

# **EA02025**

**TEXAS INSTRUMENTS, INC.'S  
09/10/03 LETTER TO ODI**

**REQUEST 11**

**BOX 13**

**PART A – C**

**PART B**

**McGuirk, Andy**

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**To:** Sullivan, Martha; Rowland, Thomas; Baumann, Russ; Baker, Gary;  
**cc:** Beringhouse, Steven; Pechonis, John; Rahman, Aziz; Bartosh, Bob  
**Subject:** Ford overview... 2/18 plans Update

attorney client privileged communication

I have an appointment to talk to Steve Reimers who is acting for Fred Porter at 2:45 thursday today.

I want to lead us thru discussions:

REVIEW FORD'S ANALYSIS SPREADSHEET (ALL, LED BY STEVE WITH THEORIES),

leak?, priority ?

OUR UPDATED CAUSE AND EFFECT DIAGRAM (BRYAN),

ABS?

OUR 'SCIENCE FAIR' EXPERIMENTS RESULTS(STEVE AND BRYAN),

REVIEW A PROPOSAL FOR OUR RESPONSE TO FORD'S POSSIBLE QUESTION POSED FROM AZIZ ABOUT TI POSITION (ANDY). no results

UNDERSTAND FORD'S DATA ABOUT ABS (C/O AZIZ FROM TEVER) AND PROP VALVE PRESSURE TRACES, do we do at TI?

DATA FROM DOW C/O FORD ABOUT BRAKE FLUID AS IT RELATES TO FIRES no results

WELL AS KAPTON (GIO AZIZ FROM FORD). no results

UNDERSTAND BRAKE SWITCH AND KAPTON WEAROUT WITH ANOTHER FORD PLATFORM...STEVE DID WE COLLECT ANY SAMPLES FROM SIMILAR AGE VEHICLES? no results

WE SHOULD ALSO DISCUSS THE POTENTIAL BRAKE PEDAL POSITION 'SOLUTION' TO HELP FORD UNDERSTAND THEIR RISKS IN THAT PATH.

AUTOMOTIVE SENSORS AND CONTROLS (AA) NUMBER  
34 FOREST ST M/S 23-08  
ATTLEBORO, MA 02703  
TEL : (508) 236-1000  
FAX : (508) 236-3748  
WAGE: (800) 467-3700 PIN 604-2044

**Epstein, Sally**

---

**From:** Beringhaus, Steven (sberinghaus@email.mot.com)  
**Sent:** Thursday, February 18, 1999 8:22 AM  
**To:** Hopkins, AL  
**Cc:** Douglas, Charles; Rahman, Aziz; Baker, Gary; Baumann, Rust; Dague, Bryan; McGuirk, Andy  
**Subject:** RE: Corrosivity of Brake Fluid/Water Mixtures on Brass

Attorney-client privileged communication

Al,  
We were hoping to get that info from Aziz through Ford. Ford seems slow to connect with Dow. We will pursue the info from our end.

Steve

-----  
**From:** Hopkins, AL  
**Sent:** Wednesday, February 17, 1999 6:06 PM  
**To:** Beringhaus, Steven  
**Cc:** Douglas, Charles; Rahman, Aziz; Baker, Gary; Baumann, Rust; Dague, Bryan; McGuirk, Andy  
**Subject:** Corrosivity of Brake Fluid/Water Mixtures on Brass

Attorney-client privileged communication

Has anybody talked to Dow from our end on the corrosivity of Brake Fluid/Water Mixtures on Brass both in the stressed and unstressed condition? Also, has anybody from our side talked to them about flammability? In particular, you had raised a good issue about the flammability/evaporation interaction. They might be able to suggest the best temperature to do your tests at.

Al

TI-NHTSA 018753

**Epstein, Sally**

**From:** McGuirk, Andy [a-mcguirk@email.mcf.com]  
**Sent:** Thursday, February 18, 1999 8:52 AM  
**To:** Sullivan, Martha; Rowland, Thomas; Baumann, Russ; Baker, Gary  
**Cc:** Beringhaus, Steven; Pechonia, John; Rahman, Aziz; Bartosh, Bob  
**Subject:** Ford overview.... 2/18 'status' Update

attorney client privileged communication

Ford has seen switch 'wear out' in several samples where brake fluid is believed to have leaked into the switch cavity (total of 7 switches 'analyzed' to 'complete scientific conclusions' from 1 P/S thermal event, 6 underhood thermal events, 2 cruise inops and 1 reference). There are 24 switches awaiting analysis at Ford, and in fact a faster paced analysis scheme is under review at Ford in order to work thru this backlog. (Steve, do we recommend this approach?...lets respond ASAP)

Ford has concluded the Town Car underhood fire and thermal event and thermal anomaly history (my 927 and my 937) is comprised of:  
148 total events...broken down by Ford as follows

127 unknown causes  
17 potential other causes  
5 pressure switch causes.....or said a different way,  
Ford might say that P/S is the number one known cause

another cut at this.....broken down by Ford

105 events status unknown  
39 events with engine off  
9 events with engine on..... or said a different way, Ford  
might say engine on/off has little effect.....

Ford's executive team has established a plan to achieve root cause phase by March 3rd.

We believe Ford has obtained a two month 'window' from NHTSA.... April 14th 'public disclosure' plan

Ford's executive team seems to be frustrated by the inability to get to root cause....to turn on/off by the 'science fair' type testing being done at both TI and Ford to create the issue

We have presented the concept of de-power of the P/S as a containment mechanism....the Ford 1st line people do not seem to be moving toward this....more Friday

We have also presented the concept of the possible application of the APT as a containment mechanism...little movement here too.

Ford's current thought seems to be that the preferred containment solution might be to replace the P/S with a Brake Pedal position sensor as is on-board the '99 Town Car. Looks like first line folks are focused here....seems like Ford 1st line guys do not want to 'tap' into brake lines in the future?

Ford continues to move slowly.... no Dew or Dupont or Teves involvement 'results' yet....seems like they're still fixing to get ready

Ford's Fred Porter my primary contact: is on vacation and I am making plans to connect with his 'acres' either late today 'he's out?' or first tomorrow to discuss and direct some of these points. I will publish a 'plan' memo early afternoon today.

4

A  
AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER  
34 FOREST ST M/S 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
PAGE: (800) 467-3700 PIN 604-2044

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FROM: Rahman, Aziz  
Sent: Wednesday, February 17, 1999 6:16 PM  
To: Beringhouse, Steven; Dague, Bryan; McGuirk, Andy; Baumann, Russ;  
Sharpe, Robert  
Subject: 2/17 Update

Main event: 2PM core team meeting. Highlights:

- Manager Len Brown agitated that Dow has not shown up yet. Will probably get them on board tomorrow or Friday.
- Exec. meeting at 4pm Friday. TI not invited. Will present test plan (copy with Steve B. ).
- Ford team in DC today at NHTSA, asking for two months for public action.
- People surprised that on-vehicle characterization has not yet occurred. Leads provided on expediting this.
- Increasing tempo on getting more parts back for analysis.
- Re-emphasized need to study warranty data more closely for trending, and special causes.
- Increasing speculation that pure heat is not sufficient to ignite. Need spark.
- Will present brake pedal position sensor to execs as possible containment.

Two tests conducted today at AVT labs:

- Passed about 54 Amps at about 1V, through switch terminals, no fluid. Temp in connector area increased to about 182 F before system went open circuit. Dissection revealed spring arm deformed and twisted away from stationary. Will have pictures tomorrow.
- Passed about 50 Amps at about 1V through switch terminals, with switch based filled with approx 50% Brake fluid, 50% salt water. Temp in connector area increased to about 270 F and stayed there. No smoke or ignition. Dissection revealed spring arm deformed. Pictures tomorrow.

-Will set up calibration station in Central Lab tomorrow.

- Will be returning to MA Friday 2pm flight. Later flights not available because of vacation week. Per Steve B.'s input, will plan to return next

week

Regards  
Azz.

**Morris, Irene**

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**From:** McGuirk, Andy  
**Sent:** Thursday, February 18, 1999 10:52 AM  
**To:** Sullivan, Martha; Rowland, Thomas; Baumann, Russ; Baker, Gary  
**Cc:** Beringhaus, Steven; Pechonis, John; Rahman, Aziz; Bertosh, Bob  
**Subject:** Ford overview.... 2/18 'status' Update

attorney client privileged communication

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Ford's Fred Porter (my primary contact) is on vacation and I am making plans to connect with his 'ectee' either late today (he's out ?) or first tomorrow to discuss and direct some of these points. I will publish a 'plan' memo early



afternoon today.

2

3  
AUTOMOTIVE SENSORS AND CONTROLS GRA MANGER  
34 FOREST ST N/S 23-08  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
PAGE: (508) 487-3708 FAX 504-2044

From: Rahman, Aziz  
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To: Beringhouse, Steven; Dague, Bryan; McGuirk, Andy; Baumann, Russ; Sharps, Robert  
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- Passed about 64 Amps at about 1V, through switch terminals, no fluid. Temp in connector area increased to about 182 F before system went open circuit. Dissection revealed spring arm deformed and twisted away from stationary. Will have pictures tomorrow.

- Passed about 50 Amps at about 1V through switch terminals, with switch based filled with approx 60% Brake Fluid, 50% salt water. Temp in connector area increased to about 270 F and stayed there. No smoke or ignition. Dissection revealed spring arm deformed. Pictures tomorrow.

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Regards  
Aziz.

**Epstein, Sally**

**From:** McGuirk, Andy [a-mcguirk@vernet.ma.llnwd.net]  
**Sent:** Thursday, February 18, 1999 12:22 PM  
**To:** Sullivan, Martin; Rowland, Thomas; Baumann, Russ; Baker, Gary  
**Cc:** Berghaus, Steven; Pecharis, John; Rahman, Aziz; Bartosh, Bob  
**Subject:** Ford overview... 2/18 please Update

- attorney client privileged communication

i have an appointment to talk to Steve Reimers who is acting for Fred Porter at 2:45 thursday today.

i want to lead us thru discussions:

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leak?, priority ?

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TI-NHTSA 018759

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AUTOMOTIVE SEISSORS AND CONTROLS QRA NUMBER  
34 FOREST ST RM 23-06  
ATTLEBORO, MA 01735  
TEL : (508) 233-5000  
FAX : (508) 233-5742  
PAGE: (508) 233-3700 EXT 604-2044

From: McQuick, Andy  
Sent: Thursday, February 19, 1999 8:52 AM  
To: Sullivan, Martha; Howland, Thomas; Houghton, Russ; Baker, Gary  
Cc: Springhouse, Steven; Pachonis, John; Nakama, Akin; Barwick, Bob  
Subject: Ford overview.... 2/18 'status' Update

attorney client privileged communication

Ford has seen patch 'wear out' in several samples where brake fluid is believed to

TI-NHTSA 018760

have looked into the switch cavity (total of 7 switches 'analyzed' to 'complete scientific conclusions' from 1 P/S thermal event, 3 underhood thermal events, 2 cruise inops and 1 reference). — there are 24 switches awaiting analysis at Ford, and in fact a faster paced analysis scheme is under review at Ford in order to work thru this backlog. (Steve, do we recommend this approach?...lets respond ASAP)

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TI-NHTSA 018761

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34 FOREST ST N/A 22-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
FAX2: (800) 487-3700 PIN 604-2044

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Sent: Wednesday, February 17, 1999 8:16 PM  
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Regards  
Aziz.

TI-NHTSA 018762

**Monie, Irene**

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**From:** McGuirk, Andy  
**Sent:** Thursday, February 18, 1999 2:22 PM  
**To:** Sullivan, Martha; Rowland, Thomas; Baumann, Russ; Baker, Gary  
**Cc:** Beringhaus, Steven; Paschon, John; Rahman, Aziz; Bartosh, Bob  
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8

AUTOMOTIVE BUREAU AND CONTROL'S Q&A NUMBER  
34 FORDST ST W/S 11-01  
ACTON, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3748  
FREN: (800) 447-3780 DTN 604-2844

From: McGurk, Andy  
Sent: Thursday, February 18, 1999 9:52 AM  
To: Sullivan, Martha; Rowland, Thomas; Baumann, Russ; Baker, Gary  
Cc: Beringhaus, Steven; Pechonis, John; Rahman, Aziz; Bartosh, Bob  
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AUTOMOTIVE SERVICES AND CONTROLS Q&A MANAGER  
34 FOREST ST R/R 23-05  
ATLANTIC, NJ 02703  
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PHONE: (800) 467-3700 PIN 604-2044

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Regards  
Aziz.

**Graveline, Dora**

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**Meeting Request**

**When:** Thursday, February 18, 1999, 2:00 PM - 3:00 PM

**Where:** 23A

**From:** McGuirk, Andy

**Date Received:** Wednesday, February 17, 1999 3:44 PM

**To:** Baker, Gary; Baumann, Russ; Beringhouse, Steven; Degue, Bryan; Hopkins, AL

**Cc:** Douglas, Charles; Rahman, Aziz; Rowland, Thomas; Sharpe, Robert; Sullivan, Martha

**Subject:** 77PS UPDATE

I WANT TO REVIEW FORD'S ANALYSIS SPREADSHEET (ALL, LED BY STEVE WITH THEORIES), OUR UPDATED CAUSE AND EFFECT DIAGRAM (BRYAN), OUR 'SCIENCE FAIR' EXPERIMENTS RESULTS(STEVE AND BRYAN), AND REVIEW A PROPOSAL FOR OUR RESPONSE TO FORD'S POSSIBLE QUESTION POSED FROM AZIZ ABOUT TI POSITION (ANDY).

ALSO, I WANT TO UNDERSTAND FORD'S DATA ABOUT ABS (C/O AZIZ FROM TEVES) AND PROP VALVE PRESSURE TRACES, AS WELL AS DATA FROM DOW C/O FORD ABOUT BRAKE FLUID AS IT RELATES TO FIRES AS WELL AS KAPTON (C/O AZIZ FROM FORD).

FINALLY, WE SHOULD UNDERSTAND BRAKE SWITCH AND KAPTON WEAROUT WITH ANOTHER FORD PLATFORM...STEVE DID WE COLLECT ANY SAMPLES FROM SIMILAR AGE VEHICLES?

WE SHOULD ALSO DISCUSS THE POTENTIAL BRAKE PEDAL POSITION 'SOLUTION' (CHARLIE AND ROE...BRIEF GARY SO HE CAN DELIVER) AND BE PREPARED TO HELP FORD UNDERSTAND THEIR RISKS IN THAT PATH.

A

**Epstein, Sally**

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**From:** McGuirk, Andy [a-mcguirk@email.mc.d.com]  
**Sent:** Friday, February 19, 1999 9:45 AM  
**To:** Degus, Bryan; Watt, Jim; Beringhaus, Steven  
**Cc:** Rahman, Aziz; Saumann, Russ; Pachonis, John  
**Subject:** MATERIAL FOR AZIZ

**Importance:** High

AZIZ WILL COME INTO THE PLANT SATURDAY TO PICK UP FOLLOWING ITEMS:

SAMPLES OF P/S FROM THE KAPTON CHARACTERIZATION TESTING WE HAVE DONE HERE (PROVIDES FORD THE 'SAME' SAMPLES WE HAVE COLLECTED FROM THE 'EVERY 200,000' CYCLE TEST TO CHARACTERIZE WEAR STATES.

.....BRYAN AND STEVE, PLS COORDINATE THESE INTO AZIZ OFFICE FOR HIS PICK UP

OFFSET KEYWAY CONNECTOR TO FIT THE PRESSURE SWITCHES WE ARE ALL TALKING ABOUT....PRESSURE TESTER HAS WRONG (?) CONNECTOR AND NEEDS RIGHT CONNECTOR HARNESS

.....BRYAN AND STEVE, PLS COORDINATE INTO AZIZ OFFICE FOR HIS PICK UP

'CORRECT' PRESSURE FITTING TO CONNECT INTO PRESSURE STATION AND INTO SWITCH QUICK CONNECT.

.....BRYAN AND STEVE AND JIM WATT, PLS COORDINATE INTO AZIZ'S OFFICE FOR SAT PICKUP

IF THERE ARE ANY QUESTIONS, PAGE AZIZ BEFORE NOON TODAY.....JIM WATT, PLS 'HOVER' OVER THIS TO ASSURE IT HAPPENS

A  
AUTOMOTIVE SENSORS AND CONTROLS QRA MANGER  
34 FOREST ST N/E 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
PAGE: (800) 467-3700 PIN 604-2044

TI-NHTSA 018768

**Epstein, Sally**

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**From:** Sharpe, Robert [rsharpe@email.mc.ti.com]  
**Sent:** Monday, February 22, 1999 7:16 AM  
**To:** Douglas, Charles  
**Cc:** McGuirk, Andy; Rahman, Aziz  
**Subject:** Brake Pressure Switch History

Hi Charlie,

During last Friday's "Executive Level" review at Ford regarding the Town Car issue, interest was expressed towards the change on our switch between snap disc and quiet disc. My understanding is that this change occurred sometime in CY95 (to quiet disc), based on your 12/8/98 E-Mail. In addition, we also thought that the "F2AC" was a quiet disc application, however, we have a few field returns of the "F2AC" that have CY92 date codes. Please confirm timing of the quiet disc changeover as well as history of the "F2AC".

As discussed with Andy on Friday afternoon, Ford expressed much interest with the change (focused on timing) to "quiet disc" applications. They were very pleased that our DOE addresses both quiet and snap disc applications.

Best Regards,

Rob Sharpe  
Texas Instruments  
Phone (248) 305-5729  
Fax (248) 305-5734  
rsharpe@ti.com

TI-NHTSA 018769

**Epstein, Sally**

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**From:** McGuirk, Andy [a-mcguirk@email.mc.ti.com]  
**Sent:** Monday, February 22, 1999 7:29 AM  
**To:** Watt, Jim  
**Cc:** Beiringhaus, Steven  
**Subject:** FW: Brake Pressure Switch History

Jim, pls connect with Charlie and help build a clear time-line of the switch

\*  
AUTOMOTIVE SENSORS AND CONTROLS QRA MANGER  
34 FOREST ST N/S 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
PAGE: (800) 467-3700 PIN 604-2044

-----  
**From:** Sharpe, Robert  
**Sent:** Monday, February 22, 1999 8:17 AM  
**To:** Douglas, Charles  
**Cc:** McGuirk, Andy; Rahman, Aziz  
**Subject:** Brake Pressure Switch History

Hi Charlie,

During last Friday's "Executive Level" review at Ford regarding the Town Car issue, interest was expressed towards the change on our switch between snap disc and quiet disc. My understanding is that this change occurred sometime in CY95 (to quiet disc), based on your 12/8/98 E-Mail. In addition, we also thought that the "F2AC" was a quiet disc application, however, we have a few field returns of the "F2AC" that have CY92 date codes. Please confirm timing of the quiet disc changeover as well as history of the "F2AC".

As discussed with Andy on Friday afternoon, Ford expressed much interest with the change (focused on timing) to "quiet disc" applications. They were very pleased that our DOE addresses both quiet and snap disc applications.

