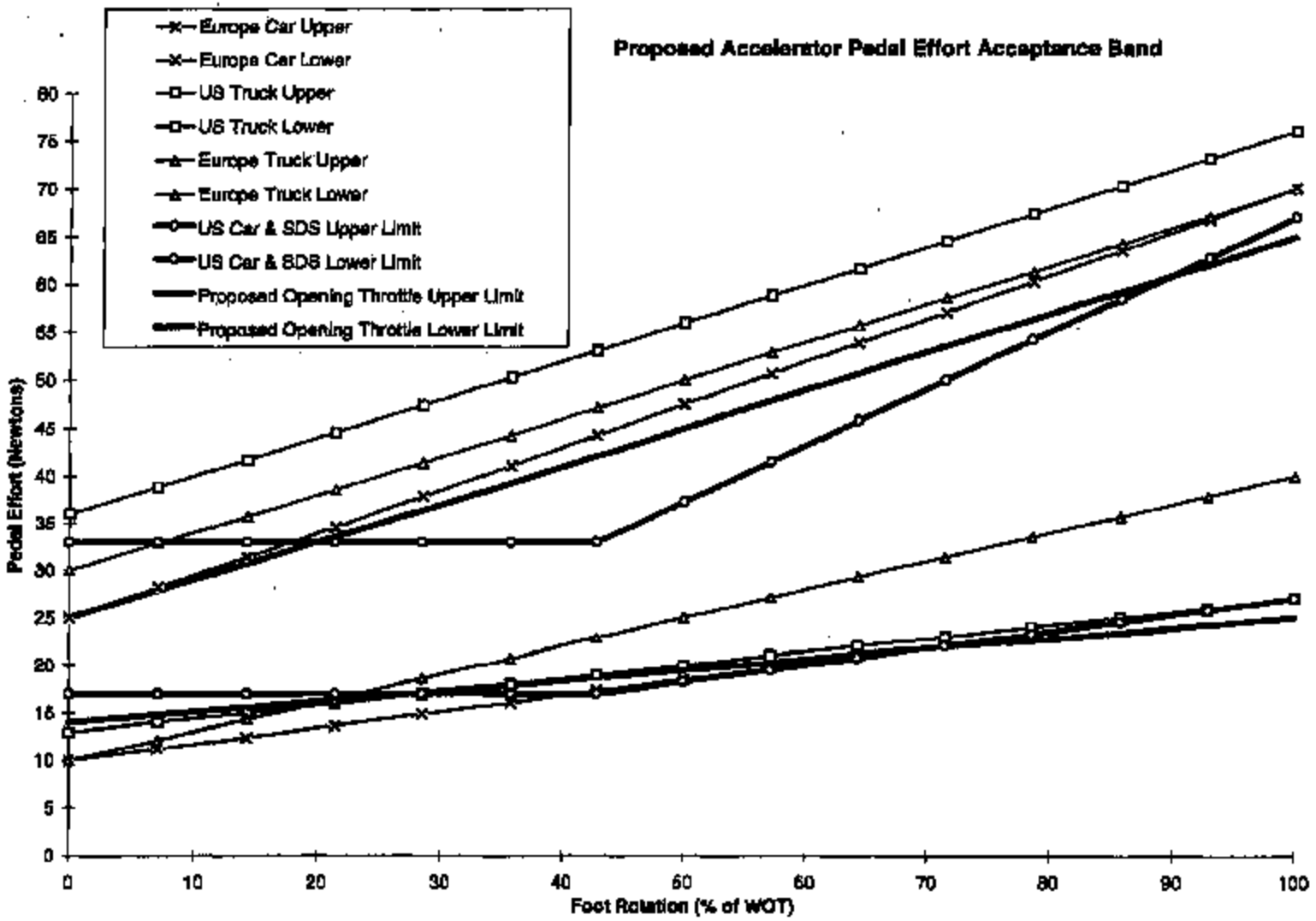
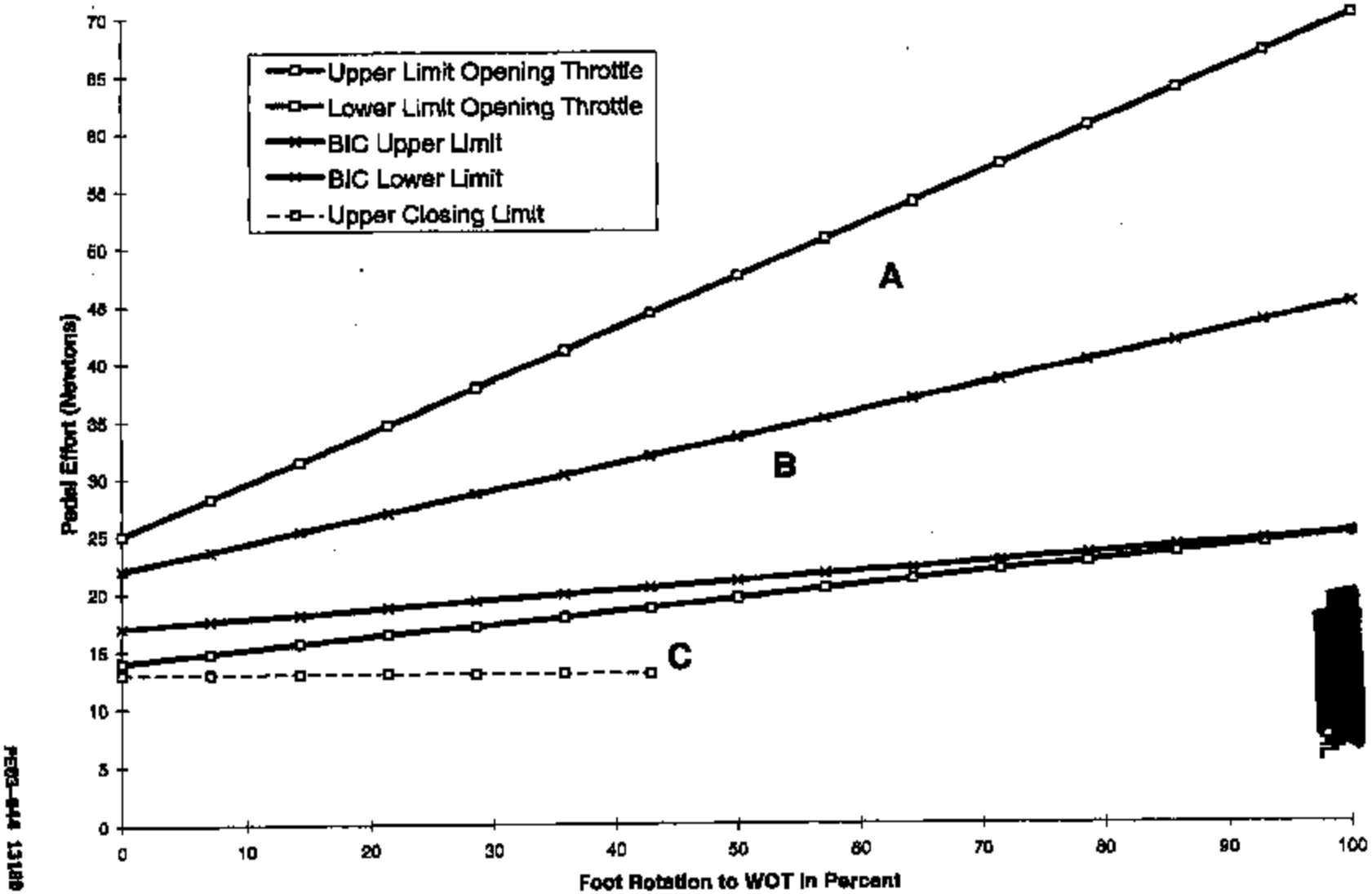
PE03-044
FORD
5/13/2005
APPENDIX I
BOOK 17 OF 28
PART 3 OF 4


Proposed Accelerator Pedal Effort Acceptance Band
Europe Car Upper
Europe Car Lower
US Truck Upper
US Truck Lower
Europe Truck Upper
Europe Truck Lower
US Car & SDS Upper Limit
US Car & SDS Lower Limit
Proposed Opening Throttle Upper Limit
Proposed Opening Throttle Lower Limit
Pedal Effort (Newtons)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
0
10
20
30
40
50
60
70
80
90
100
Foot Rotation (% of WOT)


Proposed Accelerator Pedal Effort vs Foot Rotation Bands
Upper Limit Opening Throttle
Lower Limit Opening Throttle
BIC Upper Limit
BIC Lower Limit
Upper Closing Limit
A
B
C
Pedal Effort (Newtons)
Foot Rotation to WOT in Percent
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
0
10
20
30
40
50
60
70
80
90
100

[redacted]

[redacted]

Procurement File Checklist
Purchase Order or Part No. 1131 POMS

This checklist is to be used to manage the contents of Purchase Order files in compliance with Purchasing Procedure 4.3 – Quality Records Management and the Procurement Quality Records Matrix. This form contains a comprehensive list of all Quality Records which may possibly be contained in a procurement file. Include this checklist in the Procurement file and check the documents contained in the file. The file is the official record of the transaction for the Purchasing Organization.

The Procurement file serves as the basis on which the Company defends itself against lawsuits and charges of wrongdoing in the placement of business. It can also serve to reflect compliance with government regulations. To comply with Corporate and Purchasing procedures and to support smooth transitions between buyers, it is imperative that the file contain those controlled documents that will establish the integrity of the file and clearly indicate which records are controlled.

CONTROLLED QUALITY RECORDS

- Request for Quotation (Manual) #PP-P-F050/Supplier Signed Quotation (Hardcopy)** ☐
- Supplier Quotation (Signed hardcopy) ☐
- Purchase Orders & Amendments (Manual) ☐
- Long Term Agreements ☐
- Non-QI Sourcing Approval Request Form ☒
- P.O. Terms and Conditions Modification (By Part or Supplier) ☐
- Lump Sum Approval Form ☐
- Lump Sum Purchase Order ☐
- Local Project Purchase Order ☐
- Supplier Confidentiality Agreement ☐
- FPDS Early Sourcing Workplan (Manual) ☐
- Early Sourcing Approval Request ☐
- FPDS Early Supplier Involvement Agreement ☐
- Interim Sourcing Agreement ☐
- FPDS Target Agreement (includes program-specific FSS ESOW & Quality/Reliability SOW) ☐
- FPDS Sourcing Agreement ☐

UNCONTROLLED QUALITY RECORDS

All other records held for information or reference purposes.

Form must be used in design competition/market test packages, if a systems-generated RFQ is not available. "Request for Quotation" package includes all documentation supporting the sourcing decision.

NOTE: Responsible Purchasing personnel shall maintain the Quality Records so they clearly indicate which records are controlled and uncontrolled.

Signature: [signature] Form Initiation Date: 4/4/03

[redacted]

From the Desk of

Jim Burrows
Q4dP Room 242; MD: 665 Q4dP
Phone: 313-337-2505; FAX: 313-317-4249
Jburrow3@ford.com

7/2

George,

No Additional Savings for my commodities

/Jim Burrows

[redacted]

Wheels, Tires & Fuel Systems Section

- [x] Stan Dobby
- [ ] George Coundouriotis
- [ ] Mike Merlin
- [ ] Jim Pratt
- [ ] Jim Burrows
- [ ] Gretchen Guest-Alessi
- [ ] ~~Craig Coscarelli~~
- [ ] Jim Paluga
- [ ] ~~Kent Robinson~~
- [ ] Jeff Wellman
- [ ] Sue Gerard
- [ ] Craig Shatzer
- [ ] Chandan Dutta
- [ ] Maureen Warner

PLEASE...

- [ ] Advise Status
- [ ] Circulate & Return
- [ ] Circulate & Toss
- [ ] Handle
- [ ] Make Copies
- [ ] Note
- [ ] See Me
- [ ] Sign

ASSIGNMENT

Due Date 7/7

Return to George for consolidation.

REMARKS

Gary Hagan Date 7/1/98

Ford Automotive Operations
Chassis & Electrical
Commodity Management
Drop 665, CMP Building

July 1, 1998

ny additional non-design

)00 per unit savings objective

7

Cc: Please 7/10/98

[redacted]

PE93-844 21228

[redacted]

[redacted]

Procurement File Checklist
Purchase Order or Part No. V137 Forms

This checklist is to be used to manage the contents of Purchase Order files in compliance with Purchasing Procedure 4.3 – Quality Records Management and the Procurement Quality Records Matrix. This form contains a comprehensive list of all Quality Records which may possibly be contained in a procurement file. Include this checklist in the Procurement file and check the documents contained in the file. The file is the official record of the transaction for the Purchasing Organization.

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CONTROLLED QUALITY RECORDS

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- Supplier Quotation (Signed hardcopy) ☐
- Purchase Orders & Amendments (Manual) ☐
- Long Term Agreements ☒
- Non-QI Sourcing Approval Request Form ☒
- P.O. Terms and Conditions Modification (By Part or Supplier) ☐
- Lump Sum Approval Form ☐
- Lump Sum Purchase Order ☐
- Local Project Purchase Order ☐
- Supplier Confidentiality Agreement ☐
- FPDS Early Sourcing Workplan (Manual) ☐
- Early Sourcing Approval Request ☒
- FPDS Early Supplier Involvement Agreement ☐
- Interim Sourcing Agreement ☐
- FPDS Target Agreement (includes program-specific FSS ESOW & Quality/Reliability SOW) ☐
- FPDS Sourcing Agreement ☐

UNCONTROLLED QUALITY RECORDS

All other records held for information or reference purposes.

***Form must be used in design competition/market test packages, If a systems-generated RFQ is not available. "Request for Quotation" package includes all documentation supporting the sourcing decision.*

NOTE: Responsible Purchasing personnel shall maintain the Quality Records so they clearly indicate which records are controlled and uncontrolled.

Signature: [signature] Form Initiation Date: 4/4/03

[redacted]

From: Goodwin, William (W.R.)
Sent: Wednesday, July 30, 2003 6:01 PM
To: Liposky, Lawrence (L.J.); Figurski, Patrick (P.M.); Pallett, Tobias (T.J.); Wait, Suzanne (S.K.)
Cc: Stephens, Craig (C.); Bass, Raynard (R.); West, Gregory (G.S.); Childress, Terry (T.W.)
Subject: RE: Accel Pedal IR Contract Discussion

Here is the updated proposal, I will also attempt a list of items to initiate a work plan as we discussed Monday.

2 Track PPS IR controls contra...

Please note the revised review timing from 2:30 to 3:30 tomorrow.

Regards,

Bill Goodwin
Technical Specialist, Speed and Position Sensors
V Engine Engineering, Ford Motor Company
Tel: 313 337-6679 Fax: 313 390-4084
email: wgoodwin@ford.com
textpage mailto:3137960571@alphapage.airtouch.com

---Original Message---
From: Liposky, Lawrence (L.J.)
Sent: Wednesday, July 30, 2003 7:35 AM
To: Figurski, Patrick (P.M.); Pallett, Tobias (T.J.); Wait, Suzanne (S.K.)
Cc: Stephens, Craig (C.); Goodwin, William (W.R.); Bass, Raynard (R.); West, Gregory (G.S.)
Subject: RE: Accel Pedal IR Contract Discussion

Bill can you forward a copy of the strawman to Toby and Suzanne ?? Need to re confirm time also. Greg will follow up. thanks

Larry Liposky
Supervisor - Accelerator Controls
Tough Truck / Outfitters
Phone 24-81726
Pager 796-0949

---Original Message---
From: Figurski, Patrick (P.M.)
Sent: Wednesday, July 30, 2003 6:55 AM
To: Pallett, Tobias (T.J.); Wait, Suzanne (S.K.)
Cc: Stephens, Craig (C.); Goodwin, William (W.R.); Liposky, Lawrence (L.J.); Bass, Raynard (R.)
Subject: Accel Pedal IR Contract Discussion

Toby/Suzanne-- Craig Stephens recommended I invite you to a discussion on Thursday at POEE CR B at 1:30 - 2:30 regarding a potential IR project for 2 track Pedal Sensor. We will start with a "state of the business" discussion centering around supply base assessment and brief overview of current pedal designs. We'll then discuss a proposal to pursue 2 track design for pedal sensor and what is required to implement. For discussion purposes, Bill Goodwin has put together a strawman for an IR contract for this proposed project.

