From: Scheuer, James (J.A.)
Sent: Thursday, October 03, 2002 2:01 PM
To: DeFore, Matthew (M.)
Subject: 5R55 Shift Feel / Double Detent Update

I met with Y.Y. today and he is in the process of tweaking the P-R peak to mask the double detent feel. As a first attempt to see if he is directionally correct, he has moved the park area ramp outward to artificially move the peak leftward. This will however, come at the expense of detent spring pre-load which based on recent history, may not be the best solution. It did however reduce the double detent to a more uniform slope (I'll show you the plot) so I think we're heading in the right direction. Next, we will try moving only the peak and stretching out the backside of the slope into the R detent.

The shifter / park ADAMS model for AX also looks pretty cool. Check it out when you get a chance.

Jim Scheuer
Product Design Engineer
Park Systems Design 5R55 & 6R Transmissions
Mechanical / Structural Sub Systems
Ford Automatic Transmission New Product Center

From: Li, Ying-Yong (Y.)
Sent: Friday, September 20, 2002 4:28 PM
To: DeFore, Matthew (M.)
Subject: 5R55S ParK Mechanism

Hi, Matthew,

Could you please double check the number of the park gear? The one I am using is 1L2P-7M092-AB. The one listed in the following can not be found in the metaphase. Thanks much and have a nice weekend,

Ying-Yong Li

734-523-6012
yli17@ford.com

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Friday, September 20, 2002 1:11 PM
To: Li, Ying-Yong (Y.)
Cc: Perng, Chin-Yuan (C.Y.)
Subject: 5R55S Park System Components

Ying-Yong - Please confirm the following park components are in the 5R55S model for P-R, R-P efforts (torque to turn) which we discussed earlier today. If not, the model will need to be updated. Thanks.

1L2P-7A441-AC	park pawl
1L2P-7D410-AB	park rod
1L2P-7D070-BA	pawl return spring
1L2P-7C494-BA	detent lever (rooster comb)
XW4P-7M092-BB	park gear
XW4P-7E332-AB	detent spring assembly
90GT-7D419-AB	abutment

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

From: Scheuer, James (J.A.)
Sent: Friday, October 11, 2002 8:39 AM
To: Lajiness, Vince (V.)
Cc: DeFore, Matthew (M.)
Subject: 5R55S P-R / R-P Double Detent

Vince, we will require the following vehicles for testing the modified rooster combs:

(1) 2003 Lincoln LS - floor shift
(1) U231 Aviatior - floor shift
(1) U152 Explorer - column shift

The testing will consist of:

Torque to turn - ADAMS modeling
Torque to turn - Bench test using transmissions from the 3 vehicles above
Jury evaluation / Peak efforts at shifter

Let me know when these vehicles will be available and we will get started immediately.

Jim Scheuer
Product Design Engineer
Park Systems Design 5R55 & 6R Transmissions
Mechanical / Structural Sub Systems
Ford Automatic Transmission New Product Center

From: Lu, Xiaoyong (XL.)
Sent: Wednesday, August 31, 2005 9:11 AM
To: Ahmed, Kamal (K.)
Cc: DeFore, Matthew (M.); Perng, Chin-Yuan (C.Y.)
Subject: 5R55S Torque to Turn

Attachments: t2t_drag.jpg; t2t_nodrag.jpg

t2t_drag.jpg (65 KB)

t2t_nodrag.jpg (64 KB)

Kamal:

I have completed the analysis you requested. Since my PC crashed yesterday and I could not write a report right away. I'll attached the two graphs and summarise the data below for you to have a look.

Here is the peak torque to turn corresponding each position:
(All units are Newton-mm and Maximum and Minimum preload is 29N and 25N, respectively)

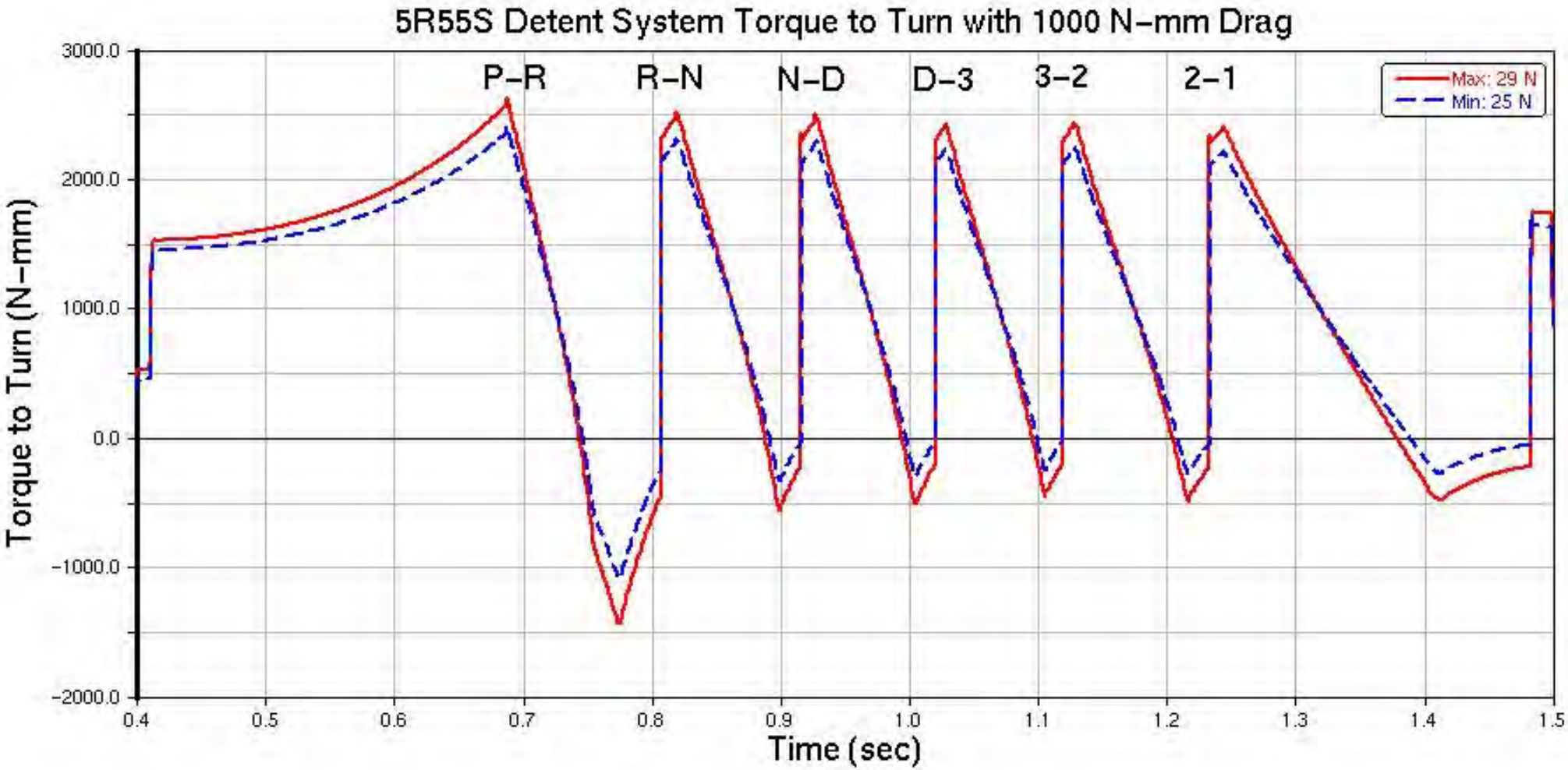
For No Drag:

Positions:	P--R	R--N	N--D	D--3	3--2	2--1
Max:	1627.2	1511.5	1498.3	1421.9	1436.0	1411.9
Min:	1406.6	1310.4	1293.3	1233.6	1244.3	1221.1

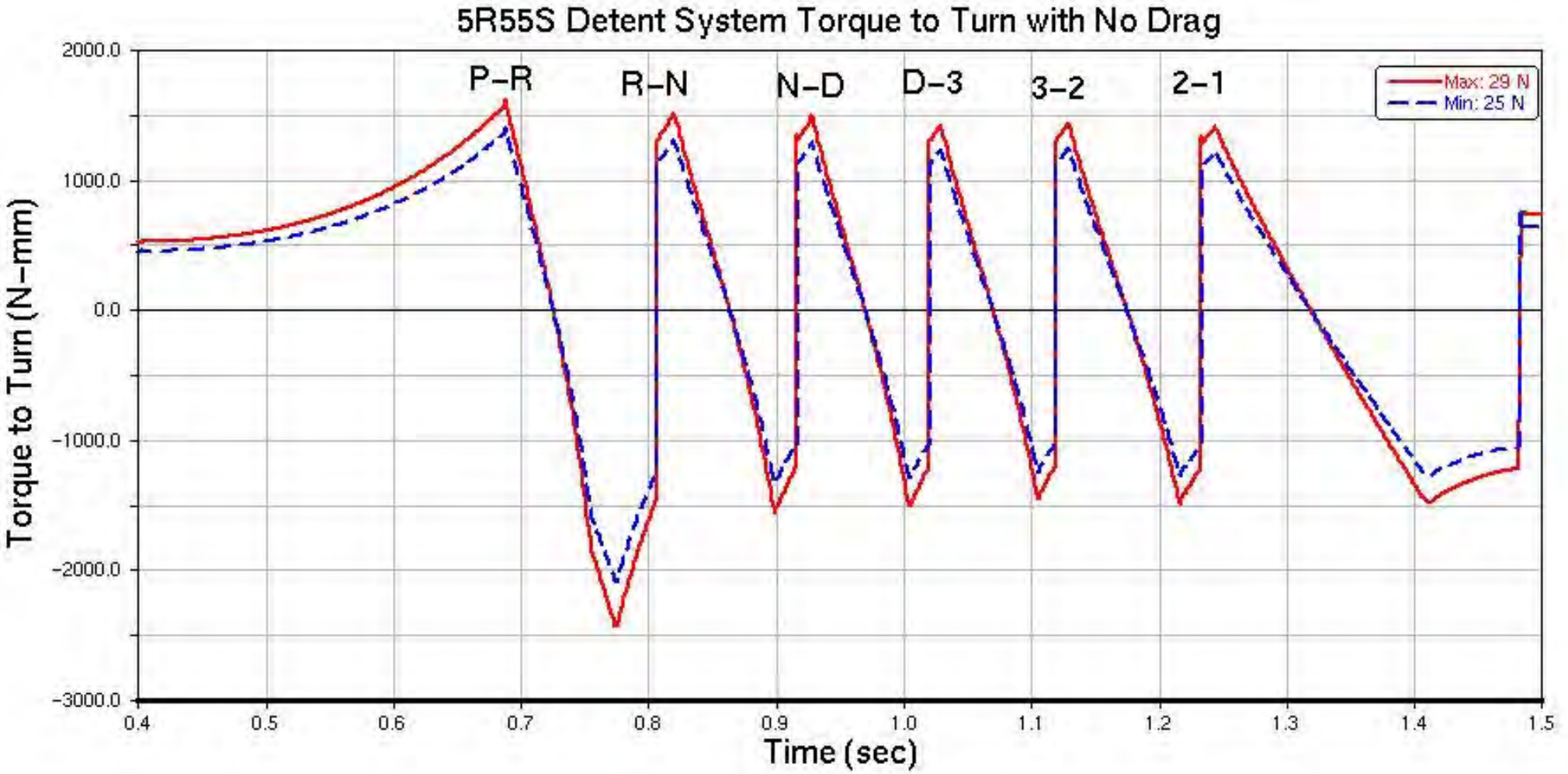
With 1000 N-mm Drag

Positions:	P--R	R--N	N--D	D--3	3--2	2--1
Max:	2627.2	2511.5	2498.3	2421.9	2436.0	2411.9
Min:	2406.6	2310.4	2293.3	2233.6	2244.3	2221.1

PE09-020 0862



PE09-020 0863



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5R55W 5 Speed Automatic Transmission

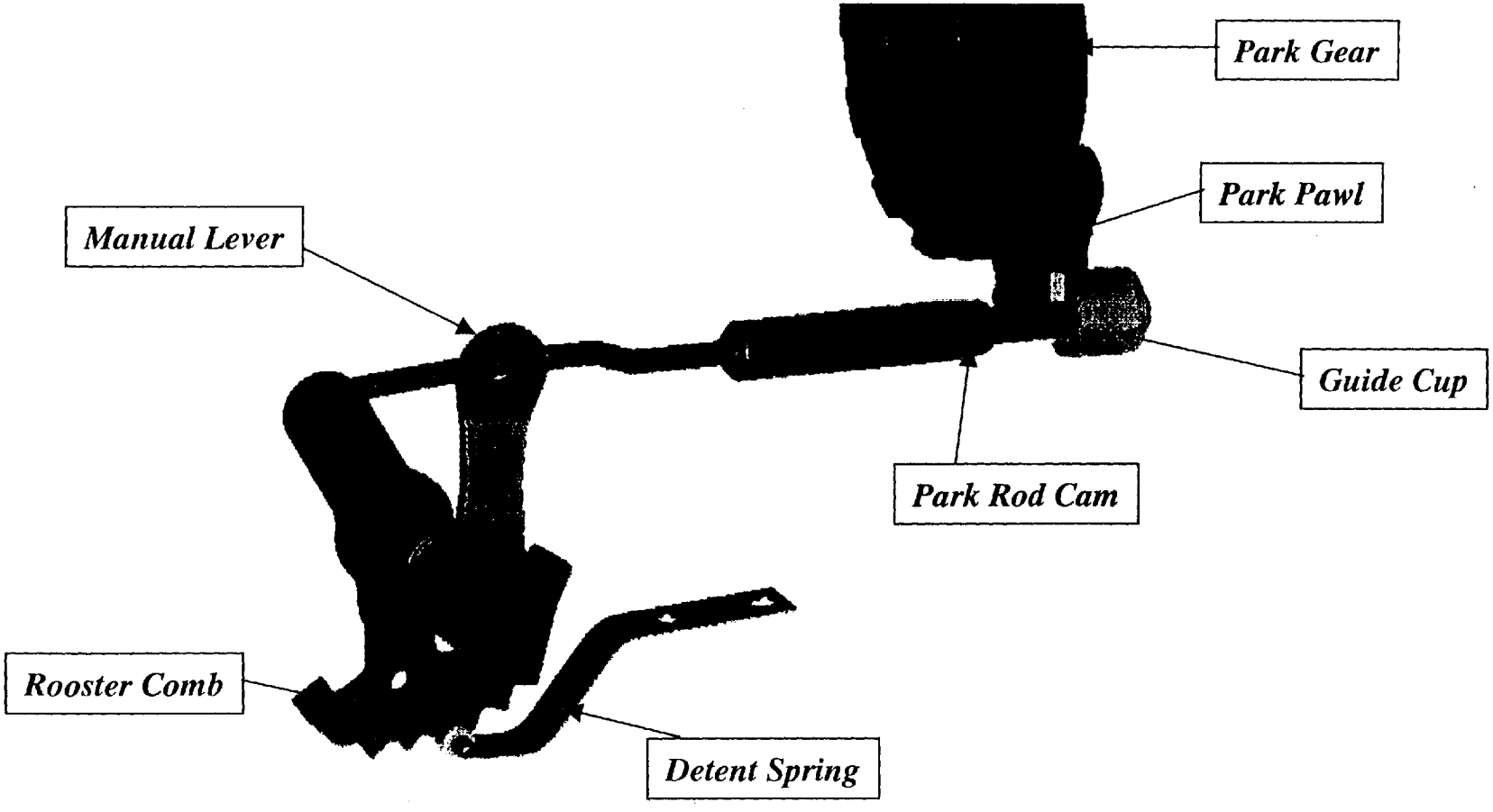
[redacted]

Park System Review

Dan Hildebrand
Manager, 5R55 [redacted] Systems Dept
dhildebr@ford.com

Ford Motor Company

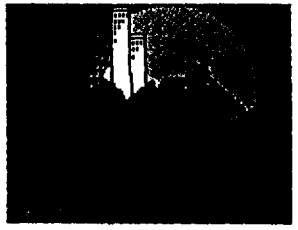
5R55W Park System



Revised: 10/4/2000
Originated: 10/04/00

Dan Hildebrand, Manager,
5R55N/W/S/E Systems

Park System Functions - I



- Prevent transmission output shaft rotation (vehicle movement)
  - ✓Engage Park
  - ✓Maintain Engagement of Park
- Permit transmission output shaft rotation (vehicle movement)
  - ✓Disengage Park
  - ✓Maintain Disengagement of Park

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Park System Functions - II

		How	Return Spring	Disengagement system	Cam / ratchet system	Cam / park ramp system
Maintain Disengagement of pawl and gear	=		X	0	0	0
Disengage pawl from gear			X	X	0	0
Engage pawl into gear			X	X	X	0
Maintain engagement of pawl and gear			X	X	X	X

Control Parameters:
Cam park angle; Pawl tooth angle;Pawl to Cam Interface;Cam surface finish; Pawl tooth surface finish

Signal:

Gra

Disengagement System

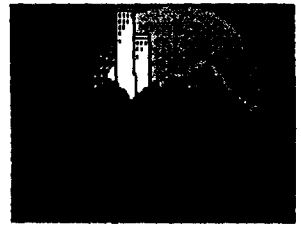
Torque

Noise

Revised: 10/4/2000
Originated: 10/04/00

Dan Hildebrand, Manager,
5R55N/W/S/E Systems

History



- Revised shifter and transmission park system after CP to achieve full park engagement
- Exceeded max drop in speed limit
- Increased pawl circular tooth thickness to address drop in speed
- On full DV test, did not hold grade @ max GVW

Overview

- Pawl tooth angle adjusted by 5° (nose up side) to address hold issue
- Analytical force balance model predicted potential for cam spit–outs at upper bound and high shifter efforts at lower bound of this new design
- Using this model, a window was identified within the current design specifications of the cam angle where function would not be compromised

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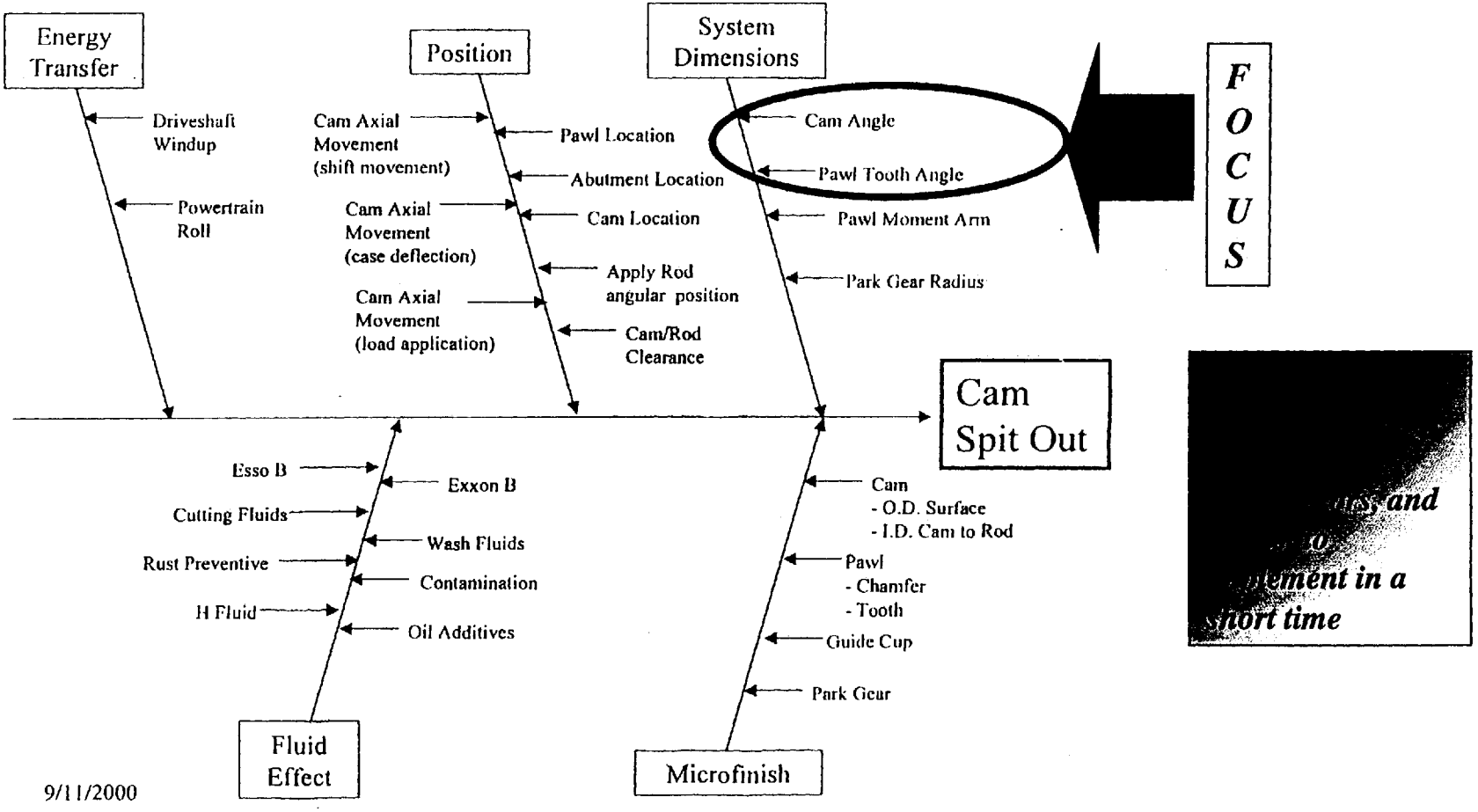
Cam Spit Out – C&E



Revised: 10/4/2000
Originated: 10/04/00

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5R55N/W/S/E Systems

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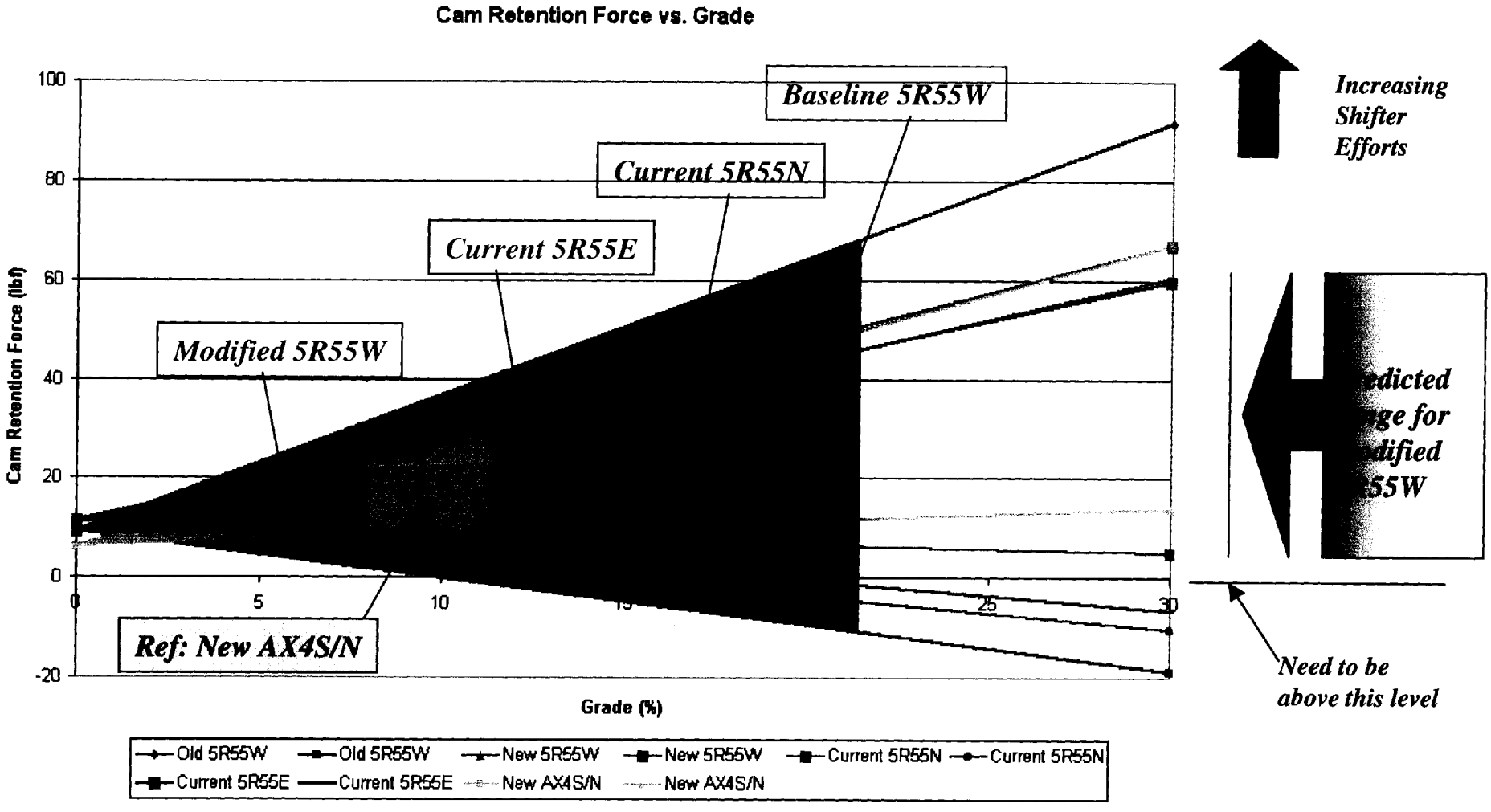
Analytical Force Balance



Increasing Shifter Efforts

edicted ge for dified 55W

Need to be above this level

Revised: 10/4/2000
Originated: 10/04/00

Dan Hildebrand, Manager,
5R55N/W/S/E Systems

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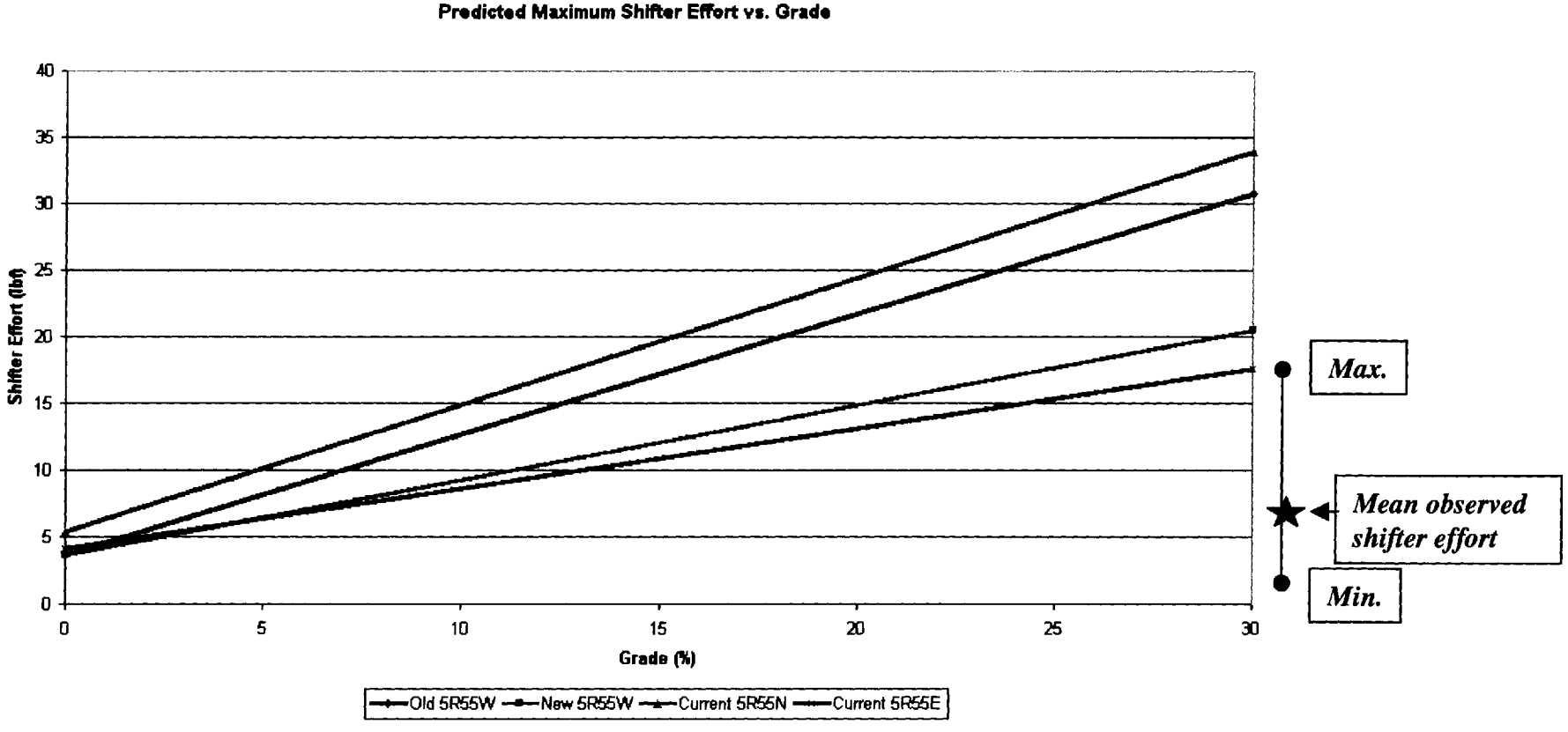
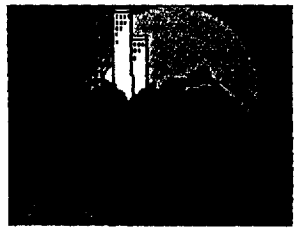
Shifter Efforts

- ***Graph shows predicted upper bound for shifter efforts***
- ***Analytical force balance model (Pg. 8) with the shifter system incorporated***
- ***Measured shifter efforts data from DV tests – within the upper bound***



Design Position



- Park Pawl: 5° MPI machined pawl; 61-62 HRc
- Park Rod: A. + E. Keller cold formed rod ground to 9.5° - 10.0° full included angle cam, polished, phosphate coated
- 270 N-mm return spring
- Park gear at 52 HRc minimum

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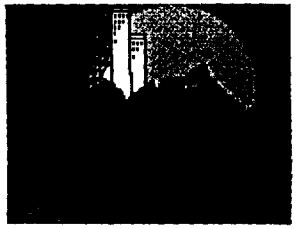
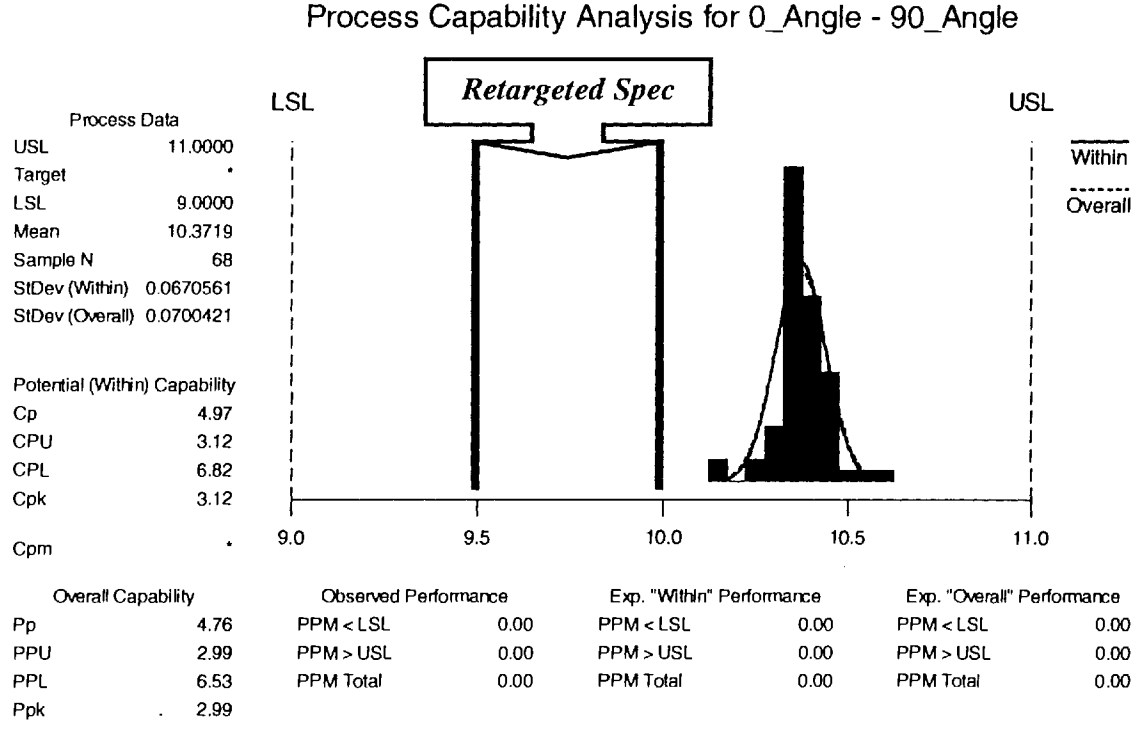
Park Rod – Cam Angle Retarget



- ***Capability assessment of Park rod cam angle based on cold formed parts and original spec***
- ***Spec retargeted based on analytical model – moving away from potential spit out situation***
- ***Model correlates well with observed data during DV tests***
- ***Park rod cam angles to be controlled to new spec by grinding, polishing and phosphate coating***



Process Data	
USL	11.0000
Target	.
LSL	9.0000
Mean	10.3719
Sample N	68
StDev (Within)	0.0670561
StDev (Overall)	0.0700421

Potential (Within) Capability	
Cp	4.97
CPU	3.12
CPL	6.82
Cpk	3.12
Cpm	.

Overall Capability	
Pp	4.76
PPU	2.99
PPL	6.53
Ppk	2.99

Observed Performance	
PPM < LSL	0.00
PPM > USL	0.00
PPM Total	0.00

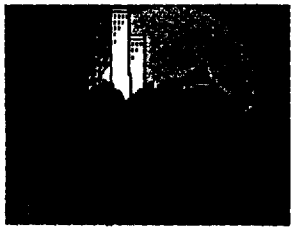
Exp. "Within" Performance	
PPM < LSL	0.00
PPM > USL	0.00
PPM Total	0.00

Exp. "Overall" Performance	
PPM < LSL	0.00
PPM > USL	0.00
PPM Total	0.00

Revised: 10/4/2000
Originated: 10/04/00

Dan Hildebrand, Manager,
5R55N/W/S/E Systems

Status



- Nine combined tests have been completed (using production park rods with 5° pawl)
- No spit – outs observed
- No excessive shifter efforts observed
- Drop in speeds meet the spec (1.5 - 3.5 mph)
- Passed the bump test
- Maximum vehicle movement – 60% complete – Passed
- 23 Hang-ups out of 900 pull out events in a 30% grade, nose up with max GVW

Hang-ups: Analysis I

- Symptom: When shifter is pulled out of park, pawl does not release from the gear
- Observed only in nose up situation at 30% grade, max GVW
- Test consists of 10 sequences of 10 pull out events (max GVW at 30% grade), with a ratcheting test between each sequence
- Never observed in first two pull outs within any test sequence
- Never observed in first sequence of 10 pull outs
- Not observed with revised test procedure
- Self – correcting when forward drive engaged

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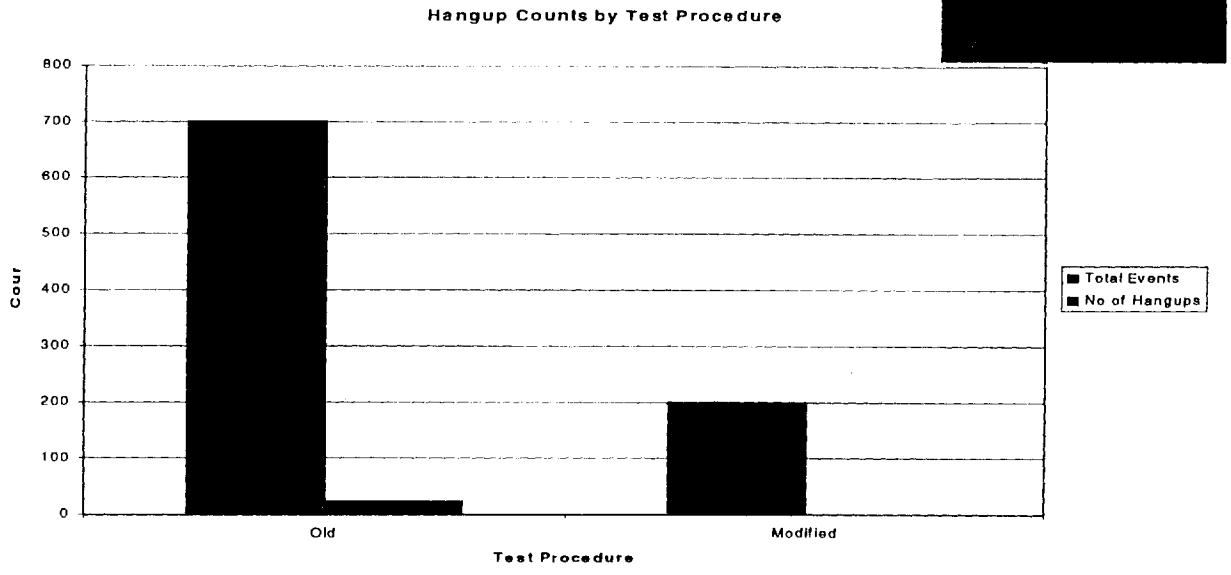
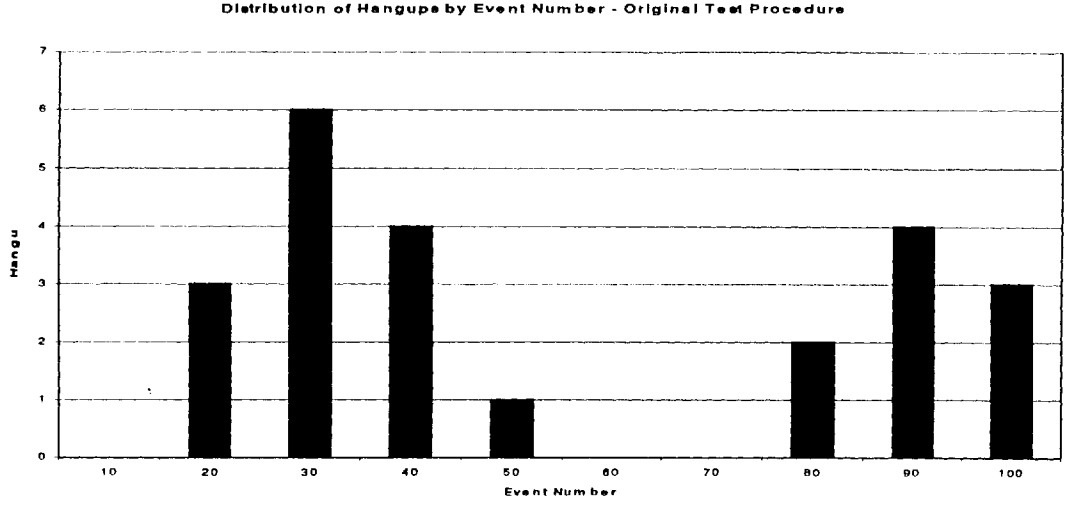
Hang-ups: Analysis II

- *23 Hangups out of a total of 700 events (7 tests – 100 events each) performed using Old Test procedure*
- *No hangups in a total of 200 events (2 tests – 100 events each) performed using Modified test procedure*
- *Lower graph shows number of hangups recorded during the tests (sorted by event number)*





Revised: 10/4/2000
Originated: 10/04/00

Dan Hildebrand, Manager,
5R55N/W/S/E Systems

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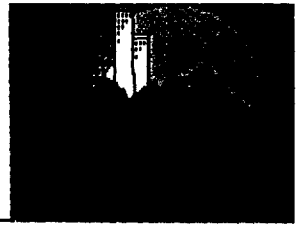
Ongoing Actions / Next Steps



- Further testing with retargeted cams to confirm commencing 10/5/2000
- Implement process control actions (demonstrated capability or 100% inspection on critical characteristics) to ensure cams and pawls meet new specs
- Support supplier capability improvements
- Reviewing data with OGC for risk assessment and legal implications
- Further confirmation with 24 Integrated build vehicles with all new shifter & transmission system parts
- Exploring post Job#1 robustness actions

From: Landes, Stephen (S.L.)
Sent: Thursday, September 28, 2000 11:24 AM
To: Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Chen, Jershi (J.); Dover, Harry (H.); Fyie, Matthew (M.L.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Landes, Stephen (S.L.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Ramnath, Das (M.D.); See, Raymond (R.J.); Sledz, Ted (T.M.); Spaulding, Todd (T.C.); Tsai, Pingfang (P.); Virdee, Harbinder (H.S.); Xu, Yehong (Y.)
Cc: Yuhasz, Philip (P.D.); Greene, Lisa (L.A.); Retallack, Lynn (L.M.); Antrim, William (W.R.)
Subject: 5R55W Park System Team Assignments

Attachments: Microsoft Project - Team Assignments.pdf

The attached file is the latest update to our team assignments. Please review the list and be prepared to update the team on progress.

Please be aware that a Peer Review on this park system has been scheduled for Monday 2 Oct 00 all afternoon. As all of the Park Section wil be involved in the peer review I expect we will not have a team meeting on Monday. Team meetings will be held as scheduled daily including Saturday and Sunday.

Microsoft Project - Team Assig...

Stephen Landes
5R55N/W/S/E Systems Engineering
slandes@ford.com
(734) 523-5841
Text Page: slandes

Team Assignments as of Thu 9/28/00
Park System DV Plan

Highlighted Tasks have been completed

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
2	Team	Definition	80%	Thu 9/7/00	Sun 9/10/00	NA
3	mfyie	Bench test: coef. of friction confirmation	100%	Sat 9/9/00	Fri 9/15/00	Fri 9/15/00

Notes

Sample #4 passed all pullouts through 700 ibs-ft static load; apwl shaft cracked and small cracks appeared in the case and x-hsng, pawl shaft bore elongated -- similar to high-speed ratchet test results.
As of 9/13:
Samples 1, 2, 3: no data; broken parts
Samples 4, 5, 6: tests completed; good data
Sample 7: laser pawl; test postponed
Samples 9, 10, 11: to be done 9/13/00
Two additional samples will be run with laser pawls for the selected geometry.
Add two "E" transmissions to this test. (lhart to obtain transmissions).
9/14: no parts broken since the stand was recalibrated after sample #4 and we switched to running 4x4's. Sample #8 returned to build up for unrelated o/s binding. Lowest mu recorded to date is 0.087.
9/15: Dennis Fergusen is setting up to run "E" transmissions on the stand. There is good information that suggests early sample breakage is related to over torque on the stand due to stand operating practice (setting torque after initiating cycle). We will wait to do new pawls until the next BDX shipment of transmissions arrives (schd for 9/19). "E" transmissions are available.
9/16: The testing needed to support validation of the ADAMS model is complete. Additional testing on "E" and with the 3deg pawls will be done separately.
9/17: Summarize second batch of data for 9/18 AM meeting.

4	mfyie jbrazin	Verify instructions/torque loads given to HMS lab; calibrate bench machine	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00
5	cperng	Validate ADAMS Model	100%	Tue 9/12/00	Thu 9/14/00	Thu 9/14/00

Notes

9/15: Mu assessment complete and the model ahs been updated.

6	rperri	Determine Explorer lever ratio	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
7	ptsai,rperri	Pullout effort comparison	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes

1) RHD values higher than LHD
2) "W" nose up higher than nose down
3) Re-run calculations with latest geometry

9/14: still waiting for "N" data from SHV. lhart to call Ken Stacherski for assistance.
9/15: SHV data received; revise table for 12:30 meeting (add DEW98 N w/ floor shifter). Also need offset numbers and update the matrix.
9/16: Complete. offset numbers will be added to a separate matrix to avoid confusion.

8	cperng	Force balance calculations - baseline	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes

Ratchet spring is adequate. If the pawl is aligned with a gear space & Park is selected a minimum of 14 N is required of the ratchet spring to depress the pawl. The current spring pre-load provides 40+/-2 N.
We need a flatter cam angle to compensate for low coef of friction. The present included angle is 9 to 11 deg.
9/14: need a one page summary written for this analysis.
9/15: These calculations are run at nominal conditions. We should consider running them at worst/best case conditions. Decide at 12:30 meeting. No decision at 12:30 -- right people not present.
9/16: Summary document revised and complete.

PE09-020 0880

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
9	cperng	Force balance calculations - revised cam angle	100%	Sun 9/17/00	Mon 9/18/00	Mon 9/18/00

Notes
9/16: Recalculate with the revised cam half angle of 4.5deg +/- 30min to confirmed instructions planned for Keller.
9/17: 4deg is too flat for RHD shift efforts; need to keep minimum angle to 4.5deg and reduce tolerance.

10	kbriscoe	Baseline bump test	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00

Notes
test being performed 9/12.
9/14: test passed; requesting formal lab report for 9/15.

11	yxu1	Measure peak dynamic torque and compare to 5R55N.	100%	Tue 9/12/00	Sun 9/17/00	Sun 9/17/00

Notes
Use an instrumented drive shaft from a calibration vehicle.
Drive shaft obtained 9/12.
Drive shaft being installed 9/13/00.
9/14: Instrumented driveshaft installed; tests performed on 9/13. Initial results indicate that the test stand torque values are in the "ballpark". Re-run tests with vehicle at GVW.
9/15: Waiting for camera work to be completed in vehicle.
9/16: Camera vehicle will run dynamic torque test this morning and then return to camera investigation.
9/17: Test run last night, data being summarized today.

12	yxu1	Compare measured torque data with calculated loads of what we expect vehicle to see.	100%	Sun 9/17/00	Mon 9/18/00	Mon 9/18/00

Notes
9/15: Require GVW torque data from instrumented axle (vehicle running camera tests).
9/18: The data now confirms the test stand is using appropriate loads, and the data can be used as input for CAE work.

13	yxu1	Determine Keller's capability on park rod cam angle	100%	Mon 9/11/00	Sat 9/16/00	Sat 9/16/00

Notes
9/13: dhildebr will contact BDX and Euro Purch for support in getting response from Keller. We need to be sure what Keller is providing, with what tolerance, and at what capability. Determine what tolerance reduction is possible and what is being quoted for 4R100.
Indication is that capability at +/- 30min is 1.05.
9/14: Still working with Keller to determine capability; tolerance is apparently +/- 30min on 1/2 angle.
9/15: Keller can make two different parts, but will have difficulty telling them apart. tsledz, yxu1, jbrazin to work on error proofing the parts/assembly.
9/17: We have a good idea where Keller is today, but need to determine how to help them lower the nominal half angle and narrow the tolerance.

14	yxu1	Investigate alternate park rod supplier.	100%	Fri 9/15/00	Tue 9/19/00	Tue 9/19/00

Notes
9/15: Finding an alternate supplier was raised as a possibility by pyuhasz.
9/21: The conclusion is that as Keller is able to reduce their tolerance by modifying processes we should remain with Keller.

15	jbrazin mfyie dadamcz1 lhart tsledz	Create Fishbone diagram for Park System	100%	Sun 9/10/00	Tue 9/12/00	Tue 9/12/00

PE09-020 0881

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
16	jbrazin mfyie dadamcz1 lhart tsledz	Fishbone analysis	25%	Sun 9/10/00	Wed 9/20/00	NA

Notes
9/14: Data from the "Visible A/T" and FEA are required to begin eliminating items on the diagram.

17	jbrazin,msimetko	Update AX4N Energy Transfer diagram in team meeting room for 5R55W and application for specific issues.	0%	Sat 9/16/00	Mon 9/18/00	NA
18	lmckinni	Park System FEA: get priority in CAD	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
FEA kicked off 9/11. hvirdee will set up a meeting with Jer-Shi Chen to review FEA requirements. Completion forecast for 9/15.
9/13: no timing commitment from CAE
9/14: timing is 2.5 to 3 days for quick answer; Friday, 9/22 for full answer.

19	CAE,mramnath	Perform Park System FEA	75%	Wed 9/13/00	Fri 9/22/00	NA

Notes
9/14: This is the quick FEA
9/15: Preliminary results received. full analysis for Sunday morning. Analysis confirms expectations of location of breakout. Recommended improvements in clude longer pawl shaft, deeper holes in case and x-hsg, chamfer on pawl shaft holes. Update Saturday AM.
9/17: Expect update 9/18 AM meeting.

20	mfyie	Re-run engagement calcs with other pawl designs	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
CAD has done the runs; evaluating results.
9/13: Doing a study with 6deg design. mfyie, cperng, yxu1 to review today.
9/14: inputting 6deg design; plan to complete today.
9/15: Complete. An order for 5deg and 6deg pawls has been placed with MPI.

21	hvirdee	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	100%	Mon 9/11/00	Tue 9/19/00	Tue 9/19/00

Notes
Parts from Sample #4 test run 9/11 are being sent to the lab.
9/14: Pawl & Shaft sent to lab (yxu1); bench test samples 1 & 2 case and xhsng sent to lab (hvirdee); pawl & shaft from vehicle 957 (broken xfr case) sent to lab.
9/15: Initial results were due today at 12:30; no results available.
9/16: Sample #2 x-hsg was a sand cast part with much lower hardness than a dies cast part. Fracture analysis on the Sample #2 case will be available Tuesday. There is nothing here to indicate chemistry as a cause of failures.
9/17: no update
9/21: Lab report received. There are no materials issues.

22	hvirdee	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	100%	Tue 9/12/00	Tue 9/19/00	Tue 9/19/00

Notes
We need porosity, chemistry, and tensile strength. Samples should be requested from Ryobi (N) and Fagor and Koeln Forge (W).
9/16: Chemistry is consistent with 380 Al spec; European Al is slightly higher in Mg than US. Contact suppliers for more complete analysis and comparable strengths.
9/17: No update
9/21: Lab report received. There are no materials issues.

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
23	dadamcz1	Obtain stack up on park pawl shaft (length & alignment)	17%	Mon 9/11/00	Fri 9/22/00	NA

Notes
9/14: Same as task 23: consolidate
9/15: In process
9/16: Measurements show bearing surface is 4.7mm in xhsg and 7.4mm in case; not much shaft lateral movement; deeper holes and longer shaft is better; existing holes do have chamfers.
hvirdee to provide CAD with :E: case and xhsg drawing numbers; need to create a comparison betwen "W" and "N".
9/21: The designed is updating team members today; results tomorrow.

24	mfyie jbrazin	Finalize DVP&R proposal	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00

Notes
9/14: proposed DV sent out for comment.
9/15: Draft has been circulated. No decision is required at this time; wait until screening DV results are available to finalize.
9/21: The finalized DVP&R and vehicle/hardware requirements are to be reviewed on 9/22 at the 12:30 meeting.

25	yxu1	Perform ultimate strength test on "N" and "W" systems. Add "E"	7%	Tue 9/12/00	Mon 9/25/00	NA

Notes
Two samples: one "N" and one "W", tested in the nose up direction.
9/13: direction is to add "E" to this test so we can compare across the whole family.
9/14: Need "N" case (lhart to help); check files for old "E" tests (mfyie, lhart) (file check complete).
9/15: "N" is all set to run; "E" needs further checking. The "W" 4x4 can be run with a 4x2 shaft; the 4x2 with a minimally modified x-hsg. yxu1 needs 4x2 x-hsg drawings and 4x4 xfr xcase spline drawings for a fixture. The 4x2 drawings are complete; existing 4x4 fixtures have been located and the numbers provided to yxu1.
9/17: Ready to run "N" cases today; rsee1 finding parts.
9/21: Requested 4x2 output shafts have been delivered to the lab. Timing to run tests is expected tomorrow at 12:30.

26	Travis Miller	Review all data supporting a change in the pawl return spring force.	100%	Wed 9/13/00	Fri 9/15/00	Fri 9/15/00

Notes
Need a "fresh eyes" review of the data and a recommendation on proceeding with this change for Job1.

27	Cognition,rperri,hdover,yx	Perform VSA-type audit on the Park System. (Cognition)	50%	Wed 9/13/00	Mon 9/25/00	NA

Notes
rperri: business arrangements for analysis
yxu1: drawing list for hdover
hdover: collect drawings and carry to Cognition
9/14: Timing calls for initial model by noon today; meet with mfyie, yxu1 on defining park achievement; verify set up angle, gear positions. Cognition will establish nominal measurements and then six-sigma levels. Drawings complete to Cognition.
9/15: hdover has additional information requested by Cognition and will take it to them today.
9/16: Cognition has all the required data. The model is complete and dimensioned. It shows the OML angle at 0.80deg while previous analyses have shown 1.15deg. We agree to use the 0.80deg calculated offset from vertical. rperri to meet with mfyie and yxu1 to develop further direction.
9/21: The set up angle has been re-calculated and is now determined to be 0.73deg from vertical. The calculation and method will be written into the model assumptions. The model can be animated, and much is being learned.
9/26: Design assumptons were discussed, and the model will be used to improve the definition of what it means to be "in Park".

28	dadamcz1 lhart jbrazin slandes	Develop Screening DV	100%	Thu 9/14/00	Fri 9/15/00	Fri 9/15/00

Notes
9/14: DV draft is complete and is to be reviewed with Tom Cross to see how he wants work orders written to support the plan.
9/16: Test time from first start to final return to garage for r&r is running about 10 hours.

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
29	W956	Perform Screening DV W956	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes
4.0L 4x2 3.27 axle
9/16: ran 60 nose ups; efforts high (felt like 20 to 30#); good pawl/gear engagement; hard to achieve abutment; lots of park gear movement. Get torque data next (klittle2), then return to camera work. On 30% grade park components are immersed in oil.
9/17: ready to run
9/18: lost park during fwd drop ins; pawl pi cracked in half; extension housing hole cracked; case hole elongated; distress seemed pointed inward.

30	W957	Perform Screening DV W957	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes
4.6L 4x4 3.73 axle
9/16: 100 nose ups and downs; no ratcheting, no sticks, low loads; getting park pawl changed.
9/17: ready to run
9/18: completed 17 HS ratchets then broke a return spring; did maintain park; only ratcheted forward.

31	ZA00041	Perform Screening DV & Baseline ZA00041	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes
4.6L 4x4 3.73 axle RHD
9/16: Performed baseline; loads between 9 and 36#; 4 ratchets on nose ups (cycles 89, 91, 97, 99); determine from thaugh if these were skips or ratchets down the hill; need post-test inspection and pawl change. (XW4P park pawl).
9/17: park rod and pawl change

32	W946	Perform Screening DV W946	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes
4.0L 4x2 3.73 axle
9/16: 100 nose ups and downs; no ratcheting, no sticks; low loads; ready to run again.
9/17:

33	W954	Perform Screening DV W954	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes
4.6L 4x4 3.55 axle
9/17: park rod and pawl change; ready to run
9/18: test 13: skipped 1 tooth several times (nose up 7, nose down 1); with 4deg cam: couldn't pull out of park on first try.

34	Team	Approve DVP&R proposal	0%	Fri 9/22/00	Fri 9/22/00	NA

Notes
9/14: Draft DV circulated for comment.
9/21: Approval targeted for 9/22 at 12:30

35	Team	Recommend Hardware Direction	100%	Sat 9/23/00	Sat 9/23/00	Sat 9/23/00

Notes
9/21: System design direction is:
260Nmm return spring (Sherdel)
4.7 +/- 0.2 deg cam half angle (Keller)

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Recommend Hardware Direction" continued						
	Notes 6deg pawl with 0.4mm added tooth thickness to compensate for reduction made with angle change (MPI) Weekend testing will confirm design direction.					
37	klittle2	Vehicle 956: install digital read out	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
38	klittle2	Vehicle 954: won't start	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
39	klittle2	Vehicle 957: replace transfer case; add digital read out	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
40	dhildebr	Obtain 4x2 w/ 3.27 axle	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes The vehicle is available in Dearborn. Kim Briscoe will bring it to Livonia.					
41	hdover dadamcz1	Obtain RHD vehicle from Shifter group	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
42	hdover	Obtain cables, brackets, clips	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
43	yxu1	Purch order for new pawls	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes Laser cut pawls are due 9/15/00. 9/15: Pawls arrived 9/14.					
44	yxu1	Purch order for extension housings	100%	Thu 9/7/00	Sun 9/10/00	Sun 9/10/00
45	ecastro1	Purch order for 24 transmissions	100%	Thu 9/7/00	Sun 9/10/00	Sun 9/10/00
	Notes Bordeuax built the transmissions on 9/11/00.					
46	BDX	Deliver 24 transmissions to ATNPC	100%	Tue 9/12/00	Mon 9/18/00	Mon 9/18/00
47	peckman	Purch 2 new force gages	100%	Thu 9/7/00	Tue 9/12/00	Tue 9/12/00
	Notes Two new gages received.					

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
48	mfyie	Design/Fab bench test fixture	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
49	dadamcz1 lhart hdover jbrazin	Create Visible A/T	100%	Sun 9/10/00	Thu 9/14/00	Thu 9/14/00
	Notes	A camera is to be installed in a vehicle/transmission on 9/12; first results for 9/13 meeting. 9/15: Complete on 9/14; collect data on 9/15.				
50	klittle2	Install Digital Read-outs in all five test vehicles	0%	Mon 9/18/00	Mon 9/25/00	NA
	Notes	9/18: Work with DTA to order read out units to be fabricated outside; get timing from supplier.				
52	mfyie	Bench test selected prototype pawl with Max Park Disengagement Load	0%	Tue 9/26/00	Wed 9/27/00	NA
53	mfyie	Bench test	50%	Thu 9/21/00	Thu 9/28/00	NA
54	yxu1	Combined Ratchet/Pullout	0%	Sat 9/23/00	Tue 9/26/00	NA
55	kbriscoe	Bump Test	0%	Tue 9/26/00	Fri 10/13/00	NA
56	yxu1	DV Testing	0%	Wed 9/27/00	Tue 10/10/00	NA
58		STA to work with Keller to confirm their capability and reduce tolerance.	0%	Sun 9/17/00	Wed 9/20/00	NA
	Notes	9/16: Dan Hildebrand will contact Michel F. and ask him to work with Keller.				
59	mfyie,yxu1	Provide marked up drawings showing cam angle change	100%	Sat 9/16/00	Sun 9/17/00	Sun 9/17/00
	Notes	9/16: FAX marked sketch to Keller and Bordeaux 9/25: Testing demonstrates that the proposed angle change does not improve function. We will not change the part for Job1. CLOSED				
60	mfyie,yxu1	Investigate additional processesing to reduce cam half angle tolerance.	100%	Sun 9/17/00	Tue 9/19/00	Tue 9/19/00
	Notes	9/16: Investigate sort and grind; any other options? 9/18: Confirmed that a centerless grinding operation can be added to a new die to provide parts with lower nominal half angle and a tighter tolerance.				

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
61	tsledz,yxu1,jbrazin	Find a method for interim mis-assembly proofing rods with "W" vs "E" bullets.	100%	Sun 9/17/00	Fri 9/22/00	Fri 9/22/00
	Notes 9/16: As it looks like we need to change the cam angle for "W" this item gets its own task (from task 13). 9/25: CLOSED -- the rod cam is not being changed fro Job1.					
62	Andreas Bockelmann	Deliver prototype parts to ATNPC for testing	100%	Mon 9/18/00	Thu 9/21/00	Thu 9/21/00
	Notes 9/18: Prototypes are expected by Saturday, 23 Sept 00. 9/21: Parts arrived by courier today.					
63	Andreas Bockelmann	Deliver PSW'd parts to Bordeaux for PV and production.	100%	Thu 9/7/00	Thu 10/5/00	Thu 10/5/00
	Notes 9/18: Proposed timing is 4 weeks from go ahead; "go" given today. 9/25: CLOSED -- no part change for Job1					
65		Release initiated	100%	Tue 9/19/00	Tue 9/19/00	Tue 9/19/00
66		Back-up PSW	0%	Tue 9/19/00	Mon 10/2/00	NA
67		Parts manufacturing and delivery to Bordeaux	0%	Tue 9/19/00	Fri 10/6/00	NA
69	MPI Subcontractor	Machine MPI produced pawls already in stock	0%	Sat 9/23/00	Fri 9/29/00	NA
70	MPI	Final processing of pawls at MPI	0%	Sat 9/30/00	Mon 10/2/00	NA
71	MPI	Ship pawls to BDX	0%	Tue 10/3/00	Sat 10/7/00	NA
73	MPI	Production die	0%	Sat 9/23/00	Sun 10/8/00	NA
74	MPI	PSW Parts	0%	Mon 10/9/00	Thu 10/12/00	NA
75	MPI	Ship to Bordeaux	0%	Fri 10/13/00	Sat 10/14/00	NA

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Ship to Bordeaux" continued						
77		PV/Production MRD	0%	Tue 10/10/00	Tue 10/10/00	NA
78	BDX	Build PV transmissions	0%	Wed 10/11/00	Wed 10/11/00	NA
79	BDX	Perform PV test	0%	Thu 10/12/00	Sun 10/15/00	NA
80	BDX	PSW	0%	Mon 10/16/00	Mon 10/16/00	NA
81	BDX	Transmission Job1	0%	Mon 10/16/00	Mon 10/16/00	NA
82	BDX	Ship to LAP	0%	Mon 10/16/00	Wed 10/18/00	NA
84		IB MRD	0%	Fri 10/20/00	Fri 10/20/00	NA
86		MRD #2 for Final Design Pawls	0%	Sun 10/15/00	Sun 10/15/00	NA
87		PV Build	0%	Mon 10/16/00	Mon 10/16/00	NA
88		PV Test	0%	Tue 10/17/00	Fri 10/20/00	NA
89		Re-PSW	0%	Sat 10/21/00	Sat 10/21/00	NA
90		Ship to LAP	0%	Sun 10/22/00	Thu 10/26/00	NA
91		Current Green Pawl Stock Expires	0%	Wed 11/1/00	Wed 11/1/00	NA

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
92	yxu1,klittle2	Measure peak dynamic torque and compare to 5R55N.	0%	Thu 9/21/00	Fri 9/29/00	NA

Notes

9/18: Develop a list of requirements for doing instrument axle testing on a 4X4.

95		9/24/00 AM	0%	Sun 9/24/00	Sun 9/24/00	NA

Notes

Send 4, 5, 6deg pawls to Chem Met to confirm they meet specs on print (yxu1)
Get report from Chem Met on pawls already in lab. (yxu1, 9/25)
Identified park gears with most damage and send them to the lab (yxu1)
Observation: the system is producing some Windstar-like noises
Summarize bench test data (ptsai, 9/25)
Do visual inspections on parts from completed tests (yxu1, jbrazin)
Get Toyota park system study from Wroblewski (lmckinni)
Investigate shot peening for pawl (jbrazin)
Determine the angle from drive to nominal park for floor vs column shifter (hdover)
Determine how far into park we go (position on cam) for floor vs column shifter (hdover)
Perform ABA test between vehicles 041 and 957: swap transmissions to see if the reason for 041 success is realted to the shifter (lhart)
Run MathCAD model with proposed design (mfyie, 9/25 AM)
Install optical encoder on vehicles 946 and 041 (lhart)
Obtain digital read outs for all five vehicles (klittle2)
Checkout RCONS and PCA2 modules in all 5 vehicles (lhart)
Approve DVP&R at 12:30 meeting (slandes -- copies)

96		9/24/00 PM	0%	Sun 9/24/00	Sun 9/24/00	NA

Notes

Decision Matrix	Weight	Angle Change fom 1L2P-AA	
		4 deg	5 deg
Pull Out Effort	8	0	1
Drop In Speed	7	1	0
H. S. Ratchet	1	0	0
Spit Out	10	0	1
Hang Up	9	1	0
Score		16	18

The Team met on Sunday afternoon and reviewed test data and progress. We decided to see where we stood on making a decision on pawl tooth angle modification and used the above decision matrix to evaluate our position. After constructing the matrix it was the team decision to direct MPI to use the 5deg modification design. The key assessment criteria is "spit out". Even with out the weights applied the matrix would have resulted in a tie with the decision going to 5 deg because of the spit out issue. If only spit out and hang up were considered the decision would still be to sue 5 deg because of spit out considerations.

A set of good and bad pawls will be sent to ChemMet for analysis:
6deg unused
"N" unused
old "W" unused
pass and fail parts from current tests
"E" unused
"E" from team tests

We need to determine the proper sample size for DVP&R tests at the Monday 12:30.
A program specific DVP&R will be ready by COB Monday (yxu1)
Determine RHD vehicle requirements for the DV (hdover)

97		9/25/00 AM	0%	Mon 9/25/00	Mon 9/25/00	NA

Notes

All required pawls except the "E" tested part have been provided to the lab. MFYIE will find and supply the used "E" pawl.
Preliminary Chem Met test results have been communicated to MPI; test report to follow.

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/25/00 AM" continued

Notes

The ABA test between vehicles 041 and 957 has been partially completed: both vehicles experienced hang up at the 75th cycle. We will not do the last "A" portion of the test as the parts are too worn to provide reasonable results, and other test requirements will take precedence.
Some discussion on DV sample sizes has been held. The bump test will be a size of one; bench tests will be a size of three.

98		9/25/00 PM	0%	Mon 9/25/00	Mon 9/25/00	NA

Notes

The bump test will be held on Wednesday using vehicle 956 (4x2 with a 3.27 axle -- worst case vehicle for this test). YXU1 to supply a transmission to kbrisoce today for the test.
NOTE: lhart and slandes discussed which return spring to build in this transmission;, we have A, B, & C springs at this point with A being current, B close to production intent, but no actual production intent spring on hand. As the "A" spring would present the greatest risk of test failure we will use that spring -- a "Pass" under these worst case conditions should support system sign off.
The tested "E" pawl is being pulled for the lab.
RHD vehicle 041 will be retunred to hdover for a few days for a management review.
Modeling to support the 5deg pawl decision should be ready by the Tuesday meeting (mfyie)
Bench test data needs to be summarized (yxu1 & ptsai)

Analytical Data Collection

- Run models at tolerance limits using test data from bench and vehicle tests (coefficients, loads, etc.) mfyie, cperng
- Run bench tests on 5 deg pawls from the large batch (3 samples) yxu1
- Perform drop in tests with 5 deg pawl prototype level parts kbriscoe/lhart
- Perform the barrier test (Wednesday, kbriscoe)
- Determine what testing we can perform with existing pawls and which ones require new big batch parts.

Note: final dimensions have been given to Sherdel for the return spring.

Release the pawl and return spring, advnace the transmission assembly number. yxu1/cdavis42
Transmit the design for the new pawl with circular tooth thickness increas to cperng for ADAMS study and MPI for prototype parts. yxu1
Investigate process modifications for MPI as post-Job1 actions. jbrazin

99		9/26/00 PM	0%	Tue 9/26/00	Tue 9/26/00	NA

Notes

Vehicle Prep Issues:

- Change tire inflation from 26 to 30 psi to match new Company direction.
- Prep vehicles with the 5deg pawls we have in hand.
- Optical encoders are being installed on two vehicles.
- We have found ways to read vehicle speeds from the encoders (RCON direct or signal conditioning boxes; digital read outs when available).
- ABA testing on 041 and 957 will be completed. The team agreed to swap transmissions with no change in parts. If this produces useable results and additional work is indicated then we will consider a proper ABA, swapping transmissions with new or "stoned" parts.

F/U from 9/25:

- Bump test is to be performed on Wednesday; on track
- The tested "E" pawl has been taken to the lab
- HDOVER is temporarily updating the RHD vehicle for a management review.
- Modeling of teh 5deg pawl is inprocess; to be complete on 9/27.
- Initial drop in speed tests were run; values slightly higher than predicted; results are to be compared with model values (cperng)
- 4deg: 3.0 to 3.2 mph
- 5deg: 3.6 mph
- Sherdel has committed to PSW parts at BDX on 4 Oct 00.
- MPI will work with Jim Brazin to develop a work plan for investigating process improvements recommended by our lab. The MPI rep was here to spend time with our lab team.
- Confirmed that the return spring to be used for initial DV testing is the "A" spring; OK for bump test.
- A stack up request for circular tooth thickness has been submitted to CAD (#2081). F/U to make sure they're working on it (yxu1).

New:

- Finalize the DVP with vehicle requirements (lhart, dadamcz1, jbrazin, dhildebr).

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"9/26/00 PM" continued						

Notes

- Send a tested "N" pawl to the lab (yxu1).
- Note that modeling includes max/min mu and correlated to torque loads from test vehicles (yes, per mfyie)
- Bench tests:
- one run at 5deg pawl, complete
- two samples to go
- run a failed (hang up) transmission on the bench to measure mu underthose circumstance (yxu1).
- We have 5 pawls in hand, more are expected from MPI's big batch on Friday.
- We have 15 transmissions in hand with 24 more coming from BDX.
- Keller will work on a plan to investigate and improve their manufacturing tolerance.
- We need to do a layout of a damaged pawl and give those dimensions to Cognition for study in our full system stack up model (yxu1, hdover).

100		9/27/00 PM	0%	Wed 9/27/00	Wed 9/27/00	NA

Notes

Park System and some Transmission System team members met with Mr. Yuhasz. No regular team meeting was held. Briefly, unless the team can answer the issue raised by mfyie's model which shows the system not holding park on grade at minimum mu and maximum park rod cam angle we are not ready for production. The following assignments came from the meeting:

- Calculate the max cam angle sufficient for no spit out (mfyie)
- Obtain park rods in 0.1deg increments over the tolerance range; all phosphate coated; surface characteristics identified (yxu1)
- Benchmark E/N/AX with MathCAD model and similar mu values (mfyie)
- Find the transmission system with base pawl or 3deg pawl that skipped; measure cam angle/surface; confirm it still skips; rerun with 5deg pawl (lhart dadamcz1)
- Find ways to limit cariation in mu (dhildebr)
- Conduct one day peer review (vlajines)
- Add G. MacDonald to peer review team (pyuhasz)
- ZF help with review? (pyuhasz)

PE09-020 0891

From: Landes, Stephen (S.L.)
Sent: Friday, September 15, 2000 5:24 PM
To: Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Dover, Harry (H.); Fyie, Matthew (M.L.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Sledz, Ted (T.M.); Tsai, Pingfang (P.); Xu, Yehong (Y.)
Cc: Antrim, William (W.R.)
Subject: 5R55W Park System Team Status

Attachments: Microsoft Project - Team Assignments.pdf

The attached file is our status as of Noon on 15 Sept 00. We will review the status in tomorrow morning's 7AM Line Up Meeting.

Microsoft Project - Team Assig...

Stephen Landes
5R55N/W/S/E Systems Engineering
slandes@ford.com
(734) 523-5841
Text Page: slandes

Team Assignments as of Fri 9/15/00
Park System DV Plan

Highlighted Tasks have been completed

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
2	Team	Definition	80%	Thu 9/7/00	Sun 9/10/00	NA
3	cpernng	Validate ADAMS Model	100%	Tue 9/12/00	Thu 9/14/00	Thu 9/14/00

Notes
9/15: Mu assessment complete and the model ahs been updated.

4	mfyie	Bench test: coef. of friction confirmation	0%	Thu 9/7/00	Tue 9/12/00	NA

Notes
Sample #4 passed all pullouts through 700 ibs-ft static load; apwl shaft cracked and small cracks appeared in the case and x-hsng, pawl shaft bore elongated -- similar to high-speed ratchet test results.
As of 9/13:
Samples 1, 2, 3: no data; broken parts
Samples 4, 5, 6: tests completed; good data
Sample 7: laser pawl; test postponed
Samples 9, 10, 11: to be done 9/13/00
Two additional samples will be run with laser pawls for the selected geometry.
Add two "E" transmissions to this test. (lhart to obtain transmissions).
9/14: no parts broken since the stand was recalibrated after sample #4 and we switched to running 4x4's. Sample #8 returned to build up for unrelated o/s binding. Lowest mu recorded to date is 0.087.
9/15: Dennis Fergusen is setting up to run "E" transmissions on the stand. There is good information that suggests early sample breakage is related to over torque on the stand due to stand operating practice (setting torque after initiating cycle). We will wait to do new pawls until the next BDX shipment of transmissions arrives (schd for 9/19). "E" transmissions are available.

5	rperri	Determine Explorer lever ratio	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
6	ptsai,rperri	Pullout effort comparison	50%	Sun 9/10/00	Wed 9/13/00	NA

Notes
1) RHD values higher than LHD
2) "W" nose up higher than nose down
3) Re-run calculations with latest geometry

9/14: still waiting for "N" data from SHV. lhart to call Ken Stacherski for assistance.
9/15: SHV data received; revise table for 12:30 meeting (add DEW98 N w/ floor shifter). Also need offset numbers and update the matrix.

7	cpernng	Force balance calculations	75%	Sun 9/10/00	Wed 9/13/00	NA

Notes
Ratchet spring is adequate. If the pawl is aligned with a gear space & Park is selected a minimum of 14 N is required of the ratchet spring to depress the pawl. The current spring pre-load provides 40+/-2 N.
We need a flatter cam angle to compensate for low coef of friction. The present included angle is 9 to 11 deg.
9/14: need a one page summary written for this analysis.
9/15: These calculations are run at nominal conditions. We should consider running them at worst/best case conditions. Decide at 12:30 meeting. No decision at 12:30 -- right people not present.

8	kbriscoe	Baseline bump test	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00

Notes
test being performed 9/12.
9/14: test passed; requesting formal lab report for 9/15.

PE09-020 0893

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
9	yxu1	Measure peak dynamic torque and compare to 5R55N.	25%	Tue 9/12/00	Thu 9/14/00	NA

Notes
Use an instrumented drive shaft from a calibration vehicle.
Drive shaft obtained 9/12.
Drive shaft being installed 9/13/00.
9/14: Instrumented driveshaft installed; tests performed on 9/13. Initial results indicate that the test stand torque values are in the "ballpark". Re-run tests with vehicle at GVW.
9/15: Waiting for camera work to be completed in vehicle.

10	yxu1	Compare measured torque data with calculated loads of what we expect vehicle to see.	0%	Mon 9/11/00	Tue 9/12/00	NA

Notes
9/15: Require GVW torque data from instrumented axle (vehicle running camera tests).

11	mfyie jbrazin	Verify instructions/torque loads given to HMS lab; calibrate bench machine	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00
12	yxu1	Determine Keller's capability on park rod cam angle	25%	Mon 9/11/00	Tue 9/12/00	NA

Notes
9/13: dhildebr will contact BDX and Euro Purch for support in getting response from Keller. We need to be sure what Keller is providing, with what tolerance, and at what capability. Determine what tolerance reduction is possible and what is being quoted for 4R100.
Indication is that capability at +/- 30min is 1.05.
9/14: Still working with Keller to determine capability; tolerance is apparently +/- 30min on 1/2 angle.
9/15: Keller can make two different parts, but will have difficulty telling them apart. tsledz, yxu1, jbrazin to work on error proofing the parts/assembly.

13	yxu1	Investigate alternate park rod supplier.	0%	Fri 9/15/00	Tue 9/19/00	NA

Notes
9/15: Finding an alternate supplier was raised as a possibility by pyuhasz.

14	jbrazin mfyie dadamcz1 lhart tsledz	Create Fishbone diagram for Park System	100%	Sun 9/10/00	Tue 9/12/00	Tue 9/12/00
15	jbrazin mfyie dadamcz1 lhart tsledz	Fishbone analysis	25%	Sun 9/10/00	Tue 9/12/00	NA

Notes
9/14: Data from the "Visible A/T" and FEA are required to begin eliminating items on the diagram.

16	jbrazin	Update AX Energy Transfer diagram in team meeting room for 5R55W and application for specific issues.	0%	Fri 9/15/00	Sun 9/17/00	NA
17	lmckinni	Park System FEA: get priority in CAD	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
FEA kicked off 9/11. hvirdee will set up a meeting with Jer-Shi Chen to review FEA requirements. Completion forecast for 9/15.
9/13: no timing commitment from CAE
9/14: timing is 2.5 to 3 days for quick answer; Friday, 9/22 for full answer.

PE09-020 0894

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
18	CAE,mramnath	Perform Park System FEA	29%	Wed 9/13/00	Fri 9/15/00	NA

Notes
9/14: This is the quick FEA
9/15: Preliminary results received. full analysis for Sunday morning. Analysis confirms expectations of location of breakout. Recommended improvements in clude longer pawl shaft, deeper holes in case and x-hsg, chamfer on pawl shaft holes. Update Saturday AM.

19	mfyie	Re-run engagement calcs with other pawl designs	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
CAD has done the runs; evaluating results.
9/13: Doing a study with 6deg design. mfyie, cperng, yxu1 to review today.
9/14: inputting 6deg design; plan to complete today.
9/15: Complete. An order for 5deg and 6deg pawls has been placed with MPI.

20	hvirdee	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	25%	Mon 9/11/00	Fri 9/15/00	NA

Notes
Parts from Sample #4 test run 9/11 are being sent to the lab.
9/14: Pawl & Shaft sent to lab (yxu1); bench test samples 1 & 2 case and xhsng sent to lab (hvirdee); pawl & shaft from vehicle 957 (broken xfr case) sent to lab.
9/15: Initial results were due today at 12:30; no results available.

21	hvirdee	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	25%	Tue 9/12/00	Fri 9/15/00	NA

Notes
We need porosity, chemistry, and tensile strength. Samples should be requested from Ryobi (N) and Fagor and Koeln Forge (W).

22	dadamcz1	Obtain stack up on park pawl shaft (length & alignment)	50%	Mon 9/11/00	Fri 9/15/00	NA

Notes
9/14: Same as task 23: consolidate
9/15: In process

23	mfyie jbrazin	Finalize DVP&R proposal	50%	Mon 9/11/00	Tue 9/12/00	NA

Notes
9/14: proposed DV sent out for comment.
9/15: Draft has been circulated. No decision is required at this time; wait until screening DV results are available to finalize.

24	yxu1	Perform ultimate strength test on "N" and "W" systems. Add "E"	25%	Tue 9/12/00	Fri 9/15/00	NA

Notes
Two samples: one "N" and one "W", tested in the nose up direction.
9/13: direction is to add "E" to this test so we can compare across the whole family.
9/14: Need "N" case (lhart to help); check files for old "E" tests (mfyie, lhart) (file check complete).
9/15: "N" is all set to run; "E" needs further checking. The "W" 4x4 can be run with a 4x2 shaft; the 4x2 with a minimally modified x-hsg. yxu1 needs 4x2 x-hsg drawings and 4x4 xfr xcase spline drawings for a fixture. The 4x2 drawings are complete; existing 4x4 fixtures have been located and the numbers provided to yxu1.

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
25	Travis Miller	Review all data supporting a change in the pawl return spring force.	100%	Wed 9/13/00	Fri 9/15/00	Fri 9/15/00
	Notes	Need a "fresh eyes" review of the data and a recommendation on proceeding with this change for Job1.				
26	Cognition,rperri,hdover,yx	Perform VSA-type audit on the Park System.	25%	Wed 9/13/00	Fri 9/15/00	NA
	Notes	rperri: business arrangements for analysis yxu1: drawing list for hdover hdover: collect drawings and carry to Cognition 9/14: Timing calls for initial model by noon today; meet with mfyie, yxu1 on defining park achievement; verify set up angle, gear positions. Cognition will establish nominal measurements and then six-sigma levels. Drawings complete to Cognition. 9/15: hdover has additional information requested by Cognition and will take it to them today.				
27		Pawl Shaft stack up	0%	Wed 9/13/00	Fri 9/15/00	NA
	Notes	yxu1 and jbrazin to review 5R55N stack up and determine if a longer pawl shaft is possible; demonstrate that this is a necessary improvement for Job1. 9/14: Same as task 20: consolidate				
28	Team	Approve DVP&R proposal	25%	Wed 9/13/00	Wed 9/13/00	NA
	Notes	9/14: Draft DV circulated for comment.				
29	dadamcz1 lhart jbrazin slandes	Develop Screening DV	0%	Thu 9/14/00	Fri 9/15/00	NA
	Notes	9/14: DV draft is complete and is to be reviewed with Tom Cross to see how he wants work orders written to support the plan.				
30	W956	Perform Screening DV W956	0%	Fri 9/15/00	Sun 9/17/00	NA
	Notes	4.0L 4x2 3.27 axle				
31	W957	Perform Screening DV W957	0%	Fri 9/15/00	Sun 9/17/00	NA
	Notes	4.6L 4x4 3.73 axle				
32	ZA00041	Perform Screening DV & Baseline ZA00041	0%	Fri 9/15/00	Sun 9/17/00	NA
	Notes	4.6L 4x4 3.73 axle RHD				

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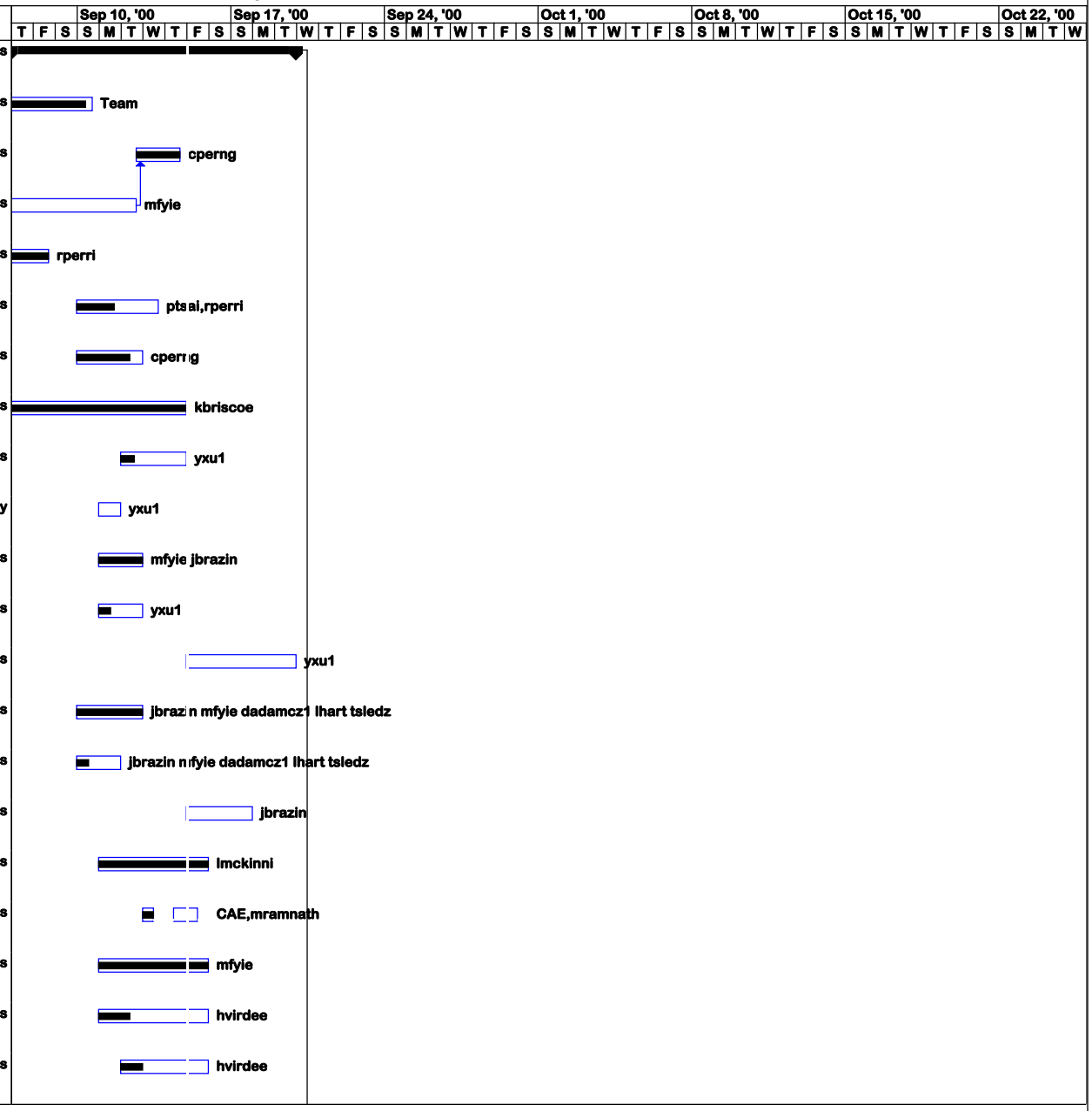
ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
33	W946	Perform Screening DV W946	0%	Fri 9/15/00	Sun 9/17/00	NA
	Notes 4.0L 4x2 3.73 axle					
34	W954	Perform Screening DV W954	0%	Fri 9/15/00	Sun 9/17/00	NA
	Notes 4.6L 4x4 3.55 axle					
35	Team	Recommend Hardware Direction	0%	Sat 9/16/00	Sat 9/16/00	NA
37	klittle2	Vehicle 956: install digital read out	0%	Thu 9/7/00	Sat 9/16/00	NA
38	klittle2	Vehicle 954: won't start	0%	Thu 9/7/00	Sat 9/16/00	NA
39	klittle2	Vehicle 957: replace transfer case; add digital read out	0%	Thu 9/7/00	Sat 9/16/00	NA
40	dhildebr	Obtain 4x2 w/ 3.27 axle	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes The vehicle is available in Dearborn. Kim Briscoe will bring it to Livonia.					
41	hdover dadamcz1	Obtain RHD vehicle from Shifter group	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
42	hdover	Obtain cables, brackets, clips	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
43	yxu1	Purch order for new pawls	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes Laser cut pawls are due 9/15/00. 9/15: Pawls arrived 9/14.					
44	yxu1	Purch order for extension housings	0%	Thu 9/7/00	Wed 9/20/00	NA

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
45	ecastro1	Purch order for 24 transmissions	100%	Thu 9/7/00	Sun 9/10/00	Sun 9/10/00
	Notes Bordeuax built the transmissions on 9/11/00.					
46	BDX	Deliver 24 transmissions to ATNPC	0%	Tue 9/12/00	Tue 9/19/00	NA
47	peckman	Purch 2 new force gages	100%	Thu 9/7/00	Tue 9/12/00	Tue 9/12/00
	Notes Two new gages received.					
48	mfyie	Design/Fab bench test fixture	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
49	dadamcz1 lhart hdover jbrazin	Create Visible A/T	100%	Sun 9/10/00	Thu 9/14/00	Thu 9/14/00
	Notes A camera is to be installed in a vehicle/transmission on 9/12; first results for 9/13 meeting. 9/15: Complete on 9/14; collect data on 9/15.					
55	yxu1	DV Testing	0%	Tue 9/26/00	Tue 10/10/00	NA
67	MPI Subcontractor	Machine MPI produced pawls already in stock	0%	Sat 9/16/00	Mon 9/25/00	NA
68	MPI	Final processing of pawls at MPI	0%	Tue 9/26/00	Sat 9/30/00	NA
69	MPI	Ship pawls to BDX	0%	Sun 10/1/00	Thu 10/5/00	NA
70	LAP	Integrated Build at LAP	0%	Mon 10/23/00	Mon 10/23/00	NA

PE09-020 0898

Park System DV Plan

ID	Task Name	Duration	Resource
1	Problem Scope	13 days	
2	Definition	4 days	Team
3	Validate ADAMS Model	2 days	cpernng
4	Bench test: coef. of friction confirmation	5.99 days	mfyie
5	Determine Explorer lever ratio	2 days	rperri
6	Pullout effort comparison	4 days	ptsai,rperri
7	Force balance calculations	3 days	cpernng
8	Baseline bump test	8 days	kbriscoe
9	Measure peak dynamic torque and compare to 5R55N.	3 days	yxu1
10	Compare measured torque data with calculated loads of what we expect vehicle to see.	1 day	yxu1
11	Verify instructions/torque loads given to HMS lab; calibrate bench machine	2 days	mfyie jbrazin
12	Determine Keller's capability on park rod cam angle	2 days	yxu1
13	Investigate alternate park rod supplier.	5 days	yxu1
14	Create Fishbone diagram for Park System	3 days	jbrazin mfyie dadamcz1 lhart tsledz
15	Fishbone analysis	2 days	jbrazin mfyie dadamcz1 lhart tsledz
16	Update AX Energy Transfer diagram in team meeting room for 5R55W and application for specific issues.	3 days	jbrazin
17	Park System FEA: get priority in CAD	5 days	lmckinni
18	Perform Park System FEA	1.75 days	CAE,mramnath
19	Re-run engagement calcs with other pawl designs	5 days	mfyie
20	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	5 days	hvirdee
21	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	4 days	hvirdee



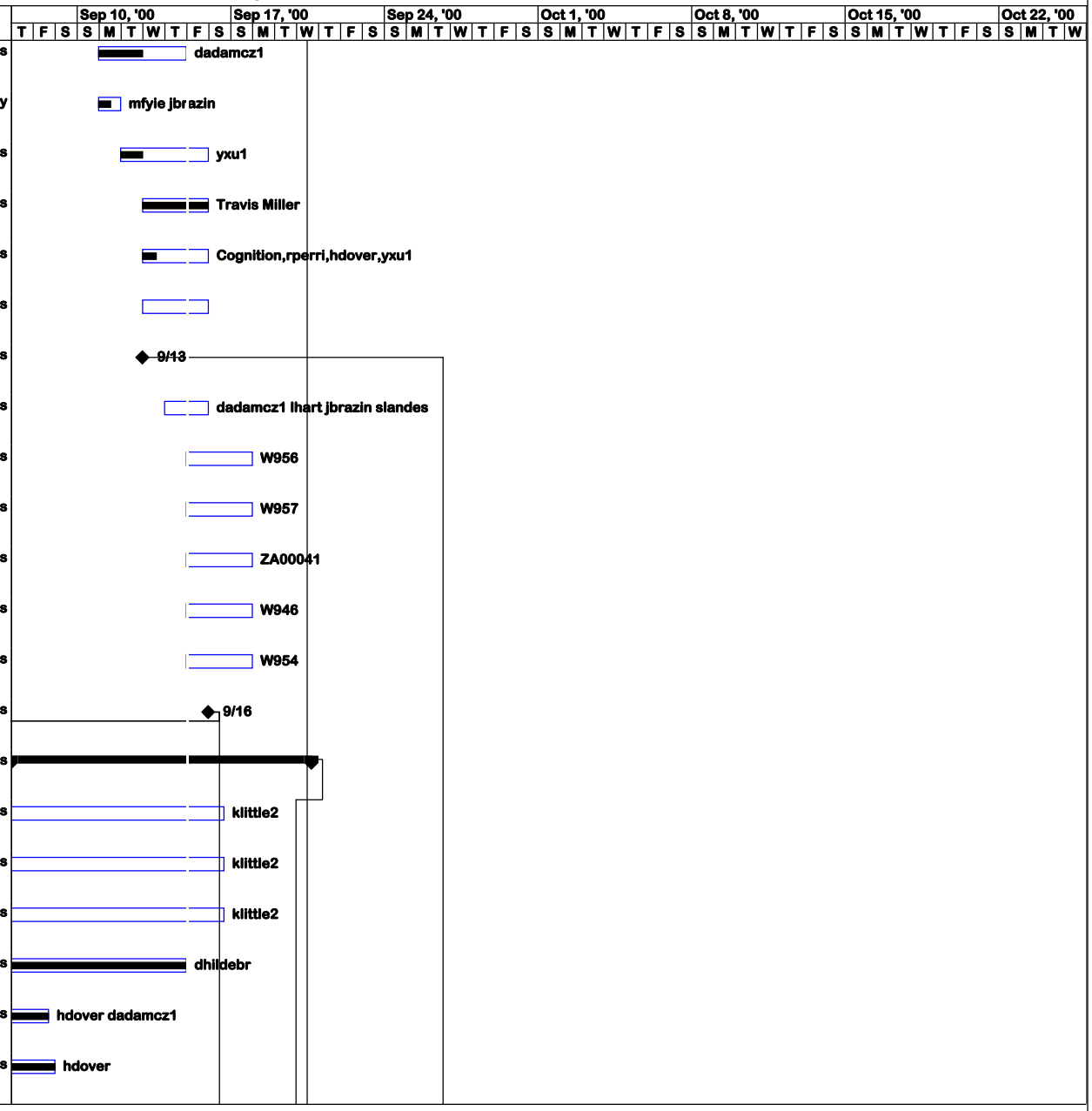
Project: Park System DV Plan
Date: Fri 9/15/00

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks
Progress | Summary | Rolled Up Milestone | Split | Project Summary

PE09-020 0899

Park System DV Plan

ID	Task Name	Duration	Resource
22	Obtain stack up on park pawl shaft (length & alignment)	4 days	dadamcz1
23	Finalize DVP&R proposal	1 day	mfyle jbrazin
24	Perform ultimate strength test on "N" and "W" systems. Add "E"	4 days	yxu1
25	Review all data supporting a change in the pawl return spring force.	3 days	Travis Miller
26	Perform VSA-type audit on the Park System.	3 days	Cognition,rperri,hdover,yxu1
27	Pawl Shaft stack up	3 days	
28	Approve DVP&R proposal	0 days	9/13
29	Develop Screening DV	2 days	dadamcz1 lhart jbrazin slandes
30	Perform Screening DV W956	3 days	W956
31	Perform Screening DV W957	3 days	W957
32	Perform Screening DV & Baseline ZA00041	3 days	ZA00041
33	Perform Screening DV W946	3 days	W946
34	Perform Screening DV W954	3 days	W954
35	Recommend Hardware Direction	0 days	9/16
36	Infrastructure Actions	13.99 days	
37	Vehicle 956: install digital read out	9.99 days	klittle2
38	Vehicle 954: won't start	9.99 days	klittle2
39	Vehicle 957: replace transfer case; add digital read out	9.99 days	klittle2
40	Obtain 4x2 w/ 3.27 axle	8 days	dhildebr
41	Obtain RHD vehicle from Shifter group	2 days	hdover dadamcz1
42	Obtain cables, brackets, clips	2 days	hdover



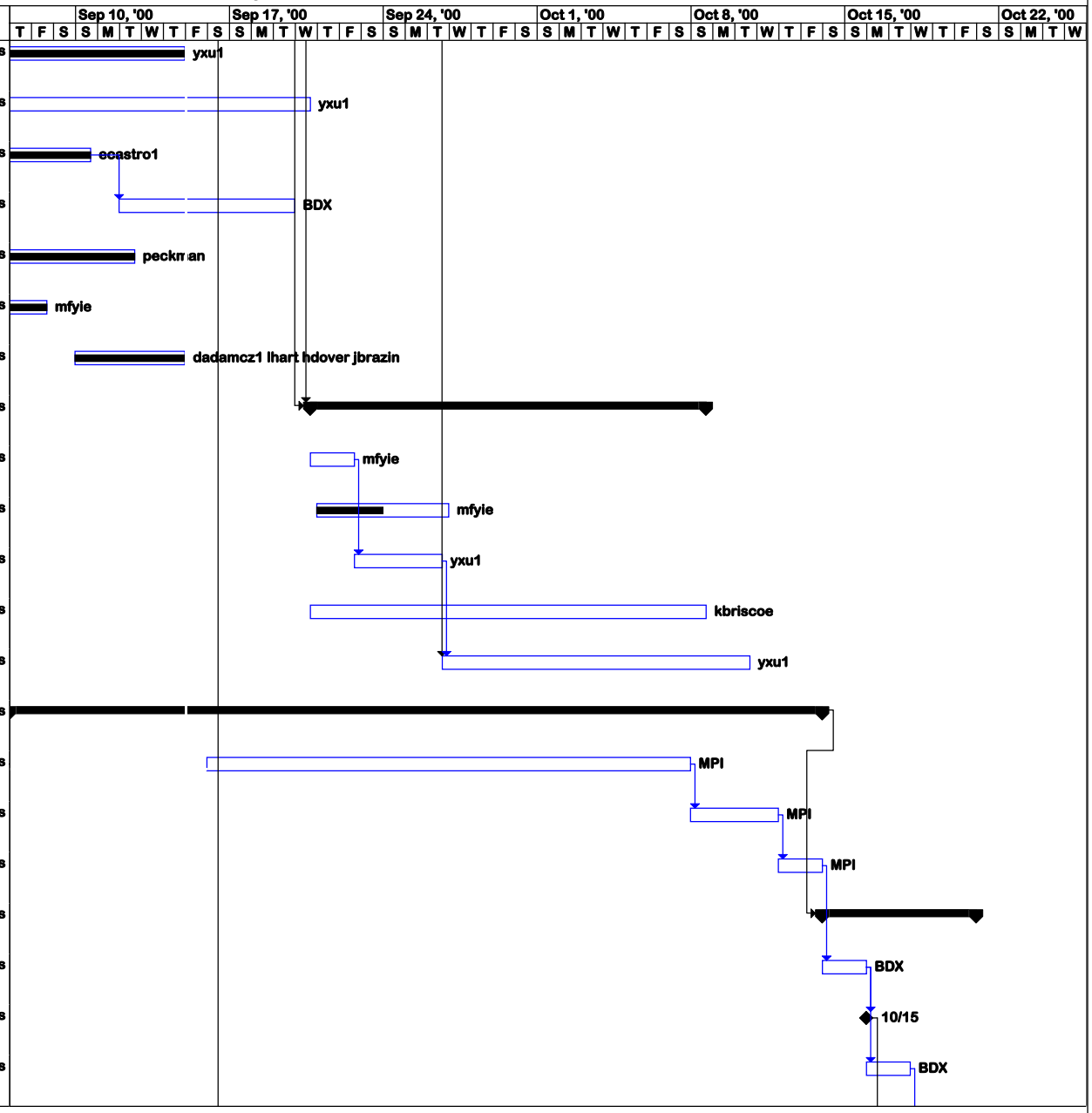
Project: Park System DV Plan
Date: Fri 9/15/00

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks
Progress | Summary | Rolled Up Milestone | Split | Project Summary

PE09-020 0900

Park System DV Plan

ID	Task Name	Duration
43	Purch order for new pawls	8 days
44	Purch order for extension housings	13.99 days
45	Purch order for 24 transmissions	4 days
46	Deliver 24 transmissions to ATNPC	8 days
47	Purch 2 new force gages	5.99 days
48	Design/Fab bench test fixture	2 days
49	Create Visible A/T	5 days
50	Corrective Action Validation	18 days
51	Bench test selected prototype pawl with Max Park Disengagement Load	2 days
52	Bench test	6 days
53	Combined Ratchet/Pullout	4 days
54	Bump Test	18 days
55	DV Testing	14 days
56	MPI Actions	37 days
57	Production die	22 days
58	PSW Parts	4 days
59	Ship to Bordeaux	2 days
60	Bordeaux Actions	7 days
61	Build PV transmissions	2 days
62	Transmission Job1	0 days
63	Perform PV test	2 days



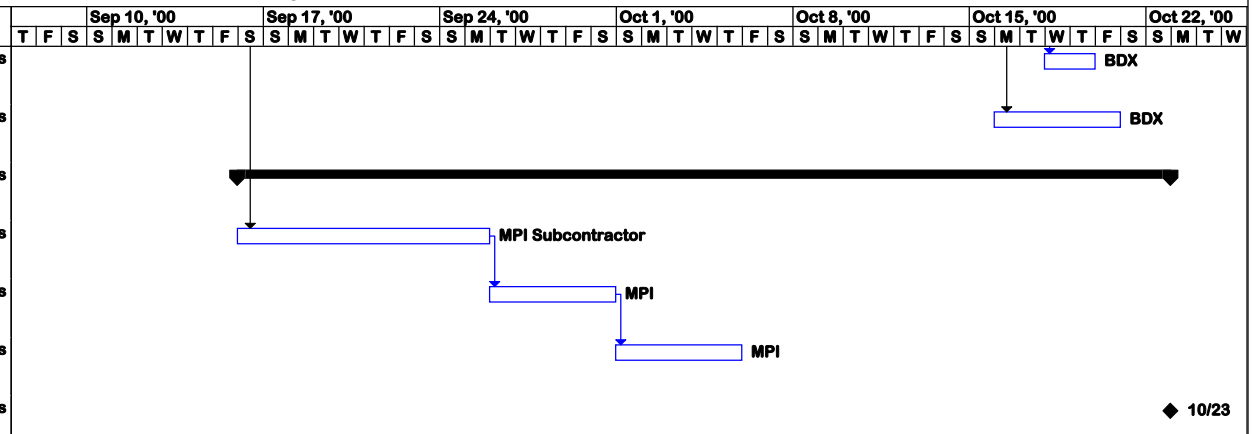
Project: Park System DV Plan
Date: Fri 9/15/00

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks
Progress | Summary | Rolled Up Milestone | Split | Project Summary

PE09-020 0901

Park System DV Plan

ID	Task Name	Duration
64	PSW	2 days
65	Ship to LAP	5 days
66	Alternate Support Plan	37 days
67	Machine MPI produced pawls already in stock	10 days
68	Final processing of pawls at MPI	5 days
69	Ship pawls to BDX	5 days
70	Integrated Build at LAP	0 days



Project: Park System DV Plan
Date: Fri 9/15/00

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks
Progress | Summary | Rolled Up Milestone | Split | Project Summary

PE09-020 0902

From: Rentz, Drew (A.G.)
Sent: Wednesday, October 11, 2000 2:15 PM
To: Ahmed, Kamal (K.); Blomgren, Jim (J.R.); Brazin, Jim (J.C.); Bruck, Al (A.J.); Fyie, Matthew (M.L.); Haggerty, Judy (J.F.); Heuver, Brad (B.R.); Landes, Stephen (S.L.); MacDonald, George (G.F.); Matthews, Kate (K.H.); McKinnis, Larry (L.N.); Miller, Jean (J.M.); Miller, Travis (T.); Perri, Ron (R.J.); Rentz, Drew (A.G.); Retallack, Lynn (L.M.); Rubel, Yury (Y.); Segovia, Jim (J.); Spaulding, Todd (T.C.); Xu, Yehong (Y.)
Cc: Lajiness, Vince (V.)
Subject: 5R55W Peer Review Agenda

Attachments: Agenda.doc

Agenda.doc (84 KB)

Attached file contains notes as well as assignments from the Oct 10th 5R55W Peer Review

5R55W Park System Peer Review
Thursday 10/5/2000, 8:30 - 11:30am

Documents	Page
Agenda	2
Peer Reviewers	3
Minutes	4-7
Lessons Learned	8
Assignments	9
Conculsion	10

5R55W Park System Peer Review
Thursday 10/5/2000, 8:30 - 11:30am
Exec. Conference Room
AGENDA

Item	Lead	Time Length (Min)	Time Start (Time)
1) Introductions/Purpose	J. Miller	5	8:30
2) 5R55W Park System Summary	L. McKinnis	10	8:35
3) 5R55W Park System Design - Design Assumptions/Specs - Analytical Design - Design Decision - Hardware Status - DVP&R/FMEA - Review of information from Ford OGC - Current Issues	J. Haggerty Y Xu Matt Fyie	45	8:45
4) Feedback from Reviewers	All	45	9:30
5) Issues Summary, Job#1 Readiness	Drew Rentz All	45	10:15
6) Wrap-up/Next Steps	All	30	10:45

Vince Lajiness
Manager - Business Leadership
ATEO/Powertrain
ATO Livonia, W134D, Box12
Phone 523-3353, Fax 523-6129, Pager 734-797-4889

5R55W Park System Peer Review
Thursday 10/5/2000

Peer Reviewers

Name		
First	**Last**	**Function/Department**
Yuri	Rubel	Bus. Ldr.
Judy	Haggery	Park Design
Matt	Fyie	Park Design
Yehong	Xu	Park Design
Stephen	Landes	5R55W Prog. Cntl.
Lynn	Retallack	Mech. Sys. Comp.
Larry	McKinnis	Mech. Sys. Comp.
George	MacDonald	WSAP PTO Resident Engineer
Travis	Miller	AX4S/N Trans. System
Brad	Heuver	Mech. Sys. Comp.
Drew	Rentz	Bus. Ldr.
Ron	Perri	Shift Systems
Todd	Spauling	Shift Systems
Al	Bruck	4F27E Res Engr
Jim	Blomgren	4R70/4R100/5R110W Park Mech
Kamal	Ahmed	CD4E/CVT (H.T.) Park Mech
Jim	Brazin	Park System Components
Kim	Matthews	Bus. Ldr.
Jim	Segovia	PTO Quality Office
Jean	Miller	Bus. Ldr.

After introductions, meeting purpose (Evaluate the Park systems capability it's functional purpose) was stated. In addition at the end of the review there will clear agreement on the any assignments which results from this review. Specific issues are:

Park skipping and ratcheting
Park engagement

Design History

The 5R55W Park system is an evolutionary design from the 5R55N. The original intention was to use the 5R55N design but loading characteristics requires a change. The 5R55N was based off the 5R55E which was designed in Europe by Dave Turtle's organization. Changes were made due to packaging. 5R55N is used in LS 2 wheel drive vehicle with lower loads.

Base Document

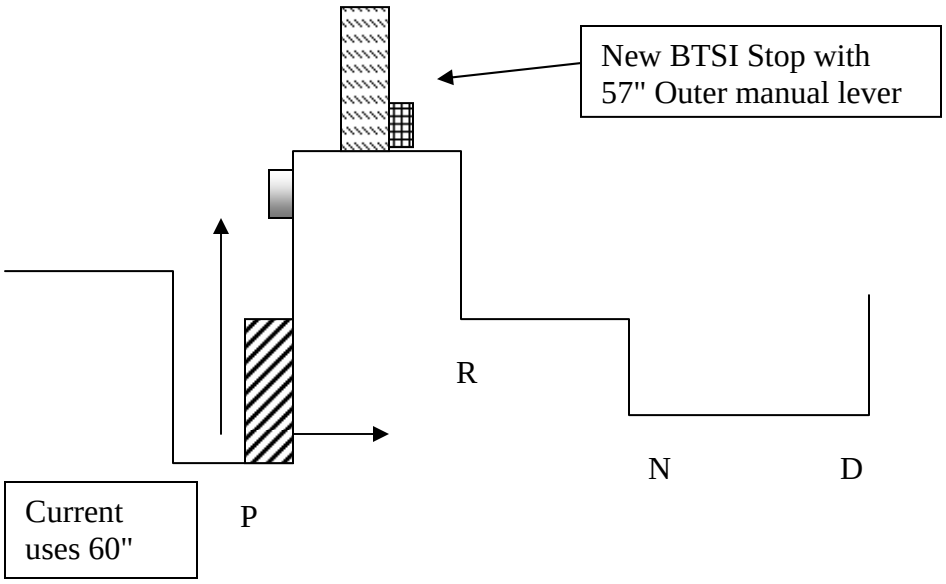
The 5R55W 5-speed Automatic Transmission Park System Review presentation (Dated 10/4/2000) was used as the basis for the Park Review. Document contains:

- Park Systems Function (Page 3, 4)
- History Changes made after CP (Page 5, 6, 7).
  - Originally axle ratio of 3.71 was the same for both 4x2 and 4x4. Now 4x2 has 3.27 and. 3.55, 4x4 has 3.55 and 3.73
  - New Column shifter
- Analytical evaluation of current design (Page 8, 9, 10, 11)
- Status (page 12 - Vehicle tests. 13, 14) Note statement "Never observed in first two pull outs within any test sequence is not accurate
- Next Steps (Page 15)

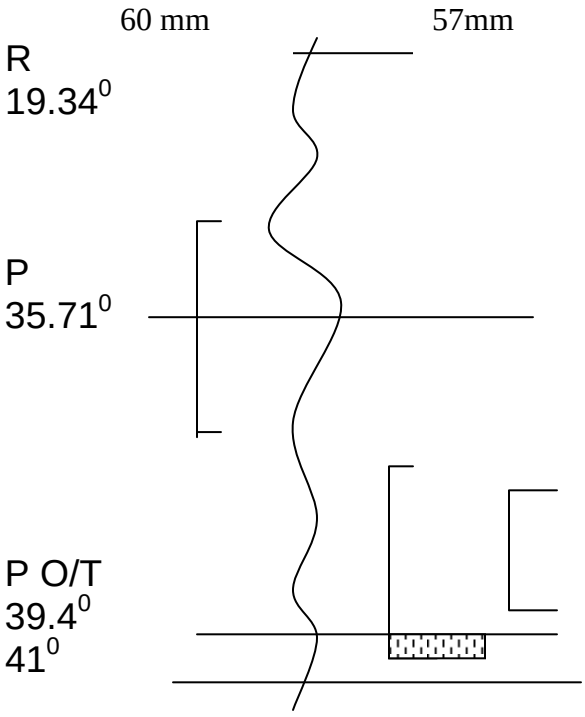
If you have the Presentation file I believe it would be a good idea to add to minutes

Shifter change

Explanation of column shifter change and its effects on the Park mechanism was presented.

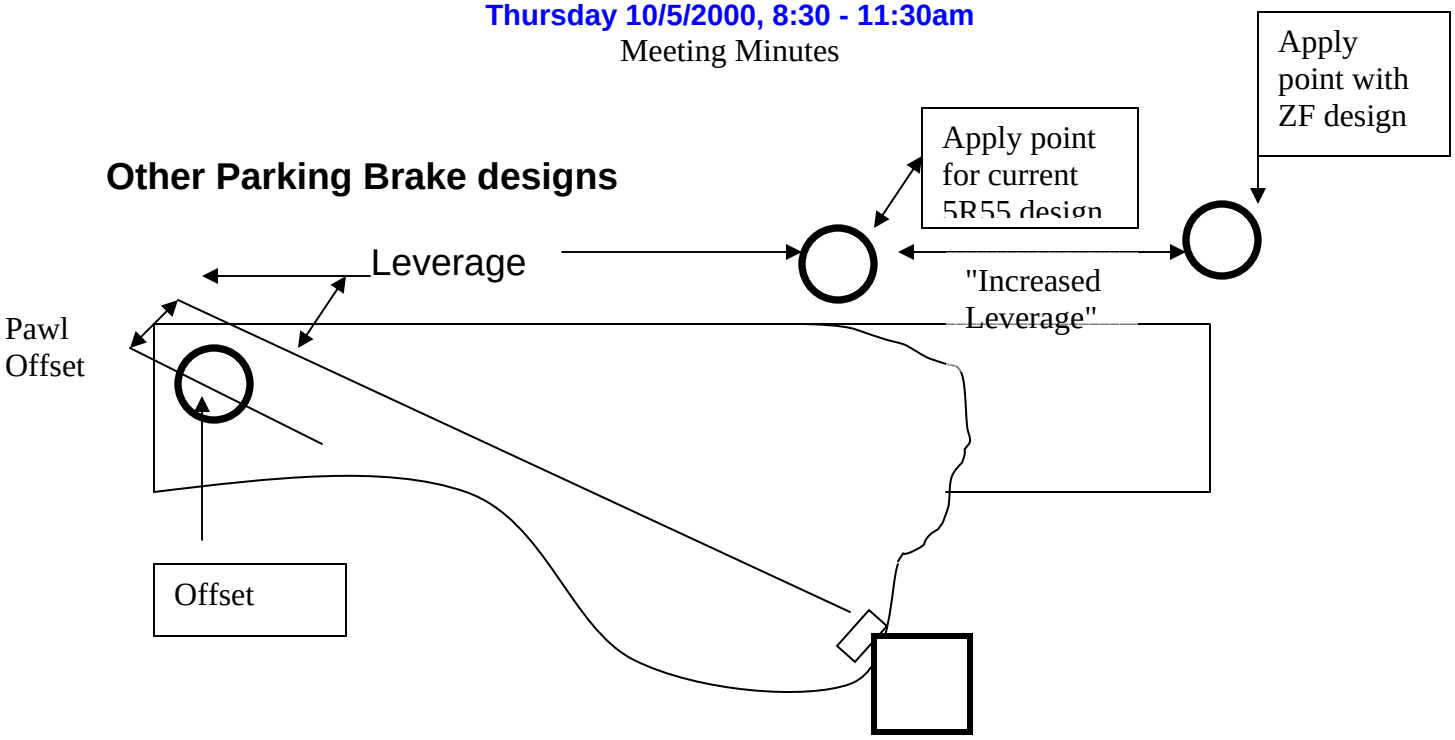


New shifter design allows additional movement



Supplier (Visteon) will tighten up manufacturing to limit variability of column shift mechanism. In addition shift cable bracket will be stiffened.

Other Parking Brake designs



Changing the pawl tooth angle affects the amount offset. Reducing offset reduces spitout force

Park skipping and ratcheting, the following changes were made based on the analytical force balance model:

- Pawl tooth angle adjusted by 5^0
- Material added to Cam (Nose down/tension side)
- Visteon will reduce variation on parts supplied - Park rod ground to 9.5^0 –10.0^0 full included angle and phosphate coated
- 270N-mm return spring

These actions will increase coefficient of friction and thus mitigate problem

Park engagement issue

The test which indicates engagement issues, is a standard test, but does not represent customer usage. The combined test involves sequences of nose up and nose down pullouts alternating with forward and reverse drop ins. When pullouts are run rapidly (10 in a row within 15 or 20 seconds) there have been some observed incidents of park pawl not disengaging from the park gear. A modification to the rate at which pullouts are performed which is consistent with customer likely usage patterns has been designed. There have been no observed incidents of park pawl hanging in park gear when running the test with this modification.

Lessons Learned:

- Speed measurement should be done with optical encoders and digital readouts instead of Rcons
- Need place holder in "Near Zero Prototype" imitative to ensure that prototype vehicles are available for parking system testing
- Cable Bracket can not be allowed to deflect under load and consider die casting for rigidity and NVH damping
- DVP&R – need to look at it and understand. I.e. Indicate passed with vehicle load of xxx, axle ratio of yy etc.; show all testing and rationale for changes from generic.
- Understand what the effective system coefficient of friction ($\bar{u}$) is and what affects it – this should be a 6 σ project.
- Understand the efficiency of the system delivering force to the park system; include impact of cable travel, temperature
- Leverage is the key to a good park system

Assignments

Item	Individual
Go Back and ask Technicians are there any skip Tooth (with old angle)?	George MacDonald
Put lessons learned in FMEA (See above). PUT ū in FMEA	Jim Brazin
Issues will not be closed until documents are complete	Document authors
Ask Mazda about past experiences (CD4E dual mode drop in speed)	Al Bruck
Gather data on Coefficient of Friction for Cam and Abutment. What is wear at 50,000 or 100,000 miles	Lynn Retallck (How to get data)
Power out of hangs up in reverse to check for transmission damage Should we consider adding testing @ 40^0 ? Y. Xu Is park gear heat treat process stable? Y. Xu Do we get as much material transfer in coast down/drop in as in pullout on grade? Do ratcheting drop ins with pull outs on grade to get whatever material transfer we can to affect possible hang up.	Steve Landes will find appropriate person
Complete DVP&R	Judy Haggerty
Follow up on 1MC heat treat and scale to handle build up material	Judy Haggerty
Drop in Speed, need good data and proper instrumentation	Lori Hart
Maintain contact with OGC on material build up (Continue testing with large sample size – 24 vehicles)	Steve Landes
Inform Dave Dreyer that the "Near Zero Prototype Initiative" must a vehicle available for parking brake test	Drew Rentz (Completed 10-6)

Conclusion:

- Park system meets functional requirements
- Follow up on design changes for park system pre and post job # 1

From: Villar, Daniel (D.A.)
Sent: Sunday, July 30, 2000 6:27 PM
To: Payapilly, Abe (A.); Mack, Claude (C.M.); Krause, Albert (A.R.); LeBrell, Charles (C.R.); Horoszy, Ted (T.B.); Allard, Chris (C.E.); Brohl, Jerry (G.G.); Levine, Julie (J.A.); Whitbeck, Rod (R.G.); John Daniter (E-mail); Wayne M. Avers (E-mail); Daker, Ziad (A.Z.); Porter, Alan (A.J.); Marotzke, Vicki (V.); Mark Monohon (E-mail); Simon, Rodney (D.); Johnston, Alan (A.C.); LeBrell, Charles (C.R.); Perri, Ron (R.J.); Dover, Harry (H.); West, David (D.G.); Robey, Donald (D.H.); Spaulding, Todd (T.C.)
Subject: 7/27-Minutes: Wear Failure Rvw Mtg -- U152 Strg Col Insert Plate & Shift Lever

WEAR FAILURE RVW MTG -- U152 STRG COL INSERT PLATE & SHIFT LEVER
Date: 7/27/00
Time: 8am-11am
Loc: Defiance Testing & Engg Facility

PURPOSE
To review and examine Visteon's Shift System Durability Cycle Test procedure, testing fixture, and failed parts off their DV1 run.

AGENDA
1) What is the Failure criteria for the Shift System Durability Cycle Test?
2) What is the current DV test and procedure?
3) What were the DV1 failures and issues that may have led to them?
4) Review of the DV1 Failed Parts (Shift Lever & Insert Plates).

MINUTES
1) What is the Failure criteria for the Shift System Durability Cycle Test?

a) Alan Johnston explained the SDS defined failures: system fails to function; cannot select intended gear; system feel degradated (rooster comb); loss of positive engagement; and abillity to remain locked in Park.

b) Team agreed that there is "no" specific definition of a "failure" available for a Defiance technician (or future technician) to identify. This needs to be provided by Visteon and agreed to by Ford.

2) What is the DV test and procedure?

a) Components included in this system test is the steering column, shift lever, trans cable, and transmission buck (w/ OML and Rooster Comb).

b) Test fixture functions system test by translating the shift lever through several gear shift selections (in the following order: P-D-D1-back to R-P).

3) What were the DV1 failures and issues that may have led to them?

a) DV1 Failure identified was that the shift lever was worn nearly 1/2 through on the functional end that translates through the insert plate (Note hardness rqmts were: Shift Lever: R15N 89min (RC 58 min) & Insert Plate: RC 58 min).

b) Issues identifed by the team that may have led to the failures:
- Insert Plates were Laser Cut Prototypes

- Test fixture was applying a push force during return of the lever into the detent of the insert plate
- Park detect switch had an interference with the shifter pin causing the pin to work itself out and potentially causing lever to misalign.

c) Additional Issues, identified after team review of the test fixture that was running the DV2 test run.
- Team realized that Defiance, the test source, did not have a set of criteria that would define a failure in the system test.
- Team questioned the validity of the test (how is it validated, how do you monitor the test to ensure it never drifts, and how do you certify the test?).
- Team identifed that the test fixture seemed to contribute to unwanted loading in the system and was not being monitored (i.e. load cells) to identify any "drifting" from the intended requirements.

4) Review of the DV1 Failed Parts (Shift Lever & Insert Plates).

a) Claude Mack and Al Krause identifed to the team that in-order to understand if the hardness process played a role in the wearing failure of the shift lever they would have to analyse the case depth hardness and microstructure of both the shift lever and insert plate.

b) Team believes that the combination of items 3a and 3b, above, were the main causes that potentially produced the bogus results identified in the DV1 test.

ASSIGNMENTS FOR NEXT MEETING (July 31, 2000 @ 8am-11am)
1) Need to identify failure critera.
- By 7/28, Vicki Marotzke to get part off High Mileage Steering Column's from Indy for review.
- By TBD, Chis Allard to investigate getting parts off QFTF vehicles.
- By 7/31, A team needs to review parts and recommend failure criteria (team should include the following: Visteon, Ford Chassis, Dura Auto, Admiral Tool, Ford Shift System Controls, Ford Statistical/Quality Person).

2) Need to understand test procedure and if it is applicable to the current U152 design
- By 7/31, Visteon (A. Porter): How to validate/certify the test must be defined by Alan Johnston, Ziad Daker, Don Robey, Dave West, and Ford's Shift System Control Group.
- By 7/31, Ford (D. Villar/C. Allard) : Get people from the past who originally ran the test to review test procedure and fixture (which includes a technician from Bldg 4 and Carron & Co).

3) Recommend Hardness Spec for Shift Lever and Insert Plate
- By 7/31, Claude Mack and Al Krause to recommend hardness spec. with hardness and microstructure results from:
a) DV1's U152 failed parts (Inst plt @ RC58min and Sht Lvr @ R15N 89min ~ RC 58min)
b) Current U/PN150 parts
c) Current U152 released parts (Inst plt @ RC58-60 and Sht Lvr @ R15N 90.5-92 ~ RC 60-63)

****
Next Meeting
Date: 7/31/00
Loc: Defiance
Time: 8am-11am
****Stay tune for the agenda**********
****

Regards,

Dan Villar, Explorer Steering
Ford Motor Company, U152 Chassis Engineering
Loc: PDC 1D-L42
Ph/Fx#: 313-33-75680
Profs/(Email): dvillar / (dvillar@gw.ford.com)

Levine, Julie (J.A.)

From: Villar, Daniel (D.A.)
Sent: Wednesday, September 20, 2000 8:31 AM
To: 'Mike Kauth'; Jeremy King; Bobosky, Chuck (C.M.); Levine, Julie (J.A.); Miller, Stephen (S.); Bratcher II, John (J.E.); Perry Strautz; Vickey Frandsen; Chris Yazaki: Adamson (E-mail); Lyons III, Spencer (S.); Korzan, William (W.); Marotzke, Vicki (V.); Porter, Alan (A.J.)
Cc: Villar, Daniel (D.A.)
Subject: 9/19- Saline Visit- U152 Strg Column Wireshield to BSI Clearance

12pm Saline Timing Mtg
1) Reconfirmed that Phase I will be available at Saline on 10/2/00.
2) Reconfirmed that Phase II will be available at Saline wk of 11/14/00.
3) Yazaki and Saline now have U152 ramp-up schedule required to identify required quantities of Phase I to bank up before Phase II is available.
4) PMT 12 needs to provide timing plan that coordinates incorporating the BSI quieting features, based on Yazaki's Phase II timing.

Review of Final Wireshield Design (Rapid Proto provide by J. King)
1) 9/18 request from J. Bratcher's, to change forward wireshield mount to decrease thickness of mount from 6mm to 3mm is not required after today's review. It was determined that a longer screw (12mm effective length) can be accomodated on all mount locations (wireshield, PATS, MFS, and PRNDL) that use a common screw.
2) Complete overview of design was done with Spenser Lyons, Visteon Chassis, Jeremy King, Yazaki, John Bratcher, PMT 6 any myself. Base on this review no more future design changes will be required.

Review of Phase I design and forward mount on new trans cable brace.
1) Added 3mm shim to simulate new trans cable brace under fwd wireshield mount. Identified that fwd wireshield mount's flexiblity take up most of the potenial added interference to the shroud. Team estimated that it would most likely add an additional 0.5-1mm interference to the shroud, which could potentially contribute to the existing gapping seen at shroud parting line. This would hurt us only on Nova Calls.
2) Additional issue, Phase I fwd mount may potentially fall through new 12mm pierced hole in trans cable brace when driving screw. D. Villar/Spencer Lyons to check if really an issue with new trans cable bracket on a column in Dearborn.

Dan Villar, U152 Explorer Chassis
Steering Column Sub-system
Loc: PDC 1D-L42
Ph/Fx: 313-337-5680
Email: dvillar@ford.com

-----Original Message-----
From: Mike Kauth [mailto:mkauth@yazaki-na.com]
Sent: Monday, September 18, 2000 2:17 PM
To: dvillar@ford.com; Jeremy King
Cc: cbobosky@ford.com; jlevine@ford.com; smille18@ford.com; jbratche@visteon.com; Perry Strautz; Vickey Frandsen
Subject: RE: Updated: U152 Strg Column Wireshield to BSI Clearance

Dan-

Jeremy is planning on faxing the proposal to you today and sending Cad Data tomorrow morning. If possible, he will also send the Cad data this afternoon. Jeremy will contact you sometime this afternoon to give you

2002 MY U152

DIFFICULT TO OPERATE SHIFT LEVER
ANALYSIS OF CUSTOMER CONCERNS
GQRS, ICCD, WARRANTY

SUMMARY

- Shows sharp reduction in TGW's after Dec'01 production. Few data points to confirm the effect of Jan'02 special cause (Insert plate redesign, in production 1/28/02, C11126684)

- ICCD (emerging concerns) and Warranty show no evidence of special cause.

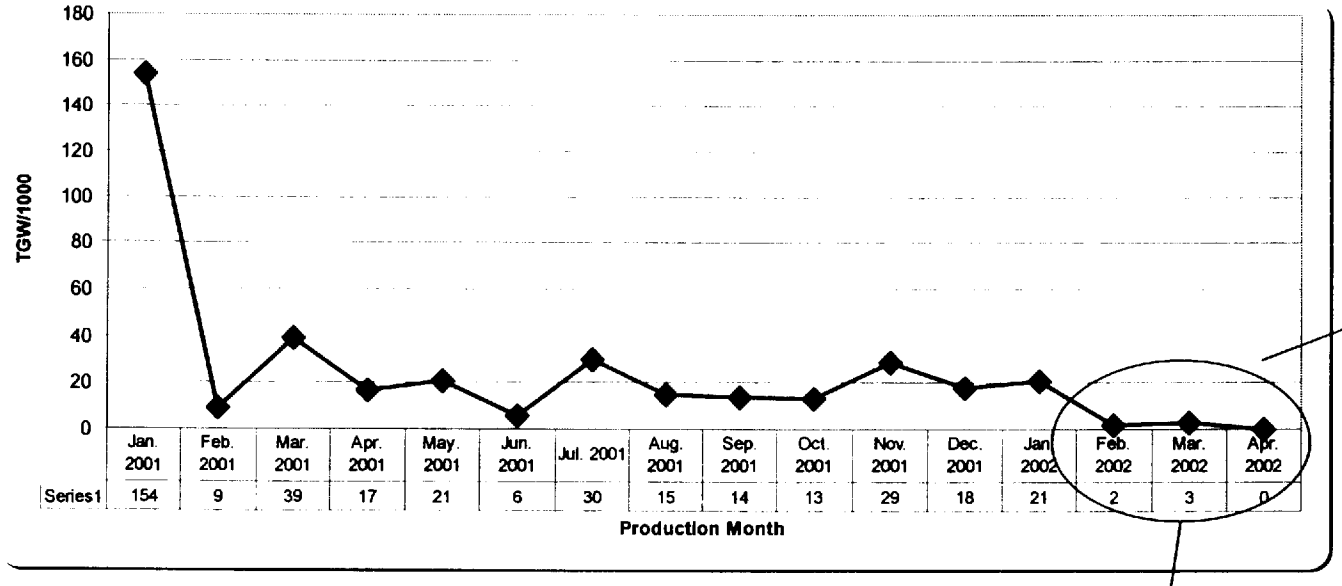
CONCLUSIONS & RECOMMENDATIONS

- 'Unexpected shifter movement' is not a significant contributor to warranty.
- TGW/1000 data, which shows reduction, is based on immature data. GQRS and ICCD data need to be monitored.
- Do not recommend a project yet. Suggest Sri (V.E.) and Anselm (Chassis) to monitor on a monthly basis and report out trends that require your attention (3-4 hrs/month)

2002 MY YTD GQRS, 3 MIS, TGW/1000

DIFFICULT TO OPERATE SHIFT LEVER

(RUN DATE: 10/16/2002]



YTD:	17
MAR 2001-JAN 2002:	19
FEB 2002-APR 2002:	2

TGW is trending lower AFTER Jan'02 Insert Plate design change.

Uncertain if the shift can be sustained BASED on historical variation in the statistic

Need to monitor

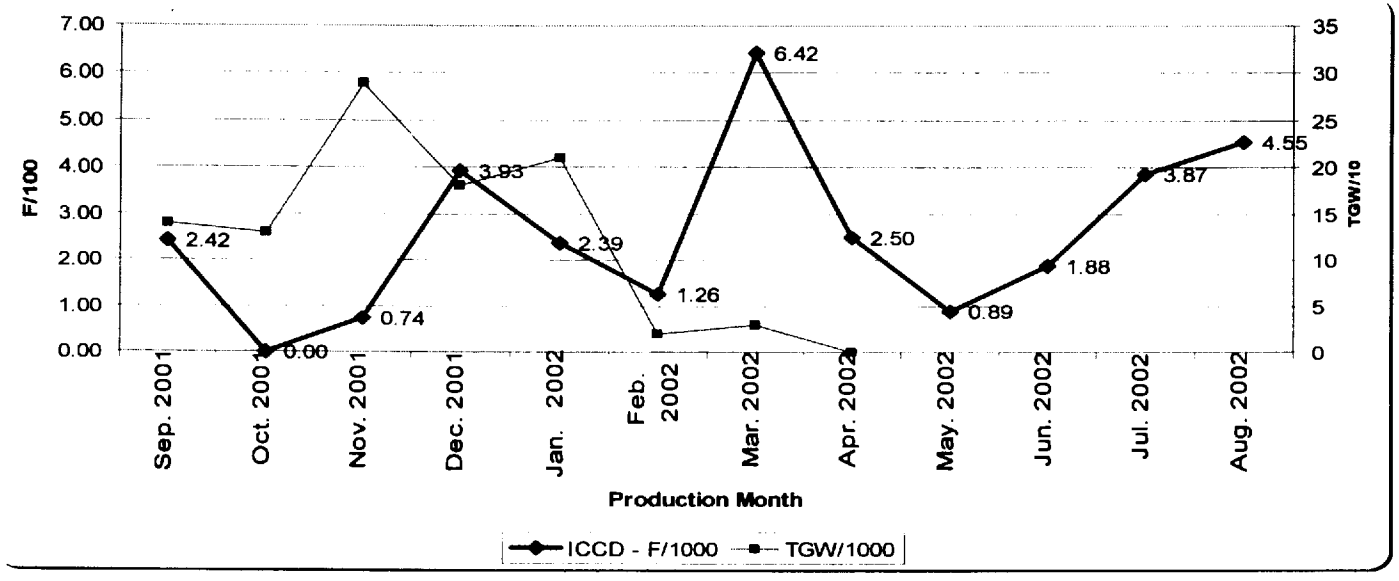
VERBATIM GROUPS	RECENT MOP Feb. 02-Apr. 02	HISTORICAL All MOP
Customer Moves Lever To D, But Hears And Sees Lever Move Into Selected Position After Short Drive	25%	36%
Customer Expects Engagement Feel - Drops In To Detent; Engage Into Slot; Customer Hunts For Proper Position And May Miss Desired Selection	50%	34%
Sticky, Hard To Place	12.5%	17%
Indicator Not Cleary Visible	0%	6%
Misc.	12.5%	8%
Total Verbatims	8	53

ICCD Claims Analysis

P51 DIFFICULT TO OPERATE SHIFT LEVER

BUILD DATE: 11/29/00-8/30/02

CALL DATE 03/30/01-10/04/02



F/1000 Statistic shows no evidence of special cause

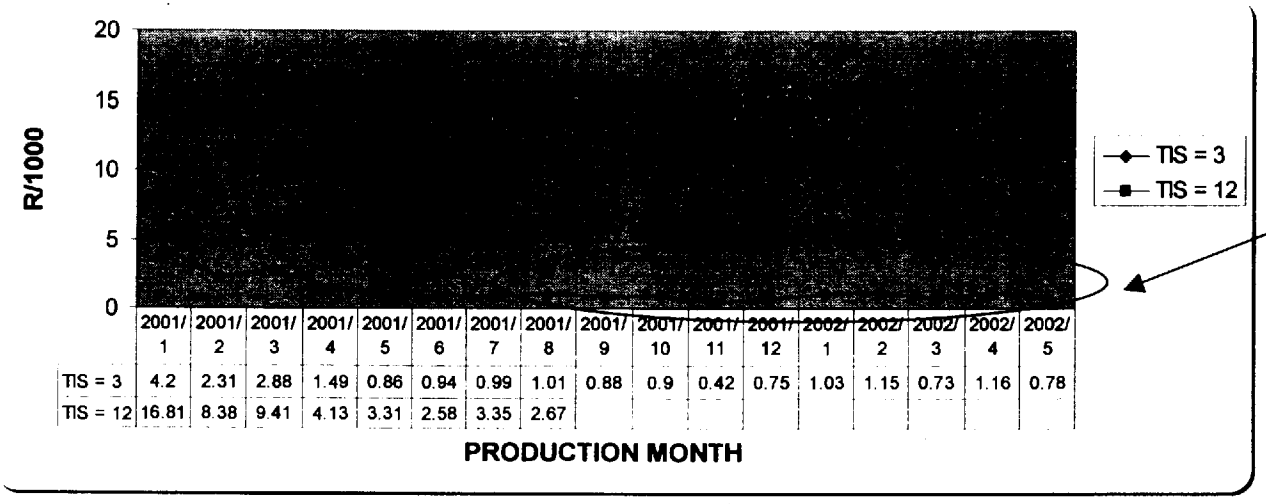
Further evidence of this is in the table below (BEFORE/AFTER)

DISTRIBUTION OF CONCERNS	AFTER FEB'02-AUG'02	BEFORE JAN'01-JAN'02
When lever is placed in D & accel, it moves and makes a clicking sound; Not seated properly and moves; Seems adjusting to proper position	52%	52%
Does not lock; Have to move/jiggle lever around. Shifter appears to be between n&d; Slips out of D	17%	21%
Would not come out of park/difficult to engage reverse	22%	21%
Shifter making noises/difficult to operate	9%	6%
Total ICCD Claims	23	33

WARRANTY

CCC-P51, R/1000

60 DAY LOGIC, NO FLEET UNITS, C/O DATE SEP 30, 2002



	2001/1	2001/2	2001/3	2001/4	2001/5	2001/6	2001/7	2001/8	2001/9	2001/10	2001/11	2001/12	2002/1	2002/2	2002/3	2002/4	2002/5
TIS = 3	4.2	2.31	2.88	1.49	0.86	0.94	0.99	1.01	0.88	0.9	0.42	0.75	1.03	1.15	0.73	1.16	0.78
TIS = 12	16.81	8.38	9.41	4.13	3.31	2.58	3.35	2.67									

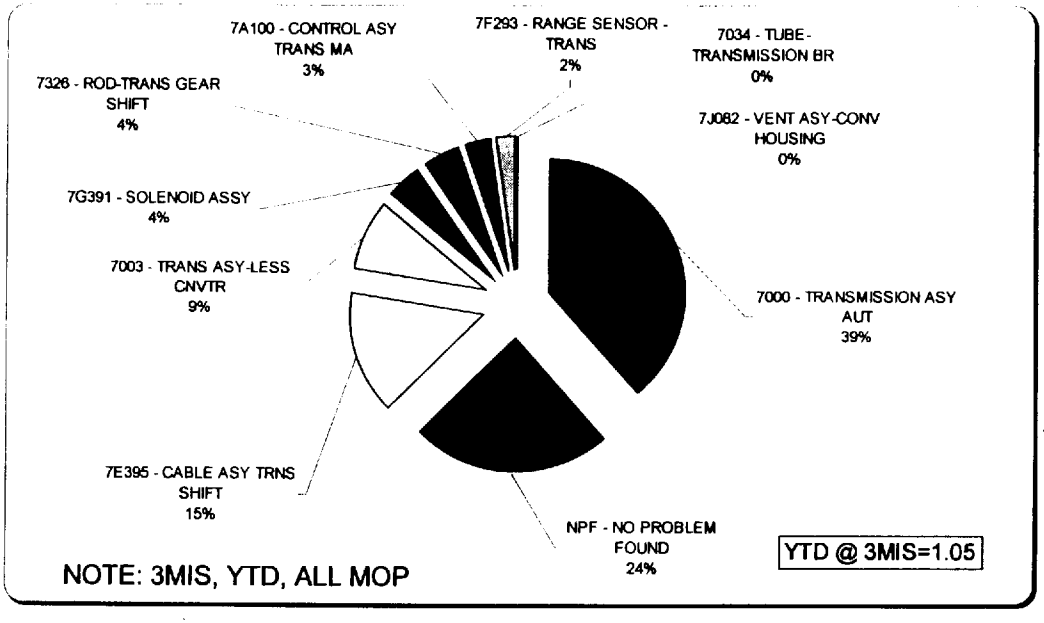
YTD
<= 3MIS = 1.05
<= 12 MIS =3.65

Relatively low value for r/1000

Statistic reveals no special cause

Is process stable, capable?

What are the top concerns for this ccc?



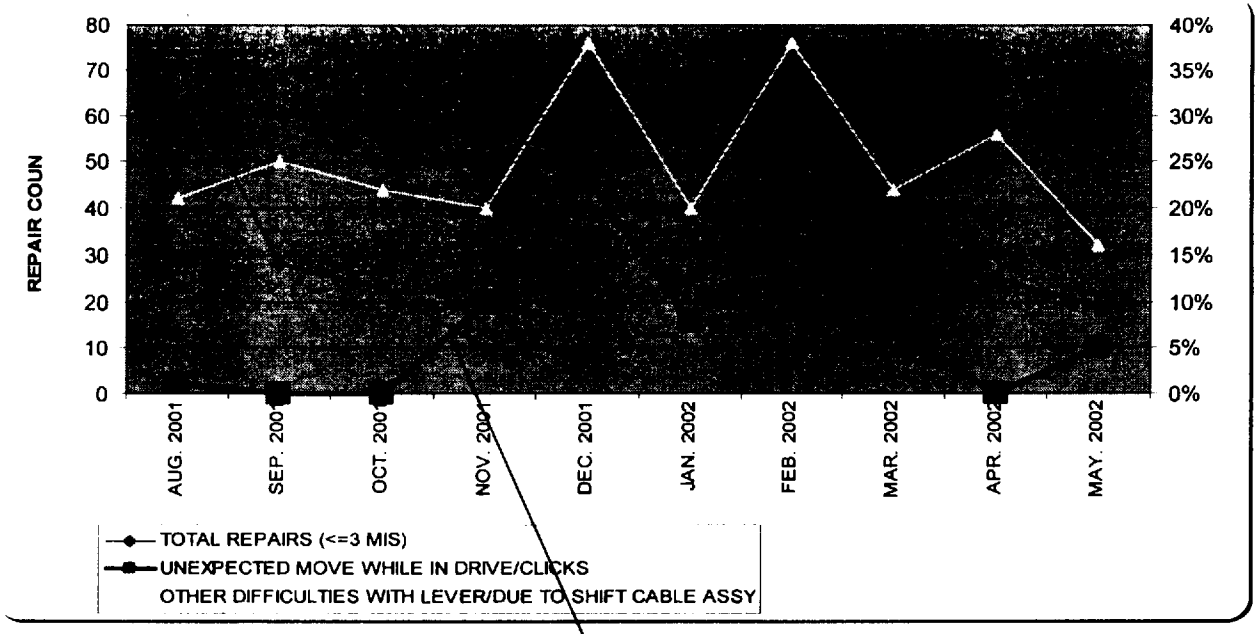
CAUSAL PART FOR REPAIR SHOWS EVIDENCE OF OTHER SIGINIFICANT EFFECTS BESIDES SHIFT LEVER POPS

HOW IMPORTANT IS 'UNEXPECTED SHIFT LEVER MOVEMENT' TO P51 WARRANTY?

FOR 3 MIS, AS % OF TOTAL CONCERNS FOR THIS PERIOD, NOT SIGNIFICANT!

SIGNIFICANT ISSUES:
175 of 252 claims [70%] are unrelated to shift lever and/or ISSUES with shift cable assembly.

MIL
Harsh/rough shifts
Delayed engagements
Trans noise
Trans. Slips
No gear engagements
Engagement clunk,
Etc.



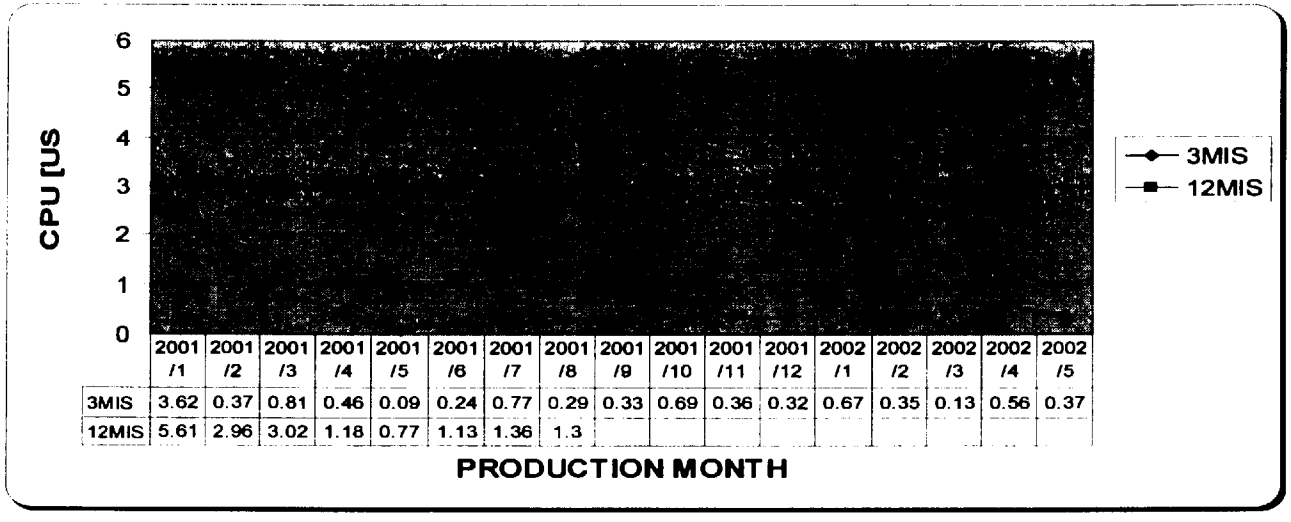
REPAIRS BINNED UNDER

7E395		CABLE ASY TRNS SHIFT
7326		ROD-TRANS GEAR SHIFT
NPF		NO PROBLEM FOUND

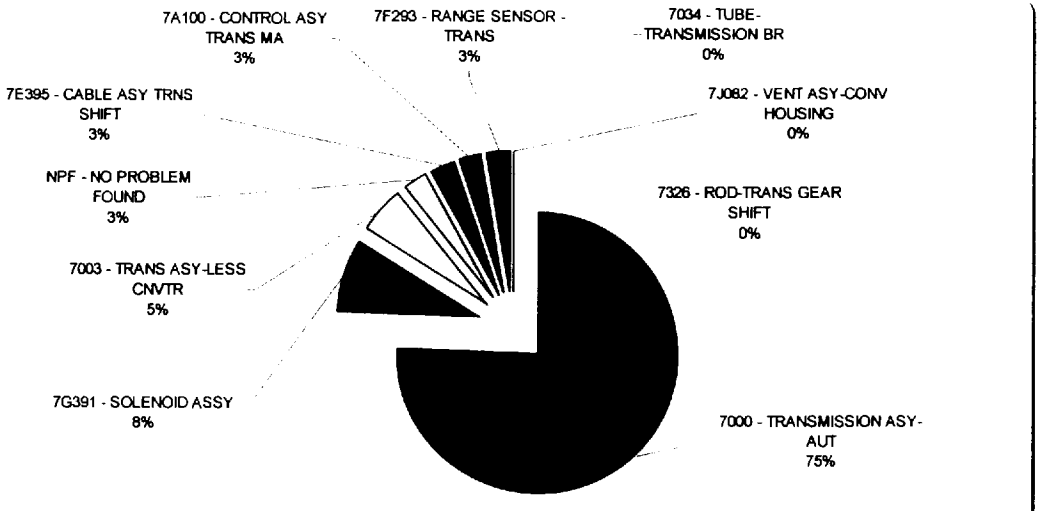
WARRANTY

CCC-P51, CPU [U.S $]

60 DAY LOGIC, NO FLEET UNITS, C/O DATE SEP 30, 2002



	2001 /1	2001 /2	2001 /3	2001 /4	2001 /5	2001 /6	2001 /7	2001 /8	2001 /9	2001 /10	2001 /11	2001 /12	2002 /1	2002 /2	2002 /3	2002 /4	2002 /5
3MIS	3.62	0.37	0.81	0.46	0.09	0.24	0.77	0.29	0.33	0.69	0.36	0.32	0.67	0.35	0.13	0.56	0.37
12MIS	5.61	2.96	3.02	1.18	0.77	1.13	1.36	1.3									



NOTE: 3MIS, YTD, ALL MOP

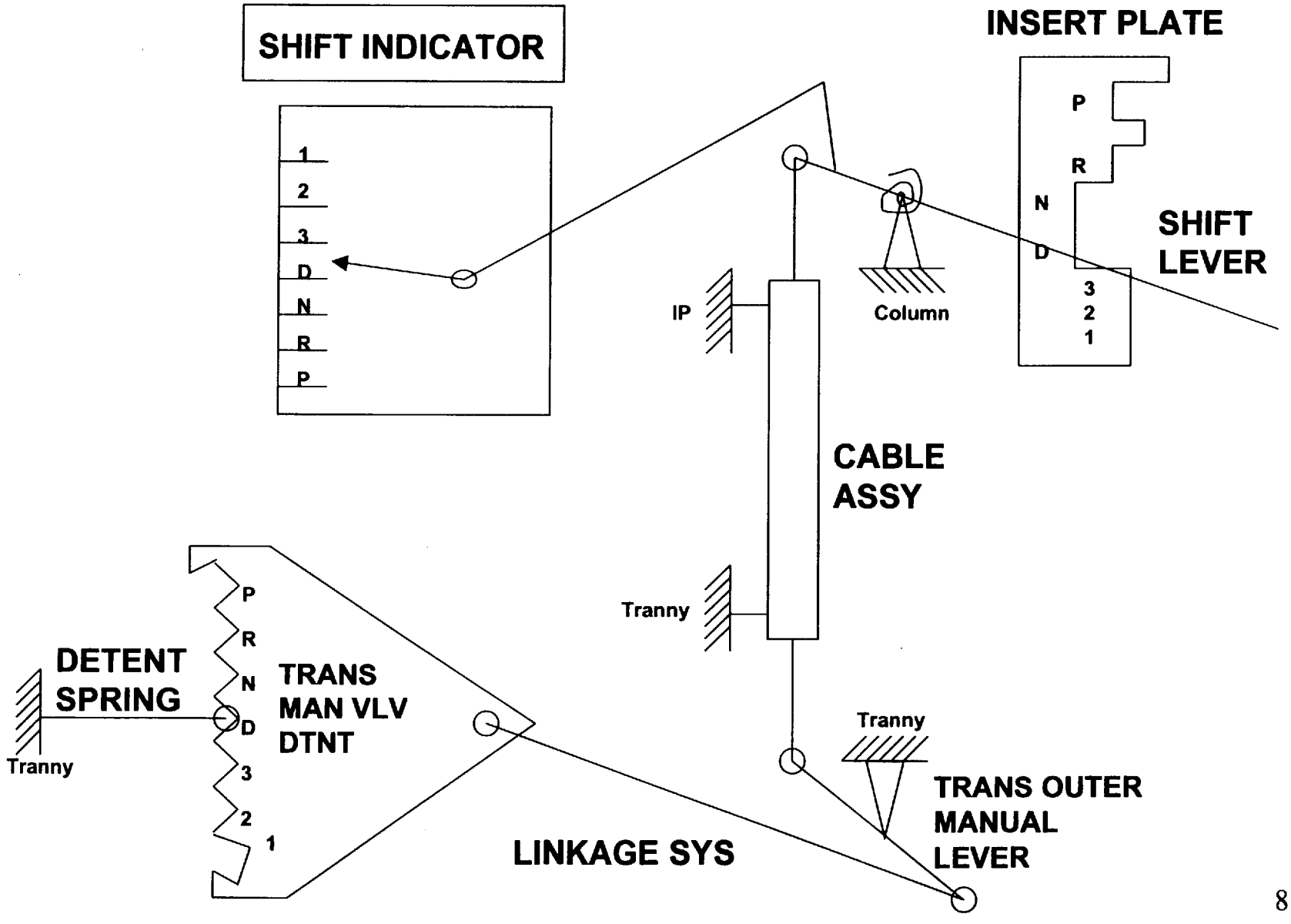
YTD @ 3MIS=$0.41

YTD
@ 3MIS = $ 0.41
@ 12 MIS = $1.53

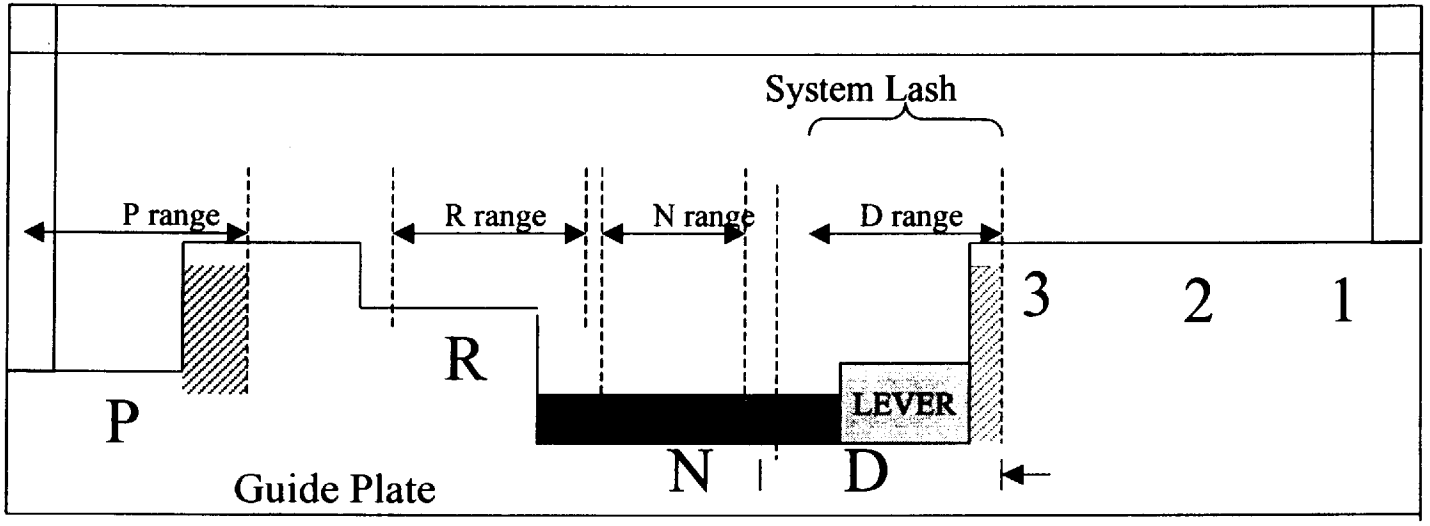
CPU's associated with the causal parts of 'shift lever movement' are not significant

REFERENCES

U152 SHIFT LEVER CABLE SYS SCHEMATIC

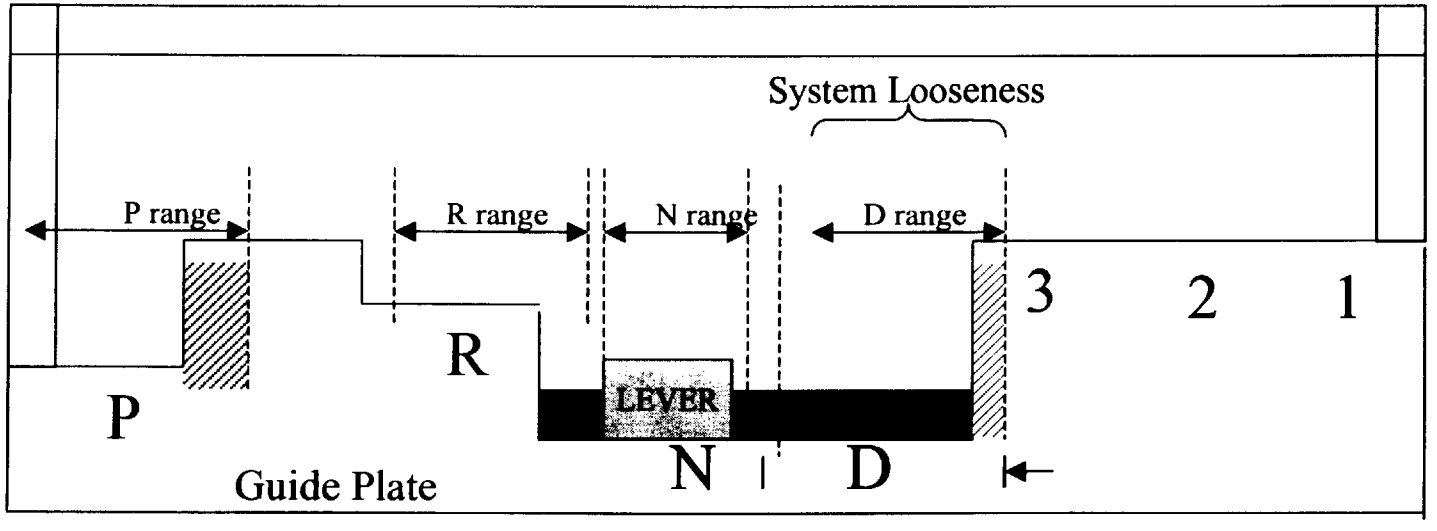


INSERT PLATE & SHIFT LEVER SCHEMATIC



PROPOSAL

LEVER HELD BY
3LB WEIGHT



GQRS

2002MY U152
DIFFICULT TO OPERATE SHIFT LEVER

		Jan. 2001	Feb. 2001	Mar. 2001	Apr. 2001	May. 2001	Jun. 2001	Jul. 2001	Aug. 2001	Sep. 2001	Oct. 2001	Nov. 2001	Dec. 2001	Jan. 2002	Feb. 2002	Mar. 2002	Apr. 2002	Total
	TGW/1000	154	9	39	17	21	6	30	15	14	13	29	18	21	2	3	0	
	TOTAL GQRS Sample Size	82	100	190	222	319	254	338	872	546	500	435	441	454	413	222	68	
	Verbatims																	
CUSTOMER MOVES LEVER TO D, BUT HEARS AND SEES LEVER MOVE INTO SELECTED POSITION AFTER SHORT DRIVE	**WHEN PUT IN D & ACCEL, SHIFT LEVER BOUNCES BACK/LOCKS IN TO PLACE/POPPING OR CLICKING SOUND**		1	1					3	2					1	1		9
	DIFFICULTY GETTING THE GEAR TO DRIVE/WILL OFTEN BE IN 3/POPS IN TO PLACE			1					2				1	1				5
	DOES NOT LOCK/POP IN TO PLACE; SEE OR HEAR LEVER DROP IN TO PLACE AFTER DRIVING							3				1		1				5
CUSTOMER EXPECTS ENGAGEMENT FEEL - DROPS IN TO DETENT; ENGAGE INTO SLOT; DROP IN TO SLOT; CUSTOMER HUNTS FOR PROPER POSITION AND MAY MISS DESIRED SELECTION	**DOES NOT GO IN TO DRIVE POSITION; HAS TO BE PUT IN PROPER POSITION**			2			1				1			1		2		7
	DOES NOT FEEL ENGAGE IN TO SLOT/DETENT/DROP IN TO LOCKED POSITION										1		2	1				4
	EASY TO MISS D AND PUT IN 3							1							1			2
	SLIDES POST POSITION WHILE TRYING TO SHIFT														1			1
	DOES NOT CLICK IN TO PLACE			1														1
	DIFFICULT TO OPERATE SHIFT LEVER SOMETIMES								1									1
	DOES NOT MAKE TRANSITION FROM ONE GEAR PLACEMENT TO OTHER												1					1
	NEVER SURE WHAT GEAR I AM IN SOMETIMES											1						1
STICKY, HARD TO PLACE	STICKS IN SHIFTING FROM PARK	2						1		2	1							6
	PARK TO REVERSE DID NOT ENGAGE - ONLY ONCE															1		1
	HARD TO PLACE INTO REVERSE					1												1
	DIFFICULT TO SHIFT TO PROPER GEAR WHEN PARKED											1						1
INDICTAOR NOT CLEARY VISIBLE	CANNOT SEE GEAR INDICATOR					1			2									3
MISC	HARSH SHIFT/NOISE/DOES NOT SIT WELL IN DASH POSITION				1						1	1		1				4

10

JCCD

2002 MY U152
Difficult to operate Shift Lever
ICCD PARETO
build date 11/29/00-8/30/02
call date 03/30/01-10/04/02

Verbatim		Jan.2001	Feb. 2001	Mar. 2001	Apr. 2001	May. 2001	Jun. 2001	Jul. 2001	Aug. 2001	Sep. 2001	Oct. 2001	Nov. 2001	Dec. 2001	Jan. 2002	Feb. 2002	Mar. 2002	Apr. 2002	May. 2002	Jun. 2002	Jul. 2002	Aug. 2002	Total by concern
	DETAILED VERBATIM									2.42	0.00	0.74	3.93	2.39	1.26	6.42	2.50	0.89	1.88	3.87	4.55	
WHEN LEVER IS PLACED IN D & ACCEL, IT MOVES AND MAKES A CLICKING SOUND; NOT SEATED PROPERLY AND MOVES; SEEMS ADJUSTING TO PROPER POSITION	WHEN PUT IN D & ACCEL, LEVER MAKES A CLICKING NOISE AND MOVES LITTLE			1				1	1	2		2		1		2			1			11
	SHIFT LEVER POPS OUT OF DRIVE WHILE DRIVING; TRANS NOES NOT JUMP GEAR								1	1						1	1					4
	WILL NOT SEAT PROPERLY IN D PROPERLY, MOVES A LITTLE, NO NOISES												1	2		1						4
	FEEL/HEAR GEAR SHIFT CLICK AS IF NOT FULLY IN CORRECT SHIFTING POSITION & ADJUSTING TO PROPER POSITION				1	1	1		1							1	1		2	1		9
	JUMPS AFTER SHIFTING INTO P/R/D; NOT SEATING PROPERLY															1						1
DOES NOT SEAT ITSELF IN D; STAYS BETWEEN D & 3	DOES NOT SEAT ITSELF IN D, STAYS BETWEEN D & 3												1									1
DOES NOT LOCK; HAVE TO MOVE/JIGGLE LEVER AROUND	DOES NOT LOCK INTO D; HAS TO MAKE SURE; VEHICLE MOVES EVEN IF NOT LOCKED							1														1
	DIFFICULT TO PUT INTO DRIVE POSITION; HAS TO MOVE LEVER AROUND; DOES NOT MAKE CLICK			1																		1
	IS NOT LOCKING IN TO D ; HAS TO SHIFT LEVER SEVERAL TIMES BEFORE IT WILL LOCK INTO PLACE															1						1
	LEVER SEATS BETWEEN N & D; HAVE TO JIGGLE TO MAKE IT GO INTO DRIVE POSITION							1														1
	WHEN PUTTING GEARSHIFT IN TO D, DOES NOT CLICK INTO PLACE UNTIL EFFORT IS APPLIED																1					1
SHIFTER APPEARS TO BE BETWEEN N&D; SLIPDS OUT OF D	LEVER DOES NOT SEAT ITSELF CORRECTLY IN D, APPEARS TO BE BETWEEN NUETRAL AND DRIVE; NO NOISES														1							1
	DOES NOT LOCK INTO POSITION; SLIPPED FROM DRIVE TO NEUTRAL													1								1
	SHIFT LEVER WOULD SLIP OUT OF GEAR				1																	1
	SHIFT LEVER JUMPED OUT OF DRIVE INTO NEUTRAL												1									1
	GETS STUCK BETWEEN NUETRAL AND DRIVE; LEVER SHIFTS INTO POSITION AFTER DRIVI NG A SHORT DISTANCE																	1				1

(11)

(1)

2002 MY U152
Difficult to operate Shift Lever
ICCD PARETO
build date 11/29/00-8/30/02
call date 03/30/01-10/04/02

Verbatim		Jan.2001	Feb. 2001	Mar. 2001	Apr. 2001	May. 2001	Jun. 2001	Jul. 2001	Aug. 2001	Sep. 2001	Oct. 2001	Nov. 2001	Dec. 2001	Jan. 2002	Feb. 2002	Mar. 2002	Apr. 2002	May. 2002	Jun. 2002	Jul. 2002	Aug. 2002	Total by concern
	DETAILED VERBATIM									2.42	0.00	0.74	3.93	2.39	1.26	6.42	2.50	0.89	1.88	3.87	4.55	
WOULD NOT COME OUT OF PARK/DIFFICULT TO ENGAGE REVERSE	DIFFICULT TO OPERATE; REQUIRES GREAT AMOUNT OF FORCE															1						1
	WOULD NOT COME OUT OF PARK/TOWED			3																		3
	WOULD NOT COME OUT OF PARK/REQUIRES EXTRA EFFORT			1									2									3
	FEELS A CATCH MOVING LEVER FROM PARK TO DRIVE																				1	1
	DIFFICULTY SHIFTING VEHICLE INTO PARK																				1	1
	STICKING WHEN PLACING THE LEVER FROM DRIVE TO PARK																			1		1
	DIFFICULTY SELECTING REVERSE GEAR; HAS TO BE PLAYED		1																	1		2
SHIFTER MAKING NOISES/DIFFICULT TO OPERATE	STICKING AND MAKING A CRANKING NOISE WHEN CHANGING GEARS																				1	1
	SHIFTER MAKING A MODERATE ARKING TYPE NOISE																		1			1
	DIFFICULT TO OPERATE												1									1
	CONERN WHEN BRINGING IT FROM N-D						1															1
Total by MOP		0	1	6	2	1	2	3	3	3	0	2	6	4	1	8	3	1	4	3	3	

12

WARRANTY CLAIMS.

CONCERN DISTRIBUTION - CCC CODE P51
MIS LESS THAN OR EQUAL TO 3

	PROD_DT	DEFECT	TOTAL	P51 %
DIFFICULT TO OPERAT SHIFT LEVER	MAY. 2002	DIFFICULT TO SHIFT OUT OF PARK	1	5%
		UNEXPECTED MOVEMENT WHILE IN DRIVE	1	5%
		WILL NOT START IN PARK	2	11%
	MAY. 2002 P51 Total		4	21%
	MAY. 2002 Total		19	
	APRL. 2002	DIFFICULT TO GET INTO PARK	1	4%
		DIFFICULT TO SHIFT OUT OF PARK	2	8%
		HARD TO SHIFT LEVER	1	4%
		INDICATOR DOES NOT LINEUP WITH GEAR SELECTED	1	4%
		LEVER/CABLE BROKEN	1	4%
		WILL NOT START IN PARK	1	4%
	APRL. 2002 P51 Total		7	28%
	APRL. 2002 Total		25	
	MAR. 2002	DIFFICULT TO GET INTO PARK	1	7%
		DIFFICULT TO OPERATE SHIFT LEVER	1	7%
		UNEXPECTED MOVEMENT WHILE IN DRIVE	1	7%
		WONT GO INTO REVERSE	1	7%
	MAR. 2002 P51 Total		4	29%
	MAR. 2002 Total		14	
	FEB. 2002	DISENGAGES	1	3%
		DOES NOT OPERATE PROPERLY	1	3%
		INDICATOR DOES NOT LINEUP WITH GEAR SELECTED	1	3%
		INOP	1	3%
		OTHER	1	3%
		SLIPS OUT OF PARK	1	3%
		SPACE BETWEEN P-R	1	3%
		UNABLE TO OPERATE	1	3%
		UNEXPECTED MOVEMENT WHILE IN DRIVE	3	9%
		WILL NOT START IN PARK	2	6%
		WONT GO INTO DRIVE	1	3%
		WONT GO INTO GEAR	1	3%
	FEB. 2002 P51 Total		15	47%
	FEB. 2002 Total		32	
	JAN. 2002	CUST COMMENT NONE	1	4%
		DIFFICULT TO SHIFT OUT OF PARK	1	4%
		INDICATOR HAS FLAT IN IT	1	4%
		STICKS	2	8%
		UNEXPECTED MOVEMENT WHILE IN DRIVE	2	8%
	JAN. 2002 P51 Total		7	28%
	JAN. 2002 GRAND Total		25	
	DEC. 2001	CUST COMMENT NONE	1	6%
		DIFFICULT TO GET INTO PARK	2	11%

		DOES NOT OPERATE PROPERLY	1	6%
		NO DETENT BETWEEN N & D	1	6%
		UNEXPECTED MOVEMENT	1	6%
		UNEXPECTED MOVEMENT WHILE IN DRIVE	3	17%
		WHEN IN BETWEEN D & 3	1	6%
		(blank)	1	6%
	DEC. 2001 P51 Total		11	61%
	DEC. 2001 Total		18	
	NOV. 2001	DIFFICULT TO GET INTO PARK	1	10%
		UNEXPECTED MOVEMENT WHILE IN DRIVE	1	10%
		WONT GO INTO PARK	1	10%
	NOV. 2001 P51 Total		3	30%
	NOV. 2001 GRAND Total		10	
	OCT. 2001	DIFFICULT TO GET INTO PARK	1	4%
		HAVE TO PULL BACK TO PUT IN D	1	4%
		WILL NOT START IN PARK	1	4%
		WONT GO INTO GEAR	1	4%
		WONT GO INTO REVERSE	1	4%
	OCT. 2001 P51 Total		5	22%
	OCT. 2001 GRAND TOTAL Total		23	
	SEP. 2001	DIFFICULT TO GET INTO REVERSE	1	4%
		FEELS LIKE OUT OF GEAR	1	4%
		INDICATOR DOES NOT LINEUP WITH GEAR SELECTED	1	4%
		VEHICLE JUMPS OUT OF GEAR	1	4%
		WILL NOT SHIFT OUT OF PARK	1	4%
		WONT GO INTO DRIVE ALL THE WAY	1	4%
		WONT GO INTO PARK	1	4%
	SEP. 2001 P51 Total		7	25%
	SEP. 2001 GRAND Total		28	
	AUG. 2001	DIFFICULT TO GET INTO PARK	1	3%
		DIFFICULT TO GET OUT OF PARK	1	3%
		LEVER/CABLE BROKEN	3	9%
		UNEXPECTED MOVEMENT WHILE IN DRIVE	1	3%
		WONT GO INTO DRIVE	1	3%
		WONT GO INTO REVERSE	1	3%
	AUG. 2001 P51 TOTAL		8	24%
	AUG. 2001 GRAND Total		34	
P51 Total			71	
Grand Total			228	31%

14

2002 U152 2PP Management Review
Louisville Assembly Plant
July 20, 2000

NOTG

AGENDA

CONFERENCE ROOM B		
<LR> Gateway Review	S. von Foerster	8:00am-10:00am
<FESO> Major Issues		
RPJ Must Fixes		
MATCH FIXTURE		
Match Fixture / Code X Review	R. Pastrick / R. Drake / P. Lalama	10:00am-11:30am
CONFERENCE ROOM B		
Vehicle Evaluation		11:30am-Noon
Water Test	C. Krueger	
Squeak & Rattle	D. Morris	
Windnoise / Air Leakage	D. Roll	
R202 Drive Team Report	S. Lightner	
EXECUTIVE DINING ROOM		Noon-12:30pm
Weekly Progress Report Metrics	H. Casinelli	
AIM Build Issues / Pink Report Status	T. Hilborn	
Open to Go Status	J. Roth	
Recommendations	H. Casinelli / S. von Foerster	
LAP BODY SHOP		
Body Shop Walkaround		12:30pm-1:45pm
EXECUTIVE GARAGE		
NOVA-C Review	Team	12:30pm-2:30pm
Outlook	H. Casinelli	

(*) invite to next Str column w/ Anne Abt Payapilly

7/20 COLUMN

(mtg w Ted Hroszy wat powdr metal)

(1) HARDNESS OF SHIFT LEVER

60-63 ABILITY TO CONTROL IN PRODUCTION

(finish change needed?)