Best Regards,

Rob Sharpe  
Texas Instruments  
Phone (248) 308-8729  
Fax (248) 305-3734  
rsharpe@ti.com

TI-NHTSA 018770

**Epstein, Sally**

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**From:** Douglas, Charles [c-douglas2@email.mc.f.com]  
**Sent:** Monday, February 22, 1999 10:08 AM  
**To:** Sharpe, Robert; Dagus, Bryan  
**Cc:** McGuirk, Andy; Rahman, Aziz; Sharpe, Robert  
**Subject:** RE: Brake Pressure Switch History

Rob,

I may have provided mis-information in my email of 12/8/98. One of the issues we face in trying to pull up this information is that historical information tells us the volume we are shipping of a specific part but it does not tie to specific platforms. We did stop shipping the snap switch that the Town Car used in CY95, however, this switch was used on a number of platforms and the Town Car may well have individually changed to the quiet switch much earlier.

The best (maybe only) way to determine exactly when we made this change is if we have any records remaining in engineering ---> Bryan, is there any documentation which exists which can help us pinpoint this timing.

Rob, if no specific information exists in engineering, I can guesstimate that the change occurred in late 1Q92 to mid 2Q92. This guesstimate is based on us shipping 40ku - 50ku of the snap switch during January and February of CY92 and ramping down to 10ku to 15ku per month by June of CY92. Also, old cost records would indicate that we made our first shipments of the silent switch occurred in April of CY92. Assuming the Town Car was the lead platform for the silent switch, this would indicate that conversion timing occurred early 2Q92.

I know that we did make a running change so 2Q92 makes sense. I also know there was significant engineering activity around this change so if we are lucky, there will be some documentation in engineering which pinpoints the change.

Regards,

Charlie

Charlie Douglas  
(508) 236-3657 (P)  
(508) 236-1599 (F)  
c-douglas2@t1.com

-----  
**From:** Sharpe, Robert  
**Sent:** Monday, February 22, 1999 8:17 AM  
**To:** Douglas, Charles  
**Cc:** McGuirk, Andy; Rahman, Aziz  
**Subject:** Brake Pressure Switch History

Hi Charlie,

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Best Regards,

Rob Sharpe  
Texas Instruments  
Phone (248) 305-5729  
Fax (248) 305-5734  
rsharpe@ti.com

**Epstein, Sally**

---

**From:** Dague, Bryan [bdague@gmail.com]  
**Sent:** Monday, February 22, 1999 10:15 AM  
**To:** Rahman, Aziz  
**Subject:** TI Durability Samples

Aziz,

Yes, we noticed that as well. It all so leaked way before any of the other switches. We are just now starting to get leakers (at about million cycles).

I think this particular switch is a "flyer". The discoloration is due to dust from the internal components wearing. I believe there is something different about this switch that generated more wear particles than the other, and we will confirm this once more switches are analyzed. I don't know if this switch was assembled with more particles in it to start with, or if it was assemble off-center causing more wear of the internal components, but one thing is clear. It was pretty dirty in the switch. Furthermore, I believe you will see this data point stick out from all the rest once they are plotted.

That is really all I can offer at this time.

Regards,  
Bry

-----  
**From:** Rahman, Aziz  
**Sent:** Monday, February 22, 1999 10:34 AM  
**To:** Dague, Bryan; McGuirk, Andy; Baumann, Russ; Beringhouse, Steven; Sharpe, Robert  
**Subject:** FW: TI Durability Samples

There seems to be a difference between the 728k sample kaptons and the rest. Any theories?

Bryan can you check if this switch was mounted on the dead-head end of the test manifold ( opposite the inlet ), where localized degradation of the brake fluid is higher? Or are the manifolds totally exhausted of brake fluid, at all test positions, for every pressure cycle? I don't remember the set-up.

Regards  
Aziz.

-----  
**From:** Rahman, Aziz  
**Sent:** Monday, February 22, 1999 10:26 AM  
**To:** 'Steve LaPointe ( Ford )'; 'Steve Reimers ( Ford )'; 'Norm LaPointe ( Ford )'; 'Fred Fortez ( Ford )'  
**Cc:** Sharpe, Robert  
**Subject:** TI Durability Samples

I have the following disassembled samples with me and I will forward them to Steve L. today pm.

200k Cycles 2 samples  
400k Cycles 2 samples  
600k Cycles 2 samples  
728k Cycles 1 sample ( observed leakage )  
800k Cycles 2 samples

This will be part of the library to establish lab tests vs field data.

Regards

TI-NHTSA 018773



ASIS.

**Epstein, Sally**

**From:** McGuirk, Andy [a-mcguirk@email.mo.tl.com]  
**Sent:** Monday, February 22, 1999 10:30 AM  
**To:** Sharpe, Robert; Dague, Bryan; Douglas, Charles; Rahman, Aziz  
**Cc:** Watt, Jim  
**Subject:** RE: Brake Pressure Switch History

charlie and i were recalling how this was a four week crisis and the Lincoln converted first (?). not sure how much procedure was followed in that crisis to convert....seem to recall ford push to do area's getting done over the phone by ford guys etc etc

**AUTOMOTIVE SENSORS AND CONTROLS QRA MANGER**  
34 FOREST ST N/S 23-05  
ATTLEBORO, MA 02703  
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FAX : (508) 236-3745  
PAGE: (800) 467-3700 FIM 604-2044

-----  
**From:** Rahman, Aziz  
**Sent:** Monday, February 22, 1999 11:18 AM  
**To:** Sharpe, Robert; Dague, Bryan; Douglas, Charles  
**Cc:** McGuirk, Andy; Sharpe, Robert  
**Subject:** RE: Brake Pressure Switch History

We could not have made any changes without Ford approval of a TI submittal. Can we go through our FFAP and SREA submittal records for both part numbers, FZVC and FZAC, with all suffixes ( AA, AB , BA etc as applicable )? I would assume that TI information will be most reliable when a specific part number was qualified/approved. As to when and on what platform a specific part number is used, the Ford system will be most accurate.

In general, we don't validate a part for a specific platform. We validate conformance to a drawing/part number and specification. Part usage/fanout is determined by the end user. I am sure Ford has a, sort of a "Bill of Materials", which they can dig up? Bracketing and usage for a specific platform based on shipping quantities will not be very accurate. Comments?

Regards  
Aziz.

-----  
**From:** Douglas, Charles  
**Sent:** Monday, February 22, 1999 11:05 AM  
**To:** Sharpe, Robert; Dague, Bryan  
**Cc:** McGuirk, Andy; Rahman, Aziz; Sharpe, Robert  
**Subject:** RE: Brake Pressure Switch History

Rob,

1  
TI-NHTSA 018775

I may have provided this information in my email of 12/8/98. One of the issues we face in trying to pull up this information is that historical information tells us the volume we are shipping of a specific part but it does not tie to specific platforms. We did stop shipping the snap switch that the Town Car used in CY95, however, this switch was used on a number of platforms and the Town Car may well have individually changed to the quiet switch much earlier.

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Regards,

Charlie

Charlie Douglas  
(508) 236-3457 (F)  
(508) 236-1598 (F)  
c-douglas2@ti.com

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From: Sharpe, Robert  
Sent: Monday, February 22, 1999 8:17 AM  
To: Douglas, Charles  
Cc: McQuirk, Andy; Rahman, Aziz  
Subject: Brake Pressure Switch History

Hi Charlie,

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Best Regards,

Rob Sharpe  
Texas Instruments  
Phone (248) 305-5729



**Graveline, Dora**

---

**From:** Rahman, Aziz  
**Sent:** Monday, February 22, 1999 10:34 AM  
**To:** Dugas, Bryan; McGuirk, Andy; Baumann, Russ; Springhouse, Steven; Sharpe, Robert  
**Subject:** FW: TI Durability Samples

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Bryan can you check if this switch was mounted on the dead-head end of the test manifold ( opposite the inlet ), where localized degradation of the brake fluid is higher? Or are the manifolds totally exhausted of brake fluid, at all test positions, for every pressure cycle? I don't remember the set-up.

Regards  
Aziz.

---

**From:** Rahman, Aziz  
**Sent:** Monday, February 22, 1999 10:38 AM  
**To:** Steve LaRouche ( Ford ); Steve Raines ( Ford ); Norm LaPointe ( Ford ); Fred Porter ( Ford )  
**Cc:** Sharpe, Robert  
**Subject:** TI Durability Samples

I have the following disassembled samples with me and I will forward them to Steve L. today pm.

200k Cycles 2 samples  
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This will be part of the library to establish lab tests vs field data.

Regards  
Aziz.

**McGuirk, Andy**

---

**From:** Rahman, Aziz  
**Sent:** Monday, February 22, 1999 5:01 PM  
**To:** McGuirk, Andy; Dague, Bryan  
**Subject:** Musings

Thinking out loud here, so please bear with me

Is there a way to identify the presence of two failure modes by looking at a Weibull chart?

The question is: We have circumferential cracks seen on parts from the lab durability test. Some field parts show the circumferential cracks, whereas other field parts show a radial crack.

The Weibull data I saw in Di Ha's report almost looked like it had a slope change halfway through. Can this be used as a predictor that a new failure mode has started?

Any Weibull gurus out there?

What happens if you have a circumferential crack and still continue to cycle, as will happen in the field? Will we see propagation of the same crack, or will a new one develop in a different direction, because the first one disturbed the stress field?

John Brennan and Ray Mandeville probably did a bunch of FE analyses. Anything in there?

**Ford is looking for, and will turn the heat on quickly, Dupont response on chemistry of change of properties of Kapton in Brake Fluid. Andy, can you please use your good offices to get expedient Dupont involvement? Ideally, a preliminary response will be good before the Wednesday meeting.**

Thanks for your help folks.

Almost forgot... small snippet from Fred:

The 95th percentile driver applies the brakes about 16 times per mile. City stop & go traffic. Probably not sufficient pressure to actuate switch. But... 16/mile is a lot of cycles, you will complete 800,000 cycles in only 30k miles. I do not know what the pressure profile will look like, will try to find out.

AZZ

**McGuirk, Andy**

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**Sent:** Monday, February 22, 1999 5:01 PM  
**To:** McGuirk, Andy; Dague, Bryan  
**Subject:** Musings

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Aziz.

**Epstein, Sally**

---

**From:** Rahman, Aziz [arahman@gmail.com]  
**Sent:** Tuesday, February 23, 1999 10:04 AM  
**To:** McQuirk, Andy; Dague, Bryan; Sharps, Robert; Baringhaus, Steven; Douglas, Charles  
**Subject:** Launch/PPAP/SREA dates

Need list of dates for approval for all switches/changes by Ford part number with all suffixes from inception of CCP5 program. Please provide the info to me by tomorrow AM for the 2.00 meeting. This is gaining serious visibility as people are trying to understand all changes.

Thanks for your help.

Regards  
Aziz.

TI-NHTSA 018781



**Epstein, Sally**

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**From:** McGuirk, Andy [a-mcguirk@emell.mc.f.com]  
**Sent:** Tuesday, February 23, 1999 10:19 AM  
**To:** Rahman, Aziz  
**Cc:** Watt, Jim; Pechonis, John  
**Subject:** RE: Launch/PPAP/SREA dates

okay....

watt is out today on pers business. i will have him work this asap with charlie tomorrow first thing.

john, should we be having beth and charlie and others working this today? (elaine???)

a

AUTOMOTIVE SENSORS AND CONTROLS QRA MANGER  
34 FOREST ST M/S 23-03  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
PAGE: (800) 467-3700 PIN 604-2044

-----  
**From:** Rahman, Aziz  
**Sent:** Tuesday, February 23, 1999 11:03 AM  
**To:** McGuirk, Andy; Dague, Bryan; Sharpe, Robert; Beringhouse, Steven; Douglas, Charles  
**Subject:** Launch/PPAP/SREA dates

Need list of dates for approval for all switches/changes by Ford part number with all suffixes from inception of CCPS program. Please provide the info to me by tomorrow AM for the 2.00 meeting. This is gaining serious visibility as people are trying to understand all changes.

Thanks for your help.

Regards  
Aziz.

**Epstein, Sally**

---

**From:** Watt, Jim [wattj@mail.mc.t.com]  
**Sent:** Wednesday, February 24, 1999 3:00 PM  
**To:** Rahman, Aziz; McGuirk, Andy; Beringhouse, Steven; Dague, Bryan  
**Cc:** Pechonis, John; Baumann, Russ  
**Subject:** RE: Launch/PPAP/SREA dates- Changes via SREA- Alerts

  
779S SREA-ALERT  
UPDATE.XLS

Aziz,

As we discussed this morning, below is an excel file, that depicts the SREA- Alert for the 779S family of products, that I compiled from our records here in TI-A:

<<779S SREA-ALERT UPDATE.XLS>>

Please call if any questions.

Jim Watt, QRA, magid: jw02; mail station 12-33; page (508)236-1010, no. (0696)  
ph (508) 236-1719;  
fax (508) 236-3153

-----  
**From:** McGuirk, Andy  
**Sent:** Tuesday, February 23, 1999 11:16 AM  
**To:** Rahman, Aziz  
**Cc:** Watt, Jim; Pechonis, John  
**Subject:** RE: Launch/PPAP/SREA dates

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**From:** Rahman, Aziz  
**Sent:** Tuesday, February 23, 1999 11:03 AM  
**To:** McGuirk, Andy; Dague, Bryan; Sharpe, Robert; Beringhouse, Steven; Douglas, Charles  
**Subject:** Launch/PPAP/SREA dates

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1

TI-NHTSA 016783

understand all changes.

Thanks for your help.

Regards  
Aziz.

77PB-SREA-ALERT UPDATE

Entry No.	SPECIALTY No.	DATE SUBMITTED	VALUE IMPROVEMENT	FORD P.N.	T-I-P. No.
1	40888	27-Feb-88	Use of alternate pressure tester for capacity improvement. Seals made including "wet pan" to fit on O-ring ring rather than on the plastic connector base.	F2AC-SP824-AA F2YC-SP824-AB F2DC-SP824-AA F2BA-SP824-AA F2TA-SP824-CA	77PB.3-1 77PB.3-1 77PB.3-2 77PB.3-3 77PB.3-3
2	40886	27-Feb-88	Use of 10LO7 steel from cold finished supplier in lieu of 10L14 steel due to temporary material supply interruption. 10LO7 steel made with same process.	F2AC-SP824-AA F2YC-SP824-AB F2DC-SP824-AA F2BA-SP824-AA F2TA-SP824-CA	77PB.3-1 77PB.3-1 77PB.3-1 77PB.3-2 77PB.3-3
3	40887	8-Sep-84	Change S.N. from S.N. B2CA-SP824AA to S.N. B2CA-SP824AB	B2CA-SP824AB	77PB.4-1
4	40891	17-Mar-88	Use of color pigments in plastic base containing ultraviolet resistant in lieu of heavy metal pigment for environmental regulations	F2TA-SP824-CA	77PB.3-3
5	282442	22-Jan-83	Use of part substitution of gray steel "SA". Changing from steel to cast steel shaft. Change is to internal dia only.	F2TA-SP824-CA	77PB.3-3
6	147882	2-Oct-82	Reduce internal cup diameter by .004 from .011 to .007 nominal. Address potential open circuit condition under vacuum. Insure to allow overhang under static cup conditions	F2YC-SP824-AB F2AC-SP824-AA F2DC-SP824-AA	77PB.3-1 77PB.3-1 77PB.3-2
7	147873	21-Nov-81	Change thread gaging specification from 2A to 2B go die gage. Use of AMS B7.1 industry standard for plated thread gages.	F2TA-SP824-CA	77PB.3-3
8	147871	8-Nov-81	Use blue colored environmental seal in lieu of red/black color with NPS edges to help differentiate part to reduce potential assembly errors.	F2VC-SP824-AB	77PB.3-1
9	14888	3-Apr-81	Change terminal position dimension from 0.80+/- 0.25mm to 0.80+/-0.25mm	F2TA-SC888-AA	87PB.3-3
10	147885	3-Apr-81	Change terminal position dimension from 0.80+/- 0.25mm to 0.80+/-0.25mm	F2TA-SP824-CA	77PB.3-3
11	Alert No. A1D1881BS	11-Oct-81	Use of manually loaded carrier strap assemblies vs auto in-line loaded arthrop. Manual arthrop passes BS tests.	F2VC-SP824-AB	77PB.3-1

**Morris, Irene**

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**From:** Watt, Jim  
**Sent:** Wednesday, February 24, 1999 4:59 PM  
**To:** Rahman, Aziz; McGuirk, Andy; Beringhouse, Steven; Dague, Bryan  
**Cc:** Pechonis, John; Baumann, Russell  
**Subject:** RE: Launch/PPAP/SREA dates- Changes via SREA- Alerts

Aziz,

As we discussed this morning, below is an excel file, that depicts the SREA- Alert for the 77PS family of products, that I compiled from our records here in TI-A:



77PS SREA-ALERT  
UPDATE.JUL8

Please call if any questions.

Jim Watt, QRA, mgid: jw02; mail station 12-33; page (508)236-1010, no. (0898)  
ph (008) 236-1719;  
fax (508)236-3153

---

**From:** McGuirk, Andy  
**Sent:** Tuesday, February 23, 1999 11:18 AM  
**To:** Rahman, Aziz  
**Cc:** Watt, Jim; Pechonis, John  
**Subject:** RE: Launch/PPAP/SREA dates

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B

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34 FOREST ST N/S 23-05  
ATTLEBORO, MA 01743  
TEL : (508) 236-2680  
FAX : (508) 236-3748  
PAGE: (000) 687-2700 EXT 884-2064

---

**From:** Rahman, Aziz  
**Sent:** Tuesday, February 23, 1999 11:03 AM  
**To:** McGuirk, Andy; Dague, Bryan; Sharpe, Robert; Beringhouse, Steven; Douglas, Charles  
**Subject:** Launch/PPAP/SREA dates

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Thanks for your help.

Regards  
Aziz.