Patrick Figurski
Manager, Powertrain Electronic Applications Department **PEB3-844 19688**

[redacted]

(313) 337-3809

FE83-844 19889

[redacted]

2 track Accelerator Pedal Control System - PT Controls IR Contract — DRAFT

IR Project Leaders

FRL, Project Lead: _____ PCSE Controls Project Leader: _____

ENTIRE PAGE CONFIDENTIAL

Summary Description of New Technologies — *Describe the Project and the CR technologies being brought to IR*

Purpose: Develop a Robust 2 track accelerator pedal control system

- Develop Control Software to change from 3 track Accel Pedal inputs to 2 track accel pedal input and utilize brake sensor inputs to mitigate the severity of functional degradation upon the loss of one of the pedal sensor inputs.
- Develop level of functionality and demonstrate failure mode response when single failure mode and multiple failure modes are pres
- Benchmark competitive performance of accel pedal control systems and failure modes on 2 track system for sensor failure
- Develop system consistent with both the benchmark of competitive performance and internal requirements developed by Ford Brands(Volvo, Mazda, Aston Martin, Jaguar/Land Rover, and Ford Europe)
- Define system interface requirements for the pedal and brake sensor inputs
- Resolve any potential patent issues through patent submittals or patent clearance from OGC
- Possible Additional Goal : Reduce FMEM mode count from the current 8 to a target level of less than 6

Target Program Description — *Identify Target Program including LS/P level) for the first Implementation of New Technology*

Lead Program: TBD (late 2007 or standard 2008 program likely)
Next applications:

IR Demonstration Plan — *Define the method(s) being used for IR Demonstration (Dyno, Vehicle, VPACS or any combination required)*

Demo. Plan: Proposed Surrogate Test Platform P221 (The intent in using P221 is to minimize effort in getting representative modules and vehicles, so efforts can be focused on the actual intent of the IR; rather than obtaining test hardware)

Module Type: Oak Family
S/W Method:
Vehicle:
Engine:
Trans.:
Unique H/W:

Range of Application — *Define the range of Products / Programs that this IR demonstration applies to, for technology migration.*

Investigate interaction issues with CVT, manual transmission, HEV and VDE engines

Technology Compatibility — *Possible evaluation of the compatibility of this technology, enablers required and incompatible technologies.*

Enablers:
2 track contacting and contactless pedal sensors

Exclusions:

Related IR Contract(s) — *Identify other related IR Contracts and Projects*

IR Projects	Description	Author / Contact	Contract Issue Date
Technology)			
Engine/Trans H/W			
PCSE	2 Track Pedal Sensor and input circuit IR(If necessary if unique pedal outputs are required) Must be compatible with I ETC system being developed		

Key Program Milestones — *IR Project Resource timing plan and its relation to the target Vehicle Program milestone (if applicable)*

Project Timing: PT R&D Milestones	Request Date	Date	Program Timing: FPDS Milestones	MSTP1 FPDS/Tem.	Date
• 2 Track IR contract initiated		Current	•		
• IR Program Team identified			•		
• IR development work			•		
• IR Declaration		32 MSTP1 from target program	•		
• Pilot Program implementation		J1	•		
• 1st Wave Rollout		10-16 Months post Pilot J1			
• 2nd Wave Rollout		20-28 Months post Pilot J1			

PE03-044 18698

[redacted]

2 track Accelerator Pedal Control System - P/T Controls IR Contract — DRAFT

ENTIRE PAGE CONFIDENTIAL

P/T Controls IR Criteria & Demonstration Methods			Modify Criteria and Demonstration Methods Planned for IR Completion	
Attribute/Criteria	Attribute Impacted? OBD	Deliverable	IR Demonstration Method	Measure of Success
• Functional/ Performance Criteria	N	In non failure mode operation		
	Y	In failure mode operation		Concurrence of Completion by SSFT
• Fuel Economy	N			
• Emissions	N			
• OBD Monitor Evaluation	Y	Define fault codes and fault detection method for brake and pedal inputs		Concurrence of Completion by SSFT
• Torque Monitor	Y	Incorporate revised inputs(accel and brake) into IPC:Equinox function including SLOWS and BOA functions		Concurrence of Completion by SSFT
• Software/Strategy & Tools	Y	Software and strategy—noted above; Tools-no changes anticipated		Concurrence of Completion by SSFT
• Calibration/Mapping Methodology & Tools	Y	Develop and/or update Calibration guides for of Pedal, ETC FMEM, and Brake Monitor		Concurrence of Completion by SSFT
• H/W Models	Minimal			
• SDS	Y	Update as necessary		Concurrence of Completion by SSFT
• Patent Search	Y	Including Patent Clearance or negotiated patent usage on developed technology		Intellectual property issues resolved
Invention Disclosure	Y	As applicable		Concurrence on Completion by SSFT
• Package/ Weight Implications	N			
• Cost	Y	This development must be supported by the improved value of the 2 track design		Cost model concurred with H/W group
• Quality/Reliability	Y	Equivalent or better reliability to the customer--develop a formal reliability assessment		Concurrence of Completion by SSFT
• H/W Serviceability	N			
• Supplier/Sourcing	N	Not required as part of IR—captured in other work		Captured in Separate Hardware and Input filter circuit if necessary
• FMEA	Y	update to capture revised design; update fault tree		Concurrence of Completion by SSFT
• P-Diagram	Y	minimal for contacting sensor		Updates to be led by H/W group with SSFT input
• Controls DV Plan	y	Develop 2 track related test methods and acceptance criteria for ETC, ETC monitor and FMVSS.		Concurrence of Completion by SSFT
• Other	Y	1)Include Volvo/Ford Europe/Mazda/Jaguar/Land Rover/Aston Martin input		

PE83-844 19681

[redacted]

ENTIRE PAGE CONFIDENTIAL

Risks & Opportunities *Identify Key Risks & Opportunities related to Timing, Resources, R&R's, etc...*

Risks

-
-

Opportunities

- Attempt at Commonality with other segments of Ford on number of outputs and failure mode response
- Flexibility to use Contacting or Contactless pedal sensors and broader supply base (No 3 track contactless sensors exist and would be cost prohibitive if they did)
- Potential System Cost Reduction
-

Comments

1

IR Contract Signatures *Concurrence of Key Stakeholders for this IR Project*

Director - CAFE North American Engineering	Director - P/T Restraints & Advanced Engineering
P/T Control System Engineering Chief Engineer	P/T Controls Research & Development Manager
P/T Applications Chief Engineer	Chassis/Brake Engineering Manager
CNE 2007 VN127	PCR&D Controls Project Leader

PE03-844 19892

[redacted]

2 track Accelerator Pedal Control System - P/T Controls IR Contract — DRAFT

P/T Controls IR Criteria & Demonstration Methods		Complete Status to Target with Risk Assessment and color Rating			
	Attribute Impacted?				
Attribute/Criteria	(Y/N)	Deliverable	Measure of Success	Status / Risk	R/Y/G
• Functional/ Performance Criteria	N Y	In-non failure mode operation In failure mode operation	Concurrence of Completion by SSFT e KEPI		
• Fuel Economy	N				
• Emissions	N				
• OBD Monitor Evaluation	Y	Define falut codes and fault detection method for brake and pedal inputs	Concurrence of Completion by SSFT		
• Torque Monitor	Y	[illegible] inputs(accel and brake) into IPC?Equizzer function including	Concurrence of Completion by SSFT		
• Software/Strategy & Tools	Y	Develop and/or update Calibration guides for of Pedal, ETC FMEM, and	Concurrence of Completion by SSFT		
• Calibration/Mapping Methodology & Tools	Y	Develop and/or update Calibration guides for of	Concurrence of Completion by SSFT		
• H/W Models	Minimal	[illegible]			
• Patent Search	Y	Clearance or negotiated patent usage on [illegible]	Intellectual property issues resolved		
Invention Disclosure	Y	As applicable	Concurrence on Completion by SSFT		
• Package/ Weight Implications	N				
• Cost	Y	The development must be supported by the improved value of the 2	Cost model concurred with H/W group		
• Quality/Reliability	Y	Equivalent or better reliability to the customer--develop a formal reliability assessment	Concurrence of Completion by SSFT		
• H/W Serviceability	N				
• Supplier/Sourcing	N	Not required as part of IR--captured in other work	Captured in Separate Hardware and Input filter circuit if necessary		

[redacted]

ENTIRE PAGE CONFIDENTIAL

PE83-044 18883

[redacted]

2 track Accelerator Pedal Control System - P/T Controls IR Contract *DRAFT*

• SDS	Y	Update as necessary	Concurrence of Completion by SSFT
• P-Diagram	Y	minimal for contacting sensor	Updates to be set by H/W group with SSFT input
• FMEA	Y	update to capture revised design; update fault tree	Concurrence of Completion by SSFT
• Controls DV Plan	y	Develop 2 track related test methods and acceptance criteria for ETC, ETC monitor and FMVSS.	Concurrence of Completion by SSFT
• Other	Y	(Include Volvo/Ford Europe/Mazda/Jaguar/L and Rover/Aston Martin input	

[redacted]

Comments

1. Not above and beyond what current production TC imply; current production TCs can have an effect on emissions in order to provide improved safety. In our meeting with VEE, it has been agreed that FMEA will be used to show robustness with respect to unattended prolonged TC applications.

IR Engineering Signoff Signatures *Concurrence from Key Stakeholders of Completion of IR Project*

Director - CAFE North American Engineering	Director - P/T Research & Advanced Engineering
P/T Control System Engineering Chief Engineer	P/T Controls Research & Development Manager
P/T Applications Chief Engineer	Chassis/Brake Engineering Manager
CNE 2007 VN127	PCR&D Controls Project Leader

PEBS-044 19894

[redacted]

[redacted]

Ford Williams Pedal Tolerance Test Plan

- Calibration plan (R14 tentative timing 3/31/03)
  - Engine
  - OBD II
  - Transmission
  - Power monitor
  -
- Williams Controls actions (Timing TBD
  - Slope guard band based off initial KLT
    - 1-2 3.34
    - 1-3 3.04
    - 2-3 3.63
  - Tolerance available if testing is successful
    - +3.5/-2.5%
- Field Actions:
  - SSM for dealer pinpoint test
- DV
  - SDS deviation
  - Reliability assessment of current warranty risk
  - Vehicle effects- Pedal does not perform as well in vehicle as it does when mounted to bed plate at WMCO EOL tester. Therefore this change in voltage must be accounted for within the calibration.
- Manufacturing
  - EOL parameters at KTP
  - Warranty share

[redacted]

FRED HAMILTON / CHARLIE M GREG WEIR
BOB BERANGER LARRY LIRSKI 1.24.03
EMMETT RYAN

OWNER NOTIFICATION

SENSOR BLACK BOX ACCELERATED TESTS - THIS FAILURE NEEDS TIME FOR IT TO OCCUR

PARTS PASSED DV & PV

PV PARTS INDICATED FAILURE

DID PARTS PASS VEHICLE DURABILITY?

WE CANNOT FIND THE RESULTS

KEY LIFE TESTS WOULD NOT PICK THIS CONDITION UP DUE TO TIME LIMITATION

ETC ISSUE NOT ADJUSTABLE VS FIXED

NYE LUBE SUPPLIER

WABASH DOES THE MIXING

SECOND GEN DESIGN (2 TRACK)

COMBINE SWITCH & SENSOR ON PCM

FIX → PHENOLIC BARRIER NON MIGRATING LUBE, CONTROLLED APPLICATION

PE03-044 20638

[redacted]L

[redacted]

WARRANTY DATA

COUNTS

60.00 MIL
15.00 H/TRAN
1.00 YOU-IN

39-44

BOB HILDING - OGC
CCAG

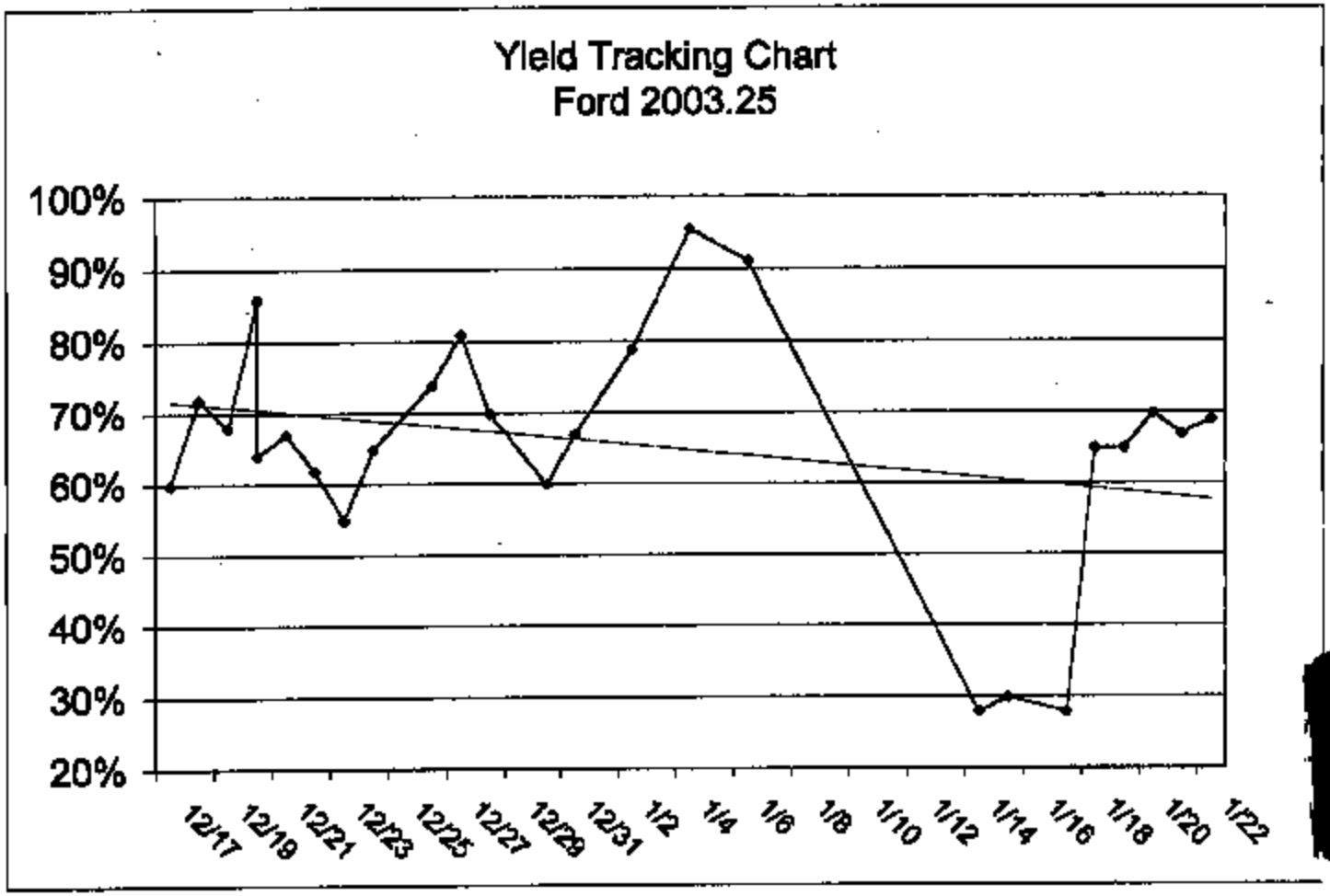
JAY LOGEL 42223

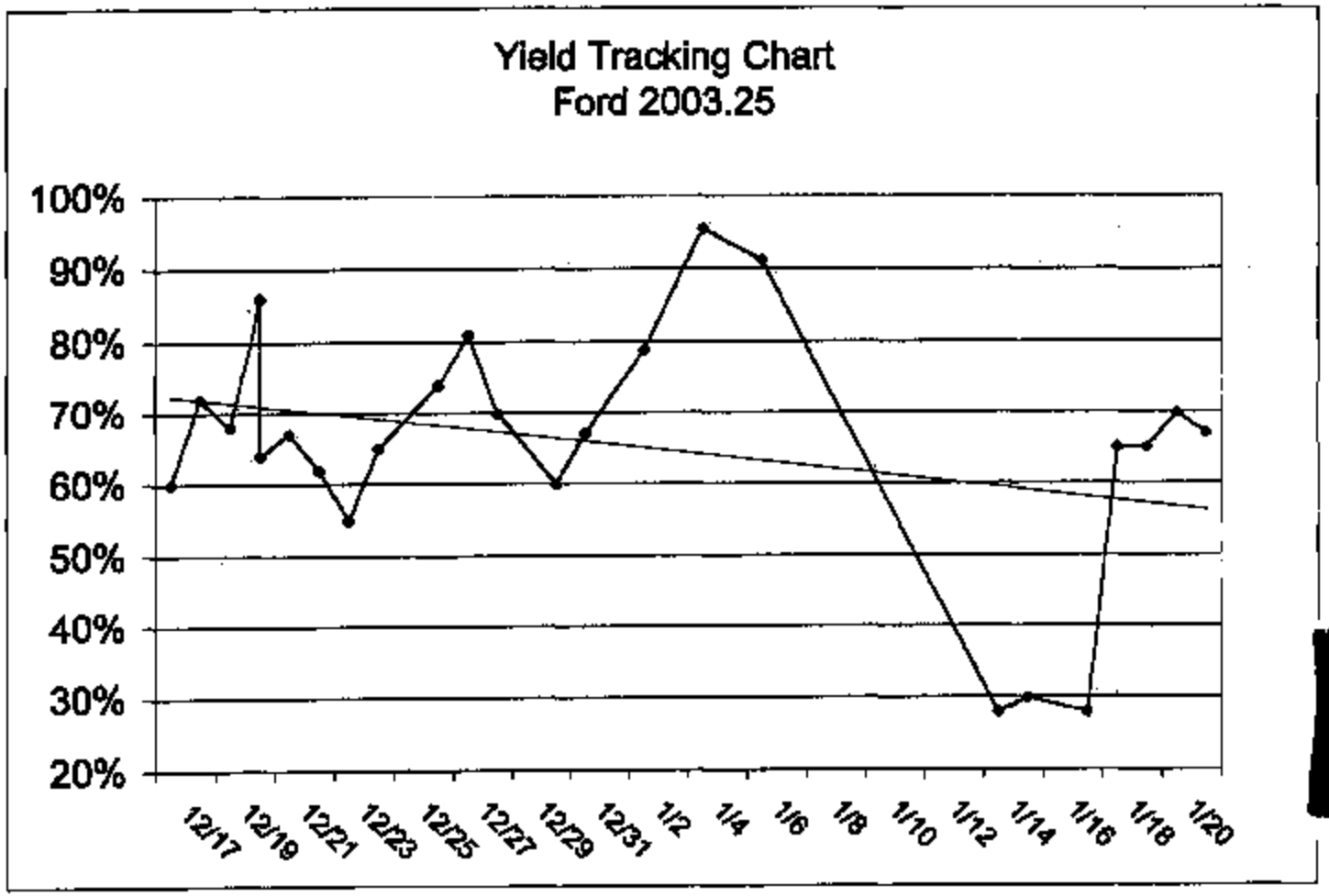
GREG OSWALD 0460

APG FORD WAS AWARE DURABILITY FAILURE
ARIZONA PROVING GROUNDS
SOME FORD PERS.
DUE TO INEXPERIENCED ENGINEER

[redacted]

Based on last 1/24/03
100 pieces
are above @ 88%
yield
- improvement due to better
- Alignment of z sheets
in clean room
- added additional
injectors





[redacted]

TO ALL PLANT EMPLOYEES [redacted]

Due to yield issues on the Ford 3-track ETC we are currently in an ALERT condition with Ford's Kentucky Truck Plant. We are approximately 4,000 parts behind in meeting KTP's build requirements and Ford is very concerned about our ability to keep their plant running.

We have a plan in place to first meet Ford's needs and, at the same time, to resolve our yield issues.

UNTIL FURTHER NOTICE, all employees associated with the Ford Pedal assembly line, Ford sensor line and the Clean Room should plan to work a seven-day work week and overtime each day as the supply of components allows. This requirement includes all positions supporting the production of these units.

Our objective is to produce a minimum of 720 parts for shipment daily. With our plan in place and your cooperation we should be current with Ford's requirements by the second week of February.

Thank you,

Ken Pyle
1/21/03

PE03-044 21359

[redacted]

[redacted]

WILLIAMS CONTROLS

FORD SUPERDUTY FIXED ETC
Yield Improvement and Ship Plan

Updated 01/22/03

KTP Production support Plan

- Build 720 ETC's daily, Ship per schedule to KTP to support production quantities (Daily rate maximum of 688 thru 02/02)

- WMCO Production schedule requirements to meet required build are anticipated at 60% yield.

    1. Element production area will be required to produce 1500 element daily.
    2. Sensor production area will be required to produce 1250 sensors daily.
    3. ETC production area will be required to produce 1200

    Note: Efforts are in process to establish a second shift for he cleanroom.

    Note: Present production is running at 65 % to 75 %.

Line capacity of producing 4250 ETC's weekly.

- One shift, 5-day operations
- Element capacity – 2000/shift
- Sensor capacity – 1200/shift
  ETC assembly capacity – 1200/shift

Yield Improvement Efforts

- Element Production
  Review artwork translation process (Develop Inspection criteria)
  Evaluate all punch press operation (Provide dimensional inspection process)
  Evaluate all printing process (develop dimensional inspection criteria)
  Review element for improved manufacturability.
  Improve element tester reliability- Add two more positioning pins at heat-stake holes.
- Sensor Production
  Implement sensor end of line tester. (Long Lead Item) Item affects yields at ETC at a 2 % to 3 % rate.
- ETC Production
  Requires no evident revisions.
- Concurrently,
  Control Plan reviews with efforts to increase inspections
  Revisit PFMEA.