(2) COL @ 150 lbs → show Bob Himes
get ML320 also (slips 120)

(3) powder metal part timing →
supplier name to GSB

(4) how choose <CC> - outside help??
FOCUS <CC> - key 10 (90% story)

SUSPENSION

(5) deterioration due to 4700 bushing
→ Do we need to ~~[illegible]~~ - update
FGV driving fleet

(6) TIMING OF Monroe VISTEON w/ change for timing & durability

next week w/ Visteon → 2/week
Tokico } Eng's & Acct mgr AT&T Bridge
Monroe }
Tonnies Purchasing

PE09-020 0932

Levine, Julie (J.A.)

From: Levine, Julie (J.A.)
Sent: Wednesday, August 02, 2000 11:08 AM
To: Porter, Alan (A.J.); Clary, Robert (R.C.); Mantey, John (J.E.); Allard, Chris (C.E.); Villar, Daniel (D.A.); Fuchs, Douglas (D.E.)
Cc: Brohl, Jerry (G.G.); Von Foerster, Steve (S.)
Subject: Assignments from 8/2 Steering Column meeting with Himes, Davis, Stevens

The following are the assignments from this morning's meeting on steering column:

1) A very detailed review of the shift lever control plan needs to occur with Tim Davis.
In this review the following are required:
a) details of poke-yokes of how the heat treat is being controlled
b) results of in-depth check of current stock and what the heat treat specs were
c) historical quality performance of Dura and their tier II - anything heat treat related
d) locate the review onsite whereever the heat treating occurs
ASSIGNED TO: Dan Villar - Ford Chassis
DUE DATE: Review is to occur before 8/23 (schedule asap to get on Tim's calendar)

2) Provide data on contact stress between the lever and the insert plate for both the U152 and the PR column to Bob Himes. Purpose is to show they are similar / equivalent.
ASSIGNED TO: Alan Porter - Visteon Steering
DUE DATE: After data is located, review with Jerry Brohl, then e-mail to Himes. To occur before 8/23.

3) Identify the role and responsibilities for post job1 - to be discussed in future by Steve von Foerster and Bob Himes

4) Utilize 20 FEU columns and measure their load to lock and then evaluate their exact load to slip. This data needs to be put into a scatter plot for the reliability review on 8/9 (see #5 below).
ASSIGNED TO: Alan Porter - Visteon Steering
DUE DATE: Data needs to be complete by 8/7 COB - put into a scatter plot for meeting with J. Brohl on 8/8

5) Reliability data on tilt mechanism fatigue test needs to be prepared for a 8/9 review with Tim Davis and Bob Himes
Note: this data needs to be ready for a pre-meeting on 8/8 with Jerry Brohl
a) Data to be discussed ONLY in cycles - no more translation to miles (ASSIGNED: D. Fuchs, DUE: 8/8)
b) B5 Weibull plot needs to be re-created with the cycles criterion for the U152 data (5/6 failed). (Fuchs, 8/8)
c) B5 Weibull plot (or whatever is appropriate for 5 suspends) for the Passat data (Fuchs, 8/8)
d) A number of what would be the B5 life (not a weibull plot - just a number) for the # of cycles / day be for the U152 B5 life to pass at that many/ day every day for ten years. (Fuchs, 8/8)
e) Scatter plot as listed above in #4 (Porter, 8/8)

6) For correlation of load to lock vs slip force, we need to evaluate clamp load to lever lock efforts. Using a strain gaged bolt on one column, measure the clamp load with respect to load of the locking lever. Put this data into a curve to represent the relationship. If more strain gage bolts are available, due on as many columns as possible.
ASSIGNED TO: Chris Allard for bolt, Alan Porter for column measurements
DUE DATE: 8/11 (timing constraint is due to availability of strain gaged bolt)

7) Schedule a review for 8/9 with Tim Davis and Bob Himes to review tilt mechanism fatigue reliability data and to agree upon requirements before the 8/11 G. Bedi SLAP meeting.
ASSIGNED TO: Jerry Brohl

8) Schedule a pre-meeting on 8/8 with Jerry Brohl to pre-review reliability data for the 8/9 meeting. (attendees: Jerry, Alan Porter, Jim Thompson, John Mantey, Doug Fuchs, Chris Allard)
ASSIGNED TO: Jerry Brohl

Any questions, please let me know.

Regards,

U152 STEERING COLUMN
8/2/00

PV

Open Issues:
1) Shift System Fatigue Test
2) Tilt Mechanism Fatigue Test (and load to slip)
3) BSI Binding (new issue as of 2PP SLAP)

Key Timing Facts: (shown in attached chart)
1) DV3 to complete 9/23
2) Production of saleable columns starts 9/5
3) PV starts 8/18 (PV for tilt mechanism starts 9/11) and completes 9/30
4) System Fill at LAP is 10/2-10/8 (U150 LAP balance out is 9/18-9/24)
5) PSW is 10/7

→ ≋ heat treat

Issues Status and Recommendations:

1) Issue: Shift System Fatigue Test - DV failure of wear between shift lever and insert plate

Status:
- Representative test parts: stamped insert plate with rolled edge will be used and heat treat call out will be latest level
- Heat treat specification: approved call out (equal heat treat is acceptable)
- Timing: DV3 starts 8/3, 45 day test with completion on 9/23

Program Recommendation / Assessment:
- Low Risk
- Proceed to job 1 with heat treat callout and designs as specified

2) Issue: Tilt Mechanism Fatigue Test - DV failure of wear and load to slip fall-off

Status:
- Design improvements will be made to the following:
  - Findings of DOE (details below) (available 8/24)
  - Surface area of plastic top hat section on impact bracket (available 9/4)
  - Investigating possibility of creep in the four plastic bushings
- DOE developed for quick changes that meet job 1 timing (detailed plan attached)
  - Factor 1 - load to lock (10 lbs vs 20 lbs)
  - Factor 2 - cam profile (tilt/tele vs tilt only)
  - Factor 3 - impact bracket surface finish (machined smooth vs rough)
- VW Passat design is superior to U152 column for load to slip and tilt mech. fatigue test.
  - VW Passat design includes roller bearings which allow for a much larger clamp load without degrading load to lock.
  - Visteon is pursuing packaging a roller bearing - timing is TBD, but at least 8 months.
- Powder metal incorporation is post-job 1 timing
  - This path is being run in parallel and the parts will not be available for test until 8/30
  - Powder metal does have a galvanic interaction issue with magnesium casting, coatings are under investigation
  - Initial DV assessment will be conducted from 9/3-9/10
  - Full DV will be required (45 days) after 9/10
  - Crash impact assessment will need to be made with sled series

Program Recommendation / Assessment:
- Risk – warranty / TGW from slip force – service is relatively easy
- Proceed to job 1 with recommendation of DOE as of 8/24 and creep findings and PV 9/11-9/18
- Incorporate Powder metal as soon as proven out post job 1
- Incorporate roller bearing design for U222 and U152 in 2003 MY

U152 STEERING COLUMN (continued)

3) Issue: BSI binding once column is assembled into I/P - new as of 2PP SLAP

Status:

- Root Cause - Recent BSI NVH action (for in park only) make the BSI more susceptible to binding when a side load is applied. Side load is applied by wiring harness guard.

- Containment Plan – FEU LAP
  - Utilize BSI without added NVH sleeve
  - Shim wire harness guard for more clearance to BSI

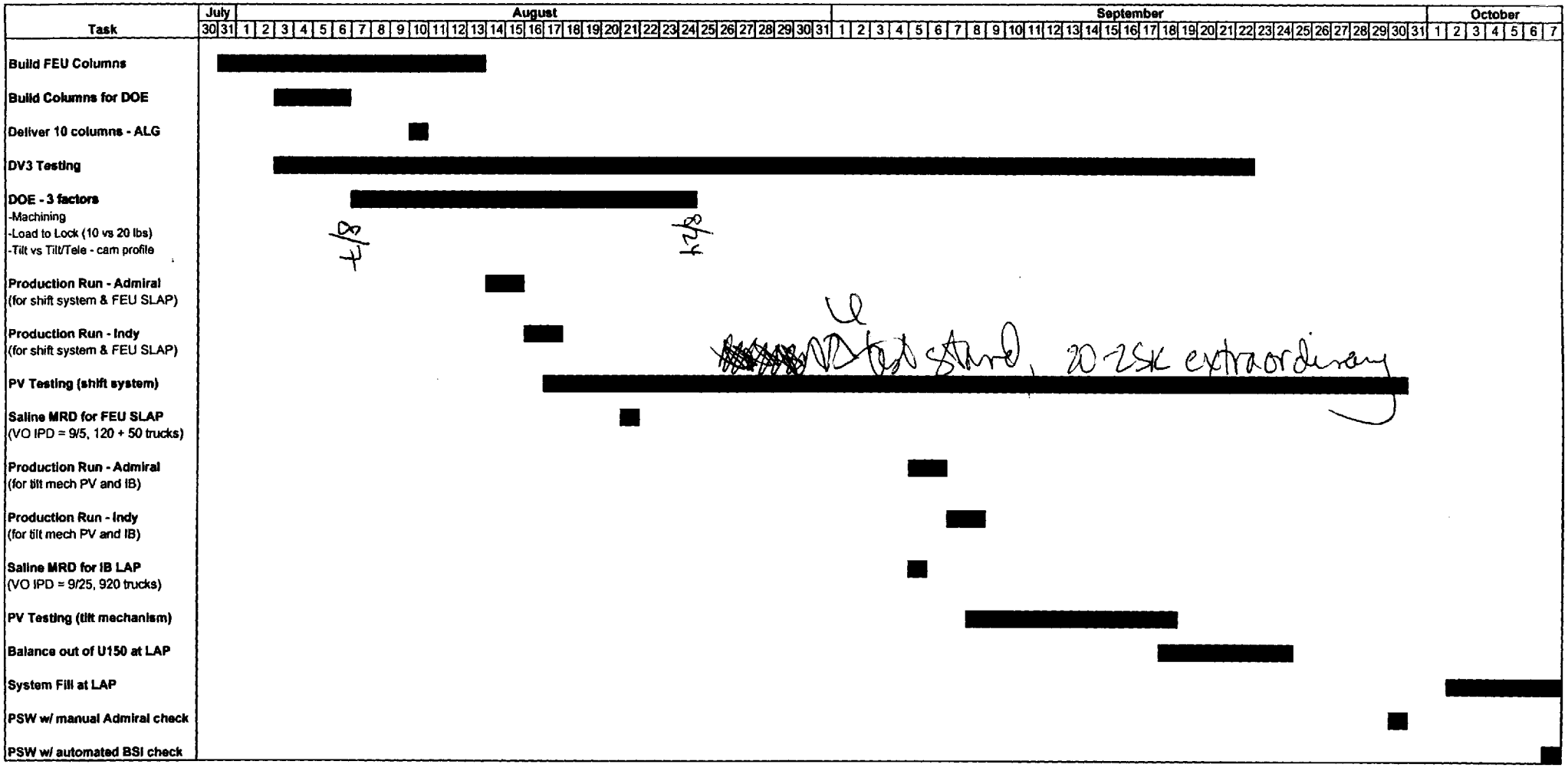
- Job 1 Resolution (FEU SLAP, IB and Job1)
  - Proceed with wire harness guard modifications for 3mm more clearance to BSI
  - Assess if NVH sleeve can be added back in by increasing BSI pole hole diameter

- Long Term Resolution (timing TBD - multiple months)
  - Change shroud outer surface to clear wiring harness
  - Change knee bolster on IP to clear new shroud outer surface
  - Validate that there is no crash impact from knee bolster change

Program Recommendation / Assessment:

- Proceed to FEU LAP with containment plan

Steering Column - Key Dates



10/9
T&C

Steering Tilt Mechanism: DOE

	Machined surface	Effort to lock	Cam profile	Test fixture 1	Test fixture 2	Test fixture 3	Test fixture 4	Test fixture 5	Test fixture 6	Test fixture 7	Test fixture 8	Test fixture 9	Test fixture 10	Test fixture 11	Test fixture 12
Run 1	rough	10 lbs	tilt only	8/7-8/10				8/11-8/14				8/7-8/10			
Run 2	smooth	10 lbs	tilt only		8/7-8/10				8/11-8/14				8/7-8/10		
Run 3	rough	20 lbs	tilt only			8/7-8/10				8/11-8/14				8/7-8/10	
Run 4	smooth	20 lbs	tilt only				8/7-8/10				8/11-8/14				8/7-8/10
Run 5	rough	10 lbs	tilt/tele				8/11-8/14	8/7-8/10				8/11-8/14			
Run 6	smooth	10 lbs	tilt/tele			8/11-8/14			8/7-8/10				8/11-8/14		
Run 7	rough	20 lbs	tilt/tele		8/11-8/14					8/7-8/10				8/11-8/14	
Run 8	smooth	20 lbs	tilt/tele	8/11-8/14							8/7-8/10				8/11-8/14

	8/7-8/10	8/11-8/14	Confirmation Run [redacted]
TF1	1A	8B	Optimal Combination
TF2	2A	7B	Optimal Combination
TF3	3A	6B	Optimal Combination
TF4	4A	5B	Optimal Combination
TF5	5A	1C	Optimal Combination
TF6	6A	2C	Optimal Combination
TF7	7A	3C	
TF8	8A	4C	
TF9	1B	5C	
TF10	2B	6C	
TF11	3B	7C	
TF12	4B	8C	

Details:
- 3 Factor DOE with 8 run combinations
- Running three sets of runs from 8/7-8/14 = A, B, C
- From 8/7-8/14 for speed, the tests will be run at ambient
- For the confirmation run, the tests will have ambient, -40C, and 65C

PE09-020 0938

PE09-020 0939

PE09-020 0940

PE09-020 0941

PE09-020 0942

PE09-020 0943

PE09-020 0944

PE09-020 0945

PE09-020 0946

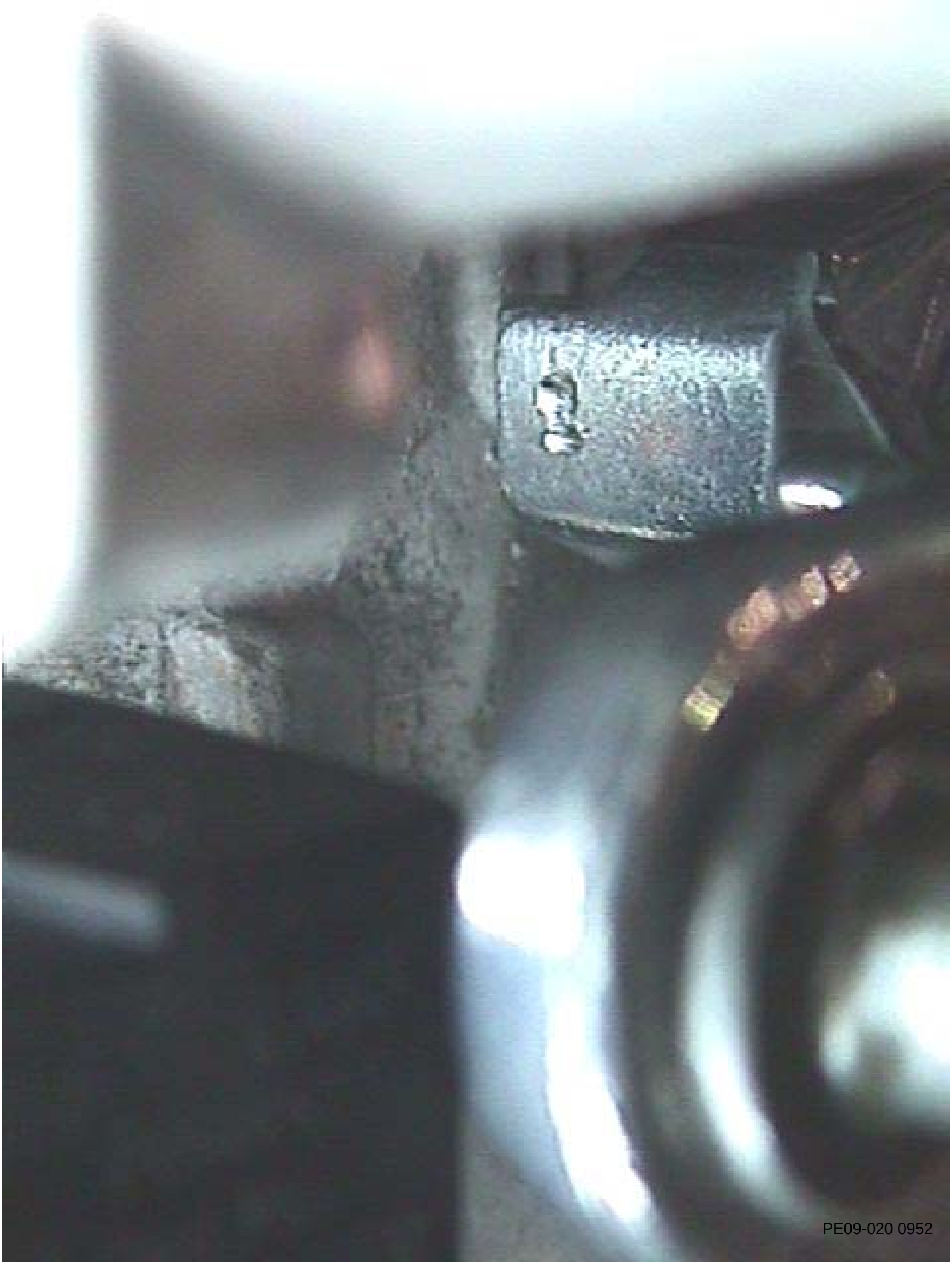
PE09-020 0947

PE09-020 0948

PE09-020 0949

PE09-020 0950

PE09-020 0951



PE09-020 0952

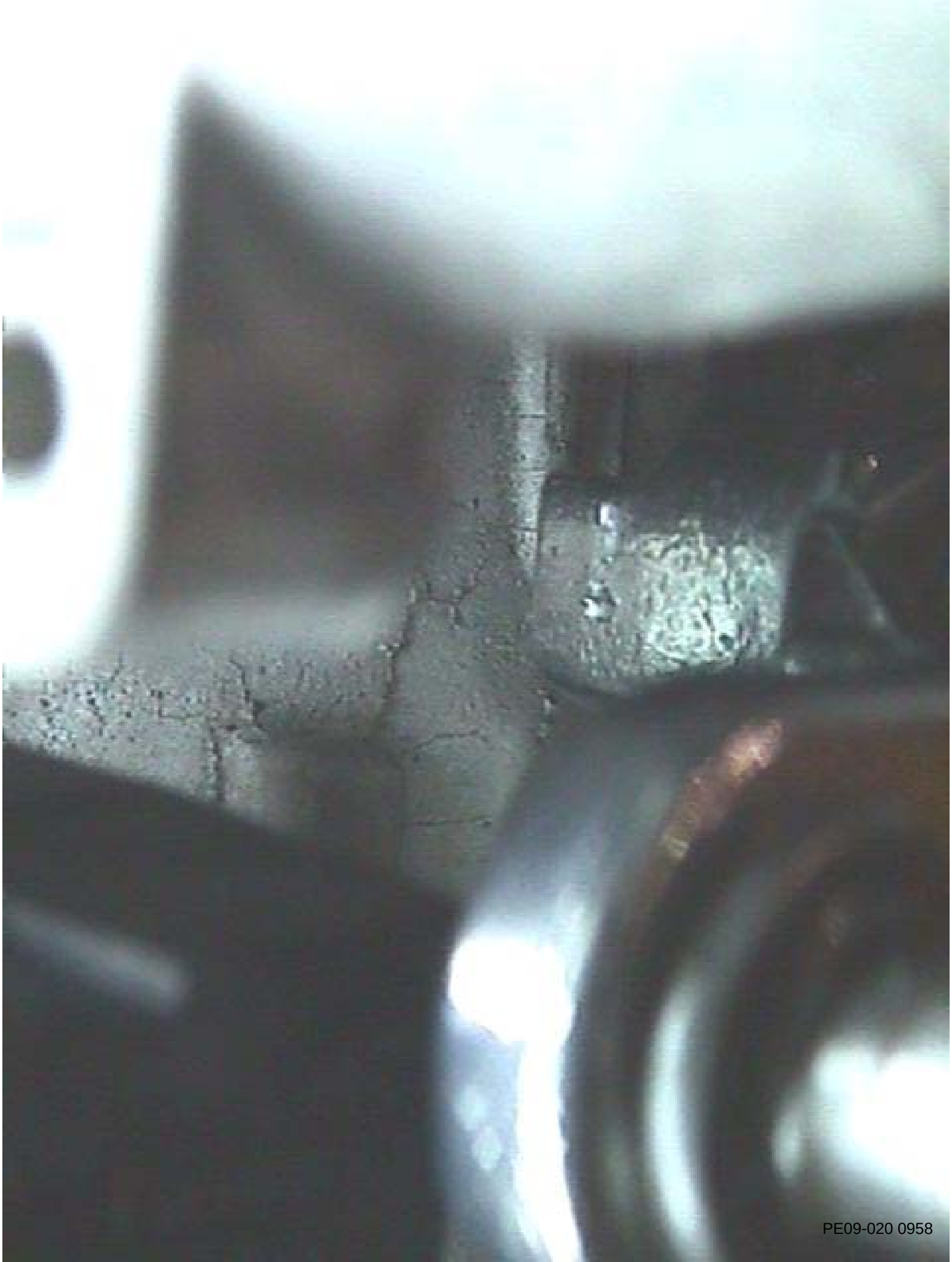
PE09-020 0953

PE09-020 0954

PE09-020 0955

PE09-020 0956

PE09-020 0957



PE09-020 0958

Brake Shift Interlock NVH - Yellow

Root Cause:

Primary: Package of Brake Shift Interlock in proximity to driver is much closer than previous columns, driven by tight package of internally collapsing column.

Secondary: Brake Shift Interlock solenoid pin rattles in guide upon depression and release of brake pedal.

Actions Taken:

(1) Isolation in BSI solenoid of the pin and guide

(2) Slow down of actuation speed of solenoid for dampening of noise

(3) Turn off BSI when in drive – done with secondary switch

Verification:

(1) Durability bench test of BSI at Pontiac Coil (1M cycles – to be completed 7/10)

(2) Jury evaluation of prototype BSI noise (when in park)

(3) Column DV testing for durability with additional switch (to be completed 7/30)

Implementation:

Under investigation. Goal is FEU contained with saleable components.

JPP at SLAP, FEU @ LAP (per Visteon)

From: Thornton, James (J.W.)
Sent: Tuesday, June 15, 2004 12:26 PM
To: Thornton, James (J.W.); Wright, Brad (.)
Cc: 'Azeem, Mohammad (M.)'; Case, Robert (R.G.); 'Johnston, Alan (A.C.)'
Subject: C11649395 - for U152 BSI ....now at Release status

My bad....I sent you the wrong Concern/Notice number....

The correct number is C11649395 and Notice NL00-E-11649395-000

Sorry for any confusion.

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

-----Original Message-----
From: Thornton, James (J.W.)
Sent: Tuesday, June 15, 2004 8:19 AM
To: Wright, Brad (.)
Cc: 'Azeem, Mohammad (M.)'; Case, Robert (R.G.); 'Johnston, Alan (A.C.)'
Subject: C11649969 - for U152 BSI ....now at Release status

Brad,
It looks like Notice NL00-E11649969-000 for the U152 BSI is now at Release status. Please ensure Visteon receives any formal kickoff.
Thanks.

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

Attn. Julie Levine

Cable Lash = 2.19 locked out

2.0mm of material was added to the neutral wall on the insert plate. It was assumed that the wall stayed parallel to the existing wall.

Transmission Angle – Drive to Neutral Insert Controlled			
	Min Neutral	Nominal	Max Neutral
Design	4.93°	9.51°	14.61°
	-3 Sigma	Mean	+3 Sigma
Case 1	5.37°	6.29°	7.08°
Case 2	3.17°	4.08°	4.87°
Case 3	2.70°	4.08°	5.34°

Design
Case Backlash
Mushroom & Lash

1.5mm of material was added to the neutral wall on the insert plate. It was assumed that the wall stayed parallel to the existing wall.

Transmission Angle – Drive to Neutral Insert Controlled			
	Min Neutral	Nominal	Max Neutral
Design	4.93°	9.51°	14.61°
	-3 Sigma	Mean	+3 Sigma
Case 1	6.45°	7.37°	8.16°
Case 2	4.24°	5.16°	5.94°
Case 3	~~3.77°~~ 4.10	5.16°	6.41°

4.11 - 4.79

1.0mm of material was added to the neutral wall on the insert plate. It was assumed that the wall stayed parallel to the existing wall.

Transmission Angle – Drive to Neutral Insert Controlled			
	Min Neutral	Nominal	Max Neutral
Design	4.93°	9.51°	14.61°
	-3 Sigma	Mean	+3 Sigma
Case 1	7.52°	8.45°	9.23°
Case 2	5.31°	6.23°	7.01°
Case 3	4.84°	6.23°	7.48°

worse case Nom Tip
5.41°

+.2 CHANGE IN INSERT PLATE TOLERANCE
⇒ 0.4

4.84
+.4
$\boxed{5.24}$

.5

Cable in Compression

2.0mm of material was added to the neutral wall on the insert plate. It was assumed that the wall stayed parallel to the existing wall.

Transmission Angle – Drive to Neutral Insert Controlled			
	Min Neutral	Nominal	Max Neutral
Design	4.93°	9.51°	14.61°
	-3 Sigma	Mean	+3 Sigma
Case 1	5.37°	6.29°	7.08°
Case 2	7.59°	8.50°	9.30°
Case 3	7.12°	8.50°	9.77°

1.5mm of material was added to the neutral wall on the insert plate. It was assumed that the wall stayed parallel to the existing wall. 1 reg adjust

Transmission Angle – Drive to Neutral Insert Controlled			
	Min Neutral	Nominal	Max Neutral
Design	4.93°	9.51°	14.61°
	-3 Sigma	Mean	+3 Sigma
Case 1	6.45°	7.37°	8.16°
Case 2	8.67°	9.59°	10.38
Case 3	8.19°	9.59°	10.85

1.0mm of material was added to the neutral wall on the insert plate. It was assumed that the wall stayed parallel to the existing wall.

Transmission Angle – Drive to Neutral Insert Controlled			
	Min Neutral	Nominal	Max Neutral
Design	4.93°	9.51°	14.61°
	-3 Sigma	Mean	+3 Sigma
Case 1	7.52°	8.45°	9.23°
Case 2	9.75°	10.68°	11.46°
Case 3	9.27°	10.68°	11.94°

Levine, Julie (J.A.)

From: Levine, Julie (J.A.)
Sent: Thursday, November 02, 2000 2:00 PM
To: Dudgeon, Brent (B.); Markatos, Chris (C.)
Cc: Porter, Alan (A.J.); Clary, Robert (R.C.); Brohl, Jerry (G.G.); Levine, Julie (J.A.)
Subject: Capability needed for Himes Tilt mech discussion

Brent / Chris - can you get capability on the following attributes and make these EEs (w/ 5000 check) - note some already are EEs?

1) Bolt - Perpendicularity of the head to the shank
2) Spring Retainer - parallelism
3) Plastic washers - all 4 of them - flatness and parallelism & thickness
4) Meridian bracket - surface finish, thickness of dog ears, parallelism, perpendicular to pivot, and distance between ears
5) Lever Assy - parallelism and thickness
6) Cam - Parallelism, hardness, density (and prove compressive strength correlates to density) and profile
7) Retainer - Parallelism, hardness, density and profile
8) Mag housing - thickness, parallelism
9) Plastic Banana Bushing - thickness
10) Outer metal washer - flatness
11) Inner spring (tilt bolt spring) - load at working height
12) Outer spring (tilt bias spring) - load at tilt up and tilt down
13) Indy on assy capability of load to lock - between 12 and 16 lbs

We need these all back from the suppliers by Tues 11/7 COB so that we can review morning of 11/8. Thanks for your help.

10:30-1:30

bearing area?
- mag housing (slot & webs)
- meridian bracket (width oval)

Admiral - 3B642 plastic
prove we tested to that // variation

- tested at? .3?
- chg print to?

PE09-020 0964

PE09-020 0965

PE09-020 0966

PE09-020 0967

PE09-020 0968

PE09-020 0969

PE09-020 0970

PE09-020 0971

PE09-020 0972

PE09-020 0973

PE09-020 0974

PE09-020 0975

8.51 - 8.61

CLEVIS

8.58 → ~~9.06~~ 8.8

8.47 ± .03

8.44 - 8.50

INTERMET THREADS IN ZINC PART
STRENGTHEN?

.3

PIN - LOCKTITE
- TORX ~~HEAD~~ W/ ~~RADIUS~~ PAN HEAD
- THREADED PIN (M4)

} HARDNESS SAME AS CURRENT PIN

10 WKS - TOOLING TIME (POSSIBLY LESS)

DURA - BUSHING - TIMING FROM EXACT PRODUCTS & 8AM FRI
- CHANNELED

0 — 5.16 5.12
5.11 5.07

PIN
5.06 - 4.99
~~4.06 - 3.99~~

Measure
- pin rock
- welded shaft lever

S02-375-S120

BSHG
.5

Exact Products
- Mike Myers
S17-592-6626
[FAX: S17-592-4868
- Sheri Kemeter
(Four Slide Tool)

SOCKET

NORTON BSNG TIMING ON 600 PIECES/DAY FOR 2 WKS UNTIL PROD REF OD } MON 12/4

CONTECH HOUSING REDUCE DIA OF:

18.52 - 18.57 NEW
18.6 - 18.7 OLD } MON 12/4

~~(*) NEED TIMING~~

TESTING -

45 - TEST 28 & measure lash post & pre
8 - BSI FATIGUE
20 - ACCEL TEST w/ loaded bishop pin lash pre & post
1 - ULTIMATE @ SHFT LEVER
~~[illegible]~~
ON-GOING - DEV 3σ - SAMPLING

COMPONENTS 12/4
ADMIRAL 12/5
INDY 12/6 → TESTING
SALINE 12/7

Column Assignments from 10/26 & 10/27 Reviews

(10/26 with Himes, Stevens and 10/27 with GSB, Himes, Stevens)

CAPABILITY OF TILT MECHANISM

1) Need to have a detailed review of all the parts in the tilt stack-up and list of their key attributes that are factors (D&R team)
   - Show what contributes to friction and to dimensional variation (new and with time)
   - Have engineering meeting first (to be scheduled for 11/2 at VCS)
   - Then review in detail for Himes/Stevens
2) Show the capability of the key attribute factors identified in item #1 (STA team)
   - For example, Indy needs to show capability on setting between 12 and 16 lbs (14 +/- 2) (STA/Indy)
3) Need compressive strength capability from Eastern Sintered & show the correlation to measuring density as on-going check (STA team with Eastern Sintered)

SHIFT SYSTEM QUESTIONS

1) Need information from FCSD about business case for not having components for column serviceable (like BSI) - J. Levine
2) For the grease application, it must be inverted delta and it must be poke-yoke into Salines' line (Visteon)
   And it must be controlled as to how much grease, where and that it gets put on every time
3) Tumbling on the insert plate - how will Admiral Chicago control the time? How verify mechanical properties are met? How do you make sure media doesn't wear out? (STA with Admiral Chicago)
4) For the VO pass through items that said 100% probe, how do you poke-yoke them? With Sensors? (STA)
5) Need to review heat treat control plan and details on the insert plate (like we have already done on the shift lever) (STA/Visteon/Villar)
6) Review at Huron Metallurgical to review heat treat of Insert plate and shift lever - demonstrate quality performance, control plan, reaction plan when things are out - meeting with Himes, Stevens on site at Huron

GENERAL QUESTIONS

1) Anne Stevens a copy of the PV matrix e-mailed to her - FINAL LEVEL WITH TIMING (A. Porter)
2) Visits to the following locations to demonstrate poke-yokes and capability: (start in mid-November)
   A) Admiral Livonia
   B) Indy
   C) Saline
3) Confirm the data in IDEAS, C3P is the final level column design (D&R team)
4) What is quality capability on Eastern Sintered? ~~Are they Q101? If not, when will they be? (STA)~~

Visteon using QS9000 & Eastern Sintered is

BOLT
- NUT
- SPRING RGT
- PLASTIC WSHR
- DOG GAR
- PLASTIC LVR BSHG
- THRUST BEARING
- LGVGR
- CAM
- RGTAINGR
- MAG CASTING
- PLASTIC BANANA BSHG
- TOP HAT PLASTIC BSHG

} 1 ASSY

(1)

COLUMN OPEN ASSIGNMENTS

** HIGHEST – PLASTIC CREEP ISSUE

- STRAIN GAGE BOLTS
- SET-UP BAKE TEST
- FUJI PAPER EVAL – CLAMP LOAD!
- ADD POST-OPERATIONS TO CLEAN-UP PLASTIC PARTS
- MEET W/ MOLDING SUPPLIERS
- FLAT WASHER → FEW LAP GOAL
- 9.8 OR 10.9 BOLT
- BELVILLE WASHER?

FEW LAP GOAL

FIND FE WHAT DATE PARTS AR

– GET CLAMP LOAD → RUSS CHERNOSKOFF FOR POWDER METAL – MEET AT DEFIANCE?

DUE 8/~~8~~7 COB – MAKE SURE VISTEON TESTS 20 FEW COLUMNS – MEASURE LOAD TO LOCK & THEN EXACT LOAD TO SLIP – CREATE SCATTER PLOT NEED FOR REL REVIEWS ON 8/8

DUE 8/7 COB – CALL ALAN & MAKE SURE RELIABILITY PLOTS ARE DONE EXACTLY PER 8/2 MINUTES MEETING W/ JERRY @ 7:30AM ON 8/8 – ASK FOR COPIES ON 8/7 COB & READ THROUGH

DUE 8/9 MON – HELP JERRY W/ 8/11 VP PRESENTATION – IF HE NEEDS IT I GAVE HIM THE POWERPOINT FILE FROM THE LAST VP MTG REMIND HIM VAL CONTOURS NEED MORNING OF 8/9, & WRITE IT AFTER HIM GIVEN ON 8/8

(2)

ONGOING
*

- MAKE SURE TIMELINE IS ON TRACK - TALK TO ALAN DAILY
  KEY: - DOE PARTS MADE 8/3-8/6
  - ALG COLUMNS → DST BY 8/11 (NATHAN GIGRGT)
  * - DOE START 8/7 → MAKE SURE THEY ARE DILIGENT IN DETAILS - WHICH TEST STAND & LABELED PARTS ARE CRITICAL
  * YOU SHOULD HAVE A MTG ON 8/7 TO REVIEW W/ DEFIANCE, ZIAD & ALAN
  - PROD RUNS - 8/15 & 8/17 INDY (ADMIRAL)
  - PV ON SHIFT SYSTEM

8/14 * MTG DOE RESULTS

* - FOR ~~CONFIRMATORY RUN~~ DOE → - ADD IN "QUICK" PLASTIC FINDINGS
- KEEP CLOSE ON WIRING HARNESS SHIM MUST BE IN ALL FEDS

- ASK FOR UPDATE ON DV3 SHIFT SYSTEM FATIGUE (RUNS 8/3 - 9/20) EIGHT FEW DAYS

- MAKE SURE HEAT TREAT SHIFT LEVER REVIEW GOES WELL W/ DAVIS ON 8/14 HAVE AS MANY PRE-MTGS AS REQUIRED

- BOTTOM LINE - PUSH, PUSH, PUSH
  BUT DO IN A FRIENDLY WAY ☺
  (ALSO, LET ALAN MANAGE HIS PEOPLE - JUST GO THROUGH HIM)

COLUMN
PV3 (POST TEST 28)

11/28/00
Admiral

MODE-1

CLEAR
1 11.664 M
CLEAR
1 11.655 M
2 0.000 M
CLEAR
1 0.023 M
CLEAR
1 0.023 M
2 3.900 M
3 4.925 M
4 5.060 M
5 5.172 M
6 5.273 M
7 5.696 M
8 6.053 M
9 6.387 M
10 7.118 M

CLEAR
CLEAR
1 0.017 M
2 3.859 M
3 4.838 M
4 4.961 M
5 5.074 M
6 5.175 M
7 5.605 M
8 6.008 M
9 6.371 M
10 7.194 M
CLEAR

COL PV1
(POST TEST #28)

CLEAR
1 0.007 M
2 3.441 M
3 4.426 M
4 4.622 M
5 4.789 M
6 4.951 M
7 5.469 M
8 5.874 M
9 6.190 M
10 6.951 M
CLEAR

1 0.002 M
2 4.021 M
3 4.463 M
4 4.661 M
5 4.804 M
6 4.926 M
7 5.458 M
8 5.867 M
9 6.227 M
10 6.878 M
CLEAR

10	7	5.605	M
15	8	6.008	M
20	9	6.371	M
30	10	7.194	M

CLEAR

COL PV1
(POST TEST #28)

CLEAR

No.	1	0.007	M
2	2	3.441	M
2	3	4.426	M
3	4	4.622	M
4	5	4.789	M
5	6	4.951	M
10	7	5.469	M
15	8	5.874	M
20	9	6.190	M
30	10	6.951	M

CLEAR

No.	1	0.002	M
2	2	4.021	M
2	3	4.463	M
3	4	4.661	M
4	5	4.804	M
5	6	4.926	M
10	7	5.458	M
15	8	5.867	M
20	9	6.227	M
30	10	6.878	M

CLEAR

COL PV2
(POST TEST #28)

No.	1	0.006	M
1	2	4.419	M
2	3	4.723	M
3	4	4.820	M
4	5	4.930	M
5	6	5.044	M
10	7	5.483	M
15	8	5.864	M
20	9	6.242	M
30	10	7.028	M

CLEAR

CLEAR

No.	1	0.002	M
1	2	4.543	M
2	3	4.813	M
3	4	4.948	M
4	5	5.074	M
5	6	5.172	M
10	7	5.671	M
15	8	6.079	M
20	9	6.432	M
30	10	7.123	M

CLEAR

.05mm INTERFERENCE
(.002IN)

1	0.008	M
2	0.936	M
3	1.335	M
4	1.525	M
5	1.688	M
6	1.821	M
7	2.361	M
8	2.770	M
9	3.131	M
10	3.787	M

CLEAR

.002IN + TIGHT GAP
CLEVIS

1	0.005	M
2	0.177	M
3	0.363	M
4	0.465	M
5	0.570	M
6	0.657	M
7	1.014	M
8	1.318	M
9	1.606	M
10	2.192	M

CLEAR

PV3 w/ TIGHTENED
CLEVIS

CLEAR

1	0.001	M
2	1.512	M
3	1.617	M
4	1.702	M
5	1.788	M
6	1.854	M
7	2.240	M
8	2.613	M
9	3.024	M
10	3.897	M

CLEAR

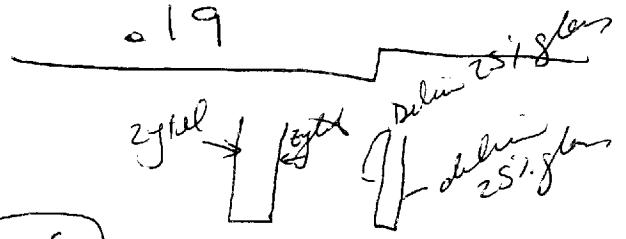
9/18

Max 20 lbs

CREEP

		COF
BEST	DELRIN w/ 25% GLASS	.35
	ZYTEL w/ KEVLAR	.46
	↓	
	DELRIN	
	↓	
WORST	DELRIN w/ TEFLON	.19

6x



PLAN A.

- New profile & new mat'l
- Wonder lube → priority w/ Dow
- consistent clamp load → Levitt
- plastics
- burnish study

PASS CRITERIA

- cycles
  - CONSISTENT
  - ~~18-20K~~ (25-30K)
  - WHITTLESEA TAXI
- Lever jiggle test
- Noise

		C	L/U	C	L/U
PM	S7	0	61/49	9K	77/46
	S8	124	91/70		55/39
	S9	173	96/60		73/42
Ceramic	60	252	75/55		100/49
	61	111	100/72		NR
	62	332	78/51		91/56

A		B		
1 -	all PM	7 -	all PM	13
2 -	2Z, 2DWG	8 -	~~[illegible]~~	14
3 -	grease	9 -	grease	15
4 -	Nylock / Current metal	10 -	Nylock / Current metal	16
5 -	Rubber springs	11 -	~~[illegible]~~ springs	17
6 -	present springs	12 -	Rubber ~~[illegible]~~ light springs	18

all delrin/glass

creep - A & B

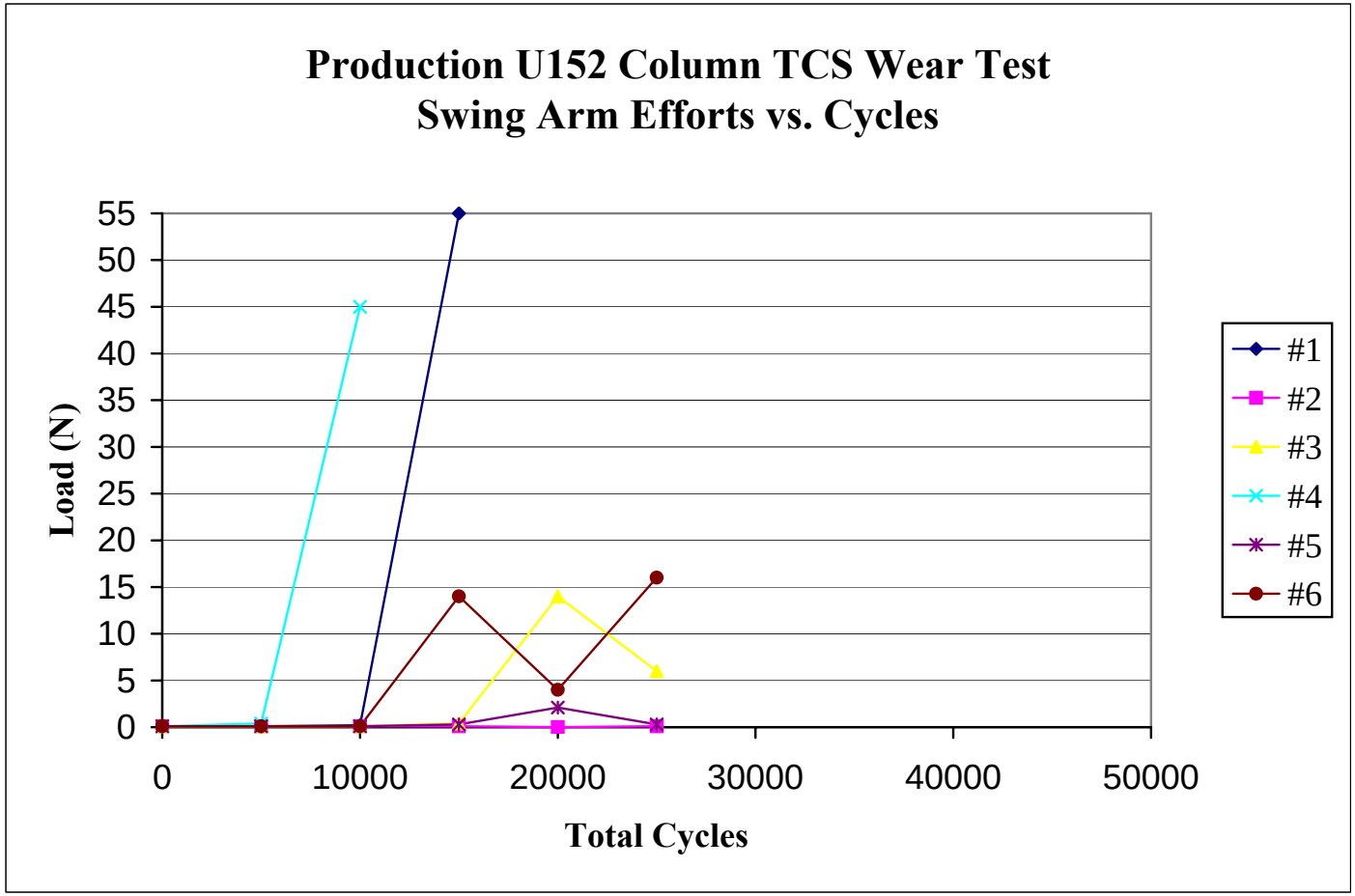
~~[illegible]~~ 66

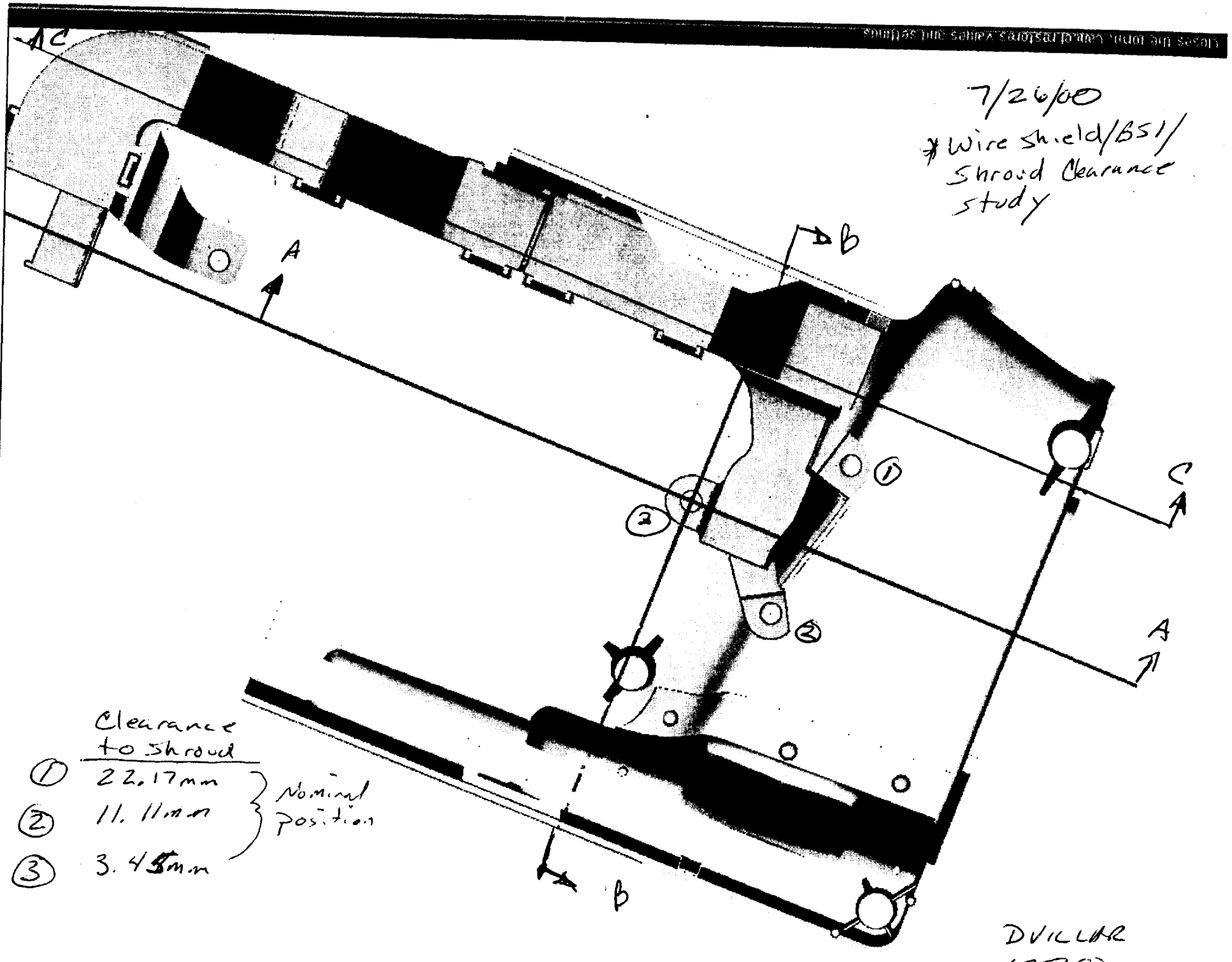
ely

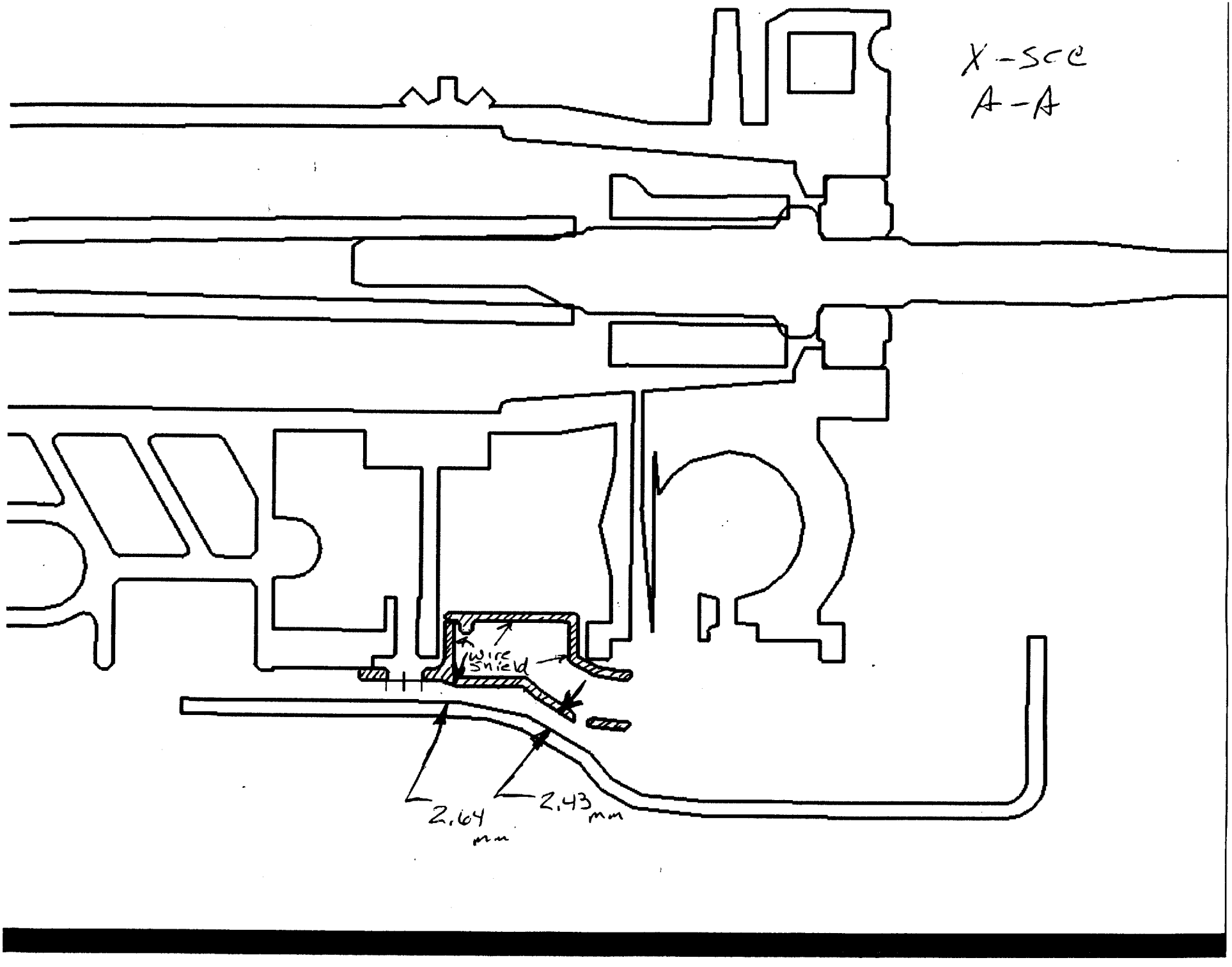
PE09-020 0984

Test Tech: J.R. & L.L. Test Engineer: L.Benfant Contact : J. Thornton Phone No: 313-845-9249			Clients Company Name: **Ford Motor Company** Sample Description & Identification: P/N 3L24-3C529-BA U152 Current Production Level Steering Column Test Specification: Swing arm efforts meas. at cable connection						**Job No: 401643-01** Sheet No: ___ of ___ Date: _____		
Total Cycles	Sample #1 Swing arm efforts	Sample #2 Swing arm efforts	Sample #3 Swing arm efforts	Sample #4 Swing arm efforts	Sample #5 Swing arm efforts	Sample #6 Swing arm efforts					Notes
No.	(N)	(N)	(N)	(N)	(N)	(N)					
0	0.1	0.1	0.1	0.1	0.1	0.1					
5000	0.1	0.1	0.1	0.4	0.1	0.1					
10000	0.2	0.1	0.1	45	0.1	0.1					
15000	55	0.1	0.4		0.3	14					
20000		0	14		2.1	4					
25000		0.1	6		0.3	16					
30000											
35000											
40000											
45000											
50000											

0
5000
10000
15000
20000
25000
30000
35000
40000
45000
50000




7/26/00
* Wire shield/BSI/ Shroud Clearance study
A
B
C
1
2
2
Clearance to Shroud
1 22.17mm
2 11.11mm
3 3.45mm
Nominal Position
DVILLAR
X75680



PE09-020 0989

X-sec
B-B

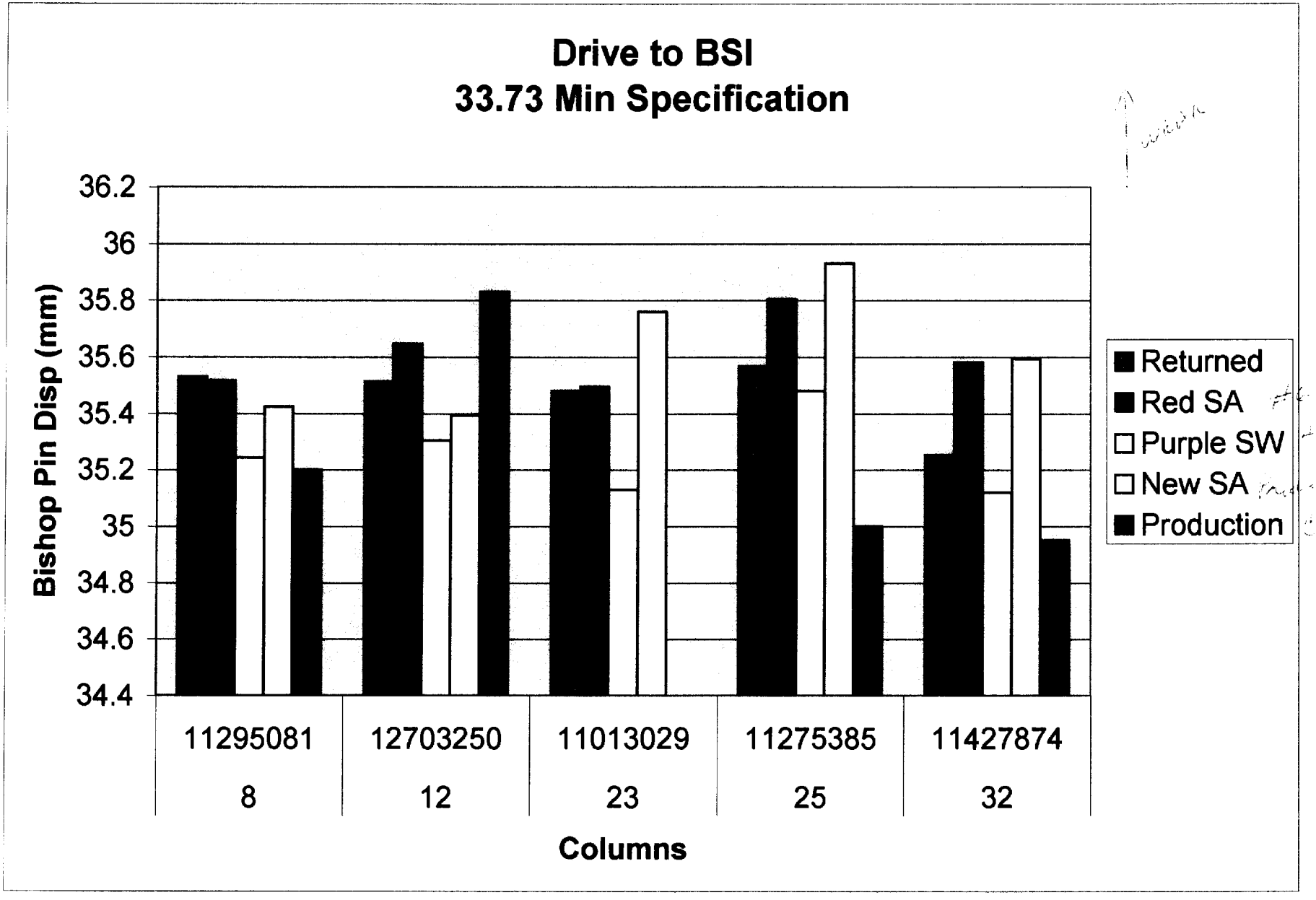
D - D

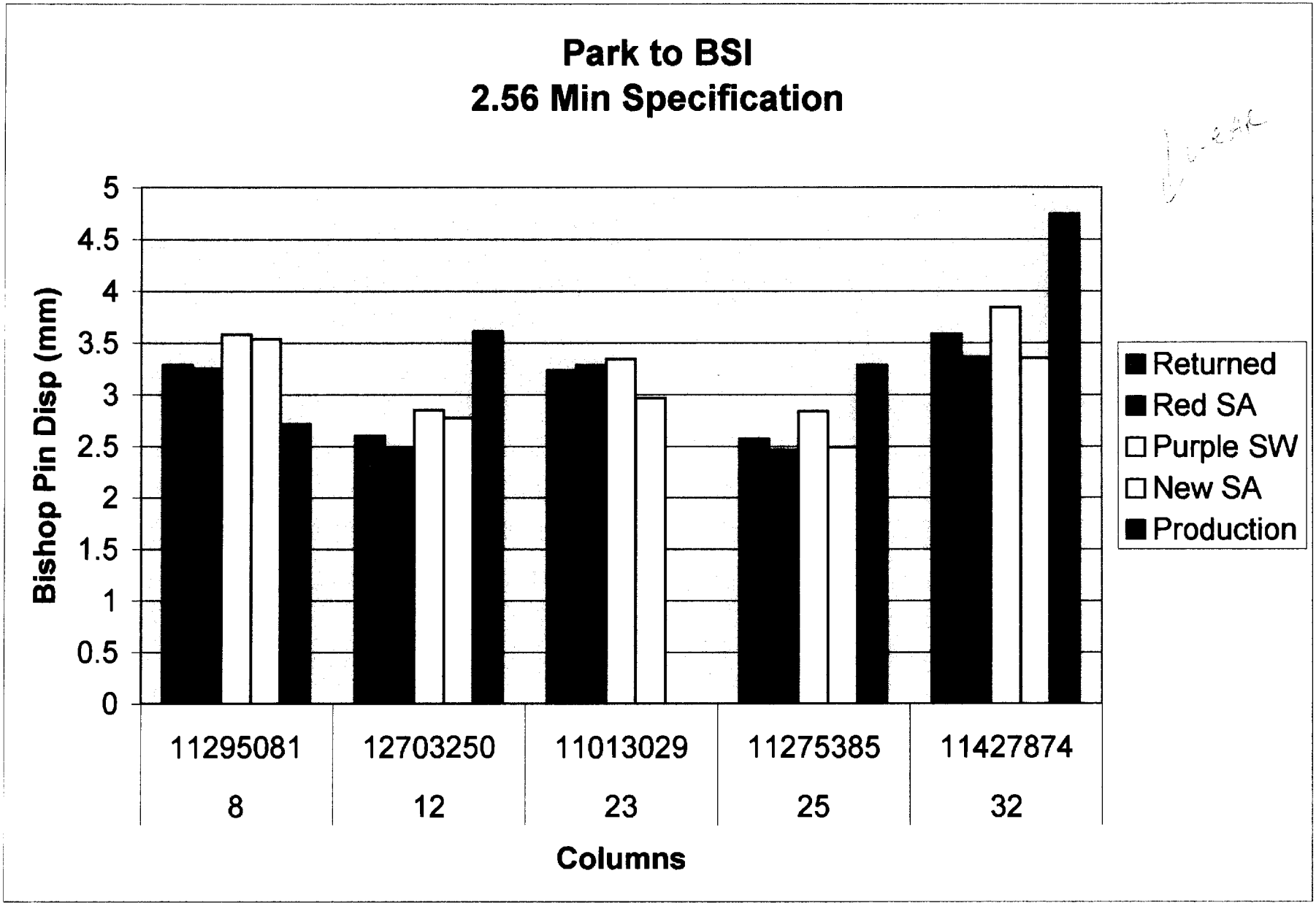
X-sec

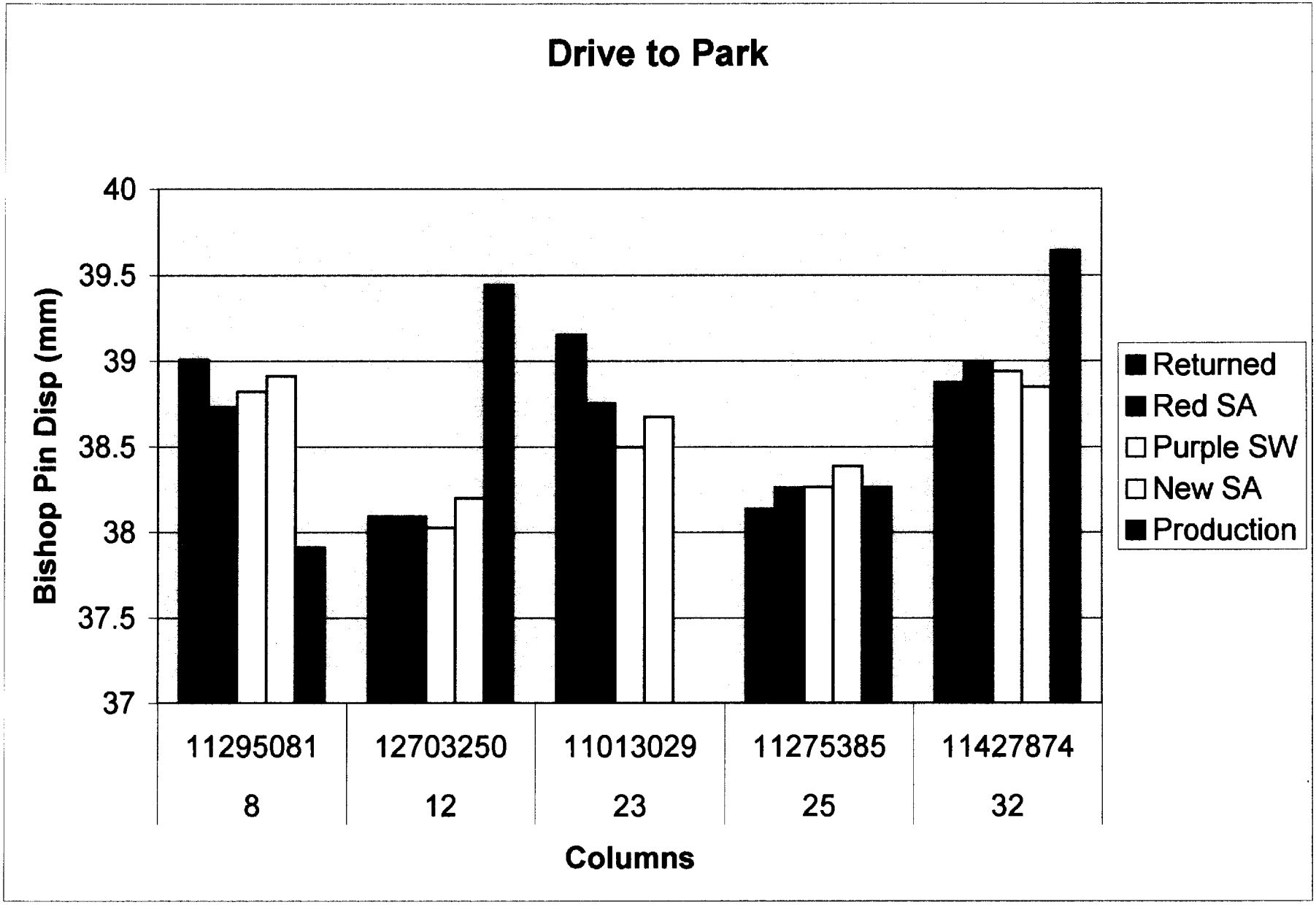
		Drive to Park					Drive to BSI					Park to BSI				
Column	ID	Production	Returned	New SA	Red SA	Purple SW	Production	Returned	New SA	Red SA	Purple SW	Production	Returned	New SA	Red SA	Purple SW
8	11295081		39.54	38.9	38.68	38.84		35.53	35.39	35.47	35.22		3.27	3.55	3.24	3.6
			38.7	38.88	38.77	38.85		35.5	35.41	35.56	35.27		3.32	3.53	3.26	3.58
			38.78	38.95	38.74	38.77		35.56	35.47	35.52	35.24		3.27	3.53	3.25	3.56
Average		37.91	39.00667	38.91	38.73	38.82	35.2	35.53	35.42333333	35.51666667	35.24333333	2.71	3.286666667	3.536666667	3.25	3.58
Sigma			0.463609	0.036056	0.045826	0.043588989		0.03	0.04163332	0.045092498	0.025166115		0.028867513	0.011547005	0.01	0.02
12	12703250		38.11	38.22	38.02	38.03		35.56	35.41	35.56	35.51		2.6	2.78	2.47	2.88
			38.1	38.22	38.13	37.99		35.51	35.4	35.68	35.17		2.6	2.77	2.5	2.8
			38.06	38.15	38.12	38.05		35.47	35.37	35.7	35.23		2.6	2.76	2.47	2.86
Average		39.44	38.09	38.19667	38.09	38.02333333	35.83	35.51333333	35.39333333	35.64666667	35.30333333	3.61	2.6	2.77	2.48	2.846666667
Sigma			0.026458	0.040415	0.060828	0.030550505		0.045092498	0.02081666	0.075718778	0.181475435		0	0.01	0.017320508	0.04163332
23	11013029		38.62	38.68	38.8	38.51		35.36	35.78	35.59	35.12		3.3	2.94	3.22	3.38
			39.5	38.62	38.75	38.44		35.5	35.71	35.51	35.07		3.16	2.94	3.26	3.35
			38.8	38.71	38.75	38.55		35.46	35.79	35.48	35.19		3.3	3.01	3.3	3.33
Average			39.15	38.67	38.75	38.495		35.48	35.76	35.495	35.13		3.23	2.963333333	3.28	3.34
Sigma			0.494975	0.045826	0	0.077781746		0.028284271	0.043588989	0.021213203	0.084852814		0.098994949	0.040414519	0.028284271	0.014142136
25	11275385		38.09	38.5	38.32	38.3		35.51	36	35.85	35.43		2.52	2.5	2.5	2.83
			38.13	38.45	38.24	38.19		35.55	36	35.79	35.44		2.57	2.49	2.43	2.82
			38.18	38.2	38.21	38.3		35.64	35.79	35.77	35.57		2.61	2.47	2.45	2.86
Average		38.26	38.13333	38.38333	38.25667	38.26333333	35	35.56666667	35.93	35.80333333	35.48	3.28	2.566666667	2.486666667	2.46	2.836666667
Sigma			0.045092	0.160728	0.056862	0.06350853		0.066583281	0.121243557	0.04163332	0.078102497		0.045092498	0.015275252	0.036055513	0.02081666
32	11427874		38.95	38.91	38.91	38.88		35.25	35.6	35.53	35.03		3.56	3.34	3.39	3.85
			38.77	38.74	38.95	38.9		35.2	35.57	35.55	35.11		3.59	3.33	3.38	3.82
			38.89	38.89	39.12	39.03		35.31	35.61	35.66	35.22		3.59	3.37	3.3	3.85
Average		39.64	38.87	38.84667	38.99333	38.93666667	34.95	35.25333333	35.59333333	35.58	35.12	4.74	3.58	3.346666667	3.356666667	3.84
Sigma			0.091652	0.092916	0.111505	0.081445278		0.055075705	0.02081666	0.07	0.09539392		0.017320508	0.02081666	0.049328829	0.017320508

Compiled Data

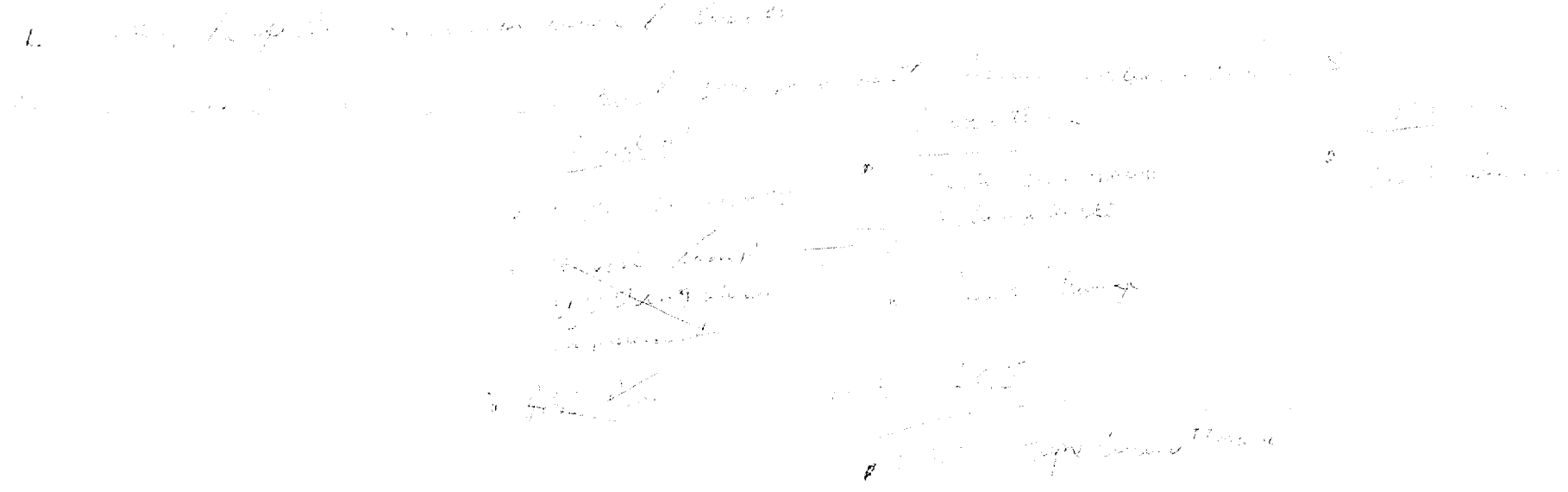
		Drive to Park					Drive to BSI					Park to BSI				
		Production	Returned	New SA	Red SA	Purple SW	Production	Returned	New SA	Red SA	Purple SW	Production	Returned	New SA	Red SA	Purple SW
8	11295081	37.91	39.00667	38.91	38.73	38.82	35.2	35.53	35.42333333	35.51666667	35.24333333	2.71	3.286666667	3.536666667	3.25	3.58
12	12703250	39.44	38.09	38.19667	38.09	38.02333333	35.83	35.51333333	35.39333333	35.64666667	35.30333333	3.61	2.6	2.77	2.48	2.846666667
23	11013029		39.15	38.67	38.75	38.495		35.48	35.76	35.495	35.13		3.23	2.963333333	3.28	3.34
25	11275385	38.26	38.13333	38.38333	38.25667	38.26333333	35	35.56666667	35.93	35.80333333	35.48	3.28	2.566666667	2.486666667	2.46	2.836666667
32	11427874	39.64	38.87	38.84667	38.99333	38.93666667	34.95	35.25333333	35.59333333	35.58	35.12	4.74	3.58	3.346666667	3.356666667	3.84


Drive to BSI
33.73 Min Specification
Bishop Pin Disp (mm)
36.2
36
35.8
35.6
35.4
35.2
35
34.8
34.6
34.4
11295081
8
12703250
12
11013029
23
11275385
25
11427874
32
Columns
Returned
Red SA
Purple SW
New SA
Production


Park to BSI
2.56 Min Specification
Bishop Pin Disp (mm)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
11295081
8
12703250
12
11013029
23
11275385
25
11427874
32
Columns
Returned
Red SA
Purple SW
New SA
Production


Drive to Park
Bishop Pin Disp (mm)
40
39.5
39
38.5
38
37.5
37
11295081
8
12703250
12
11013029
23
11275385
25
11427874
32
Columns
Returned
Red SA
Purple SW
New SA
Production

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
8	John Elway Ford Boulder 3200 28th Street Boulder, CO 80301	303-939-8600	1FMDU73WXZ[redacted]	U152	16803	12/05/03	9/20/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't stick in rev.	12703250	1
12	R E Barber Ford 3440 East Main St Ventura, CA 93003	805-642-6701	1FMDU63W6Z[redacted]	U152	24824	12/08/03	9/7/01	gearshift lever hard to move and popping like changing detents. Hard to get back into park, inter.	Column	Yes	BSI ok, wear mark p-nut brk't stick in rev.	11295081	1
23	Balise Ford of Wilbraham 1979 Boston Rd. Wilbraham, MA 01095		1FMZU72E82U[redacted]	U152	32497	12/04/03	10/25/01	Shifter catches every time it is shifted from drive into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11013029	1
25	Simi Valley Ford 2440 First Street Simi Valley, CA 93065		1FMZU63W82Z[redacted]	U152	33434	12/08/03	8/27/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11275385	1
32	Northport Ford, Inc. 6233 Jericho Turnpike Commack, NY 11725	631-499-6400	1FMZU72E92U[redacted]	U152	23364	12/08/03	11/29/01	Shifter gets jammed between reverse and park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	1142874	1



From: Xu, Yehong (Y.)
Sent: Tuesday, July 25, 2000 9:08 PM
To: Hildebrand, Dan (D.H.)
Cc: McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Spaulding, Todd (T.C.); Perri, Ron (R.J.); Haugh, Todd (T.A.); Xu, Yehong (Y.)
Subject: Drop-in Speed Issue Status

Dan:

A few parts were broken during drop-in speed test (low speed ratchet). The test was down on the latest level trans and a CPF vehicle. The broken parts are pawl shaft and case at the pawl shaft hole. The pawl shaft hole on extension housing is elongated. The part failure occurred here is similar to the one happened at BDX.

I find some debris stuck on the edge of the pawl tooth (forward drive side) and suspect they might be caused by over-heating between pawl tooth and gear teeth. Pawl and other broken parts will be sent to Metallurgy Lab for further investigation. I will give you updates when results come out. I also feel that tooth surfaces of the production park gear are rougher than that of the prototype one and there some burrs on edges of teeth. One of each 5R55E, 5R55W production and 5R55W prototype gears were sent to Carry-in Inspection for investigation. There is no surface finishing specified on tooth surfaces of the 5R55 family gears.

I now have two vehicles in my possession, but none of them can be used today. There is a problem with RCON setup and data retrieving on the 2PP 4.0L one. Todd Haugh and a tech at DTA are striving to solve the problem. The 4.6L Rob Hasse loaned to me today is on the process of installing optical encoder and calibration.

Ron Perri and Todd Spauding subjectively evaluated the 2PP vehicle and they felt that the drop-in speed was not that bad. I will run test and collect data as soon as vehicle is ready.

Please advise.

Regards,

Yehong Xu

YXU1
Park Systems Section
Mechanical/Structural Sub-Systems Dept.
Ph: (734) 458-0717
Fax: (734) 523-6052

From: Xu, Yehong (Y.)
Sent: Thursday, July 27, 2000 7:42 PM
To: Hildebrand, Dan (D.H.)
Cc: McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Brazin, Jim (J.C.); Adamczyk, David (D.W.); Haugh, Todd (T.A.); Garrett, Dave (D.M.); Antrim, William (W.R.); Grossot, Patrice (P.); Perri, Ron (R.J.); Spaulding, Todd (T.C.); Guthrie, Phil (P.J.); Xu, Yehong (Y.)
Subject: Drop-in Status - Preliminary Test Results

Dan:

Two sets of ratchet tests have been down today. Data is shown as follows:

Test #1
Vehicle: U152 4.0L 4x2 2PP
Vehicle Weight: Cube
Trans: 5R55W, 2PP, PV3 (Built in the first week of July, 2000)
# of Cycles: 8
Tester: Todd Haugh
Test Date: 7-27-2000
Forward Drop-in: 2.5 mph (average)
3.85 mph (max.)
1.98 mph (min.)
Reverse Drop-in: 2.1 mph (average)
2.56 mph (max.)
1.45 mph (min.)

Test #2
Vehicle: U152 4.6L 4x4 1PP
Vehicle Weight: Cube
Trans: 5R55W, #000137, 1PP or 2PP built before PV3
# of Cycles: 5
Tester: Yehong Xu
Test Date: 7-27-2000
Forward Drop-in: 3.9 mph (average)
4.76 mph (max.)
2.75 mph (min.)
Reverse Drop-in: 2.79 mph (average)
3.19 mph (max.)
2.12 mph (min.)

We only collected a few data points today because we wanted to take look at the results quickly. Usually, the drop-in speed on U152 is fairly consistent. The high drop-in speed I collected a few days ago was from a CPF vehicle. We think the abnormal drop-in speed might be from column shifter. We, including Larry and shift people, will have a meeting tomorrow to look into the shifter and diagnose root causes.

Regards,

Yehong Xu
YXU1
Park Systems Section
Mechanical/Structural Sub-Systems Dept.
Ph: (734) 458-0717
Fax: (734) 523-6052

From: DeFore, Matthew (M.)
Sent: Friday, June 25, 2004 8:17 AM
To: Filipe, David (D.J.); Upshaw-Gibson, Andrea (A.D.)
Cc: Ahmed, Kamal (K.)
Subject: P-R Double-Detent Feel - 5R55S - Cost to Align P-R Detent Peak to Tick Condition

The P-R double-detent feel concern was originally noticed on the LS for the 2003 MY. If we decide to move forward with the fix, it will be implemented across all 5R55S vehicles. At that time we contacted Grosshaus, the costs to modify the rooster comb tooling were (I don't expect there to be any difference today):

1) NEW TOOLING
   A twin-die fine-blanking tool: 29,450.-- Euro
   Lead-time: 15 weeks from receipt of order.

2) CONVERSION KIT for use on existing tooling
   A twin-die fine-blanking conversion kit: 21,500.-- Euro
   Lead-time: 12 weeks from receipt of order.

3) Prototype Costs
   Piece price based on 30 pieces: 150.-- Euro/per piece
   Lead-time: approx. 8 weeks from receipt of order.

We'll need to work with the supplier regarding timing. I don't remember there being a change in piece price, but I've asked Kamal to verify this. We can move forward on this particular change at any time, but may want to also consider combining with a detent profile and detent spring modification to fix the detent system force balance issue discussed w/ Phil earlier in the week (i.e. Mustang shifter concern).

Matt DeFore
Ford Motor Company - ATEO
Park & Sensor Systems Section Supervisor
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e-mail: mdefore@ford.com
text pager (internal): MDEFORE

From: Perng, Chin-Yuan (C.Y.)
Sent: Friday, January 09, 2004 12:14 PM
To: DeFore, Matthew (M.); Pline, Roger (A.); Spaulding, Todd (T.C.)
Cc: Greene, Lisa (L.A.); Retallack, Lynn (L.M.); Filipe, David (D.J.); Troy, Paul (P.G.); Renneker, Craig (C.M.)
Subject: Dynamic Modeling of Integrated 5R55W/S Park-Shifter System

A CAE report entitled "Dynamic Modeling of Integrated 5R55W/S Park-Shifter System," by Xiaoyong Lu, has been published on 01/08/04. Please visit our web http://wwwdev.ateo.ford.com/ccn/cae/dcs/cae_2004_reports.htm, Report #6, for more details.

Summary
Understanding that shift feel and park system performance is an issue inherent to the integrated park-shifter system, we initiated the effort to develop the integrate park-shifter system and conducted dynamic analysis on its performance. The model performance has been measured against available data with the help of Matt Defore. In additional to drop-in speeds, other quantities of interest (inter-component loads from ratcheting and abutted engagement) have been extracted for reference. The integrated model is ready for a wider applications in conjunction with park-shifter engineering.

Best Regards,
Chin-Yuan Perng
Supervisor, Dynamics & Control CAE
(734) 523-3498

PE09-020 1001

From: Case, Robert (R.G.)
Sent: Monday, June 07, 2004 9:51 AM
To: Bandoske, Pete (P.F.); Montgomery, Kerry (K.P.)
Subject: Explore Steering Column

Pete & Kerry.....based on our discussion listed below is the background, update and revised direction for repairing the steering column:

Background:

- The steering column high shift effort was reviewed with the March tech panel.
- Several potential repair options were reviewed.
- At that time the prime direction would be to remove the bur from the swing arm and lubricate the surface. This would be accomplished by removal of the brake shift interlock switch (BSI).
- Engineering indicated that we need to validate the long term effectiveness of the potential repair.

Update

- Several sample parts were tested with the bur removed and a lubricant added to the surface.
- The cycle testing confirmed that the addition of a lubricant does help to minimize the creation of a bur and improve the component durability.
- However, testing confirmed that the addition of a lubricant will not provide the anticipated long term repair effectiveness.
- As a result, this repair approach has been cancelled.

Revised Direction

- We have gained concurrence from engineering to permit the service of the brake shift interlock switch (BSI)
- The BSI switch has been enhanced to provide a quicker cycle time for pin pull down.
- This modified switch will be available as a stand alone service part.
- A TSB will be released to support this action.

Your assistance to communicate this with the March Tech panel members would be appreciated.

Bob Case
FCSD x00937
Warranty Program Manager

From: Scheuer, James (J.A.)
Sent: Tuesday, October 08, 2002 3:46 PM
To: DeFore, Matthew (M.)
Subject: FW: 5R55 ADAMS - Rooster Comb Modifications

FYI .....

-----Original Message-----
From: Li, Ying-Yong (Y.)
Sent: Tuesday, October 08, 2002 2:19 PM
To: Scheuer, James (J.A.)
Subject: RE: 5R55 ADAMS - Rooster Comb Modifications

Hi, Jim,

Yes, I do have some results which can totally eliminate the two-bump thing form P-R. Right now I am working on the geometry which is not only to eliminate the double peaks but also to keep other system parameters (such as detent spring force) as same as possible (also reduce some shift effort). I will contact you in couple of days to show the progress. Thanks

Ying-Yong Li

734-523-6012
yli17@ford.com

-----Original Message-----
From: Scheuer, James (J.A.)
Sent: Tuesday, October 08, 2002 1:44 PM
To: Li, Ying-Yong (Y.)
Subject: 5R55 ADAMS - Rooster Comb Modifications

Ying-Yong, any progress? Do you have anything that Matt and I can review in the next couple of days?

Jim Scheuer
Product Design Engineer
Park Systems Design 5R55 & 6R Transmissions
Mechanical / Structural Sub Systems
Ford Automatic Transmission New Product Center

From: Fyie, Matthew (M.L.)
Sent: Thursday, September 14, 2000 11:03 AM
To: Tsai, Pingfang (P.); Perri, Ron (R.J.)
Cc: Hart, Lori (L.A.)
Subject: FW: 5R55N Torque-to-Turn

Attached is torque to turn data from Sharonville for 5R55N. The columns are shifted but looks like means are 5.5 ft-lbf CW and 2.6 ft-lbf CCW.

Matt Fyie
ATEO - Park Systems
Phone: (734) 52-30120
Fax: (734) 52-36052
E-mail: mfyie@ford.com
Text Page: <mailto:7347979317@alphapage.airtouch.com>

-----Original Message-----
From: Capek, George (G.E.)
Sent: Thursday, September 14, 2000 10:42 AM
To: Fyie, Matthew (M.L.)
Cc: Tyahla, Mark (M.A.)
Subject: RE: 5R55N Torque-to-Turn

Matt,

Here is Pullout data from Sharonville..... there is a difference between Clockwise and CounterClockwise.....

Ford - Sharonville 5R55 Final Histogram Report 14-09-00 08:49 AM
Data Request: 09/01/00 00:00 thru 09/14/00 23:59 Shift: * Time from: : thru : Test Results (AC/RJ/AB/*) AC
Data Found: 09/01/00 06:06 thru 09/13/00 12:10 ALL PALLETS: Page 001 of 001
ALL MODELS: , , , , ALL STANDS:
First Serial: * Pretest Conditions (NB/R1/RA/NR/SP/*) NB Special (FR/MT/MA/*) *
Last Serial: * Test Method: (PR/AN/*) PR (ST/AU/*) ST Faults (RC/RT/DI/NO/*) *

PNT	S	DESCRIPTION	SAMPLS	UNITS	MEAN	-3 STD DEV	+3 STD DEV	PARAMETERS TYPE	LOW/HIGH NO.	VALUE	REJ CODE	SKEWNESS KURTOSIS
161	A	DELTA CW-PARK SHFT TORQ (P-N)	2789	FT-L	5.5	1.9	9.2	NONE				-0.230
								NONE				0.548
169	A	DELTA CCW-PARK SHFT TORQ (P-N)	2789	FT-L	2.6	1.0	4.3	NONE				-0.358
								NONE				2.468

The distribution looks fairly normal.....

George Capek

-----Original Message-----
From: Fyie, Matthew (M.L.)
Sent: Thursday, September 14, 2000 6:29 AM
To: Capek, George (G.E.)
Subject: 5R55N Torque-to-Turn

George - I'm working with Yehong Xu on the 5R55W park issues and one of the many things we are reviewing are torque-to-turn values of the outer manual lever on the final test stand on park pull-out events. The data from Bordeaux shows a big discrepancy between clockwise & counter-clockwise pull-out torques. We would like to see the same data from Sharonville on 5R55N for comparison and Mark Tyahla said you are the best guy to get this. I'm just looking for a distribution of data for a couple hundred units.

Can you get this data today? Let me know if there's anything I can do to help. Thanks.

Matt Fyie
ATEO - Park Systems
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Fax: (734) 52-36052
E-mail: mfyie@ford.com
Text Page: <mailto:7347979317@alphapage.airtouch.com>

From: DeFore, Matthew (M.)
Sent: Monday, August 29, 2005 8:00 AM
To: Ahmed, Kamal (K.)
Subject: FW: 5R55S Torque to Turn
Importance: High

Kamal - I believe I requested this about a 1.5 weeks back, but did not see a work request in the system. Please enter a request today to study the 5R55S detent system torque to turn w/o friction and w/ 1000 Nm of friction. The study should include the nominal, minimum and maximum torque to turn plots overlaid on the same graph. 2 graphs total - one w/o friction and one w/ friction. Each graph will also identify the detent valley and peak positions. Please confirm that you have entered the work request. Thanks.

Matt DeFore
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-----Original Message-----
From: Bastien, Richard (R.E.)
Sent: Sunday, August 28, 2005 11:01 PM
To: DeFore, Matthew (M.)
Cc: 'Case, Mark'; Platter, Robert (R.D.); Shao, Junmin (J.)
Subject: RE: 5R55S Torque to Turn

Matt,

I'm being pressured to finalize design evidence to support the shifter production tooling as soon as possible. The tooling has been kicked off but we still need to confirm the artificial feel geometry based on the OML reaction forces. Do you know when the information requested below will be made available? Please advise.

Thank you,

Richard

-----Original Message-----
From: Bastien, Richard (R.E.)
Sent: Friday, August 19, 2005 5:35 PM
To: DeFore, Matthew (M.)
Cc: 'Case, Mark'; Platter, Robert (R.D.)
Subject: RE: 5R55S Torque to Turn

Matt,

You are right, I do have all the geometry necessary to convert the torque into a force. One concern is that you gave me the OML torque graph of the 5R55N and 5R55W transmissions and I need it for the 5R55**S** transmission. The other concern is that the graph is a function of time and we don't know the angular speed to convert to an angular displacement needed in our calculations. If you don't have that information, could you make a new request to get the 5R55S OML **torque vs. angle graph**.

Thank you,

Richard

From: DeFore, Matthew (M.) [mailto:mdefore@ford.com]
Sent: Thursday, August 18, 2005 9:27 AM
To: Case, Mark
Subject: RE: 5R55S Torque to Turn

Mark - Since FEV designed the shift cable, bracket and shifter, this is something your team should be able to easily calculate with the transmission torque to turn information. You already have the OML length, hence you can determine the effective length from OML center of rotation to the line of action of the shift cable.

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-----Original Message-----
From: Case, Mark [mailto:Case@fev-et.com]
Sent: Thursday, August 18, 2005 9:19 AM
To: DeFore, Matthew (M.)
Subject: RE: 5R55S Torque to Turn

Matt,
We want to know the effort to move the OML from P to 1 – when you pull on the end of the OML.
Thanks,
Mark

From: DeFore, Matthew (M.) [mailto:mdefore@ford.com]
Sent: Thursday, August 18, 2005 8:52 AM
To: Case, Mark
Subject: RE: 5R55S Torque to Turn

Mark - The OML has nothing to do with the transmission detent system torque to turn, which was Richard's original request. The current detent spring and rooster comb are the same as those used in the study. If you're calculating shift efforts in the vehicle, then the OML will obviously have a role in those calculations. What is it that your trying to determine?

Matt DeFore
Ford Motor Company - ATEO

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-----Original Message-----
From: Case, Mark [mailto:Case@fev-et.com]
Sent: Thursday, August 18, 2005 8:39 AM
To: DeFore, Matthew (M.)
Cc: Platter, Robert (R.D.); Aldrich, Daniel (D.C.); Bastien, Richard (R.E.)
Subject: FW: 5R55S Torque to Turn

Matt,
Basically, the answer is yes, please make a new request for the 5R55S with the new OML. We believe these results are no longer valid because the OML design is changed for U251 and this program.
Thank you,

Mark Case
FEV Engine Technology
case@fev-et.com
mcase4@ford.com
phone: 248-370-8638

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Wednesday, August 17, 2005 9:41 PM
To: Bastien, Richard (R.E.)
Subject: RE: 5R55S Torque to Turn

Richard - I've reviewed all of the studies within our database. Attached is the only study where the current truck detent system has been evaluated analytically (pink line on the graph). The study only considers a nominal system. If you need more information than what is contained within this report, a new request will need to be entered in to the system.

<<report7.doc>>

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-----Original Message-----
From: Bastien, Richard (R.E.)
Sent: Wednesday, July 27, 2005 5:52 AM
To: DeFore, Matthew (M.)

Cc: Shao, Junmin (J.)

Subject: RE: 5R55S Torque to Turn

Matt,

This is unfortunately not the OML torque graph relative to P->1 and 1->P positions that I requested. Could you kindly review the link that you gave me.

Thank you,

Richard

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

From: DeFore, Matthew (M.)

Sent: Wednesday, July 27, 2005 6:22 AM

To: Bastien, Richard (R.E.)

Subject: FW: 5R55S Torque to Turn

Richard - A 5R55S detent system torque to turn study can be located at the link below.

Matt DeFore
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Park & Sensor Systems Section Supervisor
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-----Original Message-----

From: Ahmed, Kamal (K.)

Sent: Tuesday, July 26, 2005 4:04 PM

To: DeFore, Matthew (M.)

Subject: 5R55S Torque to Turn

Matt,

Following link is for 5R55S Torque to Turn Report:

http://www.apdm.ford.com/apdm/v4.0/www/ATO/CCN/CAE/DCS/Yli17/report1_03/report_lincoln_LS_filter.pdf

Regards,

Kamal Ahmed
Product Design Engineer

Park Systems Design 5R55 & 6R Transmissions
Mechanical / Structural Sub Systems
Ford Automatic Transmission New Product Center

From: DeFore, Matthew (M.)
Sent: Thursday, September 01, 2005 3:34 PM
To: Bastien, Richard (R.E.)
Subject: FW: 5R55S Torque to Turn

Attachments: drag_angle.jpg; nodrag_angle.jpg

drag_angle.jpg (73 KB)

nodrag_angle.jpg (73 KB)

Rich - Updated w/ angle rather than time.

Matt DeFore
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-----Original Message-----
From: Lu, Xiaoyong (XL.)
Sent: Thursday, September 01, 2005 9:32 AM
To: DeFore, Matthew (M.)
Cc: Ahmed, Kamal (K.); Perng, Chin-Yuan (C.Y.)
Subject: RE: 5R55S Torque to Turn

Matt:
Attached two praphs are t2t vs angle plots. The peak data are the same. Please also note that the roller position starts at reverse vally which define as 0 degree and it rolls to park (-20 deg) and then from park to 3. I also put the corresponding peak angle in the plot, so the real angle (if the park position defines as 0 deg) can be easily obtained.

Thanks

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Thursday, September 01, 2005 8:22 AM
To: Lu, Xiaoyong (XL.)
Subject: FW: 5R55S Torque to Turn

Xiaoyong - Please replot the torque graphs plotting torque vs. angle instead of time.
Thanks.

Matt DeFore
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Park & Sensor Systems Section Supervisor
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-----Original Message-----
From: Bastien, Richard (R.E.)
Sent: Thursday, September 01, 2005 5:11 AM
To: DeFore, Matthew (M.)
Subject: RE: 5R55S Torque to Turn

Matt,

I hate to disturb you again but I can't use the graphs that you sent me. Without knowing the angular speed at which this measurement was done, I can't correlate it to an angular displacement. Based on the distance between 2 and 1 relative to other PRNDL positions, it also appears that the angular speed is variable during the measurement. Could you kindly provide a graph of torque vs. angle.

Thank you,

Richard

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Wednesday, August 31, 2005 10:31 PM
To: Bastien, Richard (R.E.)
Subject: FW: 5R55S Torque to Turn

Rich - Attached are the 5R55S torque to turn plots w/o friction and w/ 1000 N-mm of friction.

Matt DeFore
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text pager (internal): MDEFORE

-----Original Message-----
From: Lu, Xiaoyong (XL.)
Sent: Wednesday, August 31, 2005 9:11 AM
To: Ahmed, Kamal (K.)
Cc: DeFore, Matthew (M.); Perng, Chin-Yuan (C.Y.)
Subject: 5R55S Torque to Turn

Kamal:
I have completed the analysis you requested. Since my PC crashed yesterday and I could not write a report right away. I'll attached the two graphs and summarise the data below for you to have a look.

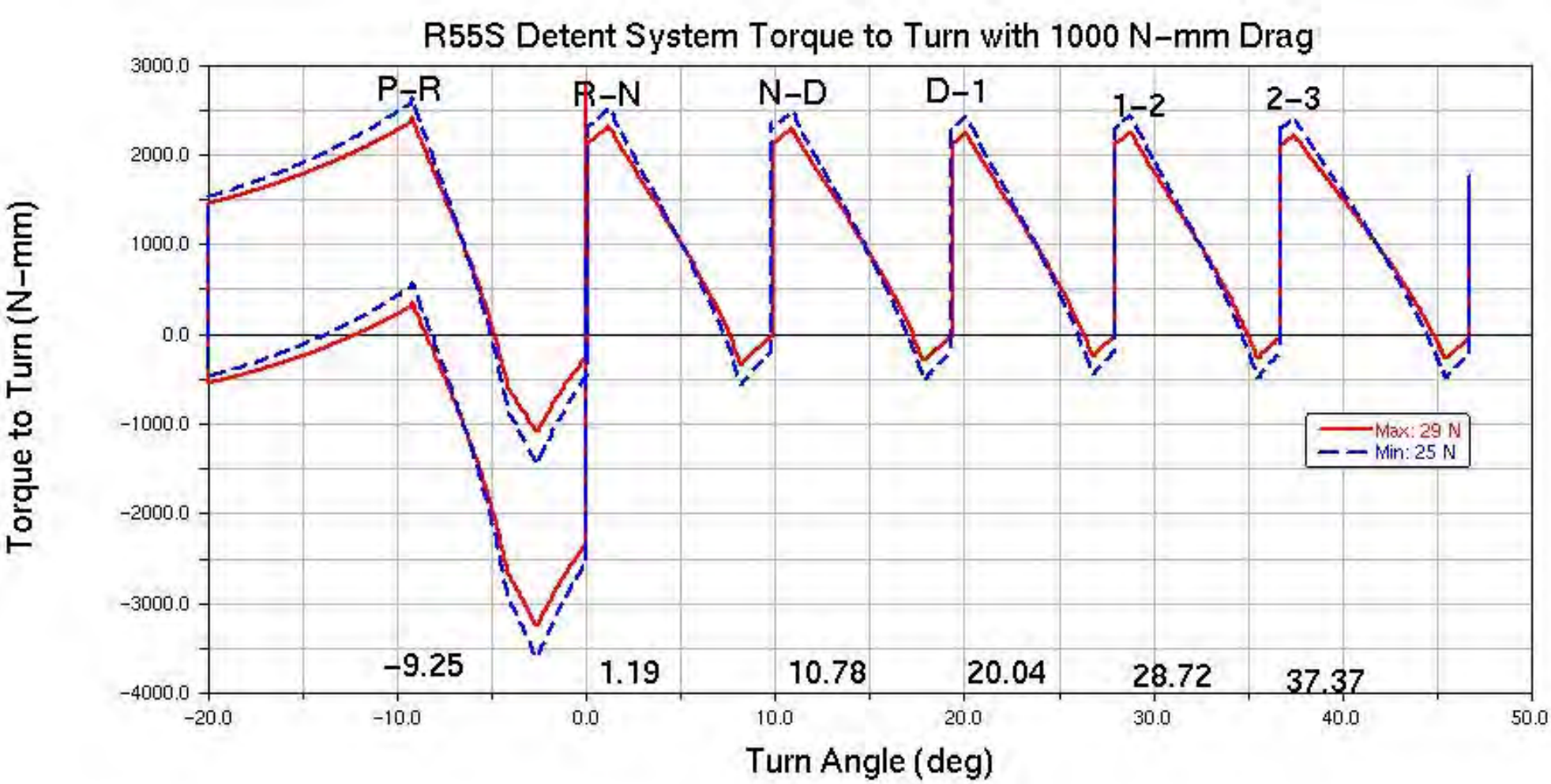
Here is the peak torque to turn corresponding each position: (All units are Newton-mm and Maximum and Minimum preload is 29N and 25N, respectively)

For No Drag:

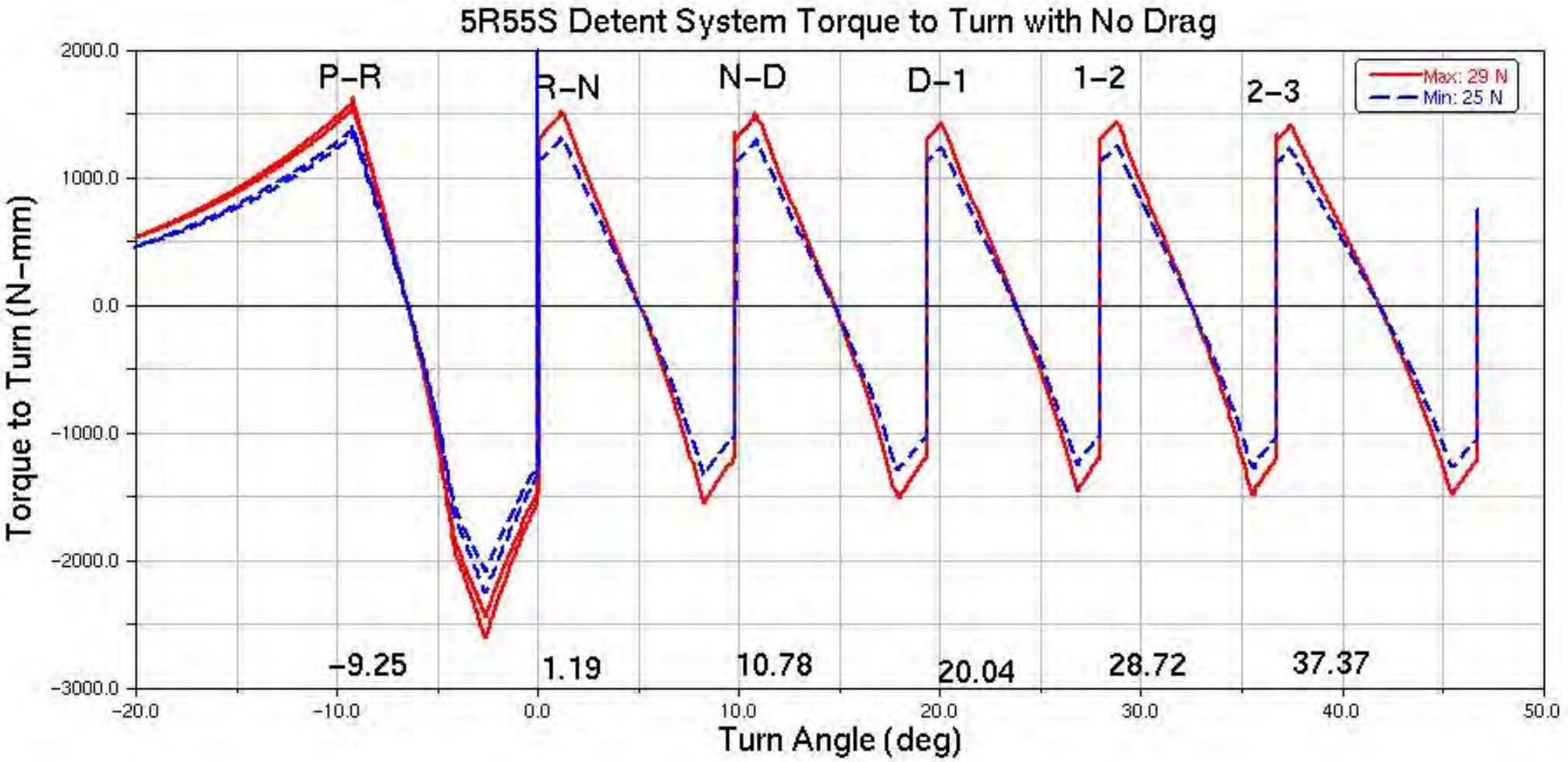
Positions:	P--R	R--N	N--D	D--3	3--2	2--1
Max:	1627.2	1511.5	1498.3	1421.9	1436.0	1411.9
Min:	1406.6	1310.4	1293.3	1233.6	1244.3	1221.1

With 1000 N-mm Drag

Positions:	P--R	R--N	N--D	D--3	3--2	2--1
Max:	2627.2	2511.5	2498.3	2421.9	2436.0	2411.9
Min:	2406.6	2310.4	2293.3	2233.6	2244.3	2221.1


R55S Detent System Torque to Turn with 1000 N-mm Drag
Torque to Turn (N-mm)
Turn Angle (deg)
P-R
R-N
N-D
D-1
1-2
2-3
-9.25
1.19
10.78
20.04
28.72
37.37
Max: 29 N
Min: 25 N
3000.0
2000.0
1000.0
0.0
-1000.0
-2000.0
-3000.0
-4000.0
-20.0
-10.0
0.0
10.0
20.0
30.0
40.0
50.0

PE09-020 1014



From: Bashur, Dennis (D.A.)
Sent: Tuesday, February 11, 2003 10:37 AM
To: Bayer, Dennis (D.F.)
Cc: DeFore, Matthew (M.); Spaulding, Todd (T.C.)
Subject: FW: 5R55S VSA

Dennis,

Matt DeFore has informed me that he would like to have the 5R55S park mech model complete prior to conducting the Shifter system analysis. This may delay the completion time of the Shifter system analysis, but I do not believe it will compromise Todd Spauldings timing on releasing the shifter system. I will confirm the timing on this analysis with Todd. Tom is proceeding with the Hydraulic and TRS Electrical portion of the park mech model since we do not have detail drawing of the Shifter components yet. Tom indicated that the hydraulic portion should take about a weeks time. I estimate that the TRS portion would be about the same timing. I am working with EDS and our internal developer to resolve the latest issue with our park mech dll. I will keep you informed of the status.

Regards,

Dennis A. Bashur
ATEO Dimensional Management Group Leader
Phone (734) 458-0721 Fax (734) 525-2090
dbashur1@ford.com

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Tuesday, February 11, 2003 9:14 AM
To: Bashur, Dennis (D.A.); Spaulding, Todd (T.C.)
Cc: Egner, Tom (T.A.)
Subject: FW: 5R55S VSA

Dennis/Todd - Please reference Tom Egner's note below, specifically the section regarding adding the shifter mechanism after the mechanical portion of the model is complete. I'd like to make the following recommendation. I would like to have the VSA study fully completed for the transmission system first before attaching the shifter system and completing the study with the effect of the shifter system. The transmission system alone would be our baseline to first understand if alignment is correct between components, potential areas for improvement in the transmission system itself, etc. This would entail completing the nominal and range study for park (tick, first engagement, first park), all detented and peak positions, hydraulic function and TRS function for the transmission system. After completing this portion of the study, then add the shifter system to complete the study and allow for an understanding of the mis-position or added potential error in placement of the OML, park system and manual valve. I'd appreciate your feedback.

Best regards,

Matt DeFore
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-----Original Message-----
From: Egner, Tom (T.A.)
Sent: Tuesday, February 11, 2003 7:57 AM
To: DeFore, Matthew (M.)
Cc: Egner, Tom (T.A.)
Subject: RE: 5R55S VSA

The mechanical portion is complete, except we have a new problem with the .dll (gen surface points not staying on gen surf).
We have EDS and our local .dll writer working on it.

I have not started the hydraulic portion at all.
The valve body, gaskets, etc. are assembled but I don't know what land-port combo's everyone is interested in.
Perhaps you could ask the valve body engineer to decide what combo's he's interested in for what system configurations.

I haven't been doing the hydraulics because Dennis Bashur said everyone wanted the Shifter Mech after the mechanical portion was done.
I should have all the .jt files transferred and orientated into nominal position by the end of today.
After that, I have to wait for the shifter engineer to get me the prints (not released in Docman). Those are due this week.

I would expect the Shifter portion to take maybe 2 weeks, the hydraulics about 1 week. The .dll situation I have no guess.

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Monday, February 10, 2003 8:40 AM
To: Egner, Tom (T.A.)
Subject: 5R55S VSA

Tom - How is the 5R55S VSA proceeding. What is your estimated time for completion of the mechanical and hydraulic portions of the study? Thanks.

Best regards,

Matthew R. DeFore
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From: DeFore, Matthew (M.)
Sent: Tuesday, September 02, 2003 6:09 PM
To: Ramnath, D (D.)
Subject: FW: 5R55W Explicit Analysis Report

Attachments: expl_report.doc

Das - I made a couple of minor corrections and saved the document to this e-mail. The report looks great.

Matt DeFore
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-----Original Message-----
From: Ramnath, Das (M.D.)
Sent: Tuesday, September 02, 2003 9:33 AM
To: DeFore, Matthew (M.)
Subject: 5R55W Explicit Analysis Report

Matt:

Please take a look at the report and provide feedback. I plan to send this out by 9/4 or 9/5.

Thanks.

expl_report.doc
(144 KB)

Regards,
Ramnath M. D. (Das)
Technical Specialist, Durability CAE
CAD/CAE/NDE Department
Ph: (734) 52-35179
Fax: (734) 52-52090
Location: ATEO,Livonia
Outlook ID: mramnath
Dept Name: CAD/CAE/NDE Department
Address: 36200 Plymouth Road, Box 26, Livonia, MI 48150

Dynamic Stress Analysis of 5R55S Park Mechanism
Das Ramnath

This report summarizes the development of a methodology to predict stresses in the park system components during the ratcheting event and engagement of the pawl in the park gear. The motivation to develop this methodology is two fold a) Ensure a production feasible analytical technique that predicts both drop in speeds and stresses in park system components b) Determine the actual dynamic magnification factor that occurs when the pawl engages.

Current Methodology

The current methodology is to analyze stresses in park components using a static analysis procedure. The model comprises of the pawl, pawl shaft, a portion of the case and a portion of the gear. The gear is usually modeled as rigid. Detailed contact between gear and pawl, pawl and pawl shaft, cam and pawl is modeled. The configuration analyzed is the park position. The loading is simulated as a torque applied on the park gear. The contact between the components ensures that the torque is correctly transmitted to the cam and the pawl shaft and finally the case as reaction forces. The missing link in this method is that the dynamic load magnification factor is incorrectly estimated. It is assumed to be 2.0. The equivalent dynamic torque is thus computed as 2.0 times the static torque developed when the vehicle is on a 30% grade. The torque developed on a grade is:

$$Tg = mg \sin\alpha * R / \lambda$$

The equivalent dynamic torque would be:

$$2Tg = 2mg \sin\alpha * R / \lambda$$

For e.g in a vehicle of mass 3000kg, tire radius R of 0.387m and λ=3.55 the equivalent dynamic torque becomes 1840 N-m. This number is not an accurate representation of the torque on the park gear during the drop in event since it totally ignores the windup of the shaft that occurs after the drop in event. It also ignores the fact that the wheels could slip before the torque reaches the critical value calculated above.

Proposed Methodology

The proposed methodology captures the windup of the shaft as a dynamic event. This is accomplished by actually simulating the ratcheting event and the drop in event using a dynamic stress analysis code called ABAQUS Explicit. Ratcheting is simulated by actuating the rooster comb clockwise (Reverse to Park) and pushing the park rod in. The compression of the ratchet spring generates the driving force to engage the pawl in the gear.

The first step is to do a drop in speed analysis. This analysis is critical because one obtains from the drop in speed a window to provide initial conditions for the stress analysis. The stress analysis is a computationally intensive procedure and hence it becomes essential to simulate the stresses only as the pawl drops in and the shaft winds up.

The drop-in-speed analysis is performed modeling the entire mechanism as a rigid system. This prevents the excessive run times associated with flexible structures due to limits imposed by the speed of sound.

When using rigid elements it is necessary to specify a time increment and a 'penalty stiffness'. For this problem, a time increment of 1.0e-7 and a 'stiffness' of 200000 Mpa/mm works well without excessive penetration.
It is also necessary to incorporate the correct resultant driveline stiffness. The resultant driveline stiffness can be calculated using the following relationship:

$$\frac{1}{K_{resul\tan t}} = \frac{1}{K_{driveshaft}} + \frac{1}{\frac{2k_{axleshaft}}{\lambda^2}}$$

where, λ is the FDR (Final Drive Ratio)
For the current analysis a resultant stiffness number of 650 N-m/rad is obtained.
The resultant stiffness is modeled using a hinge connector element that connects the park gear inertia and the vehicle inertia.

The mechanism to slow down the vehicle speed must also be modeled. The best way to do this is to connect the vehicle inertia to the ground by means of a connector element and provide a damping coefficient to that element. The damping coefficient can be calculated using a simple logarithmic law as:

$$C_\theta = \frac{I_{vehicle} * \ln(\frac{\omega_1}{\omega_2})}{(T_2 - T_1)}$$

Here $I_{vehicle}$ is the inertia of the vehicle and is computed as:

$I_{vehicle} = \frac{MR^2}{\lambda^2}$, where M is the vehicle mass, R is the tire rolling radius and λ is the Final Drive Ratio. ω1 and ω2 are the initial and final park gear speeds. T1 and T2 are two points in time.

The ratchet spring is modeled in the preloaded state using a translational connector element with an axial stiffness represented in the print. It is important to ensure that an initial preload called out on the print is developed.

The return spring is modeled as a rotational connector element that is connected to the center of the pawl shaft hole with a preload specified on the print. The rotational connector constrains out of plane rotation and transfers in-plane rotation.

Advantages of the simulation

- Detailed dynamic simulation
- Good idea of deflection of components during drop in
- Stresses on all components available

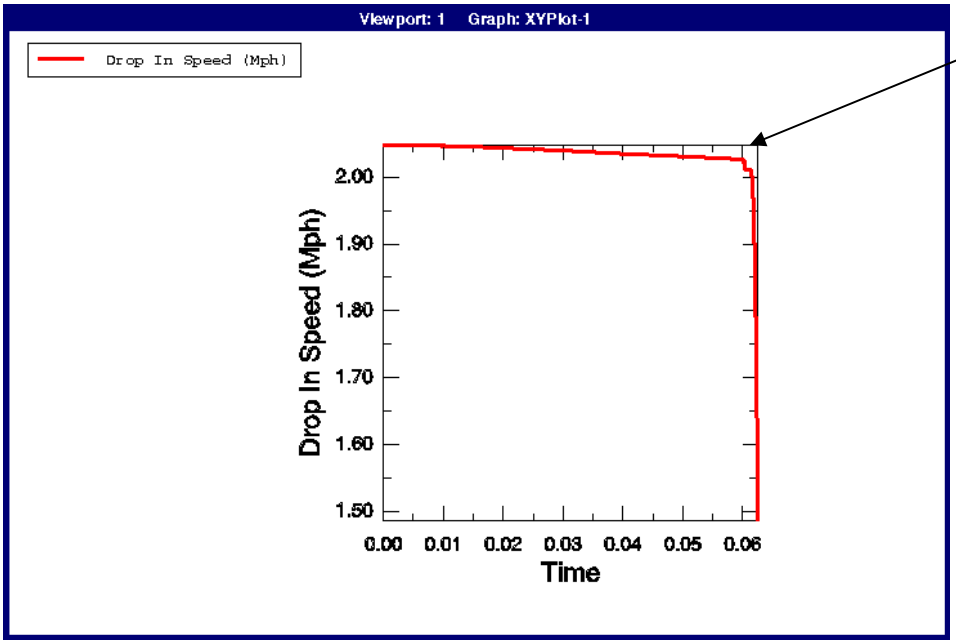
Disadvantages

- Long run times
- Stable time increment is limited by the speed of sound

Results

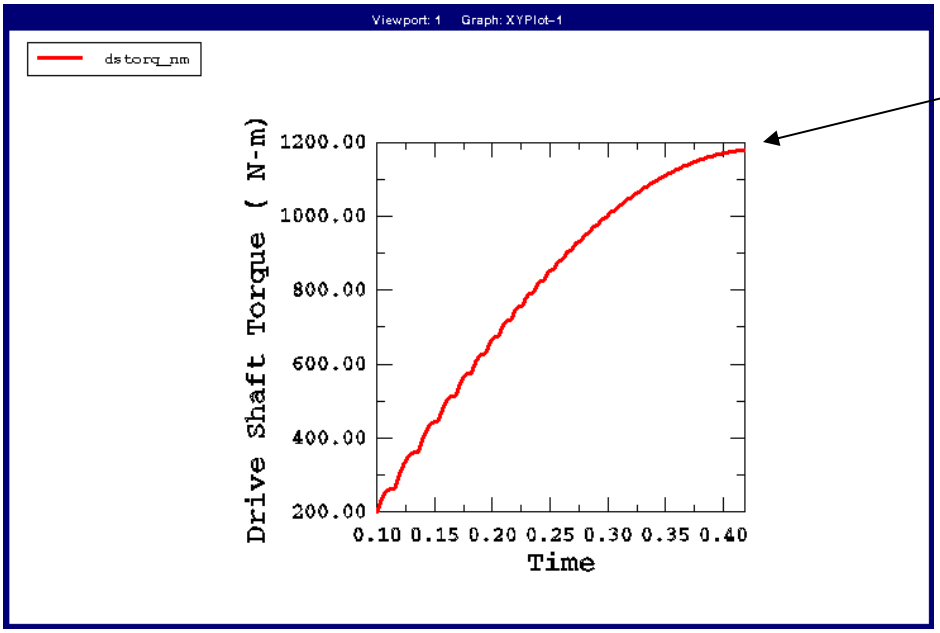
The results of the simulation are shown in the form of the following graphs. The animation files are displayed by clicking on the hyperlink.

Drop in Speed



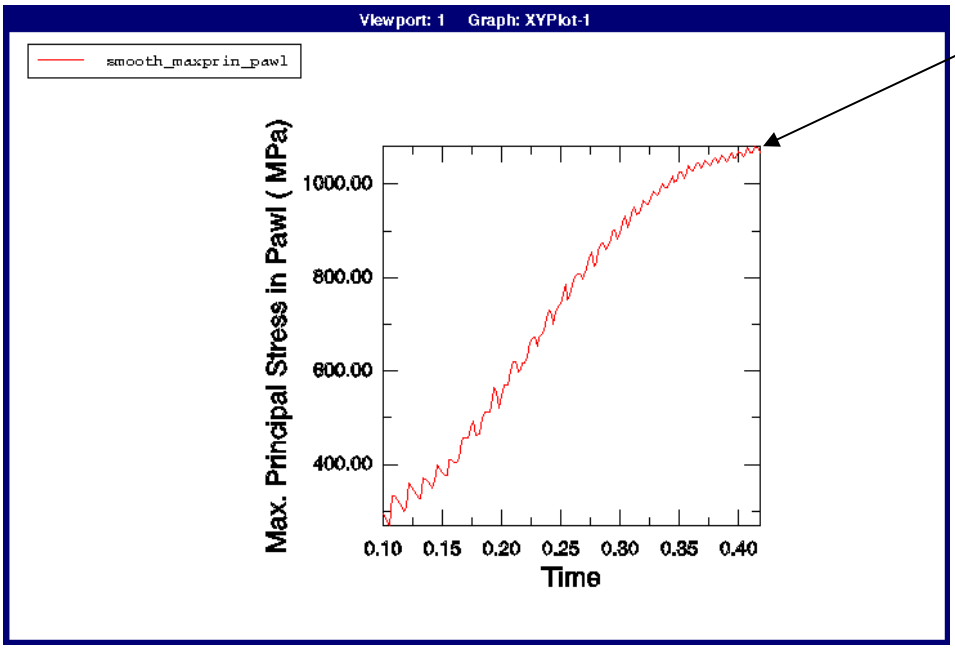
Pawl Drops into Gear

Driveshaft Torque



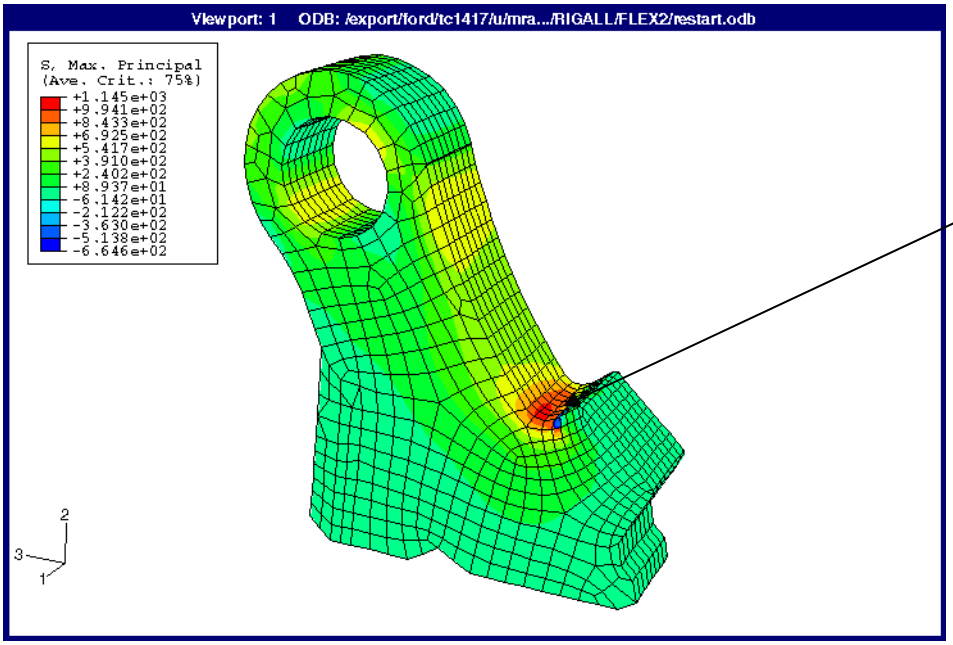
Full Windup of driveshaft

Plot of stress in Park Pawl



Max Stress at windup of driveshaft

Contour Plot of Pawl Stress



Max Stress root of pawl

Ramnath, M. D (Das)

Animation of Drop in Event
\\LIV00004\PROJ\N615\Ramnath\ratchet_down_2.avi

Animation of Stresses During Drop in event
\\Liv00004\proj\N615\Ramnath\drop_event.avi

Animation of Entire Park Assembly During Drop in Event
\\LIV00004\PROJ\N615\Ramnath\allflex_stress.avi

From: Zyskowski, Mark (M.E.)
Sent: Thursday, September 26, 2002 3:52 PM
To: Li, Ying-Yong (Y.)
Cc: Perng, Chin-Yuan (C.Y.); DeFore, Matthew (M.); Spaulding, Todd (T.C.)
Subject: FW: Artificial feel spring information

Ying-Yong,

The spring rate of the artificial feel spring is 2.39 N/mm with a preload of 17.2 N as noted below.

Thanks.

Mark Zyskowski
Auto Trans Shift Controls, RWD car
Building 3, Cube 3E028 MD3020
Phone: (313) 31-74429 Fax: (313) 24-86950
Text Pager: (313) 795-8723
Hakuna Matata...What a Wonderful Phrase!!!

-----Original Message-----
From: Jeffrey Bays [mailto:baysj@ghsp.com]
Sent: Thursday, September 26, 2002 11:56 AM
To: 'Zyskowski, Mark (M.E.)'
Subject: RE: Artificial feel spring information

Mark,

The spring load with the shifter in the D5 position is 17.2N.

Regards,

Jeff Bays
Development Group Manager
GHSP
Phone: 616-847-1499
Fax: 616-850-7291
Pager: 888-354-9042

-----Original Message-----
From: Zyskowski, Mark (M.E.) [mailto:mzyskows@ford.com]
Sent: Thursday, September 26, 2002 7:51 AM
To: Jeffrey Bays
Subject: RE: Artificial feel spring information

Thanks for the quick response, Jeff. Hopefully the preload is not that big of a deal.

Thanks.

Mark Zyskowski
Auto Trans Shift Controls, RWD car
Building 3, Cube 3E028 MD3020
Phone: (313) 31-74429 Fax: (313) 24-86950
Text Pager: (313) 795-8723
Hakuna Matata...What a Wonderful Phrase!!!

-----Original Message-----
From: Jeffrey Bays [mailto:baysj@ghsp.com]
Sent: Thursday, September 26, 2002 7:28 AM
To: 'Zyskowski, Mark (M.E.)'
Subject: RE: Artificial feel spring information

Mark,

The spring rate for the artificial feel spring is 2.39 N/mm. I will need to pull the preload in the drive position from CAD. I should have this to you later today.

Regards,

Jeff Bays
Development Group Manager
GHSP
Phone: 616-847-1499
Fax: 616-850-7291
Pager: 888-354-9042

-----Original Message-----
From: Zyskowski, Mark (M.E.) [mailto:mzyskows@ford.com]
Sent: Wednesday, September 25, 2002 1:44 PM
To: Harry Fereshetian; Hazen Sills; Jeffrey Bays
Cc: Spaulding, Todd (T.C.)
Subject: Artificial feel spring information

Jeff,

Just left you a voice mail. Was wondering if you could provide the spring rate and preload force of the artificial feel spring when it is in the drive position.

The reason being is that we are trying to model the shift system from the shift lever through the Park System to analyse the efforts in regards to Park to reverse and reverse to Park.

We will eventually need details of all the components that comprise the feel of the shifter. Details to include the shifter base, detent, lower lever, upper lever, artificial feel, artificial feel spring, artificial feel bushing, the detent slider assembly and components and the molded handle assembly.

Please consider this an official request for the details mentioned above.
Others may be added as we think of them, but this is a good list to start from. The variation of the components will be incorporated into the system feel model which we will use to optimize the shift system feel.

It would be helpful to us if we could get the spring rate and preload information of the artificial feel spring as soon as possible. The other details can follow when you get a chance to gather the information.

Thanks for your help.

Mark Zyskowski
Auto Trans Shift Controls, RWD car
Building 3, Cube 3E028 MD3020
Phone: (313) 31-74429 Fax: (313) 24-86950
Text Pager: (313) 795-8723
Hakuna Matata...What a Wonderful Phrase!!!

From: Thornton, James (J.W.)
Sent: Friday, June 18, 2004 10:33 AM
To: Case, Robert (R.G.)
Subject: FW: BSI fastener torque spec

Bob,
The torque for the BSI fastener (N805858) is 7.0+/-1.1Nm.

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

-----Original Message-----
From: Azeem, Mohammad (M.) [mailto:mazeem@visteon.com]
Sent: Tuesday, June 15, 2004 3:18 PM
To: Thornton, James (J.W.)
Subject: RE: BSI fastener torque spec

7 +/-1.1 Nm.

Mohammad Azeem
Product Design Engineer
Visteon Chassis Systems
Cube NW 62-016
Tel:313-7550981 Fax:313-7554098
e-mail:mazeem@visteon.com

-----Original Message-----
From: Thornton, James (J.W.) [mailto:jthornt2@ford.com]
Sent: Tuesday, June 15, 2004 3:15 PM
To: Azeem, Mohammad (M.)
Subject: BSI fastener torque spec

Can you tell me the BSI fastener torque?
N805858 to housing

Thanks.

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

Spaulding, Todd (T.C.)

From: Mitchell, Harold (H.J.)

Sent: Wednesday, May 08, 2002 11:45 AM

To: Chuang, Yei-Hsine (Y.H.); Dover, Harry (H.)

Cc: Spaulding, Todd (T.C.); Billingslea, Charles (C.F.); Godula, Gary (G.M.); Platter, Robert (R.D.); Jofroix, Sebastien (S.); Radl, Nathan (N.J.); Krishnaswami, Ram (R.); Scheuer, James (J.A.); Campau, Lawrence (L.J.); Ozimek, Ronald (R.G.)

Subject: FW: Iccd Concerns Summary for 5-7-02

Note the U152 ICCD reports for "shift lever clicks into place after driving" in the attached daily summaries. The Explorer claim was built March 14, 2002 and the Mountaineer was built Jan 31, 2002. I believe both builds should be after the Visteon column insert change was implemented. Comments?

I have not scheduled a follow-up meeting to our U152/UP207/P150 shift linkage GQRS meeting last month due to other conflicts, but I am interested in any updates.
-Yei-Hsine, what is status/progress of your six sigma study?
-Harry, what are results of your GQRS verbatim review for Ranger and Sport/Sport Trac? Why does 4x2 incident rate seem to be twice as high as 4x4 (and note that both of today's ICCD calls are 4x2 vehicles)?
-Does anyone else have any new information concerning shift linkage claims?

Harold Mitchell 52-34033
5R55 A/T Systems Design

-----Original Message-----
From: Phillips, Joe (L.J.)
Sent: Wednesday, May 08, 2002 10:48 AM
To: Traczynski, Albert (A.J.); All SLAP (E-mail); Anglin, Angela (A.D.); Lv area managers, Lap (L.); Ramachandran, Arvin (A.); Khan, Asad (A.); Knittle, Brett (B.A.); Drummond, Brian (B.J.); Hildreth, Brian (B.S.); Pennington, Brian (K.); Rathsburg, Brian (B.F.); Preston, Carla Traci (C.T.); Bischoff, Charles (C.H.); Brewer, Chris (C.M.); Moore, Christine (C.Y.); Claudepierre, Dale (D.E.); Kramer, Danny (D.L.); Gunn, Darlena (D.M.); Bevan, David (D.M.); Holifield, Derrick (D.F.); Meconi, Dorothy (D.E.); Beckman, Earl (E.J.); Mitchell, Harold (H.J.); Dakhlallah, Hassan (H.A.); Hwang, Hsiu-Ying (H.Y.); Luther, James (J.E.); Mase, Jason (J.T.); Duclos, Jeffrey (J.A.); Sorrell, Jeffrey (J.M.); Ford, Jeri (J.A.); Osinski, Joan (J.F.); Summers, John (J.C.); Pittel, Kimberly (K.L.); Schriewer, Kurt (K.W.); Vincent, Lanny (L.D.); Lv pvt, Lap (L.); Carter, Larry (L.J.); Krueger, Lee (L.F.); Cratty, Lisa (L.M.); Skidmore, Lisa (L.); Lv operating comm, Lap (L.); Lv spc group, Lap (L.); Maki, Mary (M.); Hofman, Michael (M.V.); McSweeney, Michael (M.J.); Radl, Nathan (N.J.); Raj, Nikhil (N.V.); Spalding, William (W.T.); Hackert, Paul (P.B.); Werle, Paul (P.W.); Luebbert, Richard (R.F.); Stevenson II, Robb (A.R.); Keller, Robert (R.F.); Cunningham, Rodrick (R.); Sabin, Scott (S.M.); Santini, Shawn (S.P.); Jofroix, Sebastien (S.); Campbell, Steve (S.L.); Davidson, Stephen (S.A.); Wolodkiewicz, Wally (S.R.); Anthony, Tracy (T.T.); Woods, William (W.H.)
Subject: Iccd Concerns Summary for 5-7-02

Regards,
Joe Phillips
PVT-ICCD Customer Relations Specialist
Louisville Assy. Plant
502-364-3462

ICCD DAILY CONCERNS

CALL DATE	NAME	VIN	MODEL	ENG	BUILD DATE	DESCRIPTION	MILES	STATUS	CUST SAT	CCC
LAP EXPL										
5/7/02	NAJOR	1FMZU64E22U[redacted]	2WD	V6	3/15/02	LH RR DOOR WON'T OPEN ALL THE WAY, BODY SIDE MOLDING HITS	1000	PART ORD	9	B05
5/7/02	STEBBINS	1FMZU63E32U[redacted]	2WD	V6	3/21/02	SMALL PAINT BUBBLES IN CENTER OF HOOD	500	REP SCH	8	F09
5/7/02	STEBBINS	1FMZU63E32U[redacted]	2WD	V6	3/21/02	OUTSIDE TEMPERATURE GAUGE IS NOT WORKING AT ALL	500	RWC	8	G29
5/7/02	COLWELL	1FMZU62E72U[redacted]	2WD	V6	3/6/02	LOW INTERMITTENT WHISTLING WIND NOISE AT 20 MPH, CAN'T DETERMINE LOCATION	1000	RWC	9	R30
5/7/02	COLWELL	1FMZU62E72U[redacted]	2WD	V6	3/6/02	RUBBER WEATHERSTRIP SEAL AROUND LIFTGATE IS LOOSE AT TOP	1000	RWC	9	B63
SLAP EXPL										
5/7/02	PRYOR	1FMZU63E32Z[redacted]	2WD	V6	3/8/02	A/C DOES NOT BLOW COLD AIR AT IDLE, VEHICLE MOVING A/C IS OK	1600	RWC	9	C02
5/7/02	SALAZAR	1FMZU63E02Z[redacted]	2WD	V6	3/19/02	VEHICLE WOULD NOT START, TOWED TO DEALER, PCM INOP, PARTS ORDERED	300	PART ORD	1	E40
5/7/02	GROOM	1FMDU63E92Z[redacted]	2WD	V6	3/11/02	CONSTANT RATTLE IN DRIVERS DOOR AT HIGHWAY SPEEDS	1000	RWC	9	N40
5/7/02	GUALTIERI	1FMZU62E82Z[redacted]	2WD	V6	3/14/02	GEAR SHIFT CLICKS INTO POSITION AFTER DRIVING A SHORT DISTANCE	2000	RWC	10	P51

LEGEND	PLANT	VEHICLE	DAILY CONCERNS	DAILY SAMP SIZE	DAILY RATE	YTD CONCERNS	YTD SAMP SIZE	YTD RATE	CUST SATISFACTION
NOT DUP = DEALER UNABLE TO DUPLICATE CONCERN	Louiisville	Explorer	5	16	31%	1077	4399	24%	90
RWC = REPAIR WHEN CONVENIENT REP'D = REPAIRED	Louisville	Mountaineer	6	34	18%	886	3283	27%	89
IN FOR = IN FOR REPAIR CAC = WANTS CAC HELP	St. Louis	Explorer	4	25	16%	930	3652	25%	89
SCH = REPAIR SCHEDULED PART ORD = PARTS ORDERED	St. Louis	Mountaineer	0	0	#DIV/0!	798	3276	24%	87

ICCD DAILY CONCERNS

CALL DATE	NAME	VIN	MODEL	ENG	BUILD DATE	DESCRIPTION	MILES	STATUS	CUST SAT	CCC
LAP MOUNT										
5/7/02	PRIOR	4M2DU86E82U[redacted]	AWD	V6	11/5/01	EXCESSIVE WIND NOISE IN VEHICLE	1000	RWC	9	R22
5/7/02	PRIOR	4M2DU86E82U[redacted]	AWD	V6	11/5/01	HORN STOPPED BEEPING WHEN USING KEY FOB	1000	RWC	9	A34
5/7/02	PRIOR	4M2DU86E82U[redacted]	AWD	V6	11/5/01	LH RR INNER FENDER HAS POOR FIT	1000	RWC	9	B64
5/7/02	PRIOR	4M2DU86E82U[redacted]	AWD	V6	11/5/01	VEHICLE STALLED AT A STOP, HAS CORRECTED ITSELF	1000	RWC	9	D21
5/7/02	PRIOR	4M2DU86E82U[redacted]	AWD	V6	11/5/01	CUSTOMER SAID PARKING LIGHTS ILLUMINATED CONSTANTLY WHEN USING FOB , THEN STARTED TO JUST BLINK WHEN USING FOB	1000	RWC	9	L29
5/7/02	BLACKWELL	4M2ZU66E22U[redacted]	2WD	V6	1/31/02	NOTICED SHIFT LEVER CLICK INTO PLACE AFTER DRIVING 2-3 MINUTES, HAPPENS INTERMITTENTLY	1070	NOT DUP	10	P51
SLAP MOUNT										
NONE										

LEGEND	PLANT	VEHICLE	DAILY CONCERNS	DAILY SAMP SIZE	DAILY RATE	YTD CONCERNS	YTD SAMP SIZE	YTD RATE	CUST SATISFACTION
NOT DUP = DEALER UNABLE TO DUPLICATE CONCERN	Louiisville	Explorer	5	18	31%	1077	4399	24%	90
RWC = REPAIR WHEN CONVENIENT REP'D = REPAIRED	Louisville	Mountaineer	6	34	16%	886	3293	27%	89
IN FOR = IN FOR REPAIR CAC = WANTS CAC HELP	St. Louis	Explorer	4	25	16%	930	3652	25%	89
SCH = REPAIR SCHEDULED PART ORD = PARTS ORDERED	St. Louis	Mountaineer	0	0	#DIV/0!	798	3278	24%	87

P221

DELPHI SAGINAW STEERING SYSTEMS

3900 HOLLAND ROAD
SAGINAW, MICHIGAN 48601
U.S.A.

Facsimile No.: (517) 757-4155

Steering Columns & Intermediate Shafts

FAX #:	313-248-6950	DATE:	30MR01
To:	TODD SPAULDING - A/T Shift Controls	Total Pages:	2
Company:	FORD		

Subject: P221 Shift Gate Detent Design

Todd,

Attached is a copy of the mainstream design proposal for the P221 shift gate detent plate. This is based upon your request to continue to adjust against the "OverDrive" travel stop. I've also included a copy of a typical gate plate for a system adjusted in "Neutral".

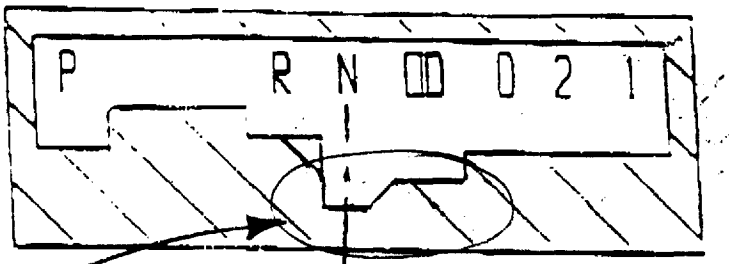
We are flexible to meet your system requirements. Please advise.

cc: Steve Skillman

From: MIKE VERMEERSCH
Phone: 517-757-4182

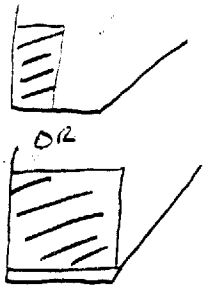
PHIL-
I'D LIKE TO DISCUSS THIS WITH YOU.
TODD

- 5/8 Columns DUE
- How does this Look

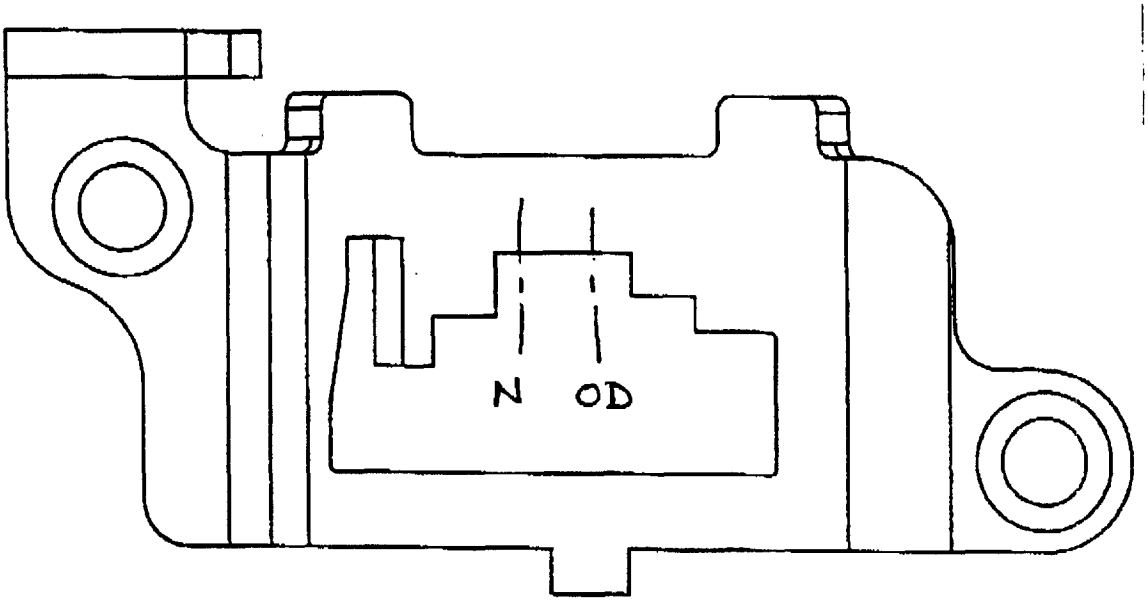


ADJUST IN NEUTRAL

TYPICAL GATE PLATE LAYOUT (GM)



SHOULD WE DO THIS IN DRIVE FOR "NON PR" COLUMNS (ELIMINATE/REDUCE LASH IN OD?).



FORD P221 MAINSTREAM

ADJUST IN OVERDRIVE

PE09-020 1031

From: Radl, Nathan (N.J.)
Sent: Tuesday, August 27, 2002 7:46 AM
To: DeFore, Matthew (M.)
Subject: FW: Lurching in Park

Matt,
Here is a note describing Steve Aiello's complaint. I guess it was only a lurch in park....sounds like he was getting a reverse engagement directly after start up.

Nathan J. Radl
5R55E/W/S Transmission Systems NVH
ATNPC, Cube W312A
Phone: (734) 266-1298
Fax: (734) 523-3910
Pager: (313) 795-9287

-----Original Message-----
From: Radl, Nathan (N.J.)
Sent: Tuesday, January 08, 2002 8:17 AM
To: Nagy, Louis (L.A.)
Subject: RE: Lurching in Park

I am having Steve Aiello work with his dealership and our hotline this week to get the transmission replaced and sent to us. I will let you know as soon as the trans is available.

Nathan J. Radl
5R55E/W/S Transmission Systems NVH
ATNPC, Cube W312A
Phone: (734) 266-1298
Fax: (734) 523-3910
Pager: (313) 795-9287

-----Original Message-----
From: Nagy, Louis (L.A.)
Sent: Tuesday, January 08, 2002 8:07 AM
To: Radl, Nathan (N.J.)
Subject: RE: Lurching in Park

Nathan, what is the status of this? Is trans being replaced?

-----Original Message-----
From: Radl, Nathan (N.J.)
Sent: Thursday, January 03, 2002 12:57 PM
To: Mitchell, Harold (H.J.); Krishnaswami, Ram (R.)
Cc: Ahmed, Kamal (K.); Nagy, Louis (L.A.); Dover, Harry (H.)
Subject: FW: Lurching in Park

I think its important to take an in-depth look at this lurch in park trans. Ram, I'm sure your engineers would be interested in opening this trans up.

Steve Aiello would like to have us replace the transmission in his vehicle. Do we want to replace it at one of our facilities or have him take it to his dealer and track the transmission through the dealership.

Nathan J. Radl
5R55E/W/S Transmission Systems NVH
ATNPC, Cube W312A
Phone: (734) 266-1298
Fax: (734) 523-3910
Pager: (313) 795-9287

-----Original Message-----
From: Aiello, Steven (S.T.)
Sent: Wednesday, January 02, 2002 1:16 PM
To: Radl, Nathan (N.J.)
Subject: RE: Lurching in Park

Nathan, can we schedule the transmission swap for next week or the following week? I will be going on a development trip up north for cold weather and will not need my truck while I am gone. Do you think you can do the trans swap at that time? I will be leaving on Wednesday morning, Jan 9 thru Friday Jan 11 and will be gone the next week as well. I would suggest you take the vehicle next Tuesday, this way you have time to do the swap.

Steve Aiello
4x4 Systems Explorer AWD / Super Duty Programs
Phone/Fax: (313)62-17690
SAIELLO@Ford.com
Text Pager: 734-797-5442 (SAIELLO)

-----Original Message-----
From: Radl, Nathan (N.J.)
Sent: Friday, December 21, 2001 10:20 AM
To: Mitchell, Harold (H.J.)
Cc: Spaulding, Todd (T.C.); Krishnaswami, Ram (R.); Ahmed, Kamal (K.); Nagy, Louis (L.A.); Dover, Harry (H.); Aiello, Steven (S.T.)
Subject: RE: Lurching in Park

The investigation into Steve Aiello's "lurch in park" vehicle was inconclusive. The team was not able to reproduce problem condition. The tests performed by the TRS, Park and Shift Systems engineers provided no unusual data that would explain the lurch in park. A further investigation into this issue is needed. Steve is willing to let us replace his trans in order to investigate it more closely. The vehicle has been returned to Steve for the holiday vacation but could be made available next year.

Nathan J. Radl
5R55E/W/S Transmission Systems NVH
ATNPC, Cube W312A
Phone: (734) 266-1298
Fax: (734) 523-3910
Pager: (313) 795-9287

-----Original Message-----
From: Nagy, Louis (L.A.)
Sent: Wednesday, December 19, 2001 3:37 PM
To: Dover, Harry (H.)
Cc: Spaulding, Todd (T.C.); Nagy, Louis (L.A.); Krishnaswami, Ram (R.); Ahmed, Kamal (K.); Radl, Nathan (N.J.)
Subject: FW: Lurching in Park

Mr. Dover, Thanks for agreeing to stop by tomorrow at 9am to review Mr Aiello's vehicle. You can find me in cube w212a in ATNPC. See you then.

Best Regards,
Louis Nagy
Park Systems & Sensors
W212A, ATNPC, Livonia MI
ph: (734) 525-2084
email: lnagy2@ford.com

-----Original Message-----
From: Radl, Nathan (N.J.)
Sent: Wednesday, December 19, 2001 10:06 AM
To: Krishnaswami, Ram (R.)
Cc: Ahmed, Kamal (K.); Nagy, Louis (L.A.)
Subject: RE: Lurching in Park

Ram,
I have dropped off the keys to Steve Aiello's personal vehicle to Lou Nagy. Steve said the lurching in park has occured two times. Both times, he was on a slight incline facing upwards and after starting the vehicle he gets a reverse engagement right away without touching the PRNDL. Please check this vehicle out if you are available. I need to return the truck to him Friday. Thanks.

Nathan J. Radl
5R55E/W/S Transmission Systems NVH
ATNPC, Cube W312A
Phone: (734) 266-1298
Fax: (734) 523-3910
Pager: (313) 795-9287

-----Original Message-----
From: Krishnaswami, Ram (R.)
Sent: Monday, December 17, 2001 2:19 PM
To: Radl, Nathan (N.J.)
Cc: Ahmed, Kamal (K.); Nagy, Louis (L.A.)
Subject: RE: Lurching in Park

Sure, try getting it this week. If I am not around, Kamal & Lou (TRS Engineers) could also look at it. I wont be in at work for most of next January, so this week will be better. Thanks!

Ram Krishnaswami (rkrishn2@ford.com)
Supervisor, Park Systems & Sensors
Automatic Transmissions, Ford Motor Co.
MD214, 35500 Plymouth Road, Livonia, MI 48150
Phone: (734) 52-**35708**; Fax: (734) 52-36052

-----Original Message-----
From: Radl, Nathan (N.J.)
Sent: Monday, December 17, 2001 12:46 PM
To: Krishnaswami, Ram (R.)
Subject: FW: Lurching in Park

Ram,
I may be able to get this vehicle here this week. Will anybody be available to look at it if I get it here or would next year be better? Let me know and I'll get back with Steve Aiello. Thanks.

Nathan J. Radl
5R55E/W/S Transmission Systems NVH
ATNPC, Cube W312A
Phone: (734) 266-1298
Fax: (734) 523-3910
Pager: (313) 795-9287

-----Original Message-----
From: Mitchell, Harold (H.J.)
Sent: Thursday, December 13, 2001 3:13 PM
To: Boyea, Dan (D.C.)
Cc: Krishnaswami, Ram (R.); Hogberg, Kevin (K.M.); Radl, Nathan (N.J.); Jofroix, Sebastien (S.)
Subject: FW: Lurching in Park

Yes, we would like to look at this vehicle. Please let Nate know when the vehicle will be available, then he will have Ram and his engineers look at it. I assume this will happen next week.

Harold Mitchell 52-34033
5R55 A/T Systems Design

-----Original Message-----
From: Krishnaswami, Ram (R.)
Sent: Thursday, December 13, 2001 3:02 PM
To: Mitchell, Harold (H.J.)
Subject: RE: Lurching in Park

Yes.

-----Original Message-----
From: Mitchell, Harold (H.J.)
Sent: Thursday, December 13, 2001 2:53 PM
To: Krishnaswami, Ram (R.)
Subject: FW: Lurching in Park

Would you like to look at this vehicle?

Harold Mitchell 52-34033
5R55 A/T Systems Design

-----Original Message-----
From: Boyea, Dan (D.C.)
Sent: Thursday, December 13, 2001 1:52 PM
To: Mitchell, Harold (H.J.)
Cc: Aiello, Steven (S.T.); Birschbach, Brett (B.J.)
Subject: Lurching in Park

Harold,

I had a visit from an ex-trans employee, Steve Aiello, I don't if you know him. He has a complaint about the transmission as follows:

"Upon starting the vehicle it immediately goes into reverse yet he has not moved the PRNDL."

This was also the complaint of the Gordy Brooks vehicle but we were unable to repeat it and now the original transmission has been replaced.

Brett and I tried a number of scenarios and the only case that the logic will give reverse is when the TRS and the manual valve is in Reverse. The PRNDL has to read Park or the vehicle will not start.

	Case 1	Case 2	Case 3	Case 4	Case 5
PDL	park	park	park	park	rev
TRS	park	rev	park	rev	any
Man Valve	park	park	rev	rev	any
Veh Start?	yes	yes	yes	yes	no

rev. engaged	no	no	no	yes	no

So, using an RCON, we found that if the calibration was changed such that the TRS read reverse when the PRNDL was in park, the vehicle would start. The starting does not seem to be dependent upon the TRS.

When the PRNDL was in park and the TRS read reverse and the prndl was moved to reverse as soon as the vehicle was started, reverse happened harshly and quickly without our normal delay.

Steve said we could look at his vehicle. Would you like to take the lead on this? Are there any verbatims out there with this issue?

Let us know what you would like to do.

From: DeFore, Matthew (M.)
Sent: Monday, October 13, 2003 5:30 PM
To: Filipe, David (D.J.); Upshaw-Gibson, Andrea (A.D.)
Cc: Pline, Roger (A.); Jofroix, Sebastien (S.); Grossot, Patrice (P.)
Subject: FW: Management Lease Vehicle - No Park Concern

Dave/Andrea - We completed analysis of Roger's management lease vehicle today at ATNPC for the 'no Park' concern. All other detent positions could be attained w/ proper transmission function. We initially removed the pan and found that the OML could not be rotated in to the Park detent position. The OML is external to the TRS therefore rocks or debris can not impede the rotation of the OML. We next removed the transfer case and extension housing which allowed us to remove the pawl, pawl shaft and pawl return spring. The OML still could not be rotated in to the Park detent position. The TRS was then removed with the same result. Finally, the valve body was removed and the OML would now rotate freely in to the Park detent.

Root Cause: Valve body, aluminum machining chip, located in valve body, which impeded the manual valve travel
Note that the machining chip was captured within the valve body and could not have entered in the valve body after the valve body was
installed on to the transmission case.
Vehicle Info: transmission serial #: 137980 (2L2P-BA)
vehicle mileage: 17515 miles
VIN #: 4M2ZU86K33Z[redacted]

Andrea has the chip along with a photo of the chip as is sat in the valve body. We replaced the manual valve and reamed the manual valve bore. Roger's vehicle is back on the road functioning w/o issue.

Matt DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
e-mail: mdefore@ford.com
text pager (internal): MDEFORE

-----Original Message-----
From: Maki, Jean (J.C.)
Sent: Friday, October 10, 2003 11:28 AM
To: DeFore, Matthew (M.)
Subject: RE: Management Lease Vehicle - No Park Concern

Matt, I am leaving you an envelope (with signed form) taped on my office door. Please run me a copy of it once its completed/signed for my records, thanks.

Jean Maki
Manager, Automatic Prototype Operations & NDE
ATNPC, Phone (734) 52-34060; Fax (734) 523-0164
jmaki@ford.com

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Friday, October 10, 2003 11:07 AM
To: Maki, Jean (J.C.)
Cc: Bolger, Jeff (J.W.); Stinson, Al (A.); Filipe, David (D.J.); Pline, Roger (A.)
Subject: Management Lease Vehicle - No Park Concern

Jean - Roger Pline, ATEO Shift Systems Supervisor, called me with an issue regarding 'no Park' on his management lease Explorer. His scheduled maintenance date is Oct. 24 at World Headquarters. I'd like to have his vehicle investigated at ATNPC instead since this is a safety related concern and I'm interested to identify root cause. Realizing this is not normal procedure, what needs to be done to investigate Roger's vehicle on 10/13? Thanks.

Matt DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
e-mail: mdefore@ford.com
text pager (internal): MDEFORE

From: Filipe, David (D.J.)
Sent: Monday, May 09, 2005 10:03 AM
To: DeFore, Matthew (M.)
Subject: FW: P-R Double-Detent Feel - 5R55S - Cost to Align P-R Detent Peak to Tick Condition

Looks like you had previously outlined the plan below.

Why not just move forward with this change if we know it fixes the double detent issue?

David Filipe
Chief Engineer - Current Programs
Automatic Transmission Engineering
Ph: 734.523.5641, Pager: 313.795.4069

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Friday, June 25, 2004 8:17 AM
To: Filipe, David (D.J.); Upshaw-Gibson, Andrea (A.D.)
Cc: Ahmed, Kamal (K.)
Subject: P-R Double-Detent Feel - 5R55S - Cost to Align P-R Detent Peak to Tick Condition

The P-R double-detent feel concern was originally noticed on the LS for the 2003 MY. If we decide to move forward with the fix, it will be implemented across all 5R55S vehicles. At that time we contacted Grosshaus, the costs to modify the rooster comb tooling were (I don't expect there to be any difference today):

1) NEW TOOLING
A twin-die fine-blanking tool: 29,450.-- Euro
Lead-time: 15 weeks from receipt of order.

2) CONVERSION KIT for use on existing tooling
A twin-die fine-blanking conversion kit: 21,500.-- Euro
Lead-time: 12 weeks from receipt of order.

3) Prototype Costs
Piece price based on 30 pieces: 150.-- Euro/per piece
Lead-time: approx. 8 weeks from receipt of order.

We'll need to work with the supplier regarding timing. I don't remember there being a change in piece price, but I've asked Kamal to verify this. We can move forward on this particular change at any time, but may want to also consider combining with a detent profile and detent spring modification to fix the detent system force balance issue discussed w/ Phil earlier in the week (i.e. Mustang shifter concern).

Matt DeFore
Ford Motor Company - ATEO
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
e-mail: mdefore@ford.com
text pager (internal): MDEFORE

From: DeFore, Matthew (M.)
Sent: Tuesday, May 03, 2005 10:28 AM
To: Spaulding, Todd (T.C.)
Cc: Greene, Lisa (L.A.); Retallack, Lynn (L.M.)
Subject: FW: S197 shifter effort

Todd - Need your expertise here. In general, Phil is asking for improved shift feel, but I'm not sure exactly what his experience has been w/ the haptic buck and if he has a specific shift feel profile in mind that the shifter team has reviewed with him.

Kamal - Head's up. Changes may be requested for the 5R55S rooster comb to improve shift feel.

Matt DeFore
Ford Motor Company - ATEO
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
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e-mail: mdefore@ford.com
text pager (internal): MDEFORE

-----Original Message-----
From: Yuhasz, Philip (P.D.)
Sent: Tuesday, May 03, 2005 10:22 AM
To: DeFore, Matthew (M.); Retallack, Lynn (L.M.); Greene, Lisa (L.A.)
Subject: RE: S197 shifter effort

Let's understand what it takes - fast.

Phil Yuhasz
Phil Yuhasz
Director of Engineering - Automatic Transmission Engineering
Ph. 734 523-0130
Fax 734 523-3239

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Tuesday, May 03, 2005 10:17 AM
To: Yuhasz, Philip (P.D.); Retallack, Lynn (L.M.); Greene, Lisa (L.A.)
Subject: RE: S197 shifter effort

I haven't been involved in the haptic buck study, so I'd have to review the optimized, detent-to-detent shift curve and understand the percent contribution from the transmission and artificial feel. If changes to the rooster comb and or detent spring are required to achieve an improved feel, we'd need to consider implementing for all 5R55S applications to reduce complexity at BDX. Today we have one rooster comb for all 5R55S transmissions.

Matt DeFore
Ford Motor Company - ATEO
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
e-mail: mdefore@ford.com

text pager (internal): MDEFORE

-----Original Message-----
From: Yuhasz, Philip (P.D.)
Sent: Monday, May 02, 2005 7:08 AM
To: Retallack, Lynn (L.M.); Greene, Lisa (L.A.); DeFore, Matthew (M.)
Subject: S197 shifter effort

What would it take to create a shift feel on the 5R55 Dura Mustang shifter, based on the Haptics(sp?) lab output that we already have a pretty good set of data points around for optimization? We also need to reduce side button effort.

Phil Yuhasz

Phil Yuhasz
Director of Engineering - Automatic Transmission Engineering
Ph. 734 523-0130
Fax 734 523-3239

From: Spaulding, Todd (T.C.)
Sent: Tuesday, March 20, 2001 9:17 AM
To: Perri, Ron (R.J.)
Subject: FW: Shifters - Cancel trip to Fostoria
Attachments: MVC-018S.JPG; MVC-019S.JPG; MVC-020S.JPG; MVC-021S.JPG

Check this out.

-----Original Message-----
From: Villar, Daniel (D.A.)
Sent: Monday, March 19, 2001 4:58 PM
To: Nehasil, Linda (L.F.)
Cc: Spaulding, Todd (T.C.); Alan Porter (E-mail); Keri Przebienda (E-mail); Levine, Julie (J.A.); Allard, Chris (C.E.); Mark Sheldon (E-mail); Antrim, William (W.R.)
Subject: RE: Shifters - Cancel trip to Fostoria

Linda,

Please followup with Mark Sheldon, PMT 6 (IP System Supervisor), for the PRNDL alignment issue.

On the Brake Shift Interlock (BSI) issue, based on William Antrim's 3/13 note below which says:

"John Rozanski just spoke to the dealer. It appears that the issue was related to the column shift interlock. The units had dead batteries in the convoy yard and the solenoid would not release. The convoy drivers forced the lever out of park and thus damaged the columns. Dealer verified that transmission manual lever shifts freely and problem was isolated to column. Dealer is awaiting replacement columns."

This sound like it may be a similar issue to what is currently being seen at LAP and SLAP. Operators are trying to overcome the BSI to shift out of park, although currently it is unclear if the battery was dead in those vehicle or some electrical failure. What they are seeing is the steering column's shifter yoke (that retains the shift lever) break away from the casting (see the attached pictures). Can you confirm this is the same issue?

Right now Visteon and I are investigating the issue occuring at LAP and SLAP and trying to understand what the operator are doing exactly. Visteon's component testing is showing that it takes a very high bending force (120lbs) to damage the steering column as shown in the pictures.

As an interum containment on this issue it seems that the convoy operators needs to be aware that, if the battery is dead on a vehicle, they need to use the is BSI override procedure in the owners manual instead of trying to force it out of Park, which results in the damage to the steering column.

Unfortunately, I can't make the meeting tommorrow, but can you forward me any Dealer Contacts and Phone Numbers?

Regards,

Dan Villar, Explorer Steering
Ford Motor Company, U152 Chassis Engineering
Loc: PDC 1D-L42
Ph/Fx#: 313-33-75680
Profs/(Email): dvillar / (dvillar@gw.ford.com)

-----Original Message-----
From: Nehasil, Linda (L.F.)
Sent: Monday, March 19, 2001 12:22 PM
To: Villar, Daniel (D.A.)
Cc: Nehasil, Linda (L.F.)
Subject: FW: Shifters - Cancel trip to Fostoria

Dan, please see the attached notes on some issues on U152 pertaining to PRNDL alignment and interlock solenoid issues resulting in customers having a hard time getting the vehicle out of park. I understand from Todd Spaulding, Supervisor of the Shift System Section, that you would be the steering column engineer to address these issues. Is this correct? If so, are you aware of these issues? I am from the Explorer Powertrain Quality section and we have a weekly PTQRT meeting where powertrain issues are addressed. I would like to invite you to tomorrow's meeting. The meeting is held in PDC - 1KS01 from 8:00 am to 10:00 am but we should get to this issue around 8:45 am. We have a call in number that you can use: 9-1-877-877-7131, participant code is: 1161534 #. Can you come to the meeting so that we can discuss and get proper containment going on these issues? Thanks for your help.

Quality comes first....
Linda F. Nehasil
Explorer Powertrain Quality
32-38671

> -----Original Message-----
> **From:** Spaulding, Todd (T.C.)
> **Sent:** Monday, March 19, 2001 11:27 AM
> **To:** Nehasil, Linda (L.F.)
> **Subject:** RE: Shifters - Cancel trip to Fostoria
>
> I believe Matt is the person from Park Systems, if not he can forward to the right person.
>
> Steering column engineer is Dan Villar (dvillar).
>
> Regards,
>
> *Todd Spaulding*
> Supervisor - ATEO Shift Systems Section
> AVT #3; Mail Drop 3020; Cube 3E021
> Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: Nehasil, Linda (L.F.)
Sent: Monday, March 19, 2001 11:25 AM
To: Spaulding, Todd (T.C.)
Subject: RE: Shifters - Cancel trip to Fostoria

Todd, Just to confirm is Matt Fyie the park systems engineer? And who is a contact from the steering column activity?

Quality comes first....
Linda F. Nehasil
Explorer Powertrain Quality
32-38671

> -----Original Message-----
> **From:** Spaulding, Todd (T.C.)
> **Sent:** Monday, March 19, 2001 11:01 AM
> **To:** Nehasil, Linda (L.F.)
> **Cc:** Antrim, William (W.R.); Fyie, Matthew (M.L.); Boyk, Greg (G.J.); Dover, Harry (H.)
> **Subject:** RE: Shifters - Cancel trip to Fostoria
>
> The issues on your list do not pertain to Harry Dover.
>
> Issues with PRNDL alignment need to be directed to the steering column activity, as does anything related to "difficult to pull out of park" relative to the interlock solenoid.
>
> We do design and release the shift cable in this system, and we are not aware of any issues with that component.
>
> Issues with "hard to pull out of park on an incline" are transmission related, and should be directed to the park systems engineer.
>
> We intend to support this meeting as interested parties, and to lend our systems expertise, but if you are coordinating this meeting you need to ensure the appropriate activities are present...in this case steering column and base trans park systems.
>
> Regards,
>
> *Todd Spaulding*
> Supervisor - ATEO Shift Systems Section
> AVT #3; Mail Drop 3020; Cube 3E021
> Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com
>
> -----Original Message-----
> **From:** Nehasil, Linda (L.F.)
> **Sent:** Monday, March 19, 2001 10:47 AM
> **To:** Dover, Harry (H.); Spaulding, Todd (T.C.)
> **Cc:** Nehasil, Linda (L.F.); Antrim, William (W.R.); Fyie, Matthew (M.L.); Boyk, Greg (G.J.)

Subject: FW: Shifters - Cancel trip to Fostoria

Todd and Harry,

Most of the transmission issues were discussed in a meeting with Steve Von Foerster on Friday, 3/16. The PRNDL alignment and hard to get out of park issues were not discussed, so we would still like your participation in the Explorer PTQRT meeting tomorrow in PDC - 1KS01. These issues should come up in the agenda around 8:45 am. The call in number is 9-1-877-877-7131, participant code is 1161534 #.

Additional information on these issues provided by Bill Antrim, stated that the PRNDL alignment issue was related to the assembly plant process, mainly misadjusted shift cable. He stated that the incoming parts need to be monitored for any issues. Has this been done and if not, who will follow up?

For the hard to park issue, Bill mentions a disconnected solenoid. Has any follow up been done with the plant process to make sure this solenoid will be connected?

Finally, follow up was to be done on the claims for the 4 vehicles stated in my original note below. What is the status of this follow up?

Please call in or come to the Explorer PTQRT meeting tomorrow at 8:45 am to discuss. Thanks!

Quality comes first....
Linda F. Nehasil
Explorer Powertrain Quality
32-38671

-----Original Message-----
From: Nehasil, Linda (L.F.)
Sent: Thursday, March 15, 2001 11:07 AM
To: Fyie, Matthew (M.L.); Dover, Harry (H.)
Cc: Nehasil, Linda (L.F.); Mitchell, Harold (H.J.); Spaulding, Todd (T.C.); Boyk, Greg (G.J.)
Subject: FW: Shifters - Cancel trip to Fostoria

Matt and Harry, It looks like the transmission issues will be discussed with Steve Von Foerster at a meeting being set up for tomorrow. If you could look into these claims prior to that meeting it would be beneficial to the discussion. I will let you know when the meeting is. Thanks

Quality comes first....
Linda F. Nehasil
Explorer Powertrain Quality
32-38671

-----Original Message-----
From: Mitchell, Harold (H.J.)
Sent: Thursday, March 15, 2001 9:39 AM
To: Nehasil, Linda (L.F.)

Cc: Spaulding, Todd (T.C.); Boyk, Greg (G.J.); Dover, Harry (H.); Fyie, Matthew (M.L.)
Subject: RE: Shifters - Cancel trip to Fostoria

Reading these claims, the first three should be closed to obsolete level hardware for the first one and BSI issue suspected on the second and third. I suspect BSI is also the fourth issue. If any of the vehicles are still available, I'm sure that either Harry Dover or our park engineer Matt Fyie would investigate them.

Harold Mitchell 52-34033
5R55 A/T Systems Design

-----Original Message-----
From: Nehasil, Linda (L.F.)
Sent: Thursday, March 15, 2001 8:37 AM
To: Mitchell, Harold (H.J.)
Cc: Nehasil, Linda (L.F.); Spaulding, Todd (T.C.); Boyk, Greg (G.J.); Dover, Harry (H.)
Subject: FW: Shifters - Cancel trip to Fostoria

Harold, The fax is hard to read as Greg faxed it to me, so when I fax again to you I think it will be worse. Sorry I was out of the office yesterday, otherwise I would have sent this over then. I can summarize for you the 4 reports. Harry Dover's name is listed as the responsible engineer on all. As for the diagnosis/repair info. not sure if Harry was the one to make the statements shown or Ken Wodzisz as his name is in parenthesis after these statements.

Greg as U152 Concern Manager needs resolution to these issues, who is responsible? Your activity or Todd Spaulding's? We need someone to follow up and present status at Tuesday's PTQRT, thanks!

Mountaineer, 2PP
Date Identified: 10/31/2000
Mileage: 12,651
Complaint description: Shift lever hard to get out of park.
Diagnosis/Repair Info.: Effort from park to reverse is on the high side. Close - has not been a customer concern and parts on this truck are out of date.
Current location: sold

Explorer, FEU
Date Identified: 2/27/2001
Mileage: 10,105
Complaint description: Difficult to get out of park sometimes.
Diagnosis/Repair Info.: CND Suspect driver did not properly depress brake. Old level veh., BSI not operating properly. (I am not sure what CND is and the " I " is kind of fuzzy on the fax for BSI, could mean brake shift interlock?)
Current location: Lot

Mountaineer, FEU
Date Identified: 12/20/2000
Mileage: 2890
Complaint description: Tough to pull shifter out of park on incline.
Diagnosis/Repair Info.: Trans. issue on LS, possibly BSI. Sent note to trans. and owner 1/12.
Current location: Action, MA

Mountaineer, FEU
Date Identified: 1/22/2001
Mileage: 6671
Complaint description: I noticed that sometimes it is difficult to shift out of park.
Diagnosis/Repair Info.: Left message advising to try to duplicate with brake properly depressed 1/22.
Current location: Allen Park, (I can't read the state.)

Quality comes first....
Linda F. Nehasil
Explorer Powertrain Quality
32-38671

-----Original Message-----
From: Mitchell, Harold (H.J.)
Sent: Wednesday, March 14, 2001 12:57 PM
To: Nehasil, Linda (L.F.)
Subject: FW: Shifters - Cancel trip to Fostoria

Please FAX to me at 52-33736.

Harold Mitchell 52-34033
5R55 A/T Systems Design

-----Original Message-----
From: Boyk, Greg (G.J.)
Sent: Wednesday, March 14, 2001 11:24 AM
To: Mitchell, Harold (H.J.)
Cc: Spaulding, Todd (T.C.); Nehasil, Linda (L.F.)
Subject: RE: Shifters - Cancel trip to Fostoria

Just FAXED over infor for the hard to get out of park. I have asked her to forward. Thanks.

Greg Boyk
U-152 Concern Manager
Explorer Quality group

313-337-4056 (W)
313-795-2874 (Pager)

-----Original Message-----
From: Mitchell, Harold (H.J.)
Sent: Wednesday, March 14, 2001 8:26 AM
To: Boyk, Greg (G.J.); Nehasil, Linda (L.F.)
Cc: Spaulding, Todd (T.C.)
Subject: FW: Shifters - Cancel trip to Fostoria
Importance: High

Are these the hard to get out of park vehicles that are on PTQRT agenda next week, or are there others?