## 77PS-SREA-ALERT UPDATE

Entry No.	SREA/ALERT No.	DATE SUBMITTED	VALUE IMPROVEMENT	FORD P.N.	T/P. N.
1	409006	27-Feb-95	Use of alternate pressure legair for capacity improvement. Scribe mark indicating "best pass" to be on crimp ring rather than on the plastic connector base.	F2AC-9F824-AA F2VC-9F824-AB F3DC-9F824-AA F3BA-9F824-AA F3TA-9F824-CA	77P8L3-1 77P8L3-1 77P8L5-2 77P8L3-2 77P8L3-3
2	409005	27-Feb-95	Use of 10L07 steel from cold headed supplier in lieu of 10L10 steel due to temporary material supply interruption. 10L07 steel made with same process.	F2AC-9F824-AA F2VC-9F824-AB F3DC-9F824-AA F3BA-9F824-AA F3TA-9F824-CA	77P8L3-1 77P8L3-1 77P8L5-2 77P8L3-2 77P8L3-3
3	408937	06-Sep-94	Change p.n. from p.n. 94DA-9F824AA to p.n. 94DA-9F824AB	94DA-9F824AB	77P8L4-1
4	408911	17-Mar-94	Use of color pigments in plastic base containing alternate material in lieu of heavy metal per governmental regulations	F3TA-9F824-CA	77P8L3-3
5	282442	22-Jan-93	Use of part submission of prior level "BA". Converting from snap to quiet disc switch. Change is to internal disc only.	F3TA-9F824-CA	77P8L3-3
6	147693	02-Dec-92	Reduce internal cup dimension by .004" from .081" to .087" nominal. Addresses potential open circuit condition under vacuum, traced to disc envelope under stack- up conditions	F2YC-9F824-AB F2AC-9F824-AA F3DC-9F824-AA	77P8L2-1 77P8L3-1 77P8L5-2
7	147673	21-Nov-91	Change thread gaging specification from 2A go to 3A go ring gage. Use of ANSI B1.1 Industry Standard for plated thread allowance.	F3TA-9F824-CA	77P8L3-3
8	147671	05-Nov-91	Use blue colored environmental seal in lieu of reddish color with black stripe to help differentiate seal; to reduce potential assembly errors.	F2VC-9F824-AB	77P8L2-1
9	149996	03-Apr-91	Change terminal position dimension from 0.50 +/- 0.20mm to 0.50 +/- 0.25mm	F2TA-9C886-AA	57P8L5-2
10	147665	03-Apr-91	Change terminal position dimension from 0.50 +/- 0.20mm to 0.50 +/- 0.25mm	F3TA-9F824-CA	77P8L3-3
11	Alert No. A10186183	11-Oct-91	Use of manually loaded sensor crimp machine vs auto in-line loaded crimper. Manual crimp passes E8 tests.	F2VC-9F824-AB	77P8L2-1

TI-NHTSA 018786

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**Epstein, Sally**

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**From:** Kitt, Michael (MB) [mkitt@dow.com]  
**Sent:** Thursday, February 25, 1999 8:04 AM  
**To:** Rahman, Aziz  
**Subject:** SAE paper discuss at Ford meeting

Aziz,  
The SAE paper that discusses brake fluid corrosion is SAE paper #  
971007. It from the Corrosion Prevention (SP-1265) series of papers.  
Hope this helps,  
Mike Kitt

**Morris, Irene**

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**From:** McGuirk, Andy  
**Sent:** Monday, March 01, 1999 11:22 AM  
**To:** Beumann, Russ; Beringhaus, Steven; Dague, Bryan; Pechonis, John; Rahman, Aziz; Rowland, Thomas; Douglas, Charles; Watt, Jim; Pawlowski, Robin; Baker, Gary; O'Neill, Ed; Haskell, Beth; Sharpe, Robert  
**Subject:** FORD P/S TRANSITIONS OF CURRENT INTEREST

JIM WATT, PLS PULL TOGETHER THE TEAM OF CHARLIE DOUGLAS AND ROBIN PAWLOWSKI AND OTHERS TO RECONSTRUCT THE TIME-LINE OF TI PRESSURE SWITCH 77PS FAMILY.

SPECIFIC AREAS OF INTEREST ARE QUIET SWITCH AND NORMAL SWITCH AS WELL AS GE PLASTIC AND CELENEX PLASTIC AS INSTALLED INTO THE FORD TOWN CAR PLATFORM IN MODEL YEAR '92 AND '93. UNDERSTAND WE ARE ABLE TO DEFINE THE TIER-ONE CUSTOMERS AND THERE WILL BE A NEED TO CONNECT THEM TO THIS PLATFORM AND YOU SHOULD USE VARIOUS AVENUES TO ACCOMPLISH SAME.

PLEASE PLAN A 'MINI' TEAM MEETING WITH JOHN PECHONIS AND CHARLIE DOUGLAS AND YOURSELF (AND OTHER IF YOU FEEL VALUE IS ADDED) (AT JOHN'S OFFICE ) TO REVIEW OUR STATUS LATER TODAY...SAY 4-ISH. IT IS IMPORTANT THIS INFO BE ACCURATE AS WELL AS PROMPT. THE RESULTING PRODUCT WOULD BE REVIEWED WITH RUSS TOMORROW MORNING BY ME.

A

AUTOMOTIVE SENSORS AND CONTROLS QSA NUMBER  
34 FOREST ST W/S 23-08  
MIDDLEBURY, MA 02703  
TEL : (508) 236-3000  
FAX : (508) 236-3745  
PAGE: (603) 467-3700 PIN 604-2046

**Morris, Irene**

---

**From:** Watt, Jim  
**Sent:** Monday, March 01, 1999 5:54 PM  
**To:** Baumann, Russ; Beringhaus, Steven; Dague, Bryan; Pechonis, John; Rahman, Aziz; Rowland, Thomas; Douglas, Charles; Pawlowick, Robin; Baker, Gary; O'Neill, Ed; Haskell, Beth; Sharpe, Robert; McGuirk, Andy  
**Subject:** RE: FORD P/S TRANSITIONS OF CURRENT INTEREST

Andy,

Below are the files you were requesting:

1. Town Car Switch Usage Sequence:



77PS@mcsm.ppt

2. 77PS Suppliers' Request For Engineering Analysis (SREA) history:



77PS SREA-ALERT  
UPDATE.XLS

3. Part Number 48516 (77PS Molded Base Material History):



77PS Molded Base  
P.N. 48516 UPDATE.XLS

Jim Watt, QRA, mgid: jw02; mail station 12-33; page (806)236-1010, no. (0698)  
ph (806) 236-1719;  
fax (806)236-3183

---

**From:** McGuirk, Andy  
**Sent:** Monday, March 01, 1999 10:22 AM  
**To:** Baumann, Russ; Beringhaus, Steven; Dague, Bryan; Pechonis, John; Rahman, Aziz; Rowland, Thomas; Douglas, Charles; Watt, Jim; Pawlowick, Robin; Baker, Gary; O'Neill, Ed; Haskell, Beth; Sharpe, Robert  
**Subject:** FORD P/S TRANSITIONS OF CURRENT INTEREST

JIM WATT, PLS PULL TOGETHER THE TEAM OF CHARLIE DOUGLAS AND ROBIN PAWLOWSKI AND

OTHERS TO RECONSTRUCT THE TIME-LINE OF TI PRESSURE SWITCH 77PS FAMILY.

SPECIFIC AREAS OF INTEREST ARE QUIET SWITCH AND NORMAL SWITCH AS WELL AS GE PLASTIC AND CELENEX PLASTIC AS INSTALLED INTO THE FORD TOWN CAR PLATFORM IN MODEL YEAR '82 AND '83. I UNDERSTAND WE ARE ABLE TO DEFINE THE TIER-ONE CUSTOMERS AND THERE WILL BE A NEED TO CONNECT THEM TO THIS PLATFORM AND YOU SHOULD USE VARIOUS AVENUES TO ACCOMPLISH SAME.

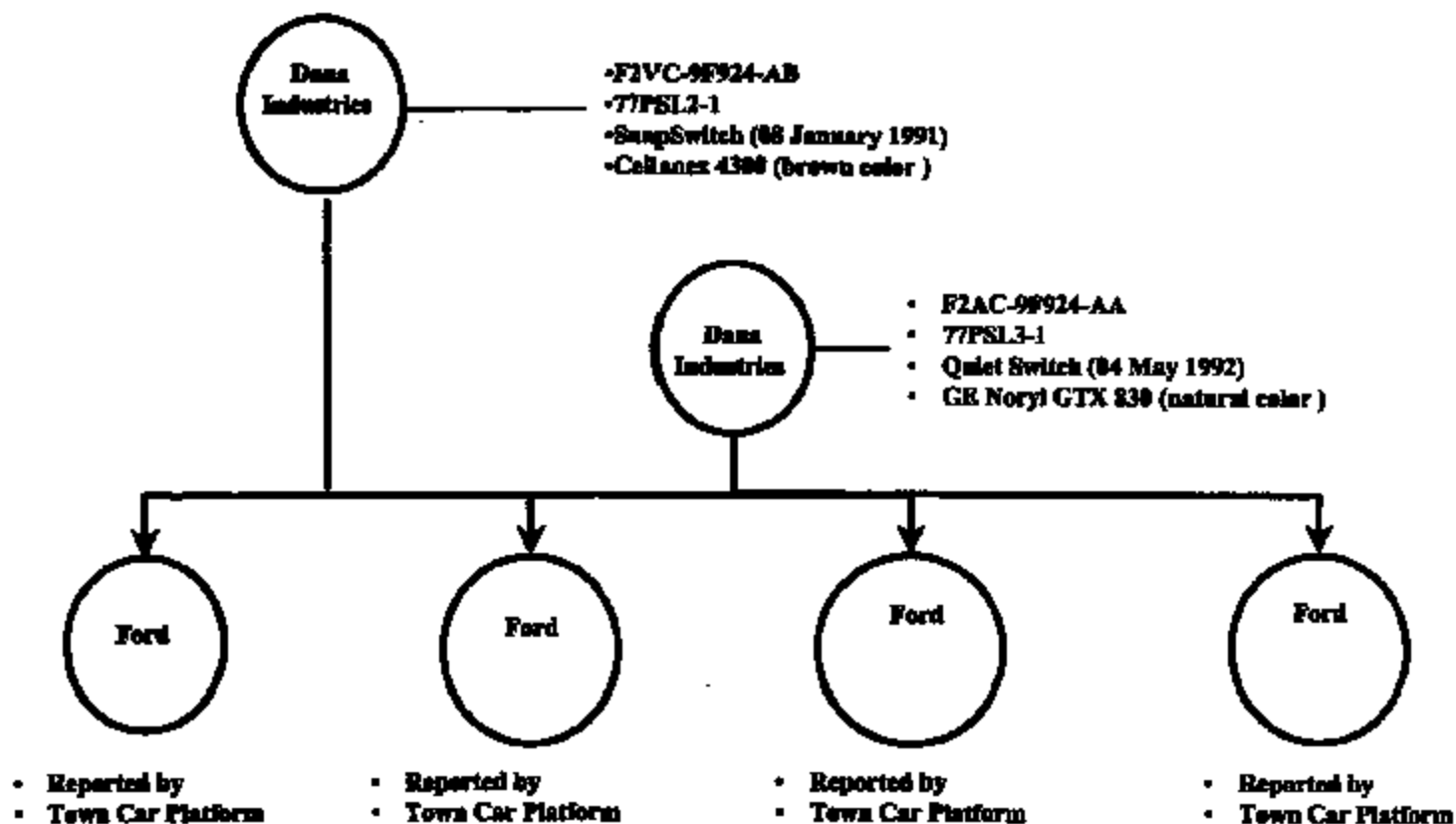
PLEASE PLAN A 'MINI' TEAM MEETING WITH JOHN PECHONIS AND CHARLIE DOUGLAS AND YOURSELF (AND OTHER IF YOU FEEL VALUE IS ADDED) (AT JOHN'S OFFICE ) TO REVIEW OUR STATUS LATER TODAY...SAY 4-ISH. IT IS IMPORTANT THIS INFO BE ACCURATE AS WELL AS PROMPT. THE RESULTING PRODUCT WOULD BE REVIEWED WITH RUSS TOMORROW MORNING BY ME.

A

AUTOMOTIVE SENSORS AND CONTROLS QSA HANDBY  
34 FOREST ST N/S 23-05  
ATLIMBORO, MA 02703  
TEL : (508) 336-3888  
FAX : (508) 336-3748  
PAGE: (800) 467-3700 PIN 604-2044

**Town Car - Cruise Control PS**  
**Ford P/N: F2VC-9F924-AB, F2AC-9F924-AA**  
**TI P/N 77PSL2-1, 77PSL3-1**

**TOWN CAR SWITCH SEQUENCE ...**



**77PS-SREA-ALERT UPDATE  
(FOR REFERENCE ONLY)**

Entry No.	SREA/ALERT No.	DATE SUBMITTED	VALUE IMPROVEMENT	FORD P.N.	TIP. N.
1	409988	27-Feb-95	Use of alternate pressure	F2AC-8F824-AA	77PBL3-1
			tester for capacity improvement.	F2VC-8F824-AB	77PBL3-1
			Scribe mark indicating "test	F3DC-8F824-AA	77PBL5-2
			pass" to be on crimp ring	F58A-8F824-AA	77PBL3-2
			rather than on the plastic	F3TA-8F824-CA	77PBL3-3
			connector base.		
2	409988	27-Feb-95	Use of 10L07 steel from cold headed	F2AC-8F824-AA	77PBL3-1
			supplier in lieu of 10L10 steel due to	F2VC-8F824-AB	77PBL2-1
			temporary material supply interruption.	F3DC-8F824-AA	77PBL5-2
			10L07 steel made with same	F58A-8F824-AA	77PBL3-2
			process.	F3TA-8F824-CA	77PBL3-3
3	409937	08-Sep-94	Change p.n. from	94DA-8F924AB	77PBL4-1
			p.n. 94DA-8F924AA to		
			p.n. 94DA-8F924AB		
4	409911	17-Mar-94	Use of color pigments in plastic	F3TA-8F824-CA	77PBL3-3
			base containing alternate		
			material in lieu of heavy metal		
			per governmental regulations		
5	283442	22-Jan-93	Use of part submission of	F3TA-8F824-CA	77PBL3-3
			prior level "BA". Converting		
			from snap to quiet disc switch.		
			Change is to internal disc only.		
6	147883	02-Dec-92	Reduce internal cup dimension	F2VC-8F824-AB	77PBL2-1
			by .004" from .091" to .087" nominal.	F2AC-8F824-AA	77PBL3-1
			Address potential open circuit	F3DC-8F824-AA	77PBL5-2
			condition under vacuum, traced		
			to disc envelope under stack-		
			up conditions		
7	147873	21-Nov-91	Change thread gaging specification	F3TA-8F824-CA	77PBL3-3
			from 2A go to 3A go ring gage.		
			Use of ANSI B1.1 industry Standard for		
			plated thread allowance.		
8	147871	05-Nov-91	Use blue colored environmental	F2VC-8F824-AB	77PBL2-1
			seal in lieu of reddish color with black		
			stripe to help differentiate seal;		
			to reduce potential assembly errors.		
9	149699	03-Apr-91	Change terminal position	F2TA-9C808-AA	57PBL5-2
			dimension from 0.50+/- 0.20mm		
			to 0.50+/-0.25mm		
10	147885	03-Apr-91	Change terminal position	F3TA-8F824-CA	77PBL3-3
			dimension from 0.50+/- 0.20mm		
			to 0.50+/-0.25mm		
11	Alert No. A10168193	11-Oct-91	Use of manually loaded sensor crimp	F2VC-8F824-AB	77PBL2-1
			machine vs auto in-line loaded crimper.		
			Manual crimp passes E3 tests.		

TI-NHTSA 018795

77PS-Molded Base 46515 UPDATE  
(FOR REFERENCE ONLY)

Entry No.	Rev No	DATE OF ECN	Drwg Bys	VALUE IMPROVEMENT	Design Engr	FORM P.N.	T.P. N.	p.a. 46515- x	Material
1	A	First Issue 08-Nov-90	Aagle	Replaced BX 9423-48	Steve Oflter	F2VC-8P824-AB	77PBL2-1	-2(brown,#2)	Cellanex 4300
				(dated 08/28/90)		F8LC-8P824-AA	77PBL2-3	-1(black,#1)	Cellanex 4300
				Cellanex 4300					
2	B	06-Jan-91	Aagle	Cellanex 4300	Steve Oflter	F2VC-8P824-AB	77PBL2-1	-2(brown,#2)	Cellanex 4300
				CN 16897		F8LC-8P824-AA	77PBL2-3	-1(black,#1)	Cellanex 4900
				Correct/clarify print views					
3	C	04-May-92	Aagle	Added (-3)	Steve Oflter	F2AC-8P824-AA	77PBL3-1	-3(natural,#2)	GE Noryl GTX 830
				GE Noryl GTX 830		84DA-8P824-AA	77PBL4-1	-3(natural,#2)	GE Noryl GTX 830
				CRM 08888		F3DC-8P824-AA	77PBL5-2	-3(natural,#2)	GE Noryl GTX 830
4	D	21-May-92	Aagle	Added (-4 through -8)	Steve Oflter	F2AC-8P824-AA	77PBL3-1	-3(natural,#2)	GE Noryl GTX 830
				CRM 08128		F2VC-8P824-AB	77PBL5-1	-2(brown,#2)	Cellanex 4300
				(-4, -7) GE Noryl GTX 830		F3DC-8P824-AA	77PBL5-2	-3(natural,#2)	GE Noryl GTX 830
				(-5, -6, -8) Cellanex 4900		F3TA-8P824-CA	77PBL3-3	-7(red, #1)	GE Noryl GTX 830
						F37A-8P824-AA	87PBL2-2	-8(gray, #1)	Cellanex 4300
						F37A-8P824-AA	87PBL3-3	-8(gray, #1)	Cellanex 4300
5	E	09-Jul-92	Aagle	Added -10	Steve Oflter	F88A-8P824-AA	77PBL3-2	-10(dk gray, #1)	GE Noryl GTX 830
				(GE Noryl GTX 830)					
				CRM 08081					
6	F	29-Dec-93	Aagle	Clarified dimensions	Aziz Rahman				
				CRM 18919					
7	G	01-May-95	Cadras	Dim added GOC note	Chris Wagner				
				CRM 26757					
8	H	20-May-96	Cadras	Note 4	Chris Wagner				
				Regrind was 80%					
				CRM 28067					
9	J	13-Jan-97	CAD	Adjust 3 notch dim	Di Ha				
				Added note CAD drag					
				CRM 32804					
10	K	18-Dec-97	CAD	Change dim placar	Di Ha				
				Remove 45- 65 degree chamfer, CRM 36283					
11	L	23-Feb-98	CAD	Change .065/.046	Di Ha				
				chamfer to .030/.020					
				CRM 36187					
12	M	01-Apr-98	CAD	Added -11 Material	Di Ha	XW43-8P824-AA	87PBL2-6	-11(brown, #1)	GE Noryl GTX 830
				GE Noryl GTX 830					
				CRM 36658					
13	N	06-May-98	CAD	Added -12 Material	Di Ha	A80820	87PBL2-6	-12(white, #1)	Cellanex 4300
				Cellanex 4300					
				ECN M40538					

TI-NHTSA 018797

**Watt, Jim**

---

**From:** Watt, Jim  
**Sent:** Monday, March 01, 1999 10:34 AM  
**To:** Dague, Bryan; Douglas, Charles; Haskell, Beth; McGuirk, Andy; Pawloweki, Robin; Pechonia, John; Rahman, Aziz  
**Subject:** 77PS Timeline- Review Of Information to date

**When:** Monday, March 01, 1999, 4:00 PM - 5:00 PM, (GMT-05:00) Eastern Time (US & Canada)  
**Where:** John Pechonia's Office

\*~\*~\*~\*~\*~\*~\*~\*~\*~\*

Please attend an update meeting on the 77PS product timeline at John Pechonia's office today at 4:00pm.

We should be able to review:

1. SREA history- J. Watt
2. 77PS base material history p.n.48516- J. Watt
3. Quiet disc / snap disc introduction to the 77PS switches- B. Dague
4. Ford Town Car switch usage history- C. Douglas
5. Tier -one usage of 77PS switches destined for Ford Town Car Platform- R. Pawlowski

Thanks,



**Watt, Jim**

---

**From:** McGuirk, Andy  
**Sent:** Monday, March 01, 1999 10:22 AM  
**To:** Baumann, Russ; Beringhouse, Steven; Dague, Bryan; Pechonis, John; Rahman, Aziz; Rowland, Thomas; Douglas, Charles; Watt, Jim; Pawlowski, Robin; Baker, Gary; O'Neill, Ed; Haskell, Beth; Sharps, Robert  
**Subject:** FORD P/S TRANSITIONS OF CURRENT INTEREST

JIM WATT, PLS PULL TOGETHER THE TEAM OF CHARLIE DOUGLAS AND ROBIN PAWLOWSKI AND OTHERS TO RECONSTRUCT THE TIME-LINE OF TI PRESSURE SWITCH 77PS FAMILY.

