitters Concerns  
PCSD, Customer Service Engineering  
PDC TVC 1JF68  
(313) 32-38572 / fax (313) 24-88181 / lterzas.ford.com

-----Original Message-----

**From:** Pascetti, Bob (R.J.)  
**Sent:** Monday, September 23, 2002 8:31 AM  
**To:** Terzas, Laura (L.D.); Karr, Jerry (G.T.); Takasawa, Keith (K.D.); Powers, Ken (K.W.); Dalbo, Bob (R.J.)  
**CC:** Marlanos, Tom (T.E.); Salamon Jr., Peter (P.F.); Hellenga, Jim (J.C.)  
**Subject:** RE: another wds issue? (AFFECTS STALLS FIX Calibration)

I take it that this means that I can report at the NAQPM today, that the service calibration is available on the Ford products, as well as the Mazda products.

I will assume this, unless otherwise informed...

Bob Pascetti

-----Original Message-----

**From:** Terzas, Laura (L.D.)  
**Sent:** Monday, September 23, 2002 8:26 AM  
**To:** Karr, Jerry (G.T.); Takasawa, Keith (K.D.); Powers, Ken (K.W.); Dalbo, Bob (R.J.); Pascetti, Bob (R.J.)  
**CC:** Marlanos, Tom (T.E.); Salamon Jr., Peter (P.F.); Hellenga, Jim (J.C.)  
**Subject:** FW: another wds issue? (AFFECTS STALLS FIX Calibration)

All: here is status from DSP (Diagnostic Service Planning) re: software work-around to give dealers access to Escape Stall calibration. Tom, how will you notify the dealers to reload B20, and when? Need a little more info. thanks.

Laura,

Pete and Mark want to give Teradyne the week to work on this. I will probably be here on Sunday to help test anything that they can produce.

If by Monday, we are still down, we will have the Dealers reload with B20.

Thanks,

Tom Marianos  
ACSG/DSP/WDS PCM Reprogramming  
tmarian1@ford.com  
Ph.:313-390-5032  
Fax: 313-248-4370

-----Original Message-----

From: Klarr, Jerry (G.T.)  
Sent: Sunday, September 22, 2002 8:53 PM  
To: Terzas, Laura (L.D.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.)  
Cc: Takasawa, Keith (K.D.); Powers, Ken (K.W.)  
Subject: RE: another wds issue? (AFFECTS STALLS FDX Calibration)

How long do you think we are talking about for the software update? Hopefully we are talking early this week.

G. T. Klarr (Jerry)  
P/T Chief Engineer: PH: 32-26868/Cube: 1BA45  
PDC/MD #206/FAX: 62-18063/gklarr@ford.com

-----Original Message-----

From: Terzas, Laura (L.D.)  
Sent: Friday, September 20, 2002 7:56 AM  
To: Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Klarr, Jerry (G.T.)  
Cc: Takasawa, Keith (K.D.); Powers, Ken (K.W.)  
Subject: FW: another wds issue? (AFFECTS STALLS FDX Calibration)

We learned about the inability of the field to access the latest Stalls calibration (released 9/4) via the Tech Hotline and our Field Service Engineers. This is a software issue with WDS, just keeping you up-to-date so we have latest for NAQPAM mtg. on Monday, should the question come up. I don't believe asking the Diagnostic Service Planning activity to go backwards with their releases at the expense of losing other functionality (diagnostic coverage and tools for other veh. lines) is appropriate. Additionally, asking dealers to reload multiple CDs creates confusion and negative feedback. We'll wait for software supplier (Teradyne) update, then decide what to do.

*Laura Terzas*  
Manager, Outlets Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF56  
(313) 32-96572 / fax (313) 24-88161 / lterzas.ford.com

-----Original Message-----

From: Marianos, Tom (T.E.)  
Sent: Thursday, September 19, 2002 5:32 PM  
To: Terzas, Laura (L.D.); Salamon Jr., Peter (P.F.)  
Cc: Suarez, Rhea (R.); Hellenga, Jim (J.C.)  
Subject: RE: another wds issue?

Laura,  
I believe that Jim Hellenga has explained the situation to you, but I will follow up with this note anyway with a written explanation.

Because, Ford is moving ahead with being able to flash other modules than just the PCM, the WDS database has required the addition of new fields to multiple tables in the database. That in turn meant that the tool that creates our database updates also required an update. Unfortunately, this information was not made known to the person who maintains the tool that creates the update files until a few weeks ago.

The B21 database was frozen about 8 weeks ago, so the data that is contained is 8 weeks old, which means updates to take care of the QSF's handled in B20 are not contained on the B21 CD.

The updates files created by the new update tool result in "testman errors" (what are effectively system crashes).

Our supplier has been working to isolate/fix the problems with the tool, that we can update our dealers with the latest calibration data.

Our options are these:

1. Hold on in hopes that Teradyne will be able to fix the tool issues by tomorrow and will be able to provide the update files to all dealers.

or

2. Ask all dealers to reload the A5 System CD and the B20 Blue CD and proceed from there.

The issues with both options are as follows (although I will probably miss some).

1. If no fix is found by tomorrow, week have lost a few days while try to sort this out, and dealers have been unable to flash vehicles that needed calibrations that are not available on the B21 base CD.

2. If we go back to B20, we lose vehicle and tool coverage that were added content to the B21 CD over what was on B20.

One thing that has been done in case we must go back to B20 is that the required update files are being Starburst to the dealers local FordStar terminal to prevent overloading the satellite system.

This is where we stand.

We really don't want to go backward, but if we need to we will.

Tom Marlanos

-----Original Message-----

From: Terzes, Laura (L.D.)  
Sent: Thursday, September 19, 2002 3:28 PM  
To: Salamon Jr., Peter (P.F.)  
Cc: Marlanos, Tom (T.E.); Suarez, Rhoe (R.)  
Subject: FW: another wds issue?

This is a critical calibration for an Escape Stalls concern ('01, '02 and '03 MYs). Any assistance and explanation you can provide will be helpful. The Escape 3.0L Stalls concern will be covered at a Monday 10/23 (4-6p.m.) North American Quality Planning and Assistance Meeting (NAQPAM). I will be attending. (Frank Ligon is attending 1st time). It would be uncomfortable for VS&P if the inability for WDS to provide this updated cal in the current release were to be mentioned. Can we get this fixed soon? compressed timing?

*Laura Terzes*

Manager, Outfitting Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF68  
(813) 82-88572 / fax (813) 24-88161 / lterzes.ford.com

-----Original Message-----

From: Pascetti, Bob (R.J.)  
Sent: Thursday, September 19, 2002 3:01 PM  
To: Terzes, Laura (L.D.)  
Cc: Delbo, Bob (R.J.); Kerr, Jerry (G.T.)  
Subject: RE: another wds issue?



Laura,  
can you personally intervene on this. The calibration is out there and the dealer's can't put it in. We didn't get any answers today at our Stalls meeting.

Anything you can do to help would be greatly appreciated.

Bob F.

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Thursday, September 19, 2002 11:42 AM  
To: Terzes, Laura (L.D.); Bob Pascetti  
Subject: FW: another wds issue?

Bob/Laura,  
Apparently the latest (B21) WDS software doesn't recognize that the stall fix updates exist. The previous version does. We don't yet have an estimate of when this issue will be resolved.

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-31786  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

From: Suarez, Rhac (R.)  
Sent: Wednesday, September 18, 2002 8:42 AM  
To: Price, Martin (M.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lindaco, Steven (S.); Rothweiler, Daniel (D.);  
Marlanos, Tom (T.E.); Lawler, David (D.A.)  
Subject: FW: another wds issue?

As soon as we get this fixed, can someone please send me a note? Our field people need this information.

Thanks!!  
Rhac

-----Original Message-----

From: Myers, Dan (D.P.)  
Sent: Tuesday, September 17, 2002 10:38 PM  
To: Suarez, Rhac (R.)  
Subject: RE: another wds issue?

Rhac,  
Can you let me know when this is fixed? I have 3 more Escapes to update as soon as I can get access to the calibration through WDS B21 or the LAN.

Thanks,

**Dan Myers**

Field Quality Engineer - Iowa  
Enhanced Concern Identification

[dmyers4@ford.com](mailto:dmyers4@ford.com)

Cell 563-505-9002  
Office 563-289-9991  
Fax 563-289-1364

-----Original Message-----

From: Suarez, Rhee (R.)  
Sent: Tuesday, September 17, 2002 12:06 PM  
To: Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
Subject: FW: another wds issue?

FYI -

-----Original Message-----

From: Marianos, Tom (T.E.)  
Sent: Tuesday, September 17, 2002 12:46 PM  
To: Suarez, Rhee (R.)  
Subject: RE: another wds issue?

This is already a high priority. We are working on it.

-----Original Message-----

From: Suarez, Rhee (R.)  
Sent: Tuesday, September 17, 2002 12:39 PM  
To: Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
Cc: Myers, Dan (D.P.); Marianos, Tom (T.E.); Lawler, David (D.A.)  
Subject: RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

*Rhee M. Suarez*

Rhee Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / PCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23944 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: Price, Martin (M.)  
Sent: Tuesday, September 17, 2002 11:51 AM  
To: Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhee (R.)  
Subject: another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2LBA-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

---

**From:** Suarez, Rhee (R.)  
**Sent:** Tuesday, September 17, 2002 1:08 PM  
**To:** Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
**Subject:** FW: another wds issue?

FYI -

-----Original Message-----

**From:** Mariano, Tom (T.E.)  
**Sent:** Tuesday, September 17, 2002 12:46 PM  
**To:** Suarez, Rhee (R.)  
**Subject:** RE: another wds issue?

This is already a high priority, We are working on it.

-----Original Message-----

**From:** Suarez, Rhee (R.)  
**Sent:** Tuesday, September 17, 2002 12:39 PM  
**To:** Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
**Cc:** Myers, Dan (D.P.); Mariano, Tom (T.E.); Lawler, David (D.A.)  
**Subject:** RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

*Rhee M. Suarez*

Rhee Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-766-6242  
Fax: 313-39-76387  
Email: rsuarez28@ford.com

-----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Tuesday, September 17, 2002 11:51 AM  
**To:** Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhee (R.)  
**Subject:** another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2LBA-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

---

**From:** Suarez, Rhas (R.)  
**Sent:** Wednesday, September 18, 2002 8:49 AM  
**To:** Terzes, Laura (L.D.); Lawler, David (D.A.)  
**Cc:** Cipriano, Jim (J.)  
**Subject:** RE: IAC for Escape

I just got word from our parts people and they were told that this part is expected to be in production at 9/30. He did not have a time yet determined for service availability.

  
RE: 87-4273 23 TWS  
drl - DRIVE...

-----Original Message-----

**From:** Terzes, Laura (L.D.)  
**Sent:** Wednesday, September 18, 2002 8:14 AM  
**To:** Suarez, Rhas (R.); Lawler, David (D.A.)  
**Cc:** Cipriano, Jim (J.)  
**Subject:** FW: IAC for Escape

Dave/Rhas: has the new IAC gone into production yet? Any chance we could send one from KCAP to Jim? I believe service stock not available yet.

-----Original Message-----

**From:** Cipriano, Jim (J.)  
**Sent:** Tuesday, September 17, 2002 2:38 PM  
**To:** Terzes, Laura (L.D.)  
**Cc:** Hopkins Ford Service  
**Subject:** IAC for Escape

Laura,

I have an Escape with the most recent calibration update which needs an IAC. This is a final repair Lemon Law attempt. Can you help me get a valve to the dealer? I have cc'd the dealer.

Thanks for your time.

Very respectfully,

*Jim Cipriano*

Field Service Engineer - Philadelphia Region  
856-727-3662 d/fn 395-3662  
cell 856-952-8407

From: Suarez, Rhae (R.)  
Sent: Tuesday, September 10, 2002 7:53 AM  
To: Lawler, David (D.A.)  
Cc: Powers, Ken (K.W.)  
Subject: RE: Stalling Escape Reflash

The TSB has recently been submitted into the system for approvals. I am guessing (going by the last 2 times) it will be about a month for it to process and released due to all the procedure steps and parts associated. The newest information is the calibration and that is now available.

Here is ISM that informs the availability of the calibration for the stall condition.....

Article #: ISM 02-09-007 Date: 09/05/2002

SOME 2001-2003 ESCAPE WITH 3.0L ENGINES MAY EXHIBIT AN INTERMITTENT STALL. VERIFY TSB 02-11-06 HAS BEEN PERFORMED THEN REPROGRAM THE PCM WITH WDS VERSION 20.12 OR LATER. 2001 & EARLY BUILD 2002 MODELS WILL UPDATE TO 1U7A-AND, ALL OTHER 2002 MODELS WILL UPDATE TO 2U7A-C2B, AND EARLY 2003 MODELS WILL UPDATE TO 3L8A-BC. FOR '01-'02 MODELS VERIFY LATEST DPFE SENSOR(2F12-9J460-AA) AND MAP(1L2Z-12B579-BA). TSB TO FOLLOW.

Also, I forwarded an email I received from the Calibration group about the Fordstar release.....

Let me know if you need any other info.  
Thanks!!  
Rhae M. Suarez

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Subject: RE: 02 Escape Calibration Concern

Importance: High

Thanks to extraordinary efforts by the multitude of people involved in the release process:

2003 MY NA market calibrations will go into production 9/10.

2003 MY market calibrations were released on Fordstar 8/30 and are currently available (WDS version B20.11)

2001/2002 MY NA market service calibrations are just now available on Fordstar (WDS B20.12).

2001/2002 MY service calibrations will be available via Internet by 9/6.

Tim,

Please approve concern C11390555 (with Keith's concurrence) to release the finned-pintle IACV for service as the necessary calibrations are now available.

Bob Dalbo

3.0L Calibration Supervisor

Outfitters Calibration, NAT

Phone: (313) 24-84947 Fax: (313) 32-31786

Pager: (313) 795-2859 Email: rdalbo@ford.com

-----Original Message-----

From: Lawler, David (D.A.)

Sent: Monday, September 09, 2002 5:09 PM

To: Suarez, Rhae (R.)

Cc: Powers, Ken (K.W.)

Subject: FW: Stalling Escape Reflash

Rhae,

Ken Powers contacted me 3:50 p. C.S.T. today on the Subject T.S.B. asking when it would be out ...

I showed him the confidential/unapproved draft and told him the Calibration reflash will be in Fordstar soon (Thursday ?).

Please stir the pot and let Ken & I know the date the actual T.S.B will be at Dealers.

Dave Lawler

FCSD Program Manager - L.H.D. Escape/Tribute/Maverick

DLAWLER1 Office: 816-414-5602 Pager: 313-754-1760

-----Original Message-----

From: Suarez, Rhae (R.)

Sent: Wednesday, August 28, 2002 7:53 AM

To: Wrightman, David (D.B.)

Cc: Lawler, David (D.A.); King, Robert (R.F.)

Subject: RE: Stalling Escape Reflash

David,

Engineering is working on releasing this new Calibration ASAP. The target time frame is around the week of Sept 9. The new TSB will not be release at the same

time. However, an ISM will capture the new calibration information so keep an eye out for that. The new TSB has a few additional steps (versus TSB# 02-11-06) and the approvals and timing will take a little longer.

I hope this helps.

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
FVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: King, Robert (R.F.)  
Sent: Wednesday, August 28, 2002 8:42 AM  
To: Wrightsman, David (D.B.)  
Cc: Suarez, Rhae (R.)  
Subject: RE: Stalling Escape Reflash

The TSB should be released soon.

Ford-"The Most Wanted Car on the American Road" circa 1952

Robert King  
LHD Escape/Maverick FCSD Program Manager  
FVT & Field Support, Vehicle Service & Programs  
Kansas City Assembly Plant (816) 459-1872, fax 459-1726

-----Original Message-----

From: Wrightsman, David (D.B.)  
Sent: Tuesday, August 27, 2002 4:26 PM  
To: King, Robert (R.F.)  
Cc: Alexander, Ray (R.B.); Moses III, George (G.C.)  
Subject: Stalling Escape Reflash

Within the notes of the FSE Roundtable discussion from this month, a reflash for the Escape for stalling was mentioned twice.

Do you have any information on this reflash? Is there a due date? Will there be a SSM issued?

Any information that you can share would surely be appreciated. I have several of these vehicles that are in the final stages of the "repair or buyback" process. It might buy us some time.

David Wrightsman  
Field Service Engineer  
FCSD-Atlanta

**From:** Jardine, Lee (L.A.)  
**Sent:** Tuesday, September 03, 2002 9:58 AM  
**To:** Suarez, Rhae (R.)  
**Cc:** Karr, Jerry (G.T.); King, Robert (R.F.); Lawler, David (D.A.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Marlanos, Tom (T.E.)  
**Subject:** RE: PROVE-OUT, U204 R11 (DURATEC) CALIBRATION ENHANCEMENT FOR STALLS ROBUSTNESS

Rhae, the PT people know how to release the calibrations. From our side, it is the same as any other calibration and the release requirements are the same. The cal must be developed, validated, and released by PT with a White Paper providing all of the final release authorizations. PT advises DSP that the cal is authorized and on the POEE VAX server. DSP pulls the cal and starts the release process each Monday. The cal will be out on FordStar and PTS no later than Thursday noon of that week.

In order for Tom to check on the status of a cal release, he must have the part number of the NEW calibration.

-----Original Message-----  
**From:** Marlanos, Tom (T.E.)  
**Sent:** Friday, August 30, 2002 7:07 AM  
**To:** Suarez, Rhae (R.); Jardine, Lee (L.A.)  
**Cc:** Karr, Jerry (G.T.); King, Robert (R.F.); Lawler, David (D.A.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.)  
**Subject:** RE: PROVE-OUT, U204 R11 (DURATEC) CALIBRATION ENHANCEMENT FOR STALLS ROBUSTNESS

What are the files? Part numbers would do.

-----Original Message-----  
**From:** Suarez, Rhae (R.)  
**Sent:** Friday, August 30, 2002 9:03 AM  
**To:** Marlanos, Tom (T.E.); Jardine, Lee (L.A.)  
**Cc:** Karr, Jerry (G.T.); King, Robert (R.F.); Lawler, David (D.A.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.)  
**Subject:** FW: PROVE-OUT, U204 R11 (DURATEC) CALIBRATION ENHANCEMENT FOR STALLS ROBUSTNESS

Tom/Lee,

Could you please assist us (or point us in the right direction) in releasing a new calibration ASAP. This is a very Hot Issue (Escape Stall) and getting this info out to the field is very important. I have been told that there is a special way/means of getting info onto Fordstar instead of waiting till the next update on Fridays.

Please let us now what needs to be done to get this accomplished.

Thank you,

*Rhae M. Suarez*

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-798-8242  
Fax: 313-33-76337  
Email: rsuarez3@ford.com

-----Original Message-----  
**From:** Terres, Laura (L.D.)  
**Sent:** Friday, August 30, 2002 8:47 AM  
**To:** Suarez, Rhae (R.)  
**Cc:** Karr, Jerry (G.T.); King, Robert (R.F.); Lawler, David (D.A.)  
**Subject:** FW: PROVE-OUT, U204 R11 (DURATEC) CALIBRATION ENHANCEMENT FOR STALLS ROBUSTNESS

Rhae FYI. Follow up with DSP re: our discussion.



Jerry: We want to go with the early release next wk llo of Fri. Field and hotline are waiting for the new cal.

*Laura Terzes*

Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF68  
(313) 32-96572 / fax (313) 24-88181 / lterzes.ford.com

---Original Message---

From: Klarr, Jerry (G.T.)  
Sent: Friday, August 30, 2002 8:41 AM  
To: Himes, Bob (R.S.); Fowler, Bernie (B.W.); Grandinett, Dave (D.H.)  
Cc: Fascetti, Bob (R.J.); Terzes, Laura (L.D.); Auller, Jim (J.E.); Kapp, Dan (Daniel R.); Wolfe, Brian (B.C.)  
Subject: FW: PROVE-OUT, U204 R11 (DURATEC)CALIBRATION ENHANCEMENT FOR STALLS ROBUSTNESS

FYI, we are ready to go on the 3.0L Escape stalls calibration re-release. I've talked with Laura Terzes about doing a special FordStar release early next week llo of waiting for Friday. We are working on accelerating the production modules.

*G. T. Klarr (Jerry)*

P/T Chief Engineer: PH: 32-299699/Cube: 1BA45  
PDC/MD #205/FAX: 82-18063/gklarr@ford.com

---Original Message---

From: Fascetti, Bob (R.J.)  
Sent: Friday, August 30, 2002 8:24 AM  
To: Powers, Ken (K.W.); Takasawa, Keith (K.D.)  
Cc: Hoffman, Michael (M.V.); Klarr, Jerry (G.T.); Wright, Robin (R.A.)  
Subject: RE: PROVE-OUT, U204 R11 (DURATEC)CALIBRATION ENHANCEMENT FOR STALLS ROBUSTNESS

Ken, Keith,

Scott did an outstanding job with this. There is no way we could have run this many vehicles without him.

Ken, if there is one thing we did right, it was to put Scott in this job two years ago. He is the finest resident I have worked with.

The signoff meeting we had last night was with Jerry Klarr, Kumar, Jim Auller, Al Hunt, Mike Hofman, Scott, Bob Dalbo, and me. We reviewed the software DV, the actual calibration parameters from PSW hardware, the EOL results, and the drive results. We agreed to proceed with one follow up item. Visteon will set up an additional review with Jerry and me, to go over a generic fault tree analysis of how a software error should be caught with their improved process. This is a discipline follow up for future programs.

Bob Fascetti

---Original Message---

From: Moorhouse, Scott (S.R.)  
Sent: Thursday, August 29, 2002 7:46 PM  
To: Savchitz, David (D.W.); Alvarado, OJ (O.J.); Clawson, Randy (R.R.); Wilson, Doug (D.A.); McDaniel, Keith (R.K.); Gardner, Pete (.); Powers, Ken (K.W.); Altonian, Don (D.J.); Corbett, Sandra (S.M.); Hoffman, Michael (M.V.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Moorhouse, Scott (S.R.); Fox, Bryan (B.J.)  
Subject: PROVE-OUT, U204 R11 (DURATEC)CALIBRATION ENHANCEMENT FOR STALLS ROBUSTNESS

A total of 87 vehicles were built and processed with the above referenced calibration (BAR2 pcm level). These vehicles were processed through initial start and EOL testing without incident. Vehicle logs of all 87 vehicles were evaluated and compared to current production vehicles by RVT, with no concerns noted.

Vehicles held were cold started and driven, with special attention to idle quality and changes made to address closed throttle stalls. Vehicles behaved per design intent. Complete drive evaluations were carried

out to insure that no other drive parameters were inadvertently affected by the change. Concurrently, Calibration Engineering and Visteon carried out additional verification on PSW'd parts delivered this week.

Results of the plant and Engineering evaluations were reviewed with Jerry Klarr, PTSE Chief Engineering, as well as Calibration Engineering and Visteon representatives. We recommend and request that we proceed with the change, with current implementation date set for 10 September. Vehicles currently built with the new calibration would be acceptable for release and ship.

Scott Moorhouse  
U204 PTSE Resident Engineer  
Kansas City Assembly Plant  
(ph) 816-459-1965 (fax) 816-459-1728  
[smoorhou@ford.com](mailto:smoorhou@ford.com)

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**From:** Marianos, Tom (T.E.)  
**Sent:** Friday, August 30, 2002 9:29 AM  
**To:** Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.)  
**Co:** Karr, Jerry (G.T.); King, Robert (R.F.); Suarez, Rhea (R.); Lawler, David (D.A.)  
**Subject:** FW:

Are the part numbers in Robin's note the ones that you are looking for?

-----Original Message-----

**From:** Peters, Robin (R.S.)  
**Sent:** Thursday, August 29, 2002 4:12 PM  
**To:** Marianos, Tom (T.E.)  
**Subject:** RE:

2003 3.0L U204  
APED E11402351-000  
3L8A-BC  
3L8A-CC  
WERS released 8/22/02

Robin Peters  
Truck PCM Timing Coordinator  
Emissions Compliance Dept.  
Phone: 313-39-01656

-----Original Message-----

**From:** Marianos, Tom (T.E.)  
**Sent:** Thursday, August 29, 2002 4:11 PM  
**To:** Peters, Robin (R.S.)  
**Subject:** RE:

What were the calibrations or part numbers?

-----Original Message-----

**From:** Peters, Robin (R.S.)  
**Sent:** Thursday, August 29, 2002 4:09 PM  
**To:** Marianos, Tom (T.E.)  
**Subject:** RE:

Thanks!

Do you know the U204 status?

Robin Peters  
Truck PCM Timing Coordinator  
Emissions Compliance Dept.  
Phone: 313-39-01656

-----Original Message-----

**From:** Marianos, Tom (T.E.)  
**Sent:** Thursday, August 29, 2002 3:53 PM  
**To:** Peters, Robin (R.S.)  
**Subject:**

Ranger files went on FordStar this morning.

Thanks,

Tom Marianos  
ACSG/DSP/WDS PCM Reprogramming  
tmarian1@ford.com  
Ph.:313-390-5032  
Fax: 313-248-4370

---

From: Suarez, Rhee (R.)  
Sent: Wednesday, August 28, 2002 2:28 PM  
To: Terzes, Laura (L.D.); King, Robert (R.F.); Lawler, David (D.A.)  
Subject: FW: 02 Escape Calibration Concern

FYI -

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Wednesday, August 28, 2002 2:27 PM  
To: Enigenburg, Timothy (T.J.); Suarez, Rhee (R.); Fournelle, Gilbert (G.); Corlew, Randall (R.L.)  
Subject: RE: 02 Escape Calibration Concern

The latest calibration to address stalling concerns will be available on Fordstar Monday, September 9, per the emergency release meeting held at 10:00 today. This presumes a successful review with the CPE at 6:30 PM tomorrow.

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-54647 Fax: (313) 32-31786  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

From: Enigenburg, Timothy (T.J.)  
Sent: Thursday, August 22, 2002 10:45 PM  
To: Dalbo, Bob (R.J.); Suarez, Rhee (R.); Fournelle, Gilbert (G.)  
Cc: Enigenburg, Timothy (T.J.)  
Subject: RE: 02 Escape Calibration Concern

Gentlemen,

I worked with the technician on this vehicle. The TSB 02-11-06 was followed step by step first and then ISM 02-06-025 was also followed. All of the listed grounds have been inspected and the PCM pins were not burnt. The MAF and DPFE were replaced. The vehicle stalled on the customer after the TSB and ISM were performed. Any help you can offer would be greatly appreciated.

Regards,

*Timothy J. Enigenburg*

Ford Motor Company  
Field Service Engineer  
N.Y. Region  
Phone: 201-529-7273  
Fax: 201-529-7270  
[teenigen@ford.com](mailto:teenigen@ford.com)

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Thursday, August 22, 2002 9:05 AM  
To: Suarez, Rhee (R.); Fournelle, Gilbert (G.)  
Cc: Enigenburg, Timothy (T.J.)  
Subject: RE: 02 Escape Calibration Concern

Rhae,

Please confirm that every step in the TSB and ISM have been performed. We will investigate getting an advanced copy of the new calibration.

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31788  
Pager: (313) 795-2858 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Wednesday, August 21, 2002 7:59 AM  
To: Fournelle, Gilbert (G.); Dalbo, Bob (R.J.)  
Cc: Eenigenburg, Timothy (T.J.)  
Subject: FW: 02 Escape Calibration Concern

Bob/Gilbert,

Can we help Tim out and save from a Buyback? Any suggestions?

Thanks!

**Rhae M. Suarez**

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23844 Pager: 313-795-6242  
Fax: 313-32-78337  
Email: [rsuarez8@ford.com](mailto:rsuarez8@ford.com)

-----Original Message-----

From: Eenigenburg, Timothy (T.J.)  
Sent: Tuesday, August 20, 2002 11:15 PM  
To: Suarez, Rhae (R.)  
Cc: Chiarello, Paul (P.J.); Eenigenburg, Timothy (T.J.)  
Subject: 02 Escape Calibration Concern

Rhae,

I am forwarding you the information on the Escape that we spoke about earlier. The vehicle is part of a large fleet that purchases many products from us. The customer has been complaining about an intermittent stalling concern since about 4000 miles. The vehicle now has 25308 miles. The vehicle stalls on decel and the TSB and ISM recommendations have been followed. The calibration was loaded from the TSB but the stalling has continued.

The technician at Hackettstown tried to update the PCM this morning but the update was not available on B20.8. The customer has involved our Ford Division Fleet Manager and Customer Service Manager. The vehicle is well within Lemon Law and we stand to loose a good fleet customer. Is it possible to receive a copy of the new stall fix calibration to get this customer back on the road with a repaired vehicle? I realize that the calibration was removed from Fordstar due to a concern if the battery would be disconnected. I will work it out with the customer to get the vehicle back in for the final revision when it becomes available, but the customer will not take the vehicle back without the "stall fix".

The vehicle information is as follows:

VIN: 1FMCU04101KA64304

Mileage: 25308 miles

Dealer: Hackettstown Ford, P&A: 02815

Please contact me at 201-529-7273 or on my cell phone at 973-632-5419. I appreciate your assistance in this situation.

Regards,

*Timothy J. Eenigenburg*

Ford Motor Company

Field Service Engineer

N.Y. Region

Phone: 201-529-7273

Fax: 201-529-7270

teenigen@ford.com

From: Suarez, Rhae (R.)  
Sent: Wednesday, August 28, 2002 8:53 AM  
To: Wrightman, David (D.B.)  
Cc: Lawler, David (D.A.); King, Robert (R.F.)  
Subject: RE: Stalling Escape Reflash

David,

Engineering is working on releasing this new Calibration ASAP. The target time frame is around the week of Sept 9. The new TSB will not be release at the same time. However, an ISM will capture the new calibration information so keep an eye out for that. The new TSB has a few additional steps (versus TSB# 02-11-06) and the approvals and timing will take a little longer.

I hope this helps.

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez86@ford.com

-----Original Message-----

From: King, Robert (R.F.)  
Sent: Wednesday, August 28, 2002 8:42 AM  
To: Wrightman, David (D.B.)  
Cc: Suarez, Rhae (R.)  
Subject: RE: Stalling Escape Reflash

The TSB should be released soon.

Ford-"The Most Wanted Car on the American Road" circa 1952

Robert King  
LHD Escape/Maverick FCSD Program Manager  
PVT & Field Support, Vehicle Service & Programs  
Kansas City Assembly Plant (816) 459-1872, fax 459-1726

-----Original Message-----

From: Wrightman, David (D.B.)  
Sent: Tuesday, August 27, 2002 4:26 PM  
To: King, Robert (R.F.)  
Cc: Alexander, Ray (R.B.); Moses III, George (G.C.)  
Subject: Stalling Escape Reflash

Within the notes of the FSB Roundtable discussion from this month, a reflash for the Escape for stalling was mentioned twice.

Do you have any information on this reflash? Is there a due date? Will there be a SSM issued?



Any information that you can share would surely be appreciated. I have several of these vehicles that are in the final stages of the "repair or buyback" process. It might buy us some time.

David Wrightsman  
Field Service Engineer  
FCSD-Atlanta

---

**From:** King, Robert (R.F.)  
**Sent:** Thursday, August 22, 2002 2:09 PM  
**To:** Suarez, Rhae (R.)  
**Cc:** Terzes, Laura (L.D.); Lawler, David (D.A.); Moorhouse, Scott (S.R.)  
**Subject:** RE: C11404407

We do not need a trial for calibration if engineering has signed off on it. Let it fly if you have a complete WERS release and engineering approval.

*Ford* "The Most Wanted Car on the American Road" circa 1982

Robert King  
LHD Escape/Maverick PCSD Program Manager  
PVT & Field Support, Vehicle Service & Programs  
Kansas City Assembly Plant (816) 459-1872, fax 459-1726

-----Original Message-----

**From:** Suarez, Rhae (R.)  
**Sent:** Thursday, August 22, 2002 12:49 PM  
**To:** King, Robert (R.F.)  
**Cc:** Lawler, David (D.A.)  
**Subject:** FW: C11404407

Bob,

Can you think of anything. I am sure Engineering is doing all other kinds of proveouts for Production. If it is good for production it should be good for Service, no?

Let me know if you have any specific suggestions (other than making sure we can use it instead of like the last one...hehehe)

Thanks,  
Rhae

-----Original Message-----

**From:** Dalbo, Bob (R.J.)  
**Sent:** Thursday, August 22, 2002 1:46 PM  
**To:** O'Callaghan, John (J.T.); Moorhouse, Scott (S.R.); Grzinek, Karen (K.M.); Veenstra, Tim (T.W.); Suarez, Rhae (R.); Terzes, Laura (L.D.); John Bogema  
**Subject:** RE: C11404407

John O./Scott,  
Thanks for the help.

Tim,  
I don't guess we need a 300 piece production trial on a service part. Agree?

Laura/Rhae,  
What specific proveout would you like for the service calibrations/parts?

John B./Karen,  
What parts are not loaded?

## **Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-31786  
Pager: (313) 785-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

### **—Original Message—**

**From:** O'Callaghan, John (J.T.)  
**Sent:** Thursday, August 22, 2002 1:37 PM  
**To:** Moorhouse, Scott (S.R.)  
**Cc:** Dalbo, Bob (R.J.)  
**Subject:** RE: C11404407

I have changed the PGMA to A, I do have two question. Why would we need to do a 300 pcs trial on old level parts for service? Why are there no parts loaded yet?

### **—Original Message—**

**From:** Moorhouse, Scott (S.R.)  
**Sent:** Thursday, August 22, 2002 12:30 PM  
**To:** O'Callaghan, John (J.T.)  
**Cc:** Dalbo, Bob (R.J.)  
**Subject:** C11404407

John, need to get this approved. Can you help us?

Scott Moorhouse  
U204 PTSE Resident Engineer  
Kansas City Assembly Plant  
(ph) 816-459-1965 (fax) 816-459-1728  
[smoorhou@ford.com](mailto:smoorhou@ford.com)

---

**From:** Lawler, David (D.A.)  
**Sent:** Thursday, August 22, 2002 3:09 PM  
**To:** Fournelle, Gilbert (G.)  
**Cc:** Terzes, Laura (L.D.); King, Robert (R.F.)  
**Subject:** Escape Stalls Mtg.

Please add me to your Escape Stalls Mtg. Dist. List.

I take over Bob King's Job effective 9/3/02.

Thanks.

***David Lawler***

PCSD Program Manager - Supercrew & Blackwood  
DLAWLER1 Office: 816-414-5602 Pager: 313-734-1760

from  
Robustness  
folder

**O'Neill, Jim (J.D.)**

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**From:** Maurer, James (J.B.)  
**Sent:** Thursday, December 05, 2002 11:51 AM  
**To:** O'Neill, Jim (J.D.)  
**Subject:** FW: Revisions to Kavlico DPFE Sensor

Jarek would like to have a phone conference with Kavlico. We will ask Kyong what is convenient to get the Kavlico designers to talk with Jarek.

Regards,

*Jim Maurer*

James B. Maurer  
V-Engine 6-Sigma Team Leader  
Fuel Metering Dept. V Engine Engineering  
Phone (313) 390-3672, Fax (313) 390-4084  
Text Page: (313) 795-5219  
Email: jmaurer@Ford.com

-----Original Message-----

**From:** Tracz, Jarek (J.A.)  
**Sent:** Thursday, December 05, 2002 11:44 AM  
**To:** Maurer, James (J.B.)  
**Subject:** RE: Revisions to Kavlico DPFE Sensor

James,

To complete the EMC analysis of the subject I need to understand the function of the various inputs/outputs from the sensors, i.e. what's RO/Vbuf/Vout?. It would be great if someone from Kavlico could call me and explain. Thanks,

Best Regards,

Jarek A. Tracz  
EMC Engineer . tel: (313) 323-1919  
RVT/EESE fax: (313) 390-5327  
Bldg. #5, Cube 2D101 emailto: jtracz@ford.com

-----Original Message-----

**From:** Maurer, James (J.B.)  
**Sent:** Wednesday, December 04, 2002 4:07 PM  
**To:** Tracz, Jarek (J.A.)  
**Cc:** O'Neill, Jim (J.D.); Gates, Freeman (F.C.)  
**Subject:** FW: Revisions to Kavlico DPFE Sensor

Jarek,

We would like to finalize the layout for the DPFE sensor tomorrow with Kavlico at noon. Please send me and Freeman Gates and e-mail with either your determination that the layout is O.K. as is, or that changes should be made. If you recommend any changes, I would like to set up a teleconference with you and Kavlico to discuss your recommendations.

Regards,

*Jim Maurer*

James B. Maurer  
V-Engine 6-Sigma Team Leader

Fuel Metering Dept. V Engine Engineering  
Phone (313) 390-3672, Fax (313) 390-4084  
Text Page: (313) 795-6219  
Email: jmaurer@Ford.com

-----Original Message-----

From: Gibbs, Freeman (F.C.)  
Sent: Wednesday, December 04, 2002 2:28 PM  
To: Tracz, Jarek (J.A.)  
Cc: Maurer, James (J.B.); O'Neill, Jim (J.D.)  
Subject: Revisions to Kavlico DPFE Sensor

Jarek,

Were you able to complete the circuit/layout review of the Kavlico DPFE sensor?

*Freeman Gibbs*

Senior EGR Systems Technical Specialist  
Tel (313)32-24807 Fax (313)39-04084  
POES Rm D-188 CM-173

**Plante, Paul (P.G.)**

**From:** Plante, Paul (P.G.)  
**Sent:** Monday, May 13, 2002 11:02 AM  
**To:** Patel, Anup (A.M.); McCoy, James (J.D.); Awad, Mahmoud (M.I.); Freeland, Mark (M.); Maurer, James (J.B.)  
**Cc:** Plante, Paul (P.G.); Poma, Amy (A.); Tshshen@vision.com; Gates, Freeman (F.C.); Pary, Brian (B.J.); O'Neill, Jim (J.D.)  
**Subject:** Assignments Follow Up-Action Required-DOEE Staff Meeting

Assignments and due dates from the 5/2/02 DOEE Staff Working Group meeting are below. Please submit your answers to Amy Poma by due date. Answers will be summarized for review at 14D meeting Tuesday/Thursday:

Amy, please give answers to Jim Maurer and Paul Plante.



Paul Plante  
V Engine Campaign Prevention Specialist  
DOEE Building, Drop 20, Cube BG049, Pillar D6  
Tele: 313-84-64138; Fax 39-02513  
Text Pager: 734-298-1906  
E Mail: pplane@ford.com (CDS ID: PPLANTE)





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**From:** Goodwin, William (W.R.)  
**Sent:** Monday, November 18, 2002 10:45 AM  
**To:** Power, James (J.H.); Pietta, Shari Finn (S.F.)  
**Subject:** LVR latest information on Vehicle testing

Jim and Shari,

I wanted to update you on a few items regarding the LVR issue:

1. Yellow Escape—This has 3 100 ohm spark plugs in right bank and 0 ohm plugs in left bank. No issues noted to date on this vehicle.
2. Red Escape—This has 6 0 ohm plug in it and just returned from Ypsil pencil coil development testing. No issues noted
3. 2002 Mazda MPV—3 0 ohm spark plugs placed in lh bank (with non ferrite coils). We had no issues which were directly attributable to the 0 ohm plugs, but we do have a transmission shift issue at 3000 RPM at high vehicle speeds that needs to be investigated further. The vehicle is currently apart to put 3 0 ohm plugs in the right bank and install non ferrite coils.
4. Discussions with Jaguar—I contacted Steve Large to discuss the LVR issue that they observed a few years ago. He noted that this was associated with a standalone throttle control module, which is no longer in their production vehicles. They did a lesson learned assessment of prior program issue and decided that they should start to do some vehicle evaluation with 0 Ohm plugs. They have been running a car around with 0 ohm plugs with no issues.

Looking forward, here are the next steps as I see them:

- A. We still need an understanding of the RFI characteristics of the 100ohm spark plug compared to a 0 ohm (Cispr box work at Honeywell)
- B. I will be attempting to contact a Mazda MPV person to get similar detail as I received from Jaguar.
- C. As Jim and I discussed this morning, we should have a more substantial review of Coef of Thermal expansion for the glass and alumina material sets. This might help determine if we might be generating a propensity to cracking in the glass that creates a path for nickel conductivity.

Regards,

Bill Goodwin  
Product Design Engineer, Ignition Systems  
V Engine Engineering, Ford Motor Company  
Tel: 313 337-9579 Fax: 313 380-4084  
email: wgoodwin@ford.com  
textpage mailto:3137950571@alphapage.aintouch.com

**From:** Dalbo, Bob (R.J.)  
**Sent:** Wednesday, July 31, 2002 5:27 PM  
**To:** Benz, Greg (G.H.); Gould, Robert (R.M.); Deeb, Joe (J.S.); 'Bernie Nikolai (E-mail)'; 'Andy Jones (E-mail)'; Bodnar, Lee (L.R.); Maxwell, Jerry (J.F.); Lindbauer, Kenneth (K.J.); Moorhouse, Scott (S.R.); Nematoishi, Sonya (S.); Goodwin, William (W.R.)  
**Cc:** Woodings, Andrew (A.T.); Fournelle, Gilbert (G.); Hockaday Jr., John (J.C.); Bogema, John (P.); Matea, John (J.); Mikota, Dennis (D.P.); Sanders, Muriel (M.S.); Hurley, Robert (R.E.); Mendziuk, Roger (R.)  
**Subject:** RE: U204 Stall Investigation, 7-26-02--Signal return wiring issues.

Don/Greg,

When we reviewed the wiring harness drawings against the Ford wiring guidelines, I don't recall discussion of this issue. In fact, just by searching through the service manual we couldn't find the engine block/PCM ground loop discussed in this paper.

We have seen noisy cam position sensor signals on multiple (non-stalling) vehicles. If there is an opportunity to clean up these signals with a simple wiring change, I'd like to include it in the Job #2 release, if possible.

**Bob Dalbo**

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31798  
Pager: (313) 785-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

**From:** Benz, Greg (G.H.)  
**Sent:** Wednesday, July 31, 2002 5:08 AM  
**To:** Gould, Robert (R.M.); Deeb, Joe (J.S.); 'Bernie Nikolai (E-mail)'; 'Andy Jones (E-mail)'; Bodnar, Lee (L.R.); Maxwell, Jerry (J.F.); Lindbauer, Kenneth (K.J.); Dalbo, Bob (R.J.)  
**Subject:** FW: U204 Stall Investigation, 7-26-02--Signal return wiring issues.

-----Original Message-----

**From:** Goodwin, William (W.R.)  
**Sent:** Tuesday, July 30, 2002 5:21 PM  
**To:** Nematoishi, Sonya (S.); Moorhouse, Scott (S.R.)  
**Cc:** Young, Lem (L.); Benz, Greg (G.H.)  
**Subject:** RE: U204 Stall Investigation, 7-26-02--Signal return wiring issues.

We have data from Kelvin Dobbins in advanced controls suggesting that there is a wiring harness error on the signal return circuit on U204 production vehicles. This could be part of some field issues you are experiencing on the vehicle. The intended configuration is for the signal return is supposed to be a clean ground circuit. On the U204, I am told that this circuit is grounded to both engine block and the PCM ground location. This basically couples significant ignition noise (and other noise sources) into any device using signal return.

I do not know enough about your control system to speculate on the potential problems of this design. If nothing else, this should be corrected for all production harnesses as soon as it can be reasonably implemented. I have no information that this is related to the problems below, but I believe there should be an assessment a potential interaction effect.

Here is Kelvin Dobbins note:

We have also checked this out on a vehicle. Although we see the common mode noise problem on the cid signal on the vehicle as well, we are only getting one simultaneous fuel pulse before the start of self.

<< File: vehicle checkout.doc >>

The tiff preview images in the Word file are a little crude. If you want a higher resolution image, you can either print it out on a postscript printer or create a pdf file using adobe distiller.

Kelvin Dobbins  
Senior Technical Specialist  
Powertrain Controls Research and Development  
Ford Research Laboratories  
Gas Turbine Laboratory, Rm. 1115  
Phone: 313-322-0457  
Fax: 313-317-7404  
email: kdobbins@ford.com

Please contact me if you would like to discuss further.

Regards,

Bill Goodwin  
Product Design Engineer, Ignition Systems  
V Engine Engineering, Ford Motor Company  
Tel: 313 337-9579 Fax: 313 380-4084  
email: wgoodwin@ford.com  
telpage malta:3137980571 @alphapage.airtouch.com

-----Original Message-----

From: Notaboom, Jim (J.E.)  
Sent: Tuesday, July 30, 2002 11:27 AM  
To: Sanders, Muriel (M.S.); Altoon, Don (D.J.); Bauer, Scott (S.C.); Bhogwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Cary Powell'; Chick, John (J.); Chin, Ming-Miu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); 'Dan Rothweiler'; De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duval, Allen (A.W.); Faccetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Goldsall, Renuka (R.V.); Goodwin, William (W.R.); Grawal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Hatt, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Junichiro (J.); Jensen, Ted (T.E.); 'John McDonald'; Jones, Andy; Jordan, Donald (D.E.); Kanai, Shing (S.); King, Robert (R.P.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); La, Dzang (D.H.); Limtaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Mandziuk, Roger (R.S.); Marck, Edmund (E.C.); Matsui, John (J.); Meurer, James (J.L.); Mezzella, Gary (G.R.); McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); 'Morgan, Tom'; Morishima, Shigeki (S.); 'Naveed Khan'; Namatdahi, Sonya (S.); Nikolai, Bernie; Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raqueseau, Alden (A.P.); Shah, Kiren (K.C.); Shirahashi, Masaru (M.); Silgenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Veenstra, Tim (T.W.); Wakeland, Ray (R.A.); Wettach, Bill (B.); Williams, Les (L.H.W.); Young, Lam (Y.)  
Subject: RE: U204 Stall Investigation, 7-26-02

VEH: '02 Escape VIN: 1FMCU04112KD11749 BUILT: 4-11-02 MILES: 1650  
CUSTOMER: Carol Sagety / 303-252-8278 (home) LOCATION: Northglenn, Colo.  
COMPLAINT: Stalls in slow traffic. Note: the stall occurs in the same location (80th between Wadsworth and 38) as the previous vehicle; checked this out and there are high tension lines crossing the road there.

TSB and SSM results:

- IAC=34%
- EVAP system passed.
- DPFE and EEC relay are the latest.
- Keys do not have excessive weight.
- All related grounds were secure.

Based on the stall location and the possibility of RFI, the MAF was updated to a 1L2Z-BA.

Also on this vehicle the battery was leaking from the seam on the corner opposite the negative post (see photos). The customer stated that when the vehicle was purchased, the original batt. was dead and was replaced. This batt. was not a service piece but looked like original equipment so its history is in question. A new service batt. was installed.

<< File: MVC-039F.JPG >>  
Serial no.

<< File: MVC-040F.JPG >>  
Acid drip from seam.

Jim Noteboom  
Powertrain Field Quality Specialist/Denver  
Phone: 303.674.4015 FAX: 303.674.5730  
Cell: 303.921.2076

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**From:** Goodwin, William (W.R.)  
**Sent:** Thursday, September 05, 2002 9:10 AM  
**To:** Fournelle, Gilbert (G.)  
**Cc:** Young, Lam (.)  
**Subject:** Declined: U204 phantom stall meeting

Gilbert,

I will be unable to attend today. I do have an update from Honeywell. They have initiated the build of the low resistance plugs. These parts take significant development of resistive glass mibing and require test exposure to ensure maximum stability of the prototype part. They are planning to have us parts in 6-8 weeks.

I do have a set of zero resistance plugs already. I believe these may be significant overkill. If the timing above is unacceptable, it might be useful to install one of these plugs, but possibly a total waste of time.

Please let me know if you would like to have further discussion.

**From:** Goodwin, William (W.R.)  
**Sent:** Tuesday, October 29, 2002 2:24 PM  
**To:** Fournelle, Gilbert (G.)  
**Subject:** RE: 3.0L U204 Phantom stall meeting

Gilbert,

We have yet to have any issues with stalls with the low resistance spark plugs. I have obtained a Mazda MPV and we have changed out half the spark plug without incident. At this point, I would propose that you drop me from your agenda and I will contact you with any pertinent information.

Regards,

**Bill Goodwin**  
Product Design Engineer, Ignition Systems  
V Engine Engineering, Ford Motor Company  
Tel: 313 357-8579 Fax: 313 390-4084  
email: wgoodwin@ford.com  
homepage mailto:3137860571@alphapage.earthlink.com

-----Original Appointment-----

**From:** Fournelle, Gilbert (G.)  
**Sent:** Wednesday, October 23, 2002 1:58 PM  
**To:** Fournelle, Gilbert (G.); Alstonian, Don (D.J.); Bauer, Scott (S.C.); Bhargava, Kamal (K.); Blackburn, Thomas (T.J.); Bogana, John (P.); Cary Powell (E-mail); Chick, John (J.); Chih, Ming-Nai (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duval, Allen (A.W.); Escott, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Gless, Stuart (S.); Goldstein, Renuka (R.V.); Goodwin, William (W.R.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Junichiro (J.); Jensen, Ted (T.E.); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shiro (S.); Khan, Naveed; Koska, Jeff (J.R.); Kwon, Soon (S.K.); Lawler, Dave (D.A.); Le, Dzung (D.H.); Limbaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Marianne, Tom (T.E.); Mathias, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McDonald, John; McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tomiko (T.T.); Morishima, Shigeki (S.); Nakano, Michio (H.); Namatoki, Sonya (S.); Nikolai, Bernie; Notbaum, Jim (J.E.); Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquapau, Aiden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirahata, Masaru (M.); Silganbauer, Jeffrey (J.R.); Suresh, Rhee (R.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Veerstra, Tim (T.W.); Welkanell, Ray (R.A.); Wettsch, Bill (B.); Williams, Lee (L.H.W.)  
**Cc:** Hoffman, Michael (M.V.)  
**Subject:** Updated 3.0L U204 Phantom stall meeting  
**When:** Thursday, October 31, 2002 2:00 PM-3:00 PM (GMT-05:00) Eastern Time (US & Canada).  
**Where:** TBS CR#1

I made a mistake in the previous meeting notice (it was one continuous meeting instead of a weekly 1 hour meeting). Sorry for the inconvenience.

Meeting agenda and meeting minutes will be send separately on a weekly basis.

toll free: 1-888-227-7015  
Ford net: 854-1208  
International: 1-830-893-8146

pass code: 8402370#  
moderator code: 3457370

# Al-Ge, Al-Se Al-Si

*SSSR, Met.*, (4), 128 (1965); *Tr. Russ. Metall.*, (4), 176 (1965).  
78Dek M.E. Drita, B.B. Kadanev, T.V. Doboshina, and N.I. Turkina, *Int. Acad.*

*Nouv. SSSR, Met.*, (4), 213 (1973); *Tr. Russ. Metall.*, (4), 163 (1973).  
78Fuj S.-I. Fujikawa, M. Sugaya, H. Takai, and K.-I. Hirano, *J. Less-Com-*

*mon Met.*, 63, 87 (1979).

Complete evaluation contains 1 figure, 2 tables, and 19 references.

## Al-Se (Aluminum-Selenium)

28.56154

75.86

$\text{Al}_2\text{Se}_3$ : B4 or  $\text{Ga}_2\text{S}_3$ ,  $H1_1$  at 90 kbar and 878 K.

The Al-Se phase diagram is re-drawn from [Hansen].

## Al-Si (Aluminum-Silicon)

26.96154

28.0554

J.L. Murray and A.J. McAlister, *Bull. Alloy Phase Diagrams*, 5(1), Feb 1984

Al-Si is a simple eutectic system with two solid solution phases,  $\alpha_1$  (Al) and diamond cubic (Si). The assessed phase diagram is based primarily on the evaluations of [68Fra], [14Rob], [88Diz], [47Sia], [55Cra], [58Mil], [67Nav], [61Gla], [66Kev], [68Dri], [68Lor], and [88Ber] and is calculated from Gibbs energies optimized with respect to the thermochemical and phase boundary data.

Al-Si alloys are among the most important commercial alloys when they contain small additions (0.01 wt.%) of Na. These alloys are denoted "modified" and are greatly improved in microstructure and mechanical properties over the binary alloys. Cu or Mg also may be added for age-hardening.

The maximum solubility of Si in (Al) is  $1.5 \pm 0.1$  at.% at the eutectic temperature, and it decreases to 0.05 at.% at 800 °C. The maximum solubility of Al in (Si) is  $0.016 \pm 0.008$  at.% at 1190 °C, the retrograde point of the (Si) solidus.

Solubility of Si in (Al) can be greatly extended by splat quenching of the liquid. The maximum extension of the solid solubility has been placed at  $11 \pm 1$  at.% Si, using TEM work on the thinnest, and hence most rapidly cooled, portions of the sample. Unlike Al-Ge alloys, Al-Si alloys have not been reported to form metastable intermetallic compounds or glassy alloys.

Metastable extensions of the equilibrium boundaries and  $T_0$  curves of equal Gibbs energies are of interest in interpreting the results of rapid solidification experiments. For Al-Si alloys, the relevant quality appears to be the intersection of the (Al)  $T_0$

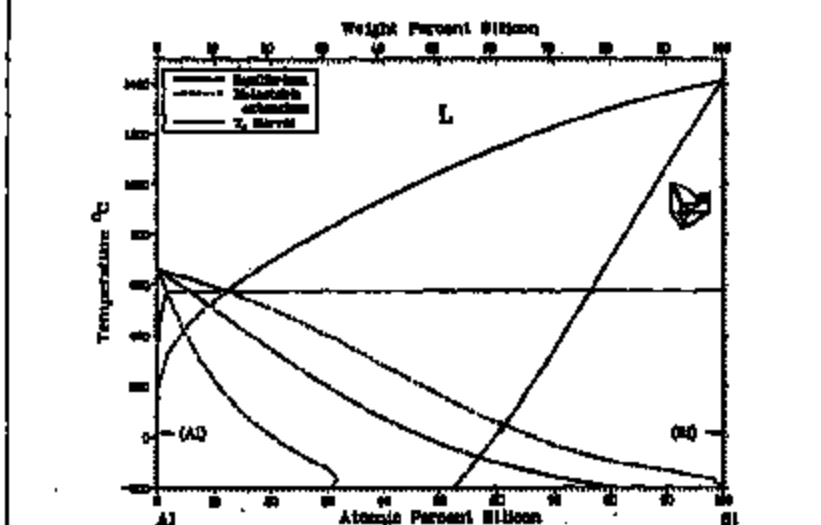
### Al-Si Invariant and Congruent Transformations

| Reaction                                 | Composition, at.% Si             | Temperature, °C | Reaction type |
|------------------------------------------|----------------------------------|-----------------|---------------|
| $L \rightleftharpoons (Al) + (Si)$ ..... | $1.5 \pm 0.1$ $19.3 \pm 0.1$ 100 | $577 \pm 1$     | Eutectic      |
| Pure component transformations           |                                  |                 |               |
| $L \rightleftharpoons (Si)$ .....        | 100                              | 1414            | Melting       |
| $L \rightleftharpoons (Al)$ .....        | 0                                | 933.452         | Melting       |

### Al-Si Crystal Structure Data

| Phase      | Composition, at.% Si | Pearson symbol | Space group  | Strukturbericht designation | Prototype   |
|------------|----------------------|----------------|--------------|-----------------------------|-------------|
| (Al) ..... | 0 to 1.5             | cF4            | $Fm\bar{3}m$ | A1                          | Cu          |
| (Si) ..... | 99.994 to 100        | cF8            | $Fd\bar{3}m$ | A4                          | C (diamond) |

### Al-Si Calculated Diagram Including $T_0$ Curves and Metastable Extensions of the Phase Boundaries



J.L. Murray and A.J. McAlister, 1984.





## Kinetics of hillock growth in Al and Al-alloys

Michał Zaborowski\*, Piotr Dumania

Institute of Electron Technology, Al. Lotników 32/46, 02 668 Warszawa, Poland

### Abstract

Hillock growth kinetics and size distribution were investigated in Al, Al:Si 1% and Al:Si1%:Cu 0.5% layers. Metallization surface was examined by optical, SEM and TEM microscopy, stylus profiling and an automatic method of hillock recognition from a microscope image. The method allowed for counting hillocks in a desired range of their diameter  $d$ . Surface density of hillocks was measured as a function of time of furnace annealing at 400°C and as a function of temperature of RTP annealing. A maximum hillock size was found to increase linearly with metallization layer thickness and with logarithm of annealing time. A total area occupied by hillocks was evaluated. Hillock density decreased versus  $1/T$  with an activation energy of 0.28 eV for Al and 0.31 eV for Al:Si. It was found, that a normalized hillock density  $N$  may be expressed by a formula  $N = N_0 \exp(-cd)$ . Values for  $N_0$  and  $c$  are given together with a short discussion. © 2000 Elsevier Science B.V. All rights reserved.

**Keywords:** Metallization; Aluminum thin films; Polycrystalline layer morphology; Hillock growth

### 1. Introduction

Aluminum-based metallization still remains the most commonly used material for interconnecting lines in silicon ICs and electro-mechanical microsystems. Polycrystalline Al layers alter their surface morphology as a consequence of heat treatment and other processes performed at elevated temperature (250–500°C). Large crystallites, so-called hillocks, can outgrow above the initial metal surface [1,2]. The driving force of hillock growth is a compressive stress caused by large mismatch of thermal expansion coefficients between Al and Si or SiO<sub>2</sub> substrate [3,4]. Hillocks are particularly undesirable in multilevel metal systems.

The aim of this work was to investigate both the growth kinetics and the size distribution of the hillocks.

### 2. Experimental

Samples were prepared by thermal oxidation of (100) oriented Si wafers to an oxide thickness of

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E-mail address: mzb@ke.waw.pl (M. Zaborowski).

0.4  $\mu\text{m}$  followed by magnetron sputter deposition of the metallization. The vacuum was better than  $1 \times 10^{-4}$  Pa and Ar pressure was equal to 0.5 Pa. We used pure Al 5 N, Al:Si 1% alloy or Al: Si 1%:Cu 0.5% alloy as a target material. Metal layer thickness ranged from 0.5 to 2.5  $\mu\text{m}$ . Substrates were heated up to approximately 180°C before sputtering. The Al reference layers were produced by means of e-gun evaporation under the same temperature conditions. All samples were annealed in a furnace or RTP reactor. Nitrogen, hydrogen or argon were used as an annealing ambient. Metallization surface was examined by a number of methods: optical, SEM and TEM microscopy, stylus profiling and an automatic method of hillock recognition from a microscope image. The last method consists of the processing of surface images acquired by a monochromatic TV camera and allows hillock-like objects to be visualized separately and measured [5].

### 3. Results and discussion

All manufactured metallization layers were polycrystalline, with grain dimensions dependent on the layer thickness and annealing conditions. A (111) preferred orientation was found from XRD measurements. SEM micrographs revealed numerous hillocks protruded into the metal layer surface (Fig. 1). Shapes and sizes of hillocks involved in Al:Si:Cu alloy by a 30 min annealing at a temperature of 450°C differ significantly from those in Al and Al:Si metallization. No influence of annealing atmosphere (nitrogen, hydrogen or argon) on the surface morphology was noted. The stylus

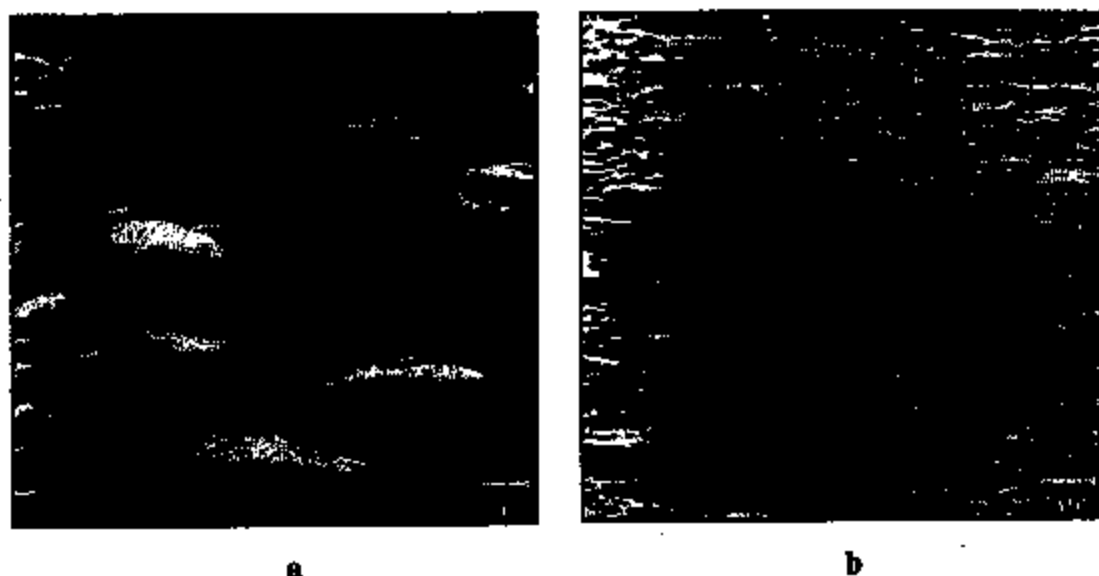


Fig. 1. Metallization surface examined by SEM after annealing (450°C, 30 min): (a) magnetron sputtered Al layer 1  $\mu\text{m}$  thick; (b) similar layer of Al:Si:Cu alloy.

profiling method was useless in the case of Al:Si:Cu because of the relatively large radius of the tip ( $2.5\text{ }\mu\text{m}$ ). This technique applied for Al and Al:Si metallization gave results comparable to the results of hillock recognition method. Nevertheless, this last method was extensively used in present investigations for reason of better hillock surface area estimation.

Hillocks start to grow up almost immediately at the beginning of annealing. Two-minute annealing of a  $0.7\text{ }\mu\text{m}$  thick Al layer at this relatively low temperature of  $400^\circ\text{C}$  is sufficient for creation of small hillocks. Fig. 2 presents surface density of these objects as a function of the time of furnace annealing in flowing nitrogen. Hillocks are collected in  $0.4\text{ }\mu\text{m}$  groups with regard to their average diameters, lower measurement limit is equal to  $0.33\text{ }\mu\text{m}$ . Longer annealing does not change the population of hillocks inside each group noticeably, but induces greater hillocks. Smaller hillocks seem to be a source of larger ones, therefore it is evident that the hillock number is here in a kind of dynamic equilibrium. A maximum hillock size, defined as a diameter of 1% of the whole hillock population exhibiting largest dimensions in the examined surface, is presented in Fig. 3. The maximum hillock size depends nearly linearly on the logarithm of annealing time. Each curve represents a different wafer and a different metal deposition process. Generally, the values for an Al:Si alloy are close to those for pure aluminum. Maximum hillocks in Al:Si:Cu are several times smaller than in Al, after the same time of annealing.