Harold Mitchell 52-34033
5R55 A/T Systems Design

-----Original Message-----
From: Antrim, William (W.R.)
Sent: Tuesday, March 13, 2001 5:20 PM
To: Mitchell, Harold (H.J.); Adamczyk, David (D.W.)
Cc: Pittel, Kimberly (K.L.); Krishnaswami, Ram (R.); Lamaud, David (D.); Fyie, Matthew (M.L.); Sabaitis, Robert (R.R.); Okubo, Shunsuke (S.); Rozanski, John (J.P.); Antrim, William (W.R.)
Subject: Shifters - Cancel trip to Fostoria
Importance: High

John Rozanski just spoke to the dealer. It appears that the issue was related to the column shift interlock. The units had dead batteries in the convoy yard and the solenoid would not release. The convoy drivers forced the lever out of park and thus damaged the columns. Dealer verified that transmission manual lever shifts freely and problem was isolated to column. Dealer is awaiting replacement columns.

No need for dealer visit. Might want to have Terry give them a call if anyone else needs info.

FYI. There was some issues during launch with the solenoids not connected but I don't think any could have made it out of the plant.

-----Original Message-----
From: Mitchell, Harold (H.J.)
Sent: Tuesday, March 13, 2001 4:28 PM
To: Adamczyk, David (D.W.)
Cc: Pittel, Kimberly (K.L.); Krishnaswami, Ram (R.); Antrim, William (W.R.); Lamaud, David (D.); Fyie, Matthew (M.L.)
Subject: FW: Shifters

Dave, do you have someone who could check these out? We should probably send one of our engineers plus Matt Fyie, if he's available tomorrow.

Harold Mitchell 52-34033
5R55 A/T Systems Design

-----Original Message-----
From: Pittel, Kimberly (K.L.)
Sent: Tuesday, March 13, 2001 4:22 PM
To: Antrim, William (W.R.)
Cc: Mitchell, Harold (H.J.); Krishnaswami, Ram (R.)
Subject: RE: Shifters

Duh!
Do not go to Fostoria.
I will see if I can send someone from here.

Harold, these trucks will not roll out of park....who could we send?
Park engineer? calibrators? You? Shifter guy?

-----Original Message-----
From: Antrim, William (W.R.)
Sent: Tuesday, March 13, 2001 4:20 PM
To: Pittel, Kimberly (K.L.)
Subject: RE: Shifters

Fostoria is just outside of Toledo. 90 minutes from Detroit, 4 hours from LAP.

-----Original Message-----
From: Pittel, Kimberly (K.L.)
Sent: Tuesday, March 13, 2001 4:13 PM
To: Antrim, William (W.R.)
Subject: RE: Shifters

where is Fostoria?
Kentucky isn't that far from Kentucky....

-----Original Message-----
From: Antrim, William (W.R.)
Sent: Tuesday, March 13, 2001 4:13 PM
To: Pittel, Kimberly (K.L.); Lamaud, David (D.)
Subject: RE: Shifters

Units are in Fostoria, Ohio. Do you want me to go there?

-----Original Message-----
From: Pittel, Kimberly (K.L.)
Sent: Tuesday, March 13, 2001 4:08 PM
To: Lamaud, David (D.); Antrim, William (W.R.)
Subject: RE: Shifters

I thought this is why we sent Bill Antrim to LAP? I even gave him the original paperwork.....
I don't understand the confusion.

Take John Rozanski and take a look at them

-----Original Message-----
From: Lamaud, David (D.)
Sent: Tuesday, March 13, 2001 4:02 PM
To: Antrim, William (W.R.); Trudeau, Terry (T.H.)
Cc: Pittel, Kimberly (K.L.); Mitchell, Harold (H.J.)
Subject: RE: Shifters

First time I hear about this. Terry, any insight or involvement on this?

David J. Lamaud
Bordeaux Transmission Plant
5R55E/N/W/S - U.S. Technical Liaison Spv.
Tel: (734)-523-5748 - Fax: (734)-523-3736

-----Original Message-----
From: Antrim, William (W.R.)
Sent: Tuesday, March 13, 2001 3:58 PM
To: Lamaud, David (D.); Pittel, Kimberly (K.L.)
Subject: FW: Shifters
Importance: High

Is anyone following this issue from Livonia? It looks like these trucks are being held for someone to evaluate. Please advise.

-----Original Message-----
From: Okubo, Shunsuke (S.)
Sent: Tuesday, March 13, 2001 11:03 AM
To: Antrim, William (W.R.)
Subject: FW: Shifters
Importance: High

Bill,

Can you follow up with them? I think it's best to get out there and take a look at these trucks.

Shunsuke Okubo
U152 Powertrain Launch Team
502-375-5009 Desk Phone
502-639-3059 Cell Phone
313-796-9330 Text Pager
sokubo

-----Original Message-----
From: Philage, Barry (B.E.)
Sent: Tuesday, March 13, 2001 10:03 AM
To: 'Brett Kull'; Okubo, Shunsuke (S.)
Cc: Kolakowski, Tom (Thomas J.); PAMMILLE (E-mail)

Subject: RE: Shifters
Importance: High

Mr. Okubo,
Please let me know what your travel plans are so that I can relay them to the people at Fostoria. They will assist in getting you to the dealership to review these vehicles if you so desire. Let me know. Thank you.

Brett,
These vehicles must remain on hold (do not work on them) at the dealership until Ford has the chance to review them or advises you/dealership otherwise. Thanks for you help.
-----Original Message-----
From: Brett Kull [mailto:brettkull@autocomm.com]
Sent: Tuesday, March 13, 2001 9:36 AM
To: Philage, Barry (B.E.); Okubo, Shunsuke (S.)
Subject: Re: Shifters

Barry,
These vehicles are at Wagoner Ford in Fostoria. We called and asked the dealer to hold until further notice. The dealer indicated that hasn't replaced anything yet, all he has done is ordered the parts.

Brett

----- Original Message -----
From: Philage, Barry (B.E.)
To: Okubo, Shunsuke (S.) ; BRETTKUL (E-mail)
Sent: Monday, March 12, 2001 4:58 PM
Subject: RE: Shifters

They are located at the Fostoria Mixing Center in Ohio.

Brett,
Please make sure these vehicles are placed on quality hold until further notice. If they are at the dealership for repair, have them wait for the review by Mr. Okubo.
-----Original Message-----
From: Okubo, Shunsuke (S.)
Sent: Monday, March 12, 2001 4:22 PM
To: Philage, Barry (B.E.)
Subject: RE: Shifters

Barry,

I am on the Powertrain launch team at Louisville Asy, and I've been asked to look into these two trucks. Can you tell me where they're located so that I can investigate? Thanks,

Shunsuke Okubo
U152 Powertrain Launch Team
502-375-5009 Desk Phone

502-639-3059 Cell Phone
313-796-9330 Text Pager
sokubo

-----Original Message-----
From: Philage, Barry (B.E.)
Sent: Friday, March 09, 2001 5:00 PM
To: Boerger, Jim (J.G.); Kuchenbrod, Bill (B.)
Cc: Taylor, Jim (J.D.); Hamme, Mike (M.R.)
Subject: FW: Shifters
Importance: High

I have placed these vehicles on hold at these locations. Do you want to look at them or do you want me to release them?

-----Original Message-----
From: ISOQOS@aol.com [mailto:ISOQOS@aol.com]
Sent: Friday, March 09, 2001 4:52 PM
To: bphilage@ford.com
Subject: Fwd: Shifters

In a message dated 3/9/01 11:16:17 AM Eastern Standard Time, ISOQOS writes:

> Barry,

The vehicles are out of Louisville. The vin numbers are 2UA06549, 2UJ05446.
One is a 4 door mountaineer, the other is an Explorer 4 door. One railcar was
an articulate car with chocks, and the other was a chain car. AutoComm sent
these out for repair.
I beleive you may have sent my email to the other address. If you want to use
isoqos@aol.com, I am usually on that name most of the day.
Let me know if you need anything else.

Barry,

> It has been brought to my attention, that two of our ramps are experiencing difficulties in getting the explorers and

moutaineers to shift out of park.
Please let me know how you would like me to handle this. Thanks.

Pamela K. Miller
Director of Safety & Quality
Caliber Auto Transfer, Inc.
dmc Auto Transfer, Inc.

PE09-020 1055

PE09-020 1056

PE09-020 1057

PE09-020 1058

From: McKinnis, Larry (L.N.)
Sent: Monday, September 11, 2000 5:10 PM
To: Spaulding, Todd (T.C.); Perri, Ron (R.J.); Tsai, Pingfang (P.)
Subject: FW: Transmission Pull out of Park Efforts

info

Larry N. McKinnis Manager, Mechanical/Structural Subsystems Department
Phone 734-52-33601 Fax 734-52-30106
Text pager, lmckinni, Mail Drop 214, cube W219-B ATNPC
Nationwide Pager 888-218-1689 Livonia Michigan 48150

-----Original Message-----
From: Antrim, William (W.R.)
Sent: Monday, September 11, 2000 10:09 AM
To: McKinnis, Larry (L.N.)
Cc: McIntosh, Bruce (B.J.)
Subject: RE: Transmission Pull out of Park Efforts

Yes, all values are in Nm.

William R. Antrim
5R55W Product Launch Leader
Bordeaux Transmission Plant
Ph. +33-556-95-4639 (7394639 Inside Ford)
Fax +33-556-95-4321 (7394332 inside Ford)

-----Message d'origine-----
De: McKinnis, Larry (L.N.)
Date: lundi 11 septembre 2000 12:56
À: Antrim, William (W.R.)
Objet: RE: Transmission Pull out of Park Efforts

Please confirm that the torque values are in N-M 's ?

Larry N. McKinnis Manager, Mechanical/Structural Subsystems Department
Phone 734-52-33601 Fax 734-52-30106
Text pager, lmckinni, Mail Drop 214, cube W219-B ATNPC
Nationwide Pager 888-218-1689 Livonia Michigan 48150

-----Original Message-----
From: Antrim, William (W.R.)
Sent: Monday, September 11, 2000 3:23 AM
To: Dover, Harry (H.); Xu, Yehong (Y.)
Cc: Landes, Stephen (S.L.); Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.)
Subject: TR: Transmission Pull out of Park Efforts

Yes, 5R55E and 5R55W are tested with the same loads.

William R. Antrim
5R55W Product Launch Leader
Bordeaux Transmission Plant
Ph. +33-556-95-4639 (7394639 Inside Ford)
Fax +33-556-95-4321 (7394332 inside Ford)

-----Message d'origine-----
De: McIntosh, Bruce (B.J.)
Date: lundi 11 septembre 2000 08:43
À: Antrim, William (W.R.)
Objet: RE: Transmission Pull out of Park Efforts

Bill,

Yes, we use 500 Nm of load in both directions, same as 5R55W.

-----Message d'origine-----
De: Antrim, William (W.R.)
Date: lundi 11 septembre 2000 08:09
À: McIntosh, Bruce (B.J.)
Objet: TR: Transmission Pull out of Park Efforts

Bruce,

Do we use the same 500 Nm output shaft load for the 5R55E, same as 5R55W?

William R. Antrim
5R55W Product Launch Leader
Bordeaux Transmission Plant
Ph. +33-556-95-4639 (7394639 Inside Ford)
Fax +33-556-95-4321 (7394332 inside Ford)

-----Message d'origine-----
De: Dover, Harry (H.)
Date: dimanche 10 septembre 2000 18:01
À: Antrim, William (W.R.)
Cc: Landes, Stephen (S.L.)
Objet: Transmission Pull out of Park Efforts

Goodmorning William! Today we were looking at some data that you had supplied to Larry McKinnis for Pull out of Park loads 5r55e and 5r55w.

The question came up as to the torque load applied to the output shaft. The difference in pull out load is significant enough to wonder whether or not they were taken for the same torque. Would you please confirm? Thanks!

Levine, Julie (J.A.)

From: Von Foerster, Steve (S.)
Sent: Monday, June 26, 2000 4:57 PM
To: Levine, Julie (J.A.); Brohl, Jerry (G.G.); Study, Alan (A.L.)
Subject: FW: U152 Steering Column

FYI

-----Original Message-----
From: Stevens, Anne (A.)
Sent: Monday, June 26, 2000 9:04 AM
To: Broadfield, Paul (P.A.); Bedi, Gurminder (G.S.); Rushwin, Shamel (S.T.)
Cc: Davis, Tim (T.P.); Maitland, Stuart/Chuck (S.); Von Foerster, Steve (S.); Claudepierre, Dale (D.); Stevens, Anne (A.); Womac, Bob (R.J.)
Subject: U152 Steering Column

I met with Steve Von Foerster and the Visteon representatives from the Steering Column Team to assess the current risk to the U-152 program.

Summary from today's meeting is as follows:

- Commitments made to Steve early June - DV testing completed by 6/30, production tooled parts for FEU and PSW 1 week late to IB, will not be met.
- Current status can not be fully assessed at this point, however outlook is that DV testing will not be completed till end August. Production tooled parts and PSW TBD. Implications of the current design status is that FEU vehicles WILL NOT BE SALEABLE. There is also risk that IB's may not be saleable, pending on problem resolution and testing outcome.
- Biggest area of concern is the Tilt Mechanism Performance and the reliability curve with the design. The team will be prepared to meet with Tim Davis on Friday to review reliability data and formulate projection.
- There are other open DV issues including ingress/egress testing, ignition actuation failure and shift system fatigue.
- I have concerns over the engineering robustness/process capability on the brake shift interlock malfunctions. The team will conduct an in-depth review with STA to assess capability of Indianapolis and the supply base to insure 100% compliance of production to meet corporate requirements.

Status will be reviewed again prior to our next launch review next month.

PE09-020 1061

From: Thornton, James (J.W.)
Sent: Monday, November 08, 2004 10:14 AM
To: Snider, Tim (T.O.)
Subject: FW: WARRANTY PARTS RETURN 5-23-02.xls
Attachments: WARRANTY PARTS RETURN 5-23-02.xls

From back in March.
I will get the last version from Admiral.

Regards,
Jim Thornton
(313) 845-9249
Ford Motor Company Steering

-----Original Message-----
From: Guillory, Kasandra (K.N.)
Sent: Monday, March 01, 2004 9:50 AM
To: Thornton, James (J.W.)
Subject: FW: WARRANTY PARTS RETURN 5-23-02.xls

fyi...

-----Original Message-----
From: Brandy Clemens [mailto:bclemens@admiral-liv.net]
Sent: Monday, March 01, 2004 9:36 AM
To: Myron Carrier; Wayne Avers; Alan Johnston (E-mail); Porter, Alan (A.J.); Guillory, Kasandra (K.N.); Mohammad Azeem (E-mail)
Subject: WARRANTY PARTS RETURN 5-23-02.xls

Rev. Date: 01/27/04

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
1	Robberson Ford Sales Inc. 2100 E Third St Bend Or 97701	541-382-4521	1FMZU73E02Z	U152	12580	12/01/03	10/2/01	Caught in Reverse	Column	Yes	Dent, Burr on Swing arm	11319770	1
2	Jim Doyle Ford Inc. 3330 Delaware Ave Kenmore, NY 14217	716-875-6100	1FMZU72EX2U	U152	12100	12/09/03	10/17/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11335111	1
3	Ford of Westfield 99 Spring field Rd. Westfield, MA 01085	413-568-2000	1FMDU74EX2Z	U152	31153	12/10/03	3/22/01	Vehicle will not come out of park	Column	Yes	BSI plunger sticks in slot of casting with pressure on BSI ignition switch missing	81091582	
4	Carville Ford , Inc. 2686 Middle Country Rd. Center reach, NY 11720	631-585-5100	1FMDU73W42U	U152	20500	12/02/03	1/14/02	Will not shift into park	Column	Yes	BSI ok wear mark p-nut brk't stick in rev.	11464051	
5	Mullahey Ford 330 Traffic way Arroyo Grande, CA 93420		1FMDU65W22Z	U152	22245	12/05/03	11/20/01	Ignition key will not come out of tumbler, shifter will not go into park	Column	Yes	BSI ok wear mark p-nut brk't stick in rev.	11427281	1
6	Perry Ford 12740 Poway Rd. Poway, CA 92064	858-748-1400	1FMZU62EX2Z	U152	29607	11/26/03	12/17/01	Key is stuck in ignition, will not come out	Column	Yes	BSI ok, damage to PD switch, BSI switch, casting at key cyl, insert plate removed	11320979	1
7	Holman Ford-Mount Laurel 1301 Route 73 Mount Laurel, NJ 080545100	609-866-0110	1FMZU73EX2U	U152	10191	12/04/03	10/16/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	81341445	1
8	John Elway Ford Boulder 3200 28th Street Boulder, CO 80301	303-939-8600	1FMDU73WXZ	U152	16803	12/05/03	9/20/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't stick in rev.	12703250	1
9	Shepard Bros., Inc. 20 Eastern Blvd. Canandaigua, NY 14424	585-394-1000	1FMZU73E82U	U152	22234	10/07/03	3/26/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev., insert plate missing, p-nut brk't bolt not in place	12572860	1
10	Jack Demmer Ford, Inc. 37300 Michigan Ave. Wayne, MI 48184		1FMZU62E12Z	U152	19359	12/30/03	2/12/02	Shifter stuck going from drive to park, hang up in reverse	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	12514166	
11	North Bros. Ford, Inc. 33300 Ford Rd Westland, MI 48185	734-421-1300	1FMZU73K92Z	U152	26491	12/31/03	6/4/02	Sticks when going in park, between reverse and park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	12653552	
12	R E Barber Ford 3440 East Main St Ventura, CA 93003	805-642-6701	1FMDU63W6Z	U152	24824	12/08/03	9/7/01	gearshift lever hard to move and popping like changing detents. Hard to get back into park, inter.	Column	Yes	BSI ok, wear mark p-nut brk't stick in rev.	11295081	1
13	Don Sanderson Ford, Inc. 6400 N 51st Ave Glendale, AZ 85301	623-842-8685	1FMDU73E02Z	U152	35850	12/06/03	7/26/01	Shifter came apart, and linkage is disconnected at trans	Column	Yes	BSI ok, shift socket broken, small rad. On shift socket	11237323	1
14	Albany Ford Inc. 718 San Pablo Ave Albany, CA 94706	510-528-1244	1FMZU73E32Z	U152	51025	11/25/03	11/6/01	Shifter will not go into park and the keys cannot be removed	Column	Yes	BSI ok, wear mark on p-nut brk't sticks in rev.	11412091	

Probable R to Park iss

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	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
15	Don Sanderson Ford, Inc. 6400 N 51st Ave Glendale, AZ 85301	623-842-8685	1FMZU63K92Z	U152	13059	12/01/03	8/21/02	hard to shift out of park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12742960	1
16	Lance Cunningham Ford 4101 Clinton Highway Knoxville, TN 37912	865-687-1400	1FMZU72E02U	U152	15214	12/09/03	2/12/01	Gear shifter fell off in hand front column	Column	Yes	BSI ok shift socket broken, small rad. On shift socket	11026364	1
17	Allan Vigil Ford of Fayetteville 275 North Glynn St. Fayetteville, GA 3021400621	770-460-9545	1FMZU6W72U	U152	35858	11/28/03	1/10/02	Hard to get into park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev. sometimes	12479132	1
18	Gene Evans Team Ford 4355 Jonesboro Rd Union City, GA 30291	770-964-9801	1FMZU62K53U	U152	31816	12/12/03	10/30/02	Gear shift sticks between park and reverse	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12838786	
19	Lake City Ford Lincoln-Mercury 315 Clayton Ave. Coeur D'Alene, ID 83815	208-664-9211	1FMZU75W8Z	U152	30974	12/08/03	11/21/01	Have to wiggle shift handle and force into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11405523	
20	Kelly Ford 776 Magnolia Ave. Melbourne, FL 32935	321-254-4283	1FMZU62K92U	U152	8884	12/02/03	6/27/02	Will not shift from drive to park, when hot after driving	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12692505	1
21	Tri-County Ford Mercury, Inc. 5101 West Highway 146 Buckner, KY 40010	502-241-7333	1FMZU73E72U	U152	40468	11/24/03	3/22/01	Ignition is hard to turn	Column	Yes	BSI ok	81092392	1
22	Lamoureux Ford, Inc. 366 Main St. East Brookfield, MA 01515	508-867-5000	1FMDU74E52U	U152	50022	11/14/03	8/10/01	Hard to get into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. sometimes	11250673	
23	Balise Ford of Wilbraham 1979 Boston Rd. Wilbraham, MA 01095		1FMZU72E82U	U152	32497	12/04/03	10/25/01	Shifter catches every time it is shifted from drive into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11013029	1
24	Ozark Ford Lincoln Mercury 172 N. Hwy 5 Camdenton, MO 65020		1FMZU74E02Z	U152	25783	12/09/03	9/5/01	Gear shifter loose	Column	Yes	BSI ok slight play in shift socket (press)	11294405	1
25	Simi Valley Ford 2440 First Street Simi Valley, CA 93065		1FMZU63W82Z	U152	33434	12/08/03	8/27/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11275385	1
26	Plaza Ford, Lincoln-Mercury, Inc. 98 New Highway 64 West Lexington, NC 27292	336-243-2731	1FMZU73W22U	U152	31711	12/11/03	5/30/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in reverse sometimes	1266303	1
27	Alexander Ford-Mercury, Inc. 1129 Murfreesboro Rd. Franklin, TN 37064	615-794-4585	1FMDU73W82U	U152	30437	12/08/03	11/12/01	Gear shifter will not go into park when driving	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11415459	
28	Mtn. View Ford, Inc. 301 East Twentieth St. Chattanooga, TN 37408	423-756-1331	1FMDU73EX2U	U152	36911	12/05/03	1/31/02	Gear shifter is hanging up between reverse and park	Column	Yes	BSI ok	12500385	

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
29	Courtesy Ford 8252 S Broadway Littleton, CO 80122	303-797-3673	1FMDU74E32Z	U152	31792	12/10/03	3/22/01	Trans shifter won't come out of park	Column	Yes	BSI ok, insert plate removed p-nut brk't bolt removed	11092155	1
30	West-Herr Ford, Inc. 5025 Camp Road Hamburg, NY 14075	716-649-5701	1FMZU73E72U	U152	31741	12/10/03	12/13/01	Key will not come out of ignition	Column	Yes	BSI ok	11421765	1
31	Towne Ford, Inc. 3535 Southwestern Blvd Orchard Park, NY 14127	716-662-6500	1FMZU73W23U	U152	14843	11/28/03	9/16/02	Shifts hard going into park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	12764113	1
32	Northport Ford, Inc. 6233 Jericho Turnpike Commack, NY 11725	631-499-6400	1FMZU72E92U	U152	23364	12/08/03	11/29/01	Shifter gets jammed between reverse and park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	1142874	
33	Albion Motors Ford-Mercury, Inc. P.O. Box 218 Albion, MI 49224-0218		1FMZU72E82U	U152	27416	11/12/02	2/9/01	Trouble with ignition switch	Column	Yes	BSI ok, small rad. On shift socket	12895848	
34	West-Herr Ford, Inc. 5025 Camp Road Hamburg, NY 14075	716-649-5701	1FMZU73EX2U	U152	20349	12/10/03	10/8/01	Shift lever broken	Column	Yes	BSI ok, BSI switch broken, shift socket broken	11333665	
35	Ripon Ford-Mercury, Inc. 1036 W Fond Du Lac St. Fond Du Lac, WI 54971		1FMPU16W83L	U222	15368	12/20/02	3/20/02	Brakes noisy, U222	Column	Yes	BSI ok, noisy, ignition switch missing, no delay on BSI	122005509	
36	Capistrano Ford 33949 Doheny Park Rd. San Juan Capistrano, CA 92675	949-240-7000	1FRMU17L23L	U222	105	03/07/03	4/26/02	Transmission trouble, U222	Column	Yes	BSI damaged, shift socket broken, no delay on BSI, U222	222020308	
37	Bill Collins Ford, Inc. 4220 Bardstown Rd. Louisville, KY 40218	502-459-9550	1FMZU75E32U	U152	11000	11/12/02	3/26/02	Steering Noisy	Column	Yes	BSI ok	11436998	
38	Glenn Bush Ford, Inc. Route 56 Apollo, PA 15613	724-478-4113	1FMPU16L63L	U222	8331	03/10/03	3/26/02	Steering/Handling and ride troubles	Column	Yes	BSI ok, no delay on BSI, U222	122007992	
39	Dick Edwards Ford Lincoln Merc. 7929 East Hwy #24 Manhattan, KS 66502		1FMPU18LX3L	U222	4929	01/20/03	10/7/02	Warning light on for air bag	Column	Yes	BSI ok, has delay, U222	222138058	1
40	Planet Ford 20403 I-45 North Spring, TX 77388		1FMRU15W83L	U222	25	01/20/03	11/27/02	Difficult to shift	Column	Yes	BSI broken, has delay, shift socket broken, U222, large rad., on shift socket	222497578	1
41	Haldeman Ford, Inc. 1741 Tilghman St. Allentown, PA 18104	610-776-7800	1FMDU73E92	U152	17439	12/09/03	9/118/01	Shifter must be put in neutral then park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	11309908	1
42	Best Ford Inc. 1901 N Mayfair rd. Wauwatosa, WI 53226	414-453-9785	1FMZU72EX2Z	U152	27881	12/09/03	9/5/01	Shifter is sticking when putting into gear	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev. sometimes	11293743	1
43	Al Long Ford, Inc. 13711 E 8 Mile Rd. Warren, Mi 48089	586-777-2700	1FMZU73K02U	U152	30035	12/10/03	6/21/02	Shifts hard going into park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	12692324	

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
44	East Ford, Inc. 3940 Highway 80 W Jackson, MS 39209	601-922-3311	1FMZU63E62U	U152	27141	12/09/03	2/12/02	Shifts hard going into park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	1251649	
45	Champion Ford Lincoln-Mercury 706 highway 74 East Rockingham, NC 28379	910-582-8383	1FMRU15W93L	U222	328	01/24/03	8/6/02	Engagement troubles	Column	Yes	BSI ok, shaft retaining clip missing, U222	222084192	
46	Miller Ford, Inc. 960 Kings Highway Fairfield, CT 06432	203-335-3185	1FMZU73W12U	U152	22914	12/03/03	6/3/02	Shifter handle is loose	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev., shaft retaining clip missing	12653113	
47	McCoy & Mills Ford 700 W Commonwealth Fullerton, CA 928321302	714-526-5501	1FMRU15W53L	U222	1969	03/06/03	6/20/02	Knock in steering	Column	Yes	BSI ok, has delay, U222	222063671	
48	Sutliff Capitol Ford 1000 Paxton St. SW Harrisburg, PA 17104		1FMZU75EX2U	U152	16304	12/08/03	8/6/01	Gear shift lever not aligned up with positions	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	11245437	1
49	Morris Ford-Mercury, Inc. 872 Saratoga Rd. Burnt Hills, NY 12019	518-3999188	1FMZU73E22Z	U152	32982	12/11/03	10/18/01	Gets stuck in reverse, will not go into park	Column	No	BSI ok, old BSI on new column, column never in auto	11785077	1
50	Echelon Ford, Inc. #4 South White Horse Pike Stratford, NJ 08084	856-627-8400	1FMZU73EX2U	U152	22319	12/09/03	2/27/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12536436	1
51	Ron Bortnick Ford, Inc. 5701 Crain Highway Upper Marlboro, MD 20772	301-627-5600	1FMDU75W32Z	U152	35233	12/26/03	9/26/01	Shifter hard to move gears	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11315075	1
52	Ray Seraphin Ford, Inc. 100 Windsor Ave Rockville, CT 06066	860-875-3369	1FMZU73K82U	U152	21347	12/03/03	7/17/02	Car won't shift out of park into gear	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. sometimes	12542590	1
53	Hill & Sanders Ford, Inc. 11250 Viers Mill Rd. Wheaton, MD 20902	301-929-8855	1FMDU73E22U	U152	35156	12/12/03	9/6/01	Hard to shift	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11283911	1
54	John Meegan Ford, Inc. Old Route 119 and 477 Mount Pleasant, PA 15666	724-547-3553	1FMZU75W72Z	U152	17989	12/29/03	10/17/01	Hard to put in park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11337784	
55	Autofair Ford, Inc. 1475 S Willow St. Manchester, NH 03103	603-625-2540	1FMZU72E02U	U152	30065	12/29/03	8/2/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11246698	
56	Pacifico Marple Ford 3015 West Chester Pike Broomall, PA 19008		1FMDU73E32Z	U152	6943	12/22/03	1/29/02	Key jamming in ignition	Column	Yes	BSI ok, ignition switch ok	12500767	1
57	Court Street Ford, Inc. 558 Latham Drive Bourbonnais, IL 60914	815-939-2600	1FMDU74EX2U	U152	27245	12/29/03	11/1/01	Key sticking in ignition	Column	Yes	BSI screw missing insert plate removed	11005816	
58	McCafferty Ford of Mechanicsburg 6320 Carlisle Pike Mechanicsburg, PA 17055		1FMZU73EX2U	U152	28000	11/14/03	6/18/01	C-S hard to get in park	Column	Yes	BSI ok wear mark p-nut brk't does not stick in rev.	11212006	

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59	Willey Ford-Bountiful 1800 South Main Bountiful, UT 84010		1FMZU73E72Z	U152	35984	12/12/03	1/7/02	Steering wheel has a lot of play in it	Column	Yes	Everything ok	128358333	1
60	Planet Ford, Inc. 2601 east Alex-Bell Road Centerville, OH 45459		1FMZU73W4Z	U152	11845	12/02/03	11/21/02	Key will not always turn in cylinder	Column	Yes	BSI ok, tried key cly. Ok (new), didn't have original key cly.	11559285	1
61	Kenosha Ford 8200-120th Ave. Kenosha, WI 53142	262-857-2134	1FMZU75E02Z	U152	25493	12/23/03	8/20/01	Shifter lever gets stuck	Column	Yes	BSI (removed) wear mark p-nut brk't	11255402	1
62	World of Ford Sales, Inc. 6129 Richmond Highway Alexandria, VA 22303	703-660-0450	1FMDU73E32U	U152	25082	12/26/03	12/14/01	Would not come out of park(shifter)	Column	Yes	BSI ok, column out of park, wear mark p-nut brk't sticks in rev.	11409586	1
63	Latham Motors, Inc. 637 Columbia street, Route 9R Latham, NY 12110	518-785-4161	1FMZU74E52Z	U152	35989	12/29/03	9/20/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in a rev.	11306847	1
64	Sunset Auto Company, Inc. 11700 Gravois Rd. St Louis, MO 63127		1FMZU62E92Z	U152	28955	12/09/03	1/25/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't	12495850	1
65	Fullerton Ford 1044 U.S. Route 22 East Somerville, NJ 08876	908-722-2500	1FMZU73K13U	U152	27525	01/02/04	9/4/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12757787	1
66	C Basil Ford, Inc. 1540 Walden Ave. Cheektowaga, NY 14225	716-897-3673	1FMZU72E02Z	U152	30790	10/13/03	9/19/01	Shifts hard going into park	Column	Yes	BSI ok shifts hard out of park	11310150	
67	Middlekauff Ford 4400 W Plano Parkway Plano, TX 75093	972-758-8035	1FMZU63K2Z	U152	35999	12/29/03	8/21/02	C-S hard to get in park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12749230	1
68	El Cajon Ford 1595 E Main El Cajon, CA 92021	619-579-8989	1FMZU62KX3Z	U152	4076	12/22/03	4/28/03	Buzzing noise in steering wheel	Column	Yes	BSI removed from column	11753149	1
69	North Central Ford 1819 North Central Expressway Richardson, TX 750803507		1FMZU64E62Z	U152	29292	12/30/03	12/20/01	Shifter catches and will not go into park with ignition off	Column	Yes	BSI ok wear mark on p-nut brk't sticks in rev.	11455261	
70	Sunset Ford 5440 Garden Grove Westminster, CA 926831898	714-372-4520	1FMZU63E12Z	U152	20915	02/11/03	2/7/02	Difficult to shift lever change gears	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12506159	1
71	Russell & Smith Ford, Inc. 3440 S Loop West Houston, TX 77025	713-663-4205	1FMZU63E02Z	U152	24730	12/04/03	3/19/01	Shifter won't come out of park	Column	Yes	BSI ok not column related	11086451	
72	Roy O'Brien, Inc. 22201 Nine Mile Rd St Clair Shores, MI 48080	586-776-7600	1FMZU63E02Z	U152	16492	12/8/03	2/12/02	Shifter is hard to get into park	Column	Yes	BSI ok light mark p-nut brk't does not stick in rev.	12500352	1

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73	Bill Brown Ford, Inc. 32222 Plymouth Rd Livonia, MI 48150	734-421-7116	1FMZU73E22Z	U152	35436	12/29/03	11/12/01	Gear shifter sticks when going from reverse to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev	11416353	
74	Towne Ford Sales 1601 El Camino Real Redwood City, CA 94063	650-366-5744	1FMDU73W52U	U152	18166	12/19/03	2/13/02	Shift levers bind	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12513801	
75	Greenway Ford, Inc. 9001 East Colonial Drive Orlando, FL 32817	407-249-3324	1FMZU63E12U	U152	42525	12/8/03	3/20/01	Shifter broken at column-advise	Column	Yes	BSI ok removed shift socket broken small rad. Shift socket	11086237	
76	Sioux Falls Ford 4101 West 41st St Sioux Falls, SD 57106	605-361-9601	1FMZU73E4U	U152	35275	12/12/03	9/13/01	Shifts hard going into park	Column	No	BSI ok no mark p-nut brk't, BSI switched Column never in auto	11759003	
77	Matthews Paoli Ford 100 West Lancaster Avenue Paoli, PA 19301		1FMZU73E32Z	U152	33512	12/5/03	1/25/02	Engine won't crank unless shift lever is moved slightly out of position	Column	Yes	BSI works insert plate removed	12496656	
78	Doug Stanley Ford 515 I-35E South De Soto, TX 75115	972-223-8050	1FMZU62K13Z	U152	16671	12/22/03	3/27/03	Shifter lever broke off and now will not come out of gear and key is stuck in ignition	Column	Yes	BSI works PDS switch broken	11532000	1
79	Willey Ford-Bountiful 1800 South Main Bountiful, UT 84010		1FMZU73E02U	U152	19704	12/18/03	3/8/02	Vehicle comes out of gear even when you don't press the brake pedal	Column	Yes	BSI ok	12550231	1
80	Columbia Ford Lincoln-Mercury 234 Route 6 Columbia, CT 06237	860-228-2886	1FMZU73K03U	U152	30395	12/26/03	8/21/02	Shifter binds going into park	Column	Yes	BSI ok found grease on plunger and p-nut brk't		1
81	Tower Ford, Inc. 124A South Middle Neck Rd Great Neck, NY 11021	516-466-6400	1FMZU73K32Z	U152	30419	12/11/03	8/1/02	Hard to put into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12705490	1
82	Litchfield Ford Route 202 Litchfield, CT 06759	860-567-4561	1FMZU74EX2Z	U152	35546	11/28/03	1/18/02	cust, states install SOP steering column parts	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12489722	1
83	Planet Ford 20403 I-45 North Spring, TX 77388		1FMZU64W22Z	U152	28081	12/19/03	12/12/01	Trans shifter won't go from drive to park without stopping in reverse after veh. Driven	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev. Shaft retainer off shaft not pressed into bearing(upper)	11448291	1
84	Marshal Mize Ford, Inc 5348 Hwy 153 Chattanooga, TN 37343	423-875-2058	1FMZU63K02U	U152	16421	12/23/03	8/2/02	Shifter will not return to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12721076	1
85	Clevenger Ford 701 North Main St Porterville, CA 93257	559-784-6000	1FMZU63E42Z	U152	23232	10/29/03	3/28/02	Gearshift hard to get out of park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12578882	1
86	Kelly Ford 776 Magnolia Ave. Melbourne, FL 32935	321-254-4283	1FMZU63W62U	U152	31520	12/30/03	11/2/01	Shift selector will not go into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11404611	
87	Friendly Ford, Inc. 3241 S Glenstone Springfield, MO 65804		1FMZU73W62Z	U152	33826	12/18/03	8/28/01	Will not shift into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11280885	1

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88	Ron Blackwell Ford, Inc. 2609 South Walton Boulevard Bentonville, AR 72712	479-273-9022	1FMZU74E02Z	U152	26168	12/19/03	7/26/01	Electrical accessory troubles	Column	Yes	BSI ok ignition switch ok	81234715	1
89	Freedom Ford, Inc. 24825 U.S. Highway 19 North Clearwater, FL 33763	727-797-6770	1FMDU64E62U	U152	35849	1/2/04	2/28/02	Has to pull gearshift forward to get into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12543543	1
90	World of Ford Sales, Inc. 6129 Richmond Highway Alexandria, VA 22303	703-660-0450	1FMZU73W32Z	U152	26275	1/2/04	3/26/03	Steering/handling and ride troubles	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12567293	1
91	Suburban Ford of Waterford, LL 5900 Highland Rd Waterford, MI 48327		1FMZU72E12U	U152	25797	12/29/03	12/11/01	Difficult to operate shift lever, change gears	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11428685	1
92	Perry Ford 12740 Poway Rd. Poway, CA 92064	858-748-1400	1FMZU72E6U	U152	8186	12/16/03	10/1/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11324465	1
93	Toms Ford, Inc. 200 State Hwy 35 Keyport, NJ 07735	732-264-1640	1FMZU73EX2U	U152	14966	12/18/03	9/17/01	Shifts hard going into park	Column	Yes	BSI ok no mark on p-nut brk't goes into park fine	11759647	1
94	Adams Ford Belton, Inc. 800 Quick Trip Way Belton, MO 64012		1FMZU73E42Z	U152	31390	12/29/03	12/14/01	Shifts hard going into park	Column	No	BSI switched column never in auto	11778791	
95	Smithtown Ford, Inc. 440 East Jericho Turnpike Smithtown, NY 117870865	631-265-2340	1FMDU73E92Z	U152	27569	1/5/04	8/20/01	Steering column/wheel squeak/rattle	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. can't remark on customer problem	11259749	
96	Parkway Motors 1010 North Main Cedar City, UT 84720	435-865-1502	1FMZU73EX2Z	U152	29008	10/28/03	11/8/01	Shifter hard to move	Column	Yes	BSI ok wear make p-nut brk't sticks in rev.	11415227	1
97	Koons Sterling Ford 46869 Harry Byrd Highway Sterling, VA 20164	703-444-5750	1FMZU73E22U	U152	35937	11/19/03	4/26/02	Hard to get gear shift out of park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12598460	1
98	Academy Ford Sales 13401 Washington Blvd. Laurel, MD 20707	301-419-2700	1FMDU74W52U	U152	34700	12/30/03	11/14/01	Gear shifter hangs up going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11424114	1
99	Academy Ford Sales 13401 Washington Blvd. Laurel, MD 20707	301-419-2700	1FMZU73E42U	U152	30280	12/29/03	4/3/02	Gear shifter seems to hang up in rev. when going from drive to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. sometimes	12579612	1
	Mike Ognibene Ford, Inc 5072 East Main Street Batavia, NY 14020		1FMZU73E62Z	U152	26082	1/26/04	2/13/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. column scraped	11033345	1
	McCafferty Ford of Mechanicsburg 6320 Carlisle Pike Mechanicsburg, PA 17055		1FMZU75K32U	U152	18000	1/23/04	5/23/02	Sticks in park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12646471	1

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	Cavalier Ford 1515 South Military Highway Chesapeake, VA 23320	757-424-1111	1FMZU72E92U[redacted]	U152	28793	1/26/04	9/4/01	C-S when putting vehicle into park you have to put the lever into neutral and try again	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11291224	1
	Simon Ford, Inc 401 North Main St Norwich, CT 06360	860-889-2608	1FMDU73E82Z[redacted]	U152	35925	12/12/03	1/7/02	Sometimes won't shift into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11405081	1
	Sam Pack's Five Star Ford 1635 I-35 East Carrollton, TX 75006	972-242-6415	1FMZU63E42Z[redacted]	U152	35215	1/29/04	12/10/01	Will not go back into park from drive	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11432030	1
	Marshall Ford 6200 Mayfield Road Mayfield Heights, OH 44124	440-449-1000	1FMZU72E12Z[redacted]	U152	26222	2/2/04	11/27/01	C-S when shifting from reverse or drive into park, shifter will not go into park unless shifter is put back into gear	Column	Yes	BSI ok wear mark p-nut brk't stick in rev sometimes column scraped	11435631	1
	El Cajon Ford 1595 E Main El Cajon, CA 92021	619-579-8989	1FMZU63E22Z[redacted]	U152	26174	11/22/04	11/28/01	Will not go into park all the way	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11435652	1
	Mullinax Ford East 28825 Euclid Ave Wickliffe, OH 44092	440-585-8000	1FMZU72E62Z[redacted]	U152	26279	1/26/04	3/1/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12543631	1
	Bob Turner's Ford Country 1101 Montano N.E. Albuquerque, NM 871074942	505-224-1234	1FMZU62K73Z[redacted]	U152	31810	2/2/04	1/10/03	Trans is hard or won't shift in or out of reverse	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev BSI bolts missing	12918014	1
	Sunbury Motor Company 943 North Fourth Street Sunbury, PA 17801	570-286-7746	1FMZU74W12U[redacted]	U152	23624	1/15/04	8/29/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11288167	1
	Sycamore Auto Center, Inc 1370 DeKalb Ave Sycamore, IL 60178	815-895-4585	1FMDU74E92Z[redacted]	U152	27421	1/27/04	8/2/01	Sticks going back into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11247165	1
	Toms Ford, Inc. 200 State Hwy 35 Keyport, NJ 07735	732-264-1640	1FMDU75W42U[redacted]	U152	23256	1/16/04	2/26/02	Shifter will not go into park at times	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	122002843	1
	McDaniel Ford 430-440 Plainview Rd Hicksville, NY 11801	516-681-9006	1FMDU73E82U[redacted]	U152	40097	2/2/04	8/3/01	Hard to shift gears	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11249194	1
	Franklin Ford, Inc 4910 Sylva Rd Franklin, NC 287346775		1FMFU18L53L[redacted]	U222	11911	1/5/04	10/5/02	Difficult to operate shift lever, change gears hard to get out of park	Column	Yes	BSI ok	222138002	
	Kenny Ross Ford South, Inc 3200 Library Road Pittsburgh, PA 15234		1FMZU72E32U[redacted]	U152	21238	1/30/04	9/10/01	Shifter gets stuck going into rev., when going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11296766	1
	Rainbow Ford Lincoln-Mercury 6980 Niagara Falls Blvd Niagara Falls, NY 14304	716-693-1400	1FMZU73E92Z[redacted]	U152	26789	1/15/04	12/6/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11434972	1

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	Don Davis Ford, Inc 633 N Hwy 360 Arlington, TX 76011	817-261-4261	1FMRU15WX3L	U222	26980	2/2/04	4/22/04	Clicking noise coming from steering column area when pressing the brakes	Column	Yes	BSI cycles ok no time delay	BSI ONLY	
	Northland Lincoln-Mercury 20839 Route 19 North Cranberry Township, PA 16066		1FMZU72E32Z	U152	26875	2/2/04	8/13/01	Steering/Handling and ride troubles	Column	Yes	Shift socket broken small rad.	11259340	
	Liberty Ford Lincoln Mercury 4215 east liberty Ave Vermillion, OH 44089	440-967-6191	1FMZU73E92Z	U152	39503	2/4/04	9/19/01	Ignition key will not come out..key is stuck	Column	Yes	PDS switch broken off insert plate	11311607	
	Irwin Lincoln Mercury Sales& Freehold Circle Rte 7 & 33 Freehold, NJ 077280008	732-462-1818	1FMZU73K8UD	U152	18000	1/23/04	6/18/02	Shifter binds	Column	Yes	BSI ok wear mark p-nut brk't stick in rev column scraped	12676269	
	Healey Ford of Ansonia, Inc 500 Main Street Ansonia, CT 06401	203-732-5000	1FMZU73KX2U	U152	11271	1/20/04	6/3/02	Shifts rough	Column	Yes	BSI ok shifts fine from park wear mark p-nut brk't sticks in rev column scraped	12653954	
	Liberty Ford Lincoln Mercury 4215 east liberty Ave Vermillion, OH 44089	440-967-6191	11FMZU73E62Z	U152	27240	1/28/04	12/20/01	Hard to get out of park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11460902	
	Maplecrest Lincoln-Mercury, Inc 2800 Springfield Ave Union, NJ 07088		1FMZU72E52U	U152	24941	11/15/03	6/15/01	Veh. Will not come out of park	Column	Yes	BSI missing clock spring brk't loose shaft retainer missing	11754940	
	Leif Johnson Ford 501 E Koenig Lane Austin, TX 78751	512-454-3767	1FMZU63E42Z	U152	15250	2/3/04	2/28/02	Gear shifter sticks when going from reverse to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12536273	
	Friendly Ford, Inc 2800 N Telegraph Monroe, MI 48162	734-243-6000	1FMZU73K72U	U152	20974	1/26/04	6/24/02	Gear shifter sticks halfway in park from drive	Column	Yes	BSI ok wear mark p-nut brk't stick in rev column scraped	12687210	
	Pearson Ford 4300 El Cajon Blvd San Diego, CA 92105	619-521-2480	1FMZU74W42Z	U152	13419	2/4/04	6/4/02	At times when in drive will not shift into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12664383	
	Noble Ford of Newton, Inc 3020 First Ave. East Newton, IA 50208		1FMZU73E12Z	U152	29226	12/4/03	2/19/02	Will not shift out of park	Column	Yes	BSI ok shifts out of park ok wear mark p-nut brk't sticks in rev column scraped	12527622	
	All American Ford 243 North Magnolia Drive Tallahassee, FL 32301		1FMDU64W32U	U152	26574	1/26/04	11/1/01	Shifter sticks when going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11422781	
	Planet Ford 20403 I-45 North Spring, TX 77388		1FMZU63E62Z	U152	21906	1/6/04	1/24/02	Trans shifter hard to get into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12483903	
	Red Bluff Ford-Mercury, Inc 2950 Main Street Red bluff, CA 96080	530-527-2816	1FMPU16L83L	U222	32814	1/28/04	3/7/02	Can not get vehicle out of park	Column	Yes	BSI ok shifter comes out of park	122002510	

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
	Brighton Ford-Mercury, Inc 8240 W Grand River Brighton, MI 48114	810-227-1171	1FMZU75E52Z	U152	34868	2/2/04	8/15/01	C-S makes a clunk when going into park from steering column area	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11268658	
	Metro Ford 1651 New State Highway Rayham, MA 02767		1FMZU73W02Z	U152	29502	1/19/04	10/30/01	C-S shifter inop	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11401832	
	Byerly Ford, Inc 4041 Dixie Hwy Louisville, KY 40216	502-448-1661	1FMZU73E4U	U152	30162	1/29/04	10/15/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11337541	
	Sebring Ford Lincoln Mercury 3201 U.S. 27 South Sebring, FL 33870		1FMZU65E92Z	U152	35882	2/2/04	11/20/01	Hard to put into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12530913	
	Hayward Ford 25501 Mission Blvd Hayward, CA 94544	510-881-1200	1FMPU17L03L	U222	7031	1/19/04	2/11/03	C-S when moving shifter from park to drive the shifter does not lock into drive	Column	Yes	BSI ok shift socket loose	223252700	
	Port Angeles ford-Lincoln-Mercury 1527 East Front Street Port Angeles, WA 98362		1FMZU73EX2U	U152	21129	1/28/04	4/26/02	Will not go into park after driving in gear	Column	Yes	BSI works BSI screws loose wear mark p-nut brk't sticks in rev column scraped	12609242	
	Mock's Ford Sales 913 S E Sixth St Grants Pass, OR 97526	541-476-6656	1FMZU72K72Z	U152	11870	1/5/04	8/22/02	Vehicle at times won't shift into park	Column	No	BSI ok p-nut brk't ok column never in auto	11758864	
	Ray Whitfield Ford Inc 10725 S Telegraph Road Taylor, MI 48180	313-291-0379	1FMZU72K92Z	U152	18205	1/21/04	7/15/02	Difficult to put into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12677765	
	Dick Smith Ford, Inc 9505 E 350 Hwy Raytown, MO 64133		1FMZU73K43Z	U152	13620	1/9/04	10/10/02	Steering column clinks when turning	Column	Yes	BSI ok shaft turns ok	11845888	
	Ramey Ford Lincoln Mercury 615 North Eisenhower Drive Beckley, WV 25801		1FMZU72E32U	U152	14501	1/20/04	1/31/02	Gets hung up in rev when trying to go into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12495426	
	Geo M Yocum, Inc 323 East Main Street Lansdale, PA 19446	215-855-1153	1FMDU73E12Z	U152	29680	1/29/04	10/29/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11402149	
	Mike Finnin Ford, L.L.C. 3600 Dodge Street Dubuque, IA 52003	563-556-1010	1FMZU73E12U	U152	32893	12/22/03	3/26/02	Shifter seems to get caught between R and P	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12574214	
	Marshall Ford 6200 Mayfield Road Mayfield Heights, OH 44124	440-449-1000	1FMFU16L13L	U222	16323	2/9/004	10/16/02	Engine will not start, no crank, dash board light comes on	Column	Yes	Unable to test BSI (in pieces)	BSI only	
	Santa Margarita Ford 30031 Santa Margarita Parkway Rancho Santa Margari, CA 92688	949-888-4348	1FMRU15W23L	U222	9588	2/12/04	1/15/03	Squeak in steering column	Column	Yes	BSI ok	222220777	

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
	Mac Haik Ford 10333 Katy Freeway Houston, TX 77024	713-932-5065	1FMDU64W12Z[redacted]	U152	43207	1/19/04	7/30/01	Trans binds when going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11238298	
	Tom Ford, Inc 98 Walker's Brook Drive Reading, MA 01867	617-944-7760	1FMDU85W73U[redacted]	U152	28681	1/27/04	11/4/02	Shifter will not come out of park	Column	Yes	BSI ok shift socket broken	12893645	
	J&S Ford, Inc 315 Clendenny Ave @ Route 440 Jersey City, NJ 07304		1FMZU72E52U[redacted]	U152	17787	2/4/04	4/29/02	Shifter gets stuck in reverse from drive to park, but in reverse goes right into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12613802	
	Michael Stead's Martin Ford 619 Francisco Blvd San Rafael, CA 94901		1FMFU18L93L[redacted]	U222	12255	1/27/04	9/7/02	Whine in steering wheel when turning it sound's like it's coming from the column	Column	Yes	BSI ok	222112596	
	Ford of Walla Walla, Inc 11 N Colville Walla Walla, WA 99362		1FMZU74E52U[redacted]	U152	28039	2/2/04	9/10/01	Shifter catches hard to get into park	Column	No	BSI ok column never in auto	11846546	
	Country Ford Limited 210 Gardiners Ave Levitton, NY 11756	516-735-7406	1FMZU73K53Z[redacted]	U152	4986	2/3/04	1/23/03	C-S shifter does not lock into place	Column	Yes	BSI plunger sticks park det-switch bent BSI switch broken	13939711	
	Sprint Ford, Inc 4402 Ann Arbor Road Dundee, MI 48131		1FMZU72E72Z[redacted]	U152	27925	1/19/04	3/7/02	Transmission troubles	Column	Yes	BSI ok wear mark p-nut brk't column scraped	12542652	
	Lithia Ford of Boise 8853 West Fairway Avenue Boise, ID 83704		1FMZU73E12Z[redacted]	U152	34043	1/14/04	11/8/01	Shifter gets stuck from drive to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11415614	

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P

11:30

12 samples < 6 - 20 lbs / 6 - 16 lbs → Belleville clamp load low

Start tomorrow [free run nut, fine thread, locktite → bolts
bounce in and out of non-linear section]

- 10/13 → casting does not include

10/9 — removing mat'l off of teeth side irregular can lube wear

2 ~~single~~ cavity tool 10/23 fixed

~~[illegible]~~ Feb 1 fixed

PV_2 - redo shift sys

PV_1 → dry lube (14x8500 cycles)

IB → PV_2 → shift system (oct 13 - 11/27) PSW

- IB Build
- test 46 run
- clamp study
- released supplies capable
- test 28

1.5mm ⇒ 4.10°

1.0mm ⇒ 5.24°

4.79°

1.25mm ⇒ 4.70

1.4±.15

.69°

4.79 - 4.10 = .69°

4.10

4.4

R N D

.30

East Entrance 183.

92-375-5183

Drive & Park before rolls

① Neutral

TURN KEY ON

- N→D onto rolls
- put back in N
- safety goes off
  - eg off key on
  - Park test
  - 1, 2, D
    Computer
  - key on w/ eg on
    - 60mph
      - shift into N for coast down
      - back in D for steady idle
      - put in R (reverse lights check)
      - back in D over rolls
        push O/D button & cruise

① Max D→N column travel w/ ID max
Min D→N column travel w/ ID min

Measurements w/ max/min
↳ col for travel
→ rooster comb
→ mis adj (VO)
→ lash cable

(Thurs Noon)

② Same measurements after cold ~~[illegible]~~ chambers on vehicle dyn ~~[illegible]~~ fcn of cable — timing TBD

S:30

~~③ cut (Thurs Noon)~~

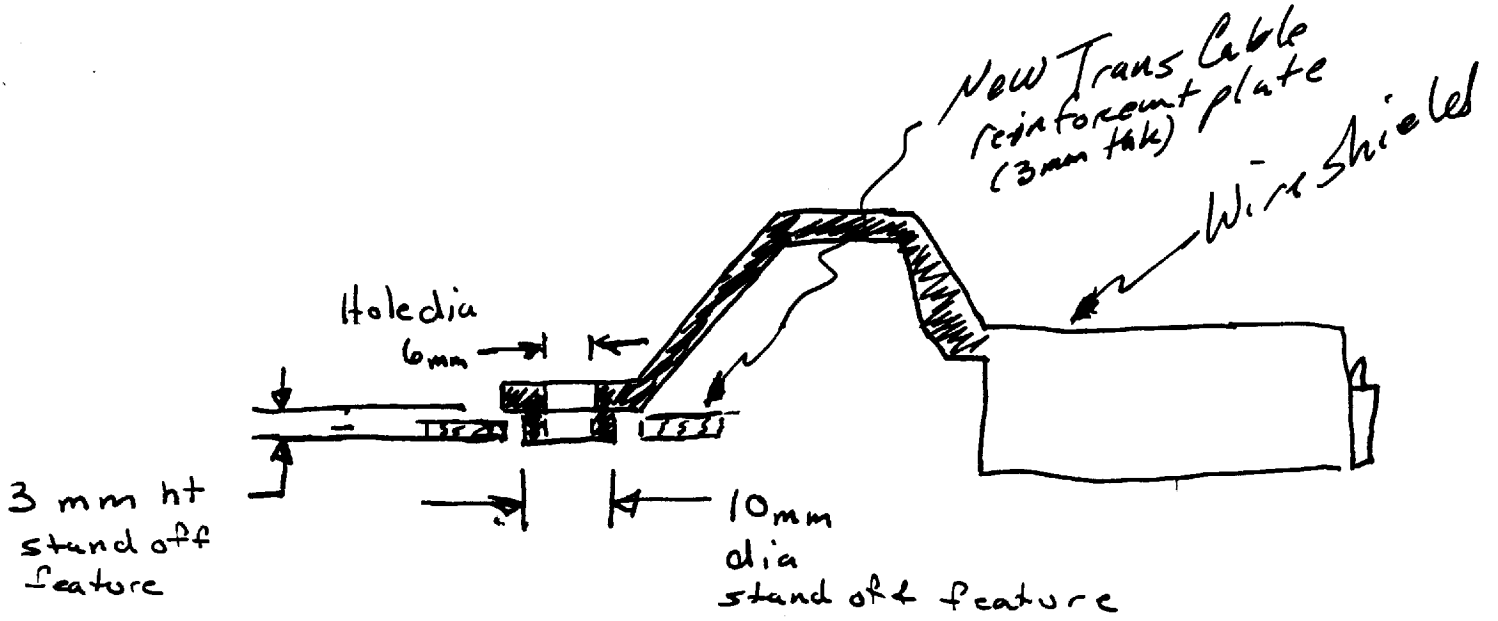
③ shift wear (10 days)

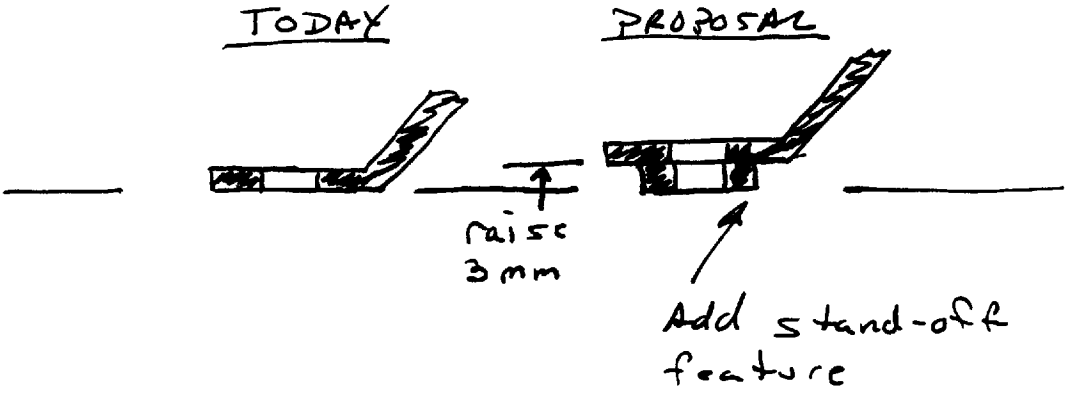
~~⑤ welded surface - confirm~~
300°F

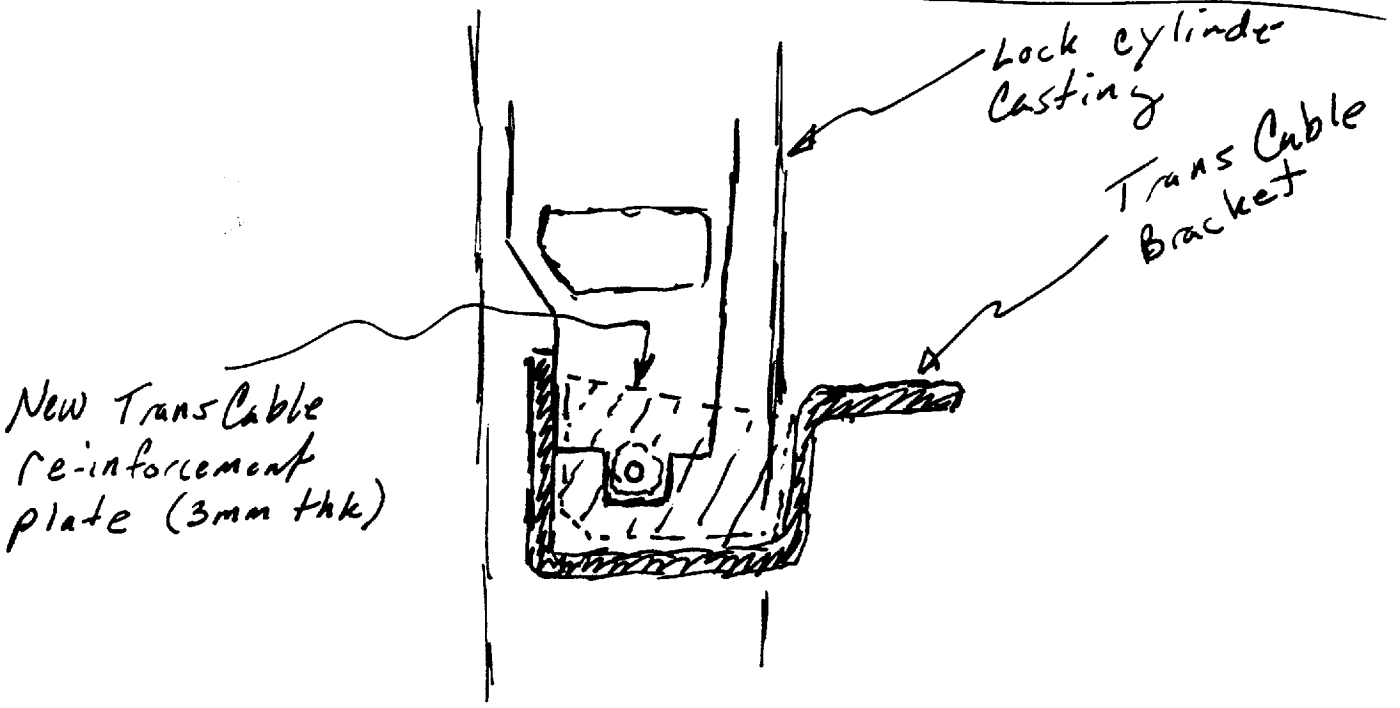
how not in tig welding?

why fix is robust?

steal 6 start testing


New Trans Cable reinforcement plate (3mm thk)
Wire Shield
Hole dia 6mm
3 mm ht stand off feature
10mm dia stand off feature


TODAY
PROPOSAL
raise 3mm
Add stand-off feature

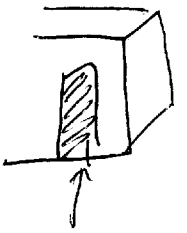

Lock cylinder Casting
Trans Cable Bracket
New Trans Cable re-inforcement plate (3mm thk)

PE09-020 1081

NIL DISCUSSION

① TEST WITHOUT GREASE – TEST #46

② aircraft industry grease



80K

>200K

(*) ③ for fine thread both free running & torque prevailing

(*) ④ 426 finish – verify bolt & nut S430 S2 (not 436)

⑤ control plan detailed reviews for CC, SC data – are they meeting supplier roadshow

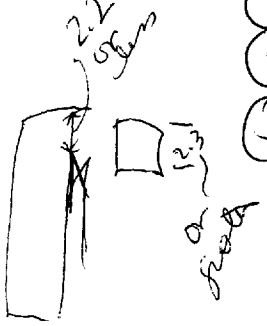
⑥ Admiral in Virginia – add NK or Hurley 2

IGNITION SWITCH

HOUSING 2.4 - 2.5
BAR

2.21 WORST CASE

SWITCH:



1. MALTA SEND IN "A" ONLY — Mar 1 check capacity 5 months
2. MALTA LOT CHECK FOR NO-GO w/ 2.2mm
3. ADMIRAL 100% CHECK FOR NO-GO w/ 2.2mm & apply green dot

HOUSING:

use certain 3.0mm width gage block

1. CONTECH CHECK w/ ~~[illegible]~~ 100% NO GO @ 2.~~25~~ 30 MIN & apply green dot
2. ADMIRAL 100% check w/ no-go @ 2.~~25~~ 30 mm & second dot
3. CONTECH CHECK w/ ~~[illegible]~~ GO GAGE FOR OPENING - CERTAIN WIDTH & HT
4. Admiral 100% check for 1st 5000 w/ GO GAGE FOR OPENING - CERTAIN WIDTH & HT

ASSY: 1) 3 dots all green
2) fcnl min lock cyl travel

SWITCH -

BLUE NO GO 2.28 - 1%
GREEN NO GO 2.18 - 98%
YELLOW NO GO 2.08 - 1%
} 50%
RED - GREATER OR = 2.28 } 50%
↳ WAIT FOR MARCH

HOUSING -

9% BLUE 2.35 NO GO
90% GREEN 2.25 NO GO
1% YELLOW 2.15 NO GO

PE09-020 1082

JFENSTER STA

5:20

Quality Issues Seen in Past (recent past)

lever
1 - ~~TMA~~ Locking lever handle (at end) - substrate plastic
2 - Locking lever stamping - shape
3 - clocking orientation
4 - overmold → quality
5 - tig welding
6 - flatness of cams ||

mag casting
1 - switch retention
2 - ||, taper
3 - flash on clamp surface
4 - oval size
5 - shift system post position
6 - wiring harness holes
7 - bore diam
8 - burrs on lock pawl
9 - slider bore finish
~~10 - taper~~ 10 - position of BSI slot

impact brkts
1 - taper, ||, surface finish on machined surfaces
2 - flash on inside chicken legs
3 - chamfer on machined surfaces ovals
4 - distortion after rivot

clockspring brkt - bending at Indy

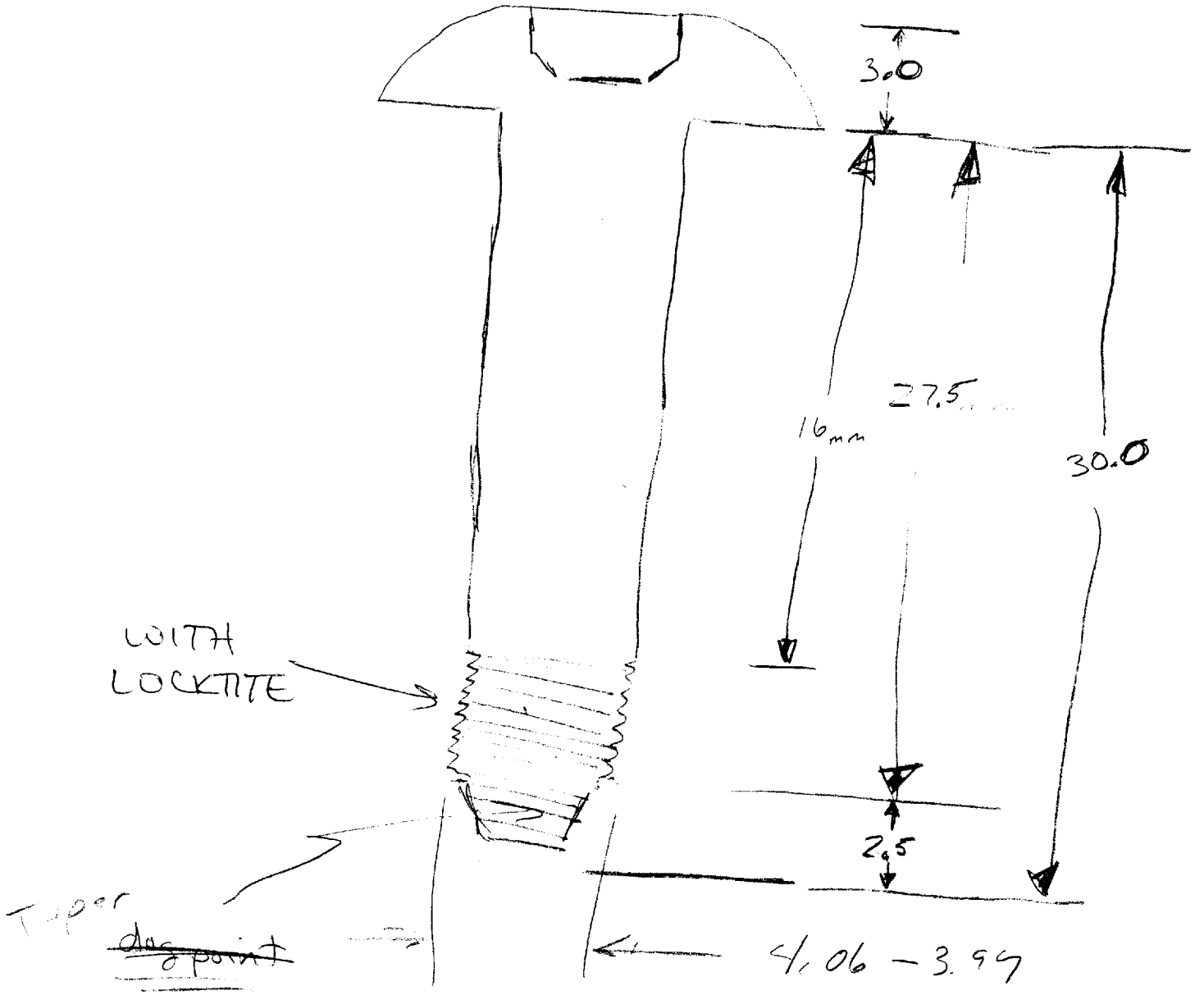
swing arm - dimensions & peanut opening relative position

shift socket - outside diam →

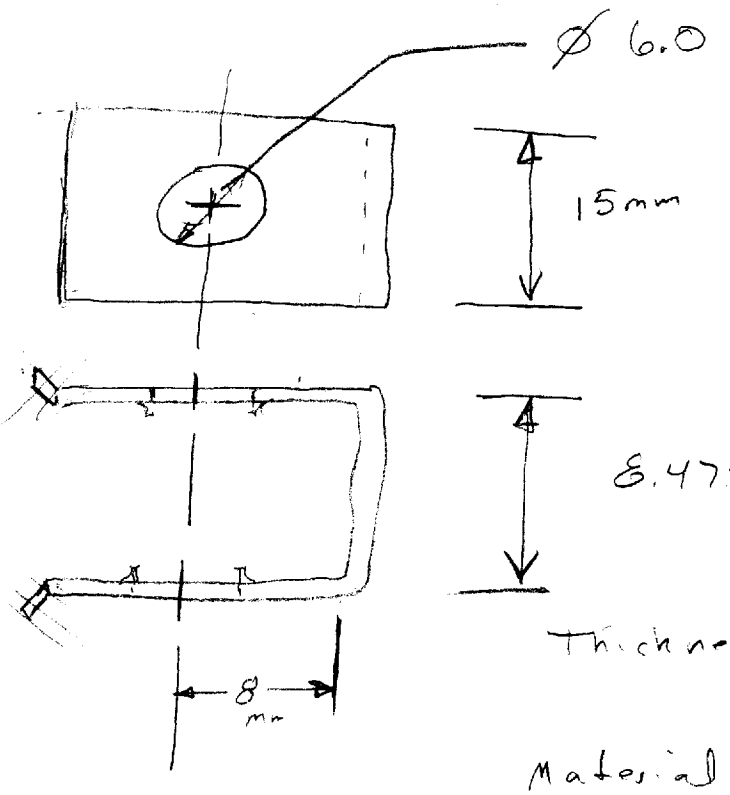
Sweepline - 100	[illegible] 2 cavity	[illegible] single cavity
10/9/00	10/23/00	2/1/01
1 - Remove mat'l off of teeth side (machine) ∴ irregular can lobe wear	fixed	fixed
2 - flash on ~~drive~~ side on psgr side ∴ wear on banana bsng	~~fixed~~ post-op to remove	fixed
3 - telescope slot is oversized due to trim die ∴ tilt retainer press fit is off (modify tilt retainer)	fixed	fixed
4 - ignition switch tab loose ∴ key chime sort & redundant feature tie strap	snap ring	fixed
5 - shift system post position 100% check ∴ shift sys travel swap swing arm to make up cliff @ Admiral	"	fixed
6 - burrs in lock panel ∴ don't pass Fmvss - hand de-burr		fixed
7 - position of BSI slot		

To: Bob Blaink
(810) 794-0629

Internal Torx Pan Head



DAN VILLAR



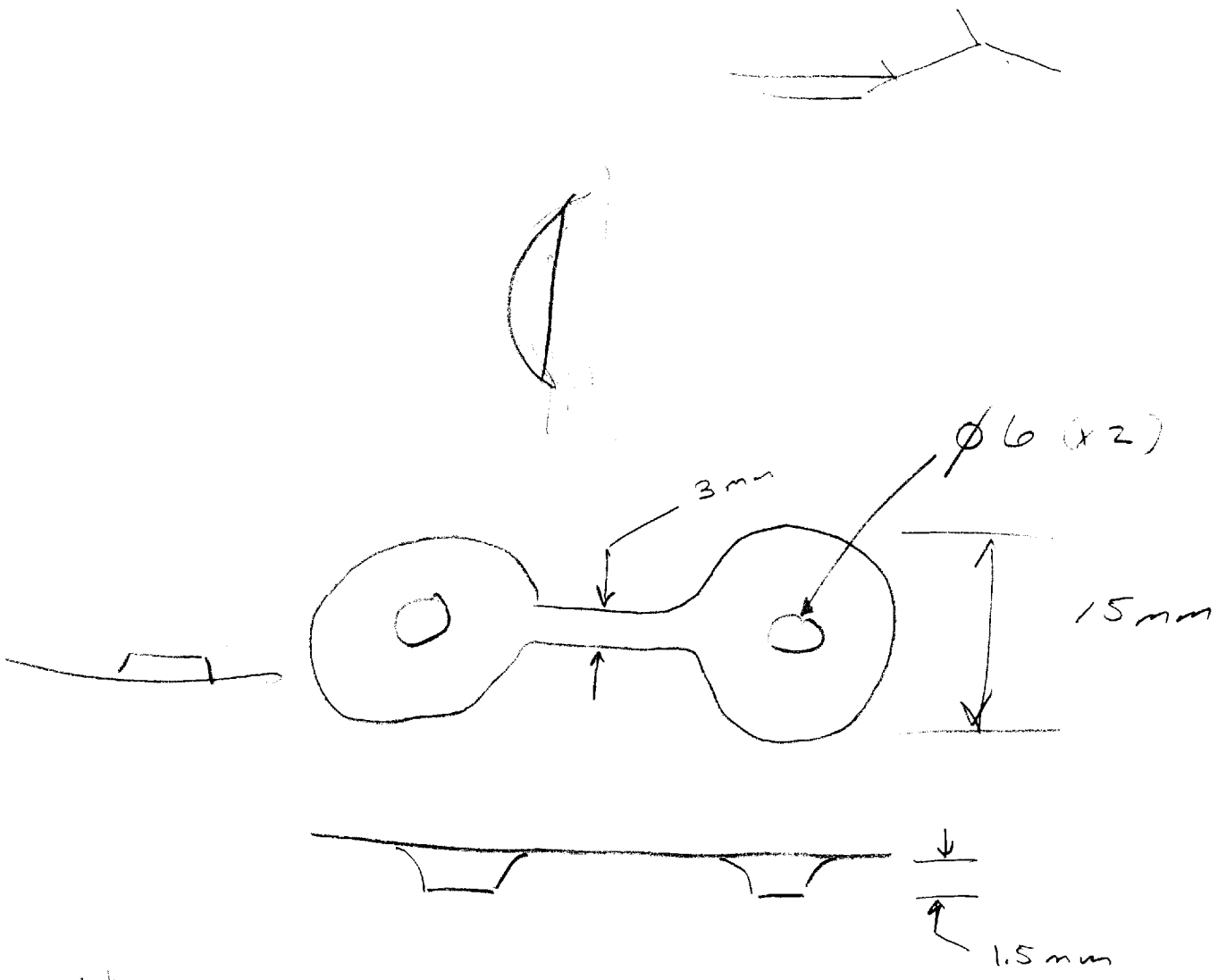
Thickness: 0.5 ± 0.025 mm

Material: Mild steel Teflon coated supplied by NORTON

Hardness: R15N 89 min

FAX: 517-592-4868
SHERI ICEMETER

FROM: JULIE LEVINE
FORD MO CO
CELL: 502-664-6146



FAX: 917-592-4663
SHERI KEMETER

FROM: JULIE LEVINE

From: Terri Bateman [tbateman@drbn006.dearborn.ford.com]
Sent: Thursday, March 02, 2000 3:19 PM
To: jbrazin@drbn006.dearborn.ford.com; cwaclaws@drbn006.dearborn.ford.com; yxu1 @drbn006.dearborn.ford.com; rperri@mail.ford.com; dhildebr@mail.ford.com; hdover@mail.ford.com
Cc: rdeinzer@mail.ford.com; rsee1@drbn006.dearborn.ford.com; lhart@drbn006.dearborn.ford.com; jlevine@mail.ford.com
Subject: LAP Issue

FYI - We have an issue with a transmission at LAP. LAP is questioning whether the two vehicles they have built at the plant have the correct minimum Park lock angle. When a trans. is shifted between Park and Reverse a vehicle can roll. Yehong Xu is working on a stack-up to figure out the minimum Park angle. However, we do not currently have equipment here in Livonia to measure the manual lever position angle when the trans is in a vehicle for the 5R55W application.

Any assistance would be appreciated.

Terri Bateman
PROFS: TBATEMAN email: tbateman@ford.com
5R55N/W Prototype Build Eng., ATNPC, Livonia, Cube #W313d
Tel: 734-266-1155 Text Pgr: 734-797-6269 FAX: 734-266-1246

Subject: Meet to review content for Chief Meeting
Location: Building 3 - 3E027

Start: Thu 5/25/2000 8:00 AM
End: Thu 5/25/2000 9:00 AM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Importance: High

Building 3, 3rd floor (side close to bldg 5) - 3E027

Meeting agenda is:

- Go through the Shift System not-robust issue (explain pictorially or in hardware)
- Show what we did to fix it.
- Show the workplan to prove it out and implement (attached)

Shift System Major Issue.xls (...

- Go through the FMEA high RPN items

Please be ready to speak to your individual design changes - in detail.

U152 Major Issue Workplan

Issue ID:

Issue Description: Shift System Robustness

Lead Activity: Chassis
Affected Activities: PTO - shift cable, transmission
Visteon - column and cluster
Overall Champion: Julie Levine

Date Opened: 3/14/2000

Date Issue Becomes Minor
(Planned): 5/8/00 (E)
(Actual): 5/15/00 (A)

Workplan:

AIMS / CR Issue Number:

Tasks Required	Champion (Activity)	Start / Fin (Plan) Start / Fin (Act.)	Results / Comments
1) Revise VSA and correlate model	PTO / Visteon	Start: 3/14/00 (A) Finish: 3/24/00 (A)	
2) Using VSA selected design alternatives, trial / measure Drive to Park angles in the craftsmanship truck using both max and min lash cables and the worst case column travel	PTO / Visteon	Start: 3/21/00 (A) Finish:4/6/00 (A)	Resolution is achieved with: 1) OML at 57mm 2) Trans min Park O/T at 41 deg 3) Column at >33.7 deg & new insert plate 4) PRNDL revised to match insert plate
3) Confirm resolution proposal with D&R for feasibility and timing	PTO - shift cable PTO - Trans Visteon - column Visteon - cluster	Start: 3/28/00 (A) Finish: 4/14/00 (E)	All engineering activities asked to provide PSW timing and 2PP support plan by Friday 4/14 COB
4) Evaluate final required detent angles for the column insert plate by VSA and convert to cluster PRNDL angles Note: Cluster will be kicked off based on VSA insert plate in hopes to meet 2PP. It is likely, that once tested in vehicle, the detent plate angles will need to be "tweaked".	Visteon - column Visteon - cluster PTO - shift cable	Start: 3/28/00 (A) Finish: 4/18/00 (E)	Evaluation on final detent angles by 4/14/00 and then creation of cluster angles by 4/18/00
5) Final confirmation on craftsmanship truck with prototype representation of all fixes. Detent Plate Iterations will occur 4/14 - 4/28 Evaluation of all prototype parts will occur 5/4-5/8	PTO - shift cable PTO - Trans Visteon - column Visteon - cluster	Start: 3/28/00 (A) Finish: 5/15/00 (A)	Evaluation of final fixes in craftsmanship truck showed resolution of issue.
6) Final costs, containment plans, CAD and CR (C11075622) to be processed 4/28/00	PTO - Trans Visteon - column Visteon - cluster	Start: 3/28/00 (A) Finish: 5/31/00 (E)	CRs processed by each group

Risk Assessment:

Assessment Date	PESO Readiness 9/20/1999	PESO 1/11/1999	Final S/O 5/1/2000	FEU (~ 7/17/00)	Job 1	No Risk Date
3/14/2000	N/A	N/A	Major	None	None	Verification at 2PP Builds (6/16)

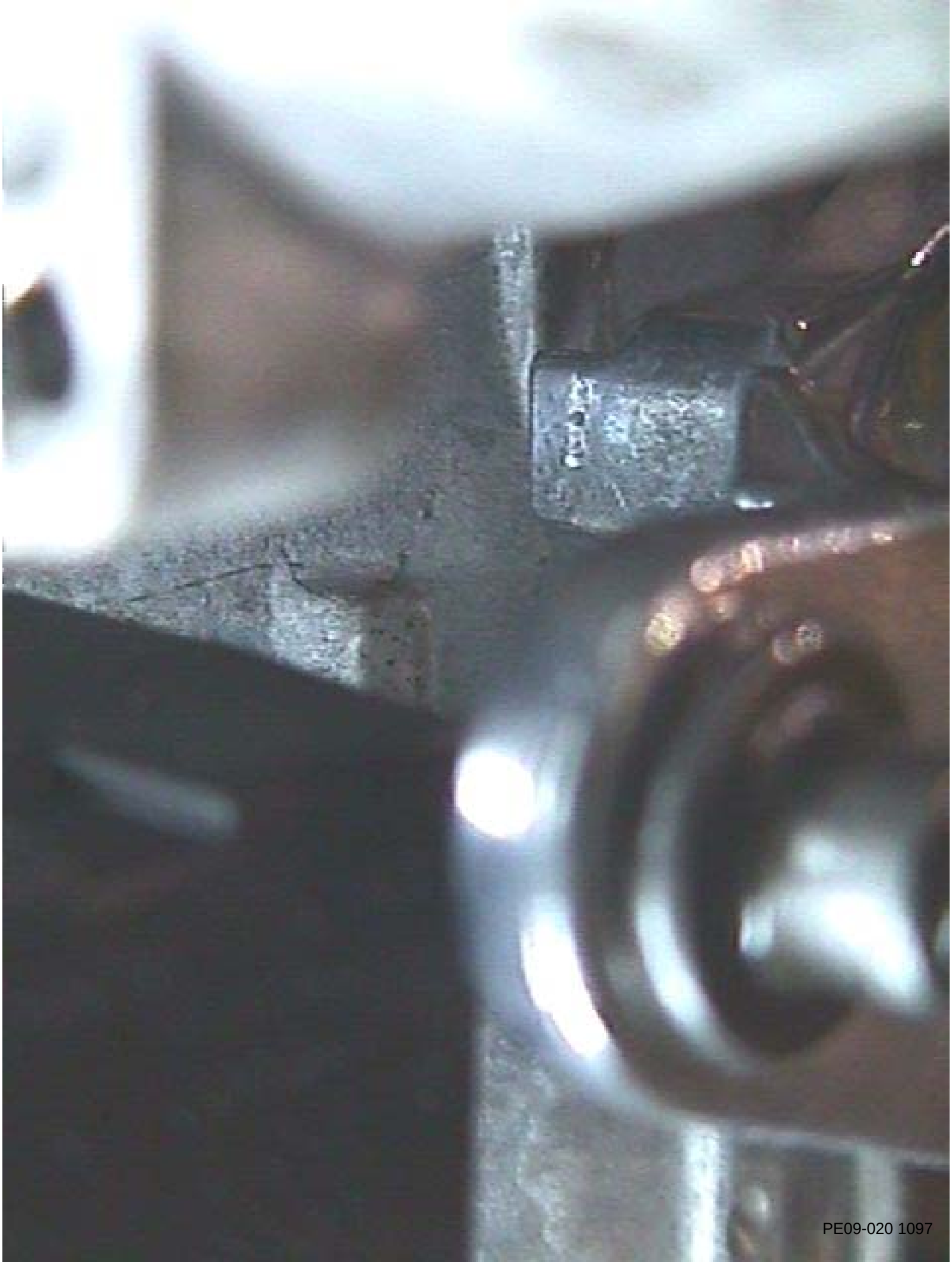
PE09-020 1090

PE09-020 1091

PE09-020 1093

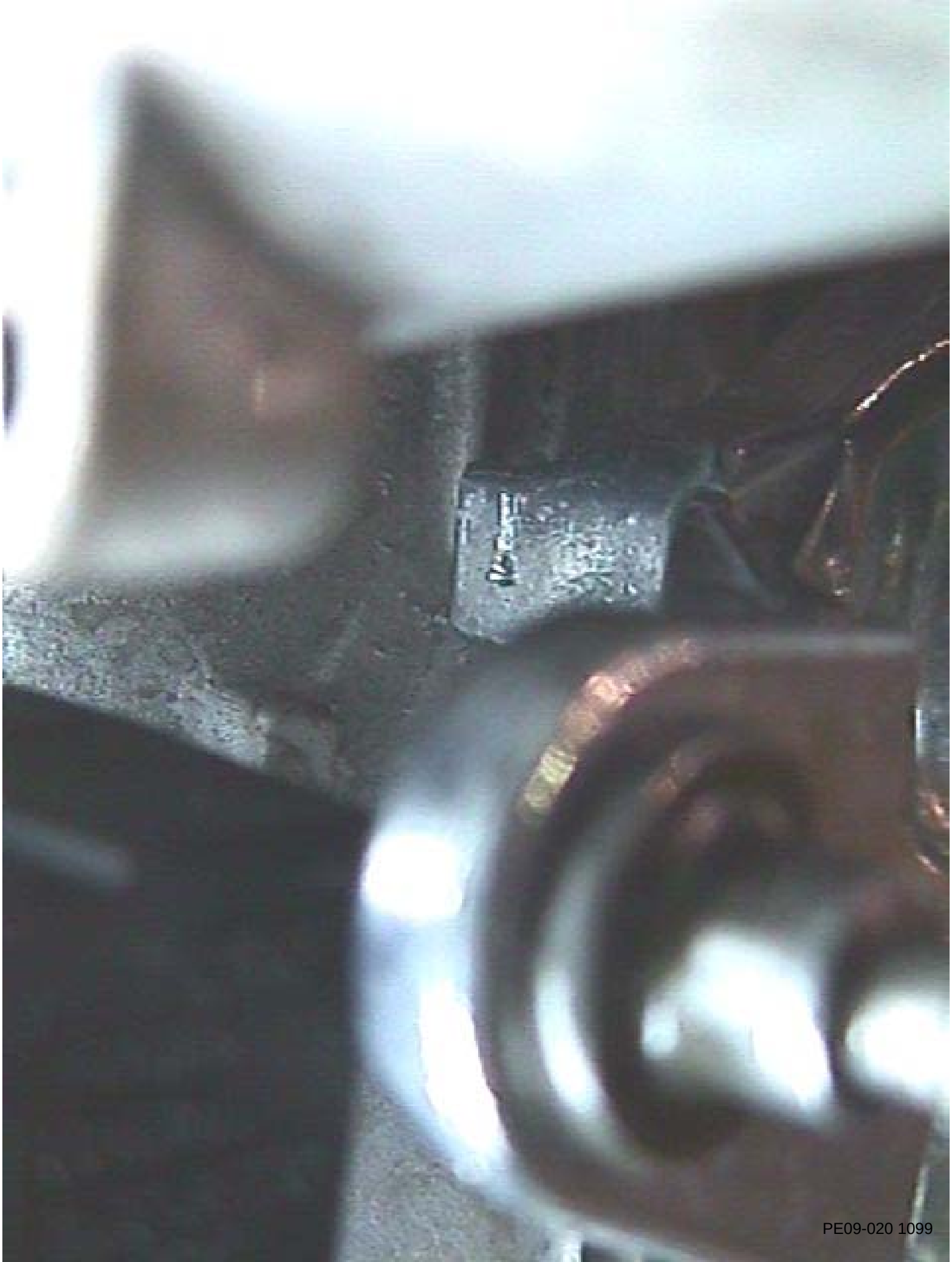
PE09-020 1095

PE09-020 1096



PE09-020 1097

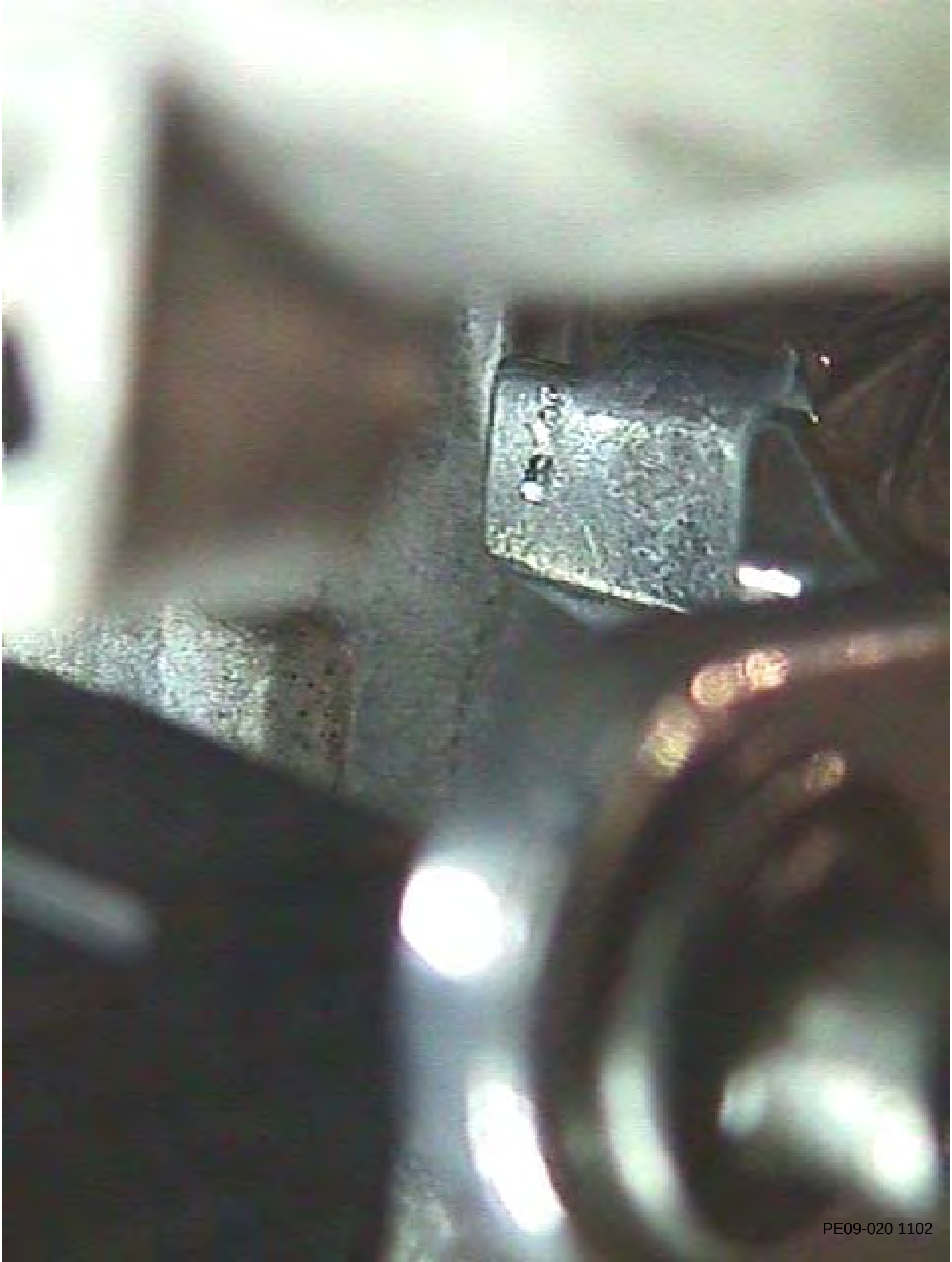
PE09-020 1098

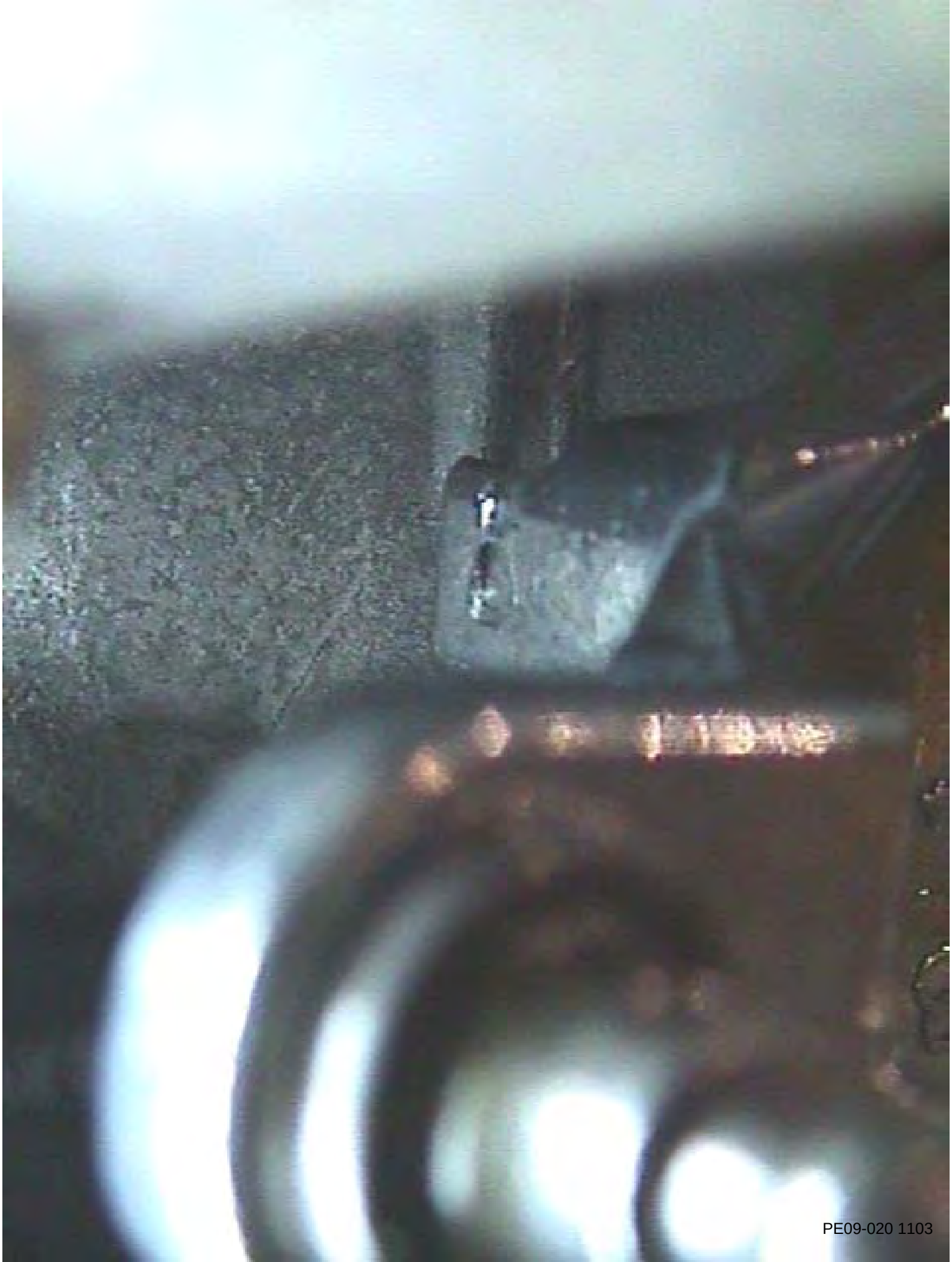


PE09-020 1099

PE09-020 1100

PE09-020 1101


PE09-020 1102



PE09-020 1103

PE09-020 1104

PE09-020 1105

PE09-020 1106

REMOVED TO CONFIDENTIAL COST

REMOVED TO CONFIDENTIAL COST

REMOVED TO CONFIDENTIAL COST

REMOVED TO CONFIDENTIAL COST

REMOVED TO CONFIDENTIAL COST

REMOVED TO CONFIDENTIAL COST

REMOVED TO CONFIDENTIAL COST

REMOVED TO CONFIDENTIAL COST

PULL OUT OF PARK DOE

Run	Transfer Case Type	Ratcheting Load	Tie Down	Nose Angle 18 degrees
1	2WD	Light 2 clicks	V	Up
2	2WD	Light 2 clicks	V	Down
3	2WD	Heavy 21 clicks	A	Down
4	2WD	Heavy 21 clicks	A	Up
5	AWD	Heavy 10 clicks	V	Up
6	AWD	Heavy 10 clicks	V	Down
7	AWD	Light 2 clicks	A	Down
8	AWD	Light 2 clicks	A	Up

From: Landes, Stephen (S.L.)
Sent: Saturday, September 16, 2000 2:47 PM
To: Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Dover, Harry (H.); Fyie, Matthew (M.L.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Sledz, Ted (T.M.); Tsai, Pingfang (P.); Xu, Yehong (Y.)
Cc: Antrim, William (W.R.)
Subject: Park System Team Assignments

Attachments: Microsoft Project - Team Assignments.pdf

The attached file is the assingment list we'll review tomorrow morning. You may note at the bottom of the list/Gantt chart that I have shown two alternatives for supporting launch at Bordeaux: Having MPI re-process their stock of green pawls, assuming about 8 weeks of stock available, and then brining on parts from the new die top match that timing (latest possible timing for the new die) versus MPI going ahead with the new die ASAP. Under the latter assumption we would still have to re-process green pawls to support the first two weeks of production -- if everything else comes along exactly on schedule.

Microsoft Project - Team Assig...

Stephen Landes
5R55N/W/S/E Systems Engineering
slandes@ford.com
(734) 523-5841
Text Page: slandes

Team Assignments as of Sat 9/16/00
Park System DV Plan

Highlighted Tasks have been completed

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
2	Team	Definition	80%	Thu 9/7/00	Sun 9/10/00	NA
3	mfyie	Bench test: coef. of friction confirmation	100%	Sat 9/9/00	Fri 9/15/00	Fri 9/15/00

Notes

Sample #4 passed all pullouts through 700 ibs-ft static load; apwl shaft cracked and small cracks appeared in the case and x-hsng, pawl shaft bore elongated -- similar to high-speed ratchet test results.
As of 9/13:
Samples 1, 2, 3: no data; broken parts
Samples 4, 5, 6: tests completed; good data
Sample 7: laser pawl; test postponed
Samples 9, 10, 11: to be done 9/13/00
Two additional samples will be run with laser pawls for the selected geometry.
Add two "E" transmissions to this test. (lhart to obtain transmissions).
9/14: no parts broken since the stand was recalibrated after sample #4 and we switched to running 4x4's. Sample #8 returned to build up for unrelated o/s binding. Lowest mu recorded to date is 0.087.
9/15: Dennis Fergusen is setting up to run "E" transmissions on the stand. There is good information that suggests early sample breakage is related to over torque on the stand due to stand operating practice (setting torque after initiating cycle). We will wait to do new pawls until the next BDX shipment of transmissions arrives (schd for 9/19). "E" transmissions are available.
9/16: The testing needed to support validation of the ADAMS model is complete. Additional testing on "E" and with the 3deg pawls will be done separately.

4	mfyie jbrazin	Verify instructions/torque loads given to HMS lab; calibrate bench machine	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00
5	cperng	Validate ADAMS Model	100%	Tue 9/12/00	Thu 9/14/00	Thu 9/14/00

Notes

9/15: Mu assessment complete and the model ahs been updated.

6	rperri	Determine Explorer lever ratio	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
7	ptsai,rperri	Pullout effort comparison	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes

1) RHD values higher than LHD
2) "W" nose up higher than nose down
3) Re-run calculations with latest geometry

9/14: still waiting for "N" data from SHV. lhart to call Ken Stacherski for assistance.
9/15: SHV data received; revise table for 12:30 meeting (add DEW98 N w/ floor shifter). Also need offset numbers and update the matrix.
9/16: Complete. offset numbers will be added to a separate matrix to avoid confusion.

8	cperng	Force balance calculations - baseline	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes

Ratchet spring is adequate. If the pawl is aligned with a gear space & Park is selected a minimum of 14 N is required of the ratchet spring to depress the pawl. The current spring pre-load provides 40+/-2 N.
We need a flatter cam angle to compensate for low coef of friction. The present included angle is 9 to 11 deg.
9/14: need a one page summary written for this analysis.
9/15: These calculations are run at nominal conditions. We should consider running them at worst/best case conditions. Decide at 12:30 meeting. No decision at 12:30 -- right people not present.
9/16: Summary document revised and complete.

PE09-020 1117

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
9	cperng	Force balance calculations - revised cam angle	0%	Sun 9/17/00	Mon 9/18/00	NA

Notes
9/16: Recalculate with the revised cam half angle of 4.5deg +/- 30min to confirmed instructions planned for Keller.

10	kbriscoe	Baseline bump test	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00

Notes
test being performed 9/12.
9/14: test passed; requesting formal lab report for 9/15.

11	yxu1	Measure peak dynamic torque and compare to 5R55N.	30%	Tue 9/12/00	Sat 9/16/00	NA

Notes
Use an instrumented drive shaft from a calibration vehicle.
Drive shaft obtained 9/12.
Drive shaft being installed 9/13/00.
9/14: Instrumented driveshaft installed; tests performed on 9/13. Initial results indicate that the test stand torque values are in the "ballpark". Re-run tests with vehicle at GVW.
9/15: Waiting for camera work to be completed in vehicle.
9/16: Camera vehicle will run dynamic torque test this morning and then return to camera investigation.

12	yxu1	Compare measured torque data with calculated loads of what we expect vehicle to see.	0%	Sun 9/17/00	Mon 9/18/00	NA

Notes
9/15: Require GVW torque data from instrumented axle (vehicle running camera tests).

13	yxu1	Determine Keller's capability on park rod cam angle	100%	Mon 9/11/00	Sat 9/16/00	Sat 9/16/00

Notes
9/13: dhildebr will contact BDX and Euro Purch for support in getting response from Keller. We need to be sure what Keller is providing, with what tolerance, and at what capability. Determine what tolerance reduction is possible and what is being quoted for 4R100.
Indication is that capability at +/- 30min is 1.05.
9/14: Still working with Keller to determine capability; tolerance is apparently +/- 30min on 1/2 angle.
9/15: Keller can make two different parts, but will have difficulty telling them apart. tsledz, yxu1, jbrazin to work on error proofing the parts/assembly.

14	yxu1	Investigate alternate park rod supplier.	0%	Fri 9/15/00	Tue 9/19/00	NA

Notes
9/15: Finding an alternate supplier was raised as a possibility by pyuhasz.

15	jbrazin mfyie dadamcz1 lhart tsledz	Create Fishbone diagram for Park System	100%	Sun 9/10/00	Tue 9/12/00	Tue 9/12/00

16	jbrazin mfyie dadamcz1 lhart tsledz	Fishbone analysis	25%	Sun 9/10/00	Wed 9/20/00	NA

Notes
9/14: Data from the "Visible A/T" and FEA are required to begin eliminating items on the diagram.

PE09-020 1118

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
17	jbrazin,msimetko	Update AX4N Energy Transfer diagram in team meeting room for 5R55W and application for specific issues.	0%	Sun 9/17/00	Tue 9/19/00	NA
18	lmckinni	Park System FEA: get priority in CAD	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
FEA kicked off 9/11. hvirdee will set up a meeting with Jer-Shi Chen to review FEA requirements. Completion forecast for 9/15.
9/13: no timing commitment from CAE
9/14: timing is 2.5 to 3 days for quick answer; Friday, 9/22 for full answer.

19	CAE,mramnath	Perform Park System FEA	29%	Wed 9/13/00	Fri 9/15/00	NA

Notes
9/14: This is the quick FEA
9/15: Preliminary results received. full analysis for Sunday morning. Analysis confirms expectations of location of breakout. Recommended improvements in clude longer pawl shaft, deeper holes in case and x-hsg, chamfer on pawl shaft holes. Update Saturday AM.

20	mfyie	Re-run engagement calcs with other pawl designs	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
CAD has done the runs; evaluating results.
9/13: Doing a study with 6deg design. mfyie, cperng, yxu1 to review today.
9/14: inputting 6deg design; plan to complete today.
9/15: Complete. An order for 5deg and 6deg pawls has been placed with MPI.

21	hvirdee	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	14%	Mon 9/11/00	Tue 9/19/00	NA

Notes
Parts from Sample #4 test run 9/11 are being sent to the lab.
9/14: Pawl & Shaft sent to lab (yxu1); bench test samples 1 & 2 case and xhsng sent to lab (hvirdee); pawl & shaft from vehicle 957 (broken xfr case) sent to lab.
9/15: Initial results were due today at 12:30; no results available.
9/16: Sample #2 x-hsg was a sand cast part with much lower hardness than a dies cast part. Fracture analysis on the Sample #2 case will be available Tuesday. There is nothing here to indicate chemistry as a cause of failures.

22	hvirdee	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	13%	Tue 9/12/00	Tue 9/19/00	NA

Notes
We need porosity, chemistry, and tensile strength. Samples should be requested from Ryobi (N) and Fagor and Koeln Forge (W).
9/16: Chemistry is consistent with 380 Al spec; European Al is slightly higher in Mg than US. Contact suppliers for more complete analysis and comparable strengths.

23	dadamcz1	Obtain stack up on park pawl shaft (length & alignment)	25%	Mon 9/11/00	Mon 9/18/00	NA

Notes
9/14: Same as task 23: consolidate
9/15: In process
9/16: Measurements show bearing surface is 4.7mm in xhsg and 7.4mm in case; not much shaft lateral movement; deeper holes and longer shaft is better; existing holes do have chamfers.
hvirdee to provide CAD with :E: case and xhsg drawing numbers; need to create a comparison betwen "W" and "N".

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
24	mfyie jbrazin	Finalize DVP&R proposal	50%	Mon 9/11/00	Tue 9/12/00	NA

Notes
9/14: proposed DV sent out for comment.
9/15: Draft has been circulated. No decision is required at this time; wait until screening DV results are available to finalize.

25	yxu1	Perform ultimate strength test on "N" and "W" systems. Add "E"	25%	Tue 9/12/00	Fri 9/15/00	NA

Notes
Two samples: one "N" and one "W", tested in the nose up direction.
9/13: direction is to add "E" to this test so we can compare across the whole family.
9/14: Need "N" case (lhart to help); check files for old "E" tests (mfyie, lhart) (file check complete).
9/15: "N" is all set to run; "E" needs further checking. The "W" 4x4 can be run with a 4x2 shaft; the 4x2 with a minimally modified x-hsg. yxu1 needs 4x2 x-hsg drawings and 4x4 xfr xcase spline drawings for a fixture. The 4x2 drawings are complete; existing 4x4 fixtures have been located and the numbers provided to yxu1.

26	Travis Miller	Review all data supporting a change in the pawl return spring force.	100%	Wed 9/13/00	Fri 9/15/00	Fri 9/15/00

Notes
Need a "fresh eyes" review of the data and a recommendation on proceeding with this change for Job1.

27	Cognition,rperri,hdover,yx	Perform VSA-type audit on the Park System. (Cognition)	25%	Wed 9/13/00	Fri 9/15/00	NA

Notes
rperri: business arrangements for analysis
yxu1: drawing list for hdover
hdover: collect drawings and carry to Cognition
9/14: Timing calls for initial model by noon today; meet with mfyie, yxu1 on defining park achievement; verify set up angle, gear positions. Cognition will establish nominal measurements and then six-sigma levels. Drawings complete to Cognition.
9/15: hdover has additional information requested by Cognition and will take it to them today.
9/16: Cognition has all the required data. The model is complete and dimensioned. It shows the OML angle at 0.80deg while previous analyses have shown 1.15deg. We agree to use the 0.80deg calculated offset from vertical. rperri to meet with mfyie and yxu1 to develop further direction.

28	dadamcz1 lhart jbrazin slandes	Develop Screening DV	100%	Thu 9/14/00	Fri 9/15/00	Fri 9/15/00

Notes
9/14: DV draft is complete and is to be reviewed with Tom Cross to see how he wants work orders written to support the plan.
9/16: Test time from first start to final return to garage for r&r is running about 10 hours.

29	W956	Perform Screening DV W956	50%	Fri 9/15/00	Sun 9/17/00	NA

Notes
4.0L 4x2 3.27 axle
9/16: ran 60 nose ups; efforts high (felt like 20 to 30#); good pawl/gear engagement; hard to achieve abutment; lots of park gear movement. Get torque data next (klittle2), then return to camera work. On 30% grade park components are immersed in oil.

30	W957	Perform Screening DV W957	30%	Fri 9/15/00	Mon 9/18/00	NA

Notes
4.6L 4x4 3.73 axle
9/16: 100 nose ups and downs; no ratcheting, no sticks, low loads; getting park pawl changed.

PE09-020 1120

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
31	ZA00041	Perform Screening DV & Baseline ZA00041	30%	Fri 9/15/00	Sun 9/17/00	NA
	Notes					
	4.6L 4x4 3.73 axle RHD 9/16: Performed baseline; loads between 9 and 36#; 4 ratchets on nose ups (cycles 89, 91, 97, 99); determine from thaugh if these were skips or ratchets down the hill; need post-test inspection and pawl change. (XW4P park pawl).					
32	W946	Perform Screening DV W946	30%	Fri 9/15/00	Sun 9/17/00	NA
	Notes					
	4.0L 4x2 3.73 axle 9/16: 100 nose ups and downs; no ratcheting, no sticks; low loads; ready to run again.					
33	W954	Perform Screening DV W954	0%	Fri 9/15/00	Sun 9/17/00	NA
	Notes					
	4.6L 4x4 3.55 axle					
34	Team	Approve DVP&R proposal	0%	Mon 9/18/00	Mon 9/18/00	NA
	Notes					
	9/14: Draft DV circulated for comment.					
35	Team	Recommend Hardware Direction	0%	Wed 9/20/00	Wed 9/20/00	NA
37	klittle2	Vehicle 956: install digital read out	0%	Thu 9/7/00	Sat 9/16/00	NA
38	klittle2	Vehicle 954: won't start	0%	Thu 9/7/00	Sat 9/16/00	NA
39	klittle2	Vehicle 957: replace transfer case; add digital read out	0%	Thu 9/7/00	Sat 9/16/00	NA
40	dhildebr	Obtain 4x2 w/ 3.27 axle	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes					
	The vehicle is available in Dearborn. Kim Briscoe will bring it to Livonia.					
41	hdover dadamcz1	Obtain RHD vehicle from Shifter group	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
42	hdover	Obtain cables, brackets, clips	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Obtain cables, brackets, clips" continued						
43	yxu1	Purch order for new pawls	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes Laser cut pawls are due 9/15/00. 9/15: Pawls arrived 9/14.					
44	yxu1	Purch order for extension housings	0%	Thu 9/7/00	Wed 9/20/00	NA
45	ecastro1	Purch order for 24 transmissions	100%	Thu 9/7/00	Sun 9/10/00	Sun 9/10/00
	Notes Bordeuax built the transmissions on 9/11/00.					
46	BDX	Deliver 24 transmissions to ATNPC	0%	Tue 9/12/00	Tue 9/19/00	NA
47	peckman	Purch 2 new force gages	100%	Thu 9/7/00	Tue 9/12/00	Tue 9/12/00
	Notes Two new gages received.					
48	mfyie	Design/Fab bench test fixture	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
49	dadamcz1 lhart hdover jbrazin	Create Visible A/T	100%	Sun 9/10/00	Thu 9/14/00	Thu 9/14/00
	Notes A camera is to be installed in a vehicle/transmission on 9/12; first results for 9/13 meeting. 9/15: Complete on 9/14; collect data on 9/15.					
51	mfyie	Bench test selected prototype pawl with Max Park Disengagement Load	0%	Wed 9/20/00	Fri 9/22/00	NA
52	mfyie	Bench test	50%	Thu 9/21/00	Tue 9/26/00	NA
53	yxu1	Combined Ratchet/Pullout	0%	Fri 9/22/00	Tue 9/26/00	NA
54	kbriscoe	Bump Test	0%	Wed 9/20/00	Sun 10/8/00	NA

PE09-020 1122

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
55	yxu1	DV Testing	0%	Tue 9/26/00	Tue 10/10/00	NA
57		STA to work with Keller to confirm their capability and reduce tolerance.	0%	Sat 9/16/00	Tue 9/19/00	NA
	Notes 9/16: Dan Hildebrand will contact Michel F. and ask him to work with Keller.					
58	mfyie,yxu1	Provide marked up drawings showing cam angle change	0%	Sat 9/16/00	Sun 9/17/00	NA
	Notes 9/16: FAX marked sketch to Keller and Bordeaux					
59	mfyie,yxu1	Investigate additional processesing to reduce cam half angle tolerance.	0%	Sat 9/16/00	Mon 9/18/00	NA
	Notes 9/16: Investigate sort and grind; any other options?					
60	tsledz,yxu1,jbrazin	Find a method for interim mis-assembly proofing rods with "W" vs "E" bullets.	0%	Fri 9/15/00	Wed 9/20/00	NA
	Notes 9/16: As it looks like we need to change the cam angle for "W" this item gets its own task (from task 13).					
61		Deliver prototype parts to ATNPC for testing	0%	Mon 9/18/00	Fri 9/22/00	NA
62		Deliver PSW'd parts to Bordeaux for PV and production.	0%	Mon 9/18/00	Fri 10/6/00	NA
63		Scherdl delivers revised pawl return spring	0%	Thu 9/7/00	Thu 9/7/00	NA
65	MPI Subcontractor	Machine MPI produced pawls already in stock	0%	Wed 9/20/00	Wed 9/27/00	NA
66	MPI	Final processing of pawls at MPI	0%	Wed 9/27/00	Sat 9/30/00	NA
67	MPI	Ship pawls to BDX	0%	Sat 9/30/00	Thu 10/5/00	NA
69	MPI	Production die	0%	Thu 9/7/00	Thu 10/12/00	NA

PE09-020 1123

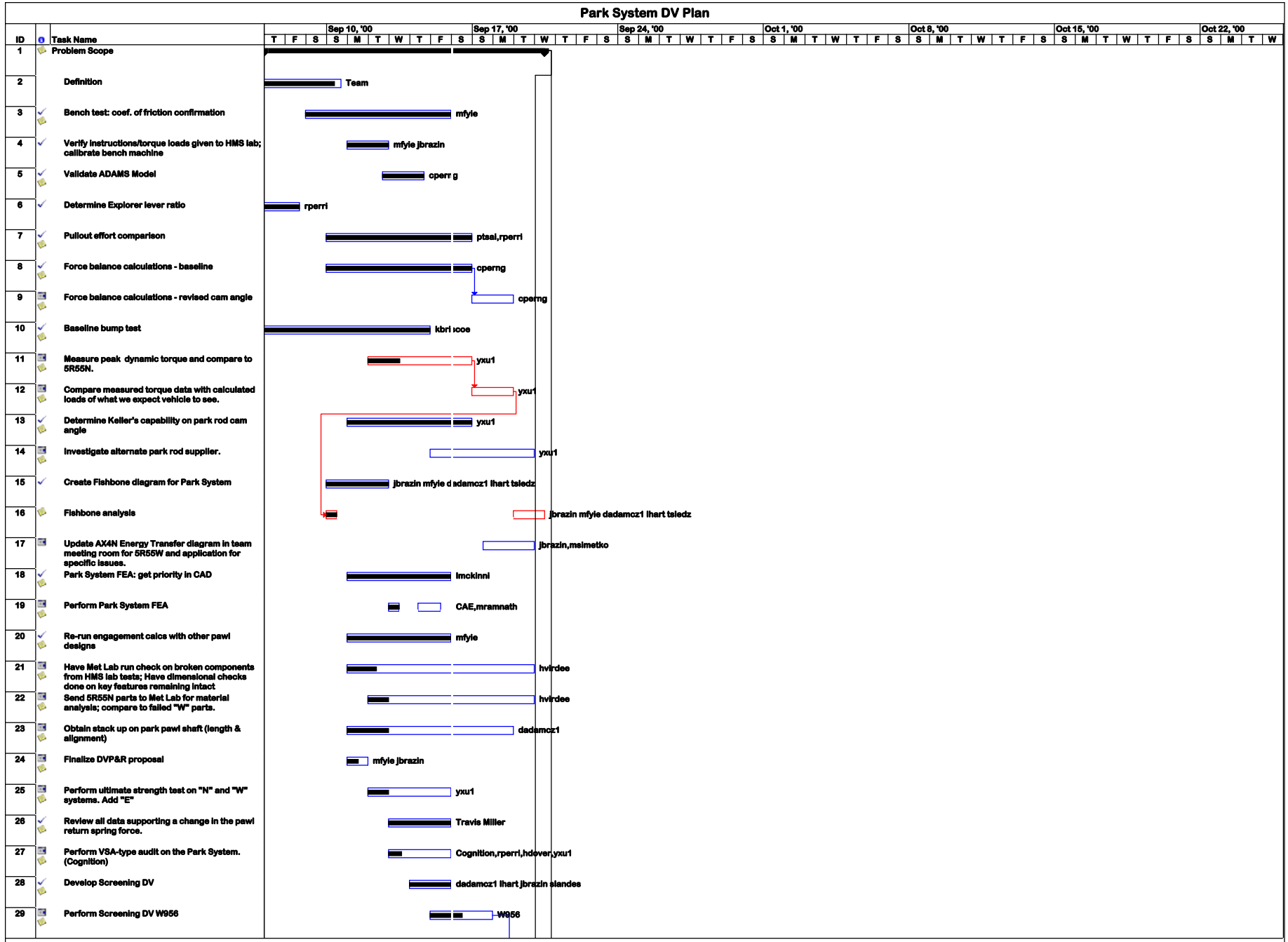
ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Production die" continued						
70	MPI	PSW Parts	0%	Thu 10/12/00	Mon 10/16/00	NA
71	MPI	Ship to Bordeaux	0%	Mon 12/4/00	Tue 12/5/00	NA
73		PV/Production MRD	0%	Sat 10/7/00	Sat 10/7/00	NA
74	BDX	Build PV transmissions	0%	Sun 10/8/00	Mon 10/9/00	NA
75	BDX	Transmission Job1	0%	Tue 10/10/00	Tue 10/10/00	NA
76	BDX	Perform PV test	0%	Tue 10/10/00	Wed 10/11/00	NA
77	BDX	PSW	0%	Thu 10/12/00	Fri 10/13/00	NA
78	BDX	Ship to LAP	0%	Tue 10/10/00	Sat 10/14/00	NA
79		MRD #2 for Final Design Pawls	0%	Tue 12/5/00	Tue 12/5/00	NA
80		Re-PSW	0%	Thu 9/7/00	Thu 9/7/00	NA
81	LAP	Integrated Build at LAP	0%	Mon 10/23/00	Sun 11/19/00	NA
83	MPI	Production die	0%	Thu 9/7/00	Thu 10/12/00	NA
84	MPI	PSW Parts	0%	Thu 10/12/00	Mon 10/16/00	NA
85	MPI	Ship to Bordeaux	0%	Mon 10/16/00	Wed 10/18/00	NA

PE09-020 1124

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Ship to Bordeaux" continued						

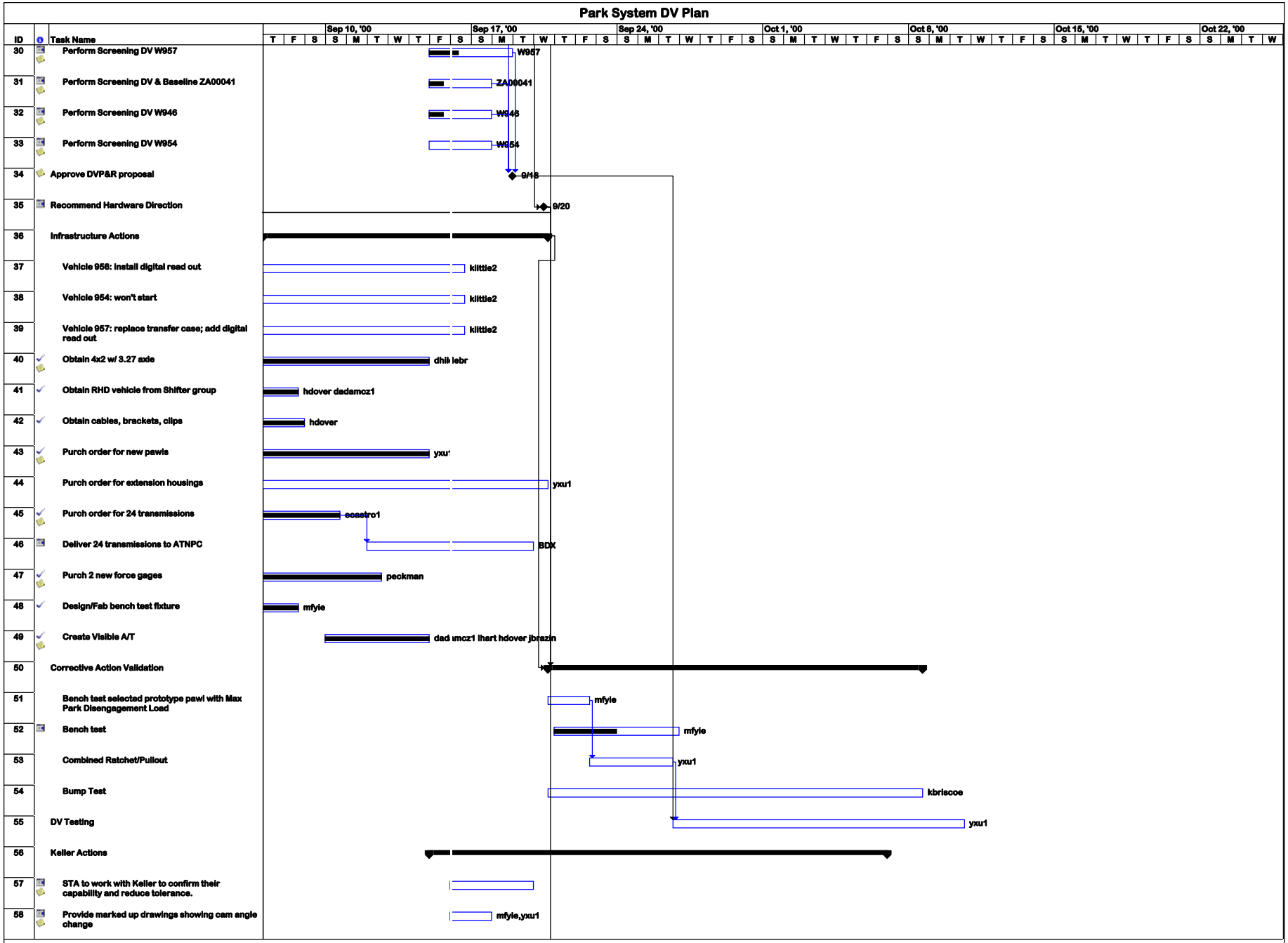
PE09-020 1125

Park System DV Plan



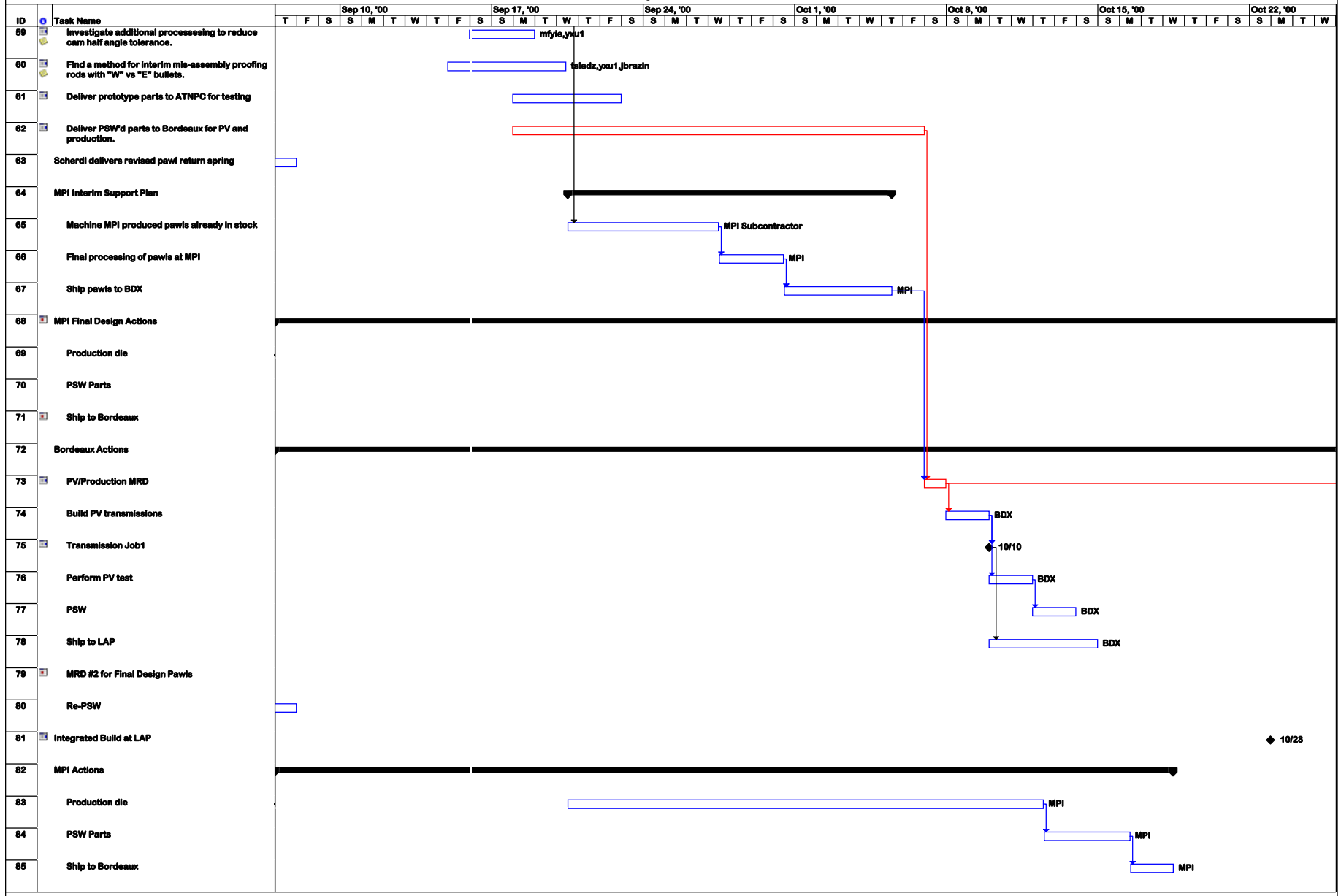
PE09-020 1126

Park System DV Plan



PE09-020 1127

Park System DV Plan



Project: Park System DV Plan
Date: Sat 9/16/00

Task | Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks
Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary

PE09-020 1128

From: Landes, Stephen (S.L.)
Sent: Thursday, September 21, 2000 5:51 PM
To: Spaulding, Todd (T.C.); See, Raymond (R.J.); Ramnath, Das (M.D.); Chen, Jershi (J.); Virdee, Harbinder (H.S.); Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Dover, Harry (H.); Fyie, Matthew (M.L.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Sledz, Ted (T.M.); Tsai, Pingfang (P.); Xu, Yehong (Y.)
Subject: Park System Team Meeting Notes and Assignments

Attachments: Microsoft Project - Team Assignments.pdf

Our Team will not meet tomorrow at 7:00AM due to the "State of ATEO" presentation being made from 8:00AM to 10:00AM at the Hellenic Cultural Center on Joy Road (now you have no excuse for missing the meeting!). We will meet at 12:30PM to cover all the overnight activity, upcoming tasks, and approve the final draft of the full DV plan for the park system. We will develop the supporting vehicle, hardware, and personnel schedules, too.

To prepare for weekend testing Jim Brazin will secure the Hill for us (two vehicle testing) and Yehong Xu will measure the pre-load on the park rod test pieces arriving today from Keller.

At the team meeting on Saturday at 12:30 we will:
Review test results for cycles 1 through 8
Decide to either continue running the test plan or agree on the 6deg pawl
Assuming we agree on the 6deg pawl we can contact MPI to kick off modification of current stock to the new 6deg dimensions.

Matt Fyie will request MPI to laser cut pawls with both 6deg and 0.4mm tooth thickness modification.

The assignment log in the attached file is sorted by lead responsible person, so you should be able to find all the tasks you're working on -- good time to check and make sure nothing has fallen through the cracks.

Thanks for all your long hours. It looks to me like we're doing two years worth of work in about 5 weeks.

Microsoft Project - Team Assig...

Stephen Landes
5R55N/W/S/E Systems Engineering
slandes@ford.com
(734) 523-5841
Text Page: slandes

Team Assignments as of Thu 9/21/00
Park System DV Plan

Highlighted Tasks have been completed

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
58		STA to work with Keller to confirm their capability and reduce tolerance.	0%	Sun 9/17/00	Wed 9/20/00	NA
	Notes	9/16: Dan Hildebrand will contact Michel F. and ask him to work with Keller.				
65		Release initiated	100%	Tue 9/19/00	Tue 9/19/00	Tue 9/19/00
66		Back-up PSW	0%	Tue 9/19/00	Mon 10/2/00	NA
67		Parts manufacturing and delivery to Bordeaux	0%	Tue 9/19/00	Fri 10/6/00	NA
77		PV/Production MRD	0%	Sun 10/8/00	Sun 10/8/00	NA
83		MRD #2 for Final Design Pawls	0%	Tue 12/5/00	Tue 12/5/00	NA
84		Re-PSW	0%	Thu 9/7/00	Thu 9/7/00	NA
62	Andreas Bockelmann	Deliver prototype parts to ATNPC for testing	100%	Mon 9/18/00	Thu 9/21/00	Thu 9/21/00
	Notes	9/18: Prototypes are expected by Saturday, 23 Sept 00. 9/21: Parts arrived by courier today.				
63	Andreas Bockelmann	Deliver PSW'd parts to Bordeaux for PV and production.	0%	Thu 9/7/00	Thu 10/5/00	NA
	Notes	9/18: Proposed timing is 4 weeks from go ahead; "go" given today.				
46	BDX	Deliver 24 transmissions to ATNPC	100%	Tue 9/12/00	Mon 9/18/00	Mon 9/18/00
78	BDX	Build PV transmissions	0%	Mon 10/9/00	Tue 10/10/00	NA
79	BDX	Perform PV test	0%	Wed 10/11/00	Thu 10/12/00	NA

PE09-020 1130

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
80	BDX	PSW	0%	Fri 10/13/00	Sat 10/14/00	NA
81	BDX	Transmission Job1	0%	Tue 10/10/00	Tue 10/10/00	NA
82	BDX	Ship to LAP	0%	Wed 10/11/00	Sun 10/15/00	NA
19	CAE,mramnath	Perform Park System FEA	75%	Wed 9/13/00	Fri 9/22/00	NA

Notes
9/14: This is the quick FEA
9/15: Preliminary results received. full analysis for Sunday morning. Analysis confirms expectations of location of breakout. Recommended improvements in clude longer pawl shaft, deeper holes in case and x-hsg, chamfer on pawl shaft holes. Update Saturday AM.
9/17: Expect update 9/18 AM meeting.

27	Cognition,rperri,hdover,yx	Perform VSA-type audit on the Park System. (Cognition)	50%	Wed 9/13/00	Mon 9/25/00	NA

Notes
rperri: business arrangements for analysis
yxu1: drawing list for hdover
hdover: collect drawings and carry to Cognition
9/14: Timing calls for initial model by noon today; meet with mfyie, yxu1 on defining park achievement; verify set up angle, gear positions. Cognition will establish nominal measurements and then six-sigma levels. Drawings complete to Cognition.
9/15: hdover has additional information requested by Cognition and will take it to them today.
9/16: Cognition has all the required data. The model is complete and dimensioned. It shows the OML angle at 0.80deg while previous analyses have shown 1.15deg. We agree to use the 0.80deg calculated offset from vertical. rperri to meet with mfyie and yxu1 to develop further direction.
9/21: The set up angle has been re-calculated and is now determined to be 0.73deg from vertical. The calculation and method will be written into the model assumptions. The model can be animated, and much is being learned.

5	cperng	Validate ADAMS Model	100%	Tue 9/12/00	Thu 9/14/00	Thu 9/14/00

Notes
9/15: Mu assessment complete and the model ahs been updated.

8	cperng	Force balance calculations - baseline	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes
Ratchet spring is adequate. If the pawl is aligned with a gear space & Park is selected a minimum of 14 N is required of the ratchet spring to depress the pawl. The current spring pre-load provides 40+/-2 N.
We need a flatter cam angle to compensate for low coef of friction. The present included angle is 9 to 11 deg.
9/14: need a one page summary written for this analysis.
9/15: These calculations are run at nominal conditions. We should consider running them at worst/best case conditions. Decide at 12:30 meeting. No decision at 12:30 -- right people not present.
9/16: Summary document revised and complete.

9	cperng	Force balance calculations - revised cam angle	100%	Sun 9/17/00	Mon 9/18/00	Mon 9/18/00

Notes
9/16: Recalculate with the revised cam half angle of 4.5deg +/- 30min to confirmed instructions planned for Keller.
9/17: 4deg is too flat for RHD shift efforts; need to keep minimum angle to 4.5deg and reduce tolerance.

PE09-020 1131

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
23	dadamcz1	Obtain stack up on park pawl shaft (length & alignment)	17%	Mon 9/11/00	Fri 9/22/00	NA

Notes
9/14: Same as task 23: consolidate
9/15: In process
9/16: Measurements show bearing surface is 4.7mm in xhsg and 7.4mm in case; not much shaft lateral movement; deeper holes and longer shaft is better; existing holes do have chamfers.
hvirdee to provide CAD with :E: case and xhsg drawing numbers; need to create a comparison betwen "W" and "N".
9/21: The designed is updating team members today; results tomorrow.

49	dadamcz1 lhart hdover jbrazin	Create Visible A/T	100%	Sun 9/10/00	Thu 9/14/00	Thu 9/14/00

Notes
A camera is to be installed in a vehicle/transmission on 9/12; first results for 9/13 meeting.
9/15: Complete on 9/14; collect data on 9/15.

28	dadamcz1 lhart jbrazin slandes	Develop Screening DV	100%	Thu 9/14/00	Fri 9/15/00	Fri 9/15/00

Notes
9/14: DV draft is complete and is to be reviewed with Tom Cross to see how he wants work orders written to support the plan.
9/16: Test time from first start to final return to garage for r&r is running about 10 hours.

40	dhildebr	Obtain 4x2 w/ 3.27 axle	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00

Notes
The vehicle is available in Dearborn. Kim Briscoe will bring it to Livonia.

45	ecastro1	Purch order for 24 transmissions	100%	Thu 9/7/00	Sun 9/10/00	Sun 9/10/00

Notes
Bordeuax built the transmissions on 9/11/00.

42	hdover	Obtain cables, brackets, clips	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00

41	hdover dadamcz1	Obtain RHD vehicle from Shifter group	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00

21	hvirdee	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	100%	Mon 9/11/00	Tue 9/19/00	Tue 9/19/00

Notes
Parts from Sample #4 test run 9/11 are being sent to the lab.
9/14: Pawl & Shaft sent to lab (yxu1); bench test samples 1 & 2 case and xhsng sent to lab (hvirdee); pawl & shaft from vehicle 957 (broken xfr case) sent to lab.
9/15: Initial results were due today at 12:30; no results available.
9/16: Sample #2 x-hsg was a sand cast part with much lower hardness than a dies cast part. Fracture analysis on the Sample #2 case will be available Tuesday. There is nothing here to indicate chemistry as a cause of failures.
9/17: no update
9/21: Lab report received. There are no materials issues.

PE09-020 1132

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
22	hvirdee	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	100%	Tue 9/12/00	Tue 9/19/00	Tue 9/19/00
	Notes We need porosity, chemistry, and tensile strength. Samples should be requested from Ryobi (N) and Fagor and Koeln Forge (W). 9/16: Chemistry is consistent with 380 Al spec; European Al is slightly higher in Mg than US. Contact suppliers for more complete analysis and comparable strengths. 9/17: No update 9/21: Lab report received. There are no materials issues.					
15	jbrazin mfyie dadamcz1 lhart tsledz	Create Fishbone diagram for Park System	100%	Sun 9/10/00	Tue 9/12/00	Tue 9/12/00
16	jbrazin mfyie dadamcz1 lhart tsledz	Fishbone analysis	25%	Sun 9/10/00	Wed 9/20/00	NA
	Notes 9/14: Data from the "Visible A/T" and FEA are required to begin eliminating items on the diagram.					
17	jbrazin,msimetko	Update AX4N Energy Transfer diagram in team meeting room for 5R55W and application for specific issues.	0%	Sat 9/16/00	Mon 9/18/00	NA
10	kbriscoe	Baseline bump test	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes test being performed 9/12. 9/14: test passed; requesting formal lab report for 9/15.					
55	kbriscoe	Bump Test	0%	Tue 9/26/00	Fri 10/13/00	NA
37	klittle2	Vehicle 956: install digital read out	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
38	klittle2	Vehicle 954: won't start	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
39	klittle2	Vehicle 957: replace transfer case; add digital read out	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
50	klittle2	Install Digital Read-outs in all five test vehicles	0%	Mon 9/18/00	Mon 9/25/00	NA
	Notes 9/18: Work with DTA to order read out units to be fabricated outside; get timing from supplier.					
85	LAP	Integrated Build at LAP	0%	Mon 10/23/00	Mon 10/23/00	NA

PE09-020 1133

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Integrated Build at LAP" continued						
18	lmckinni	Park System FEA: get priority in CAD	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00
	Notes FEA kicked off 9/11. hvirdee will set up a meeting with Jer-Shi Chen to review FEA requirements. Completion forecast for 9/15. 9/13: no timing commitment from CAE 9/14: timing is 2.5 to 3 days for quick answer; Friday, 9/22 for full answer.					
3	mfyie	Bench test: coef. of friction confirmation	100%	Sat 9/9/00	Fri 9/15/00	Fri 9/15/00
	Notes Sample #4 passed all pullouts through 700 ibs-ft static load; apwl shaft cracked and small cracks appeared in the case and x-hsng, pawl shaft bore elongated -- similar to high-speed ratchet test results. As of 9/13: Samples 1, 2, 3: no data; broken parts Samples 4, 5, 6: tests completed; good data Sample 7: laser pawl; test postponed Samples 9, 10, 11: to be done 9/13/00 Two additional samples will be run with laser pawls for the selected geometry. Add two "E" transmissions to this test. (lhart to obtain transmissions). 9/14: no parts broken since the stand was recalibrated after sample #4 and we switched to running 4x4's. Sample #8 returned to build up for unrelated o/s binding. Lowest mu recorded to date is 0.087. 9/15: Dennis Fergusen is setting up to run "E" transmissions on the stand. There is good information that suggests early sample breakage is related to over torque on the stand due to stand operating practice (setting torque after initiating cycle). We will wait to do new pawls until the next BDX shipment of transmissions arrives (schd for 9/19). "E" transmissions are available. 9/16: The testing needed to support validation of the ADAMS model is complete. Additional testing on "E" and with the 3deg pawls will be done separately. 9/17: Summarize second batch of data for 9/18 AM meeting.					
20	mfyie	Re-run engagement calcs with other pawl designs	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00
	Notes CAD has done the runs; evaluating results. 9/13: Doing a study with 6deg design. mfyie, cperng, yxu1 to review today. 9/14: inputting 6deg design; plan to complete today. 9/15: Complete. An order for 5deg and 6deg pawls has been placed with MPI.					
48	mfyie	Design/Fab bench test fixture	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
52	mfyie	Bench test selected prototype pawl with Max Park Disengagement Load	0%	Tue 9/26/00	Wed 9/27/00	NA
53	mfyie	Bench test	50%	Thu 9/21/00	Thu 9/28/00	NA
4	mfyie jbrazin	Verify instructions/torque loads given to HMS lab; calibrate bench machine	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00
24	mfyie jbrazin	Finalize DVP&R proposal	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00
	Notes 9/14: proposed DV sent out for comment. 9/15: Draft has been circulated. No decision is required at this time; wait until screening DV results are available to finalize. 9/21: The finalized DVP&R and vehicle/hardware requirements are to be reviewed on 9/22 at the 12:30 meeting.					

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
59	mfyie,yxu1	Provide marked up drawings showing cam angle change	0%	Sat 9/16/00	Sun 9/17/00	NA
	Notes 9/16: FAX marked sketch to Keller and Bordeaux					
60	mfyie,yxu1	Investigate additional processesing to reduce cam half angle tolerance.	100%	Sun 9/17/00	Tue 9/19/00	Tue 9/19/00
	Notes 9/16: Investigate sort and grind; any other options? 9/18: Confirmed that a centerless grinding operation can be added to a new die to provide parts with lower nominal half angle and a tighter tolerance.					
70	MPI	Final processing of pawls at MPI	0%	Sat 9/30/00	Mon 10/2/00	NA
71	MPI	Ship pawls to BDX	0%	Tue 10/3/00	Sat 10/7/00	NA
73	MPI	Production die	0%	Thu 9/7/00	Sat 10/14/00	NA
74	MPI	PSW Parts	0%	Sun 10/15/00	Wed 10/18/00	NA
75	MPI	Ship to Bordeaux	0%	Mon 12/4/00	Tue 12/5/00	NA
87	MPI	Production die	0%	Thu 9/7/00	Sat 10/14/00	NA
88	MPI	PSW Parts	0%	Sun 10/15/00	Wed 10/18/00	NA
89	MPI	Ship to Bordeaux	0%	Thu 10/19/00	Fri 10/20/00	NA
69	MPI Subcontractor	Machine MPI produced pawls already in stock	0%	Sat 9/23/00	Fri 9/29/00	NA
47	peckman	Purch 2 new force gages	100%	Thu 9/7/00	Tue 9/12/00	Tue 9/12/00
	Notes Two new gages received.					

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
7	ptsai,rperri	Pullout effort comparison	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes
1) RHD values higher than LHD
2) "W" nose up higher than nose down
3) Re-run calculations with latest geometry

9/14: still waiting for "N" data from SHV. Ihart to call Ken Stacherski for assistance.
9/15: SHV data received; revise table for 12:30 meeting (add DEW98 N w/ floor shifter). Also need offset numbers and update the matrix.
9/16: Complete. offset numbers will be added to a separate matrix to avoid confusion.

6	rperri	Determine Explorer lever ratio	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
2	Team	Definition	80%	Thu 9/7/00	Sun 9/10/00	NA
34	Team	Approve DVP&R proposal	0%	Fri 9/22/00	Fri 9/22/00	NA

Notes
9/14: Draft DV circulated for comment.
9/21: Approval targeted for 9/22 at 12:30

35	Team	Recommend Hardware Direction	100%	Sat 9/23/00	Sat 9/23/00	Sat 9/23/00

Notes
9/21: System design direction is:
260Nmm return spring (Sherdel)
4.7 +/- 0.2 deg cam half angle (Keller)
6deg pawl with 0.4mm added tooth thickness to compensate for reduction made with angle change (MPI)
Weekend testing will confirm design direction.

26	Travis Miller	Review all data supporting a change in the pawl return spring force.	100%	Wed 9/13/00	Fri 9/15/00	Fri 9/15/00

Notes
Need a "fresh eyes" review of the data and a recommendation on proceeding with this change for Job1.

61	tsledz,yxu1,jbrazin	Find a method for interim mis-assembly proofing rods with "W" vs "E" bullets.	0%	Sun 9/17/00	Fri 9/22/00	NA

Notes
9/16: As it looks like we need to change the cam angle for "W" this item gets its own task (from task 13).

32	W946	Perform Screening DV W946	30%	Fri 9/15/00	Sun 9/17/00	NA

Notes
4.0L 4x2 3.73 axle
9/16: 100 nose ups and downs; no ratcheting, no sticks; low loads; ready to run again.
9/17:

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
33	W954	Perform Screening DV W954	0%	Fri 9/15/00	Sun 9/17/00	NA

Notes
4.6L 4x4 3.55 axle
9/17: park rod and pawl change; ready to run
9/18: test 13: skipped 1 tooth several times (nose up 7, nose down 1); with 4deg cam: couldn't pull out of park on first try.

29	W956	Perform Screening DV W956	50%	Fri 9/15/00	Sun 9/17/00	NA

Notes
4.0L 4x2 3.27 axle
9/16: ran 60 nose ups; efforts high (felt like 20 to 30#); good pawl/gear engagement; hard to achieve abutment; lots of park gear movement. Get torque data next (klittle2), then return to camera work. On 30% grade park components are immersed in oil.
9/17: ready to run
9/18: lost park during fwd drop ins; pawl pi cracked in half; extension housing hole cracked; case hole elongated; distress seemed pointed inward.

30	W957	Perform Screening DV W957	30%	Fri 9/15/00	Mon 9/18/00	NA

Notes
4.6L 4x4 3.73 axle
9/16: 100 nose ups and downs; no ratcheting, no sticks, low loads; getting park pawl changed.
9/17: ready to run
9/18: completed 17 HS ratchets then broke a return spring; did maintain park; only ratcheted forward.

11	yxu1	Measure peak dynamic torque and compare to 5R55N.	100%	Tue 9/12/00	Sun 9/17/00	Sun 9/17/00

Notes
Use an instrumented drive shaft from a calibration vehicle.
Drive shaft obtained 9/12.
Drive shaft being installed 9/13/00.
9/14: Instrumented driveshaft installed; tests performed on 9/13. Initial results indicate that the test stand torque values are in the "ballpark". Re-run tests with vehicle at GVW.
9/15: Waiting for camera work to be completed in vehicle.
9/16: Camera vehicle will run dynamic torque test this morning and then return to camera investigation.
9/17: Test run last night, data being summarized today.

12	yxu1	Compare measured torque data with calculated loads of what we expect vehicle to see.	100%	Sun 9/17/00	Mon 9/18/00	Mon 9/18/00

Notes
9/15: Require GVW torque data from instrumented axle (vehicle running camera tests).
9/18: The data now confirms the test stand is using appropriate loads, and the data can be used as input for CAE work.

13	yxu1	Determine Keller's capability on park rod cam angle	100%	Mon 9/11/00	Sat 9/16/00	Sat 9/16/00

Notes
9/13: dhildebr will contact BDX and Euro Purch for support in getting response from Keller. We need to be sure what Keller is providing, with what tolerance, and at what capability. Determine what tolerance reduction is possible and what is being quoted for 4R100.
Indication is that capability at +/- 30min is 1.05.
9/14: Still working with Keller to determine capability; tolerance is apparently +/- 30min on 1/2 angle.
9/15: Keller can make two different parts, but will have difficulty telling them apart. tsledz, yxu1, jbrazin to work on error proofing the parts/assembly.
9/17: We have a good idea where Keller is today, but need to determine how to help them lower the nominal half angle and narrow the tolerance.

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
14	yxu1	Investigate alternate park rod supplier.	100%	Fri 9/15/00	Tue 9/19/00	Tue 9/19/00

Notes
9/15: Finding an alternate supplier was raised as a possibility by pyuhasz.
9/21: The conclusion is that as Keller is able to reduce their tolerance by modifying processes we should remain with Keller.

25	yxu1	Perform ultimate strength test on "N" and "W" systems. Add "E"	7%	Tue 9/12/00	Mon 9/25/00	NA

Notes
Two samples: one "N" and one "W", tested in the nose up direction.
9/13: direction is to add "E" to this test so we can compare across the whole family.
9/14: Need "N" case (lhart to help); check files for old "E" tests (mfyie, lhart) (file check complete).
9/15: "N" is all set to run; "E" needs further checking. The "W" 4x4 can be run with a 4x2 shaft; the 4x2 with a minimally modified x-hsg. yxu1 needs 4x2 x-hsg drawings and 4x4 xfr xcase spline drawings for a fixture. The 4x2 drawings are complete; existing 4x4 fixtures have been located and the numbers provided to yxu1.
9/17: Ready to run "N" cases today; rsee1 finding parts.
9/21: Requested 4x2 output shafts have been delivered to the lab. Timing to run tests is expected tomorrow at 12:30.

43	yxu1	Purch order for new pawls	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00

Notes
Laser cut pawls are due 9/15/00.
9/15: Pawls arrived 9/14.

44	yxu1	Purch order for extension housings	0%	Thu 9/7/00	Wed 9/20/00	NA
54	yxu1	Combined Ratchet/Pullout	0%	Thu 9/28/00	Sun 10/1/00	NA
56	yxu1	DV Testing	0%	Mon 10/2/00	Sun 10/15/00	NA
90	yxu1,klittle2	Measure peak dynamic torque and compare to 5R55N.	0%	Thu 9/7/00	Tue 9/12/00	NA

Notes
9/18: Develop a list of requirements for doing instrument axle testing on a 4X4.

31	ZA00041	Perform Screening DV & Baseline ZA00041	30%	Fri 9/15/00	Sun 9/17/00	NA

Notes
4.6L 4x4 3.73 axle RHD
9/16: Performed baseline; loads between 9 and 36#; 4 ratchets on nose ups (cycles 89, 91, 97, 99); determine from thaugh if these were skips or ratchets down the hill; need post-test inspection and pawl change. (XW4P park pawl).
9/17: park rod and pawl change

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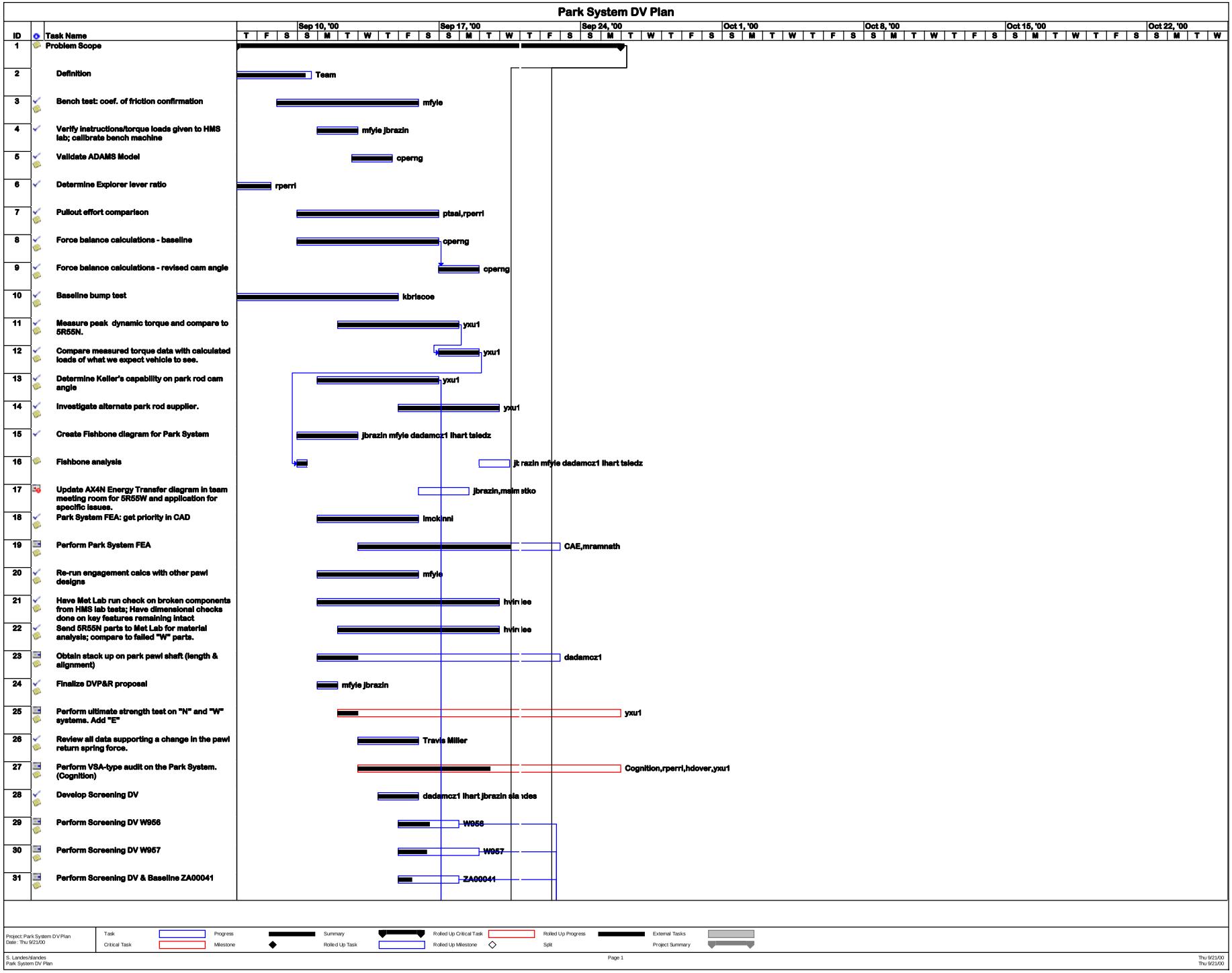
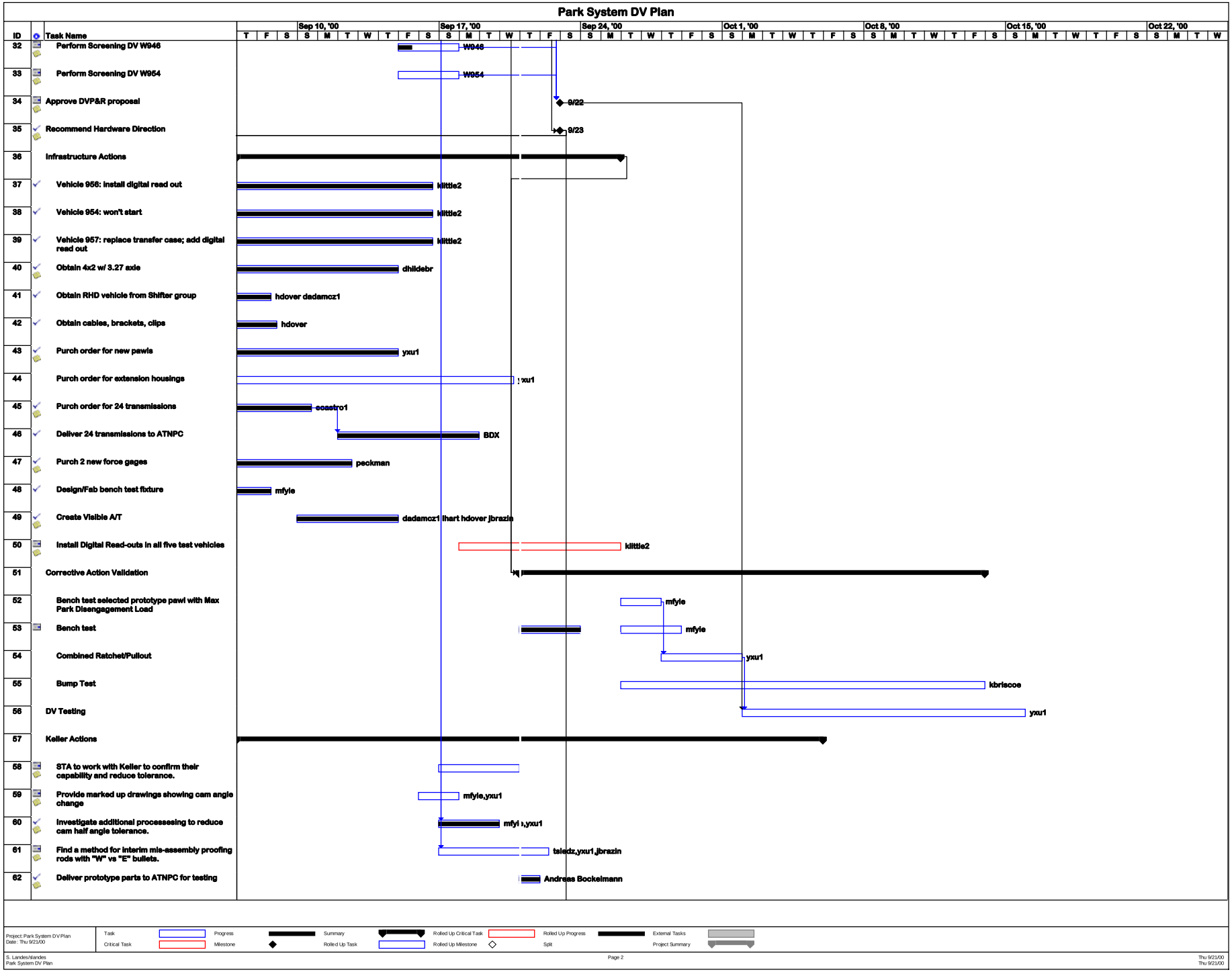
Park System DV Plan



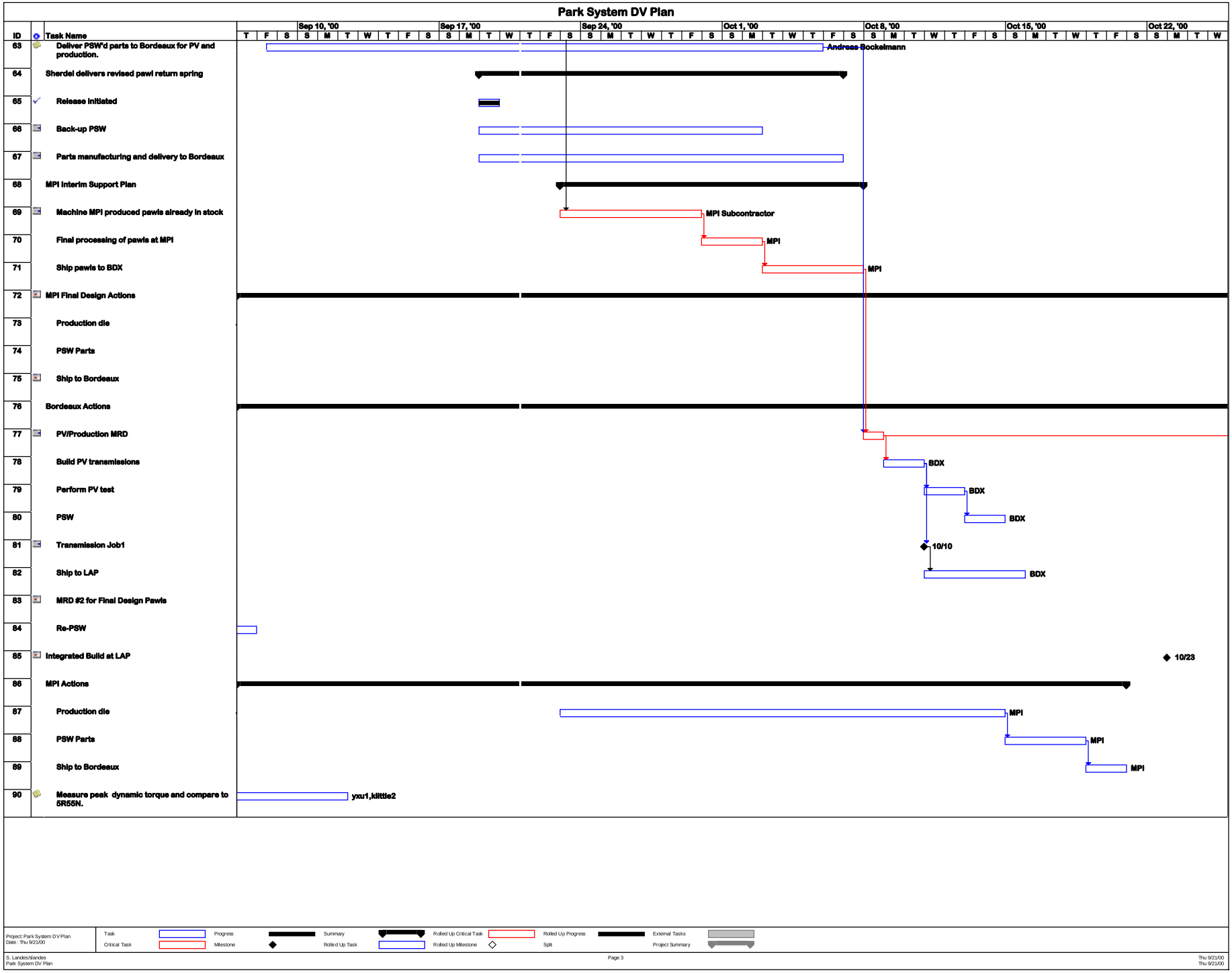
PE09-020 1139

Park System DV Plan



PE09-020 1140

Park System DV Plan



PE09-020 1141

From: Landes, Stephen (S.L.)
Sent: Monday, September 18, 2000 7:25 PM
To: Spaulding, Todd (T.C.); See, Raymond (R.J.); Ramnath, Das (M.D.); Chen, Jershi (J.); Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Dover, Harry (H.); Fyie, Matthew (M.L.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Sledz, Ted (T.M.); Tsai, Pingfang (P.); Xu, Yehong (Y.)
Cc: Antrim, William (W.R.)
Subject: Park System Team Meeting Notes and Assignments

Attachments: Microsoft Project - Team Assignments.pdf

Attached is the latest update on assingments and work plans for the team.

Microsoft Project - Team Assig...

Stephen Landes
5R55N/W/S/E Systems Engineering
slandes@ford.com
(734) 523-5841
Text Page: slandes

5R55W Park System Task Force
Supplemental Notes from Monday, 18 Sept 00

Additional Tasks:

- Microfinish on 4deg cams is suspect; measure (yxu1)
- Need to change all columns and cables for future testing (hdover)
- Looking at changing tooth profile and position altogether (try to better balance the forces in both directions) (mfie/jbrazin)
- No design direction by 12:30PM
- 3deg pawl design suspect; no real data on 4deg or 4.5deg cam

Next Steps

- Use known "passed" rod and "failed" (#8) rod in ABA testing to confirm effect (jbrazin)
- Tabulate data from tests & inspections to evaluate possible correlations. (tsledz, yxu1, dadamcz1)
    - cam angle
    - pawl angle
    - vehicle #
    - spring force
    - pass/fail result
    - particular behaviors (skip, hang up)
    - mean/SDEV for measurements
    - results of visual inspections
    - test #
    - etc
- get 4.5deg rods with proper, production representative, micro finish (yxu1)

Analytical Work

- 4X4 FEA: stress in pawl pin primarily in case; not so much in the xhsng
- Look at 4X2 model; results estimated Wed, 20 Sept 00.
- Pursue increase in pin support; results beginning Wed/Thurs
    - Pin support length/hole depth in case/cover plate
    - More material around hole in case

5R55W Park System Task Force
Supplemental Notes from Monday, 18 Sept 00

By 12:30PM

- Kevin's torque data
- Test data table & visuals
- Update on column availability

12:30PM Meeting Notes

- Torque Data: data received and confirms that the test bench is using an appropriate load; forward data to CAE for their model.
- Data Table: data table drafted; needs additional tests completed and visual inspection information; what does the data tell us? Can we reduce this to a single or several charts/graphs?
- Visual Inspections: inspections not completed; yxu1 to finish current inspections
- Column Availability: Visteon is building two columns; hdover will bring them in as soon as they are completed.
- Keller: US rep was present (Andreas Bockelmann) and reported that Keller can supply cams at a lower nominal angle and tighter tolerance with a new die and adding a centerless grinding operation; timing is about 4 weeks from being given a "Go".

What decision can we make today?

- Keller: DECIDED to authorize Keller to proceed with a new die for a 4.7deg nominal cam half angle with tolerance of 0.2deg. This will include the grinding operation to achieve the tighter tolerance.
- Pawl: Need to determine if the axle ratio is driving the issues we see; is 3deg pawl a sufficient change?
    - Run vehicle 956 with half the weight removed and weigh the vehicle empty so we can develop a curve for load v vehicle weight.
    - Run vehicle 954 with weight reduced to simulate a 3.73 axle ratio and determine as best possible the loads seen.
- Return Spring: still need to determine which company is our supplier: Automatic or Sherdel

Team Assignments as of Mon 9/18/00
Park System DV Plan

Highlighted Tasks have been completed

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
2	Team	Definition	80%	Thu 9/7/00	Sun 9/10/00	NA
3	mfyie	Bench test: coef. of friction confirmation	100%	Sat 9/9/00	Fri 9/15/00	Fri 9/15/00

Notes

Sample #4 passed all pullouts through 700 ibs-ft static load; apwl shaft cracked and small cracks appeared in the case and x-hsng, pawl shaft bore elongated -- similar to high-speed ratchet test results.
As of 9/13:
Samples 1, 2, 3: no data; broken parts
Samples 4, 5, 6: tests completed; good data
Sample 7: laser pawl; test postponed
Samples 9, 10, 11: to be done 9/13/00
Two additional samples will be run with laser pawls for the selected geometry.
Add two "E" transmissions to this test. (Ihart to obtain transmissions).
9/14: no parts broken since the stand was recalibrated after sample #4 and we switched to running 4x4's. Sample #8 returned to build up for unrelated o/s binding. Lowest mu recorded to date is 0.087.
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9/16: The testing needed to support validation of the ADAMS model is complete. Additional testing on "E" and with the 3deg pawls will be done separately.
9/17: Summarize second batch of data for 9/18 AM meeting.

4	mfyie jbrazin	Verify instructions/torque loads given to HMS lab; calibrate bench machine	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00
5	cperng	Validate ADAMS Model	100%	Tue 9/12/00	Thu 9/14/00	Thu 9/14/00

Notes

9/15: Mu assessment complete and the model ahs been updated.

6	rperri	Determine Explorer lever ratio	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
7	ptsai,rperri	Pullout effort comparison	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes

1) RHD values higher than LHD
2) "W" nose up higher than nose down
3) Re-run calculations with latest geometry

9/14: still waiting for "N" data from SHV. Ihart to call Ken Stacherski for assistance.
9/15: SHV data received; revise table for 12:30 meeting (add DEW98 N w/ floor shifter). Also need offset numbers and update the matrix.
9/16: Complete. offset numbers will be added to a separate matrix to avoid confusion.

8	cperng	Force balance calculations - baseline	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes

Ratchet spring is adequate. If the pawl is aligned with a gear space & Park is selected a minimum of 14 N is required of the ratchet spring to depress the pawl. The current spring pre-load provides 40+/-2 N.
We need a flatter cam angle to compensate for low coef of friction. The present included angle is 9 to 11 deg.
9/14: need a one page summary written for this analysis.
9/15: These calculations are run at nominal conditions. We should consider running them at worst/best case conditions. Decide at 12:30 meeting. No decision at 12:30 -- right people not present.
9/16: Summary document revised and complete.

PE09-020 1145

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
9	cperng	Force balance calculations - revised cam angle	80%	Sun 9/17/00	Mon 9/18/00	NA

Notes
9/16: Recalculate with the revised cam half angle of 4.5deg +/- 30min to confirmed instructions planned for Keller.
9/17: 4deg is too flat for RHD shift efforts; need to keep minimum angle to 4.5deg and reduce tolerance.

10	kbriscoe	Baseline bump test	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00

Notes
test being performed 9/12.
9/14: test passed; requesting formal lab report for 9/15.

11	yxu1	Measure peak dynamic torque and compare to 5R55N.	100%	Tue 9/12/00	Sun 9/17/00	Sun 9/17/00

Notes
Use an instrumented drive shaft from a calibration vehicle.
Drive shaft obtained 9/12.
Drive shaft being installed 9/13/00.
9/14: Instrumented driveshaft installed; tests performed on 9/13. Initial results indicate that the test stand torque values are in the "ballpark". Re-run tests with vehicle at GVW.
9/15: Waiting for camera work to be completed in vehicle.
9/16: Camera vehicle will run dynamic torque test this morning and then return to camera investigation.
9/17: Test run last night, data being summarized today.

12	yxu1	Compare measured torque data with calculated loads of what we expect vehicle to see.	100%	Sun 9/17/00	Mon 9/18/00	Mon 9/18/00

Notes
9/15: Require GVW torque data from instrumented axle (vehicle running camera tests).
9/18: The data now confirms the test stand is using appropriate loads, and the data can be used as input for CAE work.