SPECIFIC AREAS OF INTEREST ARE QUIET SWITCH AND NORMAL SWITCH AS WELL AS GE PLASTIC AND CELENEX PLASTIC AS INSTALLED INTO THE FORD TOWN CAR PLATFORM IN MODEL YEAR '92 AND '93. I UNDERSTAND WE ARE ABLE TO DEFINE THE TIER-ONE CUSTOMERS AND THERE WILL BE A NEED TO CONNECT THEM TO THIS PLATFORM AND YOU SHOULD USE VARIOUS AVENUES TO ACCOMPLISH SAME.

PLEASE PLAN A 'MINI' TEAM MEETING WITH JOHN PECHONIS AND CHARLIE DOUGLAS AND YOURSELF (AND OTHER IF YOU FEEL VALUE IS ADDED) (AT JOHN'S OFFICE ) TO REVIEW OUR STATUS LATER TODAY...SAY 4-ISH. IT IS IMPORTANT THIS INFO BE ACCURATE AS WELL AS PROMPT. THE RESULTING PRODUCT WOULD BE REVIEWED WITH RUSS TOMORROW MORNING BY ME.

A

AUTOMOTIVE SENSORS AND CONTROLS Q&A NUMBER  
34 FOREST ST W/S 23-06  
ATLANTIC, NJ 02703  
TEL : (508) 236-3080  
FAX : (508) 238-3748  
PHONE: (800) 467-3700 PIN 604-2044

**Epstein, Sally**

**From:** Douglas, Charles [c-douglas2@email.mc.t.com]  
**Sent:** Monday, March 01, 1999 10:15 AM  
**To:** Haskell, Beth; Watt, Jim  
**Subject:** RE: FW: 77FS Timeline- Review Of Information to date

Jim,

The information available from customer service is information that Andy specifically requested. I have not seen a copy of the report that was run and I am assuming that Robin and/or Andy is currently in possession of this information.

Regards,

Charlie

---

**Meeting Request**  
**When:** Monday, March 01, 1999, 4:00 PM - 5:00 PM, (GMT-05:00)  
**Eastern Time (US & Canada)**  
**Where:** John Pechonis' Office  
**From:** Watt, Jim (sent by Haskell, Beth)  
**Date Received:** Monday, March 01, 1999 10:39 AM  
**To:** Douglas, Charles  
**CC:**  
**Subject:** FW: 77FS Timeline- Review Of Information to date

Charlie, do you have all the info you need from CS?

---

**Meeting Request**  
**When:** Monday, March 01, 1999, 4:00 PM - 5:00 PM,  
(GMT-05:00)  
**Eastern Time (US & Canada)**  
**Where:** John Pechonis' Office  
**From:** Watt, Jim  
**Date Received:** Monday, March 01, 1999 10:34 AM  
**To:** Deque, Bryan; Douglas, Charles; Haskell, Beth;  
McQuirk,  
Andrew; Pawlowski, Robin; Pechonis, John; Rahman, Aziz  
**CC:**  
**Subject:** 77FS Timeline- Review Of Information to date

Please attend an update meeting on the 77FS product  
timeline at  
John Pechonis' office today at 4:00pm.

We should be able to review:

1. SREA history- J. Watt
2. 77FS base material history p.n.46515- J. Watt
3. Quiet disc / snap disc introduction to the 77FS  
switches- B.  
Deque
4. Ford Town Car switch usage history- C. Douglas

**Watt, Jim**

---

**From:** Douglas, Charles  
**Sent:** Monday, March 01, 1999 11:14 AM  
**To:** Haskell, Beth; Watt, Jim  
**Subject:** RE: FW: 77PS Timeline- Review Of Information to date

Jim,

The information available from customer service is information that Andy specifically requested. I have not seen a copy of the report that was run and I am assuming that Robin and/or Andy is currently in possession of this information.

Regards,

Charlie

---

**Meeting Request**

**When:** Monday, March 01, 1999, 4:00 PM - 5:00 PM, (GMT-05:00)  
**Eastern Time (US & Canada)**  
**Where:** John Pechonis' Office  
**From:** Watt, Jim (sent by Haskell, Beth)  
**Date Received:** Monday, March 01, 1999 10:39 AM  
**To:** Douglas, Charles  
**Cc:**  
**Subject:** FW: 77PS Timeline- Review Of Information to date

Charlie, do you have all the info you need from CS?

---

**Meeting Request**

**When:** Monday, March 01, 1999, 4:00 PM - 5:00 PM,  
(GMT-05:00)  
**Eastern Time (US & Canada)**  
**Where:** John Pechonis' Office  
**From:** Watt, Jim  
**Date Received:** Monday, March 01, 1999 10:34 AM  
**To:** Dague, Bryan; Douglas, Charles; Haskell, Beth;  
McGuirk,  
Andrew; Pawlowski, Robin; Pechonis, John; Rahman, Aziz  
**Cc:**  
**Subject:** 77PS Timeline- Review Of Information to date

Please attend an update meeting on the 77PS product  
timeline at  
John Pechonis' office today at 4:00pm.

We should be able to review:

**Epstein, Sally**

**From:** Watt, Jim [jwatt@email.mt.ti.com]  
**Sent:** Monday, March 01, 1999 3:55 PM  
**To:** Baumann, Russ; Beringhaus, Steven; Degue, Bryan; Pechonis, John; Rahman, Aziz; Rowland, Thomas; Douglas, Charles; Pawlowski, Robin; Baker, Gary; O'Neill, Ed; Haskell, Beth; Sharpe, Robert; McGuirk, Andy  
**Subject:** RE: FORD P/S TRANSITIONS OF CURRENT INTEREST

  
77PSstimeline.ppt

  
77PS 3REA-ALERT  
UPDATE.XLS

  
77PS Molded Base  
F.N. 46515 UP-

Andy,

Below are the files you were requesting:

1. Town Car Switch Usage Sequence:  
<<77PSstimeline.ppt>>
2. 77PS Suppliers' Request For Engineering Analysis (SREA) history:  
<<77PS 3REA-ALERT UPDATE.XLS>>
3. Part Number 46515 (77PS Molded Base Material History):  
<<77PS Molded Base F.N. 46515 UPDATE.XLS>>

JIM WATT, CRA, msgid: jw02; mail station 12-33; pager (508)236-1010, no. (0696)  
ph (508) 236-1719;  
fax (508)236-3153

-----  
**From:** McGuirk, Andy  
**Sent:** Monday, March 01, 1999 10:22 AM  
**To:** Baumann, Russ; Beringhaus, Steven; Degue, Bryan; Pechonis, John; Rahman, Aziz; Rowland, Thomas; Douglas, Charles; Watt, Jim; Pawlowski, Robin; Baker, Gary; O'Neill, Ed; Haskell, Beth; Sharpe, Robert  
**Subject:** FORD P/S TRANSITIONS OF CURRENT INTEREST

JIM WATT, PLS' PULL TOGETHER THE TEAM OF CHARLIE DOUGLAS AND ROBIN PAWLOWSKI AND OTHERS TO RECONSTRUCT THE TIME-LINE OF TI PRESSURE SWITCH 77PS FAMILY.

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TI-NHTSA 018804

RESULTING PRODUCT WOULD BE REVIEWED WITH BUSS TOMORROW MORNING BY ME.

A

AUTOMOTIVE SENSORS AND CONTROLS QRA MANGER  
34 FOREST ST W/S 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
PAGE: (800) 467-3700 PIN 604-2044

Baumann, Russ  
From: Rahman, Aziz  
Sent: Tuesday, March 02, 1998 5:11 PM  
To: McGuirk, Andy; Cague, Bryan; Douglas, Charles; Sharpe, Robert; Baumann, Russ;  
Seringhaus, Steven  
Subject: FW: SAE paper discuss at Ford meeting

Steve/Bryan

Sounds like a good paper for info on brake fluid degradation. It may be available online??

-----  
From: Kitz, Michael (MKitz@TP.noid@sa.com)  
Sent: Thursday, February 26, 1998 8:03 AM  
To: 'aziz@ll.com'  
Subject: SAE paper discuss at Ford meeting

Aziz,  
The SAE paper that discusses brake fluid corrosion is SAE paper #  
971007. It from the Corrosion Prevention (SP-1265) series of papers.  
Hope this helps,  
Mike Kitz

TI-NHTSA 018806

**Morris, Irene**

---

**From:** Pechonla, John  
**Sent:** Wednesday, March 03, 1999 8:29 PM  
**To:** Rowland, Thomas  
**Subject:** 77PSL2-1

Tom, I don't have all the pieces together yet, but I think I've got a pretty good ballpark of what I believe it will take to make 200K replacement units of the 77PSL2-1:

- 2 weeks to staff the third shift on the AMI sensor machine, device assembly and pressure test
- 2 weeks to get initial material in place (key components: base/export) May be slightly longer if we need to procure the Calenax material for the base
- I think we can initiate production before the end of this month provided we do not need to re-PPAP
- Actual build time for the 200K units should be 8-10 weeks through running this on the third shift

So, if all goes well, I think we can complete the build around the end of May. There is potential to pull this in if everything goes perfectly.

TI-NHTSA 019807

Watt, Jim

---

From: Sharpe, Robert  
Sent: Thursday, March 04, 1999 11:59 AM  
To: Watt, Jim; McGuirk, Andy; Baumann, Russ; Douglas, Charles  
Cc: Dodd, Bob  
Subject: RE: FORD P/S TRANSITIONS OF CURRENT INTEREST-

Hi Jim,

I was with Andy yesterday for the weekly meeting at Ford and discussed the possibility of yourself visiting Ford next week. When Andy left Detroit, it was not confirmed that you would be coming next week. Is this now official ??

I am traveling to San Diego on 3/8 - 3/10 with Visteon to install VOV samples onto Ford vehicles (San Diego Vehicle Fleet - Police Crown Vics).

Let me know,

***Rob Sharpe***

Tele: (416) 305-3729  
Fax: (416) 305-3724  
rsharpe@f.com

**REDACTED**

TI-NHTSA 018808



ph (508) 256-1718;  
fax (508) 256-3153

**From:** McGuirk, Andy  
**Sent:** Monday, March 01, 1999 10:22 AM  
**To:** Baumann, Russ; Beringhaus, Steven; Dagus, Bryan; Pechonis, John; Rahman, Aziz; Rowland, Thomas; Douglas, Charles; Watt, Jim; Pawlowski, Robin; Baker, Gary; O'Neill, Ed; Haskell, Beth; Sharpe, Robert  
**Subject:** FORD P/S TRANSITIONS OF CURRENT INTEREST

JIM WATT, PLS PULL TOGETHER THE TEAM OF CHARLIE DOUGLAS AND ROBIN PAWLOWSKI AND OTHERS TO RECONSTRUCT THE TIME-LINE OF TI PRESSURE SWITCH 77PS FAMILY.

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A

**Automotive Sensors and Controls QA Manager**  
34 FOREST ST N/S 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
PAGE: (800) 467-3700 ext 604-2044

**Epstein, Sally**

---

**From:** McGuirk, Andy [a-mcguirk@email.mc.ti.com]  
**Sent:** Friday, March 12, 1999 10:31 AM  
**To:** Beringhouse, Steven; Degus, Bryan; Baumann, Russ  
**Cc:** Rowland, Thomas; Paschalis, John  
**Subject:** FW: (U) Brainstorming

**AUTOMOTIVE SENSORS AND CONTROLS QRA MANGER**  
34 FOREST ST N/S 22-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3000  
FAX : (508) 236-3745  
PAGE: (800) 457-3700 FAX 604-2044

**From:** Frederick J. Porter[SMTP:fporter@ford.com]  
**Sent:** Friday, March 12, 1999 9:01 AM  
**To:** a-mcguirk@email.mc.ti.com  
**Subject:** (U) Brainstorming

**to:** a-mcguirk@email.mc.ti.com

Regards,  
Fred Porter GV - fporter fporter@ford.com  
(313)845-3722  
Chassis E/E Systems Applications (313)845-3722  
Bldg 3 - Mail Drop 5030 - Cubicle 1E004 Fax: 390-4145  
+++ Forwarding note from FPORTER --0REN007 03/11/99 17:55 +++  
**To:** N1654594--EXTERNAL

**FROM:** F. J. Porter , USAET(UTC -05:00)  
**Subject:** (U) Brainstorming

Andy,

Attached is a list of ideas that were developed by a group from our research laboratory of potential changes that could be made to the switch that may improve our condition. TI has investigated some of these already.

I would like you to go through each idea and let us know what your feasibility and manufacturing issues are as well as timing for their potential implementation.

- 1. Coat cup with plastic or other non-conductive coating (like anodizing)  
    Lengthens corrosive path to ground  
    Insulates from broken spring switch contacting ground
- 2. Make cup of non-conductive material  
    Lengthens corrosive path to ground  
    Insulates from broken spring switch contacting ground
- 3. Add plastic diaphragm between cup/transfer pin and the spring contact/switch  
    cavity  
    Additional layer of isolation between mechanical components and electrical components
- 4. Place plastic insulator disk on the cup with hole only for the transfer pin

**Epstein, Sally**

---

**From:** Mulligan, Sean [smulligan@email.mca.com]  
**Sent:** Friday, March 12, 1999 9:30 AM  
**To:** Watt, Jim  
**Subject:** 77P&L FORD TEST DATE CODE

Hi Jim,  
Here is the date code information on the Ford test switches.

77P&L2-1 8280  
77P&L3-1 7184  
77P&L4-1 9048

It would be helpful if you tell me why you need this information.

Thank you,  
Sean

**Epstein, Sally**

---

**From:** Dague, Bryan [bdague@email.mc.ti.com]  
**Sent:** Friday, March 12, 1999 1:16 PM  
**To:** West, Jim  
**Subject:** FW: 77ps.ppt



Jim,

Here is the one I was talking about this AM. I will try to add to it.

By

-----  
**From:** Proia, Stephen  
**Sent:** Wednesday, January 06, 1999 7:52 AM  
**To:** Douglas, Charles; Hopkins, AL; McGuirk, Andy; Baker, Gary; Dague, Bryan; Baumann, Russ  
**Subject:** 77ps.ppt

<<77ps.ppt>>  
Here's the "Cause & Effect" diagram we discussed yesterday. Please review and comment. Thanks

Regards,

Steve

**Epstein, Sally**

---

**From:** McGuirk, Andy [a-mcguirk@email.mc.it.com]  
**Sent:** Friday, March 19, 1999 2:57 PM  
**To:** Deque, Bryan; Rowland, Thomas; Beringhouse, Steven; Pechonis, John  
**Subject:** FW: Tim Donovan - FORD

**Importance:** High



Tm

Donovan\_FORD.doc

AUTOMOTIVE SENSORS AND CONTROLS GRA MANGER  
34 FOREST ST M/S 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
PAGE: (800) 467-3700 EIN 604-2044

Team,

"Attorney - Client Privileged Communication"

Please review and call me to edit

Thank you for your input.

<<Tim Donovan\_FORD.doc>>

March 19, 1999

Mr. Tim F. Donovan, Manager  
E/E Systems-Ongoing Prod. Dev.  
E/E Systems Engineering  
Building 5, Mail Drop 5017  
20000 Rotunda Drive, Rm 1A043  
Dearborn MI 48121-2053

Dear Tim,

Thank you for taking the time to visit with me on Wednesday, March 17, 1999.

For four months, the Texas Instruments Automotive Sensors & Controls Team has been supporting the Ford Core Diagnostic Team with technical facts, data, and analysis regarding our brake pressure switch product.

A senior TI pressure switch engineer was in residence at Ford for three weeks to assist with any switch related issues in the system diagnostic process. Senior TI participation has also been involved in the last six consecutive Ford Core Team meetings.

Below is a very brief recap of activities leading us to several conclusions:

Preliminary dealer and salvage yard samples have produced several pressure switches with brake fluid leakage supporting a theory that switches were 'failing' in the field application. Certain switches evidenced wear-out due to a combination of exposure to many pressure cycles (there appears to be a vehicle application cycle quantity issue) and water accelerating Kapton<sup>®</sup> diaphragm degradation.

**Conclusion to date:** Some switches exhibit end-of-life wear out & leak brake fluid and appear to be beyond life

We also investigated switch capability, and using agreed upon accelerated simulation life testing techniques, demonstrated the ability of the model year '92-'93-'94 Town Car brake switches to consistently exceed "cycle life specification" of 500,000 pressure cycles. TI Weibull reports of pressure switches tested in '99 conservatively demonstrate 95% reliability to 1 million cycles (with confidence greater than 50%).

**Conclusion to date:** Switch meets or exceeds specification.

TI-NHTSA 018818

Tim F. Donovan  
March 19, 1999  
Page 2

Initially it was theorized that brake fluid leakage through the pressure switch contributed to thermal events but both TI and Ford have been unsuccessful in recreating thermal events with brake fluid inside the switch even under extreme conditions. Efforts are still continuing with TI currently experimenting with switch tests using "old" brake fluid to create more knowledge regarding combinations of "old" brake fluid and water.

**Conclusion to date:** Brake fluid leakage in switch cavity does not cause thermal events.

Based upon extensive analysis of failed switches (and previous experience) we have developed and delivered a model of accelerated plastic base ignition using the constant power of the speed control circuit and conductive fluids (ionic enhanced water). This model used the 15-amp/12 volt DC power available in the speed control circuit (not the 1-amp load required by the clutch application) and created ignition using water induced corrosion based products (not brake fluid) in the switch cavity. TI understands the model sufficiently to re-create ignition in a laboratory environment.

**Conclusion to date:** Continuous speed control power allows long term corrosion if conductive fluids are present in the switch cavity.

Electrical current in excess of application needs supports corrosion process.

We would like to review the scientific problem solving process and discuss the findings to assist in accelerating our joint understanding and actions. Enclosed is a copy of the resulting theory based significant factors we have delivered to the core team to assist in the system understanding and diagnostics. Please consider a meeting with our General Manager and Design Engineering Manager to achieve this result.

Regards,

Andrew C. McGuirk  
QRA Manager  
Texas Instruments

ACM/paw

C: Thomas E. Masters - Ford  
Frederick J. Porter - Ford

TI-NHTSA 018816

Thomas Rowland - Texas Instruments  
Steve Beringhouse - Texas Instruments

TI-NHTSA 018817



**Epstein, Sally**

---

**From:** Warner, Pam [pwarn@small.mc.tl.com]  
**Sent:** Monday, March 22, 1999 9:45 AM  
**To:** Watt, Jim  
**Cc:** McGuirk, Andy  
**Subject:** RE: foils for presentation 3/24/99

Jim,  
Thank you for your quick response and for attaching the files. Some of us send the information and then realize we forgot to attach any information with it. Thanks again and have a good week.