PE83-844 21388

[redacted]

[redacted]

Hawkins, Fred (F.W.)

From: Pyle, Ken [kpyle@wmco.com]
Sent: Wednesday, February 12, 2003 2:06 PM
To: 'fhawkin2@ford.com'
Cc: Velat, Ron; Bricker, Ron; Miers, Jerry
Subject: Ford Planning Info

Fred, attached is the updated Ford Planning Matrix. I will send it to you at 8:00AM each morning. There was a problem in the Ford system this morning and, until Ron Bricker got it resolved, the information would have been incorrect. National Logistics, Ford's expedited shipping logistics company, had removed our shipments this week from the Ford daily release report which took us from a 3.5 day inventory to a .8 critical level requiring air shipments. Once corrected, we are again at a 3.5 day inventory level.

The Ford report omits the previous day's shipping activity, but I will keep you posted:

2/10 1060 units
2/11 720 units

We are on schedule for producing a minimum of 720 today and Ford logistics has requested that we don't ship again until Friday. Hopefully this, with the combination of weekend production, can get us out of the expedited shipment mode.

I currently don't have Joe's or Tim's email address. Could you forward this to them and provide me with the addresses so I can do it tomorrow.

Ken Pyle
General Manager
Williams Controls

2/12/03 per K Pyle Ford doesn't want Wms to ship til Friday (to be there for sunday's Production, 17 hr Expedite) usually ship to Ford's Distrib Warehouse w/ 5-7 day turnaround. DH 3.5

2/12/03

[redacted] [illegible]

Inv		WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU
[redacted]	Assembly Plant:	[illegible]															
1,844	Total Requirements:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Part Number	Build:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C44-9F816-AC	Proj Balance:	[redacted]															
	Assembly Plant:																
[redacted]	Total Requirements:		0	[illegible]	0										0	0	0
0	Net Build:	0	0	0	0	0	0	[illegible]				[illegible]	0	0	0	0	0
Part Number	Proj Balance:	[redacted]															
	Assembly Plant:																
[redacted]	Total Requirements:	0	[illegible]	[illegible]	0			[illegible]	[illegible]			[illegible]			0	0	0
0	Net Build:	0	0	0	0	0	0			[illegible]	[illegible]	[illegible]	0	0	0	0	0
Part Number	Proj Balance:	[redacted]															
	Assembly Plant:																
[redacted]	Total Requirements:	0	0	[illegible]	0			[illegible]							0	0	0
0	Net Build:	0	0	0	0	0	0	[illegible]					0	0	0	0	0
Part Number	Proj Balance:	[redacted]															
	Assembly Plant:																
[redacted]	Total Requirements:	0	[illegible]	[illegible]	0			[illegible]	[illegible]		[illegible]	[illegible]			0	0	[illegible]
0	Net Build:	[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	[illegible]	[illegible]	[illegible]
Part Number	Proj Balance:	[redacted]															
	Assembly Plant:																
[redacted]	Total Requirements:	[illegible]	[illegible]	[illegible]	0			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]
0	Build:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Part Number	Proj Balance:	[redacted]															
	Assembly Plant:																
[redacted]	Total Requirements:	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]
[illegible]	Net Build:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Part Number	Proj Balance:	[redacted]															
Total	Total Requirements:	647	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[redacted] 1,844	Build:	720	720	720	720	[illegible]	720	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	720	720	720	720	720
Part Number	Proj Balance:	[redacted]															

Part Number
Part Number
Part Number
Part Number
Part Number
Part Number

FEM3-044 21311

[redacted]

[redacted]

Hawkins, Fred (F.W.)

From: Pyle, Ken [kpyle@wmco.com]
Sent: Tuesday, February 11, 2003 8:07 AM
To: 'fhawkin2@ford.com'
Cc: Miers, Jerry; Bricker, Ron
Subject: WILLIAMS ETC

Fred,

Again, I apologize for not getting this info to you until this AM. The attached is a Ford document that we update daily. As you can see, we made a shipment of 1080 on Monday and currently have almost 1900 parts in inventory (at KTP, en route, and at Williams). With our projected build, that inventory increases to a point that KTP will be comfortable and expedited shipments will cease.

Ken Pyle
General Manager
Williams Controls
(941)727-5696 x 15

2/11/03

Sat 0 Sun 0 - part purge 540

Tim Gilbert Supply Chain Mgmt

[illegible] | [illegible] | [illegible]

[illegible] 10:00 AM

	Inv		Mon 2/..	Tue 2/11	Wed 2/12	Thur 2/13	Fri 2/14	Sat 2/15	Sun 2/16	Mon 2/17	Tue 2/..	Wed ..	Thur ..	Fri 2/21	Sat 2/22	Sun 2/23	Mon 2/24	Tue 2/25
[redacted]		Assembly Pl.																
	3,[illegible]	Total Requirements	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	371	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	371
Part Number		Bu	[illegible]	720	720	720	720	720	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	720	720	720	720	720
C44-0F030-AC		Proj Balance	[illegible]															
		Assembly Plant																
[redacted]		Total Requirements		0	0	0			[illegible]	0						0	0	0
	0	Set Build	0	0	0	0	0	0	[illegible]	0	[illegible]			0	0	0	0	0
Part Number		Proj Balance																
		Assembly Plant																
[redacted]		Total Requirements	0	0	0	0			0	0						0	0	0
	0	Set Build	0	0	0	0	0	0	0	0	[illegible]		[illegible]	0	0	0	0	0
Part Number		Proj Balance																
		Assembly Plant																
[redacted]		Total Requirements	0	0	0	0			0	0						0	0	0
	0	Set Build	0	0	0	0	0	0	0	0				0	0	0	0	0
Part Number		Proj Balance																
		Assembly Plant																
[redacted]		Total Requirements	0	0	0	0			0	0						0	0	0
	0	Set Build	0	0	0	0	0	0	0	0				0	0	0	0	0
Part Number		Proj Balance																
		Assembly Plant																
[redacted]		Total Requirements	0	0	0	0			0	0						0	0	0
	0	Build	0	0	0	0	0	0	0	0	0			0	0	0	0	0
Part Number		Proj Balance																
		Assembly Plant																
[redacted]		Total Requirements	0	0	0	0			0	0	0					0	0	0
	0	Set Build	0	0	0	0	[illegible]	0	0	0		0	0	0	0	0	0	0
Part Number		Proj Balance																
Total		Total Requirements	725	[illegible]	[illegible]	[illegible]	[illegible]	371	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	371
[redacted]	4,[illegible]	Build	1,[illegible]	720	720	720	720	720	720	720	[illegible]	[illegible]	[illegible]	720	720	720	720	720
Part Number		Proj Balance																

Part Number
Part Number
Part Number
Part Number
Part Number
Part Number
Part Number

150/day usage

.6 = 1080 ÷
.9
3.5
1.0
7.5 days

5-6 days transit
Need 1000 or 5.0 (DOH float)
1158 -

Element 0% - Tox% 10 sec for test
Sensors — new %
EOL — 90%

PEB3-B44 21313

[redacted]

10:00 AM

		Mon 1/27	Tue 1/28	Wed 1/29	Thu 1/30	Fri 1/31	Sat 2/1	Sun 2/2	Mon 2/3	Tue 2/4	Wed 2/5	Thu 2/6	Fri 2/7	Sat 2/8	Sun 2/9	Mon 2/10	Tue 2/11
Inv																	
[redacted]	Assembly Plant	[illegible]															
[illegible]	Total Requirements	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	614
Part Number	Builds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	720
C44-6F226-AC	Proj Balance	[redacted]															
	Assembly Plant																
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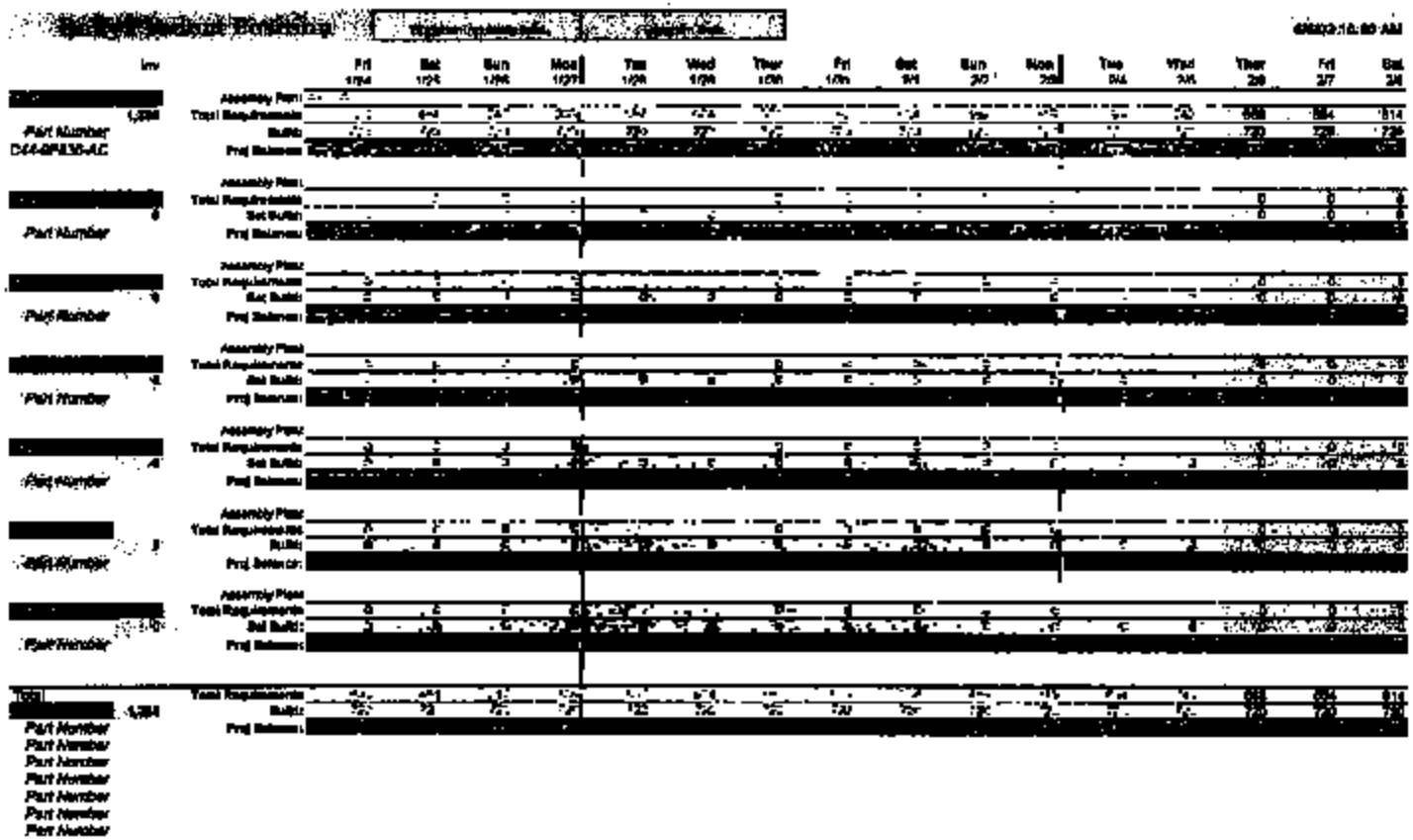
	Sched Builds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
Part Number	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Sched Builds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Part Number	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
	Sched Builds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
Part Number	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
	Sched Builds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
Part Number	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			0	0	0
	Builds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	0	0	[illegible]
Part Number	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			0	0	[illegible]
	Sched Builds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	0	0	[illegible]
Part Number	Proj Balance	[redacted]															
Total	Total Requirements	[illegible]	444	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	614
[redacted]	Builds	720	720	720	720	720	[illegible]	[illegible]	720	720	720	720	[illegible]	[illegible]	720	720	720
Part Number	Proj Balance	[redacted]															

Part Number
Part Number
Part Number
Part Number
Part Number
Part Number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Sat 1/25
Sun 1/26
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Tue 1/28
Wed 1/29
Thur 1/30
Fri 1/31
Sat 2/1
Sun 2/2
Mon 2/3
Tue 2/4
Wed 2/5
Thur 2/6
Fri 2/7
Sat 2/8
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D44-BR836-AC
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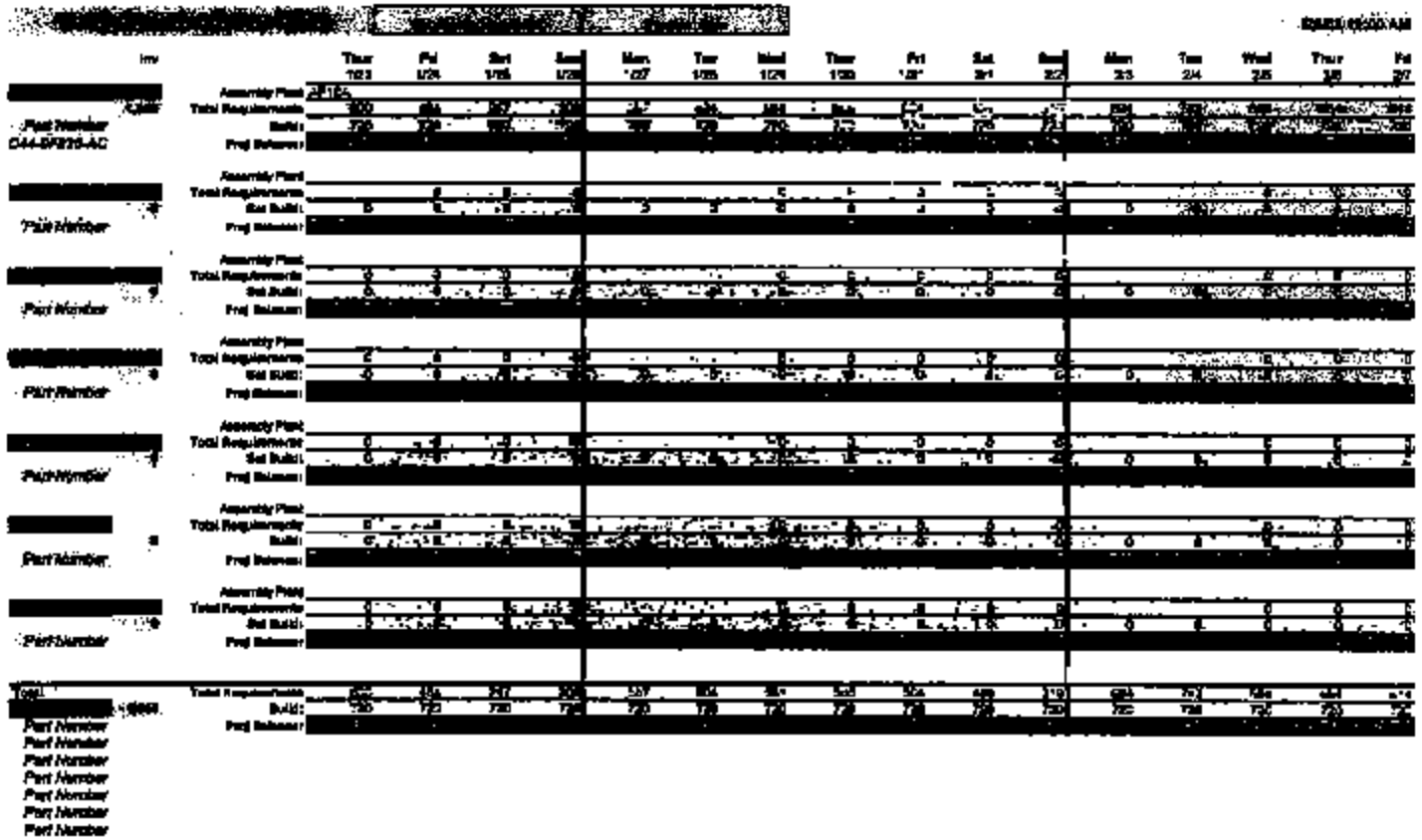
Part Number



Part Number
C44-SP835-AC

Part Number

Part Number

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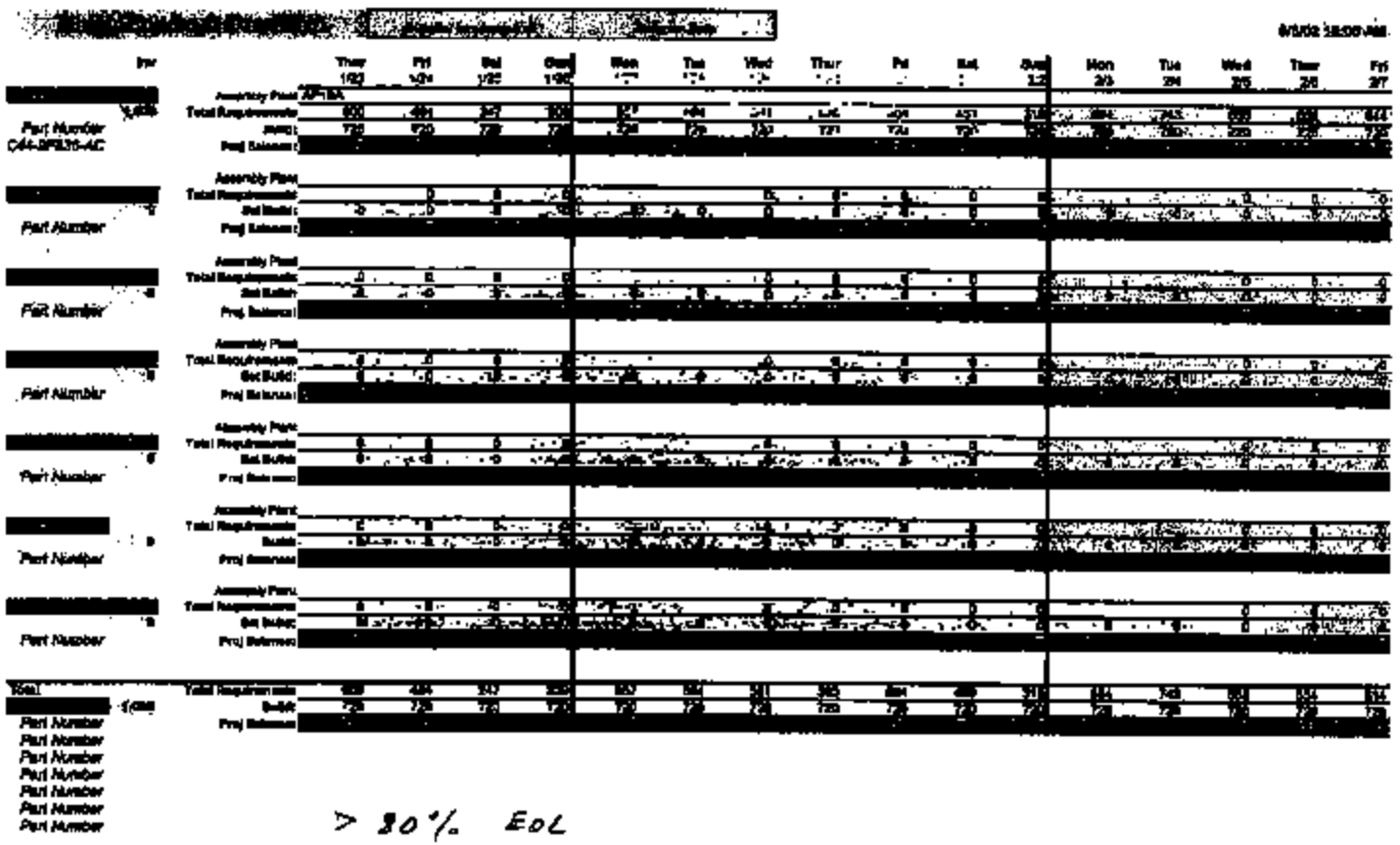


> 80% EOL yield

1.8 on hand at RTP

need to get above 7 days to go back to regular shipments

Ron Br[illegible] —

[illegible] | [illegible] | [illegible]

		Tues 1/21	Wed 1/22	Thurs 1/23	Fri 1/24	Sat 1/25	Sun 1/26	Mon 1/27	Tues 1/28	Wed 1/29	Thurs 1/30	Fri 1/31	Sat 2/1	Sun 2/2	Mon 2/3	Tues 2/4	Wed 2/5
[redacted]	Assembly Plant	[illegible]															
Part Number	Total Requirements	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]							
C44-AF [illegible]	Builds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]							
	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[redacted]															
Part Number [redacted]	Sel Builds	[redacted]															
	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[redacted]															
Part Number [redacted]	Sel Builds	[redacted]															
	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[redacted]															
Part Number [redacted]	Sel Builds	[redacted]															
	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[redacted]															
Part Number [redacted]	Sel Builds	[redacted]															
	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[redacted]															
Part Number [redacted]	Builds	[redacted]															
	Proj Balance	[redacted]															
	Assembly Plant																
[redacted]	Total Requirements	[redacted]															
Part Number [redacted]	Sel Builds	[redacted]															
	Proj Balance	[redacted]															
Total	Total Requirements	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	111	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[redacted]	Builds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Part Number	Proj Balance	[redacted]															

Part Number
Part Number
Part Number
Part Number
Part Number
Part Number

PEB3-044 21318

[redacted]

[redacted]

WILLIAMS CONTROLS

FORD SUPERDUTY FIXED ETC
Yield Improvement and Ship Plan

Updated 01/22/03

KTP Production support Plan

- **Build 720 ETC's daily, Ship per schedule to KTP to support production quantities (Daily rate maximum of 688 thru 02/02)**

- **WMCO Production schedule requirements to meet required build are anticipated at 60% yield.**

    1. **Element production area will be required to produce 1500 element daily.**
    2. **Sensor production area will be required to produce 1250 sensors daily.**
    3. **ETC production area will be required to produce 1200**

    Note: Efforts are in process to establish a second shift for he cleanroom.