Samples were divided into four parts and covered with an Al of different thickness in order to estimate the dependence of the maximum hillock size on the layer thickness. Fig. 4 shows the results of furnace annealing at a temperature of  $400^\circ\text{C}$  for 8 min in  $\text{N}_2$ . Maximum hillock size increases linearly with metallization layer thickness ranging from  $0.5$  to  $2\text{ }\mu\text{m}$ , with some scatter from one sample to another. Changing the annealing conditions to  $450^\circ\text{C}$  and 5 min (wafer no. 4) does not influence the maximum hillock sizes.

The method of hillock recognition allows for summing the areas of all detected hillocks. A fraction of the sample surface occupied by hillocks increases during annealing (Fig. 5). The total hillock area

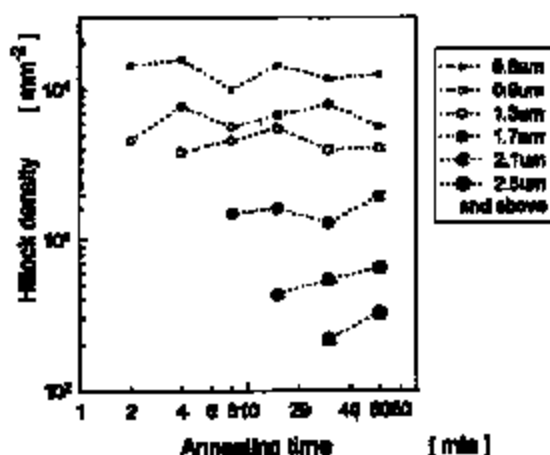


Fig. 2. Surface density of hillocks as a function of annealing time at a temperature of  $400^\circ\text{C}$  in  $\text{N}_2$  for sputter-deposited Al layer of  $0.7\text{ }\mu\text{m}$  thickness.

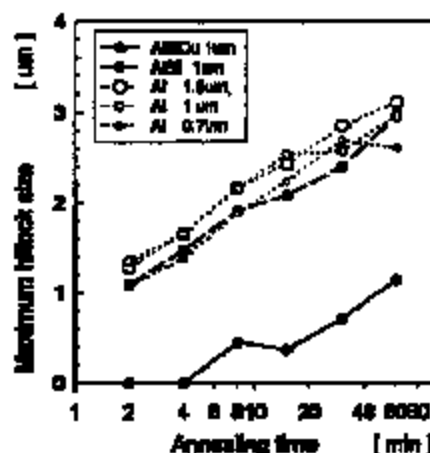


Fig. 3. Maximum hillock size as a function of annealing time at the temperature of 400°C in  $N_2$ , for Al:SiCu layer, Al:Si layer and three Al layers of different thickness.

does not exceed 3.5% in the aluminum layer. There is roughly two times less hillocks in the Al:Si layer than in pure Al after these rather low-temperature (400°C) annealings. Analogous ratio for the Al:Si:Cu metallization reaches 100.

The total hillock area varies with a metal layer thickness and annealing conditions. Fig. 6 presents results of hillock measurements after a 'moderate' annealing, performed at 400°C for 8 min, and a 'standard' annealing, at 450°C for 30 min. An influence of time and temperature product is predominant; however, both curves demonstrate similar features. The total hillock area decreases to zero for thin Al layers and saturates for the layers thicker than approximately 1.5 μm. Linear dependence of the area on the layer thickness can be easily explained because an average hillock size

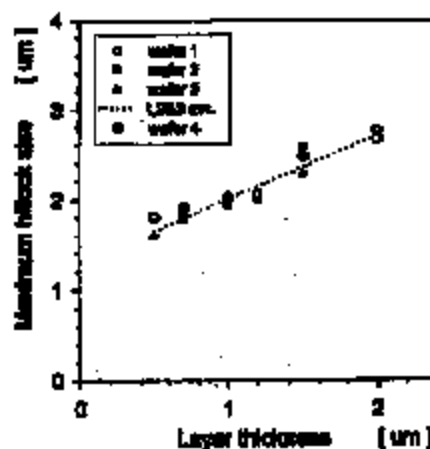


Fig. 4. Maximum hillock size versus Al layer thickness after furnace annealing at a temperature of 400°C for 8 min in  $N_2$  (samples 1, 2 and 3). Sample no. 4 was annealed at 450°C for 5 min.

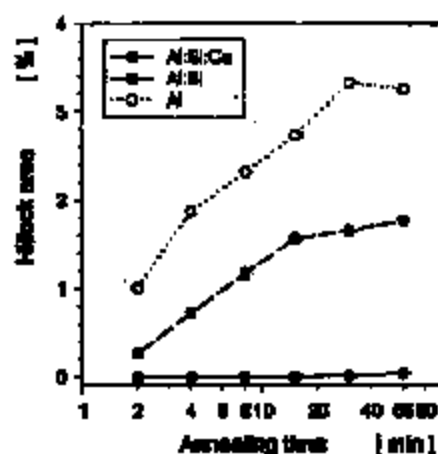


Fig. 5. Total area of hillocks normalized to the sample area as a fraction of annealing time at a temperature of 400°C in  $N_2$  atmosphere for 1  $\mu m$  thick Al and Al-based metallization layers.

is also proportional to the thickness of the Al layer in that range. Saturation of the plot, on the contrary, is less obvious. We may suppose that the reason for this phenomenon is a change of mechanism of hillock growth. Grains of the investigated 1  $\mu m$  thick Al films were found to be columnar from TEM measurements, and the mean grain area was equal to 1.2  $\mu m^2$ . The authors suppose that the shape of grains may be different in thicker films, but the problem was not studied in detail.

Surface density of hillocks rises with increase of the temperature of annealing. A series of isochronal annealings was performed using an RTP method and an argon atmosphere. A typical Arrhenius dependence was found versus  $1/T$ . Activation energies of total hillock density were

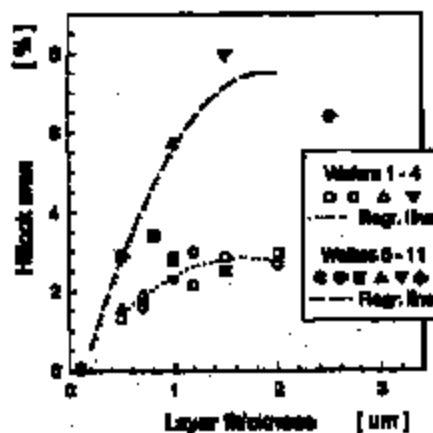


Fig. 6. Total area of hillocks normalized to the sample area versus Al layer thickness. Samples 1–4 were annealed at a temperature of 400°C for 8 min; samples 5–11 at 'standard' conditions (450°C, 30 min).

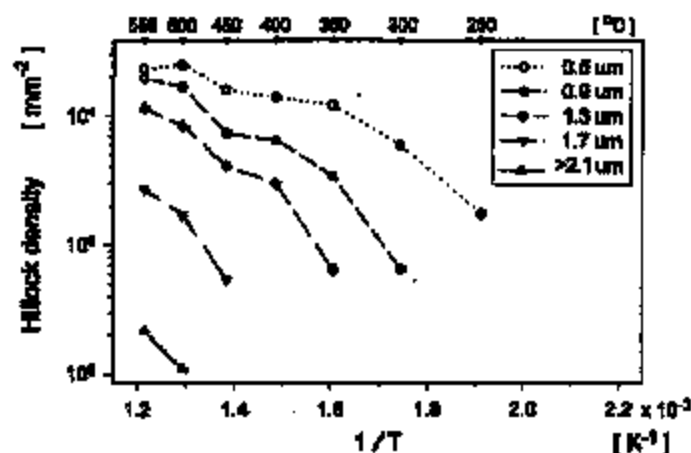


Fig. 7. Distribution of density of aluminum hillocks grouped with regard to their average diameters, as a function of reciprocal of temperature of 5 min isochronal annealings in an RTP reactor in an argon atmosphere.

calculated for the temperature range of 350–550°C, annealing time of 5 min, as 0.28 and 0.31 eV, for 1- $\mu\text{m}$  thick Al and Al:Si layers, respectively.

Hillock size statistics depends also on the temperature of annealing. Fig. 7 displays the density of hillocks in an Al layer with a thickness of 1  $\mu\text{m}$  as a function of  $1/T$ , with the average hillock diameter as a parameter. One can see that the slope of the density curves becomes higher for larger hillocks. An Arrhenius plot of the maximum hillock size represents a near straight line with an activation energy equal to 0.15 eV for Al and 0.17 eV for Al:Si.

A conclusion can be drawn from the above-presented plots that the surface hillock density, in general, decreases with the hillock diameter. A comparison of the hillock population was done for Al layers of different thickness, subjected to furnace heat treatment at a temperature of 400°C for 8 min in flowing  $\text{N}_2$ . Fig. 8 shows results for the layers of 0.7 and 1  $\mu\text{m}$ . The hillock density versus hillock size curves do not fall monotonously after such moderate annealing, but its derivative with respect to hillock diameter shows a maximum for 1–1.5  $\mu\text{m}$  hillock size values. This is close to a mean grain size which was established as 1.23  $\mu\text{m}$  for a 1- $\mu\text{m}$  thick Al layer. This suggests that the most probable mechanism of hillock growth during first few minutes of annealing is pushing out a whole grain of the film.

The above-mentioned phenomena have been investigated employing a short time and relatively low temperatures of annealing. Such an approach allows for precise analysis of hillock growth kinetics. Nevertheless, the longer annealings have a more practical meaning. In order to effectively compare the morphology of the layers we have introduced a normalized hillock density  $N$ , defined as hillock number divided by the examined area of this sample and by the width of the range of diameters of hillocks taken into account. A unit of the normalized hillock density is  $\text{mm}^{-2} \text{mm}^{-1} (= \text{mm}^{-3})$ . Normalized hillock density versus hillock size data for Al and Al-based metallization annealed at a temperature of 450°C for 30 min are gathered in Fig. 9. Data represent mean values from several samples, each layer thickness is equal to 1  $\mu\text{m}$ . The previously mentioned increase of the density of hillocks with dimensions above 1  $\mu\text{m}$  (in the case of a short annealing) is hardly visible here. The

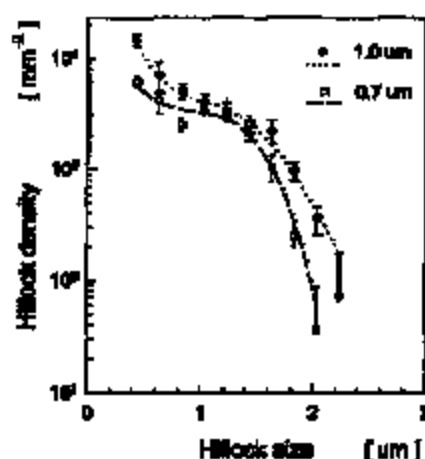


Fig. 8. Distribution of the hillock density versus hillock diameter for aluminum layers of different thickness. Vertical bars represent standard deviations of the measured values.

points for each kind of metallization are scattered near by a straight line in a logarithmic scale given by the formula:

$$N = N_0 \exp(-cd)$$

where  $d$  is hillock diameter,  $N_0$  is the density of hillocks of diameter close to zero, and  $c$  is the curve slope. Layers made of e-gun-evaporated Al, sputter-deposited Al and Al:Si produce hillocks of similar density (dashed line in Fig. 9). An Al:Si:Cu alloy gives smaller density of hillocks, particularly those of larger size. Values of  $N_0$  and  $c$  together with a standard deviation  $\sigma$ , are gathered in Table 1. Some remarks related to presented parameters can be made. The grain density can be calculated from mean

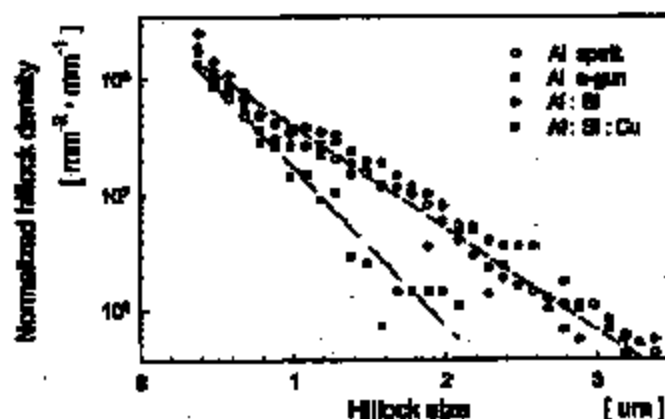


Fig. 9. Normalized density of hillocks versus hillock average diameter for often used metallization materials. Each point represent a mean value, calculated from a number of samples, annealed at a temperature of 450°C for 30 min. Dashed lines, approximate values for both Al together with Al:Si, and for Al:Si:Cu, respectively.

Table 1  
Values of  $N_0$ ,  $c$  and  $\sigma_n$

| Layer          | $c$<br>( $\mu\text{m}^{-1}$ ) | $N_0$<br>( $\text{nm}^{-2}$ ) | $\sigma_n$ |
|----------------|-------------------------------|-------------------------------|------------|
| Al, sputtering | 1.85                          | $2.07 \times 10^8$            | 0.25       |
| Al, e-gun      | 2.03                          | $3.33 \times 10^8$            | 0.33       |
| Al:Si alloy    | 2.14                          | $3.29 \times 10^8$            | 0.60       |
| Al:Si:Cu alloy | 3.18                          | $4.05 \times 10^8$            | 0.45       |

grain size (1.23  $\mu\text{m}$ ) for aluminum layer. The value of  $N_0$  does not exceed the mean grain density in the sputter-deposited Al layer, which is physically reasonable. It means that there are less potential hillocks than grains in Al metallization. A similar consideration for the Al:Si alloy (mean grain size of 1.95  $\mu\text{m}$ ) provides a conclusion, that each grain of the layer is accompanied by roughly two nuclei of hillocks. This gives evidence of the importance of Si-precipitations for hillock growth in this alloy.

#### 4. Conclusion

In this paper new details of hillock behavior are described. The size distribution of the hillocks confirms that phenomena responsible for their growth have a statistical character. The increased population of the hillocks of diameter close to the mean grain size of the metal layer was reported for the first time, to our knowledge. A decrease of the density of the smallest hillocks reported by other authors [3,4] may be explained by a sensitivity limitation of the measuring technique (e.g., stylus profiling). We believe that the automatic optical hillock recognition method is more accurate, enabling a minimum hillock size limit of 0.33  $\mu\text{m}$  (laterally). The high sensitivity of the used method calls for definition of the small hillocks. In our measurements we defined hillocks as protruded objects, surrounded by sharp edges. Therefore, an absence of these edges is particularly important in any approach for hillock suppression in metallization technology.

#### Acknowledgements

Authors wish to acknowledge Professor A. Barcz for productive discussion. The work was partially supported by the State Committee for Scientific Research in Poland under Grant No. 8T 1100114.

#### References

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- [2] F.M. d'Heurle, Metallurgical topics in silicon device interconnection: thin film stresses, *Int. Mater. Rev.* 34 (2) (1989) 53.
- [3] B. Baccoulier et al., A study of heating rate and texture influence on annealing hillocks by a statistical characterization of Al thin-film topography, *J. Appl. Phys.* 64 (11) (1988) 5483.



- [4] S. Aceto, C.Y. Chang, E.W. Vook, Hillock growth on aluminum and aluminum alloy films, *Thin Solids Films* 219 (1992) 80.
- [5] M. Zaborowski, M. Adamiec, A. Barcz, Hillock recognition by digital image processing, *Appl. Surf. Sci.* 91 (1995) 245.

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**From:** Freeland, Mark (M.)  
**Sent:** Monday, March 25, 2002 10:58 AM  
**To:** Akins, Mary (M.); Grant Helker (E-mail)  
**Cc:** Holubka, Joe (J.W.); Simko, Steven (S.J.); Haggas, Jon (.)  
**Subject:** Sample of potting gel

Mary/Grant,

Could you please get me a sample of the uncured potting gel from the chimneys. We want to do some experiments with it regarding it's effect on Al conductor traces.

About 50 cc or so would be good.

Also, please provide me with the "procedure" for using it (i.e. the normal process parameters which are relevant to using and curing the gel).

Thanks

Mark Freeland

---

**From:** Freeland, Mark (M.)  
**Sent:** Monday, March 04, 2002 2:50 PM  
**To:** Terry Tamashiro (E-mail)  
**Cc:** Hargas, Jon (.); Slimko, Steven (S.J.); Maurer, James (J.B.); Gates, Freeman (F.C.);  
Plante, Paul (P.G.)  
**Subject:** Low mileage UPAD part

Terry,

I would like to have one or two of the very low mileage UPAD parts for Auger analysis.

Specifically, there is one in the data base RML No. 8780-184 which was one of two sensors replaced on a 3.8L Mustang for the complaint of Stalling at 8 miles. The vehicle had not been delivered to the customer at the time the sensor was replaced.

Another part which would be of interest if you can locate it, would be RML 8900-080, which came from a Focus with 54 miles.

Regards

Mark Freeland

6-Sigma Black Belt  
Engine Research Department  
Ford Research Laboratory  
P.O. Box 2053  
MD 2629 - SRL - Room 1517  
Dearborn, MI 48121-2053 USA  
email: mfreela1@ford.com  
Tel.: (313) 594-7645

# Ford Motor Company

Frank M. Ligon  
Director  
Vehicle Service and Programs  
Ford Customer Service Division

Ford Motor Company  
P. O. Box 1904  
Dearborn, Michigan 48121

December 2002

**TO:** All Ford and Lincoln Mercury Dealers

**SUBJECT:** Customer Satisfaction Program 02M01: Certain vehicles equipped with a tube-mounted EGR Pressure Sensor - Additional EGR Pressure Sensor Warranty Coverage

**OASIS:** Yes

**OWNER LIST:** No

**PROGRAM TERMS:** This additional coverage program will add 2 years or 24,000 miles whichever occurs first, to the base warranty coverage for the tube mounted EGR Pressure Sensor. This coverage will automatically transfer to subsequent owners.

## VEHICLES COVERED BY THIS PROGRAM

Certain 2000 and 2001 model year vehicles equipped with a tube-mounted EGR Pressure Sensor (9J460). Refer to OASIS for specific vehicle eligibility.

## TIME AND MILEAGE LIMITS

| Warranty Type         | Current Warranty Coverage | Total Warranty Coverage |
|-----------------------|---------------------------|-------------------------|
| Federal               | 3 Years/36,000 Miles      | 5 years/60,000 Miles    |
| California Emissions* | 3 Years/50,000 Miles      | 5 Years/74,000 Miles    |
| Lincoln               | 4 Years/50,000 Miles      | 6 Years/74,000 Miles    |

\* California emissions include vehicles certified for sale in California and registered in California, Maine, Massachusetts, New York or Vermont.

## REASON FOR PROVIDING ADDITIONAL COVERAGE

Vehicles experiencing a problem with the tube mounted EGR Pressure Sensor may exhibit a Malfunction Indicator Light (MIL) along with one or more of Diagnostic Trouble Codes (DTC) P0401, P0402, P1400, or P1401.

A very small percentage of vehicles may also exhibit a MIL with the following symptoms:

- Hesitation/Surge
- Stall with restart

Any of these conditions will not cause engine damage or failure, but may decrease the customer's satisfaction with their vehicle.

## **SERVICE ACTION**

It is recommended for vehicles exhibiting any of the conditions listed above and equipped with a tube mounted EGR Pressure Sensor, that the dealer retrieve continuous DTC prior to any other diagnostics.

Dealers are to install a new tube mounted EGR Pressure Sensor at no charge to the owner of the vehicle, ONLY if one or more of these continuous DTC are present:

- P1400 – DPF EGR Sensor Circuit Low Voltage Detected
- P1401 – DPF EGR Sensor Circuit High Voltage Detected
- P0401 – EGR Flow Insufficient Detected
- P0402 – EGR Flow Excessive Detected

A failed DPFE will only exhibit one or more of the DTC listed above. This program will not cover any other continuous DTC present.

## **ATTACHMENTS**

Attachment I:           Administrative Information  
Attachment II:         Labor Allowances and Parts Ordering Information  
Attachment III:        Technical Information  
Customer Notification Letters

## **QUESTIONS?**

Claims Information: .....1-800-423-8851  
Other (Dealer Only) Program Questions: .....1-800-325-5521

Sincerely,



Frank M. Ligon

**Customer Satisfaction Program 02M01  
Certain Vehicles Equipped with a Tube-Mounted EGR Pressure Sensor  
Additional EGR Pressure Sensor Warranty Coverage**

**OASIS**

You must use OASIS to determine if a vehicle is eligible for this program.

**Note:** Submission of an "M" program claim will not remove the vehicle from OASIS because the affected vehicles are eligible for multiple repairs if the affected condition reoccurs during the extended warranty time/mileage period.

**CLAIMS PREPARATION AND SUBMISSION**

- Enter claims using DWE.
- Refer to ACESII manual for claims preparation and submission information.

**EXTENDED WARRANTY PROGRAMS AND MEASURED WARRANTY**

This program, and others may involve repairs that fall within the mileage/time coverage period of the New Vehicle Limited Warranty (NVLW). For that reason, Ford Motor Company is investigating the integration of warranty extension programs into the dealer measured warranty report for vehicles still within the NVLW.

**OWNER REFUNDS**

Ford Motor Company will only refund owner-paid repairs made on or before the last day of the month of the date of the Owner Letter (or after the date of the Owner Letter if an emergency repair was made away from the servicing dealer). Failure of the EGR Pressure Sensor (9J480) will not have an impact on any other component of the vehicle. Therefore, refunds will only be granted for the replacement of the EGR Pressure Sensor (9J480).

All supporting documentation must be retained in accordance with the Warranty and Policy Manual.

|                |         |
|----------------|---------|
| Program Code:  | 02M01   |
| Misc. Expense: | REFUND  |
| Misc. Expense: | ADMIN   |
| Misc. Expense: | 0.2 Hr. |

Refer to ACESII manual for refund information.

**RENTAL CARS**

The use of rental vehicles is not authorized for this program.

**Customer Satisfaction Program 02M01**  
**Certain Vehicles Equipped with a Tube-Mounted EGR Pressure Sensor**  
**Additional EGR Pressure Sensor Warranty Coverage**

**LABOR ALLOWANCES**

| Description                                                                                                                                                                                                                                                                                                               | Labor Operation | Labor Time |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|
| Retrieve one or more of the following Continuous DTC, P1400, P1401, P0401 or P0402, clear codes and replace tube mounted EGR Pressure Sensor, perform KOEO self test<br><br>NOTE: 0.5 hrs labor time will be paid for Econoline and Town Car. 0.4 hrs labor time will be paid for Crown Vic/Grand Marquis and Expedition. | 02M01B          | 0.3 hrs    |

**Special Notes:**

- Diagnostics performed beyond retrieving continuous DTC will not be paid for under this program.
- Pinpoint diagnostics is not required to identify a failed EGR Pressure Sensor; therefore labor time has been adjusted accordingly.
- Due to the specific DTC to identify a failed EGR Pressure Sensor, this program will not cover any other continuous DTC; normal vehicle warranty would apply for any other DTC.
- There will be no related damage claims allowed for this program.

**PARTS REQUIREMENTS**

Parts will not be direct shipped for this program. Order your parts requirement through normal order processing channels as noted below:

|                  |                            |                      |
|------------------|----------------------------|----------------------|
| Stock Orders     | Effective immediately      | Normal order process |
| Interim Orders   | Effective immediately      | Normal order process |
| Emergency Orders | First 30 days after launch | Call 1-800-325-5621  |
| Emergency Orders | 31 days after launch       | Normal order process |

| Part Number   | Description                      | Quantity |
|---------------|----------------------------------|----------|
| 2F1Z-9J480-AA | Tube Mounted EGR Pressure Sensor | 1        |

**DOR/COR NUMBER**

The DOR/COR for this program is 50291. This number identifies parts ordered for this Customer Satisfaction Program through the Special Service Support Center (1-800-325-5621).

**DEALER PRICE**

For latest prices, check DOES II or updated price book.

**PARTS RETENTION**

Follow the provisions of the Warranty and Policy Manual for "Parts Retention and Return Procedures".

**EXCESS STOCK RETURN**

Excess stock returned for credit must have been purchased from Ford Customer Service Division in accordance with Policy Procedure Bulletin 4000.

## TUBE-MOUNTED EGR PRESSURE SENSOR (9J460) REPLACEMENT

AFFECTED VEHICLES: CERTAIN 2000 AND 2001 MODEL YEAR VEHICLES  
EQUIPPED WITH TUBE-MOUNTED EGR PRESSURE SENSOR

### SERVICE PROCEDURE

1. Retrieve continuous DTCs.

#### NOTE:

Replace the EGR pressure sensor only if one or more of the following continuous DTCs are present:

P1400 — DPF EGR SENSOR CIRCUIT LOW VOLTAGE DETECTED

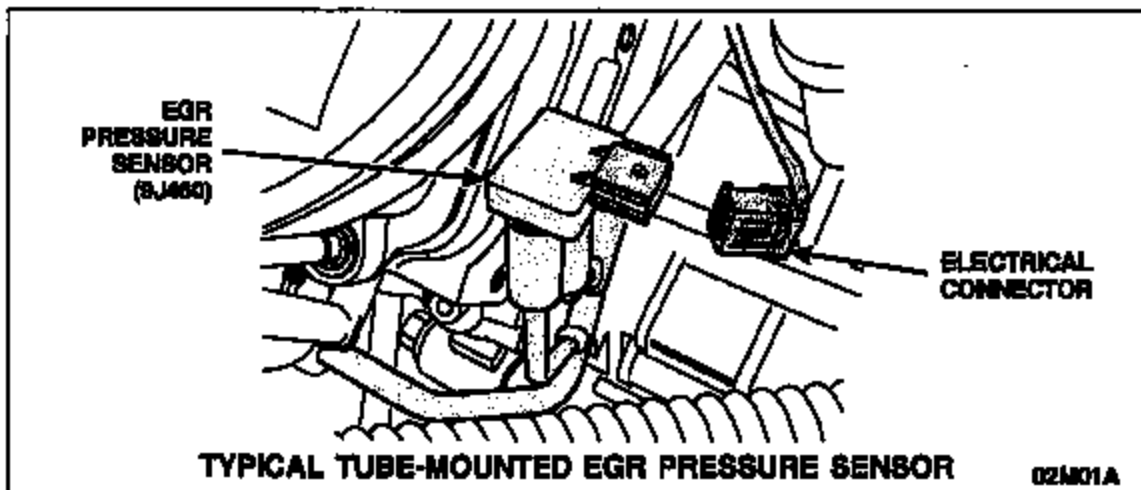
P1401 — DPF EGR SENSOR CIRCUIT HIGH VOLTAGE DETECTED

P0401 — EGR FLOW INSUFFICIENT DETECTED

P0402 — EGR FLOW EXCESSIVE DETECTED

Any other DTC present  
is not covered by this program.

2. If one or more of the DTCs listed above is present, replace the EGR pressure sensor (9J460) as follows:
  - a) Key off.
  - b) Disconnect the electrical connector and remove the EGR pressure sensor from the EGR tube.
  - c) Install the new EGR pressure sensor onto the EGR tube and connect the electrical connector.  
Note: Refer to Section 303-08 of the appropriate workshop manual if additional information is required.
3. Clear continuous DTCs.
4. Perform KOEO self test.



*Ford Motor Company*

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DEARBORN, MICHIGAN 48121  
12/02



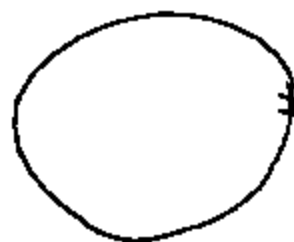
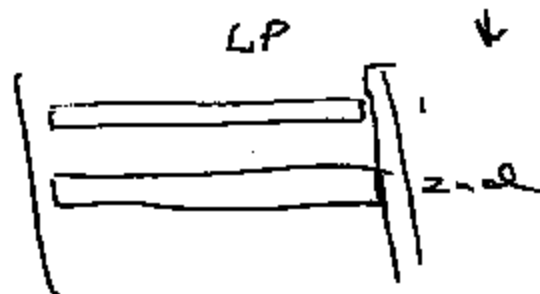
EA82-827-A 9885

## Sheet1

## Engine Oil Consumption Cycle/M Measurement vs Wants

|                                                           | Strength  |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
|-----------------------------------------------------------|-----------|---------------|-------------------|------------------------|---------------|--------------------|------------------|---------------------------|-------------------|----------------------|----------------------------|------------------------|
|                                                           | Average   |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
|                                                           | Weakness  |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Cycle Measurement                                         | QC1 D & W | Fast Dipstick | Customer Dipstick | Steady State Pedometer | TOC Pedometer | Dyno dura Dipstick | TOC Sulfur trace | Steady State Sulfur trace | Dyno Finto filter | Vehicle Finto filter | Bench-supplier Liquid trap | Bench-ISO Finto filter |
| Accuracy of measurement                                   |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Correlation to fleet                                      |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Correlation to customer                                   |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Development for validation (does it meet exp. population) |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Subsystem breakdown                                       |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Short time to generate data                               |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Inexpensive to run                                        |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Easy to set-up and correlate test fact.                   |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Minimum sample size                                       |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Not affected by fuel dilution                             |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |
| Ease of collecting data                                   |           |               |                   |                        |               |                    |                  |                           |                   |                      |                            |                        |

11/24/87 J. Ortman  
Updated 7/17/00



**Kapp, Dan (Daniel R.)**

**From:** Kapp, Dan (Daniel R.)  
**Sent:** Wednesday, April 24, 2002 9:28 AM  
**To:** Terzes, Laura (L.D.)  
**Cc:** Klarr, Jerry (G.T.); Fascetti, Bob (R.J.)  
**Subject:** FW: TSB Ford Escape stalling issue

Does the 4/24 date mean it's released now?

-----Original Message-----

**From:** Tracy, Lynn (L.J.) **On Behalf Of** Klarr, Jerry (G.T.)  
**Sent:** Wednesday, April 24, 2002 7:58 AM  
**To:** Kapp, Dan (Daniel R.); Fascetti, Bob (R.J.)  
**Subject:** FW: TSB Ford Escape stalling issue

FYI.

**G. T. Klarr (Jerry)**

Chief P/T Engineer - Outfitters  
PH: 32-26688/Fax: 62-18063  
PDC/MD #205/Cube 1BA45/Internet: gklarr@ford.com  
(Admin. L. Tracy x38205)

-----Original Message-----

**From:** Suarez, Rhee (R.)  
**Sent:** Tuesday, April 23, 2002 7:59 AM  
**To:** Klarr, Jerry (G.T.)  
**Cc:** Terzes, Laura (L.D.)  
**Subject:** RE: TSB Ford Escape stalling issue

Jerry,

Here is a the TSB number (and condition summary) for the Escape 3.0L stall concern.

Next/Previous Article (N/P): \_ Article #: TSB 02-08-06 Date: 04/24/2002

Symptom: 6 07 DRVABL STALL/QUITS

Year Vt Fm VI Mdl Trans Engine Calib Axle

Criteria: 2001 T MR

DRIVEABILITY - INTERMITTENT ENGINE QUIT OR IDLE DIP - NO DIAGNOSTIC TROUBLE

SOME VEHICLES EQUIPPED WITH THE 3.0L DURATEC ENGINE MAY EXHIBIT AN

INTERMITTENT ENGINE QUIT CONDITION. THIS IS USUALLY A ONE TIME EVENT DURING

CLOSED THROTTLE DECELERATION WITH NO DIAGNOSTIC TROUBLE CODES (DTCs) AND NO MALFUNCTION INDICATOR LAMP (MIL). THE ENGINE WILL RESTART IMMEDIATELY. WHEN NORMAL DIAGNOSTICS CANNOT PINPOINT THE ROOT CAUSE, REFER TO THE TSB FOR DETAILS.

Please let me know if you need any additional information.

*Rhee M. Suarez*

Rhee Michael Suarez  
Product Concern Engineer - Escape / Tribute / Mariner  
PVT & Field Support / FCSD  
D8C II (room 646) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-798-8242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: Terzes, Laura (L.D.)  
Sent: Monday, April 22, 2002 2:56 PM  
To: Suarez, Rhee (R.)  
Subject: RE: TSB Ford Escape stalling issue

As soon as it does, pls. forward the TSB # to Jerry Klarr. thanks.

*Laura Terzes*

Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF56  
(313) 32-36572 / fax (313) 24-88181 / lterzes.ford.com

-----Original Message-----

From: Suarez, Rhee (R.)  
Sent: Monday, April 22, 2002 2:15 PM  
To: Terzes, Laura (L.D.); King, Robert (R.F.)  
Subject: RE: TSB Ford Escape stalling issue

I have been in contact with Clay about the status. He found 2 things today that he had questions on and I have answered them. It should go out very shortly.

-----Original Message-----

From: Terzes, Laura (L.D.)  
Sent: Monday, April 22, 2002 2:12 PM  
To: Klarr, Jerry (G.T.)

Cc: Hoffman, Michael (M.V.); Fascetti, Bob (R.J.); King, Robert (R.F.); Suarez, Rhee (R.)  
Subject: RE: TSB Ford Escape stalling issue

Jerry, checked today, TSB not released yet. Bob King will provide provide status and target date. Unless, one of the key approvers has held it for some reason, It should go out shortly. We need it, to respond to the many field inquiries we continue to receive from the FCSD field operations personnel and Required Vehicle (RAV) activities.

*Laura Terzes*

Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF68  
(313) 32-36672 / fax (313) 24-88181 / lterzes.ford.com

-----Original Message-----

From: Klarr, Jerry (G.T.)  
Sent: Monday, April 22, 2002 12:25 PM  
To: Terzes, Laura (L.D.)  
Cc: Hoffman, Michael (M.V.); Fascetti, Bob (R.J.)  
Subject: FW: TSB Ford Escape stalling issue  
Importance: High

Do you have the status on the subject TSB?

*G. T. Klarr (Jerry)*

P/T Chief Engineer: PH: 32-28889/Cube: 1BA45  
PDC/MD #205/FAX: 62-18083/gtklarr@ford.com

-----Original Message-----

From: Koelber, Janet (J.) On Behalf Of Kapp, Dan (Daniel R.)  
Sent: Monday, April 22, 2002 12:12 PM  
To: Klarr, Jerry (G.T.); Fascetti, Bob (R.J.)  
Subject: FW: TSB Ford Escape stalling issue  
Importance: High

Please provide me with the status so I can get back to Jim.

-----Original Message-----

From: O'Brien, Luann (L.M.) On Behalf Of Padilla, Jim (James J.)  
Sent: Monday, April 22, 2002 8:54 AM  
To: Kapp, Dan (Daniel R.)  
Subject: FW: TSB Ford Escape stalling issue

Status?

Regards,

Jim Padilla

**Group Vice President  
Ford North America**

-----Original Message-----

**From:** Williams, Les (LHW.)  
**Sent:** Friday, April 19, 2002 1:48 PM  
**To:** Podile, Jim (James J.)  
**Subject:** TSB Ford Escape stalling issue

Hello Jim:

The TSB is now being reviewed by several different engineering groups at Ford. I am on a different FCG rotation (Computer Aided Design on the new V8 Cyclone Engine in POEE Bldg) but I am still working on getting you the latest and greatest copy. Have a good weekend.

Regards,

Les Williams  
For More, Count on Les.  
**Cyclone V8**  
**Email:** [lwilli73@ford.com](mailto:lwilli73@ford.com)  
**Tel:** 313-337-1902

2002-07-01 0010

Attendance Sheets



# PAC Task Force

Sen in 4/19/01

Alan Davis  
 Carl Shaden  
 John Cluck  
 SANDRA OSIP  
 Mike Kramer  
 Mike Ozawa  
 Bill WETTACH  
 Alan Reaume  
 Bruce E. Hayk  
 Brandon Pitt  
 Ted Jensen  
 Jim McBride  
 Rob Murray  
 PAT SWANN  
 Jim Ball  
 Shannon Elliott  
 Bill KAISER  
 Brian Stridham  
 Jeff DeLos

V-Engine BB  
 Hitachi  
 " " " "  
 V-Engine - Ford  
 Block Belt  
 DMSU  
 VEE - INTAKES  
 Materials Eng.  
 MBB  
 40LSys  
 FRL  
 FRL  
 VEE BB  
 PTSE  
 FRL  
 OBD FF  
 FRL  
 bce  
 4.OL SYS.

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 313 621-4465  
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 x08751  
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 24598  
 31423  
 88647  
 32607  
 850634  
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# IAC Sign In Sheet

|              |              |             |                      |
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**Danes, Adam (A.V.)**

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**From:** Danes, Adam (A.V.)  
**Sent:** Wednesday, March 06, 2002 8:11 AM  
**To:** carl; Chick, John (J.); Coryea, Kevin (K.W.); dave amold; Delaroderie, Jim (J.A.); D'Ha, Ken (K.M.); Gefos, Theodore (T.T.); Jensen, Ted (T.E.); Jltokyo, F (F.); kelly.clemons@hap.com; Koeko, Jeff (J.R.); lee sho; Marrone, Rob (R.B.); McBride, James (J.R.); Smythe, Joseph (J.M.); Stidham, Brian (B.); Subramanian, Swaminathan (S.); Wettach, Bill (B.)  
**Subject:** IAC Meeting Agenda

Reminder that the meeting starts at 7:30 and ends at 9:00

**Agenda**

Friction Finger Data - Jensen

Airflow reject causes and corrective actions - follow up from last week  
- Clemons, Marrone

Test Stand correlation update - Hitachi

Gage R&R Update - Hitachi

Application specific updates - Swami, Ted Gefos, Rob Marrone

Service Procedure Revisions - Delaroderie

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## PDQR Agenda For Powertrain Items

**PDC 1V G59**

**June 19, 2002**

- |                                         |                |           |
|-----------------------------------------|----------------|-----------|
| 1. Powertrain Overview                  | Jerry Conroy   | 3:40-3:45 |
| 2. 4.6L DPFE Status To Plan             | Bill Weber     | 3:45-3:50 |
| 3. 4.2L Frt. Cover Seal                 | Eric Wiebrecht | 3:50-4:00 |
| 4. 4.2L Rear Crank Seal                 | Kevin Hu       | 4:00-4:10 |
| 5. 4.6L/5.4L Oil Sending Unit           | Pete Pandolfi  | 4:10-4:20 |
| 6. 4.6L IAC Emerging Issue              | Rob Marrone    | 4:20-4:30 |
| 7. Pull Ahead-DC Nut Runners<br>For NVH | Carrie Lenz    | 4:30-4:35 |

Adm, FYI

Rob M.

# Estimates of the Atmospheric Deposition of Sulfur and Nitrogen Species: Clean Air Status and Trends Network, 1990-2000

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The Clean Air Status and Trends Network (CASTNet) was established by the U.S. EPA in response to the requirements of the 1990 Clean Air Act Amendments. To satisfy these requirements CASTNet was designed to assess and report on geographic patterns and long-term, temporal trends in ambient air pollution and acid deposition in order to gauge the effectiveness of current and future mandated emission reductions. This paper presents an analysis of the spatial patterns of deposition of sulfur and nitrogen pollutants for the period 1990-2000. Estimates of deposition are provided for two 4-yr periods: 1990-1993 and 1997-2000. These two periods were selected to contrast deposition before and after the large decrease in  $\text{SO}_2$  emissions that occurred in 1985. Estimates of dry deposition were obtained from measurements at CASTNet sites combined with deposition velocities that were modeled using the multilayer model, a 20-layer model that simulates the various atmospheric processes that contribute to dry deposition. Estimates of wet deposition were obtained from measurements at sites operated by the National Atmospheric Deposition Program. The estimates of dry and wet deposition were combined to calculate total deposition of atmospheric sulfur (dry  $\text{SO}_2$ , dry and wet  $\text{SO}_4^{2-}$ ) and nitrogen (dry  $\text{HNO}_3$ , dry and wet  $\text{NO}_3^-$ , dry and wet  $\text{NH}_4^+$ ). An analysis of the deposition estimates showed a significant decline in sulfur deposition and no change in nitrogen deposition. The highest rates of sulfur deposition were observed in the Ohio River Valley and downwind states. This region also observed the largest decline in sulfur deposition. The highest rates of nitrogen deposition were observed in the Midwest from Illinois to southern New York State. Sulfur and nitrogen deposition fluxes were significantly higher in the eastern United States as compared to the western sites. Dry deposition contributed approximately 38% of total sulfur deposition and 30% of total nitrogen deposition in the eastern United States. Percentages are similar for the two 4-yr periods. Wet sulfate and dry  $\text{SO}_2$  depositions were the largest contributors to sulfur deposition. Wet nitrate, wet ammonium, and dry  $\text{HNO}_3$

depositions were the largest contributors to nitrogen deposition.

## Introduction

Atmospheric deposition takes place via three pathways: wet deposition, cloud deposition, and dry deposition. Wet deposition is the result of precipitation events (rain, snow, etc.) that remove particles and gases from the atmosphere. Cloud or fog deposition occurs when pollutant-laden cloud or fog droplets impact vegetation or other surfaces. Dry deposition is the transfer to the landscape of particles and gases through a number of atmospheric processes in the absence of precipitation. Wet deposition rates of acidic species across the United States have been documented since 1978 by the 200-site National Trends Network of the National Atmospheric Deposition Program (1). Estimates of cloud deposition are available from the Mountain Cloud Chemistry Program (2) and the Mountain Acid Deposition Program (3), and fog deposition programs are documented in work by Weather et al. (4) and Collett et al. (5). Comparable dry deposition data on a national scale have been unavailable. However, the Clean Air Status and Trends Network (CASTNet) is now providing estimates of dry deposition at sites across the United States.

The direct measurement of dry deposition is not straightforward, but a number of investigations suggest that it can be reasonably inferred by coupling air concentration data with routine meteorological measurements (6-8). Shih et al. (6) showed that submicrometer particles and sulfur dioxide ( $\text{SO}_2$ ) deposition rates for the eastern United States were strongly dependent on wind speed, solar radiation, and condition and type of ground cover. For example, rapidly growing vegetation and forests were found to experience generally higher deposition rates than mesocosm vegetation, short grass, or snow. This approach for estimating dry deposition has been expanded by Wesely and Leight (9) to calculate deposition rates for various additional atmospheric species using site-specific meteorological data.

In 1986, the U.S. Environmental Protection Agency (EPA) established the National Dry Deposition Network (NDDN). The objective of the NDDN was to obtain field data at approximately 50 sites throughout the United States to establish patterns and trends of dry deposition. The approach adopted by the NDDN was to estimate dry deposition using measured air pollutant concentrations of  $\text{SO}_2$ , particulate sulfate ( $\text{SO}_4^{2-}$ ), particulate nitrate ( $\text{NO}_3^-$ ), nitric acid ( $\text{HNO}_3$ ), and particulate ammonium ( $\text{NH}_4^+$ ) with modeled deposition velocities ( $V_d$ ) estimated from meteorology, land cover, and site characteristic data. Passage of the Clean Air Act Amendments (CAAA) in 1990 required implementation of a national network to monitor air emissions, atmospheric deposition, and air quality to determine the effects of emissions on water quality, forests, and other sensitive ecosystems and to assess the effectiveness of the CAAA's emission reduction requirements through the operation of a long-term monitoring program. In response to these requirements, the EPA, in coordination with other Federal agencies, created CASTNet. The network became operational in mid-1991 and incorporated the NDDN program. CASTNet was designed to support the investigation of the relationships between emissions, atmospheric concentrations, and deposition. Assessments of the sensitivity of ecosystems to acidic deposition have shown that large areas of potentially sensitive terrestrial and aquatic ecosystems exist in the eastern United

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FIGURE 1. Locations of CASTNet sites as of December 2000.

States and that limited areas exist in the western United States. These findings, coupled with the expected changes in emissions of sulfur oxides ( $\text{SO}_2$ ) and nitrogen oxides ( $\text{NO}_x$ ), dictated the distribution of sites in the network.

This paper provides a spatial analysis of deposition of  $\text{SO}_2$ ,  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$ ,  $\text{HNO}_3$ ,  $\text{NH}_4^+$  from CASTNet sites for 1990–2000. As a result of the CAAA of 1990, emissions of  $\text{SO}_2$  decreased by almost 18% during 1994–1995 (16). Because of the large decrease in  $\text{SO}_2$  emissions during 1994–1995, the estimates of deposition provided herein are divided into two 4-yr periods: 1990–1993 and 1997–2000. Wet deposition estimates at (National Atmospheric Deposition Program (NADP)) sites are used along with modeled dry deposition fluxes to estimate total deposition of sulfur ( $\text{SO}_2$ ,  $\text{SO}_4^{2-}$ ) and nitrogen ( $\text{NO}_x$ ,  $\text{HNO}_3$ ,  $\text{NH}_4^+$ ). Although this paper contrasts deposition estimates at CASTNet sites from two distinct emission periods, these analyses are not designed to detect long-term trends in dry deposition. Robust statistical analyses of trends of sulfur species using CASTNet data are available in other recent publications (11–13). Trends in wet deposition data from the NADP may be found in articles by Lynch et al. (14,15). Additional analyses of CASTNet data may be found in the CASTNet Deposition Summary Report (1997–1999) (16), the CASTNet 1999 Annual Report (17), and the CASTNet 2000 Annual Report (18).

#### Experimental Methods

**Network Description.** Figure 1 shows the locations of CASTNet sites as of December 2000. At that time, the network consisted of 79 sites, two of which were collocated for the purpose of assessing network precision. Further information on the current status of CASTNet may be found at <http://www.epa.gov/castnet/>. In addition to CASTNet, another dry deposition network consisting of 13 sites, the Atmospheric Integrated Research Monitoring Network (AIRMoN), operated in the eastern United States from 1985 to 2001. AIRMoN used a similar approach to obtain estimates of dry deposition but is more research oriented in its focus. Further information

regarding the network is available at <http://www.aiaa.com.gov/research/programs/airmon.html>.

**Site Selection.** The eastern U.S. monitoring sites were selected based on the following criteria: appropriate inputs to the dry deposition model, regional representativeness, long-term availability, and accessibility. In the western United States, the limited number of sites combined with the regions of greater ecological diversity precluded determination of spatial patterns. Therefore, site selection focused primarily on locations where specific research issues could be addressed and/or where natural resources were at risk (e.g., national parks). These locations included polluted watersheds in which dry deposition information was needed to close geochemical cycles for sulfur, nitrogen, and acidity. (2) Regional meteorological trends in the spatial pattern of the sites to be characteristic (area typically 80 by 80 km), surrounding the site. First, the ambient concentrations at the site had to be representative of the region. Thus, sites near major sources of  $\text{SO}_2$  and/or  $\text{NO}_x$  were avoided to reduce the likelihood of locally perturbed concentration fields. Second, land cover near the site had to match as much as possible the dominant regional land cover to make appropriate use of meteorological data in  $V_d$  calculations. Finally, monitoring sites needed to be available for extended periods (15–20 yr) to assess concentration and dry deposition trends.

Site-specific criteria used during the site-selection process relate to conditions in the immediate vicinity of a prospective monitoring site that may perturb air quality and meteorological observations. Local sources of air contaminants and local features that may influence wind speed, wind direction, etc., were the focus of these criteria.

By design, the network attempted to capture gradients in atmospheric concentrations of pollutants (especially  $\text{SO}_2$ ). Thus, sites in the Ohio River Valley were closely spaced around emission sources and more distantly spaced throughout New England and the Atlantic Coast states. Sites were located further apart in the Southeast and the West, where the density of emission sources is considerably lower than in the

Midwest. A recent analysis of  $\text{SO}_2$  and  $\text{SO}_4^{2-}$  data by Baumgardner et al. (19) has shown that distinct gradients exist for both species moving outward from the Ohio River Valley in both northeasterly and southeasterly directions.

**Field Operations.** Measurements of ambient concentrations of  $\text{SO}_2$ ,  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$ ,  $\text{HNO}_3$ , and  $\text{NH}_4^+$  and of meteorological variables required for dry deposition calculations are performed at each site. Meteorological variables are recorded continuously and reported as hourly averages. Variables measured include wind speed, wind direction,  $\sigma$  (standard deviation of the wind direction), solar radiation, ambient temperature, temperature lapse, relative humidity, and surface wetness. Atmospheric sampling for sulfur and nitrogen species consists of week-long integrated sampling using a three-stage filter pack (16, 20). Filter packs contain three types of filters in sequence: a Teflon filter for  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$ , and  $\text{NH}_4^+$  aerosols; a nylon filter for  $\text{HNO}_3$  and  $\text{SO}_2$  (as  $\text{SO}_4^{2-}$ ); and dual  $\text{K}_2\text{CO}_3$ -impregnated cellulose filters for  $\text{SO}_2$ . The filter pack system is "open faced," meaning that a size-selective inlet is not used. Sulfate particles are almost exclusively in the fine fraction ( $<2.5 \mu\text{m}$ ) and are efficiently captured. Some of the  $\text{NO}_3^-$  particles may be in the coarse fraction ( $>2.5 \mu\text{m}$ ) and therefore collected less efficiently because of the configuration of the inlet and meteorological variables (i.e., wind speed). Filter packs are prepared and shipped to the field weekly and exchanged at each site every Tuesday. Blank filter packs are collected quarterly to evaluate passive collection of particles and gases as well as contamination during shipment and handling. Filter pack sampling and meteorological measurements are made at 10 m. Filter pack flow is maintained at 1.50 L/min at eastern sites. The flow is 3.00 L/min at western sites to better detect the lower concentrations of the analytes.

Visual observations are made periodically at the CASTNet sites to provide input variables for the model estimates of dry deposition. Vegetation status and land-use information are collected to characterize the distribution and condition of plant species that could influence deposition rates for gases (especially  $\text{SO}_2$  and particles). Vegetation data are obtained to track the evolution of the dominant plant canopy from leaf emergence (or germination) to senescence (or harvesting). Once a year, site operators also provide information on major plant species and land-use classifications within 1 km of the site. Additional land-use data are obtained by digitization, analysis, and interpretation of aerial photographs obtained from the U.S. Geological Survey (USGS) National Cartographic Information Center in Reston, VA (21). Leaf area index (LAI) measurements are taken at all sites. LAI is the one-sided leaf area of the plant canopy per unit of ground. All field equipment is subjected to semiannual inspections and multipoint calibrations using standards traceable to the National Institute of Standards and Technology (NIST). Calibration files are reviewed for completeness and adherence to standard operating procedures (SOPs). In addition, independent equipment audits are performed annually. Results of field calibrations are used to assess sensor accuracy and to flag, adjust, or invalidate field data.

**Laboratory Operations.** Filter pack samples are loaded, shipped, received, extracted, and analyzed by a central laboratory. Following receipt from the field, exposed filters and blanks are extracted and then analyzed for  $\text{SO}_2$  (as sulfate),  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$ , and  $\text{HNO}_3$  (as nitrate) by micromembrane-suppressed ion chromatography (IC). Teflon filter extracts are also analyzed for  $\text{NH}_4^+$  by the automated indophenol method using a Technicon II or TRAACS-800 autoanalyzer system. All analyses are completed within 72 h of filter extraction. Atmospheric concentrations are calculated based on the volume of air sampled following validation of the hourly flow data. Atmospheric concentrations of particulate  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$ , and  $\text{NH}_4^+$  are calculated

from analysis of Teflon filter extracts;  $\text{HNO}_3$  is calculated based on the  $\text{NO}_3^-$  found in the nylon filter extracts; and  $\text{SO}_2$  is calculated as the sum of  $\text{SO}_4^{2-}$  found in nylon and cellulose filter extracts.

**Quality Assurance and Data Analyses.** *Quality Assurance.* The CASTNet QA program is comprehensive in that it addresses all major aspects of project operations. Quality assurance plans and operational procedures were prepared for each network component. A detailed description of the CASTNet quality assurance and quality control procedures are available in the CASTNet Quality Assurance Program Plan (22).

Estimates of precision and accuracy are calculated for all measurement variables. Precision is based on the difference between measurements from separate instruments and samplers at collocated sites. Collocated sites were selected to be representative of the observed range of pollutant concentrations and environmental conditions that exist within the network. The overall precision of atmospheric concentration and meteorological data is assessed quarterly by calculating the mean absolute relative percent difference (MARPD) of values for simultaneous measurements at collocated sites. Historically, two or three sites of the network were collocated. For the period 1987–1995 (all collocated sites for all years), the MARPDs for all meteorological sensors were less than 10% (16). For the period 1990–2000 (all collocated sites for all years), the MARPDs for measured filter pack concentrations for all analytes were less than 15% with  $\text{SO}_2$  and  $\text{HNO}_3$  at or below 8% and  $\text{SO}_4^{2-}$  and  $\text{NH}_4^+$  below 6% (18). The accuracy of field measurements is determined by challenging instruments with standards that are traceable to the NIST. The accuracy of laboratory measurements is determined by analyzing independently prepared reference samples. For the years 1987–1995, the reference sample recovery mean for all analytes was between 99 and 100% (18). Additional precision and accuracy information are available in the CASTNet 1999 and 2000 Annual Reports (2, 7, 18).

**Data Analyses.** Hourly dry deposition fluxes are calculated as the product of modeled hourly deposition velocities and hourly concentrations. Hourly concentrations of the analytes are determined from the weekly integrated value with the assumption that all hourly concentrations during the weekly sampling period are equal and constant. Weekly fluxes are calculated as the mean of the valid hourly fluxes for a deposition week scaled to represent a 168-h period. The weekly value is valid if at least 70% of the available hourly values are valid. Quarterly fluxes are calculated as the mean of associated weekly values scaled to represent a 13-week period and are valid if at least 69% of the weeks are valid. Annual deposition fluxes are the mean of at least three valid quarters scaled to represent a full year. To calculate annual total deposition values, both dry and wet deposition values for the year must be valid. Wet deposition values were obtained from the NADP/NTN site closest to the respective CASTNet site and were determined to be valid using the NADP/NTN criteria. Detailed descriptions of the NADP operations and completeness/validity criteria may be found in Sisterson et al. (1). Table 1 lists the CASTNet sites that met all completeness criteria and are used for this analysis. For 1990–1993, 47 sites met the dry deposition criteria, and 43 met both the dry and wet deposition criteria. For the period 1997–2000, 62 sites met the dry deposition criteria, and 59 sites met the total deposition criteria.

For the purposes of this study, total deposition is defined as the sum of wet and dry deposition. The Appalachian Mountains of the eastern United States are subjected to cloud deposition at elevations at or greater than approximately 600 m. Cloud deposition may be a significant portion of the total deposition in these areas (23). Measurements of cloud

TABLE 1. CASTNet Sites Used in This Analysis

| site id | station                | state | latitude | longitude | elevation<br>(m) | land use       | terrain     | 1980-1983<br>dry total | 1987-2000<br>dry total | summary<br>table |
|---------|------------------------|-------|----------|-----------|------------------|----------------|-------------|------------------------|------------------------|------------------|
| ABT147  | Ablington              | CT    | 41.841   | -72.0111  | 209              | urban/agric    | rolling     |                        | x x                    |                  |
| ALH167  | Alhambra               | IL    | 38.888   | -88.8219  | 184              | agric          | flat        | x x                    | x x                    | x                |
| ANA116  | Ann Arbor              | MI    | 42.416   | -83.9018  | 267              | forested       | flat        | x x                    | x x                    | x                |
| ARE128  | Arendaville            | PA    | 39.923   | -77.3078  | 289              | agric          | rolling     | x x                    | x x                    | x                |
| ASH136  | Ashland                | ME    | 46.804   | -68.4142  | 335              | agric          | flat        | x x                    | x x                    | x                |
| BBE401  | Big Bend NP            | TX    | 29.31    | -103.177  | 1052             | forested       | complex     |                        | x x                    |                  |
| SEL118  | Bellefonte             | MO    | 39.028   | -76.8178  | 466              | range          | flat        | x x                    | x x                    | x                |
| BPT142  | Beaufort               | NC    | 34.084   | -76.6273  | 2                | agric          | flat        |                        | x x                    |                  |
| BVL130  | Bondville              | IL    | 40.081   | -88.3799  | 212              | agric          | flat        | x x                    | x x                    | x                |
| BWR129  | Blackwater NWR         | MD    | 38.446   | -76.1115  | 4                | forested/marsh | coastal     |                        | x x                    |                  |
| CAD160  | Caddo Valley           | AR    | 34.178   | -93.0983  | 71               | forested       | complex     | x x                    | x x                    | x                |
| CAN407  | Canyonlands NP         | UT    | 36.468   | -108.821  | 1814             | desert         | complex     |                        | x x                    |                  |
| CAT176  | Caryville              | NY    | 41.841   | -74.8514  | 786              | forested       | complex     |                        | x x                    |                  |
| CDR118  | Cedar Creek            | WV    | 38.979   | -80.8479  | 234              | forested       | complex     | x x                    | x x                    | x                |
| CHA487  | Chiricahua NM          | AZ    | 32.01    | -109.389  | 1970             | range          | complex     | x                      | x                      |                  |
| CKT158  | Crocket                | KY    | 37.821   | -83.0658  | 455              | agric          | rolling     |                        | x x                    |                  |
| CND128  | Candler                | NC    | 35.264   | -78.837   | 198              | forested       | rolling     | x x                    | x x                    | x                |
| CNT189  | Centennial             | WY    | 41.372   | -108.242  | 3178             | forested       | complex     | x                      | x                      |                  |
| COW137  | Coweta                 | NC    | 35.081   | -83.4302  | 884              | forested       | complex     | x x                    | x x                    | x                |
| CTH110  | Connecticut Hill       | NY    | 42.401   | -78.8638  | 801              | forested       | rolling     | x x                    | x x                    | x                |
| CVL151  | Coffeyville            | MS    | 34.003   | -89.7898  | 134              | forested       | rolling     | x                      | x                      |                  |
| DCP114  | Deer Creek             | OH    | 36.636   | -83.288   | 287              | agric          | rolling     | x                      | x                      |                  |
| DEV412  | Death Valley NM        | CA    | 36.506   | -116.838  | 126              | desert         | complex     |                        | x x                    |                  |
| EQB181  | Egbert                 | ON    | 44.232   | -78.784   | 251              | agric          | rolling     |                        | x x                    |                  |
| ESP127  | Edgar Evans            | TN    | 36.036   | -86.734   | 308              | forested       | rolling     | x x                    | x x                    | x                |
| GA8183  | Georgia Station        | GA    | 33.179   | -84.4063  | 270              | agric          | rolling     | x x                    | x x                    |                  |
| GLR466  | Gleason NP             | MT    | 48.81    | -118.985  | 876              | forested       | complex     | x x                    | x x                    | x                |
| GR8411  | Great Basin NP         | NV    | 38.005   | -114.816  | 2009             | forested       | complex     |                        | x x                    |                  |
| GR8474  | Grand Canyon NP        | AZ    | 36.089   | -112.182  | 2073             | forested       | rolling     | x x                    | x x                    | x                |
| GTH181  | Guthrie                | CO    | 38.987   | -106.988  | 3828             | range          | complex     | x x                    | x x                    | x                |
| HOW132  | Howland                | ME    | 45.216   | -68.7082  | 89               | forested       | rolling     |                        | x x                    |                  |
| JOT409  | Joshua Tree NM         | CA    | 34.071   | -116.39   | 1244             | desert         | complex     |                        | x x                    |                  |
| KIP112  | Kane Eng. Forest       | PA    | 41.888   | -75.7853  | 682              | forested       | rolling     | x x                    | x x                    | x                |
| LAV110  | Lassen Volcanic NP     | CA    | 40.838   | -121.572  | 1768             | forested       | complex     |                        | x x                    |                  |
| LOW121  | Litley C. Woods        | KY    | 37.13    | -82.88    | 336              | agric          | rolling     | x x                    | x x                    |                  |
| LRL117  | Laurel Hill            | PA    | 40.888   | -75.2822  | 618              | forested       | complex     | x x                    | x x                    |                  |
| LYE146  | Lys Brook              | VT    | 43.08    | -72.8634  | 7739             | forested       | mountaintop | x x                    | x x                    | x                |
| LYK123  | Lytton                 | OH    | 40.917   | -82.9881  | 903              | agric          | rolling     | x x                    | x x                    | x                |
| MCK131  | Madison                | IL    | 37.704   | -88.0433  | 383              | agric          | rolling     | x x                    | x x                    | x                |
| MEV408  | Massena                | NY    | 43.188   | -73.48    | 100              | forested       | rolling     | x x                    | x x                    | x                |
| MK0119  | M. K. Goddard          | PA    | 41.328   | -75.1447  | 384              | forested       | rolling     | x x                    | x x                    | x                |
| MOR408  | Mount Moriah NP        | VA    | 38.81    | -78.121   | 421              | forested       | rolling     | x x                    | x x                    | x                |
| NCA138  | North Cascades NP      | WA    | 48.098   | -121.458  | 1909             | forested       | complex     |                        | x x                    |                  |
| COF122  | Osborne                | OH    | 40.831   | -84.7281  | 284              | agric          | rolling     | x x                    | x x                    | x                |
| PAK107  | Parkton                | NC    | 35.081   | -81.3814  | 3510             | forested       | complex     | x x                    | x x                    | x                |
| PER101  | Preserve Edward        | VA    | 37.188   | -80.888   | 800              | forested       | rolling     | x x                    | x x                    | x                |
| PN414   | Preserve H. H. Collins | CA    | 38.488   | -121.188  | 836              | forested       | complex     | x x                    | x x                    | x                |
| RND188  | Randolph               | WV    | 38.81    | -80.787   | 838              | forested       | rolling     | x x                    | x x                    | x                |
| PND184  | Red Bank               | NC    | 35.104   | -82.848   | 3218             | forested       | mountaintop | x x                    | x x                    | x                |
| PRK134  | Perkinsville           | VT    | 43.808   | -72.8978  | 472              | agric          | rolling     | x x                    | x x                    | x                |
| PRU108  | Perryville             | PA    | 40.721   | -77.8319  | 378              | agric          | rolling     | x x                    | x x                    | x                |
| RCK183  | Rocky Mountain NP      | CO    | 40.277   | -105.848  | 2743             | forested       | complex     | x x                    | x x                    | x                |
| SAL183  | Salmon River           | IN    | 40.816   | -88.888   | 280              | agric          | flat        | x x                    | x x                    | x                |
| SAV164  | Savannah               | NY    | 41.39    | -116.88   | 1873             | forested       | rolling     | x x                    | x x                    | x                |
| SHN418  | Shenandoah NP          | VA    | 38.832   | -78.4384  | 1073             | forested       | mountaintop | x x                    | x x                    | x                |
| SND182  | Sand Mountain          | AL    | 34.288   | -86.8704  | 382              | agric          | rolling     | x x                    | x x                    | x                |
| SFD111  | Speedwell              | TN    | 36.488   | -83.872   | 381              | agric          | rolling     | x x                    | x x                    | x                |
| STK138  | Stockton               | IL    | 42.387   | -88       | 274              | agric          | rolling     |                        | x x                    |                  |
| BUM188  | Burnsville             | FL    | 30.187   | -84.898   | 14               | forested       | flat        | x x                    | x x                    | x                |
| UNH182  | Union                  | UT    | 40.88    | -110.32   | 3500             | range          | complex     | x x                    | x x                    | x                |
| UVL124  | Unionville             | MI    | 43.814   | -83.8887  | 201              | agric          | flat        | x x                    | x x                    | x                |
| VIN140  | Vincennes              | IN    | 38.741   | -87.4844  | 134              | agric          | rolling     | x x                    | x x                    | x                |
| WPI120  | Worton Station         | VA    | 37.33    | -80.8873  | 820              | agric          | mountaintop | x x                    | x x                    | x                |
| WBL148  | Wellston               | MI    | 44.224   | -83.8188  | 295              | forested       | flat        | x x                    | x x                    | x                |
| WFM108  | Whiteface Mountain     | NY    | 44.39    | -72.88    | 670              | forested       | complex     | x x                    | x x                    | x                |
| WFB104  | West Point B           | NY    | 41.35    | -74.06    | 203              | forested       | complex     | x x                    | x x                    | x                |
| WSP144  | Wash. Crossing         | NJ    | 40.318   | -74.8728  | 81               | range          | rolling     | x x                    | x x                    | x                |
| WET109  | Woodstock              | NH    | 43.844   | -71.7017  | 285              | forested       | complex     | x x                    | x x                    | x                |
| YEL408  | Yellowstone NP         | WY    | 44.868   | -110.4    | 2488             | agric          | rolling     |                        | x x                    |                  |
| YOS404  | Yosemite NP            | CA    | 37.711   | -119.704  | 1908             | forested       | complex     |                        | x x                    |                  |

deposition were not a routine part of CASTNet. The impact of cloud deposition on high elevation sites is discussed in a number of recent publications (2, 24, 25). Total sulfur deposition is defined as the sum of gaseous  $\text{SO}_2$  and wet and dry  $\text{SO}_4^{2-}$ . Total nitrogen deposition is defined as the sum of gaseous  $\text{HNO}_3$ , plus wet and dry  $\text{NO}_3^-$  and  $\text{NH}_4^+$ . Ammonia ( $\text{NH}_3$ ) was not measured as a part of CASTNet but may be a significant portion of total nitrogen, especially in agricultural areas (26).