-----  
**From:** Watt, Jim  
**Sent:** Monday, March 22, 1999 10:34 AM  
**To:** Warner, Pam  
**Cc:** McGuirk, Andy  
**Subject:** RE: foils for presentation 3/24/99

Below are the updated files for 77PS:

<<File: Ford 77PS(diaphragm).ppt>>

<<File: Ford 77PS(thermalevents)switch.ppt>>

<<File: Ford 77PS(thermalevents)12r.ppt>>

Jim Watt, QRA, mgid: jw02; mail station 12-33; page  
(508)236-1010, no. (0696)  
ph (508) 236-1719;  
fax (508)236-3153

-----  
**From:** Warner, Pam  
**Sent:** Monday, March 22, 1999 9:38 AM  
**To:** Watt, Jim  
**Cc:** McGuirk, Andy  
**Subject:** foils for presentation 3/24/99

Jim,  
Attached are the foils you sent to andy mcguirk (electronically) for his presentation on 3/17. Will you please update for his presentation on Wednesday, March 24th and send them back to my attention by early Tuesday, March 23 so I can electronically send them for his meeting. Thanks Jim. If you have any questions, please call me on extension 2324 or send me an email.

**Epstein, Sally**

---

**From:** Mulligan, Sean [smulligan@email.mc.tl.com]  
**Sent:** Tuesday, March 30, 1999 10:34 AM  
**To:** Demers, Richard; Dague, Bryan; Hey, D; McGuirk, Andy; Sunderam, Sundar; Watt, Jim  
**Cc:** Proia, Stephen; Douglas, Charles; Homol, Stan; Pechonis, John; Sharpe, Robert  
**Subject:** RE: Annual Re-certification for 77P8L3-S

Jim,

although impulse tests have recently been performed on this family of devices,

Calibration  
Voltage Drop  
Current Leakage  
Proof Test

were not performed either pre test or post test. This is required per Ford spec.

Regards,

Sean

-----  
**From:** Watt, Jim  
**Sent:** Tuesday, March 30, 1999 11:05 AM  
**To:** Demers, Richard; Dague, Bryan; Hey, D; Mulligan, Sean;  
McGuirk, Andrew; Sunderam, Shanmugasundaram  
**Cc:** Proia, Stephen; Douglas, Charles; Homol, Stan; Pechonis,  
John; Sharpe, Robert  
**Subject:** RE: Annual Re-certification for 77P8L3-S

Dan Hey,

thanks for the update.

We are currently significantly discrepant to the testing/documentation sequence requirements of Tokico/ Ford Motor Co. (We need to review the actions to resolve how not to be discrepant in the future. )

1. For the immediate timeframes, please finalize your testing to date, documentation, pre/post tests, ..... and compile for interim submission to Tokico. I will let them know what the action plan is to complete the remaining items, but we should be able to compile what has been completed to date.

2. In recent discussions with Sean Mulligan, some/most of the above tests have already been completed on similar 77PS part numbers for other programs and business needs; we should always review these associated tests for 'tests by similarity', where applicable.

thanks,

-----  
Jim Watt, QRA, msqid: jw02; mail station 12-33; page  
(508)236-1010, no. (0696)  
ph (508) 236-1719;  
fax (508)236-3153

Jim Watt, QRA, msgid: jw02, mail station 12-33,  
page (508)236-1010, no. (0696)  
ph (508) 236-1719;  
fax (508)236-3153

-----  
From: Douglas, Charles  
Sent: Monday, March 29, 1999 3:34 PM  
To: Watt, James  
Cc: Gildea, Robert; Preis, Stephen  
Subject: Annual Re-certification for

77PSL3-3

Jim,

I received a call today from Greg Smith, purchasing at Tokico inquiring about our lack of a response to Tokico's request for annual re-certification of the 77PSL3-3. The likelihood is that the request was either not sent in or was sent to the wrong person as there appears to have been a number of personnel changes of the years that Tokico is not up on.

Greg asked that we proactively contact:

Terry Anglin  
Quality Department  
(606) 995-2116

The objective is to address this issue and understand what documents Tokico needs to receive from us. I would appreciate it if you would take the lead on this activity and contact Terry directly.

Thanks,

Charlie

Charlie Douglas  
(508) 236-3657 (P)  
(508) 236-1598 (F)  
c-douglas2@ti.com

**Epstein, Sally**

---

**From:** Rose, Elaine [erose@email.mo.tl.com]  
**Sent:** Wednesday, March 31, 1999 2:00 PM  
**To:** Hey, D  
**Cc:** Dague, Bryan; Proja, Stephen; McGuirk, Andy; Flynn, Ruth  
**Subject:** RE: IP-2 TEST FAILURE ANALYSIS

resend; post humidity # 43-48  
regards,  
elaine rose  
LAL/QATECH  
ph. # 508-236-1907  
fax # 508-236-2326

-----  
**From:** Rose, Elaine  
**Sent:** Wednesday, March 31, 1999 2:23 PM  
**To:** Hey, Daniel  
**Cc:** Dague, Bryan; Proja, Stephen; McGuirk, Andy; Flynn, Ruth  
**Subject:** IP-2 TEST FAILURE ANALYSIS

In reviewing the post fluid resistance;post impulse & humidity failures, here are the findings:

serial # 538-15-60 (device # 19-30) post impulse fail out:

this test/Lab # reserved 11/12/97

#19, 23 & 30 auto pressure test failure of ZPLF, inaccurate reading

#25 low actuation

#26 passed actuation

#29 low actuation

measurement of the base,pin & sensors indicate normal wear &/or mispinning

base/contact configuration has since changed since product build:  
10/23/97 ( produce is 17 months old )

>> ( device # 43-48) post humidity fail out:

F/A INCONCLUSIVE..

base/contact configuration has since changed since product build:  
10/23/97

regards,  
elaine rose  
LAL/QATECH  
ph. # 508-236-1907  
fax # 508-236-2326

**Epstein, Sally**

---

**From:** Rose, Elaine [erose@email.mo.ti.com]  
**Sent:** Wednesday, March 31, 1999 1:29 PM  
**To:** Hey, D  
**Cc:** Degus, Bryan; Proia, Stephen; McGuirk, Andy; Flynn, Ruth  
**Subject:** IP-2 TEST FAILURE ANALYSIS

In reviewing the post fluid resistance, post impulse & humidity failures, here are the findings:

serial # 538-15-60 (device # 19-30) post impulse fall out:

this test/lab # reserved 11/12/97

#19, 23 & 30 auto pressure test failure of ZPLF, inaccurate reading  
#25 low actuation  
#26 passed actuation  
#29 low actuation  
measurement of the base, pin & sensors indicate normal wear &/or mispinning

base/contact configuration has since changed since product build: 10/23/97  
( produce is 17 months old )

>> ( device # 7-18) post humidity fall out:

F/A INCONCLUSIVE..

base/contact configuration has since changed since product build: 10/23/97

regards,  
elaine rose  
LAL/QATECH  
ph. # 508-236-1907  
fax # 508-236-2326

**Epstein, Sally**

---

**From:** Mulligan, Sean [smulligan@email.mc.ll.com]  
**Sent:** Thursday, April 01, 1999 10:00 AM  
**To:** McGuirk, Andy  
**Subject:** Photos



burn\_comparison.ppt



Noryl\_flame\_1.ppt



Noryl\_flame\_2.ppt



Noryl\_flame\_3.ppt

Hi Andy,

Here are some photos you requested. (Power point format).

<<burn\_comparison.ppt>> <<Noryl\_flame\_1.ppt>> <<Noryl\_flame\_2.ppt>>  
<<Noryl\_flame\_3.ppt>>

All the best,

Sean

TI-NHTSA 018825



TI-NHTSA 018826

# 77PS Base Material Comparison

TI-NHTSA 018827

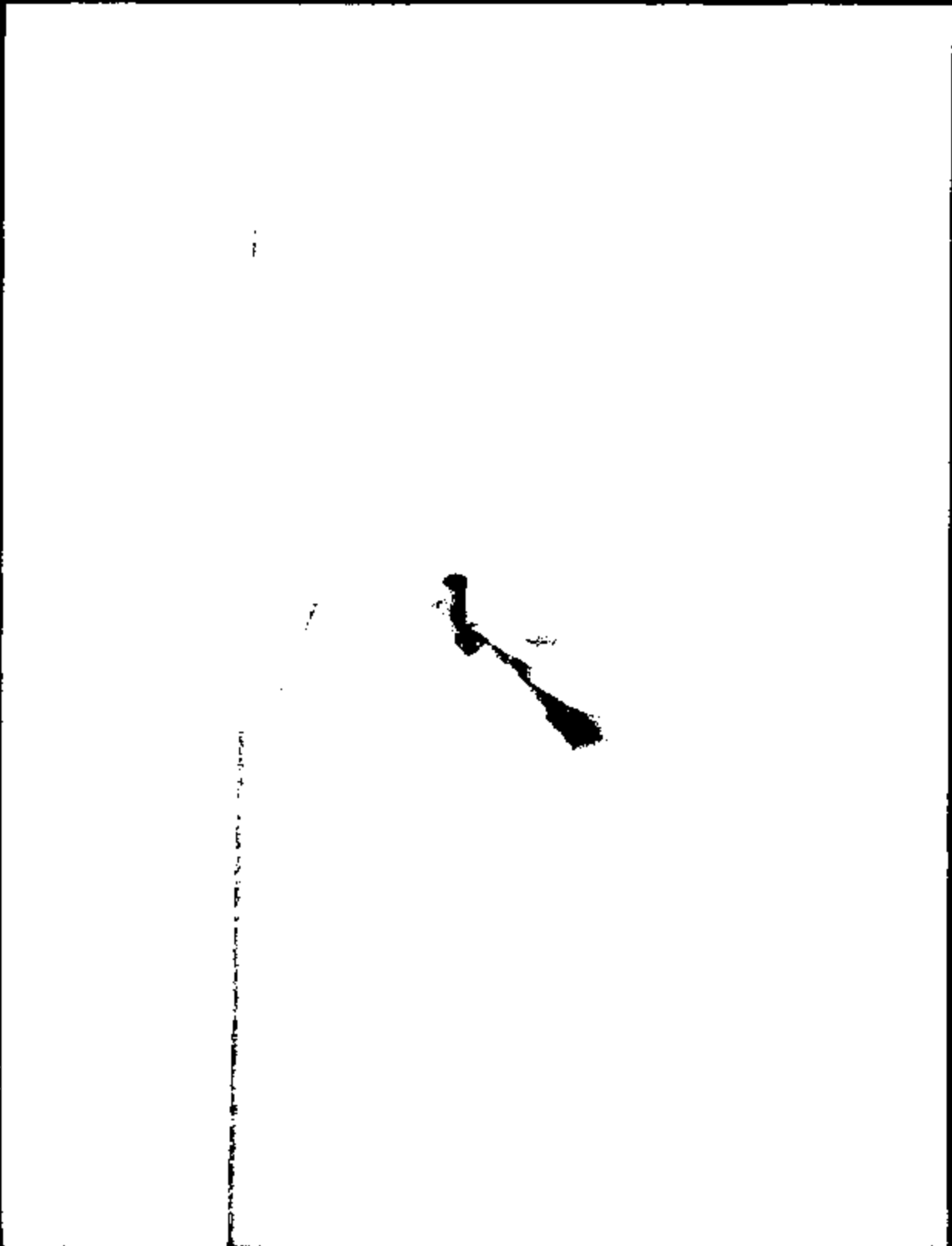
**Cellanex 4300**



**Cellanex 3316**



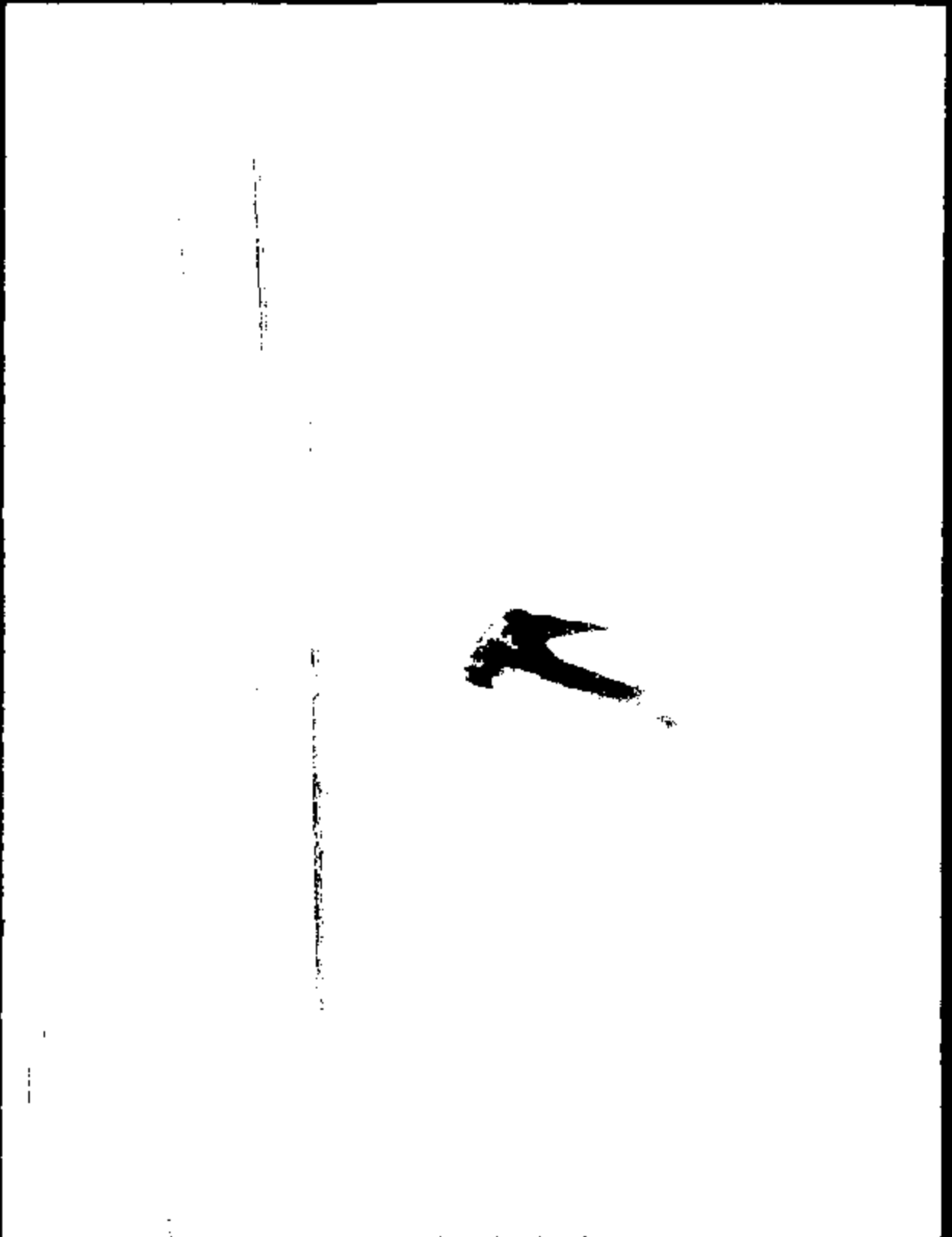




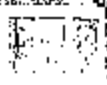
TI-NHTSA 018628



TI-NHTSA 018829



TI-NHTSA 018830



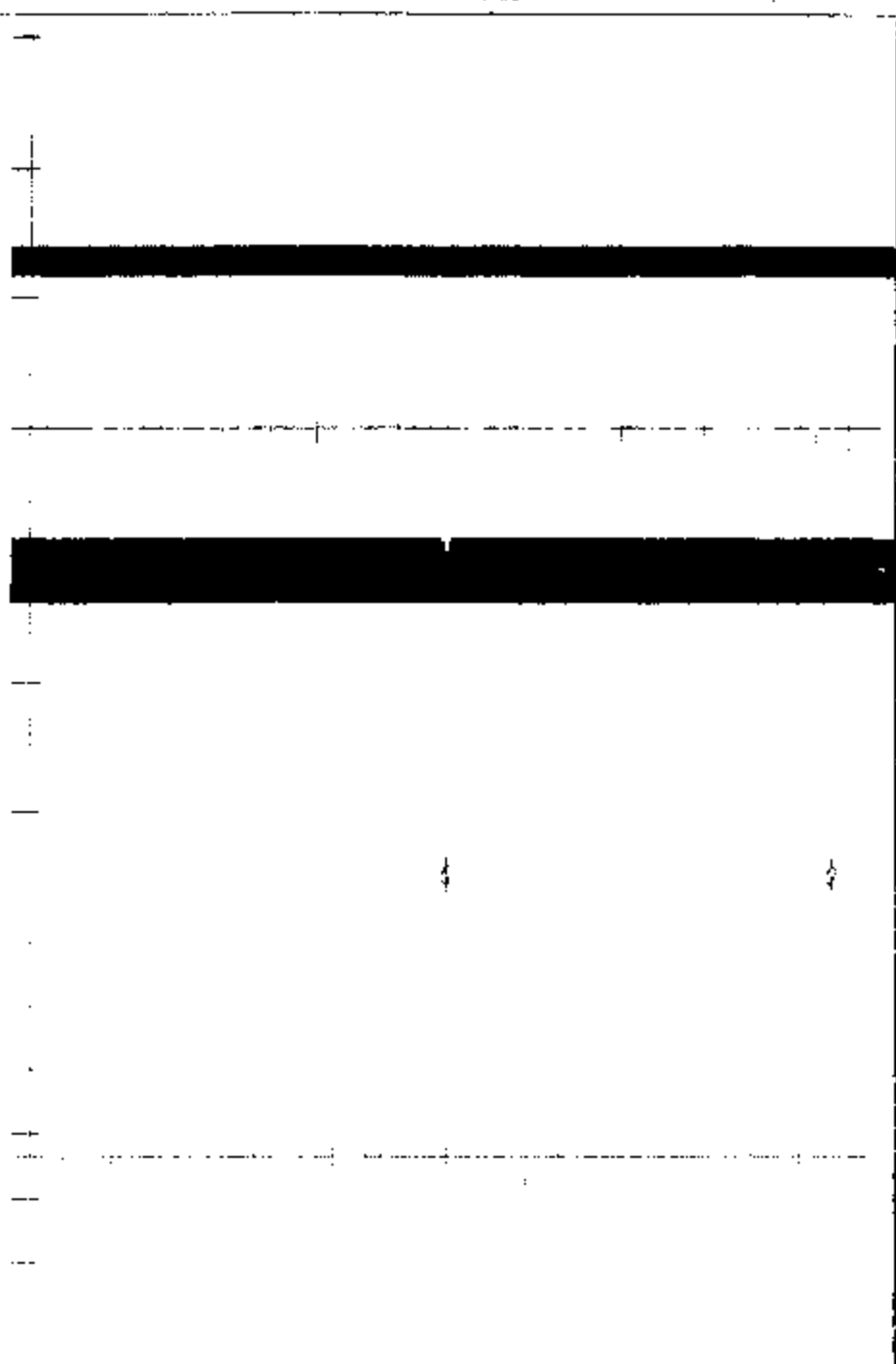
X-bar  
Chart

USL:  
0.479  
LSL:  
0.459

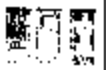
UCL:0.477  
AVG:0.4689  
LCL:0.463  
fixed