13	yxu1	Determine Keller's capability on park rod cam angle	100%	Mon 9/11/00	Sat 9/16/00	Sat 9/16/00

Notes
9/13: dhildebr will contact BDX and Euro Purch for support in getting response from Keller. We need to be sure what Keller is providing, with what tolerance, and at what capability. Determine what tolerance reduction is possible and what is being quoted for 4R100.
Indication is that capability at +/- 30min is 1.05.
9/14: Still working with Keller to determine capability; tolerance is apparently +/- 30min on 1/2 angle.
9/15: Keller can make two different parts, but will have difficulty telling them apart. tsledz, yxu1, jbrazin to work on error proofing the parts/assembly.
9/17: We have a good idea where Keller is today, but need to determine how to help them lower the nominal half angle and narrow the tolerance.

14	yxu1	Investigate alternate park rod supplier.	0%	Fri 9/15/00	Tue 9/19/00	NA

Notes
9/15: Finding an alternate supplier was raised as a possibility by pyuhasz.

15	jbrazin mfyie dadamcz1 lhart tsledz	Create Fishbone diagram for Park System	100%	Sun 9/10/00	Tue 9/12/00	Tue 9/12/00

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
16	jbrazin mfyie dadamcz1 lhart tsledz	Fishbone analysis	25%	Sun 9/10/00	Wed 9/20/00	NA
	Notes 9/14: Data from the "Visible A/T" and FEA are required to begin eliminating items on the diagram.					
17	jbrazin,msimetko	Update AX4N Energy Transfer diagram in team meeting room for 5R55W and application for specific issues.	0%	Sat 9/16/00	Mon 9/18/00	NA
18	lmckinni	Park System FEA: get priority in CAD	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00
	Notes FEA kicked off 9/11. hvirdee will set up a meeting with Jer-Shi Chen to review FEA requirements. Completion forecast for 9/15. 9/13: no timing commitment from CAE 9/14: timing is 2.5 to 3 days for quick answer; Friday, 9/22 for full answer.					
19	CAE,mramnath	Perform Park System FEA	29%	Wed 9/13/00	Fri 9/15/00	NA
	Notes 9/14: This is the quick FEA 9/15: Preliminary results received. full analysis for Sunday morning. Analysis confirms expectations of location of breakout. Recommended improvements in clude longer pawl shaft, deeper holes in case and x-hsg, chamfer on pawl shaft holes. Update Saturday AM. 9/17: Expect update 9/18 AM meeting.					
20	mfyie	Re-run engagement calcs with other pawl designs	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00
	Notes CAD has done the runs; evaluating results. 9/13: Doing a study with 6deg design. mfyie, cperng, yxu1 to review today. 9/14: inputting 6deg design; plan to complete today. 9/15: Complete. An order for 5deg and 6deg pawls has been placed with MPI.					
21	hvirdee	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	14%	Mon 9/11/00	Tue 9/19/00	NA
	Notes Parts from Sample #4 test run 9/11 are being sent to the lab. 9/14: Pawl & Shaft sent to lab (yxu1); bench test samples 1 & 2 case and xhsng sent to lab (hvirdee); pawl & shaft from vehicle 957 (broken xfr case) sent to lab. 9/15: Initial results were due today at 12:30; no results available. 9/16: Sample #2 x-hsg was a sand cast part with much lower hardness than a dies cast part. Fracture analysis on the Sample #2 case will be available Tuesday. There is nothing here to indicate chemistry as a cause of failures. 9/17: no update					
22	hvirdee	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	13%	Tue 9/12/00	Tue 9/19/00	NA
	Notes We need porosity, chemistry, and tensile strength. Samples should be requested from Ryobi (N) and Fagor and Koeln Forge (W). 9/16: Chemistry is consistent with 380 Al spec; European Al is slightly higher in Mg than US. Contact suppliers for more complete analysis and comparable strengths. 9/17: No update					

PE09-020 1147

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
23	dadamcz1	Obtain stack up on park pawl shaft (length & alignment)	25%	Mon 9/11/00	Mon 9/18/00	NA

Notes
9/14: Same as task 23: consolidate
9/15: In process
9/16: Measurements show bearing surface is 4.7mm in xhsg and 7.4mm in case; not much shaft lateral movement; deeper holes and longer shaft is better; existing holes do have chamfers.
hvirdee to provide CAD with :E: case and xhsg drawing numbers; need to create a comparison betwen "W" and "N".

24	mfyie jbrazin	Finalize DVP&R proposal	50%	Mon 9/11/00	Tue 9/12/00	NA

Notes
9/14: proposed DV sent out for comment.
9/15: Draft has been circulated. No decision is required at this time; wait until screening DV results are available to finalize.

25	yxu1	Perform ultimate strength test on "N" and "W" systems. Add "E"	25%	Tue 9/12/00	Fri 9/15/00	NA

Notes
Two samples: one "N" and one "W", tested in the nose up direction.
9/13: direction is to add "E" to this test so we can compare across the whole family.
9/14: Need "N" case (lhart to help); check files for old "E" tests (mfyie, lhart) (file check complete).
9/15: "N" is all set to run; "E" needs further checking. The "W" 4x4 can be run with a 4x2 shaft; the 4x2 with a minimally modified x-hsg. yxu1 needs 4x2 x-hsg drawings and 4x4 xfr xcase spline drawings for a fixture. The 4x2 drawings are complete; existing 4x4 fixtures have been located and the numbers provided to yxu1.
9/17: Ready to run "N" cases today; rsee1 finding parts.

26	Travis Miller	Review all data supporting a change in the pawl return spring force.	100%	Wed 9/13/00	Fri 9/15/00	Fri 9/15/00

Notes
Need a "fresh eyes" review of the data and a recommendation on proceeding with this change for Job1.

27	Cognition,rperri,hdover,yx	Perform VSA-type audit on the Park System. (Cognition)	25%	Wed 9/13/00	Fri 9/15/00	NA

Notes
rperri: business arrangements for analysis
yxu1: drawing list for hdover
hdover: collect drawings and carry to Cognition
9/14: Timing calls for initial model by noon today; meet with mfyie, yxu1 on defining park achievement; verify set up angle, gear positions. Cognition will establish nominal measurements and then six-sigma levels. Drawings complete to Cognition.
9/15: hdover has additional information requested by Cognition and will take it to them today.
9/16: Cognition has all the required data. The model is complete and dimensioned. It shows the OML angle at 0.80deg while previous analyses have shown 1.15deg. We agree to use the 0.80deg calculated offset from vertical. rperri to meet with mfyie and yxu1 to develop further direction.

28	dadamcz1 lhart jbrazin slandes	Develop Screening DV	100%	Thu 9/14/00	Fri 9/15/00	Fri 9/15/00

Notes
9/14: DV draft is complete and is to be reviewed with Tom Cross to see how he wants work orders written to support the plan.
9/16: Test time from first start to final return to garage for r&r is running about 10 hours.

29	W956	Perform Screening DV W956	50%	Fri 9/15/00	Sun 9/17/00	NA

Notes
4.0L 4x2 3.27 axle

PE09-020 1148

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Perform Screening DV W956" continued						
	Notes					
	9/16: ran 60 nose ups; efforts high (felt like 20 to 30#); good pawl/gear engagement; hard to achieve abutment; lots of park gear movement. Get torque data next (klittle2), then return to camera work. On 30% grade park components are immersed in oil. 9/17: ready to run 9/18: lost park during fwd drop ins; pawl pi cracked in half; extension housing hole cracked; case hole elongated; distress seemed pointed inward.					
30	W957	Perform Screening DV W957	30%	Fri 9/15/00	Mon 9/18/00	NA
	Notes					
	4.6L 4x4 3.73 axle 9/16: 100 nose ups and downs; no ratcheting, no sticks, low loads; getting park pawl changed. 9/17: ready to run 9/18: completed 17 HS ratchets then broke a return spring; did maintain park; only ratcheted forward.					
31	ZA00041	Perform Screening DV & Baseline ZA00041	30%	Fri 9/15/00	Sun 9/17/00	NA
	Notes					
	4.6L 4x4 3.73 axle RHD 9/16: Performed baseline; loads between 9 and 36#; 4 ratchets on nose ups (cycles 89, 91, 97, 99); determine from thaugh if these were skips or ratchets down the hill; need post-test inspection and pawl change. (XW4P park pawl). 9/17: park rod and pawl change					
32	W946	Perform Screening DV W946	30%	Fri 9/15/00	Sun 9/17/00	NA
	Notes					
	4.0L 4x2 3.73 axle 9/16: 100 nose ups and downs; no ratcheting, no sticks; low loads; ready to run again. 9/17:					
33	W954	Perform Screening DV W954	0%	Fri 9/15/00	Sun 9/17/00	NA
	Notes					
	4.6L 4x4 3.55 axle 9/17: park rod and pawl change; ready to run 9/18: test 13: skipped 1 tooth several times (nose up 7, nose down 1); with 4deg cam: couldn't pull out of park on first try.					
34	Team	Approve DVP&R proposal	0%	Mon 9/18/00	Mon 9/18/00	NA
	Notes					
	9/14: Draft DV circulated for comment.					
35	Team	Recommend Hardware Direction	0%	Wed 9/20/00	Wed 9/20/00	NA
37	klittle2	Vehicle 956: install digital read out	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
38	klittle2	Vehicle 954: won't start	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00

PE09-020 1149

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Vehicle 954: won't start" continued						
39	klittle2	Vehicle 957: replace transfer case; add digital read out	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
40	dhildebr	Obtain 4x2 w/ 3.27 axle	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes The vehicle is available in Dearborn. Kim Briscoe will bring it to Livonia.					
41	hdover dadamcz1	Obtain RHD vehicle from Shifter group	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
42	hdover	Obtain cables, brackets, clips	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
43	yxu1	Purch order for new pawls	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes Laser cut pawls are due 9/15/00. 9/15: Pawls arrived 9/14.					
44	yxu1	Purch order for extension housings	0%	Thu 9/7/00	Wed 9/20/00	NA
45	ecastro1	Purch order for 24 transmissions	100%	Thu 9/7/00	Sun 9/10/00	Sun 9/10/00
	Notes Bordeuax built the transmissions on 9/11/00.					
46	BDX	Deliver 24 transmissions to ATNPC	0%	Tue 9/12/00	Tue 9/19/00	NA
47	peckman	Purch 2 new force gages	100%	Thu 9/7/00	Tue 9/12/00	Tue 9/12/00
	Notes Two new gages received.					
48	mfyie	Design/Fab bench test fixture	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
49	dadamcz1 lhart hdover jbrazin	Create Visible A/T	100%	Sun 9/10/00	Thu 9/14/00	Thu 9/14/00
	Notes A camera is to be installed in a vehicle/transmission on 9/12; first results for 9/13 meeting. 9/15: Complete on 9/14; collect data on 9/15.					

PE09-020 1150

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
50	klittle2	Install Digital Read-outs in all five test vehicles	0%	Mon 9/18/00	Mon 9/25/00	NA
	Notes	9/18: Work with DTA to order read out units to be fabricated outside; get timing from supplier.				
52	mfyie	Bench test selected prototype pawl with Max Park Disengagement Load	0%	Tue 9/26/00	Wed 9/27/00	NA
53	mfyie	Bench test	50%	Thu 9/21/00	Thu 9/28/00	NA
54	yxu1	Combined Ratchet/Pullout	0%	Thu 9/28/00	Sun 10/1/00	NA
55	kbriscoe	Bump Test	0%	Tue 9/26/00	Fri 10/13/00	NA
56	yxu1	DV Testing	0%	Mon 10/2/00	Sun 10/15/00	NA
58		STA to work with Keller to confirm their capability and reduce tolerance.	0%	Sun 9/17/00	Wed 9/20/00	NA
	Notes	9/16: Dan Hildebrand will contact Michel F. and ask him to work with Keller.				
59	mfyie,yxu1	Provide marked up drawings showing cam angle change	0%	Sat 9/16/00	Sun 9/17/00	NA
	Notes	9/16: FAX marked sketch to Keller and Bordeaux				
60	mfyie,yxu1	Investigate additional processesing to reduce cam half angle tolerance.	100%	Sun 9/17/00	Tue 9/19/00	Tue 9/19/00
	Notes	9/16: Investigate sort and grind; any other options? 9/18: Confirmed that a centerless grinding operation can be added to a new die to provide parts with lower nominal half angle and a tighter tolerance.				
61	tsledz,yxu1,jbrazin	Find a method for interim mis-assembly proofing rods with "W" vs "E" bullets.	0%	Sun 9/17/00	Fri 9/22/00	NA
	Notes	9/16: As it looks like we need to change the cam angle for "W" this item gets its own task (from task 13).				
62	Andreas Bockelmann	Deliver prototype parts to ATNPC for testing	0%	Thu 9/7/00	Fri 9/15/00	NA
	Notes	9/18: Prototypes are expected by Saturday, 23 Sept 00.				

PE09-020 1151

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
63	Andreas Bockelmann	Deliver PSW'd parts to Bordeaux for PV and production.	0%	Mon 9/18/00	Mon 10/16/00	NA
	Notes 9/18: Proposed timing is 4 weeks from go ahead; "go" given today.					
64		Sherdel delivers revised pawl return spring	0%	Thu 9/7/00	Thu 9/7/00	NA
66	MPI Subcontractor	Machine MPI produced pawls already in stock	0%	Wed 9/20/00	Wed 9/27/00	NA
67	MPI	Final processing of pawls at MPI	0%	Wed 9/27/00	Sat 9/30/00	NA
68	MPI	Ship pawls to BDX	0%	Sat 9/30/00	Thu 10/5/00	NA
70	MPI	Production die	0%	Thu 9/7/00	Thu 10/12/00	NA
71	MPI	PSW Parts	0%	Thu 10/12/00	Mon 10/16/00	NA
72	MPI	Ship to Bordeaux	0%	Mon 12/4/00	Tue 12/5/00	NA
74		PV/Production MRD	0%	Tue 10/17/00	Tue 10/17/00	NA
75	BDX	Build PV transmissions	0%	Wed 10/18/00	Thu 10/19/00	NA
76	BDX	Transmission Job1	0%	Thu 10/19/00	Thu 10/19/00	NA
77	BDX	Perform PV test	0%	Fri 10/20/00	Sat 10/21/00	NA
78	BDX	PSW	0%	Sun 10/22/00	Mon 10/23/00	NA

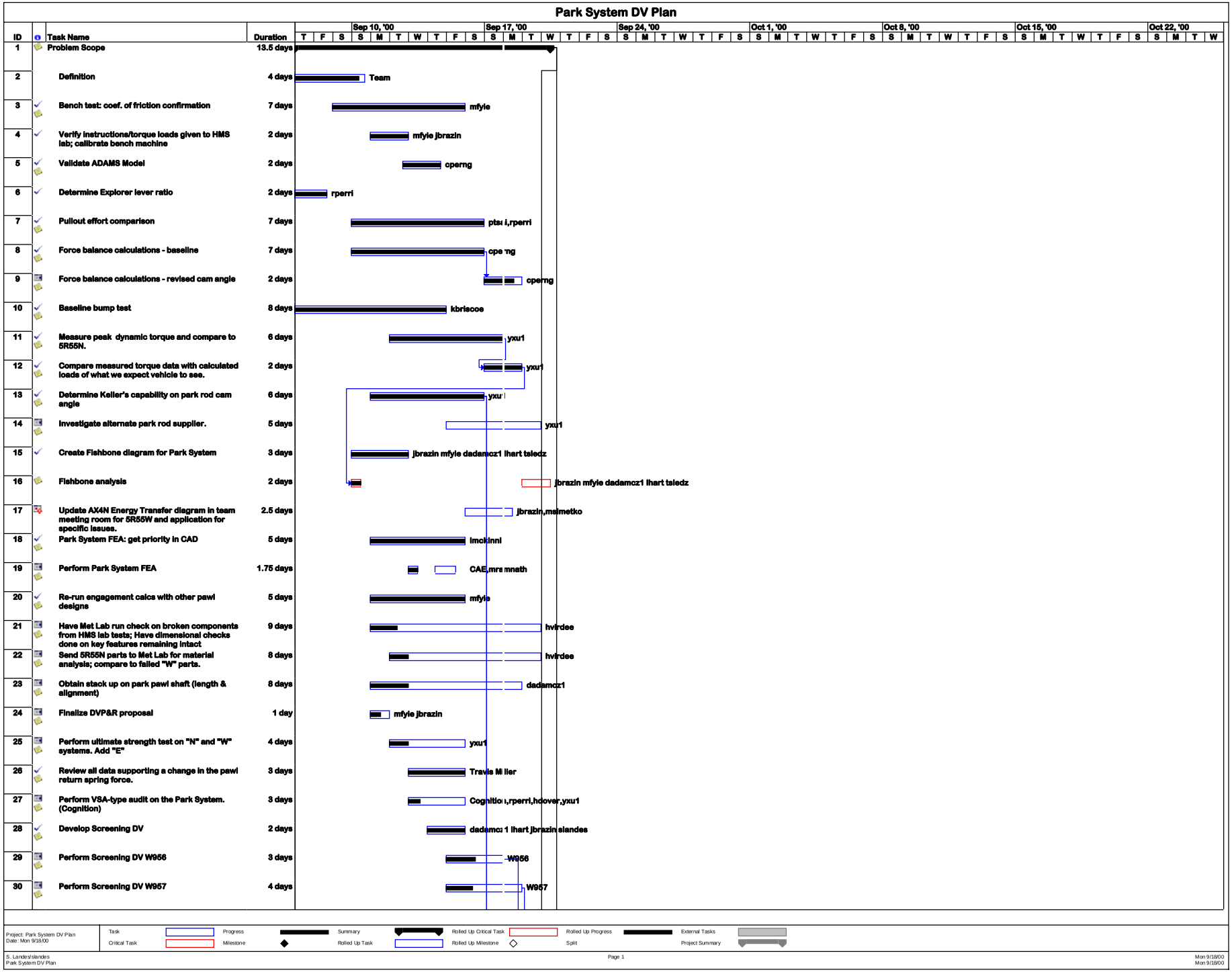
PE09-020 1152

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
79	BDX	Ship to LAP	0%	Fri 10/20/00	Tue 10/24/00	NA
80		MRD #2 for Final Design Pawls	0%	Tue 12/5/00	Tue 12/5/00	NA
81		Re-PSW	0%	Thu 9/7/00	Thu 9/7/00	NA
82	LAP	Integrated Build at LAP	0%	Mon 10/23/00	Sun 11/19/00	NA
84	MPI	Production die	0%	Thu 9/7/00	Thu 10/12/00	NA
85	MPI	PSW Parts	0%	Thu 10/12/00	Mon 10/16/00	NA
86	MPI	Ship to Bordeaux	0%	Mon 10/16/00	Wed 10/18/00	NA
87	yxu1,klittle2	Measure peak dynamic torque and compare to 5R55N.	0%	Thu 9/7/00	Tue 9/12/00	NA

Notes
9/18: Develop a list of requirements for doing instrument axle testing on a 4X4.

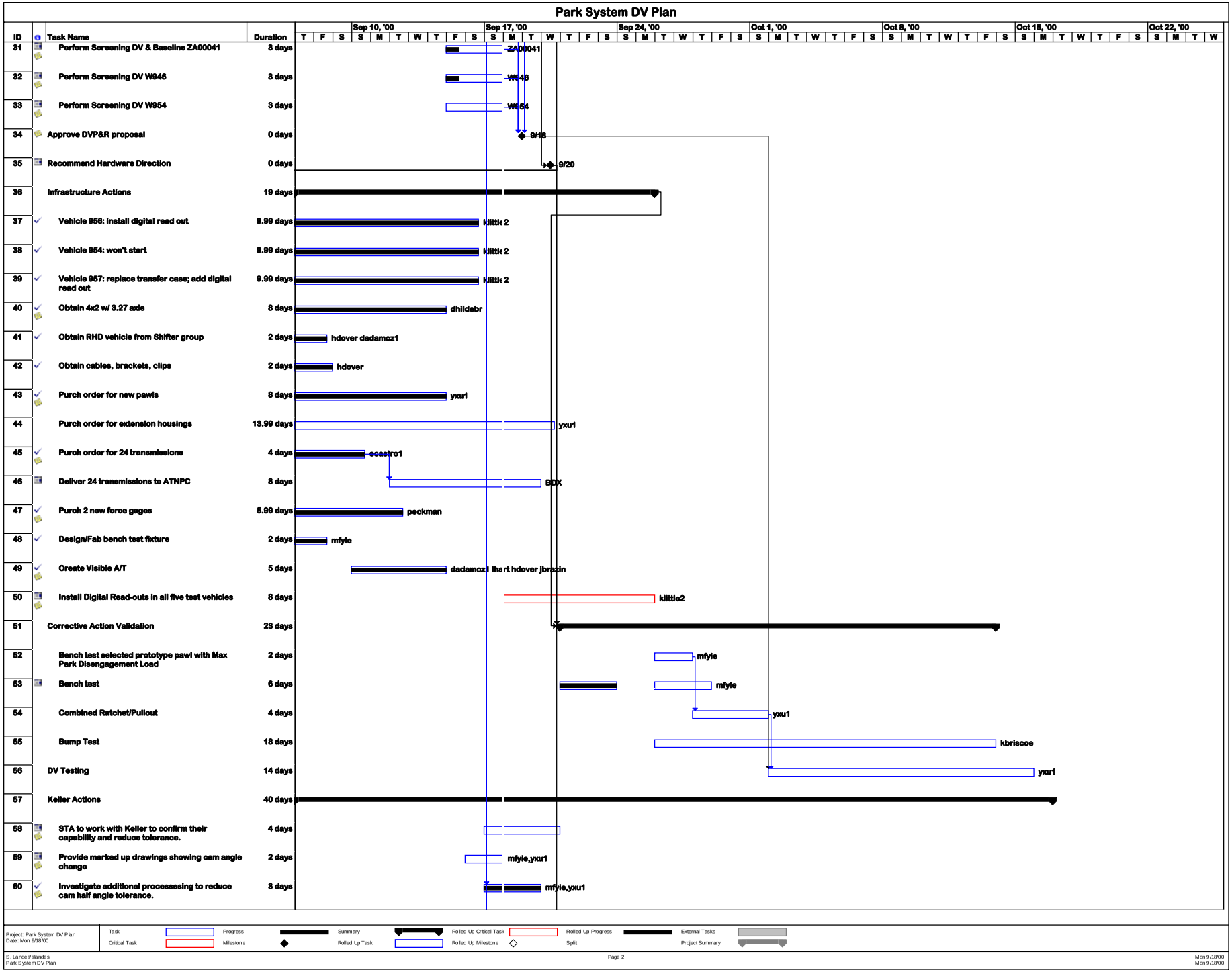
PE09-020 1153

Park System DV Plan



PE09-020 1154

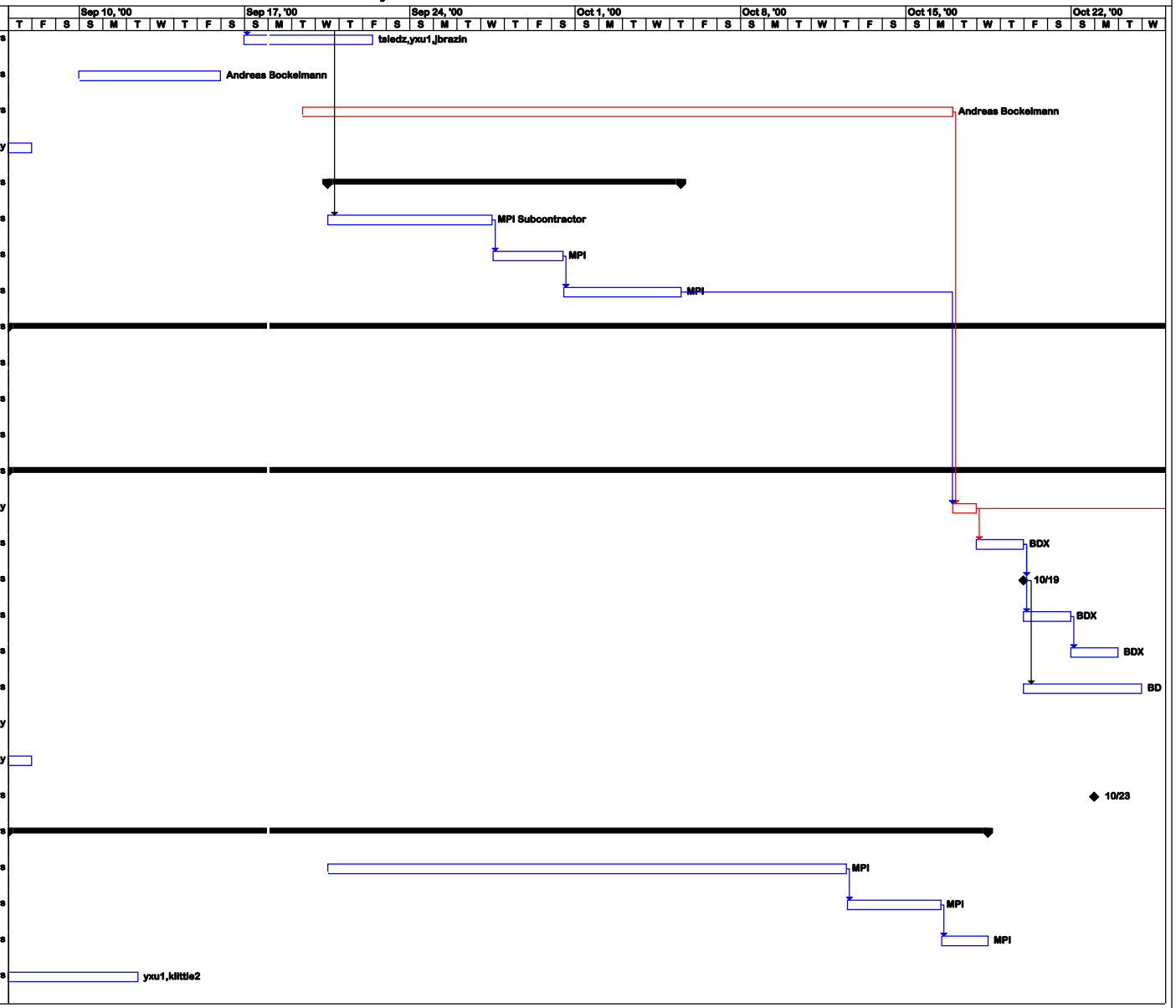
Park System DV Plan



PE09-020 1155

Park System DV Plan

ID	Task Name	Duration
61	Find a method for interim mis-assembly proofing rods with "W" vs "E" bullets.	5.33 days
62	Deliver prototype parts to ATNPC for testing	6 days
63	Deliver PSW'd parts to Bordeaux for PV and production.	27.55 days
64	Sherdel delivers revised pawl return spring	1 day
65	MPI Interim Support Plan	15 days
66	Machine MPI produced pawls already in stock	7 days
67	Final processing of pawls at MPI	3 days
68	Ship pawls to BDX	5 days
69	MPI Final Design Actions	88 days
70	Production die	22 days
71	PSW Parts	4 days
72	Ship to Bordeaux	2 days
73	Bordeaux Actions	88 days
74	PV/Production MRD	1 day
75	Build PV transmissions	2 days
76	Transmission Job1	0 days
77	Perform PV test	2 days
78	PSW	2 days
79	Ship to LAP	5 days
80	MRD #2 for Final Design Pawls	1 day
81	Re-PSW	1 day
82	Integrated Build at LAP	28 days
83	MPI Actions	41.5 days
84	Production die	22 days
85	PSW Parts	4 days
86	Ship to Bordeaux	2 days
87	Measure peak dynamic torque and compare to 5R55N.	5.5 days



Project: Park System DV Plan
Date: Mon 9/18/00

Task | Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks
Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary

PE09-020 1156

From: Landes, Stephen (S.L.)
Sent: Saturday, September 30, 2000 5:26 PM
To: Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Chen, Jershi (J.); Dover, Harry (H.); Fyie, Matthew (M.L.); Greene, Lisa (L.A.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Krishnaswami, Ram (R.); Landes, Stephen (S.L.); Little, Kevin (K.W.); MacDonald, George (G.F.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Ramnath, Das (M.D.); Retallack, Lynn (L.M.); See, Raymond (R.J.); Sledz, Ted (T.M.); Spaulding, Todd (T.C.); Tsai, Pingfang (P.); Virdee, Harbinder (H.S.); Xu, Yehong (Y.)
Cc: Antrim, William (W.R.)
Subject: Park System Team Meeting Notes and Assignments

Attachments: Microsoft Project - Team Assignments by Resource.pdf

The attached file is our list of assignments sorted by resource name (that's YOU). Please check your list of assignments and let the team know your status at the daily 12:30PM meetings AND check under the resource name "TEAM" for team meeting notes and short term assignments that haven't been added to the work plan.

Microsoft Project - Team Assig...

Stephen Landes
5R55N/W/S/E Systems Engineering
slandes@ford.com
(734) 523-5841
Text Page: slandes

Team Assignments as of Sat 9/30/00
Park System DV Plan

Highlighted Tasks have been completed

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
58		STA to work with Keller to confirm their capability and reduce tolerance.	0%	Sun 9/17/00	Wed 9/20/00	NA
		Notes 9/16: Dan Hildebrand will contact Michel F. and ask him to work with Keller.				
65		Release initiated	100%	Tue 9/19/00	Tue 9/19/00	Tue 9/19/00
66		Back-up PSW	0%	Tue 9/19/00	Mon 10/2/00	NA
67		Parts manufacturing and delivery to Bordeaux	0%	Tue 9/19/00	Fri 10/6/00	NA
77		PV/Production MRD	0%	Tue 10/10/00	Tue 10/10/00	NA
84		IB MRD	0%	Fri 10/20/00	Fri 10/20/00	NA
86		MRD #2 for Final Design Pawls	0%	Sun 10/15/00	Sun 10/15/00	NA
87		PV Build	0%	Mon 10/16/00	Mon 10/16/00	NA
88		PV Test	0%	Tue 10/17/00	Fri 10/20/00	NA
89		Re-PSW	0%	Sat 10/21/00	Sat 10/21/00	NA
90		Ship to LAP	0%	Sun 10/22/00	Thu 10/26/00	NA
91		Current Green Pawl Stock Expires	0%	Wed 11/1/00	Wed 11/1/00	NA
62	Andreas Bockelmann	Deliver prototype parts to ATNPC for testing	100%	Mon 9/18/00	Thu 9/21/00	Thu 9/21/00
		Notes 9/18: Prototypes are expected by Saturday, 23 Sept 00. 9/21: Parts arrived by courier today.				

PE09-020 1158

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
63	Andreas Bockelmann	Deliver PSW'd parts to Bordeaux for PV and production.	100%	Thu 9/7/00	Thu 10/5/00	Thu 10/5/00
	Notes 9/18: Proposed timing is 4 weeks from go ahead; "go" given today. 9/25: CLOSED -- no part change for Job1					
46	BDX	Deliver 24 transmissions to ATNPC	100%	Tue 9/12/00	Mon 9/18/00	Mon 9/18/00
78	BDX	Build PV transmissions	0%	Wed 10/11/00	Wed 10/11/00	NA
79	BDX	Perform PV test	0%	Thu 10/12/00	Sun 10/15/00	NA
80	BDX	PSW	0%	Mon 10/16/00	Mon 10/16/00	NA
81	BDX	Transmission Job1	0%	Mon 10/16/00	Mon 10/16/00	NA
82	BDX	Ship to LAP	0%	Mon 10/16/00	Wed 10/18/00	NA
19	CAE,mramnath	Perform Park System FEA	75%	Wed 9/13/00	Fri 9/22/00	NA
	Notes 9/14: This is the quick FEA 9/15: Preliminary results received. full analysis for Sunday morning. Analysis confirms expectations of location of breakout. Recommended improvements in clude longer pawl shaft, deeper holes in case and x-hsg, chamfer on pawl shaft holes. Update Saturday AM. 9/17: Expect update 9/18 AM meeting.					
27	Cognition,rperri,hdover,yx	Perform VSA-type audit on the Park System. (Cognition)	50%	Wed 9/13/00	Mon 9/25/00	NA
	Notes rperri: business arrangements for analysis yxu1: drawing list for hdover hdover: collect drawings and carry to Cognition 9/14: Timing calls for initial model by noon today; meet with mfyie, yxu1 on defining park achievement; verify set up angle, gear positions. Cognition will establish nominal measurements and then six-sigma levels. Drawings complete to Cognition. 9/15: hdover has additional information requested by Cognition and will take it to them today. 9/16: Cognition has all the required data. The model is complete and dimensioned. It shows the OML angle at 0.80deg while previous analyses have shown 1.15deg. We agree to use the 0.80deg calculated offset from vertical. rperri to meet with mfyie and yxu1 to develop further direction. 9/21: The set up angle has been re-calculated and is now deternined to be 0.73deg from vertical. The calculation and method will be written into the model assumptions. The model can be animated, and much is being learned. 9/26: Design assumptons were discussed, and the model will be used to improve the definition of what it means to be "in Park".					

PE09-020 1159

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
5	cperng	Validate ADAMS Model	100%	Tue 9/12/00	Thu 9/14/00	Thu 9/14/00

Notes
9/15: Mu assessment complete and the model ahs been updated.

8	cperng	Force balance calculations - baseline	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes
Ratchet spring is adequate. If the pawl is aligned with a gear space & Park is selected a minimum of 14 N is required of the ratchet spring to depress the pawl. The current spring pre-load provides 40+/-2 N.
We need a flatter cam angle to compensate for low coef of friction. The present included angle is 9 to 11 deg.
9/14: need a one page summary written for this analysis.
9/15: These calculations are run at nominal conditions. We should consider running them at worst/best case conditions. Decide at 12:30 meeting. No decision at 12:30 -- right people not present.
9/16: Summary document revised and complete.

9	cperng	Force balance calculations - revised cam angle	100%	Sun 9/17/00	Mon 9/18/00	Mon 9/18/00

Notes
9/16: Recalculate with the revised cam half angle of 4.5deg +/- 30min to confirmed instructions planned for Keller.
9/17: 4deg is too flat for RHD shift efforts; need to keep minimum angle to 4.5deg and reduce tolerance.

23	dadamcz1	Obtain stack up on park pawl shaft (length & alignment)	17%	Mon 9/11/00	Fri 9/22/00	NA

Notes
9/14: Same as task 23: consolidate
9/15: In process
9/16: Measurements show bearing surface is 4.7mm in xhsg and 7.4mm in case; not much shaft lateral movement; deeper holes and longer shaft is better; existing holes do have chamfers.
hvirdee to provide CAD with :E: case and xhsg drawing numbers; need to create a comparison betwen "W" and "N".
9/21: The designed is updating team members today; results tomorrow.

49	dadamcz1 lhart hdover jbrazin	Create Visible A/T	100%	Sun 9/10/00	Thu 9/14/00	Thu 9/14/00

Notes
A camera is to be installed in a vehicle/transmission on 9/12; first results for 9/13 meeting.
9/15: Complete on 9/14; collect data on 9/15.

28	dadamcz1 lhart jbrazin slandes	Develop Screening DV	100%	Thu 9/14/00	Fri 9/15/00	Fri 9/15/00

Notes
9/14: DV draft is complete and is to be reviewed with Tom Cross to see how he wants work orders written to support the plan.
9/16: Test time from first start to final return to garage for r&r is running about 10 hours.

40	dhildebr	Obtain 4x2 w/ 3.27 axle	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00

Notes
The vehicle is available in Dearborn. Kim Briscoe will bring it to Livonia.

PE09-020 1160

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
45	ecastro1	Purch order for 24 transmissions	100%	Thu 9/7/00	Sun 9/10/00	Sun 9/10/00
	Notes					
	Bordeuax built the transmissions on 9/11/00.					
42	hdover	Obtain cables, brackets, clips	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
41	hdover dadamcz1	Obtain RHD vehicle from Shifter group	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
21	hvirdee	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	100%	Mon 9/11/00	Tue 9/19/00	Tue 9/19/00
	Notes					
	Parts from Sample #4 test run 9/11 are being sent to the lab. 9/14: Pawl & Shaft sent to lab (yxu1); bench test samples 1 & 2 case and xhsng sent to lab (hvirdee); pawl & shaft from vehicle 957 (broken xfr case) sent to lab. 9/15: Initial results were due today at 12:30; no results available. 9/16: Sample #2 x-hsg was a sand cast part with much lower hardness than a dies cast part. Fracture analysis on the Sample #2 case will be available Tuesday. There is nothing here to indicate chemistry as a cause of failures. 9/17: no update 9/21: Lab report received. There are no materials issues.					
22	hvirdee	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	100%	Tue 9/12/00	Tue 9/19/00	Tue 9/19/00
	Notes					
	We need porosity, chemistry, and tensile strength. Samples should be requested from Ryobi (N) and Fagor and Koeln Forge (W). 9/16: Chemistry is consistent with 380 Al spec; European Al is slightly higher in Mg than US. Contact suppliers for more complete analysis and comparable strengths. 9/17: No update 9/21: Lab report received. There are no materials issues.					
15	jbrazin mfyie dadamcz1 lhart tsledz	Create Fishbone diagram for Park System	100%	Sun 9/10/00	Tue 9/12/00	Tue 9/12/00
16	jbrazin mfyie dadamcz1 lhart tsledz	Fishbone analysis	25%	Sun 9/10/00	Wed 9/20/00	NA
	Notes					
	9/14: Data from the "Visible A/T" and FEA are required to begin eliminating items on the diagram.					
17	jbrazin,msimetko	Update AX4N Energy Transfer diagram in team meeting room for 5R55W and application for specific issues.	0%	Sat 9/16/00	Mon 9/18/00	NA
10	kbriscoe	Baseline bump test	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes					
	test being performed 9/12. 9/14: test passed; requesting formal lab report for 9/15.					

PE09-020 1161

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
55	kbriscoe	Bump Test	0%	Tue 9/26/00	Fri 10/13/00	NA
37	klittle2	Vehicle 956: install digital read out	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
38	klittle2	Vehicle 954: won't start	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
39	klittle2	Vehicle 957: replace transfer case; add digital read out	100%	Thu 9/7/00	Sat 9/16/00	Sat 9/16/00
50	klittle2	Install Digital Read-outs in all five test vehicles	0%	Mon 9/18/00	Mon 9/25/00	NA

Notes
9/18: Work with DTA to order read out units to be fabricated outside; get timing from supplier.

18	lmckinni	Park System FEA: get priority in CAD	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
FEA kicked off 9/11. hvirdee will set up a meeting with Jer-Shi Chen to review FEA requirements. Completion forecast for 9/15.
9/13: no timing commitment from CAE
9/14: timing is 2.5 to 3 days for quick answer; Friday, 9/22 for full answer.

3	mfyie	Bench test: coef. of friction confirmation	100%	Sat 9/9/00	Fri 9/15/00	Fri 9/15/00

Notes
Sample #4 passed all pullouts through 700 ibs-ft static load; apwl shaft cracked and small cracks appeared in the case and x-hsng, pawl shaft bore elongated -- similar to high-speed ratchet test results.
As of 9/13:
Samples 1, 2, 3: no data; broken parts
Samples 4, 5, 6: tests completed; good data
Sample 7: laser pawl; test postponed
Samples 9, 10, 11: to be done 9/13/00
Two additional samples will be run with laser pawls for the selected geometry.
Add two "E" transmissions to this test. (lhart to obtain transmissions).
9/14: no parts broken since the stand was recalibrated after sample #4 and we switched to running 4x4's. Sample #8 returned to build up for unrelated o/s binding. Lowest mu recorded to date is 0.087.
9/15: Dennis Fergusen is setting up to run "E" transmissions on the stand. There is good information that suggests early sample breakage is related to over torque on the stand due to stand operating practice (setting torque after initiating cycle). We will wait to do new pawls until the next BDX shipment of transmissions arrives (schd for 9/19). "E" transmissions are available.
9/16: The testing needed to support validation of the ADAMS model is complete. Additional testing on "E" and with the 3deg pawls will be done separately.
9/17: Summarize second batch of data for 9/18 AM meeting.

20	mfyie	Re-run engagement calcs with other pawl designs	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
CAD has done the runs; evaluating results.
9/13: Doing a study with 6deg design. mfyie, cperng, yxu1 to review today.
9/14: inputting 6deg design; plan to complete today.
9/15: Complete. An order for 5deg and 6deg pawls has been placed with MPI.

PE09-020 1162

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
48	mfyie	Design/Fab bench test fixture	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
52	mfyie	Bench test selected prototype pawl with Max Park Disengagement Load	0%	Tue 9/26/00	Wed 9/27/00	NA
53	mfyie	Bench test	50%	Thu 9/21/00	Thu 9/28/00	NA
4	mfyie jbrazin	Verify instructions/torque loads given to HMS lab; calibrate bench machine	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00
24	mfyie jbrazin	Finalize DVP&R proposal	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00

Notes
9/14: proposed DV sent out for comment.
9/15: Draft has been circulated. No decision is required at this time; wait until screening DV results are available to finalize.
9/21: The finalized DVP&R and vehicle/hardware requirements are to be reviewed on 9/22 at the 12:30 meeting.

59	mfyie,yxu1	Provide marked up drawings showing cam angle change	100%	Sat 9/16/00	Sun 9/17/00	Sun 9/17/00

Notes
9/16: FAX marked sketch to Keller and Bordeaux
9/25: Testing demonstrates that the proposed angle change does not improve function. We will not change the part for Job1. CLOSED

60	mfyie,yxu1	Investigate additional processesing to reduce cam half angle tolerance.	100%	Sun 9/17/00	Tue 9/19/00	Tue 9/19/00

Notes
9/16: Investigate sort and grind; any other options?
9/18: Confirmed that a centerless grinding operation can be added to a new die to provide parts with lower nominal half angle and a tighter tolerance.

70	MPI	Final processing of pawls at MPI	0%	Sat 9/30/00	Mon 10/2/00	NA
71	MPI	Ship pawls to BDX	0%	Tue 10/3/00	Sat 10/7/00	NA
73	MPI	Production die	0%	Sat 9/23/00	Sun 10/8/00	NA
74	MPI	PSW Parts	0%	Mon 10/9/00	Thu 10/12/00	NA
75	MPI	Ship to Bordeaux	0%	Fri 10/13/00	Sat 10/14/00	NA

PE09-020 1163

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Ship to Bordeaux" continued						
69	MPI Subcontractor	Machine MPI produced pawls already in stock	0%	Sat 9/23/00	Fri 9/29/00	NA
47	peckman	Purch 2 new force gages	100%	Thu 9/7/00	Tue 9/12/00	Tue 9/12/00
	Notes Two new gages received.					
7	ptsai,rperri	Pullout effort comparison	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00
	Notes 1) RHD values higher than LHD 2) "W" nose up higher than nose down 3) Re-run calculations with latest geometry 9/14: still waiting for "N" data from SHV. Ihart to call Ken Stacherski for assistance. 9/15: SHV data received; revise table for 12:30 meeting (add DEW98 N w/ floor shifter). Also need offset numbers and update the matrix. 9/16: Complete. offset numbers will be added to a separate matrix to avoid confusion.					
6	rperri	Determine Explorer lever ratio	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
2	Team	Definition	80%	Thu 9/7/00	Sun 9/10/00	NA
34	Team	Approve DVP&R proposal	0%	Fri 9/22/00	Fri 9/22/00	NA
	Notes 9/14: Draft DV circulated for comment. 9/21: Approval targeted for 9/22 at 12:30					
35	Team	Recommend Hardware Direction	100%	Sat 9/23/00	Sat 9/23/00	Sat 9/23/00
	Notes 9/21: System design direction is: 260Nmm return spring (Sherdel) 4.7 +/- 0.2 deg cam half angle (Keller) 6deg pawl with 0.4mm added tooth thickness to compensate for reduction made with angle change (MPI) Weekend testing will confirm design direction.					
95	Team	9/24/00 AM	0%	Sun 9/24/00	Sun 9/24/00	NA
	Notes Send 4, 5, 6deg pawls to Chem Met to confirm they meet specs on print (yxu1) Get report from Chem Met on pawls already in lab. (yxu1, 9/25) Identified park gears with most damage and send them to the lab (yxu1) Observation: the system is producing some Windstar-like noises Summarize bench test data (ptsai, 9/25) Do visual inspections on parts from completed tests (yxu1, jbrazin)					

PE09-020 1164

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/24/00 AM" continued

Notes

Get Toyota park system study from Wroblewski (lmckinni)
Investigate shot peening for pawl (jbrazin)
Determine the angle from drive to nominal park for floor vs column shifter (hdover)
Determine how far into park we go (position on cam) for floor vs column shifter (hdover)
Perform ABA test between vehicles 041 and 957: swap transmissions to see if the reason for 041 success is realted to the shifter (lhart)
Run MathCAD model with proposed design (mfyie, 9/25 AM)
Install optical encoder on vehicles 946 and 041 (lhart)
Obtain digital read outs for all five vehicles (klittle2)
Checkout RCONS and PCA2 modules in all 5 vehicles (lhart)
Approve DVP&R at 12:30 meeting (slandes -- copies)

96	Team	9/24/00 PM	0%	Sun 9/24/00	Sun 9/24/00	NA

Notes

Decision Matrix	Weight	Angle Change fom 1L2P-AA 4 deg	5 deg
Pull Out Effort	8	0	1
Drop In Speed	7	1	0
H. S. Ratchet	1	0	0
Spit Out	10	0	1
Hang Up	9	1	0
Score		16	18

The Team met on Sunday afternoon and reviewed test data and progress. We decided to see where we stood on making a decision on pawl tooth angle modification and used the above decision matrix to evaluate our position. After constructing the matrix it was the team decision to direct MPI to use the 5deg modification design. The key assessment criteria is "spit out". Even with out the weights applied the matrix would have resulted in a tie with the decision going to 5 deg because of the spit out issue. If only spit out and hang up were considered the decision would still be to sue 5 deg because of spit out considerations.

A set of good and bad pawls will be sent to ChemMet for analysis:
6deg unused
"N" unused
old "W" unused
pass and fail parts from current tests
"E" unused
"E" from team tests

We need to determine the proper sample size for DVP&R tests at the Monday 12:30.
A program specific DVP&R will be ready by COB Monday (yxu1)
Determine RHD vehicle requirements for the DV (hdover)

97	Team	9/25/00 AM	0%	Mon 9/25/00	Mon 9/25/00	NA

Notes

All required pawls except the "E" tested part have been provided to the lab. MFYIE will find and supply the used "E" pawl.
Preliminary Chem Met test results have been communicated to MPI; test report to follow.
The ABA test between vehicles 041 and 957 has been partially completed: both vehicles experienced hang up at the 75th cycle. We will not do the last "A" portion of the test as the parts are too worn to provide reasonable results, and other test requirements will take precedence.
Some discussion on DV sample sizes has been held. The bump test will be a size of one; bench tests will be a size of three.

98	Team	9/25/00 PM	0%	Mon 9/25/00	Mon 9/25/00	NA

Notes

The bump test will be held on Wednesday using vehicle 956 (4x2 with a 3.27 axle -- worst case vehicle for this test). YXU1 to supply a transmission to kbrisoce today for the test.
NOTE: lhart and slandes discussed which return spring to build in this transmission;, we have A, B, & C springs at this point with A being current, B close to production intent, but no actual production intent spring on hand. As the "A" spring would present the greatest risk of test failure we will use that spring -- a "Pass" under these worst case conditions should support system sign off.
The tested "E" pawl is being pulled for the lab.
RHD vehicle 041 will be retunred to hdover for a few days for a management review.
Modeling to support the 5deg pawl decision should be ready by the Tuesday meeting (mfyie)
Bench test data needs to be summarized (yxu1 & ptsai)

PE09-020 1165

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/25/00 PM" continued

Notes

Analytical Data Collection

- Run models at tolerance limits using test data from bench and vehicle tests (coefficients, loads, etc.) mfyie, cperng
- Run bench tests on 5 deg pawls from the large batch (3 samples) yxu1
- Perform drop in tests with 5 deg pawl prototype level parts kbriscoe/lhart
- Perform the barrier test (Wednesday, kbriscoe)
- Determine what testing we can perform with existing pawls and which ones require new big batch parts.

Note: final dimensions have been given to Sherdel for the return spring.

Release the pawl and return spring, advnace the transmission assembly number. yxu1/cdavis42
Transmit the design for the new pawl with circular tooth thickness increas to cperng for ADAMS study and MPI for prototype parts. yxu1
Investigate process modifications for MPI as post-Job1 actions. jbrazin

99	Team	9/26/00 PM	0%	Tue 9/26/00	Tue 9/26/00	NA

Notes

Vehicle Prep Issues:

- Change tire inflation from 26 to 30 psi to match new Company direction.
- Prep vehicles with the 5deg pawls we have in hand.
- Optical encoders are being installed on two vehicles.
- We have found ways to read vehicle speeds from the encoders (RCON direct or signal conditioning boxes; digital read outs when available).
- ABA testing on 041 and 957 will be completed. The team agreed to swap transmissions with no change in parts. If this produces useable results and additional work is indicated then we will consider a proper ABA, swapping transmissions with new or "stoned" parts.

F/U from 9/25:

- Bump test is to be performed on Wednesday; on track
- The tested "E" pawl has been taken to the lab
- HDOVER is temporarily updating the RHD vehicle for a management review.
- Modeling of teh 5deg pawl is inprocess; to be complete on 9/27.
- Initial drop in speed tests were run; values slightly higher than predicted; results are to be compared with model values (cperng)
- 4deg: 3.0 to 3.2 mph
- 5deg: 3.6 mph
- Sherdel has committed to PSW parts at BDX on 4 Oct 00.
- MPI will work with Jim Brazin to develop a work plan for investigating process improvements recommended by our lab. The MPI rep was here to spend time with our lab team.
- Confirmed that the return spring to be used for initial DV testing is the "A" spring; OK for bump test.
- A stack up request for circular tooth thickness has been submitted to CAD (#2081). F/U to make sure they're working on it (yxu1).

New:

- Finalize the DVP with vehicle requirements (lhart, dadamcz1, jbrazin, dhildebr).
- Send a tested "N" pawl to the lab (yxu1).
- Note that modeling includes max/min mu and correlated to torque loads from test vehicles (yes, per mfyie)
- Bench tests:
- one run at 5deg pawl, complete
- two samples to go
- run a failed (hang up) transmission on the bench to measure mu underthose circumstance (yxu1).
- We have 5 pawls in hand, more are expected from MPI's big batch on Friday.
- We have 15 transmissions in hand with 24 more coming from BDX.
- Keller will work on a plan to investigate and improve their manufacturing tolerance.
- We need to do a layout of a damaged pawl and give those dimensions to Cognition for study in our full system stack up model (yxu1, hdover).

PE09-020 1166

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
100	Team	9/27/00 PM	0%	Wed 9/27/00	Wed 9/27/00	NA

Notes

Park System and some Transmission System team members met with Mr. Yuhasz. No regular team meeting was held. Briefly, unless the team can answer the issue raised by mfyie's model which shows the system not holding park on grade at minimum mu and maximum park rod cam angle we are not ready for production. The following assignments came from the meeting:

- Calculate the max cam angle sufficient for no spit out (mfyie)
- Obtain park rods in 0.1deg increments over the tolerance range; all phosphate coated; surface characteristics identified (yxu1)
- Benchmark E/N/AX with MathCAD model and similar mu values (mfyie)
- Find the transmission system with base pawl or 3deg pawl that skipped; measure cam angle/surface; confirm it still skips; rerun with 5deg pawl (lhart dadamcz1)
- Find ways to limit cariation in mu (dhildebr)
- Conduct one day peer review (vlajines)
- Add G. MacDonald to peer review team (pyuhasz)
- ZF help with review? (pyuhasz)

101	Team	9/28/00 PM	0%	Thu 9/7/00	Thu 9/7/00	NA
102	Team	9/29/00 PM	0%	Fri 9/29/00	Fri 9/29/00	NA

Notes

Tasks:

- Find highest and lowest cam angles, run bench and vehicle tests.
- Calculate points for above data.
- Run 5.0deg prod intent pawl with increasing load until spit out experienced.
- Run highest cam angle for 4.5deg to 4.7deg batch on "W" -- no pull out?
- Grind 4.7, 4.8, 4.9 cams; test "W"
- If max cam angles found do not exceed 5.2deg to 5.3 deg; modify to 5.5deg.

103	Team	9/30/00 PM	0%	Sat 9/30/00	Sat 9/30/00	NA

Notes

Data Analysis Update:

Cam Angle:

- Measurement system: it is repeatable, but part presentation may be an issue (measuring from an uncontrolled surface). Determine if there is an issue with presentation; determine how to communicate measurement method.
- investigate clamp process (clamp & rotate parts)
- investigate shadow graph
- tear down parts and measure off machined ID

Pull out data

With 4x2's and 4x4's, production cam:

- nose up v down shows very little difference
- 3.27 has higher efforts than 3.73
- Why is 4deg pawl showing higher efforts in 3.27 and 5deg pawl higher efforts in 3.73?
- 5deg pawl has less variability in pull out loads
- Both PTSAI and RKRINSHN2 analyses reach these conclusions.

Mu-sub"e" calculations

- 500# applied load shows lower Mu-e than 300# or 700#.
- 500# has less variation in both nose up and down directions than other loads.

PE09-020 1167

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/30/00 PM" continued

Notes

Direction Summary

Primary:
Multiple runs of the MathCAD model for AX, N, and W configurations have been plotted on one chart. The conclusion is that "W" is good with park cams between 4.8deg and 5.0deg.

- Refine the model
- Confirm current model conclusions with testing using sorted and oriented rods and ATNPC-machined rods.
- Determine how to control cam angle to tight tolerance around a nominal of 4.9deg; define measurement method, determine capability.
- Add 5R55E to the master comparison chart.
- Document differences in Mu-e measurements between AX and N/W (mfyie)

Secondary:

- Find ways to control mu-e on either pawl or bullet. (jbrazin)

Work to be done:

Hardware:

Bench (khogberg)

- new rods with phos coating at 300# load only; 30ccw/30cw; indexing park gear teeth
- same rod; remove phos & polish (jbrazin); rerun test
- Full test w/ strain gaged rod; peak torque @ maual shaft to peak force @ rod.
- DVP&R testing: rods with new pawls.

Lab (khogberg)

- Machine rod cams from 4.8 to 5.5 deg; two each in 0.1deg increments; polish and inspect; run in vehicles.
- Inspect rods (kamed)

Vehicles (lhart)

- New pawls (heat treat looks good; much harder)
- DV using inspected/oriented rods to give high & low angles

Other test results: 3.27 4x2 new pawl 5.6deg cam: can we get enough weight to skip?

- @Max GVW: hang up once in high numbered cycle (80's)
- @Max GVW +1000# added in 200# increments: no skips; 3 hang ups

Analytical

- Max GVW+1000# test results into MathCAD, evaluate over Mu-e range of 0.85 to 0.117; what do curves look like? (mfyie)
- Shifter efforts correlated to rod forces (mfyie)
- Shifter efforts correlated to cam forces (rkrishn2)
- Review analytical reports; assure consistency in analysis/presentation (rkrishn2)

26	Travis Miller	Review all data supporting a change in the pawl return spring force.	100%	Wed 9/13/00	Fri 9/15/00	Fri 9/15/00

Notes

Need a "fresh eyes" review of the data and a recommendation on proceeding with this change for Job1.

61	tsledz,yxu1,jbrazin	Find a method for interim mis-assembly proofing rods with "W" vs "E" bullets.	100%	Sun 9/17/00	Fri 9/22/00	Fri 9/22/00

Notes

9/16: As it looks like we need to change the cam angle for "W" this item gets its own task (from task 13).
9/25: CLOSED -- the rod cam is not being changed fro Job1.

PE09-020 1168

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
32	W946	Perform Screening DV W946	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes
4.0L 4x2 3.73 axle
9/16: 100 nose ups and downs; no ratcheting, no sticks; low loads; ready to run again.
9/17:

33	W954	Perform Screening DV W954	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes
4.6L 4x4 3.55 axle
9/17: park rod and pawl change; ready to run
9/18: test 13: skipped 1 tooth several times (nose up 7, nose down 1); with 4deg cam: couldn't pull out of park on first try.

29	W956	Perform Screening DV W956	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes
4.0L 4x2 3.27 axle
9/16: ran 60 nose ups; efforts high (felt like 20 to 30#); good pawl/gear engagement; hard to achieve abutment; lots of park gear movement. Get torque data next (klittle2), then return to camera work. On 30% grade park components are immersed in oil.
9/17: ready to run
9/18: lost park during fwd drop ins; pawl pi cracked in half; extension housing hole cracked; case hole elongated; distress seemed pointed inward.

30	W957	Perform Screening DV W957	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes
4.6L 4x4 3.73 axle
9/16: 100 nose ups and downs; no ratcheting, no sticks, low loads; getting park pawl changed.
9/17: ready to run
9/18: completed 17 HS ratchets then broke a return spring; did maintain park; only ratcheted forward.

11	yxu1	Measure peak dynamic torque and compare to 5R55N.	100%	Tue 9/12/00	Sun 9/17/00	Sun 9/17/00

Notes
Use an instrumented drive shaft from a calibration vehicle.
Drive shaft obtained 9/12.
Drive shaft being installed 9/13/00.
9/14: Instrumented driveshaft installed; tests performed on 9/13. Initial results indicate that the test stand torque values are in the "ballpark". Re-run tests with vehicle at GVW.
9/15: Waiting for camera work to be completed in vehicle.
9/16: Camera vehicle will run dynamic torque test this morning and then return to camera investigation.
9/17: Test run last night, data being summarized today.

12	yxu1	Compare measured torque data with calculated loads of what we expect vehicle to see.	100%	Sun 9/17/00	Mon 9/18/00	Mon 9/18/00

Notes
9/15: Require GVW torque data from instrumented axle (vehicle running camera tests).
9/18: The data now confirms the test stand is using appropriate loads, and the data can be used as input for CAE work.

PE09-020 1169

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
13	yxu1	Determine Keller's capability on park rod cam angle	100%	Mon 9/11/00	Sat 9/16/00	Sat 9/16/00

Notes
9/13: dhildebr will contact BDX and Euro Purch for support in getting response from Keller. We need to be sure what Keller is providing, with what tolerance, and at what capability. Determine what tolerance reduction is possible and what is being quoted for 4R100.
Indication is that capability at +/- 30min is 1.05.
9/14: Still working with Keller to determine capability; tolerance is apparently +/- 30min on 1/2 angle.
9/15: Keller can make two different parts, but will have difficulty telling them apart. tsledz, yxu1, jbrazin to work on error proofing the parts/assembly.
9/17: We have a good idea where Keller is today, but need to determine how to help them lower the nominal half angle and narrow the tolerance.

14	yxu1	Investigate alternate park rod supplier.	100%	Fri 9/15/00	Tue 9/19/00	Tue 9/19/00

Notes
9/15: Finding an alternate supplier was raised as a possibility by pyuhasz.
9/21: The conclusion is that as Keller is able to reduce their tolerance by modifying processes we should remain with Keller.

25	yxu1	Perform ultimate strength test on "N" and "W" systems. Add "E"	7%	Tue 9/12/00	Mon 9/25/00	NA

Notes
Two samples: one "N" and one "W", tested in the nose up direction.
9/13: direction is to add "E" to this test so we can compare across the whole family.
9/14: Need "N" case (lhart to help); check files for old "E" tests (mfyie, lhart) (file check complete).
9/15: "N" is all set to run; "E" needs further checking. The "W" 4x4 can be run with a 4x2 shaft; the 4x2 with a minimally modified x-hsg. yxu1 needs 4x2 x-hsg drawings and 4x4 xfr xcase spline drawings for a fixture. The 4x2 drawings are complete; existing 4x4 fixtures have been located and the numbers provided to yxu1.
9/17: Ready to run "N" cases today; rsee1 finding parts.
9/21: Requested 4x2 output shafts have been delivered to the lab. Timing to run tests is expected tomorrow at 12:30.

43	yxu1	Purch order for new pawls	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00

Notes
Laser cut pawls are due 9/15/00.
9/15: Pawls arrived 9/14.

44	yxu1	Purch order for extension housings	100%	Thu 9/7/00	Sun 9/10/00	Sun 9/10/00
54	yxu1	Combined Ratchet/Pullout	0%	Sat 9/23/00	Tue 9/26/00	NA
56	yxu1	DV Testing	0%	Wed 9/27/00	Tue 10/10/00	NA
92	yxu1,klittle2	Measure peak dynamic torque and compare to 5R55N.	0%	Thu 9/21/00	Fri 9/29/00	NA

Notes
9/18: Develop a list of requirements for doing instrument axle testing on a 4X4.

PE09-020 1170

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
31	ZA00041	Perform Screening DV & Baseline ZA00041	100%	Fri 9/15/00	Mon 9/18/00	Mon 9/18/00

Notes

4.6L 4x4 3.73 axle RHD
9/16: Performed baseline; loads between 9 and 36#; 4 ratchets on nose ups (cycles 89, 91, 97, 99); determine from thaugh if these were skips or ratchets down the hill; need post-test inspection and pawl change. (XW4P park pawl).
9/17: park rod and pawl change

PE09-020 1171

From: Landes, Stephen (S.L.)
Sent: Wednesday, September 20, 2000 11:18 PM
To: Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Dover, Harry (H.); Fyie, Matthew (M.L.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Sledz, Ted (T.M.); Tsai, Pingfang (P.); Xu, Yehong (Y.)
Subject: Park System Team Meeting Notes from Wednesday, 20 Sept 00

Attachments: 5R55W Park System Task Force Notes from Wednesday 20 Sept 00.doc

Attached are the team meeting notes from today. See you at 7AM!

5R55W Park
ystem Task Force N.

Stephen Landes
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(734) 523-5841
Text Page: slandes

5R55W Park System Task Force
Supplemental Notes from Wednesday, 20 Sept 00

7:00AM Line Up

Design Direction:

260 Nmm return spring
4.7deg cam half angle
6deg pawl
add 0.4mm to tooth (to restore 1.1mm added to tooth)

What concerns do we have with this direction?

Concern	Means to Resolve	Responsible Person
Hang Ups	Physical test in vehicle	lhart (coord)
Forces on pawl shaft, case, xhsng	FEA, High Speed Ratchet test	mramnath, jbrazin
Can't get added tooth thickness for rapid Job1 parts or for test	Confirm rapid parts OK for Job1 by ADAMS model and physical test	Cperng lhart (ccord)
Microfinish on cam	Keller needs to control this factor; determine CpK (CpK based on 100 parts, check production parts on bench) Evaluate tumble after grind?	abockelmann
Abutment step; guide cup transition from half to full circumference is stress riser.	Revise corner radius (post Job1)	
Tick in Drive	Use the final test stand at ATNPC and Bordeaux to check for this phenomenon.	
Components should show no detrimental visible distress after test per tech specialist assessment	Visual inspection of parts after test	jbrazin, yxu1

The test plan for Thursday has been written up and will be reviewed at 12:30 today.

5R55W Park System Task Force
Supplemental Notes from Wednesday, 20 Sept 00

12:30 Check

Issues/Roadblocks

Test transmissions are clogging Build Up. What should we do with them?

- Complete visual inspections: mark transmissions as complete (leave a copy of the Visual Inspection record with each inspected transmission) yxu1 to do inspections; lhart to file records
- Cases and xhsngs/cover plates need to be measured – pawl shaft hole elongation (shortest and longest diameter and orientation)
- Component disposition:
    - Retain pawl, spring, shaft; gear if note on inspection sheet as required
    - Retain case and xhsng/cover plate if in pawl shaft hole is in spec
    - Scrap case and xhsng/cover plate if not in spec
    - Other components back to Build Up for next test transmissions.

Ping-Fang Tsai presented alternative DOE matrices. The full factorial will be used (same as developed by dadamcz1 and jbrazin).

Specifically, this screening test will consist of:

- 100 nose up pullouts on the 30% grade
    - pullouts 1 through 10; measure all
    - pullouts 11 through 89; measure 1 in every 10
    - pullouts 90 through 100; measure all
- 10 nose down pullouts on the 30% grade
    - measure all
- 50 nose up pullouts on the 17% grade
    - no measurements required

5R55W Park System Task Force
Supplemental Notes from Wednesday, 20 Sept 00

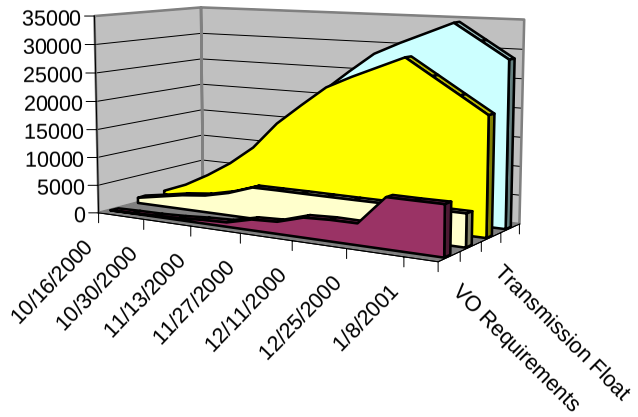
Weekend testing

Test Run	Pawl Angle	Cam Angle	Vehicle Code
1 & 2	3	4.5	A B
3 & 4	3	4.7	A B
5 & 6	6	4.5	A B
7 & 8	6	4.7	A B
REVIEW results before continuing; test plan may be revised based on results to this point.			
9 & 10	5	4.5	A B
11 & 12	5	4.7	A B
13 & 14	4	4.5	A B
15 & 16	4	4.7	A B

Vehicle "A": 4.0L, 4x2, 3.27 axle (driver must wear red shirt)
Vehicle "B": 4.6L, 4x4, 3.55 axle (blue or yellow shirt OK)

A summary of LAP/SLAP ramp up volumes and Bordeuax launch production plan was presented. Needs confirmation and support from Purchasing and Suppliers (can we support this launch volume?) Chart and table on next page (slandes)

VO Ramp Up and BDX Support Plans



	16-Oct	23-Oct	30-Oct	6-Nov	13-Nov	20-Nov	27-Nov	4-Dec	11-Dec	18-Dec	25-Dec	1-Jan	8-Jan	15-Jan
VO Requirements	0	90	158	312	640	786	1850	2051	3360	3568	3568	8368	8368	8368
Bordeaux Output per wk	1000	1750	2500	3000	4000	5500	5500	5500	5500	5500	5500	5500	5500	5500
Transmission Float	1000	2660	5002	7690	11050	15764	19414	22863	25003	26935	28867	25999	23131	20263
Bordeaux No-Air Shipping Plan	1000	2750	5160	8002	11690	16550	21264	24914	28363	30503	32435	34367	31499	28631

From: Landes, Stephen (S.L.)
Sent: Wednesday, September 13, 2000 1:03 PM
To: Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Dover, Harry (H.); Fyie, Matthew (M.L.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Sledz, Ted (T.M.); Tsai, Pingfang (P.); Xu, Yehong (Y.)
Cc: Antrim, William (W.R.); Garrett, Dave (D.M.); Haase, Robert (R.C.); Huntington, Dennis (D.C.); Kovalsky, Mark (M.S.); Mitchell, Harold (H.J.); Spaulding, Todd; Wolodkiewicz, Wally (S.R.)
Subject: Park System Team Meeting Notes/Assignments

Attachments: Microsoft Project - Team Assignments.pdf

The attached file is sorted in the same order as our work plan to try to keep design actions separate from DV and manufacturing actions. Your comments on how you would like this material organized is certainly welcome.

Microsoft Project - Team Assig...

Stephen Landes
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Team Assignments as of Wed 9/13/00
Park System DV Plan

ID	Resource Names	Name	Early Start	Early Finish
2	Team	Definition	Thu 9/7/00	Sun 9/10/00
3	cpernng	Validate ADAMS Model	Tue 9/12/00	Thu 9/14/00
4	mfyie	Bench test: coef. Of friction confirmation	Thu 9/7/00	Tue 9/12/00

Notes
Sample #4 passed all pullouts through 700 ibs-ft static load; apwl shaft cracked and small cracks appeared in the case and x-hsng, pawl shaft bore elongated -- similar to high-speed ratchet test results.
As of 9/13:
Samples 1, 2, 3: no data; broken parts
Samples 4, 5, 6: tests completed; good data
Sample 7: laser pawl; test postponed
Samples 9, 10, 11: to be done 9/13/00
Two additional samples will be run with laser pawls for the selected geometry.
Add two "E" transmissions to this test. (Ihart to obtain transmissions).

5	rperri	Determine Explorer lever ratio	Thu 9/7/00	Fri 9/8/00
6	ptsai,rperri	Pullout effort comparison	Sun 9/10/00	Wed 9/13/00

Notes
1) RHD values higher than LHD
2) "W" nose up higher than nose down
3) Re-run calculations with latest geometry

7	cpernng	Force balance calculations	Sun 9/10/00	Wed 9/13/00

Notes
Ratchet spring is adequate. If the pawl is aligned with a gear space & Park is selected a minimum of 14 N is required of the ratchet spring to depress the pawl. The current spring pre-load provides 40+/-2 N.
We need a flatter cam angle to compensate for low coef of friction. The present included angle is 9 to 11 deg.

8	kbriscoe	Baseline bump test	Thu 9/7/00	Thu 9/14/00

Notes
test being perfomred 9/12

9	yxu1	Compare measured torque data with calculated loads of what we expect vehicle to see.	Mon 9/11/00	Tue 9/12/00
10	mfyie jbrazin	Verify instructions/torque loads given to HMS lab; calibrate bench machine	Mon 9/11/00	Tue 9/12/00

PE09-020 1178

Team Assignments as of Wed 9/13/00
Park System DV Plan

ID	Resource Names	Name	Early Start	Early Finish
11	yxu1	Determine Keller's capability on park rod cam angle	Mon 9/11/00	Tue 9/12/00
	Notes	9/13: dhildebr will contact BDX and Euro Purch for support in getting response from Keller. We need to be sure what Keller is providing, with what tolerance, and at what capability. Determine what tolerance reduction is possible and what is being quoted for 4R100. Indication is that capability at +/- 30min is 1.05.		
12	jbrazin mfyie dadamcz1 lhart tsledz	Fishbone analysis	Sun 9/10/00	Tue 9/12/00
13	lmckinni	Park System FEA: get priority in CAD	Mon 9/11/00	Fri 9/15/00
	Notes	FEA kicked off 9/11. hvirdee will set up a meeting with Jer-Shi Chen to review FEA requirements. Completion forecast for 9/15. 9/13: no timing commitment from CAE		
14	mfyie	Re-run engagement calcs with other pawl designs	Mon 9/11/00	Wed 9/13/00
	Notes	CAD has done the runs; evaluating results. 9/13: Doing a study with 6deg design. mfyie, cperng, yxu1 to review today.		
15	dadamcz1	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	Mon 9/11/00	Wed 9/13/00
	Notes	Parts from Sample #4 test run 9/11 are being sent to the lab.		
16	hvirdee	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	Tue 9/12/00	Fri 9/15/00
	Notes	We need porosity, chemistry, and tensile strength. Samples should be requested from Ryobi (N) and Fagor and Koeln Forge (W).		
17	dadamcz1	Obtain stack up on park pawl shaft (length & alignment)	Mon 9/11/00	Fri 9/15/00
18	mfyie jbrazin	Finalize DVP&R proposal	Mon 9/11/00	Tue 9/12/00
19	yxu1	Perform ultimate strength test on "N" and "W" systems. Add "E"	Tue 9/12/00	Fri 9/15/00
	Notes	Two samples: one "N" and one "W", tested in the nose up direction. 9/13: direction is to add "E" to this test so we can compare across the whole family.		

PE09-020 1179

Team Assignments as of Wed 9/13/00
Park System DV Plan

ID	Resource Names	Name	Early Start	Early Finish
20	yxu1	Measure peak dynamic torque and compare to 5R55N.	Tue 9/12/00	Thu 9/14/00
	Notes Use an instrumented drive shaft from a calibration vehicle. Drive shaft obtained 9/12. Drive shaft being installed 9/13/00.			
21	Travis	Review all data supporting a change in the pawl return spring force.	Wed 9/13/00	Fri 9/15/00
	Notes Need a "fresh eyes" review of the data and a recommendation on proceeding with this change for Job1.			
22	Cognition,rperri,hdover,yx	Perform VSA-type audit on the Park System.	Wed 9/13/00	Fri 9/15/00
	Notes rperri: business arrangements for analysis yxu1: drawing list for hdover hdover: collect drawings and carry to Cognition			
23		Pawl Shaft stack up	Wed 9/13/00	Fri 9/15/00
	Notes yxu1 and jbrazin to review 5R55N stack up and determine if a longer pawl shaft is possible; demonstrate that this is a necessary improvement for Job1.			
24	Team	Approve DVP&R proposal	Wed 9/13/00	Wed 9/13/00
25	Team	Recommend Hardware Direction	Wed 9/13/00	Wed 9/13/00
27	klittle2	Vehicle 956: install digital read out	Thu 9/7/00	Sat 9/16/00
28	klittle2	Vehicle 954: won't start	Thu 9/7/00	Sat 9/16/00
29	klittle2	Vehicle 957: replace transfer case; add digital read out	Thu 9/7/00	Sat 9/16/00
30	dhildebr	Obtain 4x2 w/ 3.27 axle	Thu 9/7/00	Thu 9/14/00
	Notes The vehicle is available in Dearborn. Kim Briscoe will bring it to Livonia.			

PE09-020 1180

ID	Resource Names	Name	Early Start	Early Finish
31	hdover dadamcz1	Obtain RHD vehicle from Shifter group	Thu 9/7/00	Fri 9/8/00
32	hdover	Obtain cables, brackets, clips	Thu 9/7/00	Fri 9/8/00
33	yxu1	Purch order for new pawls	Thu 9/7/00	Wed 9/20/00
	Notes Laser cut pawls are due 9/15/00.			
34	yxu1	Purch order for extension housings	Thu 9/7/00	Wed 9/20/00
35	ecastro1	Purch order for 24 transmissions	Thu 9/7/00	Sun 9/10/00
	Notes Bordeuax built the transmissions on 9/11/00.			
36	BDX	Deliver 24 transmissions to ATNPC	Tue 9/12/00	Tue 9/26/00
37	peckman	Purch 2 new force gages	Thu 9/7/00	Tue 9/12/00
	Notes Two new gages received.			
38	mfyie	Design/Fab bench test fixture	Thu 9/7/00	Fri 9/8/00
39	dadamcz1 lhart hdover jbrazin	Create Visible A/T	Sun 9/10/00	Mon 9/18/00
	Notes A camera is to be installed in a vehicle/transmission on 9/12; first results for 9/13 meeting.			
41	mfyie	Bench test selected prototype pawl with Max Park Disengagement Load	Wed 9/27/00	Thu 9/28/00
42	mfyie	Bench test	Sun 9/10/00	Fri 9/29/00
43	yxu1	Combined Ratchet/Pullout	Fri 9/29/00	Mon 10/2/00

PE09-020 1181

ID	Resource Names	Name	Early Start	Early Finish
"Combined Ratchet/Pullout" continued				
44	kbriscoe	Bump Test	Mon 9/11/00	Wed 9/13/00
	Notes Test completed. Vehicle passed.			
45	yxu1	DV Testing	Tue 10/3/00	Mon 10/16/00
47	MPI	Production die	Thu 9/7/00	Wed 10/4/00
48	MPI	PSW Parts	Thu 10/5/00	Sun 10/8/00
49	MPI	Ship to Bordeaux	Mon 10/9/00	Tue 10/10/00
51	BDX	Build PV transmissions	Wed 10/11/00	Thu 10/12/00
52	BDX	Transmission Job1	Thu 10/12/00	Thu 10/12/00
53	BDX	Perform PV test	Fri 10/13/00	Sat 10/14/00
54	BDX	PSW	Sun 10/15/00	Mon 10/16/00
55	BDX	Ship to LAP	Fri 10/13/00	Tue 10/17/00
57	MPI Subcontractor	Machine MPI produced pawls already in stock	Wed 9/13/00	Fri 9/22/00
58	MPI	Final processing of pawls at MPI	Sat 9/23/00	Wed 9/27/00
59	MPI	Ship pawls to BDX	Thu 9/28/00	Mon 10/2/00

PE09-020 1182

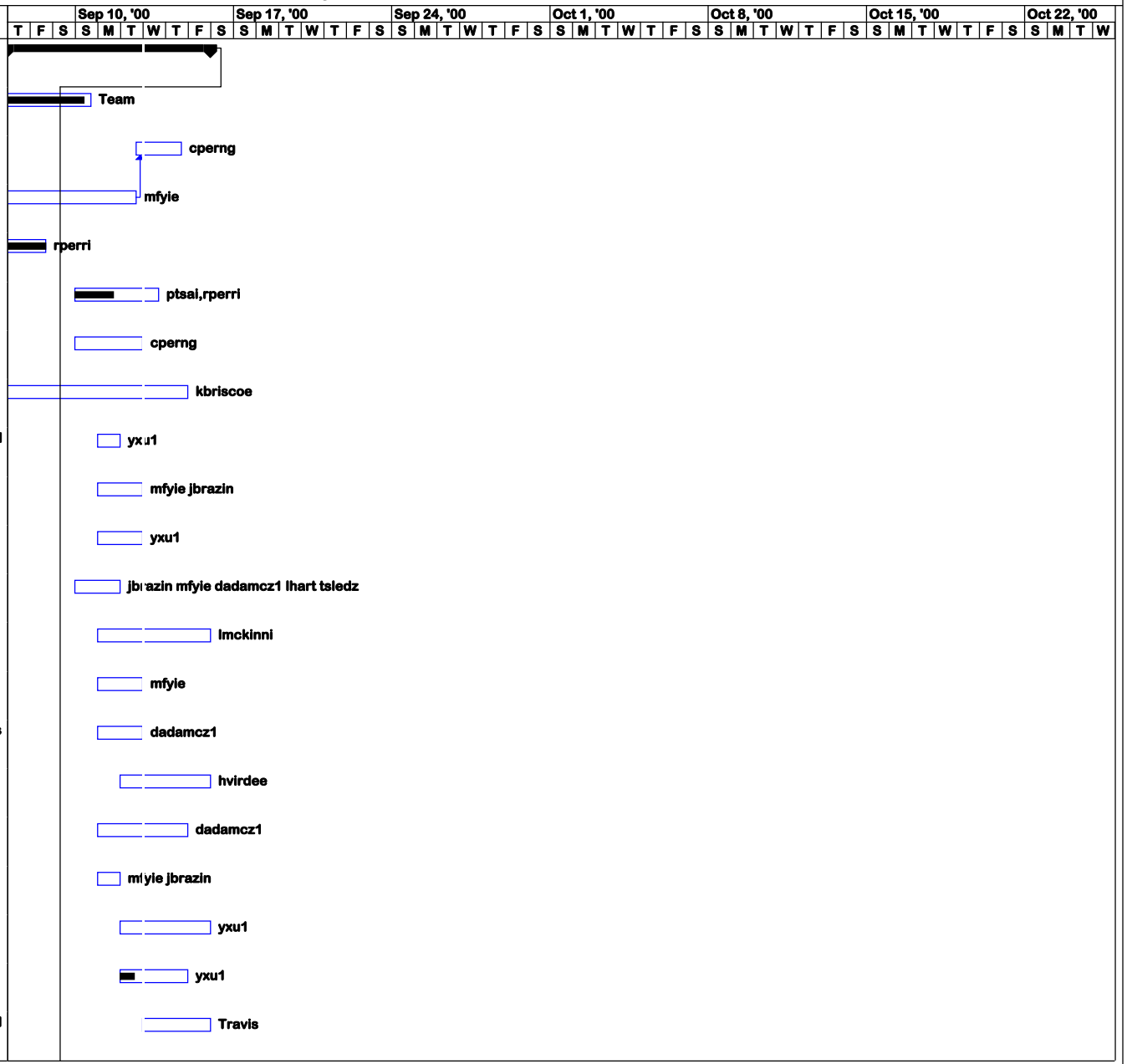
Team Assignments as of Wed 9/13/00
Park System DV Plan

ID	Resource Names	Name	Early Start	Early Finish
60	LAP	Integrated Build at LAP	Mon 10/23/00	Mon 10/23/00

PE09-020 1183

Park System DV Plan

ID	Task Name	Resource
1	Problem Scope	
2	Definition	Team
3	Validate ADAMS Model	cperng
4	Bench test: coef. Of friction confirmation	mfyie
5	Determine Explorer lever ratio	rperri
6	Pullout effort comparison	ptsai,rperri
7	Force balance calculations	cperng
8	Baseline bump test	kbriscoe
9	Compare measured torque data with calculated loads of what we expect vehicle to see.	yxu1
10	Verify instructions/torque loads given to HMS lab; calibrate bench machine	mfyie jbrazin
11	Determine Keller's capability on park rod cam angle	yxu1
12	Fishbone analysis	jbrazin mfyie dadamcz1 lhart tsledz
13	Park System FEA: get priority in CAD	lmckinni
14	Re-run engagement calcs with other pawl designs	mfyie
15	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	dadamcz1
16	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	hvirdee
17	Obtain stack up on park pawl shaft (length & alignment)	dadamcz1
18	Finalize DVP&R proposal	mfyie jbrazin
19	Perform ultimate strength test on "N" and "W" systems. Add "E"	yxu1
20	Measure peak dynamic torque and compare to 5R55N.	yxu1
21	Review all data supporting a change in the pawl return spring force.	Travis

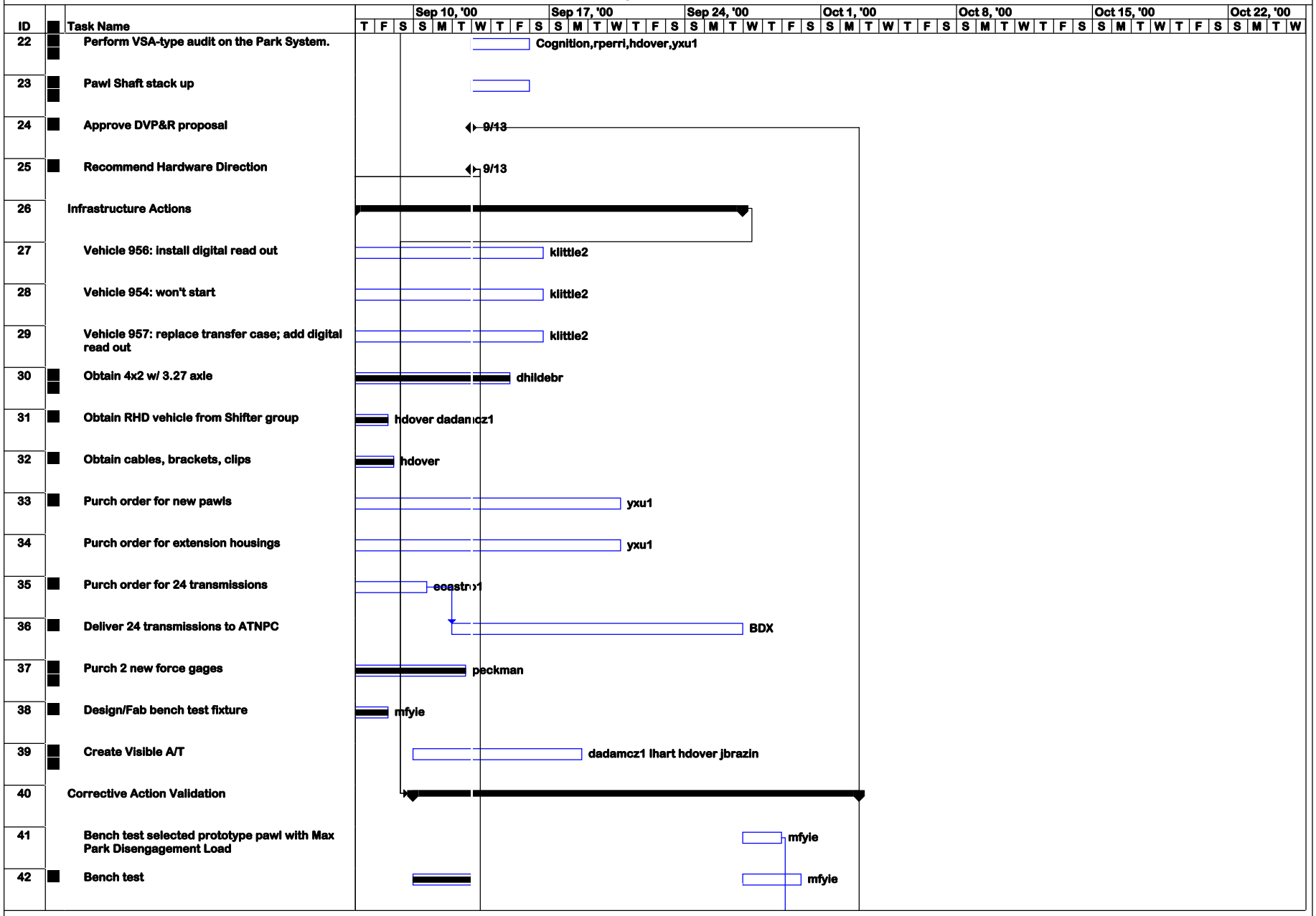


Project: Park System DV Plan
Date: Wed 9/13/00

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks
Progress | Summary | Rolled Up Milestone | Split | Project Summary

PE09-020 1184

Park System DV Plan

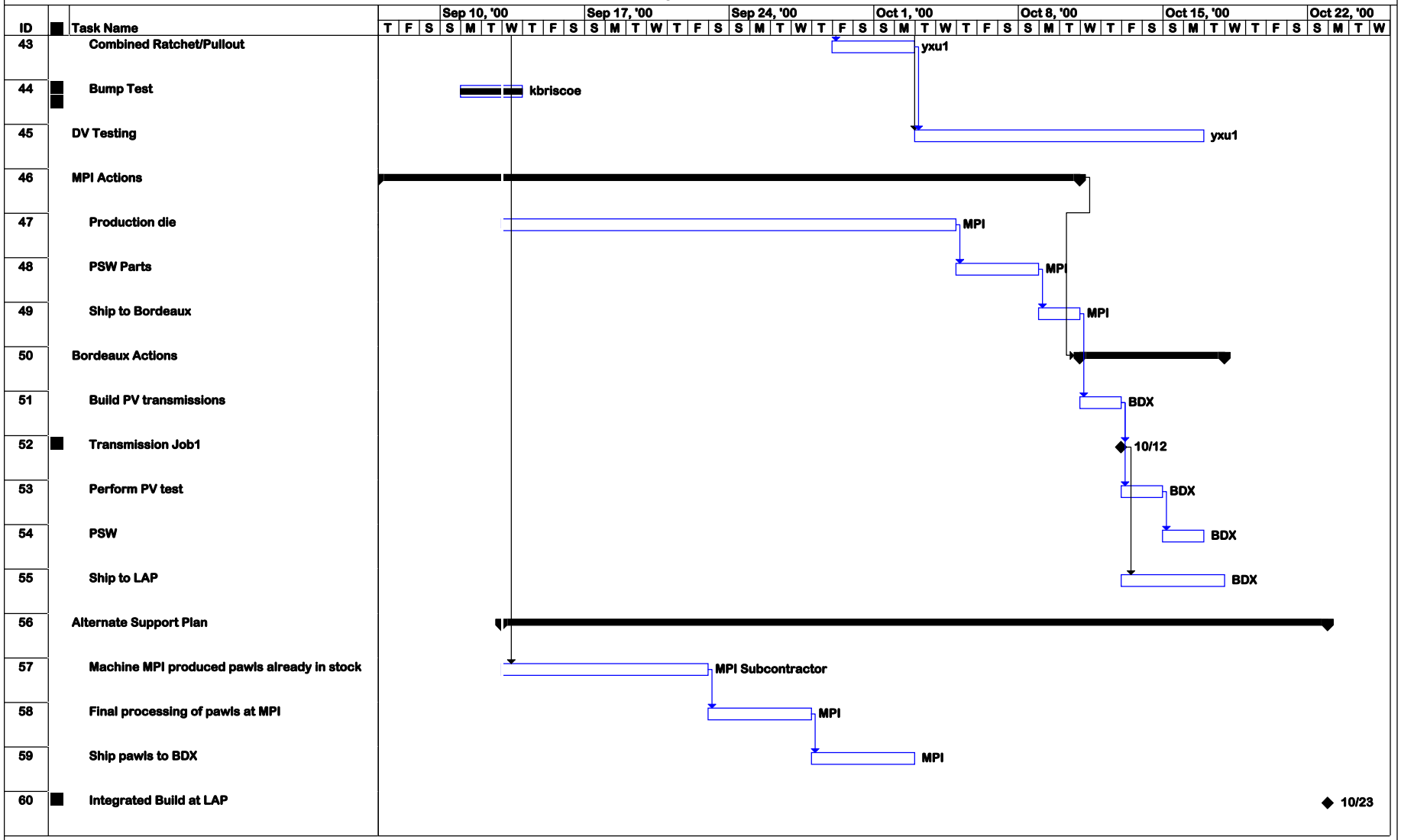


Project: Park System DV Plan
Date: Wed 9/13/00

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks
Progress | Summary | Rolled Up Milestone | Split | Project Summary

PE09-020 1185

Park System DV Plan



Project: Park System DV Plan
Date: Wed 9/13/00

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks
Progress | Summary | Rolled Up Milestone | Split | Project Summary

PE09-020 1186

From: Landes, Stephen (S.L.)
Sent: Sunday, September 17, 2000 3:48 PM
To: Spaulding, Todd (T.C.); See, Raymond (R.J.); Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Dover, Harry (H.); Fyie, Matthew (M.L.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Sledz, Ted (T.M.); Tsai, Pingfang (P.); Xu, Yehong (Y.)
Cc: Antrim, William (W.R.)
Subject: Park System Team Meeting Notes/Assignments

Attachments: Microsoft Project - Team Assignments.pdf

The attached file is our usual assignment log and some additional notes from today's meetings.

Microsoft Project - Team Assig...

Stephen Landes
5R55N/W/S/E Systems Engineering
slandes@ford.com
(734) 523-5841
Text Page: slandes

5R55W Park System Task Force
Meeting Notes from 17 Sept 00

What do we do with post-test transmissions?

Five transmissions and 5 bags of changed out pawls/cams are available now.

Summarize test data and prioritize
Tear down
Incident summary
Visual Inspection
Statistical analysis of loads on hill
List of parts to be inspected
List of parts to be sent of inspection with a list of measurements to be taken

Rebuild transmissions (with what parts?)

Agreements:

We don't need to prioritize the work. These teardowns are quick.
Line up the transmissions at the back table near the main aisle; remove pans and extensions.
Use a common inspection sheet (jbrazin to make up)
Send parts to inspection only if they are visually distressed

What direction are we going to give to our suppliers?

	Design Options		Effect on System				
Component	"A"	"B"	Pullout Effort	Cable/Bracket	Drop In Spd	Hung up	Spit out
Cam Angle	4.5deg +/- 30min	4.5deg +/- 15min					
Pawl Angle	3deg	6deg					
Return Spring	200Nmm	268Nmm					
Case							
Xhsg/Cover							
Pawl Shaft							

MPI

- Process 2000 @ 3deg & hold
- Process 2000 @ 6deg & hold
- Hold new die for final direction
- Supply 4, 5, 6deg prototype pawls (within 1-2 weeks)
- PSW both angles

Keller

- Grind cam angle to 4.5deg
- Reduce tolerance from +/-30min to +/-15min
- New die
- Grinding process for tolerance

Sherdel

- Increase return spring force from 200Nmm to 268.6Nmm

Special cams made at ATEO

Six cams made at 4deg to 4.15deg; need to be inspected
Evaluate pullout load
Need a test plan to do these tests (mfyie 18 Sept 00)

Timing

LAP MRD	20 Oct 00
BDX Ship	16 Oct
BDX PV	12 to 16 Oct
BDX Build	11 Oct
BDX MRD	10 Oct

Is our new design plan: 3deg pawl, 4.5deg+/-30min cam, and 268Nmm return spring?

What's required to answer this question?

- Summary table
  - Vehicle information
  - Baseline data
  - 3deg data for all five vehicles
  - Visual inspection comments
  - Driver comments from tests
- High Speed ratchet; two tests; 4x4 vehicles
  - Inspect trans41 for possible broken spring
  - Modify pawls to remove sharp edge
  - Run tests
- Lock in who is supplying the return spring: Sherdel or Automatic Spring

Team Assignments as of Sun 9/17/00
Park System DV Plan

Highlighted Tasks have been completed

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
2	Team	Definition	80%	Thu 9/7/00	Sun 9/10/00	NA
3	mfyie	Bench test: coef. of friction confirmation	100%	Sat 9/9/00	Fri 9/15/00	Fri 9/15/00

Notes

Sample #4 passed all pullouts through 700 ibs-ft static load; apwl shaft cracked and small cracks appeared in the case and x-hsng, pawl shaft bore elongated -- similar to high-speed ratchet test results.
As of 9/13:
Samples 1, 2, 3: no data; broken parts
Samples 4, 5, 6: tests completed; good data
Sample 7: laser pawl; test postponed
Samples 9, 10, 11: to be done 9/13/00
Two additional samples will be run with laser pawls for the selected geometry.
Add two "E" transmissions to this test. (lhart to obtain transmissions).
9/14: no parts broken since the stand was recalibrated after sample #4 and we switched to running 4x4's. Sample #8 returned to build up for unrelated o/s binding. Lowest mu recorded to date is 0.087.
9/15: Dennis Fergusen is setting up to run "E" transmissions on the stand. There is good information that suggests early sample breakage is related to over torque on the stand due to stand operating practice (setting torque after initiating cycle). We will wait to do new pawls until the next BDX shipment of transmissions arrives (schd for 9/19). "E" transmissions are available.
9/16: The testing needed to support validation of the ADAMS model is complete. Additional testing on "E" and with the 3deg pawls will be done separately.
9/17: Summarize second batch of data for 9/18 AM meeting.

4	mfyie jbrazin	Verify instructions/torque loads given to HMS lab; calibrate bench machine	100%	Mon 9/11/00	Tue 9/12/00	Tue 9/12/00
5	cperng	Validate ADAMS Model	100%	Tue 9/12/00	Thu 9/14/00	Thu 9/14/00

Notes

9/15: Mu assessment complete and the model ahs been updated.

6	rperri	Determine Explorer lever ratio	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
7	ptsai,rperri	Pullout effort comparison	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes

1) RHD values higher than LHD
2) "W" nose up higher than nose down
3) Re-run calculations with latest geometry

9/14: still waiting for "N" data from SHV. lhart to call Ken Stacherski for assistance.
9/15: SHV data received; revise table for 12:30 meeting (add DEW98 N w/ floor shifter). Also need offset numbers and update the matrix.
9/16: Complete. offset numbers will be added to a separate matrix to avoid confusion.

8	cperng	Force balance calculations - baseline	100%	Sun 9/10/00	Sat 9/16/00	Sat 9/16/00

Notes

Ratchet spring is adequate. If the pawl is aligned with a gear space & Park is selected a minimum of 14 N is required of the ratchet spring to depress the pawl. The current spring pre-load provides 40+/-2 N.
We need a flatter cam angle to compensate for low coef of friction. The present included angle is 9 to 11 deg.
9/14: need a one page summary written for this analysis.
9/15: These calculations are run at nominal conditions. We should consider running them at worst/best case conditions. Decide at 12:30 meeting. No decision at 12:30 -- right people not present.
9/16: Summary document revised and complete.

PE09-020 1192

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
9	cperng	Force balance calculations - revised cam angle	80%	Sun 9/17/00	Mon 9/18/00	NA

Notes
9/16: Recalculate with the revised cam half angle of 4.5deg +/- 30min to confirmed instructions planned for Keller.
9/17: 4deg is too flat for RHD shift efforts; need to keep minimum angle to 4.5deg and reduce tolerance.

10	kbriscoe	Baseline bump test	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00

Notes
test being performed 9/12.
9/14: test passed; requesting formal lab report for 9/15.

11	yxu1	Measure peak dynamic torque and compare to 5R55N.	100%	Tue 9/12/00	Sun 9/17/00	Sun 9/17/00

Notes
Use an instrumented drive shaft from a calibration vehicle.
Drive shaft obtained 9/12.
Drive shaft being installed 9/13/00.
9/14: Instrumented driveshaft installed; tests performed on 9/13. Initial results indicate that the test stand torque values are in the "ballpark". Re-run tests with vehicle at GVW.
9/15: Waiting for camera work to be completed in vehicle.
9/16: Camera vehicle will run dynamic torque test this morning and then return to camera investigation.
9/17: Test run last night, data being summarized today.

12	yxu1	Compare measured torque data with calculated loads of what we expect vehicle to see.	0%	Sun 9/17/00	Mon 9/18/00	NA

Notes
9/15: Require GVW torque data from instrumented axle (vehicle running camera tests).

13	yxu1	Determine Keller's capability on park rod cam angle	100%	Mon 9/11/00	Sat 9/16/00	Sat 9/16/00

Notes
9/13: dhildebr will contact BDX and Euro Purch for support in getting response from Keller. We need to be sure what Keller is providing, with what tolerance, and at what capability. Determine what tolerance reduction is possible and what is being quoted for 4R100.
Indication is that capability at +/- 30min is 1.05.
9/14: Still working with Keller to determine capability; tolerance is apparently +/- 30min on 1/2 angle.
9/15: Keller can make two different parts, but will have difficulty telling them apart. tsledz, yxu1, jbrazin to work on error proofing the parts/assembly.
9/17: We have a good idea where Keller is today, but need to determine how to help them lower the nominal half angle and narrow the tolerance.

14	yxu1	Investigate alternate park rod supplier.	0%	Fri 9/15/00	Tue 9/19/00	NA

Notes
9/15: Finding an alternate supplier was raised as a possibility by pyuhasz.

15	jbrazin mfyie dadamcz1 lhart tsledz	Create Fishbone diagram for Park System	100%	Sun 9/10/00	Tue 9/12/00	Tue 9/12/00

PE09-020 1193

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
16	jbrazin mfyie dadamcz1 lhart tsledz	Fishbone analysis	25%	Sun 9/10/00	Wed 9/20/00	NA

Notes
9/14: Data from the "Visible A/T" and FEA are required to begin eliminating items on the diagram.

17	jbrazin,msimetko	Update AX4N Energy Transfer diagram in team meeting room for 5R55W and application for specific issues.	0%	Sat 9/16/00	Mon 9/18/00	NA
18	lmckinni	Park System FEA: get priority in CAD	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
FEA kicked off 9/11. hvirdee will set up a meeting with Jer-Shi Chen to review FEA requirements. Completion forecast for 9/15.
9/13: no timing commitment from CAE
9/14: timing is 2.5 to 3 days for quick answer; Friday, 9/22 for full answer.

19	CAE,mramnath	Perform Park System FEA	29%	Wed 9/13/00	Fri 9/15/00	NA

Notes
9/14: This is the quick FEA
9/15: Preliminary results received. full analysis for Sunday morning. Analysis confirms expectations of location of breakout. Recommended improvements in clude longer pawl shaft, deeper holes in case and x-hsg, chamfer on pawl shaft holes. Update Saturday AM.
9/17: Expect update 9/18 AM meeting.

20	mfyie	Re-run engagement calcs with other pawl designs	100%	Mon 9/11/00	Fri 9/15/00	Fri 9/15/00

Notes
CAD has done the runs; evaluating results.
9/13: Doing a study with 6deg design. mfyie, cperng, yxu1 to review today.
9/14: inputting 6deg design; plan to complete today.
9/15: Complete. An order for 5deg and 6deg pawls has been placed with MPI.

21	hvirdee	Have Met Lab run check on broken components from HMS lab tests; Have dimensional checks done on key features remaining intact	14%	Mon 9/11/00	Tue 9/19/00	NA

Notes
Parts from Sample #4 test run 9/11 are being sent to the lab.
9/14: Pawl & Shaft sent to lab (yxu1); bench test samples 1 & 2 case and xhsng sent to lab (hvirdee); pawl & shaft from vehicle 957 (broken xfr case) sent to lab.
9/15: Initial results were due today at 12:30; no results available.
9/16: Sample #2 x-hsg was a sand cast part with much lower hardness than a dies cast part. Fracture analysis on the Sample #2 case will be available Tuesday. There is nothing here to indicate chemistry as a cause of failures.
9/17: no update

22	hvirdee	Send 5R55N parts to Met Lab for material analysis; compare to failed "W" parts.	13%	Tue 9/12/00	Tue 9/19/00	NA

Notes
We need porosity, chemistry, and tensile strength. Samples should be requested from Ryobi (N) and Fagor and Koeln Forge (W).
9/16: Chemistry is consistent with 380 Al spec; European Al is slightly higher in Mg than US. Contact suppliers for more complete analysis and comparable strengths.
9/17: No update

PE09-020 1194

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
23	dadamcz1	Obtain stack up on park pawl shaft (length & alignment)	25%	Mon 9/11/00	Mon 9/18/00	NA

Notes
9/14: Same as task 23: consolidate
9/15: In process
9/16: Measurements show bearing surface is 4.7mm in xhsg and 7.4mm in case; not much shaft lateral movement; deeper holes and longer shaft is better; existing holes do have chamfers.
hvirdee to provide CAD with :E: case and xhsg drawing numbers; need to create a comparison betwen "W" and "N".

24	mfyie jbrazin	Finalize DVP&R proposal	50%	Mon 9/11/00	Tue 9/12/00	NA

Notes
9/14: proposed DV sent out for comment.
9/15: Draft has been circulated. No decision is required at this time; wait until screening DV results are available to finalize.

25	yxu1	Perform ultimate strength test on "N" and "W" systems. Add "E"	25%	Tue 9/12/00	Fri 9/15/00	NA

Notes
Two samples: one "N" and one "W", tested in the nose up direction.
9/13: direction is to add "E" to this test so we can compare across the whole family.
9/14: Need "N" case (lhart to help); check files for old "E" tests (mfyie, lhart) (file check complete).
9/15: "N" is all set to run; "E" needs further checking. The "W" 4x4 can be run with a 4x2 shaft; the 4x2 with a minimally modified x-hsg. yxu1 needs 4x2 x-hsg drawings and 4x4 xfr xcase spline drawings for a fixture. The 4x2 drawings are complete; existing 4x4 fixtures have been located and the numbers provided to yxu1.
9/17: Ready to run "N" cases today; rsee1 finding parts.

26	Travis Miller	Review all data supporting a change in the pawl return spring force.	100%	Wed 9/13/00	Fri 9/15/00	Fri 9/15/00

Notes
Need a "fresh eyes" review of the data and a recommendation on proceeding with this change for Job1.

27	Cognition,rperri,hdover,yx	Perform VSA-type audit on the Park System. (Cognition)	25%	Wed 9/13/00	Fri 9/15/00	NA

Notes
rperri: business arrangements for analysis
yxu1: drawing list for hdover
hdover: collect drawings and carry to Cognition
9/14: Timing calls for initial model by noon today; meet with mfyie, yxu1 on defining park achievement; verify set up angle, gear positions. Cognition will establish nominal measurements and then six-sigma levels. Drawings complete to Cognition.
9/15: hdover has additional information requested by Cognition and will take it to them today.
9/16: Cognition has all the required data. The model is complete and dimensioned. It shows the OML angle at 0.80deg while previous analyses have shown 1.15deg. We agree to use the 0.80deg calculated offset from vertical. rperri to meet with mfyie and yxu1 to develop further direction.

28	dadamcz1 lhart jbrazin slandes	Develop Screening DV	100%	Thu 9/14/00	Fri 9/15/00	Fri 9/15/00

Notes
9/14: DV draft is complete and is to be reviewed with Tom Cross to see how he wants work orders written to support the plan.
9/16: Test time from first start to final return to garage for r&r is running about 10 hours.

29	W956	Perform Screening DV W956	50%	Fri 9/15/00	Sun 9/17/00	NA

Notes
4.0L 4x2 3.27 axle

PE09-020 1195

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Perform Screening DV W956" continued						
	Notes					
	9/16: ran 60 nose ups; efforts high (felt like 20 to 30#); good pawl/gear engagement; hard to achieve abutment; lots of park gear movement. Get torque data next (klittle2), then return to camera work. On 30% grade park components are immersed in oil. 9/17: ready to run					
30	W957	Perform Screening DV W957	30%	Fri 9/15/00	Mon 9/18/00	NA
	Notes					
	4.6L 4x4 3.73 axle 9/16: 100 nose ups and downs; no ratcheting, no sticks, low loads; getting park pawl changed. 9/17: ready to run					
31	ZA00041	Perform Screening DV & Baseline ZA00041	30%	Fri 9/15/00	Sun 9/17/00	NA
	Notes					
	4.6L 4x4 3.73 axle RHD 9/16: Performed baseline; loads between 9 and 36#; 4 ratchets on nose ups (cycles 89, 91, 97, 99); determine from thaugh if these were skips or ratchets down the hill; need post-test inspection and pawl change. (XW4P park pawl). 9/17: park rod and pawl change					
32	W946	Perform Screening DV W946	30%	Fri 9/15/00	Sun 9/17/00	NA
	Notes					
	4.0L 4x2 3.73 axle 9/16: 100 nose ups and downs; no ratcheting, no sticks; low loads; ready to run again. 9/17:					
33	W954	Perform Screening DV W954	0%	Fri 9/15/00	Sun 9/17/00	NA
	Notes					
	4.6L 4x4 3.55 axle 9/17: park rod and pawl change; ready to run					
34	Team	Approve DVP&R proposal	0%	Mon 9/18/00	Mon 9/18/00	NA
	Notes					
	9/14: Draft DV circulated for comment.					
35	Team	Recommend Hardware Direction	0%	Wed 9/20/00	Wed 9/20/00	NA
37	klittle2	Vehicle 956: install digital read out	0%	Thu 9/7/00	Sat 9/16/00	NA
38	klittle2	Vehicle 954: won't start	0%	Thu 9/7/00	Sat 9/16/00	NA

PE09-020 1196

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
39	klittle2	Vehicle 957: replace transfer case; add digital read out	0%	Thu 9/7/00	Sat 9/16/00	NA
40	dhildebr	Obtain 4x2 w/ 3.27 axle	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes The vehicle is available in Dearborn. Kim Briscoe will bring it to Livonia.					
41	hdover dadamcz1	Obtain RHD vehicle from Shifter group	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
42	hdover	Obtain cables, brackets, clips	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
43	yxu1	Purch order for new pawls	100%	Thu 9/7/00	Thu 9/14/00	Thu 9/14/00
	Notes Laser cut pawls are due 9/15/00. 9/15: Pawls arrived 9/14.					
44	yxu1	Purch order for extension housings	0%	Thu 9/7/00	Wed 9/20/00	NA
45	ecastro1	Purch order for 24 transmissions	100%	Thu 9/7/00	Sun 9/10/00	Sun 9/10/00
	Notes Bordeuax built the transmissions on 9/11/00.					
46	BDX	Deliver 24 transmissions to ATNPC	0%	Tue 9/12/00	Tue 9/19/00	NA
47	peckman	Purch 2 new force gages	100%	Thu 9/7/00	Tue 9/12/00	Tue 9/12/00
	Notes Two new gages received.					
48	mfyie	Design/Fab bench test fixture	100%	Thu 9/7/00	Fri 9/8/00	Fri 9/8/00
49	dadamcz1 lhart hdover jbrazin	Create Visible A/T	100%	Sun 9/10/00	Thu 9/14/00	Thu 9/14/00
	Notes A camera is to be installed in a vehicle/transmission on 9/12; first results for 9/13 meeting. 9/15: Complete on 9/14; collect data on 9/15.					

PE09-020 1197

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
51	mfyie	Bench test selected prototype pawl with Max Park Disengagement Load	0%	Wed 9/20/00	Fri 9/22/00	NA
52	mfyie	Bench test	50%	Thu 9/21/00	Tue 9/26/00	NA
53	yxu1	Combined Ratchet/Pullout	0%	Fri 9/22/00	Tue 9/26/00	NA
54	kbriscoe	Bump Test	0%	Wed 9/20/00	Sun 10/8/00	NA
55	yxu1	DV Testing	0%	Tue 9/26/00	Tue 10/10/00	NA
57		STA to work with Keller to confirm their capability and reduce tolerance.	0%	Sun 9/17/00	Wed 9/20/00	NA
	Notes 9/16: Dan Hildebrand will contact Michel F. and ask him to work with Keller.					
58	mfyie,yxu1	Provide marked up drawings showing cam angle change	0%	Sat 9/16/00	Sun 9/17/00	NA
	Notes 9/16: FAX marked sketch to Keller and Bordeaux					
59	mfyie,yxu1	Investigate additional processesing to reduce cam half angle tolerance.	0%	Sun 9/17/00	Tue 9/19/00	NA
	Notes 9/16: Investigate sort and grind; any other options?					
60	tsledz,yxu1,jbrazin	Find a method for interim mis-assembly proofing rods with "W" vs "E" bullets.	0%	Sun 9/17/00	Fri 9/22/00	NA
	Notes 9/16: As it looks like we need to change the cam angle for "W" this item gets its own task (from task 13).					
61		Deliver prototype parts to ATNPC for testing	0%	Mon 9/18/00	Fri 9/22/00	NA
62		Deliver PSW'd parts to Bordeaux for PV and production.	0%	Mon 9/18/00	Fri 10/6/00	NA
63		Sherdel delivers revised pawl return spring	0%	Thu 9/7/00	Thu 9/7/00	NA

PE09-020 1198

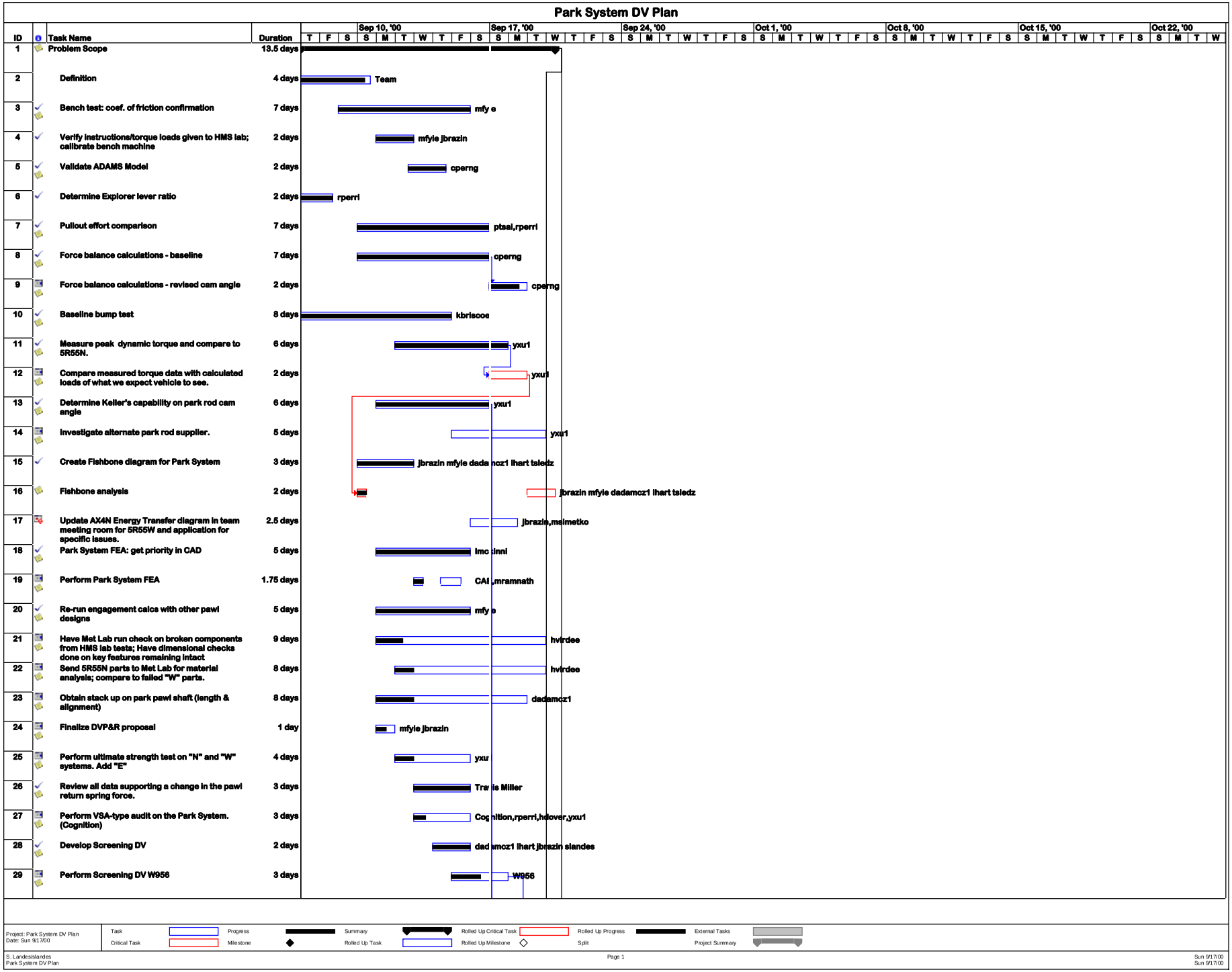
ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Sherdel delivers revised pawl return spring" continued						
65	MPI Subcontractor	Machine MPI produced pawls already in stock	0%	Wed 9/20/00	Wed 9/27/00	NA
66	MPI	Final processing of pawls at MPI	0%	Wed 9/27/00	Sat 9/30/00	NA
67	MPI	Ship pawls to BDX	0%	Sat 9/30/00	Thu 10/5/00	NA
69	MPI	Production die	0%	Thu 9/7/00	Thu 10/12/00	NA
70	MPI	PSW Parts	0%	Thu 10/12/00	Mon 10/16/00	NA
71	MPI	Ship to Bordeaux	0%	Mon 12/4/00	Tue 12/5/00	NA
73		PV/Production MRD	0%	Sat 10/7/00	Sat 10/7/00	NA
74	BDX	Build PV transmissions	0%	Sun 10/8/00	Mon 10/9/00	NA
75	BDX	Transmission Job1	0%	Tue 10/10/00	Tue 10/10/00	NA
76	BDX	Perform PV test	0%	Tue 10/10/00	Wed 10/11/00	NA
77	BDX	PSW	0%	Thu 10/12/00	Fri 10/13/00	NA
78	BDX	Ship to LAP	0%	Tue 10/10/00	Sat 10/14/00	NA
79		MRD #2 for Final Design Pawls	0%	Tue 12/5/00	Tue 12/5/00	NA
80		Re-PSW	0%	Thu 9/7/00	Thu 9/7/00	NA

PE09-020 1199

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"Re-PSW" continued						
81	LAP	Integrated Build at LAP	0%	Mon 10/23/00	Sun 11/19/00	NA
83	MPI	Production die	0%	Thu 9/7/00	Thu 10/12/00	NA
84	MPI	PSW Parts	0%	Thu 10/12/00	Mon 10/16/00	NA
85	MPI	Ship to Bordeaux	0%	Mon 10/16/00	Wed 10/18/00	NA

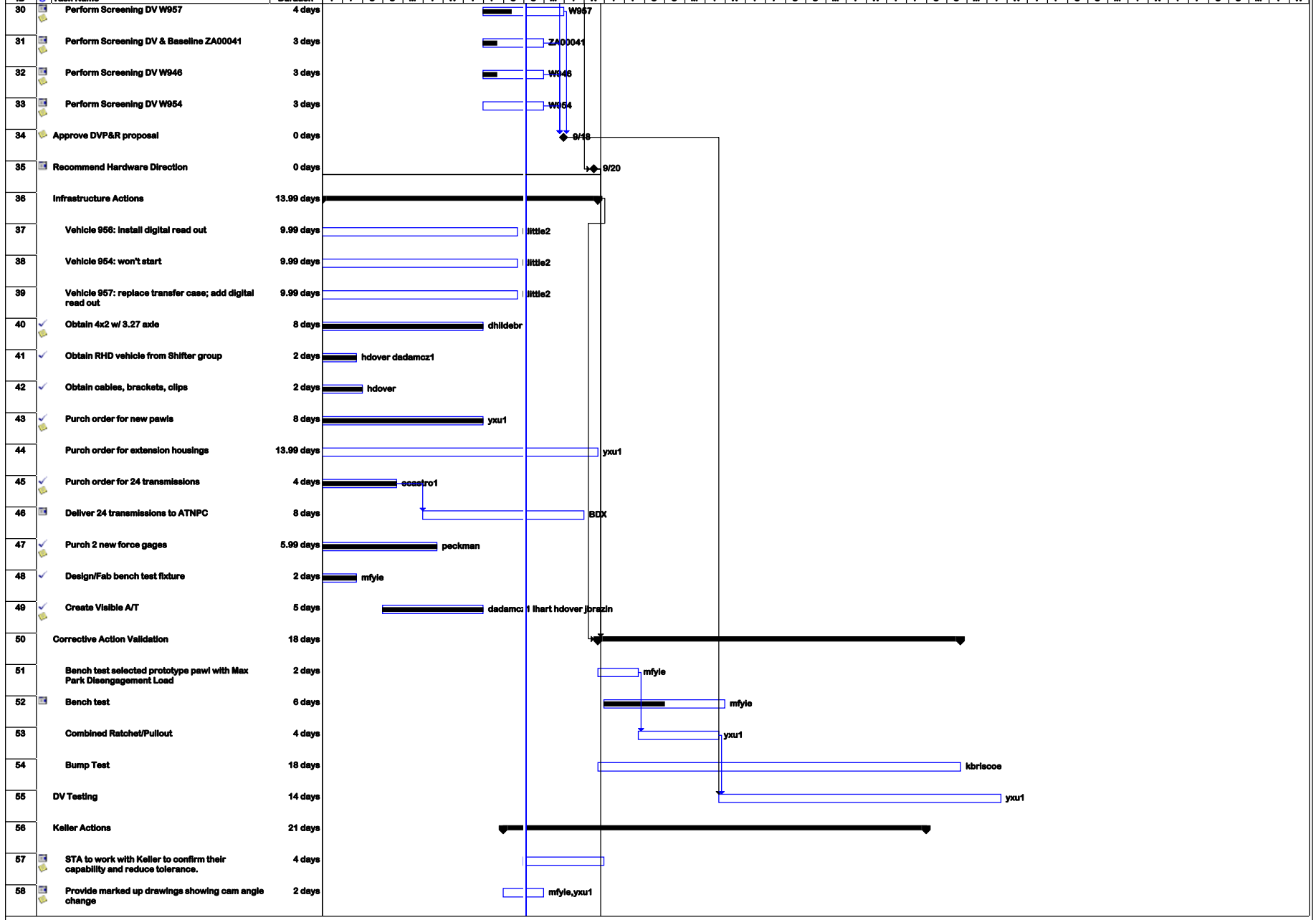
PE09-020 1200

Park System DV Plan



PE09-020 1201

Park System DV Plan



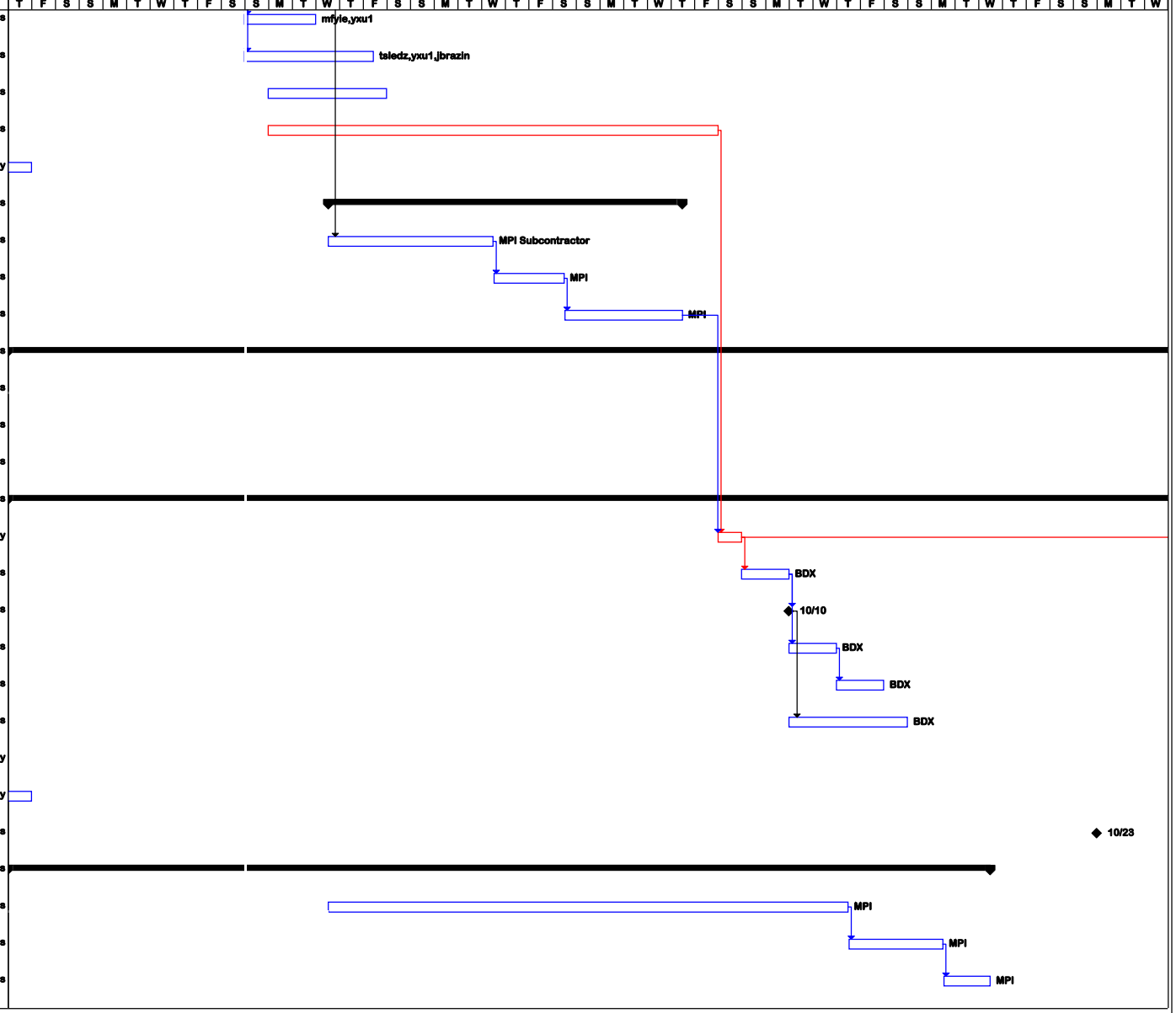
Project: Park System DV Plan
Date: Sun 9/17/00

Task | Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks
Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary

PE09-020 1202

Park System DV Plan

ID	Task Name	Duration
59	Investigate additional processessing to reduce cam half angle tolerance.	3 days
60	Find a method for interim mis-assembly proofing rods with "W" vs "E" bullets.	5.33 days
61	Deliver prototype parts to ATNPC for testing	5 days
62	Deliver PSW'd parts to Bordeaux for PV and production.	19 days
63	Sherdel delivers revised pawl return spring	1 day
64	MPI Interim Support Plan	15 days
65	Machine MPI produced pawls already in stock	7 days
66	Final processing of pawls at MPI	3 days
67	Ship pawls to BDX	5 days
68	MPI Final Design Actions	88 days
69	Production die	22 days
70	PSW Parts	4 days
71	Ship to Bordeaux	2 days
72	Bordeaux Actions	88 days
73	PV/Production MRD	1 day
74	Build PV transmissions	2 days
75	Transmission Job1	0 days
76	Perform PV test	2 days
77	PSW	2 days
78	Ship to LAP	5 days
79	MRD #2 for Final Design Pawls	1 day
80	Re-PSW	1 day
81	Integrated Build at LAP	28 days
82	MPI Actions	41.5 days
83	Production die	22 days
84	PSW Parts	4 days
85	Ship to Bordeaux	2 days



Project: Park System DV Plan
Date: Sun 9/17/00

Task | Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks
Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary

PE09-020 1203

From: Landes, Stephen (S.L.)
Sent: Monday, October 16, 2000 11:50 AM
To: Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Cabadas, Eugene (E.J.); Chen, Jershi (J.); Dover, Harry (H.); Fyie, Matthew (M.L.); Greene, Lisa (L.A.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Krishnaswami, Ram (R.); Landes, Stephen (S.L.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Ramnath, Das (M.D.); Retallack, Lynn (L.M.); See, Raymond (R.J.); Sledz, Ted (T.M.); Spaulding, Todd (T.C.); Tsai, Pingfang (P.); Virdee, Harbinder (H.S.); Xu, Yehong (Y.)
Cc: Antrim, William (W.R.)
Subject: Park System Team Open Assignment Log

Attachments: Microsoft Project - Team Assignments.pdf

Please review the attached file for your open assignments and let me know the status of these assignments at tomorrow's team meeting. Thanks.

Microsoft Project - Team Assig...

NOTE: the file is sorted by responsible individual's name, but if more than one person is listed the task will be only under their name (not duplicated for every assignee).

Stephen Landes
5R55N/W/S/E Systems Engineering
slandes@ford.com
(734) 523-5841
Text Page: slandes

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
88	BDX	PV/Production MRD	0%	Tue 10/10/00	Tue 10/10/00	NA
89	BDX	Build PV transmissions	0%	Wed 10/11/00	Wed 10/11/00	NA
90	BDX	Perform PV test	0%	Thu 10/12/00	Sun 10/15/00	NA
91	BDX	PSW	0%	Mon 10/16/00	Mon 10/16/00	NA
92	BDX	Transmission Job1	0%	Mon 10/16/00	Mon 10/16/00	NA
93	BDX	Ship to LAP	0%	Mon 10/16/00	Wed 10/18/00	NA
95	BDX	IB MRD	0%	Fri 11/3/00	Fri 11/3/00	NA
47	dadamcz1	Keller DCP	0%	Mon 10/16/00	Mon 10/16/00	NA

Notes
10/6: on site visit to:
confirm the revised measuring system is in place
check on phospahte coating process
check status of the DCP
STA help has been organized

Keller is to measure a percentage of each batch and do "go/no go" checks on the balance of parts until further notice.

51	jbrazin,lmckinni,mhaddles	Bordeaux Final Test	0%	Mon 10/9/00	Mon 10/9/00	NA

Notes
10/6: Specify measureable dimension for manual shaft torque. This is to be a rejectable item on the ES spec. Base the torque on 30% grade. Confirm with Bordeaux that they can perform this test at the required torque.

57	kbriscoe	Bump Test	0%	Tue 9/26/00	Fri 10/13/00	NA
69	Keller	STA to work with Keller to confirm their capability and reduce tolerance.	0%	Sun 9/17/00	Wed 9/20/00	NA

Notes
9/16: Dan Hildebrand will contact Michel F. and ask him to work with Keller.

PE09-020 1205

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
96	LAP	IB	0%	Mon 11/6/00	Mon 11/6/00	NA
67	lhart	DV 4 -- Park System DV	0%	Sun 10/15/00	Tue 10/17/00	NA
54	mfyie	Bench test selected prototype pawl with Max Park Disengagement Load	0%	Tue 9/26/00	Wed 9/27/00	NA
55	mfyie	Bench test	50%	Thu 9/21/00	Thu 9/28/00	NA
52	mhaddles,lmckinni	Revise ES Spec for torque dimension.	0%	Tue 10/10/00	Fri 10/13/00	NA
	Notes 10/6: Revise the ES Spec to reflect the new measureable dimension for manual shaft torque.					
81	MPI	Final processing of pawls at MPI	0%	Wed 9/27/00	Fri 9/29/00	NA
82	MPI	Ship pawls to BDX	0%	Sat 9/30/00	Wed 10/4/00	NA
84	MPI	Production die	0%	Thu 9/28/00	Fri 10/13/00	NA
85	MPI	PSW Parts	0%	Sat 10/14/00	Tue 10/17/00	NA
86	MPI	Ship to Bordeaux	0%	Wed 10/18/00	Thu 10/19/00	NA
80	MPI Subcontractor,MPI	Machine MPI produced pawls already in stock	0%	Sat 9/23/00	Tue 9/26/00	NA
77	Sherdel	Back-up PSW	0%	Tue 9/19/00	Mon 10/2/00	NA
78	Sherdel	Parts manufacturing and delivery to Bordeaux	0%	Tue 9/19/00	Fri 10/6/00	NA

PE09-020 1206

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
50	ssettine	Park Gear DCP	0%	Mon 10/16/00	Mon 10/16/00	NA

Notes
10/6: The DCP needs to be revised to show a hardness lower limit of 52.

29	Team	Approve DVP&R proposal	0%	Fri 9/22/00	Fri 9/22/00	NA

Notes
9/14: Draft DV circulated for comment.
9/21: Approval targeted for 9/22 at 12:30

106	Team	9/24/00 AM	0%	Sun 9/24/00	Sun 9/24/00	NA

Notes
Send 4, 5, 6deg pawls to Chem Met to confirm they meet specs on print (yxu1)
Get report from Chem Met on pawls already in lab. (yxu1, 9/25)
Identified park gears with most damage and send them to the lab (yxu1)
Observation: the system is producing some Windstar-like noises
Summarize bench test data (ptsai, 9/25)
Do visual inspections on parts from completed tests (yxu1, jbrazin)
Get Toyota park system study from Wroblewski (lmckinni)
Investigate shot peening for pawl (jbrazin)
Determine the angle from drive to nominal park for floor vs column shifter (hdover)
Determine how far into park we go (position on cam) for floor vs column shifter (hdover)
Perform ABA test between vehicles 041 and 957: swap transmissions to see if the reason for 041 success is realted to the shifter (lhart)
Run MathCAD model with proposed design (mfyie, 9/25 AM)
Install optical encoder on vehicles 946 and 041 (lhart)
Obtain digital read outs for all five vehicles (klittle2)
Checkout RCONS and PCA2 modules in all 5 vehicles (lhart)
Approve DVP&R at 12:30 meeting (slandes -- copies)

107	Team	9/24/00 PM	0%	Sun 9/24/00	Sun 9/24/00	NA

Notes

Decision Matrix	Weight	Angle Change fom 1L2P-AA	
		4 deg	5 deg
Pull Out Effort	8	0	1
Drop In Speed	7	1	0
H. S. Ratchet	1	0	0
Spit Out	10	0	1
Hang Up	9	1	0
Score		16	18

The Team met on Sunday afternoon and reviewed test data and progress. We decided to see where we stood on making a decision on pawl tooth angle modification and used the above decision matrix to evaluate our position. After constructing the matrix it was the team decision to direct MPI to use the 5deg modification design. The key assessment criteria is "spit out". Even with out the weights applied the matrix would have resulted in a tie with the decision going to 5 deg because of the spit out issue. If only spit out and hang up were considered the decision would still be to sue 5 deg because of spit out considerations.

A set of good and bad pawls will be sent to ChemMet for analysis:
6deg unused
"N" unused
old "W" unused
pass and fail parts from current tests
"E" unused
"E" from team tests

We need to determine the proper sample size for DVP&R tests at the Monday 12:30.
A program specific DVP&R will be ready by COB Monday (yxu1)
Determine RHD vehicle requirements for the DV (hdover)

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
108	Team	9/25/00 AM	0%	Mon 9/25/00	Mon 9/25/00	NA

Notes

All required pawls except the "E" tested part have been provided to the lab. MFYIE will find and supply the used "E" pawl.
Preliminary Chem Met test results have been communicated to MPI; test report to follow.
The ABA test between vehicles 041 and 957 has been partially completed: both vehicles experienced hang up at the 75th cycle. We will not do the last "A" portion of the test as the parts are too worn to provide reasonable results, and other test requirements will take precedence.
Some discussion on DV sample sizes has been held. The bump test will be a size of one; bench tests will be a size of three.

109	Team	9/25/00 PM	0%	Mon 9/25/00	Mon 9/25/00	NA

Notes

The bump test will be held on Wednesday using vehicle 956 (4x2 with a 3.27 axle -- worst case vehicle for this test). YXU1 to supply a transmission to kbrisoce today for the test.
NOTE: lhart and slandes discussed which return spring to build in this transmission;, we have A, B, & C springs at this point with A being current, B close to production intent, but no actual production intent spring on hand. As the "A" spring would present the greatest risk of test failure we will use that spring -- a "Pass" under these worst case conditions should support system sign off.
The tested "E" pawl is being pulled for the lab.
RHD vehicle 041 will be retunred to hdover for a few days for a management review.
Modeling to support the 5deg pawl decision should be ready by the Tuesday meeting (mfyie)
Bench test data needs to be summarized (yxu1 & ptsai)

Analytical Data Collection

- Run models at tolerance limits using test data from bench and vehicle tests (coefficients, loads, etc.) mfyie, cperng
- Run bench tests on 5 deg pawls from the large batch (3 samples) yxu1
- Perform drop in tests with 5 deg pawl prototype level parts kbriscoe/lhart
- Perform the barrier test (Wednesday, kbriscoe)
- Determine what testing we can perform with existing pawls and which ones require new big batch parts.

Note: final dimensions have been given to Sherdel for the return spring.

Release the pawl and return spring, advnace the transmission assembly number. yxu1/cdavis42
Transmit the design for the new pawl with circular tooth thickness increas to cperng for ADAMS study and MPI for prototype parts. yxu1
Investigate process modifications for MPI as post-Job1 actions. jbrazin

110	Team	9/26/00 PM	0%	Tue 9/26/00	Tue 9/26/00	NA

Notes

Vehicle Prep Issues:

- Change tire inflation from 26 to 30 psi to match new Company direction.
- Prep vehicles with the 5deg pawls we have in hand.
- Optical encoders are being installed on two vehicles.
- We have found ways to read vehicle speeds from the encoders (RCON direct or signal conditioning boxes; digital read outs when available).
- ABA testing on 041 and 957 will be completed. The team agreed to swap transmissions with no change in parts. If this produces useable results and additional work is indicated then we will consider a proper ABA, swapping transmissions with new or "stoned" parts.

F/U from 9/25:

- Bump test is to be performed on Wednesday; on track
- The tested "E" pawl has been taken to the lab
- HDOVER is temporarily updating the RHD vehicle for a management review.
- Modeling of teh 5deg pawl is inprocess; to be complete on 9/27.
- Initial drop in speed tests were run; values slightly higher than predicted; results are to be compared with model values (cperng)
- 4deg: 3.0 to 3.2 mph
- 5deg: 3.6 mph
- Sherdel has committed to PSW parts at BDX on 4 Oct 00.
- MPI will work with Jim Brazin to develop a work plan for investigating process improvements recommended by our lab. The MPI rep was here to spend time with our lab team.
- Confirmed that the return spring to be used for initial DV testing is the "A" spring; OK for bump test.
- A stack up request for circular tooth thickness has been submitted to CAD (#2081). F/U to make sure they're working on it (yxu1).

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/26/00 PM" continued

Notes

New:

- Finalize the DVP with vehicle requirements (lhart, dadamcz1, jbrazin, dhildebr).
- Send a tested "N" pawl to the lab (yxu1).
- Note that modeling includes max/min mu and correlated to torque loads from test vehicles (yes, per mfyie)
- Bench tests:
- one run at 5deg pawl, complete
- two samples to go
- run a failed (hang up) transmission on the bench to measure mu underthose circumstance (yxu1).
- We have 5 pawls in hand, more are expected from MPI's big batch on Friday.
- We have 15 transmissions in hand with 24 more coming from BDX.
- Keller will work on a plan to investigate and improve their manufacturing tolerance.
- We need to do a layout of a damaged pawl and give those dimensions to Cognition for study in our full system stack up model (yxu1, hdover).

111	Team	9/27/00 PM	0%	Wed 9/27/00	Wed 9/27/00	NA

Notes

Park System and some Transmission System team members met with Mr. Yuhasz. No regular team meeting was held. Briefly, unless the team can answer the issue raised by mfyie's model which shows the system not holding park on grade at minimum mu and maximum park rod cam angle we are not ready for production. The following assignments came from the meeting:

- Calculate the max cam angle sufficient for no spit out (mfyie)
- Obtain park rods in 0.1deg increments over the tolerance range; all phosphate coated; surface characteristics identified (yxu1)
- Benchmark E/N/AX with MathCAD model and similar mu values (mfyie)
- Find the transmission system with base pawl or 3deg pawl that skipped; measure cam angle/surface; confirm it still skips; rerun with 5deg pawl (lhart dadamcz1)
- Find ways to limit cariation in mu (dhildebr)
- Conduct one day peer review (vlajines)
- Add G. MacDonald to peer review team (pyuhasz)
- ZF help with review? (pyuhasz)

112	Team	9/28/00 PM	0%	Thu 9/28/00	Thu 9/28/00	NA
113	Team	9/29/00 PM	0%	Fri 9/29/00	Fri 9/29/00	NA

Notes

Tasks:

- Find highest and lowest cam angles, run bench and vehicle tests.
- Calculate points for above data.
- Run 5.0deg prod intent pawl with increasing load until spit out experienced.
- Run highest cam angle for 4.5deg to 4.7deg batch on "W" -- no pull out?
- Grind 4.7, 4.8, 4.9 cams; test "W"
- If max cam angles found do not exceed 5.2deg to 5.3 deg; modify to 5.5deg.

114	Team	9/30/00 PM	0%	Sat 9/30/00	Sat 9/30/00	NA

Notes

Data Analysis Update:

Cam Angle:

- Measurement system: it is repeatable, but part presentation may be an issue (measuring from an uncontrolled surface). Determine if there is an issue with presentation; determine how to communicate measurement

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ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/30/00 PM" continued

Notes

method.

- investigate clamp process (clamp & rotate parts)
- investigate shadow graph
- tear down parts and measure off machined ID

Pull out data

With 4x2's and 4x4's, production cam:

- nose up v down shows very little difference
- 3.27 has higher efforts than 3.73
- Why is 4deg pawl showing higher efforts in 3.27 and 5deg pawl higher efforts in 3.73?
- 5deg pawl has less variability in pull out loads
- Both PTSAI and RKRINSHN2 analyses reach these conclusions.

Mu-sub"e" calculations

- 500# applied load shows lower Mu-e than 300# or 700#.
- 500# has less variation in both nose up and down directions than other loads.

Direction Summary

Primary:
Multiple runs of the MathCAD model for AX, N, and W configurations have been plotted on one chart. The conclusion is that "W" is good with park cams between 4.8deg and 5.0deg.

- Refine the model
- Confirm current model conclusions with testing using sorted and oriented rods and ATNPC-machined rods.
- Determine how to control cam angle to tight tolerance around a nominal of 4.9deg; define measurement method, determine capability.
- Add 5R55E to the master comparison chart.
- Document differences in Mu-e measurements between AX and N/W (mfyie)

Secondary:

- Find ways to control mu-e on either pawl or bullet. (jbrazin)

Work to be done:

Hardware:

Bench (khogberg)

- new rods with phos coating at 300# load only; 30ccw/30cw; indexing park gear teeth
- same rod; remove phos & polish (jbrazin); rerun test
- Full test w/ strain gaged rod; peak torque @ maual shaft to peak force @ rod.
- DVP&R testing: rods with new pawls.

Lab (khogberg)

- Machine rod cams from 4.8 to 5.5 deg; two each in 0.1deg increments; polish and inspect; run in vehicles.
- Inspect rods (kamed)

Vehicles (lhart)

- New pawls (heat treat looks good; much harder)
- DV using inspected/oriented rods to give high & low angles

Other test results: 3.27 4x2 new pawl 5.6deg cam: can we get enough weight to skip?

- @Max GVW: hang up once in high numbered cycle (80's)
- @Max GVW +1000# added in 200# increments: no skips; 3 hang ups

Analytical

- Max GVW+1000# test results into MathCAD, evaluate over Mu-e range of 0.85 to 0.117; what do curves look like? (mfyie)
- Shifter efforts correlated to rod forces (mfyie)

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/30/00 PM" continued

Notes

- Shifter efforts correlated to cam forces (rkrishn2)
- Review analytical reports; assure consistency in analysis/presentation (rkrishn2)

115	Team	10/1/00 PM	0%	Sun 10/1/00	Sun 10/1/00	NA

Notes

Assignments:

Find test rod #8; run in vehicle (pull out, nose up) adding weight until spit out occurs.
Find phosphate coater to treat test cams (dadamcz1)
Run parts from Fri/Sat which were loaded to >GVW on bench (lhart/khogberg)
Run 5deg pawls with prod rods as part of DV (9 sets min) (khogberg)
Get phos coating production controls help for Keller (gmacdona)
Get BDX park gears with hardness at 58-60 and 60-62; understnad potential process improvement (dhildebr)
Analyze weekend test data (rkrishn2)
Continue DV of 5deg cams (was this supposed to be pawls?) (lhart)
Review with Barb/Phil - All - time TBD, but late PM is expected (Team)

116	Team	10/2/00 PM	0%	Mon 10/2/00	Mon 10/2/00	NA

Notes

Design Position

- Park Pawl: 5deg MPI machined pawl with good heat treat and hardness of 61 to 62.
- Park Rod: Keller cold formed rod ground to 9.5deg to 10deg full included angle cam, polished, phosphate coated, with a 40N ratchet spring.
- Return Spring: 270 Nmm
- Park Gear: no change; Bordeaux has committed to a minimum hardness of 52 vs. 50.

117	Team	10/8/00 PM	0%	Sun 10/8/00	Sun 10/8/00	NA

Notes

Testing Summary (primarily drop in speed)			Fwd		Rev		
Pawl	Cam	Spring (Nmm)	Low	High	Low	High	Comments
5deg, radisued, hard	4.8deg	268	2.49	3.48	3.09	3.3	compound angle on n.u. side
5deg, hard	4.8deg w/ Brazin mod	300	3.3	3.7	3.3	3.7	
5deg, hard	4.8deg	300	in process				
5deg, hard, 1.5mm trim on n.u. side	4.8deg w/ Brazin mod	268					Broke pawl on 2nd drop in; high pull out efforts
Grand Slam Transmission:							
5deg, radiused	4.8deg w/ Brazin mod	300	probable configuration				
Four "E" transmissions have been tested, no instrumentation, all feel good, being torn down.							

- A drawing of the revised park pawl showing a radius instead of chamfer has been completed and is being given to Will Webber today.
- The Cognition model is to be updated Monday with revised pawl and cam dimensions to confirm minimum park is still within specification. (MFYIE)
- The park stack up is still in process, but is not holding up work.
- Contact Keller to determine if the new die will eliminate the need to do the Brazin-designed second face grinding (DHILDEBR, YXU1)

PE09-020 1211

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
118	Team	10/10/00	0%	Tue 10/10/00	Tue 10/10/00	NA

Notes

Critical Issues:

Transmissions:

- 96 are being built today at BDX
- 14 are being shipped now and are to arrive on 16 Oct (ssulliva/lhart)
- Scrape the barrel here (jabdilla)

Extensions Housings: BDX shipped 60 today (ssulliva)
Covers: 20 in stock; 50 on order from BDX
Return Springs: 270Nmm springs arrived (100)
Pawls:

- Plenty of 5deg available
- ATNPC is radiusing some for testing
- MPI has completed the new blanks; machine shop is lined up; tool is ready.

Rods: testing to see if we run with smallest diameter transmission rods; confirm drop in speeds.

The team spent over an hour discussing force balance criteria and margin criteria.

Spring Balance Must:

- Result in drop in speeds between 1.5 and 3.5 mph.
- Never compress the actuator spring (ratchet spring) when engaging the system in non-abutted condition.
- Use lightest pre-load.
- Use lowest rate to reduce variability.

For the 400Nmm spring:

Installed Torque Nmm	Rotated	@ + 10%	Required Ratchet to Balance	Ratchet less 10%	Safety Factor
400	414	455	28N	36N	8N

Test Proposal

Priority	Pawl	Rod	Spring	Objective
	5deg, radiused	Smallest transitional cam diameter	270Nmm	confirm drop in is between 1.5 & 3.5 mph; pullouts <30#
	Check to see if cases yielded on 300 and 400 Nmm tests			
	if 300 yielded don't do 2			
	if 400 yielded ?			
1	Set up DOE; check lhart records for tests that match, define added tests (rkrishn2)			
2	Obtain force balance summary of other transmissions (mfyie)			

119	Team	10/11/00	0%	Wed 10/11/00	Wed 10/11/00	NA

Notes

Cognition model needs updating.
The team needs to know axial engagement of pawl and cam, and OML position for these input points: tick, abutment, half engagement, park overtravel. We are not interested in pawl bottomed in gear as this is not feasible given the linkage arrangement.

Spring Balance:
Using "E" conditions (455Nmm return spring and 50N ratchet spring) and maintianing the same safety factor yields a 330Nmm spring with the "W"'s 40N ratchet spring. In the physical buck no bullet movement was detected with 414 and 450 Nmm return springs, so a 330 should not cause bullet movement on engagement.

Rerun the physical buck test with a 330Nmm spring, and also a 330Nmm with a chamfered pawl (jbrazin/dhildebr).
Run force balance @ 330Nmm & radiused pawl (cperng).

Direction has been given to Sherdel to build the 330Nmm spring (268 & 414 springs are already in inventory).

Keller will make rods for production the way they did for 6 Oct. The Start diameter for the ratchet ramp is very important. Keller is making rods that maintain the proper transition diameter.

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"10/11/00" continued

Notes

Direction for Job1:
Parts to BDX 16 Oct
Parts to ATNPC 17 Oct
Part number has been changed; Keller is working on a unique ID system.

Inspection has been lined up to examine the pawl shaft hole on cases from the 300Nmm and 400Nmm tests.
Inspection will accept any case we send them per gmacdona.

FEA analysis indicates that increased hole depth results in reduced plastic deformation and reduced pin defelction.
Need a safety factor on pawl & shaft: compare to yield strength on pawl & shaft, do for case, too. (mramnath).

MPI has the revised drawing for the radiused pawl; 2000 blanks have been made, 200 sent to machining, should arrive at ATNPC on Saturday.
Cabadas' team has directed Stokes on heat treat sample.
Use of the radiused pawl is subject to confirmation from the Cognition model.
We need an engineer to accompany STA to MPI (lmckinni/lgreene).

NOTE: Drafting is out of business this weekend, so they need changes before Friday.
Releases:
Rod is in CAD; part # rev
Spring: need from yxu1 (needs supplier drawing & quote package)
Pawl: complete; to cdavis42 (yxu1)

Test runs:
pawl: radiused; ATNPC mfr
springs: 300 and 414
rods: Keller processed as received; as modified to recover transition diameter
rkrishn2 to work with lhart to determine what physical tests are required to complete the DOE.

120	Team	10/12/00	0%	Thu 10/12/00	Thu 10/12/00	NA

Notes

Force Balance:

A4LD was 670Nmm & 30mm lever v 58N ratchet spring
Conclusion: the "W" set up with a 330Nmm srping does not demonstrate a safety factor issue. The set up has a safety factor comparable to "E", better than 4R70W; not quite as large a margin as AX or 4R100.

Keller machined 350 rods on 11 Oct; now at the phosphater; measuring all the rods will take about 2 days; 50 rods should be available by COB Friday.
Check on travel plans to see who is coming back from BDX this weekend (slandes).
Need PO for Keller (jbardall)

Cognition model update still needs work; results due Friday.

NOTE: If we redesign the pawl it should be flipped over to put the die break on teh guide cup side (like "E"). (yxu1)

FEA is working on 4x2 iterations. We need to do iteration "E" to complete the matrix.
Dynamic overload used is 1260 per klittle test data using the 3deg pawl.

MPI: chatter on pawl where they are milling the radius; please add acceptance of this to the Alert. 330 pieces going to the heat treater today; targeting noon Saturday at ATNPC.

NOTE: rods and springs are being handled by ssulliva

NOTE: design consideration -- use thick wall tube instead of solid park pawl shaft; redistribute load to case.

Bench Tests: Matt DeFore is working on N & E ultimate strength tests; f/u with friction tests with radiused pawls.

Vehicle tests

D'line	Spring Nmm	Pawl	Rod	Pullouts	Drop In
4x4	300	radiused	as-shipped	pass	lower
4x2	300	radiused	as-shipped	pass	1>3.5, avg<3.5
4x4	400	radiused	as-shipped	pass	lowest:2.43 - 2.86
Note: pawl radius is not exact match to the MPI pawls we are getting					
Ref: "E" drop ins are running 2.0 to 2.4 mph					

Weekend Plan

PE09-020 1213

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"10/12/00" continued

Notes

Complete bench tests
DV Test: proper rods and pawls; use 300Nmm springs until 330Nmm springs arrive.
Run MPI pawls with representative parts to confirm results.
No crew for Saturday
Sunday: 2 mechanics; one shift.

121	Team	10/13/00	0%	Fri 10/13/00	Fri 10/13/00	NA

Notes

Force Balance:
Looking @ difference between radiused pawl designs (2.5mm difference). Team wants to run min & max design limits to see what model predicts for drop in speed (cpernq for Monday)

Test Data Assessment: What affects drop in speed? (rkrishn2)
#1 return spring
#2 final drive ratio
#3 radius of cam @ transition
Rsquared is 90%; within +/- 0.2mph
Radiused pawl is not a factor in drop in speed.
Predicted drop in speed:
FDR 3.73 & 3.55; 300-360Nmm spring; current cam dia => 3sigma limit <3.0mph
FDR 3.27; 3sigma => 3.5mph

Experience shows we don't break transmissions is drop in is <3.2mph
Launch with 3.75 & 3.55 axles; hold 3.27 until case modifications can be incorporated (based on this analysis)
Test data supports ADAMS predictions
Projecting for 3.73; not in actual data set, therefore less confidence than for 3.27 & 3.55.

Cognition Output:

	New Pawl		Old Pawl		
condition	Nominal	Range	Nominal	Range	Nominal Difference
abutted	-3.17	0.26	-3.4	0.46	0.23
min tick	-2.87	0.27	-2.93	0.45	0.06
park overtravel	8.04	0.85	8.04	0.89	0
Ranges are assymetric about the nominal value.					

Bench Tests: (tsalciccioli)
N&E ultimate strength this weekend
Friction tests: use Job1 intent parts next week; set up this weekend.

Parts Delivery:
MPI this afternoon
spring & rod Saturday 7PM
xhsngs received.
Transmissions on hand enough for the weekend
Running 6 combineds this weekend; drivers OK; use slow test procedure; reduced data to rkrishn2.
Use new cases & reused internals for bench
Negotiating for transmissions from LAP (rdeinzer); required for Monday.
Garage: personnel lined up Saturday PM, Sunday days.
Vehicle condition: ingeneral; tired.
Get inspection support for Sunday to do cases for plastic deformation; noon to 8pm; mfyie to arrange.

MPI:
Shipping method: BA notice in today; use BA with Alert
Add words to Alert: .25 to .50 radius spec on tip of pawl tooth; measured .64; cutter removed "non functional" material (stress riser?).
Can't ship as interim PSW because MPI can't support BDX ramp up volume; working on a plan; can ATNPC machine shop help support?
Flying parts to BDX on Sunday.

122	Team	10/15/00	0%	Sun 10/15/00	Sun 10/15/00	NA

Notes

Test Results:

PE09-020 1214

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"10/15/00" continued						

Notes

Broken cases/pawl/shaft last night using 330Nmm slightly modified spring.
Test run with 3.55 4x4 OK
Test with 3.27 indicates more work is required.
Our model predicts drop in speeds as long as the pawl remains on the ratchet ramp. Prediction to T6=> avg 3.08, max<3.5.

Two scenarios presented:
Scenario 1: use current hardware (radiused pawl, keller rod, 330Nmm spring), but do not approve 3.27 applications.
Scenario 2: use radiused pawl, Keller rod, and 400Nmm spring; approve all applications.

Concern with scenario 2: what "safety" factor is required in force balance?
Calculations say 400Nmm spring is not as robust a factor as "E", but is better than 4R70W.
Bench tests don't show any ratchet spring compression @ 400 or 450 Nmm.

T6 results: Avg = 3.08, Max = 3.59, 3.37

Scenario 3 proposed: chamfered pawl, Keller rod, 400Nmm spring, approve for all applications. Analysis shows the radius doesn't help with drop in speed; the chamfered pawl has no production volume limitation.

Non-binding voting indicates a preference for Scenario 3 for a variety of reasons.

NOTE: both pawls show evidence of riding up on the engagement ramp; we want to get the transition diameter back to print.
The Pawl Stack Up is key (both Cognition and VSA) tkohls to f/u with CAD on VSA.

NOTE: the 2.5mm difference in position of the pawl radius between ATNPC machined and MPI manufactured appears to be important. An additional reason for pursuing Scenario 3.

49	tkohls,ecabadas	Park Gear Heat Treat Process	0%	Mon 10/16/00	Mon 10/16/00	NA

Notes

10/6: We need to determine if the heat treat process is operating correctly.

48	yxu1	MPI DCP	0%	Mon 10/16/00	Mon 10/16/00	NA

Notes

10/6: YXU1 has the MPI DCP, and it includes pawl grinding. We need:

- CpK on machining
- Handling process controls (nicks have been noted)
- Process to reduce burrs on parts (BDX explanation required, but they sorted 70 parts to get 40).

56	yxu1	Combined Ratchet/Pullout	0%	Sat 9/23/00	Tue 9/26/00	NA
104	yxu1,klittle2	Measure peak dynamic torque and compare to 5R55N.	0%	Thu 9/21/00	Fri 9/29/00	NA

Notes

9/18: Develop a list of requirements for doing instrument axle testing on a 4X4.

PE09-020 1215

From: Landes, Stephen (S.L.)
Sent: Wednesday, October 18, 2000 9:27 AM
To: Adamczyk, David (D.W.); Brazin, Jim (J.C.); Briscoe, Kim (K.A.); Cabadas, Eugene (E.J.); Chen, Jershi (J.); Dover, Harry (H.); Fyie, Matthew (M.L.); Greene, Lisa (L.A.); Haggerty, Judy (J.F.); Hart, Lori (L.A.); Hildebrand, Dan (D.H.); Kohls, Tracy (T.K.); Krishnaswami, Ram (R.); Landes, Stephen (S.L.); Little, Kevin (K.W.); McKinnis, Larry (L.N.); Mitschke, Fred (F.); Perng, Chin-Yuan (C.Y.); Perri, Ron (R.J.); Ramnath, Das (M.D.); Retallack, Lynn (L.M.); See, Raymond (R.J.); Sledz, Ted (T.M.); Spaulding, Todd (T.C.); Tsai, Pingfang (P.); Virdee, Harbinder (H.S.); Xu, Yehong (Y.)
Cc: Antrim, William (W.R.)
Subject: Park System Team Open Assignments

Attachments: Microsoft Project - Team Assignments.pdf

Please review the attached assignment log and be prepared to update the team on your progress today. For BORDEAUX: Please review tasks you are responsible for an let me know what the proper dates should be. Thanks!

Microsoft Project - Team Assig...

Stephen Landes
5R55N/W/S/E Systems Engineering
slandes@ford.com
(734) 523-5841
Text Page: slandes

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
88	BDX	PV/Production MRD	0%	Tue 10/10/00	Tue 10/10/00	NA
89	BDX	Build PV transmissions	0%	Wed 10/11/00	Wed 10/11/00	NA
90	BDX	Perform PV test	0%	Thu 10/12/00	Sun 10/15/00	NA
91	BDX	PSW	0%	Mon 10/16/00	Mon 10/16/00	NA
92	BDX	Transmission Job1	0%	Mon 10/16/00	Mon 10/16/00	NA
93	BDX	Ship to LAP	0%	Mon 10/16/00	Wed 10/18/00	NA
95	BDX	IB MRD	0%	Fri 11/3/00	Fri 11/3/00	NA
47	dadamcz1	Keller DCP	0%	Mon 10/16/00	Mon 10/16/00	NA

Notes
10/6: on site visit to:
confirm the revised measuring system is in place
check on phospahte coating process
check status of the DCP
STA help has been organized

Keller is to measure a percentage of each batch and do "go/no go" checks on the balance of parts until further notice.

51	jbrazin,lmckinni,mhaddles	Bordeaux Final Test	0%	Mon 10/9/00	Mon 10/9/00	NA

Notes
10/6: Specify measureable dimension for manual shaft torque. This is to be a rejectable item on the ES spec. Base the torque on 30% grade. Confirm with Bordeaux that they can perform this test at the required torque.

57	kbriscoe	Bump Test	0%	Tue 9/26/00	Fri 10/13/00	NA
69	Keller	STA to work with Keller to confirm their capability and reduce tolerance.	0%	Sun 9/17/00	Wed 9/20/00	NA

Notes
9/16: Dan Hildebrand will contact Michel F. and ask him to work with Keller.

PE09-020 1217

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
96	LAP	IB	0%	Mon 11/6/00	Mon 11/6/00	NA
67	lhart	DV 4 -- Park System DV	0%	Sun 10/15/00	Tue 10/17/00	NA

Notes

D'Line	Axle	Pawl	Spring Nmm	Drop In
4x4	3.55	chamfer	400	2.77
4x2	3.27	chamfer	400	3.41
		previous test result		3.08
Optical encoders right on the money				
Difference is in tires: 946 has 235's and 956 has 255's				
Predictions with 3.55 axle & chamfer pawl				
	ADAMS	Regression Model		
Spring Nmm	Avg Drop In	Proper Cam	Small Cam	
260	3.12			
330	2.91	2.79	2.99	
360	2.8	2.67	2.86	
The ADAMS model shows a 0.1mph difference in drop in				
depending on whicvh side of the tooth the 1.1mm is				
asses to. In this case the add is on the nose up side.				

D'Line	Axle	pawl	Spring	Rod	Drop In
4x2	3.27	chamfer	"BA"	small	3.2
					(sm tire)
Setting up 4 tests 4x4, 3.55 axle					
Possibly 1 test 4x2 3.27 axle (W946)					
Barrier test today with W956					
NOTE: W956 has been running with an unavailable tire (255)					

54	mfyie	Bench test selected prototype pawl with Max Park Disengagement Load	0%	Tue 9/26/00	Wed 9/27/00	NA
55	mfyie	Bench test	50%	Thu 9/21/00	Thu 9/28/00	NA
52	mhaddles,lmckinni	Revise ES Spec for torque dimension.	0%	Tue 10/10/00	Fri 10/13/00	NA

Notes
10/6: Revise the ES Spec to reflect the new measureable dimension for manual shaft torque.

81	MPI	Final processing of pawls at MPI	0%	Wed 9/27/00	Fri 9/29/00	NA
82	MPI	Ship pawls to BDX	0%	Sat 9/30/00	Wed 10/4/00	NA
84	MPI	Production die	0%	Thu 9/28/00	Fri 10/13/00	NA

PE09-020 1218

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
85	MPI	PSW Parts	0%	Sat 10/14/00	Tue 10/17/00	NA
86	MPI	Ship to Bordeaux	0%	Wed 10/18/00	Thu 10/19/00	NA
80	MPI Subcontractor,MPI	Machine MPI produced pawls already in stock	0%	Sat 9/23/00	Tue 9/26/00	NA
77	Sherdel	Back-up PSW	0%	Tue 9/19/00	Mon 10/2/00	NA
78	Sherdel	Parts manufacturing and delivery to Bordeaux	0%	Tue 9/19/00	Fri 10/6/00	NA
50	ssettine	Park Gear DCP	0%	Mon 10/16/00	Mon 10/16/00	NA

Notes
10/6: The DCP needs to be revised to show a hardness lower limit of 52.

29	Team	Approve DVP&R proposal	0%	Fri 9/22/00	Fri 9/22/00	NA

Notes
9/14: Draft DV circulated for comment.
9/21: Approval targeted for 9/22 at 12:30

106	Team	9/24/00 AM	0%	Sun 9/24/00	Sun 9/24/00	NA

Notes
Send 4, 5, 6deg pawls to Chem Met to confirm they meet specs on print (yxu1)
Get report from Chem Met on pawls already in lab. (yxu1, 9/25)
Identified park gears with most damage and send them to the lab (yxu1)
Observation: the system is producing some Windstar-like noises
Summarize bench test data (ptsai, 9/25)
Do visual inspections on parts from completed tests (yxu1, jbrazin)
Get Toyota park system study from Wroblewski (lmckinni)
Investigate shot peening for pawl (jbrazin)
Determine the angle from drive to nominal park for floor vs column shifter (hdover)
Determine how far into park we go (position on cam) for floor vs column shifter (hdover)
Perform ABA test between vehicles 041 and 957: swap transmissions to see if the reason for 041 success is realted to the shifter (lhart)
Run MathCAD model with proposed design (mfyie, 9/25 AM)
Install optical encoder on vehicles 946 and 041 (lhart)
Obtain digital read outs for all five vehicles (klittle2)
Checkout RCONS and PCA2 modules in all 5 vehicles (lhart)
Approve DVP&R at 12:30 meeting (slandes -- copies)

107	Team	9/24/00 PM	0%	Sun 9/24/00	Sun 9/24/00	NA

Notes

Decision Matrix	Weight	Angle Change fom 1L2P-AA	
		4 deg	5 deg
Pull Out Effort	8	0	1

PE09-020 1219

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/24/00 PM" continued

Notes

The Team met on Sunday afternoon and reviewed test data and progress. We decided to see where we stood on making a decision on pawl tooth angle modification and used the above decision matrix to evaluate our position. After constructing the matrix it was the team decision to direct MPI to use the 5deg modification design. The key assessment criteria is "spit out". Even with out the weights applied the matrix would have resulted in a tie with the decision going to 5 deg because of the spit out issue. If only spit out and hang up were considered the decision would still be to sue 5 deg because of spit out considerations.

A set of good and bad pawls will be sent to ChemMet for analysis:
6deg unused
"N" unused
old "W" unused
pass and fail parts from current tests
"E" unused
"E" from team tests

We need to determine the proper sample size for DVP&R tests at the Monday 12:30.
A program specific DVP&R will be ready by COB Monday (yxu1)
Determine RHD vehicle requirements for the DV (hdover)

108	Team	9/25/00 AM	0%	Mon 9/25/00	Mon 9/25/00	NA

Notes

All required pawls except the "E" tested part have been provided to the lab. MFYIE will find and supply the used "E" pawl.
Preliminary Chem Met test results have been communicated to MPI; test report to follow.
The ABA test between vehicles 041 and 957 has been partially completed: both vehicles experienced hang up at the 75th cycle. We will not do the last "A" portion of the test as the parts are too worn to provide reasonable results, and other test requirements will take precedence.
Some discussion on DV sample sizes has been held. The bump test will be a size of one; bench tests will be a size of three.

109	Team	9/25/00 PM	0%	Mon 9/25/00	Mon 9/25/00	NA

Notes

The bump test will be held on Wednesday using vehicle 956 (4x2 with a 3.27 axle -- worst case vehicle for this test). YXU1 to supply a transmission to kbrisoce today for the test.
NOTE: lhart and slandes discussed which return spring to build in this transmission;, we have A, B, & C springs at this point with A being current, B close to production intent, but no actual production intent spring on hand. As the "A" spring would present the greatest risk of test failure we will use that spring -- a "Pass" under these worst case conditions should support system sign off.
The tested "E" pawl is being pulled for the lab.
RHD vehicle 041 will be retunred to hdover for a few days for a management review.
Modeling to support the 5deg pawl decision should be ready by the Tuesday meeting (mfyie)
Bench test data needs to be summarized (yxu1 & ptsai)

Analytical Data Collection

- Run models at tolerance limits using test data from bench and vehicle tests (coefficients, loads, etc.) mfyie, cperng
- Run bench tests on 5 deg pawls from the large batch (3 samples) yxu1
- Perform drop in tests with 5 deg pawl prototype level parts kbriscoe/lhart
- Perform the barrier test (Wednesday, kbriscoe)
- Determine what testing we can perform with existing pawls and which ones require new big batch parts.

Note: final dimensions have been given to Sherdel for the return spring.

Release the pawl and return spring, advnace the transmission assembly number. yxu1/cdavis42
Transmit the design for the new pawl with circular tooth thickness increas to cperng for ADAMS study and MPI for prototype parts. yxu1
Investigate process modifications for MPI as post-Job1 actions. jbrazin

110	Team	9/26/00 PM	0%	Tue 9/26/00	Tue 9/26/00	NA

Notes

Vehicle Prep Issues:

- Change tire inflation from 26 to 30 psi to match new Company direction.
- Prep vehicles with the 5deg pawls we have in hand.
- Optical encoders are being installed on two vehicles.

PE09-020 1220

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/26/00 PM" continued

Notes

- We have found ways to read vehicle speeds from the encoders (RCON direct or signal conditioning boxes; digital read outs when available).
- ABA testing on 041 and 957 will be completed. The team agreed to swap transmissions with no change in parts. If this produces useable results and additional work is indicated then we will consider a proper ABA, swapping transmissions with new or "stoned" parts.

F/U from 9/25:

- Bump test is to be performed on Wednesday; on track
- The tested "E" pawl has been taken to the lab
- HDOVER is temporarily updating the RHD vehicle for a management review.
- Modeling of teh 5deg pawl is inprocess; to be complete on 9/27.
- Initial drop in speed tests were run; values slightly higher than predicted; results are to be compared with model values (cperng)
- 4deg: 3.0 to 3.2 mph
- 5deg: 3.6 mph
- Sherdel has committed to PSW parts at BDX on 4 Oct 00.
- MPI will work with Jim Brazin to develop a work plan for investigating process improvements recommended by our lab. The MPI rep was here to spend time with our lab team.
- Confirmed that the return spring to be used for initial DV testing is the "A" spring; OK for bump test.
- A stack up request for circular tooth thickness has been submitted to CAD (#2081). F/U to make sure they're working on it (yxu1).

New:

- Finalize the DVP with vehicle requirements (lhart, dadamcz1, jbrazin, dhildebr).
- Send a tested "N" pawl to the lab (yxu1).
- Note that modeling includes max/min mu and correlated to torque loads from test vehicles (yes, per mfyie)
- Bench tests:
- one run at 5deg pawl, complete
- two samples to go
- run a failed (hang up) transmission on the bench to measure mu underthose circumstance (yxu1).
- We have 5 pawls in hand, more are expected from MPI's big batch on Friday.
- We have 15 transmissions in hand with 24 more coming from BDX.
- Keller will work on a plan to investigate and improve their manufacturing tolerance.
- We need to do a layout of a damaged pawl and give those dimensions to Cognition for study in our full system stack up model (yxu1, hdover).