**Dry Deposition Estimation.** Dry Deposition Model. CASTNet was designed based on the assumption that dry deposition or flux could be estimated as the linear product of ambient concentration ( $C$ ) and a deposition velocity ( $V_d$ ):

$$\text{flux} = CV_d \quad (1)$$

The influence of meteorological conditions and vegetation on the dry deposition process is simulated by  $V_d$ .  $V_d$  is calculated using an inferential model that uses resistances to deposition to model the naturally occurring dry deposition processes (7, 8, 27):

$$V_d = (R_a + R_b + R_s)^{-1} \quad (2)$$

$R_a$ , the aerodynamic resistance, is inversely proportional to the atmosphere's ability to transfer material downward from the planetary boundary layer to the surface layer by turbulent processes.  $R_b$  is the quasi-laminar resistance to transport through the thin layer of air in contact with the surface.  $R_s$  depends on the aerodynamics of the surface and the diffusivity of the pollutant being deposited.  $R_s$ , the canopy or surface uptake resistance, contains several terms (represented as parallel resistances) that account for the direct uptake/absorption of the pollutant by leaves, soil, other biological receptors within and below the canopy, and other surfaces such as rock and water.  $R_s$  contains parameterizations for vegetation type and density, solar radiation penetration of the canopy, and wetness of the surface.  $R_s$  is difficult to treat theoretically, and the system of equations for estimating  $R_s$  is normally empirically adjusted based on direct measurement of dry fluxes. The multilayer model (MLM) described by Meyers et al. (27) is used to estimate deposition velocity. The MLM divides a canopy into 20 layers in contrast to earlier versions in which the canopy was treated as a single layer. For each layer of the canopy, leaf boundary layer and stomatal resistances are determined using radiative transfer and wind profile models.

The MLM requires wind speed and standard deviation of wind speed at 10 m, temperature, relative humidity, solar radiation, surface wetness, and presence or absence of precipitation. The model also requires LAI, type and height of vegetation, and percent leaf out. The deposition velocity is computed on an hourly basis. The site  $V_d$  is calculated using area-weighted vegetation types within 1 km of the site. Hourly  $V_d$  and weekly integrated concentrations of  $\text{SO}_2$ ,  $\text{SO}_4^{2-}$ ,  $\text{HNO}_3$ ,  $\text{NO}_3^-$ , and  $\text{NH}_4^+$  were used to produce a weekly deposition flux.

**Model Uncertainty.** Uncertainties in MLM calculations can be considered in the context of the model formulation, input errors, and representativeness. The MLM itself is an imperfect representation of the large number of complex atmospheric processes the model simulates. Consequently, the MLM calculations will never be able to match observed deposition velocities perfectly. Instrument errors and incomplete or inaccurate characterization of other input data (e.g., evolution of LAI during the year) also produce uncertainties in model calculations.

No standards or standard methods are available to determine the accuracy of the MLM. Comparison to a direct measurement of deposition is considered the most accept-

able. The eddy correlation method is the most widely used to measure  $\text{SO}_2$  flux, and the gradient method is used for  $\text{HNO}_3$ . Two recent studies have compared the MLM with direct measurements of  $\text{SO}_2$  and  $\text{HNO}_3$  dry deposition. Meyers et al. (27) compared the MLM with the eddy correlation and the gradient method measurements at three sites with different vegetation (pasture, corn and soybeans). Finkelstein et al. (28) compared the MLM at two forested sites (deciduous and mixed coniferous-deciduous). These studies were conducted during the growing seasons of 1994–1995 and 1996–1998, respectively. Data were gathered during times of fast plant and slow plant growth and day and night periods. The results of the comparison were presented as model bias. Bias was defined as the observed value  $V_d$  minus the simulated model value  $V_d$ . The precision of the comparison was the standard deviation of individual bias determinations.

The results from Meyers et al. (27) indicated that the MLM underestimated the  $V_d$  for  $\text{SO}_2$  during the day in periods of fast-growing vegetation (soybeans and corn) and more nearly estimated the measured value at night. If all values are averaged, the bias was low:  $-0.05 \text{ cm/s}$  for corn,  $-0.04 \text{ cm/s}$  for grass, and  $-0.15 \text{ cm/s}$  for soybeans as compared to an averaged  $V_d$  of  $0.47$ ,  $0.82$ , and  $0.58 \text{ cm/s}$ , respectively. For  $\text{HNO}_3$ , the comparisons were made only during the day. Across the three types of vegetation, the overall bias was low. However, the model overestimated active values and underestimated others. Also, considerable scatter was evident between individual values. The bias for corn was  $0.08 \text{ cm/s}$ ,  $0.47 \text{ cm/s}$  for grass, and  $0.22 \text{ cm/s}$  for soybeans. The average  $\text{HNO}_3 V_d$  was  $2.5$ ,  $3.2$ , and  $2.8 \text{ cm/s}$ , respectively. In summary, the MLM underestimated dry  $\text{SO}_2$  flux by approximately 10% and overestimated  $\text{HNO}_3$  flux by about 10%.

The results from the work by Finkelstein et al. (28) on dry deposition to forest vegetation showed that the MLM underestimated  $\text{SO}_2 V_d$  for both deciduous and mixed coniferous-deciduous. For deciduous canopies, the model underestimated the  $\text{SO}_2 V_d$  to a greater degree during the day with an average bias of  $0.29 \text{ cm/s}$  as compared to a nighttime average bias of  $0.16 \text{ cm/s}$ . For the mixed coniferous-deciduous canopy, the average bias was  $0.36 \text{ cm/s}$  during the day and  $0.07 \text{ cm/s}$  for the night. The average  $V_d$  for deciduous forests for all values was  $0.60 \text{ cm/s}$  and for mixed coniferous-deciduous was  $0.72 \text{ cm/s}$ . Also, there was significant scatter between observations for both types of vegetation. Finkelstein et al. (28) did not report comparisons of direct measurements and models estimates for  $\text{HNO}_3$ . In summary, the MLM significantly underestimated the  $\text{SO}_2$  deposition velocity, i.e., from about 25 to 50% for the deciduous forest setting and from about 10 to 50% for the mixed forest.

Meyers et al. (27) and Finkelstein et al. (28) did not compare modeled  $V_d$  with direct deposition measurements for particulate  $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ , or  $\text{NH}_4^+$ . The MLM calculates a deposition velocity for fine particles ( $<2.5 \mu\text{m}$  diameter) based on parameterizations by Wesely et al. (29, 30). As stated earlier,  $\text{SO}_4^{2-}$  particles are found in the fine fraction and in association with  $\text{NH}_4^+$  particles.  $\text{NO}_3^-$  may be found in the fine and coarse fractions with a significant portion in the latter depending on the site (31). The authors recognize that the deposition estimates provided may be biased low for  $\text{NO}_3^-$  particles and possibly for  $\text{NH}_4^+$  particles. Therefore, the estimated total deposition for nitrogen would also be biased low.

Recent studies in The Netherlands by Eriksen et al. (32) indicate that the deposition velocity of fine particles to forests was higher than estimated in previous studies. Also, the researchers found that coarse particles made a substantial contribution to the deposition to these forests. In this same study, they estimated particle fluxes to the forest using a net-doughfall technique. A comparison of the two approaches (inferential model minus throughfall technique)



FIGURE 2. Mean SO<sub>2</sub> emissions by state for 1990-1993 (1000 tons).

showed good agreement for total sulfur (SO<sub>2</sub> + SO<sub>4</sub><sup>2-</sup>) (~2%) and NH<sub>3</sub>/NH<sub>4</sub><sup>+</sup> (~9%). However, the model calculations of gaseous, aerosol, and fog deposition of nitrogen species did not match the measurements. The authors attributed the discrepancy to the deposition of aerosol NO<sub>3</sub>.

Terrain effects in mountainous areas or areas that contain sharp contrasts in surfaces play an important role in the dry deposition of particles and gases. Methods evaluating dry deposition models used in these areas are not well-defined (33). A study of the CASTNet site near Charlotte, NC, compared the main site located in a valley with a satellite site located on a ridge top approximately 1000 m above. Higher concentrations and higher modeled  $V_d$  resulted in flux estimates 1.4, 2.8, and 4.4 times higher at the ridge top site for SO<sub>2</sub>, SO<sub>4</sub><sup>2-</sup>, and HNO<sub>3</sub>, respectively (16).

Brook et al. (34) studied the spatial variability in  $V_d$  due to differences in meteorological parameters measured concurrently but separated by small distances (500 m). Three sites with separate instrumentation systems were used in this study and operated from September 1994 to September 1995. The calculated hourly variability was defined as half of the difference between the maximum and the minimum values among the sites expressed as a percent of the three sites means. The point variability of hourly  $V_d$  was within ±40% for SO<sub>2</sub> and ±30% for SO<sub>4</sub><sup>2-</sup> and HNO<sub>3</sub>. The annual variability across the three sites was much less: ±10% for SO<sub>2</sub>, ±30% for SO<sub>4</sub><sup>2-</sup>, and ±40% for HNO<sub>3</sub>.

The MILM used in this study is considered an improvement over earlier versions of the model. The model is well-defined and has been evaluated for a limited number of vegetation types, terrain, and time periods. The model underestimates SO<sub>2</sub> dry deposition. Although the bias of the model is small for crops and grass, the bias is significant for forests. Overall, the MILM has a low average positive bias for HNO<sub>3</sub> (~10%); however, the model may overestimate or underestimate for any given comparison. These estimates of bias were based on comparison of 0.5-h values. Aggregated data, such as the annual fluxes that are used in this paper, would have lower uncertainties, but there is no evidence of a reduction in bias for the longer periods (34).

## Results and Discussion

**Emissions of Sulfur and Nitrogen.** Mean annual emissions of SO<sub>2</sub> for the periods 1990-1993 and 1997-2000 are shown by state in Figures 2 and 3. The states with the highest emissions of SO<sub>2</sub> are located in the Ohio River Valley. Other eastern states with high SO<sub>2</sub> emissions include Tennessee and Texas. The annual emissions of SO<sub>2</sub> in the 1990-1993 periods were greater than 1,000,000 tons from 7 short ton throughout the paper for these states. The New England states had the lowest SO<sub>2</sub> emission levels among eastern states for the time period. In the western United States, California and Arizona were the only states with mean annual SO<sub>2</sub> emissions greater than 200,000 tons for 1990 through 1993.

The CAAA required phase I stationary utility plants, which were large SO<sub>2</sub> emissions sources, to reduce emissions by the year 1995. Figure 3, which shows annual emissions of SO<sub>2</sub> for 1997-2000, indicates that the states that had the highest emissions in the 1990-1993 period (Ohio, Indiana, Pennsylvania, Kentucky, West Virginia, and Tennessee) achieved the highest emission decreases following the implementation of the phase I reductions. Ohio had the largest absolute and percent differences between the periods, 638,000 tons and 30%, respectively. States with SO<sub>2</sub> emission sources that were not involved in phase I reductions experienced smaller decreases.

**Annual emissions of NO<sub>x</sub>** (more than 95% NO and some NO<sub>2</sub>) by state for the periods 1990-1993 and 1997-2000 are shown in Figures 4 and 5, respectively. In the eastern United States, states with the highest NO<sub>x</sub> emissions were Ohio, Illinois, Indiana, New York, and Florida with emissions ranging from 900,000 to nearly 1,200,000 tons. Unlike emissions of SO<sub>2</sub>, emissions of NO<sub>x</sub> are more dispersed resulting from a combination of emissions from transportation, industrial, urban, and agricultural sources. Stationary source fuel combustion and transportation sources accounted for 65% of NO<sub>x</sub> emissions (10). In the western United States, California and Texas had the highest NO<sub>x</sub> emissions in the country with levels greater than 1,500 tons.

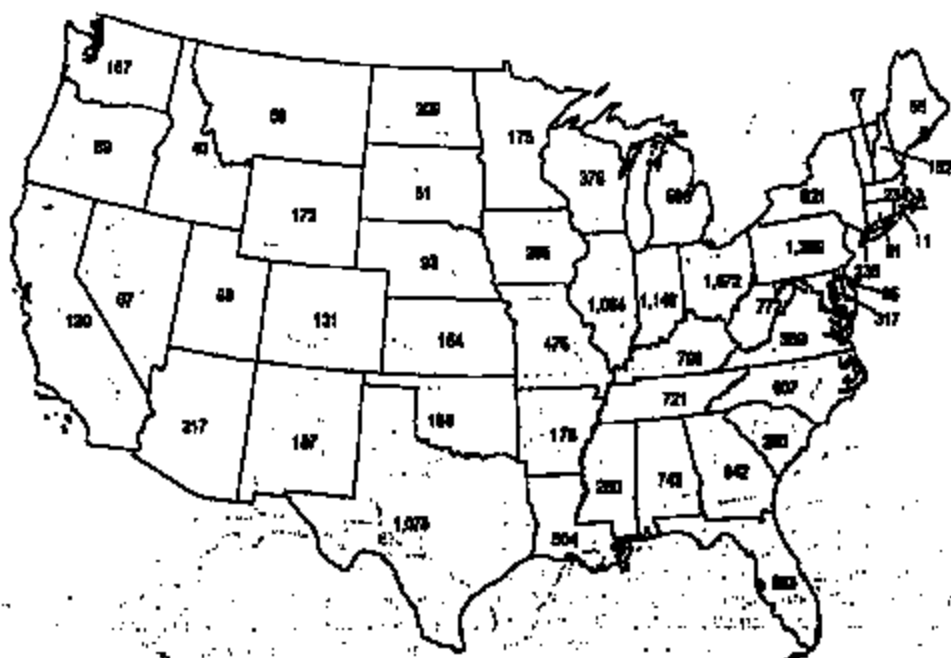


FIGURE 3. Mean SO<sub>2</sub> emissions by state for 1987-2000 (1000 tons).

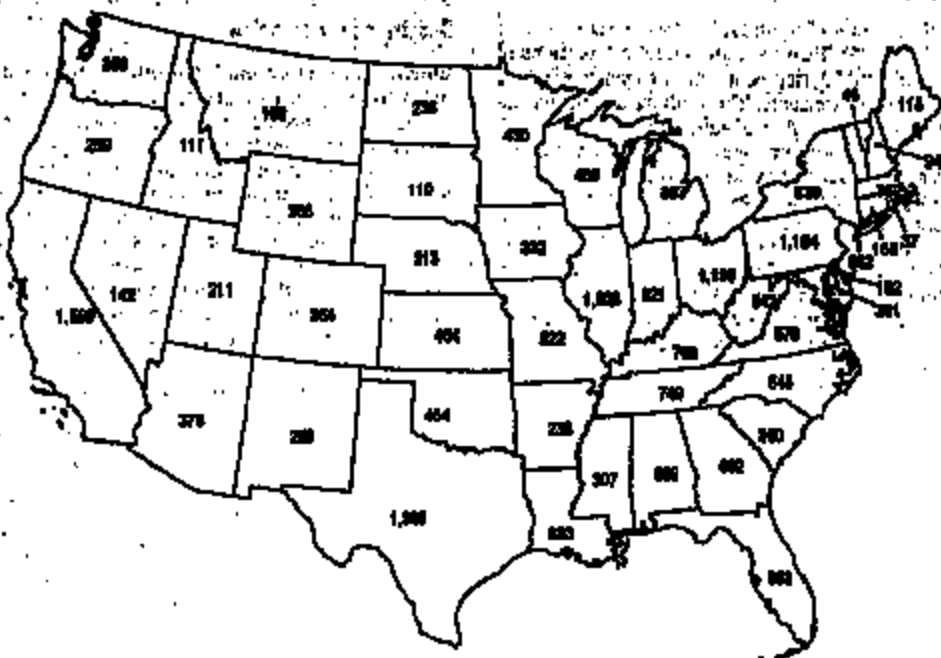


FIGURE 4. Mean NO<sub>2</sub> emissions by state for 1988-1993 (1000 tons).

The CAAA mandated emission rate limits for certain utilities emitting NO<sub>x</sub>, but did not institute a cap on NO<sub>x</sub> emissions. Figure 5 shows that, of the eastern states, only Pennsylvania had a significant decrease in NO<sub>x</sub> emissions from the period 1990-1993 to the period 1987-2000. For the remainder of the eastern states, NO<sub>x</sub> emissions either increased or decreased slightly. In the western United States, California showed a modest decrease in NO<sub>x</sub> emissions while the remainder of the states showed slight to modest increases.

**Dry Deposition of Sulfur and Nitrogen.** Dry Sulfur Deposition. The mean annual dry sulfur deposition (SO<sub>2</sub> +

SO<sub>3</sub><sup>2-</sup>) for the period 1990-1993 is shown in Figure 6. The dry deposition values are presented by site and represent a modeled estimate of the deposition within a 1 km radius of the site. Deposition estimates cannot necessarily be spatially extrapolated to larger regions. Dry sulfur deposition was highest in the eastern United States in the areas of the largest sources of SO<sub>2</sub> emissions. These included sites in the Ohio River Valley, Pennsylvania, and southern New York. The mean annual sulfur deposition was between 5 and 12 kg/ha in these areas. Dry sulfur deposition decreases significantly to less than 2 kg/ha in the upper Northeast and the Deep South.

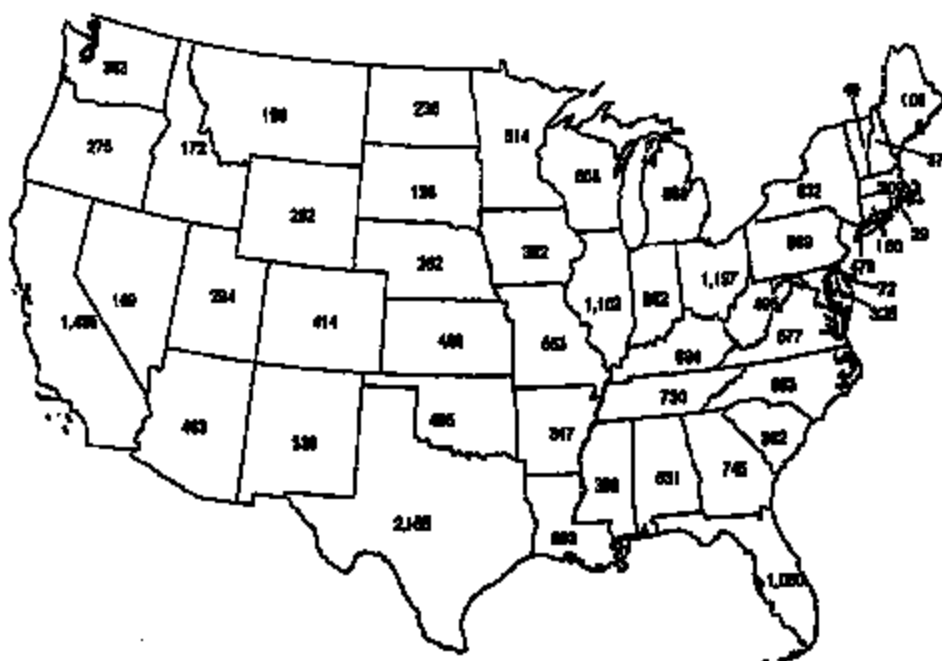


FIGURE 4. Mean NO<sub>x</sub> emissions by state for 1987-2000 (1000 tons).



FIGURE 5. Mean annual dry sulfur deposition (SO<sub>2</sub> and SO<sub>3</sub>) for 1980-1993 (kg/ha).

Dry sulfur deposition follows the pattern of SO<sub>2</sub> and SO<sub>4</sub><sup>2-</sup> concentrations found in the eastern United States (28). Dry deposition of sulfur in the western states is significantly lower than in the eastern states, again following the distribution of SO<sub>2</sub> and SO<sub>4</sub><sup>2-</sup> concentrations. All western sites had dry deposition values equal to or below 0.8 kg/ha for the period 1980-1993.

Figure 7 shows mean annual dry sulfur deposition for 1987-2000. Deposition was lower at all but one of the CASTNet sites in the eastern United States. Only the site at Coffeeville, MS, was slightly higher. Values were significantly

smaller from the Ohio River Valley to southern New York where decreases between 25% and 35% were typical. Dry sulfur deposition at western sites, which already had low deposition rates, did not show similar changes.

Several other studies have presented estimates of dry sulfur deposition. Clarke et al. (25) presented dry deposition estimates utilizing many of the same CASTNet sites used in the present study. Using an earlier version of the MIM, Clarke et al. considered annual mean SO<sub>2</sub> dry deposition for 1991. Deposition was higher in the Ohio River Valley, Pennsylvania, and southern New York with values ranging from 3 to 6 kg/

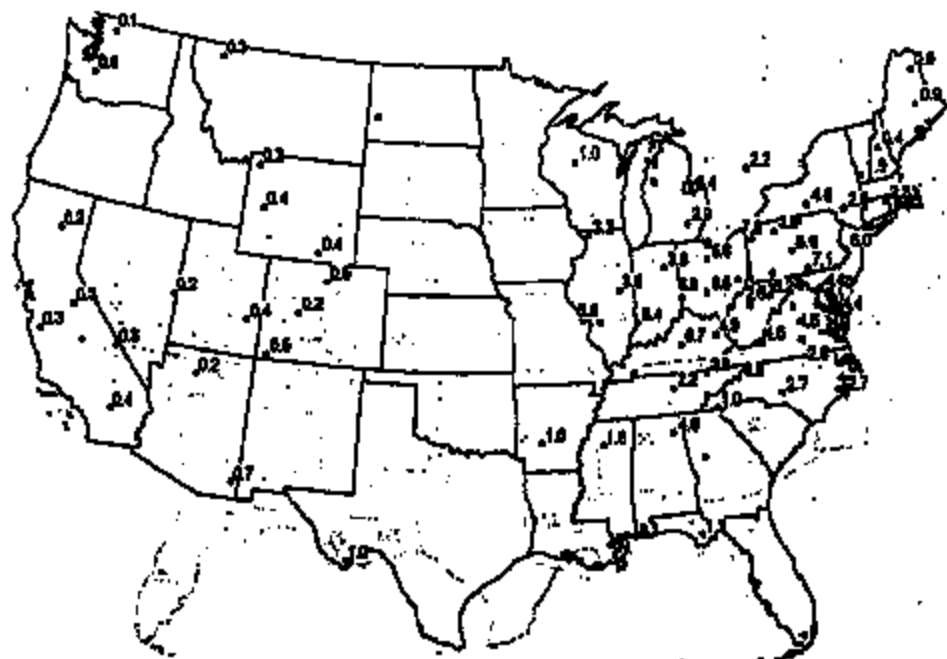


FIGURE 7. Mean annual dry sulfur deposition ( $\text{SO}_2$  and  $\text{SO}_4^{2-}$ ) for 1987-2000 ( $\text{kg/ha/yr}$ ) at collocated sites with AIR DATA. (1) 0.1, (2) 0.2, (3) 0.3, (4) 0.4, (5) 0.5, (6) 0.6, (7) 0.7, (8) 0.8, (9) 0.9.

TABLE 2. Comparison of CORE and CASTNet Dry Sulfur Deposition Estimates ( $\text{kg/ha}$ )

| CORE/satellite location      | CASTNet site | CORE value (1984-1987) | CASTNet value (1990-1993) |
|------------------------------|--------------|------------------------|---------------------------|
| Parola, GA                   | GAS183       | 5.90                   | 4.67                      |
| Shenandoah National Park, VA | SHN418       | 7.30                   | 5.90                      |
| State College, PA            | PSU108       | 4.90                   | 11.63                     |
| West Point, NY               | WPM104       | 5.50                   | 4.97                      |
| Whiteface Mountain, NY       | WFM106       | 2.80                   | 1.42                      |
| Bondville, IL                | BVL130       | 6.20                   | 4.88                      |

in ( $\text{SO}_2$  as sulfur) with a gradient of decreasing deposition away from this area, similar to the results shown by the current analysis for total dry sulfur deposition.

Meyers et al. (36) described dry deposition estimates of  $\text{SO}_2$ ,  $\text{SO}_4^{2-}$ , and total dry sulfur ( $\text{SO}_2 + \text{SO}_4^{2-}$ ) from the CORE/satellite network. Some of the CORE sites were at or close to CASTNet sites. Dry deposition was estimated at the CORE sites using the big leaf model (BLM), the predecessor of the MLM, for the years 1984-1987. For the collocated site pairs shown in Table 2, the CORE mean annual dry deposition estimates for sulfur for 1984-1987 were between 10% and 50% higher than the current estimates of mean annual dry deposition for the period 1990-1993. Changes in  $\text{SO}_2$  emissions between the two periods were also a significant factor as collocated pairs show similar percent differences in  $\text{SO}_2$  and  $\text{SO}_4^{2-}$  concentrations between CORE and CASTNet sites. For example, the mean annual  $\text{SO}_2$  concentration at Bondville, IL, decreased from  $10.44 \mu\text{g}/\text{m}^3$  for 1984-1987 to  $7.7 \mu\text{g}/\text{m}^3$  for 1990-1993, and the concentration at Whiteface Mountain decreased from  $4.67$  to  $3.55 \mu\text{g}/\text{m}^3$ .

Budger and Likens (37) estimated dry sulfur deposition at a forest near the CASTNet site CTH110 at Ithaca, NY, during 1992. Deposition was estimated using an inferential technique (BLM) and the throughfall (TF) plus stemflow (SF) technique. That analysis provided a unique comparison to the present analysis since the authors used the inferential BLM and the completely different TF-SF technique. Budger and Likens found using the TF + SF technique an estimated annual dry deposition of sulfur of  $6.0 \text{ kg/ha}$  for 1992 at the Ithaca site.

Using the BLM, the annual total dry sulfur deposition ( $\text{SO}_2$  and  $\text{SO}_4^{2-}$ ) for 1992 was  $4.5 \text{ kg/ha}$ . In the present analysis using the MLM, the estimated mean annual dry sulfur deposition for 1990-1993 was  $7.3 \text{ kg/ha}$ . Again, some of the difference is due to differences between the models, while some of the difference is attributable to lower  $\text{SO}_2$  concentrations at CTH110 during 1992. The annual mean concentration for 1992 was 6% lower than the average for the period 1990-1993.

**Nitrogen Deposition:** The mean annual dry nitrogen deposition ( $\text{HNO}_3 + \text{NO}_3^- + \text{NH}_4^+$ ) for the period 1990-1993 is shown in Figure 8. Although the pattern in the eastern United States is less distinct for dry nitrogen deposition as compared to dry sulfur deposition, the highest mean dry depositions were again in the Ohio River Valley where two sites had values greater than  $9.5 \text{ kg/ha}$ . Dry nitrogen deposition values were also high at the higher elevation sites in Virginia. With the exception of the site at Sand Mountain, AL, estimates at southeastern sites were lower than other areas in the eastern United States. Values were again the lowest in New England and in the western United States where mean dry nitrogen deposition was less than  $1.2 \text{ kg/ha}$  for the period 1990-1993.

Figure 8 shows mean annual dry nitrogen deposition for 1987-2000. Values at most sites are very similar to mean deposition estimates for the period 1990-1993. The southeastern sites are the exception in that they show increases between 10% and 45% between the two periods. The addition



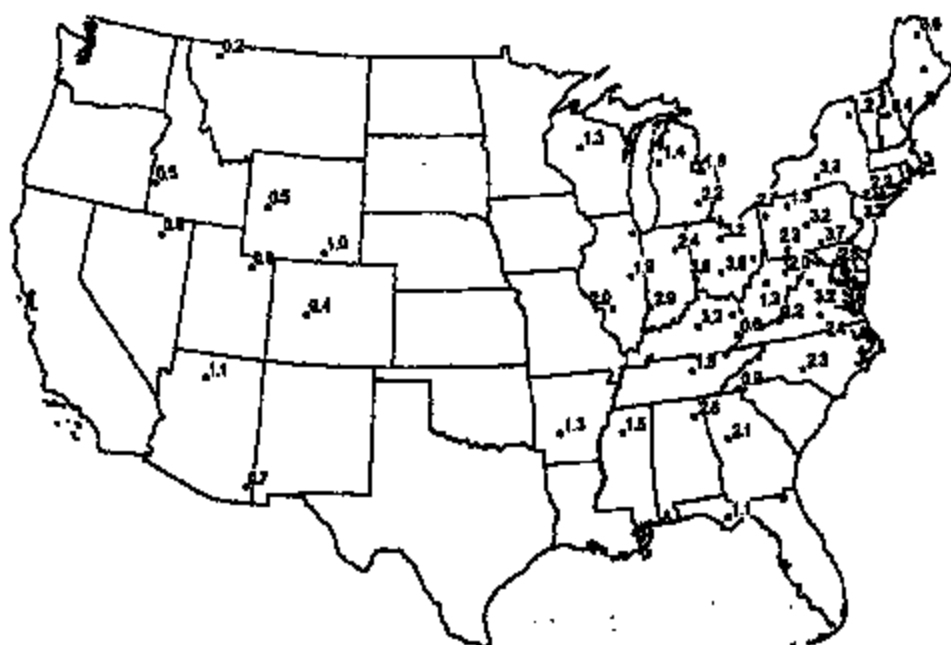


FIGURE 6. Mean annual dry nitrogen ( $\text{HNO}_3 + \text{NO}_3^- + \text{NH}_4^+$ ) for 1990-1993 (kg/ha).



FIGURE 7. Mean annual dry nitrogen ( $\text{HNO}_3 + \text{NO}_3^- + \text{NH}_4^+$ ) for 1987-1993 (kg/ha).

of CASTNet sites for the 1987-2000 period show the elevated levels of dry nitrogen deposition in southern California. For example, at Joshua Tree National Monument, the mean dry deposition was 3.2 kg/ha, which is among the highest three values for the period.

The Clarke et al. (35) analysis of CASTNet data from 1991 indicated the same pattern for one of the dry deposition constituents,  $\text{HNO}_3$ , as does the current analysis for nitrogen. Clarke et al. found a number of sites in the Midwest and Mid-Atlantic states with a mean annual  $\text{HNO}_3$  deposition of

2-3 kg/ha ( $\text{HNO}_3$  as N). In the South, annual  $\text{HNO}_3$  deposition was in the range of 1-2 kg/ha ( $\text{HNO}_3$  as N). For states on the periphery of CASTNet such as Arkansas, Maine, and Florida, Clarke et al. found  $\text{HNO}_3$  deposition in the range of 0.2-0.4 kg/ha ( $\text{HNO}_3$  as N).

Meyers et al. (36) found from their analysis of mean annual dry nitrogen deposition that the differences between the CORE/satellite estimates for 1988-89 and the current estimates for the period 1990-1993 were between 0 and 57%. Values for the collocated site pairs are shown in Table 3. Part

TABLE 3. Comparison of CORE and CASTNet Dry Nitrogen Deposition Estimates (kg/ha)

| CORE/site location           | CASTNet site | CORE value (1994-1997) | CASTNet value (1990-1993) |
|------------------------------|--------------|------------------------|---------------------------|
| Panola, GA                   | GAS153       | 2.14                   | 2.08                      |
| Shenandoah National Park, VA | SHN418       | 2.04                   | 3.25                      |
| State College, PA            | PSU100       | 2.74                   | 3.26                      |
| West Point, NY               | WPS104       | 3.05                   | 2.32                      |
| Whiteface Mountain, NY       | WPM108       | 1.54                   | 1.24                      |
| Bondville, IL                | BVL130       | 3.04                   | 1.07                      |

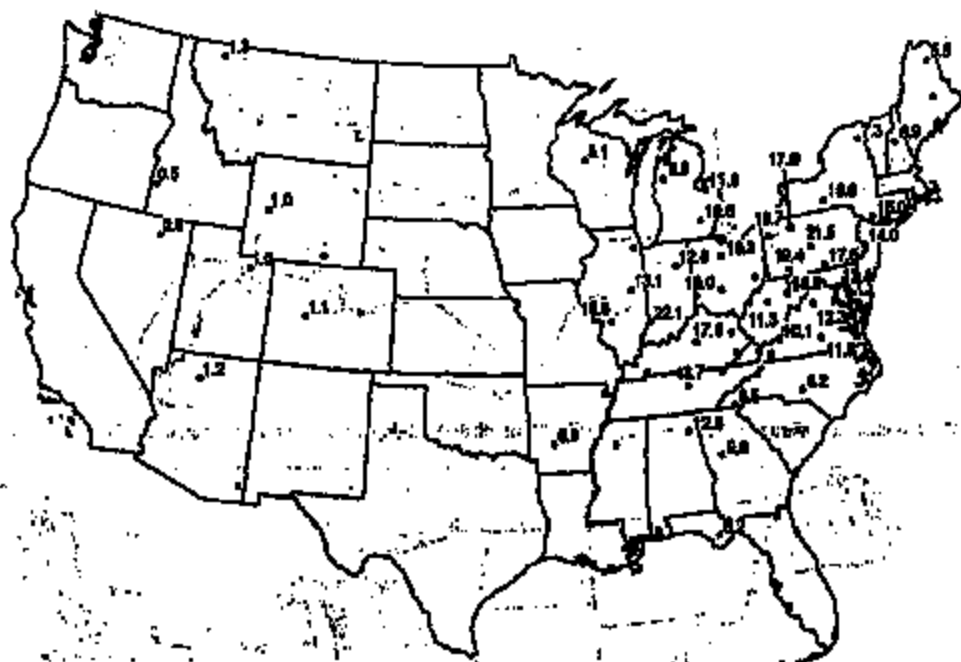


FIGURE 10. Mean annual total sulfur deposition (dry + wet) for 1990-1993 (kg/ha).

of the difference is due to the CORE estimates of nitrogen deposition not including  $\text{NH}_4^+$ , which may account for as much as 25% of the total nitrogen value.

Borer and Likens (37) found, using the TF + SF technique, an estimated annual dry deposition of nitrogen of 3.2 kg/ha for 1992 at the Ithaca, NY, site. Using the ELM, the annual nitrogen dry deposition value ( $\text{HNO}_3$ ,  $\text{NO}_3^-$ , and  $\text{NH}_4^+$ ) was 3.6 kg/ha. In the present analysis using the MLM, the estimated mean nitrogen dry deposition for 1990-1993 was determined to be 3.3 kg/ha.

**Total Sulfur and Nitrogen Deposition.** *Total Sulfur Deposition.* The mean annual total sulfur deposition for the period 1990-1993 is shown in Figure 10. Total sulfur deposition is defined as the sum of the dry component ( $\text{SO}_2$  and  $\text{SO}_4^{2-}$  particles) and wet component ( $\text{SO}_4^{2-}$  in precipitation) as sulfur. Total sulfur deposition in the east was highest in areas of highest  $\text{SO}_2$  emissions. CASTNet sites in the Ohio River Valley had mean total sulfur depositions between 15 and 22 kg/ha. CASTNet sites in Pennsylvania, southern New York, and West Virginia also had total sulfur deposition greater than 15 kg/ha. Sites away from the major  $\text{SO}_2$  emission sources had values between 5 and 10 kg/ha. In the western United States, the mean annual total sulfur depositions for the period 1990-1993 were between 1.2 and 2.4 kg/ha.

Figure 11 shows total sulfur deposition for 1987-2000. As with dry sulfur deposition, appreciable decreases are apparent throughout the eastern United States and in particular for sites along the Ohio River Valley. For the second period studied, values for these sites ranged from around 12 to 17

kg/ha with percent decreases as compared to 1990-1993 values of 16-25%. Sites in the western United States showed smaller decreases.

**Total Nitrogen Deposition.** The mean annual total nitrogen deposition, dry ( $\text{HNO}_3$  and  $\text{NO}_3^-$  and  $\text{NH}_4^+$  particles) plus wet ( $\text{NO}_3^-$  and  $\text{NH}_4^+$  in precipitation), for the period 1990 through 1993 is shown in Figure 12. In the eastern United States, the CASTNet site with the highest total nitrogen deposition was Lykens, OH, at 11.3 kg/ha. Sites located in the area from Illinois through southern New York (including Michigan) all had values above 8 kg/ha. The CASTNet site at Ashland, ME, had the lowest level in the eastern United States at 3.6 kg/ha. Mean annual total nitrogen deposition in the western United States was significantly lower than deposition estimates for the eastern states.

As with dry nitrogen deposition, little change occurred in mean annual total nitrogen deposition between the periods 1990-1993 and 1987-2000. As shown by Figure 13, values remained at similar levels throughout the Midwest and the Northeast. Some sites had small increases while others showed small decreases. Sand Mountain, AL, again showed an increase of greater than 12% between the time periods.

**Summary of CASTNet Measurements.** Although CASTNet sites in the eastern United States are rural, none are remote, and most are subject to the influence of relatively nearby sources of  $\text{SO}_2$  and  $\text{NO}_x$  emissions or the transport of sulfur and nitrogen pollutants from a variety of sources. Alternately, CASTNet sites in the western United States are remote, and many are in pristine areas. Table 4 contrasts sulfur and

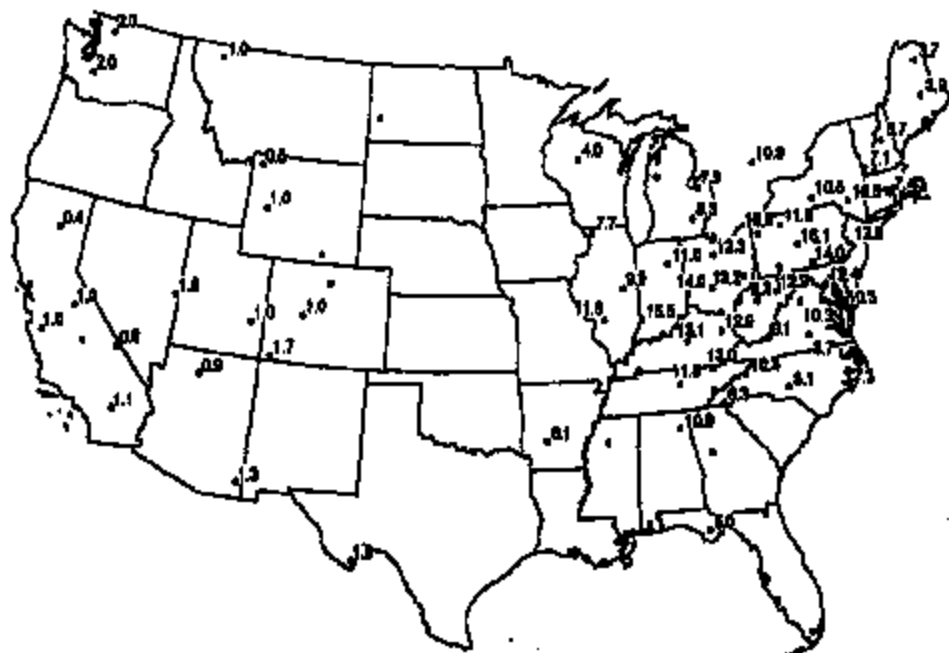


FIGURE 11. Mean annual total sulfur deposition (dry + wet) for 1987-2000 (kg/ha).

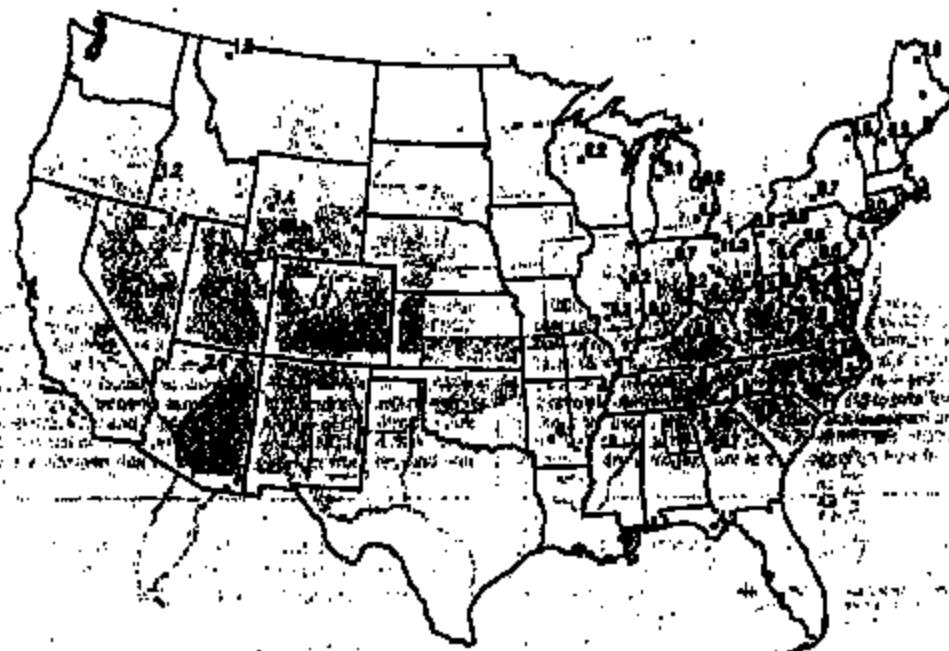


FIGURE 12. Mean annual total nitrogen deposition (dry + wet) for 1990-1993 (kg/ha).

nitrogen species, specifically their concentrations, deposition velocities, dry deposition, and wet deposition for the period 1990-1993 while Table 5 contains the same information for the period 1987-2000. Four-year means for each site were calculated, and a mean of the site-means for sites in the east and west were then calculated. In order for the mean deposition values for a site to be included in the tables, the site must have valid deposition values for 2 of the 4 yr in both periods. On the basis of these criteria, 30 eastern sites and 4 western sites were used to calculate the values in these tables.

As shown in previous discussions, dry deposition and wet deposition are significantly higher in the east as compared to the west. Tables 4 and 5 show that this is due to higher atmospheric concentrations in the east because of the closer proximity of many eastern sites to emission sources. The density of sources is also higher in the eastern United States. Examination of the ratio of airborne sulfur present as  $\text{SO}_2$  to total airborne sulfur ( $\text{RSO}_2$ ) shows that a much higher percentage of the total sulfur in the east is from  $\text{SO}_2$ , where greater numbers of large  $\text{SO}_2$  emitters operate.

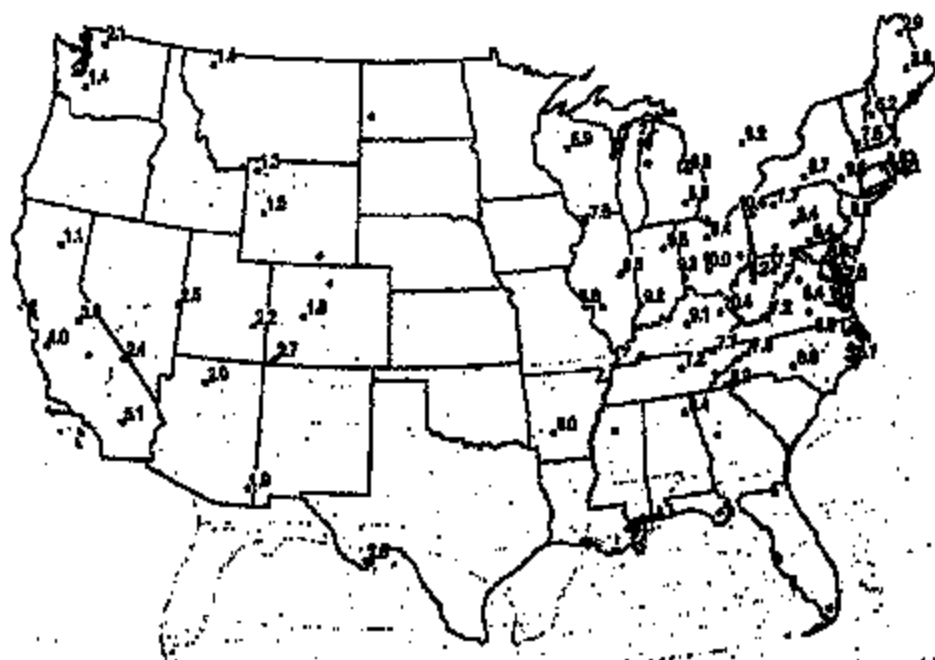


FIGURE 13. Mean annual total nitrogen deposition (dry + wet) for 1990-1993 and 1997-2000 (kg N/ha/yr).

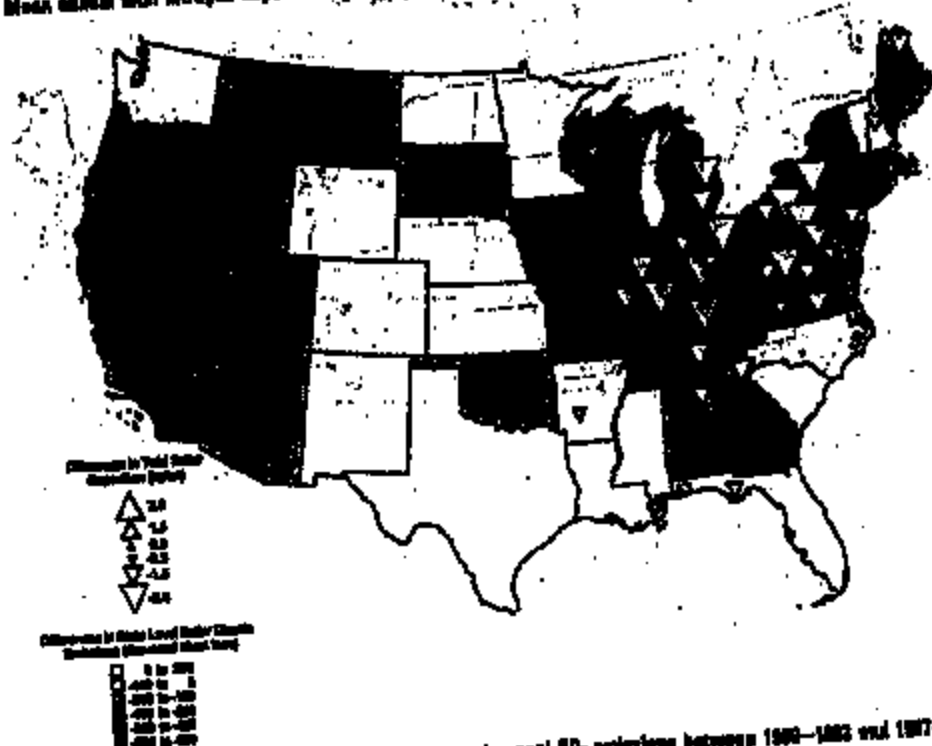


FIGURE 14. Differences in 4-yr mean total sulfur deposition and annual  $\text{SO}_2$  emissions between 1990-1993 and 1997-2000.

The dry deposition of  $\text{SO}_2$  and  $\text{HNO}_3$  is the dominant component of dry sulfur deposition and dry nitrogen deposition, respectively, in both the eastern and the western United States. In the east,  $\text{SO}_2$  is the largest percentage of the total dry sulfur deposition during both time periods. The percentage is lower in the west.  $\text{HNO}_3$  is the major contributor to total dry nitrogen deposition throughout the United States in both time periods. Other nitrogen-containing compounds including nitrogen dioxide ( $\text{NO}_2$ ), peroxyacetyl nitrate (PAN),

and  $\text{NH}_3$  may contribute to the total nitrogen at some sites. Because CASTNet does not measure these compounds, the total nitrogen estimate provided may be biased low.

Dry deposition is a significant portion of total deposition. Dry sulfur deposition in the east was approximately 36% and 37% of total deposition (wet + dry) for the periods 1990-1993 and 1997-2000, respectively. In the west, dry sulfur deposition was approximately 27% and 28% of total sulfur deposition for the same periods. The differences in percent-

TABLE 4. Summary of CASTNet Measurements for 1989-1993

| region | Concentrations ( $\mu\text{g}/\text{m}^3$ ) |                              |                           |                          |                           |
|--------|---------------------------------------------|------------------------------|---------------------------|--------------------------|---------------------------|
|        | $\text{SO}_2$                               | $\text{SO}_4^{2-}$           | $\text{NO}_3^-$           | $\text{HNO}_3$           | $\text{NH}_4^+$           |
| east   | 8.09                                        | 5.27                         | 1.09                      | 2.05                     | 1.75                      |
| west   | 0.85                                        | 0.81                         | 0.20                      | 0.45                     | 0.28                      |
| region | $\text{SO}_2$<br>(as S)                     | $\text{SO}_4^{2-}$<br>(as S) | $\text{NO}_3^-$<br>(as N) | $\text{HNO}_3$<br>(as N) | $\text{NH}_4^+$<br>(as N) |
|        |                                             |                              |                           |                          |                           |
| east   | 4.35                                        | 1.76                         | 0.25                      | 0.45                     | 1.37                      |
| west   | 0.28                                        | 0.27                         | 0.05                      | 0.10                     | 0.22                      |
| region | Deposition Velocity ( $\text{m}/\text{s}$ ) |                              |                           | particles                |                           |
|        | $\text{SO}_2$                               | $\text{HNO}_3$               |                           |                          |                           |
| east   | 0.34                                        | 1.18                         |                           | 0.10                     |                           |
| west   | 0.24                                        | 1.28                         |                           | 0.12                     |                           |
| region | Dry Deposition ( $\text{kg}/\text{ha}$ )    |                              |                           |                          |                           |
|        | $\text{SO}_2$                               | $\text{SO}_4^{2-}$           | $\text{NO}_3^-$           | $\text{HNO}_3$           | $\text{NH}_4^+$           |
| east   | 9.88                                        | 1.73                         | 0.29                      | 8.02                     | 0.80                      |
| west   | 0.38                                        | 0.24                         | 0.08                      | 1.97                     | 0.12                      |
| region | $\text{SO}_2$<br>(as S)                     | $\text{SO}_4^{2-}$<br>(as S) | $\text{NO}_3^-$<br>(as N) | $\text{HNO}_3$<br>(as N) | $\text{NH}_4^+$<br>(as N) |
|        |                                             |                              |                           |                          |                           |
| east   | 4.84                                        | 0.85                         | 0.07                      | 1.78                     | 0.43                      |
| west   | 0.19                                        | 0.11                         | 0.02                      | 0.44                     | 0.08                      |
| region | Wet Deposition ( $\text{kg}/\text{ha}$ )    |                              |                           | $\text{NH}_4^+$          |                           |
|        | $\text{SO}_4^{2-}$                          | $\text{NO}_3^-$              |                           |                          |                           |
| east   | 23.85                                       | 14.82                        |                           | 2.84                     |                           |
| west   | 2.54                                        | 3.21                         |                           | 0.69                     |                           |
| region | $\text{SO}_4^{2-}$<br>(as S)                | $\text{NO}_3^-$<br>(as N)    | $\text{NH}_4^+$<br>(as N) |                          |                           |
|        |                                             |                              |                           |                          |                           |
| east   | 7.06                                        | 3.35                         | 2.20                      |                          |                           |
| west   | 0.98                                        | 0.73                         | 0.49                      |                          |                           |

Selected Ratios

| region | $\text{HNO}_3/\text{NO}_3^-$ | $\text{NH}_4^+/\text{NO}_3^-$ | $\text{HNO}_3/\text{NH}_4^+$ | $\text{HNO}_3/\text{NO}_3^- + \text{HNO}_3/\text{NH}_4^+$ | $\text{HNO}_3/\text{NO}_3^- + \text{HNO}_3/\text{NH}_4^+ + \text{HNO}_3/\text{NO}_3^-$ |
|--------|------------------------------|-------------------------------|------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------|
| east   | 0.890                        | 0.846                         | 0.375                        | 0.427                                                     | 0.771                                                                                  |
| west   | 0.390                        | 0.814                         | 0.289                        | 0.480                                                     | 0.788                                                                                  |

Notes:  $\text{HNO}_3/\text{NO}_3^-$  = ratio of  $\text{HNO}_3$  to  $\text{NO}_3^-$  in total dry deposition;  $\text{NH}_4^+/\text{NO}_3^-$  = ratio of  $\text{NH}_4^+$  to  $\text{NO}_3^-$  in total dry deposition;  $\text{HNO}_3/\text{NH}_4^+$  = ratio of  $\text{HNO}_3$  to  $\text{NH}_4^+$  in total dry deposition;  $\text{HNO}_3/\text{NO}_3^- + \text{HNO}_3/\text{NH}_4^+$  = ratio of  $\text{HNO}_3$  to the sum of  $\text{NO}_3^-$  and  $\text{NH}_4^+$  in total dry deposition;  $\text{HNO}_3/\text{NO}_3^- + \text{HNO}_3/\text{NH}_4^+ + \text{HNO}_3/\text{NO}_3^-$  = ratio of  $\text{HNO}_3$  to the sum of  $\text{NO}_3^-$ ,  $\text{NH}_4^+$ , and  $\text{HNO}_3$  in total dry deposition.

ages reflect the proximity of the eastern sites to emission sources. Dry nitrogen deposition in the east was 28% (1989-1993) and 30% (1987-2000) of total deposition and was very similar in the west.

Other studies have examined the percentage of total deposition from the dry component. Prater et al. (35) conducted a deposition study in Minnesota from 1991 through 1993 at a number of rural and urban sites. They found that dry sulfur deposition ranged from approximately 10% to 29% of the total sulfur deposition depending on the site and year. They reported that dry nitrogen deposition ranged from 8% to 21% of the total nitrogen deposition. Although the dry nitrogen deposition component is lower than those shown by the current results, both the percentages from dry deposition for sulfur and nitrogen roughly match with percentages found for western sites where large emission sources are largely absent. Lindberg and Lovett (38) and Lovett and Lindberg (40) estimated dry and total deposition

TABLE 5. Summary of CASTNet Measurements for 1987-2000

| region | Concentrations ( $\mu\text{g}/\text{m}^3$ ) |                              |                           |                          |                           |
|--------|---------------------------------------------|------------------------------|---------------------------|--------------------------|---------------------------|
|        | $\text{SO}_2$                               | $\text{SO}_4^{2-}$           | $\text{NO}_3^-$           | $\text{HNO}_3$           | $\text{NH}_4^+$           |
| east   | 8.48                                        | 4.35                         | 1.18                      | 2.01                     | 1.87                      |
| west   | 0.48                                        | 0.72                         | 0.20                      | 0.80                     | 0.28                      |
| region | $\text{SO}_2$<br>(as S)                     | $\text{SO}_4^{2-}$<br>(as S) | $\text{NO}_3^-$<br>(as N) | $\text{HNO}_3$<br>(as N) | $\text{NH}_4^+$<br>(as N) |
|        |                                             |                              |                           |                          |                           |
| east   | 3.28                                        | 1.45                         | 0.27                      | 0.45                     | 1.22                      |
| west   | 0.23                                        | 0.24                         | 0.05                      | 0.11                     | 0.20                      |
| region | Deposition Velocity ( $\text{m}/\text{s}$ ) |                              |                           | particles                |                           |
|        | $\text{SO}_2$                               | $\text{HNO}_3$               |                           |                          |                           |
| east   | 0.34                                        | 1.25                         |                           | 0.10                     |                           |
| west   | 0.25                                        | 1.27                         |                           | 0.12                     |                           |
| region | Dry Deposition ( $\text{kg}/\text{ha}$ )    |                              |                           |                          |                           |
|        | $\text{SO}_2$                               | $\text{SO}_4^{2-}$           | $\text{NO}_3^-$           | $\text{HNO}_3$           | $\text{NH}_4^+$           |
| east   | 7.17                                        | 1.52                         | 0.34                      | 8.32                     | 0.83                      |
| west   | 0.35                                        | 0.29                         | 0.08                      | 2.02                     | 0.10                      |
| region | $\text{SO}_2$<br>(as S)                     | $\text{SO}_4^{2-}$<br>(as S) | $\text{NO}_3^-$<br>(as N) | $\text{HNO}_3$<br>(as N) | $\text{NH}_4^+$<br>(as N) |
|        |                                             |                              |                           |                          |                           |
| east   | 3.59                                        | 0.51                         | 0.08                      | 1.85                     | 0.41                      |
| west   | 0.17                                        | 0.10                         | 0.02                      | 0.45                     | 0.08                      |
| region | Wet Deposition ( $\text{kg}/\text{ha}$ )    |                              |                           | $\text{NH}_4^+$          |                           |
|        | $\text{SO}_4^{2-}$                          | $\text{NO}_3^-$              |                           |                          |                           |
| east   | 15.89                                       | 13.88                        |                           | 2.78                     |                           |
| west   | 2.07                                        | 3.23                         |                           | 0.54                     |                           |
| region | $\text{SO}_4^{2-}$<br>(as S)                | $\text{NO}_3^-$<br>(as N)    | $\text{NH}_4^+$<br>(as N) |                          |                           |
|        |                                             |                              |                           |                          |                           |
| east   | 0.21                                        | 3.75                         | 2.17                      |                          |                           |
| west   | 0.86                                        | 0.73                         | 0.43                      |                          |                           |

Selected Ratios

| region | $\text{HNO}_3/\text{NO}_3^-$ | $\text{NH}_4^+/\text{NO}_3^-$ | $\text{HNO}_3/\text{NH}_4^+$ | $\text{HNO}_3/\text{NO}_3^- + \text{HNO}_3/\text{NH}_4^+$ | $\text{HNO}_3/\text{NO}_3^- + \text{HNO}_3/\text{NH}_4^+ + \text{HNO}_3/\text{NO}_3^-$ |
|--------|------------------------------|-------------------------------|------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------|
| east   | 0.890                        | 0.846                         | 0.375                        | 0.427                                                     | 0.771                                                                                  |
| west   | 0.390                        | 0.814                         | 0.289                        | 0.480                                                     | 0.788                                                                                  |

Notes:  $\text{HNO}_3/\text{NO}_3^-$  = ratio of  $\text{HNO}_3$  to  $\text{NO}_3^-$  in total dry deposition;  $\text{NH}_4^+/\text{NO}_3^-$  = ratio of  $\text{NH}_4^+$  to  $\text{NO}_3^-$  in total dry deposition;  $\text{HNO}_3/\text{NH}_4^+$  = ratio of  $\text{HNO}_3$  to  $\text{NH}_4^+$  in total dry deposition;  $\text{HNO}_3/\text{NO}_3^- + \text{HNO}_3/\text{NH}_4^+$  = ratio of  $\text{HNO}_3$  to the sum of  $\text{NO}_3^-$  and  $\text{NH}_4^+$  in total dry deposition;  $\text{HNO}_3/\text{NO}_3^- + \text{HNO}_3/\text{NH}_4^+ + \text{HNO}_3/\text{NO}_3^-$  = ratio of  $\text{HNO}_3$  to the sum of  $\text{NO}_3^-$ ,  $\text{NH}_4^+$ , and  $\text{HNO}_3$  in total dry deposition.

Figure 14 compares changes in  $\text{SO}_2$  emissions with changes in total sulfur deposition. The differences shown are between the 1989-1993 and the 1987-2000 time periods. Changes in deposition are shown by graduated triangles with increases and decreases indicated by upward and downward

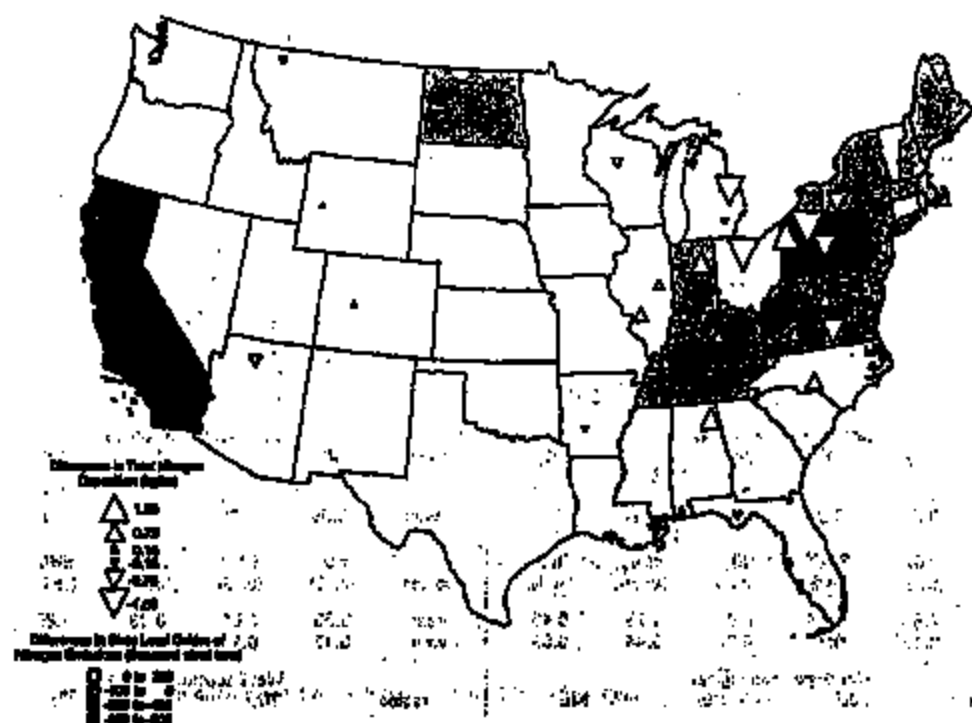


FIGURE 15. Differences in 4-yr mean total nitrogen deposition and annual  $\text{NO}_x$  emissions between 1990-1993 and 1997-2000.

pointing triangles, respectively. State-level differences in emissions are indicated by the shading of the state. Increases in emissions are designated by no shading (white). The figure shows that sulfur deposition at sites throughout the eastern United States has decreased significantly as have  $\text{SO}_2$  emissions, particularly throughout the Ohio River Valley where both deposition fluxes and emissions were highest during both time periods. Western sites decreased only slightly while emission levels were not as high and were not as dramatically affected by the implementation of phase I.