Range  
Chart

UCL:0.007  
AVG:0.0016  
LCL:0.0



press any key to continue



X-bar  
Chart

USL :  
0.895  
LSL :  
0.87

UCL : 0.889  
AVG : 0.8828  
LCL : 0.873  
fixed

Range  
Chart

UCL : 0.01  
AVG : 0.002  
LCL : 0.0

press any key to exit

X-bar  
Chart

USL:

0.11

LSL:

0.006

UCL: 0.109

Avg: 0.0953

LCL: 0.089

fixed

Range  
Chart

UCL: 0.01

Avg: 0.0012

LCL: 0.0

press any key to continue

**Epstein, Sally**

---

**From:** Pawlowald, Robin [rpawlowald@small.mc.t.com]  
**Sent:** Thursday, April 01, 1999 1:04 PM  
**To:** McGuirk, Andy; Douglas, Charles  
**Subject:** ANDY.xls



ANDY.xls

<<ANDY.xls>>

I have added more locations to the Ford 77PSL3-3

For the 77PBL3-9 code, not shown all shipping locations -- numbers for locations no longer in the d

Company	SHIP TO LOC.	FILE NUMBER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DANA CORP. 1988		77PBL2-4 / F2NC SF824 AB	31.88	47.11	53.35	0	0	0	0	0	0	0	0	0
		77PBL3-3 / F2AC SF824 AA	0	0	0	0	22.84	0	74.73	39.85	0	0	0	0
		77PBL3-2 / F2BA SF824 AA	0	0	0	0	0	0	0	0	0	0	0	0
ITT CORP. 1988		77PBL2-1 / F2VC SF824 AB	0.85	0	0	0	0	0	0	0	0	0	0	0
		77PBL3-2 / F2DZ SF824 AA	0	0	0	0	0	0	0	0	0	4.28	8.98	1.04
		77PBL3-2 / F2DZ SF824 AA	1.42	3.09	3.33	1.88	2.39	0.71	0	0	0.47	0.714	0	0.852
	1989	77PBL3-2 / F2DZ SF824 AA	1.42	0.714	1.8	1.42	1.42	0	0.71	0.71	0.714	0.478	0.478	1.19
	1990	77PBL3-2 / F2DZ SF824 AA	0.236	0.692	0.652	1.19	0	0	0	0	0	0	0	0
PITTS BROS/STHELITE 1988		77PBL2-1 / F2VC SF824 AB	48.88	43.31	0.47	31.88	32.38	3.33	33.22	33.78	21.42	48.79	44.74	18.88
		77PBL3-2 / F2DZ SF824 AA	0	0	0	0	0	0	2.78	0	0	0	0	0
		77PBL3-1 / F2VC SF824 AB	15.47	15.23	23.58	22.01	14.81	22.81	20.7	30.48	23.58	18.88	34.75	20.7
	1989	77PBL3-1 / F2VC SF824 AB	0	0	0	0	0	0	0	0.08	0	0	3.88	
	1990	77PBL2-1 / F2VC SF824 AB	23.08	12.85	19.75	25.7	23.58	8.28	8.88	3.8	1.18	8.08	0	0
		77PBL3-3 / F2TA SF824 CA	0	0	0	0	0.71	16.22	22.25	27.6	33.79	34.08	18.8	19.51
		77PBL3-3 / F2TA SF824 CA	0	0	0	0	0	0	0	0	0	0	0	0.8
	1988	77PBL3-1 / F2AC SF824 AA	27.84	30.89	28.32	28.94	18.7	11.18	10.47	7.14	14.04	9.04	2.95	8.85
		77PBL3-3 / F2TA SF824 CA	0.478	0	0	0	0	2.14	2.85	0.714	0.714	1.19	0.714	4.04
		77PBL3-1 / F2VC SF824 AB	0	0	0.285	0.714	0.478	0	0	0	0	0	0	0
	1989	77PBL3-1 / F2AC SF824 AA	11.88	4.78	8.8	8.8	0	0	0	0	0	0	0	0
		77PBL3-3 / F2TA SF824 CA	0	0	0	1.42	0	0	0	0	0	0	0	0
		77PBL3-1 / F2VC SF824 AB												
FORD MOTOR 1988		77PBL2-1 / F2VC SF824 AB	0	0	0	0	0	0	0	0	0.47	0	0	0
		77PBL2-3 / F2TA SF824 CA	18.81	18.7	31.41	18.8	24.05	15.7	13.8	19.88	18.18	8.52	17.73	15.28
		77PBL3-3 / F2TA SF824 CA	0	0	0	0	0	2.44	3.33	20.3	67.11	71.87	82.82	44.28
		77PBL3-2 / F2DZ SF824 AA	0	0	0	0	0	0	0	0	0	0	0.47	0
	1989	77PBL2-1 / F2VC SF824 AB	0	0	0	0	0	0	0	0	0.236	0	0	0
		77PBL2-6 / F2TA SF824 CA	1.87	0	0	0	0	0	0	0	0	0	0	0
		77PBL3-2 / F2BA SF824 AA	0	0	0	0	0	0	0	0	0.71	0.367	0.478	0.714
		77PBL3-3 / F2TA SF824 CA	35.28	41.85	53.75	44.56	58.31	42.84	23.58	32.45	0.47	0.714	0.858	0.852
		77PBL3-2 / F2DZ SF824 AA	0	0.71	0	0	0	0	0	0	0	0	0	0
	1990	77PBL2-1 / F2VC SF824 AB	0.236	0	0	0	0	0	0	0.71	0	0	0	0

7-NHTSA 018838



	Landa Texas	77PCL3-3 / FSTA BFGM CA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Calhoun/Dawson/Brown Township	77PCL3-2 / FBA BFGM AA	1.42	5.33	11.42	17.81	25.94	35.88	48.84	28.4	24.27	33.7	20.94	10.64									
	Brown Township/Landa/Texas	77PCL3-3 / FSTA BFGM CA	3.5	0.017	1.30	1.30	1.3	1.42	0.71	0.04	0.258	0	0	0									
	Brown Township	77PCL3-2 / FBA BFGM AA																					
1985	Calhoun	77PCL3-2 / FBA BFGM AA	16.69	16.61	16.69	21.16	26.62	22.37	14.75	25.7	22.37	25.48	11.18	8.75									
1986	Calhoun/Dawson/Brown Township	77PCL3-2 / FBA BFGM AA	14.04	18.08	21.85	26.41	21.85	19.51	14.62	27.37	18.08	18.04	14.51	15.47									
	Service (Brown Township)	77PCL3-1 / F2NC BFGM AB	0	0	0	0	0.288	0	0	0	0	0.478	0	0									
	Brown Township/Landa/Texas	77PCL3-3 / FSTA BFGM CA	0	0	0	0	0	0	0	0	0	1.2	0	0									
1987	Calhoun/Dawson/Brown Township	77PCL3-2 / FBA BFGM AA	21.18	21.42	27.8	34.08	22.84	27.37	4.78	28.41	25.94	24.27	21.75	17.37									
	Service (Brown Township)	77PCL3-1 / F2NC BFGM AB	0	0	0	0	0.714	0	0	0	0	0	0.714	0									
	Brown Township/Landa/Texas	77PCL3-3 / FSTA BFGM CA	0	0	0	0.48	0	0	0.48	1.2	0	0.48	0.69	0.288									
1988	Calhoun/Dawson/Brown Township	77PCL3-2 / FBA BFGM AA	14.75	20.75	26.45	22.84	28.85	21.89	1.40	11.9	10.47	22.84	20.17	18.18									
	Service (Brown Township)	77PCL3-1 / F2NC BFGM AB	0	0.852	0	0	0	0	0	0	0.478	0	0.85	0									
	Brown Township/Landa/Texas	77PCL3-3 / FSTA BFGM CA	2.4	6.48	0.72	1.9	3.72	1.87	0.68	1.82	2.18	2.85	2.85	1.2									
	Waynes-Fort Austin	77PCL4-1 / F2CA BFGM AA	0	0	11.8	0.288	14.38	0	0	2.88	0.75	0	3.33	0.288									

KELSEY-HAYES CO.  
1989

		77PCL3-1 / F2NC BFGM AB	4.88	4.04	5.28	2.8	2.8	3.67	2.85	0	0	0	0	0									
--	--	-------------------------	------	------	------	-----	-----	------	------	---	---	---	---	---	--	--	--	--	--	--	--	--	--

ALLIED BONA  
1989

		77PCL3-3 / FSTA BFGM CA	0	0	0.288	0	0	0.288	0	0	0	0	0.288										
1991		77PCL3-3 / FSTA BFGM CA	0.820	0.288	0	0.478	6.9	0	0.852	0.85	0	2.81	26.38	35.38									
		77PCL3-1 / F2NC BFGM AA	0	0	0	0.85	0.85	0	0	0.05	0	0	0	4.5									
1992		77PCL3-1 / F2NC BFGM AA	1.6	0	0	0	0.852	16.7	16.47	0	6.58	16.47	17.18	19.88									
		77PCL3-3 / FSTA BFGM CA	33.44	75.12	23.78	73.88	88.18	85.48	18.8	43.88	43.12	60.48	48.88	40.32									
1993		77PCL3-1 / F2NC BFGM AA	18.88	22.84	21.42	17.33	18.88	18.88	12.85	8.89	17.18	14.28	1.42										
		77PCL3-3 / FSTA BFGM CA	37.12	37.12	33.78	38.88	47.84	53.75	33.24	33.8	60.48	67.2	8.72										

TORCO  
1989

		77PCL3-3 / FSTA BFGM CA	0	0	0	1.5	0	2	30	30	60	60	60	40.18									
1994		77PCL3-3 / FSTA BFGM CA	20.18	28.5	72.88	73.72	70.08	25.04	88.44	70	45.12	10.08	18.12	40.92									
1995		77PCL3-3 / FSTA BFGM CA	74.88	85.04	30	54	48.88	64.48	52.88	78.2	88.04	61.2	48.82	47.82									
1996		77PCL3-3 / FSTA BFGM CA	68.88	85.44	62.18	71.78	60.72	38.4	85.4	107.8	81.6	81.4	84.8	64.08									
		77PCL3-3 / FBA BFGM AA											0.02										
1997		77PCL3-3 / FSTA BFGM CA	72	67.64	105.8	78.2	124.8	181.8	87.12	107	90	48	62.28	83.84									
		77PCL3-3 / FBA BFGM AA																					
1998		77PCL3-3 / FSTA BFGM CA	58.18	111.8	183.8	78.82	55.82	88.8	101.8	84.88	72.88	88.04	88.12	44.4									
		77PCL3-2 / FBA BFGM AA																					

HAYES-DANA  
1992

		77PCL3-1 / F2NC BFGM AB	0	0	0	0	0	0	0	0	0	0	28.88										
--	--	-------------------------	---	---	---	---	---	---	---	---	---	---	-------	--	--	--	--	--	--	--	--	--	--

1983	77POL3-1/F2AC OFB24 AA	0	0	0	0	0	0	0	0	0	0	0	0
1984	77POL3-1/F2AC OFB24 AA	0.8	0.8	0.0	0.0	4.0	4.0	0	0	0	0	0	0
<b>SPECIFIC DRAWING</b>													
1985	77POL3-2/FB2A OFB24 AA	0	0	0	0	0	0.280	0	0	0.714	0	0	0
1987	77POL3-2/FB2A OFB24 AA	0	0	0.296	0	0	0	0	0	0.296	0	0.470	0.296
1988	77POL3-2/FB2A OFB24 AA	0	0	0	0	0	0	0	0	0.296	0.296	0	0
<b>MILITE INDUSTRIES</b>													
1989	77POL3-4/F2AC OFB24 AA	0	0	0	0.09	14.5	0.09	14.2	12.91	0.20	16.30	2.6	0.4
	77POL3-3/F2TA OFB24 CA				0.0	0.0		1.42	2.3	2.3		2.6	
1997	77POL3-3/F2TA OFB24 CA	3.09	0	2.1	2.0	0	0	3.6	3.3	0	1.19	0	0
	77POL3-1/F2AC OFB24 AA	0	0.52	0.52	18.8	6.7	6.7	0.00	14.75	7.37	0	0	0
	77POL3-4/F2AC OFB24 AA	0	0	0	0	0	0	0	0	0	0	0	1.19
1998	77POL3-3/F2TA OFB24 CA	0	1.19	2.14	0.296	0	0	0	0	0	0	0	0
	77POL3-4/F2AC OFB24 AA												
	77POL3-4/F2AC OFB24 AA	0	0	0	0	0	0	0	0	0	0	0.296	
<b>MORCH DRAWING</b>													
1996	77POL3-11/F2AC OFB24 AA	0	0	0	0	0	0	0	0	0	0	11.42	22.84
	77POL3-8/F2TA OFB24 CA	0	0	0	0	0	0	0	0	0	0	48.86	57.1
1997	77POL3-11/F2AC OFB24 AA	15.7	18.9	18.8	18.68	16.7	21.4	6.68	4.28	4.28	0	0	0
	77POL3-8/F2TA OFB24 CA	30.4	43.0	37.12	63.76	30.4	43.88	23.32	39.8	30.4	37.1	93.76	30.4
1998	77POL3-11/F2AC OFB24 AA												
	77POL3-8/F2TA OFB24 CA	30.4	50.4	57.12	93.8	47	57.8	47	60.4	85.84	85.84	63.7	70.8

TI-NHTSA 018937

**Epstein, Sally**

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**From:** Mulligan, Sean [smulligan@gmail.com]  
**Sent:** Monday, April 06, 1999 9:48 AM  
**To:** McGuirk, Andy  
**Subject:** Ford proposed current limiting circuit.



chris\_Appt

Hi Andy,

I have some questions regarding the proposed use of a 200 mill-amp relay in the Ford circuit. My understanding is that when 300 milliamps reaches ground, the relay will actuate and open circuit the power supply. Is that the proposed plan? Also, in this scenario one side of the 77FS terminal will be grounded. Will it be grounded through the Ford clutch assembly? If so, we know from past tests that it pulls 500 milli-amps. For our experiments, I will probably float the terminal (it's not easy to pressurize the switch to open circuit).

I need to understand the proposed plan. Can you mark up the circuit drawing so I understand how the switch will be used in the proposed scenario and fax or email it ASAP? I have some questions written on the drawing.

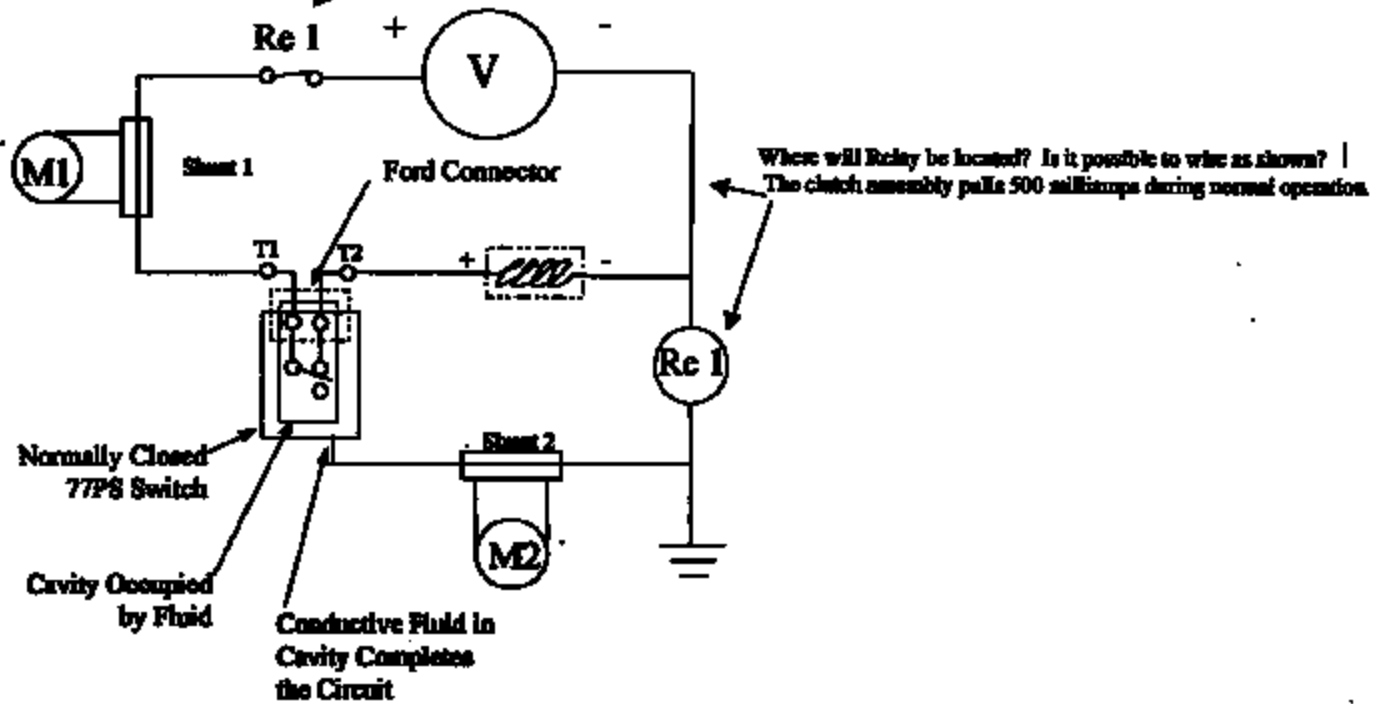
<<Circuit\_3.ppt>>

Thank you,

Sean

phone 2535  
fax 3586

I assume this will be a latching relay because as soon as this switch opens, Re1 will de-actuate. Is that correct?



TI-NHTSA 018839

**Epstein, Sally**

---

**From:** McGuirk, Andy [a-mcguirk@email.mo.ti.com]  
**Sent:** Tuesday, April 06, 1999 8:00 AM  
**To:** Dagus, Bryan  
**Subject:** FW: Ford proposed current limiting circuit.



CPWA.LAM

PER OUR DISCUSSION

A

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER  
34 FOREST ST W/S 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
MOBILE: (508) 308-6119  
PAGE: (800) 467-3700 PIN 604-2044

-----  
**From:** Mulligan, Sean  
**Sent:** Monday, April 05, 1999 10:48 AM  
**To:** McGuirk, Andy  
**Subject:** Ford proposed current limiting circuit.

Hi Andy,

I have some questions regarding the proposed use of a 200 milli-amp relay in the Ford circuit. My understanding is that when 200 milliamps reaches ground, the relay will actuate and open circuit the power supply. Is that the proposed plan? Also, in this scenario one side of the 77PS terminal will be grounded. Will it be grounded through the Ford clutch assembly? If so, we know from past tests that it pulls 500 milli-amps. For our experiments, I will probably float the terminal (it's not easy to pressurize the switch to open circuit).