111	Team	9/27/00 PM	0%	Wed 9/27/00	Wed 9/27/00	NA

Notes

Park System and some Transmission System team members met with Mr. Yuhasz. No regular team meeting was held. Briefly, unless the team can answer the issue raised by mfyie's model which shows the system not holding park on grade at minimum mu and maximum park rod cam angle we are not ready for production. The following assignments came from the meeting:

- Calculate the max cam angle sufficient for no spit out (mfyie)
- Obtain park rods in 0.1deg increments over the tolerance range; all phosphate coated; surface characteristics identified (yxu1)
- Benchmark E/N/AX with MathCAD model and similar mu values (mfyie)
- Find the transmission system with base pawl or 3deg pawl that skipped; measure cam angle/surface; confirm it still skips; rerun with 5deg pawl (lhart dadamcz1)
- Find ways to limit cariation in mu (dhildebr)
- Conduct one day peer review (vlajines)
- Add G. MacDonald to peer review team (pyuhasz)
- ZF help with review? (pyuhasz)

112	Team	9/28/00 PM	0%	Thu 9/28/00	Thu 9/28/00	NA

PE09-020 1221

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
113	Team	9/29/00 PM	0%	Fri 9/29/00	Fri 9/29/00	NA

Notes

Tasks:

- Find highest and lowest cam angles, run bench and vehicle tests.
- Calculate points for above data.
- Run 5.0deg prod intent pawl with increasing load until spit out experienced.
- Run highest cam angle for 4.5deg to 4.7deg batch on "W" -- no pull out?
- Grind 4.7, 4.8, 4.9 cams; test "W"
- If max cam angles found do not exceed 5.2deg to 5.3 deg; modify to 5.5deg.

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
114	Team	9/30/00 PM	0%	Sat 9/30/00	Sat 9/30/00	NA

Notes

Data Analysis Update:

Cam Angle:

- Measurement system: it is repeatable, but part presentation may be an issue (measuring from an uncontrolled surface). Determine if there is an issue with presentation; determine how to communicate measurement method.
- investigate clamp process (clamp & rotate parts)
- investigate shadow graph
- tear down parts and measure off machined ID

Pull out data

With 4x2's and 4x4's, production cam:

- nose up v down shows very little difference
- 3.27 has higher efforts than 3.73
- Why is 4deg pawl showing higher efforts in 3.27 and 5deg pawl higher efforts in 3.73?
- 5deg pawl has less variability in pull out loads
- Both PTSAI and RKRINSHN2 analyses reach these conclusions.

Mu-sub"e" calculations

- 500# applied load shows lower Mu-e than 300# or 700#.
- 500# has less variation in both nose up and down directions than other loads.

Direction Summary

Primary:

Multiple runs of the MathCAD model for AX, N, and W configurations have been plotted on one chart. The conclusion is that "W" is good with park cams between 4.8deg and 5.0deg.

- Refine the model
- Confirm current model conclusions with testing using sorted and oriented rods and ATNPC-machined rods.
- Determine how to control cam angle to tight tolerance around a nominal of 4.9deg; define measurement method, determine capability.
- Add 5R55E to the master comparison chart.
- Document differences in Mu-e measurements between AX and N/W (mfyie)

Secondary:

- Find ways to control mu-e on either pawl or bullet. (jbrazin)

Work to be done:

Hardware:

Bench (khogberg)

- new rods with phos coating at 300# load only; 30ccw/30cw; indexing park gear teeth
- same rod; remove phos & polish (jbrazin); rerun test
- Full test w/ strain gaged rod; peak torque @ maual shaft to peak force @ rod.

PE09-020 1222

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"9/30/00 PM" continued

Notes

- DVP&R testing: rods with new pawls.

Lab (khogberg)

- Machine rod cams from 4.8 to 5.5 deg; two each in 0.1deg increments; polish and inspect; run in vehicles.
- Inspect rods (kamed)

Vehicles (lhart)

- New pawls (heat treat looks good; much harder)
- DV using inspected/oriented rods to give high & low angles

Other test results: 3.27 4x2 new pawl 5.6deg cam: can we get enough weight to skip?

- @Max GVW: hang up once in high numbered cycle (80's)
- @Max GVW +1000# added in 200# increments: no skips; 3 hang ups

Analytical

- Max GVW+1000# test results into MathCAD, evaluate over Mu-e range of 0.85 to 0.117; what do curves look like? (mfyie)
- Shifter efforts correlated to rod forces (mfyie)
- Shifter efforts correlated to cam forces (rkrishn2)
- Review analytical reports; assure consistency in analysis/presentation (rkrishn2)

115	Team	10/1/00 PM	0%	Sun 10/1/00	Sun 10/1/00	NA

Notes

Assignments:

Find test rod #8; run in vehicle (pull out, nose up) adding weight until spit out occurs.
Find phosphate coater to treat test cams (dadamcz1)
Run parts from Fri/Sat which were loaded to >GVW on bench (lhart/khogberg)
Run 5deg pawls with prod rods as part of DV (9 sets min) (khogberg)
Get phos coating production controls help for Keller (gmacdona)
Get BDX park gears with hardness at 58-60 and 60-62; understnad potential process improvement (dhildebr)
Analyze weekend test data (rkrishn2)
Continue DV of 5deg cams (was this supposed to be pawls?) (lhart)
Review with Barb/Phil - All - time TBD, but late PM is expected (Team)

116	Team	10/2/00 PM	0%	Mon 10/2/00	Mon 10/2/00	NA

Notes

Design Position

- Park Pawl: 5deg MPI machined pawl with good heat treat and hardness of 61 to 62.
- Park Rod: Keller cold formed rod ground to 9.5deg to 10deg full included angle cam, polished, phosphate coated, with a 40N ratchet spring.
- Return Spring: 270 Nmm
- Park Gear: no change; Bordeaux has committed to a minimum hardness of 52 vs. 50.

PE09-020 1223

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
117	Team	10/8/00 PM	0%	Sun 10/8/00	Sun 10/8/00	NA

Notes

Testing Summary (primarily drop in speed)			Fwd		Rev		
Pawl	Cam	Spring (Nmm)	Low	High	Low	High	Comments
5deg, radisued, hard	4.8deg	268	2.49	3.48	3.09	3.3	compound angle on n.u. side
5deg, hard	4.8deg w/ Brazin mod	300	3.3	3.7	3.3	3.7	
5deg, hard	4.8deg	300	in process				
5deg, hard, 1.5mm trim on n.u. side	4.8deg w/ Brazin mod	268					Broke pawl on 2nd drop in; high pull out efforts
Grand Slam Transmission:							
5deg, radiused	4.8deg w/ Brazin mod	300	probable configuration				
Four "E" transmissions have been tested, no instrumentation, all feel good, being torn down.							

- A drawing of the revised park pawl showing a radius instead of chamfer has been completed and is being given to Will Webber today.
- The Cognition model is to be updated Monday with revised pawl and cam dimensions to confirm minimum park is still within specification. (MFYIE)
- The park stack up is still in process, but is not holding up work.
- Contact Keller to determine if the new die will eliminate the need to do the Brazin-designed second face grinding (DHILDEBR, YXU1)

118	Team	10/10/00	0%	Tue 10/10/00	Tue 10/10/00	NA

Notes

Critical Issues:

Transmissions:

- 96 are being built today at BDX
- 14 are being shipped now and are to arrive on 16 Oct (ssulliva/lhart)
- Scrape the barrel here (jabdilla)

Extensions Housings: BDX shipped 60 today (ssulliva)
Covers: 20 in stock; 50 on order from BDX
Return Springs: 270Nmm springs arrived (100)

Pawls:

- Plenty of 5deg available
- ATNPC is radiusing some for testing
- MPI has completed the new blanks; machine shop is lined up; tool is ready.

Rods: testing to see if we run with smallest diameter transmission rods; confirm drop in speeds.

The team spent over an hour discussing force balance criteria and margin criteria.

Spring Balance Must:

- Result in drop in speeds between 1.5 and 3.5 mph.
- Never compress the actuator spring (ratchet spring) when engaging the system in non-abutted condition.
- Use lightest pre-load.
- Use lowest rate to reduce variability.

For the 400Nmm spring:

Installed Torque Nmm	Rotated	@ + 10%	Required Ratchet to Balance	Ratchet less 10%	Safety Factor
400	414	455	28N	36N	8N

Test Proposal

PE09-020 1224

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"10/10/00" continued

Notes

Priority	Pawl	Rod	Spring	Objective
	5deg, radiused	Smallest transitional cam diameter	270Nmm	confirm drop in is between 1.5 & 3.5 mph; pullouts <30#
	Check to see if cases yielded on 300 and 400 Nmm tests			
	if 300 yielded don't do 2			
	if 400 yielded ?			
1	Set up DOE; check lhart records for tests that match, define added tests (rkrishn2)			
2	Obtain force balance summary of other transmissions (mfyie)			

119	Team	10/11/00	0%	Wed 10/11/00	Wed 10/11/00	NA

Notes

Cognition model needs updating.
The team needs to know axial engagement of pawl and cam, and OML position for these input points: tick, abutment, half engagement, park overtravel. We are not interested in pawl bottomed in gear as this is not feasible given the linkage arrangement.

Spring Balance:
Using "E" conditions (455Nmm return spring and 50N ratchet spring) and maintianing the same safety factor yields a 330Nmm spring with the "W"'s 40N ratchet spring. In the physical buck no bullet movement was detected with 414 and 450 Nmm return springs, so a 330 should not cause bullet movement on engagement.

Rerun the physical buck test with a 330Nmm spring, and also a 330Nmm with a chamfered pawl (jbrazin/dhildebr).
Run force balance @ 330Nmm & radiused pawl (cperng).

Direction has been given to Sherdel to build the 330Nmm spring (268 & 414 springs are already in inventory).

Keller will make rods for production the way they did for 6 Oct. The Start diameter for the ratchet ramp is very important. Keller is making rods that maintain the proper transition diameter.

Direction for Job1:
Parts to BDX 16 Oct
Parts to ATNPC 17 Oct
Part number has been changed; Keller is working on a unique ID system.

Inspection has been lined up to examine the pawl shaft hole on cases from the 300Nmm and 400Nmm tests.
Inspection will accept any case we send them per gmacdona.

FEA analysis indicates that increased hole depth results in reduced plastic deformation and reduced pin defelction.
Need a safety factor on pawl & shaft: compare to yield strength on pawl & shaft, do for case, too. (mramnath).

MPI has the revised drawing for the radiused pawl; 2000 blanks have been made, 200 sent to machining, should arrive at ATNPC on Saturday.
Cabadas' team has directed Stokes on heat treat sample.
Use of the radiused pawl is subject to confirmation from the Cognition model.
We need an engineer to accompany STA to MPI (lmckinni/lgreene).

NOTE: Drafting is out of business this weekend, so they need changes before Friday.
Releases:
Rod is in CAD; part # rev
Spring: need from yxu1 (needs supplier drawing & quote package)
Pawl: complete; to cdavis42 (yxu1)

Test runs:
pawl: radiused; ATNPC mfr
springs: 300 and 414
rods: Keller processed as received; as modified to recover transition diameter
rkrishn2 to work with lhart to determine what physical tests are required to complete the DOE.

120	Team	10/12/00	0%	Thu 10/12/00	Thu 10/12/00	NA

Notes

Force Balance:

PE09-020 1225

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"10/12/00" continued

Notes

A4LD was 670Nmm & 30mm lever v 58N ratchet spring
Conclusion: the "W" set up with a 330Nmm srping does not demonstrate a safety factor issue. The set up has a safety factor comparable to "E", better than 4R70W; not quite as large a margin as AX or 4R100.

Keller machined 350 rods on 11 Oct; now at the phosphater; measuring all the rods will take about 2 days; 50 rods should be available by COB Friday.
Check on travel plans to see who is coming back from BDX this weekend (slandes).
Need PO for Keller (jbardall)

Cognition model update still needs work; results due Friday.

NOTE: If we redesign the pawl it should be flipped over to put the die break on teh guide cup side (like "E"). (yxu1)

FEA is working on 4x2 iterations. We need to do iteration "E" to complete the matrix.
Dynamic overload used is 1260 per klittle test data using the 3deg pawl.

MPI: chatter on pawl where they are milling the radius; please add acceptance of this to the Alert. 330 pieces going to the heat treater today; targeting noon Saturday at ATNPC.

NOTE: rods and springs are being handled by ssulliva

NOTE: design consideration -- use thick wall tube instead of solid park pawl shaft; redistribute load to case.

Bench Tests: Matt DeFore is working on N & E ultimate strength tests; f/u with friction tests with radiused pawls.

Vehicle tests

D'line	Spring Nmm	Pawl	Rod	Pullouts	Drop In
4x4	300	radiused	as-shipped	pass	lower
4x2	300	radiused	as-shipped	pass	1>3.5, avg<3.5
4x4	400	radiused	as-shipped	pass	lowest:2.43 - 2.86
Note: pawl radius is not exact match to the MPI pawls we are getting					
Ref: "E" drop ins are running 2.0 to 2.4 mph					

Weekend Plan
Complete bench tests
DV Test: proper rods and pawls; use 300Nmm springs until 330Nmm springs arrive.
Run MPI pawls with representative parts to confirm results.
No crew for Saturday
Sunday: 2 mechanics; one shift.

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
121	Team	10/13/00	0%	Fri 10/13/00	Fri 10/13/00	NA

Notes

Force Balance:
Looking @ difference between radiused pawl designs (2.5mm difference). Team wants to run min & max design limits to see what model predicts for drop in speed (cpemg for Monday)

Test Data Assessment: What affects drop in speed? (rkrishn2)
#1 return spring
#2 final drive ratio
#3 radius of cam @ transition
Rsquared is 90%; within +/- 0.2mph
Radiused pawl is not a factor in drop in speed.
Predicted drop in speed:
FDR 3.73 & 3.55; 300-360Nmm spring; current cam dia => 3sigma limit <3.0mph
FDR 3.27; 3sigma => 3.5mph

Experience shows we don't break transmissions is drop in is <3.2mph
Launch with 3.75 & 3.55 axles; hold 3.27 until case modifications can be incorporated (based on this analysis)
Test data supports ADAMS predictions
Projecting for 3.73; not in actual data set, therefore less confidence than for 3.27 & 3.55.

Cognition Output:

PE09-020 1226

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"10/13/00" continued

Notes

	New Pawl		Old Pawl		
condition	Nominal	Range	Nominal	Range	Nominal Difference
abutted	-3.17	0.26	-3.4	0.46	0.23
min tick	-2.87	0.27	-2.93	0.45	0.06
park overtravel	8.04	0.85	8.04	0.89	0
Ranges are assymetric about the nominal value.					

Bench Tests: (tsalciccioli)
N&E ultimate strength this weekend
Friction tests: use Job1 intent parts next week; set up this weekend.

Parts Delivery:
MPI this afternoon
spring & rod Saturday 7PM
xhsngs received.
Transmissions on hand enough for the weekend
Running 6 combineds this weekend; drivers OK; use slow test procedure; reduced data to rkrishn2.
Use new cases & reused internals for bench
Negotiating for transmissions from LAP (rdeinzer); required for Monday.
Garage: personnel lined up Saturday PM, Sunday days.
Vehicle condition: ingeneral; tired.
Get inspection support for Sunday to do cases for plastic deformation; noon to 8pm; mfyie to arrange.

MPI:
Shipping method: BA notice in today; use BA with Alert
Add words to Alert: .25 to .50 radius spec on tip of pawl tooth; measured .64; cutter removed "non functional" material (stress riser?).
Can't ship as interim PSW because MPI can't support BDX ramp up volume; working on a plan; can ATNPC machine shop help support?
Flying parts to BDX on Sunday.

122	Team	10/15/00	0%	Sun 10/15/00	Sun 10/15/00	NA

Notes

Test Results:
Broken cases/pawl/shaft last night using 330Nmm slightly modified spring.
Test run with 3.55 4x4 OK
Test with 3.27 indicates more work is required.
Our model predicts drop in speeds as long as the pawl remains on the ratchet ramp. Prediction to T6=> avg 3.08, max<3.5.

Two scenarios presented:
Scenario 1: use current hardware (radiused pawl, keller rod, 330Nmm spring), but do not approve 3.27 applications.
Scenario 2: use radiused pawl, Keller rod, and 400Nmm spring; approve all applications.

Concern with scenario 2: what "safety" factor is required in force balance?
Calculations say 400Nmm spring is not as robust a factor as "E", but is better than 4R70W.
Bench tests don't show any ratchet spring compression @ 400 or 450 Nmm.

T6 results: Avg = 3.08, Max = 3.59, 3.37

Scenario 3 proposed: chamfered pawl, Keller rod, 400Nmm spring, approve for all applications. Analysis shows the radius doesn't help with drop in speed; the chamfered pawl has no production volume limitation.

Non-binding voting indicates a preference for Scenario 3 for a variety of reasons.

NOTE: both pawls show evidence of riding up on the engagement ramp; we want to get the transition diameter back to print.
The Pawl Stack Up is key (both Cognition and VSA) tkohls to f/u with CAD on VSA.

NOTE: the 2.5mm difference in position of the pawl radius between ATNPC machined and MPI manufactured appears to be important. An additional reason for pursuing Scenario 3.

123	Team	10/16/00	0%	Mon 10/16/00	Mon 10/16/00	NA

Notes

Test results in DV - 4 task notes.

PE09-020 1227

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish

"10/16/00" continued

Notes

Guide cup location:
showing 7 or 8 mm max dimension
if this is used for stack up it will giver very misleading results: Cognition results showing variation
get both xhsng and cover plate designs the same (yxu1, hvirdee)
confirm gasket compression used by Cognition (hdover)
NOTE: Need stack up from CAD, then ALERT for parts needing change, Finally change dwgs and release.

Test Plan Priorities:
first: 3.27 with chosen parts
re-using rods [critical part today]
pawls/springs OK
Transmission from LAP not here -- tracing
Transmission from BDX -- here, but some assigned to other uses
Six samples required.

Second, 3.55 4x4 (Six Samples)

Then, bump test, bench tests, remainder of DV, 3.73 axle/RHD

NOTE: send tested cases to inspection to check pawl shaft hole.

Return Spring: (jhaggerty to assure resolution tomorrow)
- What is "BA" spring used in? What force is it really? 360Nmm installed? 414 engaged?
- What is in production for "E"? "AA" at 410-510Nmm? 460 installed?

Meeting with CAD & VSA
lgreene to set up
yxu1
jbrazin
dbayer
ed?
Develop comprehensive spec: stack not started.

NOTE: per jbrazin the guide cup depth stach should be 7 to 6.5 mm

Our Notice has yellow "BA" return spring.

124	Team	10/17/00	0%	Wed 10/18/00	Wed 10/18/00	NA

Notes

Test results in DV - 4 notes

Hardware Issues:
Keller shipped 38 rods to us ion 16 Oct.
MPI is making more pawls, but they are investigating a corner fracture; BDX is requesting that all pawls be "haperized" as was done for the radiused pawls.
MPI is finishing the fine blanking tool, and finishing parts already made.
The STA visit to MPI must be rescheduled for Friday this week inadvance of BDX Job1. Fred Mitshke and a Park System Engineer to make a joint visit.
Transmissions:
LAP shipment has arrived
First BDX shipment has arrived; waiting for 96 transmissions.
HDOVER needs two transmissions (4.6L either flavor will work) for validation testing at Dura. Must have proper pawl/spring/rod; test is run in abutted condition.
Spring: there are 500 Sherdel Yellow "BA" springsd in Crib#4. YXU! will contact ssulliva to have springs moved to engineering crib.
BDX is getting 2000 springs tomorrow.
Cover/Xhsng: make sure last night's xhsngs are inspected, paying special attention to guide cup height.

Cognition
guide cup: use 7 to 6.5mm
model is 99% complete
engagement ramp: use included angle of 9.5 to 10 deg (4.75 to 5 deg half angle)
Note Keller should consider increasing barrel diameter to 16 to 15.8, but we must have a good stack first!
Need park system layout (VSA)

What is required for the park system stack?

PE09-020 1228

ID	Resource Names	Name	% Complete	Early Start	Early Finish	Actual Finish
"10/17/00" continued						
		Notes • Request layout of park system from manual shaft to output shaft. • VAS done in parallel. • If no issues then sign off & done. • Correlate with Cognitiuon FEA: • Iteration "E" seems best for both 4x2 & 4x4. • Study done at 700 and 1400 lbs-ft. At 1400 the whole pawl shaft boss is plastic (we've seen dynamic loads to 1200 or 1300 lbs-ft) • Make one run with a larger diameter pin: • Use iteration "E" assumptions; adjust pin stiffness to simulate larger diameter pin, then revise model to run with a pin of 10.48mm diameter. DV Test Plan The LHD DV will be complete on 21 Oct The RHD DV needs to be developed (lhart et al) We need to pursue doing the "ship in park" test when trucks are sent here from LAP for park system testing (dhildebr). OGC: schedule a review on Thursday late or Friday (DHH if available, mfyie, jbrazin, judy/tracy). Peer Review: makr up and close out issues.				
49	tkohls,ecabadas	Park Gear Heat Treat Process	0%	Mon 10/16/00	Mon 10/16/00	NA
		Notes 10/6: We need to determine if the heat treat process is operating correctly.				
48	yxu1	MPI DCP	0%	Mon 10/16/00	Mon 10/16/00	NA
		Notes 10/6: YXU1 has the MPI DCP, and it includes pawl grinding. We need: • CpK on machining • Handling process controls (nicks have been noted) • Process to reduce burrs on parts (BDX explanation required, but they sorted 70 parts to get 40).				
56	yxu1	Combined Ratchet/Pullout	0%	Sat 9/23/00	Tue 9/26/00	NA
104	yxu1,klittle2	Measure peak dynamic torque and compare to 5R55N.	0%	Thu 9/21/00	Fri 9/29/00	NA
		Notes 9/18: Develop a list of requirements for doing instrument axle testing on a 4X4.				

PE09-020 1229

Ford Motor Company

To: M. Defore, R. Pline, T. Spaulding
Cc: L. Greene, L. Retallack, P Troy, C. Renneker
Subject: Dynamic Modeling of Integrated 5R55W/S Park-Shifter System
From: Xiaoyong Lu
Date: Jan 07, 2004

Project #: CAE-3-2003-6973

Dynamics and Control CAE Section

Dynamic Modeling of Integrated 5R55W/S Park-Shifter System

Xiaoyong Lu

Executive Summary

Background

- Shifter and park system are critical to vehicle safety, shift feel and customer satisfaction.
- Shift feel is a total system response that reflects on the shift knob, closest to customers. It has a clear need to address the total system response, as opposed to some specific component in the system.
- Previous analyses focused on the park mechanism only. No complete integrated shifter and park system CAE dynamic model for 5R55W/S transmission has been developed to support design and engineering.

Objective

- Develop an integrated park-shifter system dynamic model for 5R55W/S transmission;
- Understand park system dynamic behaviors under various operational conditions; correlate analysis results with available test data.
- Provide design engineer physical insights for quality improvement;
- Recommend directions for problem resolution as applicable.

Results & Conclusions

Results from the analysis are summarized as follows:

- An integrated park and shifter system dynamic model has been developed.

PE09-020 1230

- The resulting model has been used to study various park behaviors, including forward and reverse ratcheting, drop-in speeds, 30% grade nose-up and nose-down abutted engagement and corresponding contact forces on pawl face and pawl shaft.
- Results are compared against available test data on drop-in speed. The results correlate well with test data.

Technical Approach

Model Information

The 3-D dynamic model is developed using the ADAMS software, shown in Figure 1. All the parts are obtained from I-DEAS solid model, including mass and inertia for each component. The parts located in the transmission case are shown in Figure 1. However, the connecting cable from the shifter to the park mechanism does not reflect the actual length; rather, they have been moved from the original position to accommodate the rigid cable assumption (model assumption), while still maintaining the original shift effect.

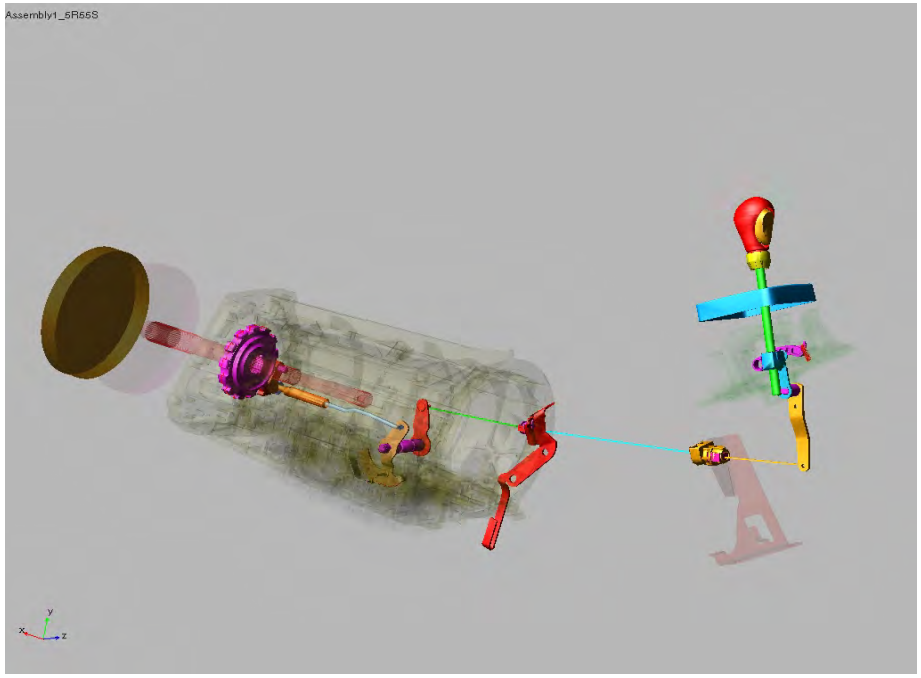


Figure 1. 3-D Adams Model of the 5R55W/S Park-Shifter System

Figure 2 displays all the parts involved in the system; vehicle and tire are modeled as virtual parts with equivalent inertias.

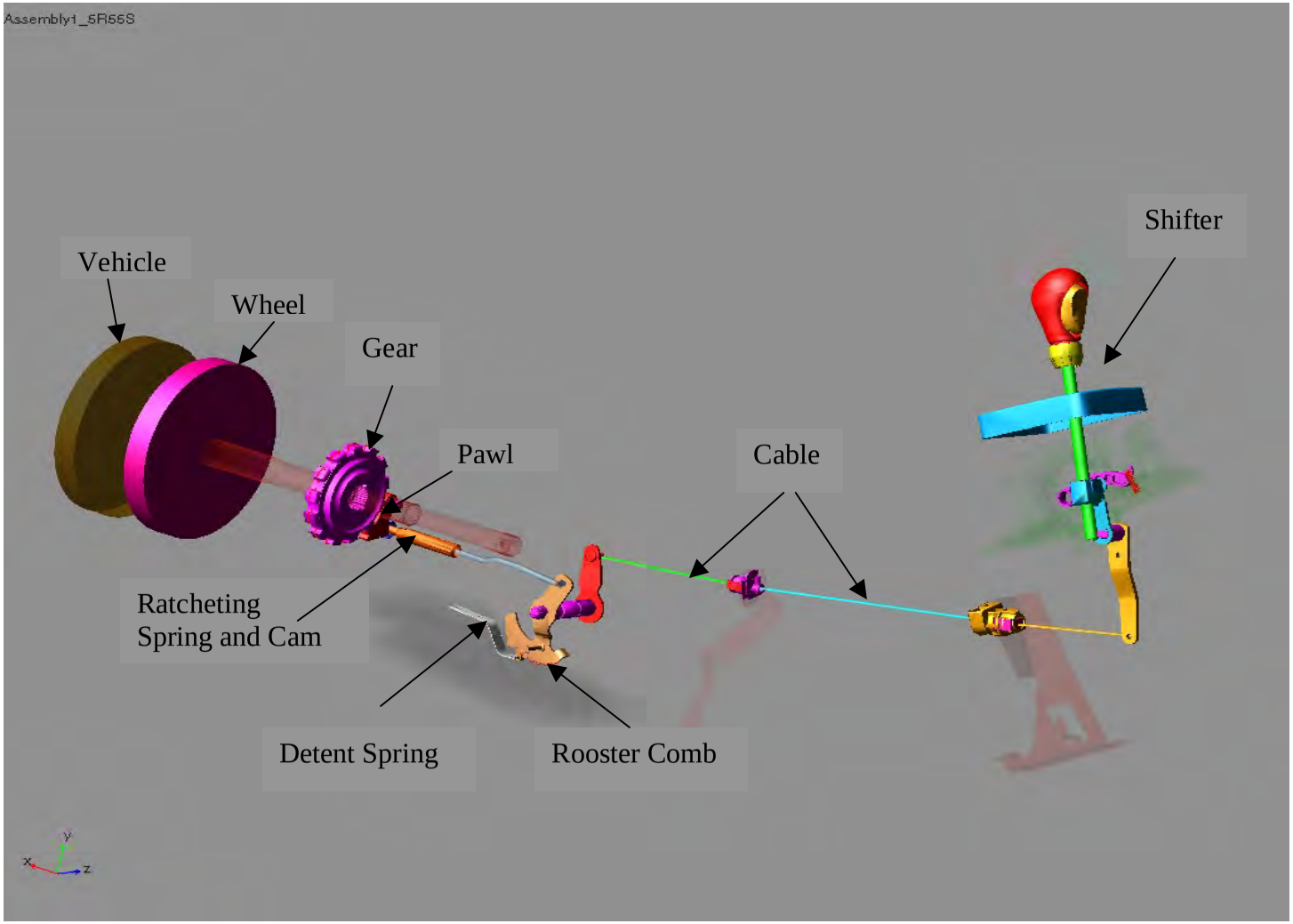


Figure 2. 5R55W/S Park-Shifter Parts and Assembly

Model Assumptions

All parts are assumed rigid, though the contacts are modeled as flexible with stiffness and damping characteristics. The flexible detent spring is customarily modeled as a rigid piece with equivalent torsional spring rate and preload. The shifter spring is a linear spring with preload. The vehicle and tire inertias have been converted to an equivalent rotational inertia. Dynamic and static friction coefficients are chosen to be 0.09 and 0.05 respectively. 2-D and 3-D contact forces are created using the built-in and user defined subroutines. In ADAMS, the contacts are modeled as unilateral constraints and the contact normal forces are computed as a non-linear spring damping force.

Results

The dynamic model has been tested under various operational conditions and compared with available test data (forward and reverse drop-in speeds). Ratchetings, abutted engagement at 30% grade and contact forces under these conditions are simulated using the model. The results are described in the following sections.

Ratcheting and Drop-in Speeds

Forward and Reverse Ratcheting

Both forward and reverse ratchetings are conducted with the model. The shifter's initial position is set at the neutral position 'N' and then commanded to park. Figure 3 displays the results for the forward ratcheting. The upper graph shows the gear speed and the vehicle speed history during the ratcheting, while the lower graph displays the park pawl position upon dropping in. It is seen that before the final drop-in, the sequence of gear speeds momentarily reduces when the pawl drops and hits the side face of a gear tooth, then its speed picks up again after the gear spits the pawl out; meanwhile, the vehicle speed decreases continuously. The simulated forward (Figure 3) and reverse (Figure 4) drop-in speeds are about 2.36MPH and 2.24MPH, respectively. The model results are plotted against the test data, shown in Figures 5 and 6. Note that the test data scatter over a range of 1.0MPH (raw data listed in Appendix 1). The model predictions lie very close to the mean values of the test data.

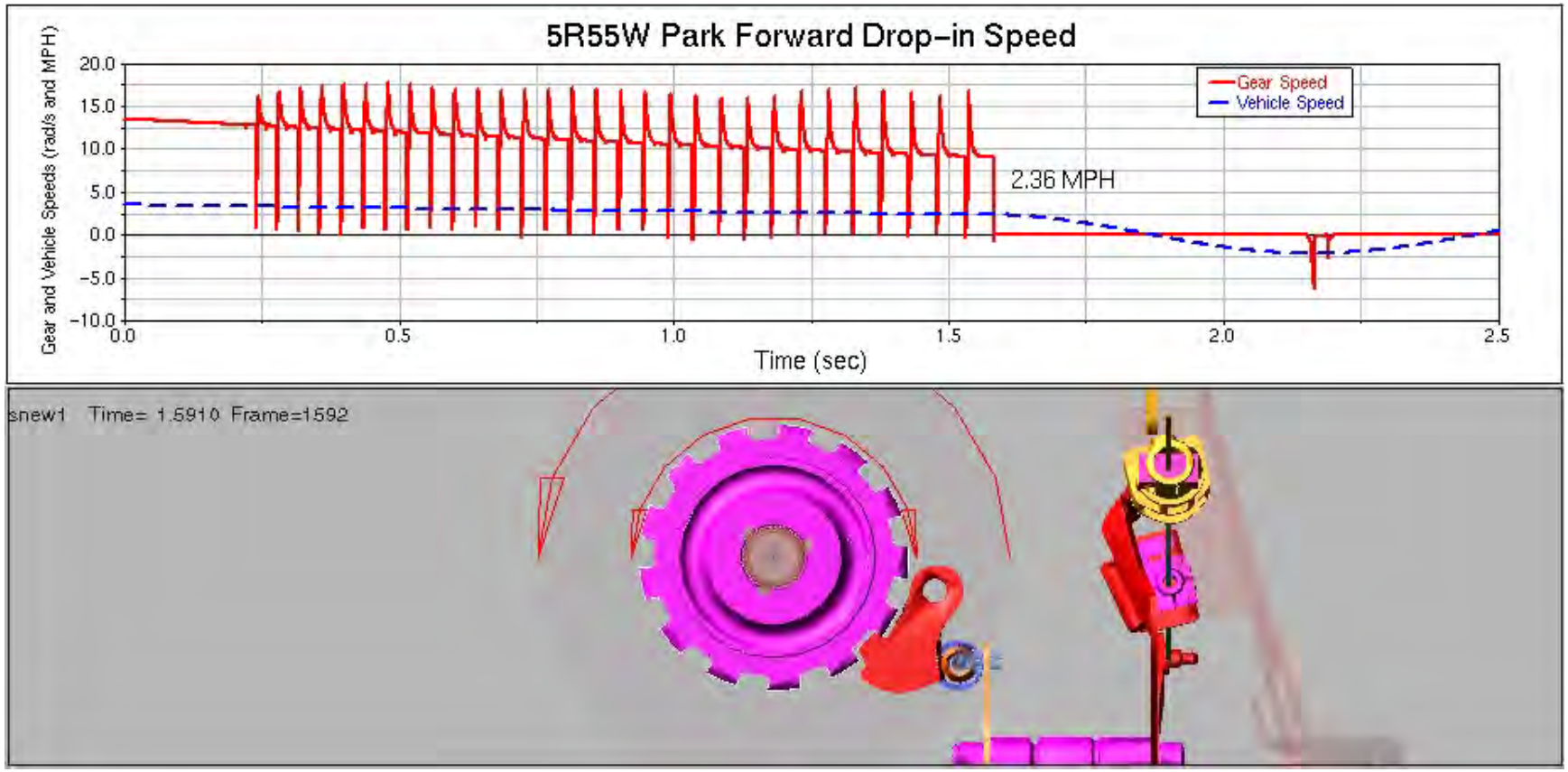


Figure 3. Park Mechanism Forward Ratcheting and Drop-in Speed

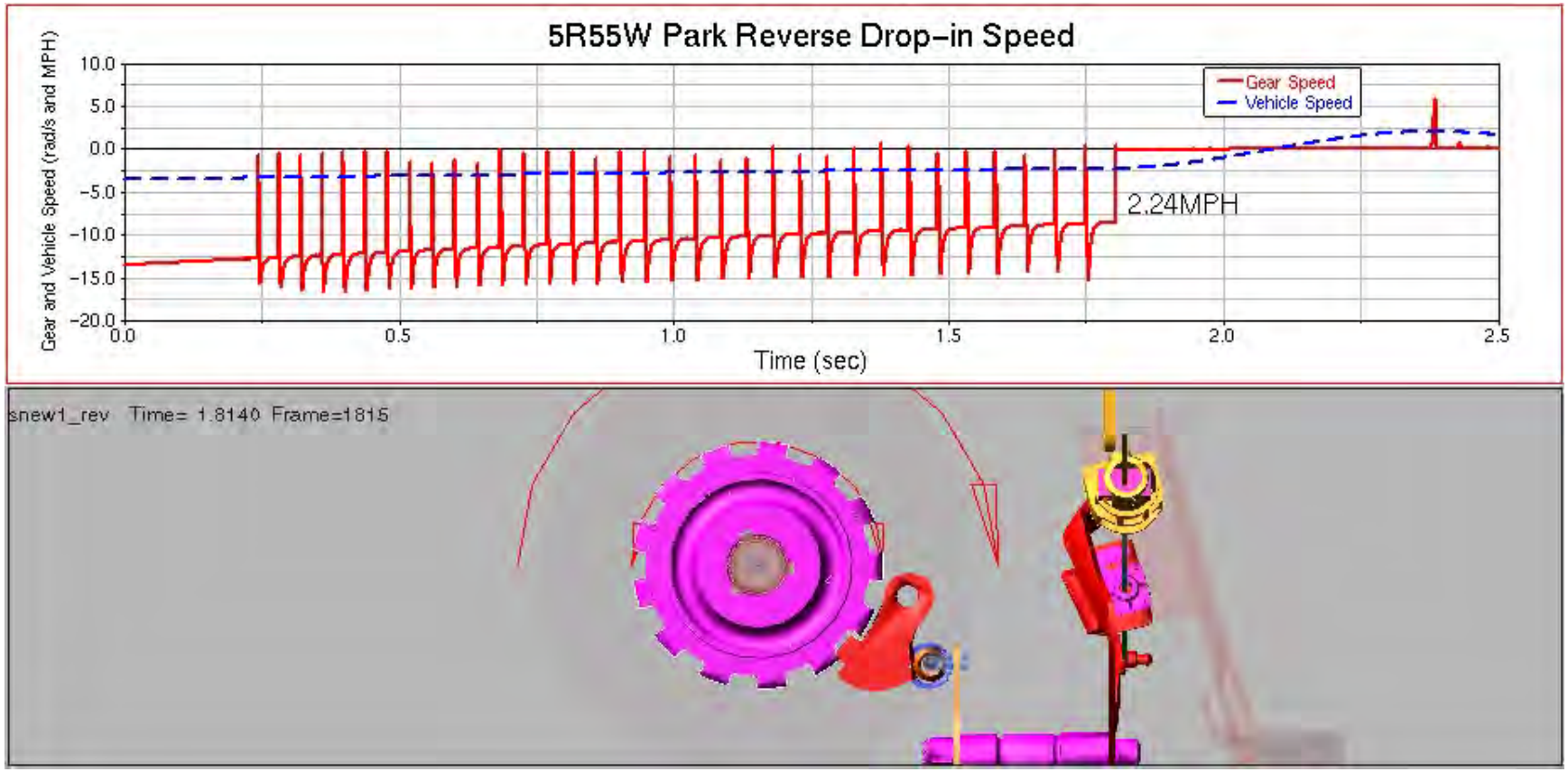


Figure 4. Park Mechanism Reverse Ratcheting and Drop-in Speed

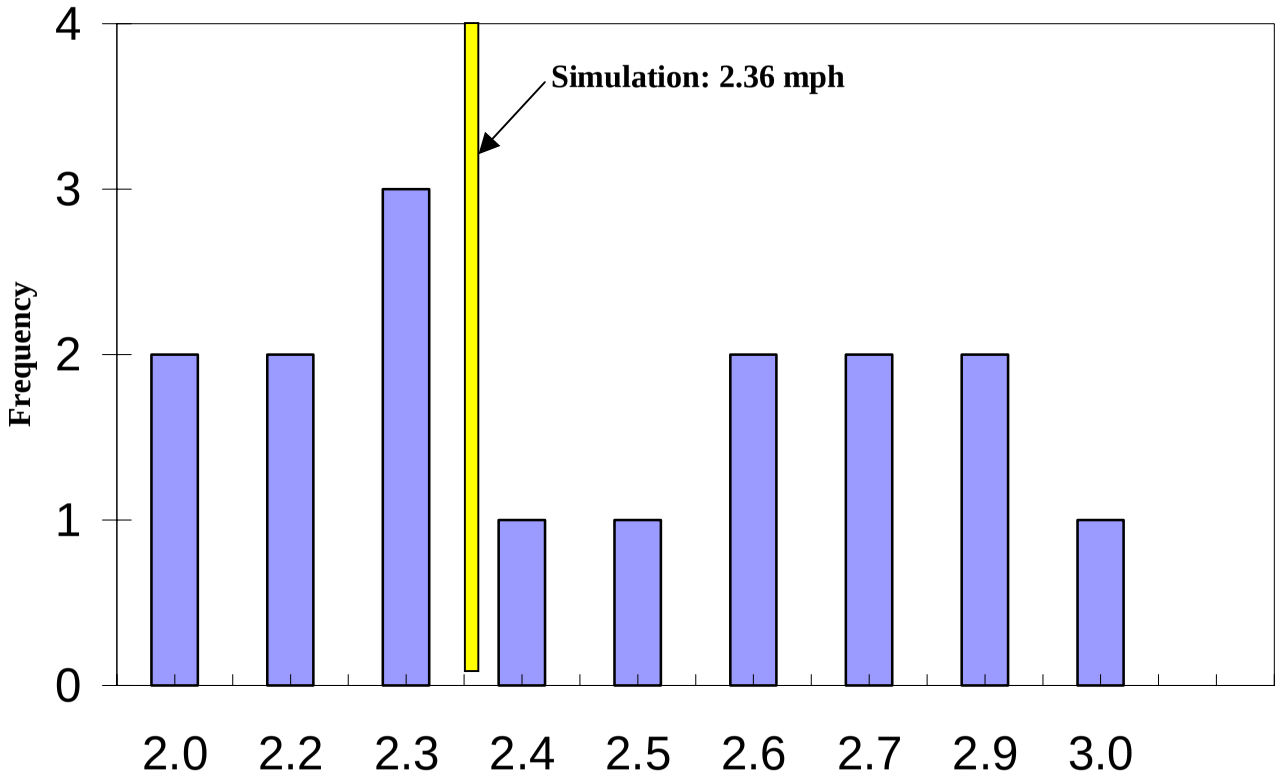


Figure 5. Forward Drop-in Test Data (mph)

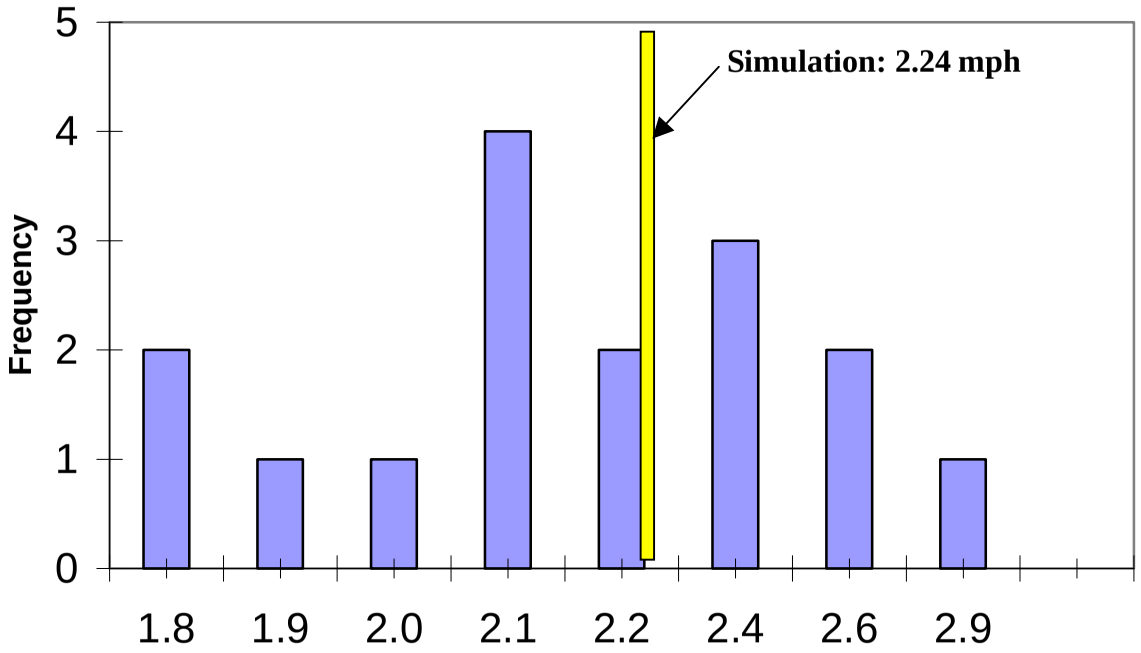


Figure 6. Reverse Drop-in Test Data (mph)

Impact / Contact Force between Parts

Impact between components during ratcheting is a major concern. Parts wear or even damage may occur because of high impact and/or contact forces. Some static analyses have been done, but detailed dynamic analysis is essential to capture a more complete picture of the system and shed light on the physics for design improvement. In addition, it is also very important to quantify the impact and/or contact force to be used as the input loading for the downstream FEA and fatigue analysis. Figures 7-10 show the impact / contact forces between components during ratchetings. In all cases, the maximum contact forces occur upon the pawl drop-in, when the park system has to absorb the vehicle kinetic energy.

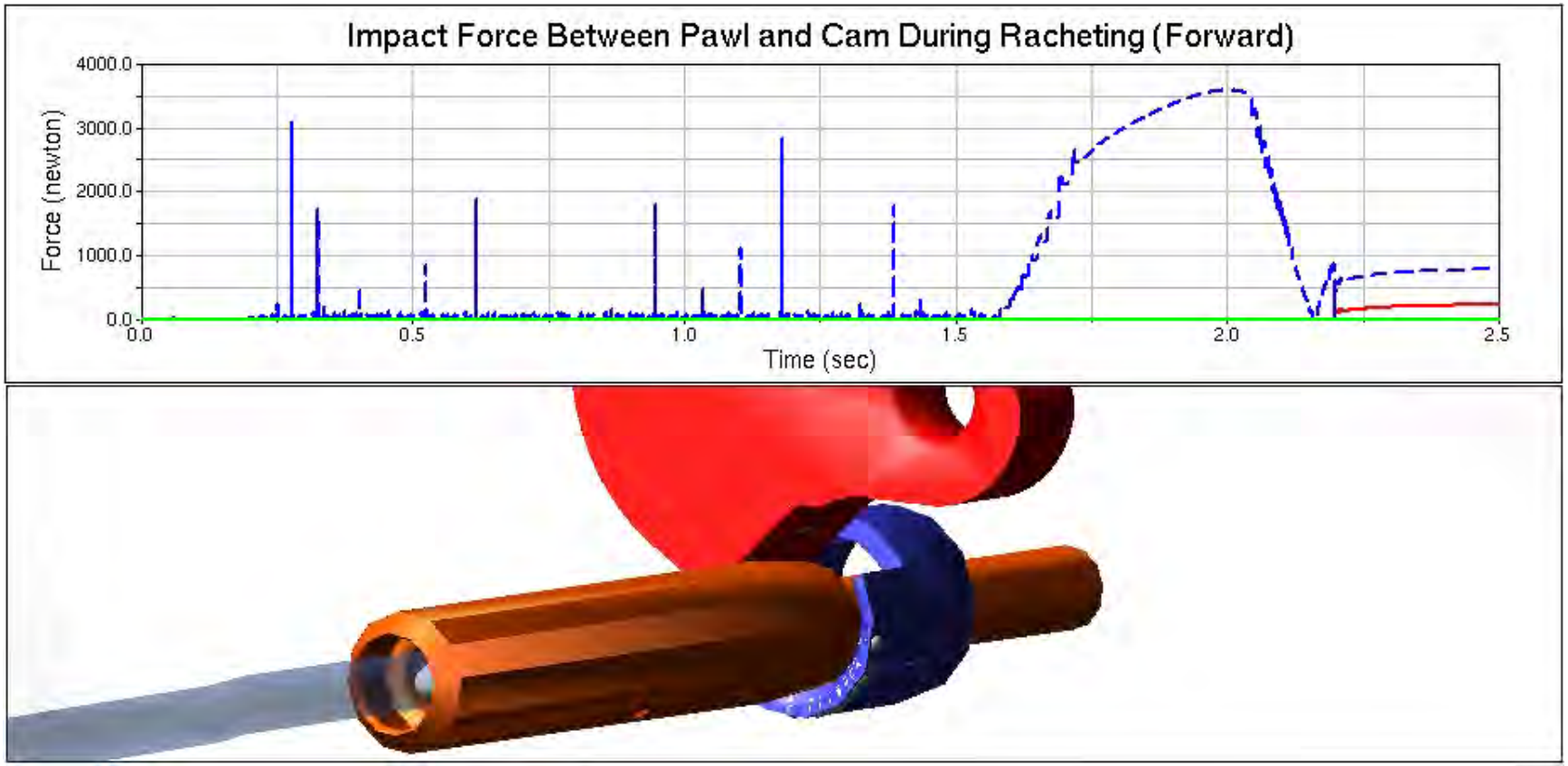


Figure 7. Impact Force Between Pawl and Cam During Ratcheting (forward ratcheting)

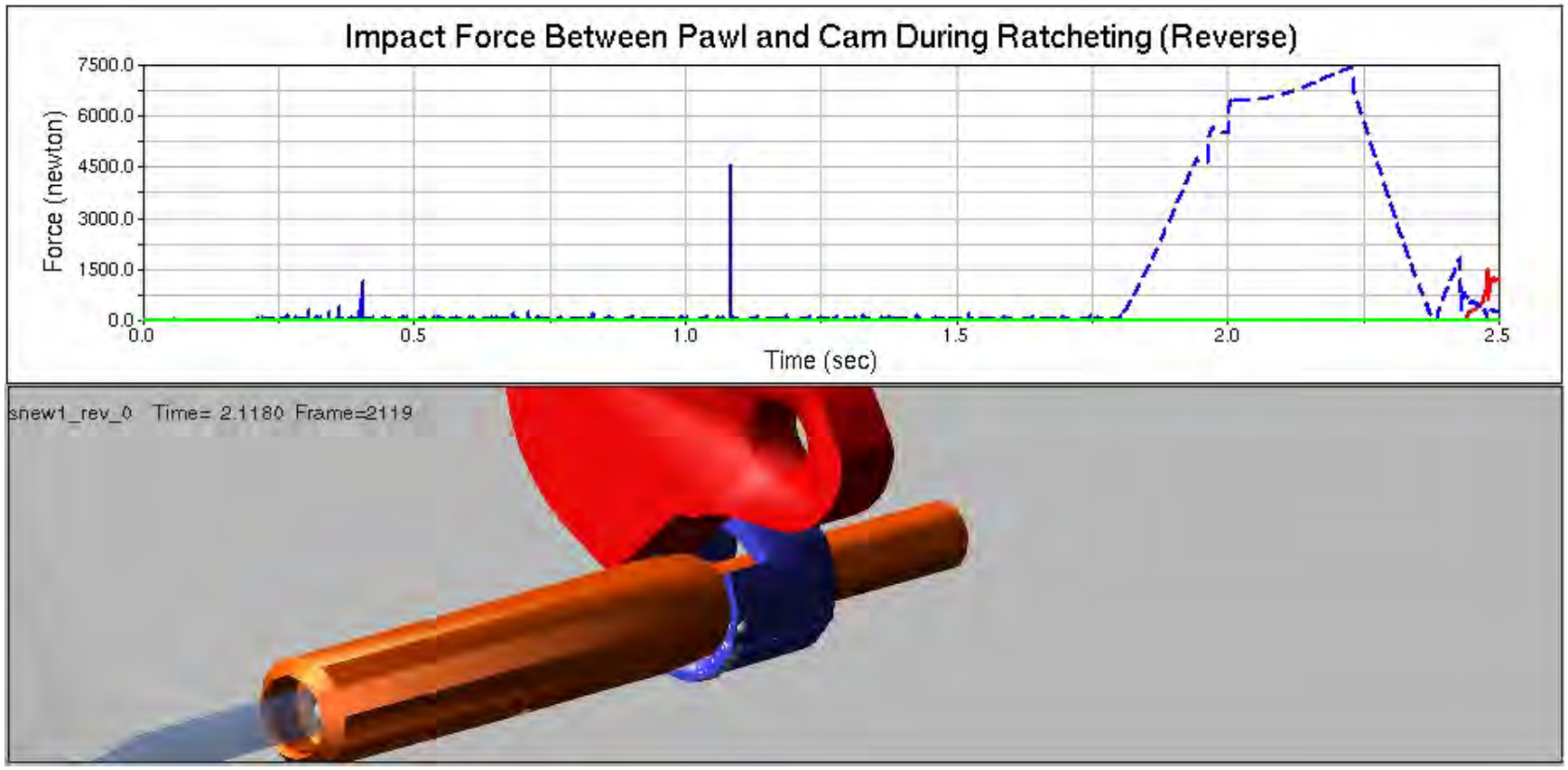


Figure 8. Impact Force Between Pawl and Cam During Ratcheting (reverse ratcheting)

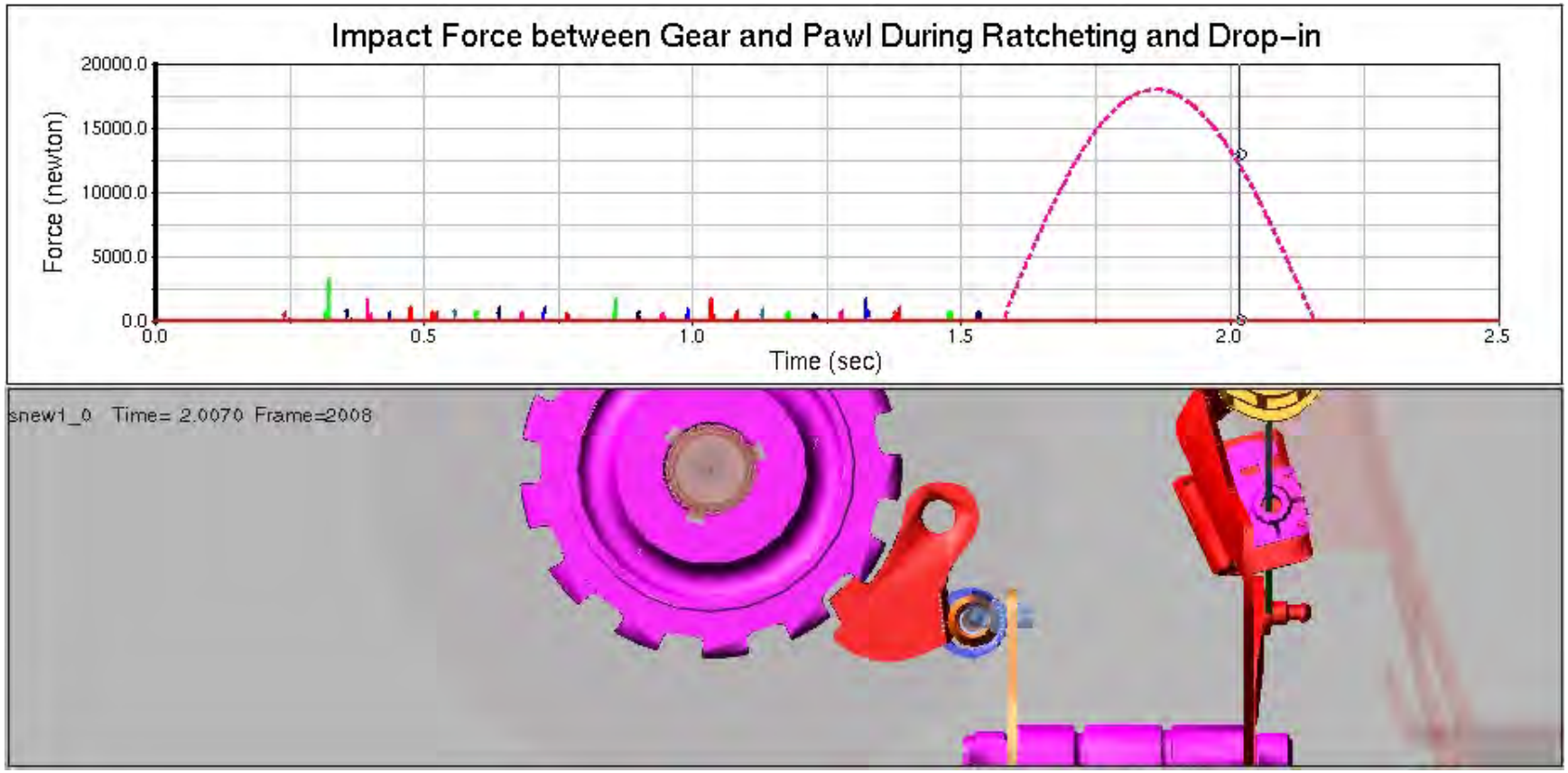


Figure 9. Impact Force Between Pawl Face and Gear During Ratcheting (forward ratcheting)

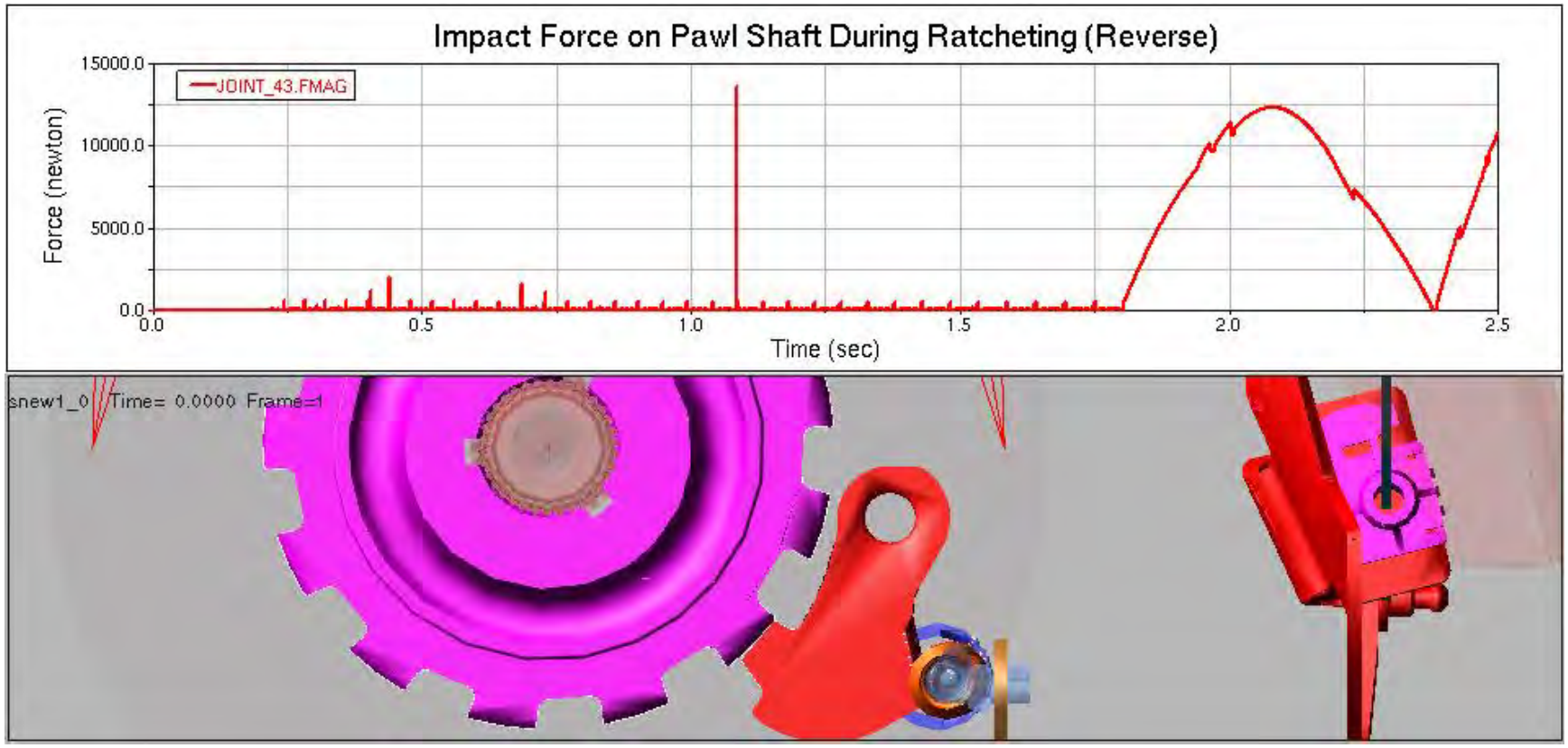
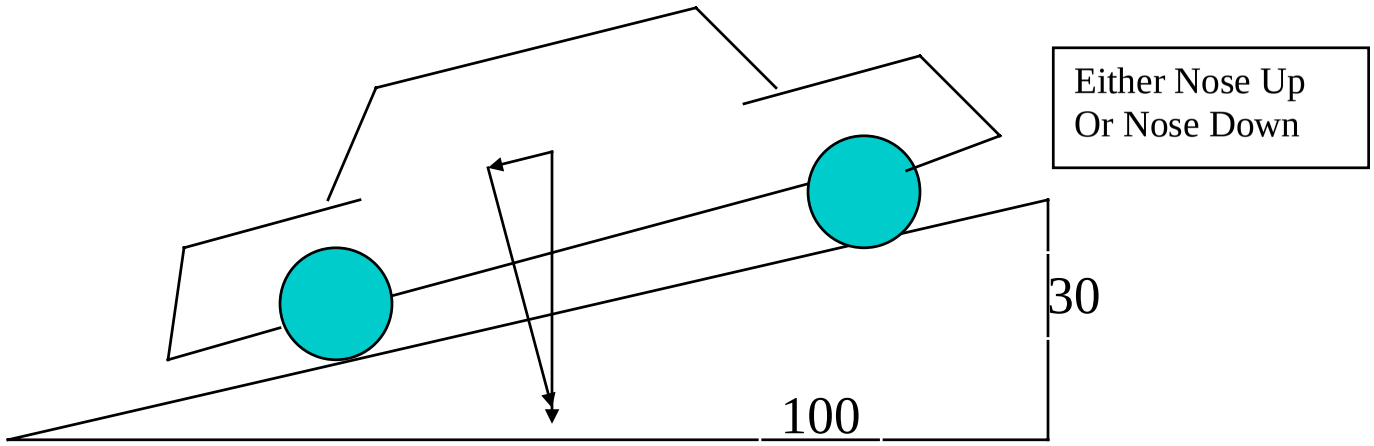


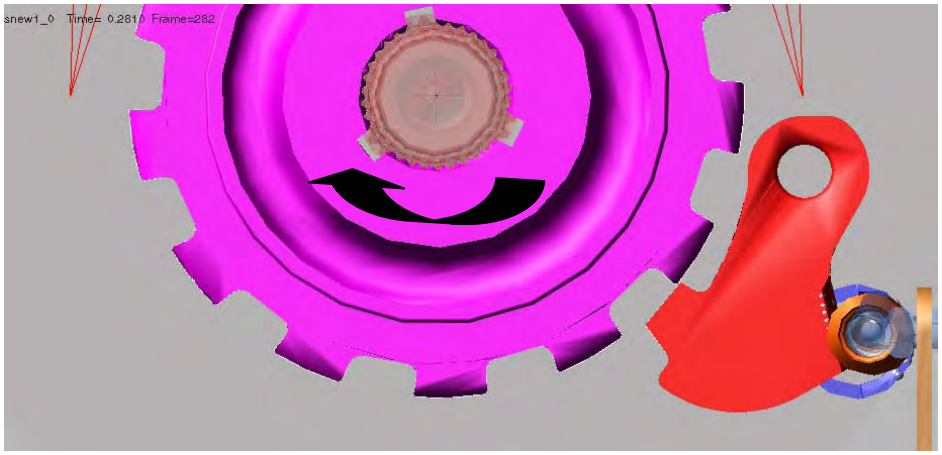
Figure 10. Impact Force of Pawl Shaft During Ratcheting (reverse ratcheting)

Abutted Engagement at 30% Grade

It is estimated that when a vehicle is parked on a ramp, abutted condition occurs as much as 85% of the time; that is, the pawl rests on the top of a certain gear tooth, shown in Figure 11. After the brake is released the vehicle starts to roll down the ramp. The subsequent park gear rotation allows the pawl to find a way to drop into the gear. It is imperative to assure that the pawl drops in and holds the gear rather than gets spit out by the vehicle roll down inertia. Figure 11 (b) shows the worst-case scenario where the pawl will move the full gear tooth length before it drops into the park gear (vehicle reaches the possible maximum speed).



(a)



(b)

Figure 11. Abutted Engagement at 30% Grade

Figure 12 demonstrates the nose-up (reverse) abutted engagement process (click abut30.avi for animation). When the shifter is moved from neutral to park, the pawl hit the gear tooth and at the same time vehicle rolls down the slope and pawl drops into

the gear after it travels through the full gear tooth length, and stops the vehicle. The results show that there is no spit-out under current simulation condition.

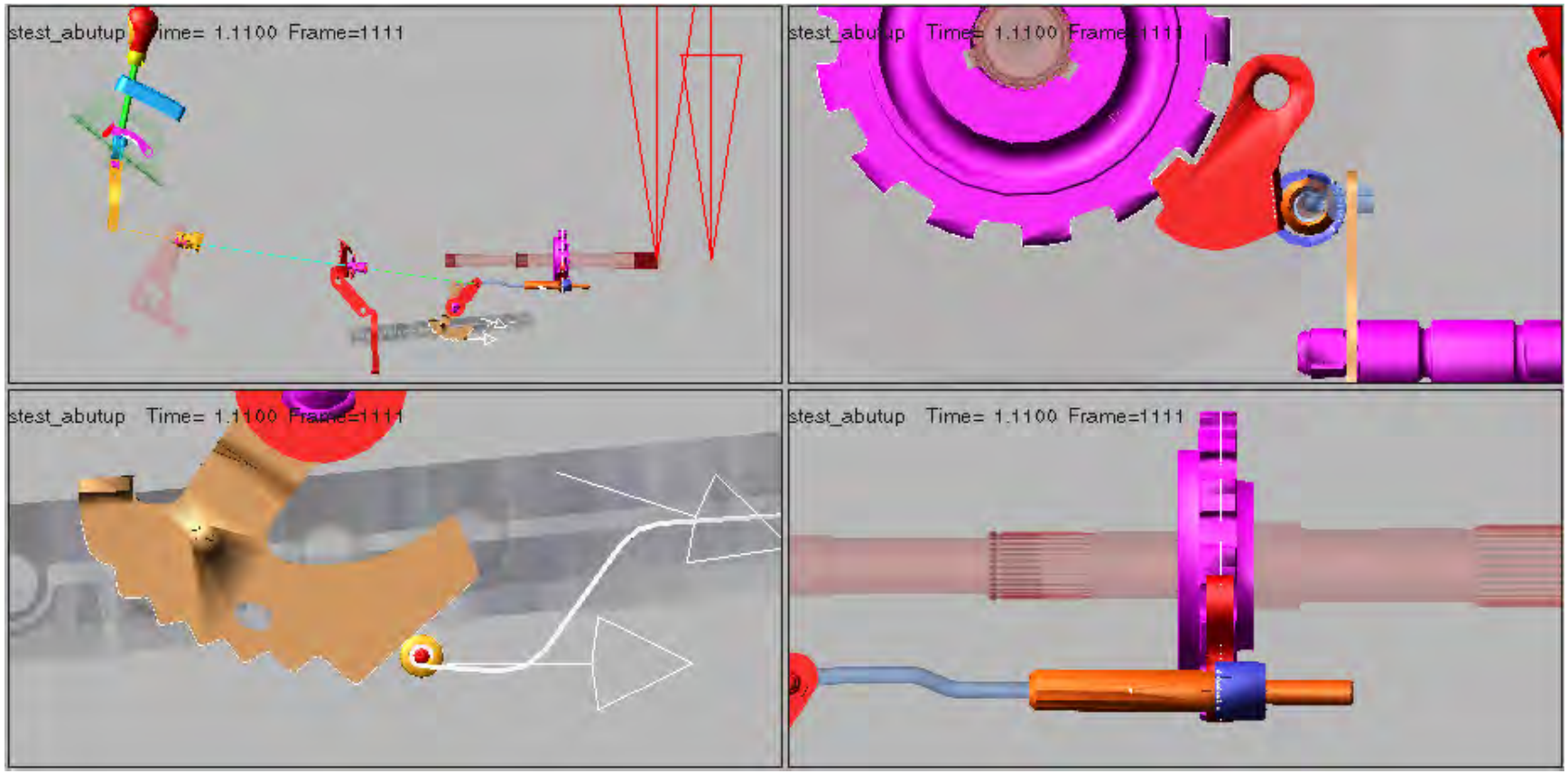


Figure 12. Nose-up Abutted Engagement Process at 30% Grade

The contact forces at pawl face and pawl shaft are displayed in Figure 13 and 14, and the dynamic forces are at 20,662N and 19,952N, respectively, for nose-up abutment, and 22,697N and 20,621N, respectively, for nose-down abutment.

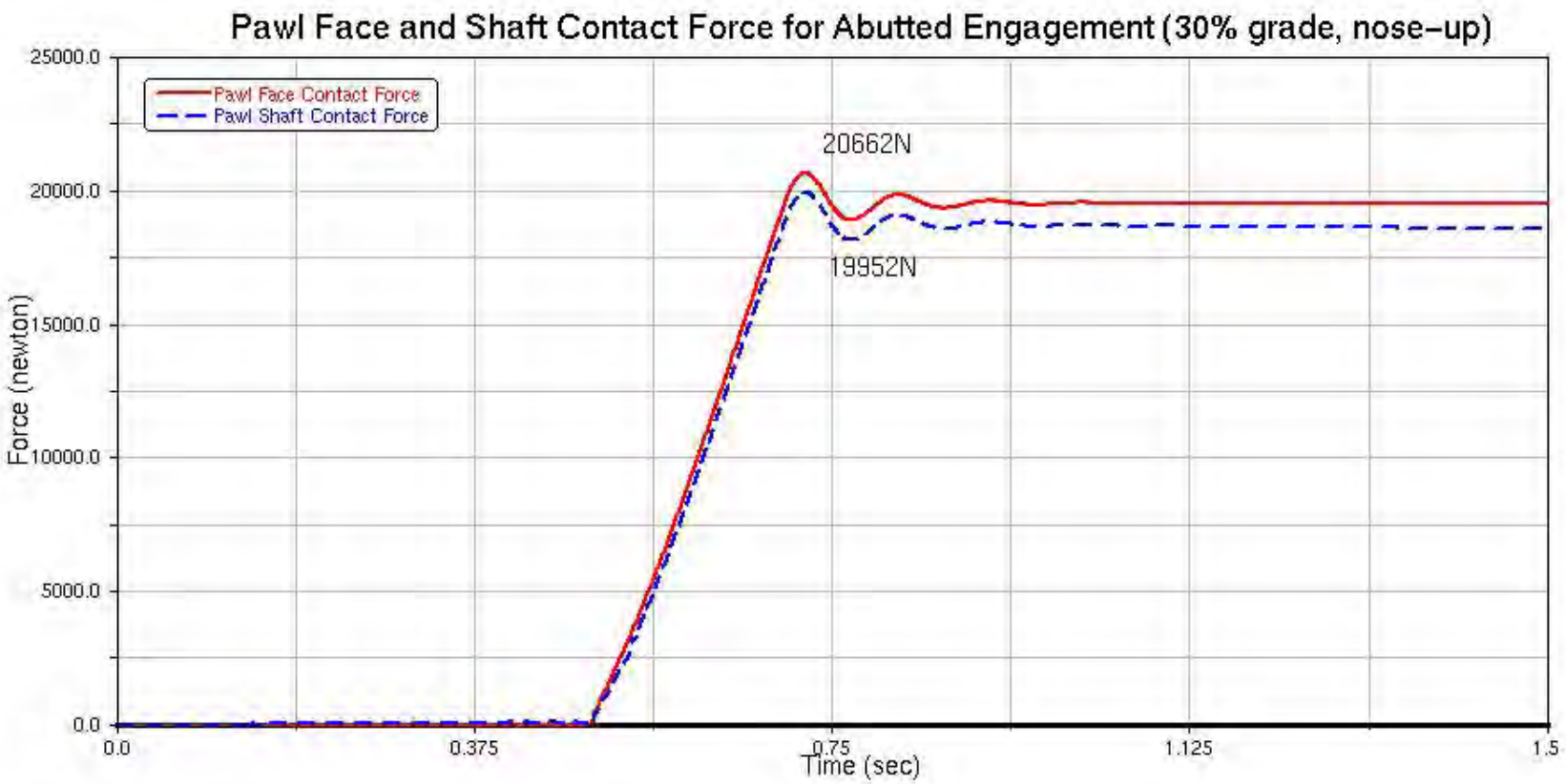


Figure 13. Contact Forces at Gear Pawl Face and Pawl Shaft at Abutted Engagement (nose-up)

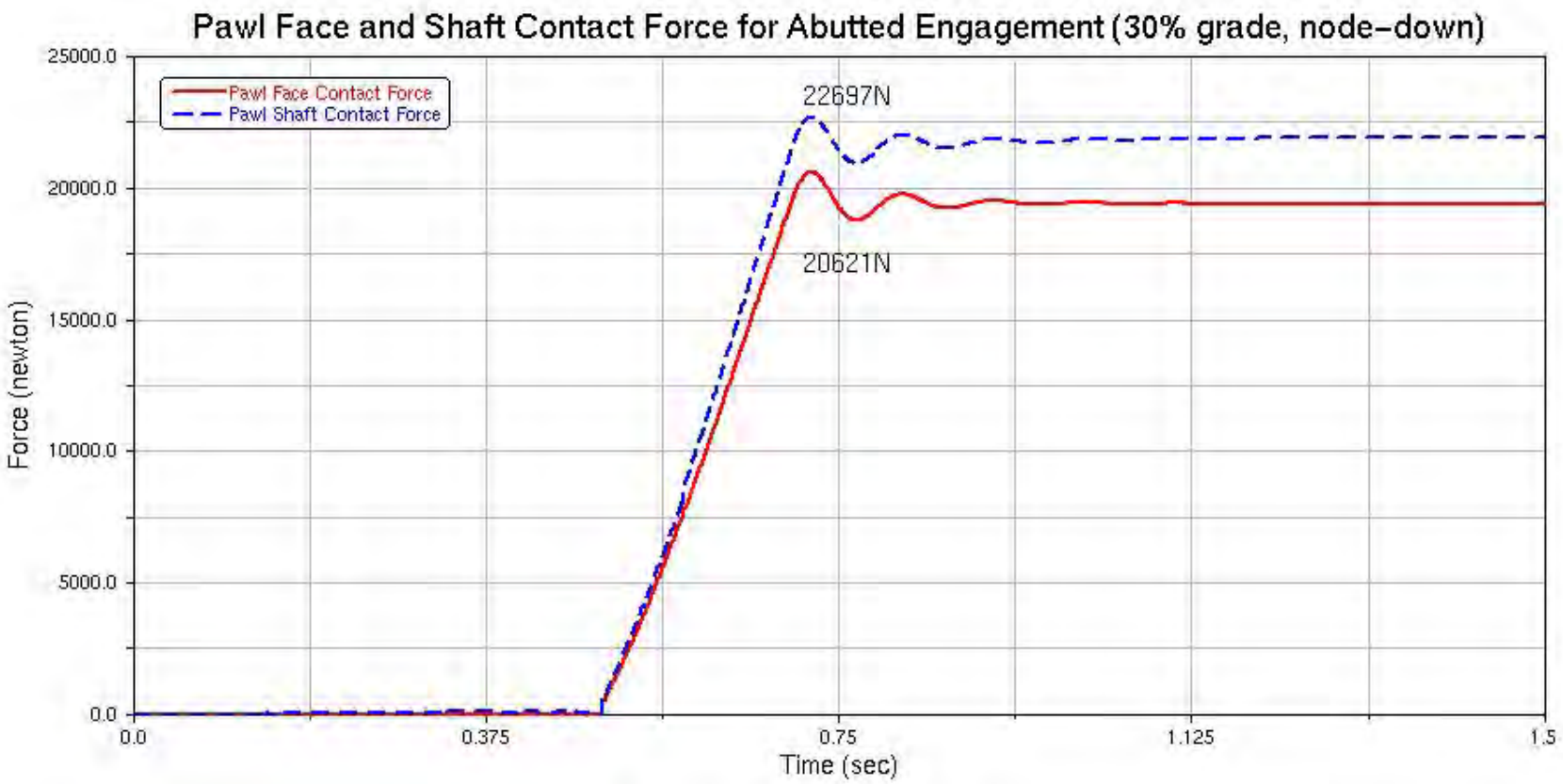


Figure 14. Contact Forces at Gear Pawl Face and Pawl Shaft at Abutted Engagement (nose-down)

Summary

- An integrated park and shifter system for 5R55W/S dynamic model has been developed.
- It is used to study various park behaviors, including forward and reverse ratcheting, drop-in speeds, 30% grade nose-up and nose-down abutted engagement and corresponding contact forces on pawl face and pawl shaft.
- The results are compared with the available test data and correlates well.
- The methodology can be used for future park system modeling.

CAE Engineer: Xiaoyong Lu (XLU4)

Concurred: Chin-Yuan Perng /s/

Appendix 1: test data

The latest drop-in speed data from the most recent DVP&R. Testing was conducted in an Explorer AWD or 4x2 w/ 3.27 FDR.

Sample #1 - Pass
Fwd. Drop-in (Max/Min/Avg):
2.7 / 2.3 / 2.5 mph
Rev. Drop-in (Max/Min/Avg):
2.4 / 1.9 / 2.2 mph

Sample #2 - Pass
Fwd. Drop-in (Max/Min/Avg):
2.7 / 2.0 / 2.3 mph
Rev. Drop-in (Max/Min/Avg):
2.4 / 2.0 / 2.2 mph

Sample #3 - Pass
Fwd. Drop-in (Max/Min/Avg):
2.6 / 2.3 / 2.4 mph
Rev. Drop-in (Max/Min/Avg):
2.1 / 1.8 / 2.0 mph

Sample #4 - Pass
Fwd. Drop-in (Max/Min/Avg):
2.9 / 2.2 / 2.6 mph
Rev. Drop-in (Max/Min/Avg):
2.4 / 2.1 / 2.2 mph

Sample #5 - Pass
Fwd. Drop-in (Max/Min/Avg):
2.5 / 2.0 / 2.3 mph
Rev. Drop-in (Max/Min/Avg):
2.2 / 1.8 / 2.0 mph

Sample #6 - Pass
Fwd. Drop-in (Max/Min/Avg):
2.9 / 2.2 / 2.6 mph
Rev. Drop-in (Max/Min/Avg):
2.9 / 2.1 / 2.3 mph

Sample #7 - Pass
Fwd. Drop-in (Max/Min/Avg):
3.0 / 2.3 / 2.6 mph
Rev. Drop-in (Max/Min/Avg):
2.6 / 2.2 / 2.4 mph

Sample #8 - Pass
Fwd. Drop-in (Max/Min/Avg):
2.6 / 2.4 / 2.5 mph
Rev. Drop-in (Max/Min/Avg):
2.6 / 2.1 / 2.4 mph

Appendix 2: Parameters Used

Return Spring: Stiffness=13.65 N-mm/deg, Preload Position=29.3 Deg
Ratcheting Spring: Stiffness=1.42 N/mm, Preload Length=69.0 mm
Detent Spring: Stiffness=231.50 N-mm/deg, Preload Position=7.5 Deg

Shifter Spring: Stiffness=2.39 N/mm, Preload Position=-17.2 mm

Vehicle Mass: 5900 lb
Final Drive Ratio=3.27 (**Explorer 4 x 2**)
Equivalent Output Shaft Stiffness: 6.4E5 N-mm/rad (Estimated data, because no test data available)
Tire: P255/70R16

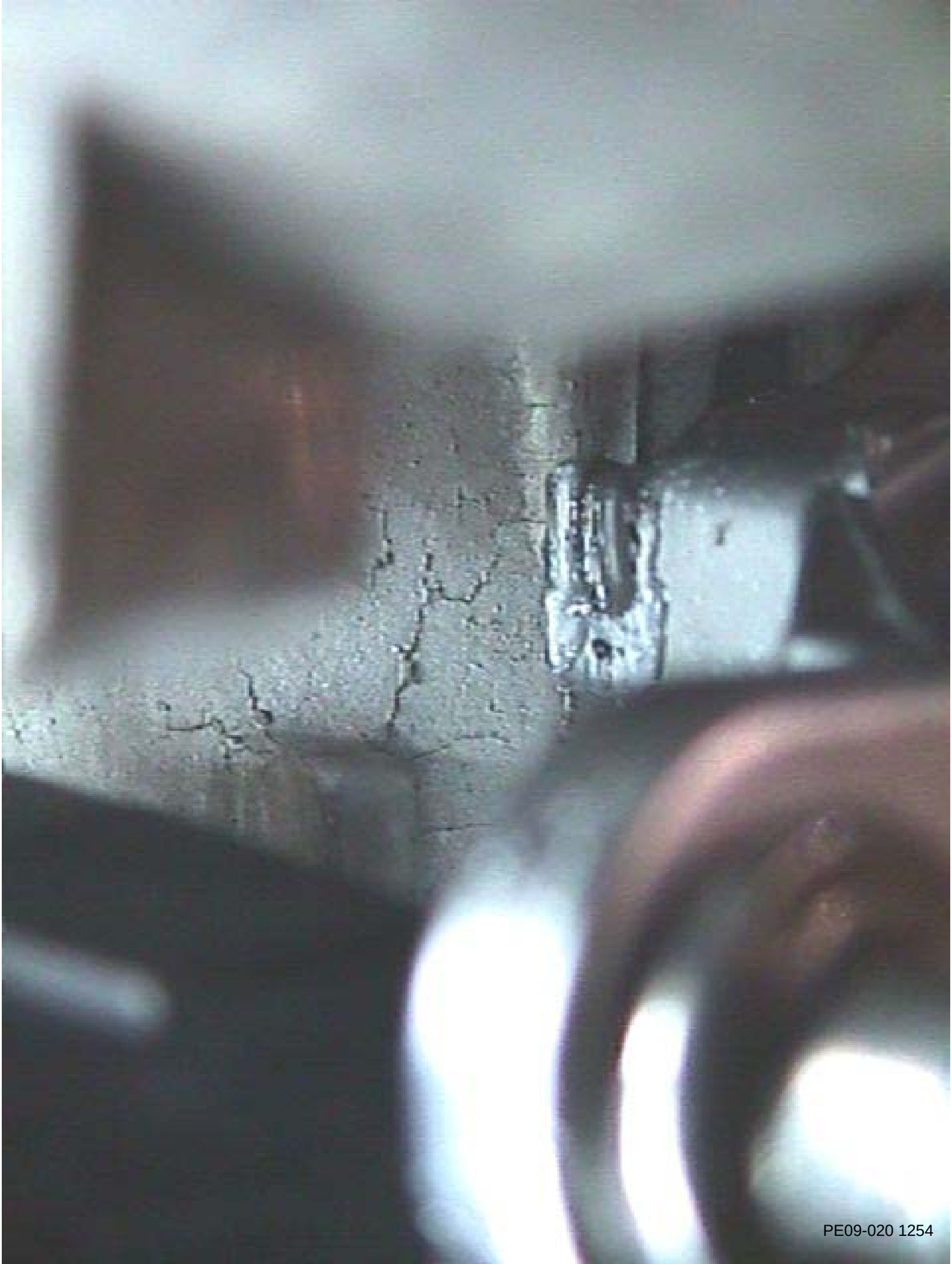
PE09-020 1249

PE09-020 1250

PE09-020 1251

PE09-020 1252

PE09-020 1253



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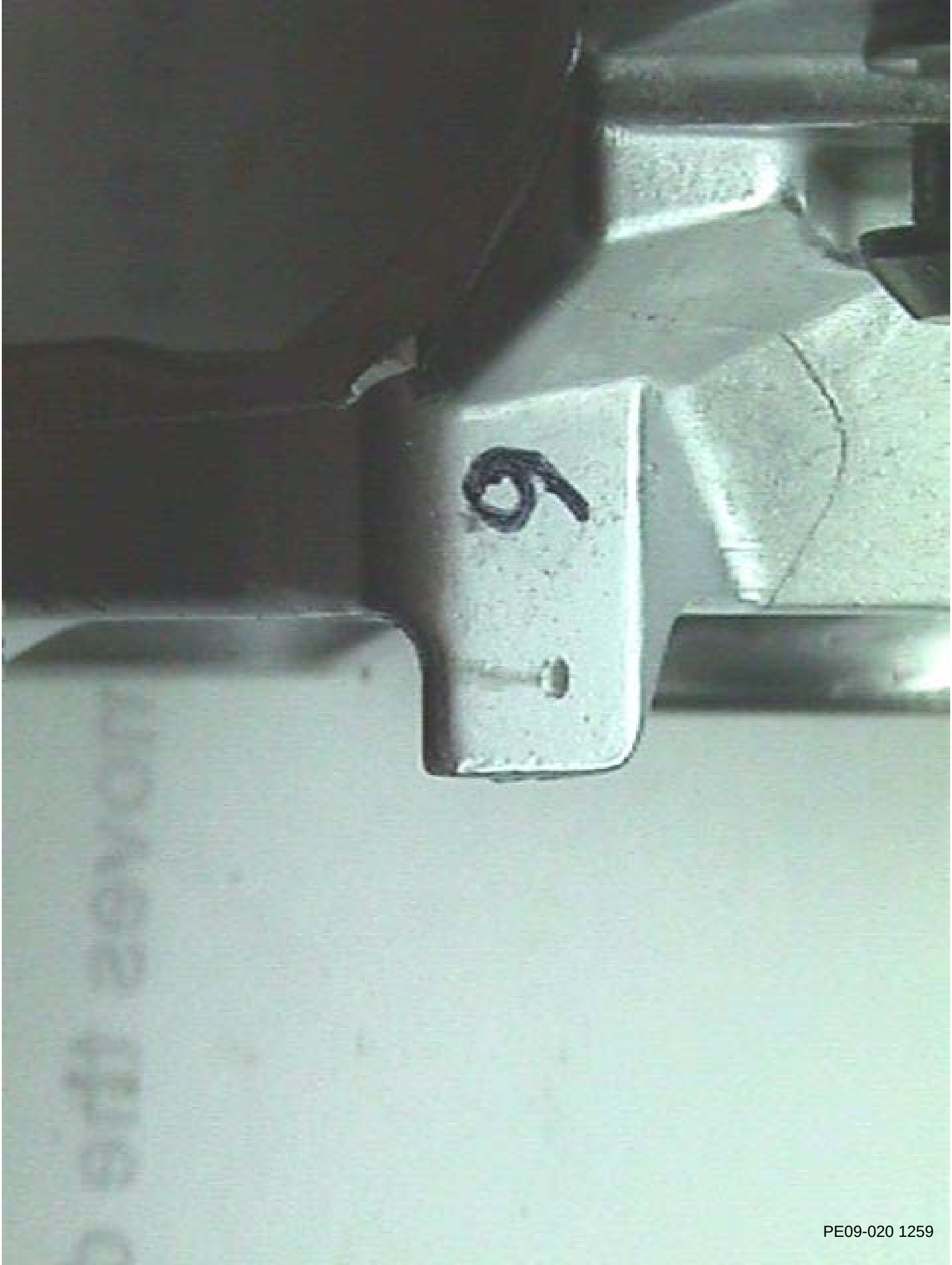
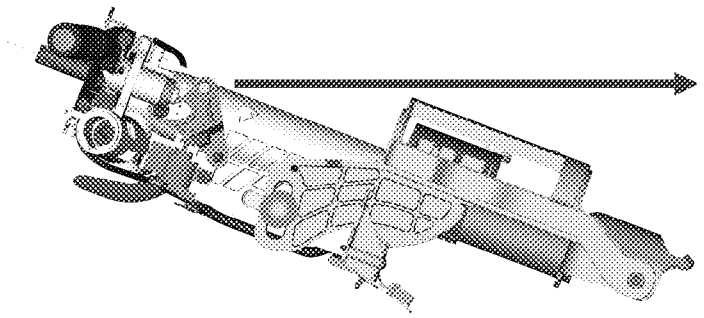
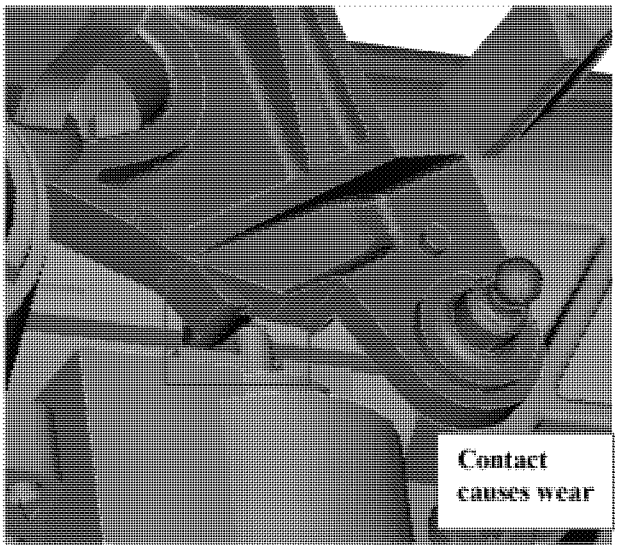


PE09-020 1259

Explorer Trans Control Selector (TCS) Failure to Reach Park

Column Issue:
BSI pin doesn't retract before the customer shifts into Park. The Trans Control Selector (TCS) hits the BSI pin and wears. As the TCS wears, it eventually creates a divot or pocket, which prevents the ramp on the TCS from pushing the BSI pin downward and out of the way. This eventually prevents the customer from shifting into Park.





Root Cause:
1) BSI pin does not fully retract before customer tries to shift into park
   - BSI has a time delay to reduce solenoid noise "clicking" sound during brake application
2) Impact of BSI pin to Swing Arm (TCS) eventually causes wear and a pocket to form
   - Influenced by material properties and surface finish

Potential Production Fixes:
1) Remove delay from the BSI (example: Expedition production)
   - may need to improve NVH of BSI to prevent noise complaints
2) Reduce the wear on the Swing Arm (TCS)
   - grease contact surface (production and service)
   - improve surface finish on BSI pin (production)
   - investigate changing the ramp angle on the Swing Arm (TCS) (production)
   - Investigate changing to harder material on Swing Arm (TCS) - $2.00 (production)

Potential Service Fix:
1) Sand and grease TCS
2) Need to prove service fix is feasible and will last.

Item	Task	Begin	End	Status
1	Get Warranty Columns	Dec-03	Feb-04	complete
2	Identify Root Cause	5-Jan-05	13-Jan-04	complete
3	Add Grease to Swing Arm in Production	15-Jan-04	-	complete
4	Define Test procedure	13-Jan-04	20-Jan-04	complete
5	Get test quote	20-Jan-04	5-Feb-04	complete
6	CPARS order column testing	13-Feb-04	20-Feb-04	
7	Test Setup	20-Feb-04	12-Mar-04	
8	Service Demonstration	10-Mar-04	11-Mar-04	
9	Baseline Testing	15-Mar-04	19-Mar-04	
10	Service Fix Testing	22-Mar-04	26-Mar-04	
11	Production Fix Testing	29-Mar-04	2-Apr-04	
12	Release for Service	26-Mar-04	9-Apr-04	

13	Release for Production	5-Apr-04	23-Apr-04

Test Tech: J.R. & L.L. Test Engineer: L.Benfant Contact : J. Thornton Phone No: 313-845-9249			Clients Company Name: **Ford Motor Company** Sample Description & Identification: P/N 3L24-3C529-BA U152 Warranty return column & BSI solenoid Production & Plated with silicone grease swing arms Test Specification: Swing arm effort req. to break away						**Job No: 401643-01** Sheet No: 1 of 1 Date: 4/29/04		
Sample	Production Swing Arm	Plated with Silicone grease swing arm	Run #1	Run #2	Run #3	Run #4	Run #5				Notes
No.			(N)	(N)	(N)	(N)	(N)				
			Post Test 25,000 cycles								
10		**X**	0	0	0	0	0				
11	**X**		0	66	0	14	0.2				
18		**X**	5	6	3	11	16				
19	**X**		47	9	81	140	101				
27	**X**		7	1	21	27	51				
50		**X**	17	31	32	49	25				
			BSI pin rotated 1/4 turn Clockwise								
10		**X**	0	0	0	0	0				
11	**X**		0	0	0	0	0				
18		**X**	0	0	0	0	0				
19	**X**		59	371	386	491	507				1
27	**X**		1	14	2	118	40				
50		**X**	6	8	0	0	3				

Equipment Log

Pos #	Test Equipment Description Make & Model	Ref. Equip. (X)	EQ #	DATE OF CALIBRATION Last	DATE OF CALIBRATION Next	Certification No.	Transducer Cal. Information Shunt Value (K OHMS)	Transducer Cal. Information Pre-Test Output (EU)/V	Transducer Cal. Information Post Test Output (EU)/V
1	Trans Tech MLP-50-CO Load Cell		139	3/22/2004	3/22/2005	58664001	60	159.4N	
2	Trans Tech MLP-50-CO Load Cell		138	3/20/2004	3/20/2005	58664002	60	159.9 N	
3	Trans Tech MLP-50-CO Load Cell		247	3/15/2004	3/15/2005	40871	60	161.2 N	
4	Trans Tech MLP-50-CO Load Cell		245	3/15/2004	3/15/2005	40871	60	160.1 N	
5	Trans Tech MLP-50-CO Load Cell		246	3/15/2004	3/15/2005	40871	60	160.1 N	
6	Trans Tech MLP-50-CO Load Cell		248	3/15/2004	3/15/2005	40871	60	161.2 N	
	Imada AXT-44 Force Gauge		19	7/4/2003	7/4/2004	52437002			
	Imada AXT-220 Force Gauge		95	11/15/2003	11/15/2004	55721010			

NOTES

NO.	
1	Run #2,3,4,5 swing arm did not break away from pin.

Test Tech: J.R. & L.L.
Test Engineer: L.Benfant
Contact : J. Thornton
Phone No: 313-845-9249

Clients Company Name: **Ford Motor Company**

Sample Description & Identification: P/N 3L24-3C529-BA
U152 Warranty return column & BSI solenoid
Production & Plated with silicone grease swing arms
Test Specification: Swing arm effort req. to break away

Job No: 401643-01
Sheet No: 1 of 1
Date: 4/29/04

Sample	Production Swing Arm	Plated with Silicone grease swing arm	Run #1	Run #2	Run #3	Run #4	Run #5				Notes
No.			(N)	(N)	(N)	(N)	(N)				
			Post Test 25,000 cycles								
10		X	0	0	0	0	0				
11	X		0	66	0	14	0.2				
18		X	5	6	3	11	16				
19	X		47	9	81	140	101				
27	X		7	1	21	27	51				
50		X	17	31	32	49	25				
			BSI pin rotated 1/4 turn Clockwise								
10		X	0	0	0	0	0				
11	X		0	0	0	0	0				
18		X	0	0	0	0	0				
19	X		59	371	386	491	507				1
27	X		1	14	2	118	40				
50		X	6	8	0	0	3				

Equipment Log

Pos #	Test Equipment Description Make & Model	Ref. Equip. (X)	EQ #	DATE OF CALIBRATION Last	DATE OF CALIBRATION Next	Certification No.	Transducer Cal. Information Shunt Value (K OHMS)	Transducer Cal. Information Pre-Test Output (EU)/V	Transducer Cal. Information Post Test Output (EU)/V
1	Trans Tech MLP-50-CO Load Cell		139	3/22/2004	3/22/2005	58664001	60	159.4N	
2	Trans Tech MLP-50-CO Load Cell		138	3/20/2004	3/20/2005	58664002	60	159.9 N	
3	Trans Tech MLP-50-CO Load Cell		247	3/15/2004	3/15/2005	40871	60	161.2 N	
4	Trans Tech MLP-50-CO Load Cell		245	3/15/2004	3/15/2005	40871	60	160.1 N	
5	Trans Tech MLP-50-CO Load Cell		246	3/15/2004	3/15/2005	40871	60	160.1 N	
6	Trans Tech MLP-50-CO Load Cell		248	3/15/2004	3/15/2005	40871	60	161.2 N	
	Imada AXT-44 Force Gauge		19	7/4/2003	7/4/2004	52437002			
	Imada AXT-220 Force Gauge		95	11/15/2003	11/15/2004	55721010			

NOTES

NO.	
1	Run #2,3,4,5 swing arm did not break away from pin.

Test Tech: J.R. & L.L. Test Engineer: L.Benfant Contact : J. Thornton Phone No: 313-845-9249	Clients Company Name: **Ford Motor Company** Sample Description & Identification: P/N 3L24-3C529-BA U152 Warranty return column & BSI solenoid Plated swing arms with silicone grease & prd. Swing arms Test Specification: Swing arm efforts meas. at cable connection	**Job No: 401643-01** Sheet No: ___ of ___ Date: _____

Total Cycles	Sample #10 Plated with silicone grease Swing arm effort	Sample #11 Production w/o grease Swing arm effort	Sample #18 Plated with silicone grease Swing arm effort	Sample #19 Production w/o grease Swing arm effort	Sample #27 Production w/o grease Swing arm effort	Sample #50 Plated with silicone grease Swing arm effort					Notes
No.	(N)	(N)	(N)	(N)	(N)	(N)					
0	3.4 to 7.8	0.2	1.4 to 7.5	1.4 to 9.6	1.8 to 2.8	0.5					1
5000	0.2	0	1.4 to 4.3	66	.3 to 13	0.2					2
10000	.5 to 1.2	2.2 to 3.7	8827cyc./55.4		9136cyc./ 57	7942 cyc./ 55.8					3
15000											
20000											
25000											
30000											
35000											
40000											
45000											
50000											

Equipment Log

Pos #	Test Equipment Description Make & Model	Ref. Equip. (X)	EQ #	DATE OF CALIBRATION Last	DATE OF CALIBRATION Next	Certification No.	Transducer Cal. Information Shunt Value (K OHMS)	Transducer Cal. Information Pre-Test Output (EU)/V	Transducer Cal. Information Post Test Output (EU)/V
1	Trans Tech MLP-50-CO Load Cell		139	3/22/2004	3/22/2005	58664001	60	159.4N	
2	Trans Tech MLP-50-CO Load Cell		138	3/20/2004	3/20/2005	58664002	60	159.9 N	
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5	Trans Tech MLP-50-CO Load Cell		246	3/15/2004	3/15/2005	40871	60	160.1 N	
6	Trans Tech MLP-50-CO Load Cell		248	3/15/2004	3/15/2005	40871	60	161.2 N	
	Imada AXT-44 Force Gauge		19	7/4/2003	7/4/2004	52437002			

NOTES

NO.	
1	Sample #50 initially measured at 1.9N to 51.2N. Requester inspected sample and rotated the BSI pin manually causing the swing arm effort to drop.
2	Sample #19 swing arm effort 66N did not break away, sample completed testing.
3	Samples #18,27 & 50 shut down swing arms did not break away during performance test, samples completed testing.

From: Xu, Yehong (Y.)
Sent: Thursday, August 24, 2000 11:02 PM
To: Hildebrand, Dan (D.H.)
Cc: Waclawski, Chris (C.G.); Brazin, Jim (J.C.); McKinnis, Larry (L.N.); Platter, Robert (R.D.); Landes, Stephen (S.L.); Dover, Harry (H.); Spaulding, Todd (T.C.); Perri, Ron (R.J.)
Subject: Pullout Test

Attachments: Microsoft Excel Worksheet; Microsoft Excel Worksheet

Dan:

I tested pullouts on two vehicles today. The following are the results:

1. CP level vehicle, PV3 trans, **new pawl**
   Completed 120 uphill pullouts, 100 downhill pullouts (pullout test only)
   Data was taken from the first 20 cycles and the last 20 cycles.

		Noseup					Nosedown		
	Cycle #	**Cycle #**	**Cycle #**	**Cycle #**		**Cycle #**	**Cycle #**	**Cycle #**	**Cycle #**
	1-10	**11-20**	**80-90**	**90-100**		**1-10**	**11-20**	**100-110**	**110-120**
	4	10.2	5.2	8.6		4.1	4.7	5.3	4.2
	5.8	7.3	4.8	6.4		3.4	4.3	5	3.8
	6.4	6.8	6.4	12.1		2.7	3.7	6.2	7.8
	6.6	6.1	6.7	7.3		3	5.8	5.3	4.5
	4.3	3.4	7.2	7.1		5.2	5.4	4.6	6.4
	4.7	5.7	5.4	6.5		3.4	3.8	4.3	4.7
	8.5	5.8	8.1	7.6		4.6	5.2	7.1	5.6
	7.5	9.2	8.3	5.2		4.8	5	4.8	5.2
	5.6	6.4	6.2	7.9		6	4.6	6	8.2
	5.4	5.2	9.3	6.8		5.1	4.1	5.5	5.9
Average	**5.88**	**6.61**	**6.76**	**7.55**		**4.23**	**4.66**	**5.41**	**5.63**

2. 2PP level vehicle, all new park components, including **new pawl.**
   Pullout test only. No ratchet test was conducted.
   Vehicle was from SLAP recently. No pullout test performed on this vehicle before.
   Could not complete 100 uphill pullouts due to vehicle stuck in park. Test terminated at 76th cycle.
   There are afew high loads.

		Noseup						
1	10.7	13.4	15.5	11.8	14.7	26.1	9.8	32.5
2	6.2	10.7	12.3	10.4	14.5	13.2	5.9	19.7
3	5.4	13.5	13	11.6	25	15.4	8.9	11.5
4	11.3	11.9	12.4	13.7	12.5	16.6	15	26.4
5	9.4	14.6	11	10.3	14.7	16	10.9	19.4
6	12.3	12.8	12.7	12	20	10.2	27.4	X
7	14	15.1	13.4	11.1	20.1	31.4	15.2	
8	11.2	11.9	13.9	11.5	15.5	30+	25.9	
9	10.9	13.4	13.8	107	9.6	17.1	20.7	
10	13.5	14.1	12.5	11.5	9.7	10.5	22	
Average	**17.48**	**13.14**	**13.05**	**21.09**	**15.63**	**17.39**	**16.17**	**21.90**
		Nosedown						
1	7.4	6.4	10.7	9.7	9.3	9.6		
2	6.6	7.3	9.4	9.2	7.3	13.7		
3	6.8	7.4	10.1	10.7	10.3	8.9		
4	5.4	6.7	8.5	14.5	8.2	7.9		
5	4.3	6.8	8.1	7.5	8.5	9.1		
6	6.9	7.5	9.3	9.5	9.1	8.4		
7	6.6	9.5	10.9	8.5	7.8	10		
8	7	8.6	9	8.2	8.5	8.5		
9	7.1	8.5	8.1	8.8	10.1	8.4		
10	5.6	7.8	10	8.5	10.8	8.5		
Average	**6.37**	**7.65**	**9.41**	**9.51**	**8.99**	**9.30**		

I will have the troubled trans installed on the CP level vehicle and run pullout test tomorrow morning.

Regards,

Yehong Xu
YXU1
Park Systems Section
Mechanical/Structural Sub-Systems Dept.
Ph: (734) 458-0717
Fax: (734) 523-6052

-----Original Message-----
From: Hildebrand, Dan (D.H.)
Sent: Thursday, August 24, 2000 4:03 PM
To: Xu, Yehong (Y.); Landes, Stephen (S.L.); Platter, Robert (R.D.)
Subject: FW: Cable Stretch

Guess I should have shared this with a larger group of people.

Dan Hildebrand, P.E.
Manager, 5R55N/E/W/S Auto Trans Systems Dept
Ph: 734-52-34598, Fax: 734-45-80991/734-52-33910
Text Pager: 734-797-6257
e-mail: dhildebr@ford.com/CDS ID: DHILDEBR
Mail Drop T-201, Rm. W318B, ATNPC, Livonia

Admin. Asst.: Judy Lardin, Ph: 734-52-34517

-----Original Message-----
From: Hildebrand, Dan (D.H.)
Sent: Thursday, August 24, 2000 10:10 AM
To: Garrett, Dave (D.M.); Waclawski, Chris (C.G.); Spaulding, Todd (T.C.)
Cc: McKinnis, Larry (L.N.)
Subject: RE: Cable Stretch

Dave Adamczyk section is running a mini-experiment in an "old" vehicle with "old" column to check pullout efforts between old pawl vs. new pawl with old column. There is a belief that "uphill" efforts have increased but there is not as yet an explained engineering logic for this.

Dan Hildebrand, P.E.
Manager, 5R55N/E/W/S Auto Trans Systems Dept
Ph: 734-52-34598, Fax: 734-45-80991/734-52-33910
Text Pager: 734-797-6257
e-mail: dhildebr@ford.com/CDS ID: DHILDEBR
Mail Drop T-201, Rm. W318B, ATNPC, Livonia
Admin. Asst.: Judy Lardin, Ph: 734-52-34517

-----Original Message-----
From: Garrett, Dave (D.M.)
Sent: Thursday, August 24, 2000 10:05 AM
To: Waclawski, Chris (C.G.); Spaulding, Todd (T.C.)
Cc: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.)
Subject: RE: Cable Stretch

Chris,
Can you have Yehong or Don Brewer get the cable/brackets to Harry Dover to inspect the "suspect" dimensional changes?

Todd
This issue is a job stopper and Engineering Sign off is September 1st. Thanks for adding Harry to our team!

David M. Garrett
5R55 N/W/S Transmission Systems A - Supervisor
MD T201 ATNPC E315B
(734)52-31343 dgarrett@ford.com

-----Original Message-----
From: Spaulding, Todd (T.C.)
Sent: Thursday, August 24, 2000 8:22 AM
To: Xu, Yehong (Y.); Dover, Harry (H.)
Cc: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Brazin, Jim (J.C.); Platter, Robert (R.D.); Garrett, Dave (D.M.); Landes, Stephen (S.L.); Perri, Ron (R.J.)
Subject: RE: Cable Stretch

Are you saying that you have pulled the shift lever all the way to the "1" position and the vehicle didn't pull out of park? That is the only way a stretched cable, deflecting brackets, etc., would keep you from pulling the vehicle out of park. I doubt this is what you are experiencing. Have you measured a cable to know it has "stretched" before making this statement?
I seem to remember having a high pull out of park issue on the DEW98 back a few months ago that was never resolved, the result of which was a "beefing up" of the shifter to handle the unexplained higher loads. Also, I would assume (speculation) that whatever is going on in the trans/system that makes it drop in too early would also tend to make it not want to come out of park. In any case, Harry will be coming out to Livonia this morning to help you out.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: Xu, Yehong (Y.)
Sent: Wednesday, August 23, 2000 10:53 PM
To: Dover, Harry (H.)
Cc: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Brazin, Jim (J.C.); Platter, Robert (R.D.); Garrett, Dave (D.M.); Landes, Stephen (S.L.); Perri, Ron (R.J.); Spaulding, Todd (T.C.)
Subject: Cable Stretch

Harry:

We have found that the U152 shift cable always stretches during the vehicle pullout test and the vehicle is stuck on the hill (always nose-up) when the stretch occurs. Tonight, my test vehicle was stuck on the hill again at 92th pullout cycle. I am sure it was not due to the inter-lock problem. A new trans and a new cable are used for the test and pullout loads are between 7.4 and 20.5 lbs, which are below 30 lbs. The last pullout force before the stuck was 15.7 lbs. I would like to have you come over to take a look the problem first thing on Thursday morning. We have an extremely tight test schedule and cannot afford to let vehicle idle. Now, we cannot complete the pullout cycles at once because of being stuck in park. We really need your help to diagnose the problem.

When you come over, would you please bring some cables with you? Thanks.

Regards,

Yehong Xu
YXU1
Park Systems Section
Mechanical/Structural Sub-Systems Dept.
Ph: (734) 458-0717
Fax: (734) 523-6052

From: Xu, Yehong (Y.)
Sent: Wednesday, August 30, 2000 12:48 AM
To: Hildebrand, Dan (D.H.)
Cc: McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Brazin, Jim (J.C.); Spaulding, Todd (T.C.); Perri, Ron (R.J.); Dover, Harry (H.); Platter, Robert (R.D.); Landes, Stephen (S.L.); Brewer, Don (D.J.); Xu, Yehong (Y.)
Subject: PV Test Results

Dan:

I have conducted three PV samples today and results are shown as follows:

1. 4x4 206W957 3.73 AR, Rebuilt trans, new bracket (silver), new cable

Results: Did not pass uphill pullout test. Loads were very low. The vehicle could not be held on the hill. Completed ratchet test. Drop-in speed data is to be compiled.

2. 4x4 206W954 3.55 AR, new trans, new bracket (silver), new cable
Results: Passed pullouts. Uphill loads are between 6 - 19 lbs.
Completed ratchet test. Did not collect drop-in speed because there is data acquisition device installed.

3. 4x2 206W956 3.73 AR, Rebuilt trans, new cable, old bracket (silver). The bracket and shift position were checked before test. There was no noticeable deformation on the bracket before test and shift position was correct.

Results: Pullout loads were high at the beginning of the cycle. Loads range between 6 - 31.6 lbs within the first 20 cycles. Among 20 uphill pullouts, two loads exceeded 30 lbs, 31.6 and 30.2 lbs. Shift position started to change at 10th cycle and loads became higher. Vehicle did not hang-up. Test was stopped after 20th cycle because loads were increasing.

We had both brackets replaced (one on trans and one on column) with the reinforced ones after 20 uphill pullouts, then resumed the test. With same the trans and the vehicle, pullout loads are significantly reduced after bracket change. The uphill range is 3 - 14.2 lbs.

The downhill pullouts are 1.5 - 7.9 lbs. These numbers might be off by one decimal because I might have overlooked the min. and max. values. However, the bracket does make difference.

We completed 100 pullouts in both directions after bracket change.
Drop-in test is completed. Data is to be compiled.

Regards,

Yehong Xu
YXU1
Park Systems Section
Mechanical/Structural Sub-Systems Dept.
Ph: (734) 458-0717
Fax: (734) 523-6052

From: DeFore, Matthew (M.)
Sent: Wednesday, July 28, 2004 11:23 AM
To: Gilewski, David (D.)
Cc: Kainz, Laura (L.L.); Ahmed, Kamal (K.)
Subject: RE: 5-D's requested for the Powertrain R202 calls for the OKTS meeting 7/23/04

Dave - Cost and timing has not changed. The detent lever (rooster comb), 1L2P-7C494-BA, is used on all 5R55S applications - car and truck. Cost could be shared as long as the programs are willing to split. This would include Explorer, Mustang, Lincoln LS & T-Bird. The P-R/R-P notchy feel is evident mainly on floor shift applications, not column.

Matt DeFore
Ford Motor Company - ATEO
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
e-mail: mdefore@ford.com
text pager (internal): MDEFORE

-----Original Message-----
From: Gilewski, David (D.)
Sent: Tuesday, July 27, 2004 10:51 AM
To: DeFore, Matthew (M.); Kainz, Laura (L.L.)
Subject: RE: 5-D's requested for the Powertrain R202 calls for the OKTS meeting 7/23/04

Matt, today the LS vehicle engineering team would like to know what it would cost to implement at todays cost & timing. Also, does the Explorer or another car line share a similiar concern so the costs could be shared.

David G. Gilewski
Phone #'s:
Wixom Launch Rm 2 -248-596-2445
Pgr. 313-795-0813
Fax- 248-59-62455
Bldg #3 . 313-337-3162
Cube 1A052
2004 & 2005 LS Powertrain PMT
Building #3- 20100 Rotunda
email=dgilewsk@ford.com

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Thursday, July 22, 2004 5:32 PM
To: Gilewski, David (D.); Kainz, Laura (L.L.)
Cc: McNeight, Anna (.); Henning, Steve (S.H.); Ahmed, Kamal (K.)
Subject: FW: 5-D's requested for the Powertrain R202 calls for the OKTS meeting 7/23/04
Importance: High

Please reference attached updated presentation for T-Bird notchy shift feel, P-R. If you need more detail, please let me know.

Matt DeFore
Ford Motor Company - ATEO
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
e-mail: mdefore@ford.com
text pager (internal): MDEFORE

-----Original Message-----
From: Gilewski, David (D.)
Sent: Wednesday, July 21, 2004 4:53 PM
To: DeFore, Matthew (M.)
Cc: McNeight, Anna (.); Henning, Steve (S.H.); Kainz, Laura (L.L.)
Subject: FW: 5-D's requested for the Powertrain R202 calls for the OKTS meeting 7/23/04
Importance: High

Matt, Anna has investigated the call of the notchy shifter feel and said it is a result of the roster comb (park pawl engagement. Can you provide the detail on the 5- panel sheet labled notchy shifter feel and explain the known issue and why no action is required.
<< File: OKTS PT issues 5D.ppt >>

David G. Gilewski
Phone #'s:
Wixom Launch Rm 2 -248-596-2445
Pgr. 313-795-0813
Fax- 248-59-62455
Bldg #3 . 313-337-3162
Cube 1A052
2004 & 2005 LS Powertrain PMT
Building #3- 20100 Rotunda
email=dgilewsk@ford.com

-----Original Message-----
From: McNeight, Anna (.)
Sent: Wednesday, July 21, 2004 4:07 PM
To: Gilewski, David (D.)
Cc: McNeight, Anna (.); Henning, Steve (S.H.)
Subject: RE: 5-D's requested for the Powertrain R202 calls for the OKTS meeting 7/23/04
Importance: High

Dave, I thought we agreed that it was not the shifter, but the trans that caused the "notch"? The correct person to work on this is Matt DeFore. You can assign this to me, but I have no power to fix it. Please advise.

-----Original Message-----
From: Gilewski, David (D.)
Sent: Wednesday, July 21, 2004 2:39 PM
To: Kainz, Laura (L.L.); Wolodkiewicz, Wally (S.R.); Yu, Eric (E.); Smith, Mark (M.A.); Huntington, Dennis (D.C.); McNeight, Anna (.); Henning, Steve (S.H.); Matthews, Patrick (P.H.); Sparks, Douglas (D.S.)
Cc: Arszulowicz, Ken (K.J.)

Subject: 5-D's requested for the Powertrain R202 calls for the OKTS meeting 7/23/04
Importance: High

All, I have started to prepare 5-D's for the following R202 calls as requested by the Plant and Launch mgt.

Laura and I need your help to complete the slides for the dry run mtgs and the final OKTS meeting scheduled for Friday 7/23/04.

Please update your slides and send to BGALE2 and CC LKAINZ and DGILEWSK by 12:00pm tomorrow for the 1:00pm Dry run. Some of these issues were just presented today, some of the items I have already contracted the engineers and they are already investigating the issues. New issue or Carry over does not matter, we need to address the cause and or justify a non action for these calls.

1) Transmission shifter feel “notchy” from Park to Reverse & Rev to Park -S.Henning/A. McNeight
2) Axle Whine- Pat Matthews/D.Sparks
3) Transmission Whistle at low speed-Dennis Huntington/Eric Yu/Mark Smith and ??? Need to evaluate vehicle 100088 T-BIrd and get name of R202 driver who made call. Was not called on the Trans stabilize drive today
4) Transmission 3-4 shift tip in change of mind shift- Eric Yu/Mark Smith

5) Drive line Vibration-(not included) Mark Shkoukani going to rebalance drive shafts/ TBD as to who will submit 5-D. Currently on 8/04 VQR agenda.
<< File: OKTS PT issues 5D.ppt >>

David G. Gilewski
Phone #'s:
Wixom Launch Rm 2 -248-596-2445
Pgr. 313-795-0813
Fax- 248-59-62455
Bldg #3 . 313-337-3162
Cube 1A052
2004 & 2005 LS Powertrain PMT
Building #3- 20100 Rotunda
email=dgilewsk@ford.com

From: Kadrovich, Kathy (K.)

Sent: Monday, May 05, 2003 12:41 PM

To: Davidson, Stephen (S.A.); DeFore, Matthew (M.); Ahmed, Kamal (K.); Lejas, Yannick (Y.Y.); Radl, Nathan (N.J.); Leong, Yew-Sum (Y.); Gremaux, Tim (T.); Moore, Gerry (G.); Filipe, David (D.J.); Premiski, Vladimir (V.P.)

Subject: RE: 5R55N Rooster Comb

No to the Lincoln LS and the Ford Thunderbird so far. I take care of S-car warranty. Only shifter issues with park/key problems. Nothing remotely like what Jaguar has experienced. Thank you.
Kathy K.

-----Original Message-----
From: Davidson, Stephen (S.A.)
Sent: Monday, May 05, 2003 10:42 AM
To: Kadrovich, Kathy (K.)
Subject: FW: 5R55N Rooster Comb

Kathy, You are not on the list-see Matt's last sentence on the 2nd issue. It's a request for searching LS and T-Bird for getting stuck on a grade.

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Monday, May 05, 2003 9:45 AM
To: Moore, Gerry (G.); Davidson, Stephen (S.A.)
Cc: Lajiness, Vince (V.); Ahmed, Kamal (K.); Lejas, Yannick (Y.Y.); Radl, Nathan (N.J.); Leong, Yew-Sum (Y.); Gremaux, Tim (T.); Filipe, David (D.J.); Premiski, Vladimir (V.P.)
Subject: RE: 5R55N Rooster Comb

Gerry - Apologies for the late reply. Seems there are two issues we are dealing with.

1. Jaguar, service-only rooster comb released for all remanufactured 5R55N transmissions
2. Issue with Jaguar vehicles, which have the 5R55N transmission, getting stuck in Park on a grade, nose-up

1. The first issue is more related to 'shift feel' or effort to disengage from Park regardless of grade. My understanding is that the service rooster comb was released to eliminate the high effort Park to Reverse concern. We conducted analytical torque to turn studies to prove the P-R efforts were reduced and equivalent to 5R55W transmission. I believe prototype components were sent to a Jaguar facility in England for evaluation with positive results and hence release of the Jaguar service rooster comb. The supplier of the rooster comb, Grosshaus, was never kicked-off with a tooling PO to begin fabrication of the required tooling to produce this part. Supplier initiation was to be handled by the Jaguar team.

A copy of the report for the Jaguar service rooster comb torque to turn study is attached.

2. The second issue was one I had not heard of until your attached note and then one of my engineers recently (end of April, 2003) conducted testing in an Explorer application with the

5R55S transmission. The 5R55S park mechanism is essentially the same as the 5R55N. During his testing the vehicle kept getting stuck on a grade after some break-in of the components. The hang-up condition was very repeatable. Bordeaux Transmission Plant has also described the same type of condition occurring on their final test stand when loading the park mechanism. Based on the spreadsheet you sent to me, I need to verify whether this concern is evident for Lincoln LS, Thunderbird and Explorer applications which also have the 5R55S/W/N transmissions. To date, the 5R55 systems team has not brought this type of concern to my attention as a field concern. My team needs to investigate this further and identify root cause. I will keep you abreast of the conclusions from the investigation. I expect we will have a force analysis study completed by 5/16/2003. Are there Jaguar transmissions available, for our evaluation, which have been returned for this concern?

Steve - Please investigate whether Explorer**, LS and Thunderbird applications** have been reported for getting stuck on a grade. I attached the spreadsheet which summarizes instances reported for Jaguar.

Thanks.

Matt DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
e-mail: mdefore@ford.com
text pager (internal): MDEFORE
-----Original Message-----
From: Moore, Gerry (G.)
Sent: Monday, May 05, 2003 8:21 AM
To: DeFore, Matthew (M.)
Subject: FW: 5R55N Rooster Comb

Hi Matt

do you have any thoughts yet on this? I need to get things moving over here as the problems are not going away!!!

Best regards

Gerry

Gerry Moore
V8 Powertrain PI Engineer
Browns Lane b/4/013
Tel: 02476 207726
Fax: 02476 202883
-----Original Message-----
From: Moore, Gerry (G.)
Sent: 29 April 2003 12:21
To: DeFore, Matthew (M.)
Subject: RE: 5R55N Rooster Comb

Hi Matt

Sorry for the delay in the reply - I have been gathering information.

Attached is a spreadsheet I have produced as an extract from the warranty data for all transmissions replaced so far (approx 5000). I searched the document using 'Park' as the keyword and it has produced over 400 instances. The main concern is either the vehicle will not come out of Park on the flat (possibly due to the rooster comb issue), or it will not come out on an incline (some having to be towed uphill to release). This second scenario is the main cause of my concern.

Have a look at the spreadsheet - it contains both technician and customer verbatims and makes very interesting reading.

There is a focus on this transmission at the moment and would appreciate any input from you. If you need transmissions with this fault I should be able to acquire some.

One problem I have been wrestling with whilst carrying out these preliminary investigations is the lack of serviceability - a thought is we might produce a kit with a rooster comb, cable and parking pawl - what are your thoughts? As long as the parking gear itself is not damaged, could this be a viable, in-car fix?

Thanks and regards

Gerry

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-----Original Message-----
From: DeFore, Matthew (M.)
Sent: 14 April 2003 22:54
To: Moore, Gerry (G.)
Cc: Ahmed, Kamal (K.)
Subject: RE: 5R55N Rooster Comb

Gerry - This is the first I've heard of Jag vehicles not disengaging Park when on a steep incline. Does your team have any further information regarding this concern such as customer or dealer verbatims, etc.? Are there transmissions available for analysis? Thanks.

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-----Original Message-----
From: Moore, Gerry (G.)

Sent: Thursday, April 10, 2003 5:20 AM
To: DeFore, Matthew (M.)
Subject: FW: 5R55N Rooster Comb

Hi Matthew

with reference to the note below to Ying-Yong, can you please let me know about the 'Park' issue as it is becoming more of a concern here in the UK.

Thanks and regards

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Browns Lane b/4/013
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-----Original Message-----
From: Li, Ying-Yong (Y.)
Sent: 07 April 2003 20:15
To: Moore, Gerry (G.)
Subject: RE: 5R55N Rooster Comb

Hi, Gerry,

I was on a training in the morning and I will be sending two reports regarding Jaguar rooster comb redesign to you. Please check them out. Actually they were done in 2001 in order to reduce high shift effort. Also you could check Matthew R. DeFore who is current supervisor for park components section. His section sent the job request on the Jaguar to me. Anything I can help, please let me know.

Best Regards,
Ying-Yong Li
Dynamics & Control CAE

-----Original Message-----
From: Moore, Gerry (G.)
Sent: Monday, April 07, 2003 7:08 AM
To: Li, Ying-Yong
Subject: 5R55N Rooster Comb

Hi Ying-Yong

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From: Davidson, Stephen (S.A.)
Sent: Wednesday, May 07, 2003 10:45 AM
To: DeFore, Matthew (M.)
Subject: RE: 5R55N Rooster Comb

Sebastien indicates he knows of 2 "stuck on grade" concerns - 1 PPP build at SLAP and 1 CQIS report (Trans sent to Bdx-no analysis yet)

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From: DeFore, Matthew (M.)
Sent: Monday, May 05, 2003 9:45 AM
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Cc: Lajiness, Vince (V.); Ahmed, Kamal (K.); Lejas, Yannick (Y.Y.); Radl, Nathan (N.J.); Leong, Yew-Sum (Y.); Gremaux, Tim (T.); Filipe, David (D.J.); Premiski, Vladimir (V.P.)
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Sent: Thursday, April 10, 2003 5:20 AM
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Dynamics & Control CAE

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Gerry Moore
V8 Powertrain PI Engineer
Browns Lane b/4/013
Tel: 02476 207726
Fax: 02476 202883

From: Li, Ying-Yong (Y.)
Sent: Friday, September 20, 2002 3:02 PM
To: DeFore, Matthew (M.)
Cc: Perng, Chin-Yuan (C.Y.)
Subject: RE: 5R55S Park System Components

Hi, Matthew,

I just checked the part numbers for 5R55S you emailed me with those I am using right now for ADAMS modeling and found there are some difference between them.

		ADAMS Model (now)	Same
1L2P-7A441-AC	park pawl	1L2P-7A441-BA	No
1L2P-7D410-AB	park rod	1L2P-7D410-AA	No
1L2P-7D070-BA	pawl return spring	Not available for geometry	
1L2P-7C494-BA	detent lever (rooster comb)	1L2P-7C494-BA	Yes
XW4P-7M092-BB	park gear	1L2P-7M092-AB	No
XW4P-7E332-AB	detent spring assembly	XW4P-7E332-AB	Yes
90GT-7D419-AB	abutment	90GT-7D419-AB	Yes

Therefore I will update my model. Also I need the stiffness and preload for the ratchet spring, the return spring, and the detent spring to make sure they are also updated ones. Thanks,

Ying-Yong Li

734-523-6012
yli17@ford.com

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Friday, September 20, 2002 1:11 PM
To: Li, Ying-Yong (Y.)
Cc: Perng, Chin-Yuan (C.Y.)
Subject: 5R55S Park System Components

Ying-Yong - Please confirm the following park components are in the 5R55S model for P-R, R-P efforts (torque to turn) which we discussed earlier today. If not, the model will need to be updated. Thanks.

1L2P-7A441-AC	park pawl
1L2P-7D410-AB	park rod
1L2P-7D070-BA	pawl return spring
1L2P-7C494-BA	detent lever (rooster comb)
XW4P-7M092-BB	park gear
XW4P-7E332-AB	detent spring assembly
90GT-7D419-AB	abutment

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052

pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

From: DeFore, Matthew (M.)
Sent: Monday, August 29, 2005 8:02 AM
To: Bastien, Richard (R.E.)
Subject: RE: 5R55S Torque to Turn

Rich - We have a request in the system for the 5R55S torque to turn study. I'd expect it to be completed by the end of the week.

Matt DeFore
Ford Motor Company - ATEO
Park & Sensor Systems Section Supervisor
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-----Original Message-----
From: Bastien, Richard (R.E.)
Sent: Sunday, August 28, 2005 11:01 PM
To: DeFore, Matthew (M.)
Cc: 'Case, Mark'; Platter, Robert (R.D.); Shao, Junmin (J.)
Subject: RE: 5R55S Torque to Turn

Matt,

I'm being pressured to finalize design evidence to support the shifter production tooling as soon as possible. The tooling has been kicked off but we still need to confirm the artificial feel geometry based on the OML reaction forces. Do you know when the information requested below will be made available? Please advise.

Thank you,

Richard

-----Original Message-----
From: Bastien, Richard (R.E.)
Sent: Friday, August 19, 2005 5:35 PM
To: DeFore, Matthew (M.)
Cc: 'Case, Mark'; Platter, Robert (R.D.)
Subject: RE: 5R55S Torque to Turn

Matt,

You are right, I do have all the geometry necessary to convert the torque into a force. One concern is that you gave me the OML torque graph of the 5R55N and 5R55W transmissions and I need it for the 5R55**S** transmission. The other concern is that the graph is a function of time and we don't know the angular speed to convert to an angular displacement needed in our calculations. If you don't have that information, could you make a new request to get the 5R55S OML **torque vs. angle graph**.

Thank you,

Richard

From: DeFore, Matthew (M.) [mailto:mdefore@ford.com]
Sent: Thursday, August 18, 2005 9:27 AM
To: Case, Mark
Subject: RE: 5R55S Torque to Turn

Mark - Since FEV designed the shift cable, bracket and shifter, this is something your team should be able to easily calculate with the transmission torque to turn information. You already have the OML length, hence you can determine the effective length from OML center of rotation to the line of action of the shift cable.

Matt DeFore
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-----Original Message-----
From: Case, Mark [mailto:Case@fev-et.com]
Sent: Thursday, August 18, 2005 9:19 AM
To: DeFore, Matthew (M.)
Subject: RE: 5R55S Torque to Turn

Matt,
We want to know the effort to move the OML from P to 1 – when you pull on the end of the OML.
Thanks,
Mark

From: DeFore, Matthew (M.) [mailto:mdefore@ford.com]
Sent: Thursday, August 18, 2005 8:52 AM
To: Case, Mark
Subject: RE: 5R55S Torque to Turn

Mark - The OML has nothing to do with the transmission detent system torque to turn, which was Richard's original request. The current detent spring and rooster comb are the same as those used in the study. If you're calculating shift efforts in the vehicle, then the OML will obviously have a role in those calculations. What is it that your trying to determine?

Matt DeFore
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-----Original Message-----
From: Case, Mark [mailto:Case@fev-et.com]
Sent: Thursday, August 18, 2005 8:39 AM
To: DeFore, Matthew (M.)
Cc: Platter, Robert (R.D.); Aldrich, Daniel (D.C.); Bastien, Richard (R.E.)
Subject: FW: 5R55S Torque to Turn

Matt,
Basically, the answer is yes, please make a new request for the 5R55S with the new OML. We believe these results are no longer valid because the OML design is changed for U251 and this program.
Thank you,

Mark Case
FEV Engine Technology
case@fev-et.com
mcase4@ford.com
phone: 248-370-8638

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Wednesday, August 17, 2005 9:41 PM
To: Bastien, Richard (R.E.)
Subject: RE: 5R55S Torque to Turn

Richard - I've reviewed all of the studies within our database. Attached is the only study where the current truck detent system has been evaluated analytically (pink line on the graph). The study only considers a nominal system. If you need more information than what is contained within this report, a new request will need to be entered in to the system.

<<report7.doc>>

Matt DeFore
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-----Original Message-----
From: Bastien, Richard (R.E.)
Sent: Wednesday, July 27, 2005 5:52 AM
To: DeFore, Matthew (M.)
Cc: Shao, Junmin (J.)
Subject: RE: 5R55S Torque to Turn

Matt,

This is unfortunately not the OML torque graph relative to P->1 and 1->P positions that I requested. Could you kindly review the link that you gave me.

Thank you,

Richard

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Wednesday, July 27, 2005 6:22 AM
To: Bastien, Richard (R.E.)
Subject: FW: 5R55S Torque to Turn

Richard - A 5R55S detent system torque to turn study can be located at the link below.

Matt DeFore
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-----Original Message-----
From: Ahmed, Kamal (K.)
Sent: Tuesday, July 26, 2005 4:04 PM
To: DeFore, Matthew (M.)
Subject: 5R55S Torque to Turn

Matt,

Following link is for 5R55S Torque to Turn Report:

http://www.apdm.ford.com/apdm/v4.0/www/ATO/CCN/CAE/DCS/Yli17/report1_03/report_lincoln_LS_filter.pdf

Regards,

Kamal Ahmed
Product Design Engineer
Park Systems Design 5R55 & 6R Transmissions
Mechanical / Structural Sub Systems
Ford Automatic Transmission New Product Center

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mcase4@ford.com
phone: 248-370-8638

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Wednesday, August 17, 2005 9:41 PM
To: Bastien, Richard (R.E.)
Subject: RE: 5R55S Torque to Turn

Richard - I've reviewed all of the studies within our database. Attached is the only study where the current truck detent system has been evaluated analytically (pink line on the graph). The study only considers a nominal system. If you need more information than what is contained within this report, a new request will need to be entered in to the system.

<<report7.doc>>

Matt DeFore
Ford Motor Company - ATEO
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text pager (internal): MDEFORE

-----Original Message-----
From: Bastien, Richard (R.E.)
Sent: Wednesday, July 27, 2005 5:52 AM
To: DeFore, Matthew (M.)
Cc: Shao, Junmin (J.)
Subject: RE: 5R55S Torque to Turn

Matt,

This is unfortunately not the OML torque graph relative to P->1 and 1->P positions that I requested. Could you kindly review the link that you gave me.

Thank you,

Richard

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Wednesday, July 27, 2005 6:22 AM
To: Bastien, Richard (R.E.)
Subject: FW: 5R55S Torque to Turn

Richard - A 5R55S detent system torque to turn study can be located at the link below.

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-----Original Message-----
From: Ahmed, Kamal (K.)
Sent: Tuesday, July 26, 2005 4:04 PM
To: DeFore, Matthew (M.)
Subject: 5R55S Torque to Turn

Matt,

Following link is for 5R55S Torque to Turn Report:

http://www.apdm.ford.com/apdm/v4.0/www/ATO/CCN/CAE/DCS/Yli17/report1_03/report_lincoln_LS_filter.pdf

Regards,

Kamal Ahmed
Product Design Engineer
Park Systems Design 5R55 & 6R Transmissions
Mechanical / Structural Sub Systems
Ford Automatic Transmission New Product Center

From: Lu, Xiaoyong (XL.)
Sent: Thursday, September 01, 2005 9:32 AM
To: DeFore, Matthew (M.)
Cc: Ahmed, Kamal (K.); Perng, Chin-Yuan (C.Y.)
Subject: RE: 5R55S Torque to Turn

Attachments: drag_angle.jpg; nodrag_angle.jpg

drag_angle.jpg (73 KB)

nodrag_angle.jpg (73 KB)

Matt:
Attached two praphs are t2t vs angle plots. The peak data are the same. Please also note that the roller position starts at reverse vally which define as 0 degree and it rolls to park (-20 deg) and then from park to 3. I also put the corresponding peak angle in the plot, so the real angle (if the park position defines as 0 deg) can be easily obtained.

Thanks

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Thursday, September 01, 2005 8:22 AM
To: Lu, Xiaoyong (XL.)
Subject: FW: 5R55S Torque to Turn

Xiaoyong - Please replot the torque graphs plotting torque vs. angle instead of time. Thanks.

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-----Original Message-----
From: Bastien, Richard (R.E.)
Sent: Thursday, September 01, 2005 5:11 AM
To: DeFore, Matthew (M.)
Subject: RE: 5R55S Torque to Turn

Matt,

I hate to disturb you again but I can't use the graphs that you sent me. Without knowing the angular speed at which this measurement was done, I can't correlate it to an angular displacement. Based on the distance between 2 and 1 relative to other PRNDL positions, it also appears that the angular speed is variable during the measurement. Could you kindly provide a graph of torque vs. angle.

Thank you,

Richard

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Wednesday, August 31, 2005 10:31 PM
To: Bastien, Richard (R.E.)
Subject: FW: 5R55S Torque to Turn

Rich - Attached are the 5R55S torque to turn plots w/o friction and w/ 1000 N-mm of friction.

Matt DeFore
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text pager (internal): MDEFORE

-----Original Message-----
From: Lu, Xiaoyong (XL.)
Sent: Wednesday, August 31, 2005 9:11 AM
To: Ahmed, Kamal (K.)
Cc: DeFore, Matthew (M.); Perng, Chin-Yuan (C.Y.)
Subject: 5R55S Torque to Turn

Kamal:
I have completed the analysis you requested. Since my PC crashed yesterday and I could not write a report right away. I'll attached the two graphs and summarise the data below for you to have a look.

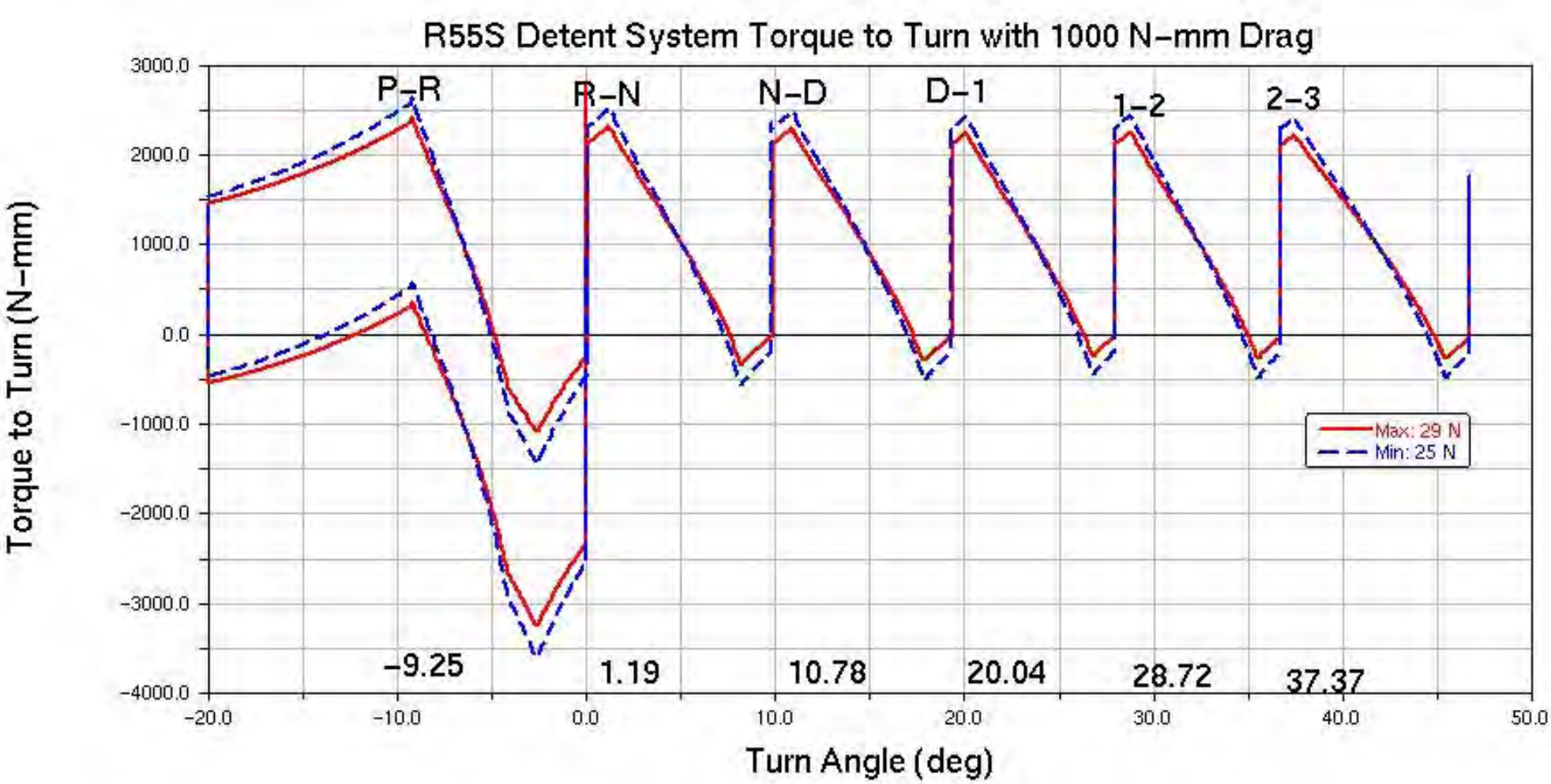
Here is the peak torque to turn corresponding each position: (All units are Newton-mm and Maximum and Minimum preload is 29N and 25N, respectively)

For No Drag:

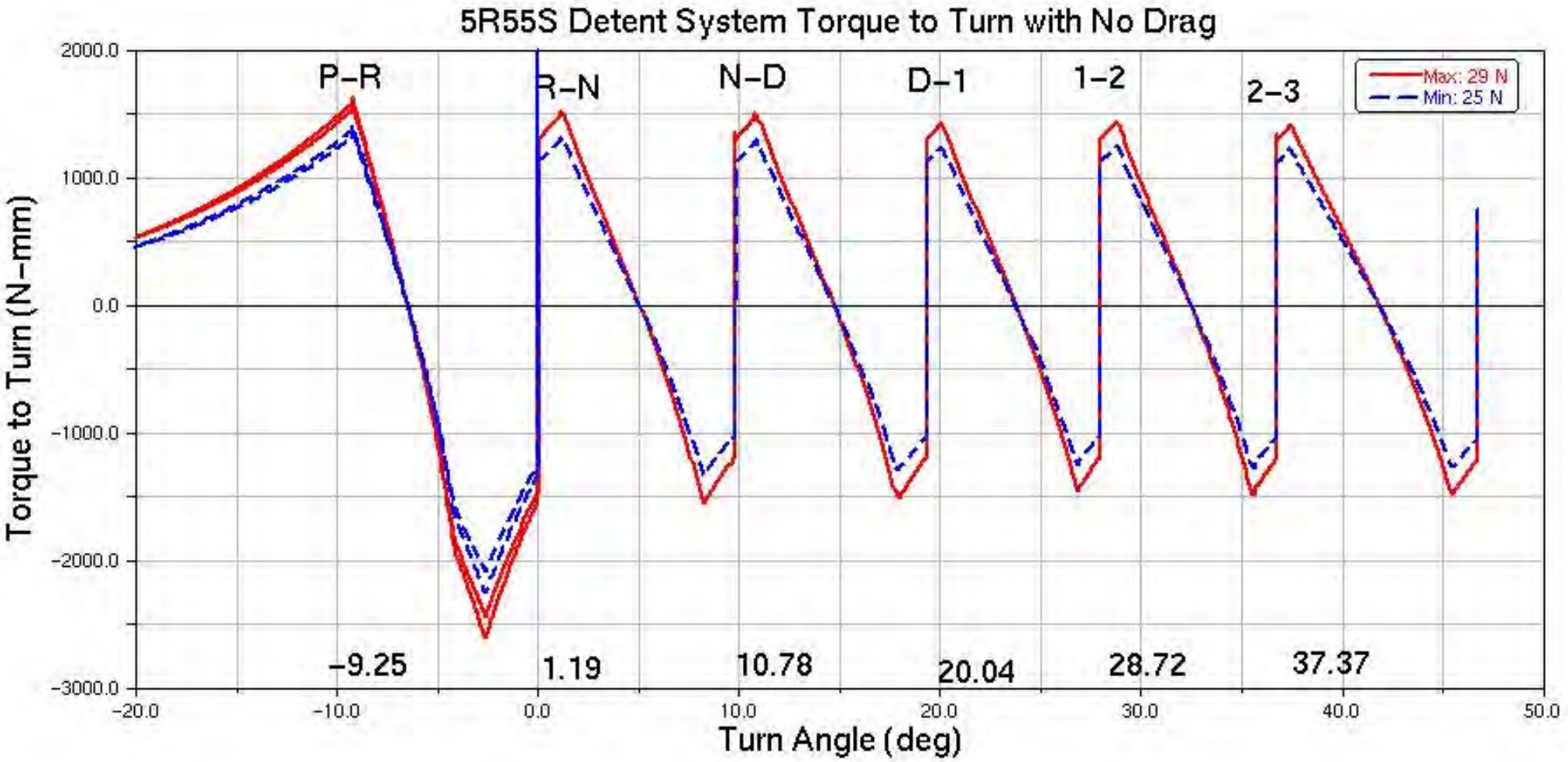
Positions:	P--R	R--N	N--D	D--3	3--2	2--1
Max:	1627.2	1511.5	1498.3	1421.9	1436.0	1411.9
Min:	1406.6	1310.4	1293.3	1233.6	1244.3	1221.1

With 1000 N-mm Drag

Positions:	P--R	R--N	N--D	D--3	3--2	2--1
Max:	2627.2	2511.5	2498.3	2421.9	2436.0	2411.9
Min:	2406.6	2310.4	2293.3	2233.6	2244.3	2221.1


R55S Detent System Torque to Turn with 1000 N-mm Drag
Torque to Turn (N-mm)
Turn Angle (deg)
P-R
R-N
N-D
D-1
1-2
2-3
-9.25
1.19
10.78
20.04
28.72
37.37
Max: 29 N
Min: 25 N
3000.0
2000.0
1000.0
0.0
-1000.0
-2000.0
-3000.0
-4000.0
-20.0
-10.0
0.0
10.0
20.0
30.0
40.0
50.0

PE09-020 1300



From: Hildebrand, Dan (D.H.)
Sent: Sunday, September 24, 2000 8:46 PM
Cc: Yuhasz, Philip (P.D.); Claus, Alain (A.); Adamczyk, David (D.W.); Landes, Stephen (S.L.); Antrim, William (W.R.); Bardallis, Jason (J.E.); Garrett, Dave (D.M.); Crandall, Scott (S.R.); Haddlesey, Mark (M.Q.); Hart, Lori (L.A.); McKinnis, Larry (L.N.); Xu, Yehong (Y.); Spaulding, Todd (T.C.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Heikka, Patrick (P.C.); Fyie, Matthew (M.L.); Brazin, Jim (J.C.); Perri, Ron (R.J.); El-Khoury, Joe (J.E.); Boes, Tim (T.P.); Sledz, Ted (T.M.)
Subject: RE: 5R55W Job#1 Launch Issue Daily Update

Senior Mgmt. Summary;

- Transmission Job#1 at Bordeaux scheduled October 16.
- First week of IB build requirements (90 units) scheduled October 13 with Job#1 content parts. (U152 Chief Program Engineer recommended MRD at LAP as late as 10/20.)
- PV/PSW of transmission assembly at Bordeaux October 12.
- PSW parts at Bordeaux on or before October 4.
- ESO scheduled 9/29 -10/2 to close all but 1 item (Park System DV with interim PSW parts will be 80% complete).

Park System:

2 Mandatory changes to support Job#1;

Park Pawl Return Spring Torque Increase - Supplier Scherdel

- increase from 200 N-mm to 270 N-mm
- supplier confimed ability to deliver production parts with PSW 2 weeks from P.O.
- Design length finalize 9/24

Park Pawl Tooth Nose Up Angle Change - Supplier MPI International Inc.

- change from base will be 5 degrees - design direction given 9/24
- interim PSW parts from MPI at Bordeaux within 12 days from direction (2000 to be ready to go to heat treater by midnight 9/25)
- PSW fine blanked parts from MPI at Bordeaux 22 days from direction (high volume process)

Build Rate and Flow Capability

- team assessing supplier ability to support Bordeaux scheduled ramp rate with low volume and/or high volume process parts (additional green pawls to be machined to 5 degree angle reduction will likely be required - other parts O.K.)
- initial efforts had addressed LAP volume requirements which are considerably lower than Bordeaux's scheduled build rate

Below is the detail with updates;

Analysis/Modelling:

- 5 degree change in nose up park pawl angle in conjunction with 35% increase in torque of pawl return spring will be released at Job #1 containment. ADAMS and Mathcad models to be updated to show full

range of expected pawl angle, cam angle, friction coefficient and spring rate per production release. Next evaluate/confirm post Job#1 improvements for conditions that can be assessed in this way. An additional increase in pawl circular tooth thickness between 0.2 and 0.7 mm is under investigation to further reduce drop in speeds - post Job#1 but containable in high volume fine blank die timing.

- 5R55W park system reaction stress FEA in progress - results show increased pawl shaft engagement is desireable. Further detail on 9/25. Areas of opportunity for improvement identified from crude model on Sat. - case/cover/extension casting material adds. Any action taken will be post Job#1.
- Cognition model complete. Major contribution and most sensitive tolerance identified relative to park cam/rod interface vs. outer manual lever location. Look into column vs. floor shift variants on 9/25.
- VSA DO 5-2000-1434 prioritized in CAD (in parallel with Cognition Model above). Initial review conducted Sat. Chamfers significantly reduce pawl pin engaged length. Room in castings to use longer shaft - this would improve strength robustness.
- Both torque to turn at the outer manual lever shaft in the clockwise direction and the torque variability in this direction as measured for a large sample of 5R55W's on the Bordeaux final test stands is high. Bordeaux checked the equipment and the data - valid. This test simulates pull out of park function in the nose up direction (below maximum in vehicle loads). Sharonville data on N test stands is similar.

DV Prep/Actions:

- Supplier made pawls (radius cutter used to modify green pawls on nose up side rather than fine blanked on that surface) with 3 degree angle change from base were evaluated with increased torque spring and production rod cam angles. Lowest axle ratio applications demonstrated that rod cam angle change is also desired. Run low axle ratio vehicles with weight reductions to confirm that output shaft torque is the driving input which changes test results on grade - take torque on vehicle with instrumented driveshaft. Scheduled 9/22.
- MPI pawls made from process like low volume process for pawl angle changes of 4, 5 and 6 degrees arrived in Livonia Fri. P.M. to support final selection/confirmation for production pawl angle.
- Pull out efforts with floor shift vehicle - baseline and with proposed production level hardware described in step above - is above 30 pound max. specification on some disengagements with baseline hardware. Design direction for cam angle change limited on the lower angle side by this consideration.
- Keller contacted to provide park rod actuating cams at extremes of tolerance range. Parts checked at Livonia are in upper 1/2 of tolerance range (opposite condition from desired). Rods with cam angles of 4.5 degrees and 4.7 degrees made via proposed low volume process at A+E Keller are at Livonia Thurs. P.M. Actual range of angles is less than requested - may reduce test matrix until upper limit parts can be delivered. Spring force also to be measured. Will evaluate friction coeficient on bench stand in parallel with start of vehicle screening test with 3 degree MPI pawls on hand. Cam finish from grinding on these first parts may be coarser than desired. Shifter efforts unacceptbly high with these cams. Bench friction obtained to compare to production rods both as received and with a post process polish and moly-kote treatment. Insufficient reduction with polish and moly-kote. Stopped all Job#1 action to modify production cams. Continuing effort to reduce tolerance but MUST maintain production surface texture and phosphate coat for any production parts.
- Re-evaluation of bump test results with 3 degree pawl change complete Tues. - PASS. Proposed changes will not deteriorate this function. Rerun with final design 9/27.
- Visual recording Sat. obtained 1 skip tooth event (1 tooth) on reverse drop in speed test with baseline parts. Otherwise all tests indicated full engagement and proper function of the system for that specific test transmission and test vehicle. Video analyzed 9/21.
- Bench test to define range of operating friction coefficients provided unexpected results - determined to be specific to sequence of starting pump first vs. starting stand electronics first - not a hardware issue. Test data sufficient to establish friction coefficients to put into analytical model. 4 more transmissions prepared and tested. Rest of friction coefficient data to be available Wed. First samples indicated coefficient down to 0.89 vs. 0.09 desired min. with general acceptable range up to 0.11/0.12. Upper limit of tested friction coefficient to be confirmed 9/25 (around 0.12). No tendency to "spit out" on bench - had been expected based on grade test results.
- 4.0L 4X2 vehicle fitted with instrumented driveshaft to establish actual torque at park gear on grade tests. Data taken 9/20 P.M. Data with unloaded vehicle indicates test stand loads are in an appropriate range. Rerun Fri. at full GVW - complete - data still indicates test stand parameters appropriate. Loads to be used in CAE models.

- 24 test transmissions built at Bordeaux Mon. A.M. and 23 shipped Thurs. Arrived at Livonia Mon. 9/18. Another 24 built 9/21 and shipped.
- Ultimate test on W bench test to be conducted (E and N also for benchmark comparison).
- Additional high speed ratchet test information is desired but secondary priority vs. pullout efforts, drop in speeds and disengagement confirmation. Pawl return spring is weakest element but maintains number of cycles previously reviewed.
- Test matrix defined and executed for final screening of cam angle, pawl angle and spring force to confirm Job#1 requirements on dimensions. Any refinements for post Job#1 improvements will be directionally identified as well. Focus is on 3.27 A/R 4X2 and 3.55 A/R 4X4 pullout efforts and ability to disengage park with unloaded 3.73 A/R vehicle on 17% grade. At test completion, drop in speeds will be assessed -> 9/25.
- Plan is to move directly to full DV after screening test is complete. Completion of full DV required prior to 9/29 - 10/2 new ESO date (combined ratchet and pullout must be run with interim PSW production intent parts to get appropriate material heat treat characteristics - due 9/28 or 9/29 in Livonia).
-

Production Prep/Supplier Actions:

- New fine blank die in progress at MPI in parallel with design direction actions. Die has been progressed to level where final direction is required from Ford.
- Team (including supplier MPI) concense that radius cut revision to existing green pawls (5482 available) can be used to support IB (needed to support Job#1).
- Finalize production timeline segments Thurs. 22 days from Ford definition of design to PSW level Fine Blanked parts at Bordeaux (paperwork to travel separately). Timing on radius cut parts 7 - 10 days plus ~ 2 days shipping to Bordeaux from 9/25. Still need to get funding to MPI through finance for work done on prior release and prototype parts. 2000 parts minumum at $2.94/pawl with $1200 fixture cost. Given Ford direction to MPI by start of business 9/25 (achieved), 2000 pawls will be ready to go to the heat treater by midnight Monday.
- Keller timing to change in park rod actuating cam nominal angle - 3 weeks to start PSW plus 1 week for PSW. Team agreed to improve timing by supplying interim PSW parts from low volume process. An alert will be required to authorize the low volume process. First 300 interim PSW parts due at Bordeaux by 10/4. Supplier authorized on 9/18 to proceed to make new tool(s) and obtain guages. DIRECTION CANCELLED, work on tool stopped as of 9/24 due to poor test results in screening matrix. Angle tolerance reduction is still desired but have to maintain surface character and phosphate coat.
- EBEA can supply an increased pawl shaft length with PSW 3 weeks from PO at piece price of 1.39 FRF. This would be a post Job#1 action. Investigating change to case casting/machining to allow more than 1mm shaft length increase and reduce stresses at the case. Have to insure that parts cannot be mixed.
- Confirmed that Scherdel can supply revised pawl return spring to support Job#1 timing. PSW can be achieved with production parts in 2 weeks at Bordeaux from direction to proceed. Scherdel is CMMS supplier. No testing done on Scherdel springs. Direction given to Scherdel to complete fatigue cycling tests. Team decision made to proceed with 35% increase in effective torque load of pawl return spring (200 n-mm -> 270 n-mm). Load increase is achieved with a spring wire diameter increase from 1.24 mm to 1.3 mm. The spring length from the coil centerline to the outside of the wire "hook" which wraps around the pawl is reduced from 44.39/43.99 mm to 44.14/43.15 mm and the location from the coil centerline to the 12/10 R on the long arm of the spring going down the pawl hook is reduced from 27.5/26.5 mm to 26.7/25.7 mm. Release to flow into system as soon as pawl angle change is confirmed - 9/25.
- Koeln Forge and Fagor requested to define timing for increase in backup material around park pawl shaft boss in case. Koeln can do this quickly. Fagor? Castings had been stopped while this request was under review. Direction given 9/20 to continue making current castings to support production demand.
- LAP build schedule is; 90 IB's week of 10/23, 76 IB's week of 10/30, 160 IB's week of 11/6, 640 Job#1's week of 11/13, 720 week of 11/20, 1600 week of 11/27, 1396 week of 12/4, 2260 week of 12/11, 2166 week of 12/18. All are intended to be saleable.
- Bordeaux build schedule is considerably more aggressive; 200/day week of 10/16, 350/day week of 10/23, 500/day week of 10/30, 600/day week of 11/6, 800/day week of 11/13, 1100/day week of 11/20, 1100/day thru December, 1500/day thru January, 1700/day in February and March.
- Team assessing supplier ability to support Bordeaux voulume rate and flow plans with either low volume and/or high volume production processes. Favorable. Another batch of green pawls will be ordered to allow further refinement to pawl prior to release of long term production direction on pawl fine blank tool.

Bore 201 Valve Wear/Sticking;

- Bordeaux confirmed that 20 micron minimum anodize thickness can be obtained. Above 30 microns the finish specification is not met. Production can support week of 9/18 with increased thickness.
- First Bordeaux test to 800/1000 Kilometers of thicker coating gave positive results. 2 parts continued to 2500 Kilometers show beginning signs of wear on sleeve and initiation of flaking/wear of valve coating similar to lower distance tests with prior level parts.
- High mileage dynamometer tests of Alcoa 4032 aluminum sleeves in progress - 2 at 50 cycles, 1 additional start 9/25. Concerns are internal sleeve wear at high mileage and wear at the sleeve/clip interface (which was a problem before the 6262-T8/T9 sleeves/plugs were anodized).
- Bordeaux purchasing Alcoa 4032 sleeves to support production if approved via long term durability test and needed to protect Job#1. Continued testing at Bordeaux shows good results - continuing to run. 3 units stopped at 5000 - 6000 Kilometers. 5 more 4032 sleeves to go on test in the states in LAP high mileage vehicles. Installation 9/23 at LAP. These will have valves with 30 - 39 micron anodize thickness processed at Bordeaux (surface is a little rougher than desired).
- Product funding Scherdel production tool ($5000) for round wire R clip to have this design available for introduction shortly after Job#1. Prototype tool available in N.A. but cannot PSW parts from this tool for production.
- Bordeaux anodize process under further review vs. 5R55N supplier. Another visit to Rich Coat (N anodize supplier - part of Allan Tool) by Livonia Engineer 9/14 to further understand process and check progress of W prototype parts. Details communicated to Bordeaux. Review continuing at Bordeaux.
- Bordeaux obtained parts in preparation to anodize valve and sleeve as separate batch (like 5R55N supplier) instead of mixed with larger parts as has been done for pre-production parts. First run 9/22. Finish 9/25 - 9/26.
- Ebea and L.C. Matre shipped Monday a quantity of sleeve blanks to INA and VCST for alternate process deburr tryouts. Parts at INA Tues. (investigate both directed sand blast and electro-chemical deburr with INA sub-suppliers) and at VCST Wed. for thermal deburr. Electro-Chemical deburr available thru INA sub-supplier starting at 200/day. VCST can thermal deburr the sleeve and has expressed interest in maintaining this business at production volumes. Volume capability and timing to be provided. Supplier near L.C. Maitre being investigated as possible production source for directed sand blast.
- Test on Bordeaux vehicle with N production valve/sleeve (minor non-functional modification to 2 land valve required to fit in valve body) and production flat wire W clip demonstrated minor wear at 1000 km like Bordeaux processed W parts.
- KLT of 4.6L PV3 trans. (Bordeaux made parts with thinner anodize coating) torn down at 270/500 cycles (about 81,000 customer miles). Valve polished and anodize worn off in an eliptical pattern at sleeve end of valve but there were no deep scratches evident - only polishing type wear.
- Test on Bordeaux vehicle with 3 land valve (combines converter clutch modulator valve with 2 land valve in same bore) and prototype round wire R clip - excellent results - duplicated on Livonia test vehicle. Pursuing further with Bordeaux Mfg. and Tim Boes. Review in Livonia 9/22. Layout and dimensional requirements FAX'd to Bordeaux 9/20 P.M.
- Effort will be initiated to tap pressure at the valve on Livonia vehicle to determine if actual presssure matches commanded pressure and assess actual pressure stability. Functional RCON/PC1A board identified. Apply and steady state signals show no oscillatory pressure signals of concern. Need to study tip out further. Accelerometer signal shows large spike in 4th/5th - attached to valve body under bore 201. May be due to torque reversal or to signal in valve bore.
- Short KLT on Chassis Roll running. 1 baseline completed 9/24 and replicated the Bordeaux road test results. 2nd baseline to complete 9/25. DOE to follow. Road test at Livonia gives results comparable to Bordeaux road test and Alcoa 4032 sleeve is running.
- EBEA to supply both 4.6L and 4.0L valve and sleeve (Alcoa 4032) for initial month of production.
- New team member(s) have provided some additional alternatives which will be investigated; make single land valve into a 2 land valve with second land piloting in a new small land in the sleeve end, investigate increased valve to sleeve clearance, investigating taper in sleeve and reduction of same, and if high fequency oscillations are present, put a small orifice in the end of the sleeve (0.5 mm dia.) or reduce single land valve overlap. Agreed that single 3 land valve is best alternative but recognize manufacturing feasibility concerns, these alternatives may provide much of the benefit of a single 3 land valve w/o the feasibility issues.

- N.A. Purchase has been authorized to discuss with Allen Tool, the possibility of providing valve/sleeve to N process as interim containment action - this is a back up plan at this time. Allen Tool continues to indicate no capacity and no interest. Master Automatic contacted and Federal Screw recommended BUT we have no experience with these suppliers on like parts so cannot recommend Job#1 support from them.

Remaining "Must Fix" Shift Quality Issues From LAP FEU and 8/31 Pinckney Management Drive Which Have Actions Open;

c) Random harsh/noisy park to reverse engagements - minor improvement

- Established transfer function for "low volume" production solenoid modules to support 9/20 R06 release using FEU solenoid modules. Improves item c) and improves other content not on the "Must Fix" list.
- Press fit spline halfshaft test for Reverse Engagement effect being prepared by U152 PTSE (FEU's have more backlash than Job#1 intent).
- Drive of R06 in FEU vehicles at LAP scheduled 9/25 - 9/27. Assess learning in first 200 miles of vehicle's life.
- Some very long engagements (over 3 seconds) reported for FEU's this week. Checking 2 day soak to confirm issue - not reproduced after either long or short soak.

Review With Dale Claudepierre and Steve von Foerster (in place of G. Bedi and R. Krygier) 9/14

- Steve recommended giving Bordeaux until 10/20 (vs. 10/16) to have parts at LAP to improve liklihood of robust decisions/support evidence (does not want to service any transmissions in builds beyond FEU).
- Both Steve and Dale were more confident that our work on the Park System would provide a valid Job#1 containment than our success to date related to valve wear. The correct steps appear to have been taken but test results do not support that process improvements have provided wear resistance comparable to the 5R55N parts.
- Phil Yuhasz indicated that we needed to re-emphasize with Purchase an effort already in progress to source initial W production for the bore 201 valve and sleeve (Converter Clutch Modulator) to Allan Tool - the N supplier.
- Report Park System Pawl Screening DV results for revised pawl nose up angle and increased torque pawl return spring to Steve as soon as they are available.
- Set up another Bedi/Krygier 5R55W review for the week of 9/25. Earliest date we could get is 10/5 - currently scheduled.

Dan Hildebrand, P.E.
Manager, 5R55N/E/W/S Auto Trans Systems Dept
Ph: 734-52-34598, Fax: 734-45-80991/734-52-33910
Text Pager: 734-797-6257
e-mail: dhildebr@ford.com/CDS ID: DHILDEBR
Mail Drop T-201, Rm. W318B, ATNPC, Livonia
Admin. Asst.: Judy Lardin, Ph: 734-52-34517

From: Hildebrand, Dan (D.H.)
Sent: Thursday, September 21, 2000 7:52 PM
Cc: Yuhasz, Philip (P.D.); Claus, Alain (A.); Adamczyk, David (D.W.); Landes, Stephen (S.L.); Antrim, William (W.R.); Bardallis, Jason (J.E.); Garrett, Dave (D.M.); Crandall, Scott (S.R.); Haddlesey, Mark (M.Q.); Hart, Lori (L.A.); McKinnis, Larry (L.N.); Xu, Yehong (Y.); Spaulding, Todd (T.C.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Heikka, Patrick (P.C.); Fyie, Matthew (M.L.); Brazin, Jim (J.C.); Perri, Ron (R.J.); El-Khoury, Joe (J.E.); Boes, Tim (T.P.)
Subject: RE: 5R55W Job#1 Launch Issue Daily Update

Senior Mgmt. Summary;

- Transmission Job#1 at Bordeaux scheduled October 16.
- First week of IB build requirements (90 units) scheduled October 13 with Job#1 content parts. (U152 Chief Program Engineer recommended MRD at LAP as late as 10/20.)
- PV/PSW of transmission assembly at Bordeaux October 12.
- PSW parts at Bordeaux on or before October 4.
- ESO scheduled 9/29 to close all but 1 item (final confirmation via test hardware review of higher mileage Alcoa 4032 Bore 201 TCC Modulator Valve sleeves to be conducted 10/2).

Park System:

3 Mandatory changes to support Job#1;

Park Rod Cam Angle - Supplier A+E Keller GmbH (critical path)

- decrease nominal from 5.0 degrees to 4.7 degrees and reduce tolerance from +/- 0.5 degrees to +/- 0.2 degrees
- supplier authorized to proceed to make new tools/guages 9/18
- supplier to deliver 300 piece interim PSW parts to Bordeaux per low volume process by October 4
- early weeks of production to be covered in this way until new cold form die and high volume process is in place and PSW'd
- initial timing estimate 3 weeks to start PSW process + 1 week to complete supplier PSW (high volume production process)

Park Pawl Return Spring Torque Increase - Supplier Scherdel

- increase from 200 N-mm to 270 N-mm
- supplier confimed ability to deliver production parts with PSW 2 weeks from P.O.

Park Pawl Tooth Nose Up Angle Change - Supplier MPI International Inc.

- change from base must be between 3 degrees and 6 degrees - additional analysis/prototype parts and 2nd screening test in progress to finalize decision relative to cam angle definition above (9/23)
- interim PSW parts from MPI at Bordeaux within 12 days from direction (2000 to be ready to go to heat treater by midnight 9/25)
- PSW fine blanked parts from MPI at Bordeaux 22 days from direction (high volume process)

Build Rate and Flow Capability

- team assessing supplier ability to support Bordeaux scheduled ramp rate with low volume and/or high volume process parts (by selecting only 1 pawl angle to be processed using existing green pawls, Bordeaux build schedule appears to be supported - to be confirmed)
- initial efforts had addressed LAP volume requirements which are considerably lower than Bordeaux's scheduled build rate

Below is the detail with updates;

Analysis/Modelling:

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- MPI pawls made from process like low volume process for pawl angle changes of 4, 5 and 6 degrees are expected in Livonia Sat. A.M. to support final selection/confirmation for production pawl angle (trying to make Fri. P.M. delivery but not high confidence).
- Pull out efforts with floor shift vehicle - baseline and with proposed production level hardware described in step above - is above 30 pound max. specification on some disengagements with baseline hardware. Design direction for cam angle change limited on the lower angle side by this consideration.
- Keller contacted to provide park rod actuating cams at extremes of tolerance range. Parts checked at Livonia are in upper 1/2 of tolerance range (opposite condition from desired). Rods with cam angles of 4.5 degrees and 4.7 degrees made via proposed low volume process at A+E Keller are at Livonia Thurs. P.M. Actual range of angles is less than requested - may reduce test matrix until upper limit parts can be delivered. Spring force also to be measured. Will evaluate friction coeficient on bench stand in parallel

with start of vehicle screening test with 3 degree MPI pawls on hand. Cam finish from grinding on these first parts may be coarser than desired - TBD.

- Re-evaluation of bump test results complete Tues. - PASS. Proposed changes will not deteriorate this function.
- Visual recording Sat. obtained 1 skip tooth event (1 tooth) on reverse drop in speed test with baseline parts. Otherwise all tests indicated full engagement and proper function of the system for that specific test transmission and test vehicle. Video analyzed 9/21.
- Bench test to define range of operating friction coefficients provided unexpected results - determined to be specific to sequence of starting pump first vs. starting stand electronics first - not a hardware issue. Test data sufficient to establish friction coefficients to put into analytical model. 4 more transmissions prepared and tested. Rest of friction coefficient data to be available Wed. First samples indicated coefficient down to 0.089 vs. 0.09 desired min. with general acceptable range up to 0.11/0.12. Upper limit of tested friction coefficient to be confirmed 9/22 (around 0.12). No tendency to "spit out" on bench - had been expected based on grade test results.
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- 24 test transmissions built at Bordeaux Mon. A.M. and 23 shipped Thurs. Arrived at Livonia Mon. 9/18. Another 24 built 9/21 and prepped for shipment.
- Ultimate test on W bench test to be conducted (E and N also for benchmark comparison).
- Additional high speed ratchet test information is desired but secondary priority vs. pullout efforts, drop in speeds and disengagement confirmation.
- Test matrix defined for final screening of cam angle, pawl angle and spring force to confirm Job#1 requirements on dimensions. Any refinements for post Job#1 improvements will be directionally identified as well. Focus is on 3.27 A/R 4X2 and 3.55 A/R 4X4 pullout efforts and ability to disengage park with unloaded 3.73 A/R vehicle on 17% grade. At test completion, drop in speeds will be assessed.
- Plan is to move directly to full DV after screening test is complete. Completion of full DV required prior to 9/29 - new ESO date.