    Note: Present production is running at 65 % to 75 %.

- **Line capacity of producing 4250 ETC's weekly.**
    - **One shift, 5-day operations**
    - **Element capacity – 2000/shift**
    - **Sensor capacity – 1200/shift**
      ETC assembly capacity – 1200/shift

Yield Improvement Efforts

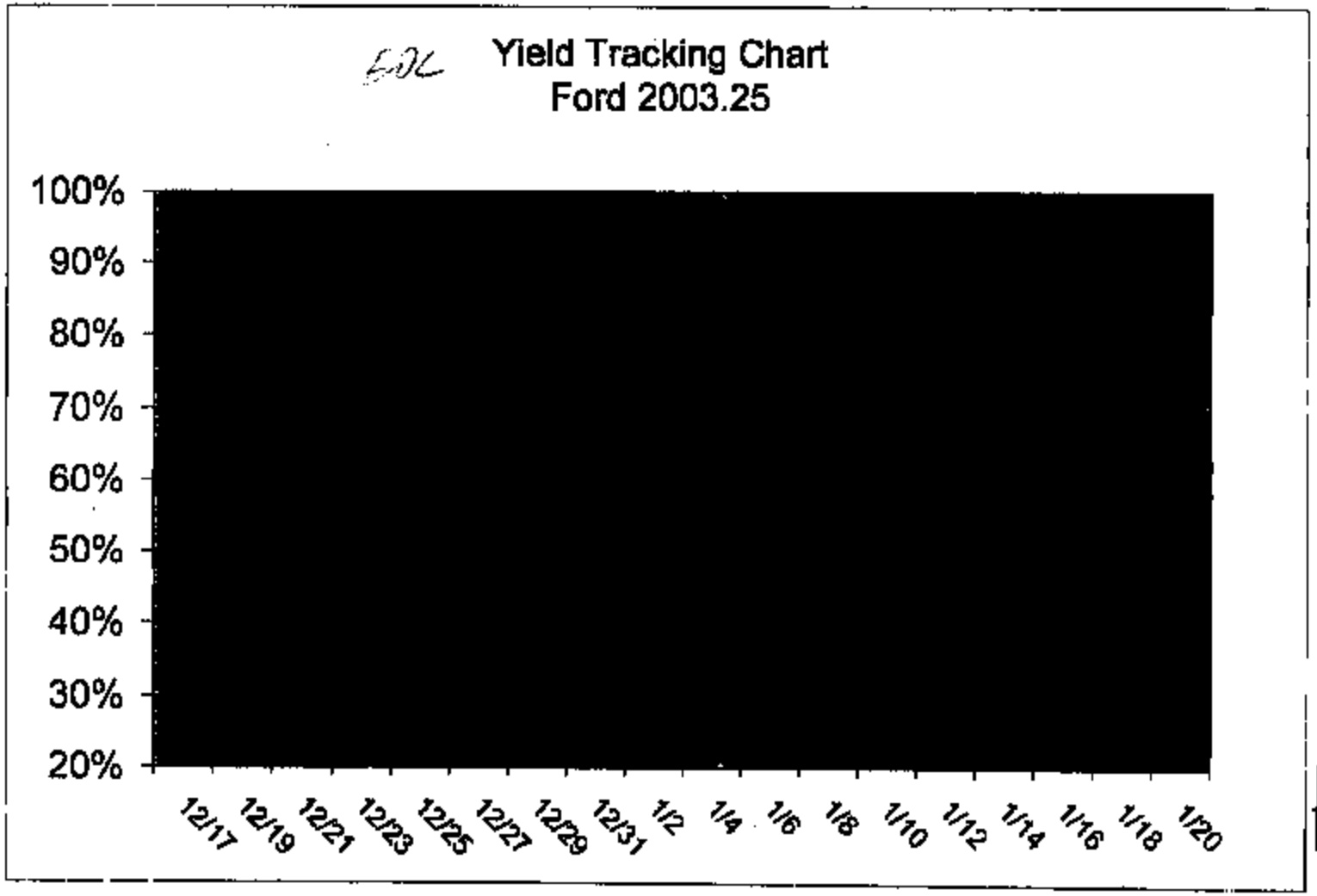
- **Element Production**
  Review artwork translation process (Develop Inspection criteria)
  Evaluate all punch press operation (Provide dimensional inspection process)
  Evaluate all printing process (develop dimensional inspection criteria)
  Review element for improved manufacturability.
  Improve element tester reliability- Add two more positioning pins at heat-stake holes.
- **Sensor Production**
  Implement sensor end of line tester. (Long Lead Item) Item affects yields at ETC at a 2 % to 3 % rate.
- **ETC Production**
  Requires no evident revisions.
- **Concurrently.**
  Control Plan reviews with efforts to increase inspections
  Revisit PFMEA.

[redacted]

[redacted]

Date	Build Schedule	Proposed Inventory	Actual Build	Actual Inventory 180	Releases	Q Shipped	Backlog	Variance to Inventory	Plant usage	
01/21/2003	720		720	900	720	720	4680		688	
01/22/2003	720	1440		-180	1440		6120		545	
01/23/2003	720	2160		180	720		6840		517	
01/24/2003	720	2880		-180	540		7380		484	
01/25/2003	720	3600		180	0				247	
01/26/2003	720	4320		180	0				309	
01/27/2003	720	5040		180	720		6100	-7920	573	2780
01/28/2003	720	5760		180	720		5820		587	
01/29/2003	720	6480		180	1260		10080		690	
01/30/2003	720	7200		180	720		10800		585	
01/31/2003	720	7920		180	540		11340		505	
02/01/2003	720	8640		180	0		11340		490	
02/02/2003	720	9360		180	0		11340		318	
02/03/2003	720	10080		180	540		11880	-11700	857	3638
02/04/2003	720	10800		180					685	
02/05/2003	720	11520		180					663	
02/06/2003	720	12240		180					662	
02/07/2003	720	12960		180					559	
02/08/2003	720	13680		180					337	
02/09/2003	720	14400		180	2700			-223	326	3883
02/10/2003	720	15120							615	
02/11/2003	720	15840							633	
02/12/2003	720	16560							604	
02/13/2003	720	17280							547	
02/14/2003	720	18000							402	
02/15/2003	720	18720							206	
02/16/2003	720	19440							200	
02/17/2003	720	20160			3060				402	3530
02/18/2003	720	20880							414	
02/19/2003	720	21600							403	
02/20/2003	720	22320							418	
02/21/2003	720	23040							401	
02/22/2003	720	23760							371	
02/23/2003	720	24480			3600				206	
02/24/2003	720	25200							402	
02/25/2003	720	25920							414	
03/03/2003	2880				3960				403	

Jan 31


Yield Tracking Chart
Ford 2003.25
100%
90%
80%
70%
60%
50%
40%
30%
20%
12/17
12/19
12/21
12/23
12/25
12/27
12/29
12/31
1/2
1/4
1/6
1/8
1/10
1/12
1/14
1/16
1/18
1/20

KTP Ratio parameters	Low Limit	Nominal	High Limit	
[illegible] 1 [illegible]	780	850	920	In counts
[illegible] 2 [illegible]	220	300	380	
[illegible] 3 [illegible]	150	200	250	
[illegible]	100	150	200	
[illegible]	780	840	900	
[illegible]	680	740	800	

Pedal assembly drawing parameters	Low Limit	[illegible]	High Limit
[illegible] CLOSED [illegible]	800	830	861
[illegible] CLOSED [illegible]	275	304	329
[illegible] CLOSED [illegible]	155	181	217
[illegible] 1_WOT ([illegible]	108	134	160
[illegible] 2_WOT ([illegible]	803	829	854
[illegible] 3_WOT ([illegible]	691	716	742

WMCO EOL parameters	Low Limit	[illegible]	High Limit
TRK_1_CLOSED (+/- 21.5 Counts)	808	830	849
TRK_2_CLOSED (+/- 21.5 Counts)	283	305	329
TRK_3_CLOSED (+/- 21.5 Counts)	171	193	214
TRK_1_WOT (+/- 21 Counts)	113	134	155
TRK_2_WOT (+/- 21 Counts)	808	829	849
TRK_3_WOT (+/- 21 Counts)	695	716	737

Percent Vref

KTP Ratio parameters	Low Limit	Nominal	High Limit
TRK_1_CLOSED	[illegible]	83.00	[illegible]
TRK_2_CLOSED	[illegible]	29.33	[illegible]
TRK_3_CLOSED	[illegible]	19.55	[illegible]
TRK_1_WOT	[illegible]	14.66	[illegible]
TRK_2_WOT	[illegible]	82.11	[illegible]
TRK_3_WOT	[illegible]	72.34	[illegible]

Pedal assembly drawing parameters	Low Limit	Nominal	High Limit
TRK_1_CLOSED	78.33	80.72	[illegible]
TRK_2_CLOSED	27.30	29.70	[illegible]
TRK_3_CLOSED	16.35	18.70	[illegible]
TRK_1_WOT	10.88	13.10	[illegible]
TRK_2_WOT	78.63	81.07	[illegible]
TRK_3_WOT	67.50	70.00	[illegible]

WMCO EOL parameters	Low Limit	Nominal	High Limit
TRK_1_CLOSED	78.78	80.69	82.90
TRK_2_CLOSED	27.43	28.77	31.17
TRK_3_CLOSED	16.73	18.82	20.92
TRK_1_WOT	11.05	13.10	15.15
TRK_2_WOT	78.96	80.98	82.98
TRK_3_WOT	67.94	69.99	72.04

Proposed nominal shift

KTP Ratio parameters	Low Limit	Nominal	High Limit	
TRK_1_CLOSED (+/- 70 Counts)	730	780	850	In counts
TRK_2_CLOSED (+/- 50 Counts)	240	290	340	
TRK_3_CLOSED (+/- 50 Counts)	130	180	230	
TRK_1_WOT (+/- 50 Counts)	75	125	175	
TRK_2_WOT (+/- 50 Counts)	730	780	830	
TRK_3_WOT (+/- 60 Counts)	625	685	745	

Proposed Nominal Shift W/ Like Tolerances +/- 70 Counts

KTP Ratio parameters	Low Limit	Nominal	High Limit
TRK_1_CLOSED (+/- 70 Counts)	730	780	850
TRK_2_CLOSED (+/- 70 Counts)	220	290	360
TRK_3_CLOSED (+/- 70 Counts)	110	180	250
TRK_1_WOT (+/- 70 Counts)	55	125	195
TRK_2_WOT (+/- 70 Counts)	710	780	870
TRK_3_WOT (+/- 70 Counts)	608	658	788

Proposed Nominal Shift W/ Like Tolerances +/- 60 Counts

KTP Ratio parameters	Low Limit	Nominal	High Limit
TRK_1_CLOSED (+/- 60 Counts)	720	780	840
TRK_2_CLOSED (+/- 60 Counts)	230	290	350
TRK_3_CLOSED (+/- 60 Counts)	120	180	240
TRK_1_WOT (+/- 60 Counts)	65	125	185
TRK_2_WOT (+/- 60 Counts)	720	780	840
TRK_3_WOT (+/- 60 Counts)	615	685	745

changes @ Rolls
WOT 1 80 - 200
WOT 2 700 - 900
WOT 3 600 - 800

Vehicle
4.75v Upper
.25v Lower
95%
5.0% Lower

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KTP Ratio parameters	Ratio Low Limit	Ratio Nominal	Ratio High Limit	Total Tolerance	Minus Tolerance	Plus Tolerance
TRK 1 CLOSED	750	820	890	140	-40	[illegible]
TRK 2 CLOSED	250	300	350	150	-54	[illegible]
TRK 3 CLOSED	100	151	250	150	-41	[illegible]
TRK 1 WOT	100	134	200	100	-34	[illegible]
TRK 2 WOT	750	[illegible]	900	120	-40	71
TRK 3 WOT	600	716	800	120	-39	84

KTP Ratio parameters PROPOSAL	Ratio Low Limit	Ratio Nominal	Ratio High Limit	Total Tolerance	Minus Tolerance	Plus Tolerance
TRK 1 CLOSED	750	820	890	140	-70	70
TRK 2 CLOSED	264	304	364	100	-40	60
TRK 3 CLOSED	141	181	241	100	-40	60
TRK 1 WOT	94	134	194	100	-40	60
TRK 2 WOT	789	829	889	100	-40	60
TRK 3 WOT	676	716	776	100	-40	60

KTP Ratio parameters PROPOSAL II To Match Print Tolerancing w/ Equal Sides at all Trains	Ratio Low Limit	Ratio Nominal	Ratio High Limit	Total Tolerance	Minus Tolerance	Plus Tolerance
TRK 1 CLOSED	760	820	880	120	-60	60
TRK 2 CLOSED	244	304	364	120	-60	60
TRK 3 CLOSED	121	181	241	120	-60	60
TRK 1 WOT	74	134	194	120	-60	60
TRK 2 WOT	769	829	889	120	-60	60
TRK 3 WOT	656	716	776	120	-60	60

NEW 01H6R3KTP [illegible]	Ratio Low Limit	Ratio Nominal	Ratio High Limit	Total Tolerance	Minus Tolerance	Plus Tolerance
[illegible] CLOSED	750	800	890	140	-46	90
[illegible] 2 CLOSED	250	300	350	150	-54	46
[illegible] 1 CLOSED	100	151	250	150	-41	51
[illegible] WOT	80	134	250	120	-54	86
[illegible] 2 WOT	700	[illegible]	920	200	+120	71
[illegible] 3 WOT	600	716	800	220	-116	84

PE83-644 21349

[redacted]

From: Beuckelaere, Phillip (P.R.)
Sent: Saturday, June 24, 2000 9:27 AM
To: Petrauskas, Lisa (L.E.)
Subject: FW: Chassis TA Status

Phillip R. Beuckelaere
Super Duty/Excursion OPD
(313) 317-2345
pbeuckel@ford.com

-----Original Message-----
From: Barbosa, Roger (R.)
Sent: Monday, April 10, 2000 7:28 AM
To: Beuckelaere, Phillip (P.R.); Johnson, Ron (R.K.)
Subject: FW: Chassis TA Status

Phil/Ron, attached are reworked copies of the TA agreement for adjustable pedals. I was in on Saturday to update but I was unable to e-mail to you since outlook was still down.

Phil: Please review and input piece price from Joe Slachta. Then send onto Ron.

Roger Barbosa
Cougar Body & Electrical PVT Supervisor
AutoAlliance/Flat Rock Assembly Plant
Tel: 734-782-7768, Fax: 734-783-8270
Pager: 888-442-0189
Email: RBARBOS1@FORD.COM

-----Original Message-----
From: Antal, Jim (J.J.)
Sent: Thursday, April 06, 2000 7:15 AM
To: Barbosa, Roger (R.)
Subject: RE: Chassis TA Status

Roger Here they are sorry it took so long. This not got lost below the screen. I am including the TA, and the ESOW. In the TA packet we also include the Reliability SOW (Generic) and a functional attribute sheet. Any questions let me know. Thanks


Williams TA.doc


Statement of Work Williams.do...


Reliability_Statement_of_Work_...

Jim Antal
Superduty Exhaust & Accell Controls
Phones: (W) 24-62678 (C) (734) 556-2970
Pager: (313)765-2297 (F) (313)59-42251
2B-B35

-----Original Message-----
From: Barbosa, Roger (R.)
Sent: Tuesday, April 04, 2000 11:15 AM
To: Antal, Jim (J.J.)
Cc: Sillanpaa, Don (D.C.); Johnson, Ron (R.K.)
Subject: FW: Chassis TA Status

Jim/Don, can you guys provide me the proforma you put together for this on fixed accelrator pedals? Would it be

possible for you to provide an electronic file of it?

Roger Barbosa
Superduty Pickup/Excursion OPD - Brakes
Product Development Center, Cube 2B-A62
Tel: 313-39-07710, Fax: 313-317-2349
E-mail: RBARBOS1@ford.com
Pager: 888-442-0189

----Original Message----
From: Beuckelaere, Philip (P.R.)
Sent: Friday, March 31, 2000 7:35 AM
To: Barbosa, Roger (R.)
Subject: FW: Chassis TA Status

Are you making progress on TA for ETC adjustable pedal?
If not, see Jim Antal and get pro-forma he used for fixed pedal. Should be very simple.