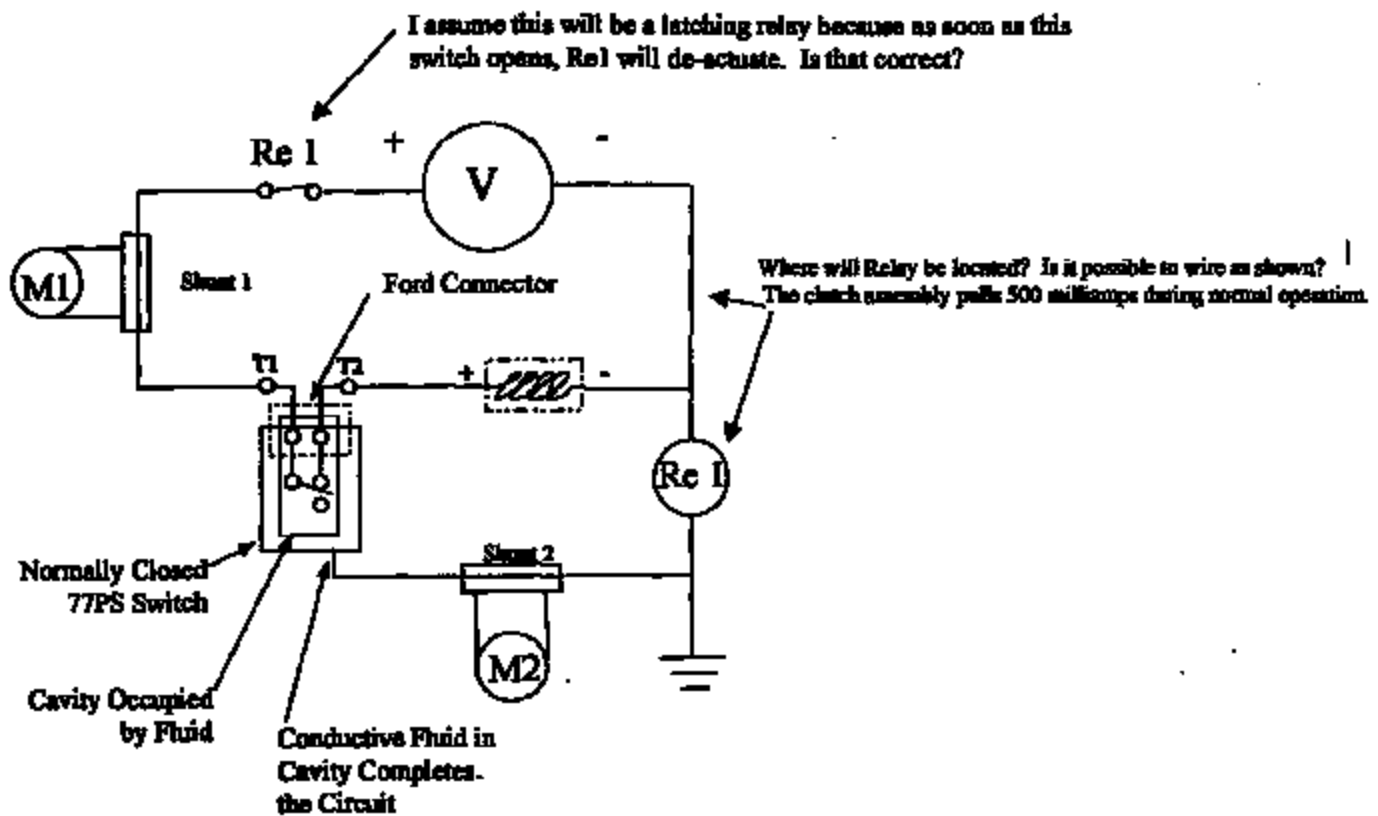
I need to understand the proposed plan. Can you mark up the circuit drawing so I understand how the switch will be used in the proposed scenario and fax or email it ASAP? I have some questions written on the drawing.

<<Circuit\_3.ppt>>

Thank you,

Sean

phone 2535  
fax 3586



TI-NHTSA 018841

**Epstein, Sally**

**From:** Mulligan, Sean [smulligan@email.mv.t.com]  
**Sent:** Wednesday, April 07, 1999 8:51 AM  
**To:** Rahman, Aziz  
**Subject:** Ford Relay



relay.ppt



relay\_testsetup.ppt

Hi Aziz,

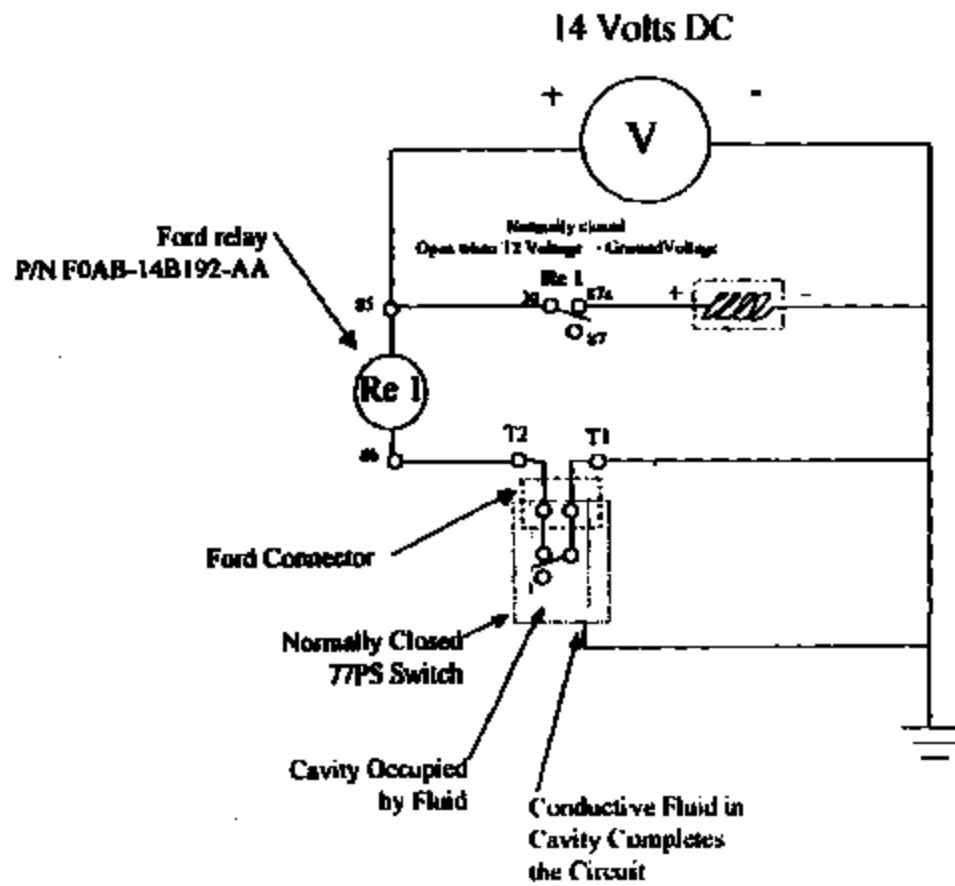
Here are the proposed relay schematics.  
relay.ppt shows the Ford application  
relay\_testsetup is our test setup.

I am getting confirmation from Fred Porter that this is indeed the proposed setup. I will notify when I get results.

All the best,

Sean

<<relay.ppt>> <<relay\_testsetup.ppt>>

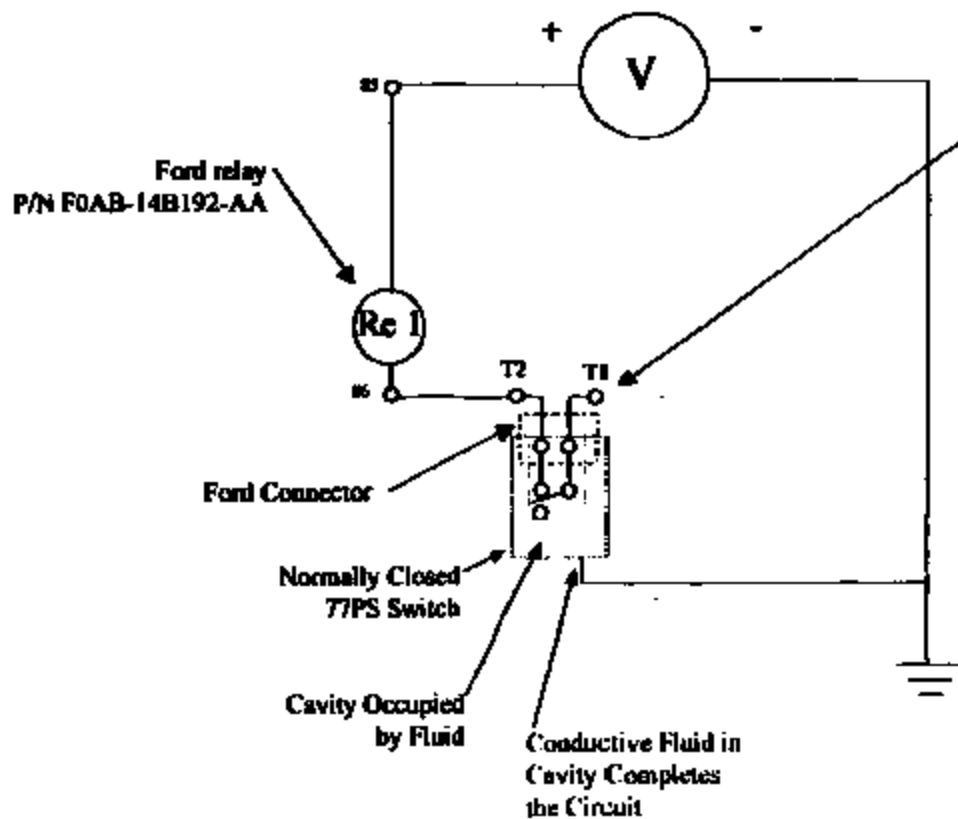


TI-NHTSA 018843



## TI Test Setup

14 Volts DC



Worst case scenario is when the switch is actuated, which puts T2 at full voltage. To facilitate testing, T1 is floating which keeps T1 and T2 at full voltage but limits current draw to 25 Amps. (This test is harsher than the worst case scenario)

TI-NHTSA 018844

**Epstein, Sally**

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**From:** O'Neill, Ed (eonell@small.mc.ll.com)  
**Sent:** Wednesday, April 07, 1999 4:50 PM  
**To:** Haynes, John  
**Cc:** Pechonis, John; McGuirk, Andy  
**Subject:** 77PS

**Importance:** High

John, How difficult would it be to provide material support for an additional 1M 77PS units on short notice? Maybe 2M. Andy will provide us with the details. Ed

**Epstein, Sally**

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**From:** McGuirk, Andy [a-mcguirk@email.mc.ti.com]  
**Sent:** Wednesday, April 07, 1999 8:51 AM  
**To:** Degus, Bryan  
**Cc:** Pawlowski, Robin; Douglas, Charles; Baumann, Russ; Watt, Jim  
**Subject:** FW: ANDY.xls



ANDY.xls

PLS TRANSLATE INTO PLASTIC BASE COLOR AND MATERIAL TYPE

A

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER  
34 FOREST ST N/S 23-05  
APPLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
MOBILE: (508) 208-6119  
PAGE: (800) 467-3700 PIN 604-2044

-----  
**From:** Pawlowski, Robin  
**Sent:** Thursday, April 01, 1999 3:04 PM  
**To:** McGuirk, Andy; Douglas, Charles  
**Subject:** ANDY.xls

<<ANDY.xls>>  
I have added more locations to the Ford 77PSL3-3

For the 77PBL3-3 model not show all shipping locations -- numbers for locations no longer on the d

Customer	MODEL LOC.	Del Number	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DANA CORP 1982		77PBL3-1 / F2NC BPSM AB	31.89	47.11	62.26	0	0	0	0	0	0	0	0	0
		77PBL3-1 / F2NC BPSM AA	0	0	0	0	22.84	0	24.73	26.88	0	0	0	0
		77PBL3-2 / F2BA BPSM AA	0	0	0	0	0	0	0	0	0	0	0	0
ITT COMP 1982		77PBL3-1 / F2NC BPSM AB	0.95	0	0	0	0	0	0	0	0	0	0	0
		77PBL3-2 / F2CX BPSM AA	0	0	0	0	0	0	0	0	0	4.28	0.99	1.04
	1983	77PBL3-2 / F2CX BPSM AA	1.42	2.09	2.26	1.08	2.28	0.71	0	0	0.47	0.714	0	0.952
	1984	77PBL3-2 / F2CX BPSM AA	1.42	0.714	1.0	1.42	1.42	0	0.71	0.71	0.714	0.478	0.478	1.18
1985	77PBL3-2 / F2CX BPSM AA	0.228	0.952	0.952	1.18	0	0	0	0	0	0	0	0	
PITTS BOMBARDIER 1982		77PBL3-1 / F2NC BPSM AB	40.89	43.31	0.47	31.88	22.28	3.53	26.22	33.75	21.42	42.79	44.24	16.88
		77PBL3-3 / F2CX BPSM AA	0	0	0	0	0	0	0	2.75	0	0	0	0
	1983	77PBL3-1 / F2NC BPSM AB	15.47	15.23	23.06	22.51	14.81	22.01	20.7	26.49	23.58	18.89	24.75	20.7
		77PBL3-1 / F2NC BPSM AA	0	0	0	0	0	0	0	0	0.25	0	0	3.23
	1984	77PBL3-1 / F2NC BPSM AB	23.88	12.85	18.75	28.7	23.88	0.28	6.85	3.5	1.18	0.89	0	0
		77PBL3-1 / F2NC BPSM AA	0	0	0	0	0.71	13.32	22.26	27.8	23.79	24.89	14.8	18.51
	77PBL3-3 / F2BA BPSM CA	0	0	0	0	0	0	0	0	0	0	0	0.5	
1984		77PBL3-1 / F2NC BPSM AA	27.84	30.88	28.32	28.84	15.7	11.18	10.47	7.14	14.54	8.04	2.85	8.85
		77PBL3-3 / F2TA BPSM CA	0.478	0	0	0	0	2.14	2.85	0.714	0.714	1.18	0.714	4.04
		77PBL3-1 / F2NC BPSM AB	0	0	0.228	0.714	0.478	0	0	0	0	0	0	0
1984		77PBL3-1 / F2NC BPSM AA	11.88	4.78	0.9	0.8	0	0	0	0	0	0	0	0
		77PBL3-3 / F2TA BPSM CA	0	0	0	1.42	0	0	0	0	0	0	0	0
		77PBL3-1 / F2NC BPSM AB												
POND MOTOR 1982	Service (Overseasship)	77PBL3-1 / F2NC BPSM AB	0	0	0	0	0	0	0	0	0.47	0	0	0
	Laredo, Texas	77PBL3-3 / F2TA BPSM CA	18.01	13.7	31.41	18.0	22.83	13.7	13.8	18.88	16.18	0.62	17.73	15.23
	Brownsville/ Laredo/													
	Corpus Christi/ Kansas City													
	Asyn/Laredo	Attygen/Local												
	Attygen/Local													
1984	Service (Overseasship)	77PBL3-1 / F2NC BPSM AB	0	0	0	0	0	0	0	0	0	0.228	0	0
	Laredo, Texas	77PBL3-3 / F2TA BPSM CA	1.87	0	0	0	0	0	0	0	0	0	0	0
	Del Rio/Brownsville/	77PBL3-2 / F2BA BPSM AA	0	0	0	0	0	0	0	0	0.71	0.287	0.478	0.714
Brownsville/ Laredo/														
Corpus Christi/ Kansas City														
Asyn/Laredo	Attygen/Local													
Attygen/Local														
1984	Service (Overseasship)	77PBL3-1 / F2NC BPSM AB	35.28	41.85	63.73	44.09	46.21	42.84	23.65	32.45	0.47	0.714	0.338	0.852
	Laredo, Texas	77PBL3-2 / F2CX BPSM AA	0	0.71	0	0	0	0	0	0	0	0	0	0
	Del Rio/Brownsville/													
Brownsville/ Laredo/														
Corpus Christi/ Kansas City														
Asyn/Laredo	Attygen/Local													
Attygen/Local														
1984	Service (Overseasship)	77PBL3-1 / F2NC BPSM AB	0.228	0	0	0	0	0	0	0.71	0	0	0	0
	Laredo, Texas	77PBL3-3 / F2TA BPSM CA	0	0	0	0	0	0	0	0	0	0	0	0
	Del Rio/Brownsville/	77PBL3-2 / F2BA BPSM AA	1.42	2.29	11.42	17.81	23.84	18.88	10.84	28.4	24.27	20.7	20.84	10.94

TI-NHTSA 018847

	Supervisory/Assistant/Assistant Development	77PBL3-3 / FBA SF24 CA 77PBL3-2 / FBA SF24 AA	3.8	0.811	1.39	1.19	1.0	1.42	0.71	0.54	0.238	0	0	0
1985	Cajalla	77PBL3-3 / FBA SF24 AA	18.08	19.51	19.88	21.16	20.32	22.27	14.75	28.7	22.37	26.45	11.15	0.75
1986	Cajalla/Assistant/Assistant Service (Development) Development/Assistant	77PBL3-2 / FBA SF24 AA 77PBL2-1 / FBA SF24 AA 77PBL3-3 / FBA SF24 CA	14.84	16.89	21.99	20.41	21.05	19.91	14.82	27.37	18.88	18.84	14.51	15.47
			0	0	0	0	0.238	0	0	0	0	0	0	
			0	0	0	0	0	0	0	0	0	1.2	0	
1987	Cajalla/Assistant/Assistant Service (Development) Development/Assistant	77PBL3-2 / FBA SF24 AA 77PBL3-1 / FBA SF24 AA 77PBL3-3 / FBA SF24 CA	21.98	21.42	27.6	24.09	22.84	21.37	4.78	28.41	28.84	24.37	24.75	17.27
			0	0	0	0	0.714	0	0	0	0	0	0.714	
			0	0	0	0.40	0	0	0.40	1.2	0	0.40	0.238	
1988	Cajalla/Assistant/Assistant Service (Development) Development/Assistant Assistant/Assistant	77PBL3-2 / FBA SF24 AA 77PBL3-1 / FBA SF24 AA 77PBL3-3 / FBA SF24 CA 77PBL4-1 / FBA SF24 AA	14.75	28.75	25.45	22.84	21.58	21.88	1.18	11.9	16.47	22.54	36.17	16.18
			0	0.982	0	0	0	0	0	0.478	0	0.85	0	
			2.4	8.85	0.72	1.8	0.72	1.83	0.89	1.82	2.95	2.88	2.88	
			0	0	11.8	0.238	14.38	0	0	0.88	0.75	0	3.39	

**MELBY-JAMES CO.**  
1989

77PBL2-1 / FBA SF24 AA	4.89	4.04	8.23	2.8	2.8	3.67	0.88	0	0	0	0	0	0
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**ALLIED SIGNAL**  
1989

77PBL3-3 / FBA SF24 CA	0	0	0.238	0	0	0.238	0	0	0	0	0	0	0.238
77PBL3-3 / FBA SF24 CA 77PBL3-1 / FBA SF24 AA	0.828	0.238	0	0.478	0.6	0	0.982	0.88	0	2.61	20.26	20.26	20.26
	0	0	0	0.85	0.85	0	0	0.88	0	0	0	0	4.5
77PBL3-1 / FBA SF24 AA 77PBL3-3 / FBA SF24 CA	2.6	0	0	0	0.982	16.7	16.47	0	0.88	15.47	17.13	16.89	16.89
	25.44	25.12	25.76	73.85	68.16	93.48	10.8	63.05	45.12	88.48	41.85	40.32	40.32
77PBL3-1 / FBA SF24 AA 77PBL3-3 / FBA SF24 CA	18.89	23.84	21.42	17.13	16.89	18.88	12.85	8.89	17.13	14.28	1.42	1.42	1.42
	67.12	67.12	63.75	38.88	47.04	43.75	20.24	23.8	40.48	67.2	6.72	6.72	6.72