Production Prep/Supplier Actions:

- New fine blank die in progress at MPI in parallel with design direction actions. Die has been progressed to level where final direction is required from Ford.
- Team (including supplier MPI) concense that radius cut revision to existing green pawls (5482 available) can be used to support IB (needed to support Job#1).
- Finalize production timeline segments Thurs. 22 days from Ford definition of design to PSW level Fine Blanked parts at Bordeaux (paperwork to travel separately). Timing on radius cut parts 7 - 10 days plus ~ 2 days shipping to Bordeaux from time of direction and funding from Ford. 2000 parts minumum at $2.94/pawl with $1200 fixture cost. Given Ford direction to MPI by start of business 9/25 (preferred 9/23 P.M.), 2000 pawls will be ready to go to the heat treater by midnight Monday.
- Keller timing to change in park rod actuating cam nominal angle - 3 weeks to start PSW plus 1 week for PSW. Team agreed to improve timing by supplying interim PSW parts from low volume process. An alert will be required to authorize the low volume process. First 300 interim PSW parts due at Bordeaux by 10/4. Supplier authorized on 9/18 to proceed to make new tool(s) and obtain guages.
- EBEA can supply an increased pawl shaft length with PSW 3 weeks from PO at piece price of 1.39 FRF. This would be a post Job#1 action. Investigating change to case casting/machining to allow more than 1mm shaft length increase and reduce stresses at the case.
- Confirmed that Scherdel can supply revised pawl return spring to support Job#1 timing. PSW can be achieved with production parts in 2 weeks (at Bordeaux?) from direction to proceed. Scherdel is CMMS supplier. No testing done on Scherdel springs. Direction given to Scherdel to complete fatigue cycling tests. Team decision made to proceed with 35% increase in effective torque load of pawl return spring (200 n-mm -> 270 n-mm). Release to flow into system as soon as pawl angle change is confirmed (affects sprring length).
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- Team assessing supplier ability to support Bordeaux voulume rate and flow plans with either low volume and/or high volume production processes. Looks favorable but confirmation may take a few more days.

Bore 201 Valve Wear/Sticking;

- Bordeaux confirmed that 20 micron minimum anodize thickness can be obtained. Above 30 microns the finish specification is not met. Production can support week of 9/18 with increased thickness.
- First Bordeaux test to 800/1000 Kilometers of thicker coating gave positive results. 2 parts continued to 2500 Kilometers show beginning signs of wear on sleeve and initiation of flaking/wear of valve coating similar to lower distance tests with prior level parts.
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- Bordeaux purchasing Alcoa 4032 sleeves to support production if approved via long term durability test and needed to protect Job#1. Continued testing at Bordeaux shows good results - continuing to run. 2 units stopped at 4000 Kilometers and 5000 Kilometers respectively so trucks could be prepped for PV. 5 more 4032 sleeves to go on test in the states in LAP high mileage vehicles. Installation to occur Sat. at LAP. These will have valves with 30 - 39 micron anodize thickness processed at Bordeaux.
- Product funding Scherdel production tool ($5000) for round wire R clip to have this design available for introduction shortly after Job#1. Prototype tool available in N.A. but cannot PSW parts from this tool for production.
- Bordeaux anodize process under further review vs. 5R55N supplier. Another visit to Rich Coat (N anodize supplier - part of Allan Tool) by Livonia Engineer 9/14 to further understand process and check progress of W prototype parts. Details communicated to Bordeaux.
- Bordeaux obtaining parts in preparation to anodize valve and sleeve as separate batch (like 5R55N supplier) instead of mixed with larger parts as has been done for pre-production parts.
- Ebea and L.C. Matre shipped Monday a quantity of sleeve blanks to INA and VCST for alternate process deburr tryouts. Parts at INA Tues. (investigate both directed sand blast and electro-chemical deburr with INA sub-suppliers) and at VCST Wed. for thermal deburr. Electro-Chemical deburr available thru INA sub-supplier starting at 200/day. VCST can thermal deburr the sleeve and has expressed interest in maintaining this business at production volumes. Volume capability and timing to be provided. Supplier near L.C. Maitre being investigated as possible production source for directed sand blast.
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- Short KLT on Chassis Roll still under development to support DOE - scheduled to start 9/21 P.M. Road test at Livonia gives results comparable to Bordeaux road test.
- EBEA to supply both 4.6L and 4.0L valve and sleeve (Alcoa 4032) for initial month of production.
- New team member(s) have provided some additional alternatives which will be investigated; make single land valve into a 2 land valve with second land piloting in a new small land in the sleeve end, investigate

increased valve to sleeve clearance, investigating taper in sleeve and reduction of same, and if high fequency oscillations are present, put a small orifice in the end of the sleeve (0.5 mm dia.) or reduce single land valve overlap. Agreed that single 3 land valve is best alternative but recognize manufacturing feasibility concerns, these alternatives may provide much of the benefit of a single 3 land valve w/o the feasibility issues.

- N.A. Purchase has been authorized to discuss with Allen Tool, the possibility of providing valve/sleeve to N process as interim containment action - this is a back up plan at this time.

Remaining "Must Fix" Shift Quality Issues From LAP FEU and 8/31 Pinckney Management Drive Which Have Actions Open;

c) Random harsh/noisy park to reverse engagements - minor improvement

- Established transfer function for "low volume" production solenoid modules to support 9/20 R06 release using FEU solenoid modules. Improves item c) and improves other content not on the "Must Fix" list.
- Press fit spline halfshaft test for Reverse Engagement effect being prepared by U152 PTSE (FEU's have more backlash than Job#1 intent).
- Drive of R06 in FEU vehicles at LAP scheduled 9/25. Assess learning in first 200 miles of vehicle's life.
- Some very long engagements (over 3 seconds) reported for FEU's this week. Checking 2 day soak to confirm issue - not reproduced on short soak.

Review With Dale Claudepierre and Steve von Foerster (in place of G. Bedi and R. Krygier) 9/14

- Steve recommended giving Bordeaux until 10/20 (vs. 10/16) to have parts at LAP to improve liklihood of robust decisions/support evidence (does not want to service any transmissions in builds beyond FEU).
- Both Steve and Dale were more confident that our work on the Park System would provide a valid Job#1 containment than our success to date related to valve wear. The correct steps appear to have been taken but test results do not support that process improvements have provided wear resistance comparable to the 5R55N parts.
- Phil Yuhasz indicated that we needed to re-emphasize with Purchase an effort already in progress to source initial W production for the bore 201 valve and sleeve (Converter Clutch Modulator) to Allan Tool - the N supplier.
- Report Park System Pawl Screening DV results for revised pawl nose up angle and increased torque pawl return spring to Steve as soon as they are available.
- Set up another Bedi/Krygier 5R55W review for the week of 9/25. Earliest date we could get is 10/5 - currently scheduled.

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e-mail: dhildebr@ford.com/CDS ID: DHILDEBR
Mail Drop T-201, Rm. W318B, ATNPC, Livonia
Admin. Asst.: Judy Lardin, Ph: 734-52-34517

From: Hildebrand, Dan (D.H.)
Sent: Wednesday, September 20, 2000 7:09 PM
Cc: Yuhasz, Philip (P.D.); Claus, Alain (A.); Adamczyk, David (D.W.); Landes, Stephen (S.L.); Antrim, William (W.R.); Bardallis, Jason (J.E.); Garrett, Dave (D.M.); Crandall, Scott (S.R.); Haddlesey, Mark (M.Q.); Hart, Lori (L.A.); McKinnis, Larry (L.N.); Xu, Yehong (Y.); Spaulding, Todd (T.C.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Heikka, Patrick (P.C.); Fyie, Matthew (M.L.); Brazin, Jim (J.C.); Perri, Ron (R.J.); El-Khoury, Joe (J.E.); Boes, Tim (T.P.)
Subject: RE: 5R55W Job#1 Launch Issue Daily Update

Senior Mgmt. Summary;

Objective is transmission Job#1 at Bordeaux on or before October 9 - PSW parts at Bordeaux on or before October 4 to meet 10/16 MRD at LAP. (U152 Chief Program Engineer recommended MRD at LAP as late as 10/20.)

Park System:

3 Mandatory changes to support Job#1;

Park Rod Cam Angle - Supplier A+E Keller GmbH

- decrease nominal from 5.0 degrees to 4.7 degrees and reduce tolerance from +/- 0.5 degrees to +/- 0.2 degrees
- supplier authorized to proceed to make new tools/guages 9/18
- initial timing estimate 3 weeks to start PSW process + 1 week to complete supplier PSW
- supplier to deliver 300 piece interim PSW parts to Bordeaux per low volume process by October 4
- early weeks of production to be covered in this way until new cold form die and high volume process is in place and PSW'd

Park Pawl Return Spring Torque Increase

- increase from 200 N-mm to 270 N-mm
- prime supplier Scherdel confimed ability to deliver production parts 2 weeks from P.O.

Park Pawl Tooth Nose Up Angle Change

- change from base must be 3 degrees or greater - additional analysis/prototype parts in progress to finalize decision relative to cam angle definition above (9/21 - 9/25E)
- interim PSW parts from MPI at Bordeaux 12 days from direction
- PSW fine blanked parts from MPI at Bordeaux 22 days from direction

Build Rate and Flow Capability

- Team assessing supplier ability to support Bordeaux scheduled ramp rate with either low volume and/or high volume process parts.
- Initial efforts have addressed LAP volume requirements which are considerably lower than Bordeaux's scheduled build rate.

Below is the detail with updates;

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Mail Drop T-201, Rm. W318B, ATNPC, Livonia
Admin. Asst.: Judy Lardin, Ph: 734-52-34517

From: Hildebrand, Dan (D.H.)
Sent: Monday, September 18, 2000 8:35 PM
Cc: Yuhasz, Philip (P.D.); Claus, Alain (A.); Adamczyk, David (D.W.); Landes, Stephen (S.L.); Antrim, William (W.R.); Bardallis, Jason (J.E.); Garrett, Dave (D.M.); Crandall, Scott (S.R.); Haddlesey, Mark (M.Q.); Hart, Lori (L.A.); McKinnis, Larry (L.N.); Xu, Yehong (Y.); Spaulding, Todd (T.C.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Heikka, Patrick (P.C.); Fyie, Matthew (M.L.); Brazin, Jim (J.C.); Perri, Ron (R.J.); El-Khoury, Joe (J.E.); Boes, Tim (T.P.)
Subject: RE: 5R55W Job#1 Launch Issue Daily Update

Upper management will now get only a brief summary on Park System per direction from Barb Samardzich.

I am assuming those of you at the working level might want to continue seeing the detail? If not, let me know, it would save me some time. The color coding will stops so you have to pick out the new stuff.

This is the Senior Mgmt. Summary;

Objective is transmission Job#1 at Bordeaux on or before October 9 - PSW parts at Bordeaux on or before October 4 to meet 10/16 MRD at LAP. (U152 Chief Program Engineer recommended MRD at LAP as late as 10/20.)

Park System:

3 Mandatory changes to support Job#1;

Park Rod Cam Angle - Supplier A+E Keller GmbH (critical path)

- decrease nominal from 5.5 degrees to 4.7 degrees and reduce tolerance from +/- 0.5 degrees to +/- 0.2 degrees
- supplier authorized to proceed to make new tools/guages 9/18
- initial timing estimate 3 weeks to start PSW process - 1 week improvement needed/being negotiated

Park Pawl Return Spring Torque Increase

- increase from 200 N-mm to 270 N-mm
- supplier Automatic Spring confirmed 2 weeks to have PSW'd parts
- supplier Scherdel to provide timing Tues. (expected to easily support timing)

Park Pawl Tooth Nose Up Angle Change

- change from base must be 3 degrees or greater - additional analysis/prototype parts in progress to finalize decision relative to cam angle definition above (9/21 - 9/25E)
- interim PSW parts from MPI at Bordeaux 12 days from direction (sufficient green stock to select 2 angles to protect timing and proceed)
- PSW fine blanked parts from MPI at Bordeaux 22 days from direction

Below is the detail with updates;

Analysis/Modelling:
- 3 degree change in nose up park pawl angle in conjunction with 35% increase in torque of pawl return spring does not address nose up issue without a coordinated change to the park rod cam angle. Need to

confirm if angle change greater than 3 degrees is needed. The drop in speed reduction achieved with 1.1mm increased circular tooth thickness pawl must be reassessed. Up to 6 degree angle change has been studied as part of effort to get common system forces in nose up and nose down direction (more than 6 degrees required to make them equal).

- 5R55W park system reaction stress FEA in progress - results show increased pawl shaft engagement is desireable. Further detail on Wed. and Fri. Areas of opportunity for improvement identified from crude model on Sat. - case/cover/extension casting material adds.
- Cognition model complete. Major contribution and most sensitive tolerance identified relative to park cam/rod interface vs. outer manual lever location.
- VSA DO 5-2000-1434 being prioritized in CAD (in parallel with Cognition Model above). Initial review conducted Sat. Chamfer significantly reduce pawl pin engaged length. Room in castings to use longer shaft - this would improve strength robustness.
- Both torque to turn at the outer manual lever shaft in the clockwise direction and the torque variability in this direction as measured for a large sample of 5R55W's on the Bordeaux final test stands is high. Bordeaux checked the equipment and the data - appears to be valid. This test simulates pull out of park function in the nose up direction (below maximum in vehicle loads). Sharonville data on N test stands is similar.
- Friction coefficient vs. force at the rod cam and spit out force indicate that rod cam angle reduction would improve system performance and robustness. Action REQUIRED at Job#1 to improve system robustness. Reduce nominal from 5.5 degrees to 4.7 degrees. Tolerance changed from +/- 0.5 degrees to +/- 0.2 degrees. This range selected to satisfy floor shifter efforts and spit out force calculations.

DV Prep/Actions:

- Supplier made pawls (radius cutter used to modify green pawls on nose up side rather than fine blanked on that surface) with angles in fine increments around proposed change were evaluated with increased torque spring and production rod cam angles. Lowest axle ratio applications demonstrated that rod cam angle change is also required.
- Pull out efforts with floor shift vehicle - baseline and with proposed production level hardware described in step above - is above 30 pound max. specification on some disengagements with baseline hardware. Design direction for cam angle change limited on the lower angle side by this consideration.
- Keller contacted to provide park rod actuating cams at extremes of tolerance range. Parts checked at Livonia are in upper 1/2 of tolerance range (opposite condition from desired).
- Re-evaluation of bump test results complete Tues. - PASS. Proposed changes will not deteriorate this function.
- Visual recording Sat. obtained 1 skip tooth event (1 tooth) on reverse drop in speed test with baseline parts. Otherwise all tests indicated full engagement and proper function of the system for that specific test transmission and test vehicle.
- Bench test to define range of operating friction coefficients provided unexpected results - determined to be specific to sequence of starting pump first vs. starting stand electronics first - not a hardware issue. Test data sufficient to establish friction coefficients to put into analytical model. 4 more transmissions prepared and tested. Rest of friction coefficient data to be available Mon. First samples indicated coefficient down to 0.088/0.089 vs. 0.09 desired min. with general acceptable range up to 0.11/0.12. No tendency to "spit out" on bench - had been expected based on grade test results.
- 4.0L 4X2 vehicle fitted with instrumented driveshaft to establish actual torque at park gear on grade tests. Data taken Wed. P.M. Data with unloaded vehicle indicates test stand loads are in an appropriate range. Rerun Fri. at full GVW - complete - data still indicates test stand parameters appropriate. Loads to be used in CAE models.
- 24 test transmissions built at Bordeaux Mon. A.M. and 23 shipped Thurs. Arrived at Livonia Mon. 9/18.
- Ultimate test on W bench test to be conducted (E also for benchmark comparison).

Production Prep/Supplier Actions:

- New fine blank die in progress at MPI in parallel with design direction actions. Die has been progressed to level where final direction is required from Ford.
- Team (including supplier MPI) to assess if radius cut revision to existing green pawls (5482 available) can be used to support IB (needed to support Job#1).
- Finalize production timeline segments Thurs. 22 days from Ford definition of design to PSW level Fine

Blanked parts at Bordeaux (paperwork to travel separately). Timing on radius cut parts 7 - 10 days plus ~ 2 days shipping to Bordeaux from time of direction and funding from Ford. 2000 parts minumum at $2.94/pawl with $1200 fixture cost.

- Keller timing to for change in park rod actuating cam nominal angle (if needed) - 3 weeks to start PSW plus 1 week for PSW. Timing needs to improve. Supplier authorized to proceed on 9/18.i
- EBEA has been asked for timing to increase length of park pawl shaft. Peter Hoeweling also asked to help expedite response from EBEA. Investigating change to case casting/machining to allow more than 1mm shaft length increase.
- Confirm Scherdel/Automatic Spring can supply revised pawl return spring to support Job#1 timing. PSW can be achieved with parts ready to ship 2 weeks from direction to proceed from Automatic Spring. Scherdel is CMMS supplier. No testing done on Scherdel springs. Direction given to Scherdel to complete fatigue cycling tests and provide production timing for torque increase revision. Team decision made to proceed with 35% increase in effective torque load of pawl return spring (200 n-mm -> 270 n-mm). Release to flow into system Fri.
- Koeln Forge and Fagor requested to define timing for increase in backup material around park pawl shaft boss in case. Koeln can do this quickly. Fagor?
- LAP build schedule is; 90 IB's week of 10/23, 76 IB's week of 10/30, 160 IB's week of 11/6, 640 Job#1's week of 11/13, 720 week of 11/20. All are intended to be saleable.

Bore 201 Valve Wear/Sticking;

- Bordeaux confirmed that 20 micron minimum anodize thickness can be obtained. Above 30 microns the finish specification is not met. Production can support week of 9/18 with increased thickness.
- First Bordeaux test to 800/1000 Kilometers of thicker coating gave positive results. 2 parts continued to 2500 Kilometers show beginning signs of wear on sleeve and initiation of flaking/wear of valve coating similar to lower distance tests with prior level parts.
- High mileage dynamometer tests of Alcoa 4032 aluminum sleeves (backup plan) had fallen behind schedule. Corrective action taken Tues. Concerns are internal sleeve wear at high mileage and wear at the sleeve/clip interface (which was a problem before the 6262-T8/T9 sleeves/plugs were anodized).
- Bordeaux purchasing Alcoa 4032 sleeves to support production if approved via long term durability test and needed to protect Job#1. Continued testing at Bordeaux shows good results - continuing to run 1 truck/2nd set up with thick anodize coating on valve and sleeve with round wire R clip. More 4032 sleeves to go on test in the states.
- Bordeaux anodize process under further review vs. 5R55N supplier. Another visit to Rich Coat (N anodize supplier - part of Allan Tool) by Livonia Engineer 9/14 to further understand process and check progress of W prototype parts. Details communicated to Bordeaux.
- Bordeaux obtaining parts in preparation to anodize valve and sleeve as separate batch (like 5R55N supplier) instead of mixed with larger parts as has been done for pre-production parts.
- Ebea and L.C. Matre shipped Monday a quantity of sleeve blanks to INA and VCST for thermal deburr tryouts. Parts at INA Tues. (investigate both directed sand blast and electro-chemical deburr with INA sub-suppliers) and at VCST Wed. Only VCST has expressed interest in maintaining this business at production volumes. Supplier near L.C. Maitre being investigated as possible production source.
- Test on Bordeaux vehicle with N production valve/sleeve (minor non-functional modification required to fit in valve body) and production flat wire W clip demonstrated minor wear at 1000 km like Bordeaux processed W parts.
- Test on Bordeaux vehicle with 3 land valve (combines converter clutch modulator valve with 2 land valve in same bore) and prototype round wire R clip - excellent results - duplicated on Livonia test vehicle. Pursuing further with Bordeaux Mfg. and Tim Boes.
- Effort will be initiated to tap pressure at the valve on Livonia vehicle to determine if actual presssure matches commanded pressure and assess actual pressure stability. Functional Rcon or PC1A board needed.
- Short KLT on Chassis Roll still under development to support DOE. Road test at Livonia gives results comparable to Bordeaux road test.

Remaining "Must Fix" Shift Quality Issues From LAP FEU and 8/31 Pinckney Management Drive Which Have Actions Open;

c) Random harsh/noisy park to reverse engagements - minor improvement

- Established transfer function for "low volume" production solenoid modules to support 9/20 R06 release using FEU solenoid modules. Improves item c) and improves other content not on the "Must Fix" list.
- Press fit spline halfshaft test for Reverse Engagement effect being prepared by U152 PTSE (FEU's have more backlash than Job#1 intent).
- Drive of R06 in FEU vehicles at LAP scheduled 9/25.

Review With Dale Claudepierre and Steve von Foerster (in place of G. Bedi and R. Krygier) 9/14

- Steve recommended giving Bordeaux until 10/20 (vs. 10/16) to have parts at LAP to improve liklihood of robust decisions/support evidence (does not want to service any transmissions in builds beyond FEU).
- Both Steve and Dale were more confident that our work on the Park System would provide a valid Job#1 containment than our success to date related to valve wear. The correct steps appear to have been taken but test results do not support that process improvements have provided wear resistance comparable to the 5R55N parts.
- Phil Yuhasz indicated that we needed to re-emphasize with Purchase an effort already in progress to source initial W production for the bore 201 valve and sleeve (Converter Clutch Modulator) to Allan Tool - the N supplier.
- Report Park System Pawl Screening DV results for revised pawl nose up angle and increased torque pawl return spring to Steve as soon as they are available.
- Set up another Bedi/Krygier 5R55W review for the week of 9/25.

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Admin. Asst.: Judy Lardin, Ph: 734-52-34517

From: Hildebrand, Dan (D.H.)
Sent: Monday, September 18, 2000 8:14 PM
To: Szczupak, Dave (D.T.); Blair, Mark (M.A.); Krygier, Roman (R.J.); Samardzich, Barb (B.J.)
Cc: Yuhasz, Philip (P.D.); Claus, Alain (A.); Adamczyk, David (D.W.); Landes, Stephen (S.L.); Antrim, William (W.R.); Bardallis, Jason (J.E.); Garrett, Dave (D.M.); Crandall, Scott (S.R.); Haddlesey, Mark (M.Q.); Hart, Lori (L.A.); McKinnis, Larry (L.N.); Xu, Yehong (Y.); Spaulding, Todd (T.C.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Heikka, Patrick (P.C.); Fyie, Matthew (M.L.); Brazin, Jim (J.C.); Perri, Ron (R.J.); El-Khoury, Joe (J.E.); Boes, Tim (T.P.)
Subject: RE: 5R55W Job#1 Launch Issue Daily Update

Objective is transmission Job#1 at Bordeaux on or before October 9 - PSW parts at Bordeaux on or before October 4 to meet 10/16 MRD at LAP. (U152 Chief Program Engineer recommended MRD at LAP as late as 10/20.)

Park System:

3 Mandatory changes to support Job#1;

Park Rod Cam Angle - Supplier A+E Keller GmbH (critical path)

- decrease nominal from 5.5 degrees to 4.7 degrees and reduce tolerance from +/- 0.5 degrees to +/- 0.2 degrees
- supplier authorized to proceed to make new tools/guages 9/18
- initial timing estimate 3 weeks to start PSW process - 1 week improvement needed/being negotiated

Park Pawl Return Spring Torque Increase

- increase from 200 N-mm to 270 N-mm
- supplier Automatic Spring confirmed 2 weeks to have PSW'd parts
- supplier Scherdel to provide timing Tues. (expected to easily support timing)

Park Pawl Tooth Nose Up Angle Change

- change from base must be 3 degrees or greater - additional analysis/prototype parts in progress to finalize decision relative to cam angle definition above (9/21 - 9/25E)
- interim PSW parts from MPI at Bordeaux 12 days from direction (sufficient green stock to select 2 angles to protect timing and proceed)
- PSW fine blanked parts from MPI at Bordeaux 22 days from direction

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Admin. Asst.: Judy Lardin, Ph: 734-52-34517

From: Hildebrand, Dan (D.H.)
Sent: Sunday, September 17, 2000 7:53 PM
To: Szczupak, Dave (D.T.); Blair, Mark (M.A.); Krygier, Roman (R.J.); Samardzich, Barb (B.J.)
Cc: Yuhasz, Philip (P.D.); Claus, Alain (A.); Adamczyk, David (D.W.); Landes, Stephen (S.L.); Antrim, William (W.R.); Bardallis, Jason (J.E.); Garrett, Dave (D.M.); Crandall, Scott (S.R.); Haddlesey, Mark (M.Q.); Hart, Lori (L.A.); McKinnis, Larry (L.N.); Xu, Yehong (Y.); Spaulding, Todd (T.C.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Heikka, Patrick (P.C.); Fyie, Matthew (M.L.); Brazin, Jim (J.C.); Perri, Ron (R.J.); El-Khoury, Joe (J.E.); Boes, Tim (T.P.)
Subject: RE: 5R55W Job#1 Launch Issue Daily Update

9/17 updates in red (some additional older info deleted)

9/14 updates in purple (some older info deleted), 9/13 updates in green, 9/12 updates in blue

Objective is transmission Job#1 at Bordeaux on or before October 9 - PSW parts at Bordeaux on or before October 4 (revised per Bordeaux build simulation) to meet 10/16 MRD at LAP.

Park System (tracked via MS Project Timing Plan which drives actions - assess ability to give design direction Monday 9/18 - confirmation parts up to 3 degree nose up change arrived 9/14 P.M.);

Analysis/Modelling:

- 3 degree change in nose up park pawl angle in conjunction with 35% increase in torque of pawl return spring will address nose up test issue and maintain drop in speed reduction achieved with 1.1mm increased circular tooth thickness pawl. Up to 6 degree angle change has been studied as part of effort to get common system forces in nose up and nose down direction (more than 6 degrees required to make them equal).
- 5R55W park system reaction stress FEA in progress - results due Monday 9/18. Areas of opportunity for improvement identified from crude model on Sat. - case/cover/extension casting material adds and pawl shaft length increase.
- Cognition model complete. Major contribution and most sensitive tolerance identified relative to park cam/rod interface vs. outer manual lever location.
- VSA DO 5-2000-1434 being prioritized in CAD (in parallel with Cognition Model above). Initial review conducted Sat. Chamfer significantly reduce pawl pin engaged length. Room in castings to use longer shaft - this would improve strength robustness.
- Both torque to turn at the outer manual lever shaft in the clockwise direction and the torque variability in this direction as measured for a large sample of 5R55W's on the Bordeaux final test stands is high. Bordeaux checked the equipment and the data - appears to be valid. This test simulates pull out of park function in the nose up direction (below maximum in vehicle loads). Sharonville data on N test stands is similar.
- Friction coefficient vs. force at the rod cam and spit out force indicate that rod cam angle reduction would improve system performance and robustness. Action desired at Job#1 to improve system robustness. Reduce nominal but do not reduce minimum. Issue with supplier 1/2 angle tolerance vs. min. angle to stay within design floor shifter pull out efforts.

DV Prep/Actions:

- Supplier made pawls (radius cutter used to modify green pawls on nose up side rather than fine blanked on that surface) with angles in fine increments around proposed change are in Livonia Thurs. P.M.
- Screening DV for 3 degree nose up pawl angle change (smaller) and increased torque pawl return spring run over the weekend - data summary to be in next report.

- Pull out efforts with floor shift vehicle - baseline and with proposed production level hardware described in step above - is above 30 pound max. specification on some disengagements with baseline hardware. Design direction for primary issue may negatively impact this result.
- Keller contacted to provide park rod actuating cams at extremes of tolerance range. Parts checked at Livonia are in upper 1/2 of tolerance range (opposite condition from desired).
- Re-evaluation of bump test results complete Tues. - PASS. Proposed changes will not deteriorate this function.
- Visual recording Sat. obtained 1 skip tooth event (1 tooth) on reverse drop in speed test with baseline parts. Otherwise all tests indicated full engagement and proper function of the system for that specific test transmission and test vehicle.
- Bench test to define range of operating friction coefficients provided unexpected results - determined to be specific to sequence of starting pump first vs. starting stand electronics first - not a hardware issue. Test data sufficient to establish friction coefficients to put into analytical model. 4 more transmissions prepared and tested. Rest of friction coefficient data to be available Mon. First samples indicated coefficient down to 0.088/0.089 vs. 0.09 desired min. with general acceptable range up to 0.11/0.12. No tendency to "spit out" on bench - had been expected based on grade test results.
- 4.0L 4X2 vehicle fitted with instrumented driveshaft to establish actual torque at park gear on grade tests. Data taken Wed. P.M. Data with unloaded vehicle indicates test stand loads are in an appropriate range. Rerun Fri. at full GVW - complete - data available.
- 24 test transmissions built at Bordeaux Mon. A.M. and 23 shipped Thurs. Due at Livonia Tues. 9/19.
- Ultimate test on W bench test to be conducted (E also for benchmark comparison).

Production Prep/Supplier Actions:

- New fine blank die in progress at MPI in parallel with design direction actions. Die has been progressed to level where final direction is required from Ford.
- Team (including supplier MPI) to assess if radius cut revision to existing green pawls (5482 available) can be used to support IB (and initial Job#1 if necessary).
- Finalize production timeline segments Thurs. 22 days from Ford definition of design to PSW level Fine Blanked parts at Bordeaux (paperwork to travel separately). Timing on radius cut parts 7 - 10 days plus ~ 2 days shipping to Bordeaux from time of direction and funding from Ford. 2000 parts minumum at $2.94/pawl with $1200 fixture cost.
- Keller timing to for change in park rod actuating cam nominal angle (if needed) - 3 weeks for PSW'd revised parts at Bordeaux from date of Ford direction. Desire 4.5 - 5 degree 1/2 angle on cam vs. 4.5 - 5.5 degree today - supplier claims +/- 1/2 degree needed. STA/Purchase assistance requested.
- EBEA has been asked for timing to increase length of park pawl shaft. Peter Hoeweling also asked to help expedite response from EBEA. Investigating change to case casting/machining to allow more than 1mm shaft length increase.
- Confirm Sherdel/Automatic Spring can supply revised pawl return spring to support Job#1 timing. PSW can be achieved with parts ready to ship 2 weeks from direction to proceed. Team decision made to proceed with 35% increase in effective torque load of pawl return spring (200 n-mm -> 270 n-mm). Release to flow into system Fri.
- Koeln Forge and Fagor requested to define timing for increase in backup material around park pawl shaft boss in case. Koeln can do this quickly. Fagor?
- LAP build schedule is; 90 IB's week of 10/23, 76 IB's week of 10/30, 160 IB's week of 11/6, 640 Job#1's week of 11/13, 720 week of 11/20. All are intended to be saleable.

Bore 201 Valve Wear/Sticking;

- Bordeaux confirmed that 20 micron minimum anodize thickness can be obtained. Above 30 microns the finish specification is not met. Production can support week of 9/18 with increased thickness.
- First Bordeaux test to 800/1000 Kilometers of thicker coating gave positive results. 2 parts continued to 2500 Kilometers show beginning signs of wear on sleeve and initiation of flaking/wear of valve coating similar to lower distance tests with prior level parts.
- High mileage dynamometer tests of Alcoa 4032 aluminum sleeves (backup plan) had fallen behind schedule. Corrective action taken Tues. Concerns are internal sleeve wear at high mileage and wear at the sleeve/clip interface (which was a problem before the 6262-T8/T9 sleeves/plugs were anodized).

- Bordeaux purchasing Alcoa 4032 sleeves to support production if approved via long term durability test and needed to protect Job#1.
- Bordeaux anodize process under further review vs. 5R55N supplier. Another visit to Rich Coat (N anodize supplier - part of Allan Tool) by Livonia Engineer 9/14 to further understand process and check progress of W prototype parts. Details communicated to Bordeaux.
- Bordeaux obtaining parts in preparation to anodize valve and sleeve as separate batch (like 5R55N supplier) instead of mixed with larger parts as has been done for pre-production parts.
- Ebea and L.C. Matre shipped Monday a quantity of sleeve blanks to INA and VCST for thermal deburr tryouts. Parts at INA Tues. (investigate both directed sand blast and electro-chemical deburr with INA sub-suppliers) and at VCST Wed. Only VCST has expressed interest in maintaining this business at production volumes. Supplier near L.C. Maitre being investigated as possible production source.
- Test on Bordeaux vehicle with N production valve/sleeve (minor non-functional modification required to fit in valve body) and production flat wire W clip demonstrated minor wear at 1000 km like Bordeaux processed W parts.
- Test on Bordeaux vehicle with 3 land valve (combines converter clutch modulator valve with 2 land valve in same bore) and prototype round wire R clip - excellent results - duplicated on Livonia test vehicle. Pursuing further with Bordeaux Mfg.
- Effort will be initiated to tap pressure at the valve on Livonia vehicle to determine if actual presssure matches commanded pressure and assess actual pressure stability.
- Short KLT on Chassis Roll still under development to support DOE. Road test at Livonia gives results comparable to Bordeaux road test.

Remaining "Must Fix" Shift Quality Issues From LAP FEU and 8/31 Pinckney Management Drive Which Have Actions Open;

c) Random harsh/noisy park to reverse engagements - minor improvement

- Established transfer function for "low volume" production solenoid modules to support 9/20 R06 release using FEU solenoid modules. Improves item c) and improves other content not on the "Must Fix" list.
- Press fit spline halfshaft test for Reverse Engagement effect being prepared by U152 PTSE (FEU's have more backlash than Job#1 intent).
- Drive of R06 in FEU vehicles at LAP scheduled 9/25.

Review With Dale Claudepierre and Steve von Foerster (in place of G. Bedi and R. Krygier) 9/14

- Steve recommended giving Bordeaux until 10/20 (vs. 10/16) to have parts at LAP to improve liklihood of robust decisions/support evidence (does not want to service any transmissions in builds beyond FEU).
- Both Steve and Dale were more confident that our work on the Park System would provide a valid Job#1 containment than our success to date related to valve wear. The correct steps appear to have been taken but test results do not support that process improvements have provided wear resistance comparable to the 5R55N parts.
- Phil Yuhasz indicated that we needed to re-emphasize with Purchase an effort already in progress to source initial W production for the bore 201 valve and sleeve (Converter Clutch Modulator) to Allan Tool - the N supplier.
- Report Park System Pawl Screening DV results for revised pawl nose up angle and increased torque pawl return spring to Steve as soon as they are available.
- Set up another Bedi/Krygier 5R55W review for the week of 9/25.

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Sent: Thursday, September 14, 2000 10:21 PM
To: Szczupak, Dave (D.T.); Blair, Mark (M.A.); Krygier, Roman (R.J.); Samardzich, Barb (B.J.)
Cc: Yuhasz, Philip (P.D.); Claus, Alain (A.); Adamczyk, David (D.W.); Landes, Stephen (S.L.); Antrim, William (W.R.); Bardallis, Jason (J.E.); Garrett, Dave (D.M.); Crandall, Scott (S.R.); Haddlesey, Mark (M.Q.); Hart, Lori (L.A.); McKinnis, Larry (L.N.); Xu, Yehong (Y.); Spaulding, Todd (T.C.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Heikka, Patrick (P.C.); Fyie, Matthew (M.L.); Brazin, Jim (J.C.); Perri, Ron (R.J.); El-Khoury, Joe (J.E.)
Subject: RE: 5R55W Job#1 Launch Issue Daily Update

9/14 updates in purple (some older info deleted)

9/13 updates in green

9/12 updates in blue

Objective is transmission Job#1 at Bordeaux on or before October 9 - PSW parts at Bordeaux on or before October 4 (revised per Bordeaux build simulation).

Park System (tracked via MS Project Timing Plan which drives actions - target for design direction Friday latest [may slip to Sunday for pawl angle]- confirmation parts arrived 9/14 P.M.);

Analysis/Modelling:

- 3 degree change in nose up park pawl angle in conjunction with 30% increase in torque of pawl return spring will address nose up test issue and maintain drop in speed reduction achieved with 1.1mm increased circular tooth thickness pawl. Up to 6 degree angle change has been studied as part of effort to get common system forces in nose up and nose down direction (more than 6 degrees required to make them equal).
- 5R55W park system reaction stress FEA in progress - results due Monday 9/18.
- Cognition model (like VSA) initiated on trans. park system (shifter already done). Nominal data entered and ready for verification. Tolerance stacks can be quickly completed after model confirmed - due 9/15.
- VSA DO 5-2000-1434 being prioritized in CAD (in parallel with Cognition Model above). Work started 9/13 P.M. - considered a "quick" job.
- Stack up of 5R55W system in progress.
- Both torque to turn at the outer manual lever shaft in the clockwise direction and the torque variability in this direction as measured for a large sample of 5R55W's on the Bordeaux final test stands is high. Bordeaux checked the equipment and the data - appears to be valid. This test simulates pull out of park function in the nose up direction (below maximum in vehicle loads). Sharonville data on N test stands requested.
- Friction coefficient vs. force at the rod cam and spit out force indicate that rod cam angle reduction would improve system performance and robustness. Action required but perhaps not necessary as part of Job#1 actions - TBD.

DV Prep/Actions:

- Supplier made pawls (radius cutter used to modify green pawls on nose up side rather than fine blanked on that surface) with angles in fine increments around proposed change are in Livonia Thurs. P.M.
- Screening DV for 3 degree nose up pawl angle change (smaller) and increased torque pawl return spring established.
- Pull out efforts with floor shift vehicle - baseline and with proposed production level hardware described in

step above - scheduled to assess acceptability and define difference wrt column shifter efforts vs. analytical differences.

- Keller contacted to provide park rod actuating cams at extremes of tolerance range.
- Re-evaluation of bump test results complete Tues. - PASS. Proposed changes will not deteriorate this function.
- One transmission/vehicle being instrumented for strain measurement, angular rotation and visual recording of operation on the various park system tests. Plan is to evaluate system from shift lever to park gear/output shaft for normal test sequences on Fri.
- Bench test to define range of operating friction coefficients provided unexpected results Sunday. Test stand calibration and test set up were reconfirmed Tues. Test data sufficient to establish friction coefficients to put into analytical model. 4 more transmissions prepared and tested. Friction data review to be complete Fri. First samples indicated coefficient down to 0.088/0.089 vs. 0.09 desired min. with general acceptable range up to 0.11/0.12. No tendency to "spit out" on bench - had been expected based on grade test results.
- 4.0L 4X2 vehicle fitted with instrumented driveshaft to establish actual torque at park gear on grade tests. Data taken Wed. P.M. Data with unloaded vehicle indicates test stand loads are in an appropriate range. Rerun Fri. at full GVW.
- 24 test transmissions built at Bordeaux Mon. A.M. and 23 shipped Thurs. Due at Livonia Tues. 9/19.
- 4th test vehicle (4.0L 4X2) available Tues. P.M. and 3.73 ratio axle installed Thurs.
- 5R55E in 2000 MY Explorer tested on Park DV - PASS, parts to be reviewed Thurs. Park components VERY similar to W Park components.
- Ultimate test on W bench test to be conducted (E also for benchmark comparison).

Production Prep/Supplier Actions:

- New fine blank die in progress at MPI in parallel with design direction actions. Die has been progressed to level where final direction is required from Ford.
- Team (including supplier MPI) to assess if radius cut revision to existing green pawls (5482 available) can be used to support IB (and initial Job#1 if necessary).
- Finalize production timeline segments Thurs. 22 days from Ford definition of design to PSW level Fine Blanked parts at Bordeaux (paperwork to travel separately). Timing on radius cut parts due Fri. midday.
- Keller to provide timing to for change in park rod actuating cam nominal angle (if needed). 3 weeks or less for PSW'd change at Bordeaux requested - information arrived with Park Engineer Thurs. P.M. - share with Team Fri. A.M.
- EBEA has been asked for timing to increase length of park pawl shaft. Peter Hoeweling also asked to help expedite response from EBEA. Investigating change to case casting/machining to allow more than 1mm shaft length increase.
- Confirm Automatic Spring can supply revised pawl return spring to support Job#1 timing (if needed). PSW can be achieved with parts ready to ship 2 weeks from direction to proceed. Team decision made to proceed with 30% increase in effective torque load of pawl return spring. Release to flow into system Fri.
- Koeln Forge and Fagor requested to define timing for increase in backup material around park pawl shaft boss in case.
- LAP build schedule is; 90 IB's week of 10/23, 76 IB's week of 10/30, 160 IB's week of 11/6, 640 Job#1's week of 11/13, 720 week of 11/20. All are intended to be saleable.

Bore 201 Valve Wear/Sticking;

- Bordeaux confirmed that 20 micron minimum anodize thickness can be obtained. Above 30 microns the finish specification is not met. Production can support week of 9/18 with increased thickness.
- First Bordeaux test to 800/1000 Kilometers of thicker coating gave positive results. 2 parts continued to 2500 Kilometers show beginning signs of wear on sleeve and initiation of flaking/wear of valve coating similar to lower distance tests with prior level parts.
- High mileage dynamometer tests of Alcoa 4032 aluminum sleeves (backup plan) had fallen behind schedule. Corrective action taken Tues. Concerns are internal sleeve wear at high mileage and wear at the sleeve/clip interface (which was a problem before the 6262-T8/T9 sleeves/plugs were anodized).
- Bordeaux purchasing Alcoa 4032 sleeves to support production if approved via long term durability test and needed to protect Job#1.

- Bordeaux anodize process under further review vs. 5R55N supplier. Another visit to Rich Coat (N anodize supplier - part of Allan Tool) by Livonia Engineer 9/14 to further understand process and check progress of W prototype parts.
- Bordeaux obtaining parts in preparation to anodize valve and sleeve as separate batch (like 5R55N supplier) instead of mixed with larger parts as has been done for pre-production parts.
- Ebea and L.C. Matre shipped Monday a quantity of sleeve blanks to INA and VCST for thermal deburr tryouts. Parts at INA Tues. (investigate both thermal deburr and electro-chemical deburr with INA sub-suppliers) and at VCST Wed. Only VCST has expressed interest in maintaining this business at production volumes. Supplier near L.C. Maitre being investigated as possible production source.
- A directed sand blast deburr supplier has been added to the mix.
- Test started on Bordeaux vehicle with N production valve/sleeve (minor non-functional modification required to fit in valve body) and round wire R clip.
- Test started on Bordeaux vehicle with 3 land valve (combines converter clutch modulator valve with 2 land valve in same bore) and round wire R clip.
- Effort will be initiated to tap pressure at the valve to confirm that actual presssure matches commanded pressure and assess actual pressure stability.
- Short KLT on Chassis Roll still under development to support DOE. Road test at Livonia gives results comparable to Bordeaux road test.

Remaining "Must Fix" Shift Quality Issues From LAP FEU and 8/31 Pinckney Management Drive Which Have Actions Open;

c) Random harsh/noisy park to reverse engagements - minor improvement

- Establishing transfer function for "low volume" production solenoid modules to support 9/20 R06 release using FEU solenoid modules. Improves item c) and improves other content not on the "Must Fix" list.
- Press fit spline halfshaft test for Reverse Engagement effect being prepared by U152 PTSE (FEU's have more backlash than Job#1 intent).
- Drive of R06 in FEU vehicles at LAP scheduled 9/25.

Review With Dale Claudepierre and Steve von Foerster (in place of G. Bedi and R. Krygier) 9/14

- Steve recommended giving Bordeaux until 10/20 (vs. 10/16) to have parts at LAP to improve liklihood of robust decisions/support evidence (does not want to service any transmissions in builds beyond FEU).
- Both Steve and Dale were more confident that our work on the Park System would provide a valid Job#1 containment than our success to date related to valve wear. The correct steps appear to have been taken but test results do not support that process improvements have provided wear resistance comparable to the 5R55N parts.
- Phil Yuhasz indicated that we needed to re-emphasize with Purchase an effort already in progress to source initial W production for the bore 201 valve and sleeve (Converter Clutch Modulator) to Allan Tool - the N supplier.
- Report Park System Pawl Screening DV results for revised pawl nose up angle and increased torque pawl return spring to Steve as soon as they are available.
- Set up another Bedi/Krygier 5R55W review for the week of 9/25.

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Admin. Asst.: Judy Lardin, Ph: 734-52-34517

From: Hildebrand, Dan (D.H.)
Sent: Tuesday, September 19, 2000 7:01 PM
Cc: Yuhasz, Philip (P.D.); Claus, Alain (A.); Adamczyk, David (D.W.); Landes, Stephen (S.L.); Antrim, William (W.R.); Bardallis, Jason (J.E.); Garrett, Dave (D.M.); Crandall, Scott (S.R.); Haddlesey, Mark (M.Q.); Hart, Lori (L.A.); McKinnis, Larry (L.N.); Xu, Yehong (Y.); Spaulding, Todd (T.C.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Heikka, Patrick (P.C.); Fyie, Matthew (M.L.); Brazin, Jim (J.C.); Perri, Ron (R.J.); El-Khoury, Joe (J.E.); Boes, Tim (T.P.)
Subject: RE: 5R55W Job#1 Launch Issue Daily Update

Senior Mgmt. Summary;

Objective is transmission Job#1 at Bordeaux on or before October 9 - PSW parts at Bordeaux on or before October 4 to meet 10/16 MRD at LAP. (U152 Chief Program Engineer recommended MRD at LAP as late as 10/20.)

Park System:

3 Mandatory changes to support Job#1;

Park Rod Cam Angle - Supplier A+E Keller GmbH (critical path)

- decrease nominal from 5.0 degrees to 4.7 degrees and reduce tolerance from +/- 0.5 degrees to +/- 0.2 degrees
- supplier authorized to proceed to make new tools/guages 9/18
- initial timing estimate 3 weeks to start PSW process + 1 week to complete supplier PSW
- A+E Keller to deliver 300 piece interim PSW parts to Bordeaux per low volume process by October 4
- early weeks of production to be covered in this way until new cold form die and high volume process is in place and PSW'd

Park Pawl Return Spring Torque Increase

- increase from 200 N-mm to 270 N-mm
- alternate supplier Automatic Spring confirmed PSW parts in 2 weeks
- prime supplier Scherdel indicates 4 weeks to supply PSW sample and additional 3 weeks from functional approval to have production parts in volume at Bordeaux

Park Pawl Tooth Nose Up Angle Change

- change from base must be 3 degrees or greater - additional analysis/prototype parts in progress to finalize decision relative to cam angle definition above (9/21 - 9/25E)
- interim PSW parts from MPI at Bordeaux 12 days from direction (sufficient green stock to select 2 angles to protect timing and proceed)
- PSW fine blanked parts from MPI at Bordeaux 22 days from direction

Note: Bore 201 wear/sticking issue root cause is NEITHER contamination from Bordeaux assembly process NOR burrs from Bordeaux processing.

Below is the detail with updates;

Analysis/Modelling:

- 3 degree change in nose up park pawl angle in conjunction with 35% increase in torque of pawl return spring does not address nose up issue without a coordinated change to the park rod cam angle. Need to confirm if angle change greater than 3 degrees is needed. The drop in speed reduction achieved with 1.1mm increased circular tooth thickness pawl must be reassessed. Up to 6 degree angle change has been studied as part of effort to get common system forces in nose up and nose down direction (approximately 9.5 degrees required to make them equal but this increases drop in speed too much).
- 5R55W park system reaction stress FEA in progress - results show increased pawl shaft engagement is desireable. Further detail on Wed. and Fri. Areas of opportunity for improvement identified from crude model on Sat. - case/cover/extension casting material adds.
- Cognition model complete. Major contribution and most sensitive tolerance identified relative to park cam/rod interface vs. outer manual lever location.
- VSA DO 5-2000-1434 being prioritized in CAD (in parallel with Cognition Model above). Initial review conducted Sat. Chamfer significantly reduce pawl pin engaged length. Room in castings to use longer shaft - this would improve strength robustness.
- Both torque to turn at the outer manual lever shaft in the clockwise direction and the torque variability in this direction as measured for a large sample of 5R55W's on the Bordeaux final test stands is high. Bordeaux checked the equipment and the data - valid. This test simulates pull out of park function in the nose up direction (below maximum in vehicle loads). Sharonville data on N test stands is similar.
- Friction coefficient vs. force at the rod cam and spit out force indicate that rod cam angle reduction would improve system performance and robustness. Action REQUIRED at Job#1 to improve system robustness. Reduce nominal from 5.0 degrees to 4.7 degrees. Tolerance changed from +/- 0.5 degrees to +/- 0.2 degrees. This range selected to satisfy floor shifter efforts and spit out force calculations. Notice package to CAD 9/20.

DV Prep/Actions:

- Supplier made pawls (radius cutter used to modify green pawls on nose up side rather than fine blanked on that surface) with 3 degree angle change from base were evaluated with increased torque spring and production rod cam angles. Lowest axle ratio applications demonstrated that rod cam angle change is also required. Run low axle ratio vehicles with weight reductions to confirm that output shaft torque is the driving input which changes test results on grade - take torque on vehicle with instrumented driveshaft.
- Pull out efforts with floor shift vehicle - baseline and with proposed production level hardware described in step above - is above 30 pound max. specification on some disengagements with baseline hardware. Design direction for cam angle change limited on the lower angle side by this consideration.
- Keller contacted to provide park rod actuating cams at extremes of tolerance range. Parts checked at Livonia are in upper 1/2 of tolerance range (opposite condition from desired).
- Re-evaluation of bump test results complete Tues. - PASS. Proposed changes will not deteriorate this function.
- Visual recording Sat. obtained 1 skip tooth event (1 tooth) on reverse drop in speed test with baseline parts. Otherwise all tests indicated full engagement and proper function of the system for that specific test transmission and test vehicle.
- Bench test to define range of operating friction coefficients provided unexpected results - determined to be specific to sequence of starting pump first vs. starting stand electronics first - not a hardware issue. Test data sufficient to establish friction coefficients to put into analytical model. 4 more transmissions prepared and tested. Rest of friction coefficient data to be available Wed. First samples indicated coefficient down to 0.088/0.089 vs. 0.09 desired min. with general acceptable range up to 0.11/0.12. No tendency to "spit out" on bench - had been expected based on grade test results.
- 4.0L 4X2 vehicle fitted with instrumented driveshaft to establish actual torque at park gear on grade tests. Data taken Wed. P.M. Data with unloaded vehicle indicates test stand loads are in an appropriate range. Rerun Fri. at full GVW - complete - data still indicates test stand parameters appropriate. Loads to be used in CAE models.
- 24 test transmissions built at Bordeaux Mon. A.M. and 23 shipped Thurs. Arrived at Livonia Mon. 9/18.
- Ultimate test on W bench test to be conducted (E also for benchmark comparison).

Production Prep/Supplier Actions:

- New fine blank die in progress at MPI in parallel with design direction actions. Die has been progressed to

level where final direction is required from Ford.

- Team (including supplier MPI) concense that radius cut revision to existing green pawls (5482 available) can be used to support IB (needed to support Job#1).
- Finalize production timeline segments Thurs. 22 days from Ford definition of design to PSW level Fine Blanked parts at Bordeaux (paperwork to travel separately). Timing on radius cut parts 7 - 10 days plus ~ 2 days shipping to Bordeaux from time of direction and funding from Ford. 2000 parts minumum at $2.94/pawl with $1200 fixture cost.
- Keller timing to for change in park rod actuating cam nominal angle (if needed) - 3 weeks to start PSW plus 1 week for PSW. Team agreed to improve timing by supplying interim PSW parts from low volume process. An alert will be required to authorize the low volume process. First 300 interim PSW parts due at Bordeaux by 10/4. Supplier authorized to proceed to make new tools on 9/18.
- EBEA has been asked for timing to increase length of park pawl shaft. Peter Hoeweling also asked to help expedite response from EBEA. Investigating change to case casting/machining to allow more than 1mm shaft length increase.
- Confirm Scherdel/Automatic Spring can supply revised pawl return spring to support Job#1 timing. PSW can be achieved with parts ready to ship 2 weeks from direction to proceed from Automatic Spring. Scherdel is CMMS supplier. No testing done on Scherdel springs. Direction given to Scherdel to complete fatigue cycling tests and provide production timing for torque increase revision. Scherdel indicates 4 weeks to supply PSW parts plus 3 weeks from functional approval to ship production parts in qunatity to Bordeaux. Team decision made to proceed with 35% increase in effective torque load of pawl return spring (200 n-mm -> 270 n-mm). Release to flow into system as soon as pawl angle change is confirmed (affects sprring length).
- Koeln Forge and Fagor requested to define timing for increase in backup material around park pawl shaft boss in case. Koeln can do this quickly. Fagor?
- LAP build schedule is; 90 IB's week of 10/23, 76 IB's week of 10/30, 160 IB's week of 11/6, 640 Job#1's week of 11/13, 720 week of 11/20, 1600 week of 11/27, 1396 week of 12/4, 2260 week of 12/11, 2166 week of 12/18. All are intended to be saleable.

Bore 201 Valve Wear/Sticking;

- Bordeaux confirmed that 20 micron minimum anodize thickness can be obtained. Above 30 microns the finish specification is not met. Production can support week of 9/18 with increased thickness.
- First Bordeaux test to 800/1000 Kilometers of thicker coating gave positive results. 2 parts continued to 2500 Kilometers show beginning signs of wear on sleeve and initiation of flaking/wear of valve coating similar to lower distance tests with prior level parts.
- High mileage dynamometer tests of Alcoa 4032 aluminum sleeves had fallen behind schedule. Corrective action taken Tues. Concerns are internal sleeve wear at high mileage and wear at the sleeve/clip interface (which was a problem before the 6262-T8/T9 sleeves/plugs were anodized).
- Bordeaux purchasing Alcoa 4032 sleeves to support production if approved via long term durability test and needed to protect Job#1. Continued testing at Bordeaux shows good results - continuing to run 1 truck/2nd set up with thick anodize coating on valve and sleeve with round wire R clip. More 4032 sleeves to go on test in the states.
- Product funding Scherdel production tool for round wire R clip to have this design available for introduction shortly after Job#1. Prototype tool available in N.A. but cannot PSW parts from this tool for production.
- Bordeaux anodize process under further review vs. 5R55N supplier. Another visit to Rich Coat (N anodize supplier - part of Allan Tool) by Livonia Engineer 9/14 to further understand process and check progress of W prototype parts. Details communicated to Bordeaux.
- Bordeaux obtaining parts in preparation to anodize valve and sleeve as separate batch (like 5R55N supplier) instead of mixed with larger parts as has been done for pre-production parts.
- Ebea and L.C. Matre shipped Monday a quantity of sleeve blanks to INA and VCST for thermal deburr tryouts. Parts at INA Tues. (investigate both directed sand blast and electro-chemical deburr with INA sub-suppliers) and at VCST Wed. Only VCST has expressed interest in maintaining this business at production volumes. Supplier near L.C. Maitre being investigated as possible production source.
- Test on Bordeaux vehicle with N production valve/sleeve (minor non-functional modification required to fit in valve body) and production flat wire W clip demonstrated minor wear at 1000 km like Bordeaux processed W parts.
- KLT of 4.6L PV3 trans. (Bordeaux made parts with thinner anodize coating) torn down at 270/500 cycles

(about 81,000 customer miles). Valve polished and anodize worn off an eliptical pattern at sleeve end of valve but there were no deep scratches evident - only polishing type wear.

- Test on Bordeaux vehicle with 3 land valve (combines converter clutch modulator valve with 2 land valve in same bore) and prototype round wire R clip - excellent results - duplicated on Livonia test vehicle. Pursuing further with Bordeaux Mfg. and Tim Boes.
- Effort will be initiated to tap pressure at the valve on Livonia vehicle to determine if actual presssure matches commanded pressure and assess actual pressure stability. Functional RCON/PC1A board identified.
- Short KLT on Chassis Roll still under development to support DOE. Road test at Livonia gives results comparable to Bordeaux road test.

Remaining "Must Fix" Shift Quality Issues From LAP FEU and 8/31 Pinckney Management Drive Which Have Actions Open;

c) Random harsh/noisy park to reverse engagements - minor improvement

- Established transfer function for "low volume" production solenoid modules to support 9/20 R06 release using FEU solenoid modules. Improves item c) and improves other content not on the "Must Fix" list.
- Press fit spline halfshaft test for Reverse Engagement effect being prepared by U152 PTSE (FEU's have more backlash than Job#1 intent).
- Drive of R06 in FEU vehicles at LAP scheduled 9/25.

Review With Dale Claudepierre and Steve von Foerster (in place of G. Bedi and R. Krygier) 9/14

- Steve recommended giving Bordeaux until 10/20 (vs. 10/16) to have parts at LAP to improve liklihood of robust decisions/support evidence (does not want to service any transmissions in builds beyond FEU).
- Both Steve and Dale were more confident that our work on the Park System would provide a valid Job#1 containment than our success to date related to valve wear. The correct steps appear to have been taken but test results do not support that process improvements have provided wear resistance comparable to the 5R55N parts.
- Phil Yuhasz indicated that we needed to re-emphasize with Purchase an effort already in progress to source initial W production for the bore 201 valve and sleeve (Converter Clutch Modulator) to Allan Tool - the N supplier.
- Report Park System Pawl Screening DV results for revised pawl nose up angle and increased torque pawl return spring to Steve as soon as they are available.
- Set up another Bedi/Krygier 5R55W review for the week of 9/25.

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Admin. Asst.: Judy Lardin, Ph: 734-52-34517

From: Hildebrand, Dan (D.H.)
Sent: Monday, September 25, 2000 11:14 PM
Cc: Yuhasz, Philip (P.D.); Claus, Alain (A.); Adamczyk, David (D.W.); Landes, Stephen (S.L.); Antrim, William (W.R.); Bardallis, Jason (J.E.); Garrett, Dave (D.M.); Crandall, Scott (S.R.); Haddlesey, Mark (M.Q.); Hart, Lori (L.A.); McKinnis, Larry (L.N.); Xu, Yehong (Y.); Spaulding, Todd (T.C.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Heikka, Patrick (P.C.); Fyie, Matthew (M.L.); Brazin, Jim (J.C.); Perri, Ron (R.J.); El-Khoury, Joe (J.E.); Boes, Tim (T.P.); Sledz, Ted (T.M.); Hoeweling, Peter (P.)
Subject: RE: 5R55W Job#1 Launch Issue Daily Update

Senior Mgmt. Summary;

- Transmission Job#1 at Bordeaux scheduled October 16.
- First week of IB build requirements (90 units) scheduled October 13 with Job#1 content parts. (U152 Chief Program Engineer recommended MRD at LAP as late as 10/20.)
- PV/PSW of transmission assembly at Bordeaux October 12.
- PSW parts at Bordeaux on or before October 4.
- ESO scheduled 9/29 -10/2 to close all but 1 item (Park System DV with interim PSW parts will be 80% complete).

Park System:

2 Mandatory changes to support Job#1;

Park Pawl Return Spring Torque Increase - Supplier Scherdel

- increase from 200 N-mm to 270 N-mm
- supplier confimed ability to deliver production parts with PSW 2 weeks from P.O.
- Design length finalized 9/24

Park Pawl Tooth Nose Up Angle Change - Supplier MPI International Inc.

- change from base will be 5 degrees - design direction given 9/24
- interim PSW parts from MPI at Bordeaux within 12 days from direction (2000 to be ready to go to heat treater by midnight 9/25)
- special attention to be paid to pawl heat treat
- PSW fine blanked parts from MPI at Bordeaux 22 days from direction (high volume process)

Build Rate and Flow Capability

- team assessing supplier ability to support Bordeaux scheduled ramp rate with low volume and/or high volume process parts (additional green pawls to be machined to 5 degree angle reduction will likely be required - other parts O.K.)
- initial efforts had addressed LAP volume requirements which are considerably lower than Bordeaux's scheduled build rate

Below is the detail with updates;

Analysis/Modelling:

- 5 degree change in nose up park pawl angle in conjunction with 35% increase in torque of pawl return spring will be released at Job #1 containment. ADAMS and Mathcad models to be updated to show full range of expected pawl angle, cam angle, friction coefficient and spring rate per production release. Next evaluate/confirm post Job#1 improvements for conditions that can be assessed in this way. An additional increase in pawl circular tooth thickness between 0.2 and 0.7 mm is under investigation to further reduce drop in speeds - post Job#1 but containable in high volume fine blank die timing.
- 5R55W park system reaction stress FEA in progress - results show increased pawl shaft engagement is desireable. Further detail on 9/25 showed most benefit on cover side. Next will study increased aluminum backup by rib/boss thickness increase and then larger pin diameter. Areas of opportunity for improvement identified from crude model on Sat. - case/cover/extension casting material adds. Any action taken will be post Job#1.
- Cognition model complete. Major contribution and most sensitive tolerance identified relative to park cam/rod interface vs. outer manual lever location. Look into column vs. floor shift variants on 9/25.
- VSA DO 5-2000-1434 prioritized in CAD (in parallel with Cognition Model above). Initial review conducted Sat. Chamfers significantly reduce pawl pin engaged length. Room in castings to use longer shaft - this would improve strength robustness.
- Both torque to turn at the outer manual lever shaft in the clockwise direction and the torque variability in this direction as measured for a large sample of 5R55W's on the Bordeaux final test stands is high. Bordeaux checked the equipment and the data - valid. This test simulates pull out of park function in the nose up direction (below maximum in vehicle loads). Sharonville data on N test stands is similar.

DV Prep/Actions:

- Supplier made pawls (radius cutter used to modify green pawls on nose up side rather than fine blanked on that surface) with 3 degree angle change from base were evaluated with increased torque spring and production rod cam angles. Lowest axle ratio applications demonstrated that rod cam angle change is also desired. Run low axle ratio vehicles with weight reductions to confirm that output shaft torque is the driving input which changes test results on grade - take torque on vehicle with instrumented driveshaft. Scheduled 9/22.
- MPI pawls made from process like low volume process for pawl angle changes of 4, 5 and 6 degrees arrived in Livonia Fri. P.M. to support final selection/confirmation for production pawl angle.
- Pull out efforts with floor shift vehicle - baseline and with proposed production level hardware described in step above - is above 30 pound max. specification on some disengagements with baseline hardware. Design direction for cam angle change limited on the lower angle side by this consideration.
- Keller contacted to provide park rod actuating cams at extremes of tolerance range. Parts checked at Livonia are in upper 1/2 of tolerance range (opposite condition from desired). Rods with cam angles of 4.5 degrees and 4.7 degrees made via proposed low volume process at A+E Keller are at Livonia Thurs. P.M. Actual range of angles is less than requested - may reduce test matrix until upper limit parts can be delivered. Spring force also to be measured. Will evaluate friction coeficient on bench stand in parallel with start of vehicle screening test with 3 degree MPI pawls on hand. Cam finish from grinding on these first parts may be coarser than desired. Shifter efforts unacceptably high with these cams. Bench friction obtained to compare to production rods both as received and with a post process polish and moly-kote treatment. Insufficient reduction with polish and moly-kote. Stopped all Job#1 action to modify production cams. Continuing effort to reduce tolerance but MUST maintain production surface texture and phosphate coat for any production parts.
- Re-evaluation of bump test results with 3 degree pawl change complete Tues. - PASS. Proposed changes will not deteriorate this function. Rerun with final design 9/27.
- Visual recording Sat. obtained 1 skip tooth event (1 tooth) on reverse drop in speed test with baseline parts. Otherwise all tests indicated full engagement and proper function of the system for that specific test transmission and test vehicle. Video analyzed 9/21.
- Bench test to define range of operating friction coefficients provided unexpected results - determined to be specific to sequence of starting pump first vs. starting stand electronics first - not a hardware issue. Test data sufficient to establish friction coefficients to put into analytical model. 4 more transmissions prepared and tested. Rest of friction coefficient data to be available Wed. First samples indicated coefficient down to 0.89 vs. 0.09 desired min. with general acceptable range up to 0.11/0.12. Upper limit of tested friction coefficient to be confirmed 9/25 (around 0.12). No tendency to "spit out" on bench - had been expected

based on grade test results.

- 4.0L 4X2 vehicle fitted with instrumented driveshaft to establish actual torque at park gear on grade tests. Data taken 9/20 P.M. Data with unloaded vehicle indicates test stand loads are in an appropriate range. Rerun Fri. at full GVW - complete - data still indicates test stand parameters appropriate. Loads to be used in CAE models.
- 24 test transmissions built at Bordeaux Mon. A.M. and 23 shipped Thurs. Arrived at Livonia Mon. 9/18. Another 24 built 9/21 and shipped.
- Ultimate test on W bench test to be conducted (E and N also for benchmark comparison).
- Additional high speed ratchet test information is desired but secondary priority vs. pullout efforts, drop in speeds and disengagement confirmation. Pawl return spring is weakest element but maintains number of cycles previously reviewed.
- Test matrix defined and executed for final screening of cam angle, pawl angle and spring force to confirm Job#1 requirements on dimensions. Any refinements for post Job#1 improvements will be directionally identified as well. Focus is on 3.27 A/R 4X2 and 3.55 A/R 4X4 pullout efforts and ability to disengage park with unloaded 3.73 A/R vehicle on 17% grade. At test completion, drop in speeds will be assessed -> 9/25.
- Plan is to move directly to full DV after screening test is complete. Completion of full DV required prior to 9/29 - 10/2 new ESO date (combined ratchet and pullout must be run with interim PSW production intent parts to get appropriate material heat treat characteristics - due 9/28 or 9/29 in Livonia).
-

<u>Production Prep/Supplier Actions</u>:

- New fine blank die in progress at MPI in parallel with design direction actions. Die has been progressed to level where final direction is required from Ford.
- Team (including supplier MPI) concense that radius cut revision to existing green pawls (5482 available) can be used to support IB (needed to support Job#1).
- Finalize production timeline segments Thurs. 22 days from Ford definition of design to PSW level Fine Blanked parts at Bordeaux (paperwork to travel separately). Timing on radius cut parts 7 - 10 days plus ~ 2 days shipping to Bordeaux from 9/25. Still need to get funding to MPI through finance for work done on prior release and prototype parts. 2000 parts minumum at $2.94/pawl with $1200 fixture cost. Given Ford direction to MPI by start of business 9/25 (achieved), 2000 pawls will be ready to go to the heat treater by midnight 9/25.
- Keller timing to change in park rod actuating cam nominal angle - 3 weeks to start PSW plus 1 week for PSW. Team agreed to improve timing by supplying interim PSW parts from low volume process. An alert will be required to authorize the low volume process. First 300 interim PSW parts due at Bordeaux by 10/4. Supplier authorized on 9/18 to proceed to make new tool(s) and obtain guages. DIRECTION CANCELLED, work on tool stopped as of 9/24 due to poor test results in screening matrix. Angle tolerance reduction is still desired but have to maintain surface character and phosphate coat.
- EBEA can supply an increased pawl shaft length with PSW 3 weeks from PO at piece price of 1.39 FRF. This would be a post Job#1 action if pursued. Investigating change to case casting/machining to allow more than 1mm shaft length increase and reduce stresses at the case. Have to insure that parts cannot be mixed.
- Confirmed that Scherdel can supply revised pawl return spring to support Job#1 timing. PSW can be achieved with production parts in 2 weeks at Bordeaux from direction to proceed. Scherdel is CMMS supplier. No testing done on Scherdel springs. Direction given to Scherdel to complete fatigue cycling tests. Team decision made to proceed with 35% increase in effective torque load of pawl return spring (200 n-mm -> 270 n-mm). Load increase is achieved with a spring wire diameter increase from 1.24 mm to 1.3 mm. The spring length from the coil centerline to the outside of the wire "hook" which wraps around the pawl is reduced from 44.39/43.99 mm to 44.14/43.15 mm and the location from the coil centerline to the 12/10 R on the long arm of the spring going down the pawl hook is reduced from 27.5/26.5 mm to 26.7/25.7 mm. Release to flow into system as soon as pawl angle change is confirmed - 9/25.
- Koeln Forge and Fagor requested to define timing for increase in backup material around park pawl shaft boss in case. Koeln can do this quickly. Fagor? Castings had been stopped while this request was under review. Direction given 9/20 to continue making current castings to support production demand.
- LAP build schedule is; 90 IB's week of 10/23, 76 IB's week of 10/30, 160 IB's week of 11/6, 640 Job#1's week of 11/13, 720 week of 11/20, 1600 week of 11/27, 1396 week of 12/4, 2260 week of 12/11, 2166 week of 12/18. All are intended to be saleable.

- Bordeaux build schedule is considerably more aggressive; 200/day week of 10/16, 350/day week of 10/23, 500/day week of 10/30, 600/day week of 11/6, 800/day week of 11/13, 1100/day week of 11/20, 1100/day thru December, 1500/day thru January, 1700/day in February and March.
- Team assessing supplier ability to support Bordeaux voulume rate and flow plans with either low volume and/or high volume production processes. Favorable. Another batch of green pawls will be ordered to allow further refinement to pawl prior to release of long term production direction on pawl fine blank tool.

Bore 201 Valve Wear/Sticking;

- Bordeaux confirmed that 20 micron minimum anodize thickness can be obtained. Above 30 microns the finish specification is not met. Production can support week of 9/18 with increased thickness.
- First Bordeaux test to 800/1000 Kilometers of thicker coating gave positive results. 2 parts continued to 2500 Kilometers show beginning signs of wear on sleeve and initiation of flaking/wear of valve coating similar to lower distance tests with prior level parts.
- High mileage dynamometer tests of Alcoa 4032 aluminum sleeves in progress - 2 at 50 cycles, 1 additional start 9/25. Concerns are internal sleeve wear at high mileage and wear at the sleeve/clip interface (which was a problem before the 6262-T8/T9 sleeves/plugs were anodized).
- Bordeaux purchasing Alcoa 4032 sleeves to support production if approved via long term durability test and needed to protect Job#1. Continued testing at Bordeaux shows good results - continuing to run. 3 units stopped at 5000 - 6000 Kilometers. 5 more 4032 sleeves to go on test in the states in LAP high mileage vehicles. Installation 9/23 at LAP. These will have valves with 30 - 39 micron anodize thickness processed at Bordeaux (surface is a little rougher than desired).
- Product funding Scherdel production tool ($5000) for round wire R clip to have this design available for introduction shortly after Job#1. Prototype tool available in N.A. but cannot PSW parts from this tool for production.
- Bordeaux anodize process under further review vs. 5R55N supplier. Another visit to Rich Coat (N anodize supplier - part of Allan Tool) by Livonia Engineer 9/14 to further understand process and check progress of W prototype parts. Details communicated to Bordeaux. Review continuing at Bordeaux.
- Bordeaux obtained parts in preparation to anodize valve and sleeve as separate batch (like 5R55N supplier) instead of mixed with larger parts as has been done for pre-production parts. First run 9/22. Finish 9/25 - 9/26.
- Ebea and L.C. Matre shipped Monday a quantity of sleeve blanks to INA and VCST for alternate process deburr tryouts. Parts at INA Tues. (investigate both directed sand blast and electro-chemical deburr with INA sub-suppliers) and at VCST Wed. for thermal deburr. Electro-Chemical deburr available thru INA sub-supplier starting at 200/day. VCST can thermal deburr the sleeve and has expressed interest in maintaining this business at production volumes. Volume capability and timing to be provided. Supplier near L.C. Maitre being investigated as possible production source for directed sand blast.
- Test on Bordeaux vehicle with N production valve/sleeve (minor non-functional modification to 2 land valve required to fit in valve body) and production flat wire W clip demonstrated minor wear at 1000 km like Bordeaux processed W parts.
- KLT of 4.6L PV3 trans. (Bordeaux made parts with thinner anodize coating) torn down at 270/500 cycles (about 81,000 customer miles). Valve polished and anodize worn off in an eliptical pattern at sleeve end of valve but there were no deep scratches evident - only polishing type wear.
- Test on Bordeaux vehicle with 3 land valve (combines converter clutch modulator valve with 2 land valve in same bore) and prototype round wire R clip - excellent results - duplicated on Livonia test vehicle. Pursuing further with Bordeaux Mfg. and Tim Boes. Review in Livonia 9/22. Layout and dimensional requirements FAX'd to Bordeaux 9/20 P.M.
- Effort will be initiated to tap pressure at the valve on Livonia vehicle to determine if actual presssure matches commanded pressure and assess actual pressure stability. Functional RCON/PC1A board identified. Apply and steady state signals show no oscillatory pressure signals of concern. Need to study tip out further. Accelerometer signal shows large spike in 4th/5th - attached to valve body under bore 201. May be due to torque reversal or to signal in valve bore.
- Short KLT on Chassis Roll running. 1 baseline completed 9/24 and replicated the Bordeaux road test results. 2nd baseline to complete 9/25. DOE to follow. Road test at Livonia gives results comparable to Bordeaux road test and Alcoa 4032 sleeve is running.
- EBEA to supply both 4.6L and 4.0L valve and sleeve (Alcoa 4032) for initial month of production.
- New team member(s) have provided some additional alternatives which will be investigated; make single

land valve into a 2 land valve with second land piloting in a new small land in the sleeve end, investigate increased valve to sleeve clearance, investigating taper in sleeve and reduction of same, and if high fequency oscillations are present, put a small orifice in the end of the sleeve (0.5 mm dia.) or reduce single land valve overlap. Agreed that single 3 land valve is best alternative but recognize manufacturing feasibility concerns, these alternatives may provide much of the benefit of a single 3 land valve w/o the feasibility issues.

- N.A. Purchase has been authorized to discuss with Allen Tool, the possibility of providing valve/sleeve to N process as interim containment action - this is a back up plan at this time. Allen Tool continues to indicate no capacity and no interest. Master Automatic contacted and Federal Screw recommended BUT we have no experience with these suppliers on like parts so cannot recommend Job#1 support from them.

Remaining "Must Fix" Shift Quality Issues From LAP FEU and 8/31 Pinckney Management Drive Which Have Actions Open;

c) Random harsh/noisy park to reverse engagements - minor improvement

- Established transfer function for "low volume" production solenoid modules to support 9/20 R06 release using FEU solenoid modules. Improves item c) and improves other content not on the "Must Fix" list.
- Press fit spline halfshaft test for Reverse Engagement effect being prepared by U152 PTSE (early FEU's have more backlash than Job#1 intent - press fit splines now in use for LAP FEU).
- Drive of R06 in FEU vehicles at LAP scheduled 9/27. Assess learning in first 200 miles of vehicle's life.
- Some very long engagements (over 3 seconds) reported for FEU's this week. Checking 2 day soak to confirm issue - not reproduced after either long or short soak.

Review With Dale Claudepierre and Steve von Foerster (in place of G. Bedi and R. Krygier) 9/14

- Steve recommended giving Bordeaux until 10/20 (vs. 10/16) to have parts at LAP to improve liklihood of robust decisions/support evidence (does not want to service any transmissions in builds beyond FEU).
- Both Steve and Dale were more confident that our work on the Park System would provide a valid Job#1 containment than our success to date related to valve wear. The correct steps appear to have been taken but test results do not support that process improvements have provided wear resistance comparable to the 5R55N parts.
- Phil Yuhasz indicated that we needed to re-emphasize with Purchase an effort already in progress to source initial W production for the bore 201 valve and sleeve (Converter Clutch Modulator) to Allan Tool - the N supplier.
- Report Park System Pawl Screening DV results for revised pawl nose up angle and increased torque pawl return spring to Steve as soon as they are available.
- Set up another Bedi/Krygier 5R55W review for the week of 9/25. Earliest date we could get is 10/5 - currently scheduled.

Dan Hildebrand, P.E.
Manager, 5R55N/E/W/S Auto Trans Systems Dept
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e-mail: dhildebr@ford.com/CDS ID: DHILDEBR
Mail Drop T-201, Rm. W318B, ATNPC, Livonia
Admin. Asst.: Judy Lardin, Ph: 734-52-34517

From: McKinnis, Larry (L.N.)
Sent: Friday, September 08, 2000 4:15 PM
To: Samardzich, Barb (B.J.)
Cc: Hildebrand, Dan (D.H.); Brown, David (D.S.); Manchester, Dennis (D.L.); Myint, Aung (A.S.); Yuhasz, Philip (P.D.)
Subject: RE: 5R55-W Park Task Force Team Meeting

The task force is working thru the weekend, and we have lined up the HMS and inspection and technical support that we know of tonight. Everyone is cooperating, very well. The team has spent the entire morning putting the test history together and trying to understand what we have evaluated and what logically needs to be done next. Steve Landis has been a very positive force in putting the necessary discipline in this process. Each of the team members have tasks assigned to perform and we will assess the progress in the morning.

Larry N. McKinnis Manager, Mechanical/Structural Subsystems Department
Phone 734-52-33601 Fax 734-52-30106
Text pager, lmckinni, Mail Drop 214, cube W219-B ATNPC
Nationwide Pager 888-218-1689 Livonia Michigan 48150

-----Original Message-----
From: Samardzich, Barb (B.J.)
Sent: Friday, September 08, 2000 1:44 PM
To: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.)
Cc: Yuhasz, Philip (P.D.)
Subject: FW: 5R55-W Park Task Force Team Meeting
Importance: High

We need to have a solution by Monday. I assume the team understands the urgency of this situation and is working round the clock this weekend. Let me know what other resources you need today so we can line them up prior to the weekend if you haven't done so already.

Barb Samardzich
Chief Engineer
Automatic Transmission Engineering,ATO/Box 21
Phone: (734) 523-5775 Fax: (734) 523-3239
Text Pgr: (734) 296-1469 Admin: Linda Isakson

-----Original Message-----
From: Blair, Mark (M.A.)
Sent: Friday, September 08, 2000 3:44 AM
To: Samardzich, Barb (B.J.)
Subject: RE: 5R55-W Park Task Force Team Meeting

I am extremely frustrated with the whole situation. As you understand from working here, we are under tremendous financial pressure and every week is $350,000 in adverse cost performance. I want the customer protected and I support quality above cost but I need a solution to the cost as well. Right now we are looking at a $700,000 to $1,400,000 adverse budget situation because of this. Unfortunately the plant and I will be held accountable for this and not Dan Hildebrand. This performance issue means the difference of making our numbers or not.....unfortunately. That being said, we are banking on a home run again and we have proven so far that we can't do that so it might even get worse.

Do what you can to turn up the heat on this!!!! Thanks.

Regards,
Mark Blair
Chief-Engineer & Manufacturing Director, Manual Transmission
Tel: 8703-2438 external: +49-(0)221-903-2438
Fax: 8703-3023 external: +49-(0)221-903-3023
e-mail: mblair1@ford.com

-----Original Message-----
From: Samardzich, Barb (B.J.)
Sent: Donnerstag, 7. September 2000 23:44
To: Blair, Mark (M.A.)
Subject: FW: 5R55-W Park Task Force Team Meeting

I did a pre-engineering <SO> review today w/ the 5R55W team. On the critical concerns you sent me a note about, I am comfortable will all except the park disengagement status. Let's leave it as progress and approach to resolve the issue was unsatisfactory => we've made some adjustments (noted below). I have directed the team to complete the analyses that support hardware modifications prior to any release. By Monday we will have definition of root cause and required changes to the park pawl, along with timing for Bordeaux impact.

Will keep you updated, the Bordeaux resident was involved in the review - I'm sure he'll update the plant.

Regards,

Barb Samardzich
Chief Engineer
Automatic Transmission Engineering,ATO/Box 21
Phone: (734) 523-5775 Fax: (734) 523-3239
Text Pgr: (734) 296-1469 Admin: Linda Isakson

-----Original Message-----
From: McKinnis, Larry (L.N.)
Sent: Thursday, September 07, 2000 5:28 PM
To: Samardzich, Barb (B.J.); Yuhasz, Philip (P.D.); Hildebrand, Dan (D.H.)
Cc: Waclawski, Chris (C.G.); Fyie, Matthew (M.L.); Spaulding, Todd (T.C.); Perri, Ron (R.J.); Haggerty, Judy (J.F.); Kohls, Tracy (T.K.)
Subject: 5R55-W Park Task Force Team Meeting

We have selected Matt Fyie to be the technical lead for this team. We will be starting the first of the team meetings in the morning at 7 Am in E219-F CR. Other technical supporting personnel will be David Adamczyk, Jim Brazin Yehong Xu. We have started the planning and development of the bench test in PAV this afternoon and should have a report from the CAE folks tomorrow. We will continue this process until we have a validated design.

Larry N. McKinnis Manager, Mechanical/Structural Subsystems Department
Phone 734-52-33601 Fax 734-52-30106
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Nationwide Pager 888-218-1689 Livonia Michigan 48150

Levine, Julie (J.A.)

From: Wayne Avers [wavers@admiral-liv.com]
Sent: Monday, September 18, 2000 6:09 PM
To: Alan Porter; Levine, Julie (J.A.)
Subject: RE: 9/19 Column Daily List

FYI

1 - I have the E & M Coated Insert Plates & Shift Levers (4:30 Today) I left
a message on Ziad's Voice mail. I will bring them to him by 10:00 AM Tues or
he can pick up if he wants sooner.

2 - On the 4 MM pivot bracket - The progressive die can be reworked in about
8 to 12 weeks. 8 for the die & some time for tryout. The weld on flange is
not a very cost or process effective thing to do. We can do it if necessary,
but this is a slow operation. The progressive die does not have the room for
a stamped flange, (No material in the correct areas) Have we looked at a
small gusset bridging the corner? or would this give us a problem with
crash?

3 - The first 4mm Pivot Bracket should be in on Wed. the week. We have to
modify the welding fixtures to accommodate. Then we will assemble some
samples.

4 - The riveting for IB will have to be done on the off line fixture. The
rivets will be in this week they will also be yellow dichromate for ID. Our
machine builder is still looking at the reworking of the current station.,
(They are on sight this week in Livonia) It looks like the station can be
saved.

5 - The 364 Shift bracket can be supported with prototype reinforcements,
and off line welding. I will have the production costs & timing tomorrow.

6 - We are running Tilt Levers from 45,000 min yield material in the next
few days. We will know if there is a problem with holding dimensions. This
should add about 20% to 25% more yield strength to the part.

7 - On the over mold tooling, our source is adding the gas hole, and we
should know soon if it will help.

Thanks, Wayne Avers
Admiral Tool & Mfg. Co. of Michigan

-----Original Message-----
From: Levine, Julie (J.A.) [mailto:jlevine@ford.com]

From: Fyie, Matthew (M.L.)
Sent: Wednesday, November 08, 2000 8:56 AM
To: Perri, Ron (R.J.); Dover, Harry (H.); Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.)
Cc: DeFore, Matthew (M.); Adamczyk, David (D.W.); Spaulding, Todd (T.C.)
Subject: RE: 65lbf Bench Test Transmissions

Using the following assumptions, the predicted disengagement effort (measured 90° to the outer manual lever as the bench data is being described) is 43 lbf.

Assumptions:
Mu = 0.12
Cam included angle = 9.5 deg
Grade = 30%
Vehicle weight = 5900 lbf
Final Drive Ratio = 3.27
Tire Size = 255/70R-16
(The vehicle weight, FDR, & tire size are used to load the system in the model)

The model is generally more conservative than real life so either something is causing a higher mu value on the bench transmissions or there are something else is different in the bench test to cause the extra load.

Matt Fyie
ATEO Park Systems
Phone: (734) 52-30120
Text Pager: (734) 797-9317

-----Original Message-----
From: Perri, Ron (R.J.)
Sent: Wednesday, November 08, 2000 7:12 AM
To: Dover, Harry (H.); Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.)
Cc: Fyie, Matthew (M.L.); DeFore, Matthew (M.); Adamczyk, David (D.W.); Spaulding, Todd (T.C.)
Subject: RE: 65lbf Bench Test Transmissions

Matt, what do the calculations predict?

-----Original Message-----
From: Dover, Harry (H.)
Sent: Monday, November 06, 2000 8:00 PM
To: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.)
Cc: Fyie, Matthew (M.L.); Perri, Ron (R.J.); DeFore, Matthew (M.); Adamczyk, David (D.W.); Spaulding, Todd (T.C.)
Subject: RE: 65lbf Bench Test Transmissions

Goodevening all! How is this out of specification result going to be handled - without an assignable cause it is difficult to close.

Normally a discrepancy of this sort should kickoff a Concern, 8D etc for resolution.

Was this done?

Thanks!

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

From: Dover, Harry (H.)
Sent: Wednesday, November 01, 2000 6:53 PM
To: Hildebrand, Dan (D.H.)
Cc: Fyie, Matthew (M.L.); Perri, Ron (R.J.); DeFore, Matthew (M.);
Adamczyk, David (D.W.); Spaulding, Todd (T.C.)
Subject: RE: 65lbf Bench Test Transmissions

I was looking for an attribute which would allow us to be able to state that we had meet the system DVP&R requirements when parts meet specification, but did not when there was an assignable cause - lack of conformance to specification, but that appears not to be the case.
That being said how will this issue be addressed? Thanks!

-----Original Message-----
From: Hildebrand, Dan (D.H.)
Sent: Wednesday, November 01, 2000 6:33 PM
To: Dover, Harry (H.)
Cc: Fyie, Matthew (M.L.); Perri, Ron (R.J.); DeFore, Matthew (M.);
Adamczyk, David (D.W.)
Subject: RE: 65lbf Bench Test Transmissions

To the best of our ability we see no characteristic with the gear tooth (teeth) to date that would result in high lever efforts. The effort to remove the vehicle from Park under load should be a result of the torque, the tooth angles, the pawl angles, the cam angles and the friction coefficients. The only difference I can see that the individual gear teeth can provide are; a unique angle at the pawl interface which changes the radial load to the park engagement ramp or a low friction coefficient. These things can increase the load transmitted to the rod by the output shaft torque. If friction is high, the transfer of load is less. If the angle is "low" vs. 90 degrees to radial line of gear, the load tranfer will be low.

Do you have other suggestions?

Dan Hildebrand, P.E.
Manager, 5R55N/E/W/S Auto Trans Systems Dept
Ph: 734-52-34598, Fax: 734-45-80991/734-52-33910
Text Pager: 734-797-6257
e-mail: dhildebr@ford.com/CDS ID: DHILDEBR
Mail Drop T-201, Rm. W318B, ATNPC, Livonia
Admin. Asst.: Judy Lardin, Ph: 734-52-34517

-----Original Message-----
From: Dover, Harry (H.)
Sent: Wednesday, November 01, 2000 4:22 PM
To: Hildebrand, Dan (D.H.); DeFore, Matthew (M.); Adamczyk, David (D.W.)
Cc: Fyie, Matthew (M.L.); Perri, Ron (R.J.)
Subject: RE: 65lbf Bench Test Transmissions

Goodafternoon! What gear parameter was above specification, and what rationale was used to correlate the high(72)lb load with the parameter deviation? Thanks!

-----Original Message-----
From: Hildebrand, Dan (D.H.)
To: DeFore, Matthew (M.); Adamczyk, David (D.W.)
Cc: Fyie, Matthew (M.L.); Perri, Ron (R.J.); Dover, Harry (H.)
Sent: 11/1/00 3:26 PM
Subject: RE: 65lbf Bench Test Transmissions

I believe we can based on in-vehicle testing that meets shift effort requirements and the fact that the cable and shift cable brackets are not deformed during in vehicle test. We cannot say on its own that we

passed but with qualification that it meets system function with no customer or hardware impact, we can approve.

Shift System folks - you can disagree? The loads got as high as ~ 72 pounds on one test sample - 3 teeth of 13 on 2 transmissions were above specification. 1 was a rerun to confirm or deny that the first unit measurements were in the "normal" population.

Dan Hildebrand, P.E.
Manager, 5R55N/E/W/S Auto Trans Systems Dept
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e-mail: dhildebr@ford.com/CDS ID: DHILDEBR
Mail Drop T-201, Rm. W318B, ATNPC, Livonia
Admin. Asst.: Judy Lardin, Ph: 734-52-34517

> -----Original Message-----
>From: DeFore, Matthew (M.)
>Sent: Wednesday, November 01, 2000 2:57 PM
>To: Hildebrand, Dan (D.H.); Adamczyk, David (D.W.)
>Cc: Fyie, Matthew (M.L.)
>Subject: RE: 65lbf Bench Test Transmissions
>
>Dan/Dave - Can we sign off on DV?
>
> -----Original Message-----
>From: Fyie, Matthew (M.L.)
>Sent: Wednesday, November 01, 2000 2:22 PM
>To: DeFore, Matthew (M.); Hildebrand, Dan (D.H.); Adamczyk, David
>(D.W.)
>Subject: 65lbf Bench Test Transmissions
>
>Gents - I took a look at transmissions #4 & 5 in build-up. Everything
>looks as it should. I didn't see anything that would explain any high
>pull-out efforts. Didn't see any cracks or burrs that would cause an
>issue.
>
>The transmissions are still down on the bench in case anyone else wants
>to take a look at them.
>
>Matt Fyie
>ATEO Park Systems
>Phone: (734) 52-30120
>Text Pager: (734) 797-9317
>

From: Case, Robert (R.G.)
Sent: Monday, June 07, 2004 8:52 AM
To: Lecznar, Robert (R.)
Subject: RE: 076-2004-0032

Overall they look pretty good. Listed below are a few comments:

- page 3 - the verbiage to remove 3 fasteners does not match the picture to remove a harness connector.
- not sure what the picture on page 4 is trying to show.
- page 5....BSI fasteners...there are only 2 and one of them is on the wire harness bundle carrier
- page 6 shows a wire harness connector with verbiage to remove 3 fasteners?

Thanks for your help!

Bob Case
FCSD x00937
Warranty Program Manager

-----Original Message-----
From: Lecznar, Robert (R.)
Sent: Wednesday, June 02, 2004 2:31 PM
To: Case, Robert (R.G.); Thornton, James (J.W.)
Subject: FW: 076-2004-0032

Please review pics and provide some feeback if necessary.....Thanks

Robert Lecznar
Product Concern Engineer
4 Door Explorer/Mountaineer
1800 Fairlane Drive, Allen Park, Michigan 48101
Cube #542
1-313-390-1253 Office
1-313-323-8042 Fax

-----Original Message-----
From: TSB [mailto:tsb@brownart.com]
Sent: Thursday, May 27, 2004 4:23 PM
To: Lecznar, Robert (R.)
Subject: 076-2004-0032

Attached are the drawings for 076-2004-0032. Please review and let me know if

there will be any changes to the art or if it is approved.

Thanks!

Jody Puskarz
Technical Writer
Brown Art Corporation
313-565-7020 phone
313-565-7022 fax
tsb@brownart.com

From: Tang, Linda (YuQun.)
Sent: Tuesday, August 27, 2002 10:31 AM
To: DeFore, Matthew (M.)
Subject: RE: Aiello Trans

Matt,

I think I picked up the rooster comb from lab. The dimensions of rooster comb are in print. Then I put it somewhere in office. Maybe i can come
to Park sections tomorrow if it is necessary.

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Tuesday, August 27, 2002 9:47 AM
To: Tang, Linda (YuQun.)
Subject: FW: Aiello Trans

Linda - Hope all is well for you. Do you remember if you picked up these 5R55W components (rooster comb + detent spring) from the inspection lab? Reference your attached note. We're being asked to close out this issue, but do not have the necessary information to do so at this time. I'd appreciate your help in locating these components. Thanks!

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

-----Original Message-----
From: Nagy, Louis (L.A.)
Sent: Monday, August 26, 2002 2:09 PM
To: Radl, Nathan (N.J.); Ahmed, Kamal (K.); DeFore, Matthew (M.)
Cc: Nagy, Louis (L.A.); Tang, Linda (YuQun.); Scheuer, James (J.A.)
Subject: RE: Aiello Trans

The functionality of the TRS was within spec, I worked with Kamal initially to check alignment and the shifter person (Harry Dover) checked the shifter adjustment. I believe the TI rep and Kamal also checked the pad positions with the encoder, Kamal can provide that analysis. Linda Tang was investigating the park side of the issue. I will talk to Matt Defore to find out the status.

-----Original Message-----
From: Radl, Nathan (N.J.)
Sent: Monday, August 26, 2002 1:33 PM
To: Nagy, Louis (L.A.); Ahmed, Kamal (K.); DeFore, Matthew (M.)
Subject: RE: Aiello Trans

Were you guys able to identify any issues with the Aiello trans? TRS, rooster comb, other park mechanisms?? If you don't recall, this trans had an inadvertent movement in park complaint. What is the status of this transmissions? Please let me know. Thanks.

Nathan J. Radl
5R55E/W/S Transmission Systems NVH
ATNPC, Cube W312A
Phone: (734) 266-1298
Fax: (734) 523-3910
Pager: (313) 795-9287

-----Original Message-----
From: Tang, Linda (YuQun.)
Sent: Friday, March 22, 2002 1:02 PM
To: Radl, Nathan (N.J.)
Subject: RE: Aiello Trans

I sent the rooster comb to Inspection Lab for checking dimensions.

Linda Y. Tang
Product Design Engineer, Park Systems Section
Mechanical/Structural Sub-Systems Department
Auto Transmission New Product Design Center
Tel: (734)458-0717, Fax: (734)523-6052
ltang6@ford.com

-----Original Message-----
From: Radl, Nathan (N.J.)
Sent: Friday, March 22, 2002 12:40 PM
To: Ahmed, Kamal (K.); Nagy, Louis (L.A.)
Cc: Krishnaswami, Ram (R.); Tang, Linda (YuQun.)
Subject: RE: Aiello Trans

Any updates on the Aiello trans?

Nathan J. Radl
5R55E/W/S Transmission Systems NVH
ATNPC, Cube W312A
Phone: (734) 266-1298
Fax: (734) 523-3910
Pager: (313) 795-9287

-----Original Message-----
From: Nagy, Louis (L.A.)
Sent: Thursday, February 28, 2002 12:10 PM
To: Radl, Nathan (N.J.)
Cc: Nagy, Louis (L.A.); Ahmed, Kamal (K.); Krishnaswami, Ram (R.); Tang, Linda (YuQun.)
Subject: RE: Aiello Trans

We did some preliminary checks of the TRS output and angle of output. After the Park Eng looks at it, we are planning to send the TRS to TI for evaluation. So far the TRS seems to function correctly.

-----Original Message-----
From: Radl, Nathan (N.J.)
Sent: Wednesday, February 27, 2002 12:57 PM
To: Ahmed, Kamal (K.)
Cc: Nagy, Louis (L.A.)
Subject: Aiello Trans

What is the status of the Aiello trans? Are you planning to teardown and inspect, or install in vehicle for testing?

Nathan J. Radl
5R55E/W/S Transmission Systems NVH
ATNPC, Cube W312A
Phone: (734) 266-1298
Fax: (734) 523-3910
Pager: (313) 795-9287

From: Porter, Alan (A.J.)
Sent: Monday, July 24, 2000 6:38 AM
To: Dover, Harry (H.); Andrews, Brian (B.)
Cc: Spaulding, Todd (T.C.); Perri, Ron (R.J.)
Subject: RE: Alert A11124547 re sticking Brake Shift Interlock Solenoid.

The housing was modified in a way that did not affect the minimum park retention dimension.

-----Original Message-----
From: Dover, Harry (H.)
Sent: Saturday, July 22, 2000 11:19 AM
To: Andrews, Brian (B.)
Cc: Porter, Alan (A.J.); Spaulding, Todd (T.C.); Perri, Ron (R.J.)
Subject: FW: Alert A11124547 re sticking Brake Shift Interlock Solenoid.

Goodmorning Brian! forgot to include you on the following note. We need assurances from Alan that the modification did not affect the minimum Park retention dimension. The Alert needs a statement to this affect.

-----Original Message-----
From: Dover, Harry (H.)
Sent: Saturday, July 22, 2000 11:09 AM
To: Porter, Alan (A.J.)
Cc: Spaulding, Todd (T.C.); Perri, Ron (R.J.)
Subject: Alert A11124547 re sticking Brake Shift Interlock Solenoid.

Goodmorning Alan!
I was at the Saline plant on Thursday when I was shown the sticking BSI solenoid (seem to remember that 2 out of 8 had stuck in the retracted position).
Today the subject alert is in my mailbox for signoff. The Alert states that the 'steering column housings were modified to allow BSI pin to travel without binding'.
Question - how was the housing modified, and would the modification affect our minimum travel requirement to retain Park, when the lever is moved out of Park onto the detent ledge? Thanks!

From: Flemings, Kasandra (K.N.)
Sent: Tuesday, November 30, 2004 4:56 PM
To: Welch, Sharon (S.L.); Thornton, James (J.W.)
Cc: Porter, Alan (A.J.)
Subject: RE: BSI Switch

Sharon -

1) Jim Thornton should be listed as the technical expert.
2) As far as the BSI for service, 1L2C-3f770-DA & 5L24-3F770-AA are actually interchangeable for service. The primary difference is the hex chrome. The pin length change is being made with the 1L2c-3f770-DA, but the notice had already been released and the changes are coming so close together, so it got documented on 5L24-3f770-AA).

KASANDRA FLEMINGS - OPD HYDRAULIC ENGINEER (P207/U152/U222/U228/EN/FN)
PHONE: 313.322.3161, FAX: 313.594.0866
EXCELLENCE IS HARD WORK !

Note: The information contained in this message may be privileged and confidential and thus protected from disclosure. If the reader of this message is not the intended recipient, or an employee or agent responsible for delivering this message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited.

-----Original Message-----
From: Welch, Sharon (S.L.)
Sent: Tuesday, November 30, 2004 1:10 PM
To: Thornton, James (J.W.); Flemings, Kasandra (K.N.)
Cc: Welch, Sharon (S.L.)
Subject: BSI Switch

Jim and Kasandra,
I am not sure which one of you to address this question to so I will ask both of you. The original part for the BSI switch was 1L2C 3F770 DA. It has recently been replaced by 5L24 3F770 AA according to WERS. Engineering direction states:

U152 BRAKE SHIFT INTERLOCK FOR USE ON 5L24-3C529-D* ONLY.
1) HEX CHROME FREE 2) BSI OVERRIDE LEVER PIN LENGTH INCREASED TO 3MM
TO ADDRESS LEVER GETTING DISLODGED DURING FUNCTION

yet the service disposition is to mix stock. Are these two parts indeed interchangeable or do we need to distinguish application? Kasandra's name is on the releases, but Jim is the individual Bob/I worked with to get this part released.

In addition, we will be publishing a Warranty Action Notice (WAN) emphasizing the availability of this part. WANs require a technical expert. (Just a person the people who publish the articles can call if they receive a dealer inquiry. Your name will not be published to the dealer body.) I am not sure who's name I should give as the technical expert. Please advise.

Thanks.

Sharon Welch

FCSD Program Manager - Warranty Task Force
Fairlane Business Park 3 246F
Phone (313) 24-83499

From: Spaulding, Todd (T.C.)
Sent: Tuesday, September 24, 2002 7:02 AM
To: DeFore, Matthew (M.); Greene, Lisa (L.A.); Retallack, Lynn (L.M.)
Cc: Pittel, Kimberly (K.L.)
Subject: RE: Evaluation of Shifter/Park System

Mark Z will be supporting the Wixom meeting from Shifter Systems. I will be heading out there as well, after evaluating a vehicle in the cold box first thing.

Todd Spaulding

-----Original Message-----
From: DeFore, Matthew (M.)
To: Greene, Lisa (L.A.); Retallack, Lynn (L.M.)
Cc: Pittel, Kimberly (K.L.); Spaulding, Todd (T.C.)
Sent: 9/23/02 6:53 PM
Subject: FW: Evaluation of Shifter/Park System

Lisa/Lynn - Jim Scheuer, Phil Guthrie and I evaluated a 2003 Thunderbird, 2003 U231 (Aviator) and 2002 LS (which had a 2003 shifter and W/S transmission components) to better understand the issues raised at the management drives. Jim and I noticed a 'double detent' feel which we narrowed to transmission function, though we're unclear if this is the concern mentioned in the management drives. Talking with Phil, Pat Oldani and Vince Lajiness what is clear is that further problem definition is required. Jim and I will be at Wixom tomorrow morning 8-9:30 a.m. to support further jury eval. on multiple vehicles.

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

> -----Original Message-----
>From: Garza, Laura (L.A.)
>Sent: Monday, September 23, 2002 6:01 PM
>To: Oldani, Pat (P.E.)
>Cc: Lajiness, Vince (V.); Spaulding, Todd (T.C.); Scheuer, James
>(J.A.); DeFore, Matthew (M.); Cibulas, Steve (S.M.)
>Subject: RE: Evaluation of Shifter/Park System
>
>No problem, I can meet you in the lobby and let you in.
>
>Laura A. Garza
>2003 Lincoln LS Powertrain Launch Leader Dearborn Phone: (313)
>845-1044 Wixom Phone: (248) 596-2592 Wixom Fax: (248) 596-2609
>Pager: (313) 796-7026 (text)
>E-mail: lgarza4@ford.com
>
> -----Original Message-----
>From: Oldani, Pat (P.E.)
>Sent: Monday, September 23, 2002 5:57 PM
>To: Garza, Laura (L.A.)
>Cc: Lajiness, Vince (V.); Spaulding, Todd (T.C.); Scheuer, James
>(J.A.); DeFore, Matthew (M.); Cibulas, Steve (S.M.)
>Subject: Evaluation of Shifter/Park System

>
>
>Laura,
>
>I have several people meeting Tuesday at 8:00am in the Wixom lobby to
>perform vehicle evaluations. Can you meet us there to provide access
>into the plant. From there we can take the shuttle to Carlite.
>
>Todd - got you page and strongly suggest that you or your engineer(s)
>support to identify root cause of the complaint. If you don't agree
>call Larry Brouwer, he has already sent e-mails to Lisa Greene and Lynn
>Retallack requesting support to resolve.
>
>
>Pat Oldani
>Supervisor,
>Lincoln P/T Trans. Development
>Phone: (313) 248-1444
>

From: Retallack, Lynn (L.M.)
Sent: Tuesday, September 24, 2002 8:24 AM
To: DeFore, Matthew (M.)
Cc: Greene, Lisa (L.A.); Spaulding, Todd (T.C.); Pittel, Kimberly (K.L.)
Subject: RE: Evaluation of Shifter/Park System

I do believe that the double detent feel is a complaint ... Mike Renucci and Jonathan Crocker have both complained about this, as well as others. We need to fix this ASAP.

Lynn Retallack
Manager, Mechanical/Structural Sub-Systems
Job Share Partner : Lisa Greene
Automatic Transmission Engineering Office
Phone: 734-523-3906, Fax: 734-523-0106

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Monday, September 23, 2002 6:54 PM
To: Greene, Lisa (L.A.); Retallack, Lynn (L.M.)
Cc: Pittel, Kimberly (K.L.); Spaulding, Todd (T.C.)
Subject: FW: Evaluation of Shifter/Park System

Lisa/Lynn - Jim Scheuer, Phil Guthrie and I evaluated a 2003 Thunderbird, 2003 U231 (Aviator) and 2002 LS (which had a 2003 shifter and W/S transmission components) to better understand the issues raised at the management drives. Jim and I noticed a 'double detent' feel which we narrowed to transmission function, though we're unclear if this is the concern mentioned in the management drives. Talking with Phil, Pat Oldani and Vince Lajiness what is clear is that further problem definition is required. Jim and I will be at Wixom tomorrow morning 8-9:30 a.m. to support further jury eval. on multiple vehicles.

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

-----Original Message-----
From: Garza, Laura (L.A.)
Sent: Monday, September 23, 2002 6:01 PM
To: Oldani, Pat (P.E.)
Cc: Lajiness, Vince (V.); Spaulding, Todd (T.C.); Scheuer, James (J.A.); DeFore, Matthew (M.); Cibulas, Steve (S.M.)
Subject: RE: Evaluation of Shifter/Park System

No problem, I can meet you in the lobby and let you in.

Laura A. Garza
2003 Lincoln LS Powertrain Launch Leader
Dearborn Phone: (313) 845-1044
Wixom Phone: (248) 596-2592
Wixom Fax: (248) 596-2609

Pager: (313) 796-7026 (text)
E-mail: lgarza4@ford.com

-----Original Message-----
From: Oldani, Pat (P.E.)
Sent: Monday, September 23, 2002 5:57 PM
To: Garza, Laura (L.A.)
Cc: Lajiness, Vince (V.); Spaulding, Todd (T.C.); Scheuer, James (J.A.); DeFore, Matthew (M.); Cibulas, Steve (S.M.)
Subject: Evaluation of Shifter/Park System

Laura,

I have several people meeting Tuesday at 8:00am in the Wixom lobby to perform vehicle evaluations. Can you meet us there to provide access into the plant. From there we can take the shuttle to Carlite.

Todd - got you page and strongly suggest that you or your engineer(s) support to identify root cause of the complaint. If you don't agree call Larry Brouwer, he has already sent e-mails to Lisa Greene and Lynn Retallack requesting support to resolve.

Pat Oldani
Supervisor,
Lincoln P/T Trans. Development
Phone: (313) 248-1444

From: Dover, Harry (H.)
Sent: Monday, August 21, 2000 4:52 PM
To: Xu, Yehong (Y.); Porter, Alan (A.J.)
Cc: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Brazin, Jim (J.C.); Spaulding, Todd (T.C.); Perri, Ron (R.J.)
Subject: RE: Failure to Disengage Vehicle from 30% Grade Due to High Pullout Efforts

OK Yehong! to summarize our findings from this afternoon's vehicle review:
1)transmission shift cable adjustment checked by starting engine in both Park and Neutral - OK
2)vehicle reverse lights when Reverse selected - OK
3)vehicle in Park when Park selected - OK
4)vehicle reverse lights ON and vehicle moved rearwards under power when Neutral selected - NOT GOOD
5)sometimes lever would not come out of Park when key in Run position and brake pedal depressed - NOT GOOD

Following readjustment of the shift cable the following was observed:
a)item 4 fixed
b)item 5 still present - determined that if the shift lever moved to the top of the detent ledge before depressing the brake, the shift lever could not be moved any further towards Reverse. By returning the lever to the Park detent slot, applying the brake, the shift lever could be moved to any desired position.

Alan! It would appear the the Brake Shift Interlock Solenoid does not have sufficient capacity to overcome the frictional load developed between the solenoid pin and the stop surface on the intermediate lever; even with no effort being placed on the shift lever. Think this condition will give us TGW'S
Vehicle is located at Livonia for Pull out of Park testing (UA81220/206W957)

-----Original Message-----
From: Dover, Harry (H.)
Sent: Monday, August 21, 2000 10:32 AM
To: Xu, Yehong (Y.)
Cc: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Brazin, Jim (J.C.); Spaulding, Todd (T.C.); Perri, Ron (R.J.)
Subject: RE: Failure to Disengage Vehicle from 30% Grade Due to High Pullout Efforts

Goodmorning Yehong!
It would seem to me that if the vehicle successfully completed 300+ pullout trials on 30% grade, then after changing transmission it could not be moved from Park on the first 30% grade trial, that the issue is either in the transmission or in the cable reinstallation procedure.
I will come out to Livonia this afternoon to check the reinstallation. And then we can take it from there.

-----Original Message-----
From: Xu, Yehong (Y.)
Sent: Sunday, August 20, 2000 9:52 AM
To: Dover, Harry (H.)
Cc: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Brazin, Jim (J.C.); Spaulding, Todd (T.C.); Perri, Ron (R.J.)
Subject: Failure to Disengage Vehicle from 30% Grade Due to High Pullout Efforts

Harry:

A 2PP U152 (4x4, 4.6L, 3.73 axle ratio) failed to disengage from park at the first cycle of pullout test (on a 30% grade) due to a high pullout effort. The trans is a rebuilt one with a brand new case, a new extension housing and all new park components, but, the cable and shifter have at lease 300 pullout cycles (on 30% grade). This is an urgent issue and we have to investigate causes immediately. If we can distinguish the source of the problem, meaning whether the problem exists in transmission or in shift system, we can find the right fix. If we can disconnect the shift cable from the outer manual lever and then try to disengage vehicle from manual lever

when the vehicle is still on the hill, we should be able to tell how much force needed to disengage a vehicle from park at the transmission. However, it is too dangerous to proceed. Please let me know if you have other feasible ways to distinguish the problem. Would you please provide some shift cables to us ASAP, so we can resume our DV tests? If you don't have cables available, please help us out by asking your supplier to ship some parts to us immediately. I need 10 cables, but, one or two pieces will help for now. Please also give me the part number for the shift cable, so I can put a purchase order in.

Please come over to take a look at the problem first thing on Monday morning. I greatly appreciate your help.

Regards,

Yehong Xu
YXU1
Park Systems Section
Mechanical/Structural Sub-Systems Dept.
Ph: (734) 458-0717
Fax: (734) 523-6052

From: Scheuer, James (J.A.)
Sent: Thursday, August 29, 2002 12:45 PM
To: DeFore, Matthew (M.)
Subject: RE: Functional for 5R55S Parking Components...

Commonization is the primary driver although there are a couple of subtle changes. 1) The half-angle tolerance on the "W" / S cam is 50% tighter 2) As we talked earlier, the rooster comb is "notchier" although it's impact on shift feel is a matter of preference 3) The S-car keeps the "N's" PM gear, the S-truck keeps its forged gear. 4) The return spring has a different rate between the "N" and "W/S" and the pawl is a bit heavier on the W/S.

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Thursday, August 29, 2002 12:00 PM
To: Scheuer, James (J.A.)
Subject: FW: Functional for 5R55S Parking Components...

Jim - What are the major differences/improvements we gain by utilizing S components in the N?

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

-----Original Message-----
From: Tyahla, Mark (M.A.)
Sent: Thursday, August 29, 2002 10:49 AM
To: Lajiness, Vince (V.); Moore, Gary (G.R.); DeFore, Matthew (M.); Scheuer, James (J.A.)
Subject: FW: Functional for 5R55S Parking Components...

FYI

Mark A. Tyahla
Sharonville 4R70W/5R55N Resident Engineer
Phone No (inside Ford) x-7339, 9-1-925-7339
Phone No (outside Ford) (513)782-7339
Fax No (513) 782-7239

-----Original Message-----
From: Smolinski, Waylon (W.S.)
Sent: Thursday, August 29, 2002 10:46 AM
To: Humphreys, Natalie (N.R.); Klenczar, Jeff (J.J.); Somerville, Jack (J.R.); Haer, Rob (R.E.); Vaughn, Dianna (D.M.); O'Connor, Dawn (D.); Tyahla, Mark (M.A.); Mincey, Michael (M.S.)
Cc: Smolinski, Waylon (W.S.); Jackson, Vernon (V.E.); Martinez, Waldemar (WM.)
Subject: Functional for 5R55S Parking Components...

Engineering gives functional approval for the 4 parking components from the 5R55S that were run in the 5R55N models. 300 pieces of each component were installed on the same 300 transmissions during a 5R build on 8/28/02 with no issues. The functional parts are as follows:

Part Name	5R55N #	5R55S #	Sta.
Park Pawl	XW4P-7A441-BC	***1L2P-7A441-AC**	360A
Park Pawl Return Spring	XW4P-7D070-BA	***1L2P-7D070-BA**	360A
Actuator Rod	XW4P-7D410-AD	***1L2P-7D410-AB**	270
Detent Lever (Rooster Comb)	XW4P-7C494-AC	***1L2P-7C494-BA**	270

***Indicates functional parts**

These 4 parts are being pulled ahead to decrease the amount of new components being implemented at one time when switching to the S-Model. The serial numbers of the transmissions containing these S-parts were run on V6 and V8 models as follows:

Model 164 (V6)
RJL-O
B/D: 8/28/02

2nd shift
1st Serial: 52441
Last Serial: 52603

Model 163 (V8)
RJL-P
B/D: 8/28/02

2nd shift
1st Serial: 91538
Last Serial: 91677

Thanks...

Waylon Smolinski
Ford Motor Company
Sharonville Transmission Plant
Phone & Fax: (513) 782-7722
Pager: (513) 589-0060
email: wsmolins@ford.com

From: Linnansalo, Vera (V.)
Sent: Wednesday, September 01, 2004 10:48 AM
To: Snider, Tim (T.O.)
Subject: RE: Greenbelt Project for SUV BOF Steering

Great!

I assume you'd like to use this project for your GB verification?

I'm in Indianapolis (at the Visteon Steering Plant) today and tomorrow -- I'll be back in Dearborn on Friday after 11 AM. Would you set up a meeting please?

I'd like to meet with you and see what charts you have.

We need to put together a 6-panel on this project. I'm hoping your charts can be part of the 6-panel (or you can help create the 6-panel presentation).

Sincerely,

Vera Linnansalo

Vera Linnansalo
Ford Chassis BB Performance Cell
PDC 1FL24
Ph: 313-594-4285
e-mail : vlinnans@ford.com <mailto:vlinnans@ford.com>

-----Original Message-----
From: Snider, Tim (T.O.)
Sent: Wednesday, September 01, 2004 10:35 AM
To: Linnansalo, Vera (V.)
Cc: Thornton, James (J.W.); Porter, Alan (A.J.)
Subject: FW: Greenbelt Project for SUV BOF Steering

Vera,

I would like to participate with Jim Thornton on the U251 Hard to Shift into Park Greenbelt project. I took Greenbelt training with Alan Porter and we used this issue for class discussion and group activities, and so I am familiar with it. What can I do? I have some of the charts we completed in class.

Regards,

Tim Snider (tsnider1@ford.com)
U293 Ford Steering Engineering
2B-C62 Product Development Center, 313-594-4129
Dearborn, MI 48121 US

-----Original Message-----
From: Thornton, James (J.W.)
Sent: Tuesday, August 31, 2004 2:13 PM
To: Snider, Tim (T.O.)
Cc: Porter, Alan (A.J.)
Subject: RE: Greenbelt Project

Please talk with Vera as she is preparing the paperwork.

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

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

From: Snider, Tim (T.O.)
Sent: Tuesday, August 31, 2004 1:57 PM
To: Thornton, James (J.W.)
Cc: Porter, Alan (A.J.)
Subject: Greenbelt Project

Jim,

I spoke with Alan and he told me to talk with you. I would like to participate with you on the U152 hard to shift into park Greenbelt project. I took Greenbelt training with Alan and so am familiar with the issue since we used this issue for discussion and group activities. I have the sheets we completed from class. Should we have a meeting to discuss what needs to be done?

Regards,

Tim Snider (tsnider1@ford.com)
U293 Ford Outfitters Steering Engineering
2B-C62 Product Development Center, 313-594-4129
Dearborn, MI 48121 USA

Levine, Julie (J.A.)

From: Villar, Daniel (D.A.)
Sent: Thursday, July 13, 2000 9:30 AM
To: Levine, Julie (J.A.)
Subject: RE: Hardness - need info Thursday morning

Hardness Direction
-Insert Plate: RC 58-60 which keeps the same case depth (0.13-0.25)
-Shift Lever: R15N 90.5-92 (~RC 60-63)

Timing on Revised Shift Lever (modify prodcuction tool to add 0.3mm to functional end)
-Still working on Dura...J. Dainter is in Branford, Canada, today...he hasn't stepped in the office yet...as soon as he does he will call me.

Timing on Revised Insert Plate (modified production tool for park detect switch bracket)
-According to Wayne Avers, Admiral, they will have production tooled insert plates by 7/27, which would be available for FEU LAP. (FYI the long lead item for the lock housing asy is the castings).

Regards,

Dan Villar, Explorer Steering
Ford Motor Company, U152 Chassis Engineering
Loc: PDC 1D-L42
Ph/Fx#: 313-33-75680
Profs/(Email): dvillar / (dvillar@gw.ford.com)

-----Original Message-----
From: Levine, Julie (J.A.)
Sent: Wednesday, July 12, 2000 7:34 PM
To: Villar, Daniel (D.A.)
Subject: Hardness - need info Thursday morning
Importance: High

Dan - What is the hardness detailed agreed upon for shift lever and insert plate?

What is the timing of that revised shift lever? When will it show up for column DV testing?

Also, what is the timing of the insert plate revised?

Regards,

Julie A. Levine
U152 Suspension and Steering PMT Leader
Ph: 24-82791 Fax:24-89193 Text Pager: 313-851-6667
e-mail: jlevine@ford.com

PE09-020 1360

A. Stevens mtg 7/13

① Ingress/Egress test correlate to customer?
new & old

- PSW when? Dup&R done?
- Parts for saleable?

② Ted Horosky - under mech property requirements for shift lever & insert plate

③ Passat test done 7/21 } - Tim Davis mtg (*)
- Anne Stevens

④ shift sys fat - accelerated test for PSW but in addition

⑤ peanut strengthen → cause problems on shift system 45 day test
(peanut at end of July)

⑥ - reset to zero? if 5K or 25K first parts has a violation
- reaction plan
- training plan @ suppliers
- operating plan - not qual office → people on floor

⑦ LAST 4 @ LAP → INSPEC SOCKET?

Tim Davis review

① Temperature → evaluate @ cold first

② rake cycle requirements - Focus,

③ ~~Mercedes / Volvo~~ / Passat - compare

✓④ Presta → data on columns

shift lever ⑤ Control plans, sampling freq
plot over time for math
<cc>
error signals if it drifts
- process parameter control
run charts of characteristics
that back it up
- plot on website - weekly
reaction plan

✓ * ⑥ cognition model - VSA report
July 10th - Bldg 3
Todd Spaulding, analyst to examine

✓ * ⑦ corporate ignition switch - RVT
why SSR for return spring
add to Tim Davis used reliability
July 12 4pm
→ Pete Pulizzi

From: Retallack, Lynn (L.M.)
Sent: Friday, November 10, 2000 2:29 PM
To: Spaulding, Todd (T.C.)
Cc: Greene, Lisa (L.A.); Kohls, Tracy (T.K.); Haggerty, Judy (J.F.); Perri, Ron (R.J.); Adamczyk, David (D.W.); Hildebrand, Dan (D.H.); Brazin, Jim (J.C.)
Subject: RE: Issue found with U152 media vehicles.

Todd - Dave Adamcyzk from 5R55W systems will be the champion for the third item identified under the quality section. We discussed this in our daily meeting and he went off to contact Bordeaux. Also, Jim Brazin and Dave were going to drive some of the vehicle here to check if this condition exists elsewhere.

Lynn Retallack
Manager, Mechanical/Structural Sub-Systems
Job Share Partner : Lisa Greene
Automatic Transmission Engineering Office
Phone: 734-523-3906, Fax: 734-523-0106

-----Original Message-----
From: Spaulding, Todd (T.C.)
Sent: Friday, November 10, 2000 11:48 AM
To: Lightner, Shawn (S.E.); Nicosia, Ray (Raymond P.); Sabaitis, Robert (R.R.)
Cc: Hildebrand, Dan (D.H.); Levine, Julie (J.A.); Porter, Alan (A.J.); Haggerty, Judy (J.F.); Perri, Ron (R.J.); Greene, Lisa (L.A.); McKinnis, Larry (L.N.); Retallack, Lynn (L.M.); Kohls, Tracy (T.K.)
Subject: RE: Issue found with U152 media vehicles.

Investigation on this issue needs to focus on (3) areas: Process, Quality, Design

1. Process

- The media vehicles are reported to have been retrofitted by Carron, to the correct process supplied by shift systems. It is also reported that vehicles at APG have had the shift cables adjusted and still exhibit the "R in N" condition. As a final check that the vehicles are indeed adjusted properly, Harry Dover from shift systems section will be flying to Phoenix Saturday morning to examine the vehicles. Until Harry looks at the vehicles I consider the cable retrofit/adjustment process as performed by Carron and at APG **suspect**.

2. Quality

- Capability data immediately needs to be obtained on the pieces of the system.
- Shift Systems will obtain capability information for the Shift Cable and the Shift Cable Bracket. Champion = T. Spaulding
- Park Systems and/or 5R55W Systems needs to obtain capability data from Bordeaux showing that the TRS, OML, and manual valve are capable for attributes that could influence this condition. Champion = **NEEDS TO BE IDENTIFIED**
- Ford Steering and/or Visteon need to obtain capability data for the column showing that it is capable for attributes that could influence this condition. Champion = **NEEDS TO BE IDENTIFIED**

3. Design

- The U152 was evaluated for this condition as part of the angle verification work performed in the resolution of the column interlock stop concern. No evidence of this condition was observed on HTFB vehicles (prior to interlock stop revisions) or 2PP vehicles (after interlock stop revisions).
- This condition has not been observed on prior vehicles builds and/or campaign prevention fresh eyes

reviews.

- This condition is also checked by tolerance analysis computer modeling. This study was completed 5/22/00 to 2PP design level drawings. Shift Systems has not been made aware of any changes to the components since that study was performed. Tolerance analysis shows that if all parts are made to the allowable print tolerances there will be a **minimum** of 4.73 degrees of separation between the OML as positioned by the column shift lever up against the Neutral wall and the "minimum Reverse" OML position. This indicates the design is correct.

Please notify myself or Harry Dover with the capability information for the trans and the column when available.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: Lightner, Shawn (S.E.)
Sent: Friday, November 10, 2000 9:47 AM
To: Nicosia, Ray (Raymond P.); Sabaitis, Robert (R.R.)
Cc: Hildebrand, Dan (D.H.); Spaulding, Todd (T.C.); Levine, Julie (J.A.)
Subject: Issue found with PRNDL at All Media

Ray/Bob:

Wanted to forward you info on an issue we have found out here with our All Media vehicles. There have been a lot of notes going around the last few days but I'm not sure which ones you may have been included on.

ISSUE:

You can get the transmission to go from Nuetral to Reverse by pushing the shift lever up so that the PRNDL indicator is on the far left side of the "N". It will shift without lifting the shift lever off the detent and moving it onto the "R" detent.

Mechanic found this by accident while moving vehicles off of hoists. WE can now get this to happen on most all vehicles.

ACTION:

Two transmission people were out here Wed/Thurs looking at "ticking" transmissions. We reviewed this issue with them. Per direction from Todd Spaulding/Dan HIldebrand they re-adjusted the PRNDL setting etc. The vehicles still shifted as explained above.

There are now several people from transmission heading out to PHoenix on Saturday to hook up with out trucks and investigate what is going on.

Just wanted to let you know what is going on.

Bob: Have you had a chance to look at the trucks at LAP and SLAP for this condition? Do not no of anything about my trucks that would make them any different than all the other trucks.

Spaulding: Is there a DV test etc. that is supposed to check for this condition? Have you seen this before?

Will let everyone know what is going on after we review in Phoenix on Saturday.

From: Spaulding, Todd (T.C.)
Sent: Friday, November 10, 2000 4:05 PM
To: Nicosia, Ray (Raymond P.); Lightner, Shawn (S.E.); Sabaitis, Robert (R.R.)
Cc: Hildebrand, Dan (D.H.); Levine, Julie (J.A.); Porter, Alan (A.J.); Haggerty, Judy (J.F.); Perri, Ron (R.J.); Greene, Lisa (L.A.); McKinnis, Larry (L.N.); Retallack, Lynn (L.M.); Kohls, Tracy (T.K.); Miller, Todd (T.R.)
Subject: RE: Issue found with U152 media vehicles.

Perhaps you guys are misinterperting me somewhat. We are going to leave no stone unturned in this investigation. I am merely pointing out that we need to check everything.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: Nicosia, Ray (Raymond P.)
Sent: Friday, November 10, 2000 3:33 PM
To: Spaulding, Todd (T.C.); Lightner, Shawn (S.E.); Sabaitis, Robert (R.R.)
Cc: Hildebrand, Dan (D.H.); Levine, Julie (J.A.); Porter, Alan (A.J.); Haggerty, Judy (J.F.); Perri, Ron (R.J.); Greene, Lisa (L.A.); McKinnis, Larry (L.N.); Retallack, Lynn (L.M.); Kohls, Tracy (T.K.); Miller, Todd (T.R.)
Subject: RE: Issue found with U152 media vehicles.

We have several trucks that Todd Miller just received from the plant that do the same. These to the best of our knowledge have not had any rework.

-----Original Message-----
From: Spaulding, Todd (T.C.)
Sent: Friday, November 10, 2000 3:29 PM
To: Lightner, Shawn (S.E.); Nicosia, Ray (Raymond P.); Sabaitis, Robert (R.R.)
Cc: Hildebrand, Dan (D.H.); Levine, Julie (J.A.); Porter, Alan (A.J.); Haggerty, Judy (J.F.); Perri, Ron (R.J.); Greene, Lisa (L.A.); McKinnis, Larry (L.N.); Retallack, Lynn (L.M.); Kohls, Tracy (T.K.)
Subject: RE: Issue found with U152 media vehicles.

The story I heard was that the cable was "disconnected at one end" during the process. In any case, we need to check the vehicles.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: Lightner, Shawn (S.E.)
Sent: Friday, November 10, 2000 3:09 PM
To: Spaulding, Todd (T.C.); Nicosia, Ray (Raymond P.); Sabaitis, Robert (R.R.)
Cc: Hildebrand, Dan (D.H.); Levine, Julie (J.A.); Porter, Alan (A.J.); Haggerty, Judy (J.F.); Perri, Ron (R.J.); Greene, Lisa (L.A.); McKinnis, Larry (L.N.); Retallack, Lynn (L.M.); Kohls, Tracy (T.K.)
Subject: RE: Issue found with U152 media vehicles.

To clarify:

The cables on these vehicles were NOT retrofitted at Carron. The only thing we did at Carron was install mass dampers on the existing cables while they were on the vehicles. Cable system was not loosened or adjusted in any way. Cable adjustments etc. are the same as they left the plant.

-----Original Message-----
From: Spaulding, Todd (T.C.)
Sent: Friday, November 10, 2000 9:48 AM
To: Lightner, Shawn (S.E.); Nicosia, Ray (Raymond P.); Sabaitis, Robert (R.R.)
Cc: Hildebrand, Dan (D.H.); Levine, Julie (J.A.); Porter, Alan (A.J.); Haggerty, Judy (J.F.); Perri, Ron (R.J.); Greene, Lisa (L.A.); McKinnis, Larry (L.N.); Retallack, Lynn (L.M.); Kohls, Tracy (T.K.)
Subject: RE: Issue found with U152 media vehicles.

Investigation on this issue needs to focus on (3) areas: Process, Quality, Design

1. Process

- The media vehicles are reported to have been retrofitted by Carron, to the correct process supplied by shift systems. It is also reported that vehicles at APG have had the shift cables adjusted and still exhibit the "R in N" condition. As a final check that the vehicles are indeed adjusted properly, Harry Dover from shift systems section will be flying to Phoenix Saturday morning to examine the vehicles. Until Harry looks at the vehicles I consider the cable retrofit/adjustment process as performed by Carron and at APG **suspect**.

2. Quality

- Capability data immediately needs to be obtained on the pieces of the system.
- Shift Systems will obtain capability information for the Shift Cable and the Shift Cable Bracket. Champion = T. Spaulding
- Park Systems and/or 5R55W Systems needs to obtain capability data from Bordeaux showing that the TRS, OML, and manual valve are capable for attributes that could influence this condition. Champion = **NEEDS TO BE IDENTIFIED**
- Ford Steering and/or Visteon need to obtain capability data for the column showing that it is capable for attributes that could influence this condition. Champion = **NEEDS TO BE IDENTIFIED**

3. Design

- The U152 was evaluated for this condition as part of the angle verification work performed in the resolution of the column interlock stop concern. No evidence of this condition was observed on HTFB vehicles (prior to interlock stop revisions) or 2PP vehicles (after interlock stop revisions).
- This condition has not been observed on prior vehicles builds and/or campaign prevention fresh eyes reviews.
- This condition is also checked by tolerance analysis computer modeling. This study was completed 5/22/00 to 2PP design level drawings. Shift Systems has not been made aware of any changes to the components since that study was performed. Tolerance analysis shows that if all parts are made to the allowable print tolerances there will be a **minimum** of 4.73 degrees of separation between the OML as positioned by the column shift lever up against the Neutral wall and the "minimum Reverse" OML position. This indicates the design is correct.

Please notify myself or Harry Dover with the capability information for the trans and the column when available.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section

AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

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From: Lightner, Shawn (S.E.)
Sent: Friday, November 10, 2000 9:47 AM
To: Nicosia, Ray (Raymond P.); Sabaitis, Robert (R.R.)
Cc: Hildebrand, Dan (D.H.); Spaulding, Todd (T.C.); Levine, Julie (J.A.)
Subject: Issue found with PRNDL at All Media

Ray/Bob:

Wanted to forward you info on an issue we have found out here with our All Media vehicles. There have been a lot of notes going around the last few days but I'm not sure which ones you may have been included on.

ISSUE:

You can get the transmission to go from Nuetral to Reverse by pushing the shift lever up so that the PRNDL indicator is on the far left side of the "N". It will shift without lifting the shift lever off the detent and moving it onto the "R" detent.

Mechanic found this by accident while moving vehicles off of hoists. WE can now get this to happen on most all vehicles.

ACTION:

Two transmission people were out here Wed/Thurs looking at "ticking" transmissions. We reviewed this issue with them. Per direction from Todd Spaulding/Dan HIldebrand they re-adjusted the PRNDL setting etc. The vehicles still shifted as explained above.

There are now several people from transmission heading out to PHoenix on Saturday to hook up with out trucks and investigate what is going on.

Just wanted to let you know what is going on.

Bob: Have you had a chance to look at the trucks at LAP and SLAP for this condition? Do not no of anything about my trucks that would make them any different than all the other trucks.

Spaulding: Is there a DV test etc. that is supposed to check for this condition? Have you seen this before?

Will let everyone know what is going on after we review in Phoenix on Saturday.

From: Villar, Daniel (D.A.)
Sent: Thursday, October 26, 2000 6:14 PM
To: Perri, Ron (R.J.)
Cc: Dover, Harry (H.); Levine, Julie (J.A.); Porter, Alan (A.J.); Clary, Robert (R.C.); Przebienda, Keri (K.A.)
Subject: RE: Need to confirm Cognition Model included the U152 Strg Col Shift Lever Variances

Ron

After reviews to prove out Admiral Tool's Strg Col Shift Sys online checking equipment it was realized that the positonal tolerance of the tang also plays a role. So if you consider the tang width is 4.00 +/-0.05mm and it's 0.20 positional tolerance relative to the A datum, at max material thickness the following conditons apply (Note that A-datum is the surface where the shift lever fits in the strg col clevis)

1) If the tang width is at its max (4.05mm) --the difference between the tang surface and the clevis surface can vary within 2.115 to 2.315mm (which give about 0.2mm of total variance).

2) If the tang width is at its min (3.95mm) --the difference between the tang surface and the clevis surface can vary within 2.115 to 2.415mm (which give about 0.3mm of total variance).

3) If the tang width is at its nominal (4.00mm) --the difference between the tang surface and the clevis surface can vary within 2.115 to 2.365mm (which give about 0.25mm of total variance).

Condition #2) is the worst case condition which allow the most variance (0.3mm). According to Bob Clary, Visteon Chassis, the steering column's shift system allows about a 2:1 ratio from the shift lever to the bishop pin. Therefore 0.3mm of total variance would allow approximately 0.6mm of movement in the trans cable (via the bishop pin). Depending on the direction of the variance, it could reduce the clearance between the BSI pin and the Swing Arm Stop or it could move the transmission from Park closer to the zone between Park and Reverse.

Do you know if the above is also included in the Cognition Model? If not, the team thinks it should be, do you agree?

Regards,

Dan Villar, Explorer Steering
Ford Motor Company, U152 Chassis Engineering
Loc: PDC 1D-L42
Ph/Fx#: 313-33-75680
Profs/(Email): dvillar / (dvillar@gw.ford.com)

-----Original Message-----
From: Perri, Ron (R.J.)
Sent: Thursday, October 26, 2000 5:57 PM
To: Villar, Daniel (D.A.)
Cc: Dover, Harry (H.)
Subject: RE: Need to confirm Cognition Model included the U152 Strg Col Shift Lever Variances

Dan,
For the Cognition Model: the tang width is 4.00 +/-0.05mm.

-----Original Message-----
From: Villar, Daniel (D.A.)
To: Perri, Ron (R.J.)
Sent: 10/26/00 9:01 AM
Subject: RE: Need to confirm Cognition Model included the U152 Strg Col Shift Lever Variances

Great, thanks.

Regards,

Dan Villar, Explorer Steering
Ford Motor Company, U152 Chassis Engineering
Loc: PDC 1D-L42
Ph/Fx#: 313-33-75680
Profs/(Email): dvillar / (dvillar@gw.ford.com)

> -----Original Message-----
>From: Perri, Ron (R.J.)
>Sent: Thursday, October 26, 2000 8:52 AM
>To: Villar, Daniel (D.A.)
>Subject: RE: Need to confirm Cognition Model included the U152
>Strg Col Shift Lever Variances
>
>Dan, I read your note this morning. I have phoned Cognition and I will
>discuss with them later today when I'm out there on other business. I
>believe the information to be in the Shift System Model, but I will
>verify.
>
> -----Original Message-----
>From: Villar, Daniel (D.A.)
>Sent: Thursday, October 26, 2000 8:42 AM
>Cc: Clary, Robert (R.C.); Hurley, Joseph (J.B.); Przebienda, Keri
>(K.A.); 'Kent Armstrong (E-mail)'; 'John Daniter (E-mail)'; Dover,
>Harry (H.); Levine, Julie (J.A.); Porter, Alan (A.J.); Perri, Ron
>(R.J.); 'Jeff Dukes (E-mail)'; 'Mark Atchison (E-mail)'; 'Audrey
>Schmidt (E-mail)'; Spaulding, Todd (T.C.)
>Subject: RE: Need to confirm Cognition Model included the U152
>Strg Col Shift Lever Variances
>
>Keri,
>
>Is the strg col shift lever (1L24-7202-AHW) on the BOM? Also, you can
>get the latest drawing off the Ford Docman to add to your package. Let
>me know if you have any problems.
>
>Ron,
>
>Sorry for sending the below notes to the wrong person...
>
>Regards,
>
>Dan Villar, Explorer Steering
>Ford Motor Company, U152 Chassis Engineering
> Loc: PDC 1D-L42
> Ph/Fx#: 313-33-75680
> Profs/(Email): dvillar / (dvillar@gw.ford.com)
>
> -----Original Message-----
>From: Dover, Harry (H.)
>Sent: Thursday, October 26, 2000 5:56 AM
>To: Villar, Daniel (D.A.); Levine, Julie (J.A.); Porter, Alan
>(A.J.); Perri, Ron (R.J.)
>Cc: Clary, Robert (R.C.); Hurley, Joseph (J.B.); Przebienda, Keri
>(K.A.); 'Kent Armstrong (E-mail)'; 'John Daniter (E-mail)'; 'Jeff Dukes

>(E-mail)'; 'Mark Atchison (E-mail)'; Perry, Ron (R.E.); Audrey Schmidt
>(E-mail); Spaulding, Todd (T.C.)
>Subject: RE: Need to confirm Cognition Model included the U152
>Strg Col Shift Lever Variances
>
>Goodafternoon Keri! You may recall in the April/May time frame you
>supplied a set of drawings to Cognition.
>
>It would be a good idea to send the latest BOM to Audrey Schmidt for
>her to review against the MA model.
>If you like, it might be quicker in the long run to put together the
>latest set of drawings, I'd pick them up and deliver ASAP (your call).
>
>Thanks!
>
>NOTE: THE WRONG R.PERRI WAS ON THE ORIGINAL DISTRIBUTION: SHOULD HAVE
>BEEN SENT TO RPERRI; NOT RPERRY.
> -----Original Message-----
>From: Villar, Daniel (D.A.)
>Sent: Wednesday, October 25, 2000 8:18 AM
>To: Levine, Julie (J.A.); Porter, Alan (A.J.)
>Cc: Clary, Robert (R.C.); Hurley, Joseph (J.B.); Przebienda, Keri
>(K.A.); 'Kent Armstrong (E-mail)'; 'John Daniter (E-mail)'; 'Jeff Dukes
>(E-mail)'; 'Mark Atchison (E-mail)'; Villar, Daniel (D.A.); Perry, Ron
>(R.E.); Dover, Harry (H.)
>Subject: RE: Need to confirm Cognition Model included the U152
>Strg Col Shift Lever Variances
>Importance: High
>
>Julie/Alan,
>
>I have not recieved a response from Ron Perry or Harry Dover yet, at
>this point I will consider the current shift lever tolerances
>acceptable on the print. Dura has revised their in-house machining
>operation that would allow them to meet the current required
>tolerances. The assumption is that, with this new process, their Cp
>will be good, but their Cpk will not (capability studies won't be
>available this Friday morning, 10/27). If this new process proves to
>be capable, then for J#1 they be will be required to 100% check parts
>before shipping until we make a post J#1 design change to the lever
>that would make them stable. This design change will not affect the
>function of the part and preliminary package studies are favorable.
>
>Containment Plan
>For IB, Dura is 100% checking parts before shipping to Saline using
>parts from the original machining process.
>
>
>Regards,
>
>Dan Villar, Explorer Steering
>Ford Motor Company, U152 Chassis Engineering
> Loc: PDC 1D-L42
> Ph/Fx#: 313-33-75680
> Profs/(Email): dvillar / (dvillar@gw.ford.com)
>
> -----Original Message-----
>From: Villar, Daniel (D.A.)
>Sent: Sunday, October 22, 2000 11:25 AM
>To: Perry, Ron (R.E.); Dover, Harry (H.)
>Cc: Porter, Alan (A.J.); Clary, Robert (R.C.); Levine, Julie (J.A.);
>Hurley, Joseph (J.B.); Przebienda, Keri (K.A.); Kent Armstrong
>(E-mail); John Daniter (E-mail); Jeff Dukes (E-mail); Mark Atchison
>(E-mail)
>Subject: Need to confirm Cognition Model included the U152 Strg
>Col Shift Lever Variances

>
>Ron/Harry,
>
>The purpose of this note is to confirm that your "Cognition Model"
>includes the U152 Shift Lever and it's contributing variances. Below
>is the conditional variance of the U152 Shift Lever's "tang width" (the
>functional end of the lever that runs through the detents) relative to
>its surface that fits in the steering column's clevis (which is the
>A-datum):
>
>**Note the tang width is 4.00 +/-0.05mm
>
>1) If the tang width is at its max (4.05mm)
>--the difference between the tang surface and the clevis surface can
>vary within 2.115 to 2.315mm (which give about 0.2mm of total
>variance).
>
>2) If the tang width is at its min (3.95mm)
>--the difference between the tang surface and the clevis surface can
>vary within 2.115 to 2.415mm (which give about 0.3mm of total
>variance).
>
>3) If the tang width is at its nominal (4.00mm)
>--the difference between the tang surface and the clevis surface can
>vary within 2.115 to 2.365mm (which give about 0.25mm of total
>variance).
>
>Condition #2) is the worst case condition which allow the most variance
>(0.3mm).   According to Bob Clary, Visteon Chassis, the steering
>column's shift system allows about a 2:1 ratio from the shift lever to
>the bishop pin. Therefore 0.3mm of total variance would allow
>approximately 0.6mm of movement in the trans cable (via the bishop
>pin). Depending on the direction of the variance, it could reduce the
>clearance between the BSI pin and the Swing Arm Stop or it could move
>the transmission from Park closer to the zone between Park and Reverse.
>
>I am do not know how much the the shift lever's variance affects the
>Cognition Model (%-wise), but I just want to make sure that it was
>considered because Dura Automotive is currently not capable of the
>above tolerances. This due to some recent last minute changes to the
>lever's functional end to help Visteon repackage their Park Detect
>Switch. We are working out several solutions for IB and J#1 with Dura,
>but want to make you aware of the issue and want to know if it plays a
>major or minor role in the model. Please respond ASAP.
>
>
>
>Regards,
>
>Dan Villar, Explorer Steering
>Ford Motor Company, U152 Chassis Engineering
>   Loc: PDC 1D-L42
>   Ph/Fx#:   313-33-75680
>   Profs/(Email): dvillar / (dvillar@gw.ford.com)
>

From: Upshaw-Gibson, Andrea (A.D.)
Sent: Thursday, July 01, 2004 6:52 PM
To: DeFore, Matthew (M.)
Cc: Ahmed, Kamal (K.); Boals, Sandra (S.L.)
Subject: RE: P-R Double-Detent Feel - 5R55S - Cost to Align P-R Detent Peak to Tick Condition

Understanding that we want to proceed this change, what does it take to test and incorporate the profile and spring modifications?

Andréa D. Upshaw-Gibson
Supervisor -5R55E/S Trans Systems
Phone: (734) 26-69768
Voice Fax: (734) 26-69768
Text Pager: [AUPSHAW] (313)-795-0716

-----Original Message-----
From: **DeFore, Matthew (M.)**
Sent: Friday, June 25, 2004 8:17 AM
To: Filipe, David (D.J.); Upshaw-Gibson, Andrea (A.D.)
Cc: Ahmed, Kamal (K.)
Subject: P-R Double-Detent Feel - 5R55S - Cost to Align P-R Detent Peak to Tick Condition

The P-R double-detent feel concern was originally noticed on the LS for the 2003 MY. If we decide to move forward with the fix, it will be implemented across all 5R55S vehicles. At that time we contacted Grosshaus, the costs to modify the rooster comb tooling were (I don't expect there to be any difference today):

1) NEW TOOLING
A twin-die fine-blanking tool: 29,450.-- Euro
Lead-time: 15 weeks from receipt of order.

2) CONVERSION KIT for use on existing tooling
A twin-die fine-blanking conversion kit: 21,500.-- Euro
Lead-time: 12 weeks from receipt of order.

3) Prototype Costs
Piece price based on 30 pieces: 150.-- Euro/per piece
Lead-time: approx. 8 weeks from receipt of order.

We'll need to work with the supplier regarding timing. I don't remember there being a change in piece price, but I've asked Kamal to verify this. We can move forward on this particular change at any time, but may want to also consider combining with a detent profile and detent spring modification to fix the detent system force balance issue discussed w/ Phil earlier in the week (i.e. Mustang shifter concern).

Matt DeFore
Ford Motor Company - ATEO
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
e-mail: mdefore@ford.com
text pager (internal): MDEFORE

From: Waclawski, Chris (C.G.)
Sent: Friday, August 25, 2000 10:53 AM
To: Dover, Harry (H.); Porter, Alan (A.J.)
Cc: Brazin, Jim (J.C.); McKinnis, Larry (L.N.); Platter, Robert (R.D.); Landes, Stephen (S.L.); Spaulding, Todd (T.C.); Perri, Ron (R.J.); Xu, Yehong (Y.); Hildebrand, Dan (D.H.)
Subject: RE: Pullout Test

Thanks Harry. The latest effort data from last night suggests a difference in loads between CP and now, with common transmission levels. We need to gather a couple of experts to help check out the system and suggest areas to examine. Harry & Alan, can you join us? This afternoon would be my request -- our local engineers (Yehong & others) will join in from this end. We are puzzled and can really use some "fresh eyes" to help us. Thanks....
Regards,

Chris Waclawski (CWACLAWS)
Park Systems, ATEO
phone: 5234305 fax: 5236052

-----Original Message-----
From: Dover, Harry (H.)
Sent: Friday, August 25, 2000 10:48 AM
To: Xu, Yehong (Y.); Hildebrand, Dan (D.H.)
Cc: Waclawski, Chris (C.G.); Brazin, Jim (J.C.); McKinnis, Larry (L.N.); Platter, Robert (R.D.); Landes, Stephen (S.L.); Spaulding, Todd (T.C.); Perri, Ron (R.J.); Porter, Alan (A.J.)
Subject: RE: Pullout Test

For the record the two cables reported as "stretched" were measured by Teleflex with the following results:

Cable A. (unit with approx 60cycles at time of removal) Conduit length 900+-4 measured 897. Gage length 208 +-2 measured 209.

Cable B. (unit with approx 71cycles at time of removal) Conduit length measured 898 and Gage length 208.2

Two column brackets were measured to have 12 to 14mm and 3 to 4mm distortion at the point of cable attachment.
The bracket with 12 to14mm distortion by hand to Visteon for review.
New stiffer bracket design is planned for introduction at Job#1 plus 90days

Hope this helps narrow the field of inquiry. Thanks!

-----Original Message-----
From: Xu, Yehong (Y.)
Sent: Thursday, August 24, 2000 11:02 PM
To: Hildebrand, Dan (D.H.)
Cc: Waclawski, Chris (C.G.); Brazin, Jim (J.C.); McKinnis, Larry (L.N.); Platter, Robert (R.D.); Landes, Stephen (S.L.); Dover, Harry (H.); Spaulding, Todd (T.C.); Perri, Ron (R.J.)
Subject: Pullout Test

Dan:

I tested pullouts on two vehicles today. The following are the results:

1. CP level vehicle, PV3 trans, **new pawl**
   Completed 120 uphill pullouts, 100 downhill pullouts (pullout test only)
   Data was taken from the first 20 cycles and the last 20 cycles.

   << OLE Object: Microsoft Excel Worksheet >>

2. 2PP level vehicle, all new park components, including **new pawl.**
   Pullout test only. No ratchet test was conducted.
   Vehicle was from SLAP recently. No pullout test performed on this vehicle before.
   Could not complete 100 uphill pullouts due to vehicle stuck in park. Test terminated at 76th cycle.
   There are afew high loads.

   << OLE Object: Microsoft Excel Worksheet >>

I will have the troubled trans installed on the CP level vehicle and run pullout test tomorrow morning.

Regards,

Yehong Xu
YXU1
Park Systems Section
Mechanical/Structural Sub-Systems Dept.
Ph: (734) 458-0717
Fax: (734) 523-6052

-----Original Message-----
From: Hildebrand, Dan (D.H.)
Sent: Thursday, August 24, 2000 4:03 PM
To: Xu, Yehong (Y.); Landes, Stephen (S.L.); Platter, Robert (R.D.)
Subject: FW: Cable Stretch

Guess I should have shared this with a larger group of people.

Dan Hildebrand, P.E.
Manager, 5R55N/E/W/S Auto Trans Systems Dept
Ph: 734-52-34598, Fax: 734-45-80991/734-52-33910
Text Pager: 734-797-6257
e-mail: dhildebr@ford.com/CDS ID: DHILDEBR
Mail Drop T-201, Rm. W318B, ATNPC, Livonia
Admin. Asst.: Judy Lardin, Ph: 734-52-34517

-----Original Message-----
From: Hildebrand, Dan (D.H.)
Sent: Thursday, August 24, 2000 10:10 AM
To: Garrett, Dave (D.M.); Waclawski, Chris (C.G.); Spaulding, Todd (T.C.)
Cc: McKinnis, Larry (L.N.)
Subject: RE: Cable Stretch

Dave Adamczyk section is running a mini-experiment in an "old" vehicle with "old" column to check pullout efforts between old pawl vs. new pawl with old column. There is a belief that "uphill" efforts have increased but there is not as yet an explained engineering logic for this.

Dan Hildebrand, P.E.
Manager, 5R55N/E/W/S Auto Trans Systems Dept
Ph: 734-52-34598, Fax: 734-45-80991/734-52-33910
Text Pager: 734-797-6257

e-mail: dhildebr@ford.com/CDS ID: DHILDEBR
Mail Drop T-201, Rm. W318B, ATNPC, Livonia
Admin. Asst.: Judy Lardin, Ph: 734-52-34517

-----Original Message-----
From: Garrett, Dave (D.M.)
Sent: Thursday, August 24, 2000 10:05 AM
To: Waclawski, Chris (C.G.); Spaulding, Todd (T.C.)
Cc: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.)
Subject: RE: Cable Stretch

Chris,
Can you have Yehong or Don Brewer get the cable/brackets to Harry Dover to inspect the "suspect" dimensional changes?

Todd
This issue is a job stopper and Engineering Sign off is September 1st. Thanks for adding Harry to our team!

David M. Garrett
5R55 N/W/S Transmission Systems A - Supervisor
MD T201 ATNPC E315B
(734)52-31343 dgarrett@ford.com

-----Original Message-----
From: Spaulding, Todd (T.C.)
Sent: Thursday, August 24, 2000 8:22 AM
To: Xu, Yehong (Y.); Dover, Harry (H.)
Cc: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Brazin, Jim (J.C.); Platter, Robert (R.D.); Garrett, Dave (D.M.); Landes, Stephen (S.L.); Perri, Ron (R.J.)
Subject: RE: Cable Stretch

Are you saying that you have pulled the shift lever all the way to the "1" position and the vehicle didn't pull out of park? That is the only way a stretched cable, deflecting brackets, etc., would keep you from pulling the vehicle out of park. I doubt this is what you are experiencing. Have you measured a cable to know it has "stretched" before making this statement?
I seem to remember having a high pull out of park issue on the DEW98 back a few months ago that was never resolved, the result of which was a "beefing up" of the shifter to handle the unexplained higher loads. Also, I would assume (speculation) that whatever is going on in the trans/system that makes it drop in too early would also tend to make it not want to come out of park. In any case, Harry will be coming out to Livonia this morning to help you out.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: Xu, Yehong (Y.)
Sent: Wednesday, August 23, 2000 10:53 PM
To: Dover, Harry (H.)
Cc: Hildebrand, Dan (D.H.); McKinnis, Larry (L.N.); Waclawski, Chris (C.G.); Brazin, Jim (J.C.); Platter, Robert (R.D.); Garrett, Dave (D.M.); Landes, Stephen (S.L.); Perri, Ron (R.J.); Spaulding, Todd (T.C.)
Subject: Cable Stretch

Harry:

We have found that the U152 shift cable always stretches during the vehicle pullout test and the vehicle is stuck on the hill (always nose-up) when the stretch occurs. Tonight, my test vehicle was stuck on the hill again

at 92th pullout cycle. I am sure it was not due to the inter-lock problem. A new trans and a new cable are used for the test and pullout loads are between 7.4 and 20.5 lbs, which are below 30 lbs. The last pullout force before the stuck was 15.7 lbs. I would like to have you come over to take a look the problem first thing on Thursday morning. We have an extremely tight test schedule and cannot afford to let vehicle idle. Now, we cannot complete the pullout cycles at once because of being stuck in park. We really need your help to diagnose the problem.

When you come over, would you please bring some cables with you? Thanks.

Regards,

Yehong Xu
YXU1
Park Systems Section
Mechanical/Structural Sub-Systems Dept.
Ph: (734) 458-0717
Fax: (734) 523-6052

From: Selinsky III, Frank (F.J.)
Sent: Friday, June 18, 2004 5:10 PM
To: Tadajewski, Ralph (R.J.); Case, Robert (R.G.)
Cc: Jaeger, Sharon (S.A.)
Subject: RE: QSF Part Request 076-2004-0032

Done, 1L2Z- 3Z719-DA.

Frank J. Selinsky
Car Front & Rear Suspension,
Car & Truck Steering
Ph: 734.523.5495
Fx: 734.458.0059

-----Original Message-----
From: Tadajewski, Ralph (R.J.)
Sent: Friday, June 18, 2004 8:21 AM
To: Selinsky III, Frank (F.J.)
Cc: Jaeger, Sharon (S.A.)
Subject: FW: QSF Part Request 076-2004-0032

-----Original Message-----
From: Jaeger, Sharon (S.A.)
Sent: Thursday, June 17, 2004 3:25 PM
To: Tadajewski, Ralph (R.J.)
Cc: Jaeger, Sharon (S.A.)
Subject: QSF Part Request 076-2004-0032

Please assign service part number.
Part is in R status in WERS and has migrated into MMP. No replacing action required.

Thanks.

```
WWRS531A R1147153        List Functions By Part Base         04/06/14 16:34:53
  Part:      __1L2C ___3F770 DA______ PT/VL: ___ EffPnt/Date: ___________________
  Func Acty: _____     CPSC:  __ __ __ C/F:   _   Class:       _
  History:   _         Prel:  _        Reg:   _   Organizatn:  _
  Engineer:  ____ ___  Color: E        Proc:  Y   Print:       _
  Action:    __   (AP,DP,RP,RV)       To Notice: ____ _ ________  ___
  To Concrn: _________                 Alert: _________          |Func|Release
 Sel C/F Part================== Acty CPSC== Seq Release=========|S Cl|S Date====
  _  F   1L2C    3F770 DA       NL00 110401 000 NL00E11649395000|R P |R 04/06/14
    <SOL.ASY-STNG.COL.SH.LVR.INTR> <TU5.*.SERVICE.2002MY.TO.CURRENT.....>
```

Sharon Jaeger
QSF/Recall Parts Specialist
Parts Supply & Logistics
Ford Customer Service Division
Ph. 734-523-5026 Fax 734-523-5628
sjaeger@ford.com
Mail Drop MD-44

Porter, Alan (A.J.)

From: Porter, Alan (A.J.)
Sent: Wednesday, June 09, 2004 3:26 PM
To: Filipe, David (D.J.); von Foerster, Steve (S.); Howard, Matthew (M.B.)
Cc: Matti, Alvin (.); Guillory, Kasandra (K.N.); Upshaw-Gibson, Andrea (A.D.); Guys, Philip (P.R.); Porter, Alan (A.J.)
Subject: RE: Shift Lever Information

Dave,
December 5th is the expected incorporation date. Keep in mind, to avoid scrap costs, this is not coordinated change and the column (shift socket/detent plate) must change first, then the shift lever. They both are installed at the Visteon Saline I/P plant. This timing includes 2 weeks to release, 3 weeks to build up stock and phase in one change before the other, and 3 weeks to PPAP the parts through 3 levels of the supply chain. The actual tooling is 18 weeks. We are full steam ahead on this.

I will check and see if there is any opportunity to accelerate at premium costs.

In preparation for change control (U152 & U222), can you have someone prepare the justification for $0.40 per vehicle cost of the improvements.

-----Original Message-----
From: Filipe, David (D.J.)
Sent: Wednesday, June 09, 2004 3:04 PM
To: Porter, Alan (A.J.); von Foerster, Steve (S.); Howard, Matthew (M.B.)
Cc: Matti, Alvin (.); Guillory, Kasandra (K.N.); Upshaw-Gibson, Andrea (A.D.); Guys, Philip (P.R.)
Subject: RE: Shift Lever Information

What is the expected production incorporation date and what can be done (premium cost) to accelerate introduction?

David Filipe
Executive Engineer
Automatic Transmission Engineering
Ph: 734.523.5641, Pager: 313.795.4069

-----Original Message-----
From: Porter, Alan (A.J.)
Sent: Monday, June 07, 2004 12:19 PM
To: von Foerster, Steve (S.); Filipe, David (D.J.); Howard, Matthew (M.B.)
Cc: Matti, Alvin (.); Guillory, Kasandra (K.N.); Porter, Alan (A.J.); Upshaw-Gibson, Andrea (A.D.)
Subject: FW: Shift Lever Information

Dave/Steve,

My top 3 priorities since January that affect my engineer working on this shift issue have been 1) Getting a new column design in for T1 (late supplier change to Delphi), 2) U152 BSI warranty fix (~$250K/month) and 3) Hex Chrome elimination.

Item #1 (T1) is all consuming, so I reassigned item #2 to another engineer. Now that #3 is released (just last week), we can refocus on the "clunks in drive" issue again.

The change we had planned will only fix 23 of 42 (55%) verbatim, not 25. The other two talk about pops/clunks in reverse. This is the same issue, but in the other direction. Since we have a clean corner on that side of the shift lever, we will add a chamfer on the "R" wall of the detent plate. We will contain this in the timing and costs below.

The column and shift lever change which significantly reduces lash will also help the "over shoot" (3 verbatim)

and "sloppy" (2 verbatim).

You may want to look at P221 to predict what our performance will be with these changes.

We will have updated costs (the quote expired) in one week (6/14) and the concern approved/released the following week (6/21). The change will cost about $0.37 - $0.40 per vehicle. The shift lever costs came in at $0.23. We need to put the chamfer on the shift lever instead of the detent plate since it already has an uncontrolled corner from the forming process. The rest of the increase is due to the reduced life of the change. I will need powertrains support at change control.

-----Original Message-----
From: Filipe, David (D.J.)
Sent: Sunday, June 06, 2004 10:41 PM
To: Porter, Alan (A.J.)
Cc: von Foerster, Steve (S.)
Subject: FW: Shift Lever Information

Alan-

The 5R55 team has been deep-diving the Transmission TGW degradation for 04MY and the data below indicates significant issues still exist with the column shifter popping during customer drive.

What is the latest timing for implementation of the socket / lever / detent plate changes that you outlined in December?

Steve-- This matter was recently reviewed during our Bordeaux Quality Review and is getting much attention from Powertrain. We obviously have other issues with some shift quality events and engagements but the ongoing shift lever issue clearly stands-out in the verbatims as a significant item. Need a commitment from the SUV team to accelerate implementation of Alan's fixes on the column shifter; otherwise, we are carrying this issue into 05MY Explorer.

Tks.

David Filipe
Executive Engineer
Automatic Transmission Engineering
Ph: 734.523.5641, Pager: 313.795.4069

-----Original Message-----
From: Upshaw-Gibson, Andrea (A.D.)
Sent: Friday, June 04, 2004 7:51 PM
To: Filipe, David (D.J.)
Subject: Shift Lever Information

Dave -

This file explains the TGW information comparing 2004MY to 2003MY << File: 2004MY TGW U152 -Shift Lever.doc >>

This file is what the Chassis Group (Alan Porter) had planned for actions to improve the condition when discussed in Dec 03 << File: Shift lever 6-panel slides .ppt >>

This files are the 2 pages that were in the attachment for TGW discussion at the PCT. They focus only on 4.0L data << File: BDX PCT att pg1.jpg >> << File: BDX PCT att pg2.jpg >>

R/1000 & CPU do not reflect the issue.

Andréa D. Upshaw-Gibson
Supervisor -5R55E/S Trans Systems
Phone: (734) 26-69768
Voice Fax: (734) 26-69768
Text Pager: [AUPSHAW] (313)-795-0716

From: Sherwood, Charlie (C.P.)
Sent: Monday, March 29, 2004 8:42 AM
To: Case, Robert (R.G.)
Cc: Thornton, James (J.W.)
Subject: RE: Spec info

Go to the MATS website and you can get copies of the specs. It's in the Materias Specifications and Standards heading; click on Search Specs.

http://www.mats.ford.com/index.cgi

Best Regards,

Charlie Sherwood
Service Lubricants Technical Expert
FCSD, Aftermkt Eng'ring & ReManuf Operations
Nat'l Parts Gen'l Office Bldg;
29500 Plymouth Rd, Livonia MI 48150
Mail Drop 74 -- Room 1530A
(734) 45-80988 fax (734) 523-3979
csherwoo@ford.com

-----Original Message-----
From: Case, Robert (R.G.)
Sent: Thursday, March 25, 2004 7:51 AM
To: Sherwood, Charlie (C.P.)
Cc: Thornton, James (J.W.)
Subject: Spec info

Charlie, need some assistance please in obtaining specification information for the following lubricants:

XG-3 - ESE-M1C171-A
XG-5 - WSS-M1C258-A1
XG--4 - ESB-M1C93-B
XG-8 - ESB-M1C111-B

We are considering using one of the above lubricants for a service action and we need some information on the specifications .....of particular interest is temperature performance hot and cold.

Bob Case
FCSD x00937
Warranty Program Manager

From: Thornton, James (J.W.)
Sent: Tuesday, June 01, 2004 8:58 AM
To: 'Leo Luce'
Subject: RE: TCS Wear Test Status

Sorry. I have been meaning to call and talk with you also. I think we are done with the swing arm testing. You are free to power down and move equipment as needed. If you could just tag columns, swing arms, etc. and pile them into the box and pallet and store them till the end of June. We can then scrap at the end of June if we don't get some urgent need to restart.
We have decided to remove the BSI time delay to help prevent the swing arm from ever contacting the BSI pin. There is a slight noise trade-off but we feel this is a more robust fix versus the swing arm. It is also easier to change in service.
Thanks very much for you and your teams work. Can you total up and tell me how much of the 30k we used so I can update our department budget?

Thanks again.

Regards,
Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

-----Original Message-----
From: Leo Luce [mailto:lluce@futuretool.com]
Sent: Tuesday, June 01, 2004 8:26 AM
To: Thornton, James (J.W.)
Subject: TCS Wear Test Status

Jim,
I didn't get a chance to talk to you the other day about the TCS wear test. I was wondering where we stand with the test at this time?

Sincerely,

Leonardo Luce
Test Operations
Phone: 734-946-2100
Fax: 734-946-0922

From: Thornton, James (J.W.)
Sent: Tuesday, March 09, 2004 10:49 AM
To: Case, Robert (R.G.); Porter, Alan (A.J.)
Subject: RE: Technician panel
Attachments: TCS_BSI_wear.ppt

Attached are some pictures we can use on Thursday if we want.

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

-----Original Message-----
From: Case, Robert (R.G.)
Sent: Wednesday, February 25, 2004 7:14 AM
To: Porter, Alan (A.J.); Thornton, James (J.W.)
Subject: Technician panel

FYI...the date has moved to Thursday 3/11..... below are the agenda times. The steering column topic is on form 8:15 to 9:00 for the green team and than 9:30 to 10:15 for the blue team.

When: Thursday, March 11, 2004 8:00 AM-5:00 PM (GMT-05:00) Eastern Time (US & Canada)

Where: Ford Technical Institute

Specific Agenda times for each of your two meetings (for each topic) are shown here.