Philip R. Beuckelaere
Super Duty/Excursion OPD
(313) 317-2345
pbeuckel@ford.com

----Original Message----
From: Lockett, Ebony (E.L.)
Sent: Wednesday, March 29, 2000 5:22 PM
To: Walsh, Thomas (T.J.); Johnson, Ron (R.K.); Cadoppa, Richard (R.J.); Smith, Ron (R.A.); DeMarco, Pat (P.M.); Beuckelaere, Philip (P.R.)
Cc: Leach, Scott (S.R.); Kepler, Judy (J.A.); Taylor, John (J.R.); Williams, Renita (R.A.)
Subject: Chassis TA Status

Here is the TA status as it stands to date:

P131/U137 ChassisTA Status

No TA's have been submitted for:
*All of P131/U137

H215 Chassis TA Status

It is my understanding that there are eleven Target Agreements for H215.

TA's that have been submitted from Chassis :

*Airbrakes (Honeywell & Aeroquip Corp.)	R. Johnson	(awaiting review from finance)
*Park Brake Cable Bracket	R. Johnson	(awaiting review from finance)
*Park Brake Cable Assembly	R. Johnson	(awaiting review from finance)
*Hydro Tubes & Hose Assembly	R. Johnson	(awaiting review from finance)

There are no TA's currently being reviewed by Finance or Purchasing.

I am attaching the TA log which is a summary of the information provided above, If you have any questions or concerns, please feel free to call me.
Thank-You.

<< File: Target Agreement Log Sheet.xls >>

Ebony L. Lockett (elockett)

[redacted]

Administrative Asst. to:
Renita Williams, CPE 2003 Program-- SuperDuty/Excursion
Martin Bray, CPE U-297 Program
MD#243 PDC 2G-K23/32-29788

[redacted]

[redacted]

PROGRAM TEAM DOCUMENT TRANSMITTAL

Cover sheet for program team documents to suppliers.

Supplier: Teleflex Automotive Group Inc.

Program Team: 2003 SD/Excursion
Chassis
Component: 03.18 Adjustable Accelerator
Electronic Throttle Control

DOCUMENT BEING TRANSMITTED:

	DOCUMENT	PURPOSE
☐	Early Supplier Involvement Agreement	Identify two or more suppliers to work with program teams to develop design intent.
☐	Sourcing Confirmation Letter	Confirms Sourcing for FPDS programs. Sourcing is committed prior to Target commitment.
☒	FPDS Target Agreement	Confirm Targets for FPDS programs.

ATTACHMENT(S) TO DOCUMENT:

	ATTACHMENT	PURPOSE
☐	Ford and Supplier Expectations	Communicates Ford and Supplier roles in Sourcing, Targets, Design and Design Validation.
☐	C3P Information	Contact Lists for C3P Information
☒	Procedure for Handling Confidential Information	Documents Confidentiality procedure and commitment to utilize.
☒	Program Specific Sys/Subsys Design Specification	Communicate design criteria.
☒	Program Specific FSS Statement of Work	Define program specific Ford/Supplier product design roles and responsibilities.
☒	Attribute Performance Expectations	Describes the performance expectations for the various attributes of a module or component.

PE83-944 21567

[redacted]

[redacted]

TARGET AGREEMENT

Vehicle/Product Program (including Model Year) 2003 SuperDuty Programs

Supplier*: Teleflex Automotive Group Inc.	Q1 Status: [redacted]
System/Subsystem/End Item/Component 05.15.01 - Adjustable Accelerator Control	Part Number(s): 3C34-9F836-AA (Use w/ Navistar 6.0L Engine)
Core / Leveraged Commodity: Leveraged	FSS Decision Maker: Glenn Wilson
Buyer: Joe Slachta (313) 59-47478	PMT # 108
Quality Targets: Functional targets ensuring lifetime robust and reliable performance (not TGW or PV1000 targets) TBD	Job #1 Date: Kentucky Truck Plant: August 6, 2002
Weight Target: 0.71Kg	Average Production Weekly Volume: TBD Maximum Production Weekly Volume: TBD Cycle Average annual FPV: F-Series = TBD Excursion = TBD
Production Piece Price Target [1] 3C34-9F836-AA = TBD	Production Tooling Target: (including gages and models) Production Tooling Start Date** : *Dates derived to support 100% PSW for 1PP MRD of 3/18/2001*
Prototype Piece Price Target: $2150 Per part	Prototype Tooling Target: TBD for all Proto-type builds through CP. *(Note: 1PP are to be PSW parts)*
Ford Vehicle Operations Labor Assembly Time Target No Applicable	Other Targets***:

COMMITMENT

Teleflex Automotive Group Inc was confirmed as the source of the above referenced system/subsystem/end item/component and has been a participating member of the PMT since Early Sourcing involvement was distributed in December of 1999. As a member of the PMT **Teleflex Automotive Group Inc:**

- Has joint responsibility for ensuring that the above specified system/subsystem/end item/component supports the established program functional/weight/quality/cost objectives.
- Has participated in the development of the above referenced Targets.
- Will participate in the design and development process outlined in the Full Service Supplier Partnering Guidelines dated July 1, 1998 (if this is a leveraged commodity), the attached program specific System/Subsystem Design Specification dated 2/25/2000, and the attached program specific FSS Statement of Work.

---

* Must be a Q1 ship point, or, if the actual ship point is not known at this time, the parent supplier commits to put the business in a Q1 facility. For a new facility (therefore not Q1), the sourcing process is described at the Ford internal WEB address http://www.purchasing.ford.com/prch_prod_proc_man/html/pppm216.html.

** Tool Start Date is the estimated date for beginning tooling expenditures. Tooling cannot commence until the PMT gives authorization in written form.

*** Commodity specific targets such as fabric specification (seats), paint colors (painted components) or, on an exception basis, Ford directed sourcing items (see Ford policy on Supplier Sub-system Sourcing Responsibility at the Ford internal WEB address "http://www.purchasing.ford.com/prch_misc_pubs/html/sply_ltr1.html".)

PE03-844 21568

[redacted]

On or before [redacted] Months Before Job #1, a Production Purchase Order based on Ford's standard purchase order terms and conditions (FGT 26, rev. 4/97[1]) will be issued which incorporates the targets contained in this Early Sourcing/Target Agreement unless either or both of the following occur:

1. Ford makes a change in program or subsystem/end item/component direction;
2. Your company is unable to continue with design and development of the subsystem/end item/component or carry out all of the responsibilities outlined in this Agreement;

in which case Ford and your company will each absorb their own cost of work for this program. If a Production Purchase Order is not issued due to (2) above, Ford, at its option, may then acquire from your company at actual cost, all or any portion of the technical information and data related to work your company performed for the program together with whatever licenses are required under your Company's intellectual property rights to use that information and data on a royalty free basis.

Upon issuance of the initial Ford Purchase Order, Supplier's Purchase Part Capacity will be the Maximum Production Weekly Volume number shown on this document. Please see the CPV2 Application on the Ford Supplier Network for further information on Purchase Part Capacity.

TARGETS

Targets have been developed as follows:

- Piece Price - at Job #1 conditions (firm Job # 1 price). Targets are denominated in currency of supplier manufacturing location.
- Tooling - based on incurred cost and includes gages and models. Targets are denominated in currency of supplier manufacturing location.
- Prototype Piece Cost and Tooling - within program prototype piece/tooling cost targets and/or existing multiplier/formula pricing agreements
- Quality - Functional targets developed using VDS cascade and SDS/CDS to ensure robust and reliable lifetime performance.
- Capacity - Capacity planning supports ongoing production at Average Production Weekly volumes and Maximum Production Weekly Volumes for a minimum of 90 days.

We the team recognize that we will be exposed to data which is sensitive in nature and needs to be protected. Technology, as well as proprietary data, will be treated in accordance with the process outlined in Attachment I.

[1] Supplemental Clauses to FGT 26, rev. 4/97:

- PROVISIONS APPLICABLE TO SELLER-OWNED TOOLING. "Seller represents and warrants that the prices for the Supplies will be no less favorable than those which Seller presently, or in the future, offers to any other customer for the same or similar goods or services for similar quantities. If Seller offers a lower price for the same or similar goods or services to any other customer during the term of a Purchase Order, then to the extent permitted by law, Seller will immediately offer Buyer the same price for the Supplies on the same terms and conditions as was offered to the other customer.

"If Seller has been notified that the special tooling required to support production of Supplies for this Purchase Order is to be funded by Seller ("Supplier-Owned Tooling"), the following provisions shall apply:

a) Seller acknowledges that the Purchase Order price includes a cost element to help Seller recover the capitalization of Supplier-Owned Tooling. The Supplier-Owned Tooling will be properly maintained by the Seller at its own expense for so long as the Supplies are purchased by Buyer for its serial production as well as for its service and replacement part requirements.

b) If Seller uses the Supplier-Owned Tooling to produce the Supplies for other customers, including aftermarket customers, such Supplies shall not incorporate any of Buyer's logos, trademarks, trade names or unique part numbers. Seller shall not disclose or imply in its marketing efforts that the Supplies are equivalent to those purchased from Seller by Buyer or any of its Associated

FE03-044 21589

[redacted]

Companies. Seller shall indemnify and hold Buyer (including its employees) harmless from and against any claim, expense, loss or liability arising out its sale of Supplies to other customers or caused by or resulting from defects in design, materials or workmanship of the Supplies sold to such customers; the failure of Seller (or its subcontractors) to fully comply with applicable federal, state, or local laws, statutes, regulations or governmental directives which regulate the sale of Supplies to such customers; and from any and all claims, suits and liability for loss of or damage to any tangible property or persons (including death) caused by any act or omission, including negligent or willful conduct of Seller or its subcontractors, arising out of such sales of Supplies to other customers.

c) In consideration of Buyer's Purchase Order for parts to be produced from the Supplier-Owned Tooling, Seller grants Buyer an exclusive, irrevocable option to purchase Supplier-Owned Tooling by paying the lesser of the outstanding unrecovered capitalization or the fair market value at the time Buyer exercises the option. Buyer may exercise this option in the event of termination or expiration of this Purchase Order. If Seller finances any portion of the Supplier-Owned Tooling, Seller will obtain for Buyer the rights granted in this subparagraph (c) from its financing source."

- TERMINATION/EXPIRATION: "Buyer may terminate a Purchase Order without liability to Seller if Seller (i) sells, or offers to sell, a substantial portion of its assets used for the production of Supplies for Buyer, or (ii) sells or exchanges, or offers to sell or exchange an amount of its stock that would result in a change in the control of Seller. Buyer shall give Seller written notice of the termination at least 30 days prior to the effective termination date. Seller shall notify Buyer no more than ten days after entering into any negotiations for the sale or exchange of its stock or assets that could result in a change of control of Seller."

The Buyer is responsible to obtain management approval for this sourcing action as outlined in the Procurement Delegation of Authorities Guide prior to signing this Target Agreement. Reference Form #PP-P-F054.

We accept the conditions stated above and we commit to work toward achievement of the targets. At Program Approval <PA>, these targets will become objectives unless the assumptions contained in the agreement are formally amended.

[redacted]

[redacted]

PMT Leader Philip Beuckelaere	Date
Vehicle Integration Supervisor I. Joseph Weems	Date
Team Finance Analyst	Date
Buyer	Date
Supplier	Date

ATTACHMENTS:

I - Procedure for Handling Confidential Information
II - Program specific System/Subsystem Design Specification dated __/__/__
III - Program specific FSS Statement of Work dated __/__/__

FE83-844 21571

[redacted]

ATTACHMENT I: PROCEDURE FOR HANDLING CONFIDENTIAL INFORMATION

During the time Supplier is participating in this Program, Ford and Supplier agree that where it is necessary for either Ford or Supplier to disclose its proprietary and confidential information to the other, the following rules will apply to the Parties:

1. A Party which receives such information from the other Party shall have a duty to protect only that information which is (a) disclosed to it in writing or as a tangible item and is marked as confidential at the time of receipt, or (b) disclosed to it in any other manner, is identified as confidential at the time of receipt and is also detailed and designated as confidential in a written memorandum delivered, within thirty (30) days of the first disclosure, to the receiving Party's representative designated for this purpose.

2. A Party which receives confidential information from the other Party shall use a reasonable degree of care, that is at least equal to the degree of care it uses to protect its own confidential information of a like kind and nature from disclosure to third parties, to protect the received confidential information from being disclosed to any third party without the express written permission of the other Party. This obligation shall continue for a period of four (4) years from the date of this Agreement or until Ford commences production of products which incorporate the subject of this Program, whichever first occurs. This obligation shall be replaced and superseded by the confidentiality obligations contained in any Purchase and Supply Agreement issued pursuant to this Agreement.

3. A Party which receives information under this Program from the other Party has no obligation to protect information which (a) was in the receiving Party's possession before receipt from the other Party; (b) becomes a matter of public knowledge through no fault of the receiving Party; (c) is rightfully received by the receiving Party from a rightfully possessing third party without a duty of confidentiality; (d) is disclosed by the other Party to a third party without a duty of confidentiality on the third party; (e) is disclosed under operation of law; or (f) is independently developed by the receiving Party's personnel who have not had access to the information designated as confidential by the other Party, and is provable by competent evidence.

[redacted]

[redacted]

ATTACHMENT II: PHASED DATA NOTIFICATION EXPLAINATION

For Ford and Seller-owned tooling, Seller will not commence production of the tooling until:

1. The Tool Start Date as indicated on the Target Agreement is reached; and

2. Seller has received written Engineering Readiness Authorization from the PMT leader for this commodity.

   Engineering Readiness Authorization means that the part is at the appropriate engineering release level, as dictated by the PMT. "Appropriate release level" might mean a "Phased Data Notification" (sequential releases of increasing levels of detail about the part prior to actual final release), or a Final Engineering Release ("P" authority release) of the part.

   For "Phased Data Notification" parts, the Engineering Release events are described in the Commodity Plan for the part. A Commodity Plan is a detailed engineering workplan of the various events in the engineering process, leading to Job #1 and production usage of the part.

   The Commodity Plan will identify two key authorization dates for each phase of the tooling process for the part. The two phases of tooling are: 1) Tool Design and Planning, and 2) Procuring Materials for the Tools/Construction of the Tools. The Commodity Plan will also detail the specific activities that the supplier can undertake at each phase of tooling.

   If the Tool Start Date on the Target Agreement has been reached (and for Ford owned tooling, Seller has received a Tool Order for tooling), Seller may initiate the activities associated with Tool design and planning upon receipt of the Phased Data Notification indicating that Tool design and planning may commence. If the Tool Start Date on the Target Agreement has been reached (and for Ford owned tooling, Seller has received a Tool Order), Seller may initiate the activities associated with Procuring Materials for the Tools/Construction of the Tools upon receipt of the Phased Data Notification indicating that material procurement and tool construction may commence.

   Seller shall not incur costs for any phase prior to the specified commencement date for that phase.

[redacted]

Section	Activity	FSS Lead Commodity	Core Commodity	CAD Support Only	CAE Support Only
1.03	Program Timing Planning & Management	X	X		
1.04	Technical Requirements - Establish/Review	X	X		
1.05	Recyclability Requirements	X			
1.06	Pre-Program / Pre-Target Agreement	X	X		
1.07	Prototype Build & Part Schedule	X	X		
1.08	CAD Responsibilities (shown here or in 2.05)	X		X	
1.09	CAE Responsibilities (shown here or in 2.05)	X			X
1.10	Tooling & Check Fixtures	X			
1.11	Budget	X	X		
1.12	Facilities & Personnel	X	X		
2.01	Subsystems Sourcing - Interface	X	X		
2.02 - 2.03	Subsystem/Component Target Delivery	X			
2.04	Systems Integration	X			
2.05	Engineering Tasks	X	X	X	X
2.06	In-house Engineering & Manufacturing Concerns	X	X		
2.07	Product Change Approval	X	X	X	
2.08	CAD/CAE	X		X	X
2.09	Subsupplier Interface	X			
2.10	Engineering Status - Meetings	X	X		
2.11	Joint Vehicle-level Concern Resolution	X			
2.12	Joint Prototype Cost, Timing & Tooling Management	X	X		
2.13	Surface Layout Responsibilities	X		X	
2.14	Market Research Properties	X			
2.15	Service Documentation	X		X	
3.01 - 3.04 3.06	Launch & Production Support	X	X		
3.05	Service Support	X			
	Misc. Attachments				

Note: This Draft has been created for presentation purposes only as an example. Template is under development and may likely include new sections in 1.0 for: Illustration, Reliability, Service and Release/Change Management. As a result of the new sections the numbering in Section 1.0 will change.

[redacted]

ENTIRE PAGE CONFIDENTIAL

Program/Model Year:	2003 Super Duty / Excursion	**Supplier/Commodity(s):**	P131/U137 Adjustable Accelerator Electronic Throttle Control
Vehicle Assumptions:	Described in Product Table Below and Section 1.02		
Program Commodity:	Described in 1.01		
CDX Requirements, Specify:	CSP Program (CAD/CAM/CAE PIM) - Sections 1.08, 1.09, 2.08 and CSP SOW		
Collocation Requirements, Specify:	Described in Section 1.12		
Program Targets:	Described in Target Agreement (to be attached), Target Table below and in Section 1.02		

Target		
Packaging:		
Net Weight:		
Gross Weight:		
Surface Area:		
Part/Center:		
Substrate:		
Part Size:		
Safety:		
Styling/Appearance: (including colors)		
Volume:		
Volume Mix:		
Thermal & Aero:		
Serviceability:		
Homologation:		
Recyclability:		
Quality:		
Cost: (see Target Agreement)		

1.0 General Program Requirements and Pre-Target Agreement

1.01 Commodity Description & Scope of Supplier Responsibility

[illegible]	[illegible]	[illegible]	CAD/CAE [illegible]
03.18 Adjustable Accelerator Electronic Throttle Control	Telefex Automotive Group Inc	Modified	X

Characteristics & Diagram (insert here)
- See Illustration on Master Document

[redacted]

Full Service Supplier (FSS) Roles & Responsibilities are defined by Ford's Full Service Supplier Partnering Guidelines and this Statement of Work. This includes the FSS Principles which require the cooperative development of targets, program/module definition, and the SOW. The Principles also describe a budget which is included as part of the SOW and is included in the piece price. Ford and the Supplier are responsible for achieving the budget and the targets. These items and others contained within the FSS Partnering Guidelines are the basis of this document. See the FSS Partnering Guidelines issued 95.12 and revised 98.07.01 for more information.

Section 1.0 describes General Program Information and Pre-Program responsibilities (Section 1.06). Sections 2.0 and 3.0 contain FSS Roles & Responsibilities from the FSS Partnering Guidelines with additions denoted by bullets ' • ' and deletions denoted by ' *does not apply* '.