**TOPCO**

77PBL3-3 / FBA SF24 CA	0	0	0	1.8	0	2	20	20	20	20	20	20	20
77PBL3-3 / FBA SF24 CA	20.18	20.5	72.89	12.72	76.89	26.04	25.44	79	45.12	10.06	15.12	48.82	48.82
77PBL3-3 / FBA SF24 CA	24.88	25.04	20	54	48.88	54.48	52.88	78.2	88.84	81.2	48.82	47.82	47.82
77PBL3-3 / FBA SF24 CA 77PBL3-3 / FBA SF24 AA	68.88	69.44	82.18	71.78	80.72	26.4	68.4	107.8	81.8	65.4	84.8	84.88	84.88
												0.82	0.82
77PBL3-3 / FBA SF24 CA 77PBL3-2 / FBA SF24 AA	72	87.84	168.8	71.2	134.8	131.8	87.12	187	20	48	82.28	82.84	82.84
77PBL3-3 / FBA SF24 CA 77PBL3-2 / FBA SF24 AA	28.18	111.8	101.8	78.82	26.82	45.8	101.8	88.88	72.88	85.04	88.12	48.4	48.4

**HAYES-DANA**  
1989

77PBL3-1 / FBA SF24 AA	0	0	0	0	0	0	0	0	0	0	29.88	29.88	29.88
77PBL3-1 / FBA SF24 AA	0	0	0	0	0	0	0	0	0	0	15.28	4.89	14.89
77PBL3-1 / FBA SF24 AA	8.9	8.9	8.9	8.9	4.9	4.9	0	0	0	0	0	0	0

TI-NHTSA 018948

**SPECIFIC CHANGE**

1985

77POL3-2 / FEMA SFPM AA 0 0 0 0 0 0.298 0 0 0.754 0 0 0

1987

77POL3-2 / FEMA SFPM AA 0 0 0.298 0 0 0 0.298 0 0.298 0 0.476 0.226

1989

77POL3-2 / FEMA SFPM AA 0 0 0 0 0 0 0 0 0.298 0.298 0 0

**MILITE MEASURE**

1989

77POL3-W/FMCA SFPM AA 0 0 0 0.08 14.6 0.88 14.2 11.81 6.23 16.32 2.6 0.4  
77POL3-S / PSTA SFPM CA 3.3 1.62 2.3 2.3 2.88

1991

77POL3-S / FMCA SFPM CA 3.09 0 2.1 2.5 0 0 3.5 3.3 0 1.98 0 0  
77POL3-W/FMCA SFPM AA 0 0.82 0.82 10.3 8.7 8.7 0.88 14.78 7.37 0 0  
77POL3-1 / FMCA SFPM AG 0 0 0 0 0 0 0 0 0 0 0 1.88

1993

77POL3-S / PSTA SFPM CA 0 1.48 2.14 0.328 0 0 0 0 0 0 0 0  
77POL3-W/FMCA SFPM AA 0 0 0 0 0 0 0 0 0 0 0 0  
77POL3-1 / FMCA SFPM AG 0 0 0 0 0 0 0 0 0 0 0 0.298

**BOUCH BRUAND**

1989

77POL3-W/FMCA SFPM AA 0 0 0 0 0 0 0 0 0 0 11.62 22.84  
77POL3-S / PSTA SFPM CA 0 0 0 0 0 0 0 0 0 0 43.88 87.1

1991

77POL3-W/FMCA SFPM AA 18.7 10.0 18.8 18.86 16.7 21.4 8.88 4.38 4.38 0 0 0  
77POL3-S / PSTA SFPM CA 80.4 49.0 87.12 86.76 80.4 -8.88 23.82 38.9 86.4 87.1 89.78 86.4

1993

77POL3-W/FMCA SFPM AA 0 0 0 0 0 0 0 0 0 0 0 0  
77POL3-S / PSTA SFPM CA 80.4 80.4 87.32 83.8 47 87.8 47 82.4 83.84 83.84 83.7 76.8

TI-NHTSA 018849

**Epstein, Sally**

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**From:** Haynes, John [jhaynes@email.mn.ti.com]  
**Sent:** Thursday, April 08, 1999 7:28 AM  
**To:** O'Neill, Ed  
**Cc:** Pechonis, John; McGuirk, Andy  
**Subject:** RE: 77PS.

It would not be easy. I would expect to add an additional 1M parts to our current orders would take between one and two months. 2M parts would push us further out accordingly. The tooling at our suppliers is fairly old, and some of them (the tools that is) get cranky when we push them for additional production. My assumptions are based on the 77PSL2-1 -- should we be looking at other ratings too? Many of the parts would be the same, but there would be some differences we would need to take into consideration.

My guess is our biggest challenges would be with the following:

Converter/Stationary term/Movable term Bassler  
Hexport Elco

To a lesser extent we might see issues with:

Cup Valentine  
Washer Diamasters  
Base IMT

If necessary we might be able to do some creative things with additional tooling, but there would be lead times associated with that too.

Obviously, the sooner we know whether we need to pull the trigger on this the better off we'll be.

Best regards,

John

-----  
**From:** O'Neill, Ed  
**Sent:** Wednesday, April 07, 1999 5:49 PM  
**To:** Haynes, John  
**Cc:** Pechonis, John; McGuirk, Andy  
**Subject:** 77PS  
**Importance:** High

John, How difficult would it be to provide material support for an additional 1M 77PS units on short notice? Maybe 2M. Andy will provide us with the details. Ed

**Epstein, Sally**

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**From:** O'Neill, Ed [eoneil@email.mc.tl.com]  
**Sent:** Thursday, April 08, 1999 7:42 AM  
**To:** Haynes, John  
**Cc:** McGuirk, Andy; Desrosiers, Ann; Pechonis, John  
**Subject:** RE: 77PS

See Andy's msg of 8:30AM. Please work with him in my absence. Get with Norm Roy on the base. The VO material is a key part of this issue. I will have the cell phone with me on this trip Thursday PM and Friday 508 930-9026.  
Ed.

-----  
**From:** Haynes, John  
**Sent:** Thursday, April 08, 1999 8:28 AM  
**To:** O'Neill, Ed  
**Cc:** Pechonis, John; McGuirk, Andy  
**Subject:** RE: 77PS

It would not be easy. I would expect to add an additional 1M parts to our current orders would take between one and two months. 2M parts would push us further out accordingly. The tooling at our suppliers is fairly old, and some of them (the tools that is) get cranky when we push them for additional production. My assumptions are based on the 77PSL2-1 -- should we be looking at other ratings too? Many of the parts would be the same, but there would be some differences we would need to take into consideration.

My guess is our biggest challenges would be with the following:

Converter/Stationary term/Movable term Bassler  
Hexport Elco

To a lesser extent we might see issues with:

Cup Valentine  
Washer Diemasters  
Base IMT

If necessary we might be able to do some creative things with additional tooling, but there would be lead times associated with that too.

Obviously, the sooner we know whether we need to pull the trigger on this the better off we'll be.

Best regards,

John

-----  
**From:** O'Neill, Ed  
**Sent:** Wednesday, April 07, 1999 5:49 PM  
**To:** Haynes, John  
**Cc:** Pechonis, John; McGuirk, Andy  
**Subject:** 77PS  
**Importance:** High

John, How difficult would it be to provide material support for an additional 1M 77PS units on short notice? Maybe 2M. Andy will provide us with the details. Ed





**Epstein, Sally**

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**From:** Rose, Elaine [erose@email.mc.li.com]  
**Sent:** Thursday, April 08, 1999 12:48 PM  
**To:** Rahman, Aziz; McGuirk, Andy; Dague, Bryan  
**Cc:** Pops, Stephen  
**Subject:** 77PS RMR's

I have had know success in recovering the returns you requested. These were not controlled by our internal record retention procedure, ie: issue a number, place in storage, etc. Because of the volume and weight, they were refused. We would end up filling the boxes, placing them on a skid, and send them to B16 whse. shelving. As a guide line, our term of retention at this time was 2 years. If these were stored in the years of '94 - '95, I would venture to say they were scrapped, esp. when the whse was closed.

I know this is not what you wanted you hear, sorry.

regards,  
elaine rose  
LAL/QATECH  
ph. # 508-236-1907  
fax # 508-236-2326

**DRAWINGS AVAILABLE UPON  
REQUEST**

**Epstein, Sally**

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**From:** Warner, Pam [pwarner@emef.mc.tl.com]  
**Sent:** Saturday, April 10, 1999 9:52 AM  
**To:** Mulligan, Sean  
**Cc:** McGuirk, Andy  
**Subject:** IGNITED PRESSURE SWITCHES

Sean,  
Andy McGuirk was wondering if you still had the photographs of the ignited pressure switches? Please call him on 3080 to discuss.

TI-NHTSA 018861

**Epstein, Sally**

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**From:** Pechonis, John [pechonis@email.mc.it.com]  
**Sent:** Monday, April 12, 1999 6:13 AM  
**To:** McGuirk, Andy; Haynes, John  
**Cc:** O'Neil, ED  
**Subject:** RE: 77ps12-1.xls

John, please recognize that if we are asked by Ford to proceed with this build, we will need to get component parts immediately to begin. Partial shipments will be necessary to keep the line running.

-----  
**From:** Haynes, John  
**Sent:** Friday, April 09, 1999 5:33 PM  
**To:** McGuirk, Andy  
**Cc:** Pechonis, John; O'Neill, Ed  
**Subject:** 77ps12-1.xls

This is where we stand today. I'll run a couple of issues to ground first thing Monday morning:

- o Steve Walters quick estimate was 250K/month, Norm is checking, too.
- o We'll hear from Hassal on Monday.
- o I need to get better information from the disc department.

Best regards,  
John

<<File: 77ps12-1.xls>>

**Epstein, Sally**

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**From:** Haynes, John [jhaynes@email.mc.ti.com]  
**Sent:** Monday, April 12, 1999 6:19 AM  
**To:** McGuirk, Andy; Pechonis, John  
**Cc:** O'Neill, Ed  
**Subject:** RE: 77ps12-1.xls

John,  
The "Begin Partial" column indicates when we can begin receiving partial shipments. We will start the clock as soon as we receive the word.  
John

-----  
**From:** Pechonis, John  
**Sent:** Monday, April 12, 1999 7:12 AM  
**To:** McGuirk, Andy; Haynes, John  
**Cc:** 'O'Neill, Ed'  
**Subject:** RE: 77ps12-1.xls

John, please recognize that if we are asked by Ford to proceed with this build, we will need to get component parts immediately to begin. Partial shipments will be necessary to keep the line running.

-----  
**From:** Haynes, John  
**Sent:** Friday, April 09, 1999 5:33 PM  
**To:** McGuirk, Andy  
**Cc:** Pechonis, John; O'Neill, Ed  
**Subject:** 77ps12-1.xls

This is where we stand today. I'll run a couple of issues to ground first thing Monday morning:  
o Steve Walters quick estimate was 250K/month, Nozm is checking, too.  
o We'll hear from Hassal on Monday.  
o I need to get better information from the disc department.

Best regards,  
John

<<file: 77ps12-1.xls>>

**Epstein, Sally**

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**From:** McGuirk, Andy [a-mcguirk@email.mc.tl.com]  
**Sent:** Tuesday, April 13, 1999 9:47 AM  
**To:** Warner, Pam  
**Subject:** FW: ANDY.xls



AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER  
34 FOREST ST M/S 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3745  
MOBILE: (508) 208-6119  
PAGE: (800) 467-3700 PIN 604-2044

-----  
**From:** Pawlowski, Robin  
**Sent:** Friday, April 09, 1999 1:52 PM  
**To:** McGuirk, Andy  
**Subject:** ANDY.xls

<<ANDY.xls>>

**DRAWINGS AVAILABLE UPON  
REQUEST**



**Epstein, Sally**

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**From:** Hopkins, Al, [ahopkins@email.mt.com]  
**Sent:** Tuesday, April 13, 1999 3:16 PM  
**To:** McGuirk, Andy  
**Subject:** Fax to Ford



Ford Letter.doc

Andy, here is the cover sheet that I was going to fax to Ford with the data.  
How does it look?

<<Ford Letter.doc>>

Al



To: **Rock Carter** Fax: **313-621-0646**

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From: **Al Hopkins (Texas Instruments)** Date: **07/12/99**

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Re: **SEM-EDS Data Collected at TI** Pages: **This Cover Sheet & 41 Pages of Data**

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CC: **[Click here and type name]**

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Urgent     For Review     Please Comment     Please Reply     Please Recycle

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Rock, this data was accumulated while Ford Engineering was present. They took copies of this data and all the actual parts of the sample. They had, however, left the small amounts of debris for our Chem Lab to perform FTIR analysis to check if there was brake fluid present. In fact, the FTIR analysis showed that this was the case.

As you know, we subsequently were requested to send this small amount of debris (wrapped in aluminum foil) back to Ford. I would think that it would be much more useful to examine the actual switch itself.

In any case, this is the key to the data. I am going to try to E-mail you the photos electronically tomorrow. If you have any questions, feel free to call me at 505-336-3040.

<u>Sample</u>	<u>Pages</u>	<u>Photos</u>	<u>Spectra</u>
Top Surf of Cup After Degreasing	1-14	01-05	001-009
Terminal Cavity after Disassembly	15-28	06-15	010-013
"A" - Black Flake from Trough	29-31	20	020-021
"B" - Material Scraped from Cup Assembly	32-37	21	022-026
"C" - Green Material on Cup	38-41	22	027-029

Regards,

Al



**DRAWINGS AVAILABLE UPON  
REQUEST**

**Currey, Pat**

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**From:** Demers, Richard [rdemers@email.mc.ti.com]  
**Sent:** Monday, April 19, 1999 10:49 AM  
**To:** McQuirk, Andy  
**Subject:** IMPULSE TEST DATA FOR IP2 TEST

ANDY,

JIM WATT STOPPED ME THIS MORNING IN BLDG. 12 HE WAS TELLING THAT YOU WERE AGAIN LOOKING FOR SOME DATA FROM THE LINE, IN THE FORM OF CHARACTERISTIC SHEETS.

HE SAID HE THOUGHT YOU MAY BE LOOKING FOR STUFF FROM THE EARLY 90's 1991 etc. IS THIS CORRECT?

THE DATA I SUPPLIED YOU WITH LATE LAST YEAR WAS FROM 1998 .

IN ANY CASE, UNLESS YOU WANT STUFF YTD. I WOULD NEED TO RETRIEVE IT FROM DATA STORAGE.

PLEASE ADVISE , THANKS & REGARDS, RICK

Rick Demers  
Texas Instruments, Inc.  
34 Forest Street Attleboro, Ma, 02703  
tel # 508-236-2588 (fax) 508-236-2430

**Currey, Pat**

**From:** McGuirk, Andy [a-mcguirk@email.mc.ti.com]  
**Sent:** Monday, April 19, 1999 3:19 PM  
**To:** Demers, Richard  
**Cc:** Watt, Jim; Sundaram, Sundar  
**Subject:** RE: IMPULSE TEST DATA FOR IP2 TEST

the answer will be a 'qualified' yes to both questions.....i do not know if you/i need characteristic sheets. i want all 77 ps impulse test 'history' with focus on the line 400k and 500k cycle test at room temp (the so called rapid cycler that all qc used to run in qc loading samples etc) with focus on after test for 'no oil leakers after cycles' for production pilots and runs that were ultimately built into product and shipped...

start the data summary with most recent history first

a

**AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER**  
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FAX : (508) 236-3745  
MOBILE: (508) 208-6119  
PAGE: (800) 467-3700 PIN 604-2044

-----  
**From:** Demers, Richard  
**Sent:** Monday, April 19, 1999 11:49 AM  
**To:** McGuirk, Andy  
**Subject:** IMPULSE TEST DATA FOR IP2 TEST

ANDY,

JIM WATT STOPPED ME THIS MORNING IN BLDG. 12 HE WAS TELLING THAT YOU WERE AGAIN LOOKING FOR SOME DATA FROM THE LINE, IN THE FORM OF CHARACTERISTIC SHEETS.

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PLEASE ADVISE . THANKS & REGARDS, RICK

Rick Demers  
Texas Instruments, Inc.  
34 Forest Street Attleboro, Ma, 02703  
tel # 508-236-2388 (fax) 508-236-2430

TI-NHTSA 018869

**Currey, Pat**

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**From:** Hopkins, AL [ahopkins@email.mc.ti.com]  
**Sent:** Thursday, April 22, 1999 9:44 AM  
**To:** Mulligan, Sean  
**Cc:** Dagus, Bryan; Beringhaus, Steven; McGuirk, Andy  
**Subject:** RE: Corrosion analysis

I have quite a bit of data now. Let's get together to review it and see exactly what you need.

AL

-----  
**From:** Mulligan, Sean  
**Sent:** Thursday, April 22, 1999 10:00 AM  
**To:** Hopkins, AL  
**Subject:** Corrosion analysis

Hi AL,  
We are feeling increased pressure to produce reports on the 77PS issue. The corrosion analyses are needed. It will take some time to incorporate your findings into the reports. Can you expedite the analyses?

All the best,

Sean P. Mulligan

Phone (508) 236-2535  
Fax (508) 236-3586

**Currey, Pat**

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**From:** Mulligan, Sean [smulligan@email.mc.ti.com]  
**Sent:** Thursday, April 22, 1999 10:38 AM  
**To:** McGuirk, Andy  
**Subject:** RE: Corrosion analysis

Copper, Iron, and Chromium only. Beryllium can not be detected (as I understand).

All the best,

Sean P. Mulligan

Phone (508) 236-2535  
Fax (508) 236-3586

-----  
**From:** McGuirk, Andy  
**Sent:** Thursday, April 22, 1999 11:27 AM  
**To:** Mulligan, Sean  
**Subject:** RE: Corrosion analysis

COPPER?

BEUC?

A  
AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER  
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TEL : (508) 236-3080  
FAX : (508) 236-3745  
MOBILE: (508) 208-6119  
PAGE: (800) 467-3700 PIN 604-2044

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**From:** Mulligan, Sean  
**Sent:** Thursday, April 22, 1999 11:07 AM  
**To:** Hopkins, AL; McGuirk, Andy  
**Cc:** Dague, Bryan; Beringhouse, Steven  
**Subject:** RE: Corrosion analysis

Andy,  
we've analyzed old brake fluid for water content and metal content. We have those results. No other testing of brake fluid in the works.

All the best,

Sean P. Mulligan

Phone (508) 236-2535  
Fax (508) 236-3586

-----  
**From:** McGuirk, Andy  
**Sent:** Thursday, April 22, 1999 10:57 AM  
**To:** Mulligan, Sean; Hopkins, AL  
**Cc:** Dague, Bryan; Beringhouse, Steven  
**Subject:** RE: Corrosion analysis