	Blue Team		***Green Team***
8:15 - 9:30	Seat Track Noise	8:15 - 9:00	Steering Column (Explorer)
9:30 - 10:15	Steering Column (Explorer)	9:00 - 9:30	Satellite Radio Diagnostics
10:15 - 10:45	Satellite Radio Diagnostics	9:30 - 10:45	Seat Track Noise
10:45 - 11:00	ESST Cabinet Solution	10:45 - 11:00	ESST Cabinet Solution
11:00 - 11:45	Lunch	11:00 - 11:45	Lunch
11:45 - 1:45	Axle	11:45 - 2:15	Ford 500/Freestyle
1:45 - 2:15	AC Coil/Clutches	2:15 - 2:45	AC Coil/Clutches
2:15 - 4:45	Ford 500/Freestyle	2:45 - 4:45	Axle

Bob Case
FCSD x00937

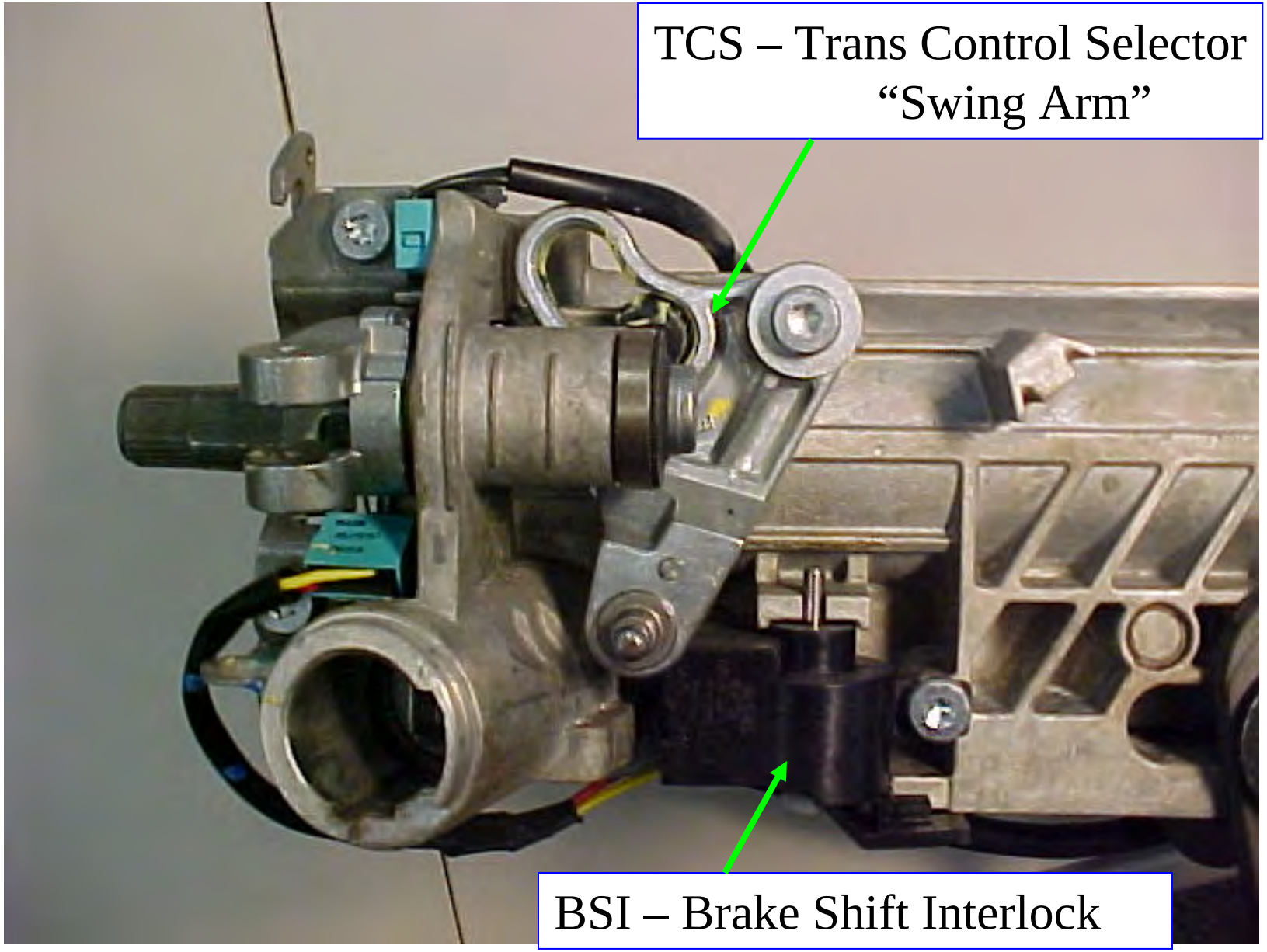
Warranty Program Manager

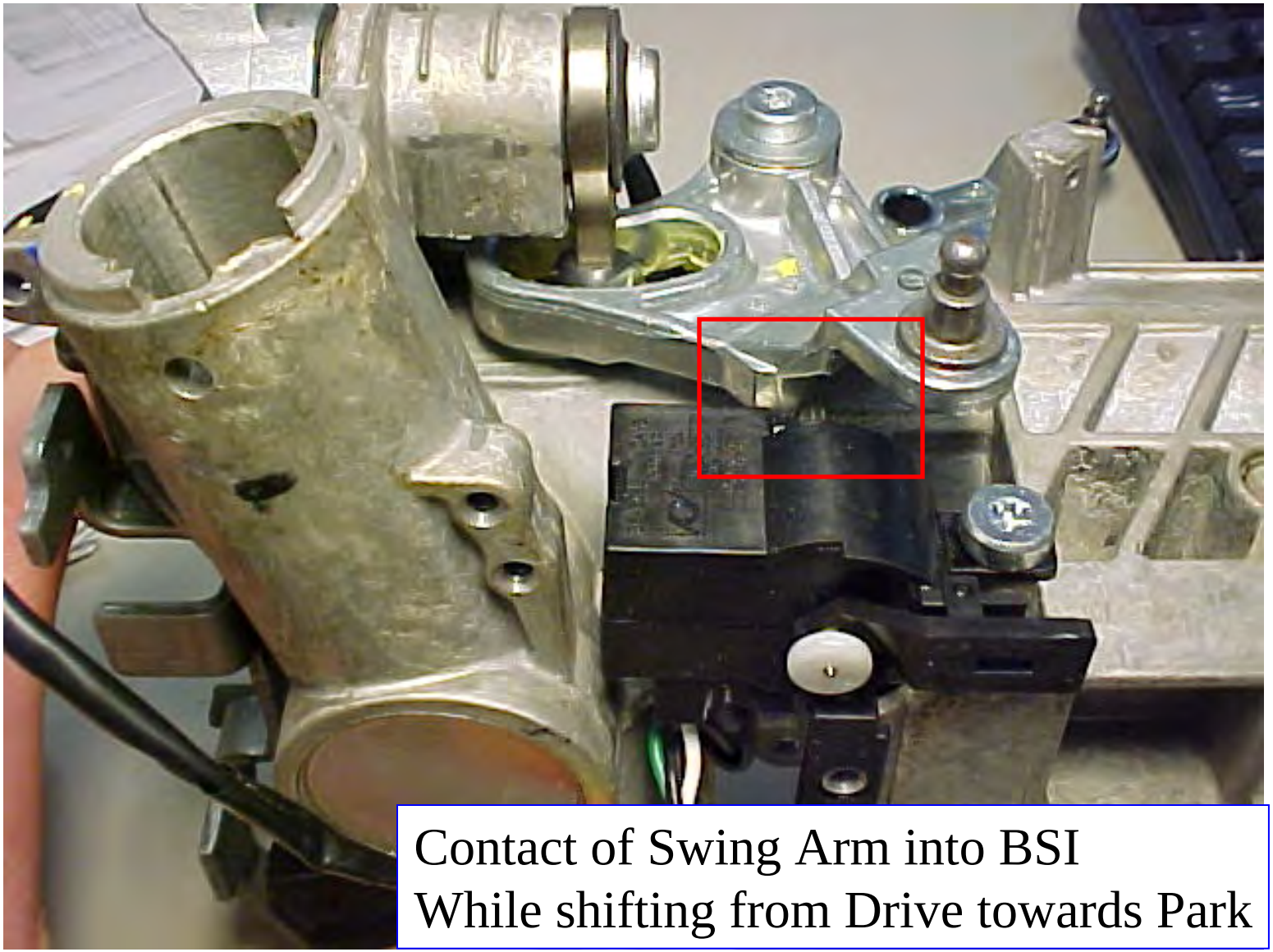
Technician Panel discussion of Explorer Steering column

Thursday, March 18, 2004

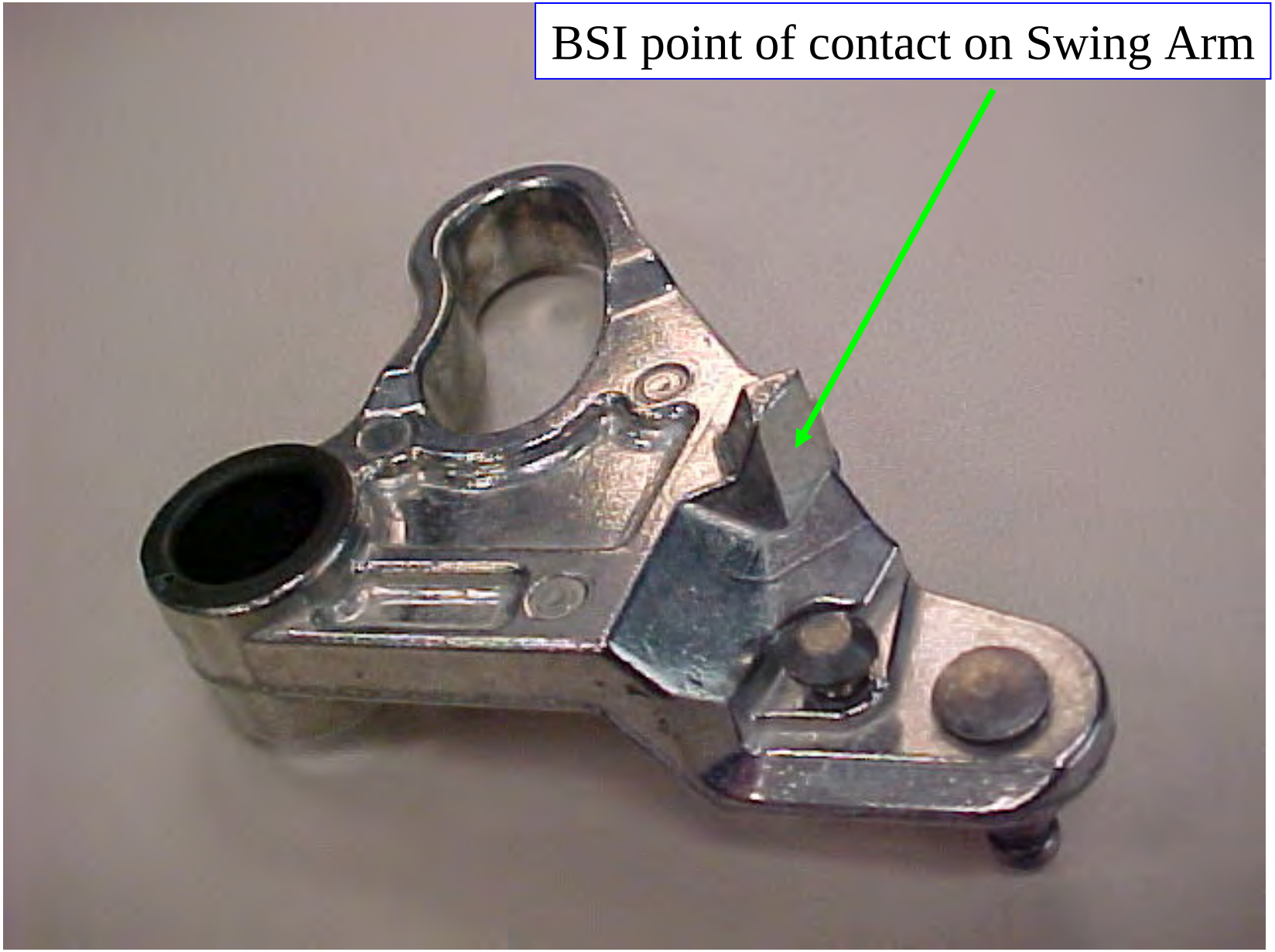
Ford Technical Institute

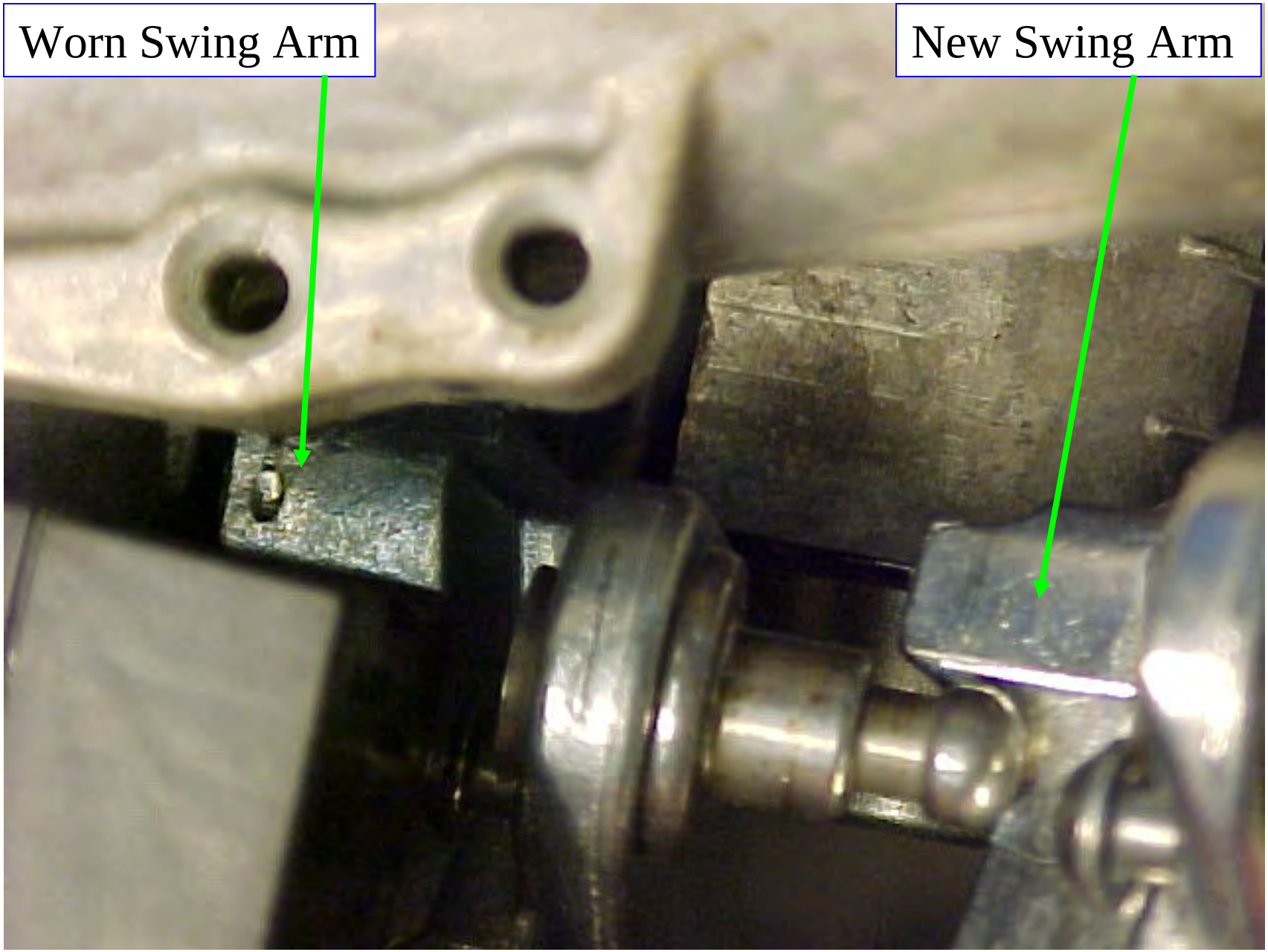
	Blue Team		Green Team	
8:15 - 9:30	Seat Track Noise		8:15 - 9:00	Steering Column (Explorer)
9:30 - 9:45	Break	9:00 - 9:30	Satellite Radio Diagnostics	
9:45 - 10:30	**Steering Column (Explorer)**		9:30 - 9:45	Break
10:30 - 11:00	**Satellite Radio Diagnostics**		**9:45 - 11:00**	**Seat Track Noise**
11:00 - 11:45	Lunch	11:00 - 11:45	Lunch	
11:45 - 1:45	Axle	11:45 - 2:15	Ford 500/Freestyle	
1:45 - 2:15	AC Coil/Clutches		2:15 - 2:45	AC Coil/Clutches
2:15 - 4:45	Ford 500/Freestyle		2:45 - 4:45	Axle

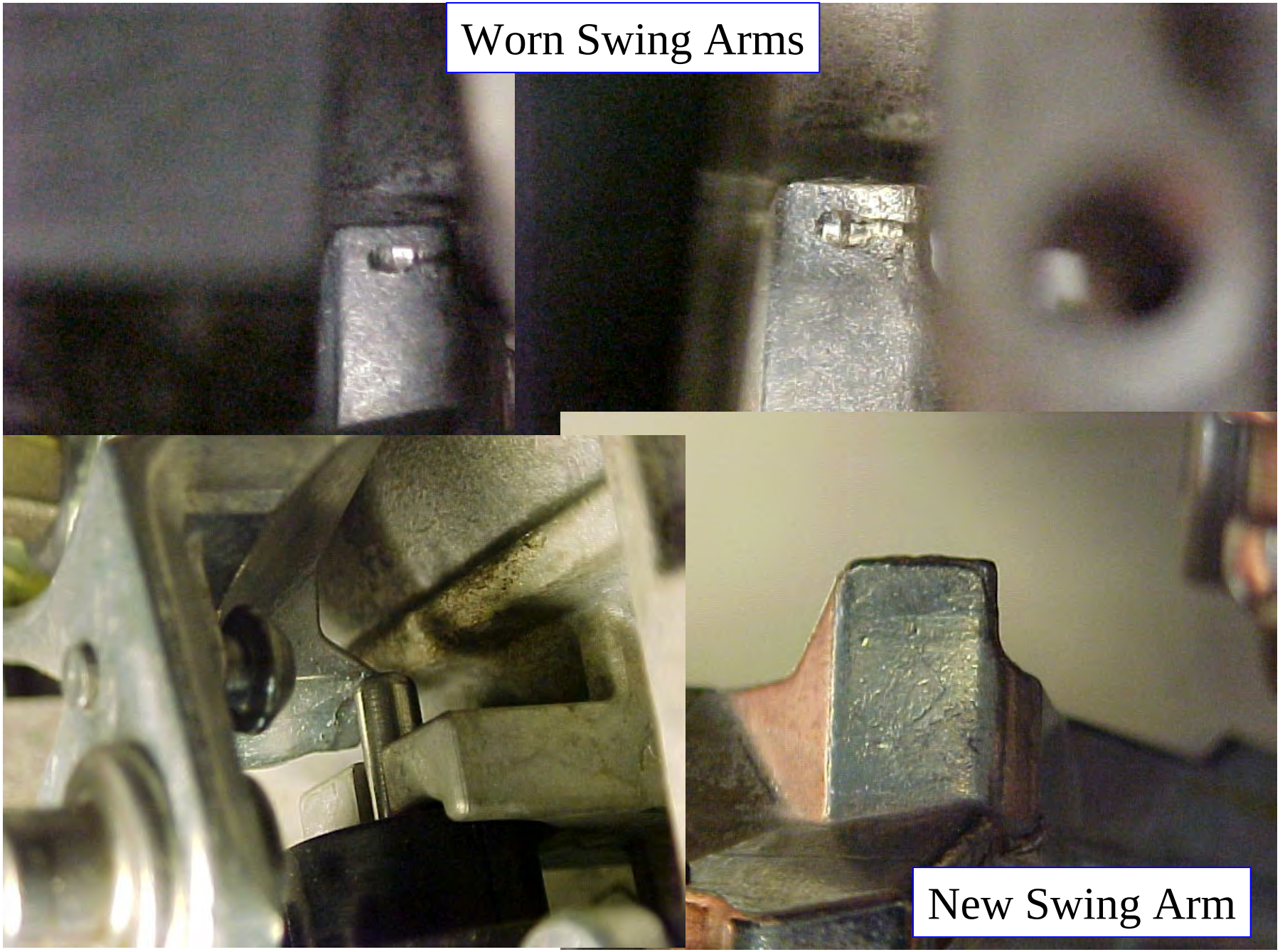

TCS – Trans Control Selector
"Swing Arm"
BSI – Brake Shift Interlock



Contact of Swing Arm into BSI
While shifting from Drive towards Park


BSI point of contact on Swing Arm


Worn Swing Arm
New Swing Arm


Worn Swing Arms
New Swing Arm

From: Lecznar, Robert (R.)
Sent: Thursday, May 27, 2004 1:31 PM
To: Thornton, James (J.W.)
Cc: Case, Robert (R.G.)
Subject: RE: TSB

Thanks.....I'll move forward with the TSB.....

Robert Lecznar
Product Concern Engineer
4 Door Explorer/Mountaineer
1800 Fairlane Drive, Allen Park, Michigan 48101
Cube #542
1-313-390-1253 Office
1-313-323-8042 Fax

-----Original Message-----
From: Thornton, James (J.W.)
Sent: Thursday, May 27, 2004 1:30 PM
To: Lecznar, Robert (R.)
Cc: Case, Robert (R.G.)
Subject: RE: TSB

Concern number C11649395.
The switch is listed as 1L24-3F770-DA.
There already has the suffixed bumped.

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

-----Original Message-----
From: Lecznar, Robert (R.)
Sent: Thursday, May 27, 2004 1:09 PM
To: Thornton, James (J.W.)
Cc: Case, Robert (R.G.)
Subject: RE: TSB

Hi James,

Do you have the concern number for the release of the new BSI switch?

Robert Lecznar
Product Concern Engineer
4 Door Explorer/Mountaineer
1800 Fairlane Drive, Allen Park, Michigan 48101
Cube #542
1-313-390-1253 Office
1-313-323-8042 Fax

-----Original Message-----
From: Case, Robert (R.G.)
Sent: Thursday, May 27, 2004 1:01 PM
To: Lecznar, Robert (R.)
Subject: RE: TSB

As of now it is 1L2C-3F770-DA. However, the suffix will most liekly be bumped.

B. Case

-----Original Message-----
From: Lecznar, Robert (R.)
Sent: Tuesday, May 25, 2004 11:02 AM
To: Case, Robert (R.G.)
Subject: TSB

Hi Bob,

Do you have the part number for the BSI handy?

Robert Lecznar

Product Concern Engineer
4 Door Explorer/Mountaineer
1800 Fairlane Drive, Allen Park, Michigan 48101
Cube #542
1-313-390-1253 Office
1-313-323-8042 Fax

From: Kroll, Susan (S.E.)
Sent: Friday, October 29, 2004 11:48 AM
To: Snider, Tim (T.O.); Linnansalo, Vera (V.); Thornton, James (J.A.)
Subject: RE: U152 Greenbelt Project Update

Vera, Tim, Jim:

I recently started a new position and moved to Building #1. I don't think I'm going to be able to adequately support the green belt project with my background and my new responsibilities. I have an opportunity to join a project that is just starting in my department and I think I would be better suited for it. If this is going to create a problem, please let me know and I will prioritize things so that I can become more involved in the chassis project.

Regards,

Susan Kroll
Body CAD Sheet Metal Supervisor
D219/258/333 & S197
Building #1, 12G023
Phone: (313) 24-82543

-----Original Message-----
From: Snider, Tim (T.O.)
Sent: Wednesday, October 27, 2004 3:13 PM
To: Linnansalo, Vera (V.); Porter, Alan (A.J.); Thornton, James (J.A.); Kroll, Susan (S.E.)
Subject: U152 Greenbelt Project Update

Everyone,

Attached is the U152 Hard to Shift Greenbelt project. I added warranty information and charts, from the Chassis Quarter Back web page, to the Define section, as well as pictures to the cover page.

Veera,

How do the slides look and what is a good next step in completing the project?

Susan,

Are you working on the RTDA R&P Teardown chart?

<< File: Project24784.U152 Hard to Shift.tsnider1.ppt >>

Regards,
Tim Snider (tsnider1@ford.com)
U293/U251 Ford Steering Engineering
2B-C62 Product Development Center, 313-594-4129
Dearborn, MI 48121 USA

From: Spaulding, Todd (T.C.) [tspauldi@mail.ford.com]
Sent: Tuesday, April 11, 2000 8:35 AM
To: Levine, Julie (J.A.)
Cc: Porter, Alan (A.J.); 'Ron Perri'; 'Harry Dover'; 'Phil Guthrie'
Subject: RE: U152 shift system testing with 57 mm OML.

Julie -

The evaluations have been slow because of delays at Visteon in getting the vehicles ready for us to evaluate.

We don't design the insert plate. We are the final check that the insert plate is correct. The insert plate is designed by the column activity.

From our evaluation last Friday, we were able to determine that 1st gear o/t wall needs to be moved away from Drive. Other positions seemed to be ok, although (and I must stress this) there was so much "slop" in the column at the lever pivot that an accurate assessment was impossible.

Since the Cognition model has been correlated at both the column and the trans, Visteon should make use of Audrey to determine the cable stick out dimensions at the column for the various gear positions. They should then be able to design the insert plate to match. PTO Shift Systems will perform the final verification as stated in my note below when production quality parts are available.

Let me know if we need more discussion. Thanks.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: Levine, Julie (J.A.)
Sent: Monday, April 10, 2000 4:29 PM
To: Spaulding, Todd (T.C.)
Subject: FW: U152 shift system testing with 57 mm OML.

Todd - I am confused, I thought that last week that PTO shift systems was going to give Visteon the design of the detents that are optimal so that we can finish the detent plates. What is the hold up? It seems we are going too slow on these evaluations.....please advise.

-----Original Message-----
From: Spaulding, Todd (T.C.)
To: Levine, Julie (J.A.); Porter, Alan (A.J.); Przebienda, Keri (K.A.); Clary, Robert (R.C.); 'Harry Dover'; 'Phil Guthrie'; Perri, Ron (R.J.)
Cc: Waclawski, Chris (C.G.); Xu, Yehong (Y.); 'Audrey Schmidt'
Sent: 4/10/00 10:13 AM
Subject: U152 shift system testing with 57 mm OML.

Subject

Shift system testing of U152 vehicle with 57 mm trans OML. Testing performed by R. Perri/P. Guthrie at Visteon on 4/6 - 4/7/2000. Vehicle 302W769; column 1PP391 (certified for minimum D-BTSI and max D-P o/t).

Tested with min and max lash shift cables, nominal and +/- 1 tooth mis-adjust.

Results

1. System travel was adequate to ensure safe park achievement at the BTSI stop. System output at P o/t is hard against the trans over travel stop (undesirable condition, must be addressed).

2. The amount of "slop" in the column at the lever pivot made it very difficult to evaluate feel at the P o/t stop.

3. PRNDL alignment was not correct, adjustment was not centered at nominal cable adjustment.

4. Output of column at P o/t measured 41 mm. 39 mm was previously reported to be the maximum. PLEASE CLARIFY. This directly affects the P o/t condition.

Recommendations/Next steps

1. Need to confirm model results for 57 mm OML: D-BTSI, D-P, D-P o/t, P-BTSI (Ford - Requested 4/10)

2. Need to obtain certified production column "tweaked" to provide min. D-BTSI and max D-P o/t expected with production tolerance variation (Visteon)

3. Need to obtain production or "more production representative" 57 mm trans OML.

4. Need to obtain transmission modified to provide 41 degree min over travel stop (Ford - requested 6/10)

5. Need to get correct insert plate and PRNDL components (Visteon)

6. Need to test 2, 3, 4, and 5 in a vehicle (Shift Systems will test).

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

From: Welker, Cindy (C.)
Sent: Wednesday, October 27, 2004 7:30 AM
To: Snider, Tim (T.O.)
Subject: RE: U152 Steering Column Greenbelt Project

Tim,

I don't use GQI for my data, I use AWS-Analytical Warranty System so I can't help you with the website.

-----Original Message-----
From: Snider, Tim (T.O.)
Sent: Tuesday, October 26, 2004 9:44 AM
To: Smith, Garry (G.R.); Welker, Cindy (C.)
Subject: U152 Steering Column Greenbelt Project

Garry/Cindy,

I am working with Jim Thornton and Alan Porter on a Greenbelt project titled "Service Fix for U152: Hard to Shift Into and Out of Park". Jim showed me graphs of the Explorer Steering Column, 3C529, Cost per Unit and R/1000 from Chassis Quarterback, which apparently were either created or authorized by one of you. For the Define portion of the Greenbelt project, I would like to recreate these graphs and see if there are any others I can create to show that a warranty issue is forming. Do either of you have time to show me how you created these graphs? I can come to your desk. I have just become familiar with the Global Quality website (http://www.quality.ford.com/cognos/cgi-bin/upfcgi.exe), but am still learning my way around. Thanks.

Regards,
Tim Snider (tsnider1@ford.com)
U293/U251 Ford Steering Engineering
2B-C62 Product Development Center, 313-594-4129
Dearborn, MI 48121 USA

From: Spaulding, Todd (T.C.)
Sent: Friday, September 01, 2000 1:24 PM
To: Brohl, Jerry (G.G.)
Cc: Levine, Julie (J.A.); Waclawski, Chris (C.G.); Perri, Ron (R.J.)
Subject: RE: U152 Visteon Column Shift Cable Bracket

Jerry - The pull out of park test started from a WCR requirement (07.00-P-2 section 5.8.2) that specified the maximum load for the customer to move the shift lever out of park when on a 30% grade at maximum GVM. This requirement is 135 N maximum (30.35 lbs).

A durabiility test is conducted by ATEO (transmission) to validate the components of the shift system (SDS requirement AM-0065). This test verifies proper function of shift system components after 100 cycles with the vehicle nose facing uphill, and 100 with the nose facing downhill (200 total cycles) when on a 30% grade at max GVM.

I believe that somewhere along the line this number of cycles was correlated to a "worst case" customer usage profile. Also, for information, pull out of park is part of the R-310 durability procedure.

I do not know exactly when in the test the brackets deformed, because the testing was performed by the park systems group at ATEO. Deformed brackets from the test were given to Alan Porter of Visteon for evaluation. As Ron Perri indicated in his note below, the consequences of permanent deformation (or even excessive deflection) of this bracket can be serious.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: Brohl, Jerry (G.G.)
Sent: Thursday, August 31, 2000 4:41 PM
To: Spaulding, Todd (T.C.)
Cc: Levine, Julie (J.A.)
Subject: FW: U152 Visteon Column Shift Cable Bracket

Todd, can you provide more detail on the "Pull out of Park" test. Is it a WCR/SDS? What is the customer correllation/rationale for the test? When in the test did the bracket deform and by how much? etc.

I'm just trying to understand the risk here. Thanks.

-----Original Message-----
From: Levine, Julie (J.A.)
Sent: Tuesday, August 29, 2000 10:26 AM
To: Brohl, Jerry (G.G.)
Subject: FW: U152 Visteon Column Shift Cable Bracket

FYI

Regards,

Julie A. Levine
U152 Suspension and Steering PMT Leader
Ph: 24-82791 Fax:24-89193 Text Pager: 313-851-6667

e-mail: jlevine@ford.com

-----Original Message-----
From: Perri, Ron (R.J.)
Sent: Tuesday, August 29, 2000 9:31 AM
To: Spaulding, Todd (T.C.); Levine, Julie (J.A.)
Subject: RE: U152 Visteon Column Shift Cable Bracket

Julie, in the note below Todd is illustrating a failure mode from bracket deformation. I want to further elaborate.

We knew that lack of bracket stiffness contributed to the "looseness" feeling or lack of precision in the shift system. Now we have been told that the transmission pull from park test cannot be completed due to bracket permanent deformation. That is due to the pull from park motion bending the bracket toward the column lever arm. This results in the transmission being left in park when the column shift lever is moved to reverse. Further movement of the lever from reverse to drive (for example) may finally result in getting the transmission out of park but now the transmission is in one gear and the PRNDL indicates another. If the bracket is not stiffened, and testing successfully completed, the failure mode must be reviewed with ASO, OGC, etc.

-----Original Message-----
From: Spaulding, Todd (T.C.)
Sent: Monday, August 28, 2000 5:45 PM
To: Levine, Julie (J.A.)
Cc: Perri, Ron (R.J.)
Subject: RE: U152 Visteon Column Shift Cable Bracket

If the deflection is great enough (as it was in one of the cases) the PRNDL indicator would be off by a detent - for example, show "N" but the trans would be in Drive.

In addition, I received a call today from a gentlemen in (I believe) OGC who was extremely concerned over the descriptions he has heard on the functional aspects of the new Visteon column (specifically not locking the shift lever into park). I believe we have convinced him we are ok on U152, but he is concerned about other applications.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: Levine, Julie (J.A.)
Sent: Monday, August 28, 2000 12:46 PM
To: Spaulding, Todd (T.C.)
Subject: RE: U152 Visteon Column Shift Cable Bracket

What occurs as a result of the deflection?

Regards,
Julie A. Levine
U152 Suspension and Steering PMT Leader
Ph: 24-82791 Fax:24-89193 Text Pager: 313-851-6667
e-mail: jlevine@ford.com

-----Original Message-----
From: Spaulding, Todd (T.C.)
Sent: Monday, August 28, 2000 8:59 AM
To: Porter, Alan (A.J.)
Cc: Perri, Ron (R.J.); Levine, Julie (J.A.); Pietrzyk, Gary (G.M.); Korzan, William (W.); Johnston, Alan (A.C.); Zinn, Dave (D.C.); Mattern, Don (D.); Thomas, Jim (J.J.); Dover, Harry (H.)
Subject: U152 Visteon Column Shift Cable Bracket

Some of you on the distribution of this note may already be aware of this...for those who are not, the shift cable attachment bracket on the Visteon column used in the U152 has been failing (undergoing permanent deflection) during Pull out of Park testing at max GVW on 30% grade (ATEO test for auto trans shift system). This occurred during testing performed late last week, and again today.

Harry Dover has hand delivered example brackets from this testing to Alan Porter. Harry will also be getting the test data to Alan. Basically, test consists of 100 pull out of park events with the vehicle nose pointed up the 30% grade, and 100 with the nose pointed down, with the vehicle loaded at max GVW.

We have been talking about bracket stiffness since at least April...what is the plan? I have been hearing Job # 1 plus 90 days, but have seen nothing official stating this. Is there a concern in the system releasing a new, improved bracket? If not, Harry will enter one today.

Also - When will we see a response entered into concern C11087875 (lock shift lever in park position)?

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

From: Welch, Sharon (S.L.)
Sent: Thursday, December 16, 2004 3:12 PM
To: Narkiewicz, David (D.P.)
Cc: Lovell, Pam (P.D.); Welch, Sharon (S.L.)
Subject: RE: Updated WAN article

Importance: High

Here is my suggestion:

Steering Column Shift Concerns – 2002-2005 Explorer/Mountaineer Article 1-A-05
TSB 04-22-12 was published on 10/29/04 with a new service procedure and a **NEW Brake Shift Interlock (BSI) Switch** which allows for replacement of just the BSI in lieu of the steering column assembly.

- Note: Part #1L2Z-3Z719-DA listed in TSB 04-22-12 has been superseded by part #5L2Z-3Z719-A.

Sharon Welch
FCSD Program Manager - Warranty Task Force
Fairlane Business Park 3 246F
Phone (313) 24-83499

-----Original Message-----
From: Narkiewicz, David (D.P.)
Sent: Thursday, December 16, 2004 2:36 PM
To: Welch, Sharon (S.L.)
Cc: Lovell, Pam (P.D.); Narkiewicz, David (D.P.)
Subject: Updated WAN article
Importance: High

Sharon:

Dave Yu asked us to rewrite your WAN article because he thought it read more like an SSM/TSB. So I have rewritten it, please take a look and let me know if this is acceptable or changes you might suggest. The catch I need this back ASAP. Sorry for the rush.

Steering Column Shift Concerns – 2002-2005 Explorer/Mountaineer Article 1-A-05
TSB 04-22-12 was published on 11/1/04 with a new service procedure and a **NEW Brake Shift Interlock (BSI) Switch**. Previously if a BSI switch failed you had to replace the entire steering column assembly.

- Note: TSB (04-22-12) lists part # #1L2Z-3Z719-DA this part number has been superseded by #5L2Z-3Z719-A.

Category: Chassis-Steering System
Do: Follow the repair procedure in TSB 04-22-12.
Don't: Replace the steering column assembly for this concern.

David P. Narkiewicz
Warranty Analyst
Warranty Analysis Department - FCSD
Suite 1S131 Regent Court
Phone: 313-390-0696 Fax: 313-390-0440

E-mail: DNARKIEW@FORD.COM

From: Scheuer, James (J.A.)
Sent: Friday, October 25, 2002 4:19 PM
To: Lajiness, Vince (V.); Long, Greg (G.); DeFore, Matthew (M.)
Subject: RE: Vehicles for P-R / R-P Double-detent Test

Both Greg and I will be out of the office on Monday and Greg will be gone Tuesday as well. I picked up an Explorer from Dearborn yesterday - keys are in Don Brewer's keybox. Matt, if Jerry V. doesn't contact you with rooster combs on Monday, I'll follow-up on Tuesday.

-----Original Message-----
From: Lajiness, Vince (V.)
Sent: Thursday, October 24, 2002 11:29 AM
To: Scheuer, James (J.A.); Long, Greg (G.)
Subject: RE: Vehicles for P-R / R-P Double-detent Test

Greg... the Aviator we should is veh#069.

Vince Lajiness (vlajines@ford.com)
5R55N/S Transmission Systems Supervisor
Ford Powertrain/ATEO
ATNPC, Livonia MI. (MD T-201)
Phone 734-523-3353, Fax 734-523-3910

-----Original Message-----
From: Scheuer, James (J.A.)
Sent: Thursday, October 24, 2002 10:31 AM
To: Long, Greg (G.)
Cc: Lajiness, Vince (V.)
Subject: RE: Vehicles for P-R / R-P Double-detent Test

Greg, any update on an LS and Aviator? Looks like Larry Ryan has the Explorer over at TEEE - ready for pickup today.

-----Original Message-----
From: Lajiness, Vince (V.)
Sent: Thursday, October 24, 2002 8:12 AM
To: Scheuer, James (J.A.); Long, Greg (G.)
Subject: RE: Vehicles for P-R / R-P Double-detent Test

Talk to Greg Long. He will line up one of our Tick evaluation cars to put your rooster comb into for evaluation.

Vince Lajiness (vlajines@ford.com)
5R55N/S Transmission Systems Supervisor
Ford Powertrain/ATEO
ATNPC, Livonia MI. (MD T-201)
Phone 734-523-3353, Fax 734-523-3910

-----Original Message-----
From: Scheuer, James (J.A.)
Sent: Wednesday, October 23, 2002 8:25 AM
To: DeFore, Matthew (M.); Lajiness, Vince (V.)
Subject: Vehicles for P-R / R-P Double-detent Test

Larry Ryan will be delivering a 4.0L 4x2 Explorer tomorrow around 10:30am. I expect the the rooster combs to be finished by tomorrow or Friday as well. Since the focus is still on the 2003 LS, we should try to obtain one of these as soon as possible for jury eval.. Vince, can you work with Kevin Norris to see when one will be available?

Jim Scheuer
Product Design Engineer
Park Systems Design 5R55 & 6R Transmissions
Mechanical / Structural Sub Systems
Ford Automatic Transmission New Product Center

From: Leo Luce [lluce@futuretool.com]
Sent: Tuesday, April 27, 2004 1:21 PM
To: Thornton, James (J.W.)
Subject: RE: Warranty Return Column Pre-Test Data

Jim,
Here are the results of the swap. Let me know if you want me to still start Sample #50 as is.

Sample No.	Sample Description	Swing arm Pre-Test Load (N)
11	Current Production w/o grease	.2
50	Plated with Silicone Grease	1.9 to 51.2

-----Original Message-----
From: Thornton, James (J.W.) [mailto:jthornt2@ford.com]
Sent: Tuesday, April 27, 2004 11:42 AM
To: Leo Luce
Cc: Porter, Alan (A.J.)
Subject: RE: Warranty Return Column Pre-Test Data

Leo,
These loads are what we expected. From what we can tell about 80%+ of the high efforts is related to the divot on the swing arm. The remaining high efforts is causes by wear between the BSI pin and the column housing. This portion is what you are measuring even after you have replaced the swing arms.

You can go ahead and start except for one change. Please switch the swing arms between sample 11 and sample 50. This will put the new plated/greased part on the worst column....sample 50. Please redo the baseline measurements for these two columns after switch arms.

Thanks.

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

-----Original Message-----
From: Leo Luce [mailto:lluce@futuretool.com]
Sent: Tuesday, April 27, 2004 11:22 AM
To: Thornton, James (J.W.)
Cc: Porter, Alan (A.J.)
Subject: Warranty Return Column Pre-Test Data

Jim,
Here is the pre-test data for the plated with Silicone grease and production w/o grease swing arms. You may want to

take a look at them before I start testing due to the results let me know.

Sample No.	Sample Description	Swing arm Pre-Test Load (N)
10	Plated with Silicone Grease	3.4 to 7.8
11	Plated with Silicone Grease	1.4 to 3.2
18	Plated with Silicone Grease	1.4 to 7.5
19	Current Production w/o grease	1.4 to 9.6
27	Current Production w/o grease	1.8 to 2.8
50	Current Production w/o grease	3.2 to 28

Sincerely,

Leonardo Luce
Test Operations
Phone: 734-946-2100
Fax: 734-946-0922

From: Thornton, James (J.W.)
Sent: Thursday, April 29, 2004 1:07 PM
To: 'Leo Luce'
Subject: RE: Warranty Return Column Test Status 4/29/04 11:00am

Leo,
I wont be able to get out there this afternoon. I will stop by tomorrow morning if it is OK with you to see the parts and drop off plated sample #3.
For this afternoon, please:
1) measure force to totally push thru to park for all 6 columns (3 plated & 3 regular production)
- take 3 to 5 measurements per column and record the range
2) rotate BSI pin 1/4 to 1/2 turn and remeasure
- take 3-5 measurements per column and record the range
3) remove arms from columns
4) remove grease
5) take digital photos
6) Send measurements and photos to Jim

No need to start any new testing at this time. I think we are seeing that the plated & grease swing arms are not robust enough and so we will probably just have to remove the electronic delay from the BSI so the pin retracts faster than someone can shift. We can talk more tomorrow about this.

Thanks. I will be here in PDC this afternoon if you have questions for me.
Thanks very much for your good work.

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

-----Original Message-----
From: Leo Luce [mailto:lluce@futuretool.com]
Sent: Thursday, April 29, 2004 10:56 AM
To: Thornton, James (J.W.)
Cc: Porter, Alan (A.J.)
Subject: Warranty Return Column Test Status 4/29/04 11:00am

Jim,
The last column just finished up the last 25k-cycles. Let me know if you plan on coming out today to inspect these columns?

Sincerely,

Leonardo Luce
Test Operations
Phone: 734-946-2100
Fax: 734-946-0922

Levine, Julie (J.A.)

From: Von Foerster, Steve (S.)
Sent: Sunday, September 10, 2000 3:59 PM
To: Levine, Julie (J.A.); Bobosky, Chuck (C.M.); Miller, Stephen (S.)
Cc: Brohl, Jerry (G.G.); Villar, Daniel (D.A.); Korzan, William (W.); Porter, Alan (A.J.); Marotzke, Vicki (V.); Hilborn, Theresa (T.O.)
Subject: RE: Wire shield Changes - due to BSI clearance AND due to shift cable bracket changes

This appears to be a much better timing plan than what was presented to me at LAP - I will have Julie with me at all future discussions on this subject. I have two concerns:

- Everything is always home run and we don't have that good of batting average. I would like SLA parts made and the first prototype part out of the tool trialed at the plants BEFORE we start sending them to Yazaki to be shipped to the plants.

- I am fully in support of the BSI rattle issue being post job #1 (6mm gap) and not worth the effort for a home run plan. The Shift system change is another story and this plan has us missing IB LAP - Dan Hildebrand certainly does not agree with this plan and I need more details from the Chassis team before I know what is the right direction.

-----Original Message-----
From: Levine, Julie (J.A.)
Sent: Thursday, September 07, 2000 12:16 PM
To: Bobosky, Chuck (C.M.); Miller, Stephen (S.)
Cc: Von Foerster, Steve (S.); Brohl, Jerry (G.G.); Villar, Daniel (D.A.); Korzan, William (W.); Porter, Alan (A.J.); Marotzke, Vicki (V.); Hilborn, Theresa (T.O.)
Subject: Wire shield Changes - due to BSI clearance AND due to shift cable bracket changes

Just to make sure that everyone is on the same page for the wiring harness shield plan...I want to recap our discussion from today. Chuck - Please e-mail this onto the Yazaki folks, I don't know their e-mail address.

There are two sets of changes being driven to the wiring harness shield:
1) Changes for BSI: At the rear part of the shield (where the three tabs are) - wiring is being rerouted and the wiring shield is changing for clearance to BSI
2) Changes for Shift cable bracket reinforcement: To reinforce the shift cable bracket for the A/T test, the wiring shield needs to be modified to accept the bracket with reinforcement on all LHD and to not have the bracket on RHD (floor shift). The details of this design are being worked out by Dan Villar (Ford-steering), Willy Korzan (Visteon - steering) and Jeremy King (Yazaki) today.

A) For wire shield tooling - there is three prong approach:
Step 1: modified production tool to achieve 2mm clearance to BSI with NO change for shift cable bracket - see comments below in C) as to why shift cable brkt changes need not be contained
Step 2: proto tool for wiring shield to achieve 6mm clearance to BSI and WITH change for shift cable brkt
Step 3: new production tool that achieves 6mm clearance to BSI and WITH change for shift cable brkt

B) Timing for all three steps are being worked out in detail by Yazaki, but the approximates are: wkg 10/2-10/1
Step 1: to Saline by early October → 9/29 Yazaki 10/9→ SSI wkg 10/9-SSI
Step 2: to Saline by early November
Step 3: to Saline by February/March
For any and all wire shield changes - do not retrofit wiring harnesses - not worth the risk and this timing assumes no retrofits.

C) Visteon is still working out when the reinforcement on the shift cable bracket will be brought in - the goal is ASAP - like for IB at LAP (or phased in for IB LAP). The wiring shield as is will be used and will bend slightly (this will be verified to not cause any more issue for shroud buldging). The wiring shield for IB LAP beginning AND for Step 1 will have shroud buldging anyways and this should make it no worse (thus Step 1 need not be delayed to contain shift cable bracket change)

D) BSI sleeve change will be a coordinated change and will not come in until Step 2 is in Saline - this is early

November.

E) Yazaki owes a detailed timing plan and costs for the three steps of wiring shields.

Any questions, please advise.

Regards,

Julie A. Levine
U152 Suspension and Steering PMT Leader
Ph: 24-82791 Fax:24-89193 Text Pager: 313-851-6667
e-mail: jlevine@ford.com

From: Pittel, Kimberly (K.L.)
Sent: Monday, November 04, 2002 8:41 AM
To: DeFore, Matthew (M.)
Subject: RE: Workplan - 5R55S/LS P-R & R-P Objectionable Efforts/Feel

are we still moving on this?

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Tuesday, September 24, 2002 4:36 PM
To: Oldani, Pat (P.E.)
Cc: Pittel, Kimberly (K.L.); Scheuer, James (J.A.); Lajiness, Vince (V.); Perng, Chin-Yuan (C.Y.); Retallack, Lynn (L.M.); Greene, Lisa (L.A.); Li, Ying-Yong (Y.)
Subject: Workplan - 5R55S/LS P-R & R-P Objectionable Efforts/Feel

1. Build ADAMS model with current 5R55S components to analyze TTT (torque to turn):

> evaluate park abutted and engaged conditions during:
> > engine off - no torque acting on park system - abutted condition
> > engine on - torque in park (hydraulic drag when transmission is in neutral) - P-R transitions
> > engine on - torque acting on driveline w/ brake applied - R-P transitions

> correlate ADAMS model TTT output to objectionable feel as experienced in the engine on condition
> model to be completed 9/27/02

2. Evaluate 2002 vehicle to understand if there is a difference between 2002 and 2003 MY applications.

> vehicle will be available 9/25/2002
> after initial 2002 component evaluation, update vehicle w/ 2003 MY shifter system, cable and park components
> install driveshaft torque meter if deemed necessary
> install camera internal to transmission to view mechanical interaction between park components during P-R/R-P events
> correlate visual of mechanical interaction to series of events which lead to feel/audible issues
> correlate mechanical interaction to ADAMS model TTT output

Upon completion of Action #2, determine park system design changes possible to alleviate objectionable feel and noise concern.

> verify modified components within model
> fabricate modified components and evaluate in-vehicle

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

From: Spaulding, Todd (T.C.)
Sent: Tuesday, September 24, 2002 5:30 PM
To: DeFore, Matthew (M.)
Cc: Guthrie, Phil (P.L.); Zyskowski, Mark (M.E.)
Subject: RE: Workplan - 5R55S/LS P-R & R-P Objectionable Efforts/Feel

Matt - Thanks. For purposes of this eval ('03 shifter in '02 vehicle) no need to change the shift cable. The '03 cable had a couple changes in routing clips, but nothing functional.

'03 shifter will be delivered to you sometime tomorrow, Phil is hoping to get some time on an '02 out there to measure efforts and will bring it along.

Mark/Phil - Info.

Regards,

Todd Spaulding
Supervisor - ATEO Shift Systems Section
AVT #3; Mail Drop 3020; Cube 3E021
Ph: 313-33-71677; Fax: 313-24-86950; TSPAULDI@ford.com

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Tuesday, September 24, 2002 5:20 PM
To: Spaulding, Todd (T.C.)
Subject: FW: Workplan - 5R55S/LS P-R & R-P Objectionable Efforts/Feel

Left you off the list..... Will need your assistance obtaining 2003 shifter module and cable. Thanks.

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Tuesday, September 24, 2002 4:36 PM
To: Oldani, Pat (P.E.)
Cc: Pittel, Kimberly (K.L.); Scheuer, James (J.A.); Lajiness, Vince (V.); Perng, Chin-Yuan (C.Y.); Retallack, Lynn (L.M.); Greene, Lisa (L.A.); Li, Ying-Yong (Y.)
Subject: Workplan - 5R55S/LS P-R & R-P Objectionable Efforts/Feel

1. Build ADAMS model with current 5R55S components to analyze TTT (torque to turn):

> evaluate park abutted and engaged conditions during:
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> after initial 2002 component evaluation, update vehicle w/ 2003 MY shifter system, cable and park components
> install driveshaft torque meter if deemed necessary
> install camera internal to transmission to view mechanical interaction between park components during P-R/R-P events
> correlate visual of mechanical interaction to series of events which lead to feel/audible issues
> correlate mechanical interaction to ADAMS model TTT output

Upon completion of Action #2, determine park system design changes possible to alleviate objectionable feel and noise concern.

> verify modified components within model
> fabricate modified components and evaluate in-vehicle

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

From: DeFore, Matthew (M.)
Sent: Wednesday, September 25, 2002 11:22 AM
To: Oldani, Pat (P.E.)
Subject: RE: Workplan - 5R55S/LS P-R & R-P Objectionable Efforts/Feel

Pat - Just had a conversation w/ Ram Krishnaswami (Park Systems Supervisor before me). He stated that this issue has been known since '99 LS. I have reams of data/documentation that states that the root cause is the driveline unwinding (transfer of potential to kinetic energy), when transitioning from R-P, which causes the park gear to rotate at a high angular acceleration, allowing the park gear teeth to 'slap' and impact the park pawl tooth. More information to come, but modifying park components may not lead the team to resolving this issue.

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

-----Original Message-----
From: Oldani, Pat (P.E.)
Sent: Wednesday, September 25, 2002 7:31 AM
To: DeFore, Matthew (M.)
Subject: FW: Workplan - 5R55S/LS P-R & R-P Objectionable Efforts/Feel

Matt - Any additional timing that you can fill in on this action plan would be appreciated. I'll be reporting out at the 12:00 meeting - haven't seen an agenda to see what time we are actually on.

Pat

-----Original Message-----
From: DeFore, Matthew (M.)
Sent: Tuesday, September 24, 2002 4:36 PM
To: Oldani, Pat (P.E.)
Cc: Pittel, Kimberly (K.L.); Scheuer, James (J.A.); Lajiness, Vince (V.); Perng, Chin-Yuan (C.Y.); Retallack, Lynn (L.M.); Greene, Lisa (L.A.); Li, Ying-Yong (Y.)
Subject: Workplan - 5R55S/LS P-R & R-P Objectionable Efforts/Feel

1. Build ADAMS model with current 5R55S components to analyze TTT (torque to turn):

    > evaluate park abutted and engaged conditions during:
        > engine off - no torque acting on park system - abutted condition
        > engine on - torque in park (hydraulic drag when transmission is in neutral) - P-R transitions
        > engine on - torque acting on driveline w/ brake applied - R-P transitions

    > correlate ADAMS model TTT output to objectionable feel as experienced in the engine on condition
    > model to be completed 9/27/02

2. Evaluate 2002 vehicle to understand if there is a difference between 2002 and 2003 MY applications.

> vehicle will be available 9/25/2002
> after initial 2002 component evaluation, update vehicle w/ 2003 MY shifter system, cable and park components
> install driveshaft torque meter if deemed necessary
> install camera internal to transmission to view mechanical interaction between park components during P-R/R-P events
> correlate visual of mechanical interaction to series of events which lead to feel/audible issues
> correlate mechanical interaction to ADAMS model TTT output

Upon completion of Action #2, determine park system design changes possible to alleviate objectionable feel and noise concern.

> verify modified components within model
> fabricate modified components and evaluate in-vehicle

Best regards,

Matthew R. DeFore
Park & Sensor Systems Section Supervisor
E213A/B ATNPC Livonia, MI MD T-214
ph: (734) 52-30129
fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

Tracking:

Recipient	Read
Oldani, Pat (P.E.)	Read: 9/25/2002 11:24 AM

From: Perng, Chin-Yuan (C.Y.)
Sent: Tuesday, September 24, 2002 5:48 PM
To: DeFore, Matthew (M.); Oldani, Pat (P.E.)
Cc: Pittel, Kimberly (K.L.); Scheuer, James (J.A.); Lajiness, Vince (V.); Retallack, Lynn (L.M.); Greene, Lisa (L.A.); Li, Ying-Yong (Y.)
Subject: RE: Workplan - 5R55S/LS P-R & R-P Objectionable Efforts/Feel

We are working on the ADAMS model at "full throttle." We'll review with you when we get the results.

Best Regards,
Chin-Yuan Perng
Supervisor, Dynamics & Control CAE
(734) 523-3498

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Sent: Tuesday, September 24, 2002 4:36 PM
To: Oldani, Pat (P.E.)
Cc: Pittel, Kimberly (K.L.); Scheuer, James (J.A.); Lajiness, Vince (V.); Perng, Chin-Yuan (C.Y.); Retallack, Lynn (L.M.); Greene, Lisa (L.A.); Li, Ying-Yong (Y.)
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ph: (734) 52-30129

fax: (734) 52-36052
pg: (734) 296-3280
email: mdefore@ford.com
text pager (internal): MDEFORE

From: Thornton, James (J.W.)
Sent: Wednesday, May 12, 2004 2:52 PM
To: Case, Robert (R.G.)
Subject: Reference - swing arm

Attachments: Swing arm service.ppt

Bob,
Here is the reference procedure for changing a swing arm.
We talked about this before and you asked for it for reference.

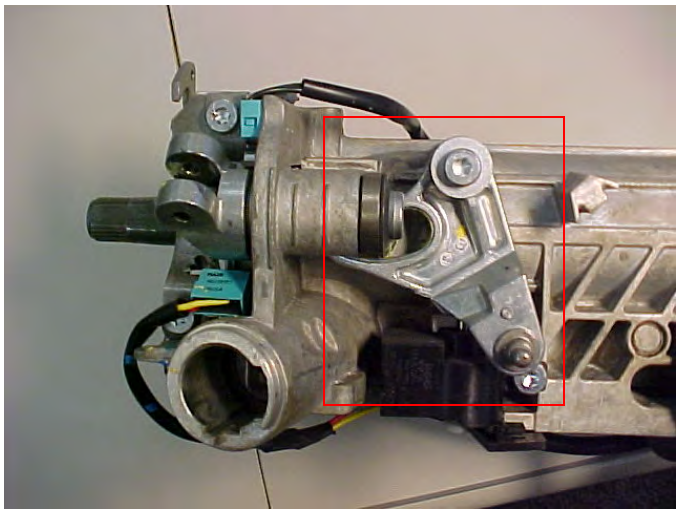
Swing arm service.ppt (2 MB)

Regards,

Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

<u>Swing arm Replacement</u>



1) Check for difficult to reach Park
2) Remove column shrouds
3) Visually inspect for swing arm divot/wear
4) Disconnect transmission shift cable from Swing Arm
5) Disconnect PRNDL cable from Swing Arm
6) Remove shift Arm pin
7) Pull shift arm out of detent plate but still engaged in shift socket
8) Slowly push shift arm downward until ball pops out of swing arm
9) Continue applying pressure until swing arm drops downward
10) Use 10mm socket to remove swing arm fastener
11) Remove swing arm

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

12) Inspect ball for any burrs caused by swing arm removal

13) Remove any burrs with needle nose pliers (if necessary)

14) Install new plated swing arm

15) Push swing arm upward to half engage the ball

16) Push ball into socket by hand or use shift lever in socket if extra leverage is required

17) Install new shift arm pin

18) Coat swing arm fastener with locktight and install with 7.5Nm of torque

19) Reconnect PRNDL cable to swing arm

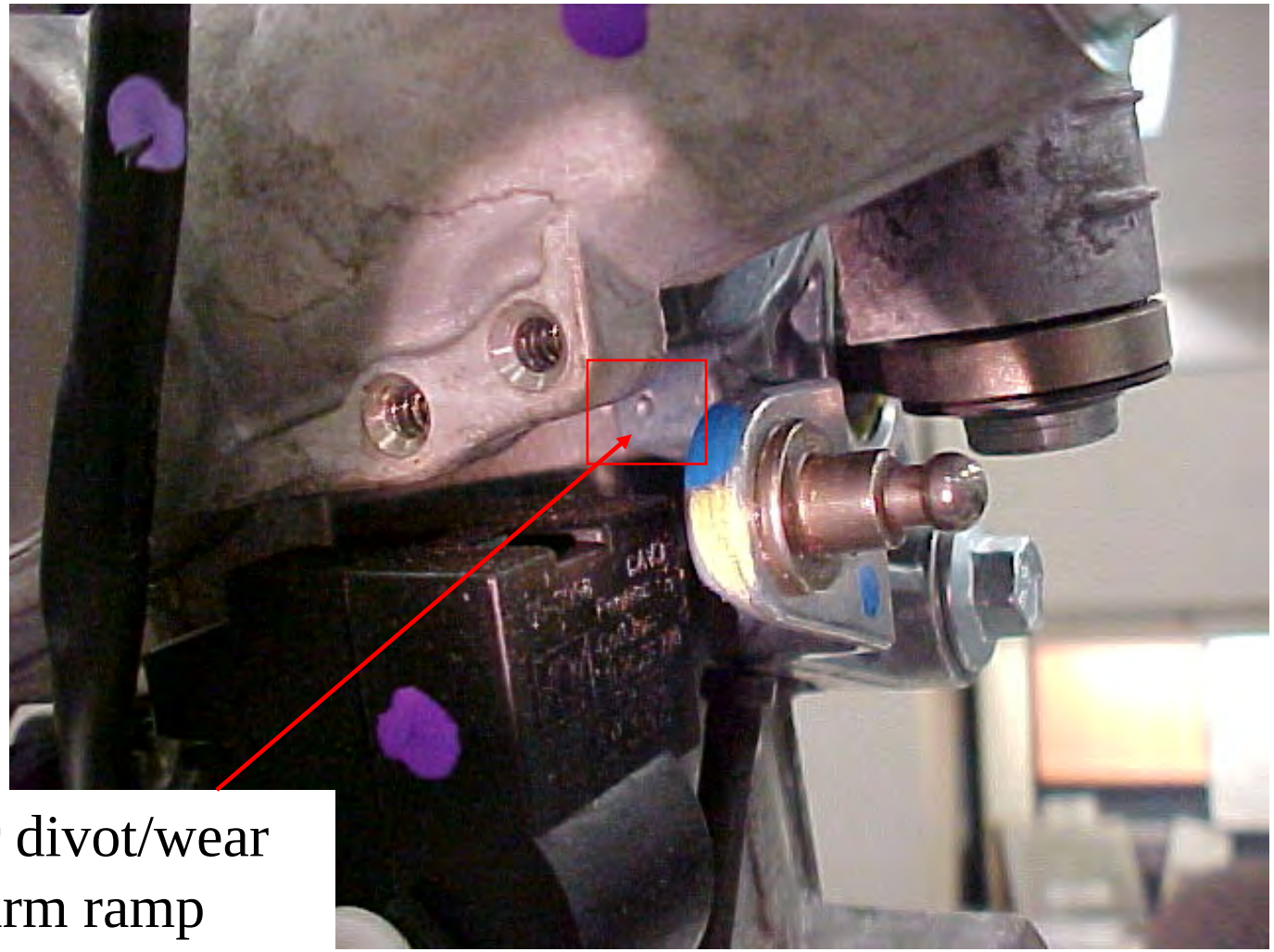
20) Reconnect transmission shift cable to the swing arm

21) With engine running and parking brake fully on, check that vehicle can not be shifted out of Park without a foot on the brake. (Warning: Ensure parking brake is ON)

22) Shift out of Park into Drive. With parking brake fully on, remove foot from the brake and shift into Park. Shift system should not have any noticeable sticking when shifting into Park.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

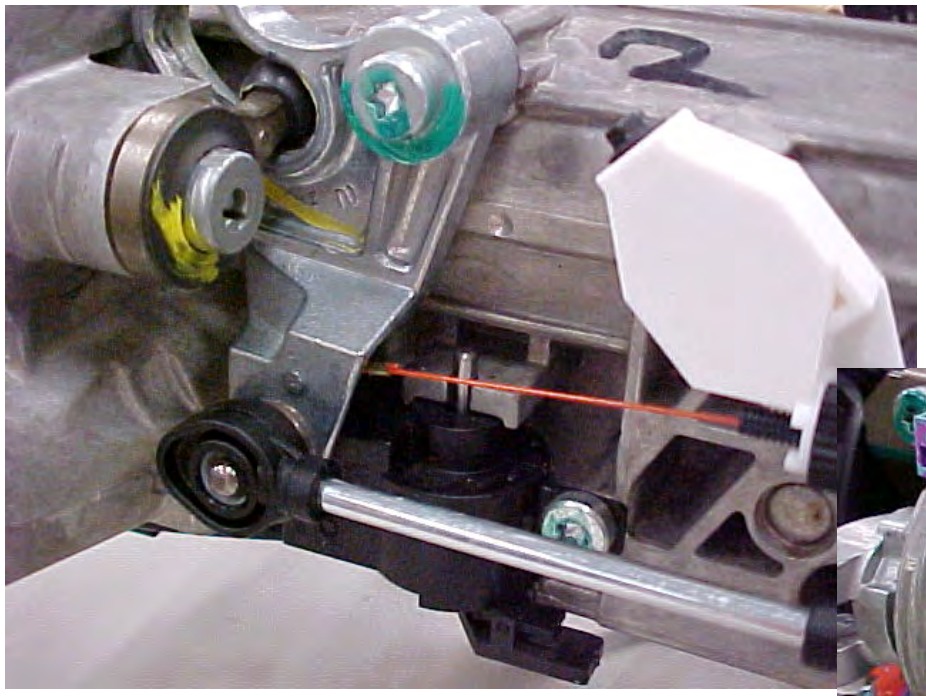
Swing arm Replacement

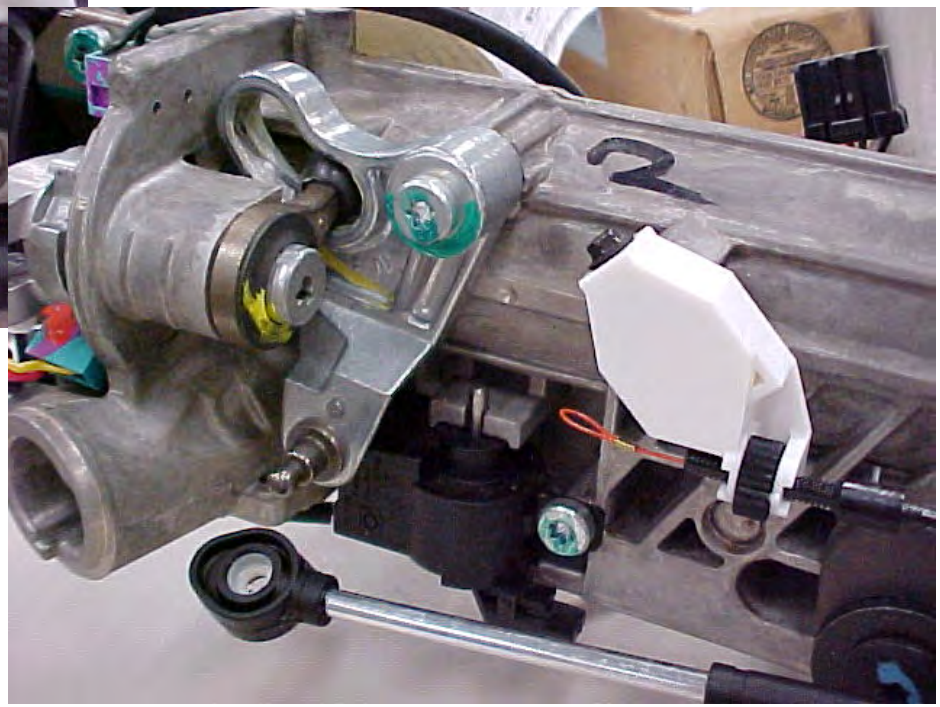


Inspect for divot/wear on swing arm ramp

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

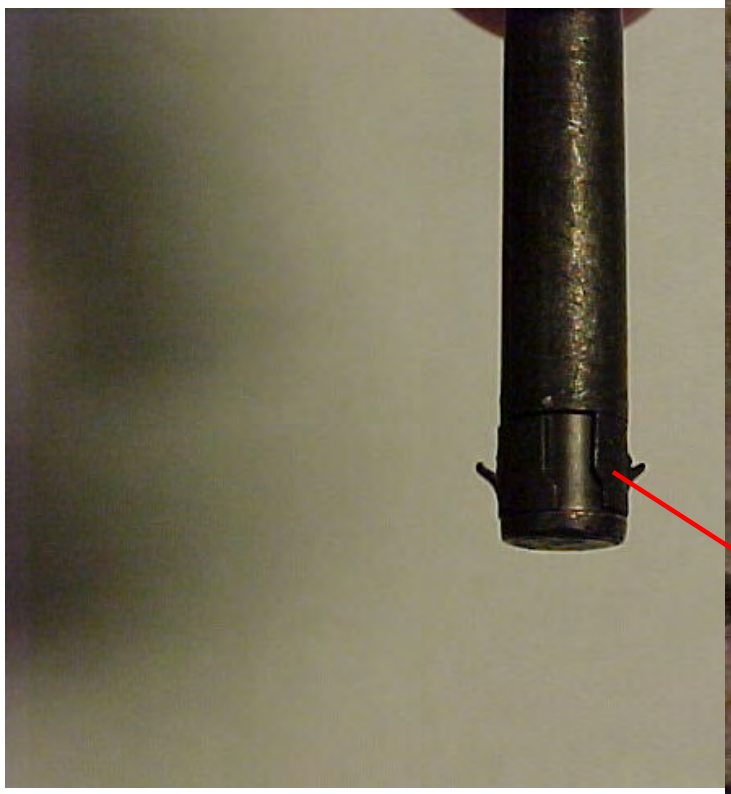




Remove PRNDL and Transmission Cables from Swing Arm

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

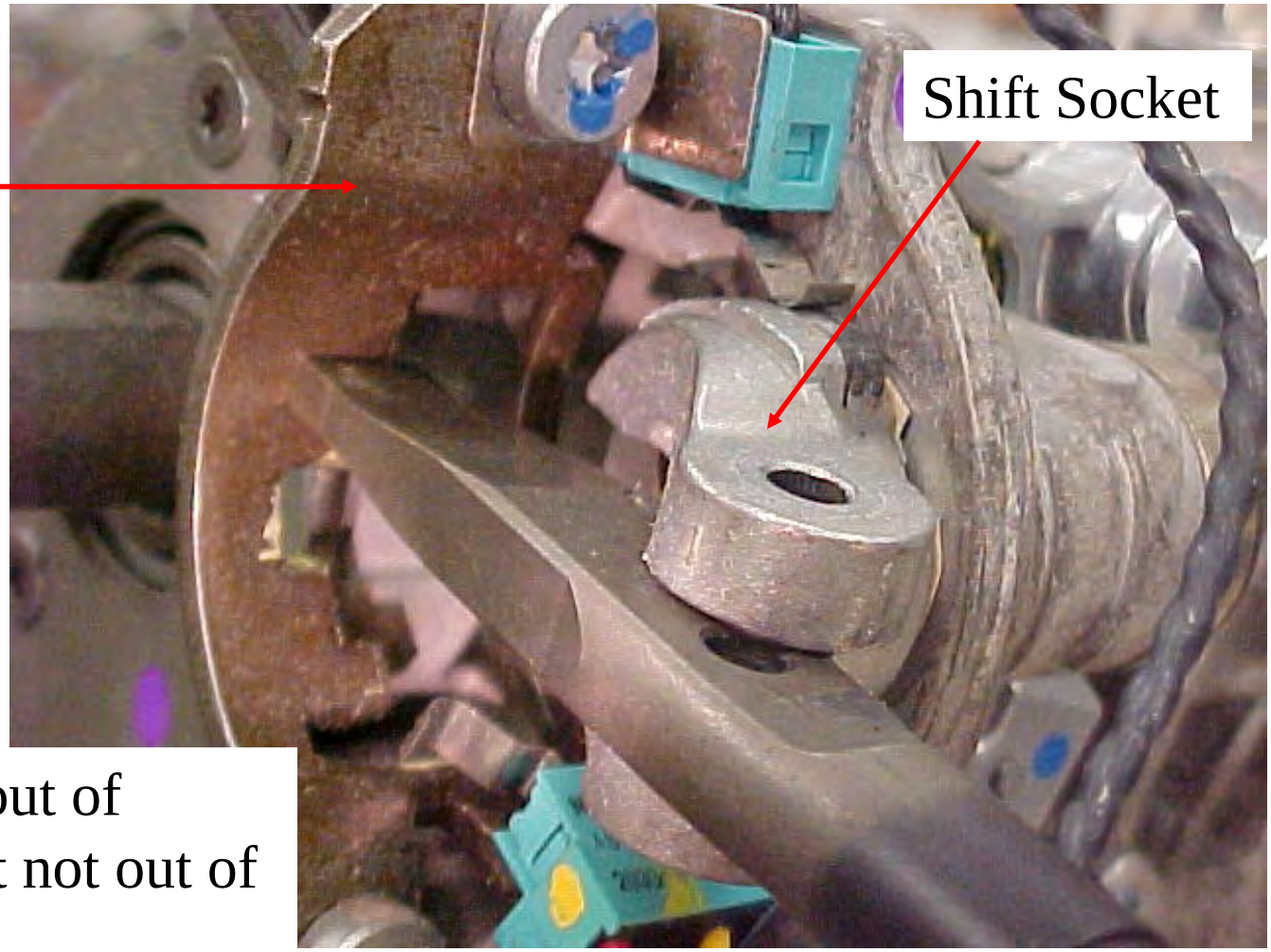


Remove shift arm pin locking tabs to enable pin removal

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

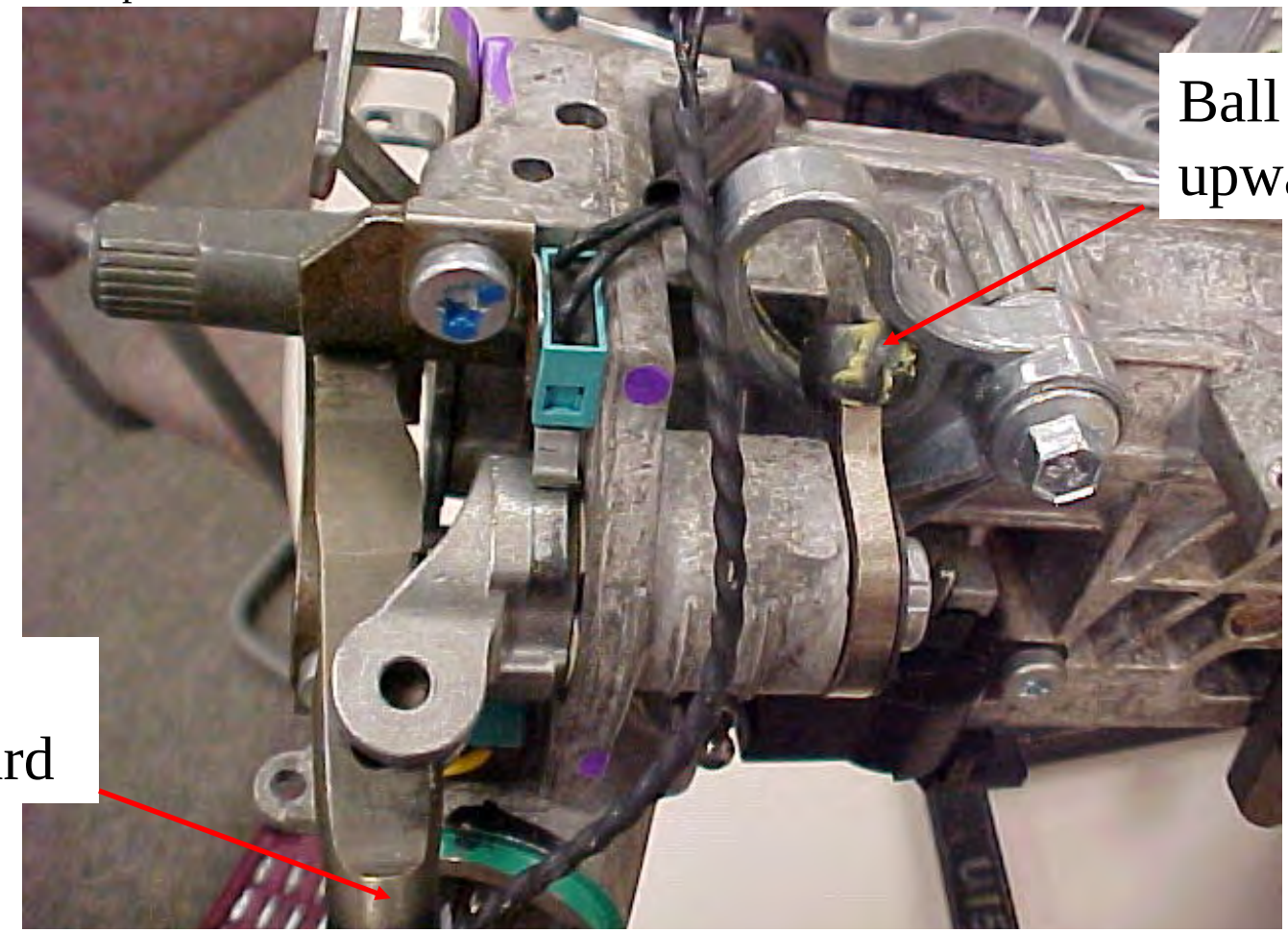
Detent Plate



Pull shift arm out of detent plate but not out of shift socket

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

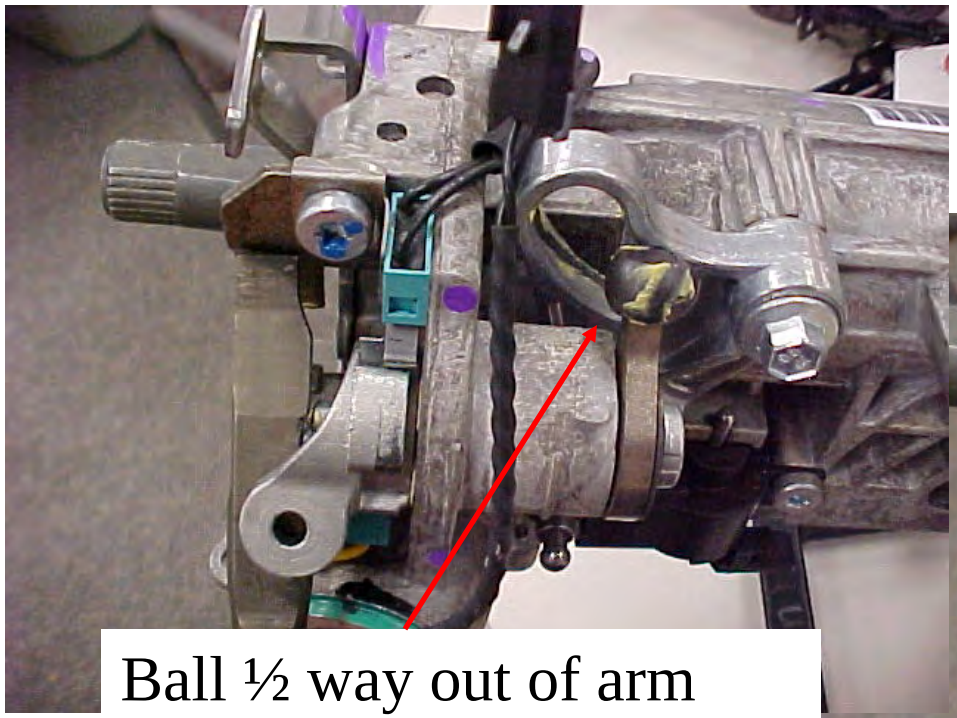
Swing arm Replacement



Slowly push downward on the shift arm until the ball “pops” out of the swing arm

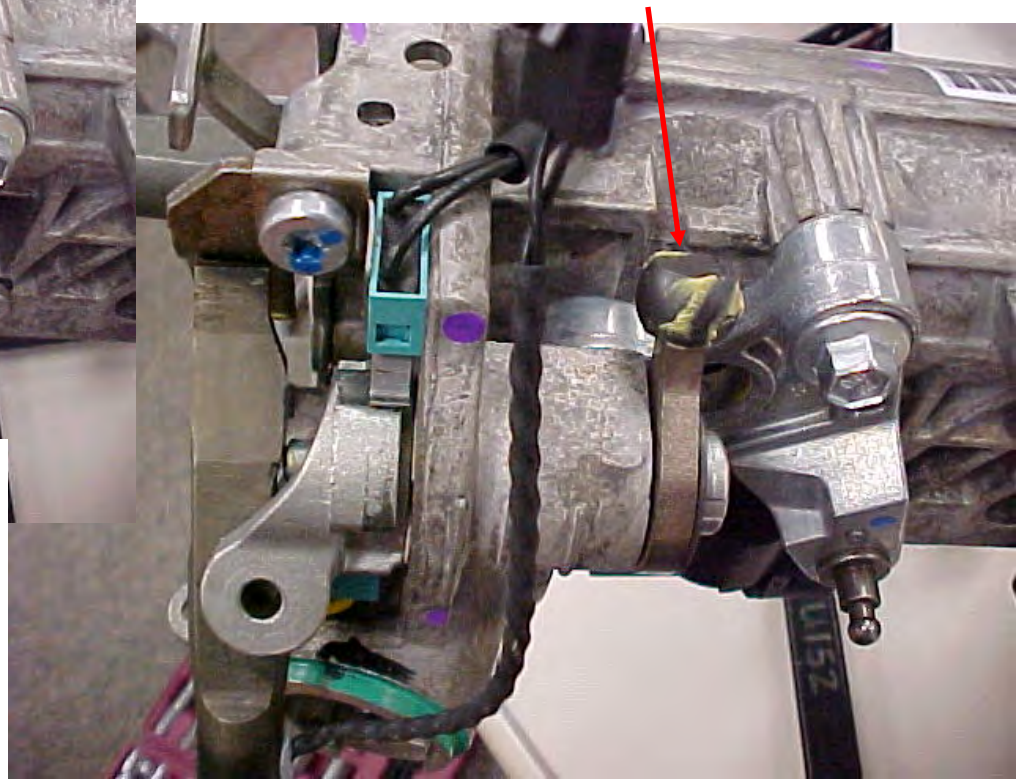
U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement



Ball ½ way out of arm

Ball fully out of swing arm. Swing arm will rotate CCW once ball pops free.



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U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

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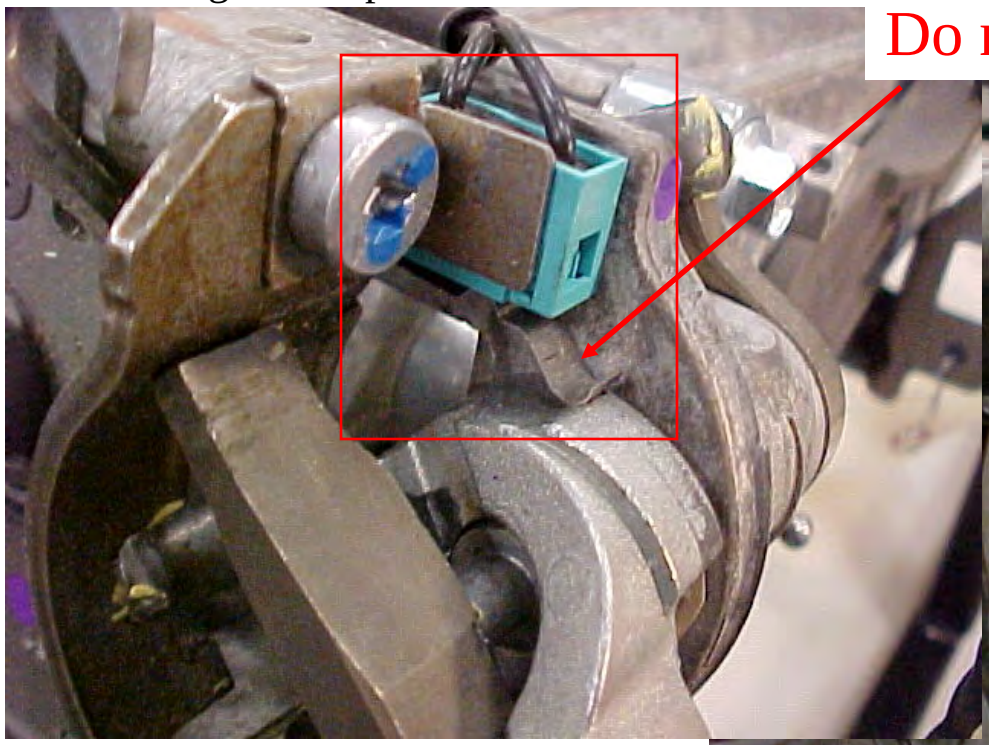
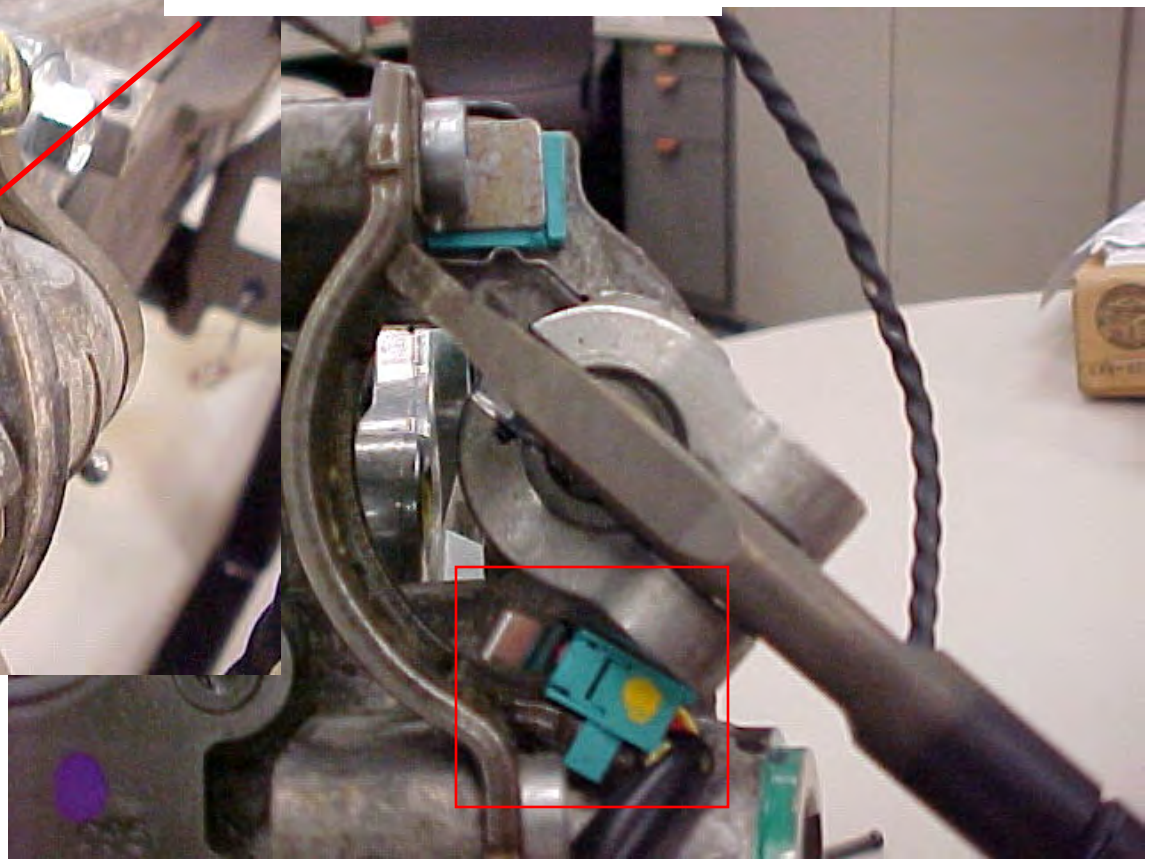


Do not bend this tab

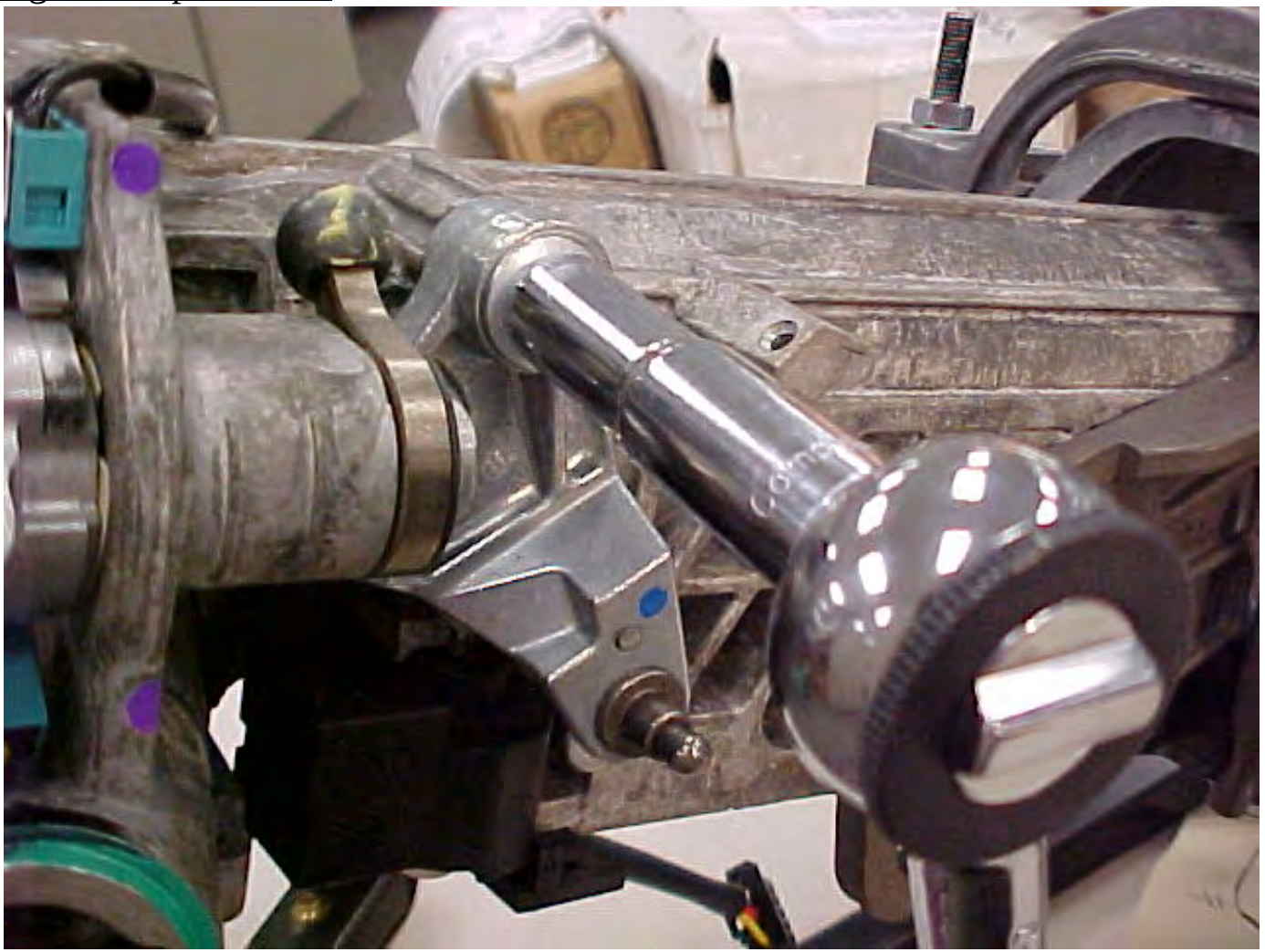


Warning:

Be careful not to damage the two switches or bend the tabs. Slight pressure from the socket onto the lower switch housing is OK.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement



Using a 10mm socket, remove swing arm fastener

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

Remove Old swing arm

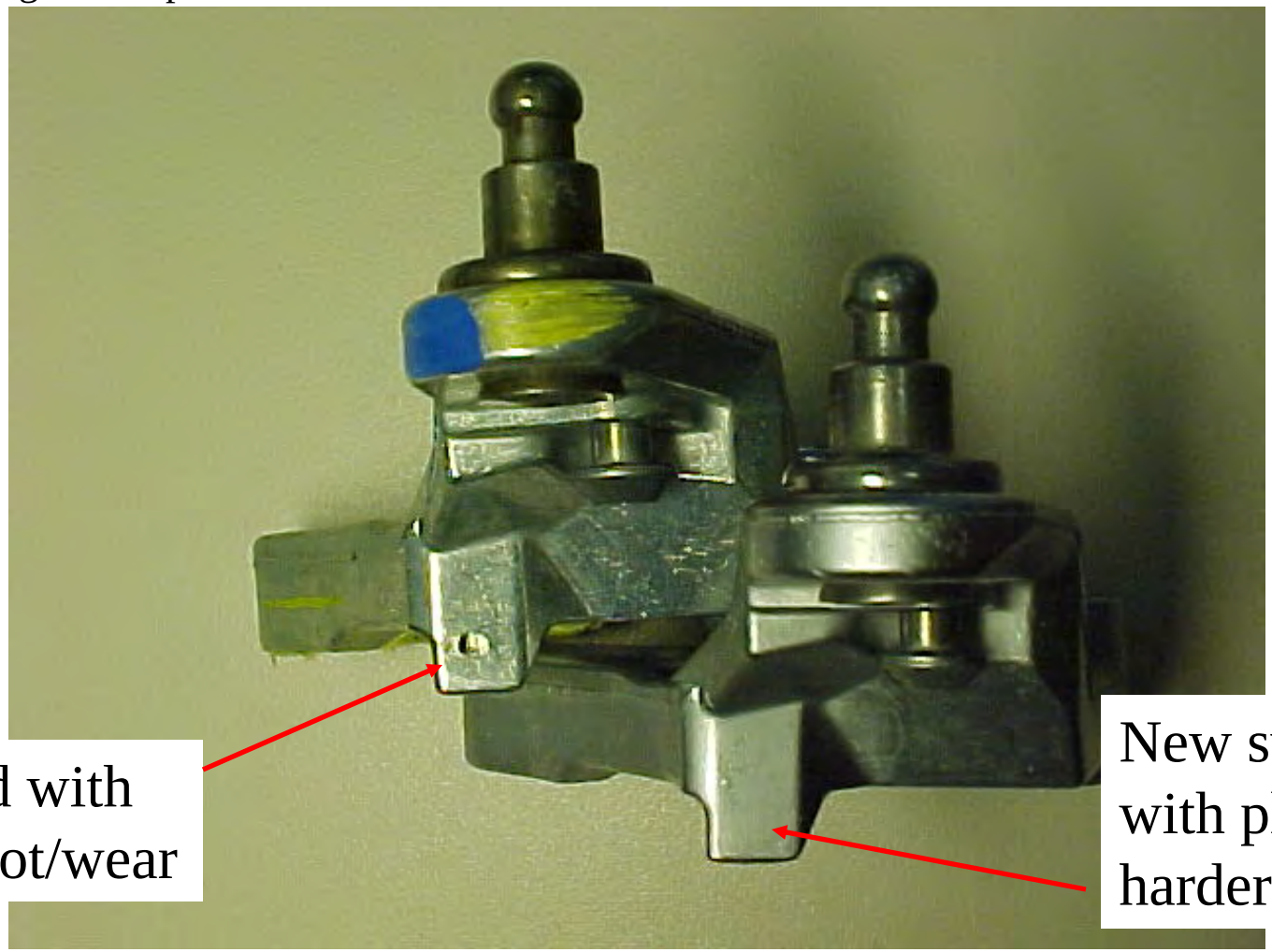
U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

Inspect shift socket ball for burrs. Remove any burrs with needle nose pliers if necessary. Do not sand and do not remove grease.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

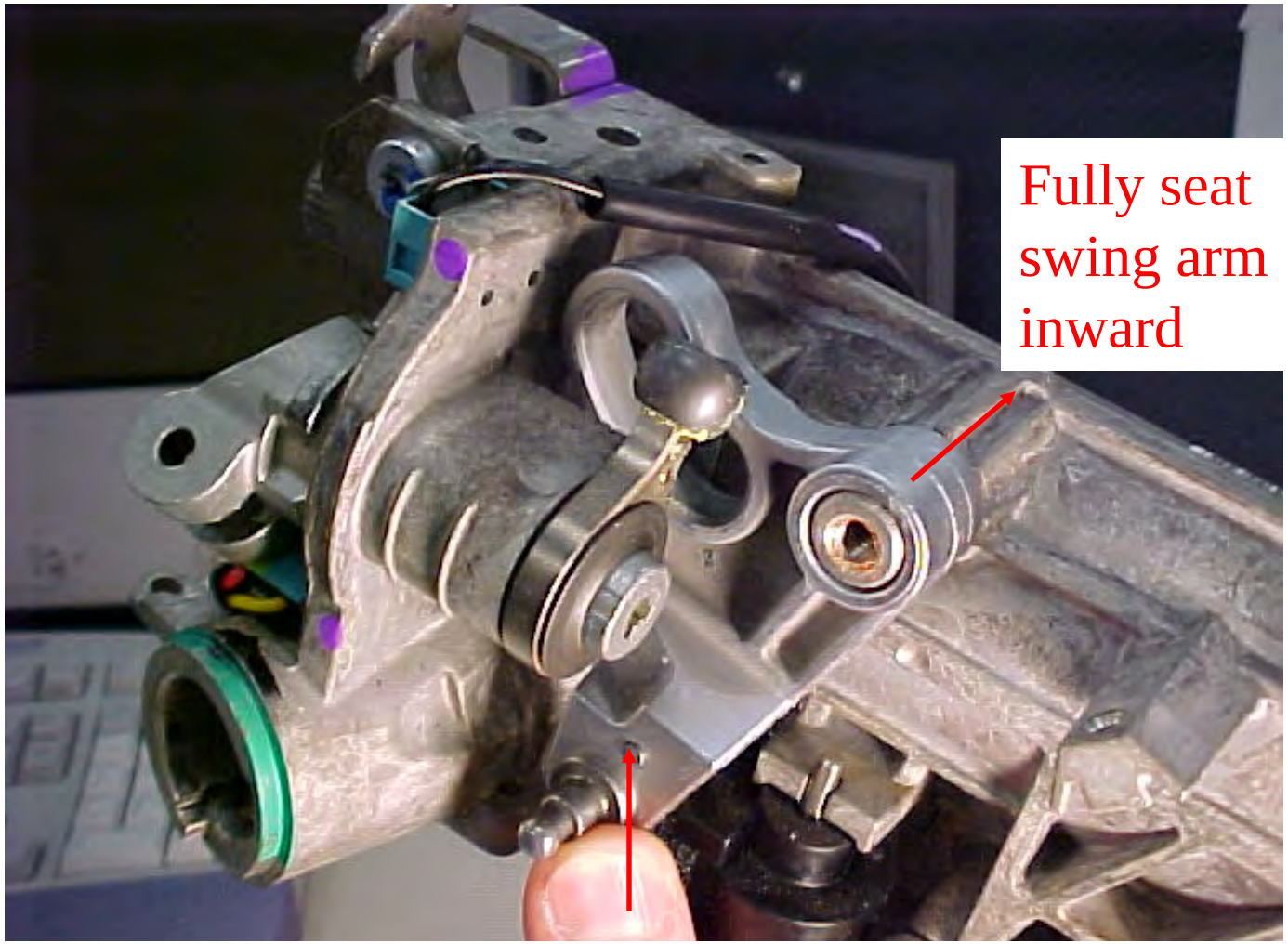
Swing arm Replacement



View of new versus old worn swing arm.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

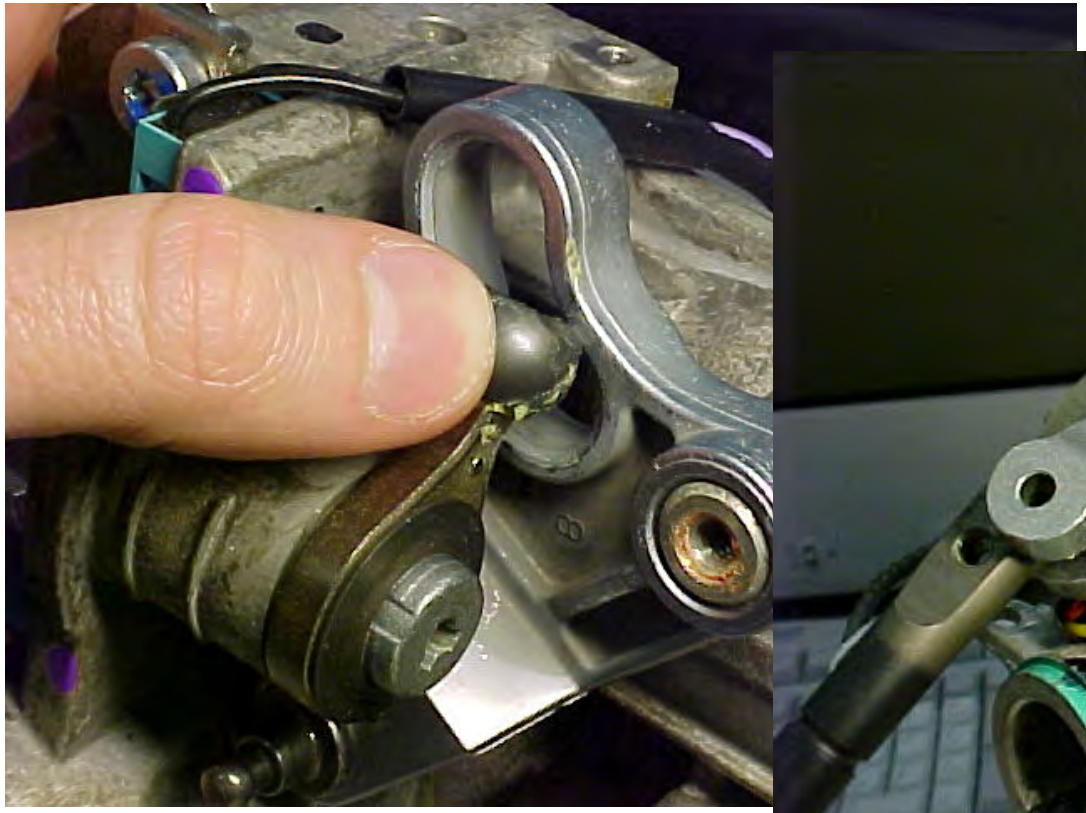
Swing arm Replacement

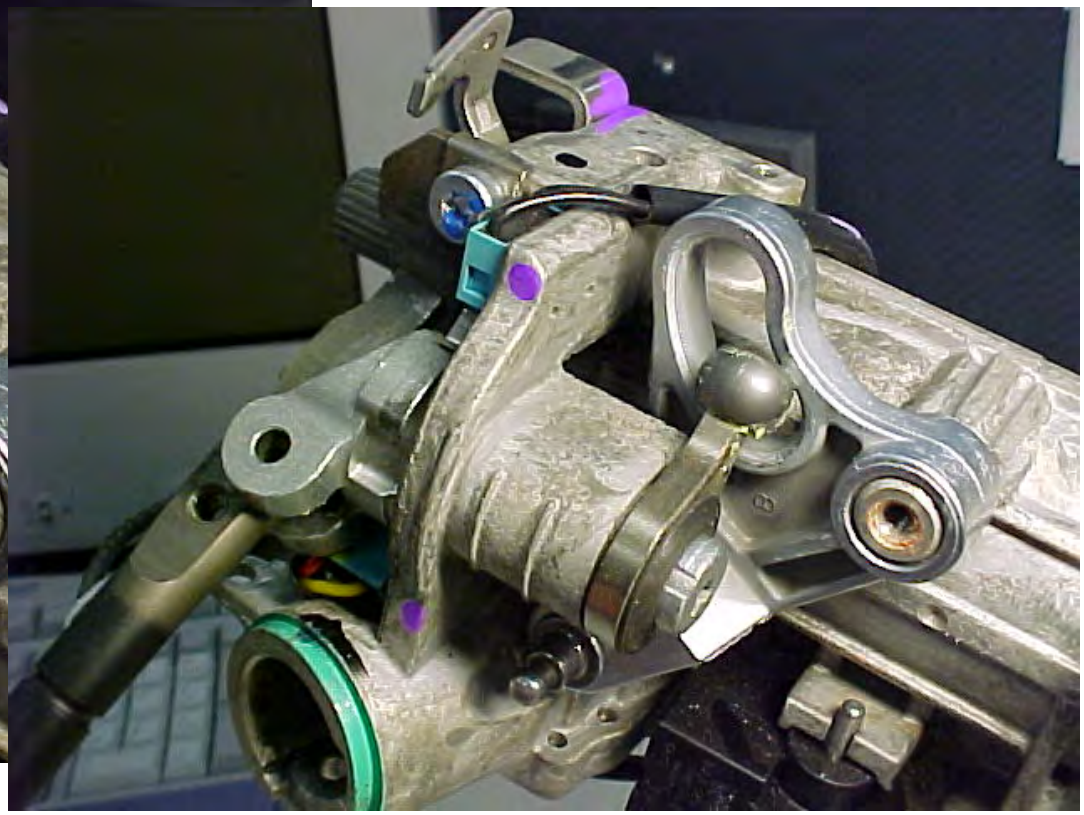


Install new swing arm. Fully seat onto casting. Then, push upward until ball half engages into swing arm.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

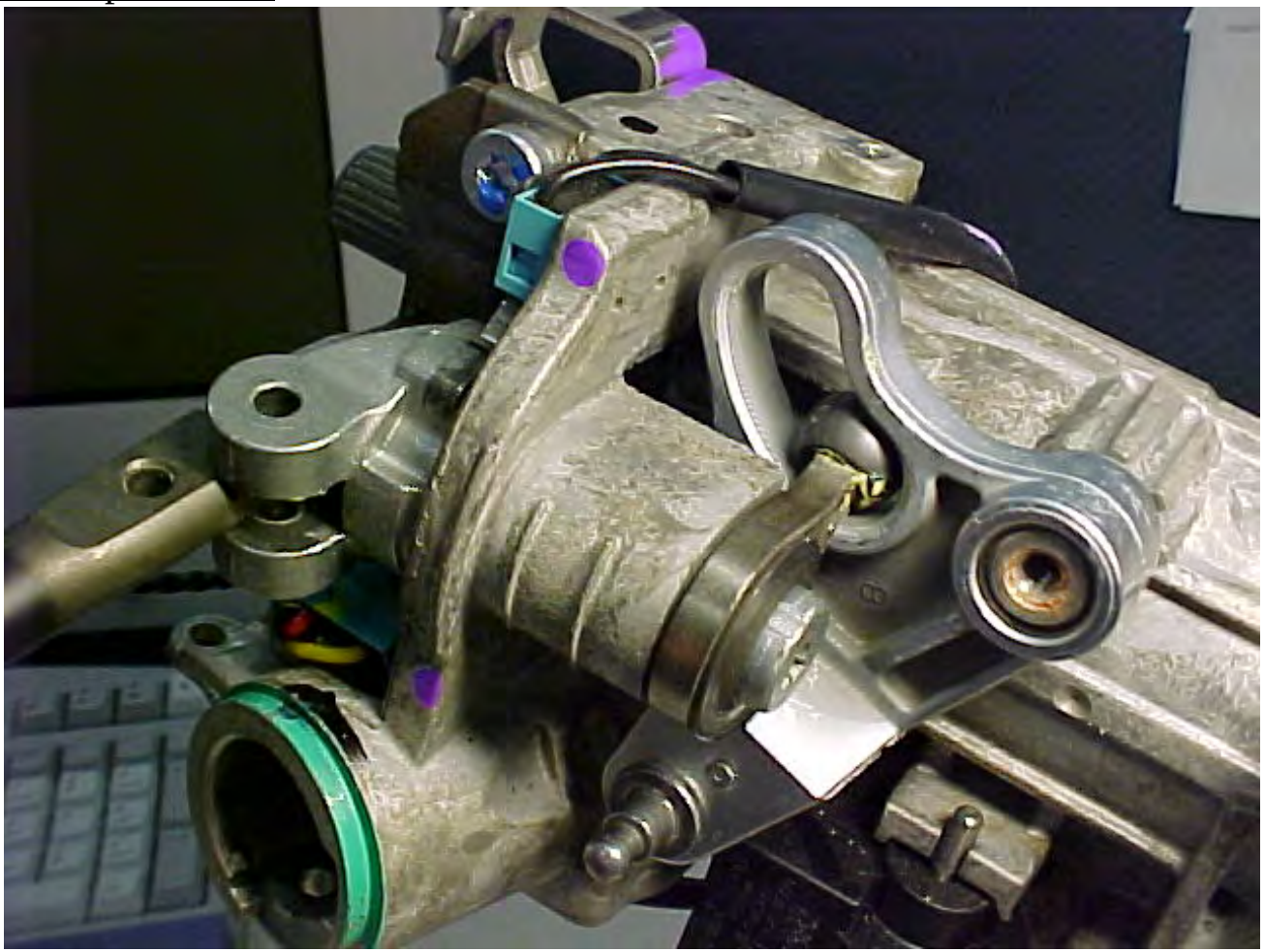




With swing arm rotated full CW and ball half engaged, push the ball into the swing arm. (use shift arm if more leverage is required)

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

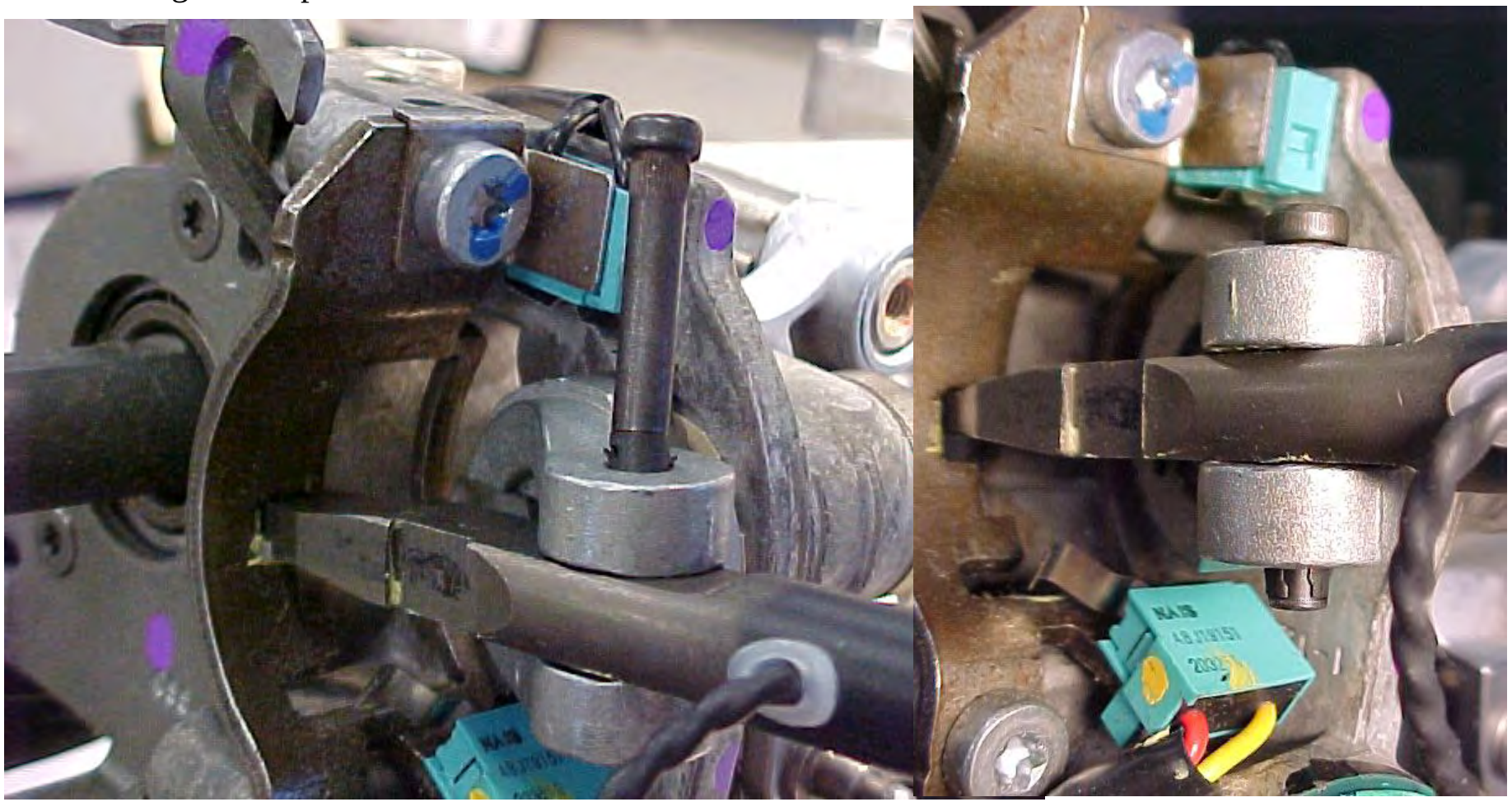
Swing arm Replacement



Ball back into swing arm slot. (Swing arm slot will already be greased before shipping for service but grease is not shown in this picture.)

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

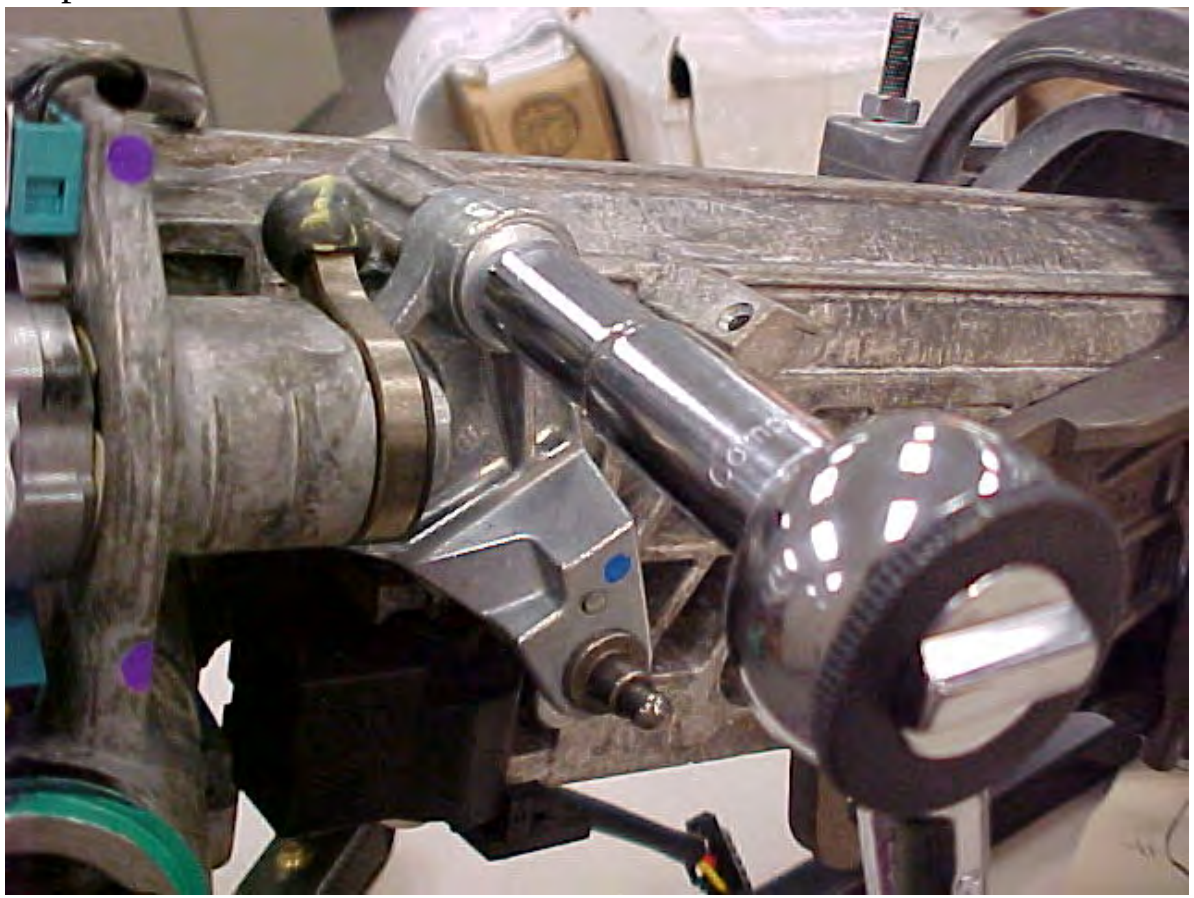
Swing arm Replacement



With the shift arm in the Drive detent slot, install a new Pin.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

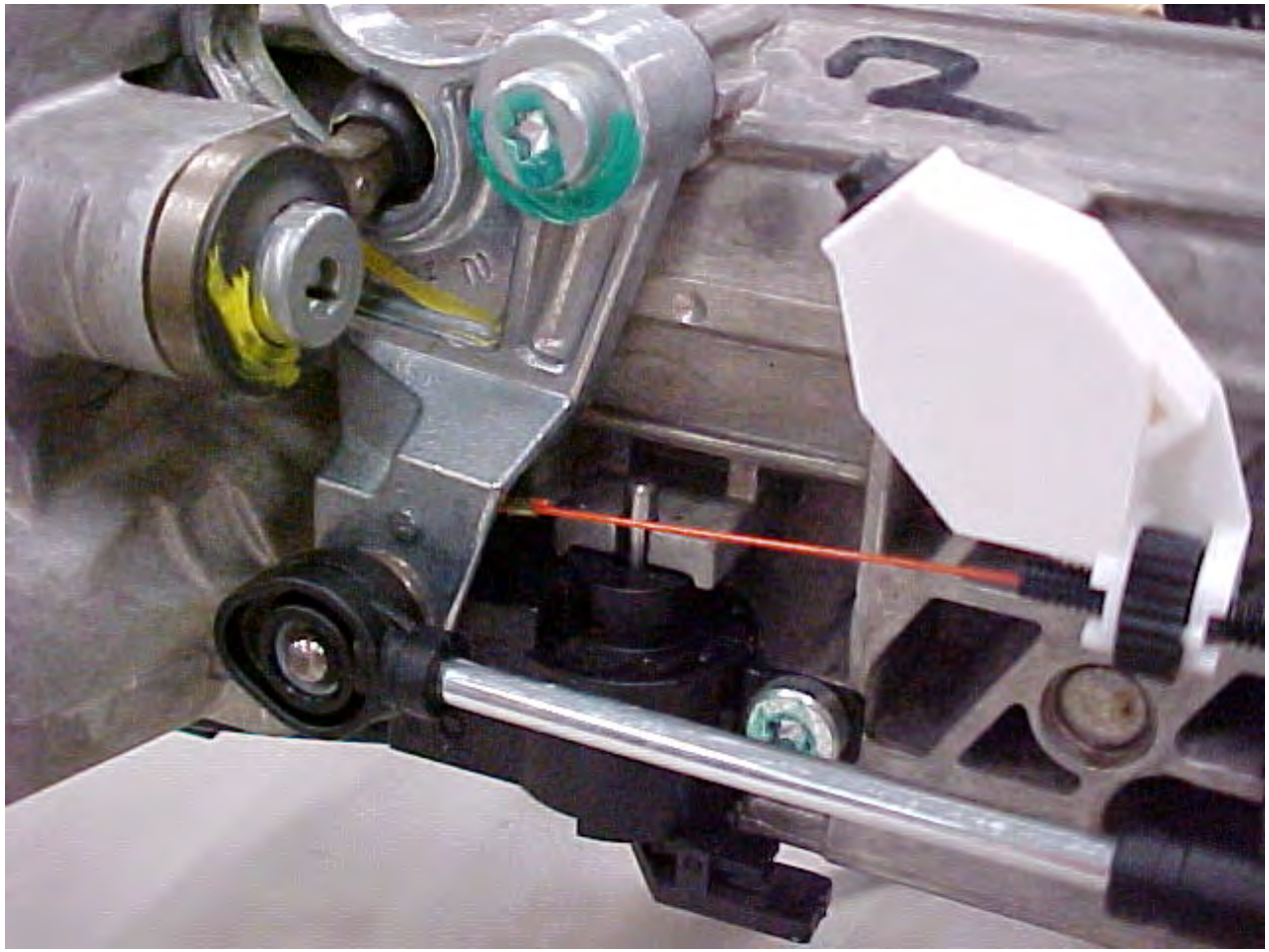
Swing arm Replacement



Put lock tight on swing arm fastener and tighten to 7.5Nm.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement



Reconnect PRNDL and Transmission cables.

U152 LHD

Current shift cable to column brkt vs. proposed reinforced brkt.

Deflection at brkt during normal gear to gear shifts on AT Shift System's buck:

Current brkt. Deflection (measured at brkt.) = approx .012 in (.30 mm)

Reinforced brkt. Deflection = approx .007 in (.18 mm) or approximately 58% less deflection

Note, the increased rigidity noticeably affects the shifter feel when shifting from gear to gear but the improvement is not easily quantified with objective data.

The method used to obtain these lash measurements was to attach a gravity based inclinometer to the shift lever, apply a 1 lb force 13mm from the end of the lever, zero the inclinometer and record the angular travel (of the lever) at the following loads. The linear travel (lash) was then calculated based on the distance of 242 mm (approx. measured) from the lever pivot to the end of the lever handle.

	1 lb	2 lb	2.5 lb	3 lb
D Std Brkt	3.1 mm	6.3 mm	n/a	9.2 mm
D Reinforced Brkt	2.9 mm	4.9 mm	n/a	8.0 mm
R Std Brkt	11.6 mm	17.3 mm	20.6	n/a
R Reinforced Brkt	11.6 mm	16.7 mm	**	n/a

** w/ reinforced brkt, trans would shift to N before a 2.5 lb load could be applied to the shift lever

	SHIFT EFFORTS GEAR - GEAR (lbs)		OML Torque to Turn (in-lbs)
	Craftsmanship Vehc. Proposed Rooster Comb	1 PP Current Rooster Comb	Craftsmanship Vehc. Trans Torque to Turn
P > R	2.60	5.10	15.75
R > N	2.72	2.60	16.08
N > D	2.67	2.49	16.00
D > 3	2.47	2.56	15.33
3 > 2	2.52	2.67	14.83
2 > 1	2.89	2.49	14.83
1 > 2	3.32	3.04	15.00
2 > 3	3.13	3.24	15.17
3 > D	3.08	3.17	15.08
D > N	3.29	3.12	15.83
N > R	3.39	3.32	16.17
R > P	5.02	4.82	25.92

P. Guthrie
5/26/00

From: Case, Robert (R.G.)
Sent: Tuesday, June 15, 2004 1:51 PM
To: Kaercher, Don (D.F.)
Cc: Case, Robert (R.G.)
Subject: Service part

Don, need some help please. We are working on a large QB project involving a steering column issue for Explorer. The fix will involve replacement of a revised brake shift interlock switch (BSI). Currently, the switch is a component to the column and was not released for service.

We will now service the BSI and a TSB is being developed.

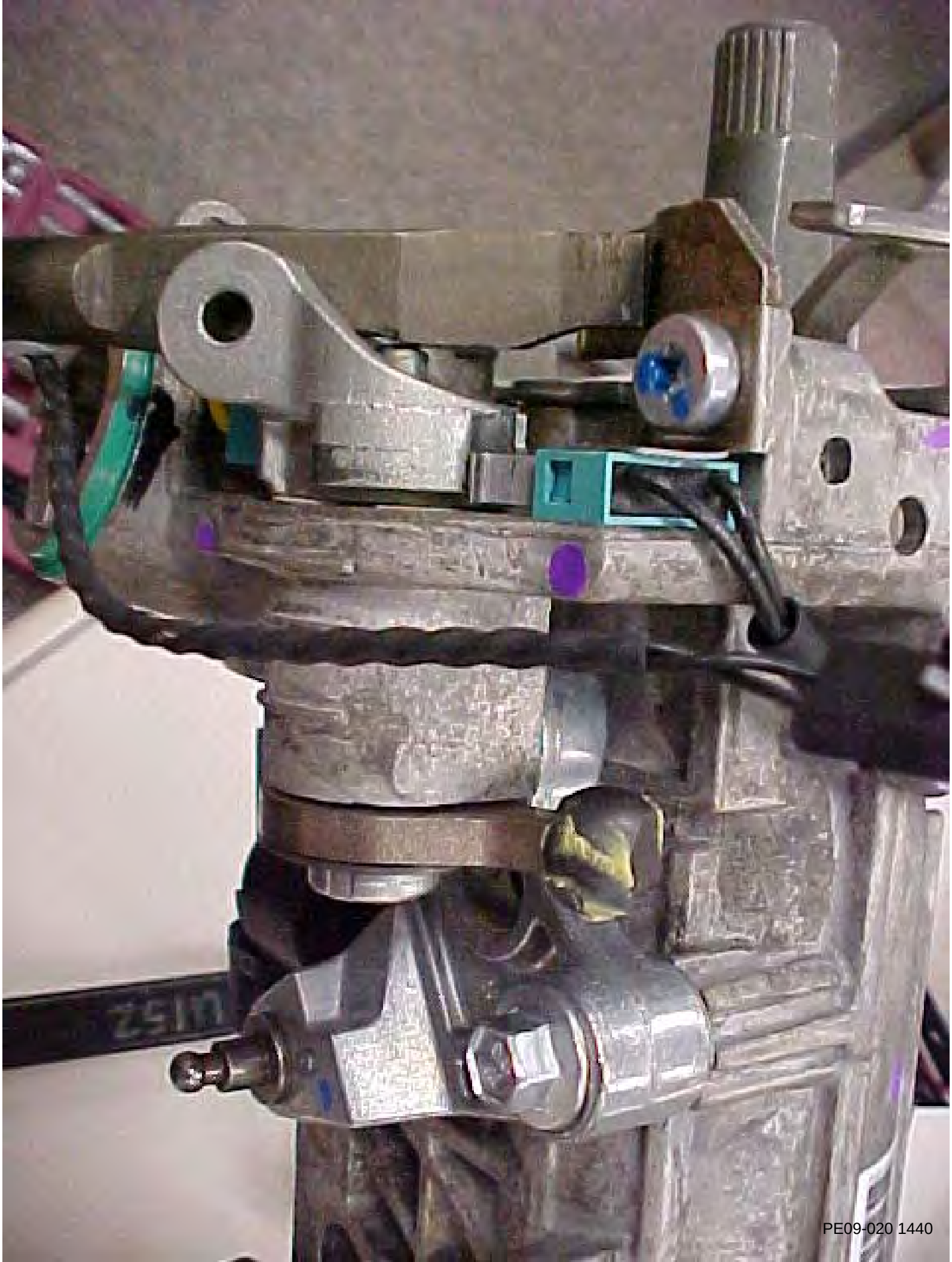
I'm told the BSI switch has been released as follows:

- Concern number C11649395 and Notice NL00-E-11649395-000
- The switch is listed as 1L24-3F770-DA.

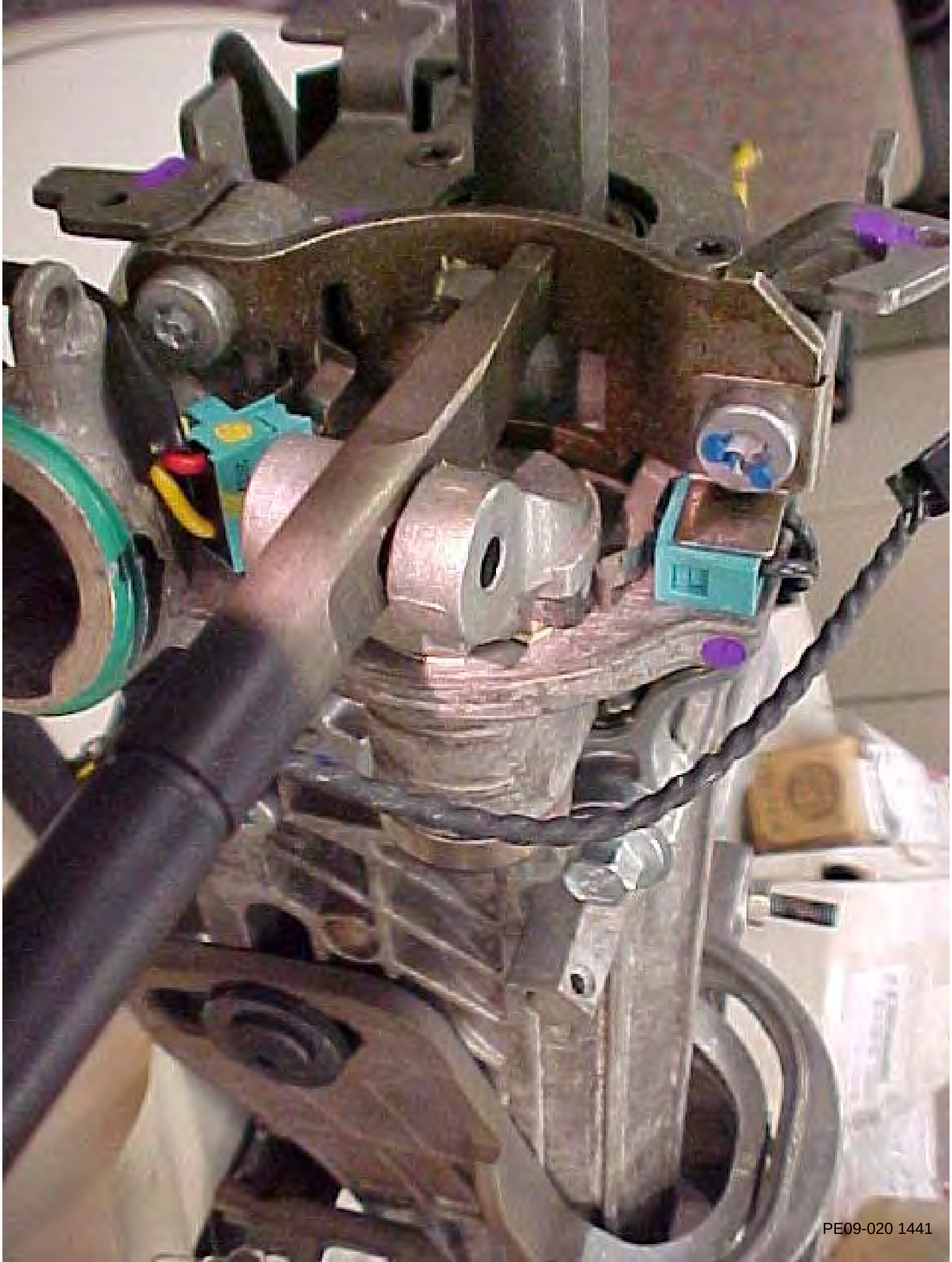
Could you please request someone in your shop to review the above information to get the ball rolling in the right direction.

Thanks in advance.

Bob Case
FCSD x00937
Warranty Program Manager



PE09-020 1440



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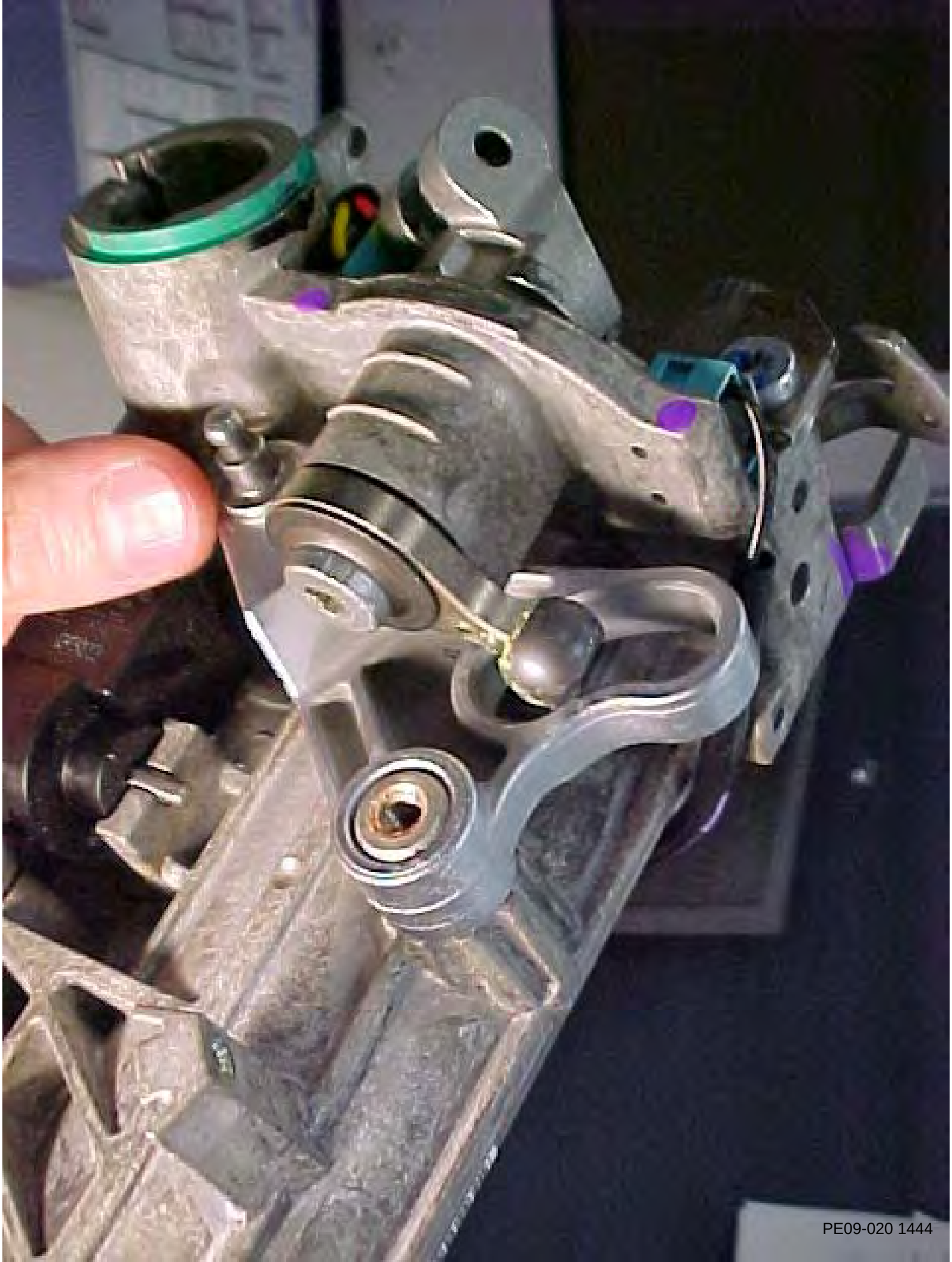

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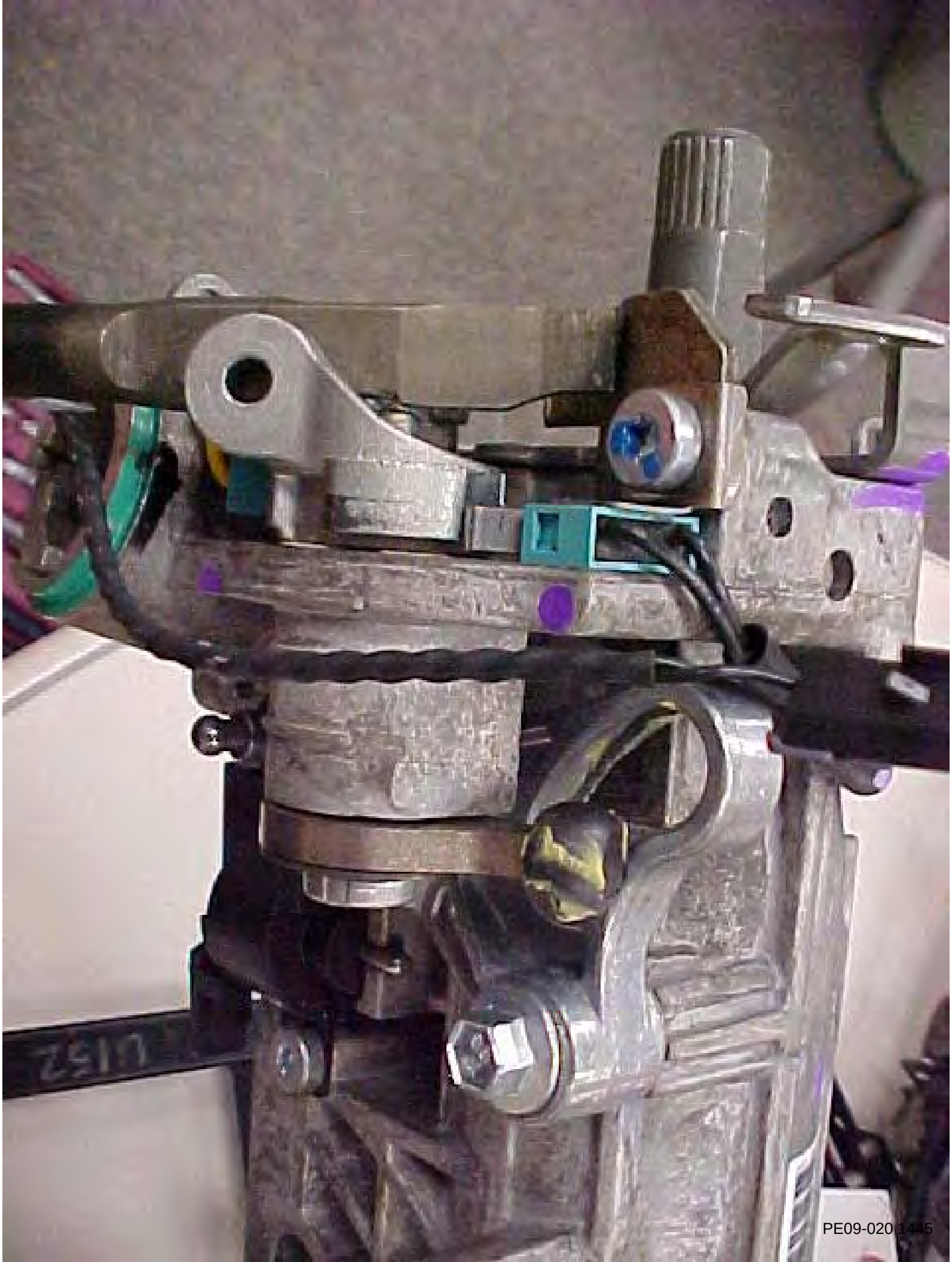
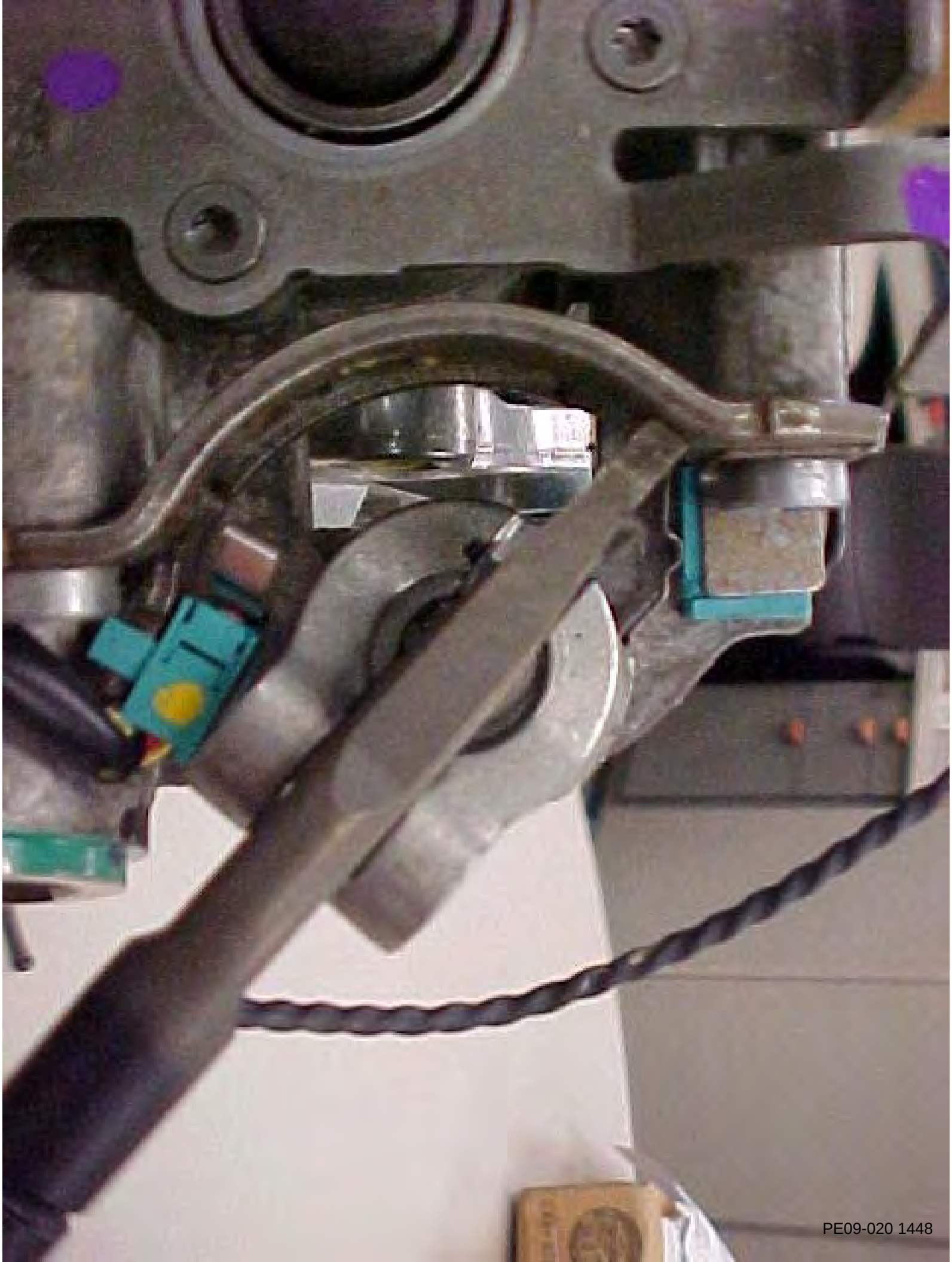


PE09-020 1445

PE09-020 1446

PE09-020 1447



PE09-020 1448

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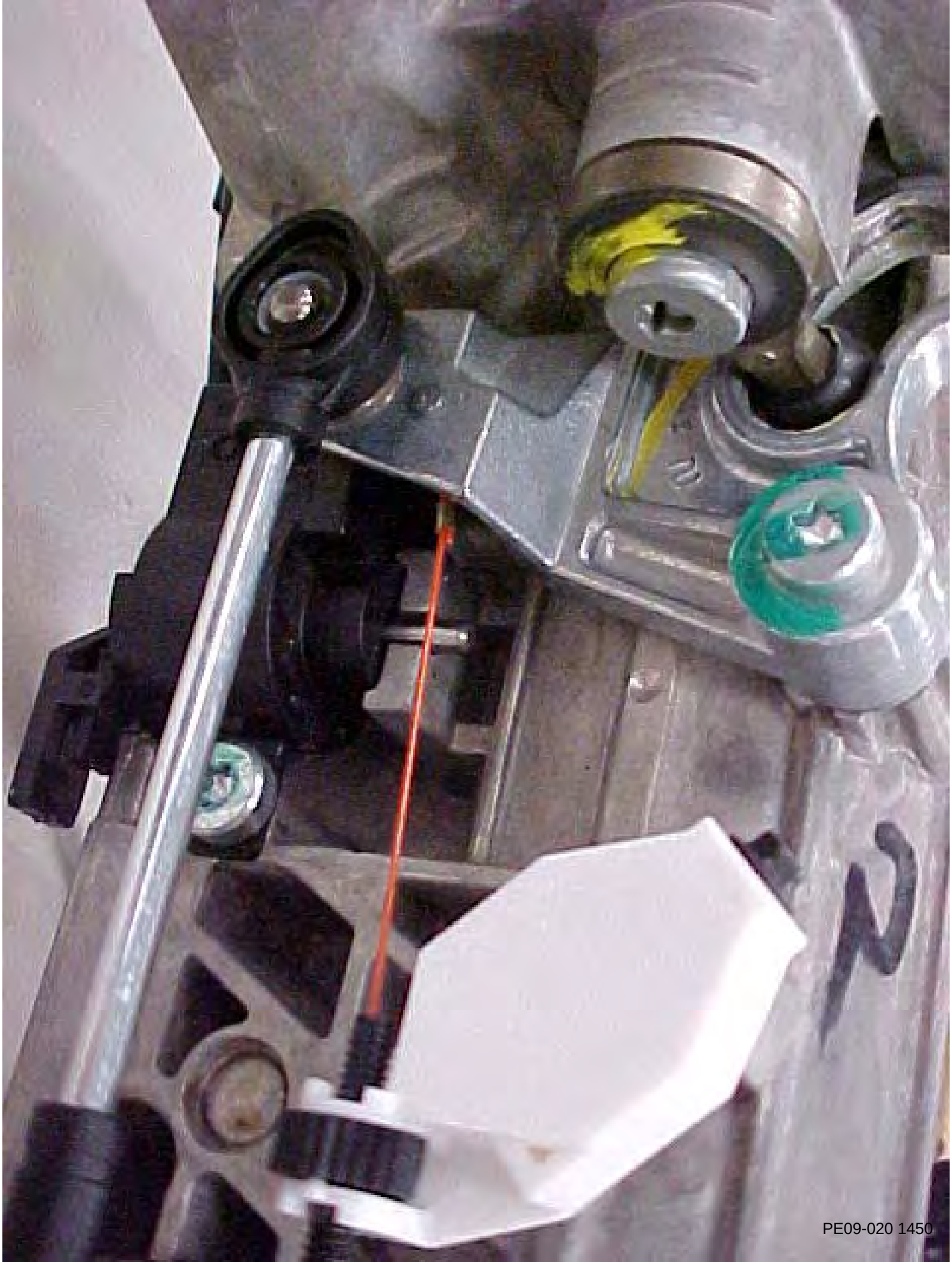

PE09-020 1450

PE09-020 1451

PE09-020 1452

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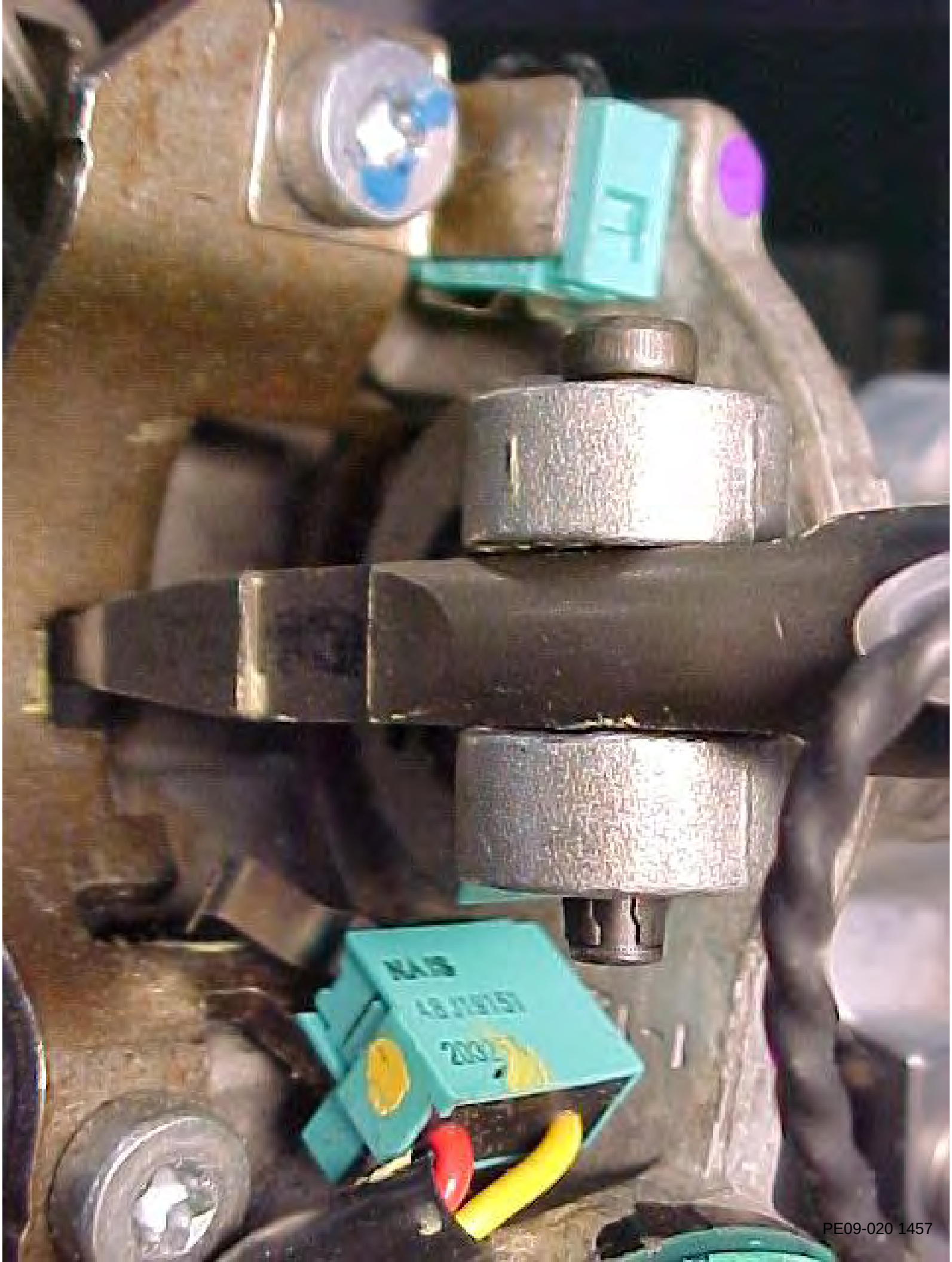
PE09-020 1454

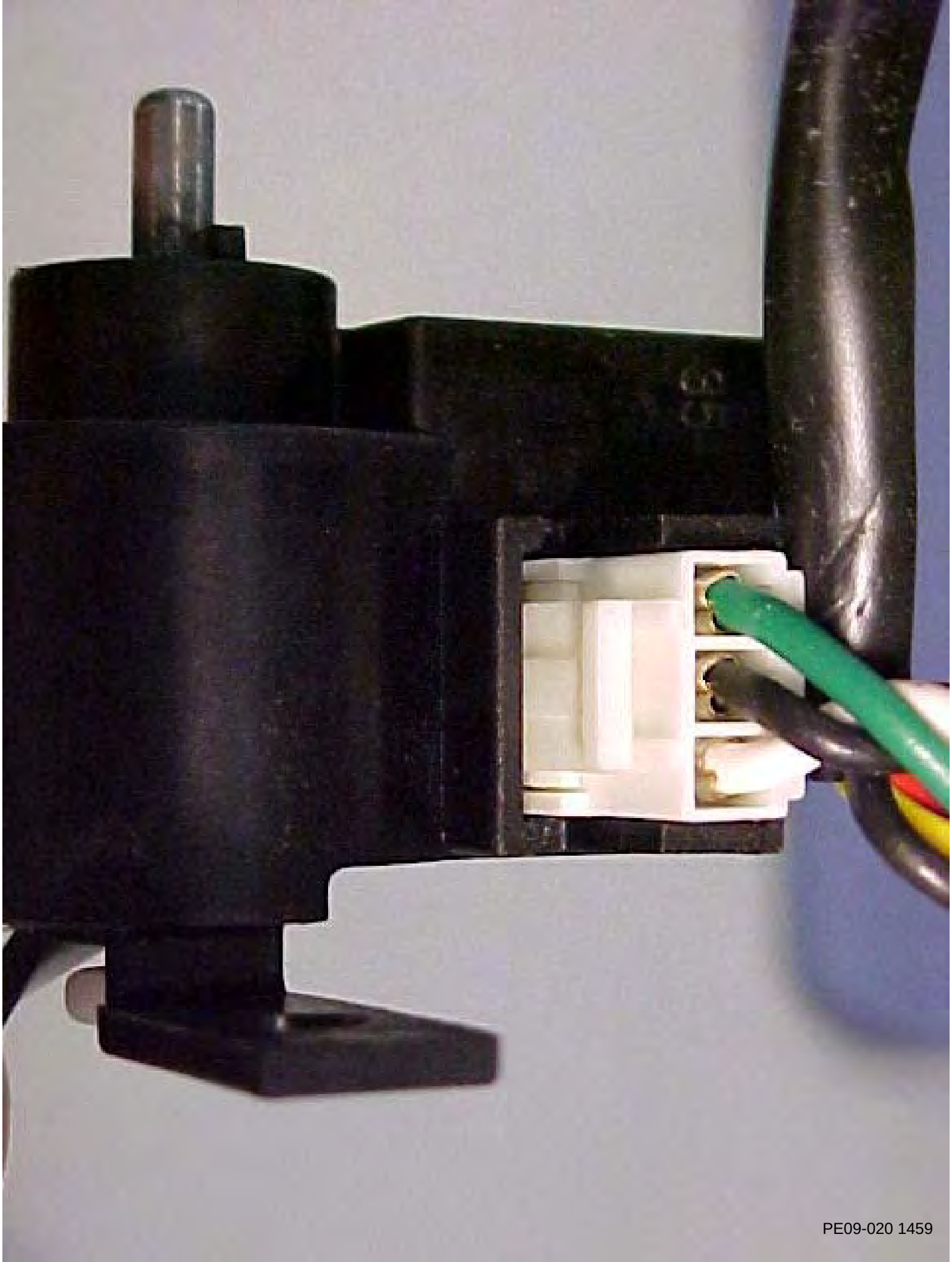
PE09-020 1455

PE09-020 1456



PE09-020 1457

PE09-020 1458



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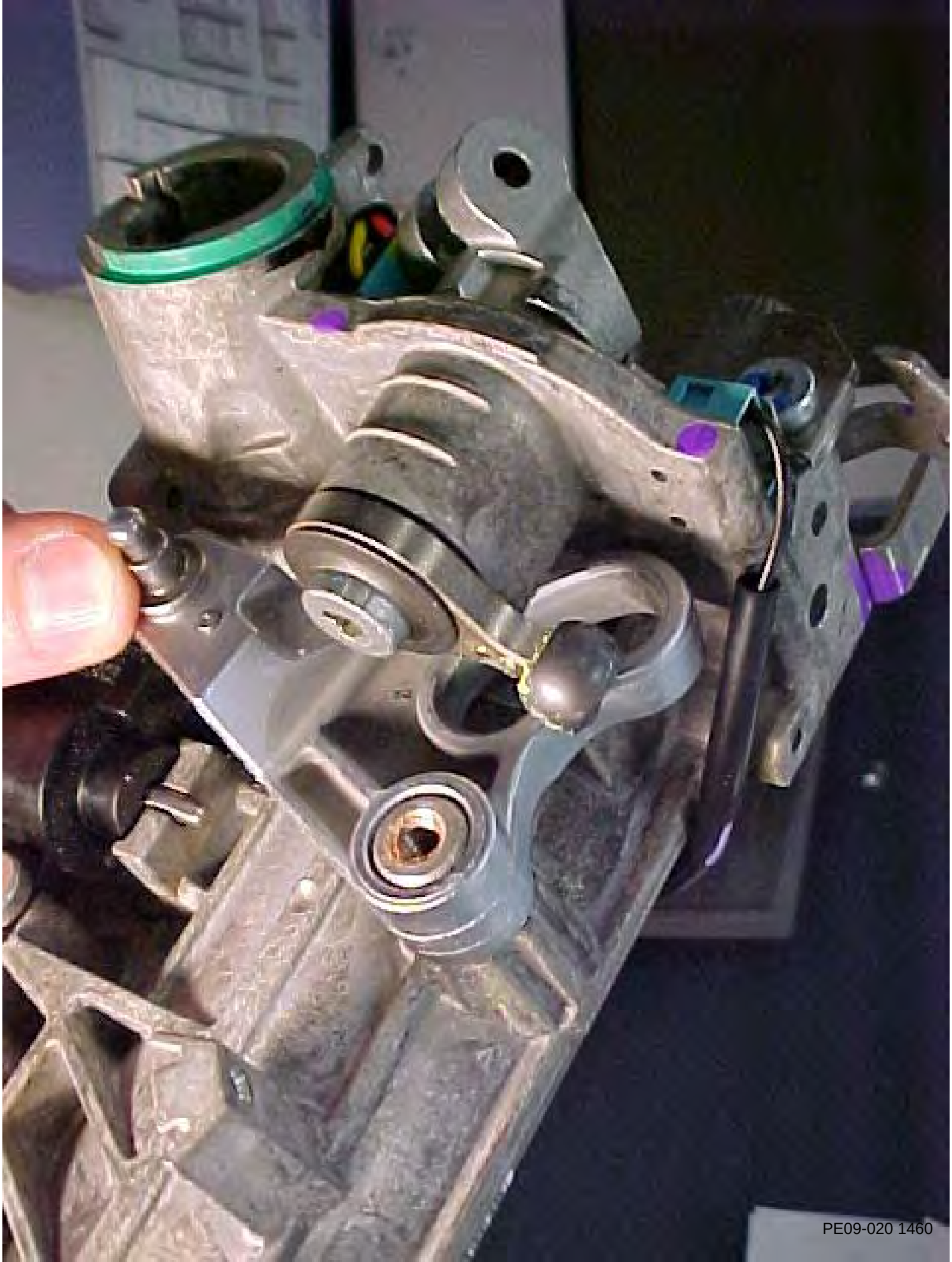
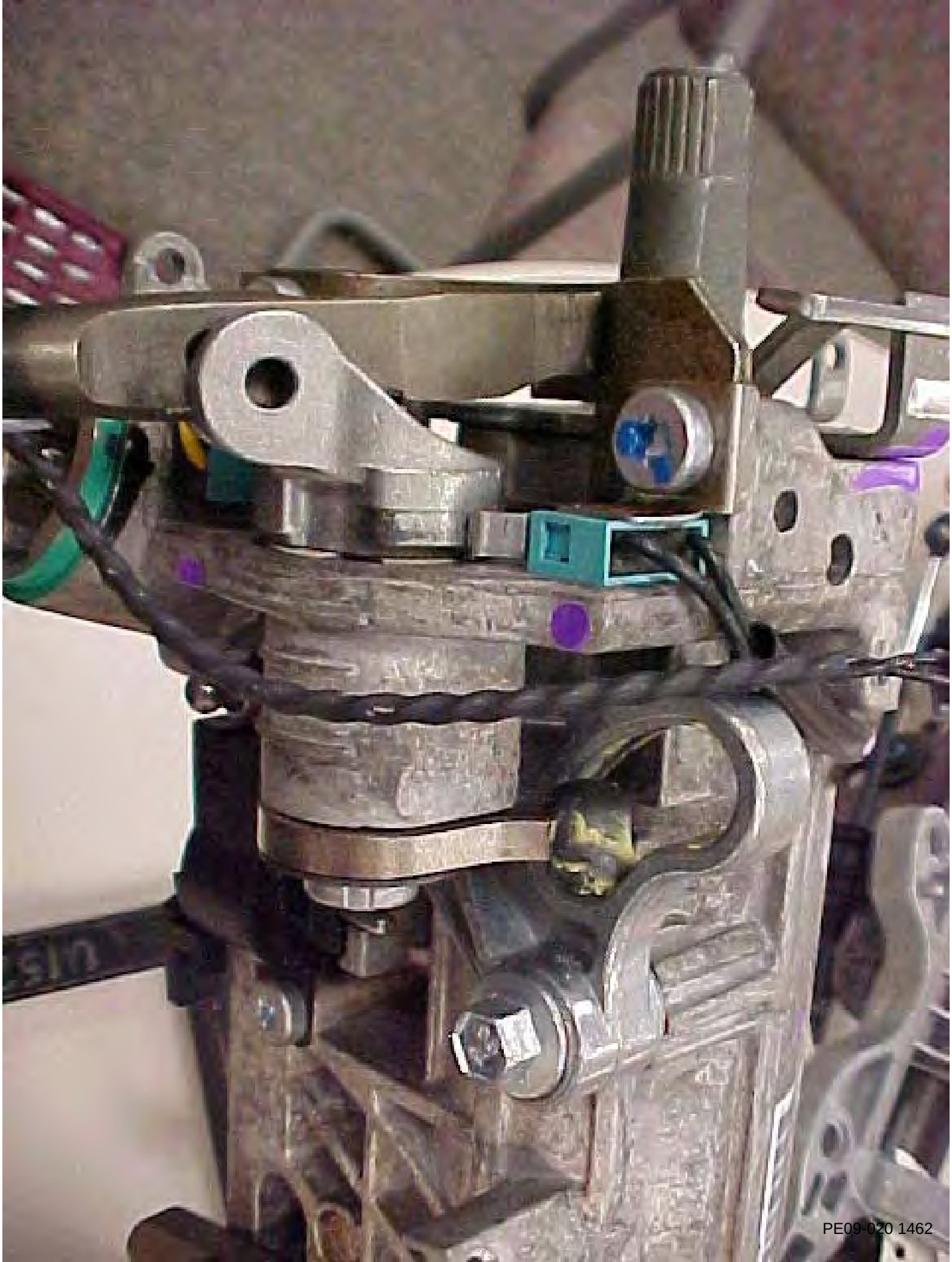


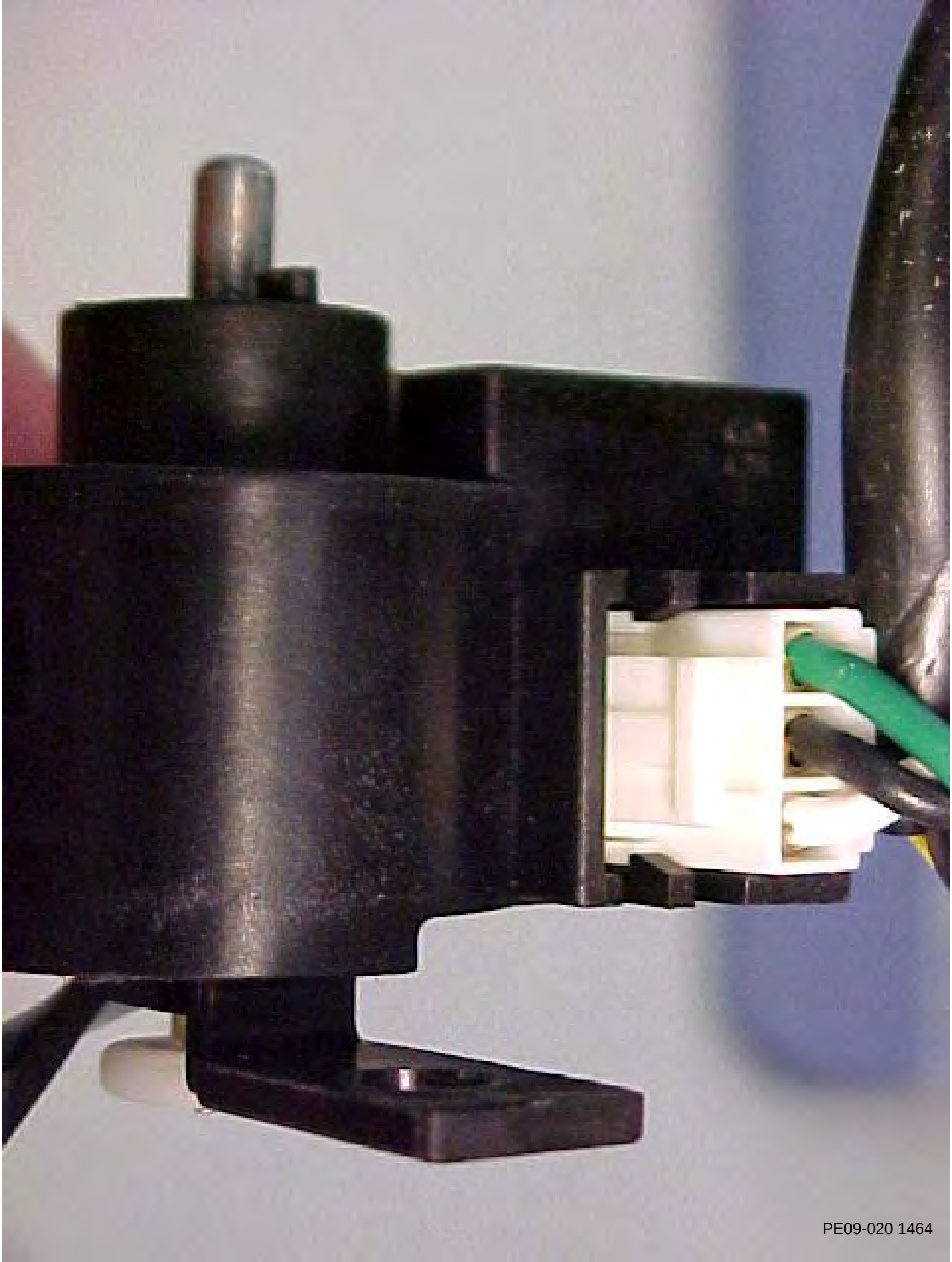
PE09-020 1460

PE09-020 1461



PE09-020 1462

PE09-020 1463



PE09-020 1464

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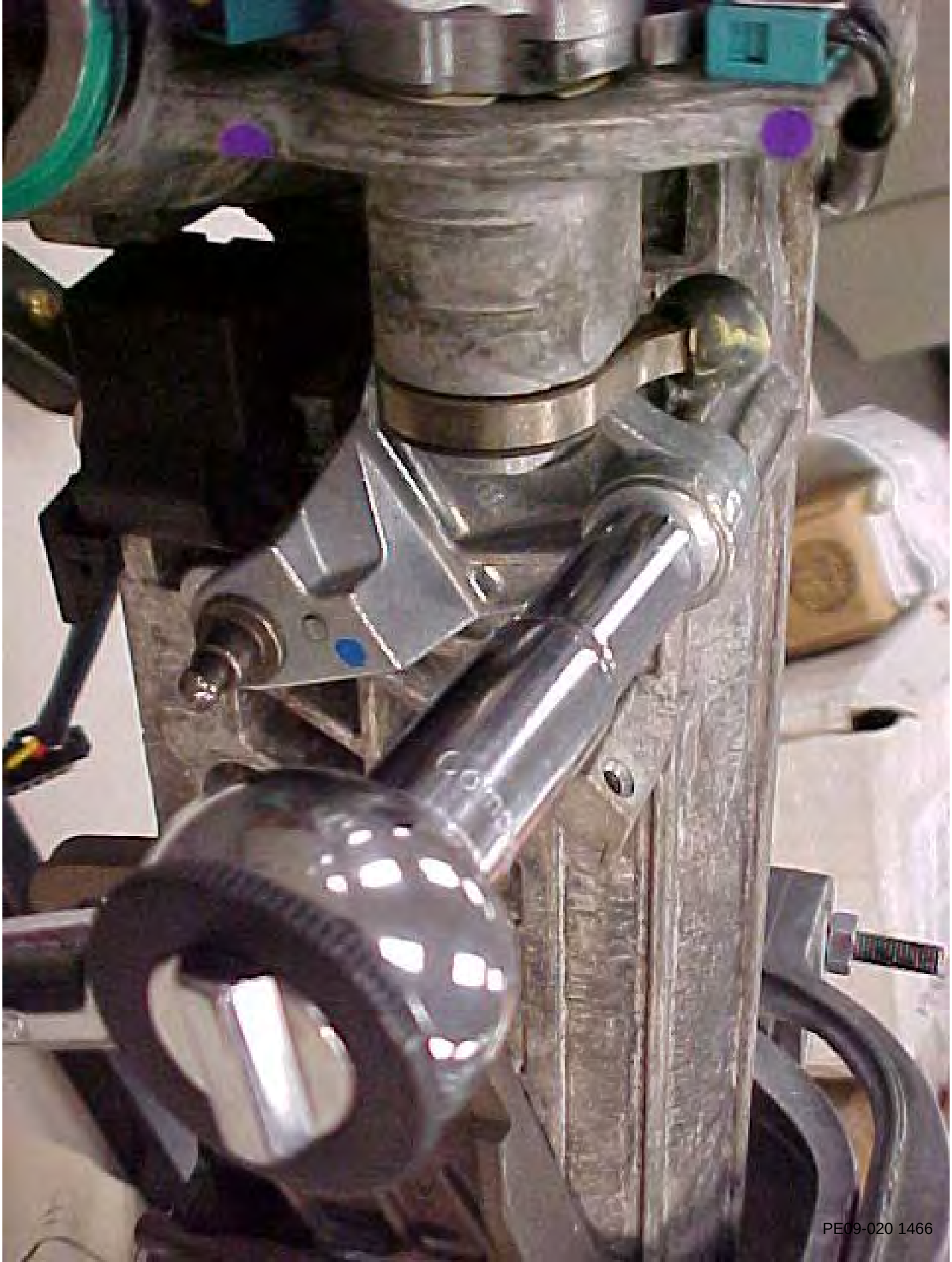

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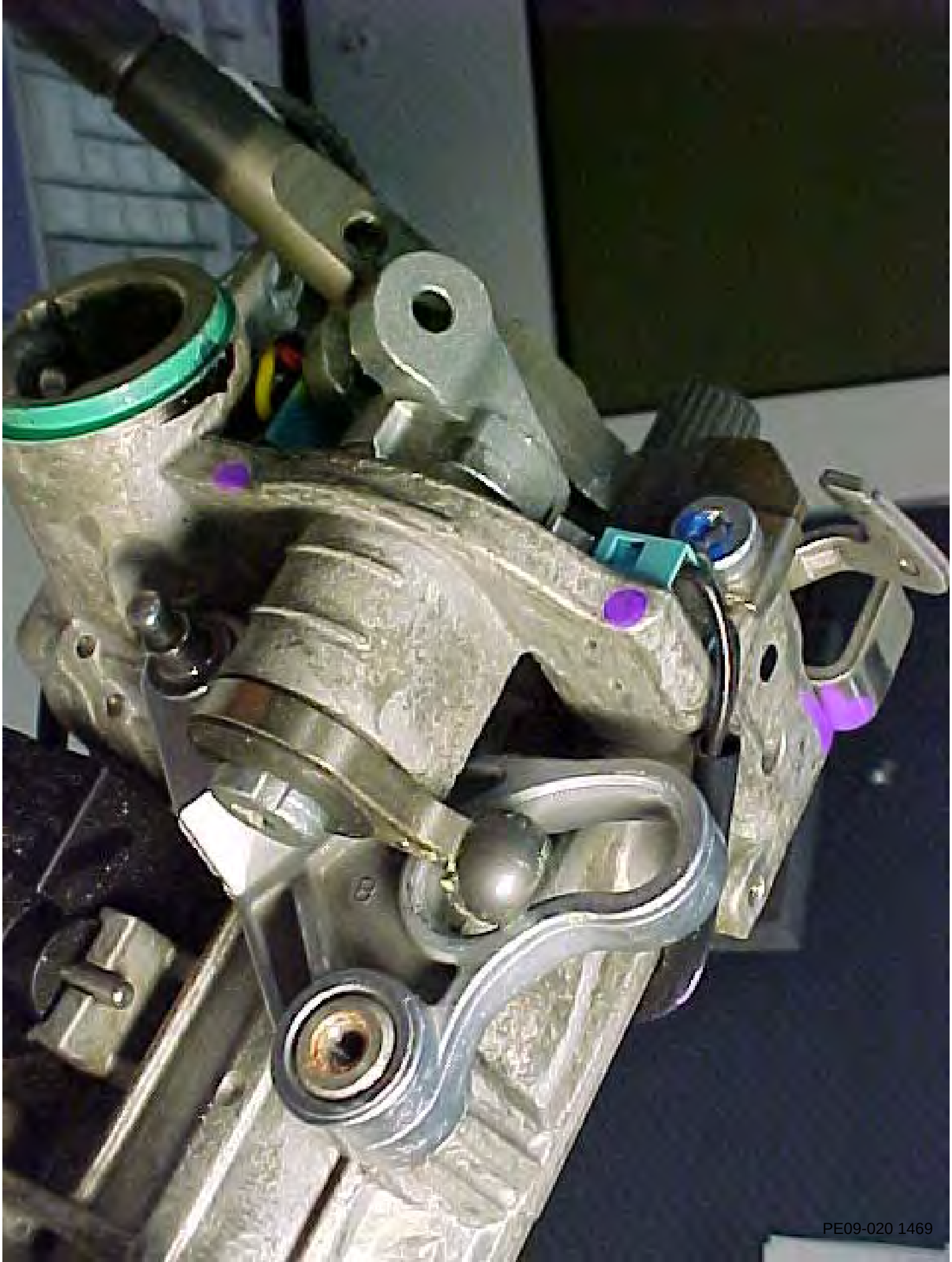
PE09-020 1467

PE09-020 1468


PE09-020 1469

PE09-020 1470

PE09-020 1471

PE09-020 1472

PE09-020 1473

PE09-020 1474

PE09-020 1475

PE09-020 1476

Close

From: Guillory, Kasandra (K.N.)
To: Levine, Julie (J.A.)
Cc: Lightner, Shawn (S.E.); Brohl, Jerry (G.G.); Von Foerster, Steve (S.)