1.02 Program/Commodity Assumptions are listed below and will be provided by Ford at least two weeks prior to the planned signing of target agreement:

1.02.1 Program Direction Letter
1.02.2 Ford Assembly Plant Locations: [Kentucky Truck Plant, Cuatitlan assembly Plant]
1.02.3 Leveraged Commodity: [redacted]

1.03 Program Timing

Code	Milestone	Date
SI	Strategic Intent	June 1999
C3P	Readiness with Data Integrity Test (Section 1.06 for details)	August 1999
SC	Strategic Confirmation	August 1999
TA	Target Agreement Signed	January 28, 2000
Level 3 CAD	Ideas package data with Design concept	January 28, 2000
PH	Proportions & Hardpoints	January 28, 2000
PA	Program Approval	April 2000
Level 4 CAD	All Interfaces and Some Component Detail Defined	April 2000
FEAS	Feas Sign-Off	N/A
DSO	Design Sign-Off	N/A
PT	Powertrain Design Complete - Design Release	February 20, 2001
PR	Product Readiness	January 2001
CP	Confirmation Prototype	April 23, 2001
CC	Change Cut-Off	December 2001
TA	Tooling Authority	TBD
Production TO	Production Tool Order	TBD
LR	Launch Readiness	March 22, 2000
SO	Engineering Sign-Off	March 4, 2000
LS	Launch Sign-Off	April 29, 2000
JI	Job #1	August 5, 2002 (KTP)

1.04 Technical Requirements

The following documents define the technical requirements for the component

Description	Reference
Program Direction Letter (PDL)	GEN01216/08/28/99
WCR Requirements	Provided by Ford
SDS Requirements:	See file
Program - Specific SDS	See File
PMT & supplier Work Plan that documents the following key events: • Reliability/Robustness Plan (Described in 1.06 and deliverables in 2.05) • Service Plan (described in 1.06 and deliverables in 2.05) • Engineering Sign-off Evidence (evidence and sign off requirements noted in 2.05) • CAD Deliverables (overview in 1.08 and data deliverables in 2.08) • CAE Deliverables (overview in 1.09 and data deliverables in 2.08)	
DVP&R: Vehicle Level, System Level, Component Level, CAE level (noted in 2.05)	On-goingupdates

1.05 **Recyclability Requirements**

- New Plastic and/or rubber parts must contain at least 25% by weight post-consumer recycled content. Exceptions to this must be reviews and approved by the Recycling Attribute Team.
- All us of recycled material for parts form surogate programs must contain that recycled material content incurrent program use.
- All plastic/components must be marked with material identification in accordance with Engineering Drafting Standards Metrics 98nadard NO. E-4 issues April 19, 1996, SAE J1344 and ISO Standards.

In the following sections, work is described in a paired set. The Ford responsibilities are denoted with an (Ax) and they have complementing Supplier action set denoted with a (Bx).

1.06 **Pre-Program Work; Pre-Target Agreement**

A. Ford will perform the following pre-program activities:	B. Supplier will perform the following pre-program activities:
• Appoint a Ford Decision Maker/PMT leader (A1)	• Provide list of engineering and manufacturing team contacts including roles & responsibilities (B1)
• Provide Supplier with key Quality documents and support including (A2) ◊ Ford Reliability Guide (FRG) ◊ Ford Quality/Reliability Statement of work ◊ Cooperatively develop tooling and warranty responsibility that will be included in the FSS relationship; document in the Reliability SOW and be part of the TA ◊ Review and approve supplier submitted O/R Commodity Strategy	• Develop a Quality/Reliability strategy that meets FRG Intent and Ford O/R SOW guidelines (B2) ◊ Provide Strategy including robustness & Reliability method to be used ◊ Description of Campaign prevention process ◊ [redacted] Warranty Sharing Agreement ◊ Conducting FMA on Top 5 Super Duty Exhaust Warranty issues ◊ Competitive benchmarking ◊ Train Engineer in all Ford FTEP training classes
• Cooperatively develop system/component functional & cost targets with supplier (A3)	• Cooperatively develop system/component functional & cost targets with supplier (B3)
• Make available vehicle and engine package information. (A4) ◊ Ford engineering will insure all necessary CAD data is made available for Arvin CAD activity to access through Metaphase and the INI bridge.	• Create and develop designs that are compatible with vehicle package environment (B4) ◊ Incorporate design improvements as directed by Ford ◊ Design Feasibility-Optimize vehicle/system to support program targets; provide package/design improvements
• Cooperatively develop service part requirements if any (A5)	• Cooperatively develop service strategy that includes: (B5) ◊ Meeting FCSD specific commodity targets ◊ Design system/components for ease of maintenance or repair at a competitive cost ◊ Identification of serviceable items via Service Bill-of-Material (SBOM) ◊ Identification of Tier II supplier core system specific service parts per SBOM ◊ System diagnostic and special dealer tool identification ◊ Capacity planning including service requirements
• Train Teletex Engineering support in the Ford Engineering CSP Curriculum (A6)	• Comply with CSP requirements described in section 2.08 (B6)
• Provide access to FMC WERS CONCERN and ALERT system to allow the supplier to generate the necessary data to support FMC release system. (A7)	• Prepare design release records in WERS (B7)
• Develop and cascade appearance acceptance (A8)	
• Communicate and facilitate Dunnage and shipping package requirements (A9)	• Identify material dunnage and shipping rack package assumptions including estimated packaging density, part orientation and rack dimensions used to identify packaging piece price, this is to be don in concurrence with the packaging guidelines.(B8) ◊ Verify design with Packaging Guidelines "must & wants" utilizing CAD data ◊ Review prototype shipping rack design with prototype parts and verify whether "must & wants" have been achieved

ENTIRE PAGE CONFIDENTIAL

1.07 **Prototype Build & Part Schedule**

A. Ford will be responsible for issuing and executing the Prototype Plan including the following detail schedules:

- Craftsmanship sign-off schedule (to be provided by PMT Leader No Later than July 31, 2000)
- Service part schedule (to be provided by PMT Leader No Later than July 31, 2000)
- Vehicle Launch Plan
- Prototype build and tooling schedule (See table below)

PROTOTYPE BUILD & TOOLING SCHEDULE

Build Event	MRD	Tooling Requirement	Build Location	Build Specs
AP1 Build	03/27/2000	Prototype	TBD	To be Provided by Ford
AP2 Build	07/10/2000	Prototype	TBD	Minimum of 18 weeks
AP3 Build	09/05/2000	Prototype	TBD	Prior to MRD for all
Reliability Build	02/05/2001	Prototype	TBD	Builds
CP Build	04/23/2001	Prototype (Production Release)	TBD	
1PP	03/18/2002	Production (PSW parts)	TBD	

B. Supplier will provide the following:

- End-items/components to support builds at negotiate prototype part cost

Base Part Number and Description	Proto-type Piece Cost
-9F836- Accelerator Pedal	To Be Negotiated

Note: Volumes and cost for the above are negotiated as part of the Target Agreement.

- Product personnel to support prototype and production builds on site and during launch
- Product and personnell to support vehicle testing and vehicle sign-off
- Product to support service parts schedule
- On time PSW part approval

1.08 **CAD General Responsibilities: (specific deliverables and timing managed by CAD Detail Schedule a.k.a VITAL)**

A. Ford will be responsible for providing:

- CAD modeling guidelines (if applic. list here)
- Review of CAD model described in table below (A1)
- CAD file organization, procedures, and drawing requirements (Ford will provide) (A2)
  - ⇒ Engineering CAD File Organization and Data Exchange Guideline
  - ⇒ Illustration CAD File Organization and Data Exchange Guideline
- Ford Engineering CAD & Drafting Standards and any local procedures that apply (Ford will provide) (A2)
- Electronic library
- Design-specific Product Information Management requirements
- Layout numbering
- Related data for package, compatibility, and release that is not the supplier's design responsibility (A3)
- Methods of archiving released 3D CAD data (A4)

B. Supplier will be responsible for providing:

- The CAD models listed below in the prescribed format. Details and timing will be managed by CAD Detail Schedule and VITAL. (B1)

	[redacted]				Release Form		[redacted]		Supplier Confidentia l
	Definition F, P,P(-H), P(-I)	Native/ Translated	Appearance Levels (L-IV,)	CAD Levels (1-7,)	Release CAD File	Release Drawing	CAD Illustration Req'd	CAD Mfg. Req'd	Restrict Other Suppliers
03.15.01 - 9F836-	F	N	N/A	2,3,4,6,7,	X	X	No		None

- Compliance to CAD File, Data Exchange, and Drafting Standards provided by Ford: (B2) (list Guideline and date)
- Electronic communication of CAD data via IMI
- CAD Package Studies, CAD Feasibility, CAD Compatibility and CAD Release of designs (B3)
- Archiving and release of 3D Data and Drawing prescribed by Ford (B4)

[redacted]

Content Description	Leads	Constraints
[redacted]		

[redacted]

Content Description / System Components	[redacted]		
[redacted]			

[redacted]

1.11 Budget

The budget which accompanies this SOW and Target Agreement is dated tbd and totals $ tbd . This amount has been included in the piece cost target and will be managed by Supplier and the Ford Decision Maker in accordance with the FSS Partnering Guidelines issued 95.12 and revised 97.06.01.

The budget does not include design & engineering work resulting from activity not covered in this SOW (i.e. Ford - Sourced Tier 2 supplier non-conformance's, Ford added-starters, Target and/or specification changes after xxxxx, Ford re-surfacing post SLR, etc.)

1.12 Facilities & Personnel

A. Ford will provide:
- facilities at locations where supplier personnel can be stationed; this includes office space, furniture, and phones at Pre-Program, program home base and launch sites (A1)

B. Supplier will provide the following:
- technical and engineering liaison at the Supplier Engineering Center and plant location for Job #1 plus 90 days (via phone, e-mail and on-site as needed) (B1)
- On-Call engineering support 24hrs per day during proto-type builds and Launch with the ability to be at Ford site within 24hrs. (Pager or Cell phone and list of contact required to be provided to PMT Leader and Launch Team Leader)
- Technical and engineering support at the supplier facilities as required.
- APQP Leader at the manufacturing facility.

2.0 *FSS Responsibilities Throughout the Program Implementation Phase Extracted from the Ford FSS Partnering Guidelines*

2.01 Subsystems Sourcing in accordance with Ford's Subsystems Sourcing Guidelines

2.02 Deliver the subsystem/component to target

2.03 Meet function, reliability/quality, safety, homologation, craftsmanship and recyclability requirements

2.04 Systems Integrator must ensure compatibility of all included components/systems

2.05 Function as the Program Module Team/Component Program Module Team Engineer for the subsystem/component. [list engineering tasks that are in-addition to Partnering Guidelines in table below with a " • "]

Engineering Tasks (L - Lead Responsibility, S - Support Only)	FSS

Engineering Prove-out:
• Develop and maintain System DVP&R
• Develop and maintain Component DVP&R
• Create and maintain Design & Process FMEAs
• Compliance with SDS and other technical requirements noted in Section 1.04
• Technical/engineering liaison support
• Sign-offs
  ▪ Component level during pre-builds
  ▪ System level after builds
	L

Preparation and maintenance of graphics files and engineering illustrations including: • Component CAD model and necessary detailed drawings compliant to Ford CAD & Drafting Standards per schedule noted in 2.08	L
Design Compatibility Review and Structures Support including: • CAD models for package and digital buck / drawings per schedule noted in 2.08 • CAE Model and data as noted on 1.09 and 2.08	L
Utilize Advanced Product Quality Plan to support Quality Objectives including: • All 23 elements and associated checklists contained with FMCs APQP • Supplier Developed Ford approved Quality/Reliability Strategy described in 1.06 • Periodic APQP reviews including management of open issues list	L
Manage and support the release and shipment of all serviceable components * *to be negotiated under separate contract*	L
Timing and Release Material Control support functions including change management	L
Manage component(s) scheduling • Provide required engineering freeze dates for each build communicated in the build schedule shown in section 1.07 to allow for sufficient prototype build time to support MRD.	L
Manage overall program timing of component(s) to ensure that all key milestones are met including: • Develop and execute a program workplan • Provide prototype parts according to agreed upon schedules (see Section 1.07) • Provide parts to schedules agreed upon (schedule provided in Section 1.03)	L
Develop and maintain part data records in WERS	L
Studio Engineering role does not apply	N/A
Provide vehicle and service part launch support	L
Support Ford Corporate documentation and reporting requirements • Maintain QOS / PTPRP / FPDS Checkpoint evidence books	L

2.06 Resolve Supplier in-house engineering and manufacturing concerns including:
- Utilize corrective action/problem resolution process throughout the program

2.07 Obtain Ford PMT Decision Makers agreement on feasibility and cost of Change Requests affecting systems before implementing change including:
- Participate in PMT/PAT and change control meetings as required.

2.08 Develop and maintain Computer Aided Design/Computer Aided Engineering models for subsystems/components (internal & sourced items) according to the following Data Delivery Schedule: [redacted]

- Reference CAE Schedule (if any) and/or Supplier Workplan

Note: Specific delivery dates will be controlled and managed through CAD Detail Schedule and VTTAL; see attached CAD Deliverables Map for timing and model levels - insert appropriate CAD Level where 'n' is shown

Data Delivery Table - Section 2.08

Event		D.D.	Deliverer	CAD Level
Pre-PH	Proportions & Hardpoints	Hardpoints Process and specifically Hardpoint affecting Engine Cover (HP #)	Ford	O-F
Fess	Feasibility Studies	CAD feasibility studies to support package and concept development	Supplier	2
SI	Strategic Intent	Deliver CAD Level 2	Supplier	2
SC	Strategic Confirm	Deliver CAD Level 3	Supplier	3
PH	Proportions & Hardpoints	Deliver CAD Level 3	Supplier	3
PA	Program Approval	Deliver CAD Level 4	Supplier	4
PT	Powertrain Design	Deliver CAD Level 6	Supplier	6
PT + 4wks	Design	CAD Level 6	Supplier	6
CR	Compatibility Reviews	Performed via Digital Buck - some drawings may be requested (On going) AP1 AP3 CP	Ford & Supplier	 3 3 7
CP	Confirmation Prototype	Provide CAD data to support FMC safety CAE (as required - *ok data* - CP Design level is latest level typically used - CAE Sign-Off)	Supplier	7
DR	Design Release	1. Supplier release of CAD Design and associated Drawing 2. WERS Notice Approval	Supplier Ford	7
Ongoing	Digital Buck	Provide and maintain up-to-date data for FMC digital buck	Ford & Supplier	2-7
Ongoing	Meetings & Data	Support meetings with data; including up-to-date drawings, 3D models, charts and written submissions (preferably electronic).	Ford & Supplier	2-7
Ongoing	Drawings & 3D	Prepare drawings that have up-to-date 3D models; simultaneous support of 2D and Digital Buck requirements.	Ford & Supplier	2-7
[redacted]				

2.9 Direct subsuppliers

2.10 Review jointly with Ford the engineering status as appropriate and control to target including:

- Develop an open issues management process for reporting design changes, risks and opportunities and open issues for the component.
- Provide communication as appropriate to all affected functions
- Review open issues on a regular basis (Minimum bi-weekly) and act in a timely manner to support program objectives.
- Ensure open issue management follows the 8D philosophy
- Recommend and implement opportunities to improve quality/design within agreed-upon budget noted in Section 1.09
- Maintain QOS documents tracking Quality, Cost, Weight, Facilities and Attribute Targets performance vs. objectives

2.11 Resolve jointly with Ford vehicle level problems and concerns utilizing the 8D Format

2.12 Manage jointly with Ford prototype cost, timing and tooling to meet vehicle goals and objectives including:

- Provide prototype parts according to agreed upon schedules

2.13 Surface Layout responsibilities

2.14 Market Research Property responsibilities

2.15 Develop service documentation for the subsystem or components specifically:

- component illustration pages for service manual (to be discussed)

3.0 FSS Responsibilities Throughout the Production Phase

3.01 Investigate problems, provide resolutions and implement corrective actions including:
- Utilization of correction action/problem resolution process (8D, FMEA Process)

3.2 Modify component for continuous quality improvement with agreement from Ford Decision maker
- all component or system modification that result in a change to the part geometry, cost must be approved by Ford PMT Leader prior to proceeding with change
- Internal changes to suppliers facility or process after PSW must be approved by Ford PMT Leader

3.03 Modify design/manufacturing for continuous cost improvement.
- all component or system modification that result in a change to the part geometry, cost must be approved by Ford PMT Leader prior to proceeding with change
- Internal changes to suppliers facility or process after PSW must be approved by Ford PMT Leader

3.04 Direct subsuppliers.

3.05 Provide ongoing service support for the service life cycle of the subsystem or component

3.06 Investigate and resolve jointly with Ford in-plant manufacturing and process concerns

[redacted]

Item		Total Cost	Target (if applicable amount)
1.03	Program Timing Planning & Management		
1.04	Technical Requirements - Establish/Review		
1.05	Regulatory Requirements		
1.06	Pre-Program / Pre-Target Agreement		
1.07	Prototype Build & Part Schedule		
1.08	CAD Responsibilities (shown here or in 2.05)		
1.09	CAE Responsibilities (shown here or in 2.05)		
1.10	Tooling & Check Fixtures		
1.11	Budget		
1.12	Facilities & Personnel		
2.01	Subsystems Sourcing - Interface		
2.02 - 2.03	Subsystem/Component Target Delivery		
2.04	Systems Integration		
2.05	Engineering Tasks		
2.06	In-house Engineering & Manufacturing Concerns		
2.07	Product Change Impacts		
2.08	CAE/CAD		
2.09	Subsupplier Interface		
2.10	Engineering Status - Meetings		
2.11	Joint Vehicle-level Concern Resolution		
2.12	Joint Prototype Cost, Timing & Tooling Management		
2.13	Surface Layout Responsibilities		
2.14	Materials Research Properties		
2.15	Service Documentation		
3.01 - 3.04 3.06	Launch & Production Support		
3.05	Service Support		
	TOTALS:		[redacted]

NOT REQUIRED

NOT REQUIRED

NOT REQUIRED

NOT REQUIRED

Supplier Internal Budget

Engrg. Budget (incl. in Target)

[redacted]

[redacted]

QUALITY / RELIABILITY
10 Year / 250,000 Mile Statement of Work

Objective:

- To formalize the commitment between Ford Motor Company (FMC) and its' Full Service Supplier (FSS) to develop (DVP), execute, and document (DVP&R) a plan for demonstrating *Program Specific* product reliability which will satisfy Customer expectations during a 10 year / 250,000 mile useful life.
- To define the minimum expectations from both the FSS and Ford Motor Company in delivering a reliable program product.
- To define roles and responsibilities.
- To outline a process by which the FSS and FMC can develop a mutual understanding of the product reliability expectations.
- To clearly communicate that Ford's definition of "Reliability" extends to both the functional failure and performance degradation of a product.

Responsibility:

A Supplier Quality Champion will be responsible for the development of the reliability deliverables that are to be agreed upon by:

- The Full Service Supplier
- The Ford Motor Company product Design & Release engineer and/or PMT leader
- The Ford Motor Company program Quality/Reliability engineer and/or supervisor

In order to ensure the successful delivery of Ford's Robustness and Reliability requirements, the supplier MUST fully support the Ford Reliability Guide (FRG) principles, Product Development Q-1 (PD-Q1), and Design for Six Sigma (DFSS). Copies of the FRG manual can be obtained from the program Quality/Reliability section and from the Ford Internal web site (http://www.dearborn2.ford.com/avtqual2/frg). Information and training on PD-Q1 and DFSS can be obtained from the program Quality/Reliability section. It is encouraged that the FSS supplement this process with their own supplier-specific actions (i.e.: APQP, Control Plans, etc.).