Figure 15 shows a similar type of comparison between  $\text{NO}_x$  emissions changes and total nitrogen deposition differences. Many states show increases in  $\text{NO}_x$  emissions, while Pennsylvania and California have decreases in emission levels. Different sites throughout the Ohio River Valley indicate large decreases and increases in nitrogen deposition within close proximity to one another.

CASTNet has operated since 1987. The network measures atmospheric concentrations of  $\text{SO}_2$ ,  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$ ,  $\text{HNO}_3$ , and  $\text{NH}_4^+$  along with meteorological variables. These data are used with an inferential model, the MIM, to provide estimates of dry deposition of sulfur ( $\text{SO}_2$ ,  $\text{SO}_4^{2-}$  particles) and nitrogen ( $\text{HNO}_3$ ,  $\text{NO}_3^-$  and  $\text{NH}_4^+$  particles) at a number of rural and remote sites in the eastern and western United States. Although it may be a significant source of nitrogen in some areas,  $\text{NH}_3$  is not measured in CASTNet and is not included as part of the total dry nitrogen. Dry deposition estimates for 1990-2000 were analyzed in this study as mean annual fluxes of two periods: 1990-1993 and 1997-2000. These periods were selected to reflect the implementation of phase I  $\text{SO}_2$  emission reductions in 1984-1995.

Sulfur deposition (dry + wet) in the east follows spatial patterns similar to that of sulfur emissions. The highest deposition levels are found in areas, such as from the Ohio River Valley to New York, with the highest  $\text{SO}_2$  emissions and associated high atmospheric concentrations. Eastern sites near the periphery of the network exhibit sulfur deposition fluxes comparable to remote areas in the west where

emissions are much lower. As with sulfur deposition, patterns of nitrogen deposition (dry + wet) in the east are similar to those of nitrogen emissions and concentrations. Nitrogen deposition does not have the distinct gradients found for sulfur as nitrogen emissions are more dispersed and originate from a number of different sources. Highest nitrogen deposition occurs near urban or agriculture areas.

In both the eastern and the western United States, the dry deposition of  $\text{SO}_2$  and  $\text{HNO}_3$  is the dominant component of dry sulfur deposition and dry nitrogen deposition, respectively. The dry component of total deposition is smaller than the wet component for both sulfur and nitrogen deposition. Percentages are similar for both 1990-1993 and 1997-2000.

Eastern CASTNet sites have experienced a significant decrease in sulfur deposition between the 4-yr periods 1990-1993 and 1997-2000, reflecting the CAAA phase I emission reductions. Sites in states with phase I utilities or near phase I utilities experienced a 25-30% decrease in sulfur deposition. CASTNet sites in states with lesser or no influence from phase I utilities experienced smaller decreases. Sulfur deposition at CASTNet sites in the western United States changed minimally from 1990-1993 to 1997-2000. The majority of eastern and western CASTNet sites experienced little change in nitrogen deposition between periods due to nitrogen emissions remaining relatively constant nationwide during the 10-yr period of study.

#### Acknowledgments

We acknowledge the dedication and resolve of the many individuals in and outside the program that have made CASTNet a success, and a special thanks goes to the site operators. The U.S. Environmental Protection Agency (EPA) through its Office of Research and Development and Office of Air and Radiation, and the Department of the Interior, National Park Service, has funded this research. This paper has been subjected to peer and administrative review and

has been approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation of use.

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ES011146G

# WARD'S ENGINE AND VEHICLE TECHNOLOGY UPDATE

Powertrain/Chassis/Electronics  
Design/Materials/Manufacturing

VOLUME 28, NUMBER 5 / MAY 1, 2002



## Underuse of additives: EPA failure?

CHICAGO — The question of whether oil companies are adequately treating U.S. gasoline with the proper additives designed to control fuel-injector, intake valve and combustion chamber deposits continues to stir debate among experts (see *WEVTU* — April 15, '02, p.1).

And other questions are surfacing, as well — what does the U.S. Clean Air Act call for, and is the Environmental Protection Agency

adequately carrying out the letter of the law? *WEVTU* is told by fuel industry sources that a whopping 85% of gasoline is under-treated — leaving only 15% adequately treated at 1,000 parts per million (ppm), while much of the rest is under-treated at 100 ppm. The situation leaves motorists on their own to choose among aftermarket fuel additives or to seek expensive repair-shop de-

CONTINUED ON PAGE 3

## Fuel additives not adequate, say many

CONTINUED FROM PAGE ONE  
port discount services.

Loren Beard, DelmarChrysler AG's senior manager-Energy Programs & Environmental Energy Planning, says the root cause is the EPA's failure to adequately carry out Section 211L of the Clean Air Act, which mandates use of deposit-control additives in gasoline.

Beard says not only is much of the U.S. gasoline supply under-treated, but the problem has become worse in recent years due to gasoline molecular cutbacks in the use of needed additives. He also says some of the widely used additives contribute to the formation of combustion chamber deposits, rather than reduce them.

Another fuels engineer says that among the commonly used deposit control additives are polyisobutylene, polyisobutylene succinimide and polyisobutylene phenyl oxides, all of which have the unfortunate characteristic of causing intake valve stem "stickiness."

In order to offset this, materials called fluidizers are combined with the additive, but these result in increased combustion chamber deposits.

Among the more effective gasoline deposit-control additives is said to be polyetheramines, which does triple duty by controlling fuel-injector, intake valve and combustion chamber deposits without fluidizers and their related problems.

However this material is more costly — yet when used at a good dosage level is said to cost well less than one cent per gallon of treated gasoline.

Although the marketers of certain gasoline brands advertise that their fuel is formulated to solve the problem, John Cabanias, director of environment and energy for the Assoc. of International Auto Manufacturers, says a number of the AIAM's members report recent increases in fuel-injector plugging but lack good data on the national picture.

Argues EPA mechanical engineer Jeffrey Herzog, who was involved in drafting the EPA's deposit-control regulation: "Drivability concerns related to deposit formation (that are) linked to emissions performance are not under our (EPA) charter."

But some industry fuel engineers insist deposit levels severe enough to cause drivability problems have a significant impact on emissions, which should come within EPA's assignment, they say.

A spokesman for the American Petroleum Institute says the group does not have a position regarding adequate levels of gasoline deposit-control additives at this time. AMOCO (now BP) in the Chicago area did not return calls requesting comment on the additive issue. □

— Bob Brooks

May 1, 2002



# Gasoline additives issue goes to Washington

Growing concerns about gasoline deposit-control additives will be addressed by the Environmental Protection Agency, Ward's has learned. A response now is being developed under the direction of Robin Moran, Center Director, EPA Assessment and Standards Div., Ann Arbor, MI, and David Kortum in the EPA's Washington office.

Following WBTVU's initial story regarding the issue (see WBTVU — April 15, '02, p.2), various interests, including the AAA Motor Club office in St. Louis, MO, have voiced concern. Mike Right, AAA Missouri vice president, says in an e-mail to the EPA that AAA Missouri's automotive technicians have noticed an increasing number of vehicles that are experiencing fuel-related problems such as increases in carbon deposits in EGR (exhaust gas recirculation) passages and on intake valves and in fuel injectors.

"What, if anything, can be done to insure that consumers are getting the appropriate quality fuel for their vehicles at the pump?" he asks in his message.

An engineer at a major OE supplier of engine components tells Ward's there is no question about the growth in problems he believes may be related to the gasoline additive shortfall situation. This could explain increasing incidences of stalling EGRs, as well as other problems, he adds.

James Haldeman, professor of automotive technology at Sinclair Community College in Dayton, OH, and author of numerous

## FUEL/EMISSIONS

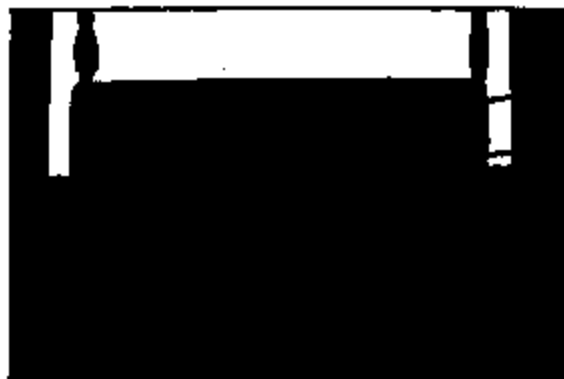
Some gasoline refiners advertise that certain grades of gasoline contain additives that can control deposits or even clean engines with existing deposits.

auto-repair books, says, combustion chamber deposits can increase EGR passage clogging.

"But if suitable additives are in the fuel, they will prevent the carbon particles from adhering to each other, which will prevent this clogging," he says. "Carbon attracts carbon, but a good dispersant additive such as Techtron (polyetheramine) prevents this from occurring and helps separate carbon particles that have combined."

The importance of this is illustrated by vehicle onboard diagnostic (OBD) emissions-test failure data reported by the State of Wisconsin for a period in 2001. The state's data show that after oxygen-sensor and air-fuel faults, EGR is the next most frequently recorded fault.

In an effort to move analysis of the problem and its solution forward, both auto maker trade associations, the Alliance of Automobile Manufacturers and the Assoc. of International Auto Manufacturers, say they are seeking to arrange member meetings with the EPA on the issue and plan to monitor developments.



It has yet to be determined how much time the EPA staff will need to complete its fact-finding and prepare a formal response, or whether the EPA will call for the use of "cleaner" additive packages in all grades of gasoline to offset the consequences of reported widespread underuse of additives and underuse of additives that do not contribute to combustion chamber deposits.

The American Petroleum Institute won't comment on the controversy, saying that the selection and dosage of gasoline additives for each brand and grade of fuel is decided by its member oil companies.

BP/Amoco, for one, says all grades of Amoco, BP and Arco gasoline contain full deposit-control additives that do not contribute to combustion chamber deposits — and that its Amoco Ultimate has sufficient additive to clean injectors and intake valves. □

— Bob Brooks

## DC may develop truck as next fuel-cell vehicle

CONTINUED FROM PAGE ONE

methanol, which was not readily available at all stops, so drop shipments were made to some points. The FCV was refueled every 300 miles (483 km) and averaged a gasoline equivalent of 40 mpg (5.9L/100 km) for the journey. Methanex supplied the methanol.

The auto maker has tested a series of FCV concepts in its NRECAR (for New Electric Car) program that dates back to 1994.

NRECAR 2 used compressed hydrogen. NRECAR 3 showed it was possible to reform methanol. NRECAR 4 used liquid hydrogen and NRECAR 4A switched back to compressed hydrogen. NRECAR 5 and the Jeep Commander 2 concepts convert methanol onboard.

Before the merger, the former Chrysler Corp. looked into onboard reforming of gasoline. Asked about the use of a gasoline reformer by General Motors Corp. and Toyota Motor Corp. today, Panik says he is pretty sure about that fuel. Although a gas-to-liquid infrastructure exists, the low-sulfur gasoline needed to supply hydrogen to fuel cells is not yet available, he says.

Panik, who also is outgoing chairman of

the CFCP, says NRECAR 5 is the last fuel cell concept car DC will make. The next generation will be production cars leased to customers. They will be heavily subsidized because the low-volume vehicles would otherwise be prohibitively expensive.

Distribution of the second-generation FCVs still will be limited, and lease rates also will be heavily subsidized.

But Panik says there will be no subsidies for the production vehicles sold to all corners in 2010. "The volumes are too large to subsidize."

FCVs haven't yet demonstrated the durability of internal-combustion (IC)-powered vehicles, admits Panik. Fuel cells for buses currently have a life expectancy of only 50,000 miles (80,465 km), which is not competitive with diesel engines. His target is to double life expectancy of fuel cells by 2007.

Although NRECAR 5 achieved solid results, the tiny A-Class already is a high-mileage car. The gasoline-engine model gets 34 mpg (6.9L/100 km) while the diesel achieves 51 mpg (4.6L/100 km), which is far more efficient than the current NRECAR 5 posted on its coast-to-coast trip.

Panik says he had a deadline for locking-

in the design of the NRECAR 5, and had the decision been made later, he might have selected a larger, less fuel-efficient vehicle such as an SUV or pickup for the fuel cell concept vehicle. He concedes the choice of a subcompact A-Class does not show the full advantages of fuel cell operation.

Despite the relatively low fuel economy of the NRECAR 5, Panik notes that even with methanol the car is a "very green" performer. He says there are no particulates, nitrogen oxide or carbon dioxide emissions. Carbon monoxide emissions are less than half those from an IC engine. That gives fuel cells a great environmental advantage over IC engines.

He also notes fuel cells are almost twice as efficient, attaining an efficiency of about 46% vs. 26% for an IC engine.

Wolfgang Weim, the team leader based at the CFCP headquarters in Sacramento, CA, says the fuel-cell system held up perfectly. Two bolts, four fuel filters and a plastic water bottle had to be changed. Otherwise, a trailer filled with spare parts that followed the NRECAR 5 went unused. □

— Herb Shuldyer

IAC Task Force Sign In 12/13/01

|               |                |            |          |
|---------------|----------------|------------|----------|
| Adam Davis    | VEE            | x26698     | ADAVES   |
| BOB WETTACH   | Comp B-INTAKES | x21695     | AWETTACH |
| Carl Slindee  | Hitchi         | 2484726748 |          |
| BILL KAISER   | RESEARCH       | x55318     | EKAISER  |
| Peter Hubbard | VEE-EPD        | x03054     | phubbard |
| John Chick    | Hitchi         | x14465     | Jchick1  |

**Wade, Wally (W.R.)**

---

**Subject:** U204 Mass Air Feedback for Black Oak  
**Location:** W. Wade's Office

**Start:** Fri 3/15/02 4:30 PM  
**End:** Fri 3/15/02 6:30 PM

**Recurrence:** (none)

**Meeting Status:** Meeting organizer

**Required Attendees:** Wade, Wally (W.R.); Dalbo, Bob (R.J.); Wenzel, Richard (R.L.); Cullen, Michael (M.J.);  
Fournelle, Gilbert (G.); Auler, Jim (J.E.)

**Importance:** High

Requested by W. R. Wade

**AGENDA**

- Review 2 feedback loops (fast mass airflow and slow rpm)
- Review proposal to turn-off mass air flow feedback at idle
- Decision on final strategy

**Wanet, Richard (R.L.)**

---

**From:** Fascetti, Bob (R.J.)  
**Sent:** Wednesday, March 13, 2002 5:07 PM  
**To:** Wanet, Richard (R.L.)  
**Subject:** RE: Mass Air Feedback

Ok. I'll talk with Bob. I would like you bought in to the direction, so we can proceed on all of my programs.

Thanks,

—Original Message—

**From:** Wanet, Richard (R.L.)  
**Sent:** Wednesday, March 13, 2002 4:25 PM  
**To:** Fascetti, Bob (R.J.)  
**Cc:** Wanet, Richard (R.L.)  
**Subject:** Mass Air Feedback

Hi Bob,

Good technical people at SolLab for controls questions would be Jeff Cook (JCOOK2), Davor Hrovat (DHROVAT), and Jeff Greenberg (JGREENB2). These are all "Staff Technical Specialists". I have not talked with these folks in years and I will not discuss this issue with them.

After our meeting today I thought of a way to satisfy both of our needs. If we wrote the logic to run the Ido\_ol controller on deceler and at idle, as Bob Dalbo desires, and also include a calibratable minimum vehicle speed condition, I could live with that. I left a message for Tom Luther describing this approach.

Regards,

***Dick Wanet***

Calibration Technical Specialist

Phone: (313)32-20165 FAX: (313)24-65399  
Room: 1F06 Dynamometer Lab  
Email: rwanet@ford.com

**Wanat, Richard (R.L.)**

---

**From:** Wanat, Richard (R.L.)  
**Sent:** Wednesday, March 13, 2002 4:25 PM  
**To:** Fasoetti, Bob (R.J.)  
**Cc:** Wanat, Richard (R.L.)  
**Subject:** Mass Air Feedback

Hi Bob,

Good technical people at SolLab for controls questions would be Jeff Cook (JCOOK2), Davor Hrovat (DHROVAT), and Jeff Greenberg (JGREENB2). These are all "Staff Technical Specialists". I have not talked with these folks in years and I will not discuss this issue with them.

After our meeting today I thought of a way to satisfy both of our needs. If we wrote the logic to run the idle\_cl controller on decelerate and at idle, as Bob Dalbo desires, and also include a calibratable minimum vehicle speed condition, I could live with that. I left a message for Tom Luther describing this approach.

Regards,

*Dick Wanat*

Calibration Technical Specialist

Phone: (313)32-20165 FAX: (313)24-86399  
Room: 1F08 Dynamometer Lab  
Email: rwanat@ford.com

**Price, Martin (M.)**

---

**From:** Marianos, Tom (T.E.)  
**Sent:** Wednesday, September 25, 2002 10:36 AM  
**To:** Myers, Dan (D.P.)  
**Cc:** Price, Martin (M.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Hayduk, Mark (M.S.); Suarez, Rhae (R.)  
**Subject:** RE: another wds issue?

Dan,  
I understand the issues and we will fix this ASAP with a B21.3 Update, but I have another question.

Can you go back and verify the part number in the PCM. 2L8A-AA should not be recognized by WDS. It was never WERS released, and should not be in the field.

Thanks,

Tom Marianos  
ACSG/DSP/WDS PCM Reprogramming  
tmarian1@ford.com  
Ph.:313-390-5032  
Fax: 313-248-4370

-----Original Message-----

**From:** Myers, Dan (D.P.)  
**Sent:** Tuesday, September 24, 2002 6:02 PM  
**To:** Suarez, Rhae (R.)  
**Cc:** Price, Martin (M.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Hayduk, Mark (M.S.)  
**Subject:** RE: another wds issue?

Rhae,  
FYI

I just updated my WDS with B21.1A from the LAN and it still won't allow me to update 3.0L Escapes to the latest level. It is stating that the 2L8A-AA calibration (what is currently in the vehicle) is the latest level for the 2002 Escape. Not the 2U7A-CZB that I was able to download from WDS version B20.12 last week. How can I get a copy of the calibrations (for 01-03) on disc so I won't have to reschedule any more vehicles?

Thanks,

*Dan Myers*

Field Quality Engineer - Iowa  
Enhanced Concern Identification

[dmyers4@ford.com](mailto:dmyers4@ford.com)

Cell 563-505-9002  
Office 563-289-9991  
Fax 563-289-1364

## Price, Martin (M.)

---

**From:** Marianne, Tom (T.E.)  
**Sent:** Wednesday, September 25, 2002 10:25 AM  
**To:** Salamon Jr., Peter (P.F.); Daibo, Bob (R.J.); Suarez, Rhae (R.); Terzes, Laura (L.D.); Stiegel, Mark (M.S.); Fascetti, Bob (R.J.)  
**Co:** Jordan, LeBron (L.); Judson, Roger (R.); Dorony, Kenneth (K.R.); Tiernan, Paul (P.D.); Price, Martin (M.); Altonian, Don (D.J.); Fournelle, Gilbert (G.); Limtiaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Hayduk, Mark (M.S.)  
**Subject:** RE: another wds issue?

OK everyone, here is what has happened.

We had a an update for U204 in early August covered by white paper 1891, where a series of service fix part numbers replaced previous running change releases.

We chained all of those together the running changes with the service fixes and released to the field as we were authorized to do.

The very next week, the newly released calibrations were found to create a surge issue, so we were asked by Powertrain to immediately unchain the new from the old. Which we did.

In late August/Early September, white paper 1921 was released, which replaced the first service release calibrations with a new one. We then made our updates and released to the field.

In the process of updating, the 1921 white paper never referenced the previous running calibrations so the chaining of the production calibrations to the service fixes was not made.

We can fix this in B21.3 later this week.

This may sound confusing, so let me try to make more simple.

1. Let's say you have calibration A and you replace it w/ calibration B, so

A => B

2. A problem is found and now we are told to change our logic to:

A does not go to B

so you have a stand alone A and a stand alone B (that is not flashable now).

A Stand alone

B Stand alone (although not flashable)

3. Now Calibration C comes out and we are told that it replaces Calibration B, so you now have:

A stand alone

B => C

C is the latest.

In this case, we were not told to point Cal A at Cal C.

We will fix this week, but this is how we got to this point.

I hope that this explains it all.

If you have any questions, feel free to ask.

Tom

-----Original Message-----

**From:** Salamon Jr., Peter (P.F.)  
**Sent:** Wednesday, September 25, 2002 8:41 AM

To: Marianos, Tom (T.E.); Judson, Roger (R.)  
Cc: Tieman, Paul (P.D.); Jordan, LeBron (L.); Dorony, Kenneth (K.R.)  
Subject: FW: another wds issue?  
Importance: High

Tom / Roger,

I thought that all was OK with the Escape, including instructions to the hotline and the field on how to load the software. Have you heard of any concerns in the field? Is this a one-off?

Regards,  
Pete

-----Original Message-----

From: Terzas, Laura (L.D.)  
Sent: Wednesday, September 25, 2002 8:25 AM  
To: Salomon Jr., Peter (P.F.); Dorony, Kenneth (K.R.)  
Subject: FW: another wds issue?

Someone pls. confirm and respond on status.

*Laura Terzas*

Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF68  
(313) 32-36572 / fax (313) 24-88181 / lterzas.ford.com

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Tuesday, September 24, 2002 6:07 PM  
To: Marianos, Tom (T.E.); Jordan, LeBron (L.)  
Cc: Terzas, Laura (L.D.); Bob Pascetti  
Subject: FW: another wds issue?

LeBron/Tom,  
Do we still have a WDS issue?

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 795-2869 Email: rbdalbo@ford.com

-----Original Message-----

From: Myers, Dan (D.P.)  
Sent: Tuesday, September 24, 2002 6:02 PM  
To: Suarez, Rhoe (R.)  
Cc: Price, Martin (M.); Alzonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtaco, Steven (S.); Rothweller, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Hayduk, Mark (M.S.)  
Subject: RE: another wds issue?

Rhoe,  
FYI

I just updated my WDS with B21.1A from the LAN and it still won't allow me to update 3.0L Escapes to the latest level. It is stating that the 2L8A-AA calibration (what is currently in the vehicle) is the latest level for the 2002 Escape. Not the 2U7A-CZB that I was able to download from WDS version B20.12 last week. How can I get a copy of the calibrations (for 01-03) on disc so I won't have to reschedule any more vehicles?

Thanks,

*Dan Myers*

Field Quality Engineer - Iowa  
Enhanced Concern Identification



**dmyers4@ford.com**

Cell 563-505-9002  
Office 563-289-9991  
Fax 563-289-1364

---Original Message---

From: Suarez, Rhee (R.)  
Sent: Tuesday, September 17, 2002 12:06 PM  
To: Price, Martin (M.); Altoonien, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweller, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
Subject: FW: another wds issue?

FYI -

---Original Message---

From: Marlanos, Tom (T.E.)  
Sent: Tuesday, September 17, 2002 12:46 PM  
To: Suarez, Rhee (R.)  
Subject: RE: another wds issue?

This is already a high priority, We are working on it.

---Original Message---

From: Suarez, Rhee (R.)  
Sent: Tuesday, September 17, 2002 12:39 PM  
To: Price, Martin (M.); Altoonien, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweller, Daniel (D.); Sanders, Muriel (M.S.)  
Cc: Myers, Dan (D.P.); Marlanos, Tom (T.E.); Lawler, David (D.A.)  
Subject: RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

***Rhee M. Suarez***

Rhee Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-92-2344 Pager: 313-796-8242  
Fax: 313-93-78387  
Email: rsuarez8@ford.com

---Original Message---

From: Price, Martin (M.)  
Sent: Tuesday, September 17, 2002 11:51 AM  
To: Altoonien, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweller, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhee (R.)  
Subject: another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2L8A-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

Price, Martin (M.)

---

From: Myers, Dan (D.P.)  
Sent: Tuesday, September 24, 2002 6:02 PM  
To: Suarez, Rhee (R.)  
Cc: Price, Martin (M.); Altoonlan, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtiaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Hayduk, Mark (M.S.)  
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Thanks,

*Dan Myers*

Field Quality Engineer - Iowa  
Enhanced Concern Identification

[dmyers4@ford.com](mailto:dmyers4@ford.com)

Cell 583-506-9002  
Office 583-289-9991  
Fax 583-289-1364

-----Original Message-----

From: Suarez, Rhee (R.)  
Sent: Tuesday, September 17, 2002 12:06 PM  
To: Price, Martin (M.); Altoonlan, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtiaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
Subject: FW: another wds issue?

FYI -

-----Original Message-----

From: Marlanos, Tom (T.E.)  
Sent: Tuesday, September 17, 2002 12:46 PM  
To: Suarez, Rhee (R.)  
Subject: RE: another wds issue?

This is already a high priority. We are working on it.

-----Original Message-----

From: Suarez, Rhee (R.)  
Sent: Tuesday, September 17, 2002 12:39 PM  
To: Price, Martin (M.); Altoonlan, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtiaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
Cc: Myers, Dan (D.P.); Marlanos, Tom (T.E.); Lawler, David (D.A.)  
Subject: RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

*Rhee M. Suarez*

Rhee Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick

PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-798-6242  
Fax: 313-33-76337  
Email: rsuarez28@ford.com

---Original Message---

From: Price, Martin (M.)  
Sent: Tuesday, September 17, 2002 11:51 AM  
To: Albonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintano, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhee (R.)  
Subject: another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2L8A-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

## Price, Martin (M.)

---

**From:** Suarez, Rhee (R.)  
**Sent:** Monday, September 23, 2002 12:47 PM  
**To:** Price, Martin (M.)  
**Subject:** RE: another wds issue? (AFFECTS STALLS FIX Calibration)

I don't know???? after I sent R I started to go through it. I ended up more confused on what actually happened to fix it. I was hoping one of you guys would have given me an answer not a question back =)

I'll send Marianos an email to see what level you guys should be looking at. Any other questions?

### -----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Monday, September 23, 2002 12:41 PM  
**To:** Suarez, Rhee (R.)  
**Subject:** RE: another wds issue? (AFFECTS STALLS FIX Calibration)

is that wds version 21.2?

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

### -----Original Message-----

**From:** Suarez, Rhee (R.)  
**Sent:** Monday, September 23, 2002 12:34 PM  
**To:** Lintaca, Steven (S.); Albornan, Don (D.J.); Price, Martin (M.); Kerkel, Shirji (S.); Lawler, David (D.A.)  
**Subject:** FW: another wds issue? (AFFECTS STALLS FIX Calibration)

FYI -

### -----Original Message-----

**From:** Terzas, Laura (L.D.)  
**Sent:** Monday, September 23, 2002 11:50 AM  
**To:** Fascetti, Bob (R.J.); Kier, Jerry (G.T.); Takasawa, Keith (K.D.); Powers, Ken (K.W.); Dalbo, Bob (R.J.)  
**Cc:** Stegel, Mark (M.S.); Dorony, Kenneth (K.R.); Salamon Jr., Peter (P.F.); Suarez, Rhee (R.); Marianos, Tom (T.E.)  
**Subject:** RE: another wds issue? (AFFECTS STALLS FIX Calibration)

I just spoke to DSP. You can report the service calibration is available for Ford and Mazda products. The access issue is resolved.

### *Laura Terzas*

Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF68  
(313) 32-36672 / fax (313) 24-88161 / lterzas.ford.com

### -----Original Message-----

**From:** Fascetti, Bob (R.J.)  
**Sent:** Monday, September 23, 2002 8:31 AM  
**To:** Terzas, Laura (L.D.); Kier, Jerry (G.T.); Takasawa, Keith (K.D.); Powers, Ken (K.W.); Dalbo, Bob (R.J.)  
**Cc:** Marianos, Tom (T.E.); Salamon Jr., Peter (P.F.); Hollenga, Jim (J.C.)  
**Subject:** RE: another wds issue? (AFFECTS STALLS FIX Calibration)

I take it that this means that I can report at the NAQ/PAM today, that the service calibration is available on the Ford products, as well as the Mazda products.

I will assume this, unless otherwise informed...

Bob Fascetti

-----Original Message-----

From: Terzee, Laura (L.D.)  
Sent: Monday, September 23, 2002 8:26 AM  
To: Karr, Jerry (G.T.); Takasawa, Keith (K.D.); Powers, Ken (K.W.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.)  
Cc: Marianos, Tom (T.E.); Salamon Jr., Peter (P.F.); Hellenga, Jim (J.C.)  
Subject: FW: another wds issue? (AFFECTS STALLS FIX Calibration)

All: here is status from DSP (Diagnostic Service Planning) re: software work-around to give dealers access to Escape Stall calibration. Torn, how will you notify the dealers to reload B20, and when? Need a little more info. thanks.

Laura,  
Pete and Mark want to give Teradyne the week to work on this. I will probably be here on Sunday to help test anything that they can produce.

If by Monday, we are still down, we will have the Dealers reload with B20.

Thanks,

Tom Marianos  
ACSG/DSP/WDS PCM Reprogramming  
tmarian1@ford.com  
Ph.:313-380-5032  
Fax: 313-248-4370

-----Original Message-----

From: Karr, Jerry (G.T.)  
Sent: Sunday, September 22, 2002 8:53 PM  
To: Terzee, Laura (L.D.); Fascetti, Bob (R.J.); Dalbo, Bob (R.J.)  
Cc: Takasawa, Keith (K.D.); Powers, Ken (K.W.)  
Subject: RE: another wds issue? (AFFECTS STALLS FIX Calibration)

How long do you think we are talking about for the software update? Hopefully we are talking early this week.

G. T. Karr (Jerry)  
P/T Chief Engineer. PH: 32-26689/Cuba: 1BA45  
PDC/MD #205/FAX: 62-18063/gtkarr@ford.com

-----Original Message-----

From: Terzee, Laura (L.D.)  
Sent: Friday, September 20, 2002 7:56 AM  
To: Fascetti, Bob (R.J.); Dalbo, Bob (R.J.); Karr, Jerry (G.T.)  
Cc: Takasawa, Keith (K.D.); Powers, Ken (K.W.)  
Subject: FW: another wds issue? (AFFECTS STALLS FIX Calibration)

We learned about the inability of the field to access the latest Stalls calibration (released 9/4) via the Tech Hotline and our Field Service Engineers. This is a software issue with WDS, just keeping you up-to-date so we have latest for NAQPM mtg. on Monday, should the question come up. I don't believe asking the Diagnostic Service Planning activity to go backwards with their releases at the expense of losing other functionality (diagnostic coverage and tools for other veh. lines) is appropriate. Additionally, asking dealers to reload multiple CDs creates confusion and negative feedback. We'll wait for software supplier (Teradyne) update, then decide what to do.

Laura Terzee  
Manager, Outfitting Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF88  
(313) 32-36572 / fax (313) 24-88181 / lterzee.ford.com

-----Original Message-----

**From:** Marlenos, Tom (T.E.)  
**Sent:** Thursday, September 19, 2002 5:32 PM  
**To:** Terzas, Laura (L.D.); Salamon Jr., Peter (P.F.)  
**Cc:** Suarez, Rhee (R.); Hellenga, Jim (J.C.)  
**Subject:** RE: another wds issue?

Laura,  
I believe that Jim Hellenga has explained the situation to you, but I will follow up with this note anyway with a written explanation.

Because, Ford is moving ahead with being able to flash other modules than just the PCM, the WDS database has required the addition of new fields to multiple tables in the database. That in turn meant that the tool that creates our database updates also required an update. Unfortunately, this information was not made known to the person who maintains the tool that creates the update files until a few weeks ago.

The B21 database was frozen about 8 weeks ago, so the data that is contained is 8 weeks old, which means updates to take care of the QSF's handled in B20 are not contained on the B21 CD.

The updates files created by the new update tool result in "testman errors" (what are effectively system crashes).

Our supplier has been working to isolate/fix the problems with the tool, that we can update our dealers with the latest calibration data.

Our options are these:

1. Hold on in hopes that Teradyne will be able to fix the tool issues by tomorrow and will be able to provide the update files to all dealers.

or

2. Ask all dealers to reload the A5 System CD and the B20 Blue CD and proceed from there.

The issues with both options are as follows (although I will probably miss some).

1. If no fix is found by tomorrow, week have lost a few days while try to sort this out, and dealers have been unable to flash vehicles that needed calibrations that are not available on the B21 base CD.

2. If we go back to B20, we lose vehicle and tool coverage that were added content to the B21 CD over what was on B20.

One thing that has been done in case we must go back to B20 is that the required update files are being Starburst to the dealers local FordStar terminal to prevent overloading the satellite system.

This is where we stand.

We really don't want to go backward, but if we need to we will.

Tom Marlenos

-----Original Message-----

**From:** Terzas, Laura (L.D.)  
**Sent:** Thursday, September 19, 2002 3:28 PM  
**To:** Salamon Jr., Peter (P.F.)  
**Cc:** Marlenos, Tom (T.E.); Suarez, Rhee (R.)  
**Subject:** FW: another wds issue?

This is a critical calibration for an Escape Stalls concern ('01, '02 and '03 MYs). Any assistance and explanation you can provide will be helpful. The Escape 3.0L Stalls concern will be covered at a Monday 10/23 (4-6p.m.) North American Quality Planning and Assistance Meeting (NAQPAM). I will be attending. (Frank Ligon is attending 1st time). It would be uncomfortable for VS&P if the inability for WDS to provide this updated cal in the current release were to be mentioned. Can we get this fixed soon? compressed timing?

*Laura Terzas*

Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF66  
(313) 32-36572 / fax (313) 24-86161 / lterzes.ford.com

-----Original Message-----

From: Fascetti, Bob (R.J.)  
Sent: Thursday, September 19, 2002 3:01 PM  
To: Terzes, Laura (L.D.)  
Cc: Dalbo, Bob (R.J.); Karr, Jerry (G.T.)  
Subject: RE: another wds issue?

Laura,  
can you personally intervene on this. The calibration is out there and the dealer's can't put it in. We didn't get any answers today at our Staff meeting.

Anything you can do to help would be greatly appreciated.

Bob F.

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Thursday, September 19, 2002 11:42 AM  
To: Terzes, Laura (L.D.); Bob Fascetti  
Subject: FW: another wds issue?

Bob/Laura,  
Apparently the latest (B21) WDS software doesn't recognize that the stall fix updates exist. The previous version does. We don't yet have an estimate of when this issue will be resolved.

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-31786  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

From: Suarez, Rhoe (R.)  
Sent: Wednesday, September 18, 2002 8:42 AM  
To: Price, Martin (M.); Alibon, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limfaco, Steven (S.); Rothwaller, Daniel (D.);  
Marianos, Tom (T.E.); Lawler, David (D.A.)  
Subject: FW: another wds issue?

As soon as we get this fixed, can someone please send me a note? Our field people need this information.

Thanks!!  
Rhoe

-----Original Message-----

From: Myers, Dan (D.P.)  
Sent: Tuesday, September 17, 2002 10:38 PM  
To: Suarez, Rhoe (R.)  
Subject: RE: another wds issue?

Rhoe,  
Can you let me know when this is fixed? I have 3 more Escapes to update as soon as I can get access to the calibration through WDS B21 or the LAN.

Thanks,

*Dan Myers*

Field Quality Engineer - Iowa  
Enhanced Concern Identification

**dmyers4@ford.com**

Cell 563-505-9002  
Office 563-289-9991  
Fax 563-289-1364

-----Original Message-----

From: Suarez, Rhoe (R.)  
Sent: Tuesday, September 17, 2002 12:06 PM  
To: Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
Subject: FW: another wds issue?

FYI -

-----Original Message-----

From: Marianos, Tom (T.E.)  
Sent: Tuesday, September 17, 2002 12:46 PM  
To: Suarez, Rhoe (R.)  
Subject: RE: another wds issue?

This is already a high priority. We are working on it.

-----Original Message-----

From: Suarez, Rhoe (R.)  
Sent: Tuesday, September 17, 2002 12:39 PM  
To: Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
Cc: Myers, Dan (D.P.); Marianos, Tom (T.E.); Lawler, David (D.A.)  
Subject: RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

***Rhoe M. Suarez***

Rhoe Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 648) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: Price, Martin (M.)  
Sent: Tuesday, September 17, 2002 11:51 AM  
To: Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhoe (R.)  
Subject: another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2LBA-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133



**Price, Martin (M.)**

---

**From:** Suarez, Rhea (R.)  
**Sent:** Monday, September 23, 2002 12:34 PM  
**To:** Limasaco, Steven (S.); Alkocrian, Don (D.J.); Price, Martin (M.); Kawai, Shinji (S.); Lawler, David (D.A.)  
**Subject:** FW: another wds issue? (AFFECTS STALLS FIX Calibration)

FYI -

-----Original Message-----

**From:** Terzee, Laura (L.D.)  
**Sent:** Monday, September 23, 2002 11:50 AM  
**To:** Fascetti, Bob (R.J.); Kier, Jerry (G.T.); Takasawa, Keith (K.D.); Powers, Ken (K.W.); Dalbo, Bob (R.J.)  
**Cc:** Stiegel, Mark (M.S.); Dorony, Kenneth (K.R.); Salamon Jr., Peter (P.F.); Suarez, Rhea (R.); Marlanos, Tom (T.E.)  
**Subject:** RE: another wds issue? (AFFECTS STALLS FIX Calibration)

I just spoke to DSP. You can report the service calibration is available for Ford and Mazda products. The access issue is resolved.

*Laura Terzee*  
Manager, Outfitters Concerns  
FCSO, Customer Service Engineering  
PDC TVC 1JF86  
(313) 32-38872 / fax (313) 24-88181 / lterzee.ford.com

-----Original Message-----

**From:** Fascetti, Bob (R.J.)  
**Sent:** Monday, September 23, 2002 8:31 AM  
**To:** Terzee, Laura (L.D.); Kier, Jerry (G.T.); Takasawa, Keith (K.D.); Powers, Ken (K.W.); Dalbo, Bob (R.J.)  
**Cc:** Marlanos, Tom (T.E.); Salamon Jr., Peter (P.F.); Hollings, Jim (J.C.)  
**Subject:** RE: another wds issue? (AFFECTS STALLS FIX Calibration)

I take it that this means that I can report at the NAQPAM today, that the service calibration is available on the Ford products, as well as the Mazda products.

I will assume this, unless otherwise informed...

Bob Fascetti

-----Original Message-----

**From:** Terzee, Laura (L.D.)  
**Sent:** Monday, September 23, 2002 8:25 AM  
**To:** Kier, Jerry (G.T.); Takasawa, Keith (K.D.); Powers, Ken (K.W.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.)  
**Cc:** Marlanos, Tom (T.E.); Salamon Jr., Peter (P.F.); Hollings, Jim (J.C.)  
**Subject:** FW: another wds issue? (AFFECTS STALLS FIX Calibration)

All: here is status from DSP (Diagnostic Service Planning) re: software work-around to give dealers access to Escape Stall calibration. Tom, how will you notify the dealers to reload B20, and when? Need a little more info, thanks.

---

Laura,  
Pete and Mark want to give Teradyne the week to work on this. I will probably be here on Sunday to help test anything that they can produce.

If by Monday, we are still down, we will have the Dealers reload with B20.

Thanks,

Tom Marlanos  
ACSG/DSP/WDS PCM Reprogramming  
tmarlan1@ford.com

Ph.:313-390-5032  
Fax: 313-248-4370

-----Original Message-----

From: Klarr, Jerry (G.T.)  
Sent: Sunday, September 22, 2002 8:53 PM  
To: Terzes, Laura (L.D.); Fascetti, Bob (R.J.); Delbo, Bob (R.J.)  
Cc: Takasawa, Keith (K.D.); Powers, Ken (K.W.)  
Subject: RE: another wds issue? (AFFECTS STALLS FIX Calibration)

How long do you think we are talking about for the software update? Hopefully we are talking early this week.

G. T. Klarr (Jerry)  
P/T Chief Engineer; PH: 32-26668/Cube: 1BA45  
PDC/MD #205/FAX: 62-18063/gklarr@ford.com

-----Original Message-----

From: Terzes, Laura (L.D.)  
Sent: Friday, September 20, 2002 7:56 AM  
To: Fascetti, Bob (R.J.); Delbo, Bob (R.J.); Klarr, Jerry (G.T.)  
Cc: Takasawa, Keith (K.D.); Powers, Ken (K.W.)  
Subject: FW: another wds issue? (AFFECTS STALLS FIX Calibration)

We learned about the inability of the field to access the latest Stalls calibration (released 9/4) via the Tech Hotline and our Field Service Engineers. This is a software issue with WDS, just keeping you up-to-date so we have latest for NAQPM mtg. on Monday, should the question come up. I don't believe asking the Diagnostic Service Planning activity to go backwards with their releases at the expense of losing other functionality (diagnostic coverage and tools for other veh. lines) is appropriate. Additionally, asking dealers to reload multiple CDs creates confusion and negative feedback. We'll wait for software supplier (Teradyne) update, then decide what to do.

*Laura Terzes*  
Manager, Outfitters Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF58  
(313) 32-36872 / fax (313) 24-88151 / lterzes.ford.com

-----Original Message-----

From: Marianos, Tom (T.E.)  
Sent: Thursday, September 19, 2002 5:32 PM  
To: Terzes, Laura (L.D.); Salamon Jr., Peter (P.J.)  
Cc: Suarez, Rhoe (R.); Hellenga, Jim (J.C.)  
Subject: RE: another wds issue?

Laura,  
I believe that Jim Hellenga has explained the situation to you, but I will follow up with this note anyway with a written explanation.

Because, Ford is moving ahead with being able to flash other modules than just the PCM, the WDS database has required the addition of new fields to multiple tables in the database. That in turn meant that the tool that creates our database updates also required an update. Unfortunately, this information was not made known to the person who maintains the tool that creates the update files until a few weeks ago.

The B21 database was frozen about 8 weeks ago, so the data that is contained is 8 weeks old, which means updates to take care of the QSFs handled in B20 are not contained on the B21 CD.

The updates files created by the new update tool result in "testman errors" (what are effectively system crashes).

Our supplier has been working to isolate/fix the problems with the tool, that we can update our dealers with the latest calibration data.

Our options are these:

1. Hold on in hopes that Teradyne will be able to fix the tool issues by tomorrow and will be able to provide the

update files to all dealers.

or

2. Ask all dealers to reload the A5 System CD and the B20 Blue CD and proceed from there.

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1. If no fix is found by tomorrow, we have lost a few days while try to sort this out, and dealers have been unable to flash vehicles that needed calibrations that are not available on the B21 base CD.
2. If we go back to B20, we lose vehicle and tool coverage that were added content to the B21 CD over what was on B20.

One thing that has been done in case we must go back to B20 is that the required update files are being Starburst to the dealers local FordStar terminal to prevent overloading the satellite system.

This is where we stand.

We really don't want to go backward, but if we need to we will.

Tom Marianos

-----Original Message-----

From: Terzes, Laura (L.D.)  
Sent: Thursday, September 19, 2002 3:28 PM  
To: Salamon Jr., Peter (P.F.)  
Cc: Marianos, Tom (T.E.); Suarez, Rhee (R.)  
Subject: FW: another wds issue?

This is a critical calibration for an Escape Stalls concern ('01, '02 and '03 MYs). Any assistance and explanation you can provide will be helpful. The Escape 3.0L Stalls concern will be covered at a Monday 10/23 (4-6p.m.) North American Quality Planning and Assistance Meeting (NAQPAM). I will be attending. (Frank Ligon is attending 1st time). It would be uncomfortable for VS&P if the inability for WDS to provide this updated cal in the current release were to be mentioned. Can we get this fixed soon? compressed timing?

*Laura Terzes*

Manager, Outfitting Concerns  
FCSD, Customer Service Engineering  
PDC TVC 1JF58  
(313) 32-36572 / fax (313) 24-88181 / lterzes.ford.com

-----Original Message-----

From: Fascetti, Bob (R.J.)  
Sent: Thursday, September 19, 2002 3:01 PM  
To: Terzes, Laura (L.D.)  
Cc: Dalbo, Bob (R.J.); Klarr, Jerry (G.T.)  
Subject: RE: another wds issue?

Laura,  
can you personally intervene on this. The calibration is out there and the dealer's can't put it in. We didn't get any answers today at our Stalls meeting.

Anything you can do to help would be greatly appreciated.

Bob F.

-----Original Message-----

From: Dalbo, Bob (R.J.)  
Sent: Thursday, September 19, 2002 11:42 AM  
To: Terzes, Laura (L.D.); Bob Fascetti  
Subject: FW: another wds issue?

Bob/Laura,  
Apparently the latest (B21) WDS software doesn't recognize that the stall fix updates exist. The previous

version does. We don't yet have an estimate of when this issue will be resolved.

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 796-2869 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Wednesday, September 18, 2002 8:42 AM  
To: Price, Martin (M.); Altomieri, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtaco, Steven (S.); Rothweiler, Daniel (D.);  
Merlanos, Tom (T.E.); Lawler, David (D.A.)  
Subject: FW: another wds issue?

As soon as we get this fixed, can someone please send me a note? Our field people need this information.

Thanks!!  
Rhae

-----Original Message-----

From: Myers, Dan (D.P.)  
Sent: Tuesday, September 17, 2002 10:36 PM  
To: Suarez, Rhae (R.)  
Subject: RE: another wds issue?

Rhae,  
Can you let me know when this is fixed? I have 3 more Escapes to update as soon as I can get access to the calibration through WDS B21 or the LAN.

Thanks,

*Dan Myers*

Field Quality Engineer - Iowa  
Enhanced Concern Identification

[dmyers4@ford.com](mailto:dmyers4@ford.com)

Cell 563-505-9002  
Office 563-289-9991  
Fax 563-289-1364

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Tuesday, September 17, 2002 12:06 PM  
To: Price, Martin (M.); Altomieri, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtaco, Steven (S.); Rothweiler, Daniel (D.);  
Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
Subject: FW: another wds issue?

FYI -

-----Original Message-----

From: Merlanos, Tom (T.E.)  
Sent: Tuesday, September 17, 2002 12:46 PM  
To: Suarez, Rhae (R.)  
Subject: RE: another wds issue?

This is already a high priority, We are working on it.

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Tuesday, September 17, 2002 12:39 PM

To: Price, Martin (M.); Altounian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Umlacco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
Cc: Myers, Dan (D.P.); Marlanza, Tom (T.E.); Lawler, David (D.A.)  
Subject: RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

*Rhac M. Suarez*

Rhac Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-795-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

-----Original Message-----

From: Price, Martin (M.)  
Sent: Tuesday, September 17, 2002 11:51 AM  
To: Altounian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Umlacco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhac (R.)  
Subject: another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2L8A-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

*Harold Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

---

**From:** Price, Martin (M.)  
**Sent:** Thursday, November 14, 2002 2:58 PM  
**To:** Suarez, Rhee (R.)  
**Subject:** FW: YL8F-CE

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

-----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Wednesday, November 06, 2002 4:12 PM  
**To:** Marlanos, Tom (T.E.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhee (R.)  
**Subject:** YL8F-CE

I just walked a tech through reprogramming a pcm manually because he installed a YL8F-CE MPC 161 pcm and wds said there was no later calibration. We manually entered 1U7A-AXD and it took. I checked our 21.8 calibration database and it shows that YL8F-CE does not update to anything later. Can we get this looked into for all calibrations, I suspect this isn't the only one. I'm still worried that many pcm's won't update and techs won't catch it and let them go.

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

---

**From:** Price, Martin (M.)  
**Sent:** Wednesday, November 13, 2002 8:21 AM  
**To:** Suarez, Rhae (R.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

so can you ask dallape to remove SSM 16374 now? I already asked to have the ISM removed. At the next meeting we can discuss a new ISM, if necessary.

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**-----Original Message-----**

**From:** Suarez, Rhae (R.)  
**Sent:** Tuesday, November 12, 2002 3:13 PM  
**To:** Price, Martin (M.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

???? don't know??

I don't think so though. They'll just make me release another one. What it's only been 3 TSBs so far for this concern?!!?!?!?

**-----Original Message-----**

**From:** Price, Martin (M.)  
**Sent:** Tuesday, November 12, 2002 3:10 PM  
**To:** Suarez, Rhae (R.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

Is it possible to revoke a tsb once it has been released?

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**-----Original Message-----**

**From:** Suarez, Rhae (R.)  
**Sent:** Tuesday, November 12, 2002 2:57 PM  
**To:** Price, Martin (M.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

I can't wait to re-do it again when the engineers (IAC, VMV, etc....) see that this is released!!!!

**-----Original Message-----**

**From:** Price, Martin (M.)  
**Sent:** Tuesday, November 12, 2002 2:56 PM  
**To:** Suarez, Rhae (R.)

ENG2-027-R 10000

**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

OH BOY!!

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

-----Original Message-----

**From:** Suarez, Rhae (R.)

**Sent:** Tuesday, November 12, 2002 2:45 PM

**To:** Fournelle, Gilbert (G.); Dalbo, Bob (R.J.); Terzes, Laura (L.D.); Lawler, Dave (D.A.); Altoonian, Don (D.J.); Price, Martin (M.)

**Subject:** FW: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

**Importance:** High

Escape Stall TSB# 2-23-01 is now released.

-----Original Message-----

**From:** GSIPLUS@FORD.COM [mailto:GSIPLUS@FORD.COM]

**Sent:** Tuesday, November 12, 2002 2:35 PM

**To:** RSUAREZ8@FORD.COM

**Subject:** 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

**Importance:** High

**English TSB Article 02-23-1 has been released for publication**

The following Technical Service Bulletin (TSB) article has been moved from collaboration and is now final. Dealers may view this article on the next business day via OASIS and [qcddealer.com](http://qcddealer.com). Company personnel may view it at: <http://techservice.tso.ford.com/>.

**Concern Tracking Number:** 97-4373R5

**TSB Article Number:** 02-23-1

**Description:** DRIVEABILITY - INTERMITTENT ENGINE QUIT OR IDLE DIP  
- NO DIAGNOSTIC TROUBLE CODES (DTCs) PRESENT -  
VEHICLES EQUIPPED WITH 3.0L DURATEC ENGINE ONLY.

**Vehicles:** ESCAPE



**Price, Martin (M.)**

---

**From:** Price, Martin (M.)  
**Sent:** Wednesday, November 13, 2002 8:19 AM  
**To:** Rob Percha (E-mail); Stanley Highe (S.) (E-mail)  
**Subject:** ISM 02-09-007

TSB 02-23-01 updates this ISM, can I get it removed please?

ISM 02-09-007

SOME 2001-2003 ESCAPE WITH 3.0L ENGINES MAY EXHIBIT AN INTERMITTENT STALL. VERIFY TSB 02-11-06 HAS BEEN PERFORMED THEN REPROGRAM THE PCM WITH WDS VERSION 21.3 OR LATER. 2001 & EARLY BUILD 2002 MODELS WILL UPDATE TO 1U7A-AXD, ALL OTHER 2002 MODELS WILL UPDATE TO 2U7A-CZB, AND EARLY 2003 MODELS WILL UPDATE TO 3L8A-BC. FOR '01-'02 MODELS VERIFY LATEST DPFE SENSOR(2F1Z-9J480-AA) AND MAF(1L2Z-12B579-BA). TSB TO FOLLOW.

AUTHOR: MARTIN PRICE (MPRICE28) 79133

\*UPDATE\* 9/26/2002 SH FOR WDS VERSION. M. PRICE

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

**From:** Price, Martin (M.)  
**Sent:** Tuesday, November 12, 2002 3:10 PM  
**To:** Suarez, Rhoe (R.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

Is it possible to revoke a tsb once it has been released?

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

—Original Message—

**From:** Suarez, Rhoe (R.)  
**Sent:** Tuesday, November 12, 2002 2:57 PM  
**To:** Price, Martin (M.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

I can't wait to re-do it again when the engineers (IAC, VMV, etc....) see that this is released!!!

—Original Message—

**From:** Price, Martin (M.)  
**Sent:** Tuesday, November 12, 2002 2:56 PM  
**To:** Suarez, Rhoe (R.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

OH BOY!!

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

—Original Message—

**From:** Suarez, Rhoe (R.)  
**Sent:** Tuesday, November 12, 2002 2:45 PM  
**To:** Fournelle, Gilbert (G.); Dalbo, Bob (R.J.); Terzes, Laura (L.D.); Lawler, Dave (D.A.); Altoonian, Don (D.J.); Price, Martin (M.)  
**Subject:** FW: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)  
**Importance:** High

Escape Stall TSB# 2-23-01 is now released.

—Original Message—

**From:** GSIPLUS@FORD.COM [mailto:GSIPLUS@FORD.COM]  
**Sent:** Tuesday, November 12, 2002 2:35 PM  
**To:** RSUAREZ8@FORD.COM  
**Subject:** 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

0002-827-A 10011

**Importance: High**

**English TSB Article 02-23-1 has been released for publication**

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**Concern Tracking Number: 97-4373R5**

**TSB Article Number: 02-23-1**

**Description: DRIVEABILITY - INTERMITTENT ENGINE QUIT OR IDLE DIP  
- NO DIAGNOSTIC TROUBLE CODES (DTCs) PRESENT -  
VEHICLES EQUIPPED WITH 3.0L DURATEC ENGINE ONLY.**

**Vehicles: ESCAPE**

**Price, Martin (M.)**

**From:** Price, Martin (M.)  
**Sent:** Tuesday, November 12, 2002 2:56 PM  
**To:** Suarez, Rhoe (R.)  
**Subject:** RE: 97-4373R6 has gone to FINAL as 02-23-1 (enUSA)

OH BOY!!

***Martin Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**-----Original Message-----**

**From:** Suarez, Rhoe (R.)  
**Sent:** Tuesday, November 12, 2002 2:45 PM  
**To:** Fournelle, Gilbert (G.); Dalbo, Bob (R.J.); Terzes, Laura (L.D.); Lawler, Dave (D.A.); Altkonian, Don (D.J.); Price, Martin (M.)  
**Subject:** FW: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)  
**Importance:** High

Escape Stall TSB# 2-23-01 is now released.

**-----Original Message-----**

**From:** GSIPLUS@FORD.COM [mailto:GSIPLUS@FORD.COM]  
**Sent:** Tuesday, November 12, 2002 2:35 PM  
**To:** RSUAREZ8@FORD.COM  
**Subject:** 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)  
**Importance:** High

**English TSB Article 02-23-1 has been released for publication**

The following Technical Service Bulletin (TSB) article has been moved from collaboration and is now final. Dealers may view this article on the next business day via OASIS and [qcddealer.com](http://qcddealer.com). Company personnel may view it at: <http://techservice.tso.ford.com/>.

**Concern Tracking Number:** 97-4373R5

**TSB Article Number:** 02-23-1

**Description:** DRIVEABILITY - INTERMITTENT ENGINE QUIT OR IDLE DIP  
- NO DIAGNOSTIC TROUBLE CODES (DTCs) PRESENT -  
VEHICLES EQUIPPED WITH 3.0L DURATEC ENGINE ONLY.

**Vehicles:** ESCAPE

## Price, Martin (M.)

---

**From:** Price, Martin (M.)  
**Sent:** Monday, November 11, 2002 8:08 AM  
**To:** Avery, Kevin (K.); Barnes, Andrew (A.); Chacon, Jose (J.); Comeau, Sylvain (S.); Cruz, Jose (J.); Dow, Winthrop (W.); Girard, Mario (M.); Harvey II, Lewis (L.); Heisner, Blaine (B.M.); Highe, Stanley (S.); Huspen, Timothy (T.F.); Knoll, Alexander (A.); Kotha, Robert (R.P.); Krein, Bradley (B.); Kunst, Christopher (C.); Loh, Chou (C.); Mantgen, Keith (K.); Mueller, John; Owens, Jonathan (J.); Periton, Caleb (C.); Price, Martin (M.); Roussel, Stephane (S.); Schmidt, Matthew (M.); Schmitz, Michael (M.); Stagemann, Rolf (R.S.); Ufimzeff, Ben (B.)  
**Subject:** FW: Escape stall calibration

Sorry the part# is YL8F-CE.

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

#### —Original Message—

**From:** Price, Martin (M.)  
**Sent:** Friday, November 08, 2002 3:45 PM  
**To:** Avery, Kevin (K.); Barnes, Andrew (A.); Chacon, Jose (J.); Comeau, Sylvain (S.); Cruz, Jose (J.); Dow, Winthrop (W.); Girard, Mario (M.); Harvey II, Lewis (L.); Heisner, Blaine (B.M.); Highe, Stanley (S.); Huspen, Timothy (T.F.); Knoll, Alexander (A.); Kotha, Robert (R.P.); Krein, Bradley (B.); Kunst, Christopher (C.); Loh, Chou (C.); Mantgen, Keith (K.); Mueller, John; Owens, Jonathan (J.); Periton, Caleb (C.); Price, Martin (M.); Roussel, Stephane (S.); Schmidt, Matthew (M.); Schmitz, Michael (M.); Stagemann, Rolf (R.S.); Ufimzeff, Ben (B.)  
**Subject:** Escape stall calibration

Note that wds is still not completely correct when trying to reprogram the pcm. On version 21.8 it won't update part# YL8E-CE, however if you type it in manually it will work. This may be true with other old calibrations also but as of yet I don't have any specifics.

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

---

**From:** Price, Martin (M.)  
**Sent:** Wednesday, November 06, 2002 4:12 PM  
**To:** Mariano, Tom (T.E.); Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limlaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhea (R.)  
**Subject:** YL8F-CE

I just walked a tech through reprogramming a pcm manually because he installed a YL8F-CE MPC 161 pcm and wds said there was no later calibration. We manually entered 1U7A-AXD and it took. I checked our 21.8 calibration database and it shows that YL8F-CE does not update to anything later. Can we get this looked into for all calibrations, I suspect this isn't the only one. I'm still worried that many pcm's won't update and techs won't catch it and let them go.

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

---

**From:** Suarez, Rhee (R.)  
**Sent:** Thursday, November 14, 2002 3:02 PM  
**To:** Marianos, Tom (T.E.); Price, Martin (M.)  
**Cc:** Lawler, Dave (D.A.); Terzes, Laura (L.D.)  
**Subject:** FW: YL8F-CE

Marti - has this concern been addressed?

Tom - is there anything you guys can do to fix this?

Please let me know if there is anything I can do to assist.

Thanks!

*Rhee M. Suarez*

Rhee Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

—Original Message—

**From:** Price, Martin (M.)  
**Sent:** Wednesday, November 06, 2002 4:12 PM  
**To:** Marianos, Tom (T.E.); Altschuler, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Linteco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhee (R.)  
**Subject:** YL8F-CE

I just walked a tech through reprogramming a pcm manually because he installed a YL8F-CE MPC 181 pcm and wds said there was no later calibration. We manually entered 1U7A-AXD and it took. I checked our 21.8 calibration database and it shows that YL8F-CE does not update to anything later. Can we get this looked into for all calibrations, I suspect this isn't the only one. I'm still worried that many pcm's won't update and techs won't catch it and let them go.

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

## Price, Martin (M.)

---

**From:** Percha, Rob (R.A.)  
**Sent:** Wednesday, November 13, 2002 9:38 AM  
**To:** Price, Martin (M.)  
**Subject:** RE: ISM 02-09-007

done!

-----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Wednesday, November 13, 2002 8:19 AM  
**To:** Rob Percha (E-mail); Stanley Higha (S.) (E-mail)  
**Subject:** ISM 02-09-007

TSB 02-23-01 updates this ISM, can I get it removed please?

ISM 02-09-007

SOME 2001-2003 ESCAPE WITH 3.0L ENGINES MAY EXHIBIT AN INTERMITTENT STALL. VERIFY TSB 02-11-06 HAS BEEN PERFORMED THEN REPROGRAM THE PCM WITH WDS VERSION 21.3 OR LATER. 2001 & EARLY BUILD 2002 MODELS WILL UPDATE TO 1U7A-AXD, ALL OTHER 2002 MODELS WILL UPDATE TO 2U7A-CZB, AND EARLY 2003 MODELS WILL UPDATE TO 3L8A-BC. FOR '01-'02 MODELS VERIFY LATEST DPFE SENSOR(2F1Z-9J480-AA) AND MAF(1L2Z-12B679-BA). TSB TO FOLLOW.

AUTHOR: MARTIN PRICE (MPRICE28) 79133

\*UPDATE\* 8/26/2002 SH FOR WDS VERSION. M. PRICE

*Martin Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133



**Price, Martin (M.)**

---

**From:** Suarez, Rhee (R.)  
**Sent:** Wednesday, November 13, 2002 8:24 AM  
**To:** Price, Martin (M.)  
**Subject:** RE: 97-4373R6 has gone to FINAL as 02-23-1 (enUSA)

good call. I always put that in the template that it replaces an old message but I don't think they catch that all the time. I'll tell them.

Thanks!

-----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Wednesday, November 13, 2002 8:21 AM  
**To:** Suarez, Rhee (R.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

so can you ask dallape to remove SSM 16374 now? I already asked to have the ISM removed. At the next meeting we can discuss a new ISM, if necessary.

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

-----Original Message-----

**From:** Suarez, Rhee (R.)  
**Sent:** Tuesday, November 12, 2002 3:13 PM  
**To:** Price, Martin (M.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

???? don't know??

I don't think so though. They'll just make me release another one. What it's only been 3 TSBs so far for this concern?!!?!?!?

-----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Tuesday, November 12, 2002 3:10 PM  
**To:** Suarez, Rhee (R.)  
**Subject:** RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

is it possible to revoke a tsb once it has been released?

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

-----Original Message-----

**From:** Suarez, Rhee (R.)

Sent: Tuesday, November 12, 2002 2:57 PM  
To: Price, Martin (M.)  
Subject: RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

I can't wait to re-do it again when the engineers (IAC, VMV, etc....) see that this is released!!!!

-----Original Message-----

From: Price, Martin (M.)  
Sent: Tuesday, November 12, 2002 2:56 PM  
To: Suarez, Rhae (R.)  
Subject: RE: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)

OH BOY!!

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Tuesday, November 12, 2002 2:45 PM  
To: Fournelle, Gilbert (G.); Dalbo, Bob (R.J.); Terzas, Laura (L.D.); Lawler, Dave (D.A.); Altoonien, Don (D.J.);  
Price, Martin (M.)  
Subject: FW: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)  
Importance: High

Escape Stall TSB# 2-23-01 is now released.

-----Original Message-----

From: GSIPLUS@FORD.COM [mailto:GSIPLUS@FORD.COM]  
Sent: Tuesday, November 12, 2002 2:35 PM  
To: RSUAREZ8@FORD.COM  
Subject: 97-4373R5 has gone to FINAL as 02-23-1 (enUSA)  
Importance: High

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Concern Tracking Number: 97-4373R5

TSB Article Number: 02-23-1

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- NO DIAGNOSTIC TROUBLE CODES (DTCs) PRESENT -  
VEHICLES EQUIPPED WITH 3.0L DURATEC ENGINE ONLY.

Vehicles: ESCAPE

## Price, Martin (M.)

---

**From:** Suarez, Rhoe (R.)  
**Sent:** Monday, November 11, 2002 12:48 PM  
**To:** Lawler, Dave (D.A.); Alboonlan, Don (D.J.); Price, Martin (M.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.)  
**Subject:** enUSA\_en97-4373R5.pdf

Here is the last change to look at the TSB before it goes out the door. It will go final at COB today. So if you have any major issues with it please contact Dave Lawler (I will be in a meeting this afternoon).



enUSA\_en97-4373R5.  
pdf

Good work everyone and we can finally get this one out of our hair!!!!!!

## Price, Martin (M.)

---

From: Dalbo, Bob (R.J.)  
Sent: Monday, July 29, 2002 8:10 PM  
To: Price, Martin (M.)  
Subject: RE: Hotline Repair Recommendations

Thanks, Marti. Point taken about the technicians' veracity; we know they don't perform all the current TSB actions even when they say they do.

The important thing (particularly from the NHTSA perspective) is that we are doing our best to provide the best, most accurate information possible to the field. I personally appreciate your help in doing that.

Regarding the FSEs, is there a mechanism to get them the same information as the hotline techs now have? Again, I imagine the FSEs can recommend what they feel is best, but we ought to make their recommendations as enlightened as possible.

## Bob Dalbo

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84647 Fax: (313) 32-31786  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

### -----Original Message-----

From: Price, Martin (M.)  
Sent: Friday, July 26, 2002 3:44 PM  
To: Dalbo, Bob (R.J.)  
Cc: Highe, Stanley (S.)  
Subject: FW: Hotline Repair Recommendations

The note at the very bottom was sent to the entire hotline for future calls. Also we do record all of our phone calls so if you have any specific vehicles this occurred on we can verify what exactly hotline recommended. Please keep in mind that technicians aren't entirely truthful. Many times they say things to cover the repairs they choose to make. I have also just received info back on the report below where an FSE made this recommendation, please don't confuse hotline advice with FSE's recommendations.

Caller Name: BILL REEVER (T) Report#: 2GJCS004 NHL  
Call Type (G/N/C): C Print Rpt(S/D): Ctl #: Date: 07/26/2002  
Dealer ID: 01474 Maguire's Ford, Inc. Phone: (717) 834-3111  
OASIS NOT Contacted Oasis History: Grid:  
Symptom: 8 07 5 93 DRVABL STALL/QUITS ACCELERATION ALL ENGINE TEMP  
Addl Sym: STALLS AT CRUISE Causal Cond: How/When Code:  
Vehicle: 2002 ESCAPE 4X4,XLT WAGON 1FMCU04142KC58324 Bld: 03/16/2002  
Engine: 3.0L DUR Serial: 328294087 Cal: 2M11A30 A/C: A Odom: 978 M  
Trans: CD4E E Serial: 2L8PFA8120700 Body Conv:  
07/10/2002 09:20AM BENJAMIN UFIMZEFF MSS - FCSD - TECH SVC HOTLINE  
CUSTOMER STATES THE VEHICLE HAS A STALL AT CRUISE. TECH HAS PERFORMED  
TSB FOR STALL A FEW WEEKS AGO AND CUSTOMER STATES STALLS AT CRUISE.  
SEEKING DIRECTION.HAS NOT DUPLICATED.

07/10/2002 09:20AM BENJAMIN UFIMZEFF MSS - FCSD - TECH SVC HOTLINE  
ISM 02-06-026 VERIFY TSB 02-11-06 HAS BEEN PERFORMED, CK PCM HARNESS  
SUGGEST TECH TO CK ALL CONNECTIONS AS ISM ABOVE.

07/10/2002 01:21PM ANDREW BARNES MSS - FCSD - TECH SVC HOTLINE  
TECH HAS GONE THOUGH ALL OF THE OTHER CHECKS. HE DID FIND THAT THE  
BARO IS 10 HZ LOW AT 147. HAS DISCONNECTED THE BATTERY AND REDROVE  
THE VEHICLE AND THE BARO IS STILL LOW. SEEKING FURTHER ASSISTANCE.

07/10/2002 01:21PM ANDREW BARNES MSS - FCSD - TECH SVC HOTLINE  
ADVISED THE TECH TO CHECK FOR ANY VACUUM LEAKS, EXHAUST RESTRICTIONS.

ETC. IF NONE ARE FOUND REPLACE THE MAF WITH THE REVISED ONE.

07/11/2002 11:12AM BLAINE HEISNER MSS - FCSD - TECH SVC HOTLINE  
TECH CALLING BACK STATING DID VERIFY VMV WENT TO 100%, FTP DROPPED TO  
2.2 VOLTS, BACK TO 2.6. ENTIRE TIME VMV WAS AT 100%. TECH COULD NOT  
PULL OVER TO VERIFY STALL. SEEKING IF THIS IS NORMAL OPERATION. TECH  
SUSPECTS VMV AT FAULT.

07/11/2002 11:12AM BLAINE HEISNER MSS - FCSD - TECH SVC HOTLINE  
ADV TECH VMV COMMANDED OPEN, BUT AT TIMES, ERRATICALLY CLOSING. ADV  
THIS COULD CAUSE LOW AIR FLOW TO ENGINE, POSSIBLY CAUSING STALL. ADV  
TO REPLACE VMV AND RETEST.

07/24/2002 08:26PM MARK VALESEY(FSE) MSS - FCSD - REG - PHILADELPH  
MVALESEY@FORD.COM, 856-727-3667 VM, CELL 856-952-9400. HAD TECHNICIAN  
SET BASE IDLE TO 510 RPM, WARM ENGINE IN GEAR, IAC DISCONNECTED. MAKE  
SURE TP VOLTAGE IS AT 1.0 VOLTS +/- .02 VOLTS, AND IAC IS AT 30 TO 32%

07/24/2002 08:49PM MARK VALESEY(FSE) MSS - FCSD - REG - PHILADELPH  
APPROVED FOR TECH ASSIST REFERRAL PROCESSING BY MVALESEY

***Martt Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Original Message**

From: Highe, Stanley (S.)  
Sent: Friday, July 26, 2002 3:24 PM  
Subject: Hotline Repair Recommendations

**FYI**

Please make sure to exercise caution when making any repair recommendations to dealers and be sure that we are making diagnosis and repair recommendations that are in accordance with established practices as outlined in the manuals. It has been alleged by Engineering that Hotline personnel have recommended adjusting the throttle body on Escape 3.0L vehicles for drivability issues. So far, no reports suggesting this is being done by Hotline personnel have been found.

Stanley Highe shighe@ford.com  
QOS Analyst  
Technical Service Hotline  
1700 Fairlane, Allen Park 48101  
313-31-79395

**Price, Martin (M.)**

---

**From:** Highe, Stanley (S.)  
**Sent:** Friday, July 26, 2002 3:24 PM  
**Subject:** Hotline Repair Recommendations

FYI

Please make sure to exercise caution when making any repair recommendations to dealers and be sure that we are making diagnosis and repair recommendations that are in accordance with established practices as outlined in the manuals. It has been alleged by Engineering that Hotline personnel have recommended adjusting the throttle body on Escape 3.0L vehicles for drivability issues. So far, no reports suggesting this is being done by Hotline personnel have been found.

Stanley Highe shighe@ford.com  
QOS Analyst  
Technical Service Hotline  
1700 Fairlane, Allen Park 48101  
313-31-79395

## Price, Martin (M.)

---

From: Highe, Stanley (S.) on behalf of Echhot, T. (T.)  
Sent: Friday, July 26, 2002 3:01 PM  
To: Price, Martin (M.)  
Subject: RE: Escape throttle adjustment

That wasn't the Hotline, that was the FSE. Not even close. Evidently they don't know the difference.

### -----Original Message-----

From: Price, Martin (M.)  
Sent: Friday, July 26, 2002 2:57 PM  
To: Echhot, T. (T.)  
Subject: RE: Escape throttle adjustment

I just got this TAR report back, maybe this is what they are talking about. 2GJCS004.

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

### -----Original Message-----

From: Highe, Stanley (S.) On Behalf Of Echhot, T. (T.)  
Sent: Friday, July 26, 2002 12:36 PM  
To: Price, Martin (M.)  
Subject: RE: Escape throttle adjustment

I have not found any report in CQIS where any Hotliner said to adjust the throttle body, nor anything close to it. Let me know who sent you the note so I can advise him/her/them that if they are going to make accusations, to have proof, names, dates, report numbers, VINs, etc.

### -----Original Message-----

From: Price, Martin (M.)  
Sent: Friday, July 26, 2002 12:29 PM  
To: Echhot, T. (T.)  
Subject: RE: Escape throttle adjustment

no proof that I'm aware of. They just say that tech's are telling them that we recommended it, which is probably the techs just CYA'ing.

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

### -----Original Message-----

From: Highe, Stanley (S.) On Behalf Of Echhot, T. (T.)  
Sent: Friday, July 26, 2002 12:24 PM  
To: Price, Martin (M.)  
Subject: RE: Escape throttle adjustment

will do. Do they have proof, like specific names of the Hotline personnel, or is this another hotline causing us to get blamed again?

### -----Original Message-----

From: Price, Martin (M.)  
Sent: Friday, July 26, 2002 12:15 PM  
To: Echhot, T. (T.)  
Subject: Escape throttle adjustment

Engineering is saying that hotliners are still recommending adjusting throttle stops on Escapes and they want

this to stop. Could we send a note to everyone advising not to do this to please them? Thanks!

*Matti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133



**Price, Martin (M.)**

---

From: Schmidt, Matthew (M.)  
Sent: Friday, July 12, 2002 6:45 PM  
To: Price, Martin (M.)  
Subject: iam

How does this guy get iam's. check comment #4

STEVE MYERS  
Family Ford Inc  
Netcong, NJ  
(973)347-3000 posted July 12, 2002 8:22 AM ET (US)

Has anyone come up with a definite fix for the stalling/ quits running concern yet? I have one that I can't verify, went through the most recent TSB, 02-11-06, and found nothing. Any suggestions? Customer insists that the vehicle stalls, very intermittently.

ERNEST WITMER  
Palmer H Reed Motor Sales  
Valley View, PA  
(570)682-3874 posted July 12, 2002 12:15 PM ET (US)

What year? Right now I am working on a 02 with the same symptoms and also doing the tsb. My customer owned a 01 with the same problem. It was verified and Lemon Lawed. Hope I surely find the problem with this one. This is going to be repair attempt #1.

Joe Maharg  
Friendly Ford, Inc.  
Springfield, MO  
(417)883-4330 posted July 12, 2002 1:41 PM ET (US)

WE HAVE HAD 3 OF THE 02 ESCAPES WITH A DYING CONCERN AT 30-40MPH. UNFORTUNATLY, IT ONLY HAPPEN EVERY 1200-1500 MILES. WE HAVE PERFORMED TSB 02-11-06 ON ALL OF THEM AND SET THEM LOOSE. \*\*\* THIS WEEK A (FSE) TOLD ME THAT THIS TSB IS NOT GOING TO FIX THE PROBLEM. ??????????????

TERRY WOOD  
King Charlie Hillard Ford  
Ft Worth, TX  
(817)370-5000 posted July 12, 2002 2:24 PM ET (US)

ISM ARTICLE#02-06-025 6/17/02 FROM RAV SOME 2001-2001 ESCAPES MAY EXHIBIT AN INTERMITTENT STALL, VERIFY TSB 02-11-06 HAS BEEN DONE AND PERFORM THE FOLLOWING , DISCONNECT AND INSPECT PCM HARNESS FOR BURNT OR BENT PINS. INSPECT MAF GASKET. IF

STALL IS RELATED TO RFI (IE; RADIO TOWER/2WAY RADIO) RREPLACE MAF W/ 1LS2-12B579-BA, INSPECT DPFE SENSOR, IF PART # YF1E-9J460-AD AND NO WHITE DOT PRESENT (NOTE COULD BE ANY WHERE ON SENSOR) REPLACE WITH A YF1Z-9J460-AD WITH A WHITE DOT OR 2F1Z-9J460-AA (NO DOT REQUIRED). INSPECT C270B,C,D,C110,C133 FOR WATER INTRUSION-PINPROBLEMS, INSPECT G300,G100, REMOVE BATTERY TRAY AND INSPECT G104/105,G101. INSPECT CKP HARNESS NEAR COMPRESSOR. GOOD LUCK TW

STEVE MYERS

Family Ford Inc

Netcong, NJ

(973)347-3000 posted July 12, 2002 4:19 PM ET (US)

02 escape. I am waiting for the updated maf sensor. won't see it till monday. I'll check all grounds and pcm connector. Already installed the updated dpfe. we'll see what happens.

Matthew Schmidt

Ford Technical Hotline

Technical Service Engineer

313-317-4280

mschmi56@ford.com

## Price, Martin (M.)

---

From: Sanders, Muriel (M.S.)  
Sent: Friday, July 12, 2002 4:31 PM  
To: Price, Martin (M.)  
Subject: RE: ISM to dealers?

Ok. I usually only give the text to dealers anyway, but it's possible I forgot to delete the ISM # on something.

### *Muriel Sanders*

U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

#### -----Original Message-----

From: Price, Martin (M.)  
Sent: Friday, July 12, 2002 3:27 PM  
To: Suarez, Rhae (R.); Sanders, Muriel (M.S.)  
Subject: ISM to dealers?

Muriel, Rhae we would like to keep the term ISM away from the public, ie: dealers. The information can be provided to them but not the term ISM or #. It makes it look like we are keeping secrets from them, and they don't like that. Plus then the public can get hold of these and the response won't be good. Thanks.

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

#### -----Original Message-----

From: Willis, Jeff (J.E.)  
Sent: Friday, July 12, 2002 3:13 PM  
To: Price, Martin (M.)  
Subject: RE: Escape Stall

TERRY WOOD  
King Charlie Hillard Ford  
Ft Worth, TX  
(817)370-6000 posted July 12, 2002 2:24 PM ET (US)

#### -----Original Message-----

From: Price, Martin (M.)  
Sent: Friday, July 12, 2002 3:11 PM  
To: Willis, Jeff (J.E.)  
Subject: RE: Escape Stall

I don't know, probably FSE. DO you know who posted the message?

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

#### -----Original Message-----

From: Willis, Jeff (J.E.)  
Sent: Friday, July 12, 2002 2:33 PM  
To: Price, Martin (M.)

**Subject:** Escape Stall

Marti,

I was cruising the message boards and found this. I wondering how the tech got this ISM. Maybe a FSE or CSM gave it to them?

**Author Topic:** Escape stalling

**STEVE MYERS**  
Family Ford Inc  
Netcong, NJ  
(973)347-3000 posted July 12, 2002 8:22 AM ET (US)

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Has anyone come up with a definite fix for the stalling/ quits running concern yet? I have one that I can't verify, went through the most recent TSB, 02-11-06, and found nothing. Any suggestions? Customer insists that the vehicle stalls, very intermittently.

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What year? Right now I am working on a 02 with the same symptoms and also doing the tab. My customer owned a 01 with the same problem. It was verified and Lemon Lawed. Hope I surely find the problem with this one. This is going to be repair attempt #1.

**Joe Maharg**  
Friendly Ford, Inc.  
Springfield, MO  
(417)883-4330 posted July 12, 2002 1:41 PM ET (US)

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**Jeffrey Willis**  
Service Engineer

Engine Prior Approval Group  
Ford Technical Hotline  
(313) 248-8204

**Price, Martin (M.)**

---

**From:** Wills, Jeff (J.E.)  
**Sent:** Friday, July 12, 2002 3:13 PM  
**To:** Price, Martin (M.)  
**Subject:** RE: Escape Stall

TERRY WOOD  
King Charlie Hillard Ford  
Ft Worth, TX  
(817)370-5000 posted July 12, 2002 2:24 PM ET (US)

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**From:** Price, Martin (M.)  
**Sent:** Friday, July 12, 2002 3:11 PM  
**To:** Wills, Jeff (J.E.)  
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*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

---Original Message---

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**Sent:** Friday, July 12, 2002 2:33 PM  
**To:** Price, Martin (M.)  
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Jeffrey Willis  
Service Engineer  
Engine Prior Approval Group  
Ford Technical Hotline  
(313) 248-8204

**Price, Martin (M.)**

---

**From:** Pepitone, GII (J.)  
**Sent:** Thursday, June 27, 2002 2:11 AM  
**To:** Johnson, Jim (J.S.); Bilicki, John (J.R.); Corbett, Sandra (S.M.); Altocnlan, Don (D.J.); Aynessazian, Kam (K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Rothweiler, Daniel (D.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); McDonald II, John (J.M.); Jordan, Donald (D.E.); King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Mandziuk, Roger (R.S.); Marck, Edmond (E.C.); Matessa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tomiko (T.T.); Morishima, Shigeki (S.); Nemetolahi, Sonya (S.); Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Sanders, Muriel (M.S.); Shah, Kran (K.C.); Shirashi, Masaru (M.); Stillerbauer, Jeffrey (J.R.); Suarez, Rhae (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veenstra, Tim (T.W.); Wakenell, Ray (R.A.); Wattach, Bill (B.); Williams, Les (L.H.W.); Yeung, Lam (L.); Benintende, Robert (R.F.); Goering, Kimberly (K.L.); Suarez, Rhae (R.); Terzes, Laura (L.D.); Martin, Mike (M.S.); Weder, Mark (M.A.); Amely, Felix (F.A.); Bradley, Joe (J.C.); Linde, Peter (P.A.); Goering, Kimberly (K.L.); Terzes, Laura (L.D.); Benintende, Robert (R.F.); Weder, Mark (M.A.); Amely, Felix (F.A.)  
**Co:** Pepitone, GII (J.); DiAngelo, Renaldo (R.); Beranier, Joel (J.R.); Surti, P. J. (P.J.); Noteboom, Jim (J.E.)  
**Subject:** PFQS's Investigation Results of Virgin Islands Escape Driveability Concerns  
**Importance:** High

Good evening everyone:

Here's my report on my trip.



Results of Virgin Island  
ESCAP...

I will be calling in on the Conference all at 2pm today.

Call-in info: 1-877-870-3528 or Ford net 9-1-954-1144  
International Participants: 1-830-683-1704  
Passcode: 7673538, then hit #

I thank the Team for all their assistance.

GII Pepitone  
Powertrain Field Quality Specialist-"PFQS" in  
South Florida  
Office/Answering Machine: 954-753-9989  
Cell Phone 954-242-2088  
"With Warranty you are Paying for the Sins of the Past"



## Price, Martin (M.)

---

From: Pepitone, Gil (J.)  
Sent: Friday, June 14, 2002 3:23 PM  
To: Johnson, Jim (J.S.); Bilicki, John (J.R.); Corbett, Sandra (S.M.); DiAngelo, Renaldo (R.); Altoonian, Don (D.J.); Aynessazian, Kam (K.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chin, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Rothweller, Daniel (D.); De Pena, Juan (J.E.); Diez, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); McDonald II, John (J.M.); Jordan, Donald (D.E.); King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Mandzluk, Roger (R.S.); Marck, Edmond (E.C.); Matessa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tomiko (T.T.); Morishima, Shigeki (S.); Nematollahi, Sonya (S.); Notaboom, Jim (J.E.); Ortmann, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepsau, Alden (A.P.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirahshi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Takasawa, Keith (K.D.); Takubo, Hiroichi (H.); Veenstra, Tim (T.W.); Wakenell, Ray (R.A.); Wettach, Bill (B.); Williams, Lee (L.H.W.); Young, Lam (L.); Benintende, Robert (R.F.); Fernandez, Ruben (R.); Bradley, Joe (J.C.); Goering, Kimberly (K.L.); Suarez, Rhea (R.); Terzee, Laura (L.D.); Martin, Mike (M.S.); Wexler, Mark (M.A.); Amely, Felix (F.A.)  
Cc: Pepitone, Gil (J.)  
Subject: Inspection Sheet for St. Croix Vehicle Inspection

Good afternoon everyone: I have included all those that I have been in continuous communication, plus all who are part of the "Escape Stalls Team" Conference Call which I have attended.

The file below contains the form I will use. This information is a result of the feedback I have received from Mr. Altoonian, plus all existing Service Communications, both external and internal.

Please note that the items are ordered in such a way to allow me to leave the vehicle in it's original state until I can replicate the Stalls Concern, if ever.

I intend on extensively driving these Units until I deem it impossible for Concern replication.

At that point, I will perform any modifications to at least leave the Units at the latest repair level possible.



St. Croix Escape  
Vehicle Data...

FYI...  
Gil Pepitone  
Powertrain Field Quality Specialist-"PFQS" in  
South Florida  
Office/Answering Machine: 954-753-9969  
Cell Phone 954-242-2066  
"With Warranty you are Paying for the Sins of the Past"

**Price, Martin (M.)**

---

**From:** Chacon, Jose (J.)  
**Sent:** Wednesday, July 31, 2002 5:00 PM  
**To:** Kunst, Christopher (C.); Avery, Kevin (K.); Barnes, Andrew (A.); Brugger, Thomas (T.); Comeau, Sylvain (S.); Cruz, Jose (J.); Dow, Winthrop (W.); Drallatta, Adam (A.); Garza, Robert (R.); Girard, Mario (M.); Helmer, Blaine (B.M.); Highe, Stanley (S.); Huspen, Timothy (T.F.); Knoll, Alexander (A.); Koths, Robert (R.P.); Krein, Bradley (B.); Loh, Chou (C.); Mantgen, Keith (K.); Mueller, John (J.); Owens, Jonathan (J.); Perriton, Caleb (C.); Price, Martin (M.); Roussel, Stephane (S.); Schmidt, Matthew (M.); Schmile, Michael (M.); Ufimzeff, Ben (B.)  
**Subject:** RE: 2002 Escape stall fix

Thank you, It is good to know who's the King!!!

-----Original Message-----

**From:** Kunst, Christopher (C.)  
**Sent:** Wednesday, July 31, 2002 4:52 PM  
**To:** Avery, Kevin (K.); Barnes, Andrew (A.); Brugger, Thomas (T.); Chacon, Jose (J.); Comeau, Sylvain (S.); Cruz, Jose (J.); Dow, Winthrop (W.); Drallatta, Adam (A.); Garza, Robert (R.); Girard, Mario (M.); Helmer, Blaine (B.M.); Highe, Stanley (S.); Huspen, Timothy (T.F.); Knoll, Alexander (A.); Koths, Robert (R.P.); Krein, Bradley (B.); Kunst, Christopher (C.); Loh, Chou (C.); Mantgen, Keith (K.); Mueller, John (J.); Owens, Jonathan (J.); Perriton, Caleb (C.); Price, Martin (M.); Roussel, Stephane (S.); Schmidt, Matthew (M.); Schmile, Michael (M.); Stegemann, Rolf (R.S.); Ufimzeff, Ben (B.)  
**Subject:** 2002 Escape stall fix

Team,  
Check out this confirmed fix on 2002 Escape stall concern.

Caller Name: JAMES JETER (SF) Report#: 2GTAH003 NHL  
Call Type (G/N/C): C Print Rpt(S/D): Ctl #: Date: 07/31/2002  
Dealer ID: 02530 Pegues-Hurst Motor Compan Phone: (903) 232-2585  
OASIS YES Contacted Oasis History: Grid: \_\_\_  
Symptom: 8 01 0 00 DRVABL NO CRANK  
Addl Sym: NO START, NO COM WITH PCM Causal Cond: How/When Code: \_\_\_  
Vehicle: 2002 ESCAPE 4X2,XLT WAGON 1FMYU03172KD02402 Bld: 04/10/2002  
Engine: 3.0L DUR Serial: 365674086 Cal: 2M11A30 A/C: A Odom: 3495 M  
Trans: CD4E E Serial: 2L8PEB7120940 Body Conv: \_\_\_

RP 07/20/2002 09:13AM JEREMY FLESCH MSS - FCSD - TECH SVC HOTLINE  
TECH STATES THAT THE TRUCK STALLED GOING UP DRIVEWAY AND WOULD NOT START, AND HAS NO COMMUNICATION WITH THE PCM

RE 07/20/2002 09:13AM JEREMY FLESCH MSS - FCSD - TECH SVC HOTLINE  
ADVISED TECH TO ENSURE THAT HTE POWERS AND GROUNDS ARE ADEQUATE, ALSO ENSURE THAT V-REF IS NOT SHORTED

RP 07/23/2002 01:25PM JOSE CRUZ MSS - FCSD - TECH SVC HOTLINE  
TECH CALLING BACK. STATES THAT THE PTS WEBSITE IS NOT WORKING. CALLING FOR AS BUILT DATA.

RE 07/23/2002 01:25PM JOSE CRUZ MSS - FCSD - TECH SVC HOTLINE  
ADV. TECH I WOULD FAX THE AS BUILT DATA TO HIM. FAXED TO 419-888-4215

RP 07/23/2002 02:00PM KEVIN AVERY MSS - FCSD - TECH SVC HOTLINE  
TECH STATES REPLACED PCM AND IT IS SEEKING VEHICLE DATA, STATES CAME FROM A CHRYSLER DEALER AND UNFAMILIAR WITH THIS SETP.

RE 07/23/2002 02:00PM KEVIN AVERY MSS - FCSD - TECH SVC HOTLINE  
ADV TECH PCM IS NEEDING AS BUILT DATA, ADV TECH HOW TO OBTAIN DATA, PROVIDED VEHICLE DATA.

- RP 07/31/2002 09:13AM JOSE CHACON MSS - FCSD - TECH SVC HOTLINE  
THE TECHNICIAN WORKING ON THIS VEHICLE STATES: "THIS VEHICLE IS NOW IN OUR SHOP, THIS VEHICLE IS AT A DIFFERENT SHOP (TECHNICIAN JAMES AT P&A CODE 02530) THIS VEHICLE KEEPS SMOKING PCM'S, WE HAVE NO IDEA WHY. WE JUST INSTALLED THE THIRD PCM. ON THE LAST PCM THE ENGINE WILL NO START, THE INSTRUMENT CLUSTER SET CODES P0705/U1282/B1601/B1318. CLEARED THE CODES AND REPROGRAMMED THE KEYS ALL THE CODES ARE NO LONGER THERE. THE MLP SENSOR LOOK O.K." LOOKING FOR DIRECTION.
- RE 07/31/2002 09:13AM JOSE CHACON MSS - FCSD - TECH SVC HOTLINE  
TSB 02-11-08 PERFORM NORMAL DIAG, RE-FLASH THE (PCM)  
ADVISED THE TECHNICIAN:  
NO KNOWNS ON WHY THE PCM KEEP FAILING. SUGGEST TO CHECK FOR ANY SHORTS AT THE MLP SENSOR OR HARNESS, MONITOR THE DPFE SENSOR FOR VOLTAGE REFERENCE SHORTS. UNPLUG THE PCM PINS 90/91 AND RE-EVALUATE. LOOK FOR ANY BURNT PIN OR BENT PINS AT THE PCM CONNECTOR. USE TSB 02-11-08 AS A REFERENCE.
- RP 07/31/2002 10:33AM BRADLEY KREIN MSS - FCSD - TECH SVC HOTLINE  
SF CALLING IN. SF STS THAT THERE HAVE BEEN 3 PCM'S REPLACED IN THIS VEHICLE. SF STS THAT EACH TIME THE PCM WILL FAIL IT WILL NOT WORK IN ANOTHER VEHICLE. SF STS THAT HE WILL HAVE NO COMMUNICATION DURING THE CONCERN. TECH SEEKING KNOWNS.
- RE 07/31/2002 10:33AM BRADLEY KREIN MSS - FCSD - TECH SVC HOTLINE  
ADVISED SF TO CHECK THE VREF CIRCUIT FOR A POSSIBLE SHORT TO GROUND CAUSING PCM FAILURE. ALSO ADVISED TECH TO CHECK THE DPFE SENSOR FOR SIGNS OF A POSSIBLE CAUSE SHORTING OUT VREF.
- CA 07/31/2002 04:19PM CHRISTOPHE KUNST MSS - FCSD - TECH SVC HOTLINE  
TECH CALLING BACK WITH FIX INFORMATION. TECH STATES HE FOUND VREF CIRCUIT 351 AND IGNITION CAPACITOR CIRCUIT 296 CHAFFED AND SHORTED ON AN A/C LINE ABOUT 2 INCHES FROM CONNECTOR 134. TECH BELIEVES IGNITION CAPACITOR FEEDBACK THROUGH VREF CIRCUIT WAS CAUSING PCM FAILURES.

*Chris Kunst*

Service Engineer / Dearborn Engine Specialist  
Ford Technical Service Hotline  
Phone # (313) 317-9293

## Price, Martin (M.)

**From:** Noteboom, Jim (J.E.)  
**Sent:** Tuesday, July 30, 2002 11:27 AM  
**To:** Sanders, Muriel (M.S.); Altonian, Don (D.J.); Bauer, Scott (S.C.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); 'Cary Powell'; Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); 'Dan Rothweiler'; De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duvall, Allen (A.W.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Goodwin, William (W.R.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Holman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); 'John McDonald'; 'Jones, Andy'; Jordan, Donald (D.E.); Kanai, Shini (S.); King, Robert (R.F.); Koeko, Jeff (J.R.); Kwon, Soon (S.K.); Le, Dzong (D.H.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Mandziuk, Roger (R.S.); Marck, Edmond (E.C.); Matea, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); 'Morgan, Tom'; Morishima, Shigeki (S.); 'Navsed Khan'; Nemotohshi, Sonya (S.); 'Nikolai, Bernie'; Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Aiden (A.P.); Shah, Kiran (K.C.); Shirahshi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veenstra, Tim (T.W.); Wakonell, Ray (R.A.); Wettsch, Bill (B.); Williams, Lee (LHW.); Yeung, Lem (.)  
**Subject:** RE: U204 Stall Investigation, 7-28-02

VEH: '02 Escape VIN: 1FMCU04112KD11740 BUILT: 4-11-02  
MILES: 1860  
CUSTOMER: Carol Segety / 303-252-8278 (home) LOCATION: Northglenn, Colo.  
COMPLAINT: Stalls in slow traffic. Note: the stall occurs in the same location (80th between Wadsworth and 36) as the previous vehicle; checked this out and there are high tension lines crossing the road there.

### TSB and SSM results:

- IAC=34%
- EVAP system passed.
- DPFE and EEC relay are the latest.
- Keys do not have excessive weight.
- All related grounds were secure.

Based on the stall location and the possibility of RFI, the MAP was updated to a 1L2Z-BA.

Also on this vehicle the battery was leaking from the seam on the corner opposite the negative post (see photos). The customer stated that when the vehicle was purchased, the original batt. was dead and was replaced. This batt. was not a service piece but looked like original equipment so it's history is in question. A new service batt. was installed.



100-0207.jpg

Serial no.



100-0207.jpg

Acid drip from seam.

Jim Noteboom  
Powertrain Field Quality Specialist/Denver  
Phone: 303.674.4015 FAX: 303.674.6730  
Cell: 303.921.2076

**Price, Martin (M.)**

---

**From:** Sanders, Muriel (M.S.)  
**Sent:** Monday, August 12, 2002 2:12 PM  
**To:** Price, Martin (M.)  
**Subject:** RE: revised

Looks fine. You may want to highlight the fact that 2003MY vehicles will not need the dpfe checked. This may avoid confusion.

*Muriel Sanders*  
U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

-----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Monday, August 12, 2002 11:08 AM  
**To:** Altoonlan, Don (D.J.); DeBo, Bob (R.J.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhea (R.)  
**Subject:** revised

Ok how's this?

<< File: Escape Stall ISM.doc >>

*Marti Price*  
Cleveland Engine Specialist, DSC I #153  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

---

**From:** Marianos, Tom (T.E.)  
**Sent:** Monday, August 19, 2002 1:54 PM  
**To:** Price, Martin (M.)  
**Subject:** RE: wds 20.8

But they are not flashable. That is an additive list. We could remove them, but that would not really make a difference.

We listed them in the database as not certified, so they are not flashable.

-----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Monday, August 19, 2002 1:52 PM  
**To:** Marianos, Tom (T.E.)  
**Subject:** RE: wds 20.8

They're still listed on the wds calibration lists on the web, were those just not changed?

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

-----Original Message-----

**From:** Marianos, Tom (T.E.)  
**Sent:** Monday, August 19, 2002 12:52 PM  
**To:** Fournelle, Gilbert (G.)  
**Cc:** Suarez, Rhee (R.); Price, Martin (M.)  
**Subject:** RE: wds 20.8

Gilbert,  
We turned off those calibrations on Wednesday of last week.

-----Original Message-----

**From:** Fournelle, Gilbert (G.)  
**Sent:** Monday, August 19, 2002 11:23 AM  
**To:** Marianos, Tom (T.E.)  
**Cc:** Suarez, Rhee (R.); Price, Martin (M.)  
**Subject:** RE: wds 20.8

Tom,

Can you please look into this issue. The new calibrations should be pulled from service. We are working on an R11 release to fix the strategy problem which occurred in the R10 release. There is an issue with incorrect KAM initialization which could cause issues at startup with cleared KAM.

Sincerely,

*Gilbert Fournelle*

V6 U204 Calibration Engineering  
1AE27 Truck Engine Engineering (TEE)  
Phone:(313)3904988 Fax:(313)3231786

-----Original Message-----

**From:** Suarez, Rhee (R.)  
**Sent:** Monday, August 19, 2002 9:45 AM  
**To:** Price, Martin (M.); Fournelle, Gilbert (G.); Sanders, Muriel (M.S.)  
**Subject:** RE: wds 20.8

sorry, I don't have any ability to do anything like this. The only person I know that deals with WDS cals is Tom Marianos. Anyone contact him yet? Let me know.

-----Original Message-----

From: Price, Martin (M.)  
Sent: Monday, August 19, 2002 9:38 AM  
To: Fournelle, Gilbert (G.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
Subject: RE: wds 20.8

our list shows the 2001 calibration is still there. It shows on the list I sent previously.

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

-----Original Message-----

From: Fournelle, Gilbert (G.)  
Sent: Monday, August 19, 2002 9:27 AM  
To: Price, Martin (M.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
Subject: RE: wds 20.8

The calibrations are not yet fixed. It looks like only the 2001 service calibrations were removed. I do not know why this happened, the 2003 and 2002 service calibrations should also have been removed. Rhae, can you please take of this?

Regards,

*Gilbert Fournelle*

V6 U204 Calibration Engineering  
1AE27 Truck Engine Engineering (TEE)  
Phone:(313)3804868 Fax:(313)3231766

-----Original Message-----

From: Price, Martin (M.)  
Sent: Monday, August 19, 2002 9:10 AM  
To: Sanders, Muriel (M.S.); Suarez, Rhae (R.); Fournelle, Gilbert (G.)  
Subject: wds 20.8

Version 20.8 is out and the new calibrations are still listed. Are they fixed? If not why weren't they removed?

<< File: WDS CAL DB B20A.8.zip >>

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

---

From: Fournelle, Gilbert (G.)  
Sent: Monday, August 19, 2002 11:23 AM  
To: Marianos, Tom (T.E.)  
Cc: Suarez, Rhae (R.); Price, Martin (M.)  
Subject: RE: wds 20.8

Tom,

Can you please look into this issue. The new calibrations should be pulled from service. We are working on an R11 release to fix the strategy problem which occurred in the R10 release. There is an issue with incorrect KAM initialization which could cause issues at startup with cleared KAM.

Sincerely,

***Gilbert Fournelle***

V8 U204 Calibration Engineering  
1AE27 Truck Engine Engineering (TEE)  
Phone:(313)3904988 Fax:(313)3231788

-----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Monday, August 19, 2002 9:45 AM  
To: Price, Martin (M.); Fournelle, Gilbert (G.); Sanders, Muriel (M.S.)  
Subject: RE: wds 20.8

sorry, I don't have any ability to do anything like this. The only person I know that deals with WDS cals is Tom Marianos. Anyone contact him yet? Let me know.

-----Original Message-----

From: Price, Martin (M.)  
Sent: Monday, August 19, 2002 9:38 AM  
To: Fournelle, Gilbert (G.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
Subject: RE: wds 20.8

our list shows the 2001 calibration is still there. It shows on the list I sent previously.

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

-----Original Message-----

From: Fournelle, Gilbert (G.)  
Sent: Monday, August 19, 2002 9:27 AM  
To: Price, Martin (M.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
Subject: RE: wds 20.8

The calibrations are not yet fixed. It looks like only the 2001 service calibrations were removed. I do not know why this happened, the 2003 and 2002 service calibrations should also have been removed. Rhae, can you please take of this?

Regards,

***Gilbert Fournelle***

V8 U204 Calibration Engineering  
1AE27 Truck Engine Engineering (TEE)  
Phone:(313)3904988 Fax:(313)3231788



-----Original Message-----

From: Price, Martin (M.)  
Sent: Monday, August 19, 2002 9:10 AM  
To: Sanders, Muriel (M.S.); Suarez, Rhea (R.); Fournelle, Gilbert (G.)  
Subject: wds 20.8

Version 20.8 is out and the new calibrations are still listed. Are they fixed? If not why weren't they removed?

<< File: WDS CAL DB B20A.8.zip >>

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

## Price, Martin (M.)

---

From: Suarez, Rhae (R.)  
Sent: Monday, August 19, 2002 10:10 AM  
To: Price, Martin (M.)  
Subject: RE: wds 20.8

that's what I thought. But Gilbert was asking me if I could handle it..... nope sorry =)

### -----Original Message-----

From: Price, Martin (M.)  
Sent: Monday, August 19, 2002 9:51 AM  
To: Suarez, Rhae (R.)  
Subject: RE: wds 20.8

I think Gil or Bob Dalbo could handle it, I presume they make the requests to WDS callibrators.

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

### -----Original Message-----

From: Suarez, Rhae (R.)  
Sent: Monday, August 19, 2002 9:45 AM  
To: Price, Martin (M.); Fournelle, Gilbert (G.); Sanders, Muriel (M.S.)  
Subject: RE: wds 20.8

sorry, I don't have any ability to do anything like this. The only person I know that deals with WDS cals is Tom Marianos. Anyone contact him yet? Let me know.

### -----Original Message-----

From: Price, Martin (M.)  
Sent: Monday, August 19, 2002 9:38 AM  
To: Fournelle, Gilbert (G.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
Subject: RE: wds 20.8

our list shows the 2001 calibration is still there. It shows on the list I sent previously.

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

### -----Original Message-----

From: Fournelle, Gilbert (G.)  
Sent: Monday, August 19, 2002 9:27 AM  
To: Price, Martin (M.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
Subject: RE: wds 20.8

The calibrations are not yet fixed. It looks like only the 2001 service calibrations were removed. I do not know why this happened, the 2003 and 2002 service calibrations should also have been removed. Rhae, can you please take of this?

Regards,

### *Gilbert Fournelle*

V8 U204 Calibration Engineering  
1AE27 Truck Engine Engineering (TEE)  
Phone:(313)3904988 Fax:(313)3231788

-----Original Message-----

From: Price, Martin (M.)  
Sent: Monday, August 19, 2002 9:10 AM  
To: Sanders, Muriel (M.S.); Suarez, Rhoe (R.); Fournelle, Gilbert (G.)  
Subject: wds 20.8

Version 20.8 is out and the new calibrations are still listed. Are they fixed? If not why weren't they removed?

<< File: WDS CAL DB B20A.8.zip >>

*Martin Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

## Price, Martin (M.)

---

From: Suarez, Rhee (R.)  
Sent: Monday, August 19, 2002 9:45 AM  
To: Price, Martin (M.); Fournelle, Gilbert (G.); Sanders, Muriel (M.S.)  
Subject: RE: wds 20.8

sorry, I don't have any ability to do anything like this. The only person I know that deals with WDS cal's is Tom Marianos. Anyone contact him yet? Let me know.

### -----Original Message-----

From: Price, Martin (M.)  
Sent: Monday, August 19, 2002 9:38 AM  
To: Fournelle, Gilbert (G.); Sanders, Muriel (M.S.); Suarez, Rhee (R.)  
Subject: RE: wds 20.8

our list shows the 2001 calibration is still there. It shows on the list I sent previously.

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

### -----Original Message-----

From: Fournelle, Gilbert (G.)  
Sent: Monday, August 19, 2002 9:27 AM  
To: Price, Martin (M.); Sanders, Muriel (M.S.); Suarez, Rhee (R.)  
Subject: RE: wds 20.8

The calibrations are not yet fixed. It looks like only the 2001 service calibrations were removed. I do not know why this happened, the 2003 and 2002 service calibrations should also have been removed. Rhee, can you please take of this?

Regards,

### *Gilbert Fournelle*

V8 U204 Calibration Engineering  
1AE27 Truck Engine Engineering (TEE)  
Phone:(313)3904988 Fax:(313)3231786

### -----Original Message-----

From: Price, Martin (M.)  
Sent: Monday, August 19, 2002 9:10 AM  
To: Sanders, Muriel (M.S.); Suarez, Rhee (R.); Fournelle, Gilbert (G.)  
Subject: wds 20.8

Version 20.8 is out and the new calibrations are still listed. Are they fixed? If not why weren't they removed?

<< File: WDS CAL DB B20A.8.zip >>

### *Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

---

**From:** Fournelle, Gilbert (G.)  
**Sent:** Monday, August 19, 2002 9:27 AM  
**To:** Price, Martin (M.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
**Subject:** RE: wds 20.8

The calibrations are not yet fixed. It looks like only the 2001 service calibrations were removed. I do not know why this happened, the 2003 and 2002 service calibrations should also have been removed. Rhae, can you please take of this?

Regards,

***Gilbert Fournelle***

V6 U204 Calibration Engineering  
1AE27 Truck Engine Engineering (TEE)  
Phone:(313)3904968 Fax:(313)3231786

—Original Message—

**From:** Price, Martin (M.)  
**Sent:** Monday, August 19, 2002 9:10 AM  
**To:** Sanders, Muriel (M.S.); Suarez, Rhae (R.); Fournelle, Gilbert (G.)  
**Subject:** wds 20.8

Version 20.8 is out and the new calibrations are still listed. Are they fixed? If not why weren't they removed?

<< File: WDS CAL DB B20A.8.zip >>

***Marti Price***

Cleveland Engine Specialist, D&C I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

## Price, Martin (M.)

From: Dalbo, Bob (R.J.)  
Sent: Wednesday, August 28, 2002 9:21 PM  
To: Price, Martin (M.)  
Subject: RE: 2:00 PM stall meeting

8/8/2002E at this point. Stay tuned.

## Bob Dalbo

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 795-2858 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

### —Original Message—

From: Price, Martin (M.)  
Sent: Wednesday, August 28, 2002 6:28 PM  
To: Dalbo, Bob (R.J.)  
Subject: RE: 2:00 PM stall meeting

please just let me know when the calibration is available on wds.

## Marti Price

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
[mprice28@ford.com](mailto:mprice28@ford.com) ph. (313)317-9133

### —Original Message—

From: Dalbo, Bob (R.J.)  
Sent: Wednesday, August 28, 2002 4:40 PM  
To: Fournelle, Gilbert (G.); Alkoonian, Don (D.J.); Bauer, Scott (S.C.); Bhojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell (E-mail); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duval, Allen (A.W.); Fascetti, Bob (R.J.); Freeland, Mark (M.); Giles, Stuart (S.); Goldhale, Renuka (R.V.); Goodwin, William (W.R.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Jiyunichiro (J.); Jansen, Ted (T.E.); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shingi (S.); Khan, Naved; King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); La, Dzong (D.H.); Limdeco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Matassa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McDonald, John; McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tomiko (T.T.); Morishima, Shigeki (S.); Nemotohishi, Sonya (S.); Nikolai, Bernie; Nolsboom, Jim (J.E.); Orman, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquesau, Alden (A.P.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shimachi, Masaru (M.); Silgenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veestra, Tim (T.W.); Wakenell, Ray (R.A.); Weibach, Bill (B.); Williams, Les (L.H.W.)  
Subject: RE: 2:00 PM stall meeting

Thursday's (8/29) stall meeting will be cancelled to focus on the R11 calibrations' production trial.

## Bob Dalbo

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84947 Fax: (313) 32-31786  
Pager: (313) 795-2858 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

### —Original Message—

From: Fournelle, Gilbert (G.)  
Sent: Thursday, August 22, 2002 10:02 AM  
To: Alkoonian, Don (D.J.); Bauer, Scott (S.C.); Bhojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Cary Powell (E-mail); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Duval, Allen (A.W.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Freeland, Mark (M.); Giles, Stuart (S.); Goldhale, Renuka (R.V.); Goodwin, William (W.R.); Grewal, Bill (B.S.); Grimes, Jeff (J.R.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hoshino, Jun (J.); Ichikawa, Jiyunichiro (J.); Jansen, Ted (T.E.); Jones,

Andy, Jordan, Donald (D.E.); Karel, Shingl (S.); Khan, Naveed; King, Robert (R.F.); Kosko, Jeff (J.R.); Kwon, Soon (S.K.); La, Dzong (D.H.); Limbaco, Steven (S.); Linde, Peter (P.A.); Liu, Jana (J.); Marck, Edmond (E.C.); Matsa, John (J.); Maurer, James (J.B.); Mazzella, Gary (G.R.); McDonald, John; McGee, Brett (B.L.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tomiko (T.T.); Morishima, Shigeki (S.); Nematohtaki, Sonya (S.); Nicolai, Bernie; Noteboom, Jim (J.E.); Ortmann, James (J.W.); Powers, Ken (K.W.); Price, Martin (M.); Raquapau, Aiden (A.P.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Shah, Kiran (K.C.); Shirahashi, Masaru (M.); Stigantbauer, Jeffrey (J.R.); Suarez, Rhoe (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Veenstra, Tim (T.W.); Wakeneil, Ray (R.A.); Webbach, Bill (B.); Williams, Les (L.H.W.)

**Subject**

2:00 PM stall meeting

There will be no stall meeting at 2:00 pm today. The next meeting will be scheduled next week Thursday at 2:00pm. I will send the updated call in info and a meeting notice as soon as it is available.

Sincerely,

*Gilbert Fournelle*

V8 U204 Calibration Engineering  
1AE27 Truck Engine Engineering (TEE)  
Phone:(313)3904968 Fax:(313)3231786

**Price, Martin (M.)**

---

**From:** Suarez, Rhea (R.)  
**Sent:** Wednesday, September 18, 2002 8:42 AM  
**To:** Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Umtaco, Steven (S.); Rothweiler, Daniel (D.); Marianos, Tom (T.E.); Lawler, David (D.A.)  
**Subject:** FW: another wds issue?

As soon as we get this fixed, can someone please send me a note? Our field people need this information.

Thanks!  
Rhea

-----Original Message-----

**From:** Myers, Dan (D.P.)  
**Sent:** Tuesday, September 17, 2002 10:38 PM  
**To:** Suarez, Rhea (R.)  
**Subject:** RE: another wds issue?

Rhea,  
Can you let me know when this is fixed? I have 3 more Escapes to update as soon as I can get access to the calibration through WDS B21 or the LAN.

Thanks,

*Dan Myers*

Field Quality Engineer - Iowa  
Enhanced Concern Identification

[dmyers4@ford.com](mailto:dmyers4@ford.com)

**Cell** 563-505-9002  
**Office** 563-289-9991  
**Fax** 563-289-1364

-----Original Message-----

**From:** Suarez, Rhea (R.)  
**Sent:** Tuesday, September 17, 2002 12:06 PM  
**To:** Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Umtaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
**Subject:** FW: another wds issue?

PYI -

-----Original Message-----

**From:** Marianos, Tom (T.E.)  
**Sent:** Tuesday, September 17, 2002 12:46 PM  
**To:** Suarez, Rhea (R.)  
**Subject:** RE: another wds issue?

This is already a high priority, We are working on it.

-----Original Message-----

**From:** Suarez, Rhea (R.)  
**Sent:** Tuesday, September 17, 2002 12:39 PM  
**To:** Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Umtaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
**Cc:** Myers, Dan (D.P.); Marianos, Tom (T.E.); Lawler, David (D.A.)  
**Subject:** RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.



## *Rhae M. Suarez*

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-8242  
Fax: 313-33-78337  
Email: rsuarez2@ford.com

### —Original Message—

From: Price, Martin (M.)  
Sent: Tuesday, September 17, 2002 11:51 AM  
To: Altonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Umlacco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
Subject: another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2L8A-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

## *Mart Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

## Price, Martin (M.)

---

**From:** Suarez, Rhae (R.)  
**Sent:** Tuesday, September 17, 2002 1:06 PM  
**To:** Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtiaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
**Subject:** FW: another wds issue?

FYI -

### -----Original Message-----

**From:** Marianos, Tom (T.E.)  
**Sent:** Tuesday, September 17, 2002 12:46 PM  
**To:** Suarez, Rhae (R.)  
**Subject:** RE: another wds issue?

This is already a high priority. We are working on it.

### -----Original Message-----

**From:** Suarez, Rhae (R.)  
**Sent:** Tuesday, September 17, 2002 12:39 PM  
**To:** Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtiaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
**Cc:** Myers, Dan (D.P.); Marianos, Tom (T.E.); Lawler, David (D.A.)  
**Subject:** RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

*Rhae M. Suarez*

Rhae Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-796-6242  
Fax: 313-33-78337  
Email: rsuarez8@ford.com

### -----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Tuesday, September 17, 2002 11:51 AM  
**To:** Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtiaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhae (R.)  
**Subject:** another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2L8A-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

*Marti Price*

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

## **Price, Martin (M.)**

---

**From:** Suarez, Rhea (R.)  
**Sent:** Tuesday, September 17, 2002 1:08 PM  
**To:** Price, Martin (M.); Altoonlan, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintacco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Lawler, David (D.A.); Myers, Dan (D.P.)  
**Subject:** FW: another wds issue?

PYI -

### **-----Original Message-----**

**From:** Marianos, Tom (T.E.)  
**Sent:** Tuesday, September 17, 2002 12:46 PM  
**To:** Suarez, Rhea (R.)  
**Subject:** RE: another wds issue?

This is already a high priority. We are working on it.

### **-----Original Message-----**

**From:** Suarez, Rhea (R.)  
**Sent:** Tuesday, September 17, 2002 12:39 PM  
**To:** Price, Martin (M.); Altoonlan, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintacco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
**Cc:** Myers, Dan (D.P.); Marianos, Tom (T.E.); Lawler, David (D.A.)  
**Subject:** RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

***Rhea M. Suarez***

Rhea Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 648) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-788-8242  
Fax: 313-33-76337  
Email: rsuarez8@ford.com

### **-----Original Message-----**

**From:** Price, Martin (M.)  
**Sent:** Tuesday, September 17, 2002 11:51 AM  
**To:** Altoonlan, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Lintacco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhea (R.)  
**Subject:** another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2L8A-AD does not show to update to 2U7A-CZB, in fact 2U7A-CZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

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**From:** Knoll, Alexander (A.)  
**Sent:** Tuesday, September 17, 2002 12:43 PM  
**To:** Price, Martin (M.)  
**Cc:** Huspen, Timothy (T.F.)  
**Subject:** FW: Escape T-body Adjustment  
  
**Importance:** High

-----Original Message-----

**From:** Makowski, Scott (S.A.)  
**Sent:** Tuesday, September 17, 2002 12:36 PM  
**To:** Durfee, Tom (T.P.); Kosco, Jeff (J.W.); Ulmatta, Gary (G.D.)  
**Cc:** Kobel, Rob (R.D.); Knoll, Alexander (A.)  
**Subject:** FW: Escape T-body Adjustment  
**Importance:** High

Tom please look into this and make sure that we correct this situation.  
I believe Alex is right on the money, we should not be advising tech's to drill out t-bodies.  
The only people to be giving direction to the field is the Hotline, this type of fix will end up in tech tips, QC dealers, etc....

Jeff/Gary do you agree?

*Regards*

**Scott Makowski**

**Supervisor V-Engine Service Engineering**  
**Phone: (313)32-32063 Pager (313)796-2136**  
**E-mail: [SMAKOWSKI@FORD.COM](mailto:SMAKOWSKI@FORD.COM)**

-----Original Message-----

**From:** Kobel, Rob (R.D.)  
**Sent:** Tuesday, September 17, 2002 12:25 PM  
**To:** Altonian, Don (D.J.); Corbett, Sandra (S.M.)  
**Cc:** Price, Martin (M.); Huspen, Timothy (T.F.); Knoll, Alexander (A.); Makowski, Scott (S.A.)  
**Subject:** RE: Escape T-body Adjustment

Don/Sandra,  
We were given direction by V Engine Engineering to avoid throttle hard stop adjustments. Is the attached procedure an approved and signed off repair that can be communicated to the entire dealer body? If it isn't, this type of information puts dealers at risk and creates issues for our Hotline (the attached shows how technicians spread the word once they have something that makes their repair look successful even if it's wrong). If this is an alternative repair to replacing the throttle bodies, please follow the appropriate process for dealer publication (OASIS Special Service Messages or Technical Service Bulletins).

Thanks.

**Rob Kobel**

**[rkobel@ford.com](mailto:rkobel@ford.com)**  
**Hotline Prior Approval & 4/8 Engine Operations Manager**  
**Ford Technical Service Hotline**  
**(313) 31-79398**

## **Price, Martin (M.)**

---

**From:** Suarez, Rhee (R.)  
**Sent:** Tuesday, September 17, 2002 12:39 PM  
**To:** Price, Martin (M.); Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.)  
**Cc:** Myers, Dan (D.P.); Marianos, Tom (T.E.); Lawler, David (D.A.)  
**Subject:** RE: another wds issue?

I just got a message from Dan Myer (FQE) with the same concern. He had to go to another dealer that hasn't updated their WDS to version 21 yet in order to help a customer out. We need to fix this ASAP.

***Rhee M. Suarez***

Rhee Michael Suarez  
Product Concern Engineer - Escape / Tribute / Maverick  
PVT & Field Support / FCSD  
DSC II (room 548) / 1800 Fairlane Dr. / Allen Park, MI 48101  
Phone: 313-32-23344 Pager: 313-798-6242  
Fax: 313-33-78337  
Email: rsuarez2@ford.com

### **-----Original Message-----**

**From:** Price, Martin (M.)  
**Sent:** Tuesday, September 17, 2002 11:51 AM  
**To:** Altoonian, Don (D.J.); Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Limtaco, Steven (S.); Rothweiler, Daniel (D.); Sanders, Muriel (M.S.); Suarez, Rhee (R.)  
**Subject:** another wds issue?

It appears now on version 21.1 wds isn't linking some of the updates. The 2L8A-AD does not show to update to 2U7A-CZB, in fact 2U7A-GZA doesn't update to CZB. I think the 2001 calibrations are ok. I did not check 2003's.

***Marti Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

**Price, Martin (M.)**

---

**From:** Durfee, Tom (T.P.)  
**Sent:** Tuesday, September 10, 2002 8:07 AM  
**To:** Price, Martin (M.)  
**Subject:** RE: 3.0L IAC Escape

Yes sir a reprogram is required.

This is advance notice I just approved the notice today.

-----Original Message-----

**From:** Price, Martin (M.)  
**Sent:** Tuesday, September 10, 2002 8:02 AM  
**To:** Durfee, Tom (T.P.)  
**Subject:** RE: 3.0L IAC Escape

If they replace the IAC, a reprogram is required?

***Martin Price***

Cleveland Engine Specialist, DSC I #353  
1700 Fairlane Dr, Allen Park, MI 48101  
mprice28@ford.com ph. (313)317-9133

-----Original Message-----

**From:** Durfee, Tom (T.P.)  
**Sent:** Tuesday, September 10, 2002 7:51 AM  
**To:** Price, Martin (M.); Knoll, Alexander (A.)  
**Subject:** 3.0L IAC Escape

Coming soon to a parts counter near you.

PCM reflash required.

|               |               |
|---------------|---------------|
| Delete        | Replace       |
| YF1E-9F715-AB | 1L8E-9F715-AA |

**Tom Durfee**

Ford Motor Co. V Engine Service Engineering

☎ ☎ (313) 846-0902  e-mail: [tdurfee@ford.com](mailto:tdurfee@ford.com) [smallo:tdurfee@ford.com](mailto:smallo:tdurfee@ford.com)

Inside Ford text pager: <http://tom7.dearbom.ford.com/mg/escapes?PAGEID=tdurfee>

Outside text pager: [3137848306@alphapage.entruck.com](mailto:3137848306@alphapage.entruck.com)

US Mail: Ford Motor Company  
21500 Oakwood Blvd.  
Dearborn, MI 48121  
Mail Drop 88



R10KAMissue.doc



U204

stakeER8-21-02.doc

**Fascetti, Bob (R.J.)**

---

**From:** Klarr, Jerry (G.T.)  
**Sent:** Sunday, August 26, 2002 7:38 PM  
**To:** Fascetti, Bob (R.J.); Corbett, Sandra (S.M.)  
**Cc:** Tarzee, Laura (L.D.); Hoare, Graham (G.); Klarr, Jerry (G.T.)  
**Subject:** FW: August 27 Dealer Council Presentations

Bob/Sandra - need to change the dates on Production Incorporation to agree with latest plan. Sandra, also combine the TSB items together and re-arrange the others so we have three statements:

- 1) TSB effectiveness when performed properly and plans to simplify for field.
- 2) Design actions Implemented since last SMAC (?) review
- 3) R11 plan

Laura - can we walk this or can we still get this updated in the presentation. If too late, we'll go with what we submitted and verbalize the updates.

G. T. Klarr (Jerry)

P/T Chief Engineer: PH: 32-28888/Cube: 1BA45  
 PDC/MD #205/FAX: 62-18083/gklarr@ford.com

-----Original Message-----

**From:** Klarr, Jerry (G.T.)  
**Sent:** Friday, August 23, 2002 7:46 AM  
**To:** Tracy, Lynn (L.J.)  
**Subject:** FW: August 27 Dealer Council Presentations

G. T. Klarr (Jerry)

P/T Chief Engineer: PH: 32-28888/Cube: 1BA45  
 PDC/MD #205/FAX: 62-18083/gklarr@ford.com

-----Original Message-----

**From:** Corbett, Sandra (S.M.)  
**Sent:** Friday, August 16, 2002 12:38 PM  
**To:** Koerschner, Michelle (M.M.); Graham, Amy (A.S.); Fascetti, Bob (R.J.); Klarr, Jerry (G.T.); Dalbo, Bob (R.J.)  
**Cc:** Hoffman, Michael (M.V.)  
**Subject:** FW: August 27 Dealer Council Presentations

Powertrain updates for the August 27th Dealer Council meeting.



PTSE Concerns  
(JKarr081602).p...

**Sandy Corbett**

**Escape Powertrain PMT & QRT**

Phone/Fax: (313)59-44351

Product Development Center 2H-B66

-----Original Message-----

**From:** Tracy, Lynn (L.J.)  
**Sent:** Friday, August 16, 2002 10:47 AM  
**To:** Corbett, Sandra (S.M.)  
**Subject:** FW: August 27 Dealer Council Presentations

Here is the file.

Have a good day

*Lynn Tracy*

Administrative Assistant to G. T. Karr

32-38205 Fax: 313-82-18083

PTSE - PDC MD #208/Cube 1BA48

-----Original Message-----

**From:** Koerschner, Michelle (M.N.)  
**Sent:** Thursday, August 08, 2002 3:48 PM  
**To:** Kosewnik, John (J.J.); Karr, Jerry (G.T.); Samardich, Barb (B.J.); Beck, Mike (M.C.); Vido, Adrian (A.J.); Guys, Philip (P.R.); Perodich, James (J.W.)  
**Cc:** Graham, Amy (A.S.); Bartlett, Michele (M.W.); Goesser, Louise (L.K.); Barron, Keith (G.K.); Kapp, Dan (Daniel R.); Opaleski, Steven (S.J.); Fescettl, Bob (R.J.)  
**Subject:** August 27 Dealer Council Presentations

You have been requested to present at the August 27, Dealer Council meeting. Most of you have already received a meeting notice, please notify me if you have not. The meeting is schedule from 9AM-12PM. A detailed agenda will be available next week.

A draft & format for each of your presentations has been created. Included are: Engine, Transmission, Powertrain Systems, 7.3L AIS, Product Development, and Vehicle Operations. The basic format for each functional area is:

- Warranty, Customer Sat and TGW overview - 3 Pages (VO, PD and 7.3L are not required to include)
- Product Concern Summary for the Top 8 Areas of Concern - 1 Page (the intent is to have a one page summary on each area so we can close out these issues with all the dealers for a final time, regardless of the open/closed status)
  - Jerry: Please note the request to review latest status on Escape Stalls has been made.
- Related Affinity Team Update - placeholder and format request included, 1-2 Pages
  - TBD Engine Affinity Team (John - we would like your recommendation as to which team)
  - Smooth Shift Transmission Affinity Team
  - Brake Noise Affinity Team (PD)



- Paint Affinity Team (VO)

Please provide contacts for the Affinity Teams to Amy Graham and I so we coordinate their input.

Please submit the presentation material to Amy Graham (AGRAHAM4) and myself (MKOERSCH) by COB August 14.

Please let Amy and I know if we can provide additional assistance.



Engine Concerns  
(JKozewnik0808...)



ATO Concerns  
(BSamardzich0808...)



PTSE Concerns  
(JKam0808).ppt...