The supplier shall demonstrate competency in the Quality and Reliability disciplines agreed to in the FSS skill requirements and in the Reliability Plan or provide a training plan to acquire this competency.

Document Location:

Suppliers can obtain the Quality/Reliability 10 year/250,000 Mile Statement of Work from the program Reliability Engineer and/or from the Truck Vehicle Center Quality web site (*http://www.dearborn2.ford.com/tvcqity*)

Implementation:

The Ford Engineering Decision Maker (PMT Leader) is responsible for leading the team to execute the Statement of Work document and associated deliverables by the appropriate program milestone(s). The Quality 10 year / 250,000 mile Statement of Work will be packaged with the Engineering Statement of Work and Target Agreements.

[redacted]

[redacted]

QUALITY / RELIABILITY
10 Year / 250,000 Mile Statement of Work

Supplier Name: Teleflex Automotive Group Inc.

Component/Subsystem/System Name: Adjustable Accelerator Electronic throttle Control

The Full Service Supplier will:

- develop a Reliability & Robustness Plan which defines the engineering disciplines that the FSS shall accomplish during the program development.
- implement a PD-Q1 peer review process (see attached PD-Q1 Handbook, Attachment VI) and demonstrate continuous improvement in PD-Q1 scores.
- support and participate in Ford DFSS efforts.
- supply a metric showing achievement of the required level of functional performance against relevant noise factors.
- document variation in functional performance in terms of customer expectations, hard failures, and soft failures.
- fully implement a process, such as the Ford Campaign Prevent Process, with the intent to eliminate the need for Campaigns, recalls, or "near misses".

Functional Performance:

The functional performance targets should be established during the development of both the program-specific *System Design Specifications* (SDS), appropriate *Parameter Diagrams* (P-diagrams identify the ideal functions and noise factor error states and failure modes), and FMEA's. Where individual component targets are not available or appropriate, the subsystem or system target will be referenced (i.e. component level functional performance must be consistent with and support achievement of the subsystem / system level target/s) as determined through the Target Cascade Process, which is detailed in Ford Product Development System (FPDS).

The definition of failure is crucial to reliability assessment. Failures can be either ***SOFT*** (degraded performance to an unacceptable level) and/or ***HARD*** (product function ceases). Targets for both the SOFT and HARD reliability failures are to be established and documented in the component Design Verification Plan (DVP). These test targets and criteria are to reflect customer expectations for the useful life (10 years / 250,000 miles) of the component/subsystem/system ideal function(s) and MUST be program specific. Use of generic failures or "failure levels" is not acceptable, as they may not sufficiently represent the customer expectations for product reliability for this program.

Reliability & Robustness Demonstration:

The component/subsystem/system MUST consistently perform its ideal function in the presence of uncontrollable influences (NOISE FACTORS). Noise factors, which MUST be included in tests used to demonstrate reliability, include:

- Piece-to-piece variation (primarily a result of manufacturing capability)
- Product changes over useful life (wear, fatigue)
- Customer usage and duty cycles
- External environment (climate, road surfaces)
- System interactions with adjacent components

Applicable noise factors are usually identified during the development of the P-diagram. Together with the Ford Reliability and D&R (Design & Release) engineers, the FSS MUST develop:

- an appropriate robustness and reliability metric to assess the consistent performance of the design. Testing sample size should also be determined and documented in the DVP.
- a strategy for managing and documenting the identified noises. Techniques for managing noise factors include, but are not restricted to:
  1. Supplier Design and Process Failure Mode Effect Analysis (FMEA's) which address all component functions, interfaces with adjacent components, and mistake-prevention in design and manufacturing. Action plans MUST be identified in the FMEA's for any failure mode which:
     - has a severity rating of 9 or 10 regardless of occurrence
     - has a severity rating of 5-8 AND occurrence of 4-10.
  2. Parameter Design techniques for making the design robust against the identified noises
  3. Process Control Methods (PCM) for reducing piece-to-piece variation.
  4. Tolerancing – a technique used to make a design robust against part tolerances.

(For Reliability Demonstration documentation, reference Attachment III)

If the product is considered to be either "new technology", or existing technology being used in a "new environment", then both a "System P-Diagram" and Concept FMEA should be developed prior to component level reviews. In addition, a surrogate component/subsystem/system (i.e.: Best-In-Class) should be identified and used for comparative reliability assessments.

All Design FMEA's must be completed and reviewed by Ford Motor Co. prior to Program Approval <PA>. Documentation of all completed FMEA (Concept, Design, Process) reviews must be supplied to the program Quality/Reliability engineer for inclusion in the program Quality/Reliability Discipline Assessment Matrix (QRDAM.)

Assessment of Robust Designs:

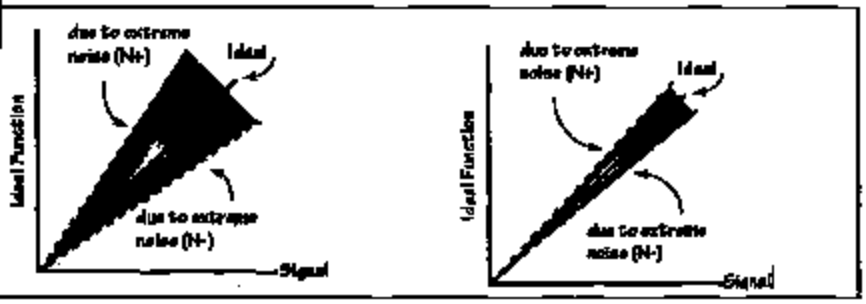
The supplier MUST be able to demonstrate that:

- They have identified and quantified program-specific "noise" factors that impact the component/subsystem/system. Generic "noise factors" must be made program-specific to ensure that the unique customer requirements are satisfied for each product application (real world user profile).
- The type and severity of the identified noise factors correspond to program-specific 10 year/250,000 mile useful life period.
- Appropriate noise factors are included during the execution of all DVP testing. When possible, noise factors should be compounded to create worst case noise scenarios. For instance, the supplier should evaluate a component which is at the minimal/maximum level of part tolerance (dimension, strength, smoothness) against an extreme set of external noises (temperature, humidity, user conditions).

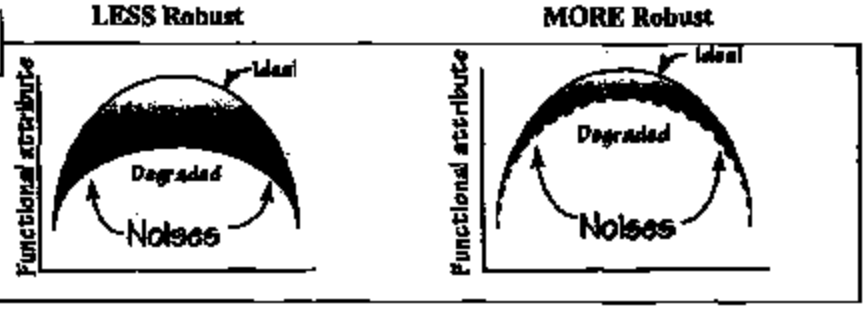
- The end item design (as received by Ford Motor Co.) reliability/robustness is verified against an appropriate testing metric. Testing metrics must include sufficient component, subsystem, and system test samples in:
  - Key Life Testing
  - Test-to-failure (Weibull analysis) - ref. Time to Failure example on this page
  - Signal-to-Noise Ratio (Taguchi methods for robustness) - ref. example on this page
  - Comparative testing (testing against either a competitors' or surrogate component)
  - Component, subsystem, and system level testing
  - etc.
- The degradation of the functional characteristics has been assessed - ref. Example on this page

Examples of Reliability Documentation

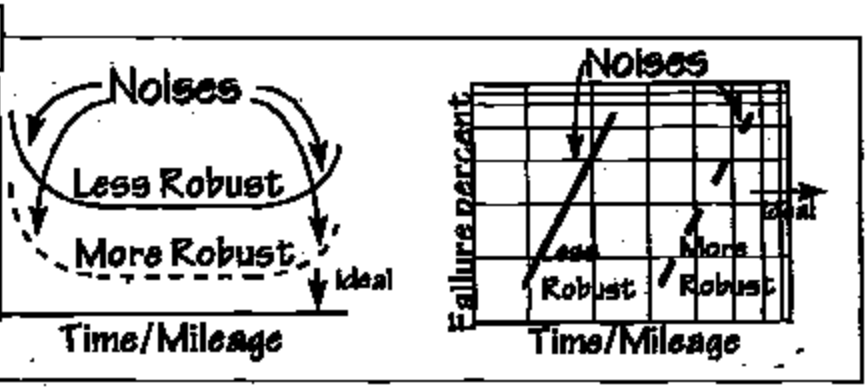
S/N Ratio Analysis



Degradation Analysis



Time to Failure



Design Verification and In-Process Testing

The Supplier has to ensure that the Design-Verification-Plans (DVP), Validation and ongoing In-Process Tests are updated and enhanced, if required, to reflect:

1. The range of critical Noise Factors that the component/subsystem/system will be exposed to during the component Useful Life
2. The suppliers historical knowledge
3. Key Life Tests

The DVP documentation has to be completed by Program Approval <PA>.

System / Subsystem / Component Quality History

The Supplier has to demonstrate their understanding of the historical quality of their products in regard to:

- Supplier's site internal quality and capability
- The 0-mile Parts-Per-Million (PPM), Auto-Alliance International (AAI), MAZDA or FORD plant/s quality performance
- Failure definition and root cause determination of:
  - 3 year / 36k mile Base Warranty
  - High Mileage issues
  - Campaignable Events (Campaign Prevent process)
  - Parts Recall Center returns
  - Fleet feedback
- Things Gone Wrong (TGW) reported by Customers, both short term (3MIS) and long term (3YIS), as captured in Global Quality Research System (GQRS)
- Impact (i.e. positive and negative) of new product on Customer Satisfaction quality (TGW)
- J.D. Power Initial Quality Study (IQS2) Concerns and Automotive Performance Execution Layout Study (APEAL) scores.

If the component/subsystem/system represents a new technology, similar systems (i.e. surrogate data) should be investigated and used for performance comparisons.

Design and Production Readiness Reviews

The Supplier shall present their design and production readiness status in reviews with the Program Team at appropriate checkpoints, with supporting Quality data including the history, drawings / models, Design and Process FMEA, System Design Specifications (SDS), DVP, Process Layouts, Control Plans etc..

Engineering Quality Tools

The Supplier must demonstrate that:

- their program-specific engineers are familiar with the Ford Reliability Guide (FRG) and FD-Q1 in general, and conversant in using appropriate engineering quality tools and methods (e.g. Reliability, Design of Experiments, 8D concern resolution process, FMEA, PCM, etc.),
- participate in Ford DFSS as appropriate,
- or have professional support dedicated to the specific program,
- or have a training plan to acquire a working knowledge in time for supporting the program needs.

[redacted]

QUALITY / RELIABILITY
10 Year / 250,000 Mile Statement of Work

Warranty sharing agreement (if applicable to supplier): ref. Attachment V

Approved by:

Signature - Ford Engineering Decision Maker — Date

Signature - Ford Quality / Reliability Supervisor — Date

Signature - FSS Program Manager — Date

Supplier Assistance:

The Ford Supplier Quality / Technical Assistance (SQA / STA) Team and the Ford TVC Engineering Quality Team will help in regard to questions related to any of the above mentioned subject.

The key responsibilities will be managed as follows:
Ford TVC STA Manager
Forward Model Quality and Reliability Supervisor

[redacted]

QUALITY / RELIABILITY
10 Year / 250,000 Mile Statement of Work

INDEX OF ATTACHMENTS

ATTACHMENT I : Definitions and Descriptions

This list of definitions and descriptions is included for reference and convenience.

ATTACHMENT II. References

These references point the teams to some sources of information related to Reliability and Robustness.

ATTACHMENT III. Reliability matrix - Incorporating Noise in Testing

This matrix relates specific design verification methods (DVP) to the specific noises and illustrates a method to demonstrate which noises are included in the Test Plan.

ATTACHMENT IV: 10 Yrs./250,000 Mile Reliability - What Does It Mean?

Clarifies the definition of 10 year / 250,000 mile reliability as it relates to automotive engineering.

ATTACHMENT V. Warranty Sharing Example

This example Warranty Sharing Agreement illustrates the basic concepts of warranty sharing.

ATTACHMENT VI. Product Development Q1, Peer Design Handbook

Establishes criteria for peer Engineering Reviews and requirements for achievement of a Q1 Award for Engineering.

ATTACHMENT I. DEFINITIONS AND DESCRIPTIONS

A. Reliability Plan

The Reliability Plan should at a minimum state which disciplines are performed and when they are/were completed. As a quality record, it should comply with Q90000. Ideally the Reliability Disciplines, detailed in the plan, should be concurrent with the FSS Design Process; at a minimum the FSS Reliability Disciplines must meet program timing. Records of the completion of the Reliability Disciplines should be available for review with Ford. The supplier may select their own format for existing Reliability Plans.

B. Robustness

Robustness is the ability of a product to meet the expectations of the customers (which includes assembly and service as well as the end customers) throughout the range of the noise factors (manufacturing variation, environmental effects, changes over life, customer usage and systems interactions). A Full Service Supplier is expected to understand these effects and to consider them in the design rather than to just design to specifications.

C. Reliability

The probability that the product will perform its intended function over time/mileage under specific operating conditions. Expressed another way, reliability is the percent of vehicles which meet customer requirements (without failure) at a specified time/mileage objective.

D. Reliability Demonstration

Reliability demonstration involves testing with the following factors:

- a useful life period (10 years /250,000 miles , or other as agreed),
- definition of failure (soft and hard),
- the combination of noises to be tested discussioned over the useful life,
- required performance (safety/dependability, high confidence, initiation, cost of ownership)
- statistically valid sample size to demonstrate reliability
- a reliability demonstration matrix completed with above information

E. Campaign Prevention Process

The Full Service Supplier is expected to understand the failure modes which have lead to vehicle campaigns, recalls and near misses in the auto industry. Measures should be taken to avoid making the same or similar mistakes in the future. The Ford Campaign Prevention Process is one method to do this but the supplier may implement their own methods as an enhancement to the Ford process.

F. Warranty Sharing

Some suppliers may be approached to participate in Warranty Sharing which formalizes the financial accountability of the Full Service Supplier. The philosophy of the warranty sharing process is to reward extraordinary efforts of the FSS to reduce Warranty well below the agreed-to target and to have the supplier share in the Warranty which is in excess of the agreed to target.

ATTACHMENT II. REFERENCES

I. Ford Contacts

SVC Quality Office: http://www.svc.ford.com/svc_quality/org.xls
LVC Quality Office: http://www.dearborn2.ford.com/lvcqual/
TVC Quality Office: http://www.dearborn2.ford.com/tvcqlty/

II. FAO Reliability Guide (FRG)

The following web site has summaries of the Modules in the FRG
http://www.dearborn.ford.com/avtqual/frg/M.summary.htm

The FRG is available at:
http://www.dearborn2.ford.com/avtqual2/frg/
(this site may require that you click the <reload> button after getting to the module site)

III. Reliability Target Setting

Reliability Targets may be set on the commodity or by specific tests used to age the commodity and account for the noise factors. The Ford Reliability Guide (FRG) has an acceptable method to determine the Reliability Target for a commodity. Reliability Targets should be consistent with the program targets.

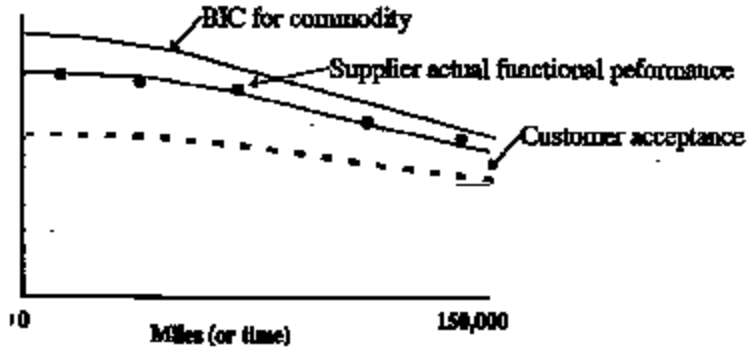
Reference: FRG Module #5 http://www.dearborn.ford.com/avtqual/frg/m5_targs.pdf

IV. Degradation Analysis

Degradation Analysis is used to ensure that certain (non-safety related) functions meet customer expectations throughout the life of the vehicle recognizing that the customer expectations may change for an older vehicle. Some examples of degradation analysis include fading of colors, increased time to obtain full function, fabric wear or gaps between components.

Reference: FRG Module #9 http://www.dearborn.ford.com/avtqual/frg/m9_dtech.pdf

Example:



Degradation Analysis: Graphical Example

V. Campaign Prevention Process

Reference: http://www.dearborn2.ford.com/avtqual2/campaign/index.html

VI. Methods for Demonstrating Reliability

Key Life Testing (KLT)

Key Life Testing is a method to demonstrate Reliability and Robustness by combining the primary stresses into one test or a series of tests on the same units. Ford has developed a method to create KLT's which includes obtaining Real World Usage Profiles.
Reference: FRG Module #2 at http://www.dearborn.ford.com/avtqual/frg/m2_klt.pdf

Accelerated Testing

Reference: FRG Module #10 at http://www.dearborn.ford.com/avtqual/frg/m10_act.pdf

Sample Size Reduction

Reference FRG Module #11 at http://www.dearborn.ford.com/avtqual/frg/m11_ss.pdf

Other Sources of Reliability Information

The American Society for Quality has a Certification program for Reliability Engineers which describes the Body of Knowledge that a Reliability Engineer should have.
Reference: http://www.asq.org/standcert/certification/cre1.html

ATTACHMENT III. Reliability Demonstration Matrix

(Next Page)

ATTACHMENT IV

10 Year/250,000 Mile Reliability

What does it mean?