7.3L  
(Jys8Perezich0808).ppt



PD Concerns  
(MBeck0808).ppt



VO Concerns  
(AVido0808).ppt

Sincerely,

*Michelle M. L. Koerschner*

Executive Advisor to Louise Goeser, Corporate Quality

PDC 1RA11 In Office: M-T-Th

PH: 313-24-88999

FAX: 313-59-43207

PLEASE CC TWA JOB SHARE PARTNER ON ALL NOTES: Amy Graham - AGRAHAM4 (M-T-W-F)

PH: 313-39-09702

**Fascetti, Bob (R.J.)**

---

From: Bauer, Scott (S.C.)  
Sent: Thursday, September 05, 2002 3:41 PM  
To: Dalbo, Bob (R.J.); Fascetti, Bob (R.J.)  
Subject: Update Paper for NHTSA Quarterly Meeting and Takasawa Meeting

The attached Word file contains the update paper I prepared as back-up for Ray and Pete at the recent NHTSA quarterly review meeting. We're planning on giving this to Keith at tomorrow morning's meeting.



NHTSA 3Q Mtg  
7E01-043 Fact She.

Scott C. Bauer  
Truck Safety Investigations  
Automotive Safety Office  
Ford Motor Company  
Office: (313) 59-49786  
Fax: (313) 59-42268  
Fairlane Plaza South, Suite 500 East

**Fascetti, Bob (R.J.)**

---

**From:** Peters, Robin (R.S.)  
**Sent:** Wednesday, August 21, 2002 11:24 AM  
**To:** Alan Trilling (E-mail); Altoonlan, Don (D.J.); Atley III, David (D.); Austin, James (J.E.); Belzyt, Roseann (R.); Blackford, Gary; Bogema, John (P.); Borthwick, Duncan (D.); Brown, Jennifer (J.); Bulck, Jeffrey (J.); Corbett, Sandra (S.M.); Cusumano, Jacob (J.J.); Dalbo, Bob (R.J.); Dave Godshall (E-mail); DeBrule, Peter (P.E.); Don Marzewski (E-mail); Ellen Connolly (E-mail); Ezban, Al (.); Fagerman, Todd (T.M.); Fascetti, Bob (R.J.); Forintos, Darryl (D.A.); Fournelle, Gilbert (G.); Goble, Linas (L.P.); Gould, Tom (T.); Grzincic, Karen (K.M.); Harrison, Darius (D.A.); Hazima, Joe (J.); Handricks, Kerry (K.D.); Harr, George (G.J.); Huck, Dave (D.E.); James Walesch (E-mail); Jordan, LeBron (L.); Kanai, Shinji (S.); Kreuter, Richard (R.B.); Krohn, Maggie (M.M.); Lewis, Dennis (D.J.); Linds, Peter (P.A.); Loo, Donald (D.C.); Maureen Fernoyte (E-mail); Mazzella, Stephanie (S.R.); McDonald, John (J.R.); Moorhouse, Scott (S.R.); Morgan, Dan (W.D.); Motoshahi, Masa (M.); Nikolai, Bernie (B.E.); Ostach, Gabrielle (G.); Plattenberger, Karl (K.J.); Przybylo, Ken (K.); Raymond, Dennis (D.J.); Redding, Joe (J.M.); Rich Fad (E-mail); Rusu, Jessica (J.L.); Schlott, Michael (M.D.); Sheeran, William (W.M.); Shirahashi, Masaru (M.); Smith, Steven (S.V.); Stanley, Mark (M.); Sullivan, Todd (T.E.); Takasawa, Keith (K.D.); Torsky, Leonard (L.J.); Traakos, Diane (D.M.); Varlone, Philip (P.D.); Veenstra, Tim (T.W.); Weber, Chris (C.R.); Wiltbrodt, Frank (F.J.); Young, Dan (D.G.); Zielinski, Jay (J.A.)  
**Subject:** 2003 3.0L U204 Emergency PCM Release Workplan

The attached file contains the workplan that was developed at today's PCM emergency release meeting. If you have any questions or concerns with timing, please contact me ASAP.



U204 8-21-02.doc

Robin Peters  
Truck PCM Timing Coordinator  
Emissions Compliance Dept.  
Phone: 313-39-01656

## **Fascetti, Bob (R.J.)**

---

**Subject:** FW: Timing for Co-ordinated Change to Carbon Canister/Fuel Bundle & Pipe Assy Fuel Fill (Conf Call)  
**Location:** SUV PVT Conf Rm  
**Start:** Fri 6/14/2002 10:00 AM  
**End:** Fri 6/14/2002 11:00 AM  
**Show Time As:** Tentative  
**Recurrence:** Weekly  
**Recurrence Pattern:** every Monday, Wednesday, and Friday from 9:00 AM to 10:00 AM  
**Meeting Status:** Not yet responded  
**Required Attendees:** Syed, Shaheen (Q.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.); Veenstra, Tim (T.W.)

### **-----Original Appointment-----**

**From:** Syed, Shaheen (Q.)  
**Sent:** Thursday, June 13, 2002 2:22 PM  
**To:** Syed, Shaheen (Q.); Chih, Ming-Niu (M.N.); Moorhouse, Scott (S.R.); 'patoconnell@bahaiyenterprises.com'; 'SMARSHA1@visteon.com'; Rockel, Royce (R.R.); Shah, Kiran (K.C.); Linde, Peter (P.A.); 'dennis.lennox@auto.lt.com'; 'CPowell3@visteon.com'  
**Cc:** Harpelt, John (J.P.); Powers, Ken (K.W.); Johnson, Ruth (R.)  
**Subject:** Timing for Co-ordinated Change to Carbon Canister/Fuel Bundle & Pipe Assy Fuel Fill (Conf Call)  
**When:** Occurs every Monday, Wednesday, and Friday effective 6/14/2002 until 7/15/2002 from 9:00 AM to 10:00 AM (GMT-06:00) Central Time (US & Canada).  
**Where:** SUV PVT Conf Rm

The purpose of this re-currence meeting is to review the timing and identify the road blocks and resolve until in-corporation of this co-ordinated change.

The concern number related to this change is C11326281

**Note:**

**MING, Attached please use this action matrix to capture open issues. Please take a lead on this open issue matrix.**

Please make a note of Conf Call Info:

1-800-678-2250  
964-1126 FordNet  
1-830-424-2076 International

6827791 Passcode



U204-Vent Line  
Open Issues.xls...

EA82-827-A 10089

**Fascetti, Bob (R.J.)**

---

**From:** Dalbo, Bob (R.J.)  
**Sent:** Monday, June 03, 2002 2:22 PM  
**To:** Graham, Jackie (J.R.)  
**Cc:** Takasawa, Keith (K.D.); Shah, Kiran (K.C.); Chih, Ming-Niu (M.N.); Veenstra, Tim (T.W.); Sanders, Muriel (M.S.); Bob Fascetti; Gilbert Fournelle  
**Subject:** FW: New Vent Line

Jackie,  
Could you please arrange a half hour on Keith's schedule in the next day or two for the addressees of this not to discuss the Escape vent line change implementation?

Thanks,

*Bob Dalbo*

3.0L Calibration Supervisor  
Outfitters Calibration, NAT  
Phone: (313) 24-84847 Fax: (313) 32-31788  
Pager: (313) 795-2859 Email: [rdalbo@ford.com](mailto:rdalbo@ford.com)

—Original Message—

**From:** Chih, Ming-Niu (M.N.)  
**Sent:** Monday, June 03, 2002 2:03 PM  
**To:** Dalbo, Bob (R.J.)  
**Cc:** 'sammons@Visteon.com'; 'cpowell@Visteon.com'  
**Subject:** New Vent Line

Bob,  
Here you have the story.



CanisterVentLineCh  
ange.xls

**Fascetti, Bob (R.J.)**

---

**From:** Koerschner, Michelle (M.M.)  
**Sent:** Tuesday, June 04, 2002 3:58 PM  
**To:** Kapp, Dan (Daniel R.)  
**Cc:** Kirt, Jerry (G.T.); Graham, Amy (A.S.); Gossier, Louise (L.K.); Fascetti, Bob (R.J.)  
**Subject:** Dealer Council Product Concern Review

Attached is the compiled Powertrain Systems (etalle concerns) presentation file and status. Please let me know if you agree with the GYR assessment in the summary and the Open/Closed status in the Excel file. Please forward any changes and your concurrence back to Amy and I. The intent is to present all of the Product Concern material at the July 11th, 9:00-3:00PM, PSMAC.



Staffs Top 6.ppt



Product Concern  
Summary from 5...

Sincerely,

*Michelle M. L. Koerschner*

ENG2-627-A 18824

Executive Advisor to Louise Goesser, Corporate Quality  
PDC 1RA11 In Office: M-T-Th  
PH: 813-24-88999  
FAX: 313-59-43207

PLEASE CC TWA JOB SHARE PARTNER ON ALL NOTES: Amy Graham - AGRAHAM4 (M-T-W-F)  
PH: 813-39-09702

**Fascetti, Bob (R.J.)**

---

**From:** Sanders, Muriel (M.S.)  
**Sent:** Friday, June 07, 2002 11:56 AM  
**To:** Fascetti, Bob (R.J.)  
**Subject:** U204 Stall Summary

Bob,

I removed the information you requested and re-worded some of the items. Let me know if you have any questions or comments. Thanks.



J204 Phantom Stall  
Summary.doc...

***Muriel Sanders***

U204 3.0L Calibration  
Ford Motor Company  
Phone: 313-32-27307  
Fax: 313-32-31786  
E-mail: msander6@ford.com

Durastec Engines  
V-Engine Engineering  
Phone - 313 846 5080  
Fax - 313 594 7323  
esventio@ford.com  
Text Pager:313-851-0828

## Fascetti, Bob (R.J.)

---

From: Williams, Les (LHW.)  
Sent: Tuesday, December 18, 2001 5:18 PM  
To: Dalbo, Bob (R.J.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Klostermann, Eric (E.)  
Subject: Top Root Causes of Stalling



U204 Top  
Intermittent Stall Ro.

Bob & Bob:  
You think Klarr would like to see this?

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

## Fascetti, Bob (R.J.)

---

From: Luehrsen, Eric (E.A.)  
Sent: Friday, January 04, 2002 4:58 PM  
To: Sullivan, Jamie (J.P.); Williams, Les (LHW.); Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.K.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanel, Shihji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limitaco, Steven (S.); Linde, Peter (P.A.); Liu, Jans (J.); Marok, Edmond (E.C.); Metasa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Orman, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquapau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shiraishi, Masaru (M.); Stiggenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vaccio, Anne Marie (A.); Wakenell, Ray (R.A.); Williamson, David (D.E.); Yeung, Lem (.)  
Cc: Svantickas, Ed (E.); Campbell, Wayne (C.W.); Redding, Joe (J.M.); Halliburton, Joshua (J.)  
Subject: RE: Meeting Minutes 1/3/02

Les, Hitachi will likely be ready to deliver fin-pintle IAC to CEP2 four weeks after all Ford approvals are noted (WERS). That will include calibration sign off and CEP2 feasibility.

-----Original Message-----

**From:** Sullivan, Jamie (J.P.)  
**Sent:** Friday, January 04, 2002 4:52 PM  
**To:** Williams, Les (LHW.); Altoonian, Don (D.J.); Amanda, Harry (H.F.); Badgley, Joel (J.K.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chih, Ming-Hui (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Hart, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shingji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matsa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematoishi, Sonya (S.); Nikolai, Bernie; Notaboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirahishi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakaneil, Ray (R.A.); Williamson, David (D.E.); Yeung, Lam (.)  
**Cc:** Sventickas, Ed (E.); Campbell, Wayne (C.W.); Redding, Joe (J.M.); Halliburton, Joshua (J.)  
**Subject:** RE: Meeting Minutes 1/3/02

Les, I would like the next meeting to include a brief discussion of implementation timing for actions and their affect on KCAP. Once the team develops a fix plan, I will need to work with KCAP to develop a flawless implementation plan.

Thanks.

-----Original Message-----

**From:** Williams, Les (LHW.)  
**Sent:** Friday, January 04, 2002 4:04 PM  
**To:** Altoonian, Don (D.J.); Amanda, Harry (H.F.); Badgley, Joel (J.K.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chih, Ming-Hui (M.N.); Chin, Daniel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); De Pena, Juan (J.E.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Hart, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Hurley, Robert (R.E.); Ichikawa, Jyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shingji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Matsa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematoishi, Sonya (S.); Nikolai, Bernie; Notaboom, Jim (J.E.); Ortmann, James (J.W.); Powell, Cary; Powers, Ken (K.W.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Shah, Kiran (K.C.); Shirahishi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhea (R.); Sullivan, Jamie (J.P.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakaneil, Ray (R.A.); Williamson, David (D.E.); Yeung, Lam (.)  
**Cc:** Sventickas, Ed (E.)  
**Subject:** Meeting Minutes 1/3/02

Idle Air Robustness Action (updated calibration) has improved conditions in a few stalling vehicles (read 'field reports' section in minutes). Good job ladies and gents, we will monitor the situation as the vehicles accumulate more mileage.

Items for next meeting

1. Les Williams- Contact Robin Peters and ensure '02 service calibration has been released
2. Steve Lintaco and Bob King/ Rhea Suarez: Most recent Mazda/Ford Buyback Counts
3. Les Williams- Investigate Dan Rothweiler's bad VMV
4. Scott Moorhouse: Check on status of Inverted Delta Items involving ground wires.
5. Dave Williamson/Steve Lintaco: Contact appropriate parties in Japan to expedite Mazda sign-off of updated MAF.
6. Les Williams. Collect PCV Valves for Jim Ortmann.

<< File: Vehicle Stall Meeting Minutes for 1\_3\_02.doc >>

Regards,  
Les Williams

For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

---

**From:** Corbett, Sandra (S.M.)  
**Sent:** Monday, January 14, 2002 2:53 PM  
**To:** Fascetti, Bob (R.J.)  
**Subject:** FW: Stalls Update

Here is the latest data run.

**Sandy Corbett**  
**Escape P/T QRT**  
Phone/Fax: (313)59-44351  
West Park Center 426-C

-----Original Message-----

**From:** Hansen, George (G.C.)  
**Sent:** Monday, January 14, 2002 2:52 PM  
**To:** Corbett, Sandra (S.M.)  
**Subject:** Stalls Update



STALLS  
12\_31\_01.xls

--  
**George Hansen**  
Escape, PTQRT  
2H-D63, PDC  
(313) 84-81800  
ghansen4



**Fascetti, Bob (R.J.)**

---

**From:** Moorhouse, Scott (S.R.)  
**Sent:** Friday, December 14, 2001 5:23 PM  
**To:** Dalbo, Bob (R.J.); Austin, James (J.E.)  
**Cc:** Fascetti, Bob (R.J.)  
**Subject:** U204 WARRANTY, HSE/SURGE AND STALLS

Attached find warranty for hes/surge and stalls for 2.0L and 3.0L U204 for your review. Duratec is sheet 1, zetec sheet 2. Takasawa had asked how we were doing relative to stalls in VQR, hence, the warranty run. Hadn't looked at hes/surge for awhile, so thought I would pull it as well.



U204\_WARRANTY\_  
12.14.01.xls

**Fascetti, Bob (R.J.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Monday, December 17, 2001 3:13 PM  
**To:** Altonian, Don (D.J.); Amenda, Harry (H.F.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gliss, Stuart (S.); Goldshtein, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jyunichiro (J.); JBADGLE2 was deleted 20011213; Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostermann, Eric (E.); Kwon, Soon (S.K.); Limtaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrsen, Eric (E.A.); Marck, Edmond (E.C.); Metese, John (J.); Mezzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Namatollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Ortman, James (J.W.); Powell, Cary; Price, Martin (M.); Raquepeu, Aiden (A.P.); Rothweller, Daniel (D.); Shah, Kiren (K.C.); Shirakshi, Masaru (M.); Stigenbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Sullivan, Jennie (J.P.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Yeung, Lem (.)  
**Subject:** Stall Meeting Minutes 12/11/01



Vehicle Stall  
Meeting Minutes...

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Monday, December 17, 2001 5:08 PM  
**To:** Hansen, George (G.C.)  
**Cc:** Dalbo, Bob (R.J.); Kwon, Soon (S.K.); Fascetti, Bob (R.J.)  
**Subject:** Timeline of hardware change

Here you go George.



Stall Timeline.xls

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

---

**From:** Williams, Les (LHW.)  
**Sent:** Tuesday, December 18, 2001 9:58 AM  
**To:** Dalbo, Bob (R.J.); Fournelle, Gilbert (G.); Fascetti, Bob (R.J.)  
**Subject:** Top Intermittent Stall Root Causes



Top Stall Root  
Causes.xls

Regards,  
Les Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

---

**From:** Williams, Lee (LHW.)  
**Sent:** Wednesday, December 06, 2001 8:59 PM  
**To:** Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Daibo, Bob (R.J.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Harr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostmann, Eric (E.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marck, Edmond (E.C.); Matasa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Price, Martin (M.); Raquesau, Alden (A.P.); Rothweller, Daniel (D.); Shirashi, Masaru (M.); Stillerbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** Meeting minutes 12/4/01



Vehicle Stall  
Meeting Minutes...

Regards,  
Lee Williams  
For More, Count on Lee  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1AE20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

---

**From:** Williams, Lee (LHW.)  
**Sent:** Thursday, December 06, 2001 7:51 AM  
**To:** Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.); Bhojwani, Kamal (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Daibo, Bob (R.J.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Giles, Stuart (S.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Harr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Klostmann, Eric (E.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Luehrs, Eric (E.A.); Marck, Edmond (E.C.); Matasa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Naveed Khan; Nematollahi, Sonya (S.); Nikolai, Bernie; Noteboom, Jim (J.E.); Price, Martin (M.); Raquesau, Alden (A.P.); Rothweller, Daniel (D.); Shirashi, Masaru (M.); Stillerbauer, Jeffrey (J.R.); Suarez, Rhee (R.); Takasawa, Keith (K.D.); Takubo, Hirochi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.); Williamson, David (D.E.); Yeung, Lam (.)  
**Subject:** FW: 3.0L Escape IAC Valve Contamination

thanks Ted:

-----Original Message-----

From: Jensen, Ted (T.E.)  
Sent: Wednesday, December 05, 2001 10:10 PM  
To: Williams, Les (LHW.)  
Subject: 3.0L Escape IAC Valve Contamination

Les,

I have developed a system for evaluating the contamination in IAC valves. I will use this file tomorrow at our meeting.



3.0L Escape IAC  
Valve Contamin...

Ted

**Fascetti, Bob (R.J.)**

---

From: Williams, Les (LHW.)  
Sent: Monday, December 10, 2001 11:32 AM  
To: Altoonian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.); Bhojwani, Kamel (K.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chick, John (J.); Chih, Ming-Niu (M.N.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Diaz, Timothy (T.P.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gilles, Stuart (S.); Gokhale, Ranuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Ichikawa, Jiyunichiro (J.); Jensen, Ted (T.E.); John McDonald (E-mail); Jones, Andy; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kostermann, Eric (E.); Kwon, Soon (S.K.); Limtaco, Steven (S.); Linds, Peter (P.A.); Liu, Jane (J.); Luhrs, Eric (E.A.); Marck, Edmond (E.C.); Matassa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Morishima, Shigeki (S.); Navsed Khan; Nematollahi, Somya (S.); Nikolai, Bernie; Notaboom, Jim (J.E.); Price, Martin (M.); Raquepau, Alden (A.P.); Rothweiler, Daniel (D.); Shikishi, Masaru (M.); Stiglbauer, Jeffrey (J.R.); Suarez, Rhae (R.); Takasawa, Keith (K.D.); Takubo, Hiroshi (H.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Les (LHW.); Williamson, David (D.E.); Young, Lem (.)  
Subject: 12/8/01 meeting minutes



Vehicle Stall  
Meeting Minutes...

Regards,  
Lee Williams  
For More, Count on Les  
U204 3.0L Powertrain Calibration  
Truck Engine Engineering, Suite 1A20  
Phone: (313)33-72503  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

---

**From:** Bhojwani, Kamal (K.)  
**Sent:** Wednesday, September 12, 2001 6:13 PM  
**To:** 'ajones8@viateon.com'; Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gokhale, Ranuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hofman, Michael (M.V.); Holmes, Jeffrey (J.R.); Inoue, Takashi (T.); 'jmcdo3@viateon.com'; Jordan, Donald (D.E.); Kamal, Shinji (S.); King, Robert (R.F.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Matoss, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Nematollahi, Sonya (S.); Raquesau, Alden (A.P.); Stilgenbauer, Jeffrey (J.R.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.)  
**Subject:** Meeting Agenda for 9/13 Stall Meeting



U204 Stall Issue  
Meeting Agend...

Regards,

*Kamal Bhojwani*

U204 3.0L Powertrain Calibration  
TRB, Suite 1AE30  
Phone: (313) 39-01969  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

---

**From:** Fournelle, Gilbert (G.)  
**Sent:** Thursday, September 13, 2001 3:45 PM  
**To:** Vecchio, Anne Marie (A.); Lintaco, Steven (S.); Moorhouse, Scott (S.R.); King, Robert (R.F.); Dalbo, Bob (R.J.); Altoonlan, Don (D.J.); Marck, Edmond (E.C.)  
**Cc:** Bhojwani, Kamal (K.); Fascetti, Bob (R.J.); Jordan, Donald (D.E.); Kwon, Soon (S.K.)  
**Subject:** Updated Checklist for the U204 stall issue  
**Sensitivity:** Private

Attached is the updated checklist



Stalls  
checklist\_updated.xls

**Gilbert Fournelle**

V6 U204 Calibration Engineering  
1AE27 Truck Engine Engineering (TEE)  
Phone:(313)3904968 Fax:(313)3231786

**Fascetti, Bob (R.J.)**

---

**From:** Bhojwani, Kamal (K.)  
**Sent:** Tuesday, September 18, 2001 8:33 AM  
**To:** 'ajones3@visteon.com'; Altoonlan, Don (D.J.); Amanda, Harry (H.F.); Badgley, Joel (J.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Inoue, Takashi (T.); 'jmccona3@visteon.com'; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Matesa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Namatollahi, Sonya (S.); Raquepau, Aiden (A.P.); Stilgenbauer, Jeffrey (J.R.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.)  
**Subject:** Updated Stall Issue Resolution Sheet

Attached is the latest version of the U204 Stall Issue Resolution Sheet. Since I didn't send out meeting minutes from the last meeting, please refer to this document for the most recent updates.



Phantom Stall Issue  
Resolution...

Regards,  
*Kamal Bhojwani*  
U204 3.0L Powertrain Calibration  
TEB, Suite 1A830  
Phone: (313) 39-01969  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

---

**From:** Bhojwani, Kamal (K.)  
**Sent:** Tuesday, September 18, 2001 5:15 PM  
**To:** Fascetti, Bob (R.J.)  
**Subject:** FW: Phantom Stall - Mazda Official Position

FYI

Regards,  
Kamal Bhojwani  
U204 3.0L Powertrain Calibration  
TEB, Suite 1A830  
Phone: (313) 39-01969  
Fax: (313) 32-31786

-----Original Message-----

**From:** Steven Limtiaco [mailto:SLimtiaco@mazdausa.com]  
**Sent:** Tuesday, September 18, 2001 1:56 PM  
**To:** 'kbhojwan@ford.com'  
**Subject:** Phantom Stall - Mazda Official Position

Kamal,

Darrel Chin notified me that the Mazda official position will be determined by Ed Marck. His group normally handles recalls, SBPs, and ONPs. We sent an email to him to follow-up with you. Let me know if you do not receive a reply from Ed Marck.

Steve Limtiaco  
Mazda North American Operations  
Tribute Product Support Engineer  
949-442-6514 (phone)  
949-442-6599 (fax)  
e-mail: slimtiac@mazdausa.com

### **Fascetti, Bob (R.J.)**

---

**From:** Bhojwani, Kamal (K.)  
**Sent:** Wednesday, September 19, 2001 5:25 PM  
**To:** 'ajones8@viateon.com'; Altounian, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gokhale, Ranuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Inoue, Takashi (T.); 'jimcdona3@viateon.com'; Jordan, Donald (D.E.); Kanai, Shinji (S.); King, Robert (R.F.); Kwon, Soon (S.K.); Limtiaco, Steven (S.); Linda, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Matsa, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Nematollahi, Sonya (S.); Raquepau, Aiden (A.P.); Stiggenbauer, Jeffrey (J.R.); Vecchio, Anne Marie (A.); Wakanell, Ray (R.A.)  
**Subject:** Meeting minutes from yesterday's stall meeting

Let me know if you have any questions/comments.



Vehicle Stall  
Meeting Minutes ...

Regards,  
*Kamal Bhojwani*  
U204 3.0L Powertrain Calibration  
TEB, Suite 1AE30  
Phone: (313) 39-01969  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

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**From:** Bhojwani, Kamal (K.)  
**Sent:** Tuesday, September 25, 2001 6:33 PM  
**To:** 'ajones8@visteon.com'; Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Badgley, Joel (J.); Blackburn, Thomas (T.J.); Bogema, John (P.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Inoue, Takashi (T.); 'jmcdo3@visteon.com'; Jordan, Donald (D.E.); Kanai, Shingi (S.); King, Robert (R.F.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Metase, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Nematollahi, Sonya (S.); Raquesau, Aiden (A.P.); Stigenbauer, Jeffrey (J.R.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.)  
**Subject:** Minutes from today's (9/25) stall meeting



Vehicle Stall  
Meeting Minutes ...

Regards,  
*Kamal Bhojwani*  
U204 3.0L Powertrain Calibration  
TRE, Suite 1A830  
Phone: (313) 39-01969  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

---

**From:** Bhojwani, Kamal (K.)  
**Sent:** Monday, October 01, 2001 6:06 PM  
**To:** Benz, Greg (G.H.); Deeb, Joe (J.S.); Baskins, Robert (R.S.); 'jvies@visteon.com'; Altoonlan, Don (D.J.); Amenda, Harry (H.F.); Andy Jones; Badgley, Joel (J.); Bernie Nikolai; Blackburn, Thomas (T.J.); Bogema, John (P.); Chin, Darrel (D.); Corbett, Sandra (S.M.); Dalbo, Bob (R.J.); Fascetti, Bob (R.J.); Fournelle, Gilbert (G.); Gokhale, Renuka (R.V.); Hansen, George (G.C.); Herr, George (G.J.); Hoffman, Michael (M.V.); Holmes, Jeffrey (J.R.); Inoue, Takashi (T.); John McDonald; Jordan, Donald (D.E.); Kanai, Shingi (S.); King, Robert (R.F.); Kwon, Soon (S.K.); Lintaco, Steven (S.); Linde, Peter (P.A.); Liu, Jane (J.); Marck, Edmond (E.C.); Metase, John (J.); Mazzella, Gary (G.R.); Mooney, Larry (L.); Moorhouse, Scott (S.R.); Morgan, Tom; Nematollahi, Sonya (S.); Raquesau, Aiden (A.P.); Stigenbauer, Jeffrey (J.R.); Vecchio, Anne Marie (A.); Wakenell, Ray (R.A.); Williams, Lee (LHW.)  
**Subject:** Meeting Minutes from 9/28 Wiring review and Agenda for 10/2 Stall Meeting



Vehicle Stall  
Wiring\_EEC Review...



U204 Stall Issue  
Meeting Agenda...

Regards,  
*Kamal Bhojwani*  
U204 3.0L Powertrain Calibration  
TRE, Suite 1A830  
Phone: (313) 39-01969  
Fax: (313) 32-31786



**Fascetti, Bob (R.J.)**

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**From:** Bhojwani, Kamal (K.)  
**Sent:** Friday, August 10, 2001 6:28 PM  
**To:** Fascetti, Bob (R.J.); Hofman, Michael (M.V.); Linde, Peter (P.A.); Kwon, Soon (S.K.); Dalbo, Bob (R.J.); Corbett, Sandra (S.M.); Moorhouse, Scott (S.R.); Altoonian, Don (D.J.); Lintleco, Steven (S.); Marck, Edmond (E.C.); King, Robert (R.P.); Vecchio, Anne Marie (A.); Mazzella, Gary (G.R.); Inoue, Takashi (T.); Badgley, Joel (J.); Holmes, Jeffrey (J.R.); Han, George (G.J.); Nematollahi, Sonya (S.); Amenda, Harry (H.F.); Jordan, Donald (D.E.); 'jmcdo3@visteon.com'; 'ajones8@visteon.com'; Blackburn, Thomas (T.J.); Liu, Jane (J.); Kanai, Shinji (S.)  
**Subject:** Meeting Minutes from 8/10/01 Vehicle Stalls

Attached are the meeting minutes from today's meeting.  
Please feel free to contact me if you have any questions/comments.



Vehicle Stall  
Meeting Minutes ...

Have a nice weekend!

Regards,  
*Kamal Bhojwani*  
U204 3.0L Powertrain Calibration  
TEB, Suite 1A830  
Phone: (313) 39-01969  
Fax: (313) 32-31786

**Fascetti, Bob (R.J.)**

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**From:** Walker, Carrie (C.J.)  
**Sent:** Tuesday, August 14, 2001 1:41 PM  
**To:** Powers, Ken (K.W.)  
**Cc:** Fascetti, Bob (R.J.); Sauer, Robert (R.M.); Corbett, Sandra (S.M.); Hofman, Michael (M.V.)  
**Subject:** RE: ICCD Customers with Stall

Here is the info requested:



D21 Verbetims.xls

*Carrie J. Walker*  
ICCD CRS  
Kansas City Assembly Plant  
Ph# 816-414-5557  
Fax# 816-486-1870  
Pager# 913-567-1747

ENG2-627-A 18113

-----Original Message-----

From: Powers, Ken (K.W.)  
Sent: Tuesday, August 14, 2001 11:56 AM  
To: Walker, Carrie (C.J.)  
Cc: Fascetti, Bob (R.J.); Sauer, Robert (R.M.); Corbett, Sandra (S.M.); Hofman, Michael (M.V.)  
Subject: ICCD Customers with Stall

Carrie, can you please forward a file with ICCD customer names of people who have had stalls? The 'stalls team' will be calling them. Thanks.

*Ken Powers*

Escape/Tribute PVT Manager, KCAP  
Ph: 816-459-1729; Fax: -1728

**Fascetti, Bob (R.J.)**

---

From: Shinji Kanai [kanai.sh@sv.mazda.co.jp]  
Sent: Tuesday, August 14, 2001 10:03 PM  
To: 'Corbett, Sandra (S.M.)'; ajones8@viateon.com; 'Altounian, Don (D.J.)'; 'Amenda, Harry (H.F.)'; 'Badgley, Joel (J.)'; 'Blackburn, Thomas (T.J.)'; 'Dalbo, Bob (R.J.)'; 'Fascetti, Bob (R.J.)'; 'Harr, George (G.J.)'; 'Hofman, Michael (M.V.)'; 'Holmes, Jeffrey (J.R.)'; 'Inoue, Takashi (T.)'; jmcdone3@viateon.com; 'Jordan, Donald (D.E.)'; 'Kanai, Shinji (S.)'; 'King, Robert (R.F.)'; 'Kwon, Soon (S.K.)'; 'Limtiao, Steven (S.)'; 'Linde, Peter (P.A.)'; 'Liu, Jane (J.)'; 'Marck, Edmond (E.C.)'; 'Mazzella, Gary (G.R.)'; 'Moorhouse, Scott (S.R.)'; 'Nematollahi, Sonya (S.)'; lmorgan@lsar.com; 'Vecchio, Anna Maria (A.)'  
Subject: EEC Relay photos



EEC relay Omron & Hella.jpg



EEC relay Omron.jpg



EEC relay Hella.jpg

Attached photos show condition of each relay. Vehicle

direction is mentioned on photos.

OMRON: Contact point is located under coil. Coil pulls contact to upward.

Hella: Contact point is located front of coil. Coil pulls contact to backward.

Shinji Kanai  
Manager, Tribute Plant QA  
Mazda North American Operations

Ford Kansas City Assembly Plant  
Plant Vehicle Team  
8121 N.E. Hwy. 69, Claycomo, MO 64118 USA  
Tel: 816-459-1623/ Fax: -1726/ e-mail: kanai.sh@sv.mazda.co.jp  
Local Text Pager: 9135677156@alphapage.airtouch.com

## Intermittent Stall - No Codes, No Verification

| REPORT<br>DATE | MILES | VIN               | BUILD<br>DATE | ST SYMPT   | ADDITIONAL SYM                 | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------|-------|-------------------|---------------|------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11022000       | 1327  | 1FMYU03141KD62259 | 08072000      | MO 807700  | INT STALL ON DECEL             | TECH STATES THAT THE CUSTOMER IS COMPLAINING OF AN INT STALL ON DECEL WITH THE BRAKE NOT APPLIED. NO DIAG HAS BEEN DONE CALLING FOR KNOWNS. ADVISED THE TECH THAT THERE ARE NO COMMON CONCERNS FOR THIS AS YET. LOOK FOR LOOSE CONNECTIONS OR GROUNDS OR HARNESS CONCERNS, TRY TO DUPLICATE THE CONCERN AND WATCH FUEL PRESSURE GET A RECORDING AND LOOK FOR EVAP OR EGR FLOW.<br>DEALER CALL MADE REPAIR IDLE AIR CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 11022000       | 2034  | 1FMYU04171KD62789 | 07192000      | MIN 807700 | INT STALL ON DECEL             | TECH STATES THAT THE CUSTOMER STATES THAT THE VEH HAS AN INT STALL ON DECEL. THEY CAN NOT DUPLICATE THE CONCERN CALLING FOR KNOWNS. ADVISED THE TECH TO LOOK FOR LOOSE CONNECTIONS POOR GROUNDS OR HARNESS CHAFES, ALSO LOOK TO SEE IF THE EVAP IS COMMANDED ON DURING THE CONCE CONCERN, THERE MAY BE FUEL IN THE CANISTER, OR THE ROLLOVER VALVE MAY BE STICKING, CAUSING RAW FUEL TO BE PULLED IN WHILE PURGING.<br>TECH STATES THEY HAVE BEEN DRIVING THE VEHICLE FOR ALMOST A WEEK AND CANNOT DUPLICATE THE CUSTOMERS CONCERN. TECH HAS CHECK THE CANISTER FOR SIGNS OF RAW FUEL AND NONE WERE NOTED. CUST IS NOT WANTING THE VEHICLE BACK UNTIL FIXED.<br>ADV TECH TO HAVE THE CUST DRIVE THE VEHICLE WITH YOU. IF TECH STILL CANNOT DUPLICATE THE CONCERN RETURN IT TO THE CUST. IF CUST WILL NOT TAKE THE VEHICLE BACK GET THE CSM INVOLVED...<br>DEALER CALL MADE NO DEFECT FOUND. |
| 11032000       | 2262  | 1FMCU04101KD07030 | 07272000      | WA 807900  | INTERMITTENT STALL/HES         | CUSTOMER STS VEH HAS INTERMITTENT STALL CONCERN AT 20MPH AND INTERMITTENT HESITABLE ON ACCEL TECH UNABLE TO DUPLICATE OR VERIFY SEEKING KNOWNS NO DTC'S FUEL TRIMS NORMAL<br>ADV TECH OF NO KNOWNS AND TO ADV CUSTOMER TO CHANGE FUEL BRANDS POSSIBLE CAUSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 11062000       | 1412  | 1FMCU03191KE78965 | 08312000      | FL 807803  | ALLEGED STALL AT CRUISE        | TECH STATES THE CUSTOMER ALLEGES THE VEHICLE STALLS ONCE WHILE AT A CRUISE. NO CODES ARE SET IN THE PCM. HE HAS NOT BEEN ABLE TO DUPLICATE THE CONCERN. THE CUSTOMER STATES THAT IT FELT LIKE SOMEONE SHUT THE KEY OFF. THE VEHICLE RESTARTED RIGHT AWAY. SEEKING FOR ANY KNOWNS OR ADVICE.<br>ADVISE TECH NO KNOWNS WERE AVAILABLE, ADVISE TO CHECK ALL THE POWERS AND GROUNDS FOR THE PCM, INSPECT THE EEC HARNESS AT THE RIGHT NEAR THE MOTOR MOUNT FOR POSSIBLE PINCH OR CHAFFING.<br>DEALER CALL WAS MADE, NO CODES DISPLAYED AND NO DEFECT FOUND.                                                                                                                                                                                                                                                                                                                                     |
| 11082000       | 1879  | 1FMYU04191KF05463 | 10172000      | MO 807000  | INT. STALL                     | TECH LOOKING FOR KNOWNS ON STALLING CONCERNS. CANT DUPLICATE. ADVISE TECH TO CHECK WIRING HARNESS ON RIGHT HAND SIDE ENGINE MOUNT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 11082000       | 37    | 1FMYU02131KE85004 | 09222000      | CO 807693  | DIED WHILE DRIVING             | SD STATES THE CAR DIED WHILE DRIVING AND IS LOOKING FOR KNOWNS FOR THIS CONCERN.<br>ADV SD THERE IS NO KNOWNS, ADV TO DO BASIC CHECKS.<br>DEALER CALL MADE, TECH INDICATED THAT THE AIRFLOW METER WAS UNPLUGGED, VEHICLE WORKED OK. NO DEFECT FOUND.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 11082000       | 3807  | 1FMYU04151KD62828 | 07192000      | NJ 807783  | INT. STALL ON DECEL/NO DUPLICA | CUSTOMER STATES WHEN CRESTING A HILL AND STARTING TO GO DOWN THE VEHICLE WILL STALL. CUSTOMER STATES IT STALLS WHEN HE LETS OFF THE GAS PEDAL. CUSTOMER STATES IT ONLY HAPPENS ON HILLS.<br>ADV TECH OF NO KNOWN CONCERNS. ADV TECH TO VERIFY IAC % BASE IDLE. VMV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST SYMPT | ADCL SYM                              | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|-------|-------------------|------------|----------|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11102000    | 37    | 1FMYU02181KE66004 | 09222000   | CO       | 807000                                | NOT OPENING. CONSULTED WITH SMC JAKE DOSS AND HE HAD NO INFORMATION. ADV TECH TO VERIFY THE CONCERN. DEALER CALL WAS MADE, NO DEFECT FOUND. VEHICLE DIED WHILE DRIVING, WON'T RESTART. NO CHECK ENGINE LIGHT, NO CODES, DCL DISPLAY, SHORT FUEL TRIM AT 22 TO 24% SHOULD BE 0. MAF HAD WATER CONTAMINATION. INSTALLED NEW MAF AND CHECKED, OK.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 11102000    | 3748  | 1FMCUD4151KE66221 | 08212000   | DN       | 807800                                | THE ENGINE STALLED WHILE DRIVING. WE CHECKED FOR CODES - NO CODES. WE DROVE THE TRUCK AND TRIED TO DUPLICATE THE CONCERN. WE WERE UNABLE TO DO SO. WE CONTACTED THE TECH HOTLINE - NO OTHER CONCERN OUT THERE. WE RELEASED THE TRUCK AND ASKED THE CUSTOMER TO TRY AGAIN AND SEE HOW MUCH FUEL IS IN IT AND WEATHER FACTOR IF RELATED OR NOT. PART_NBR 12850 CHANGED TO BY NBAKERS SYMPTOM_CODE 807000 CHANGED TO 807800 BY NBAKERS. DEALER CALL MADE NO DEFECT FOUND. SECOND TIME VEHICLE WAS IN FOR REPAIR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 11102000    | 3748  | 1FMCUD4151KE66221 | 08212000   | DN       | 888298 P0401 CONTINUOUS P1406 RUNNING | THE VEHICLE IS IN FOR SERVICE DUE TO THE CUSTOMER ALLEGES THE VEHICLE STALLED ON DECEL. THE CUSTOMER INDICATED SHE WAS COMING OF THE HIGHWAY ON DECEL AND THE VEHICLE STALLED. THE TECHNICIAN STATED HE IS UNABLE TO DUPLICATE THE CONCERN AND IS REQUESTING ANY ADDITIONAL TECHNICAL INFORMATION. RECOMMENDED TECHNICIAN FOR THIS CONCERN IT WILL BE NECESSARY TO RECREATE THE CONCERN BEFORE ANY REPAIR ATTEMPT. FOR NOW MONITOR THIS PIDS AND ESURE THEY ARE WITH IN SPECS.<br>IAC % = AT IDLE/HWY MILES IAT = TEMPERATURE/VOLTAGE<br>IAC % = VOLTAGE ECT = TEMPERATURE/VOLTAGE<br>TP = VOLTAGE/MODE VSS = MILE/H HERTZ/SPEEDOMETER<br>NO KNOWNS PERTAINING TO THIS CONCERN.<br>DEALER CALL WAS MADE VEHICLE WAS RETURNED TWICE WITH NO DEFECT FOUND. NO CODES DISPLAYED.<br>FREEZE FRAME DATA: ECT = 90C DEG LFTR 1 = -07.80 %<br>LOAD = 51.4 % LFTR 2 = -02.34 % CLOSED LOOP.<br>RPM = 2100.00 SFTR 1 = -01.58 %<br>MPH = 101.00 SFTR 2 = -02.34 %<br>THE TECHNICIAN WORKING ON THE VEHICLE STATES THE CHECK ENGINE LIGHT IS ON. CODES P0401/P1406 ARE STORED IN MEMORY. THE WDS DATA LOGGER SHOWS THE DPFE VOLTAGE IS AT 4.5 VOLTS, IS THIS CORRECT? THE VEHICLE RUNS FINE. THE CUSTOMERS ALSO COMPLAINED LONG TIME AGO THAT THE VEHICLE STALLED. REQUESTING ADDITIONAL TECHNICAL INFORMATION. REVIEW THE ABOVE FREEZE FRAME DATA.<br>ISM 00-12-029 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE INDICATED TECHNICIAN IS LIKELY THE DPFE SENSOR IS DOING ITS JOB, CHECK FOR LOOSE POWER/GROUNDS CONNECTIONS. IF ALL CHECKS O.K. THEN THE EGR VALVE IS STOCK OPEN, THE DPFE VOLTAGE AT IDLE/KOEO SHOULD BE AT 1.0 VOLTS, USE TSB 97-22-01 AS A REFERENCE. USING SHOP AIR REGULATE IT TO |

E982-627-A 18118

## Intermittent Stall - No Codes, No Verification

| REPORT<br>DATE | MILES | VIN                | BUILD<br>DATE | ST | SYMPT  | ADDL SYM                     | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------|-------|--------------------|---------------|----|--------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11202000       | 327   | 1FMYU03181KESL3523 | 08272000      | CA | 507783 | STALLS ON TURNS.             | 10 PSI, USE AN AIR NOZZLE, REMOVE THE EGR VALVE FROM THE VEHICLE AND APPLY AIR TO BOTH ENDS, IF AIR FLOW IS EVIDENT THEN THE VALVE IS STUCK OPEN.<br>SYMPTOM 8 07 7 83 CHANGED TO 6 08 2 08 BY JCHACON3<br>TECH STATES THE VEHICLE STALLS ON RIGHT TURNS. NO CODES IN THE PCM. NO DIAGNOSTIC HAVE BEEN STARTED. SEEKING FOR KNOWN OR ADVICE.<br>ADVISE TECH OF THE FEW CASE WE HAD ON HAND. ADVISE TECH TO INSPECT FOR POSSIBLE WATER INTRUSION INTO THE MAF SENSOR. ALSO MONITOR THE FUEL PRESSURE WHEN THE CONCERN IS PRESENT. CHECK THE CKP CIRCUIT AS WELL. |
| 11272000       | 241   | 1FMYU04131KF17806  | 10122000      | NH | 507600 | INT STALLS LEFT TURNS        | SF STS CUSTOMER STS THAT VEHICLE STALLS INTERMITTENTLY ON LEFT HAND TURNS, HASNT VERIFIED, MONITORED FUEL PRESS WITH GAUGE, ALSO MONITORED PIDS, SEEKING KNOWN                                                                                                                                                                                                                                                                                                                                                                                                  |
| 11282000       | 2757  | 1FMCU04101KE70485  | 08242000      | IL | 507693 | STALL AT CRUISE              | ADV BF NO KNOWN, TRY TO DUPLICATE CONCERN, CHECK IAC, LOAD<br>TECH STATES THAT THE CUST ALLEGES THAT THE VEH STALLED AT CRUISE. TECH STATES THAT HE CANNOT DUPLICATE THE CONCERN HE ALSO STATES THAT THERE ARE NO CODES. TECH STATES THAT HE CHECKED THE FUEL PRESSURE & IT IS AT 42 PSI. TECH LOOKING FOR KNOWN.                                                                                                                                                                                                                                               |
| 12072000       | 24    | 1FMYU01121KF69710  | 11052000      |    | 507591 | 1X STALL AT 45 MPH           | ADVISED TECH THAT THE FUEL PRESSURE SHOULD BE 65 PSI ADVISED TECH TO REPLACE THE FUEL PUMP & TO RECHECK THE FUEL PRESSURE.<br>VEHICLE STALLED 1X ON ACCEL FROM 40MPH COLD WHEN SALESPERSON WAS MOVING UNIT TO A DIFFERENT LOT. VEHICLE RESTARTED IMMEDIATELY IN NEUTRAL. NO CODES. CAN NOT DUPLICATE AGAIN.                                                                                                                                                                                                                                                     |
| 12082000       | 80    | 1FMYU02111KE6800   | 08282000      | NH | 507600 | STALL ON HARD DECEL          | NO KNOWN AT THIS TIME. POSSIBLE FUEL ISSUE. ATTEMPT TO DUPLICATE BEFORE ATTEMPTING REPAIR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 12182000       | 399   | 1FMCU03111KF45003  | 11022000      | FL | 507693 | CUSTOMER ALLEGES STALL       | TECH STS HAS A STALL ON A HARD DECEL. TECH LOOKING FOR KNOWN.<br>ADV TECH TO CHECK FOR IAC OPERATION. ADV TECH TO CHECK FOR LIQUID FUEL IN THE VAPOR MANAGEMENT SYSTEM.                                                                                                                                                                                                                                                                                                                                                                                         |
| 12282000       | 654   | 1FMYU01821KF63270  | 11082000      | VA | 507493 | STUMBLE STALL LOW FUEL PRESS | CUSTOMER ALLEGES VEHICLE STALLED, RESTARTED NORMALLY, TECH UNABLE TO VERIFY CONCERN, HAS DRIVEN 40 MILES.<br>ADVISE CHECK PCM POWER AND GROUND CIRCUITS, BATTERY JUNCTION BOX CONNECTIONS AND TAP ON PCM. NO KNOWN ON THIS CONCERN AT THIS TIME.                                                                                                                                                                                                                                                                                                                |
| 01102001       | 578   | 1FMCU041X1KF02214  | 10042000      | OR | 507000 | INT STALL DOWNHILL           | DEALER CALL MADE NO DEFECT FOUND NO CODES DISPLAYED.<br>TECH STATES VEHICLE WILL STUMBLE AND STALL. VEHICLE IS RUNNING REAL LEAN AND DOES NOT SEEM TO BE GETTING FUEL PRESSURE. TECH HAS REPLACED THE FUEL PUMP. TECH IS LOOKING FOR KNOWN.                                                                                                                                                                                                                                                                                                                     |
| 01122001       | 4545  | 1FMYU04131KE00002  | 08012000      | NY | 508491 | INT STALL/RUNS ROUGH COLD    | ADV TECH TO VOLT DROP POWER AND GROUND TO THE FUEL PUMP.<br>TECH STS CUSTOMER STS THAT VEHICLE STALLED ONCE GOING DOWN A STEEP HILL, ONLY HAD 1/4 TANK OF FUEL AT TIME, TECH HASNT VERIFIED, SEEKING KNOWN                                                                                                                                                                                                                                                                                                                                                      |
| 01152001       | 2945  | 1FMYU04111KE00363  | 08162000      | NS | 508298 | STALLS/RPM GAUGE INOP.       | ADV TECH NO KNOWN<br>TECH STS CUSTOMER STS THAT INTERMITTENTLY ON A COLD MORNING VEHICLE WILL STALL AND RUN ROUGH AFTER STARTUP, TECH HASNT VERIFIED, CHECKED FUEL PRESS WITH GAUGE, SEEKING KNOWN                                                                                                                                                                                                                                                                                                                                                              |
|                |       |                    |               |    |        |                              | ADV TECH NO KNOWN, CHECK IAC OPERATION, DUPLICATE CONCERN<br>TECH STS CUST STS INTERMITT. VEHICLE WILL STALL AT A STOP. CUST ALSO ST                                                                                                                                                                                                                                                                                                                                                                                                                            |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST | SYMPT  | ADDL GYM                     | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------|-------|-------------------|------------|----|--------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01282001    | 702   | 1FMYU03191KF44165 | 11062000   | CA | 007493 | STALLS @ IDLE AND RUNS ROUGH | <p>S RPM GAUGE WENT TO 4000 WHEN TRYING TO PASS ANOTHER VEHICLE ON THE HIGHWAY AND ALL POWER WAS LOST. TECH STS HAS NOT BEEN ABLE TO VERIFY EITHER CONCERN. TECH STS HAS NO CODES...SEEKING KNOWNS.</p> <p>ADVISED TECH OF NO KNOWNS ON EITHER CONCERN. ADVISED TECH TO VERIFY CONCERNS THEN DIAGNOSE OR CALL HOTLINE BACK.</p> <p>CUST ALLEGES THAT VEHICLE WILL STALL AT IDLE AND RUNS ROUGH ONLY AFTER FILLING THE GAS TANK. SF WAS UNABLE TO VERIFY CONCERN BUT STATES THAT CUST STOPS FUELING AT THE FIRST CLICK OF THE PUMP. SF SEEKING KNOWNS.</p> <p>ADVISED SF OF NO KNOWNS. ADVISED SF TO CHECK EVAP CANISTER FOR RAW FUEL, CHECK EVAP SYSTEM TO MAKE SURE THEY'RE FUNCTIONING,....</p>                                                                                                                                                      |
| 02012001    | 3516  | 1FMCU04111KF06763 | 10062000   | CA | 007700 | ALLEGED STALL AT STOP        | <p>TECH STS CUST STS OVER 3600 MILE PERIOD VEHICLE HAS STALLED TWICE WHEN COMING TO A STOP. TECH STS HAS NOT BEEN ABLE TO VERIFY THE CONCERN. TECH STS HAS NO CODES. TECH SEEKING KNOWNS.</p> <p>ISM 00-12-026 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE</p> <p>ADVISED TECH TO VERIFY THAT EGR IS NOT STICKING OPEN AT IDLE AS PER ISM ABOVE. ADVISED TECH TO VERIFY THAT PCM HAS LATEST CALIBRATION.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 02062001    | 4067  | 1FMYU02181KDF7030 | 07262000   | IL | 007663 | STALLS AT CRUISE             | <p>TECH STATES THE CUSTOMER ALLEGES THE VEHICLE STALLS WHILE DRIVING THE VEHICLE LOSES ALL ELECTRICAL POWER. WHEN THE CONCERN IS PRESENT THE VEHICLE WILL NOT CRANK, THE LIGHTS ON THE DASH, THE RADIO OR THE HEAD LIGHT ARE ALSO DOWN. THE ONLY THING THAT DOES WORK ARE THE POWER DOOR LOCKS. HE HAS WIGGLE THE HARNESS AND HAS FOUND NOTHING WRONG. HE ALSO INSPECTED THE IGNITION SWITCH AND IT SEEMS FINE.</p> <p>SEEKING FOR ANY KNOWNS OR ADVICE.</p> <p>ADVISE TECH NO KNOWNS WERE AVAILABLE, ADVISE HIM TO CHECK THE CENTRAL JUNCTION BOX FOR POSSIBLE WATER INTRUSION, IF FOUND RESEAL THE WINDSHIELD. ALSO INSPECT THE MAIN LOOM AT THE POWER DISTRIBUTION BOX AS IT ENTERS THE LEFT FENDER FOR POSSIBLE CHAFFING.</p>                                                                                                                      |
| 02092001    | 1990  | 1FMCU04101KF43763 | 11132000   | NC | 007592 | STALLED ON DECEL.            | <p>VEHICLE WAS BROUGHT IN FOR A STALLING CONCERN. CUSTOMER DESCRIBED AS WHILE GOING UP A HILL RIGHT AT THE TOP OF THE HILL VEHICLE STALLED OUT. CUSTOMER LET VEHICLE ROLLED DOWN THE HILL PULLED OVER TRY TO START IT AND IT STARTED RIGHT UP. TECH CANNOT DUPLICATE CONCERN. SEEKING ADVICE.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 02162001    | 1887  | 1FMYU04121KF62004 | 12062000   | NC | 007662 | STALLED ONE TIME AT CRUISE   | <p>ADVISED TECH NO KNOWNS. POSSIBLE STICKY IAC. REPLACE IF NECESSARY.</p> <p>TECH STATES THAT THE CUSTOMER STATES THAT THE VEH STALL ONE TIME AT CRUISE, THE VEH IMMEDIATELY RESTARTED AFTER PULLING OVER AND STOPPING. THE TECH HAS DRIVEN THE VEHICLE FOR TWO DAYS AND HAS NOT BEEN ABLE TO VERIFY THE CONCERN. CALLING FOR SUGGESTIONS.</p> <p>ISM 00-12-026 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE</p> <p>ADVISED THE TECH OF THE ABOVE, THE CONCERN WILL HAVE TO BE VERIFIED BEFORE FURTHER DIAG WILL BE EFFECTIVE.</p> <p>TECH CALLING ON STALLING CONCERN INTERMITTENTLY, HAS NOT VERIFIED. HOWEVER THE CUSTOMER HAS EXPERIENCED SEVERAL TIMES NOW WHILE AT 45 MPH. SUGGEST TECH TO REPLACE THE PCM POWER RELAY. HAVE HAD SOME REPORTS OF PCM POWER RELAY ISSUES. ALSO MAY CK THE POWER DISTRIBUTION BOX FOR WATER ENTRY. (SME) MAKE.</p> |

02062-027-A 10118

## Intermittent Stall - No Codes, No Verification

| REPORT<br>DATE | MILES | VIN               | BUILD<br>DATE | ST SYMPT | ADCL SYM | COMMENTS                     |
|----------------|-------|-------------------|---------------|----------|----------|------------------------------|
| 02282001       | 8238  | 1FMCU04111KE70188 | 08062000      | BC       | 807792   | ONE TIME STALL AT CRUISE     |
| 02282001       | 11000 | 1FMYU03161KE81063 | 08212000      | FL       | 807893   | INT STALLS                   |
| 03082001       | 3900  | 1FMYU04181KE87853 | 08222000      | CT       | 807893   | ALEDGED STALL AND RESTART    |
| 03082001       | 8006  | 1FMYU041X1KE80086 | 08152000      | WV       | 204227   | DRIVING OIL, ALT ENGINE LITE |
| 03122001       | 488   | 1FMYU04181KA73144 | 02232001      | OH       | 807793   | STALL AT DECEL/ROUGH IDLE    |

THE TECH CALLED BACK STATING THAT THE VEHICLE DOES HAVE A SUNROOF. SEEKING KNOWN ON THE CONCERN. ADVISED THE TECH TO INSPECT THE POWER DISTRIBUTION BOX FOR WATER INTRUSION, REPAIR OR REPLACE AS NECESSARY. TECH STATES THAT THE CUSTOMER IS STILL COMPLAINING OF AN INT STALL CONCERN, THE VEHICLE ALWAYS RESTARTS. THEY CAN NOT DUPLICATE THE CONCERN. CALLING FOR FURTHER SUGGESTIONS. ADVISED THE TECH THAT THERE ARE STILL NO COMMON CONCERNS, WE HAVE SEEN A FEW DPFE SENSOR CONCERNS, STICK IAC OR EGR VALVE CONCERNS. THE BEST THING WOULD BE TO VERIFY THE CONCERN. TECH SITS VEHICLE STALLED ONE TIME FOR OWNER AND RESTARTED AFTER A FEW SECONDS OF CRANKING. TECH SITS HE HAS FOUND NO CODES IN PCM. TECH CANNOT DUPLICATE CONCERN. SEEKING KNOWN. ADV TECH OF NO LIKE REPORTS IN DASH. ADV TECH TO ASK OWNER TO WATCH M ILL LIGHT IF CONCERN RETURNS TO POSSIBLY AID IN DIAG. TECH COULD TAP TEST PCM RELAYS, PCM, ETC.. TECH SITS THAT INTERMITTENTLY VEHICLE WILL STALL, TECH HAS ONLY HAD IT HAPPEN TO HIM ONCE. NO CODES, HAS MONITORED PIDS AND TEST DROVE, SEEKING KNOWN/ADVICE. ADV TECH NO KNOWN, WIGGLE TEST PCM HARNESS, BJB CONNECTIONS, MONITOR FRP, PIP, RPM. TECH SITS CUSTOMER ALEDGES VEHICLE STALLS AND RESTARTS AND TECH SITS HAS NOT BEEN ABLE TO VERIFY CONCERN AND HAS NO OTHER INFORMATION ON VEHICLE. AND IS SEEKING KNOWN. ADVISE TECH TO VERIFY WITH CUSTOMER FUEL LEVEL AND SPEED OF VEHICLE TURNING OR STOPPING OR ACCELERATING HOT OR COLD CK FUEL PRESSURE AT IDLE AND WOT. SM STATES CUSTOMER STATES THAT WHILE DRIVING OIL, ALT AND ENGINE LITE COMES ON HAS LOSS OF STEERING AND BRAKES. VEHICLE IS NOT THERE SO HAS NOT ROAD TESTED OR LOOKED AT. ADV SM TO SEE IF ANY CODES THEN LOOK FOR WATER OR CORROSION IN FUSE BOX AND CONNECTOR 283 RT BELOW FUSE BOX. SM STATES THAT HE LOOKED AT CENTRAL JUNCTION BOX AND FOUND NO WATER ENTRY THERE OR IN CONNECTOR 283 HAS STILL NOT DUPLICATED CONCERN. LOOKING FOR ANY KNOWN. TECH SITS VEHICLE HAS STALL CONCERN AT COAST, TECH HAS 2 VEHICLES WITH THIS CONCERN, TECH IS SEEKING KNOWN ON ISSUE. ISM 00-12-028 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE ISM 06-03-082 CALL VANCE EDGAR FOR ASSISTANCE ADVISED TECH TO INSPECT FOR PCM POWER RELAY RELEASEING, PCM POWERS AND GROUNDS, VERIFY EGR IS NOT STICKING, TRY TO DUPLICATE CONCERN, MAKE SURE VMV IS NOT PULLING LIQUID FUEL AFTER OVERFILLING. TECH SITS CK IS STILL COMPLAINING OF CONCERN, THE VEHICLE HAS NEW PCM RELAYS BUT CONCERN IS STILL PRESENT TECH HAS NEVER DUPLICATED CONCERN. SEEKING KNOWN ON PCM CALIBRATION RELATED TO CONCERN. ADVISED TECH TO PREVIOUS RECOMMENDATIONS, VERIFY CONCERN, INSPECT FOR

0002-027-A 10118

## Intermittent Stall - No Codes, No Verification

| REPORT<br>DATE | MILES | VIN               | BUILD<br>DATE | ST SYMPT | ADCL SYM | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| 03/22/01       | 3312  | 1FMYU01BX1KA08710 | 12/06/2000    | CA       | 007692   | INTERMITTENT STALL ON ACCEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                |       |                   |               |          |          | <p>OVERFILLING, RIDE WITH CUSTOMER.</p> <p>TECH CALLS BACK AND STATES THAT CUST IS CONCERN OF ROUGH IDLE AND RPM FLUCTUATION(60RPM)?? TECH HAS COMPARED VEHICLE WITH KNOWN GOOD VEHICLE CAN NOT FIND ANYTHING WRONG. TECH SEEKING KNOWNS.</p> <p>ADVISED TECH OF NO KNOWNS. ADVISED TECH THAT IF HE HAS COMPARED WITH KNOWN GOOD VEHICLE AND THEY ARE THE SAME, THEN IT'S NORMAL, RPM WILL FLUCTUATE SOME WITH LOAD INCREASE OR DECREASE. ADVISED TECH THAT IDLE RPM FOR VEHICLE IS 730-750RPM ACCORDING TO PCED. ADVISED TECH THAT HE COULD CHECK IAC, MAF, POWER BALANCE...</p> <p>TECH STATES THAT THE CUSTOMER IS COMPLAINING THAT THE VEHICLE STALLS, THE TECH CAN NOT DUPLICATE THE PROBLEM. THE MOST RECENT CONCERN WAS AT THE TOP OF A LONG HILL DURING ACCELERATION. SEEKING FOR ANY KNOWNS OR ADVICE.</p> <p>ADVISED TECH TO CHECK THE FUEL SYSTEM UNDER THE SAME CONDITIONS TO VERIFY THAT THE FUEL PUMP WILL MAINTAIN PRESSURE. ALSO CHECK THE FUEL SYSTEM FOR LEAK DOWN, AND CHECK CRANKSHAFT ENDPLAY FOR POSSIBLE INTERMITTENT BAD SIGNAL FROM THE CKP.</p> <p>TECH STS THAT ONE OF THE VEHICLES OWNERS STS THAT GOING UPHILL AROUND 70MPH+ THE ENGINE WILL LOSE POWER, HE WILL PULL OVER AND ENGINE REVS FINE IN NEUTRAL BUT WHEN PUT INTO GEAR IT WILL BARELY MOVE, THE OTHER OWNER STS THAT THE ENGINE STALLS GOING UPHILL AROUND 70MPH+, TECH HASN'T BEEN ABLE TO DUPLICATE EITHER CONCERN. ROAD TESTED VEHICLE AND MONITORED CHT AND FUEL PRESSURE WITH GAUGE, FUEL PRESSURE IS ABOVE 40PSI, CHT WILL GET UP TO 235 DEG UPHILL AT ABOUT 70MPH, TECH THINKS ENGINE IS RUNNING TOO HOT, PREVIOUS TECH REPLACED WIRES &amp; COIL, SEEKING ADVICE ADV TECH THAT ENGINE IS STILL RUNNING WITHIN NORMAL OPERATING TEMP, ADV THAT IF ENGINE IS RUNNING TOO HOT IT SHOULD SET A CODE OR COOLANT SHOULD BOIL OUT OVERFLOW, MAKE SURE FANS ARE WORKING PROPERLY, TECH NEEDS TO DUPLICATE CONCERN, IF CANNOT HE MAY NEED TO GET CSB INVOLVED WITH CUSTOMER.</p> <p>DIFFERENT DEALER CALLING ON ON VEHICLE. CUSTOMER HAS SAME COMPLAINT, VEHICLE BEGINS TO LACK POWER, THEN STALLS. CUSTOMER RELUCTANT TO BRING VEHICLE IN TO DEALER - WANTS IT BOUGHT BACK. SM SEEKING ANY SUGGESTIONS - ***TAR*** IF POSSIBLE?</p> <p>DISCUSSED CONCERN WITH ZETEC SUBJECT MATTER EXPERT AND ADVISED SM TO CHECK FOR CODES. IF P1270 IS PRESENT, THEN KNOWN CONCERN THAT IS UNDER INVESTIGATION. IF NO CODE PRESENT AND STILL CANNOT DUPLICATE, CONTACT CSB. ADVISED WILL NOT ***TAR*** REPORT AT THIS TIME AS VEHICLE IS NOT AT DEALER AND CONCERN CAN NOT BE REDILY DUPLICATED.</p> <p>AS REPORTS THEY DID GET VEHICLE TO STALL ONCE. NO CODES. LOOKING FOR KNOWNS.</p> <p>ADVISED @ POSSIBLE EGR VALVE PROBLEMS, CHECK PCM AND FUEL RELAY, IF THEY CAN DUPLICATE IT, TO HOOK UP WDS AND WATCH PIDS, IF NOT THEN HOOK UP FLIGHT RECORDER, REPLACE RELAY.</p> <p>TECH STATES VEHICLE STALL OUT ON CUSTOMER AT CRUISE. TECH ALSO STATED THAT VEHICLE CAME IN WITH A DISCHARGED BATTERY. BATTERY WAS CHARGED.</p> |
| 03/12/01       | 3605  | 1FMYU02M21KF79175 | 12/11/2000    | MO       | 007695   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 03/12/01       | 3728  | 1FMCU04161KE73018 | 08/28/2000    | ON       | 007600   | STALLED AT CRUISE P0430                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |



## Intermittent Stall - No Codes, No Verification

| REPORT<br>DATE | MILES | VIN               | BUILD<br>DATE | ST SYMPT  | ADDL SYM                      | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| 03282001       | 9504  | 1FMYU041X1KE74496 | 09062000      | NJ 007000 | INT STALLS                    | AND GENERATOR TESTED, BOTH TESTED OK. LOOKING FOR KNOWN<br>ADVISED TECH TO PERFORM WIGGLE TEST ON PCM, ALSO CHECK PCM POWER AND G<br>ROUND CIRCUITS. TECH WAS UNABLE TO VERIFY CONCERN.<br>TECH STS CUSTOMER STS THAT ENGINE QUIT AND VEHICLE LOST POWER STEERING<br>AND BRAKING, TECH HADNT VERIFIED, NO CODES, WIGGLE TESTED BJB, PCM H<br>ARNERS AND ENGINE CONTROL CIRCUITRY TO NO EFFECT, SEEKING KNOWN<br>ADV TECH NO KNOWN, ATTEMPT TO DUPLICATE CONCERN, GET MORE INFO FROM C<br>USTOMER.<br>TECH STATES VEHICLE DIES AT IDLE WHEN HOT, STATES HAS NO CODES. STATES<br>CAN KEEP IT RUNNING BY FEATHERING, STATES HAS PUT NEW IAC ON. STATES<br>LOOKING FOR KNOWN.<br>ISM 08-02-03 VAPOR LOCK CAUSED BY "WINTER BLEND" FUELS<br>ISM 00-12-02 OK FOR STICKING SHUT OR STUCK OPEN EGR VALVE<br>ADVISED TO CHECK FOR STICKING EGR VALVE AND TO CHECK FUEL QUALITY.<br>ADVISED TECH TO CALL BACK IF FURTHER ASSISTANCE IS NEEDED.<br>CUSTOMER STS VEH HAS INTERMITTENT STALL CONCERN ON DECEL DOWN A HILL<br>AND DURING TURNS TECH UNABLE TO VERIFY NO DTCS HAS REPLACE PCM<br>RELAY TO NO AVAIL SEEKING KNOWN<br>ADV TECH OF NO KNOWN AND TO CHECK BASE IDLE AND FUEL LEVEL DURING<br>CONCERN GET INFO FROM CUSTOMER ON WHEN CONCERN HAPPENS FUEL LEVEL AND<br>DUPLICATE AND ISOLATE CAUSE<br>SM CALLS ON SAME CONCERN, STATES THAT CONCERN COULD NOT BE VERIFIED,<br>FUEL LEVEL WAS AT 1/4 TANK, SEEKING KNOWN.<br>ADVISED SM PER PREVIOUS RECOMMENDATION, NO KNOWN, DO NOT ATTEMPT<br>REPAIR UNLESS CONCERN IS VERIFIED.<br>GENERAL MANAGER STATES THE VEHICLE HAS STALL DURING DECEL, DEALER HAS<br>NOT VERIFIED THE CONCERN, BUT CUSTOMER STATES VEHICLE STALLS AT CRUISE<br>35 MPH USUALLY ON DECEL HAS NO CODES, PCM POWER RELAY HAS BEEN REPLACED<br>AND DISTRIBUTION BOX INSPECTED.<br>SUGGEST TO REMOVE G104, CLEAN AND RE-INSTALL, BLOCK OFF THE EVAP VLV<br>AND RETEST FOR POSSIBLE RICH CONVERN FLOODING OUT ENGINE ON DECEL.<br>LOOK AT THE DPFE VOLTAGE READING BEING ERRATIC-REPLACE DPFE SENSOR IF<br>SUSPECT. NORMAL VOLTAGE AT 1.0V KOEO AND KOER.<br>CUST ALLEGE THAT VEHICLE STALLED WHILE DRIVING. TECH HAS NOT VERIFIED<br>CONCERN AND IS SEEKING KNOWN.<br>ADVISED TECH OF NO KNOWN, DO NOT ATTEMPT REPAIR UNLESS CONCERN IS<br>VERIFIED.<br>TECH STS HAS ALLEGED STALL WHEN BRAKING AND TURNING. HAS NO CODES IN<br>PCM. TECH STS HE HEARD ABOUT A WATER CONCERN IN THE WIRING. SEEKING<br>INFORMATION FOR WATER REPAIR.<br>ADV TECH TO CHECK CENTRAL JUNCTION BOX FOR WATER DAMAGE. THIS CAN<br>CAUSE RADIO CONCERN OR STARTING WITH KEY IN THE RUN POSITION. MAY NOT<br>BE RELATED TO A STALL CONCERN. ADV TO TAP ON PCM RELAY FOR POSSIBLE<br>UNLATCHING CONCERN. IF ENGINE STALLS WHEN RELAY IS TAPPED, REPLACE<br>RELAY. ADV INTERMITTENT CONCERNS ARE HARD TO VERIFY REPAIRS.<br>TECH STATES THE VEHICLE HAS CRUISE, HAPPENED FOR THE CUSTOMER 2 TIMES. |
| 04042001       | 433   | 1FMYU04171KAS861  | 02122001      | OH 607400 | DIES AT IDLE                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 04062001       | 4216  | 1FMYU04181KES8881 | 02262000      | HI 607492 | INT STALL ON DECEL            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 04052001       | 2496  | 1FMYU04181KF42075 | 10202000      | PA 607000 | ALLEGE STALL WHILE DRIVING    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 04052001       | 6142  | 1FMCU03181KF70772 | 11052000      | MI 807792 | ALLEGED STALL BRAKING/TURNING |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 04062001       | 7898  | 1FMYU04161KE81178 | 09082000      | GA 607893 | STALLS AT CRUISE              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST SYMPT  | ADDL SYM                    | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------|-------|-------------------|------------|-----------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 04072001    | 2280  | 1FMCU08141KFC2807 | 11022000   | FL 607769 | ALLEGED STALL ON DECELL     | TECH HAS NOT VERIFIED, NO CODES, RESTARTS FINE, SEEKING SUGGESTIONS/KNOWNS.<br>ADVISED TECH TO A FEW CONCERNS, CK THE PCM POWER RELAY, REPLACE AND CK THE WIRING, ALSO ADVISED OF POSSIBLE WATER ENTRY AT LEFT KICK PANEL.<br>TECH STS CUSTOMER ALLEGES VEHICLE STALLS GOING DOWN THIS ONE HILL, AND AS SOON AS YOU STOP VEHICLE WILL RESTART AND TECH STS HAS NOT BEEN ABLE TO VERIFY CONCERN AND TECH STS CUSTOMER WILL NOT LEAVE VEHICLE TO BE CKED OR ROAD TESTED AND TECH IS SEEKING KNOWNS FOR CONCERN.<br>ADVISE TECH THERE ARE NO KNOWNS FOR THIS CONCERN AND TO ATTEMPT TO VERIFY CONCERN ON BASE GROUNDS AND POWERS AND IF CONCERN FOUND SUBMITT EDR FOR FIX.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 04112001    | 740   | 1FMYU04191KA85798 | 03142001   | PA 607791 | STALLS/QUITS WHILE TURNING. | THE TECHNICIAN WORKING ON THIS VEHICLE STATES THIS VEHICLE STALL AND QUITS INTERMITTENTLY WHILE TURNING, NO CODES IN THE PCM AND STILL UNABLE TO DUPLICATE THE CONCERN, ARE THERE ANY KNOWNS PERTAINING TO THIS, REQUESTING ADDITIONAL TECHNICAL INFORMATION.<br>ISM 00-12-028 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE<br>T88 97-22-01 DELTA PRESSURE FEEDBACK EGR (DPFE) - DIAGNOSTIC TIPS INDICATED TECHNICIAN FOR THIS CONCERN CHECK FOR LOOSE CONNECTIONS AT THE MASS AIR FLOW, MONITOR THE MAF VOLTAGE AND HERTZ, MONITOR THE DPFE VOLTAGE KOEO/KOER @ IDLE USE T88 97-22-01.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 04112001    | 7427  | 1FMCU04171KF31721 | 10272000   | NC 607893 | ALLEGED STALL WHILE DRIVING | CUST ALLEGED THAT VEHICLE STALLED WHILE DRIVING. TECH HAS NOT VERIFIED CONCERN, NO CODES SET AND STATED THAT PIDS ARE READING NORMAL. TECH SEEKING KNOWNS.<br>ADVISED TECH OF NO KNOWNS. ADVISED TECH TO FIND OUT MORE ABOUT CONCERN FROM CUST, CHECK FOR OVERFILLING CONCERN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 04132001    | 5553  | 1FMCU04141KEB1182 | 08082000   | PA 607895 | ALLEGED DIES WHILE DRIVING  | SM STS HAS ALLEGED STALL WHILE DRIVING. THE VEHICLE WILL RESTART. HAS NO CODES IN PCM. HAS NOT BEEN ABLE TO DUPLICATE CONCERN. SEEKING ADV.<br>ADV SM TO TAP ON THE PCM POWER RELAY WHILE RUNNING. IF IT STALLS, REPLACE THE RELAY. ALSO CHECK POWER DIOD FOR LOOSE TERMINALS.<br>TECH STATES CUSTOMER WAS DRIVING VEHICLE AND ALLEGEDLY STALLED AND CUSTOMER LOSTED POWER STEERING. ADVISED TECH REPORT WILL BE PROCESSED FOR TECH ASSIST AS FOR CUSTOMER SATISFACTION ON REPEAT STALL CONCERN.<br>ADVISED TECH WHILE WAITING FOR FSE CHECK G101 AND G100, AS WELL AT PIN 21/22 FOR CKP SENSOR FOR POOR CONNECTIONS.<br>WENT TO DEALERSHIP ON 8/27/01 AND SPOKE WITH TECHNICIAN (BRAD) AND SM (GARY DIABELIS) ON THIS CONCERN. CONCERN HAPPENED FOR THE CUSTOMER A COUPLE OF TIMES IN INTERVALS OF APPROX 1000 MILES. WE WERE NOT ABLE TO VERIFY CONCERN, BUT IT WAS DISCOVERED THAT + TERMINAL GOING TO POWER DISTRIBUTION BOX DID NOT SEEM TO BE SUPPORTED PROPERLY. THERE WAS SOME MOVEMENT AT BOX AND 20 AMP FUEL PUMP FUSE MOVED WHEN CABLE WAS WIGGLED. WIGGLE TEST AT POW DIST BOX DID NOT REPEAT CONCERN. FROM HO TLINE'S SUGGESTIONS, R & RD CKP SENSOR, WENT OVER G100 & G101 & POWER DISTRIBUTION BOX.<br>FOLLOWED UP ON THIS VEH ON 7/6/01. CUST HAS BEEN DRIVING VEH AND HAS NOT HAD STALL CONCERN, ACCORDING TO SERV WRITER (CHUCK). CLOSE TAIL 1X STALL AT CRUISE. VEHICLE RESTARTED IMMEDIATELY. |
| 04162001    | 7832  | 1FMYU04191KE88378 | 08212000   | TN 607895 | STALL WHILE DRIVING         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST | SYMPT  | ADDL SYM                   | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|-------|-------------------|------------|----|--------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 04172001    | 406   | 1FMYU031X1KAB8830 | 03302001   | GA | 807882 | STALL AT CRUISE REPORTED   | CAN NOT VERIFY CONCERN. NO CODES, SEEKING KNOWN<br>NO KNOWN, CHECK ODOMETER FOR PCM COMMUNICATION AT TIME OF CONCERN.<br>CUSTOMER REPORTS ENGINE STALLED WHILE DRIVING. RESTARTED OK.<br>FOREMAN STATES NO CODES PRESENT (PASS).<br>VEHICLE DRIVEN SIXTY MILES WITHOUT DUPLICATING CONCERN.<br>RECOMMENDED INSPECTION OF ENGINE CONTROL WIRING HARNESSSES AND CONNECTORS. INSPECT CENTRAL JUNCTION BOX AND WIRING FOR LOOSE CONNECTIONS OR WATER ENTRY.<br>INTERMITTENT STALL OVER BUMPS. |
| 04232001    | 3029  | 1FMYU04181KE88861 | 03262000   | HI | 807000 |                            | WE COULD NOT DUPLICATE THE CONCERN BY DRIVING THE VEHICLE. WE OPENED THE POWER DISTRIBUTION BOX UNDER THE HOOD AND TAPPED ON THE TOP OF THE RELAY AND IF IT IS THE EARLY DESIGN RELAY IT HAS HORIZONTAL POINTS IN THE RELAY AND THE ENGINE WILL STALL. WE HAVE BEEN ABLE TO VERIFY THIS CONDITION WITH ALMOST EVERY V8 ESCAPE IN INVENTORY. REPAIR IS TO REPLACE THE RELAY WITH A RANGER STYLE AND IT HAS VERTICAL POINTS INSIDE AND IT WILL NOT STALL OVER BUMPS.                        |
| 04232001    | 100   | 1FMYU04131KB12806 | 03282001   | PA | 601300 | INTERMITTENT STALL/RESTART | TECH STATES VEHICLE HAS INTERMITTENT STALL CONCERN. TECH STATES VEHICLE DOES RESTART HOWEVER. TECH LOOKING FOR KNOWN.                                                                                                                                                                                                                                                                                                                                                                     |
| 04252001    | 5748  | 1FMCU04181KF08886 | 10182000   | NJ | 807000 | INTERMITTENT STALL CONCERN | ADVISED TECH OF CONCERNS AT POWER DISTRIBUTION BOX. ADVISED TECH TO WIGGLE TEST PCM POWER RELAY AND DIODE. ADVISED TECH TO PERFORM SAME TEST FOR FUEL PUMP RELAY. ADVISED TECH TO ALSO CHECK PCM GROUND.                                                                                                                                                                                                                                                                                  |
| 04262001    | 5100  | 1FMYU04881KD97308 | 10062000   | NJ | 807000 | INT STALL HARD START       | TECH STATES VEHICLE HAS INTERMITTENT STALL CONCERN. TECH WAS ABLE TO VERIFY CONCERN. TECH STATES AT TIME HAD MANUAL FUEL PRESSURE GAUGE INSTALLED AND SAW FUEL PRESSURE GO FROM 85 PSI TO 30. TECH LOOKING FOR KNOWN.                                                                                                                                                                                                                                                                     |
| 04282001    | 8871  | 1FMCU04101KA37022 | 02122001   | VA | 807000 | STALL ON DECEL             | ADVISED TECH TO VOLTAGE DROP GROUND CIRCUIT FOR FUEL PUMP. ADVISED TECH IF POWER AND GROUND CIRCUITS OK, TO REPLACE FUEL PUMP MODULE ASSEMBLY.                                                                                                                                                                                                                                                                                                                                            |
| 04272001    | 5001  | 1FMYU04131KE84113 | 09182000   | GA | 807793 | ALLEGED VEHICLE STALL      | CUSTOMER STS VEH HAS INTERMITTENT STALL CONCERN HARD START NEED TO FETHER ACCEL PEDDAL FOR VEH TO START AND RUN. TECH UNABLE TO DUPLICATE NO DTC'S SEEKING KNOWN.                                                                                                                                                                                                                                                                                                                         |
| 06012001    | 5008  | 1FMYU041X1KF66876 | 01112001   | MI | 807488 | LOW ENGINE RPM             | ADV TECH OF NO KNOWN SUSPECT POSSIBLE FUEL PUMP CONCERN OR LEAKING FRP (CONSULTED WITH SANTOS RIVERA SUBJECT MATTER EXPERT).<br>TECH STS CUST STS ON A LONG DECEL AFTER UNIT HAS WARMED UP ENGINE WILL DIE. TECH STS HAS NO CODES AND CANNOT DUPLICATE THE CONCERN. SEEKING KNOWN.                                                                                                                                                                                                        |
|             | 0     |                   |            |    |        |                            | ADVISED TECH OF NO KNOWN IN OASIS OR FIELD REPORTS. ADVISED TECH TO CHECK EGR OPERATION/RUN WDS EVAP TEST/CHECK FOR ANY LATER PCM CALIBRATION. VERIFY CONCERN BEFORE ATTEMPTING REPAIRS.                                                                                                                                                                                                                                                                                                  |
|             | 0     |                   |            |    |        |                            | SD STS CUSTOMER ALLEGES VEH STALLS AT SLOW SPEEDS AND RESTARTS WITH NO PROBLEM SD HAS NOT VERIFIED CONCERN AS OF YET BUT IS SEEKING KNOWN FOR CONCERN                                                                                                                                                                                                                                                                                                                                     |
|             | 0     |                   |            |    |        |                            | ADVISE SD TO CK FOR WATER ENTRY INTO CONNECTORS UNDER DASH SINCE VEH HLE HAD WINDSHIELD WATER LEAK AND CK EEC POWER RELAY FOR SHOCK SENSIT                                                                                                                                                                                                                                                                                                                                                |
|             | 0     |                   |            |    |        |                            | MEATRY VERIFY ALL POWERS AND GROUNDS ARE SECURE                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|             | 0     |                   |            |    |        |                            | TECH STS ALLEGED STALL ON ACCEL. TECH HAS NOT VERIFIED THE CONCERN.                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Intermittent Stall - No Codes, No Verification

| REPORT<br>DATE | MILES | VIN               | BUILD<br>DATE | ST | SYMPT  | ADCL SYM                      | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------|-------|-------------------|---------------|----|--------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                |       |                   |               |    |        |                               | TECH HAS VERIFIED A LOW ENGINE RPM OF 400 RPM. HAS NO CODES IN PCM.<br>TECH REPROGRAMMED THE PCM WITH NO CHANGE. SEEKING ADVICE<br>ADV TECH TO UNPLUG THE IAC. CHECK THE RPM READING AND COMPARE TO<br>COMPLAINT RPM. IF THE RPM MATCHES, LOOK FOR LOSS OF POWER OR GROUND TO<br>IAC. ALSO MAY HAVE A STICKING IAC OR PCM CONCERN.<br>REPLACED IAC VALVE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 05022001       | 2718  | 1FMYU04181KA73135 | 02222001      | PA | 807482 | INTERMITTENT STALLING CONCERN | TECH STATES THAT THE CUST ALLEGES THAT WHEN AT A STOP OR WHILE TURNING<br>THE ENG WILL STALL. TECH STATES THAT ARE NO CODES ALSO STATES THAT HE<br>CANNOT DUPLICATE THE CONCERN. ALSO STATES THAT HE MONITORED PIDS &<br>CHECKED FOR VACUUM LEAKS & IT IS OK. TECH ALSO STATES THAT HE CHECKED<br>FUEL PRESSURE & IT IS 36 PSI. TECH LOOKING FOR KNOWNS.<br>ADVISED TECH OF NO KNOWNS. ALSO ADVISED TECH THE FUEL PRESSURE & IF<br>STILL 36 PSI ADVISED TECH TO REPLACE THE FUEL PUMP & RECHECK FOR THE<br>CONCERN. ADVISED TECH THAT THE FUEL PRESSURE SHOULD BE 35 PSI.<br>THE TECH STATES THAT THE CUSTOMER IS COMPLAINING OF AN INTERMITTENT<br>STALL ON DECEL AT A STOP. THE TECH CAN NOT VERIFY. SEEKING FOR KNOWNS<br>ADVISED THE TECH TO ATTEMPT TO DUPLICATE THE CONCERN, INSPECT THE IAC<br>FOR STICKING AND INSPECT FUEL LEVEL AND QUALITY.<br>COULD NOT DUPLICATE CONCERN. ALL WIRING AND CONNECTIONS.<br>THE TECH STATES THAT THE CUSTOMER STATED THAT THE VEHICLE STALLED<br>WHILE CRUISING AT 45 MPH. THE VEHICLE THEN RESTARTED. FUEL LEVEL IS<br>ABOUT 1/2 TANK AND THERE ARE NO CODES. SEEKING FOR KNOWNS.<br>ISM 00-12-025 OK FOR STICKING SHUT OR STUCK OPEN EGR VALVE<br>ADVISED THE TECH TO INSPECT THE EGR SYSTEM FOR POSSIBLE STICKING EGR<br>VALVE OR FAULTY DIFFE SENSOR. REPAIR OR REPLACE AS NECESSARY.<br>COULD NOT VERIFY |
| 06032001       | 1717  | 1FMCU041X1KA73362 | 02222001      | MO | 807782 | INTERMITTENT STALL            | THE ENGINE SHUTS DOWN WHEN DRIVING PAST CERTAIN LOCATIONS.<br>CONSTANTLY AROUND WIRELESS PHONE SATELLITE TRANSMISSION TOWERS.<br>CHECKED FOR DTC'S NONE IN MEMORY OR SELF TEST. NO OASIS SENS OR<br>TBS'S.<br>SRV_DLR_CODE 07893 CHANGED TO 07839 BY PCHARNEY SYMPTOM_CODE 807600<br>CHANGED TO 807600 BY PCHARNEY<br>SENT TO VISTEON.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 06032001       | 2988  | 1FMCU04121KF85845 | 12112000      | NC | 807882 | INTERMITTENT STALL            | CUSTOMER REPORTS VEHICLE QUIT ON ROAD COASTED TO A STOP.<br>CUSTOMER CYCLED IGNITION KEY AND VEHICLE STARTED/RAN NORMALLY.<br>CODES REPORTEDLY PASS<br>ADVISED TECH USE WDS TO RECORD ANY NETWORK CODES, PENDING OR<br>FREEZE-FRAME DATA. SUGGESTED VEHICLE WIRING OR LOSS OF CKP SIGNAL AS<br>POSSIBLE "NO CODE" FAILURE<br>RECOMMENDED TECH OR WRITER DRIVE OVER WEEKEND IF POSSIBLE ATTEMPTING<br>TO DUPLICATE CONCERN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 05042001       | 2781  | 1FMYU04111KF57088 | 11012000      | HI | 807800 |                               | TECH STATES THAT THE CUST ALLEGES THAT THE ENG STALLED WHEN GOING DOWN<br>HILL & IT DID IT ONCE & IT STARTED RIGHT UP. TECH STATES THAT THERE<br>ARE NO CODES ALSO STATES THAT HE DROVE THE VEH & CANNOT DUPLICATE THE<br>CONCERN. TECH LOOKING FOR KNOWNS.<br>ADVISED TECH OF NO KNOWNS. ALSO ADVISED TECH TO DRIVE THE VEH &                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 06042001       | 7558  | 1FMYU04181KE82460 | 08142000      | PA | 807000 | UNVERIFIED QUIT ON ROAD       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 08072001       | 2655  | 1FMYU04181KF42757 | 10232005      | BC | 807782 | INTERMITTENT STALL            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST SYMPT  | ADDL SYN           | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|-------|-------------------|------------|-----------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 08072001    | 2181  | 1FMYUD4151KE79382 | 08142000   | PA 007792 | ALLEGED STALL      | <p>MONITOR PIDS &amp; FUEL PRESSURE. FUEL PRESSURE SHOULD BE 65 PSI. TECH STS HAS INTERMITTENT STALL ON DECEL. HAS NO CODES IN PCM. TECH IS NOT ABLE TO VERIFY THE CONCERN.</p> <p>ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL. SURVEY ENTER - INTERMITTENT STALL ON DECEL. TOLD TO V AND RESET. BASE IDLE-ENGINE DID NOT IDLE AT ALL WHEN ISC DISCONNECTED. RESET BASE IDLE TO 650 RPM. EXTENSIVE TEST DRIVE.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 05072001    | 2781  | 1FMYUD4111KF57086 | 11012000   | HI 607000 | INTERMITTENT STALL | <p>TECH STATES CUSTOMER IS COMPLAINING OF INTERMITTENT STALL CONCERN. CUSTOMER STATES VEHICLE STALLS OUT WHEN PASSES CELL PHONE SIGHTS. CUSTOMER ALLEGES VEHICLE WILL STALL OUT 2 OUT OF 3 TIMES AT SIGHT. TECH HAS BEEN UNABLE TO VERIFY CONCERN.</p> <p>ADVISED TECH TO CHECK GROUND G100 FOR CKP SHIELD GROUND. ADVISED TECH TO SHIELD CKP CIRCUIT AND GROUND ONE END OF SHIELD.</p> <p>TECHNICIAN STATED THAT HAS THE SAME CONCERN AND STILL CAN NOT VERIFY THE CONCERN. LOOKING FOR FURTHER ASSISTANCE.</p> <p>ADVISED THE TECHNICIAN TO VERIFY THE CONCERN, USE WDS AND MONITOR ALL PIDS.</p> <p>TECH CALLED IN AND STATES THAT THE CUSTOMER STILL ALLEGES THAT THE VEHICLE STALLS IN THIS ONE AREA. TECH SEEKING KNOWNS AND IS UNABLE TO DUPLICATE.</p> <p>ADVISED THE TECH TO ASK MORE QUESTIONS OF THE CUSTOMER ABOUT THE AREA AND TERRAIN (EX. STEEP HILL) THAT THE STALL HAPPENS IN. ADVISED TO TEST DRIVE WITH CUSTOMER TO OBSERVE DRIVING HABITS.</p>                                                                                                                                                                                                                                                                                             |
| 08082001    | 13995 | 1FMYUD3141KF00835 | 10042000   | CA 007500 | STALLS/HESITATION  | <p>CUSTOMER'S CONCERN REPORTED AS STALL AT STOP/DECEL. TECH REPORTS NOT BEING ABLE TO DUPLICATE CONCERN.</p> <p>NOTED PERCEIVED HESITATION ON ACCEL.</p> <p>CODES REPORTED AS PASS.</p> <p>TECH AWARE OF REPEAT VEHICLE CONCERNS REPORTED BY CUSTOMER. ENGINE HAS BEEN REPLACED.</p> <p>TECH FEELS CUSTOMER MAY WISH TO HAVE VEHICLE REACQUIRED.</p> <p>COMPETENT TECH FEELS THAT PERFORMANCE OF THIS VEHICLE MAY BE NORMAL.</p> <p>TECH CALLED TO CHECK LATEST INFORMATION REGARDING HESITATION. ISM 00-12-028 CK FOR STICKING BHUT OR STUCK OPEN EGR VALVE.</p> <p>RECOMMENDED NORMAL DIAG FOR CONCERN REPORTED.</p> <p>BARO VALUE CORRECT FOR LOCALITY.</p> <p>WDS FUEL SYSTEM TESTS.</p> <p>VOLT.DROP-TEST VEHICLE WIRING GROUND POINTS.</p> <p>MONITOR EGR SYSTEM FOR INTERMITTENT DIFFERENTIAL SIGNAL FAULT.</p> <p>ADVISED TO AVOID REPLACEMENT OF PART(S) NOT TESTED AS DEFECTIVE OR FOUND TO BE CASUAL.</p> <p>TECH DROVE THE VEHICLE OVERNIGHT AND FELT BUCKLE/STALL CONCERN. TECH PINPOINTED TO THE PCM HARNESS CONNECTOR AT PCM. TESTED ALL PINS AND WIRES FOR LOOSENESS. FEELS HAS PCM CONCERN.</p> <p>SUGGEST TECH TO REPLACE THE PCM BASE ON THE INFORMATION GIVEN. WILL NEED TO PERFORM KEY CODE PROGRAM WITH 2 KEYS AND SET TIRE SIZE AND</p> |

0802-627-9 10125

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN                | BUILD DATE | ST | SYMT   | ADDITIONAL SYM              | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------|-------|--------------------|------------|----|--------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 05112001    | 5390  | 1FMYU03151K0F53548 | 11022000   | TX | 807800 | STALLS AT 45 MPH INTER,     | AXLE RATIO.<br>CUSTOMER STATES THE VEHICLE HAS STALLING CONCERN WHILE DRIVING. TECH HAS NOT BEEN ABLE TO DUPLICATE THE CONCERN. VEHICLE RESTARTS FINE. SUGGEST DEALER TO REPLACE THE PCM POWER RELAY AND OK PRIMARY GROUND G104 AND CLEAN AS NECESSARY.<br>HAS RECHECKED DRIVING 100 MILES TOTAL DRIVE WITH NO CODES STILL CANNOT DUPLICATE CONCERN.<br>REDC TO DISCONNECT DPFE VALVE AND RETEST.<br>CHECK TO SEE IF ODOMETER GOES TO ALL DASHES DUE TO LOSS PCM CONNECTION SF STS LAST TIME VEHICLE STALLED HAD 1/4 TANK OF FUEL BUT STARTED RIGHT BACK UP PER CUSTOMER THEN VEHICLE STALLED AGAIN AND CUSTOMER HAD VEHICLE TOWED IN.<br>ADVISE SF TO INSPECT FOR CONTAMINATION IN FUEL TANK AND POSSIBLE CLOGGED FUEL RESERVOIR.                                                         |
| 05112001    | 541   | 1FMYU04151K040480  | 04172001   | KS | 807593 | ALLEGED STALLING CONCERN    | TECH STS THAT CUSTOMER STS THAT THE VEHICLE STALLED. TECH STS THAT HE HAS DRIVEN THE VEHICLE FOR 80 MILES AND IS UNABLE TO VERIFY THE COMPLAINT. TECH SEEKING KNOWNS.<br>ADVISED THE TECH OF NO KNOWNS. ADVISED THE TECH TO CHECK THE EEC RELAY FOR TIGHT CONNECTIONS. CHECK THE CMP CIRCUIT FOR ANY PINCHED OR CHAPPED WIRES.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 05122001    | 498   | 1FMYU04151K040480  | 04172001   | KS | 807800 |                             | THE ENGINE DIED WHILE DRIVING ON HIGHWAY. DID NOT START BACK UP ON FIRST TRY. WOULDN'T CRANK. AFTER IT SAT 1 HOUR STARTED OK. HAD BEEN DRIVING 25 MINUTES.<br>EEC TEST PASS B1007. PINPOINT TEST. TEST DROVE 73 MILES AND CALLED HOTLINE, UNABLE TO DUPLICATE ANY CONCERNS. CUSTOMER WANTED VEHICLE BACK.<br>SYMPTOM_CODE 807000 CHANGED TO 807800 BY DSTELTER<br>CUST ALLEGES THAT VEHICLE STALLS WHILE DRIVING. SD HAS NOT VERIFIED CONCERN AND IS SEEKING KNOWNS.<br>IRM 88-02-096 VAPOR LOCK CAUSED BY "WINTER BLEND" FUELS<br>ADVISED SD OF NO KNOWNS. ADVISED SD NOT TO ATTEMPT REPAIR UNLESS CONCERN IS VERIFIED. ADVISED SD TO CALL CURT AND CHECK IF CUST FILLS THE GAS TANK PRIOR TO CONCERN, SUSPECT OVERFILLING.<br>NO PROBLEM FOUND FOR CUSTOMERS STALLING OUT CONCERN.       |
| 06162001    | 761   | 1FMCU03181K040006  | 04162001   | GA | 807693 | ALLEGED STALL WHILE DRIVING | TECHNICIAN BOB STATES THAT THE VEHICLE HAS AN ALLEGED STALL CONCERN. THE CUSTOMER STATES THAT HE VEHICLE LOST POWER, AND THE CHECK ENGINE LIGHT AND OIL LIGHT CAME ON. THE VEHICLE STALLED, AND THEY PULLED ON TO THE SIDE OF THE ROAD. THE VEHICLE STARTED FINE, AND THE CONCERN WAS GONE. NOW THE VEHICLE IS BACK WITH THE SAME CONCERN. THE FIRST TIME THE CONCERN HAPPENED WAS AT 829 MILES AND THE SECOND TIME WAS AT 7220 MILES. THE TECHNICIAN TOOK THE VEHICLE ON A 25 MILE TEST DRIVE, AND WASN'T ABLE TO DUPLICATE THE CONCERN. THERE ARE NO CODES, AND THE VEHICLE IS WORKING CORRECTLY AT THIS TIME. TECHNICIAN SEEKING ANY KNOWNS.<br>ADVISED TECHNICIAN THAT THERE ARE NO KNOWNS FOR THIS CONCERN. ADVISED TECHNICIAN TO MAKE SURE THAT HE PCM IS AT THE LATEST CALIBRATION. |
| 05162001    | 7807  | 1FMYU04131K051255  | 06082000   | PA | 807693 | ALLEGED STALL CONCERN       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

E002-87-A 18128

**Intermittent Stall - No Codes, No Verification**

| REPORT DATE | MILES | VIN               | BUILD DATE | ST | SYMPT  | ADDITIONAL SYM                  | COMMENTS                                                                                                                                                                                                                                              |
|-------------|-------|-------------------|------------|----|--------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |       |                   |            |    |        |                                 | ADVISED TECHNICIAN TO CHECK THE FUEL PRESSURE AND TO MAKE SURE THAT IT ISN'T BLEEDING DOWN. ADVISED TECHNICIAN NOT TO ATTEMPT ANY REPAIRS UNLESS THE CONCERN CAN BE DUPLICATED. ADVISED TECHNICIAN TO CALL BACK IF NEEDING ANY FURTHER ASSISTANCE.... |
| 05172001    | 1700  | 1FMCU08191KB27126 | 04102001   | GA | 807862 | INTERNAL STALL/RESTARTS/NO CODE | ADVISED TECHNICIAN TO CHECK THE FUEL PRESSURE AND TO MAKE SURE THAT IT ISN'T BLEEDING DOWN. ADVISED TECHNICIAN NOT TO ATTEMPT ANY REPAIRS UNLESS THE CONCERN CAN BE DUPLICATED. ADVISED TECHNICIAN TO CALL BACK IF NEEDING ANY FURTHER ASSISTANCE.... |
|             | 0     |                   |            |    |        |                                 | ADVISED TECHNICIAN TO CHECK THE FUEL PRESSURE AND TO MAKE SURE THAT IT ISN'T BLEEDING DOWN. ADVISED TECHNICIAN NOT TO ATTEMPT ANY REPAIRS UNLESS THE CONCERN CAN BE DUPLICATED. ADVISED TECHNICIAN TO CALL BACK IF NEEDING ANY FURTHER ASSISTANCE.... |
|             | 0     |                   |            |    |        |                                 | ADVISED TECHNICIAN TO CHECK THE FUEL PRESSURE AND TO MAKE SURE THAT IT ISN'T BLEEDING DOWN. ADVISED TECHNICIAN NOT TO ATTEMPT ANY REPAIRS UNLESS THE CONCERN CAN BE DUPLICATED. ADVISED TECHNICIAN TO CALL BACK IF NEEDING ANY FURTHER ASSISTANCE.... |
|             | 0     |                   |            |    |        |                                 | ADVISED TECHNICIAN TO CHECK THE FUEL PRESSURE AND TO MAKE SURE THAT IT ISN'T BLEEDING DOWN. ADVISED TECHNICIAN NOT TO ATTEMPT ANY REPAIRS UNLESS THE CONCERN CAN BE DUPLICATED. ADVISED TECHNICIAN TO CALL BACK IF NEEDING ANY FURTHER ASSISTANCE.... |
| 06182001    | 4480  | 1FMYU041X1KF88001 | 01102001   | OH | 807862 | ALLEGED INTERMITTENT STALLING   | TECH STS THAT HE HAS AN INTERMITTENT STALLING CONCERN. TECH STS THAT HE IS UNABLE TO VERIFY THE CONCERN. TECH SEEKING KNOWNS FOR A INTERMITTENT STALLING CONCERN.                                                                                     |
|             | 0     |                   |            |    |        |                                 | ADVISED THE TECH TO TRY TAPPING ON THE EEC POWER RELAY. ADVISED TECH THAT HE MAY HAVE A LOOSE PIN ON THE RELAY. ADVISED THE TECH TO VERIFY THE CONCERN.                                                                                               |
|             | 0     |                   |            |    |        |                                 | ADVISED THE TECH TO TRY TAPPING ON THE EEC POWER RELAY. ADVISED TECH THAT HE MAY HAVE A LOOSE PIN ON THE RELAY. ADVISED THE TECH TO VERIFY THE CONCERN.                                                                                               |
|             | 0     |                   |            |    |        |                                 | ADVISED THE TECH TO TRY TAPPING ON THE EEC POWER RELAY. ADVISED TECH THAT HE MAY HAVE A LOOSE PIN ON THE RELAY. ADVISED THE TECH TO VERIFY THE CONCERN.                                                                                               |
| 06212001    | 1616  | 1FMYU01151KA56847 | 01282001   | FL | 807862 | ALLEGED SHUTS-OFF WHILE DRIVING | CUST ALLEGED THAT VEHICLE SHUTS-OFF WHILE DRIVING WHEN ENGINE IS HOT. SM HAS NOT VERIFIED CONCERN, HAS NO CODES AND IS SEEKING KNOWNS.                                                                                                                |
|             | 0     |                   |            |    |        |                                 | ISM 06-02-088 VAPOR LOCK CAUSED BY "WINTER BLEND" FUELS                                                                                                                                                                                               |
|             | 0     |                   |            |    |        |                                 | ADVISED SM OF NO KNOWNS, ADVISED SM TO CHECK FUEL QUALITY AND NOT TO ATTEMPT REPAIR UNLESS CONCERN IS VERIFIED.                                                                                                                                       |
|             | 0     |                   |            |    |        |                                 | ADVISED SM OF NO KNOWNS, ADVISED SM TO CHECK FUEL QUALITY AND NOT TO ATTEMPT REPAIR UNLESS CONCERN IS VERIFIED.                                                                                                                                       |
| 06212001    | 6801  | 1FMYU04111KD08139 | 07312000   | VA | 807800 |                                 | TECH STATED THAT THE VEH HAS AN INT STALL CONCERN. THE TECH HAS VERY LITTLE INFO FROM THE CUST AS TO WHEN IT HAPPENS AND CAN NOT VERIFY THE CONCERN. CALLING FOR KNOWNS.                                                                              |
|             | 0     |                   |            |    |        |                                 | ISM 06-12-028 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE                                                                                                                                                                                            |
|             |       |                   |            |    |        |                                 | ADVISED THE TECH THAT THE CONCERN WILL HAS TO BE VERIFIED, LOOK FOR STICKING EGR, OR POSS A BAD DIFF. LOOK FOR FUEL SYSTEM CONCERNS, IAC, CKP. POSS GET A RECORDING OF THE CONCERN.                                                                   |
|             |       |                   |            |    |        |                                 | CUSTOMER WANTED VEHICLE RETURNED                                                                                                                                                                                                                      |
| 06212001    | 8724  | 1FMYU04161KD08743 | 07242000   | NE | 807462 | INTERMITTENT STALL AT STOP.     | TECH STATES THAT THE CUST ALLEGES THAT THE ENG STALLED WHILE AT A STOP BUT STARTED RIGHT UP. TECH STATES THAT THERE ARE NO CODES HE ALSO STATES THAT HE DROVE THE VEH & CANNOT DUPLICATE THE CONCERN. TECH LOOKING FOR KNOWNS.                        |
|             |       |                   |            |    |        |                                 | ADVISED TECH OF NO KNOWNS. ALSO ADVISED TECH TO HOOKUP A FUEL PRESSURE GAUGE & CHECK FUEL PRESSURE & LEAKDOWN SHOULD HAS 66 PSI FUEL PRESSURE ALSO ADVISED TECH TO CHECK FUEL QUALITY.                                                                |
| 06252001    | 750   | 1FMCU04141KB23084 | 04092001   | WA | 807799 | STALLED ON DECEL ONCE B1322     | TECH STATES THE CUSTOMER ALLEGES THE VEHICLE STALLED ONCE ON A DECEL AT 40 MPH. TECH CANNOT DUPLICATE. NO CODES IN PCM. SEEKING KNOWNS. VEHICLE HAS A SUNROOF.                                                                                        |
|             |       |                   |            |    |        |                                 | ISM 06-12-028 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE                                                                                                                                                                                            |
|             |       |                   |            |    |        |                                 | ADV TECH TO CHECK FOR BINDING EGR VALVE. CHECK CENTRAL JUNCTION BOX AND C263 FOR WATER ENTRY. REROUTE DRAIN HOSE FOR SUNROOF.                                                                                                                         |
|             |       |                   |            |    |        |                                 | SM CALLING FOR FOLLOWUP INFO CONCERNING FUEL GAUGE AND LOW FUEL LAMP NOT COMING ON WHEN VEHICLE RAN OUT OF GAS.                                                                                                                                       |
|             |       |                   |            |    |        |                                 | ADVISE S.M. OF DEALER TEST MODE, PCM FAULT CODES AND VARIOUS TEST METHODS FOR PCM.                                                                                                                                                                    |
| 06292001    | 11865 | 1FMYU01181KA18473 | 12112000   | KY | 807683 | UNVERIFIED STALL                | SERVICE MANAGER LOOKING FOR "KNOWNS" FOR UNVERIFIED STALL/OUT CONCERN                                                                                                                                                                                 |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST     | SYMPT            | ADCL SYM                 | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|-------|-------------------|------------|--------|------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 05062001    | 840   | 1FMCU04131KA09334 | 01022001   | 807892 | STALLS AT CRUISE |                          | VEHICLE NOT PRESENTLY AT DEALER REPORTED MILEAGE WAS RECORDED 0506/01. ADVISED MANAGER HAVE DRIVE TECH USE WDS TO DETERMINE CODE STATUS WHEN VEHICLE IS SCHEDULED INTO SHOP. TECH STATES THAT THE VEHICLE IS IN NOW AND THE MILEAGE IS 12,256. TECH HAS INSPECTED FUEL PRESSURE (33 PSI), IAC 43.8%. TECH UNABLE TO DUPLICATE CONCERN. TECH SEEKING DIRECTION. ADVISED THE DLR TO REPLACE PCM POWER RELAY AND TO INSTALL A FLIGHT REC ORDER IN THE VEHICLE. ADVISED TO MONITOR VREF, VPWR, IAC, ETC. SERVICE MANAGER STATED THAT HAS A CONCERN OF STALLS AT CRUISE, PULLS OVER AND STARTS UP- CAN NOT VERIFY THE CONCERN, NO CODES, FREEZE FRAME DATA. ADVISED THE SERVICE MANAGER TO VERIFY THE CONCERN. PER SME- TO CHECK THE POWERS AND GROUNDS TO THE PCM- TO PERFORM A TAP TEST ON THE PCM, TO SNAP IN A KNOWN GOOD DPFE.                                                                                                                  |
| 08062001    | 7228  | 1FMYU04141KEB1723 | 09152000   | MA     | 807493           | DIES ON TURNS            | TECH STATES HE IS LOOKING FOR KNOWNS ON DIES ON TURNS AT TIMES, THE TECH HAS NOT VERIFIED THE CONCERN. NO CODES IN THE SYSTEM. ADV TECH TO CHECK THE FUEL FILTER, ADV TO TALK WITH THE CUSTOMER, CHECK HOW MUCH FUEL WAS IN THE TANK DURING THE CONCERN. ISM 98-02-035 VAPOR LOCK CAUSED BY "WINTER BLEND" FUELS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 08062001    | 3338  | 1FMYU02141KP99192 | 12082000   | ON     | 807893           | ALLEGED STALLS AT CRUISE | TECH STS CUSTOMER ALLEGES VEHICLE WILL STALL WITH CRUISE ON AND TECH ST B HAS NOT BEEN ABLE TO VERIFY CONCERN AND IS SEEKING ANY KNOWNS FOR CONCERN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 08062001    | 600   | 1FMYU03191KB63430 | 06222001   | TX     | 807893           | INT STALL ON DIPSHILLS   | ADVISE TECH THERE ARE NO KNOWNS FOR ALLEGED CONCERN AND HE WILL NEED TO ATTEMPT TO VERIFY CONCERN AND SUBMIT EDSR WITH FINDINGS SF STATES THE VEHICLE IS AN ALLEGED STALL CONCERN ONLY IN ONE AREA. IT WILL ALLEGEDLY STALL ON A DIP IN THE ROAD. THE SF HAS DRIVEN THE VEHICLE IN THIS AREA AND HE CANNOT DUPLICATE THE CONCERN. HE IS LOOKING FOR ANY KNOWNS ON THIS CONCERN. THIS IS THE SECOND VEHICLE THE CUSTOMER HAS HAD THIS CONCERN WITH. THE FIRST VEHICLE WAS BOUGHT BACK AND SHE WAS PUT INTO A NEW ESCAPE. NOW THIS VEHICLE IS DOING THE SAME THING.                                                                                                                                                                                                                                                                                                                                                                               |
| 08062001    | 1892  | 1FMCU02101KB12878 | 03312001   | MD     | 807402           | VEHICLE STALLED/NO CODES | ADVISED SF TO TRY TO DUPLICATE THE CONCERN. DUE TO THE CIRCUMSTANCES INVOLVED, HE MAY NEED TO GET THE ZONE INVOLVED. IF HE CANNOT DUPLICATE AFTER REPEATED TESTING, HE SHOULD CONTACT HIS ZONE REP OR RECONTACT US FOR A TECH ASSIST REFERRAL. SHOP FOREMAN REDROVE UNIT TO SAME LOCATION AND CAN DUPLICATE STALL BY DOING FOLLOWING: LONG DECEL DOWN HILL, AT BOTTOM START TO ACCELERATE AND ENGINE STALLS. IMMEDIATE RESTART. UNABLE TO DETERMINE CAUSE. TECH CALLED STATING THE VEHICLE STALLED ON THE CUSTOMER AND TOOK SEVERAL ATTEMPTS TO START. STATED THERE ARE NO CODES. DOES NOT KNOW HOW MUCH GAS WAS IN THE TANK. DOES NOT HAVE ANY MORE INFO PERTAINING TO THE STALL. LOOKING FOR ADVICE. ADVISED TO TAP ON THE EEC POWER RELAY. IF THE RELAY UNLATCHES, CHECK THE POWERS AND GROUNDS TO THE RELAY. IF THEY ARE FINE REPLACE IT AND REVERIFY. ADVISED TO GET MORE INFO FROM THE CUSTOMER AND SUBMIT EDSR. CHECK TO SEE THE VEHICLE |

E882-827-A 18128



## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST SYMPT | ADCL SYM | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| 08072001    | 11845 | 1FMYU04161KE7G562 | 08232000   | OH       | 807893   | ALLEGED STALLS AT CRUISE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|             |       |                   |            |          |          | <p>RUN ROUGH WHEN IT DID START? DID IT BLOW BLACK SMOKE?</p> <p>TECH STS THAT HE HAS A STALLING CONCERN. TECH STS THAT HE IS UNABLE TO VERIFY THE CONCERN. TECH STS THAT HE REPLACED THE EEC RELAY.</p> <p>TECH SEEKING KNOWN</p> <p>ADVISED TECH TO MAKE SURE THAT THE RELAY PIN CONNECTIONS ARE TIGHT.</p> <p>ADVISED TECH TO CHECK THE DPFE VOLTAGE KOED AND KOER AT IDLE THE VOLTAGES SHOULD BE THE SAME. ADVISED TECH TO CHECK THE BARO, MONITOR THE FUEL TRIMS, MAF, TP. VERIFY THE CONCERN.</p> <p>TECH STS STILL HAS THE SAME CONCERN. TECH CANT VERIFY THE CONCERN.</p> <p>HAS NO CODES. TECH STS HIS FSE WANTED HIM TO CALL FOR UPDATED INFO.</p> <p>REPORT #: 1EHL005 REPLACE PROCESSOR ASSY</p> <p>REPORT #: 1EAH027</p> <p>ADV TECH TO UNPLUG THE IAC. CHECK THE RPM READING AND COMPARE TO COMPLAINT RPM. IF THE RPM MATCHES, LOOK FOR LOSS OF POWER OR GROUND TO IAC. ALSO MAY HAVE A STICKING IAC OR PCM CONCERN.</p> <p>ADV TECH TO VERIFY THE CONCERN. ADV TO CHECK THE RPM PID AND FUEL PRESSURE AT THE TIME OF THE CONCERN. ADV TECH TO CHACK AND ADJUST BASE IDLE IF NEEDED.</p> <p>R&amp;R DEC POWER RELAY. WOULD BECOME CUT OFF POWER TO PCM.</p> <p>FSE LOOKING FOR ANY UPDATES ON THE STALLING CONCERN. CHECKED PAST REPORTS AND CONSULTED MARTI PRICE. ADVISED FSE THERE ARE NO UPDATES.</p> <p>TECH STS CUSTOMER ALLEGES VEHICLE WILL STALL AT CRUISE SPEEDS AND HAS TO STOP VEHICLE TO RESTART AND TECH STS HE HAS NOT BEEN ABLE TO VERIFY CONCERN AND IS SEEKING KNOWN FOR THIS ALLEGED CONCERN.</p> <p>ADVISE TECH THAT THERE ARE NO KNOWN FOR STALL AT CRUISE SPEEDS AND TRY TO VERIFY CONCERN AND RETRIEVE ANY DTC'S AND REVIEW DATA IF ANY THING FOUND SUBMITTE EDSR.</p> <p>UNABLE TO DUPLICATE CONCERN.</p> <p>TECH STS SAME CONCERN, CANNOT VERIFY, SEEKING KNOWN.</p> <p>ISM 01-07-036 CK GRNDS 104 &amp; 105, SEND EDSR'S</p> <p>ADV TECH CHECK FOR LATEST PCM CALIBRATION.</p> |
| 08072001    | 10601 | 1FMYU04131KF57765 | 11152000   | OK       | 807899   | INT STALL WHILE DRIVING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|             |       |                   |            |          |          | <p>INT STALL AT CRUISE. SEEMS TO HAPPEN MORE ON DOWN HILLS. HAPPENS WITH IN FIRST 5-6 MILES OF DRIVE.</p> <p>HAS NOT BEEN ABLE TO DUPLICATE ON MULTIPLE TEST DRIVES. NO CODES.</p> <p>REPORT #: 1EGRF8010 - RESET BASE IDLE</p> <p>CHECK BASE IDLE. ADVISED THIS IS A KNOWN CONCERN AND IS UNDER INVESTIGATION. THERE IS NO OTHER FIX AVAILABLE AT THIS TIME.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 08082001    | 10815 | 1FMCU04131KF31888 | 10312000   | MO       | 807898   | STALL AT CRUISE/RESTARTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|             |       |                   |            |          |          | <p>TECH STS CUSTOMER &amp; PORTER STS THAT VEHICLE BOGGED DOWN AND STALLED AT CRUISE, TECH HASNT BEEN ABLE TO DUPLICATE, NO CODES IN PCM, SEEKING KNOWN</p> <p>ADV TECH NO KNOWN, CHECK OTHER MODULES FOR CODES FOR POSSIBLE PCM POWER OR GROUND ISSUE, CHECK FUEL PUMP CIRCUIT, MONITOR IAC%, MAF, BARO, FUEL TRIMS</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 08122001    | 3078  | 1FMYU04181KF31653 | 10292000   | VA       | 807892   | STALL WHILE DRIVING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|             |       |                   |            |          |          | <p>TECH CALLED STATING THE VEHICLE INTERMITTENTLY STALLED.</p> <p>THERE ARE NO CODES AND CANNOT VERIFY THE CONCERN. THERE IS CURRENTLY A 1/2 TANK OF FUEL IN THE VEHICLE, BUT DOES NOT</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## Intermittent Stall - No Codes, No Verification

| REPORT<br>DATE | MILES | VIN               | BUILD<br>DATE | ST SYMPT | ADCL SYM | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------|-------|-------------------|---------------|----------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 06122001       | 35469 | 1FMYU02161KE77497 | 09072000      | NC       | 807000   | ALLEGED CUTTING OFF AT STOPS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                |       |                   |               |          |          | <p>KNOW HOW MUCH WAS IN AT THE TIME OF CONCERN. THE CUSTOMER EXPLAINED IT FELT LIKE THE VEHICLE LOSS POWER BEFORE THE STALL. THERE WAS ONE TIME WHERE IT STARTED TO LOSE POWER AND PRESSED ON THE GAS TO GET IT GOING AGAIN. WHEN THE VEHICLE DID STALL, IT HAD TO SIT FOR ABOUT 10 MINUTES BEFORE IT STARTED. THE FUEL TRIMS ARE SITTING AT ABOUT 0 AND IS LOOKING FOR ADVICE.</p> <p>ADVISED HE MAY HAVE TO VERIFY THE CONCERN TO DIAGNOSE. ADVISED TO CHECK THE FUEL PRESSURE. CHECK C402.</p> <p>CUST ALLEGES THAT VEHICLE WILL INTERMITTENTLY STALLS COMING TO A STOP AND IN REVERSE. TECH HAS NOT VERIFIED STALLING AT STOPS BUT STATES THAT VEHICLE WILL INTERMITTENTLY STALLS IN REVERSE. TECH HAS REPLACED IAC TO NO AVAIL, SEEKING KNOWN.</p> <p>ISM 00-12-026 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE ADVISED TECH TO MONITOR IAC AND LOAD PID DURING CONCERN, IF BOTH INCREASES, POSSIBLE TRANS CONCERN. ADVISED TECH TO CHECK BASE IDLE SETTING, FUEL TRIMS, BARO.</p> <p>TECH HAVING CONCERN. TECH STATES RIGHT BEFORE VEHICLE DIES LOAD GOES UP TO 80% AND IAC GOES UP TO 70%. TECH STATES CONCERN IS MOSTLY PRESENT COLD AND WHEN PLACED IN REVERSE.</p> <p>ADVISED TECH TO CHECK FOR KINKED TRANS COOLER LINES. ADVISED TECH TO CHECK TRANS LINE PRESSURE. ADVISED TECH TO PLACE NOID LIGHT ON INJECTORS AND SEE IF INJECTOR PULSE IS LOST BEFORE VEHICLE DIES.</p> <p>TECH STATES VERY INTERMITTANTLY STALLS WHEN SHIFTED INTO REVERSE. TECH STATES IAC GOES FROM 29% TO 45 %, AND LOAD GOES FROM 25% TO 80% WHEN CONCERN (STALL) IS PRESENT. TECH SEEKING IF ANY KNOWN.</p> <p>ADVISED TECH TO PUT VEHICLE ON HOIST AND SEE IF STALLS WHEN PUT IN REVERSE, WITH FOOT ON BRAKE. RETEST WITH FOOT OFF BRAKE. IF OK, POSSIBLE THE TORQUE CONVERTOR COMING ON.</p> <p>TECH STATES NO STALL IF WHEELS OFF GROUND AND BRAKE OFF. ALSO TRIED TO STALL ONE TIME AS SLOW TO STOP IN FWD. WITH INCREASE IN LOAD PID.</p> <p>STALLS MORE WHEN COLD AND MOSTLY IN REV. LOOKING FOR EXCH.</p> <p>ADVISE TO ORDER NEW OVER COUNTER IF NEED EXCH.</p> <p>TECH STS HAS ALLEGED STALL CONCERN ON DECEL. TECH STS HAS NO CODES IN PCM. TECH HASN'T BEEN ABLE TO VERIFY THE CONCERN. SEEKING KNOWN.</p> <p>REPORT # 1B3FS010</p> <p>ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL.</p> <p>ADV TECH OF THE ABOVE REPORT. ADV TO CHECK AND ADJUST BASE IDLE IF NEEDED. ALSO VERIFY PCM POWERS AND GROUNDS.</p> <p>ADV UP IDLE</p> <p>THE VEHICLE STALLED WHILE DRIVING AT APPROX 80 KILOS ON DECELERATION. ALSO THE FOLLOWING DAY THE ENGINE CRANKED AND WOULD NOT START. THE CUSTOMER WAITED ABOUT AN HOUR AND THE VEHICLE STARTED. THE SAME CONDITION EXISTED THE NEXT DAY. AFTER THE VEHICLE STALLED ON THE HIGHWAY IT RESTARTED AFTER CUSTOMER CAME TO A STOP.</p> |
| 06122001       | 10834 | 1FMYU04161KE66502 | 08112000      | IL       | 807763   | ALLEGED STALL ON DECEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                |       |                   |               |          |          | <p>TECH STS HAS ALLEGED STALL CONCERN ON DECEL. TECH STS HAS NO CODES IN PCM. TECH HASN'T BEEN ABLE TO VERIFY THE CONCERN. SEEKING KNOWN.</p> <p>REPORT # 1B3FS010</p> <p>ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL.</p> <p>ADV TECH OF THE ABOVE REPORT. ADV TO CHECK AND ADJUST BASE IDLE IF NEEDED. ALSO VERIFY PCM POWERS AND GROUNDS.</p> <p>ADV UP IDLE</p> <p>THE VEHICLE STALLED WHILE DRIVING AT APPROX 80 KILOS ON DECELERATION. ALSO THE FOLLOWING DAY THE ENGINE CRANKED AND WOULD NOT START. THE CUSTOMER WAITED ABOUT AN HOUR AND THE VEHICLE STARTED. THE SAME CONDITION EXISTED THE NEXT DAY. AFTER THE VEHICLE STALLED ON THE HIGHWAY IT RESTARTED AFTER CUSTOMER CAME TO A STOP.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 06122001       | 1368  | 1FMYU04161KB69130 | 06082001      | ON       | 807882   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