Support Material for the
90 day High Mileage Reliability Concern Resolution Process
Top 100 Supplier Roll-Out

Prepared: Tim Davis (tdavis5@ford.com)

[redacted]

[redacted]

QUALITY / RELIABILITY
10 Year / 250,000 Mile Statement of Work

To clarify the definition of 10 year/250,000 mile (10/250) reliability, as it relates to automotive ng, and to frame the discussion within the context of how we should set reliability targets for ograms. i.e. we try to answer the question

"What does 10 year/250,000 mile reliability mean?".

arting point is the AVT definition of 10/250 reliability, developed from pre-Ford 2000 reliability IAAO and EAO, and is

atisfy Customer expectations for reliability throughout a vehicle useful life of 10 years or 250,000 miles (whichever is tougher)"

ind: Reliability, as a mathematical concept, represents a measure of probability that a specimen ree from failure within a specified period of *either* years *or* miles *or* cycles. This concept is ort in Box 1 on the facer. Ten years is considered a "reasonable period" over which a vehicle is about 10% of our customers do more than 250,000 miles in this period. An engineering definition ity is ***failure mode avoidance***. Avoiding failure modes increases the probability of failure free

Failure: The definition of failure is crucial to reliability assessment. Failures can be *soft* (degraded ce to an unacceptable level) or *hard* (product function ceases). Usually hard failures relate to ts, while soft failures relate to systems. Professor Don Clausing (MIT) has categorized the causes into two types. These are

1) failures due to mistakes,
and
2) failures due to lack of robustness.

is a reliability problem that could have been avoided by the application of current engineering e (for example design guidelines detailed in System Design Specifications), and avoidance of these ailures is primarily a matter of vigilance. The occurrence of these failures in the field is hard to front, since much of our engineering activity is directed at not having these happen at all. Any of mistakes actually occurring is an admission of failure in our engineering process, which we try t before launch (e.g. FMEA/design reviews, Fresh Eyes reviews, and application of the Campaign n process).

ue to *2)* are bound to occur since this represents the robustness of the design to combinations of es (see Box 2 facer), and there will always be noise combinations in the field that could lead to t either we did not foresee, or that we did not test for in the DVP. The objective of robustness ng is to minimize the occurrence of these failures, but they can never be eliminated completely. to the obvious question of trying to measure the reliability (for example, as illustrated in Box 1) of and hard failures for robustness problems. This problem is discussed on page 2.

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Noise conditions: Failures caused by robustness problems are dependent on the actual noise condition that is encountered in the field. For example, shifting gears while driving at high speeds on a freeway (noise #3), coupled with excessive variability of the bearing diameter (noise #1) may cause bearing failures in an automatic transmission in markets where driving speeds are higher (e.g. Germany compared to the US).

The intent of the *Key Life Test* is (or should be) to reflect the appropriate noise condition (using the "noise tree" in Box 2) to generate the appropriate failure. The role of the 10/250 concept is as a **useful life period**, and **not a target**. This means that **10/250 is used to dimension the noise factors** as they will appear in the test; (Note: Box 3 facer, details some systems which currently have lower useful life periods than 10/250).

Reliability measures: The *actual* reliability in the field due to robustness failures, is a (mathematical) function of two things:

a) the reliability of a specimen *at each possible noise condition encountered in the field*, and
b) the statistical distribution of the noises over the *entire population* of vehicles.

Both *a)* and *b)* are unknown and impossible to evaluate, except perhaps in the most simple of cases. Even if we could estimate them, we could never confirm reliability predictions based on them in practice because at 10/250 almost all our vehicles are lost to follow-up at this time and mileage.

However, it is possible to measure the reliability at particular combinations of noises. These noise conditions are typically taken to be extreme ends of the noise spectra, and are sometimes referred to as "the minimum 90th percentile usage conditions", although technically this phrase is inappropriate when more than one noise factor is involved. It is performance measures taken at these noise conditions that should be used in assessing reliability in Vehicle Programs. The actual form of the reliability measure depends on each particular case, but could be the percent predicted to fail inside a 10 years or 250,000 miles period (hard failures), or a certain level of degradation in function over this time/mileage (soft failures). Examples are discussed below. **These reliability assessments are only applicable for the noise condition specified in the test.** They do *not apply* to the field as a whole for reasons *a)* and *b)*.

Reliability requirements: There are many ways that a reliability requirement may be worded in an engineering specification, and the wording in these requirements may vary from one system to another. A selection of examples appears on the facer (Box 4), illustrating the way requirements might be specified.

Comments:

Example i: is unworkable, since no noise factor conditions are specified for this reliability target, and measuring reliability to 7 decimal places is not feasible for sample size reasons, amongst others.

Example ii: is slightly better, and specifies the 90th percentile customer usage, and references the Key Life Test, but does not specify a performance criteria.

Example iii: is better still, with details on noise factors, failure modes, and performance criteria on the test.

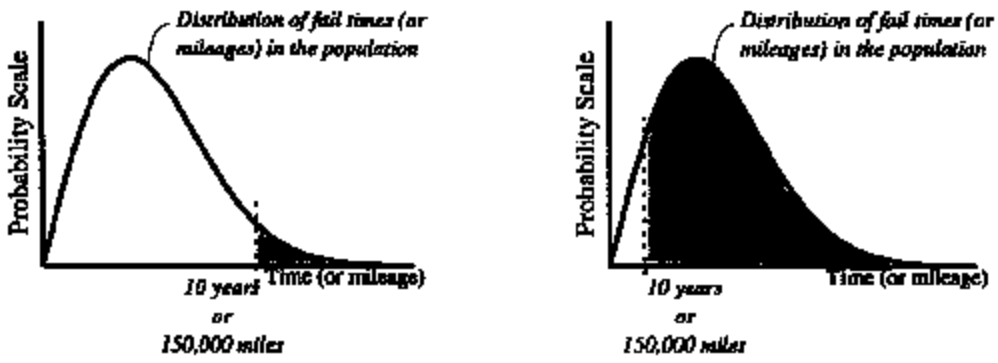
Reliability Target development: should remain focused on tests (rather than the field) and involve four main components - • a useful life period (10/250, or some other), • definition of failure (soft and hard), • the combination of noises to be tested dimensioned over the useful life, • required performance (safety & dependability, high confidence, irritation, cost of ownership), from benchmarked competition (default: Toyota). These four requirements are not always specified in SDS's, but the long term aim is to standardize reliability requirements to these criteria.

<SO> criteria: Signing off to SDS reliability requirements will not yet give a consistent approach to verifying reliability performance, because the requirements are presented in different ways. The recommendation for our current Forward Model Programs is that **all DV and Key Life Tests be reviewed for the appropriate noise factors over the appropriate useful life period**, with reliability targets developed for these tests (rather than targets related to field performance). The examples on the facer illustrate this. Box 5 is from the High Mileage Problem Resolution Process and shows how reliability improvement was demonstrated on batteries using a rig test with the appropriate noise factors to generate the field failure. Box 6 illustrates a target for both nominal and degraded performance for interior idle noise (source: CD132 target book).

> NOTE: The PASCAR test is deaigned to test major interfaces between body, chassis, and powertrains and does not reflect extreme noise conditions for most vehicle components, and so *should not* be the default for reliability sign-off.

In Summary: 10 years/250,000 miles should be viewed as a useful life period over which we need to know how good we are, and how good we need to be, at a component level (hard failures) or system level (soft failures). It is not in itself a target. This useful life period should be used to dimension the noise factors as they should appear in our sign off tests.

Box 1 — **Schematic of the reliability definition**



= low reliability at 10/250 (~10%)
(many failures well before 10/250)

= high reliability at 10/250 (~90%)
(many failures well after 10/250)
Sometimes specified as "B_{10}=10/250"

Box 2 — **Sources of Noises which cause robustness failures in automotive applications**

Variability in hardware:
- **#1** Piece-to-piece variation of part dimensions
- **#2** Changes in dimension (wear-out) or strength (fatigue) over time/mileage

Variability in conditions of use:
- **#3** Customer usage and duty cycle

Variability in environment:
- **#4** External environment (e.g. climate and road conditions)
- **#5** Internal environment created by cross-talk with neighboring components (e.g. heat, vibration)

Box 3

Systems with typically lower useful life periods than 10/250

(source: CD132 reliability plan/Corporate Quality maintenance & wear out items)

Brake pad material (25,000 miles)	Air, oil and fuel filters
Brake disc (50,000 miles)	Brake fluid
Front tyres (25,000 miles)	Stabilizer bar bush(*)
Rear tyres (40,000 miles)	Wheel suspension bushes*
Wiper blades (1 year)	Fan belt and camshaft belt†
Clutch disc assembly* (60,000 miles)	Body frame corrosion
Car battery † (3/4 years)	Transmission synchronizer rings*
Ignition key battery	Drive shaft sealing ring*
Lightbulbs	Water pump
Shock absorber	Hub bearing
Exhaust/Catalyst †	Brake pipes
Spark Plugs†/Glow plugs	Lubes/coolants

† subject of 1st round of High Mileage Resolution Process

* subject of 2nd round of High Mileage Resolution Process: (*) tbd

Box 4

Examples of Reliability Requirements

Example i. SEAL RELIABILITY

Abstract: The dynamic sealing system must meet 0.9989835 reliability for 250k miles.

Example ii. THE ENGINE/TRANSMISSION MOUNT SYSTEM

Abstract: The engine/transmission mount system, including isolators, brackets, and fasteners, shall withstand 250,000 miles and 10 years of 90th percentile customer usage, or program objectives, whichever is greater, as demonstrated by the applicable key life test and the applicable vehicle durability test procedure(s), including simulated shitpucat.

Example iii. DECKLID - SLAM OPEN CYCLE DURABILITY

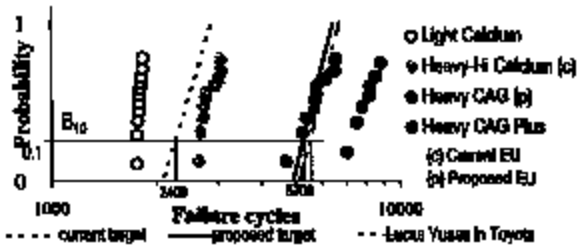
Abstract: To meet the corporate durability requirement, the decklid must function without squeaking, rattling, binding, and loss of effort, etc., when subjected to a minimum of 10,000 slam open cycles as described in the note below. The hinges and counterbalance must maintain function and the outer panel surface must not exhibit any damage. Note: The following constitutes one decklid slam open cycle: 1) Raise decklid to full open 2) Apply 110N (25 lb) overload at center of gravity 3) Lower decklid to ajar position.

The long term aim is to standardize the reliability requirement statements in SDS's using the 4 criteria:

- a useful life period (10/250, or some other),
- definition of failure (soft and hard),
- the combination of noises to be tested dimensioned over the useful life,
- required performance (safety/dependability, hi conf, irritation, cost of ownership),

Demonstrated reliability against *particular* noise conditions (hard failure)
Example - Battery (Useful life period = 3years)

Weibull Plot



Particular Noise conditions for this test:

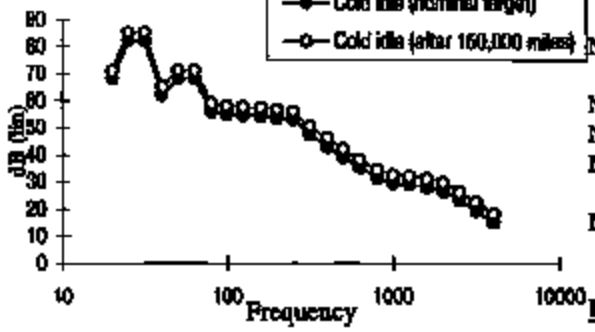
N#1 randomly selected batteries to simulate material and dimensional variation (~10 per test)
N#2 generated by the test (material loss)
N#3 deep charge (14.8v) and dis-charge (25A) cycles
N#4 not applicable
N#5 simulated: heat (75°C) from the engine compartment, parasitic load.

Failure Mode:
Inability to deliver high rate discharge to 7.2v for 30s.

Note: The emphasis is on demonstrated *reliability improvement* on the test, and *not* reliability prediction in the field.

Box 6

CD132 Vehicle Interior Idle Noise Target Spectrum (soft failure)
(useful life period = 250,000 miles)



Particular Noise conditions for this test:

source: Generic P/T NVH Development & Verification plan

N#1 mount stiffness/installation variability; body modes; dampers.
N#2 after PASCAR
N#3 extended idle periods; accessory electrical loads
N#4 ambient temperature; operating temperature; park on incline.
N#5 engine fan unbalance; exhaust flex.; fuel level; suspension bushing compliance.

Failure Mode: max 3dB deterioration over frequency

ATTACHMENT V. Warranty Sharing Example

Ford Automotive Operations

Ford Motor Company
17101 Rotunda Drive
P.O. Box TBD
Mail Drop TBD
Dearborn, Michigan 48121

Date

To: Supplier XYZ CEO

Subject: Ford/Supplier XYZ Warranty Reduction Program

As you know, Ford and your company have been discussing a warranty reduction effort whereby financial incentives would be used to reward your company's participation in our effort to reduce warranty costs

The specific process for XYZ's program will involve:

- The A,B,C…vehicle lines
- D,E,F … WCC's/Part Numbers (or other)
- Use of the following share percentages as between Ford and your company:
  - Any deterioration 50%/50%
  - Savings up to 5% no sharing
  - Savings 5 to 10% 25% supplier sharing
  - Savings > 10% 50%/50%
- Resulting lump sum payments between Ford and XYZ will be based on actual warranty costs determined for 6 months in service (MIS) as measured at a consistent point in time post Job #1; subsequent adjustments will be made based on 18 and 30 MIS experience.
- The program begins with the 200X model year. The first financial checkpoint will be February 200(X+1).

This letter defines the administrative process of our warranty reduction effort and is meant to clarify the specific process conditions for Ford and XYZ with respect to the incentive payments. It does not replace the Ford purchase order terms and conditions as they may apply to recall campaigns or product liability actions. If this letter accurately expresses your understanding of the warranty sharing program, and your company wishes to participate in the financial incentives, please so indicate by signing below.

Agreed:

Company XYZ Title: _____ Ford Buyer _____

Ford Customer Service Division Representative _____

[redacted]

-----Original Message-----
From: Florini, John (J.J.)
Sent: Friday, September 21, 2001 11:49 AM
To: Florini, John (J.J.); Abbasi, Basel (B.A.); Chau, Jimmy (J.); Dalton, Joel (J.D.); Leroux, Mark (M.D.); Petraukas, Lisa (L.E.); Rippy, James (J.M.); Server, Mel (M.M.); Shath, Rakesh (R.); Slowinsk, Tom (T.V.); Villar, Daniel (D.A.); Weber, Michael (M.J.); West, Gregory (G.S.)
Cc: Branik, David (D.P.); Crappa, Wally (W.S.); Edelen, Jack (J.M.); Liposky, Lawrence (L.)
Subject: RE: PTSE/Chassis Adjustable Pedal R&R's

Thank you to those who provided their input which I have included in this document. I will be setting up a meeting as soon as schedules allow with the following individuals for a final review of the content included in this document.

Larry Liposky
Mel Server
Tom Slowinsk
Dave Branik
Wally Crappa
Jack Edelen
John Florini

If you would like to provide additional input, please forward those to your respective Supervisor and myself. We will be sure to discuss them when we meet. Again, thanks to all who provided their input.

Regards,

PTSE_Chassis SOW.doc

John J. Florini
Supervisor, Accelerator Controls - Outfitters
Stationary Components P/T Sub-Systems Engineering
PDC, 2D-G46, MD 113
Phone: (313) 33-73854
Fax: (313) 32-31153
Page: (734) 651-0854
E-mail: <mailto:jflorini@ford.com>

-----Original Message-----
From: Florini, John (J.J.)
Sent: Monday, September 10, 2001 8:24 AM
To: Abbasi, Basel (B.A.); Chau, Jimmy (J.); Dalton, Joel (J.D.); Leroux, Mark (M.D.); Petraukas, Lisa (L.E.); Rippy, James (J.M.); Server, Mel (M.M.); Shath, Rakesh (R.); Slowinsk, Tom (T.V.); Villar, Daniel (D.A.); Weber, Michael (M.J.); West, Gregory (G.S.)

[redacted]

[redacted]

Cc: Branik, David (D.P.); Crapps, Wally (W.S.); Edelen, Jack (J.M.); Lipsky, Lawrence (L.J.)
Subject: RE: PTSE/Chassis Adjustable Pedal R&R's

If you have not yet provided feedback to me regarding Chassis/PTSE SOW content, please do so by C.O.B. tomorrow, 9/11. Thank you.

John J. Fiorini

Supervisor, Accelerator Controls - Outfitters
Stationary Components P/T Sub-Systems Engineering
PDC, 2D-G46, MD 113

Phone: (313) 33-73654
Fax: (313) 32-31153
Page: (734) 651-0854
E-mail: <mailto:jfiorini@ford.com>>

---Original Message---
From: Florini, John (J.J.)
Sent: Friday, August 31, 2001 5:41 PM
To: Slowirsk, Tom (T.V.); Gaw, Ron (R.N.); Villar, Daniel (D.A.); Sheth, Rakesh (B.); Weber, Michael (M.J.); Dalton, Joel (J.D.); Petrauskas, Lisa (L.E.); Rippy, James (J.M.); West, Gregory (G.S.); Sarver, Mel (M.M.)
Cc: Branik, David (D.P.); Crapps, Wally (W.S.); Brennan, Patrick (P.M.); Cowley, Michael (M.O.); Allen, Dave (D.R.); Edelen, Jack (J.M.); Lipesky, Lawrence (L.J.); Thompson, Greg (G.)
Subject: PTSE/Chassis Adjustable Pedal R&R's

A meeting was held Thursday, 8/30 to discuss lessons learned from the U137 and U152 adjustable pedal launches.

Those in attendance:
Dave Branik
Wally Crapps
John Florini
James Rippy
Greg Thompson

It was agreed that a Statement of Work should be developed to clearly document the critical PTSE and Chassis tasks required during the development of adjustable brake and accelerator pedal assemblies.

You have been identified by as a key participant in the development if this document by the wounds you possess through a difficult launch or as a potential victim on a future program. You may have been selected because of the seemingly smooth launch of a previous adjustable pedal program, or because you may be just beginning a 2004 or 2005 program targeted to introduce adjustable pedals.

For whatever reason, your help in this effort will ensure we don't miss a beat the next time around. I have attached a DRAFT SOW as a starting point to be used to define R&R's more clearly between Chassis and PTSE. It is less than half the size of a standard SOW we typically use with Full Service Suppliers modified to specifically address internal Chassis/PTSE tasks.

<< File: PTSE_Chassis SOW.doc >>

What I would like from each Supervisor is confirmation that the employee this note was addressed to is the correct person to be assigned this task. Please rely with confirmation by C.O.B. Wednesday, 9/5.

Tasks to be completed.

1. Review document and identify any specific area where misunderstandings have occurred. Please sent me your feedback electronically highlighted in red by C.O.B. 9/7.

PE83-844 28188

[redacted]

[redacted]

2. The first round of review will be scheduled during the week of 9/10 including those employees you identify as a section representative.
3. Input from this meeting and mutual agreements will be included in this document for a second review during the week of 9/17.
4. The second review will be scheduled the week of 9/17 with the initial review group and section supervisors.

We hope to have this exercise completed by the week of 9/24 but will extend this date if needed should we encounter scheduling conflicts. It is more important that we have your input captured than meeting the date. If there are conflicts that cannot be overcome, I will make arrangements with you individually to ensure your input is captured.

Thank you for sharing your experiences and suggestions in advance.

Regards,

John J. Florini

Supervisor, Accelerator Controls - Outfitters
Stationary Components P/T Sub-Systems Engineering
PDC, 2D-G46, MD 113
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