E962-027-A 18136

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILE  | VIN                | BUILD DATE | ST SYMPT  | ADDL SYM                       | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------|-------|--------------------|------------|-----------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00132001    | 18984 | 1FMCUD4141KD69744  | 07282000   | MO 807491 | START STALL IN MORNING         | WE ROAD TESTED VEHICLE AND TESTED THE EEC. AFTER DRIVING FOR APPROX. 80 KILOMETERS THE CONCERN COULD NOT BE DUPLICATED BY US. WE RELEASED THE VEHICLE TO THE CUSTOMER AND SHE WILL MONITOR. THE CUSTOMER IS NERVOUS DRIVING THIS VEHICLE NOW.<br>VIN 1FMYU0418K280130 CHANGED TO 1FMYU0418K280130 BY DBTELTER<br>SYMPTOM_CODE 807000 CHANGED TO 807882 BY DBTELTER<br>ADVISED TECH THERE ARE NO KNOWNS AT THIS TIME. HE SHOULD CHECK TO MAKE SURE BASE IDLE IS CORRECT. NEEDS TO DUPLICATE BEFORE ANY REPAIR ATTEMPTS ARE MADE.                                                                                                                                                                                                                                                       |
| 00158001    | 21837 | 1FMCUD4111KD62573  | 08082000   | TX 807782 | STALL/RESTARTS                 | THE TECH STATES THAT THE VEHICLE INTERMITTENTLY STALLS, AND HAS STALLED ON DECEL. THE TECH CAN NOT DUPLICATE THE CONCERN AND IS SEEKING FOR KNOWNS ON THE ISSUE.<br>ADVISED THE TECH TO ATTEMPT TO VERIFY LOSS OF CKP SIGNAL, PCM POWER, OR FUEL, AND TO INSPECT THE PCM POWER RELAY BY LIGHTLY TAPPING ON THE RELAY, AND CHECKING THE CONNECTION.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 00152001    | 1898  | 1FMCUD4191K828248  | 04202001   | OH 807493 | STALLS INTERMITTENTLY          | INTERMITTENT STALLING TECH HAS NOT DUPLICATED<br>CHECK FOUND NO CODES CANT REMEMBER WHAT PID VALUES WERE<br>HAS NOT PERFORMED INTERMITTENT FAULT DIAGNOSIS<br>THINKS IT IS PCM PROGRAMMING DOESNT KNOW ANYTHING ELSE AT THIS TIME<br>RECC TO TECH TO GET PCED AND FOLLOW INTERMITTENT FAULT DIAGNOSIS AAND TO GET MORE INFORMATION FROM CUSTOMER ON WHEN THIS HAPPENS<br>AND TIMES LIKE FULE LEVEL AND TIME OF DAY TO POSSIBLY HELP PINPOINT<br>TECH STS THAT HE HAS A STALLING CONCERN. TECH STS THAT HE IS UNABLE TO DUPLICATE THE CONCERN. TECH STS THAT HE HAS NO CODES. TECH SEEKING KNOWNS<br>ADVISED TECH TO CHECK THE EEC POWER RELAY PINS FOR PROPER TIGHTNESS.<br>ADVISED TECH THAT A LOOSE CONNECTION COULD CAUSE A STALLING CONCERN.<br>CHECK ALL PCM POWERS AND GROUNDS. |
| 00152001    | 2988  | 1FMCUD4191K804752  | 03222001   | NY 807589 | ALLEGED STALLING CONCERN       | INTERMITTENTLY STALLS WHILE TURNING/ COULD NOT VERIFY CONCERN.<br>CUST ALLEGES THAT VEHICLE CUTS-OFF WHILE DRIVING, WILL RESTART EASILY.<br>TECH HAS NOT VERIFIED CONCERN, NO CODES AND SEEKING KNOWNS.<br>ADVISED TECH OF NO KNOWNS. ADVISED TECH TO GET MORE INFO FROM CUST IF CONCERN HAPPENED ON ACCEL, TURN, DECEL,...AFTER FILLING GAS TANK...<br>VERIFY CONCERN.                                                                                                                                                                                                                                                                                                                                                                                                               |
| 00152001    | 15780 | 1FMYU04101KD91526  | 07202000   | VA 807000 | ALLEGED CUTS-OFF WHILE DRIVING | UNVERIFIED STALL CONCERN.CUSTOMER ALLEGES ENGINE STALLS.TYPICALLY WHEN USING SPEED-PASS AT TOLLBOOTH ON NJ TRNPK. LOSS OF POWER WINDOWS AND SPEED CONTROL ALSO REPORTED.TECH HAS NOT BEEN ABLE TO VERIFY OR DUPLICATE CONCERN.CODES OBTAINED,B1323 AND B1362.<br>CLIFORD BRAND ALARM(REMOTE START)ADD-ON EQUIPMENT PRESENT IN VEHICLE<br>INSPECT VEHICLE WIRING,HARDNESS,CONNECTORS AND GROUND POINTS.<br>MONITOR DIFFE SIGNAL FOR ERRATIC VOLTAGE.<br>AFTER-MARKET ALARM EQUIP.WIRING MAY NEED TO BE REMOVED AND AFFECTED WIRING REPAIRED TO ELIMINATE ADD-ON EQUIPMENT AS CAUSUAL.                                                                                                                                                                                                  |
| 00152001    | 8287  | 1FMYU04181K062807  | 07192000   | NJ 807700 | UNVERIFIED STALL               | TECH CALLED STATING THE VEHICLE WILL STALL INTERMITTENTLY. STATED HE VERIFIED THE CONCERN. THERE ARE NO CODES IN THE PCM AND WAS ABLE TO COMMUNICATE WITH THE PCM AT THE TIME. STATED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 00162001    | 8128  | 1FMCUD08181KE71880 | 08202000   | FL 807000 | INTERMITTENT STALL             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST SYMPT  | ADDL SYM                  | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------|-------|-------------------|------------|-----------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |       |                   |            |           |                           | IT WILL STALL OVER A SPEED BUMP OR WHEN PUT INTO DRIVE. CHECKED PCM CONNECTIONS. WIGGLED THE HARNESS AND COULD NOT VERIFY BY WIGGLING THE HARNESS. CHECKED POWERS AND GROUNDS TO PCM. LOOKING FOR ADVICE. ADVISED TO CHECK FOR CHAFFING AT THE PCB WHERE THE HARNESS ENTERS THE INNER FENDER. ADVISED TO TAP ON THE IEC RELAY AND SEE IF IT RELEASES. IF IT RELEASES, REPLACE THE RELAY. CHECK THE HARNESS AT THE ENGINE MOUNT ON THE RH SIDE FOR CHAFFING. WIGGLE THE ENGINE HARNESS AND TRY AND DUPLICATE THE STALL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 08192001    | 4168  | 1FMCU04121KFB5483 | 11302000   | PA 807792 | ALLEGED STALL WITH A/C ON | TECH STS HAS ALLEGED STALL WITH A/C ON AND ON DECEL. TECH STS HAS NO CODES IN PCM. SEEKING KNOWNS. REPORT #: 1EGFSD10. ADV TECH TO VERIFY THE CONCERN, ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL. ADV TECH OF THE ABOVE REPORT. ADV TO CHECK THE BASE IDLE. ALSO VERIFY THE A/C PRESSURES ARE OK. ADV TECH TO VERIFY THE CONCERN. TECH STATES THAT THE CUST ALLEGES THAT THE VEH STALLED WHEN EXITING THE FREEWAY & IT WAS HARD TO START. TECH STATES THAT THERE ARE NO CODES. ALSO STATES THAT HE CANNOT DUPLICATE THE CONCERN. TECH LOOKING FOR KNOWNS. ADVISED TECH OF NO KNOWNS. ALSO ADVISED TECH TO CHECK THE FUEL PRESSURE & LEAKDOWN. FUEL PRESSURE SHOULD BE 60PSI & THERE SHOULD BE NO LEAKDOWN. ALSO ADVISED TECH TO MONITOR PIDS & FUEL PRESSURE WHILE DRIVING THE VEH. ALSO TO GET MORE INFORMATION FROM THE CUST LIKE HOW MUCH FUEL WAS IN THE FUEL TANK. HOW LONG THEY WERE DRIVING THE VEH. TECH STATES THE CUSTOMER ALLEGES THE VEHICLE STALLS AT A CRUISE. NO CODES ARE STORED IN THE PCM AND HE HAS NOT BEEN ABLE TO DUPLICATE THE CONCERN. THE CUSTOMER STATES THE VEHICLE STARTS RIGHT BACK UP WITH NO PROBLEM AT ALL. SEEKING FOR ANY KNOWNS OR ADVICE. ADVISE TECH NO KNOWNS WERE AVAILABLE, ADVISE TO TAP ON THE IEC RELAY AND SEE IF IT STALLS, CHECK FOR LOOSE PINS AT THE POWER DIST. BOX AS WELL. |
| 08192001    | 9085  | 1FMCU08111KD98804 | 07242000   | CA 807583 | INT STALL ON DECEL        | IF STS CUST ALLEGES VEH STALLED WHEN DRIVING, STS WAS WRITTEN UP PREVIOUSLY FOR STRUGGLES TO START AND THEN TICKING NOISE ONCE RUNNING, SF STS CANNOT VERIFY CONCERN AND HAS NO CODES, UNSURE OF PID READINGS, SEEKING KNOWNS. ADV TECH NO KNOWNS, ADV VERIFY CONCERN OR OBTAIN APPLICABLE DTC'S BEFORE ATTEMPTING REPAIRS, CHECK FUEL DELIVERY SYSTEM. TECH STATES THAT THE CUST ALLEGES THAT THEY WERE DRIVING THE VEH & THE ENG STALLED BUT IT STARTED RIGHT UP. TECH STATES THAT THERE ARE NO CODES. ALSO STATES THAT HE DROVE THE VEH A HOUR & A HALF & CANNOT DUPLICATE THE CONCERN. TECH LOOKING FOR KNOWNS. ADVISED TECH TO CHECK FUEL PRESSURE & IT SHOULD BE 66 PSI. ALSO ADVISED HIM TO CHECK FOR A STICKING IAC & TO CHECK FOR THE PCV HOSE BLOWING OFF & TO CHECK THE BJB CONNECTIONS & THE PCM POWERS & GROUNDS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 08202001    | 4481  | 1FMYU04111KFB7434 | 01102001   | PA 807683 | REPEAT STALL AT CRUISE    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 08202001    | 3690  | 1FMYU01111KA46806 | 01222001   | TX 807000 | INT STALLS WHEN DRIVING   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 08202001    | 624   | 1FMYU03111KB80288 | 06032001   | OH 807793 | INT STALL AT CRUISE       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST SYMPT  | ADDITIONAL SYM               | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|-------|-------------------|------------|-----------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 06202001    | 8320  | 1FMCU04151KF64483 | 12012000   | IN 807783 | DIED ONCE                    | HAS NO CODES CUSTOMER COMPLAINED OF CUTTING OUT ONCE WHEN TANK WAS ABOUT HALF FULL TECH SEEKING KNOWNS<br>REGG TO DRAIN TANK TO 1/4 FULL AND RETEST TO SEE IF A FUEL PUMP ISSUE EXISTS AND TO ALSO MONITOR PIDS WHILE DRIVING TO SEE IF TP SIGNAL IS LOST                                                                                                                                                                                                                                                                                                                 |
| 06212001    | 6616  | 1FMYU04181KE98461 | 09282000   | NY 807583 | STALLS ON ACCELERATION       | TECH STS ALLEGED STALL ON ACCEL. TECH HAS NOT VERIFIED THE CONCERN. TECH HAS VERIFIED A LOW ENGINE RPM OF 400 RPM. HAS NO CODES IN PCM. TECH REPROGRAMMED THE PCM WITH NO CHANGE. SEEKING ADVICE<br>ADV TECH TO UNPLUG THE IAC. CHECK THE RPM READING AND COMPARE TO COMPLAINT RPM. IF THE RPM MATCHES, LOOK FOR LOSS OF POWER OR GROUND TO IAC. ALSO MAY HAVE A STICKING IAC OR PCM CONCERN.                                                                                                                                                                             |
| 06212001    | 860   | 1FMCU04181KB73308 | 06182001   | CA 807883 | ALLEGED STALLS WHILE CRUISE  | TECH STS CUSTOMER ALLEGES VEHICLE STALLED WHILE DRIVING AND RESTARTED WITHOUT PROBLEM AND TECH IS UNABLE TO VERIFY CONCERN AND IS SEEKING KNOWNS FOR CONCERN<br>ADVISE TECH THAT THERE ARE NO KNOWNS FOR CONCERN AT THIS TIME AND TO TRY TO VERIFY CONCERN                                                                                                                                                                                                                                                                                                                |
| 06222001    | 3820  | 1FMYU04111KF77020 | 12012000   | AB 807000 | INT STALL, NO CODES          | SF STS CUST ALLEGES VEH HAS STALLED 3 TIMES SINCE NEW, DOESNT WANT VEH BACK UNTIL CONCERN IS RESOLVED, SF STS CANNOT VERIFY, NO CODES, SEEKING KNOWNS.<br>ADV SF NO KNOWNS, ADV POSSIBLE CONNECTION CONCERNS IN PDS, POSSIBLE PCM DIODE OR POWER RELAY CONCERN.                                                                                                                                                                                                                                                                                                           |
| 06262001    | 8020  | 1FMYU04161KF89903 | 12152000   | OH 807000 | INT STALL ON HILLS FULL FUEL | SW STATES THE CUSTOMER ALLEGES THE VEHICLE HAS STALLED 2 TIMES IN 6000 MILES. HE STATES IT HAPPENED WHEN GOING DOWN HILL WITH A FULL TANK OF FUEL. HE IS LOOKING FOR ANY KNOWNS.<br>ADVISED SW THERE ARE NO KNOWNS. HE SHOULD CHECK THE VMV LINE AND CANISTER FOR RAW FUEL. POSSIBLE RICH PURGE CONCERN. NEED TO DUPLICATE BEFORE MORE DIAGNOSIS/REPAIRS CAN BE PERFORMED.<br>COULD NOT VERIFY CONCERN                                                                                                                                                                    |
| 06262001    | 6369  | 1FMYU04181KF18439 | 10122000   | OH 807882 | INT STALL WHILE DRIVING      | SM STATES THAT THE CUST ALLEGES THAT THE ENG STALLED WHILE DRIVING & IT STARTED RIGHT UP. SM STATES THAT THEY CANNOT DUPLICATE THE CONCERN & THERE ARE NO CODES. SM LOOKING FOR KNOWNS.<br>ADVISED SM OF NO KNOWNS. ALSO ADVISED SM TO CHECK THE FUEL PRESSURE & IT SHOULD BE 65 PSI ALSO TO DRIVE THE VEH & TO MONITOR FUEL PRESSURE & PIDS & TRY TO DUPLICATE THE CONCERN.                                                                                                                                                                                              |
| 06272001    | 315   | 1FMYU04101KA34077 | 01262001   | PA 807000 |                              | WHILE DRIVING HOME AFTER TAKING DELIVERY, VEHICLE STALLED OUT. CUSTOMER COASTED INTO A DRIVEWAY AND VEHICLE RESTARTED NORMALLY. VEHICLE RAN NORMALLY AFTER THAT. DROVE IT TO DEALERSHIP. DOES NOT WANT VEHICLE BACK UNTIL FIXED.<br>TECH ROAD TESTED SEVERAL MILES, CHECK ENGINE LIGHT NOT ON, RAN GOOD. RAN NGS, EEC SCAN, ALL PASS. CHECKED ALL ELEC. CONNECTIONS AND FUSE/RELAY CONNS. ALL OK. RAN OASIS, NO TSB'S OR SEM'S. CALLED TECH HOTLINE, WAS ADVISED OF A POSSIBLE CONCERN WITH A FEW OTHER VEHICLES. FORD ENGINEERS UNABLE TO DUPLICATE AND HAVE NO ANSWERS. |
| 06272001    | 11889 | 1FMYU03101KE83860 | 06262000   | TN 807000 | ALLEGED STALL WHILE DRIVING  | CUSTOMER ALLEGES THAT THE VEHICLE STALLS WHILE DRIVING. TECH IS UNABLE TO DUPLICATE THE CONCERN. TECH SEEKING KNOWNS.<br>ADVISED THE TECH TO LIGHTLY TAP ON THE EEC POWER RELAY WHILE THE                                                                                                                                                                                                                                                                                                                                                                                 |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST SYMPT  | ADDITIONAL SYM             | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|-------|-------------------|------------|-----------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 06272001    | 315   | 1FMYU04101KA34077 | 01262001   | PA 807682 | STALLED AND RESTARTED      | VEHICLE IS RUNNING. TECH STATED THAT THE VEHICLE DID STALL WHEN HE TAPPED ON THE RELAY. ADVISED THE TECH TO CHECK THE PINS IN THE FUSE BOX AND IF OK THEN REPLACE THE RELAY AND RETEST. TECH CALLED STATING THE CUSTOMER WAS DRIVING THE VEHICLE AND IT STALLED. STATED THE VEHICLE WAS BEING DRIVEN AT LOW SPEEDS. THE AMBIENT TEMP IS VERY WARM. CUSTOMER COASTED TO THE SIDE OF THE ROAD AND THE VEHICLE STARTED WITH NO PROBLEM. TECH DROVE THE VEHICLE 10 MILES AND NO PROBLEM FOUND. THERE ARE NO CODES. LOOKING FOR ADVICE. STATED THE FUEL GAGE IS ON A LITTLE OVER 1/4 TANK. ADVISED TO CHECK THE PCM CONNECTIONS. ADVISED TO CHECK THE CONNECTIONS IN THE POWER DISTRIBUTION BOX AND AT THE EEC RELAY. UNABLE TO DUPLICATE CONCERN. |
| 06282001    | 8514  | 1FMYU04111KE78057 | 09012000   | OH 807703 | ALLEGED STALLS ON DECELL   | TECH STS HAS VEHICLE THAT CUSTOMER ALLEGES STALLS ON DECELL AND TECH HAS DRIVEN VEHICLE FOR TWO DAYS AND HAS NOT VERIFIED ANY DRIVE SYMPTOMS AND HAS NO DTC'S AND IS SEEKING ANY KNOWNS FOR CONCERN. ADVISE TECH TO CK EEC POWER RELAY FOR SHOCK SENSITIVE BY TAPPING RELAY AND ALSO CK EGR OPERATION AND THERE ARE NO OTHER KNOWNS.                                                                                                                                                                                                                                                                                                                                                                                                          |
| 06292001    | 887   | 1FMYU04191KE80637 | 06302001   | PA 807683 | STALLED WHILE DRIVING      | CUSTOMER STATES THE VEHICLE STALLED WHILE DRIVING, WOULD NOT RESTART. HAS NO CODES, WAS TOWED IN AND TECH HAS NOT DUPLICATED. SUGGEST TECH TO CK FOR WATER ENTRY NEAR THE DRIVERS KICK PANEL, CK PCM POWER RELAY AND CONNECTIONS, CK DIFFERENTIAL FOR SHORTING OUT VREF (SME) PARTIAL. VEHICLE WAS BROUGHT IN FOR A STALL WHILE AT CRUISE. TECH AS YET TO DUPLICATE CONCERN, NO CODES.                                                                                                                                                                                                                                                                                                                                                        |
| 06292001    | 13862 | 1FMYU04181KF08314 | 10172000   | NC 807800 | ALLEGED STALL AT CRUISE.   | REPORT #: 1ECIF010<br>ADVISED THE TECH TO ATTEMPT TO DUPLICATE THE CONCERN. CHECK BASE IDLE POSSIBLE IAC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 06292001    | 2460  | 1FMYU04181KA44338 | 01252001   | AB 807000 | VEH STALLING DURING CRUISE | TECH REPORTS VEHICLE HAS INT STALL DURING CRUISE. CANNOT VERIFY REPAIR SEEKING KNOWNS. ADVISED TECH TO CHECK PCM POWER RELAY PINS FOR TIGHTNESS. CHECK IAC OPERATION, BASE IDLE. CHECK CRANK SHAFT ENDPLAY AND INTEGRITY OF THE CRANK SENSOR. CHECK FOR PCM UPDATES.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 06292001    | 4006  | 1FMCU04171KA83778 | 02082001   | ON 807800 | STALLS ON HIGHWAY          | CUSTOMER ALLEGES THAT THE VEHICLE STALLS WHEN DRIVING AND WHEN RESTARTED IT HAD NO POWER. TECH IS UNABLE TO CONFIRM CONDITION AND SAID THAT EVERYTHING APPEARED OK. TECH SEEKING KNOWNS. ADVISED THE TECH TO LIGHTLY TAP ON THE EEC POWER RELAY AND SEE IF THE VEHICLE STALLS. ADVISED IF DOES THEN REPLACE THE RELAY. ADVISED TECH TO CHECK TO SEE IF THE PCM HAS THE LATEST CAL ALSO. ADV TO CONFIRM CONDITION BEFORE ATTEMPTING ANY OTHER REPAIRS.                                                                                                                                                                                                                                                                                         |
| 06302001    | 5701  | 1FMYU04181KF43846 | 11132000   | PA 807682 |                            | CUST. STATES: VEH. STALLS WHILE DRIVING AT STEADY SPEED OF 45 MPH.<br>* ON 4-20-01 CUST. COMPLAINED THAT VEH. QUITS WHILE DRIVING. HOTLINE DIRECTED TECH. TO TAP EEC POWER RELAY, VEH. STALLED. TECH. REPLACED EEC POWER RELAY.<br>* ON 5-3-01 CUST. COMPLAINED THAT VEH. QUITS WHILE DRIVING. HOTLINE DIRECTED TO CHECK VARIOUS ITEMS, TECH. REPLACED FUSE BOX DIODE.                                                                                                                                                                                                                                                                                                                                                                        |

## Intermittent Stall - No Codes, No Verification

| REPORT<br>DATE | MILES | VIN               | BUILD<br>DATE | ST SYMPT | ADCL SYM | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------|-------|-------------------|---------------|----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 06302001       | 7192  | 1FMCU04141KES1182 | 06082000      | PA       | 607692   | <p>* ON 8-8-01 CUST. COMPLAINED THAT VEH. QUIT WHILE DRIVING AT STEADY SPEED OF 45 MPH. REGION TRADED CUST. OUT OF VEHICLE.</p> <p>* ROOT CAUSE NOT DETERMINED.</p> <p>* MARK HAYDUK - PITTSBURGH FQE - 724-822-4342</p> <p>CUST. STATES: ENGINE WILL STALL WHILE DRIVING AT STEADY SPEED.</p> <p>* CUST. COMPLAINED ON 4-12-01 AT 6,863 MI THAT THE ENGINE SHUT OFF WHILE DRIVING. TECH. FOUND NO CODES AND COULD NOT DUPLICATE CONCERN. TECH. TAPPED ON ECC POWER RELAY AND ENG. DID NOT STALL. TECH. CHANGED ECC POWER RELAY AS A PRECAUTION PER HOTLINE.</p> <p>* CUST. COMPLAINED ON 8-21-01 AT 7,192 MI THAT THE ENGINE SHUT OFF WHILE DRIVING AT A STEADY SPEED. TECH. FOUND NO CODES AND COULD NOT DUPLICATE CONCERN. FQE SUGGESTED CHANGING POWER DIST. BOX FOR POTENTIAL LOOSE PINS.</p> |
| 06302001       | 333   | 1FMYU04181KC00795 | 06112001      | NE       | 607698   | <p>ALLEGED STALLS AND QUILTS</p> <p>SM STS HAS VEHICLE THAT CUSTOMER ALLEGES STALLS WHILE AT CRUISE SPEED AND NO SM HAS NOT BEEN ABLE TO VERIFY CONCERN AND IS SEEKING KNOWNS FOR CONCERN</p> <p>ADVISE SM TO PERFORM SHOCK TEST ON POWER RELAY AND IF ENGINE DIES THEN REPLACE RELAY AND CK PINS AND ALSO CK FOR ANY DTCS IF P1000 PRESENT THEN CK FOR BASE POWERS AND GROUNDS</p>                                                                                                                                                                                                                                                                                                                                                                                                                |
| 07022001       | 11833 | 1FMYU04181KE00897 | 07282000      | CO       | 607600   | <p>INT STALL DURING CRUISE</p> <p>THE TECH STATED THAT THE CUSTOMER IS COMPLAINING OF AN INTERMITTENT STALLING CONCERN. THE TECH HAS BEEN UNABLE TO VERIFY THE CONCERN. SEEKING FOR ANY KNOWNS ON THE ISSUE.</p> <p>ADVISED THE TECH TO CHECK PCM POWERS AND GROUNDS, PCM POWER RELAY, AND INSPECT THE CRANK SENSOR.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 07022001       | 2836  | 1FMYU04181KB61100 | 04262001      | PA       | 607700   | <p>ALLEGED STALL WHILE DRIVING</p> <p>CUSTOMER ALLEGES THAT THE VEHICLE STALLED WHILE DRIVING. TECH IS UNABLE TO CONFIRM THE CONDITION. TECH CALLING SEEKING KNOWNS.</p> <p>ADVISED THE TECH TO LIGHTLY TAP ON THE ECC POWER RELAY WHILE THE ENGINE IS RUNNING AND SEE IF IT STALLS. ADVISED IF IT DOES THEN CHECK PINS IN THE FUSE BOX FOR THE RELAY AND REPLACE THE RELAY. ADVISED THE TECH IF THE CONCERN IS STILL THERE THEN CHECK BASE IDLE WITH IAC UNPLUGGED AND IF NEEDED ADJUST TO 850 RPMs. ADVISED TECH THAT IF NO OTHER CONCERNS ARE FOUND THEN DUPLICATE THE CONCERN BEFORE ATTEMPTING ANY OTHER REPAIRS.</p>                                                                                                                                                                         |
| 07022001       | 189   | 1FMCLD4101K081889 | 08012001      | PA       | 607692   | <p>STALL AT CRUISE, NO CODES</p> <p>CUSTOMER PURCHASED A NEW ESCAPE SEVERAL WEEKS AGO. DURING THE FIRST COUPLE HUNDRED MILES IT STALLED 2X AT CRUISE. COULD NOT FIND ANYTHING WRONG, SO DEALER GAVE CUSTOMER A DIFFERENT ESCAPE. THIS ONE HAS NOW STALLED 1X AT CRUISE. SEEMS TO HAPPEN WITHIN A 2 MILE STRETCH OF HIGHWAY THAT IS KNOWN FOR RADIO INTERFERENCE (CELL PHONES GO OUT). VEHICLE RESTARTS FINE.</p> <p>HAS NOT VERIFIED OR DUPLICATED CONCERN. ATTEMPTED 1HR ROAD TEST IN TH AT 2 MILE STRETCH OF HIGHWAY TO NO AVAIL.</p> <p>KNOWN CONCERN. UNDER INVESTIGATION. ATTEMPT TO DUPLICATE CONCERN FURTHER. CHECK FOR PCM POWER, GROUND, COMMUNICATION. MAY WANT TO SHIELD CKP WIRING FROM C110 TO PCM.</p>                                                                               |
| 07032001       | 9860  | 1FMYU04181KG81129 | 12042000      | WV       | 607692   | <p>THE VEHICLE STALLS AND WILL NOT RESTART. THE ENGINE QUIT WHILE DRIVING</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN                | BUILD DATE | ST SYMPT  | ADOL SYM                   | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|-------|--------------------|------------|-----------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 07032001    | 7555  | 1FMYU04101KE80138  | 08162000   | ON 807593 | STALLS WHILE DRIVING, ONCE | <p>AT 45 MPH AND WOULD NOT RESTART. SECOND TIME I LET IT SIT FOR A HALF HOUR AND IT RESTARTED.</p> <p>COULD NOT VERIFY CONCERN, NO CODES. TEST DRIVE APPROXIMATELY 100 MILES AND COULD NOT VERIFY CONCERN.</p> <p>SRV_DLR_CODE 54010 CHANGED TO 07457 BY 8DAVIS20 SYMPTOM_CODE 807500 CHANGED TO 807592 BY 8DAVIS20</p> <p>CUST STATES STALLED WHILE DRIVING. TECH STATES CANNOT VERIFY CONCERN AT THIS TIME. NO MIL CODES, RUNS FINE. SEEKING IF ANY KNOWN</p> <p>REPORT #: 1E4H027</p> <p>TECHVC 080322001 08:58AM SURVEY ENTRY MSS - FCSD - TECH SV</p> <p>REPLACED IAC VALVE.</p> <p>ISM 01-05-026 HESITATION/TUMBLE ON TIP-IN, UPDATE (PCM) CALL TO R12 ADVISED TECH TO CHECK AND SEE IF PCM IS AT LATEST CALIBRATION, PER ISM CHECK IAC AND EGR VALVE FOR STICKING.</p> |
| 07032001    | 9689  | 1FMYU04181KFB1123  | 12042000   | WV 807582 | STALLS, HARD RESTART       | <p>CUST STATES STALLS AT CRUISE, CRANKS, BUT DOES NOT RESTART. LET SIT 12 HOUR AND VEHICLE STARTS UP, HAPPENED TWICE. SF STATES ALWAYS STARTS AT DEALER AND CANNOT VERIFY ANY STALL CONCERN. CUST STATES HAS ENOUGH KNOCK ALSO, SF STATES UNABLE TO VERIFY THAT CONCERN ALSO. SEEKING IF ANY KNOWN</p> <p>ADVISED SF TO VERIFY CONCERN BEFORE ANY REPAIRS ARE MADE. CHECK FUEL PRESSURE, JUNCTION BOX CONNECTIONS, CHECK FOR EGR VALVE STICKING.</p> <p>NO KNOWN AT THIS TIME</p>                                                                                                                                                                                                                                                                                             |
| 07032001    | 3742  | 1FMYU04121KB27421  | 04092001   | MO 801300 | INT STALL NO START         | <p>CUSTOMER SITS VEH STALL WHEN DRIVING WITH NO CRANK NO START CONCERN</p> <p>TECH UNABLE TO DUPLICATE FOUND 81332 IN ICM SEEKING KNOWN</p> <p>ADV TECH OF NO KNOWN AND TO CHECK POWER DIST BOX FOR CONNECTION CONCERNS</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 07032001    | 8080  | 1FMYU03121KE85248  | 05272000   | HI 807783 | STALL ON DECEL, AND CRUISE | <p>INTERMITTANT STALL WHILE DRIVING AND ON DECEL RESTARTS FINE.</p> <p>NO CODES. HAS NOT VERIFIED OR DUPLICATED CONCERN.</p> <p>ISM 08-12-028 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE</p> <p>REPORT #: 1E6F8010 - RESET BASE IDLE</p> <p>REPORT #: 1E6IP016 - COULD NOT DUPLICATE</p> <p>CHECK FOR COMMUNICATION WITH PCM AT TIME OF CONCERN. POSSIBLY SWAP DIFF E AND RETEST. RESET BASE IDLE PER PAST REPORT. ADVISED STALL AT CRUISE CONCERN IS UNDER INVESTIGATION, NO FIX AVAILABLE AT THIS TIME.</p>                                                                                                                                                                                                                                                               |
| 07032001    | 8483  | 1FMYU04191KE75423  | 08302000   | PQ 807363 | STALL ON ACCEL             | <p>TECH STATED THAT VEHICLE WILL STALL AFTER A DOWNHILL COAST AND THEN ACCELERATING TO START UP AN INCLINE, TECH HAS ROADTESTED VEHICLE AND IS UNABLE TO REPRODUCE CONCERN.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 07032001    | 32388 | 1FMYU03141KE57083  | 08042000   | GA 807000 | INTERMITTENT STALL         | <p>CHECK FOR LOOSE CONNECTIONS, CHECK GROUNDS.</p> <p>TECH STATES VEHICLE WAS TOWED IN BECAUSE IT STALLED AND WOULD NOT START, THERE ARE NO DTCs AND VEHICLE STARTED RIGHT UP WHEN IT GOT TO THE DLR. TECH HAS REFLASHED PCM AND IS CALLING FOR MORE INFO.</p> <p>ADV. TECH THAT WE ARE LOOKING INTO THIS CONCERN AND ADVISE TO CHECK PCM POWERS AND GROUNDS, EEC RELAY AND TRY TO DUPLICATE CONCERN. NO OTHER KNOWN AT THIS TIME.</p>                                                                                                                                                                                                                                                                                                                                        |
| 07032001    | 17881 | 1FMYU0341X1KB48254 | 08072000   | MO 807500 | INT STALL 30-45 MPH        | <p>SM STATES THE VEHICLE HAS AN INTERMITTENT STALL CONCERN USUALLY BETWEEN 30-45 MPH. HE STATES THEY CANNOT DUPLICATE THE CONCERN, BUT</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |



## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN                | BUILD DATE | ST SYMPT | ADDL SYM | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|-------|--------------------|------------|----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |       |                    |            |          |          | THE VEHICLE BELONGS TO ONE OF THE SALESMEN AND HE HAS DUPLICATED THE CONCERN. HE STATES IT HAPPENS 1-2 TIMES IN A TWO WEEK PERIOD. HE IS LOOKING FOR ANY KNOW CONCERNS.                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |       |                    |            |          |          | ADVISED SM THAT THERE ARE NO KNOWNS. HE SHOULD CHECK THE PIN FITS IN THE POWER DISTRIBUTION BOX. IF POSSIBLE, HE MAY TRY SENDING A WDS HOME WITH THE SALESMAN AND TRY TO CAPTURE A RECORDING OF THE EVENT. HE NEEDS TO DUPLICATE BEFORE MORE DIAGNOSIS CAN BE DONE.                                                                                                                                                                                                                                                                                                                          |
|             |       |                    |            |          |          | BM STS SAME CONCERN, CANNOT VERIFY IN 3 DAY TEST WITH WDS, SEEKING KNOWNS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 07092001    | 8786  | 1FMCUD4181KE72855  | 08262000   | BC       | 807000   | ADV SM NO KNOWNS, ADV NEED A RECORDING OF EVENTS DURING THE CONCERN. THE VEHICLE STALLS OUT AFTER DRIVING DOWNHILL AT CITY SPEEDS, A LOSS OF BRAKES AND STEERING ASSIST.                                                                                                                                                                                                                                                                                                                                                                                                                     |
|             |       |                    |            |          |          | UNABLE TO DUPLICATE. THIS HAPPENED TWICE IN ONE WEEK. NO CODES. THIS IS THE SECOND CUSTOMER WITH THE SAME CONCERN. BOTH WERE COMING FROM HIGHER ELEVATIONS DROPPING APPROXIMATELY 500-700 FEET. IF THERE IS ANY INFORMATION OUT THERE WE WOULD LIKE TO KNOW, THANKS.                                                                                                                                                                                                                                                                                                                         |
| 07092001    | 623   | 1FMCUD4121K080146  | 05302001   | PA       | 807000   | INT STALL DOING DOWN INCLINES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|             |       |                    |            |          |          | TECH STS CUST ALLEGES VEH STALLED TWICE WHEN DRIVING, BOTH TIMES WHEN GOING DOWN A HILL. STS ALSO ONE OTHER TIME WENT TO START VEH AND WOULD CRANK BUT NOT START, CYCLED KEY AND VEH STARTED. CUST DOESNT RECALL IF THEFT LIGHT WAS FLASHING OR NOT, CANNOT VERIFY, NO CODES, PIDS ARE FINE, SEEKING KNOWNS.                                                                                                                                                                                                                                                                                 |
|             |       |                    |            |          |          | ADV TECH NO KNOWNS, VERIFY CONCERN BEFORE REPAIRING.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 07092001    | 8700  | 1FMYUD4181KF01700  | 10022000   | MI       | 807793   | INTERMITTENT STALLING CONCERN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|             |       |                    |            |          |          | TECH STS THAT HE HAS AN INTERMITTENT STALLING CONCERN WHILE GOING OVER ROUGH ROAD. TECH STS THAT HE HAS NO CODES. TECH SEEKING ANY KNOWNS FOR THIS CONCERN.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|             |       |                    |            |          |          | ADVISED TECH TO CHECK THE EEC POWER RELAY. ADVISED TECH TO MAKE SURE THAT THE PINS ARE TIGHT. ADVISED TECH TO CHECK PCM POWERS AND GROUNDS. ALSO CHECK FOR POSSIBLE CKP CHAFFING CONCERNS.                                                                                                                                                                                                                                                                                                                                                                                                   |
| 07092001    | 20111 | 1FMYUD4181KF33045  | 10182000   | TX       | 807000   | INTER STALL AT IDLE AND DECEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|             |       |                    |            |          |          | TECH STATES THAT CUSTOMER SAYS VEHICLE INTER STALLS AT IDLE AND DURING A DECEL. NO CODES. VEHICLE STARTS RIGHT BACK UP WHEN IT STALLS. ADVISED TECH TO CHECK FUEL PRESSURE, AND FROM GROUND. ALSO CHECK IAC, AND PCV VALVE. TECH NEEDS TO MONITOR MAPV, TP, DPFV, AND FUEL PRESSURE ON A ROAD TEST.                                                                                                                                                                                                                                                                                          |
| 07102001    | 2086  | 1FMYUD4151K0811725 | 05232001   | NE       | 807803   | STALLS AT CRUISE AND RESTART                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|             |       |                    |            |          |          | SD STS CUSTOMER STS THAT VEHICLE STALLED 2X AT CRUISE AND WOULDN'T RESTART UNLESS THEY LET IT SIT AWHILE, SD HASNT VERIFIED CONCERN, SEEKING KNOWNS/ADVICE                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|             |       |                    |            |          |          | ADV SD TO CHECK BUS CONNECTIONS, TAP ON RELAYS, CHECK PCM HARNESS, DISCONNECT IAC AND MAKE SURE ENGINE STILL IDLES, IF NOT RESET THROTTLE STOP IDLE ENGINE IDLES BETWEEN 500-600 RPM W/ IAC DISCONNECTED, SUBMIT EDR (SHOP FOREMAN CALLED STATING THE VEHICLE INTERMITTENTLY STALLS. STATED THEY CANNOT VERIFY THE CONCERN. STATED THERE ARE NO CODES. STATED THE VEHICLE STALLED ON DECEL AT CRUISE. STATED THE CUSTOMER PULLS OFF TO THE SIDE OF THE ROAD AND THE VEHICLE RESTARTS. STATED THE LONG AND SHORT FUEL TRIMS ARE AROUND 0, PLUS OR MINUS A COUPLE PERCENT. LOOKING FOR ADVICE. |
| 07102001    | 1022  | 1FMYUD4181K081152  | 05102001   | VA       | 807823   | INTERMITTENT STALL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Intermittent Stall - No Codes, No Verification

| REPORT<br>DATE | MILES | VIN               | BUILD<br>DATE | ST SYMPT | ADCL SYM | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------|-------|-------------------|---------------|----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 07102001       | 4850  | 1FMYU04181KA78209 | 02282001      | PA       | 507883   | ALLEGED STALL WHILE DRIVING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                |       |                   |               |          |          | <p>REPORT #: 1FLH023<br/>           REPORT #: 1ESF8010<br/>           ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL. ADV TECH OF THE ABOVE REPORT. ADV TO CHECK AND ADJUST BASE IDLE IF NEEDED. ALSO VERIFY PCM POWERS AND GROUNDS.<br/>           REPORT #: 1EGF8010<br/>           ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL. ADVISED OF THE ABOVE REPORTS. ADVISED TO DISCONNECT THE IAC AND SET THE BASE IDLE TO 500-550 RPM. ADVISED TO RESET THE KAM.<br/>           TECH STS HAS ALLEGED STALL WHILE DRIVING. HAS NO CODES AND FUEL PRESSURE IS 40 PSI. TECH CAN'T VERIFY THE CONCERN. SEEKING KNOWN<br/>           REPORT #: 1ECH005 REPLACE PROCESSOR ASSY<br/>           REPORT #: 1EAH027<br/>           ADV TECH TO UNPLUG THE IAC. CHECK THE RPM READING AND COMPARE TO COMPLAINT RPM. IF THE RPM MATCHES, LOOK FOR LOSS OF POWER OR GROUND TO IAC. ALSO MAY HAVE A STICKING IAC OR PCM CONCERN.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 07112001       | 5872  | 1FMCU041730F53368 | 11282000      | OH       | 607883   | ALLEGED STALL AT CRUISE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                |       |                   |               |          |          | <p>ADV TECH THE REPORTS SEEM TO BE STALLING AT IDLE OR ON DECEL. ADV TECH TO VERIFY THE CONCERN PRIOR TO ANY REPAIRS.<br/>           TECH STATES THE CUSTOMER ALLEGES THE VEHICLE STALLS AT A STEADY CRUISE. NO CODES IN THE PCM AND HE HAS NOT BEEN ABLE TO DUPLICATE THE CONCERN. THE CUSTOMER ALLEGES THAT IT FELT AS IF SOMEONE SHUT THE KEY OFF. THE CUSTOMER ALSO ALLEGES THE BATTERY LIGHT COMES ON WHILE DRIVING AT A CRUISE INTERMITTENTLY. SEEKING FOR ANY KNOWN OR ADVICE.<br/>           ISM 01-08-013 ESCAPE 3.0L CHRGNG SYSTEM, CALL NUMBER LISTED BELOW<br/>           ADVISE TECH TO GET MORE INFORMATION REGARDING THE ALLEGED BATTERY LIGHT COMING ON AT A CRUISE, IF HE CAN VERIFY THEN CALL TONY C. AT THE #ABOVE LISTED IN THE ISM.<br/>           AS FOR THE ALLEGED STALL CHECK THE EEC POWER RELAY, HE CAN TAP ON IT AND SEE IF IT STALLS.<br/>           SERVICE MANAGER CALLED STATING THE VEHICLE STALLS AT CRUISE INTERMITTENTLY. THEY CANNOT VERIFY THE CONCERN. STATED THERE ARE NO CODES. THE CUSTOMER NOTICES THE STALL WHEN THE STEERING GETS STIFF. LOOKS DOWN AT THE TACH AND IT IS AT 0. PULLS OFF TO THE SIDE OF THE ROAD AND THE VEHICLE WILL RESTART WITH NO PROBLEM. LOOKING FOR ADVICE.<br/>           ADVISED TO CHECK THE IAC CONNECTIONS. ADVISED TO CHECK THE EEC RELAY CONNECTIONS AND THE HARNESS THROUGH THE GROMMET AT THE POWER DISTRIBUTION BOX. ADVISED TO RESET THE BASE IDLE TO 500-550 RPM. ADVISED TO SUBMIT AN EDSR OR CALL THE HOTLINE BACK IF THEY FIND THE ROOT CAUSE.<br/>           THE TECHNICIAN IS LOOKING FOR ADDITIONAL INFORMATION ON THIS VEHICLE. THE CUSTOMER ALLEGES THE VEHICLE JUST STALLS AND QUILTS WHILE DRIVING.</p> |
| 07112001       | 10871 | 1FMCU03181KD87464 | 07242000      | TX       | 607883   | STALL AT CRUISE/NO CODES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST | SYMPT  | ADDL SYM                     | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-------|-------------------|------------|----|--------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |       |                   |            |    |        |                              | <p>ANY ADDITIONAL KNOWNS? REQUESTING ADDITIONAL TECHNICAL INFORMATION.</p> <p>ISM 01-08-013 ESCAPE 3.0L CHRGNG SYSTEM, CALL NUMBER LISTED BELOW</p> <p>ADVISED TECHNICIAN FOR THIS CONCERN NO OTHER UPDATES, ONLY ONE CONFIRM</p> <p>FDX WITH LOOSE GROUNDS G104G108. THESE GROUNDS ARE LOCATED BELOW THE</p> <p>BATTERY TRAY. TRY TO DRIVE THE VEHICLE WITH ALL THE ELECTRICAL LOADS</p> <p>ON AND CHECK IF THE CONCERN IS PRESENT. IF ABLE TO DUPLICATE THE</p> <p>CONCERN SUGGEST TO CONTACT THE FOLLOWING FIELD QUALITY ENGINEERS, FORD</p> <p>IS CURRENTLY REVIEWING THIS UNITS.</p> <p>TEXAS / DAN HAMMACK / 713-881-4003 / 713-542-4186</p> <p>TEXAS / DAVE PILGRIM / 972-318-1059 / 972-571-8407</p> <p>TEXAS / LYNN SORESENSEN / 281-443-6582 / 281-384-0817</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 07/12/001   | 7570  | 1FMYU04121KA34470 | 01/20/2001 | PA | 807000 | ALLEGED STALL WHILE DRIVING  | <p>CUSTOMER ALLEGES THAT THE VEHICLE STALLED WHILE DRIVING DOWNHILL. TECH</p> <p>UNABLE TO DUPLICATE AND CAN SEE NO CONCERNS WITH THE VEHICLE. BF</p> <p>SEEKING KNOWNS.</p> <p>ADVISED THE SF TO CHECK THE FUEL LEVEL OF THE VEHICLE TO MAKE SURE</p> <p>THAT THERE ARE NO CONCERNS WITH FUEL BENDER. ADVISED SF TO TAP ON</p> <p>BEG RELAY TO SEE IF THE VEHICLE STALLS AND IF IT DOES THEN REPLACE THE</p> <p>RELAY. ADVISED SF TO ALSO CHECK THE BASE IDLE WITH THE IAC UNPLUGGED</p> <p>(550 RPM).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 07/12/001   | 8013  | 1FMYU03131KA53229 | 02/12/2001 | IG | 907782 | ENGINE STALL AT HOT          | <p>DLR STS ENGINE STALL AT HOT TEMPERATURES WHILE DECEL. NO DTC PRESENT.</p> <p>ISM 00-12-026 OK FOR STICKING SHUT OR STUCK OPEN EGR VALVE</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 07/12/001   | 1372  | 1FMYU04141KC18379 | 08/06/2001 | MO | 607000 | ALLEGED STALL WHILE DRIVING. | <p>ISM 01-08-013 ESCAPE 3.0L CHRGNG SYSTEM, CALL NUMBER LISTED BELOW</p> <p>TECHNICIAN STATED THAT HAS AN ALLEGED CASE OF THE ENGINE STALLING WHIL</p> <p>E DRIVING, RESTARTED RIGHT AWAY. LOOKING FOR ASSISTANCE.</p> <p>REPORT #: 1EUP002</p> <p>ADVISED TECH OF NO KNOWNS, ALSO ADVISED TECH TO HOOKUP A FUEL PRESSURE</p> <p>GAUGE &amp; CHECK FUEL PRESSURE &amp; LEAKDOWN SHOULD HAS 65 PSI FUEL PRESSURE</p> <p>ALSO ADVISED TECH TO CHECK FUEL QUALITY.</p> <p>REPORT #: 1EGFS010</p> <p>ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV</p> <p>TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL</p> <p>REPORT #: 1FLHF023</p> <p>REPORT #: 1EGFS010</p> <p>ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV</p> <p>TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL</p> <p>ADV TECH OF THE ABOVE REPORT. ADV TO CHECK AND ADJUST BASE IDLE IF</p> <p>NEEDED. ALSO VERIFY PCM POWERS AND GROUNDS.</p> <p>ADVISED THE TECHNICIAN OF THE PREVIOUS REPORTS.</p> <p>TECH STATES THE VEHICLE HAS AN INTERMITTENT STALL CONCERN. HE STATES</p> <p>HE HAS NOT BEEN ABLE TO DUPLICATE THE CONCERN. THE CUSTOMER STATES</p> <p>THAT THEY HEAR A "SIZZLING" NOISE AND THEN IT WILL STALL. THE CUSTOMER</p> <p>STATES THEY MUST WAIT FOR A WHILE THEN IT WILL RESTART. HE IS SEEKING</p> <p>ANY KNOWNS.</p> <p>ADVISED TECH THAT HE SHOULD CHECK FOR PROPER PIN FITS IN THE POWER</p> <p>DISTRIBUTION BOX. ALSO CHECK FOR COMPONENTS HEATING UP AND GOING OPEN.</p> <p>SINCE THERE ARE NO CODES, IT SOUNDS LIKE THE PCM IS LOSING POWER OR</p> |
| 07/12/001   | 1876  | 1FMYU04121KB81674 | 06/11/2001 | NY | 507000 | INT STALL CONCERN            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN                | BUILD DATE | ST | SYMPT  | ADOL SYM                     | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| 07132001    | 22002 | 1FMCLJ04161KD82557 | 08032000   | OK | 507500 | STALLS WHILE DRIVING         | GROUND. CHECK POWER RELAY AND DIODE FOR ANY CONCERNS. NEEDS TO DUPLICATE BEFORE MORE DIAGNOSIS/REPAIRS ARE ATTEMPTED.<br>THE TECH STATES THAT THE CUSTOMER IS COMPLAINING OF A STALL WHILE DRIVING. THE TECH CAN NOT DUPLICATE THE CONCERN AND IS SEEKING FOR KNOWNS.<br>ADVISED THE TECH TO CHECK THE CONNECTORS IN THE DRIVERS SIDE KICK PANEL FOR WATER INTRUSION, CHECK THE CCRM FOR WATER INTRUSION, TAP ON THE PCM POWER RELAY, PERFORM A VOLT DROP ON ALL THE PCM GROUNDS, AND VERIFY IF THE CONCERN COULD BE FUEL RELATED.<br>TECH STS STILL CANT VERIFY THE CONCERN TECH STS HE RELEASED THE VEHICLE AND DID NO REPAIRS.<br>REPORT #: 30M3004 REPLACE SENSOR - CRANKSHAFT POSITION -<br>I CALLED BACK THE TECH AS REQUESTED. HE TOLD ME THAT HE LET THE VEHICLE GO. ADV TECH IF THE CUSTOMER COMES BACK, VERIFY THE CONCERN ALSO ADV TECH TO CHECK THE PCM POWER RELAY AND CKP SENSOR.<br>TECHNICIAN STATED THAT HAS A CONCERN OF STALLS WHILE DRIVING FORWARD - REVERSE- HOT OR COLD- CAN NOT VERIFY THE CONCERN.<br>ADVISED THE TECHNICIAN NO KNOWN CONCERNS- VERIFY THE CONCERN- USE CUSTOMER FLIGHT RECORDER- JOHN OWENS WILL CALL BACK - FOR FURTHER ASSISTANCE. |
| 07142001    | 12084 | 1FMYUJ03101KE38571 | 08042000   | IA | 507500 | STALLS ON CRUISE.            | THE CUSTOMER REPORTS THE VEHICLE DIES AT TIMES.<br>RAN A 120 MILE ROAD TEST WITH TECH AND THE CONCERN NEVER SURFACED. IM SENDING THIS IN BECAUSE AT A RECENT SOPSA MEETING, SEVERAL OTHER TECHS FROM DIFFERENT DEALERS HAD EXPERIENCED SIMILAR CONCERNS WITH NEW ESCAPES.<br>SRV_CLR_CODE BYE10 CHANGED TO 07742 BY SDAB120<br>THE VEHICLE ACTS LIKE IT WANTS TO STALL AT TIMES, ONLY WHEN OUTSIDE AIR TEMPERATURE IS HOT.<br>NO DTC'S AND WE COULD NOT REPRODUCE THE SYMPTOM AT THIS TIME.<br>SYMPTOM_CODE 507000 CHANGED TO 507402 BY N8AK800<br>CUSTOMER STS VEH HAS INTERMITTENT STALL CONCERN ON DECEL. TECH NOT ABLE TO DUPLICATE VEH HAS NO DTC'S SEEKING KNOWNS<br>ISM 00-12-026 OK FOR STICKING SHUT OR STUCK OPEN EGR VALVE<br>REPORT #: 1E8F8010<br>REPORT #: 1FLHF023<br>REPORT #: 1E8F8010                                                                                                                                                                                                                                                                                                                                                                        |
| 07162001    | 4710  | 1FMYUJ02141KA28115 | 12182000   | CA | 507000 |                              | ADV TECH OF ISM AND TO VERIFY BASE IDLE SETTING PER PAST REPORTS<br>TECH STS CUSTOMER ALEDGES VEHICLE STALLS ON STOPS AND WILL RESTART AND TECH STS HAS NO DTC'S AND IS UNABLE TO VERIFY CONCERN<br>ADVISE TECH TO VERIFY CONCERN IF POSSABLE AND VERIFY POWER RELAY IS NOT SHOCK SENSITIVE NO OTHER KNOWNS FOR CONCERN<br>FSE STS VEHICLE HAS A CONCERN OF STALLING INTERMITTENTLY ON DECEL. CONCERN HAS NOT BEEN DUPLICATED. FSE HAS NO PID INFORMATION. QUICK TEST HAS NOT BEEN PERFORMED. SEEKING KNOWNS.<br>ISM 00-12-026 OK FOR STICKING SHUT OR STUCK OPEN EGR VALVE<br>REPORT #: 1E8F8010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 07162001    | 3143  | 1FMYUJ04171KA58005 | 02122001   | NY | 507402 |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 07162001    | 1291  | 1FMYUJ03151KC18582 | 08142001   | GA | 507782 | INT STALL ON DECEL.          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 07162001    | 1846  | 1FMYUJ03181KB52016 | 04272001   | TX | 507793 | ALEDGED STALL ON STOPS       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 07162001    | 3400  | 1FMYUJ04101KB40598 | 04172001   | PA | 507793 | INTERMITTENT STALL ON DECEL. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| 07172001    | 700   | 1FMYU04131KC37271 | 08272001   | MO | 007793 | ALLEGED STALL ON DECEL      | <p>ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL. ADV FBE TO MONITOR PIDS. PERFORM QUICK TEST. VERIFY BASE IDLE. RECORD EVENT IF POSSIBLE AND DIAG AS PER DATALOGGER. IF ASSISTANCE IS NEEDED TO DIAG AS PER RECORDING, CALL BACK FOR ASSISTANCE.</p> <p>TECH STATES THE CUSTOMER ALLEGES THE VEHICLE STALL ON HER WHILE DRIVING DOWN A HILL AT A DECEL. NO CODES ARE STORED IN THE PCM. HE HAS NOT BEEN ABLE TO DUPLICATE THE CONCERN. SEEKING FOR ANY KNOWN OR ADVICE.</p> <p>ADVISE TECH TO CHECK THE EEC POWER RELAY FOR POSSIBLE CONCERNS. NO KNOWN WERE AVAILABLE.</p>                                                                                                                  |
| 07172001    | 2386  | 1FMYU041X1KF18032 | 10252000   | GA | 007403 | INTERMITTENT STALL/NO CODES | <p>TECH CALLED STATING THE VEHICLE STALLS INTERMITTENTLY. STATED THERE ARE NO CODES. TESTED HE REPLACED THE IAC ABOUT 3 WEEKS AGO AND IS BACK FOR THE CONCERN. CUSTOMER STATES THE CONCERN HAPPENS WARM OR COLD. WILL HAPPEN ON ACCEL OR DECEL. STATED HE VERIFIED THE CONCERN ONCE WHEN THE VEHICLE WAS PUT INTO GEAR. LOOKING FOR ADVICE.</p> <p>ADVISED TO DRIVE THE VEHICLE AGAIN AND TRY TO DUPLICATE THE STALL. ADVISED TO TAKE A RECORDING OF AS MANY PIDS HE CAN SELECT. ADVISED IF HE CANNOT VERIFY THE STALL, SET THE BASE IDLE AND RESET THE KAM.</p>                                                                                                                                                                                                                             |
| 07172001    | 13478 | 1FMYU03104KE75150 | 06312000   | MI | 007703 | ALLEGED STALL/HEBINATION    | <p>TECH STS HAS ALLEGED HESITATION AND WANTS TO STALL OUT. TECH STS WHEN THE VEHICLE IS ALMOST STOPPED THEN ACCELERATED, THE ENGINE WANTS TO STALL. TECH CANT VERIFY THE CONCERN. HAS NO CODES IN THE PCM. SEEKING KNOWN</p> <p>IRM 00-12-028 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE<br/>REPORT #: 1FLHF023<br/>REPORT #: 1E3F8010</p> <p>ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL. ADV TECH OF THE ABOVE REPORT. ADV TO CHECK AND ADJUST BASE IDLE IF NEEDED. ALSO VERIFY PCM POWERS AND GROUNDS.<br/>REPORT #: 1E3F8010</p> <p>ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL.</p> |
| 07172001    | 10308 | 1FMYU03111KF89404 | 12012000   | MS | 007792 | INTERMITTENT STALL ON DECEL | <p>ADV TECH TO VERIFY THE CONCERN. ADV TO ALSO CHECK THE BASE IDLE AND ADJUST IF NEEDED. ALSO ADV TECH TO CHECK FOR POSSIBLE STICKING EGR VALVE.</p> <p>TECH STS VEHICLE HAS AN INTERMITTENT STALLING CONCERN ON DECEL. TECH HAS NOT BEEN ABLE TO DUPLICATE CONCERN. HAS PROPER PID VALUES AT THIS TIME. SEEKING KNOWN CONCERNS.</p> <p>IRM 00-12-028 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE<br/>ADV TECH POSSIBILITY OF EGR VALVE STICKING OPEN. ALSO ADV TECH TO VERIFY BASE IDLE AS PER IAC DUTY CYCLE.</p>                                                                                                                                                                                                                                                                         |
| 07172001    | 4834  | 1FMYU03161KB22312 | 04032001   | OH | 007793 | INTERMITTANT STALL ON DECEL | <p>TECH STATES HAS INTERMITTANT STALL. STATES HAS NOT REPRODUCED IT. STATE</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| REPORT DATE | MILES | VIN                | BUILD DATE | ST | SYMPT  | ADCL SYM                   | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| 07182001    | 11553 | 1FMYUD4141KAM278   | 02062001   | VA | 007608 | STALL AT CRUISE, RESTARTS. | S CUSTOMER COMPLAINT OF INTERMITTANT STALL ON DECEL GOING DOWN A HILL. STATES FUEL PRESSURE NORMAL. LOOKING FOR ANY KNOWN. ADVISED IT SOUNDS FUEL RELATED AND NEED TO INVESTIGATE HOW MUCH FUEL WAS IN TANK. ADVISED IF MORE HELP NEEDED TO CALL BACK. INTERMITTANT STALL AT CRUISE. VEHICLE RESTARTS FINE. CANNOT DUPLICATE CONCERN. NO CODES. INSPECT CKP SENSOR AND HARNESS. CHECK DPF. CONCERN IS UNDER INVESTIGATION. VERIFY CONCERN BEFORE ATTEMPTING REPAIR. CHECK FUEL PUMP GROUND. TECH STATES THAT CUSTOMER SAYS VEHICLE STALLS INTER, WHILE DRIVING. NO CODES. ENGINE CUTS OUT LIKE KEY IS BEING TURNED OFF. WARNING LIGHTS ARE ON WHEN THE VEHICLE DIES. TECH CANT VERIFY AND HE IS LOOKING FOR ANY KNOWN. ADVISED TECH TO CHECK FPM GROUND AND CONNECTOR. ALSO CHECK C140 NEAR THE TRANSMISSION FOR CHAFING. TECH NEEDS TO ROAD TEST VEHICLE AND MONITOR CKP, TP, AND FRPP81 AND VOLTAGE. TECH STATES THE CUSTOMER ALLEGES THE VEHICLE STALLS INTERMITTENTLY ON A CRUISE OR DECEL. NO PATTERN TO THE CONCERN. THE VEHICLE RESTARTS FINE EVERYTIME. NO CODES IN THE PCM AND HE HAS NOT BEEN ABLE TO DUPLICATE THE CONCERN. SEEKING FOR ANY KNOWN OR ADVICE.<br>REPORT #: 1FLHF023<br>REPORT #: 1EGF8010<br>ADV TECH TO VERIFY THE CONCERN. ADV THE PCM LEVEL IS NOT CURRENT. ADV TO CHECK AND SET BASE IDLE IF NEEDED. ALSO LOOK FOR LOSS OF CKP SIGNAL. ADV TECH OF THE ABOVE REPORT. ADV TO CHECK AND ADJUST BASE IDLE IF NEEDED. ALSO VERIFY PCM POWERS AND GROUNDS. TAP ON THE EEC RELAY AS WELL, IF IT STALLS REPLACE IT. |
| 07182001    | 3394  | 1FMYUD4141K2529038 | 04112001   | MI | 007000 | STALLS AT 40 MPH INTER     | CUST STATES VEHICLE WILL STALL AT CRUISE. CYCLE KEY AND VEHICLE STARTS. SW STATES NO MIL CODES, (PASS), HAS CHECKED ALL WIRING FOR CONCENS AND NONE FOUND. SEEKING IF ANY KNOWN. ADVISED SW TO CHECK PIN FIT ON BATTERY JUNCTION BOX. TAP TEST PCM POWER RELAY. POSSIBLY REPLACE PCM RELAY.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 07182001    | 10904 | 1FMYUD4112KF63382  | 11102000   | BC | 007763 | ALLEGED STALL              | THE TECHNICIAN WORKING ON THIS VEHICLE STATES THIS VEHICLE STALLS/QUITS INTERMITTENTLY. NO CODES IN THE PCM AND UNABLE TO DUPLICATE THE CONCERN. ASKED THE TECHNICIAN IF THIS CONCERN HAPPENS WHEN THE VEHICLE HOT/COLD? THE TECHNICIAN WAS UNABLE TO ANSWER THIS CONCERN. REQUESTING ADDITIONAL TECHNICAL INFORMATION.<br>ISM 01-05-013 ESCAPE 3.0L CHARGING SYSTEM, CALL NUMBER LISTED BELOW<br>ISM 00-12-026 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE<br>REPORT #: 1FLHF023<br>REPORT #: 1EGF8010<br>REPORT #: 1EUFL002<br>ADVISED THE TECHNICIAN NO TO MANY KNOWN, REVIEW THE ABOVE ISMS. CHECK FOR LOOSE GROUNDS G104/G106 AND SUBMIT AN EDR WITH DETAILED INFORMATION ON THIS CONCERN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 07202001    | 8023  | 1FMYUD4171KF68015  | 12212000   | MO | 007663 | STALLS, WHILE DRIVING      | CUSTOMER STATES VEHICLE WILL STALL ON DECEL AT APPROX 40 MPH. VEHICLE WILL ONLY STALL AFTER WARMED TO NORMAL OPERATING TEMPERATURE. TECH HAS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 07202001    | 5720  | 1FMYUD4181KA08480  | 03122001   | PA | 007500 | INTERMITTENT STALLING.     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 07232001    | 15311 | 1FMYUD4151KF63721  | 11142000   | NH | 007000 | INT. STALL ON DECEL        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## Intermittent Stall - No Codes, No Verification

| REPORT DATE | MILES | VIN               | BUILD DATE | ST SYMPY   | ADDL SYN                       | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------|-------|-------------------|------------|------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |       |                   |            |            |                                | NOT BEEN ABLE TO VERIFY CONCERN AND IS SEEKING KNOWN.<br>ADVISED TECH TO INSPECT PCM GROUNDS, ESPECIALLY G104, 105 BENEATH BATTERY TRAY. PERFORM WIGGLE TEST ON POWER DISTRIBUTION BOX AND CKP CIRCUIT. ALSO LIGHTLY TAP ON CKP AND PCM POWER RELAY WITH VEHICLE RUNNING TO TRY TO DUPLICATE CONCERN. ADVISED TECH THAT THIS CONCERN IS CURRENTLY UNDER INVESTIGATION BY ENGINEERING.                                                                                                                                                                                                                             |
| 07242001    | 584   | 1FMYU04151KC00000 | 08042001   | OH 807000  | STALLS                         | ISM 01-07-038 CK GNDS 104 & 105, SEND EDSRS<br>VEHICLE BROUGHT IN FOR A STALL. TECH HAS NOT BEEN ABLE TO DUPLICATE. DROVE OVER 80 MILES TO TRY TO DUPLICATE CONCERN.<br>SUGGESTED TO REMOVE BATTERY TRAY AND INSPECT G104. MAKE SURE SCREW BOTTOMS OUT AND THERE IS A TIGHT CONNECTIONS AT G104.                                                                                                                                                                                                                                                                                                                  |
| 07242001    | 5853  | 1FMCU04121KB25474 | 04112001   | WV 807893  | INT STALL AT CRUISE, RESTARTS  | TECH STATES THAT THE VEH INT STALLS AT CRUISE AND WILL RESTART. THEY CAN NOT DUPLICATE THE CONCERN. CALLING FOR KNOWN OR SUGGESTIONS.<br>ISM 01-07-038 CK GNDS 104 & 105, SEND EDSRS<br>ISM 02-12-028 CK FOR STICKING SHUT OR STUCK OPEN EGR VALVE<br>REPORT #: 1ECIP010<br>REPORT #: 1DME9004 REPLACE SENSOR - CRANKSHAFT POSITION - ADVISED OF THE ABOVE.                                                                                                                                                                                                                                                       |
| 07242001    | 1322  | 1FMYU04181KF15747 | 10162000   | KS 807000  | INTERMITTENT STALLING          | TECH STS THAT HE HAS AN INTERMITTENT STALLING CONCERN. TECH STS THAT THIS IS THE SECOND TIME THAT THE VEHICLE HAS BEEN IN FOR THE SAME CONCERN. TECH STS THAT THE VEHICLE HAS NO CODES AND IT ALWAYS STARTS RIGHT BACK UP FOR THE CUSTOMER.<br>ADVISED TECH TO CHECK G104/105 FOR GOOD CONNECTION. ADVISED TECH THAT THIS IS THE GROUND FOR THE EEC RELAY. ADVISED TECH THAT THE GROUND IS UNDER THE BATTERY TRAY.                                                                                                                                                                                                |
| 07242001    | 3599  | 1FMYU04171KB40526 | 04182001   | MIN 807583 | INTERMITTENT STALLING          | SW STS THAT HE HAS AN INTERMITTENT STALLING CONCERN. SW STS THAT HIS TECH HAS BEEN UNABLE TO FIND ANYTHING WRONG. SW STS THAT THERE ARE NO CODES AND THE VEHICLE WILL START RIGHT UP AFTER STALLING.<br>SW STS THAT THE VEHICLE WILL SEEM TO STALL AFTER HITTING THE BRAKES<br>TECH SEEKING KNOWN.<br>ADVISED TECH TO REMOVE THE BATTERY AND TRAY. CHECK THE GROUND 104/105 MAKE SURE THAT IT IS CLEAN AND TIGHT FOR A GOOD CONNECTION.<br>ADVISED SW THAT THIS GROUND IS FOR THE EEC POWER RELAY.                                                                                                                |
| 07242001    | 10631 | 1FMYU03101KF71228 | 12152000   | MS 807000  | INT STALLING/CAN NOT DUPLICATE | THE TECH STATES THAT THE CUSTOMER IS COMPLAINING OF AN INTERMITTENT STALLING CONCERN THAT OCCURS WITH A LOW TANK OF FUEL, OFTEN WHILE TURNING OUT OF THE DRIVEWAY. THE TECH CAN NOT DUPLICATE THE CONCERN. SEEKING FOR ANY KNOWN.<br>ADVISED THE TECH TO ATTEMPT TO VERIFY A LOSS OF FUEL PRESSURE WITH A LOW FUEL LEVEL, INSPECT THE FUEL PUMP JET SCREEN FOR CONTAMINATION, AND REPLACE THE FUEL PUMP, FILTER, AND FLUSH THE TANK. ALSO INSPECT G104 AND G105 UNDER THE BATTERY TRAY, INSPECT THE CONNECTORS IN THE DRIVER'S FRONT KICK PANEL AND THE OCRM FOR WATER INTRUSION, AND TAP ON THE PCM POWER RELAY. |