Subject: Shift efforts and lash
Sent: 12/2/00 10:53 AM **Importance:** Normal

Julie,

Here is what I found:

1ua81100 - 2PP LAP unit: 30,530 mi (highest mileage truck still in one piece)
Efforts - no degradation
Lash in Park: 2 mm
Lash in Rev: 13 mm
Lash in Neutral: 13 mm
Lash in Drive: 4 mm

1ua21232 - 1PP LAP unit: 12,830 mi
Efforts - no degradation
Lash in Park: 3 mm
Lash in Rev: 10 mm
Lash in Neutral: 10 mm
Lash in Drive: 3 mm

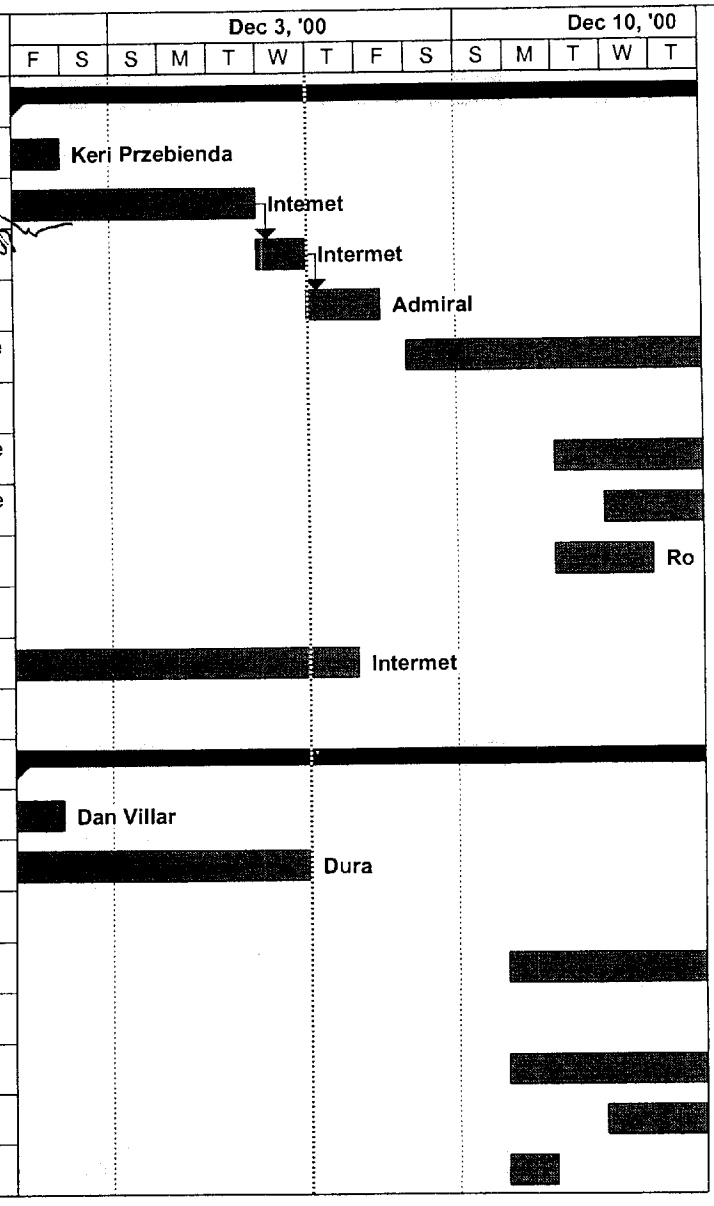
1zj00002 - 1PP SLAP unit: 18,330 mi
Efforts - no degradation
Lash in Park: 0 mm
Lash in Rev: 10 mm
Lash in Neutral: 10 mm
Lash in Drive: 3 mm

2ua00220 - IB LAP unit: 8.5 mi
Lash in Park: 1mm
Lash in Rev: 7 mm
Lash in Neutral: 7 mm
Lash in Drive: 1mm

2ua00173 - IB LAP unit: 4349 mi
Efforts - no degradation
Lash in Park: 2 mm
Lash in Rev: 7 mm
Lash in Neutral: 7 mm
Lash in Drive: 2 mm

Kasandra Guillory - U152 Vehicle Integration
Phone: 502-375-5142, Cell Phone 502.639.9212 Fax : 502.375-5120 /5125
Work like you don't need the money, Love like you have never been hurt, and Dance like no one is

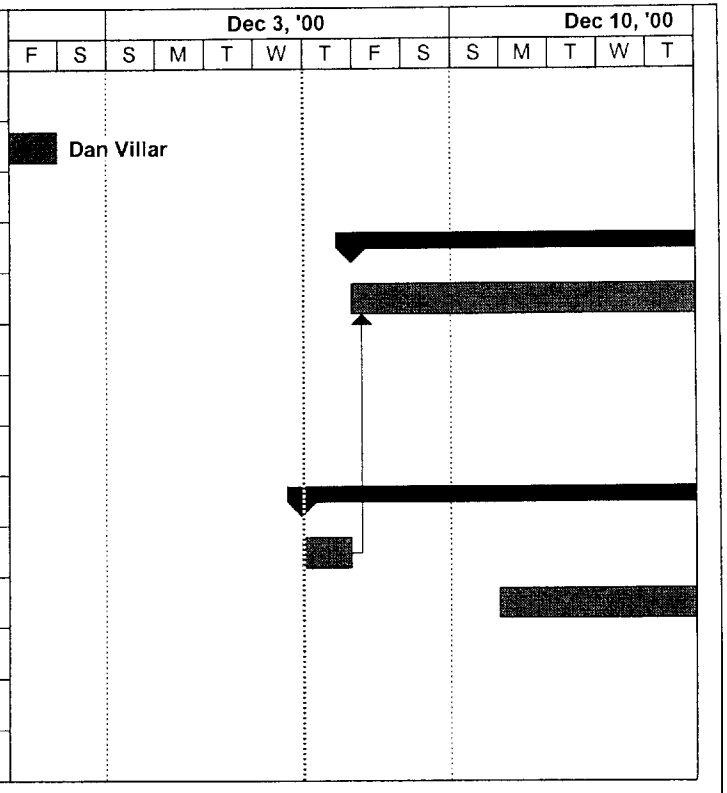
ID	Task Name	Duration	Start	Finish	Prede	Resource Names
1	**Shift Socket Hole Change**	**51d**	**Fri 12/1/00**	**Thu 2/8/01**		
2	Kick off Intermet tooling change(1	1d	Fri 12/1/00	Fri 12/1/00		Keri Przebienda
3	Tooling change - socket cavity 1	3d	Fri 12/1/00	Tue 12/5/00		Intemet
4	Cast parts, layout, ship	1d	Wed 12/6/00	Wed 12/6/00	3	Intermet
5	Build new sockets into columns	1.5d	Thu 12/7/00	Fri 12/8/00	4	Admiral
6	PV Test #28-shift system fatigue	45d	Sat 12/9/00	Thu 2/8/01		Ziad Daker/Keri Prze
7	In vehicle evaluation after 200K	1d	Tue 1/16/01	Tue 1/16/01		Ron Perri
8	PV Test #30-BSI fatigue test	8d	Tue 12/12/00	Thu 12/21/00		Ziad Daker/Keri Prze
9	PV Test # -BSI ultimate	2d	Wed 12/13/00	Thu 12/14/00		Ziad Daker/Keri Prze
10	In vehicle evaluation pre test part	2d	Tue 12/12/00	Wed 12/13/00		Ron Perri
11	Kickoff Intermet cavity 2 change	1d	Wed 1/17/01	Wed 1/17/01	7	Keri Przebienda
12	Tooling change - socket cavity 2	5d	Fri 12/1/00	Thu 12/7/00		Intermet
13						
14	**Shift Lever Hole Change**	**94d**	**Fri 12/1/00**	**Tue 4/10/01**		
15	Kick off Dura tooling change	1d	Fri 12/1/00	Fri 12/1/00		Dan Villar
16	Machine prototype parts, layout,	4d	Fri 12/1/00	Wed 12/6/00		Dura
17	Tooling change to lever		Wed 1/17/01	Tue 4/10/01	7	Dura
18	PV Test #28-shift system fatigue	45d	Mon 12/11/00	Fri 2/9/01		Ziad Daker
19	In vehicle evaluation after 200K	1d	Tue 1/16/01	Tue 1/16/01		
20	PV Test #30-BSI fatigue test	8d	Mon 12/11/00	Wed 12/20/00		
21	PV Test # 32 -BSI ultimate	2d	Wed 12/13/00	Thu 12/14/00		
22	In vehicle evaluation pre test part	1d	Mon 12/11/00	Mon 12/11/00		



Project: Shift Socket Lash Reduction
Date: Thu 12/7/00

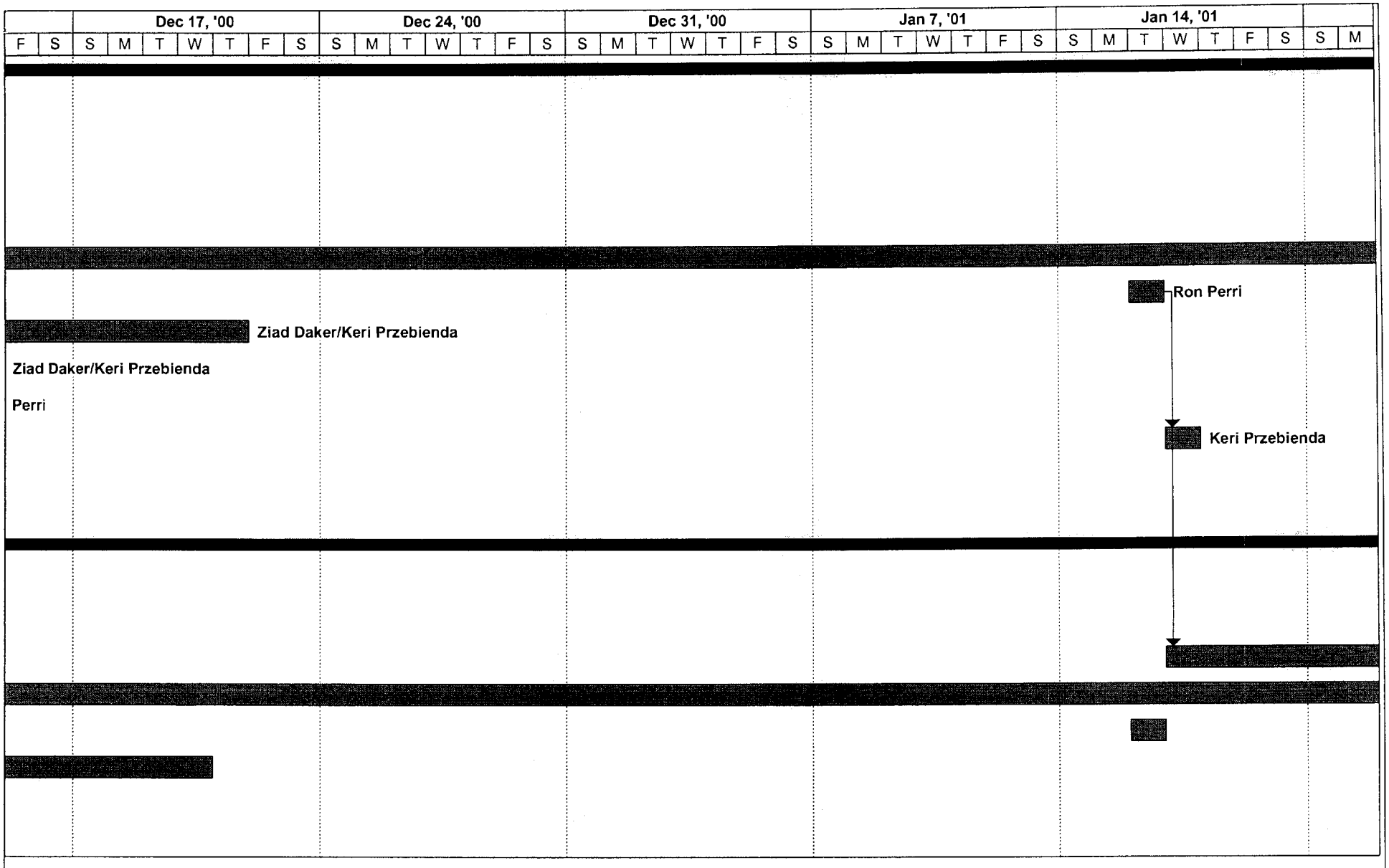
Task | Summary | Rolled Up Progress
Progress | Rolled Up Task
Milestone | Rolled Up Milestone

ID	Task Name	Duration	Start	Finish	Prede	Resource Names
23						
24	**Shift Lever Pin Change**	1d	Fri 12/1/00	Fri 12/1/00		Dan Villar
25						
26	**Shift Socket Bushing Change**	**21d**	**Fri 12/8/00**	**Thu 1/4/01**		**Keri Przebienda**
27	change blank length	4w	Fri 12/8/00	Wed 1/3/01	32	
28	update prints & release	5d	Mon 12/18/00	Fri 12/22/00		
29	PSW parts	1d	Thu 1/4/01	Thu 1/4/01	27	
30						
31	**LCH bore change**	**16d**	**Thu 12/7/00**	**Wed 12/27/00**		**Keri Przebineda**
32	test parts to determine diameter	1d	Thu 12/7/00	Thu 12/7/00		
33	change bore diameter (1 cavity)	5d	Mon 12/11/00	Fri 12/15/00		
34	update prints & release	5d	Mon 12/18/00	Fri 12/22/00	33	
35	PSW	2d	Mon 12/25/00	Tue 12/26/00	34	
36	produce parts	1d	Wed 12/27/00	Wed 12/27/00	35	



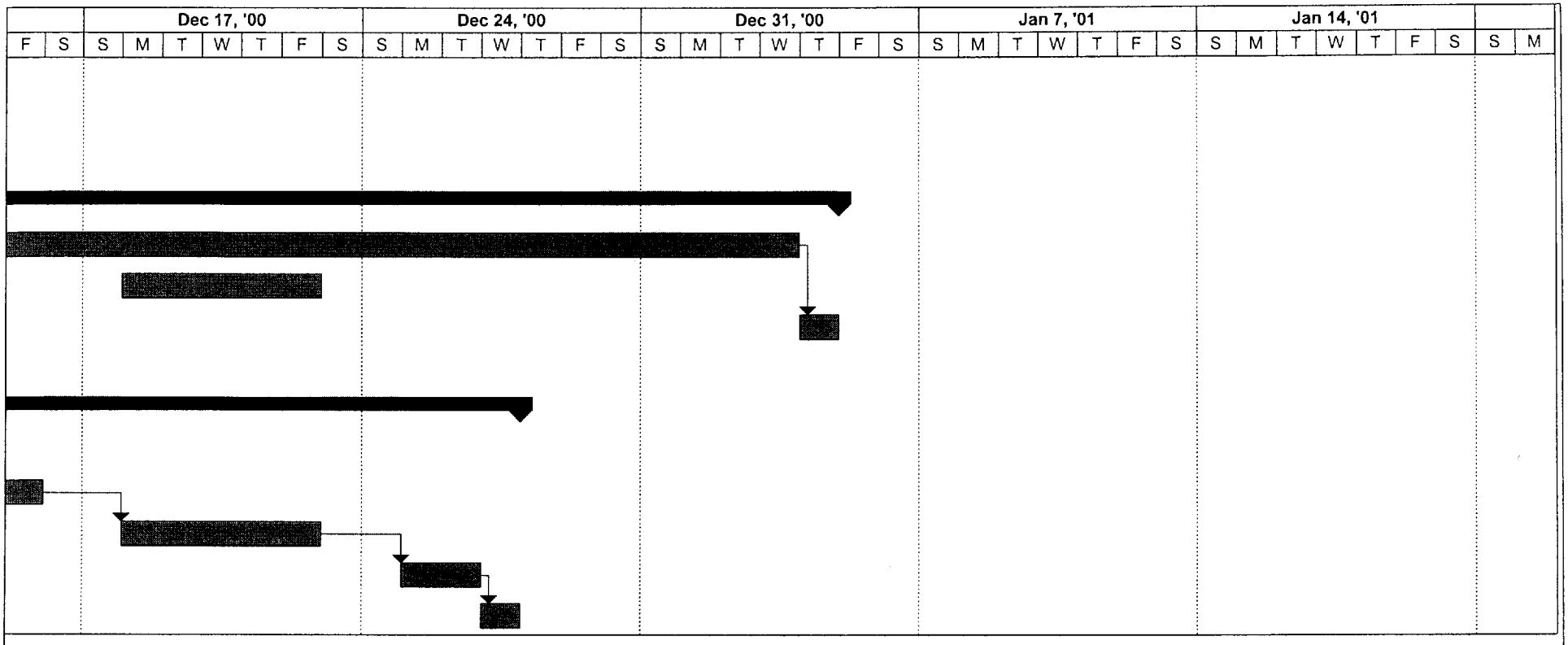
Project: Shift Socket Lash Reduction
Date: Thu 12/7/00

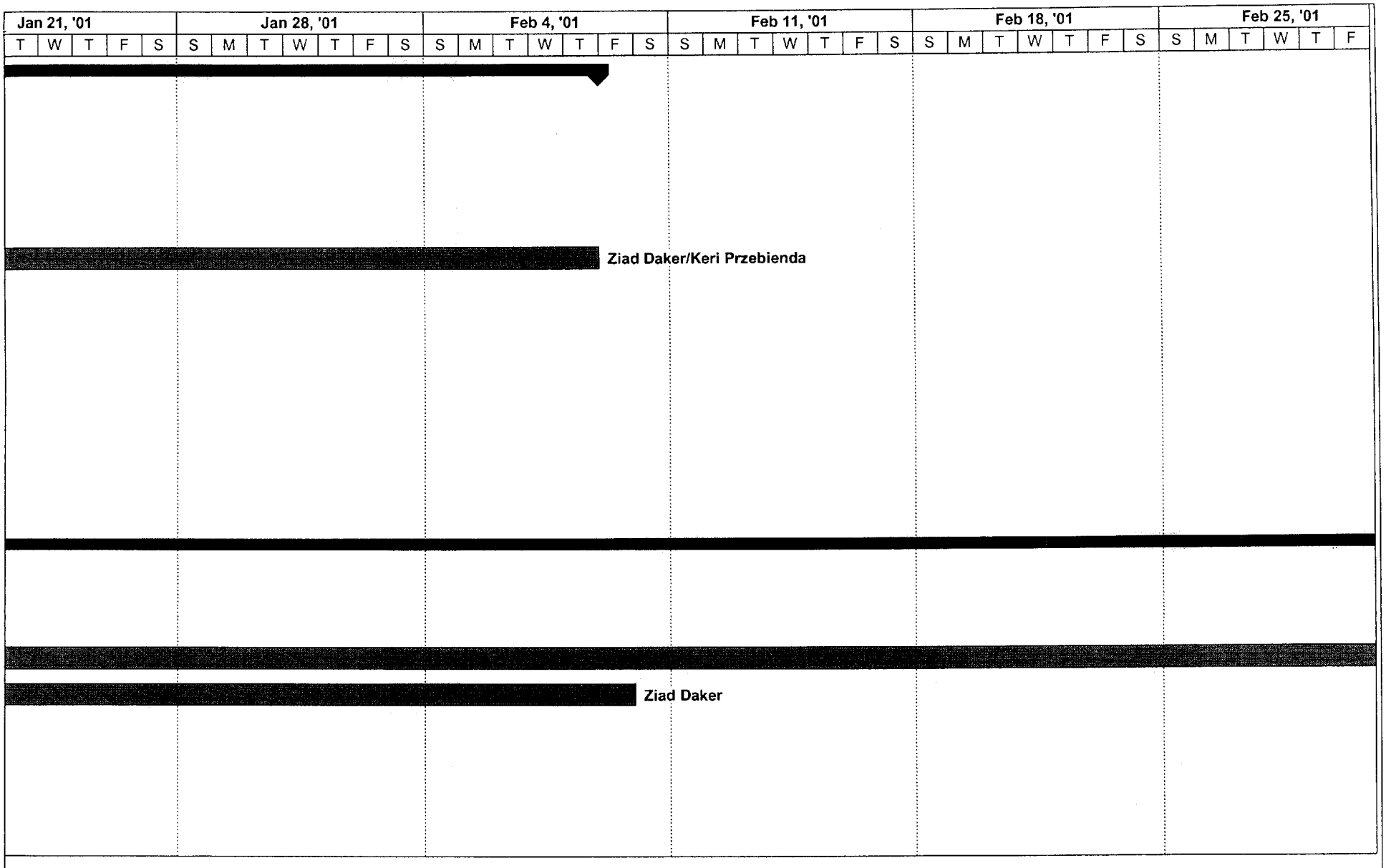
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress



Project: Shift Socket Lash Reduction
Date: Thu 12/7/00

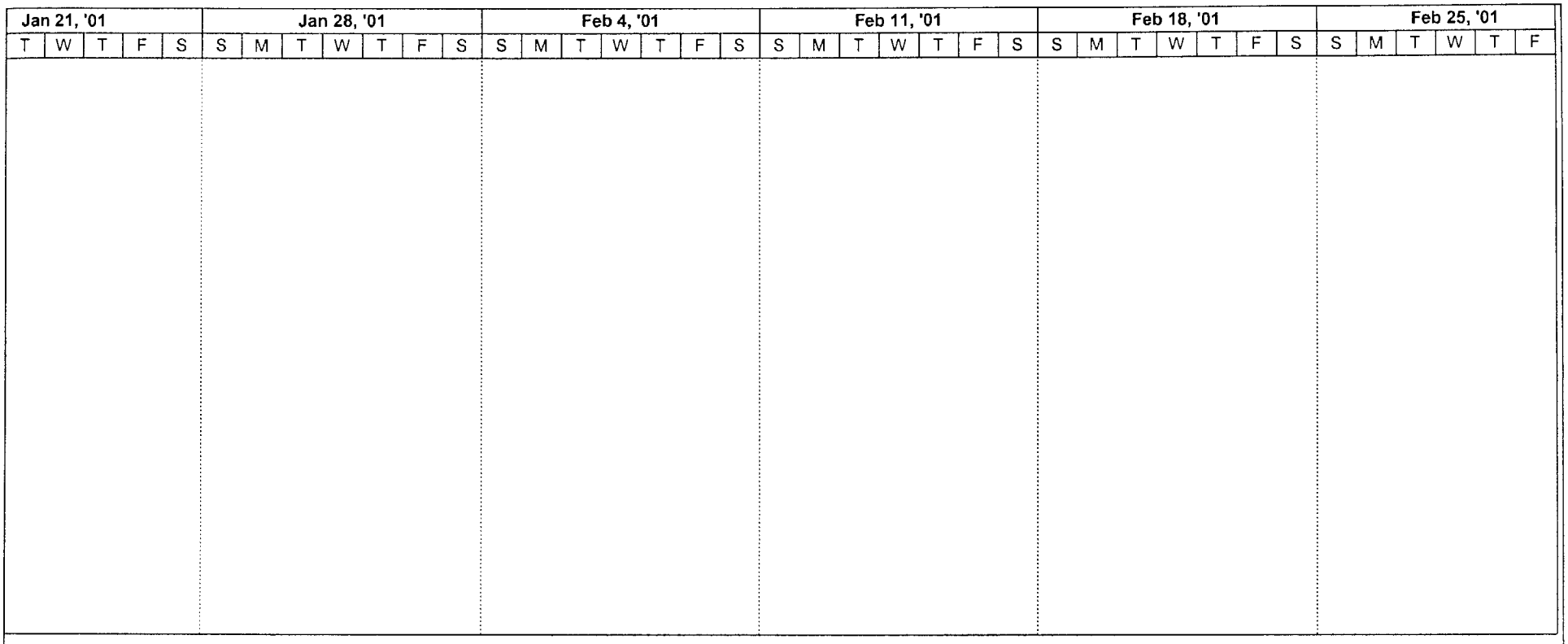
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress


Dec 17, '00
Dec 24, '00
Dec 31, '00
Jan 7, '01
Jan 14, '01
F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M
Project: Shift Socket Lash Reduction
Date: Thu 12/7/00
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress



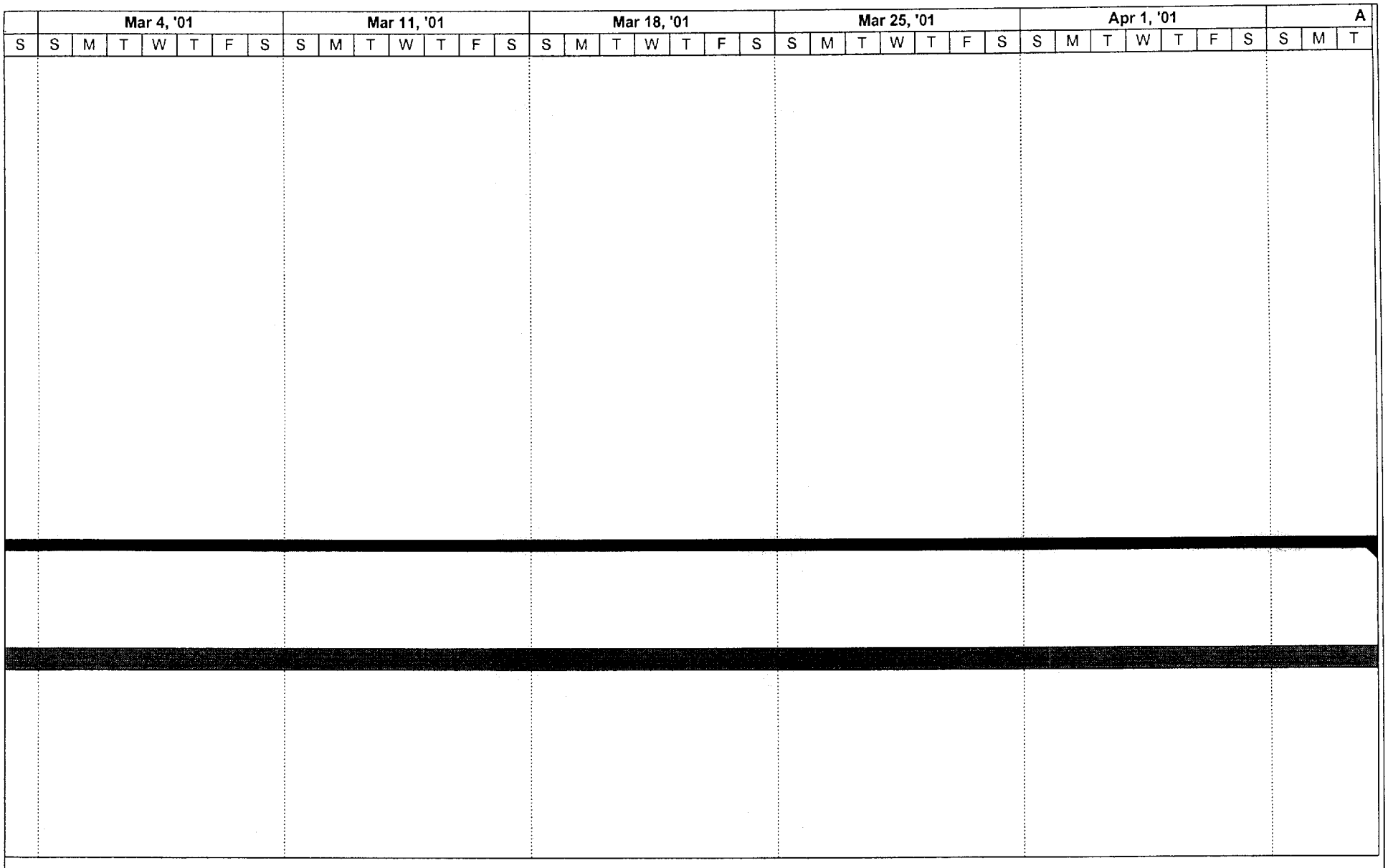
Project: Shift Socket Lash Reduction
Date: Thu 12/7/00

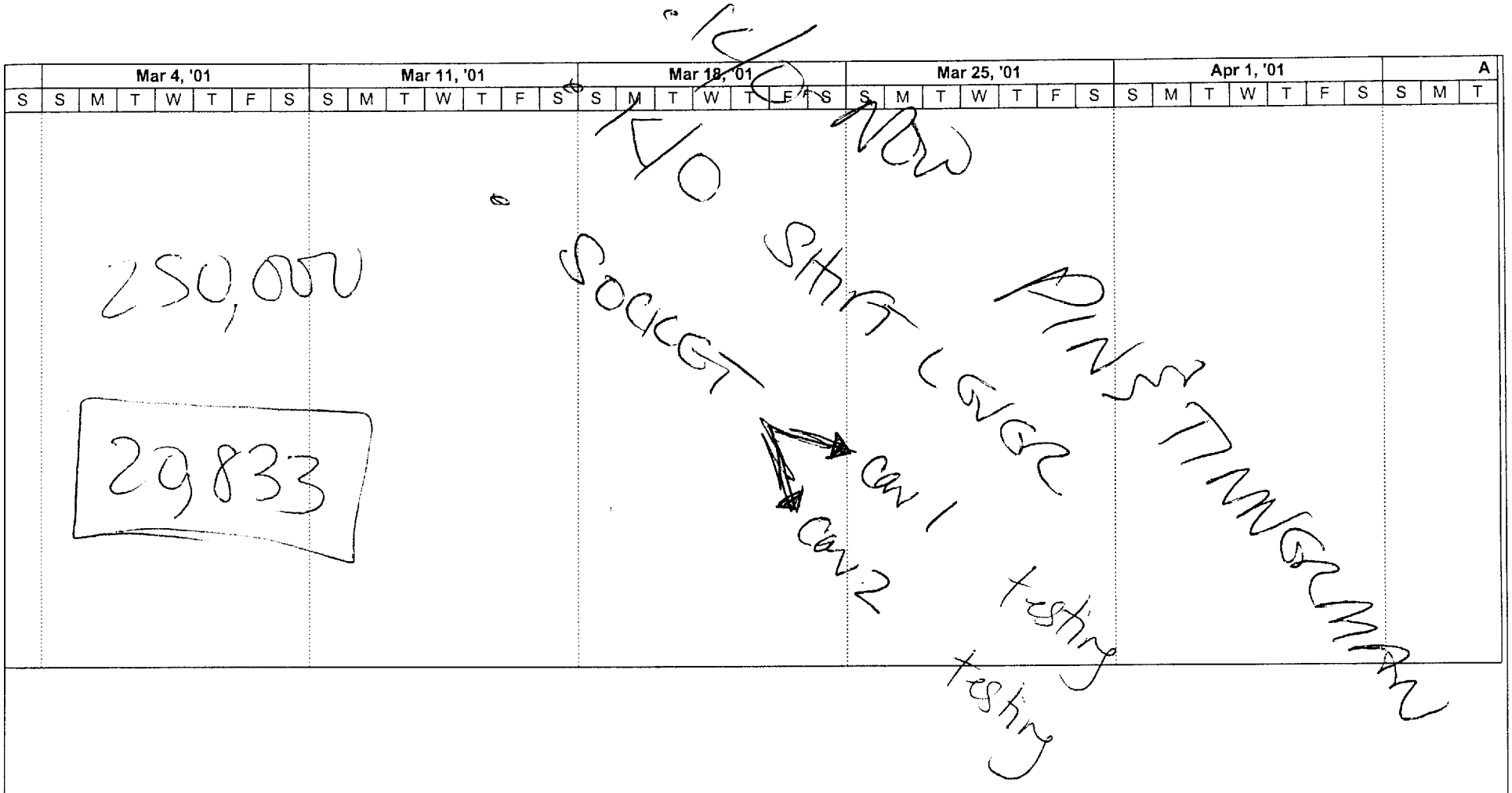
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress



Project: Shift Socket Lash Reduction
Date: Thu 12/7/00

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress


Mar 4, '01
Mar 11, '01
Mar 18, '01
Mar 25, '01
Apr 1, '01
A
S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T
Project: Shift Socket Lash Reduction
Date: Thu 12/7/00
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress



Project: Shift Socket Lash Reduction
Date: Thu 12/7/00

Task | Summary | Rolled Up Progress
Progress | Rolled Up Task
Milestone | Rolled Up Milestone

Levine, Julie (J.A.)

From: Levine, Julie (J.A.)
Sent: Thursday, November 16, 2000 10:31 AM
To: Porter, Alan (A.J.); Brohl, Jerry (G.G.); Hurley, Joseph (J.B.); Thompson, James (J.S.)
Cc: Markatos, Chris (C.)
Subject: Shift System info.

Updates to this from today's 9:00 with shift system group:

For # 3 - I said sort on insert plates is on going - keeping them in the 1.4 +/- .15 mm. We need to establish this as an SC on the insert plate and we need to evaluate / demonstrate why we think Admiral can hold this tight tolerance of +/- 0.15 mm

For # 9 - I said we are waiting to change the insert plate tool until we are all sure of the number we want. This requires confirmation of the VSA, evaluating our post-wear (test 28) parts effects on NR and DN issues, evaluating the force-deflection curves AND evaluating tightening the socket. We should NOT change the tool again until we are sure of the effects of these.

Added #17 - evaluate post wear (test 28) parts for NR / DN issues

Also, they want to have a call-in for 5:00 today to go over the force-deflection curves and the shift cable measurement results. They will page APORTER and JBROHL with this meeting information.

Also, during the weekend, they want to have brief call-in updates on the ambient measurements and cold eval that are occurring in vehicle. Again, the will textpage APORTER and JBROHL with the tele conf info. This is important because the VPs / entire team assume Monday builds at LAP /SLAP are a go and that we would only stop them if these measurements went wrong.

Thanks - have fun with this, I will think of you from the beach (NOT!).

Regards,

Julie A. Levine
U152 Suspension and Steering PMT Leader
Ph: 24-82791 Fax:24-89193 Text Pager: 313-851-6667
e-mail: jlevine@ford.com

-----Original Message-----
From: Knight, Cassandra (C.R.)
Sent: Thursday, November 16, 2000 9:03 AM
To: Study, Alan (A.L.); Yuhasz, Philip (P.D.); Brohl, Jerry (G.G.); Levine, Julie (J.A.); Porter, Alan (A.J.); Thompson, James (J.S.); Hurley, Joseph (J.B.); McKinnis, Larry (L.N.); Brazin, Jim (J.C.); Adamczyk, David (D.W.); Carlin, Mike (M.C.); Haddlesey, Mark (M.Q.); Perri, Ron (R.J.); Dover, Harry (H.); Guthrie, Phil (P.J.); Haggerty, Judy (J.F.); Hildebrand, Dan (D.H.)
Subject: FW: Please send to everyone for 9:00 meeting

From: Retallack, Lynn (L.M.)
Sent: Thursday, November 16, 2000 8:59 AM
To: Knight, Cassandra (C.R.)
Subject: Please send to everyone for 9:00 meeting

5R55W_ U152 Workplan.doc

Lynn Retallack
Manager, Mechanical/Structural Sub-Systems
Job Share Partner : Lisa Greene
Automatic Transmission Engineering Office
Phone: 734-523-3906, Fax: 734-523-0106

Workplan for U152 / 5R55W N-R / N-D

	Action	Responsibility	Timing	Results
1	Check to see if RH-Drive floor shifter exhibits the same concern	Julie Levine / Harry Dover	11/15/00	CLOSED - Vehicles checked at STAP exhibited the N-R condition when loaded to 50 lb or more. In all cases, when load was released, vehicle went back into neutral.
2	Determine maximum tolerance on thickness for Norton bushing.	Alan Porter	11/15/00	CLOSED – tolerance for parts produced to date is 0.47-0.48 (30 part sample)
3	Sort column insert plates to 1.25-1.55mm.	Julie Levine	11/16/00	
4	Can outer manual lever tolerance be reduced ?	Dave Adamczyk	11/16/00	
5	Develop a load – deflection curve for the column with current and reduced tolerance bushings.	Alan Porter	11/16/00	
6	Add load – deflection curve to Cognition model.	Audrey	TBD	
7	Review Cognition model and update to latest level for all parts.	Ron Perri / Audrey	11/16/00	
8	Determine how much we can bias the N-D peak on the rooster comb toward D – need 0.67 degrees in conjunction with insert plate change.	Judy Haggerty / Tracy Kohls / Yehong Xu / Jim Brazin / CAD	TBD	
9	Change insert plate tool for 1.4+/-0.15	Alan Porter	11/16/00	
10	Measure vehicle at ambient and –40F with Max lash socket + max travel D-N wall for N-R condition and min lash socket + min travel D-N wall for N-D condition (to be done with with 30 measured cables from Teleflex).	Ron Perri / Harry Dover / Alan Porter	11/18/00	
11	Arrange for cold room either at ATNPC or LAP.	Lynn Retallack	11/16/00	Contacted Bob Sabaitis – cold room is reserved at LAP. Waiting to hear back from A.Myint on ATNPC.
12	Arrange for mechanic support on Friday for cable / column evaluation testing.	Lynn Retallack	11/16/00	Call Dennis Manchester
13	Evaluate change to electronic TRS to move D.			
14	Evaluate change to manual valve to move D.			
15	Tighten up socket bushings	Alan Porter		
16	Can outer manual lever tolerance be reduced ?	Dave Adamczyk	11/16/00	
17	Post-45 day test	Alan Porter	11/21/00	

Shift system

- PV no load data
- insert plates - no diff bet DV3 & PV
- 4.1 insert plate spacing below spec

- PV - test stand 2 ran w/ grease
  no wear

12 stands

1. measure efforts & speed on stands - DV3 & PV
2. PV sample 4 hardness
3. insert plate - tumble for thickness
4. shift lever - roundness more surface area
5. grease - micro switch issue

→ creep status?
→ strain gage bolts? for cer & pudr mtl

{75% lefter efforts
{30% strain → @1500
20# } → @9,000
5# } slipped one @9,000 → 4,500

#46

zinc
- 4000-8000 clamp
- 1500 cycles - drops 2000N

(process change)
- cer, pudr mtl
Thurs COB 9/14

extruded zinc
can profile
9/22 - process + geometry change
9/28 results

factor of 6
300,000 psi

#28

- copper infiltration
- cintered
- through hardening
- compressive strength
- tumbling
70K → 130K

Creep

- 6 parts - last Fri
- strain info, clamp study
  ↳ table
- curve
- 5 good, 1 bad
- 9/15 done
& then post-measure

need data

sample #23
5500N
normalizing clamp load

- DOE - post measured IT (ziad)
- POST measure

wire shield

SHORTENED SHIFT LEVER

1/2" OR MORE - BENDER CHANGE (STD 12 LOCKS)
BUILD UP STOCK?

1/2" OR LESS - CHANGE LOCATOR
BUILD

- EFFECTS EFFORT TO SHIFT
-

[redacted]

11/29

30 seconds holding trans to level

- Col w/ max lash cable @ nom adjust @ 29 lbs → R
- Col w/ max lash cable w/ no mis-adjust @ 20-24 lbs → R 22
- Col w/ max lash cable w/ no mis adjust other way @ 36 lbs → R
- Col w/ min lash cable @ nom adjust @ 28 lbs → R
- Col w/ min lash cable w/ no mis-adjust @ 21-24 lbs → R
- Col w/ min lash cable w/ no misadjust other way @ 34 lbs → R

Shift Lever

#s	mm deflection (just above hole)
1	.080
2	.135
3	.204
4	.258
5	.332
10	.642
15	1.05
20	2.244 (?)
30	

held in vice from tip

⊔ = ~4.5mm

ACTION PLAN:

SLOP = 7
~~[illegible]~~ 30 NEW SLOP = 5

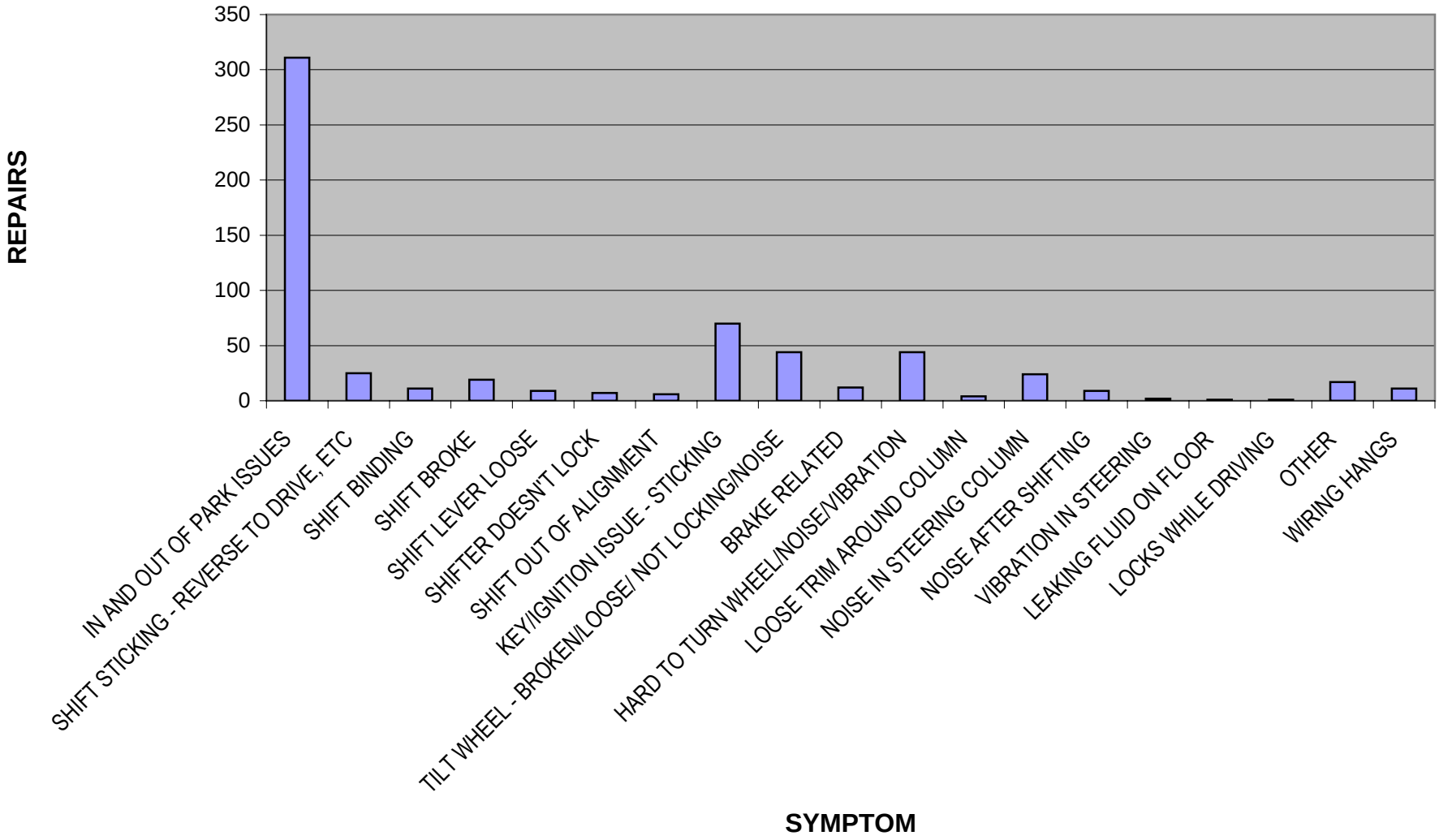
1) POST PV PARTS EVALUATE IN VEHICLE
- COMBOS NEW & OLD COL, NEW & OLD TRANS, NEW & OLD SHFT CABLE (WITH LATEST INSERT PLATE)

2) ON COLUMN/SHIFT LEVER
1 - TIGHTEN CLEVIS JOINT
2 - TIGHTEN SOCKET
3 - deflection of lever

3) Reduce wear kt. Clevis & Shift lever

4) Investigate improved bushing mat'l

2003/4 MY Tear Down Results



EXPLORER	
MY	03-04
REPAIRS	575
IN AND OUT OF **PARK** ISSUES	311
SHIFT STICKING - REVERSE TO DRIVE, ETC	25
SHIFT BINDING	11
SHIFT BROKE	19
SHIFT LEVER LOOSE	9
SHIFTER DOESN'T LOCK	7
SHIFT OUT OF ALIGNMENT	6
KEY/IGNITION ISSUE - STICKING	70
TILT WHEEL - BROKEN/LOOSE/ NOT LOCKING/NOISE	44
BRAKE RELATED	12
HARD TO TURN WHEEL/NOISE/VIBRATION	44
LOOSE TRIM AROUND COLUMN	4
NOISE IN STEERING COLUMN	24
NOISE AFTER SHIFTING	9
VIBRATION IN STEERING	2
LEAKING FLUID ON FLOOR	1
LOCKS WHILE DRIVING	1
OTHER	17
WIRING HANGS	11

SOME OF THE VERABTIMS CONTAIN MORE THEN ONE ISSUE WHEN BRINGING THE CAR IN FOR SERVI
THERE WILL BE MORE NUMBER OF REPAIRS THEN ACTUALLY LINE NUMBER OF REPAIRS

CE,

MDL_YR	VIN_CD	LBR_COST	VEH_LINE_CD	MKT_DERIVE	BOD_CAB_STY	ER_SERIES_C	DRIVE_CD	ENG_CD	TRANS_CD	PLANT_CD	PRODN_DT	WRTY_START_DT	NAME	DOC_NUM	PH_NUM	WCC_CD	_NUM_CAUS	_NUM_CAUS	_NUM_CAUS	JST_CONC_C	COND_CD
2003	ZU85W63UC1	100.3	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	28-Apr-03	30-Sep-03	KEHOE FORD	92453901	6344444	5R01	3L2Z	3C529	CA	C50	1
2003	ZU85K93ZA4	87.97	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AV	12-Dec-02	18-Dec-02	ORD-MT. VER	9615256	8958500	5R01	3L2Z	3C529	BA	P01	41
2003	ZU84K73UB0	12.5	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	10-Dec-02	17-Dec-02	\ FORD LINC I	6061006	4322418	5R01	*	3C529	*	N58	42
2003	ZU83W93UB2	108.96	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	8-Jan-03	31-Jan-03	HEAD MOTOR	12401901	7272200	5R01	3L2Z	3C529	BA	P01	69
2003	ZU83K43ZA1	101.87	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AV	27-Sep-02	8-Nov-02	OASIS FORD	1200051	5911111	5R01	3L2Z	3C529	BA	P01	42
2003	ZU83K23UA3	102.89	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	17-Sep-02	23-Nov-02	I-CAIRNS FOF	302096A	3778100	5R01	3L2Z	3C529	BA	N57	30
2003	ZU83K03UB5	106.49	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	4-Feb-03	31-Jul-03	I-CAIRNS FOF	356231A	3778100	5R01	3L2Z	3C529	BA	P01	1
2003	ZU75WX3ZA2	108.12	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	1-Nov-02	18-Nov-02	ENEY-WEST I	203728A	9224500	5R01	3L2Z	3C529	BA	A85	28
2003	ZU75W93UC2	82.49	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	23-Apr-03	25-Aug-03	DY O'BRIEN, IN	35061201	7767600	5R01	3L2Z	3C529	BA	T90	1
2003	ZU75W83ZA4	281.15	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	17-Dec-02	19-Dec-02	ALIER FORD,	4077001	6452780	5R01	3L2Z	3C529	BA	P01	42
2003	ZU75W03ZB1	87.92	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	22-May-03	3-Nov-03	RWOOD FORD	213532B	4295478	5R01	3L2Z	3C529	BA	P66	41
2003	ZU75K73ZA8	67.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	27-Feb-03	4-Apr-03	JESS FORD	4840801	6330110	5R01	3L2Z	3C529	BA	N33	42
2003	ZU75K43ZA8	93.37	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Feb-03	14-Apr-03	RSON FORD, I	026464A	3638100	5R01	3L2Z	3C529	BA	P01	41
2003	ZU74WX3ZA4	369.9	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	22-Nov-02	27-Nov-02	FORD OF AM	157468A	6885464	5R01	3L2Z	3C529	BA	P09	41
2003	ZU74W83UB5	173.9	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	6-Feb-03	30-Sep-03	L WOODS FO	210873A	4544200	5R01	3L2Z	3C529	BA	P09	28
2003	ZU74W83UA4	86.85	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	30-Sep-02	7-Oct-02	TINGS FORD,	043174C	7580114	5R01	3L2Z	3C529	BA	P09	42
2003	ZU74W33UA4	153.63	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	1-Oct-02	12-Mar-03	FORD AT OX	304388A	4262500	5R01	3L2Z	3C529	BA	P01	42
2003	ZU74KX3UA7	75.91	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	30-Nov-02	STER FORD,	3287101	7871700	5R01	3L2Z	3C529	BA	P01	41
2003	ZU74K73UB8	306.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Mar-03	26-Mar-03	FORD-MERCU	53490705	3293673	5R01	3L2Z	3C529	BA	D02	1
2003	ZU74K63UA3	83.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-02	26-Dec-02	RY MOTOR C	105044A	2867746	5R01	1L2Z	3C529	JA	P01	42
2003	ZU74K53ZA3	175.78	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Nov-02	14-Jan-03	FORD OF DE	60870701	9323673	5R01	3L2Z	3C529	BA	P01	28
2003	ZU74K53ZA1	163.78	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Oct-02	9-Oct-02	FORD LINCO	5821951	8273566	5R01	3L2Z	3C529	BA	N58	33
2003	ZU74K53UA4	75.95	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	1-Oct-02	7-Mar-03	AIRWAY FOR	9428101	5783600	5R01	3L2Z	3C529	BA	N58	42
2003	ZU74K53UA4	92.23	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	1-Oct-02	7-Mar-03	AIRWAY FOR	9564301	5783600	5R01	3L2Z	3C529	BA	N59	42
2003	ZU74K43UA8	165.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Nov-02	13-Nov-02	STONE FORD	21260801	4344141	5R01	3L2Z	3C529	BA	P01	42
2003	ZU74K33UB3	200.38	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Jan-03	31-Jan-03	N SQUARE FO	5374401	4819400	5R01	3L2Z	3C529	BA	A88	1
2003	ZU74K13UA0	80.11	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Aug-02	31-Mar-03	JRE FORD OF	048061A	6255600	5R01	3L2Z	3C529	BA	P01	42
2003	ZU74K03UB7	97.96	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	5-Mar-03	20-Sep-03	N & LARKIN FO	5215452	8922300	5R01	3L2Z	3C529	BA	L13	41
2003	ZU73WX3ZA5	143.17	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	6-Jan-03	14-Feb-03	NDLY FORD,	092849B	2436000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73WX3UC5	70.28	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	11-Jun-03	14-Jul-03	AVISTA MOTO	180309E	3696681	5R01	*	3C529	*	N17	42
2003	ZU73WX3UA1	130.15	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	27-Aug-02	10-Oct-02	H BROS. FOR	10968501	4211300	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W93ZA9	503.65	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	10-Mar-03	18-Feb-04	AMONTE FOR	095129A	7557007	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W93ZA2	180.69	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	15-Oct-02	27-Nov-02	SON MOTORS	1161071	8733449	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W73ZA5	113.2	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	11-Dec-02	22-May-03	/E ROGERS F	16481	8788151	5R01	3L2Z	3C529	BA	L13	42
2003	ZU73W73UA4	98.47	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	30-Sep-02	31-Mar-03	FORD-MERCI	075435A	6474151	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W63ZA9	131.51	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	18-Mar-03	13-Jun-03	ERIOR FORD,	167530G	7822400	5R01	3L2Z	3C529	BA	P01	69
2003	ZU73W63ZA3	67.92	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	15-Oct-02	22-Oct-02	/E ROGERS F	15043	8788151	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W63UA4	73.02	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	4-Oct-02	14-Oct-02	RSTATE FORI	14015802	8660781	5R01	3L2Z	3C529	BA	C50	42
2003	ZU73W63UA4	80.76	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	2-Oct-02	12-Jan-03	I NOLAN FOR	185140B	6312000	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73W53UC5	80.06	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	18-Jun-03	27-Jun-03	JLTS FORD, I	29978903	9342388	5R01	3L2Z	3C529	BA	C50	33
2003	ZU73W53UA5	238.07	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	24-Oct-02	22-Aug-03	AN FORD SAL	121733A	5347651	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W43ZA4	77.33	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	21-Nov-02	18-May-03	NET FORD, I	15973402	4323673	5R01	3L2Z	3C529	BA	L23	41
2003	ZU73W43ZA4	77.33	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	21-Nov-02	18-May-03	NET FORD, I	16160701	4323673	5R01	3L2Z	3C529	BA	C50	42
2003	ZU73W43ZA4	77.33	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	21-Nov-02	18-May-03	NET FORD, I	16293501	4323673	5R01	3L2Z	3C529	BA	C50	42
2003	ZU73W43ZA4	90.22	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	21-Nov-02	18-May-03	NET FORD, I	15400002	4323673	5R01	3L2Z	3C529	BA	L13	42
2003	ZU73W43ZA1	187.5	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	26-Sep-02	23-Dec-02	CHMID FORD	272719B	3991000	5R01	3L2Z	3C529	BA	T90	39
2003	ZU73W43UA2	142.98	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	26-Sep-02	11-Dec-02	ORNO BROS I	266882A	6762200	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W33ZA6	100.21	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	23-Jan-03	8-Feb-03	EHOLD FORD	7321651	4623131	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73W33ZA5	68.58	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	16-Dec-02	23-Jan-03	IEWLON FOR	057214A	3425146	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W33ZA4	136.73	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	9-Dec-02	17-Dec-02	NNER FORI	2026451	4284000	5R01	3L2Z	3C529	BA	L13	42
2003	ZU73W33ZA4	172.13	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	27-Nov-02	2-Jan-03	OHERTY FOR	7544101	3573114	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73W33ZA0	101.87	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	19-Sep-02	11-Dec-02	OASIS FORD	5468451	5911111	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W33UA5	81.35	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	17-Oct-02	29-Oct-02	WNE FORD, II	260230A	6626500	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73W23ZA6	103.81	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	23-Jan-03	12-Feb-03	SINCLAIR FOR	32448102	8922600	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73W23UA7	92.12	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	6-Nov-02	19-Nov-02	HOLZER FORI	179731D	4741234	5R01	3L2Z	3C529	BA	P09	42
2003	ZU73W23UA3	81.35	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	16-Sep-02	29-Nov-02	WNE FORD, II	249134B	6626500	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73W13UB7	118.98	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	6-Mar-03	12-Jun-03	TIS FORD, IN	12649901	6534000	5R01	*	3C529	*	P01	33
2003	ZU73W13UA8	78.43	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	8-Nov-02	21-Aug-03	PITAL FORD I	2506151	7904600	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73W13UA2	97.73	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	11-Sep-02	26-Nov-02	FORD SALES	161522A	5343673	5R01	3L2Z	3C529	BA	P24	42
2003	ZU73KX3ZB1	107.9	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Apr-03	30-Apr-03	IULTZ FORD,	17209301	6243600	5R01	3L2Z	3C529	BA	N58	42
2003	ZU73KX3ZB1	485.56	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Apr-03	30-Apr-03	IULTZ FORD,	17767401	6243600	5R01	3L2Z	3C529	BA	N33	42
2003	ZU73KX3ZA8	142.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Mar-03	18-Mar-03	OUGHBRED	20134001	5051818	5R01	3L2Z	3C529	BA	P09	42
2003	ZU73KX3ZA5	159.51	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	12-Dec-02	30-Jun-03	SE FORD SAL	10550001	7566655	5R01	3L2Z	3C529	BA	N33	42
2003	ZU73KX3ZA4	97.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Nov-02	25-Apr-03	W BEAVERT	91774201	6441131	5R01	3L2Z	3C529	BA	P01	7

2003	ZU73KX3ZA4	426.51	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Nov-02	23-Nov-02	RD OF FAIRFI	1444951	4213300	5R01	3L2Z	3C529	BA	L13	41
2003	ZU73KX3ZA2	137.07	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Oct-02	30-Jul-03	JETTE FORD,	028972A	8351190	5R01	3L2Z	3C529	BA	D02	42
2003	ZU73KX3ZA1	109.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Oct-02	19-Oct-02	AYVILLE FOR	45938805	5894800	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73KX3ZA0	184.16	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Sep-02	12-Sep-02	NN FORD IN (	38505301	9984000	5R01	3L2Z	3C529	BA	C50	41
2003	ZU73KX3UB2	88.55	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Dec-02	3-Jan-03	RSCH FORD I	607503	8795381	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73KX3UA8	94.5	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	22-Nov-02	RVIS FORD, II	082093B	8983000	5R01	*	3C529	*	P01	42
2003	ZU73KX3UA8	80.68	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	29-Nov-02	STON MOTOR	41297701	9623941	5R01	3L2Z	3C529	BA	P09	X4
2003	ZU73KX3UA6	79.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Oct-02	25-Nov-02	ILSON MOTOI	7207952	7524201	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73KX3UA5	192	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Oct-02	25-Nov-02	FORD INCORI	138264A	5623315	5R01	3L2Z	3C529	BA	L13	42
2003	ZU73KX3UA4	144.81	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Oct-02	27-Nov-02	IIVERSAL FOI	9293851	2739700	5R01	3L2Z	3C529	BA	P09	42
2003	ZU73KX3UA2	243.97	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Sep-02	29-Oct-02	WNS FORD, I	8153451	3492240	5R01	3L2Z	3C529	BA	N57	42
2003	ZU73KX3UA1	197.03	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Aug-02	31-Jul-03	FORD & MER	024400A	8425416	5R01	3L2Z	3C529	BA	P01	1
2003	ZU73KX3UA0	200.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Aug-02	7-Sep-02	RANKLIN FOR	029827A	5280040	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K93ZB2	393.53	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-May-03	24-Jun-03	BAY FORD	17595901	8764484	5R01	3L2Z	3C529	BA	N57	33
2003	ZU73K93ZB1	191.13	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	15-Apr-03	10-Jun-03	AND FORD, II	3978501	3866120	5R01	3L2Z	3C529	BA	L13	42
2003	ZU73K93ZA4	168.26	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	6-Dec-02	11-Dec-02	NELL MOTOR	068850A	7299700	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K93ZA4	107.23	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	22-Nov-02	4-Apr-03	SS BROS. FC	7754503	8251212	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K93ZA4	89.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	7-Nov-02	23-Nov-02	EY/BARR FO	7366752	2263673	5R01	3L2Z	3C529	BA	C50	41
2003	ZU73K93ZA3	118.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	22-Oct-02	21-Dec-02	HGATE FORI	110937A	9845011	5R01	3L2Z	3C529	BA	P09	28
2003	ZU73K93ZA2	67.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Oct-02	18-Oct-02	Y O'BRIEN, IN	34263301	7767600	5R01	*	3C529	*	T90	33
2003	ZU73K93ZA1	200.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	26-Sep-02	26-Nov-02	ASI MOTORS	21368701	8986100	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K93ZA1	91.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	26-Sep-02	21-May-03	AN SELLERS	4672152	6437500	5R01	3L2Z	3C529	BA	N57	42
2003	ZU73K93ZA1	188.08	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	20-Sep-02	31-Oct-02	RD LINCOLN	044657A	2261600	5R01	3L2Z	3C529	BA	C50	42
2003	ZU73K93UC6	75.89	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Jul-03	6-Aug-03	HMONT FOR	293825A	7526611	5R01	3L2Z	3C529	BA	B74	42
2003	ZU73K93UC3	198.65	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-May-03	28-May-03	FORD OF AM	161566B	6885464	5R01	3L2Z	3C529	BA	P09	42
2003	ZU73K93UB9	83.46	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	27-Mar-03	11-Apr-03	AC-JACKSON	96735401	*	5R01	3L2Z	3C529	BA	C50	42
2003	ZU73K93UB8	108.06	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Mar-03	4-Jun-03	SDALE FORI	7479552	4729500	5R01	3L2Z	3C529	BA	P01	1
2003	ZU73K93UB8	167.31	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Mar-03	28-Apr-03	ASI MOTORS	21584401	8986100	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K93UB2	69.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Jan-03	4-Mar-03	RO FORD-L/M	15167103	4526334	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K93UB2	243.57	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Dec-02	1-Jan-03	THAM FORD,	16789401	8948000	5R01	3L2Z	3C529	BA	P01	1
2003	ZU73K93UA7	175.48	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	4-Dec-02	ORD LINCOLI	1540701	3913000	5R01	3L2Z	3C529	BA	L13	1
2003	ZU73K93UA1	225.22	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Aug-02	28-Dec-02	ITROSE FORI	35743001	6660711	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K83ZB4	244.36	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Jul-03	23-Aug-03	NN MOTOR C	34267801	9466611	5R01	*	3C529	*	N33	7
2003	ZU73K83ZA4	69.34	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Nov-02	28-Nov-02	AC - SALT LA	75655901	*	5R01	1L2Z	3C529	JA	C50	42
2003	ZU73K83ZA3	76.37	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Nov-02	23-Nov-02	D LINCOLN M	35130101	3481400	5R01	3L2Z	3C529	BA	C50	42
2003	ZU73K83ZA1	80.77	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Sep-02	5-Oct-02	RD LINCOLN	3316401	2823000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K83ZA0	79.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Sep-02	24-Oct-02	SA AUTO GR(	3406501	2806000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K83ZA0	85.48	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Sep-02	26-Jul-03	CLASSIC FORI	81997601	9423898	5R01	3L2Z	3C529	BA	P01	69
2003	ZU73K83UC6	114.45	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Jul-03	8-Aug-03	RTZ RAC - MI	33314401	*	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K83UB9	114.18	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Apr-03	19-Apr-03	MIER FORD,	5328151	2587200	5R01	3L2Z	3C529	BA	L07	41
2003	ZU73K83UA6	207.33	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Oct-02	17-Dec-02	ORD OF ANS	13521101	7325000	5R01	3L2Z	3C529	BA	P68	1
2003	ZU73K73ZB5	57.9	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	30-Jul-03	29-Sep-03	JNTRYSIDE FI	58251	5489676	5R01	*	3C529	*	N59	42
2003	ZU73K73ZA6	12.05	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Jan-03	25-Jan-03	NIS FORD CO	10944306	4640661	5R01	*	3C529	*	N57	42
2003	ZU73K73ZA6	84.46	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Jan-03	5-Dec-03	ALITY FORD,	1860901	8827000	5R01	*	3C529	*	C50	D1
2003	ZU73K73ZA6	198.51	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	9-Jan-03	19-Feb-03	VALLEY FORI	19452901	2822350	5R01	3L2Z	3C529	BA	D03	42
2003	ZU73K73ZA3	184.77	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Nov-02	23-Nov-02	FORD CENTE	65221	2353636	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K73ZA3	83.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Oct-02	28-May-03	HN MARKEL, I	290671A	3939700	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K73ZA2	112.61	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Oct-02	24-Oct-02	SA AUTO GR(	99772601	2806000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K73ZA2	162.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Oct-02	24-Jan-03	MS MOTOR C	2095851	2342770	5R01	3L2Z	3C529	BA	C50	7
2003	ZU73K73UB2	60	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Jan-03	18-Jan-03	ELLY MOTOR	59051101	2372757	5R01	3L2Z	3C529	BA	N57	42
2003	ZU73K73UA7	128.53	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Nov-02	2-Jan-03	ILLIKEN FORI	141202C	2553100	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K73UA6	28.01	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Oct-02	27-Nov-02	BLE FORD, IN	016231A	7660700	5R01	*	3C529	*	P01	69
2003	ZU73K73UA6	112.02	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Oct-02	27-Nov-02	BLE FORD, IN	017009A	7660700	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K73UA3	189.17	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-02	12-Nov-02	AN FORD SAL	314770B	5433333	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K73UA2	143.02	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Sep-02	18-Oct-02	ITE FORD, IN	3722901	7591200	5R01	3L2Z	3C529	BA	C50	1
2003	ZU73K73UA1	107.9	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	29-Aug-02	24-Sep-02	IULTZ FORD,	18408102	6243600	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K63ZA8	75.55	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Feb-03	1-Mar-03	IORDAN FORI	621430A	2591981	5R01	3L2Z	3C529	BA	P01	33
2003	ZU73K63ZA5	89.99	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Dec-02	28-Feb-03	Y O'BRIEN, IN	34214801	7767600	5R01	3L2Z	3C529	BA	T90	41
2003	ZU73K63ZA3	186.29	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	1-Nov-02	31-Jan-03	FORD SALE	21553501	3473111	5R01	3L2Z	3C529	BA	P09	42
2003	ZU73K63ZA3	130.98	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Oct-02	31-Dec-02	RNE FORD & M	287640A	6649841	5R01	3L2Z	3C529	BA	L13	42
2003	ZU73K63ZA1	246.05	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Sep-02	4-Nov-02	OASIS FORD	4216951	5911111	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K63ZA0	76.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Sep-02	26-Sep-02	OCHRANE MO	20348501	6561100	5R01	*	3C529	*	C50	7
2003	ZU73K63UC2	40.89	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-May-03	19-Jun-03	RDON FORD	4559602	9472500	5R01	*	3C529	*	N57	33
2003	ZU73K63UA7	219.15	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	31-Oct-02	2-Jan-03	ILLIKEN FORI	126067A	2553100	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K63UA7	115.25	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	31-Oct-02	29-Sep-03	IAMI FORD, I	12053302	6433673	5R01	3L2Z	3C529	BA	P01	28

2003	ZU73K63UA6	144	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Oct-02	19-Apr-03	N FORD SALE	8943002	2645104	5R01	3L2Z	3C529	BA	A85	1
2003	ZU73K63UA6	160.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Oct-02	20-Dec-02	IRN MOTOR S	474816A	7842321	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K63UA5	188.02	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	16-Oct-02	28-Dec-02	ERICK MOTOF	384980A	6636111	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K63UA2	0	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Sep-02	11-Nov-02	VLES FORD,	8890304	6909200	5R01	*	3C529	*	N57	82
2003	ZU73K63UA2	187.61	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Sep-02	11-Nov-02	VLES FORD,	8890302	6909200	5R01	3L2Z	3C529	BA	N57	33
2003	ZU73K53ZB2	402.27	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	23-May-03	7-Jun-03	PIERRE FORD	14735407	3642200	5R01	3L2Z	3C529	BA	P09	42
2003	ZU73K53ZB2	593.14	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	6-May-03	12-Sep-03	HPORT FORI	128153B	4995300	5R01	3L2Z	3C529	BA	N57	7
2003	ZU73K53ZB0	103.28	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Apr-03	14-Apr-03	MERICAN FOR	157343B	4876700	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K53ZA9	99.34	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	24-Mar-03	19-May-03	ALDEMAN FOI	22612503	5867600	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K53ZA6	158.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	23-Jan-03	30-Sep-03	JNTRY FORD	5658951	7357400	5R01	3L2Z	3C529	BA	P01	33
2003	ZU73K53ZA4	156.5	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Dec-02	21-Dec-02	RLD OF ROSE	116118A	2456100	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K53ZA4	92.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Nov-02	23-Nov-02	T FORD SALE	503354B	8386000	5R01	3L2Z	3C529	BA	N57	42
2003	ZU73K53ZA3	101.87	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	29-Oct-02	12-Jun-03	OASIS FORD	1958151	5911111	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K53ZA3	105.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Oct-02	27-Jan-03	LAGE FORD I	570051	5653900	5R01	3L2Z	3C529	BA	P01	28
2003	ZU73K53ZA2	283.17	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	7-Oct-02	10-Dec-02	ARPER MOTO	7826101	4437311	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K53UC7	127.31	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Jul-03	26-Sep-03	R BLOOMFIEL	625751	7466900	5R01	3L2Z	3C529	BA	P01	1
2003	ZU73K53UC6	158	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Jul-03	28-Jul-03	LOUF FORD, I	247667C	9510300	5R01	3L2Z	3C529	BA	P01	69
2003	ZU73K53UC2	203.77	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-May-03	11-Oct-03	OMS FORD, IN	324677A	2641600	5R01	3L2Z	3C529	BA	L13	D4
2003	ZU73K53UA8	86.86	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Nov-02	26-Dec-02	FORD OF WA	39009801	6744781	5R01	3L2Z	3C529	BA	L13	42
2003	ZU73K53UA6	203.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Oct-02	7-Nov-02	ORD OF MT. V	10975801	6646900	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K53UA6	60.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Oct-02	22-Oct-02	NETT FORD,	1327651	2862191	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K53UA0	277.5	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Aug-02	5-Sep-02	MON'S TYSON	749711A	4480100	5R01	3L2Z	3C529	BA	P09	42
2003	ZU73K43ZB5	135.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	14-Aug-03	30-Jan-04	M OF PARKEF	061345A	4858585	5R01	3L2Z	3C529	BA	N58	42
2003	ZU73K43ZA7	90.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Feb-03	13-Jun-03	LAGE FORD I	4111951	5653900	5R01	3L2Z	3C529	BA	N59	33
2003	ZU73K43ZA6	178.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Jan-03	25-Jan-03	LONG FORD	63519102	6336661	5R01	3L2Z	3C529	BA	L15	41
2003	ZU73K43ZA0	90.07	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Sep-02	26-Sep-02	RY GEWEKE F	6341403	8212121	5R01	3L2Z	3C529	BA	P24	42
2003	ZU73K43UC7	172.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Jul-03	13-Aug-03	FORD OF WIL	123260A	5434300	5R01	3L2Z	3C529	BA	L13	41
2003	ZU73K43UC6	115.14	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Jun-03	7-Jul-03	LITE FORD, IN	5437101	7591200	5R01	3L2Z	3C529	BA	C50	1
2003	ZU73K43UB6	204.08	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Feb-03	11-Apr-03	H'S F-L-M OF	7615601	4228071	5R01	3L2Z	3C529	BA	C50	42
2003	ZU73K43UB2	602.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Dec-02	30-Apr-03	SCO BAY FO	14157303	8465577	5R01	3L2Z	3C529	BA	A85	28
2003	ZU73K43UA3	184.87	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-02	13-Dec-02	AYWARD FOF	43348503	8811200	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K43UA3	103.43	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Sep-02	18-Oct-02	_ KOLB JR. FC	21266602	3598100	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K43UA2	137.81	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Sep-02	25-Sep-02	MILNE FORD	4544151	9487700	5R01	3L2Z	3C529	BA	D50	42
2003	ZU73K33ZB5	181.66	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Jul-03	20-Nov-03	UNG FORD II	30062501	5982599	5R01	3L2Z	3C529	BA	P01	69
2003	ZU73K33ZB3	102	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	29-May-03	15-Jul-03	OWN FORD, I	2465804	5990600	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K33ZB0	56.96	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	2-Apr-03	24-May-03	ICO MARPLE	1900251	3535500	5R01	*	3C529	*	N33	33
2003	ZU73K33ZA6	93.98	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Jan-03	5-Apr-03	RHAR MOTOI	1564852	4691801	5R01	3L2Z	3C529	BA	N57	42
2003	ZU73K33UB7	217.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	10-Mar-03	30-Apr-03	M HILL FORD	6527901	4523900	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K33UB4	76.88	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	27-Jan-03	11-Feb-03	ORN MOTOR	036010B	7232131	5R01	3L2Z	3C529	BA	P01	69
2003	ZU73K33UB2	78.11	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Jan-03	27-May-03	VANDA FORD	74951	5322208	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K33UB0	99.26	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Dec-02	30-Jun-03	RD OF NEW (	16977301	9664546	5R01	3L2Z	3C529	BA	H22	41
2003	ZU73K33UA8	130.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Nov-02	15-Nov-02	OM LAKE FOF	40449801	3532000	5R01	3L2Z	3C529	CA	P01	41
2003	ZU73K33UA6	105	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Oct-02	30-Dec-02	ARNEY FORD	11865202	3861771	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K33UA4	146.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	1-Oct-02	24-Jul-03	NBERG MOTO	047091A	4592154	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K33UA3	78.53	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Sep-02	26-Dec-02	DAY FORD	127716A	2429900	5R01	3L2Z	3C529	BA	L13	41
2003	ZU73K33UA2	70.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Sep-02	25-Mar-03	AMARA FORD	7273502	2758922	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K33UA2	99.26	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Sep-02	13-Nov-02	CARDI FORD	6021351	5617500	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K33UA1	102	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	29-Aug-02	30-Oct-02	OWN FORD, I	2520901	5990600	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K23ZB4	76.67	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	24-Jun-03	1-Jul-03	ERT-FOX FOR	557401	6531350	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K23ZA8	89.99	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Mar-03	19-May-03	VIS FORD, IN	245015A	3557500	5R01	3L2Z	3C529	BA	C50	42
2003	ZU73K23ZA5	102.95	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	7-Jan-03	22-Jan-03	ER MOTORS	17360301	9255500	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K23ZA5	442.48	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Dec-02	19-Jan-03	OMARK FORD	486338A	6391131	5R01	3L2Z	3C529	BA	N33	33
2003	ZU73K23ZA4	152.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	12-Nov-02	25-Jan-03	OASIS FORD	1660952	5911111	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K23ZA2	294.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	9-Oct-02	28-Oct-02	AN FORD CO	2097201	8473673	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K23UC1	157.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	28-Apr-03	23-Jun-03	NEENAH-ME	4186801	7279000	5R01	3L2Z	3C529	BA	N57	1
2003	ZU73K23UC0	95.07	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	2-Apr-03	18-Apr-03	) ZEIGLER FO	084893B	8978431	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K23UB0	11.15	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Dec-02	8-Jan-03	:KMAN MOTO	63202	5772142	5R01	*	3C529	*	N57	1
2003	ZU73K23UB0	89.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Dec-02	31-Dec-02	: BASS FORD,	141652	9346591	5R01	3L2Z	3C529	BA	N58	30
2003	ZU73K23UA9	83.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Nov-02	31-Dec-02	CMAHON FOF	9357402	8384801	5R01	*	3C529	*	P01	42
2003	ZU73K23UA9	167.16	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Nov-02	31-Dec-02	CMAHON FOF	9488801	8384801	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K23UA8	109.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Nov-02	26-Nov-02	WER FORD II	167750C	4666400	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K23UA6	94.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Oct-02	27-Nov-02	ERST MOTOR	128266A	9467761	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K23UA5	91.95	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Oct-02	21-Oct-02	ONS FORD, IN	25403101	7971520	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K23UA4	86.08	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Oct-02	23-Oct-02	FORD TRUCI	051014A	6563160	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K23UA2	82.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	16-Sep-02	29-Mar-03	N HOSKINS F	11379101	3844242	5R01	3L2Z	3C529	BA	L20	42

2003	ZU73K23UA1	83.09	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Sep-02	19-Dec-02	LINCOLN-ME	144075A	2253700	5R01	3L2Z	3C529	BA	N58	42
2003	ZU73K23UA0	227.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Aug-02	7-Sep-02	MPERIAL FOR	2886701	4732800	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K13ZB1	84.79	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	1-May-03	26-Nov-03	WE FORD SAI	31768501	8542555	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K13ZA7	238.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Jan-03	12-Feb-03	LONG FORD	67196501	6336661	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K13ZA5	250.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Dec-02	31-Dec-02	S MINNETON	31834101	5465441	5R01	3L2Z	3C529	BA	P01	1
2003	ZU73K13ZA3	181.77	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Oct-02	31-Dec-02	ORNO BROS I	240852C	6762200	5R01	3L2Z	3C529	BA	L13	1
2003	ZU73K13ZA0	87.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Sep-02	15-Oct-02	AN SELLERS	3452651	6437500	5R01	3L2Z	3C529	BA	N57	42
2003	ZU73K13ZA0	93.36	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Sep-02	6-Nov-03	SON FORD-M	60628401	9953537	5R01	3L2Z	3C529	BA	L13	41
2003	ZU73K13ZA0	297	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Sep-02	26-Sep-02	UTURE FORI	040899B	7863673	5R01	3L2Z	3C529	BA	N57	42
2003	ZU73K13ZA0	229.78	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	12-Sep-02	28-Sep-02	ORD LINCOLN	2468463	5437300	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K13UC7	155.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Jul-03	8-Aug-03	ME-DUNCAN	23671701	2687500	5R01	3L2Z	3C529	BA	N57	42
2003	ZU73K13UB5	159.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Feb-03	18-Feb-03	ENDALL FOR	50613103	3422151	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K13UB2	160.45	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Jan-03	2-Apr-03	IIVERSAL FOI	9389651	7861660	5R01	3L2Z	3C529	BA	P01	1
2003	ZU73K13UB0	10.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Dec-02	7-Feb-03	FORD LINCOI	16915402	4840121	5R01	162Z	3C529	JA	T90	33
2003	ZU73K13UB0	89.89	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Dec-02	12-Dec-02	ORD OF WA	53155003	6744781	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K13UA8	99.88	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Nov-02	26-Nov-02	ELL MOTORS	16954001	9824500	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K13UA8	336.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	12-Dec-02	L FORD-MER	21762101	5812356	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K13UA7	153.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Oct-02	3-Feb-03	ORD LINCOL	5191551	6848300	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K13UA6	414.74	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Oct-02	31-Oct-02	CDANIEL FOF	027485A	6819000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K13UA4	152.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Oct-02	25-Jan-03	PLE FORD IN	649301	2901100	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K13UA1	173.44	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Sep-02	28-Sep-02	LLERTON FO	9332951	7222500	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K03ZA3	129.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	30-Oct-02	23-Dec-02	BAY SHORE F	29120301	6651300	5R01	3L2Z	3C529	BA	P24	42
2003	ZU73K03ZA3	138.43	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Oct-02	6-Feb-03	BOXTEL FORI	5970001	4993131	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K03ZA2	120.95	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Oct-02	18-Mar-03	ORD OF ANS	34241401	7325000	5R01	3L2Z	3C529	BA	P68	41
2003	ZU73K03ZA0	145.06	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	9-Sep-02	1-Oct-02	NGDALE FOR	9990951	7515766	5R01	3L2Z	3C529	BA	N58	42
2003	ZU73K03UC1	183.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Apr-03	31-May-03	OURTESY FOI	10968901	2551771	5R01	3L2Z	3C529	BA	P68	42
2003	ZU73K03UB3	344.96	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Jan-03	21-Apr-03	K AVENUE F(	8242501	5689205	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K03UB0	12.83	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Dec-02	12-Dec-02	FORD LINCOL	10091101	4421840	5R01	*	3C529	*	N57	33
2003	ZU73K03UA6	162.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	29-Oct-02	22-Nov-02	ZZO FORD, IN	245890C	3532300	5R01	3L2Z	3C529	BA	P01	41
2003	ZU73K03UA3	183.73	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-02	9-Oct-03	AN MOTORS	085645A	3632870	5R01	3L2Z	3C529	BA	P01	42
2003	ZU73K03UA0	188.62	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Aug-02	7-Sep-02	FORD LINCOL	2393351	2282886	5R01	3L2Z	3C529	BA	P68	42
2003	ZU72KX3ZB0	93.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Apr-03	30-Apr-03	ON BROS. FC	58173001	7957900	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72KX3ZA1	81.35	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Oct-02	12-May-03	BRADY FORD	5722201	3416655	5R01	3L2Z	3C529	BA	N58	D4
2003	ZU72KX3UA2	461.52	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Sep-02	27-Nov-02	FORD SALES	569201	5372301	5R01	3L2Z	3C529	BA	L13	42
2003	ZU72KX3UA2	129.32	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Sep-02	31-Dec-02	& L FORD, IN	8642301	2527255	5R01	3L2Z	3C529	BA	L13	42
2003	ZU72KX3UA1	68.22	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Aug-02	25-Feb-03	ES FORD OF I	6886501	3896325	5R01	3L2Z	3C529	BA	P09	42
2003	ZU72KX3UA0	110.01	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Aug-02	9-Dec-02	ISTER FORD,	1729405	7871700	5R01	3L2Z	3C529	BA	L07	X1
2003	ZU72K93ZB3	114.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Jun-03	23-Aug-03	R MOTOR COI	6232301	2672118	5R01	3L2Z	3C529	BA	P01	41
2003	ZU72K93ZA4	75.44	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Nov-02	3-Dec-02	FORD OF SYF	7346601	4744275	5R01	3L2Z	3C529	BA	P01	41
2003	ZU72K93UB8	101.28	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Mar-03	13-Dec-03	ORTHINGTON	24359201	2765300	5R01	3L2Z	3C529	BA	P01	69
2003	ZU72K83ZA9	82.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Mar-03	8-Apr-03	NT MOTOR C(	054284A	*	5R01	*	3C529	*	C50	33
2003	ZU72K83ZA9	213.37	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Mar-03	8-Apr-03	NT MOTOR C(	056241A	*	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K83ZA3	180.05	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	24-Oct-02	9-Dec-02	CHESTER FC	53015201	2887564	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K83UA8	222.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Nov-02	23-Sep-03	IAMI FORD, I	8363001	6433673	5R01	3L2Z	3C529	BA	P01	12
2003	ZU72K83UA8	100.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Nov-02	29-Nov-02	NORRIS FORI	2972252	2850200	5R01	3L2Z	3C529	BA	N57	30
2003	ZU72K73ZA4	81.86	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	19-Nov-02	4-Dec-02	MPUS FORD,	5340701	3471830	5R01	3L2Z	3C529	BA	H22	42
2003	ZU72K73ZA2	74.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Oct-02	8-Mar-03	N OF SPIRIT	12658701	3362701	5R01	3L2Z	3C529	BA	L15	69
2003	ZU72K73UC8	78.25	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Jul-03	4-Sep-03	ORD OF EAST	3635801	4791000	5R01	3L2Z	3C529	BA	P01	41
2003	ZU72K73UC3	99.88	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-May-03	13-Jun-03	S FORD CORF	7652302	2736060	5R01	3L2Z	3C529	BA	N58	41
2003	ZU72K73UB3	99.5	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Jan-03	25-Jan-03	MAN FORD, II	9692051	6363200	5R01	3L2Z	3C529	BA	N57	42
2003	ZU72K73UA3	65.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Sep-02	18-Oct-02	AIRWAY FOR	9385601	5783600	5R01	3L2Z	3C529	BA	N57	42
2003	ZU72K73UA1	488.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Sep-02	7-Oct-02	ILIA MOTORS	041462A	9312800	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K63ZA2	88.85	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Oct-02	20-Jan-03	HGATE FORI	111126A	9845011	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K63UB2	260.3	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Jan-03	5-Sep-03	O OF NEW JEI	5106651	4672900	5R01	3L2Z	3C529	BA	P09	42
2003	ZU72K63UA9	106.66	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Nov-02	3-Mar-03	ME-DUNCAN	18924202	2687500	5R01	3L2Z	3C529	BA	H20	42
2003	ZU72K63UA7	277.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Oct-02	31-May-03	). M. YOCUM,	59551	8551153	5R01	3L2Z	3C529	BA	G29	1
2003	ZU72K53ZA8	203.18	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Mar-03	6-Jun-03	ORNO BROS I	269729A	6762200	5R01	3L2Z	3C529	BA	L15	69
2003	ZU72K53UB5	112.02	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Feb-03	6-Mar-03	BLE FORD, IN	019398D	7660700	5R01	3L2Z	3C529	BA	H22	41
2003	ZU72K53UB2	92.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Jan-03	21-Jan-03	ORK FORD IN	302754A	2311945	5R01	3L2Z	3C529	BA	A85	41
2003	ZU72K53UA8	137	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Nov-02	22-Nov-02	FORD OF AM	161297B	6885464	5R01	3L2Z	3C529	BA	P09	42
2003	ZU72K53UA3	59.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Sep-02	22-Nov-02	FORD MERC	1669601	6659526	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K53UA2	97.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Sep-02	26-Sep-02	C&C FORD	4289901	9439000	5R01	3L2Z	3C529	BA	N58	D4
2003	ZU72K43ZB4	167.46	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Jul-03	7-Nov-03	THAM FORD,	16824101	8948000	5R01	3L2Z	3C529	BA	P01	1
2003	ZU72K43UB0	105.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Dec-02	21-Mar-03	ORD-LINCOLN	1581702	3727272	5R01	3L2Z	3C529	BA	P01	41
2003	ZU72K43UA6	77.56	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Oct-02	26-Feb-03	RTESY FORD	14991101	4552436	5R01	3L2Z	3C529	BA	P01	41

2003	ZU72K43UA0	110.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Aug-02	24-Oct-02	FORD OF AM	123809A	6885464	5R01	3L2Z	3C529	BA	L13	42
2003	ZU72K33ZA6	92.54	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Jan-03	30-May-03	LINAX FORD I	104819A	5858000	5R01	3L2Z	3C529	BA	P09	42
2003	ZU72K33UB4	78.25	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Jan-03	25-Apr-03	RNE FORD, II	4314451	6692121	5R01	3L2Z	3C529	BA	L13	7
2003	ZU72K33UA6	104.32	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Oct-02	25-Jul-03	DIUM FORD, L	1646752	9352400	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K33UA4	126.27	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Oct-02	31-Dec-02	SIDE FORD,	186529A	9234100	5R01	3L2Z	3C529	BA	P01	41
2003	ZU72K23ZA7	90.67	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Jan-03	3-Oct-03	NTERSTATE F	018459A	8336700	5R01	3L2Z	3C529	BA	N59	33
2003	ZU72K23ZA5	220.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Dec-02	13-Feb-03	TASCA FORD	164763A	6811300	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K23UB9	138.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	27-Mar-03	9-May-03	FORD OF NEV	2052851	*	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K13UA7	113.94	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	1-Nov-02	29-Nov-02	ELON FORD,	17249302	6278400	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K13UA5	126.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Oct-02	14-Dec-02	HY FORD CO	6591304	4948800	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K13UA3	137.16	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Sep-02	29-Dec-02	N M. LANCE F	026793A	8718600	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K03ZB1	83.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Apr-03	28-Apr-03	RLES GABUS	247619A	2700707	5R01	3L2Z	3C529	BA	C50	33
2003	ZU72K03ZA6	89.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Jan-03	27-Feb-03	KWELL FORD	11983101	4531100	5R01	3L2Z	3C529	BA	L13	41
2003	ZU72K03ZA3	162.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Oct-02	23-Dec-02	ESSWAY FOR	3517601	6865900	5R01	3L2Z	3C529	BA	P01	42
2003	ZU72K03ZA1	70.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	27-Sep-02	18-Oct-02	AMARA FORD	7023001	2758922	5R01	3L2Z	3C529	BA	C50	42
2003	ZU72K03UB6	138.45	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Feb-03	8-Jul-03	HY FORD CO	6129701	4948800	5R01	3L2Z	3C529	BA	P01	41
2003	ZU72K03UB5	139.86	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Feb-03	18-Mar-03	ON BROS. FC	58242801	7957900	5R01	3L2Z	3C529	BA	L13	41
2003	ZU72K03UA6	84.19	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Oct-02	27-Nov-02	IFICO'S ARD	449752	6493700	5R01	3L2Z	3C529	BA	P01	42
2003	ZU65K83UB0	128.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	4-Dec-02	27-Dec-02	PLANET FORI	26718301	7193700	5R01	3L2Z	3C529	BA	P01	41
2003	ZU64KX3ZA2	118.97	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Oct-02	8-Feb-03	VERT FORD, I	6273501	3454343	5R01	3L2Z	3C529	BA	C50	33
2003	ZU64KX3UA3	138.05	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Sep-02	4-Nov-02	EWAY FORD	9372751	5633023	5R01	3L2Z	3C529	BA	N25	69
2003	ZU64K73ZA1	79.98	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Oct-02	4-Nov-02	/DITCH FORD	167952A	5952211	5R01	3L2Z	3C529	BA	N57	41
2003	ZU64K73UB2	280.72	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Jan-03	25-Mar-03	FORD-MERCU	18787702	4539391	5R01	3L2Z	3C529	BA	N58	69
2003	ZU64K63UB2	151.5	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	8-Jan-03	1-Mar-03	ANDERS FOR	10680205	8543673	5R01	3L2Z	3C529	BA	P01	41
2003	ZU64K03UB0	212.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Dec-02	24-Sep-03	FORD - ST. PE	16105501	3233400	5R01	3L2Z	3C529	BA	N58	41
2003	ZU63WX3ZA8	83.33	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	26-Feb-03	12-Mar-03	ANDERS FOR	10524401	8543673	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63W83ZA3	124.02	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	25-Oct-02	25-Nov-02	NE STAR FOI	35464601	9313300	5R01	3L2Z	3C529	BA	L19	41
2003	ZU63W73ZA3	90.8	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	22-Oct-02	28-Jan-03	VANTAGE FO	9922906	3599689	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63W63UB0	132.51	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	4-Dec-02	31-Dec-02	BINS FORD L	3461953	9229131	5R01	3L2Z	3C529	BA	P01	D4
2003	ZU63W43UA1	178.79	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	30-Aug-02	27-Sep-02	D MOTORS, I	2085571	8770711	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63W33ZA9	90.5	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	13-Mar-03	30-Jun-03	CITRUS FORI	45164602	3900930	5R01	3L2Z	3C529	BA	L13	41
2003	ZU63W13UA0	120.97	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	21-Aug-02	15-Nov-02	REE FORD, II	473189B	3371529	5R01	3L2Z	3C529	BA	P01	69
2003	ZU63W03ZA2	84.1	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	18-Oct-02	30-Dec-02	E MYERS FO	443606A	8968200	5R01	3L2Z	3C529	BA	L23	42
2003	ZU63KX3ZB0	76.3	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	1-Apr-03	27-Aug-03	LLS FORD LII	2230052	6921121	5R01	3L2Z	3C529	BA	L23	41
2003	ZU63KX3ZA4	145.89	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	11-Nov-02	18-Nov-02	EDGAR FOR	6561201	3322145	5R01	3L2Z	3C529	BA	C50	42
2003	ZU63KX3ZA3	86.94	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	31-Oct-02	9-Nov-02	UTTER FORD	5610051	3217400	5R01	3L2Z	3C529	BA	L13	2
2003	ZU63KX3ZA3	406.56	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	22-Oct-02	26-Dec-02	ADERSHIP FC	328171C	3618100	5R01	3L2Z	3C529	BA	C50	41
2003	ZU63KX3ZA2	96.25	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Oct-02	7-Nov-02	PLANET FORI	20571301	7193700	5R01	3L2Z	3C529	BA	N58	33
2003	ZU63KX3ZA1	190.07	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Sep-02	26-Apr-03	ON MOTORS,	10891801	3505600	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63KX3UA6	193.75	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	25-Oct-02	24-Jun-03	ORD STONE M	4079651	3443300	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63KX3UA5	181.3	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Oct-02	31-Dec-02	EDOM FORD,	9211603	7972277	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K93ZA8	246.14	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Feb-03	22-Apr-03	_ MONTE FOF	6456951	4487681	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K93ZA8	128.63	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	21-Feb-03	18-Jun-03	VANTAGE FO	10729901	3599689	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K93ZA5	79.79	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Dec-02	12-Feb-03	STATE FORD	1747051	2995900	5R01	3L2Z	3C529	BA	P69	41
2003	ZU63K93ZA5	91.91	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Jan-03	6-May-03	BBS FORD, II	27783603	3626364	5R01	3L2Z	3C529	BA	T90	42
2003	ZU63K93ZA4	91.91	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	20-Nov-02	15-Dec-02	BBS FORD, II	28363901	3626364	5R01	3L2Z	3C529	BA	T90	42
2003	ZU63K93UA4	65.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Oct-02	4-Aug-03	OK MOTOR (	21015302	7622641	5R01	3L2Z	3C529	BA	N58	42
2003	ZU63K83ZB0	226.54	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	19-Mar-03	19-Apr-03	TH BAY FORD	4386401	6440211	5R01	3L2Z	3C529	BA	L13	69
2003	ZU63K83ZA9	17.63	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	21-Mar-03	26-Apr-03	SUNSET FORI	9597151	8980744	5R01	*	3C529	*	N57	7
2003	ZU63K83ZA0	132.21	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	13-Sep-02	28-Sep-02	J FORD GULF	163913D	3714000	5R01	3L2Z	3C529	BA	C50	33
2003	ZU63K83UB1	124.38	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	10-Dec-02	23-Apr-03	ULLINAX FOF	383666A	8897600	5R01	3L2Z	3C529	BA	C50	42
2003	ZU63K83UA2	135	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Sep-02	12-Dec-02	ALD FORD LII	171632	4238787	5R01	3L2Z	3C529	BA	N58	41
2003	ZU63K83UA1	140.88	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	27-Aug-02	9-May-03	FORD OF MAI	6311451	4221100	5R01	3L2Z	3C529	BA	H22	69
2003	ZU63K83UA0	85.37	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	28-Aug-02	28-Sep-02	KE SHAD FOI	4147801	7773673	5R01	3L2Z	3C529	BA	G29	42
2003	ZU63K73ZB4	224.1	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Jul-03	28-Aug-03	A MARGARITA	279415A	4596800	5R01	3L2Z	3C529	BA	N58	33
2003	ZU63K73ZB3	93.06	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	27-May-03	16-Aug-03	OTORS FRAN	198543A	4791100	5R01	3L2Z	3C529	BA	N33	42
2003	ZU63K73ZA6	208.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	24-Jan-03	16-May-03	PACIFIC FORI	9659951	4263301	5R01	3L2Z	3C529	BA	L13	41
2003	ZU63K73ZA4	140.42	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Nov-02	12-Nov-02	RT & BAKER	2812051	8913000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K73ZA1	135.82	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	25-Sep-02	25-Nov-02	URTESY FOI	13188601	3286000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K73UC7	84.1	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	30-Jul-03	30-Sep-03	E MYERS FO	435319A	8968200	5R01	3L2Z	3C529	BA	A85	28
2003	ZU63K73UA4	291.03	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	21-Oct-02	4-Feb-03	CKER FORD	106542A	7901100	5R01	3L2Z	3C529	BA	P01	69
2003	ZU63K73UA4	68.24	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Oct-02	18-Oct-02	FORD LINC M	210492D	9771234	5R01	3L2Z	3C529	BA	P01	69
2003	ZU63K73UA0	81.24	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	20-Aug-02	7-Sep-02	CURRIE FORI	56686606	8725555	5R01	3L2Z	3C529	BA	P01	69
2003	ZU63K63ZB1	90.12	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-May-03	31-May-03	VERT FORD, I	10400502	3454343	5R01	3L2Z	3C529	BA	N58	41
2003	ZU63K63ZA8	244.28	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Mar-03	22-Mar-03	VISTA FORD	7663251	8847600	5R01	3L2Z	3C529	BA	L13	1

2003	ZU63K63ZA8	80.74	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	17-Feb-03	5-May-03	LINCOLN-ME	086465A	3326161	5R01	3L2Z	3C529	BA	L23	42
2003	ZU63K63ZA2	79.2	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Oct-02	10-Feb-03	NOLLER FOR	1193951	2359211	5R01	3L2Z	3C529	BA	N57	42
2003	ZU63K63UB3	88.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	22-Jan-03	6-Feb-03	.IS AUTO CEN	11151601	4265585	5R01	3L2Z	3C529	BA	L13	1
2003	ZU63K63UB3	229.4	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	22-Jan-03	6-Feb-03	.IS AUTO CEN	11141602	4265585	5R01	3L2Z	3C529	BA	L13	28
2003	ZU63K63UA8	151.14	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Nov-02	27-Nov-02	ORD-LINCOLN	6672501	2945126	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K63UA6	91.69	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Oct-02	31-Mar-03	ORD-MERCUI	044609A	2344661	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K63UA2	189.74	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Sep-02	30-Dec-02	FORD LINCOL	124909E	2373673	5R01	3L2Z	3C529	BA	N58	46
2003	ZU63K53ZB2	161.67	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	7-May-03	30-May-03	GALPIN FORD	7566091	7873800	5R01	3L2Z	3C529	BA	P01	69
2003	ZU63K53ZA7	81.29	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	4-Feb-03	30-May-03	ENTRAL FOR	592854	9609800	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K53ZA3	66.76	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	23-Oct-02	2-Jan-03	LIVER FORD-	2197603	8642611	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K53ZA3	170.94	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	24-Oct-02	14-Dec-02	ORT MARINA	29870501	6493673	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K53ZA2	93.4	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	2-Oct-02	26-Oct-02	TLER FORD, I	19537001	5319911	5R01	3L2Z	3C529	BA	P09	41
2003	ZU63K53ZA1	217.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Sep-02	5-Oct-02	OFFPAUIR, IN	7909401	5563631	5R01	3L2Z	3C529	BA	N57	42
2003	ZU63K53UC2	158.69	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	6-May-03	21-Jul-03	NCHO FORD	37450301	6991302	5R01	3L2Z	3C529	BA	A85	42
2003	ZU63K53UB9	216.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	19-Mar-03	28-Apr-03	ENWAY FORD	4427751	2753200	5R01	3L2Z	3C529	BA	N18	42
2003	ZU63K53UB8	227.77	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Mar-03	30-May-03	ELDE FORD IN	22833701	5693400	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K53UB0	137.2	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Dec-02	23-Dec-02	OTT'S FORD I	229241	8596627	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K53UA9	121.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	14-Nov-02	22-Sep-03	PITAL FORD I	023207A	7904600	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K53UA8	66	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Nov-02	2-Jan-03	SEATON FOR	6330801	9892121	5R01	3L2Z	3C529	BA	L13	42
2003	ZU63K53UA6	143.7	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Oct-02	11-Nov-02	IAX FORD-ME	14927801	4289094	5R01	3L2Z	3C529	BA	P09	42
2003	ZU63K53UA5	139.17	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Oct-02	24-Dec-02	VIS MOTOR C	35556001	9250234	5R01	3L2Z	3C529	BA	L15	41
2003	ZU63K53UA4	66	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Oct-02	22-Oct-03	ACEWAY FOR	1573501	3935000	5R01	3L2Z	3C529	BA	N58	42
2003	ZU63K53UA2	154.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	11-Sep-02	28-Oct-02	ORT MILL FOR	066533B	5475454	5R01	3L2Z	3C529	BA	P83	42
2003	ZU63K43ZB1	117.9	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Apr-03	30-Aug-03	MBALL FORD,	272844A	3513000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K43ZB0	83.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	2-Apr-03	10-Oct-03	ENTRAL FOR	929352	9609800	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K43ZA9	90.13	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	13-Mar-03	1-Sep-03	UNTRY OF LE	559322B	2212900	5R01	3L2Z	3C529	BA	C50	42
2003	ZU63K43ZA6	142.19	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	22-Jan-03	17-Feb-03	MUNDAY FOR	9955101	3033000	5R01	3L2Z	3C529	BA	P01	1
2003	ZU63K43ZA4	244.93	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	6-Nov-02	7-Dec-02	VERT FORD, I	5682701	3454343	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K43ZA3	81.28	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	1-Nov-02	14-Jun-03	CARTER FORI	089939B	3318111	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K43ZA2	379.9	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Oct-02	19-Jan-03	GALPIN FORD	7211761	7873800	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K43UB5	216.13	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	14-Feb-03	7-Oct-03	S FORD OF T	21951401	3867800	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K43UB3	85.19	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	22-Jan-03	25-Jul-03	HETLER FOR	2969201	6253030	5R01	3L2Z	3C529	BA	N58	42
2003	ZU63K43UB1	33.6	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Jan-03	29-Mar-03	/ANS FORD IN	1402751	5223673	5R01	3L2Z	3C529	BA	P09	7
2003	ZU63K43UA3	78.43	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	19-Sep-02	2-Nov-02	PITAL FORD I	1229851	7904600	5R01	3L2Z	3C529	BA	P24	42
2003	ZU63K43UA3	111.11	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	19-Sep-02	2-Nov-02	PITAL FORD I	1146151	7904600	5R01	3L2Z	3C529	BA	N57	41
2003	ZU63K43UA1	258.82	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Sep-02	27-Sep-02	TLE-CLICK FO	43689201	7685888	5R01	3L2Z	3C529	BA	L13	42
2003	ZU63K33ZA6	141.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Jan-03	16-Feb-03	VISTA FORD	7137251	8847600	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K33ZA5	196.21	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Jan-03	25-Jan-03	TH COUNTY F	311882A	9459900	5R01	3L2Z	3C529	BA	S39	1
2003	ZU63K33UB3	98.7	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	15-Jan-03	2-Sep-03	EV SMITH FOR	38542103	8452900	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K33UB0	150.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Dec-02	21-Mar-03	TH CENTRAL I	68439401	2313491	5R01	3L2Z	3C529	BA	L13	1
2003	ZU63K33UA7	69.6	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	30-Oct-02	26-Dec-02	RD LINCOLN M	14294901	7567111	5R01	3L2Z	3C529	BA	P01	12
2003	ZU63K33UA6	174.24	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	18-Oct-02	13-Nov-02	W SOUTH FO	9682001	6936821	5R01	3L2Z	3C529	BA	P09	42
2003	ZU63K33UA2	144	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Sep-02	13-Dec-02	E JARRETT F	20546101	2838521	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K23ZA4	89.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Nov-02	22-Dec-02	ER HELLER F	4032752	7453361	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K23ZA3	260.31	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	25-Oct-02	7-Dec-02	OWNEY FOR	7586052	8616771	5R01	3L2Z	3C529	BA	P68	14
2003	ZU63K23ZA1	340.4	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	30-Sep-02	19-Nov-02	TOMES FORD	20629402	6991010	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K23UB3	81.53	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	24-Jan-03	14-Jun-03	AGE FORD OF	455474A	2870955	5R01	3L2Z	3C529	BA	P01	42
2003	ZU63K23UA2	78.64	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Sep-02	27-Sep-02	' FORD OF AN	178980A	2254151	5R01	3L2Z	3C529	BA	C50	1
2003	ZU63K13ZB1	205.63	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-May-03	30-Jul-03	DLEKAUFF FO	580112A	9853600	5R01	3L2Z	3C529	BA	N59	33
2003	ZU63K13ZA0	106.74	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	13-Sep-02	28-Sep-02	PLANET FORD	27677901	7193700	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K13UC6	14.41	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	26-Jun-03	25-Jul-03	ON QUALITY	204469A	9567000	5R01	*	3C529	*	C50	33
2003	ZU63K13UB8	84.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	11-Mar-03	9-Nov-03	ONE FORD OF	505129C	5576500	5R01	3L2Z	3C529	BA	P01	41
2003	ZU63K13UB6	112.6	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	28-Feb-03	21-Apr-03	E PATTON FO	015687A	7498113	5R01	3L2Z	3C529	BA	G29	42
2003	ZU63K13UA8	40.51	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Nov-02	15-Dec-02	OY & MILLS F	966827A	5265501	5R01	*	3C529	*	A88	42
2003	ZU63K13UA2	75.23	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Sep-02	18-Sep-02	COUNTRY FO	6789351	9648131	5R01	3L2Z	3C529	BA	T90	42
2003	ZU63K13UA0	188.5	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	21-Aug-02	4-Mar-03	ENWAY FORD	5545551	2753200	5R01	3L2Z	3C529	BA	T90	1
2003	ZU63K03ZA7	257.18	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	22-Jan-03	15-Mar-03	AXWELL FOR	689212A	4435000	5R01	3L2Z	3C529	BA	C50	42
2003	ZU63K03ZA0	93.19	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	20-Sep-02	17-Oct-02	NE STAR FOI	31585401	9313300	5R01	1L2Z	3C529	JA	N58	42
2003	ZU63K03UC7	166.38	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	25-Jul-03	26-Sep-03	ORT MARINA	31462202	6493673	5R01	3L2Z	3C529	BA	B95	42
2003	ZU63K03UA5	88.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Oct-02	26-Dec-02	ACHTREE FO	5915651	4557673	5R01	3L2Z	3C529	BA	N58	41
2003	ZU63K03UA2	125.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Sep-02	13-Mar-03	ACHTREE FO	5907251	4557673	5R01	3L2Z	3C529	BA	N58	42
2003	ZU63K03UA1	254.61	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	28-Aug-02	3-Feb-03	INCOLN-MER	160821	7737339	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62KX3ZB1	90.73	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	28-Apr-03	11-Jul-03	L CAJON FOR	6054752	5798888	5R01	3L2Z	3C529	BA	N58	42
2003	ZU62KX3UA2	115.11	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	11-Sep-02	23-Dec-02	FLAMMER FO	2504651	9375131	5R01	3L2Z	3C529	BA	C50	12
2003	ZU62K93ZA6	102.47	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Jan-03	14-Apr-03	NCH FORD, IN	45341501	7947100	5R01	3L2Z	3C529	BA	P01	69

2003	ZU62K93ZA1(	207.11	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	19-Sep-02	7-Dec-02	ALL FORD-MI	12840502	2902200	5R01	3L2Z	3C529	BA	P01	1
2003	ZU62K93UB2	74.83	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	20-Dec-02	4-Jan-03	ERITAGE FOF	18062302	9077800	5R01	3L2Z	3C529	BA	H04	42
2003	ZU62K93UA9	88.33	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	18-Nov-02	2-Dec-02	ORD CORPO	7166455	8679136	5R01	3L2Z	3C529	BA	L13	1
2003	ZU62K83ZB1!	104.89	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	28-Apr-03	26-Jan-04	NEINMAN FO	037707A	3279000	5R01	3L2Z	3C529	BA	C50	69
2003	ZU62K83ZA7!	88.18	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	6-Feb-03	14-Oct-03	JOHNSON F	57490901	4543711	5R01	3L2Z	3C529	BA	P01	41
2003	ZU62K83ZA3!	350	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	12-Nov-02	23-Dec-02	UTTER FORD	2613551	3217400	5R01	3L2Z	3C529	BA	T90	30
2003	ZU62K73ZB3	140.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	21-May-03	22-Aug-03	UITT FORD, L	12662101	5695226	5R01	3L2Z	3C529	BA	L13	1
2003	ZU62K73ZA6(	91.9	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Jan-03	1-Mar-03	NER'S FORD (	33436901	7666600	5R01	3L2Z	3C529	BA	P01	41
2003	ZU62K73ZA1'	60	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Sep-02	11-Oct-02	RT CAB-LAS \	6098901	*	5R01	3L2Z	3C529	BA	P01	1
2003	ZU62K73UA1	84.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	27-Aug-02	10-Nov-02	HAIRE FORI	3598752	9336571	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62K63ZB5'	0	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	11-Aug-03	27-Aug-03	& COUNTRY	295555A	4813673	5R01	3L2Z	3C529	BA	N57	42
2003	ZU62K63ZA7!	301.45	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Feb-03	25-Oct-03	RT LAVACA F(	156669A	5521155	5R01	3L2Z	3C529	BA	L13	42
2003	ZU62K63ZA5'	412.73	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Dec-02	27-Feb-03	ORD LINCOLN	152215C	9676191	5R01	3L2Z	3C529	BA	L13	42
2003	ZU62K63ZA3(	159.1	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	24-Oct-02	2-Jan-03	CHMID FORD	288945A	3991000	5R01	3L2Z	3C529	BA	T90	1
2003	ZU62K63ZA1'	106.21	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	28-Sep-02	9-Nov-02	SON FORD S/	9491901	2920000	5R01	3L2Z	3C529	BA	P01	41
2003	ZU62K63ZA1;	116.77	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Sep-02	20-Jan-03	'HITFIELD FOI	092647A	2910300	5R01	3L2Z	3C529	BA	N57	42
2003	ZU62K63UB2	84.88	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	7-Jan-03	23-Feb-03	NE FORD OF	046087A	2780303	5R01	3L2Z	3C529	BA	L15	1
2003	ZU62K63UA3	229.77	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Sep-02	15-Jan-03	DDEN FORD S	223455C	7624200	5R01	3L2Z	3C529	BA	L23	42
2003	ZU62K53ZB0!	187.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Apr-03	4-May-03	WONDRIES F	269070A	2893591	5R01	3L2Z	3C529	BA	N58	41
2003	ZU62K53ZA7	160.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	24-Jan-03	19-Feb-03	) OF MONTEB	84665501	8386920	5R01	3L2Z	3C529	BA	C50	33
2003	ZU62K53ZA1'	150	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Sep-02	11-Oct-02	RT CAB-LAS \	6121801	*	5R01	3L2Z	3C529	BA	P01	1
2003	ZU62K53UC5	83.03	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	10-Jun-03	31-Jul-03	FORD AT TH	3739403	2923325	5R01	3L2Z	3C529	BA	N58	42
2003	ZU62K53UA7	91.91	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	30-Oct-02	19-Nov-02	EVANS TEAM	8420251	9649801	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62K43ZA8'	175.34	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	27-Feb-03	2-May-03	TTS FORD-M	116834A	6695200	5R01	3L2Z	3C529	BA	L13	42
2003	ZU62K43ZA5(	100.73	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	2-Dec-02	18-Dec-02	EZ FORD SALI	7431253	4872582	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62K43ZA3'	69.35	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	31-Oct-02	30-Nov-02	BALL FORD,	286767A	3513000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62K43UA3	179.03	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Sep-02	18-Oct-02	AIRWAY FOR	9568001	5783600	5R01	3L2Z	3C529	BA	N58	42
2003	ZU62K33ZA8;	161.11	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Feb-03	8-Mar-03	VE STAR FOF	22702701	9463900	5R01	3L2Z	3C529	BA	C50	42
2003	ZU62K33UA4	107.23	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Oct-02	30-Oct-02	URTESY FOI	4391451	9222700	5R01	3L2Z	3C529	BA	B95	42
2003	ZU62K33UA3	201.45	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Sep-02	26-Apr-03	RMANCE FOI	201462A	2974111	5R01	3L2Z	3C529	BA	N58	33
2003	ZU62K33UA3	389.48	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Sep-02	26-Apr-03	RMANCE FOI	201956A	2974111	5R01	3L2Z	3C529	BA	N57	42
2003	ZU62K23ZA9'	109.54	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Mar-03	28-Jul-03	H BROS. FOR	12215401	4211300	5R01	3L2Z	3C529	BA	L23	28
2003	ZU62K23ZA5'	106.67	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	12-Dec-02	23-Jan-03	ERLY FORD I	312786A	4481661	5R01	3L2Z	3C529	BA	P67	42
2003	ZU62K23ZA1!	87.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	1-Oct-02	19-Dec-02	EARSON FOR	228142A	2837181	5R01	3L2Z	3C529	BA	N57	42
2003	ZU62K23UC1	118.61	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	7-Apr-03	22-Apr-03	MCCARTY F(	14508701	6633831	5R01	3L2Z	3C529	BA	A85	42
2003	ZU62K23UA2	82.68	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	24-Sep-02	2-Oct-02	LINCOLN-MI	7462401	2404020	5R01	3L2Z	3C529	BA	P01	41
2003	ZU62K13ZB2'	276.37	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	14-May-03	18-Jun-03	BANY FORD I	19186401	5281244	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62K13ZB1!	107.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	30-Apr-03	31-May-03	ACIENDA FOF	11951701	3831615	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62K13ZB0'	234.92	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	7-Apr-03	30-Jun-03	EARSON FOR	242283A	2837181	5R01	3L2Z	3C529	BA	N57	42
2003	ZU62K13ZA1	124.29	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	17-Sep-02	24-Jul-03	A PORTE FOR	144342B	4711642	5R01	3L2Z	3C529	BA	T90	42
2003	ZU62K13UA8(	112.64	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	8-Nov-02	21-Dec-02	NSON FORD,	1096701	3682135	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62K13UA2	158.09	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	24-Sep-02	22-Apr-03	ORY FORD L-	5628701	8878571	5R01	3L2Z	3C529	BA	L13	42
2003	ZU62K03ZA9;	114.58	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Mar-03	2-Apr-03	COUNTY FOR	125824A	3292120	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62K03ZA1'	60	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Sep-02	11-Oct-02	RT CAB-LAS \	6099001	*	5R01	3L2Z	3C529	BA	P01	1
2003	ZU62K03ZA0!	142.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Sep-02	16-Oct-02	LLOVIO FORI	2785751	9277888	5R01	3L2Z	3C529	BA	L66	42
2003	ZU62K03ZA0	96.25	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	4-Sep-02	19-Oct-02	OLLINS FORI	2270351	6043673	5R01	3L2Z	3C529	BA	N57	42
2003	ZU62K03UB3	81.6	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Jan-03	19-Sep-03	FITZPATRICK	1580851	5023673	5R01	3L2Z	3C529	BA	L13	1
2003	ZU62K03UA9'	88.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Nov-02	11-Dec-02	BY JONES F(	8135252	7388000	5R01	3L2Z	3C529	BA	P01	42
2003	ZU62K03UA2	213.59	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Sep-02	2-Oct-02	LINCOLN-MI	7365801	2404020	5R01	3L2Z	3C529	BA	P01	41
2003	DU85W93ZA0	130.92	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AV	3-Sep-02	27-Oct-02	OM LAKE FOF	40229602	3532000	5R01	3L2Z	3C529	BA	H21	41
2003	DU85W53ZA5	131.67	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AV	23-Jan-03	3-Feb-03	LLER FORD II	114288C	4251000	5R01	3L2Z	3C529	BA	P01	1
2003	DU85K83ZA1	78	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AV	18-Sep-02	15-Oct-02	IOTOR COMP	104327B	3522162	5R01	4L2Z	3C529	DA	P01	42
2003	DU85K33UB1	81.97	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	11-Dec-02	13-Feb-03	JD SONS MOT	208208A	6523000	5R01	3L2Z	3C529	BA	P01	42
2003	DU84W53ZA3	153.5	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AV	11-Nov-02	22-Feb-03	OURTESY FOI	557871B	7944343	5R01	*	3C529	*	N50	42
2003	DU84W33UB4	190.6	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	28-Jan-03	30-Sep-03	NN FORD IN (	43705101	9984000	5R01	3L2Z	3C529	BA	P01	42
2003	DU84W13UB0	135.88	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	2-Dec-02	30-Dec-02	RIVERS FORI	2780931	8899215	5R01	3L2Z	3C529	BA	P01	42
2003	DU83K83ZA2(	102.16	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AV	7-Oct-02	22-Oct-02	SDALE FORI	5381252	4729500	5R01	3L2Z	3C529	BA	N58	1
2003	DU75WX3ZA1	75	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	14-Oct-02	2-Jan-03	SON FORD S/	011000E	6979161	5R01	3L2Z	3C529	BA	P01	41
2003	DU75W93ZA5	122.8	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	16-Jan-03	22-Apr-03	OURTESY FOI	566759B	7944343	5R01	3L2Z	3C529	BA	P01	69
2003	DU75W83ZA7	85.18	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	5-Feb-03	21-Apr-03	OB BELL FOR	323277B	7663600	5R01	3L2Z	3C529	BA	L13	42
2003	DU75W73ZA4	170.79	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	26-Nov-02	14-Dec-02	ERGREEN FC	25944201	3926900	5R01	3L2Z	3C529	BA	P01	42
2003	DU75W73ZA2	212.52	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	1-Oct-02	16-Nov-02	IDLE FORD S/	248156B	4844800	5R01	3L2Z	3C529	BA	P01	42
2003	DU75W73UA1	90.37	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	28-Aug-02	26-Dec-02	LLER FORD II	21021403	3353181	5R01	3L2Z	3C529	BA	P01	42
2003	DU75W63ZA4	67.18	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	26-Nov-02	5-Dec-02	ORD AUTO S/	6296851	8411000	5R01	3L2Z	3C529	BA	P01	69
2003	DU75W33ZA6	268.29	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	8-Feb-03	15-Feb-03	WNS FORD, I	1580653	3492240	5R01	3L2Z	3C529	BA	P01	42

2003	DU75W33ZA3	238.09	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	12-Nov-02	19-Nov-02	=ORD LINC-M	5133601	3566366	5R01	3L2Z	3C529	BA	P01	42
2003	DU75W33UA1	582.07	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	23-Sep-02	31-Dec-02	K GROVE FO	24593502	4787000	5R01	3L2Z	3C529	BA	A85	63
2003	DU75W23ZA5	48.54	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	24-Jan-03	2-Jun-03	'AD FORD ME	049563A	2633127	5R01	*	3C529	*	C50	33
2003	DU75W23ZA1	188.6	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	23-Sep-02	26-Dec-02	DREW FORD	9406451	4647777	5R01	3L2Z	3C529	BA	P01	1
2003	DU75K43ZA0	91.15	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Jan-03	18-Jan-03	ELON FORD,	17234901	6278400	5R01	3L2Z	3C529	BA	P01	42
2003	DU75K23ZA0	115.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Sep-02	18-Sep-02	)URTESY FOI	184392A	9423000	5R01	3L2Z	3C529	BA	N58	42
2003	DU74WX3ZA3	155.4	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	4-Nov-02	10-Mar-03	TALLINGS FC	28705901	4834352	5R01	3L2Z	3C529	BA	P09	1
2003	DU74WX3UA4	70.96	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	3-Oct-02	17-Oct-02	LLSBORO FO	9786102	9348100	5R01	3L2Z	3C529	BA	P01	69
2003	DU74W93UA7	147.87	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	6-Nov-02	13-Dec-02	MONROE FOR	11236701	7828291	5R01	3L2Z	3C529	BA	C50	41
2003	DU74W53ZA9	102.25	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	13-Mar-03	11-Aug-03	ONS FORD, II	4108351	2417200	5R01	3L2Z	3C529	BA	N57	42
2003	DU74W33UA2	69.55	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	18-Sep-02	27-Sep-02	/ANS FORD IN	2044251	5223673	5R01	3L2Z	3C529	BA	P09	41
2003	DU74W13UA9	110.25	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	27-Nov-02	24-Dec-02	)MARK FORD	515903A	6391131	5R01	*	3C529	*	G29	42
2003	DU74W03ZA2	114.07	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	31-Oct-02	30-Nov-02	BOXTEL FORI	3161401	4993131	5R01	3L2Z	3C529	BA	P01	42
2003	DU74KX3UB0	134.35	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	16-Dec-02	11-Apr-03	ROTHERS FC	2578751	6936730	5R01	3L2Z	3C529	BA	P01	1
2003	DU74K83ZA1	93.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	2-Oct-02	29-Mar-03	RD OF SPRIN	40991501	9227900	5R01	3L2Z	3C529	BA	C50	69
2003	DU74K43UC7	209.61	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Jul-03	28-Aug-03	CHAMBERS	197606	8481350	5R01	3L2Z	3C529	BA	P31	42
2003	DU74K03ZA1	205.05	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	20-Sep-02	9-Jan-03	OASIS FORD	2885451	5911111	5R01	3L2Z	3C529	BA	N57	42
2003	DU73WX3ZA1	104.85	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	20-Sep-02	12-Oct-02	.WAY FORD B	389679C	9398600	5R01	3L2Z	3C529	BA	P01	41
2003	DU73W83ZB2	22.8	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	5-May-03	31-Dec-03	!G MIDTOWN	2521902	5642631	5R01	*	3C529	*	N57	12
2003	DU73W33UA8	371.8	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	14-Nov-02	28-Dec-02	SLAND FORD	3196201	6755933	5R01	3L2Z	3C529	BA	P01	42
2003	DU73W23UA1	59.58	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	4-Sep-02	9-Sep-02	, FORD MERC	1645305	6659526	5R01	3L2Z	3C529	BA	P01	42
2003	DU73KX3ZA1	177.98	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	23-Sep-02	1-Oct-02	& COUNTRY	2868451	4713673	5R01	3L2Z	3C529	BA	C50	42
2003	DU73KX3UB6	372.89	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Feb-03	26-Mar-03	LLERTON FO	9835051	7222500	5R01	3L2Z	3C529	BA	P01	42
2003	DU73KX3UA9	89.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Nov-02	29-Jan-03	RD OF MAHO	213781A	6288800	5R01	3L2Z	3C529	BA	L13	1
2003	DU73K93UB5	109.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Feb-03	15-May-03	)WER FORD II	167776A	4666400	5R01	3L2Z	3C529	BA	P01	42
2003	DU73K93UA2	109.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Sep-02	16-Sep-02	AYVILLE FOR	45942302	5894800	5R01	3L2Z	3C529	BA	P01	D4
2003	DU73K63UA4	105.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Oct-02	31-Mar-03	RNET FORD I	1285851	3585600	5R01	3L2Z	3C529	BA	N58	42
2003	DU73K53ZA4	282.09	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	12-Nov-02	27-Nov-02	FUSZ FORD,	14290401	5329955	5R01	3L2Z	3C529	BA	P01	42
2003	DU73K53UB7	116.08	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Feb-03	30-Sep-03	MAN FORD, II	9533551	6363200	5R01	3L2Z	3C529	BA	L13	41
2003	DU73K53UA8	91.91	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Nov-02	28-Dec-02	)RD AT NORT	13449001	6495100	5R01	3L2Z	3C529	BA	C50	41
2003	DU73K33UA7	300.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Oct-02	15-Nov-02	GE MOTOR C	617351	4895414	5R01	3L2Z	3C529	BA	P09	42
2003	DU73K33UA6	107.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Oct-02	20-Nov-02	OWN FORD, I	2057401	5990600	5R01	3L2Z	3C529	BA	P01	42
2003	DU73K23UB0	184.99	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Dec-02	2-Jan-03	IFFIN FORD, I	174901B	8695000	5R01	3L2Z	3C529	BA	P01	55
2003	DU73K13UA7	203.76	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	31-Oct-02	31-Jan-03	OLONIAL FOI	168275A	7483503	5R01	3L2Z	3C529	BA	P01	42
2003	DU73K13UA3	186.06	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Sep-02	30-Sep-02	' SHAW FORD	813704	5860900	5R01	3L2Z	3C529	BA	N58	42
2003	DU73K13UA3	244.54	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Sep-02	30-Sep-02	' SHAW FORD	707401	5860900	5R01	*	3C529	*	H22	69
2003	DU72K93ZA5	805.22	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	9-Dec-02	24-Mar-03	JRTIS FORD-I	4886661	7692300	5R01	3L2Z	3C529	BA	L13	1
2003	DU65WX3ZA8	118.65	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	6-Mar-03	30-Jun-03	SOBH FORD,	3358752	6334005	5R01	3L2Z	3C529	BA	P01	42
2003	DU65W93UA2	107.18	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	12-Sep-02	24-Apr-03	AVALIER FOR	825020B	4241111	5R01	3L2Z	3C529	BA	P09	42
2003	DU65W53ZA3	107.97	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	18-Nov-02	25-Nov-02	SE FORD COI	25142402	4616000	5R01	3L2Z	3C529	BA	P01	42
2003	DU64W63ZA4	101.42	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	19-Nov-02	1-Dec-02	/ CENTURY F	087444B	2852221	5R01	3L2Z	3C529	BA	P01	41
2003	DU64W53UB3	85.39	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	24-Jan-03	22-Apr-03	:REE FORD, II	479416A	3371529	5R01	3L2Z	3C529	BA	P01	69
2003	DU64K23UA5	98.12	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	25-Oct-02	25-Jan-03	CROWN FORI	3778953	8671121	5R01	3L2Z	3C529	BA	N27	42
2003	DU64K13ZA2	67.94	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	9-Oct-02	16-Oct-02	RAY FORD S,	920652	2831301	5R01	3L2Z	3C529	BA	L13	42
2003	DU63W93UB0	153.13	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	6-Dec-02	7-Mar-03	TEAM FORD	8854051	3955100	5R01	3L2Z	3C529	BA	N11	42
2003	DU63W93UB0	240.64	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	6-Dec-02	7-Mar-03	TEAM FORD	9251551	3955100	5R01	3L2Z	3C529	BA	N33	42
2003	DU63W13ZA8	197.54	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	19-Feb-03	18-Mar-03	GNUSSEN FC	382928B	6515600	5R01	3L2Z	3C529	BA	P01	42
2003	DU63K93UA5	31.42	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	14-Oct-02	20-Nov-02	) FORD-PENS	9798651	4769050	5R01	3L2Z	3C529	BA	C50	41
2003	DU63K73ZB3	124.53	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	2-Jun-03	13-Jun-03	EGEHR MOT(	8322901	2411042	5R01	3L2Z	3C529	BA	L13	42
2003	DU63K43ZA3	128.53	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	25-Oct-02	19-Jan-03	L CAJON FOR	7655951	5798888	5R01	3L2Z	3C529	BA	P24	42
2003	DU63K33ZA8	87.59	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Feb-03	16-Jul-03	SKELTON FO	150804A	8956700	5R01	3L2Z	3C529	BA	P01	1
2003	DU63K23UB2	105.04	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Jan-03	27-Jul-03	:CURRIE FOR	5464751	4886787	5R01	3L2Z	3C529	BA	P09	69
2003	DU63K03ZB0	172.62	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Apr-03	6-Jul-03	:R FORD VAL	4754801	2556600	5R01	3L2Z	3C529	BA	C50	46
2003	DU63K03UB0	123.25	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Dec-02	22-Jan-03	TH CENTRAL I	63019601	2313491	5R01	3L2Z	3C529	BA	T90	69
2004	ZU84WX4UA4	156.05	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	30-Sep-03	19-Mar-04	:ORD LINCOL	15564201	6649211	5R01	3L2Z	3C529	BA	N57	1
2004	ZU83E64UB4	155.14	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	10-Mar-04	23-Apr-04	_ KOLB JR. FO	21320701	3598100	5R01	3L2Z	3C529	BA	L13	41
2004	ZU75W14ZA6	72.04	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	23-Jan-04	15-Mar-04	SALE FORD	3663101	9352335	5R01	3L2Z	3C529	BA	A85	42
2004	ZU74WX4UB2	86.32	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	2-Feb-04	6-Feb-04	ELL FORD LIN	5579452	8872311	5R01	3L2Z	3C529	BA	P09	42
2004	ZU74W04UA5	78.68	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	28-Oct-03	26-Nov-03	BEELYE FORI	59266501	3753820	5R01	3L2Z	3C529	BA	C50	1
2004	ZU73W34UB2	172.77	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	27-Jan-04	27-Feb-04	FORD - TURN	168452B	*	5R01	3L2Z	3C529	BA	L13	41
2004	ZU73W14ZA1	243.78	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	24-Sep-03	17-Oct-03	)EMMER FOR	320510A	7212600	5R01	3L2Z	3C529	BA	H21	30
2004	ZU73KX4ZA5	150.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	22-Dec-03	6-Jan-04	YAN FORD SA	5170551	3953900	5R01	3L2Z	3C529	BA	L23	42
2004	ZU73KX4ZA4	96.17	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Dec-03	25-Dec-03	RAC - SACRA	31818301	*	5R01	3L2Z	3C529	BA	P01	42
2004	ZU73KX4ZA0	199.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	20-Aug-03	4-Sep-03	)RD MERCUR	251367A	6542122	5R01	3L2Z	3C529	BA	P01	42
2004	ZU73K94UA8	238.52	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Dec-03		LUCAS MOTOR COMP.	15259801	3863100	5R01	3L2Z	3C529	BA	P01	46

2004	ZU73K94UA6	111.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Nov-03	21-Feb-04	N SQUARE FO	5633901	4819400	5R01	3L2Z	3C529	BA	N59	14
2004	ZU73K94UA3	95.13	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-03	2-Oct-03	STATE FORD	2315052	2995900	5R01	3L2Z	3C529	BA	P01	41
2004	ZU73K94UA3	119.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-03	2-Oct-03	STATE FORD	1853551	2995900	5R01	3L2Z	3C529	BA	P01	1
2004	ZU73K94UA1	111.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Aug-03	29-Dec-03	N SQUARE FO	5609602	4819400	5R01	3L2Z	3C529	BA	N59	14
2004	ZU73K74UB0	103.65	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Jan-04	1-May-04	RANKLIN FOR	042360A	5280040	5R01	3L2Z	3C529	BA	P01	42
2004	ZU73K74UB0	319.68	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Jan-04	31-Jan-04	ON FORD NOI	73539401	4824228	5R01	3L2Z	3C529	BA	N57	42
2004	ZU73K74UA0	253.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Aug-03	27-Dec-03	ALDEMAN FOI	017513A	5867600	5R01	3L2Z	3C529	BA	P01	42
2004	ZU73K64ZA7	84.01	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Feb-04	30-Mar-04	/DEN FORD, I	5564201	2482128	5R01	3L2Z	3C529	BA	N58	42
2004	ZU73K64ZA6	120.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	6-Feb-04	16-Feb-04	MERICAN FOR	157045A	4876700	5R01	3L2Z	3C529	BA	P01	41
2004	ZU73K54UB1	72.04	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Jan-04		COUNTY MOTOR COMF	15069201	2266301	5R01	3L2Z	3C529	BA	L13	69
2004	ZU73K54UB0	64.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Jan-04	27-Jan-04	RAC - CLEVE	041466A	*	5R01	3L2Z	3C529	BA	P01	42
2004	ZU73K44ZA5	218.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	6-Jan-04	9-Mar-04	MEY FORD, II	5705101	9882574	5R01	3L2Z	3C529	BA	N57	42
2004	ZU73K44ZA2	21.94	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	24-Oct-03	14-Nov-03	& H MOTOR C	260601	5247267	5R01	*	3C529	*	L13	42
2004	ZU73K44ZA2	261.04	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Oct-03	27-Jan-04	WLEY FORD,	5763551	2613030	5R01	3L2Z	3C529	BA	L26	41
2004	ZU73K34ZA2	108.27	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	2-Oct-03	14-Feb-04	LAGE FORD I	4268951	5653900	5R01	3L2Z	3C529	BA	N57	33
2004	ZU73K34UB1	74.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Jan-04	29-Jan-04	AC - NEWPOF	33613901	*	5R01	3L2Z	3C529	BA	L13	42
2004	ZU73K24ZA3	145.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Oct-03	5-Dec-03	IN FORD SALI	038394A	7334364	5R01	3L2Z	3C529	BA	P01	42
2004	ZU73K24ZA0	88.85	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	21-Aug-03	5-Sep-03	NSET FORD, I	205449A	9778888	5R01	3L2Z	3C529	BA	C50	42
2004	ZU73K24UA3	196.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Sep-03	12-Nov-03	EHOLD FORD	7231351	4623131	5R01	3L2Z	3C529	BA	L13	41
2004	ZU73K04ZA5	112.32	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	7-Jan-04	12-Mar-04	ON FORD SAI	19033101	8782500	5R01	3L2Z	3C529	BA	N58	42
2004	ZU72KX4UB0	223.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Jan-04	27-Jan-04	THOMAS FOR	6173701	2817500	5R01	3L2Z	3C529	BA	P01	33
2004	ZU72K74UA6	176.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	29-Oct-03	4-Dec-03	GAN FORD, II	9772155	3733878	5R01	3L2Z	3C529	BA	N57	33
2004	ZU72K74UA5	90.78	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Oct-03	11-Dec-03	LLS FORD LIN	8429901	6491111	5R01	3L2Z	3C529	BA	N57	30
2004	ZU72K44ZA1	261.03	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	29-Sep-03	5-Jun-04	DIEHL FORD	14657301	7342640	5R01	3L2Z	3C529	BA	L15	42
2004	ZU72K34ZA2	264.17	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Oct-03	6-Feb-04	CHLEY FORD	28541301	5718801	5R01	3L2Z	3C529	BA	L13	42
2004	ZU72K34UB2	76.14	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	27-Jan-04		32 FORD-MERCUR	139994A	7322124	5R01	3L2Z	3C529	BA	A85	12
2004	ZU72K14UB2	147.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Feb-04	13-Mar-04	MON FORD, IN	6871551	8892601	5R01	3L2Z	3C529	BA	P01	1
2004	ZU72K14UB2	255.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Feb-04	19-Feb-04	STRONG FOR	103953A	3282223	5R01	3L2Z	3C529	BA	P01	1
2004	ZU72K04UA9	364.09	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Dec-03	13-Feb-04	JDO FORD LIN	6202151	7745678	5R01	3L2Z	3C529	BA	L13	69
2004	ZU64K14UB1	84.41	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Jan-04	28-Feb-04	NORRIS FORI	3855702	8786364	5R01	3L2Z	3C529	BA	N57	42
2004	ZU64K14UB1	123.23	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Jan-04	28-Feb-04	NORRIS FORI	4037302	8786364	5R01	3L2Z	3C529	BA	N57	42
2004	ZU63K54ZA8	160.7	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	25-Feb-04	24-Apr-04	ACH FORD, IN	584074A	4862717	5R01	3L2Z	3C529	BA	P09	42
2004	ZU63K54UA6	66.71	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	29-Oct-03	30-Dec-03	ER & LIMBAUC	7071101	2455271	5R01	3L2Z	3C529	BA	N58	1
2004	ZU63K34UA6	177.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	30-Oct-03		ATLANTIC FORD TRUCK	067835A	5878220	5R01	3L2Z	3C529	BA	P01	1
2004	ZU63K14UB1	69.92	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	15-Jan-04	7-Feb-04	E PATTON FO	027843A	7498113	5R01	3L2Z	3C529	BA	N58	41
2004	ZU63K14UA4	58.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	7-Oct-03	22-Oct-03	ET RAC - FT M	6905141	*	5R01	3L2Z	3C529	BA	C50	33
2004	ZU62KX4ZA6	154.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	22-Dec-03	1-Mar-04	ORT MILL FOF	068524C	5475454	5R01	3L2Z	3C529	BA	N58	69
2004	ZU62KX4ZA0	79.49	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Sep-03	29-Nov-03	ILLESPIE FOF	7230753	5091000	5R01	3L2Z	3C529	BA	N50	42
2004	ZU62K94ZA6	129.67	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	15-Dec-03	30-Dec-03	STAR FORD	62618601	9560977	5R01	3L2Z	3C529	BA	L13	41
2004	ZU62K94ZA1	75.32	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	11-Sep-03	7-Feb-04	NDALL FORD	7429151	4521311	5R01	*	3C529	*	P09	7
2004	ZU62K94UA3	86.71	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Sep-03	2-Nov-03	ENWAY FORD	5022751	2753200	5R01	*	3C529	*	C50	7
2004	ZU62K84ZA7	218.71	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Jan-04		BOB BAKER FORD-MISSI	493090A	2975001	5R01	3L2Z	3C529	BA	L13	42
2004	ZU62K84UA7	21.02	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	19-Nov-03	29-Feb-04	FLAMMER FO	6027353	9375131	5R01	3L2Z	3C529	BA	C50	42
2004	ZU62K74UA1	140.16	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	29-Aug-03	8-Dec-03	FLAMMER FO	5020651	9375131	5R01	3L2Z	3C529	BA	L13	42
2004	ZU62K74UA1	74.44	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	21-Aug-03	26-Nov-03	TINGS FORD,	042099A	7580114	5R01	3L2Z	3C529	BA	N59	41
2004	ZU62K54UA0	111.27	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	5-Aug-03	10-Sep-03	AMERICAN F	10858001	*	5R01	3L2Z	3C529	BA	L13	1
2004	ZU62K44ZA7	382.75	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	4-Feb-04		GILDNER FORD-LINCOLN	10201	2464508	5R01	3L2Z	3C529	BA	L13	41
2004	ZU62K14ZA2	92.06	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	7-Oct-03	17-Nov-03	LONG FORD,	9967101	7772700	5R01	3L2Z	3C529	BA	L23	1
2004	DU83K04UA4	92.54	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	2-Oct-03	17-Oct-03	ORD LINCOLN	19944401	6310040	5R01	3L2Z	3C529	BA	N58	42
2004	DU83K04UA4	337.11	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	2-Oct-03	17-Oct-03	ORD LINCOLN	19849001	6310040	5R01	3L2Z	3C529	BA	G29	42
2004	DU75K14UA5	65.03	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	15-Oct-03	10-Dec-03	APITAL MOTO	125254A	2247378	5R01	3L2Z	3C529	BA	P01	1
2004	DU73K04UB1	83.51	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Jan-04	28-Jan-04	IGFIELD FORI	2995651	8260058	5R01	3L2Z	3C529	BA	N58	42
2004	DU72K14ZA7	166.84	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	2-Feb-04	17-Feb-04	ORD OF MT. V	10709201	6646900	5R01	3L2Z	3C529	BA	P01	1
2004	DU63K34UB6	79.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Mar-04	7-Apr-04	SANDLER FLI	250049C	9702500	5R01	3L2Z	3C529	BA	N57	42
2004	DU63K14ZA0	209.18	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	27-Aug-03	16-Nov-03	NCHO FORD	36874301	6991302	5R01	3L2Z	3C529	BA	N58	42
2004	DU62K94UA3	86.94	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	22-Sep-03	23-Apr-04	ON BOHN FOF	319180A	3477000	5R01	3L2Z	3C529	BA	P09	41

RPR_DT	TIS_WSD	CLM_KEY	MILGE	MTRL_COST	T_COST_GRC	LBR_HRS	TECHNICIAN	TECHI
8-Jan-04	4	4217977	9361	632.73	733.03	1.6	TILT LOCK BROKEN INTERNALLY IN COL DIAG REPLACED COL ASSY MT3C529 TIME TO DIAG	
13-Apr-04	17	5810164	19827	438.59	526.56	1.4	STEERING COLUMN LINKAGE BINDING STEERING COLUMN ASSEMBLY REMOVE AND INSTALL	
29-Jan-04	14	4349824	17781	0	12.5	0.2	CHECKED OUT TILT WHEEL NOISE. THE SLIDES WERE DRY. LUBED TILT SLIDES, NOISE GONE. ALL OK AT THIS TIME. 999A .2 OK PER DAVE WATTS.	
9-Mar-04	14	4824430	20794	438.59	547.55	1.2	INTERNAL FAILURE REMOVED STEERING COLUMN AND SWAPPED OVER PARTS,ADJUSTED, CHECKED GOOD	
2-Mar-04	17	5560970	24500	551.37	653.24	1.2	HARD TO PUT INTO PARK REPLACED STEERING COLUME	
3-Dec-02	1	265808	219	576.73	679.62	1.2	DIAG NOIE INSIDE COLUMN R&R STEERING COLUMN TRANSFER PARTS TO NEW COLUMN	
19-Apr-04	9	5607123	8690	438.59	545.08	1.2	VERIFY CONCERN CHECK OPERATION FOUND STEERING COLUMN LOCKING PLATE BROKEN BY SHIFTER CAUSING SHIFTERTO LOCK WHEN SHIFTIN	
29-Nov-02	1	287174	627	576.73	684.85	1.7	ELECTRICAL TEST PIN POINT TEST AND REPLACED STERING COLUMNAND SOLENOID	
11-Dec-03	4	3733327	6451	470.02	552.51	1.1	VERIFIED SHIFTER LOOSE PINPOINT REPLACE COLUMN ASSY SHIFTER EAR BROKEN OFF TRANSFER PARTS REPLACE SHIFTER LEVER BROKEN RET	
18-Dec-03	13	3834119	25430	438.59	719.74	3.1	CHECK VEHICLE,REPLACE STEERING COLUM ASSEMBLY,LOOSEN LEFT SI DE OF DASH TO REMOVE PINCHED WIRE LOOM PULLED TO TIGHT T GE,RE	
7-Nov-03	1	3385887	183	438.59	526.51	1.2	INSPECT SHIFT LOCK OPERATION FOUND LOCK SOLENOID STICKING, REMOVE SHIFT LOCK SOLENOID FROM STK# 31746 AND INSTALL ONTO T289	
10-Sep-03	6	2434065	3171	438.59	506.28	1.2		
11-Feb-04	11	4474206	7758	574.24	695.61	1.2	CONFIRMED. FOUND STEERING COLUMN INTERNAL FAILURE (STIFF) EVEN WITH SHIFT CABLE DISCONNECTED. REPLACED STEERING COLUMN ASS	
9-Dec-03	13	3866078	11175	438.59	808.49	5.4	11175 CHECK GEARSHIFT INTERLOCK STICKS.REMOVETRIM AND FIND ACTUATOR STICKING.DISARM SRS.REMOVE DASH PANEL AND REPLAC IFT OF	
22-Jun-04	9	6576621	26227	439.29	613.19	2.3	26227 BRAKE SHIFT INTERLOCK SOLENOID SHORTED BRAKE SHIFT SOLENOID ELECTRICAL DIAGNOSIS. PINPOINT TEST IS INACCURATE. REF EED .6	
6-Mar-04	18	4983910	11423	438.59	525.44	1.4	11423 SHIFT INTERLOCK NOT WORKING PROPERLY DIAG, FOUND SHIFT INTERLOCK SHORTING CALLED HOTLINE TALKED TO LERON HOTLINI LOCK	
29-Dec-03	10	3891661	18311	438.59	592.22	2.3	18311 WARR. QUICK TEST PIN POINT TEST COMPUTER TEST FIND OUT THAT INNER LOCK SILINOILD SHORTED OUT BURN WIRE REPAIR WIRE AND I	
19-Apr-04	17	5590315	30379	438.59	514.5	1.2	REPLACED STEERING COLUMN BINDING, ORDERED TRIM PIECE, OK TO DRIVE	
19-Apr-04	14	5612058	14364	473.95	780.67	6	REPLACE COMPLETE STEERING COLUMN	
18-Oct-02	0	159520	699	596.92	680.12	1.6	VERIFIED INTERLOCK ACTUATOR NOT WORKING. RAN PPT TESTS G, AT G12 TO REPLACE ACTUATOR. CHK OASIS PER SSM 15030 SWITCH NOT SEF	
23-Aug-03	8	2321921	9491	438.59	614.37	2.2	TESTED SYSTME. GETTING POWER FROM BRAKE LIGHT SWITCH. SHIFTER INTERLOCK MICROPROCESSORE WAS OPEN. REPLACED STEERING COL	
23-Nov-02	2	254190	2744	576.73	740.51	2.5	INSTALL SPECIAL ORDERD STEERING SHAFT AND MOUNTING ASSY...REMOVED AND TRANSFERD STEERING WHEEL,CLOCK SPRING MULTIF	
10-Oct-02	0	152259	29	576.73	652.68	1.4	CK FOR NOISE, REPLACED STEERING COLUMN, RETEST	
19-Nov-02	0	355032	1255	726.49	818.72	1.7	REPLACED THE STEERING COLUMN AND THE SECTOR SHAFT.	
8-Apr-04	18	5475049	15917	438.59	604.19	2.5	CHECK SHIFT MECHANISM. CHECK LOCK OUT FOR SHIFTER. REMOVE AND REPLACE STEERING COLUMN	
15-Apr-04	15	5720884	11921	473.95	674.33	2.2	VERIFIED CUST CONCERN DEFECTIVE SHIFTER AND STEERING COLUMN REMOVED AND REPLACED	
26-Apr-04	14	5830873	21192	438.59	518.7	1.2	1053TWARRT CK OUT SHIFTER OP;STICKS BETWEEN R& PARK RE PLA CE ENTIRE STEERING COLUMN;TRANSFER STEERING WHE EL;SHIFTER;INGN	
6-Oct-03	1	3126948	6483	438.59	536.55	1.5	TECH 120 DIAG CHECK IGNITION KEY UNABLE TO REMOVE KEY FOUND SOLONIOD NOT RELEASING ON STEERING COLUMN TRACE OUT WIRIN ING C	
29-Mar-04	14	5378258	35680	438.59	581.76	1.9	35680 VERIFED CUSTOMER CONCERN REMOVED STEERING COLOUM SHROUD AND FOUND THAT THE SHIFT LOCK SOLENOID WAS AT FAULT CE TH	
23-Feb-04	8	4632219	18487	0	70.28	1	FOUND SHIFTER INTERLOCK MAKING NOISE IN DASH AREA REMOVE AND DROP DOWN STEERING COLUMN APPLIED ELECTRIC GREASE AND ADJUS	
22-Dec-03	15	3827663	12013	438.59	568.74	1.7	CC42 3C529 CC42, BCE DAIG, VERIFY SHIFTER INOP, PINPOINT TEST, ACCESS DRIVERS AIRBAG, ACCESS STEERING WHEEL, ACCESS KNEE P.WHICI	
14-Nov-03	0	3428681	5	470.02	973.67	4.6	PERFORM TRANSMISSION PRELIMINARY INSPECTION. HOOKUP NGS AND RUN SELF TESTS. READ PIDS DATA. RMEOVE AND INSTALL STEERI HEEL	
9-Jan-04	14	4082379	19800	438.59	619.28	3		
9-Jan-04	8	4161534	15056	474.99	588.19	2	INSPECTED AND REPLACED STEERING COLUMN.INSTALLED NEW TUMBLER IN IGNITION	
11-May-04	14	6419414	20904	469.92	568.39	1.6	MT3514 TIME TO DIAG NO OR HARD SHIFTING OF TRANS GEARS WHEN MOVING LEVER TO OR FROM THE NEUTRAL TO REVERSE TO PARK PO:VE. RE	
2-Dec-03	6	3707453	7710	438.59	570.1	1.8	TEST PINPOINT TEST REPLACE STEERING COLUMN SOLENOID STICKING REPLACE COLUMN RETEST OK	
13-Jan-04	15	4182768	14783	438.59	506.51	1.2	VERF CONCERN.REPLACED STEERING COLUMN.VERF PROPER OPERATION	
23-May-03	8	1592428	7192	596.92	669.94	1.2	CK OUT REPLACED STEERING COLUMN DUE TO NOT STAYING IN POSITION	
16-Mar-04	15	5026619	21514	438.59	519.35	1.2	21514 VERIFY CONCERN REPLACE ENTIRE STEERING COLUMN FOR SHIFTER BINDING TEST DRIVE OK	
15-Apr-04	10	5536476	19792	438.59	518.65	1.2	INSPECT VERIFY CONCERN AND REPLACED STEERING COLUMN DUE TO TILT WOULD NOT STAY IN PLACE STEERING COLUMN JUST FLOPPED AROU	
2-Sep-03	1	2363712	519	438.59	676.66	3.5	519 TEST BRAKE SHIFT INTERLOCK CIRCUITS, TRACE WIRING CIRCUITS THROUGH CONNECTOR C2008, WORKS INTERMITTENTLY, TRACE CC IR STE	
2-Dec-03	7	3945813	11845	438.59	534.57	1.2	CHECK OUT AND FOUND NECESSARY TO REPLACE STEERING COLUMN AS PER FORD SPECIAL SERVICE MESSAGE FOR KEY CYLINDER	
7-Feb-04	9	4481964	11846	438.59	515.92	1.2	CHECK OUT AND FOUND NECESSARY TO REPLACE STEERING COLUMN DUE TO NON LOCKING OF WHEEL CAUSED BY INTERNAL FAILURE	
16-Mar-04	11	5003307	11864	438.59	515.92	1.2	CHECK OUT AND FOUND NECESSARY TO REPLACE STEERING COLUMN; STEERING COLUMN HAD INTERNAL CONCERN WHICH WOULD NOT AL CORR	
17-Jun-03	2	1672430	2298	596.92	743.14	1.4	CHECKED OUT RAN OASIS AND CALLED HOTLINE REPLACED STEERING COLUMN BINDING IGNITION LOCK LINKAGE	
13-Jan-03	1	406576	442	596.92	784.42	2.6	442 CC 39 DEACTIVATE AIRBAG SYSTEM FOR ACCESS, REPLACE ST EERING COLUMN ASSY MISBUILT AND TRANSFER ALL PA RTS	
29-Jan-04	14	4314480	18366	438.59	581.57	1.9	18366 INSPECT CABLE & LINKAGE REMOVE & REPLACE COMPLETE STEERING COLHUM TRANSFER ELECTRICAL COMPONETS & STEERING WHL CO	
16-Jun-04	17	6451266	20013	563.9	664.11	1.2	STEERING COLUMN BINDING. STEERING COLUMN ASSEMBLY REMOVE AND INSTALL	
22-Dec-03	12	3984997	14325	438.59	507.17	1.2	INSPECTED AND FOUND SHIFT COLUMN WOULD NOT LET YOUGO FROM DRIVE TO PART CONTACTED HOTLINE ADVISED TO REPLACE COLUMN	
2-Apr-04	16	5438119	15776	598.49	735.22	1.8	XXXXX LOCK CYLINDER IGNITION REPLACE AND REPIN WHEN REQUIRED	
24-Jun-04	18	6627959	22226	438.59	610.72	2.2	VERIFY CONCERN. CONSULT OASIS FOR SSM OR TSB, NONE. RNI COLUMN TRIM TO INSPECT. DISCONNECT SHIFT CABLE, PROBLEM STILL EX TEERI	
18-Sep-03	10	2570327	12980	551.37	653.24	1.2	VEH WONT COME OUT OF PARK RPL STEERING COLUMN	
14-Apr-04	18	5512435	9306	438.59	519.94	1.2	9306 VERIFY CONCERN FOUND THE INTER LOCK ON THE COLUM WAS NOT MOVING ALL THE WAY REPLACED STEERING COLUAM RETESTED ALL O	
16-Feb-04	13	4678045	24293	438.59	626.4	1.2	STEERING COLUMN ASSEMBLY REMOVE AND INSTALL (3524)	
16-Jun-04	20	6594463	17043	438.59	530.71	1.2	17043 42 TEST AND REPLACED STEERING COLUME RETEST OK	
28-Nov-03	13	3689729	14843	438.59	519.94	1.2	14843 COULD NOT VERIFY CONCERN, SHIFTS INTO PARK WITH NORMAL EFFORT MULTIPLE TIMES. NO INFO ON OASIS FOR CONCERN. INSPE HEN F	
2-May-03	0	1091385	4	0	118.98	1.5	R&R STEERING COLUMN, REPAIR SHIFTER ROD ARM TO SHIFTER CABLE REFASTEN TO SHAFT & REPAIRED BROKEN PATS CONNECTOR TO RECEIVI	
14-Jan-03	0	423572	253	596.92	675.35	1.2	SWITCH INOP REPL COMPLETE STEERING COLUMN	
15-Jan-03	2	431796	3786	639.56	737.29	1.5	3790 42 VEHICLE WILL NOT SHIFT OUT OF PARK. BRAKE LIGHT WORK NORMALLY. REMOVED STEERING COLUMN COVERS AND CHECKED CIR ED PC	
11-Jun-03	2	1455994	761	596.92	704.82	1.2	VERIFY NOISE IN STEERING COLUMN WHEN RELEASE BRAKE PEDAL. FOUND NOISE FROM SHIFT LOCKOUT SOLENOID. SOLENOID IS PART OF STEEI	
21-Oct-03	6	3047189	3501	438.59	924.15	5.4	VERIFY NOISE FROM LEFT SIDE OF DASH AREA. RR INSTRUMENT PANEL FOR ACCESS. FOUND NOISE FROM GEARSHIFT LOCK ACTUATOR. PA RT WA	
17-May-04	15	6090003	28494	438.59	637.17	1.9	SHIFT DETENT ON STEERING COLUMN HAS EXCESSIVE PLAY TEST DROVE AND VERIFIED VEHICLE POPS OUT OF DRIVE AND INTO NEUTRAL. INSPE	
13-Jan-04	7	4779763	6338	438.59	598.1	2.3	REPLACED STEERING COLUMN, FOR BAD SHIFT INTERLOCK SWITCH. TEST DROVE. OK.	
13-Feb-04	10	4542352	15655	438.59	535.83	1.2	TECH 976288 INSTALLED SO PART FROM PREVIOUS RO. DISARMED SRS SYSTEM, REMOVED LOWER TRIM PANEL AND STEERING COLUMN TRIM.	

17-Jul-03	8	1904122	24161	438.59	865.1	4.6	SHIFTER INTER LOCK ASSY PERFORM TEST AND INSPECT AND REPLACE INTER LOCK ASSY AND RECHECK
30-Dec-02	0	440760	55	576.73	713.8	2.6	PREFORMED DIAG LOCATED DEFECTIVE INTERLOCK SWITCH CALLED FORD ASSISTANCE HAD TO REPLACE COMPLETE COLUMN FOR PROPER OPE
23-Feb-04	17	4750976	19733	438.59	548.28	1.2	CHECKED SHIFT OPERATION IN AND OUT OF PARK, VERIFIED HARD TO SHIFT. RAN OASIS, FOUND TSB 02 17 6, UPDATED STEERING REMOVED AND I
18-Mar-03	7	763834	13559	639.56	823.72	2.3	CHECK TILT DOES NOT LOCK IN UNDER DASH PANEL SUPPORT BRACKET SCHROUD FOUND NYLON WASHER FOR TILT BROKE APART NECESSARY T
24-Nov-03	11	3564464	22435	469.92	558.47	1.2	VERIFIED CUSTOMERS CONCERN. REPLACE STEERING COLUMN ASY.
26-Apr-04	18	5714632	30701	16.13	110.63	1.4	ABS LIGHT COMES AND GOES VERIFY RETRIEVE DTCS ABS DIAG ROAD TEST WHILE MONITORING PID DATA NO REAR SPEED INPUT R&R SENSOR AI
8-Jan-03	2	373057	1705	596.92	677.6	2	REPLACED STERRING COLUMN, INTERLOCK SWITCH BAD
21-Jan-04	15	4380348	17890	438.59	518.08	1.2	AS PER HOTLINE RPRT 4AUCG011 STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
15-Mar-03	4	738301	5247	619.53	811.53	3.2	VERIFIED CONCERN REMOVED STEERING COLUMN SHROUD REMOVED IGNITION CYLINDER CK ALL OK REMOVED IGNITUION SWITCH CK KEY SENT
29-Aug-03	10	2617521	19039	438.59	583.4	2.1	MISC M TIME PLEASE VERIFED COMPLAINT PINPIONT TEST BAD LOCK OUT ACTUATO
15-Nov-02	1	263955	503	772.82	1016.79	3.2	NOISE IN STEERING COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
17-Feb-03	0	573724	3	596.92	793.95	3.4	RWEPLACE BROKEN SHIFT COULUM
13-Aug-03	12	2195417	16730	529.11	729.5	2.9	16730 CK SHIFTER BINDING CK OASIS NO MSGS REMV LOWER DASH TRIM AND COLUMN TRIM INSPECT LINKAGE INTERLOCK SOL BINDING ON LINK
15-Aug-03	2	2378368	3351	443.13	836.66	5.5	ATTEMPTED TO REPAIR, UNABLE TO GET REPLACEMENT CLIP VERFIED CONCERN, TRIED TO ORDER PART, CALLED HOT LINE FOR HELP. REQUESTE
22-Dec-03	7	3915105	7419	438.59	629.72	3.5	TECH VERIFIED CONCERN CKD OASIS NO HELP FOUND LOCK CYLINDER HAD ALREADY BEEN REPLACED RO 039146 TECH CALLED FORD TECH H DID
5-Apr-04	17	5410430	21670	438.59	606.85	2.2	REMOVE KICK PANEL AT DRIVERS COLUMN REMOVED AFTER MARKET WIRING REMOVED COLUMN AND TRANSFERRED AND ELECTRICAL PARTS AN
5-Apr-04	13	5423296	12429	438.59	545.82	1.4	REPLACED STICKING STEERING COLUMN AND ADJ REPL STREEING COLUMN AND ADJ
2-Apr-03	5	897238	8731	596.92	686.52	1.2	STEERING COLUMN VERIFY WILL NOT LOCK FOR TILT INSPECT AND REPLACE STEERING COLUMN
17-May-04	18	6145891	19850	438.59	557.06	1.6	PERFORM COLUMN DIAGS. SOLENOID SHORTED. INSTALL UPDATED STEERING COLUMN ASSY.
17-Jul-03	10	1819102	12373	0	67.49	0.9	DIAG TILT WHEEL RR DRIVERS LOWER DASH TRIM PANEL RR COLUMN C OVERS RR STEERING COLUMN RESECURE TILT WHEEL LEVER RETEST
6-Apr-04	17	5380041	12492	438.59	638.69	2.2	ROADTEST FOR INT VEHICLE NOT COMING OUT OF PARK.HOOK UP WDS SELF TEST PCM CODE P1000 PASS.DATALOGGER TO MONITOR AND RECO
2-Jun-03	1	1371054	1186	626.74	718.14	1.2	N57 STEERING COLUMN ASSEMBLY REPLACE
6-May-03	7	1240586	6433	699.85	887.93	3.1	ROAD TEST, RATTLE IN STEERING, CHECKED OASIS, SSM 16427, REPLACED LOWER STEERING SHAFT, ROAD TESTED,NOISE STILL THER, REPLACEE
6-Apr-04	9	5419823	29322	438.59	514.48	1.2	29322 CHECK OPERATION OF THE STEERING COLUMN TILT. REMOVE AND REPLACE THE STEERING COLUMN ASSY. RECHECK OPERATION.
30-Jan-04	9	4425482	6642	438.59	637.24	2.9	6642 ROAD TESTED. SHIFT LEVER STICKS WHEN MOVING THREW GEARS. RAISED VEHCILE. INSPECTED SHIFT CABLES AND LINKAGES. ALL C ICALL
19-Sep-03	6	3686622	14026	402.88	486.34	1.2	REPLACED SHIFT LEVER
17-Jun-04	13	6534827	12001	438.59	546.65	1.2	SHIFTER INTERLOCK BROKEN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
22-Jun-04	15	6495316	11283	438.59	605.9	1.8	EXTRA TIME TO VERIFY CONCERN NOTHAPPENING WHEN FIRST CHECKED THEN VERIFIED LOWRER DASH TRIM CK 4 VOLTAGE AT INTERLOCK REPL
19-Apr-04	14	5604855	15046	438.59	508.51	1.2	STEERING COLUMN HAS PROBLEM WITH SHIFT INTERLOCK SWITCH REMOVED STEERING COLUMN TO REPLACE ASSY COLUMN AND SWITCH
12-May-04	17	6030212	25540	483.26	726.83	3.2	REPLACED STEERING CLOUMN DUE TO BENT SHIFTING MECHIINSIM AND HAD TO REPLACE BRAKE LIGHT SWITCH DUE TSB 02 05 01 ALSO HAD TO R
7-Jun-04	19	6407304	17654	591.76	767.24	2.4	VERIFIED SHIFT LEVER BROKEN. REMOVED TRIM FOR STEERING COLUMN. FOUND INTERLOCK SWITCH STICKING. REPLACED STEERING COLUMN
16-Mar-04	15	4926510	19121	445.95	671.17	3.2	VERIFIED SELECTOR STICKING WHEN GOING INTO PARK.CHECKED OASIS.NO TSB S OR SSM.REMOVED STEERING COLUM AND TRANSFERED LUID.
31-Mar-04	8	5523947	13073	0	244.36	2.8	DIAG AND ACCESS SHIFT LOCK ACTUATOR AND LUBE RETEST OK (MT)
31-Dec-02	2	410322	54	511.64	580.98	1.2	REPLACED STEERING COLUMN
17-Dec-03	13	3789101	21935	438.59	514.96	1.2	CONFIRMED COMPLAINT INSPECTED AND FOUND BRAKE SHIFT INTER LOCK NOT WORKING PROPERLY REPLACED STEERING COLUMN THAT IS THE
14-Aug-03	11	2228789	21582	438.59	519.36	1.4	CK SHIFTER PROBLEM,REM STEERING COLUMN,DISCONNECT BATT & AIR BAG,REM STEERING WHL,DISCONNECT ALL WIRING,INSTALLED NEW COLU
11-Mar-04	17	4902951	33113	438.59	518.08	1.2	COULDNT GET INTO PARK UNLESS I STEPPED ON BRAKE P01,42,3C529 ST COLUME BINDING INTERNALLY RAN OASIS CALLED HOTLINE AND SAID TC
7-Oct-03	3	2840857	3630	438.59	524.07	1.2	REPLACED STEERING COLUMN ASY. CONTAINING SHIFT INTERLOCK
24-Jan-04	6	4664588	7594	375.94	490.39	2.1	REPLACE THE BRAKE SHIFT INTERLOCK SOLENOID ASSY
19-Feb-04	11	4652775	22873	438.59	552.77	1.2	IGNITION KEY WONT COME OUT RPL COLUMN
18-Jul-03	8	1868143	12259	474.99	682.32	2.4	DIAGNOSE AND REPLACE INTERLOCK IGNITION SWICH AND COLUMN
14-Jan-04	4	4096095	2725	0	57.9	1	TEST DROVE TO CONFIRM..RATTLING NOISE COMING FRON THE SHIFT INTERLOCK SOLENOID..ADJUSTED THE PARK TO NEUTRAL INTERLOCK E KEY
22-Apr-04	16	5725832	31135	0	12.05	0.2	LUBED LOWER STEERING COLUMN BOOT
27-Aug-03	0	2343871	20	0	84.46	1.2	FLOOR MAT??? VERIFIED CONCERN. FOUND EXCESSIVE LUBE FROM STEERING COLUMN DRIPPING ON MAT. REMOVED STEERING COLUMN. CLEAN
17-Apr-03	2	1042824	1379	596.92	795.43	3	IGNITION TO GO TO THELOCK POSITION WAS BROKEN OFFSWITCH NEXTTO THE SHIFT LEVER THAT ALLOWS THEREMOVED STEERING COLUI. HAD
22-Dec-03	14	3842333	23773	438.59	623.36	3.5	DIAGNOSTIC TRACED VOLTAGE, CHECKED GROUND TO SHIFT INTERLOCK SOLENOID.MICROPROCESSOR AND SOLENOID ARE ALL ONE UNIT. R & F
19-Jun-03	1	1568215	770	596.92	680.34	1.2	FOUND SHIFT INTERLOCK MICROPROCESSOR HAD INTERNAL OPEN CI.ONLY SERVICEABLE BY STEERING COLUMN RPLCMTREPLACED STEERING C
3-Nov-03	13	3183175	25151	438.59	551.2	1.7	THE LEVER IS MADE OF TOO SOFT A METAL AND THE ACTUATER WEARS A HOLE INTO LEVER AND IT JAMS RUN ELECTRICLE DIAG TRACE BIN ED HC
1-Mar-04	14	4730619	13252	438.59	601.39	2.2	VERIFY TILT WHEEL CONCERN, VK AND FOUND TILT MECHANISM NOT OPERATING PROPERLY M TIME TO TRY TO REPAIR TILT MECHANISM, WOULD
26-Feb-04	14	4668020	20208	438.59	498.59	1.2	
12-Jan-04	13	4173819	15487	450.9	579.43	1.7	15487 41 3C529 VERFIY SHIFTER NOT GOING INTO PARK FROM DRIVE BCE, PINPOINT TEST, WDS TESTED NO CODES REPLACE COLUMN PER :NG WI
20-Mar-04	16	5044982	21276	0	56.01	0.3	21276 VERIFY COMPLAINT PERFORMED DIAGNOSTIC ROUTINES NEEDS NEW UPDATED STEERING COLUMN ORDERED PART MILEAGE OUT 21277
5-Apr-04	17	5365094	22003	438.59	578.61	1.2	22003 INSTALLED SOP STEERING COLUMN RETEST OK MILEAGE OUT 22004
4-Sep-03	10	2558635	15000	449.59	778.76	2.5	VERIFY SHIFTER NO GO INTO PARK INTERMITTANT AND BRAKE SWITCH HOT REPLACE SWITCH RETEST REMOVE STEER COLUMN AND INSPECT REI
7-Oct-02	0	125908	4	728.31	871.33	1.8	VERIFY CONCERN FOUND CONDITION PRESENT PERFORM NECESSARY DIAG FOR CONDITION MAKE NEW KEY AND REPLACE BINDING CYLINI CH BF
13-Apr-04	19	5530154	14551	438.59	546.49	1.2	VERIFY SHIFTER GETS STUCK CHK OASIS NO SSM OR TSB CHK SHIFT LOCK ACTUATOR GETS STUCK REPLACE STEERING COLUMN SHIFT LOCK ACT
15-Mar-04	13	5068201	19301	469.92	545.47	1.2	REPLACE SLOPPY STEERING COLUMN ASSEMBLY.
10-Jul-03	5	1714751	8583	438.59	528.58	1.2	DIAG PINPOINT REPLACE STEERING COLUMN ASSY SHIFT LOCK ACT BINDING RETEST
4-Jun-04	17	6338675	19235	469.92	656.21	2.8	SHIFT INTERLOCK BINDING CHECK LINKAGE REMOVE COLUMN COVER FOR ACESS TO SHIFTER INTER LOCK.CHECK OPERATION CONTACT HOTLINI
2-Mar-04	15	4874826	16502	481.17	612.15	2	DIAGNOSE KEY WONT COME OUT OF IGNTION WONT GO TO APARK SHIFTER BROKEN REMOVE AND INSTALL STEERING COLUMN REPLAE REPL SHII
2-May-03	6	1104369	10509	751.08	997.13	3	ACTUATOR NOT OPERATING PROPERLY EEC (QUICK TEST) DIAGNOSIS
23-Jan-04	17	4238283	27651	0	76.58	1.2	TENSION ON STEERING COLUMN BRAKE NEEDS RESET ACCESS DASH AND STEERING COLUMN RESET TENSION ON COLUMN BRAKE REINSTALL TR
9-Apr-04	10	5433099	5161	0	40.89	0.5	CHECK TILT COLUMN MECHANISM AND ADJUST AND SECURE
1-Apr-03	3	847590	2848	596.92	816.07	3	2850 CK OUT REPL STERERING COLUNM TO REPL COLUNM ASY NESS TO TRANSFER T SIG SWITCH,CLOCKSPRING SHIFT LEVER WIRING HARNESS
1-Mar-04	6	4860937	2983	438.59	553.84	1.7	VERFIED CONCERN,PINPOINT TEST,FOUND BAD SHIFT SOLENOID REPLACED STEERING COLUMN,RETEST OK

24-Apr-03	1	1042959	294	596.92	740.92	2.4	CHECK FOR KEY DISASSEMBLE STEERING COLUMN EXTRA TIME FOR AB NORMAL DIAG FOUND REMOVAL INHIBITANT SWITCH BROKEN CALLED
8-Oct-03	10	3334572	15412	470.02	770.82	2.4	MOVING FORWARD THEN GOING TO PARK WILL NOT GO.PARK PAWL IS BINDING IN TRANS. WILL NEED TO REMOVE PAN POSSIBLY VALVERO4 VE TC
30-Dec-03	13	4207479	15538	438.59	626.61	2.5	15538 VERIFY COMPLAINT, FOUND VEHICLE WILL NOT GO INTO PARK UNLESS PRESSURE IS LET OFF SHIFTER ONCE VEHICLE IS IN REVERSE. THE S
5-Feb-03	3	602371	2337	0	252	0	ESP NINE DAY RENTAL
5-Feb-03	3	545272	2337	775.8	963.41	2.6	REPLACE STEERING WHEEL AND STEERING COLUMN
26-May-04	12	6262250	21476	648.95	1051.22	5.3	VERIFY PROBLEM, TRY ADJUSTING CABLE. REPLACE WITH NEW CABLE. CHECK SHIFTER. REPLACE WITH NEW ONE. STILL DROPS OFF. DISABI UNTIN
17-May-04	9	6169489	8445	614.54	1207.68	6.5	ROAD TEST VERIFY CONCERN REMOVE AND REPLACE STEERING COLUMN BEARINGS RE TEST SLIGHT NOISE STILL REMOVE AND REPLACE STEERI
21-May-04	14	6146049	9466	572.05	675.33	1.2	REPLACED STEERING COLUMN RECHECKED OK
24-Nov-03	7	3579214	7479	581.13	680.47	1.2	CONFIRMED CONDITION AND PIN POINTED KEY INTERLOCK SOLENOID NOT FUNCTIONING PROPERLY REPLACEMENT OF COLUMN REQUIRED SHIFT
3-Feb-04	5	4409178	4986	438.59	597.29	1.7	SHIFTER MOVES IN RUN W OUT STEPPING ON BRAKE CHECK AND VERIFIED CHK FUSES OK FROM C270 TO C2008 OK C278 LG RD POWER CHK TERLC
19-Jun-03	7	1561700	6589	788.78	945.28	1.8	TESTED REPLACED STEERING COLUMN AS PER SSM 15030
29-Dec-03	14	3956094	23471	438.59	531.31	1.2	23471 3C529 FOUND OUT THAT THERE WAS A CLICKING NOISE COMIN FROM STEERING COLUMN WHILE SET IN REVERSE. DIAG AND FOUND (ACED
19-May-04	12	6087584	7019	551.37	653.24	1.2	VEH NOT SHIFTING INTO PARK REPACLED COLUMN
16-Jun-03	5	1475852	10149	596.92	702.85	1.4	INSPECT AND VERIFY VEHICLE WILL NOT SHIFT OUT OF PARK , SHIFT LOCK INOP, REMOVE LOWER COLOUM TRIM , TEST SHIFT LOCK ACCUAT IVATE
3-Feb-04	15	4560861	21650	438.59	721.76	3.8	DEFECTIVE SHIFT INTERLOCK VERIFIED THE CONCERN.RAN OASIS,NO SSMS.PINPOINT TEST AND FOU ND THAT THE SHIFT INTERLOCK IS NO CK,M
17-Jun-04	9	6545866	11139	575.81	703.12	1.4	SHIFT COLLAR BROKEN,REPLACE STEERING COLUMN
26-Feb-04	8	4813839	15486	570.48	728.48	1.9	15486 15499 PERFORMED DIAG FOR SHIFT LINKAGE AS PER 307 05 9 IN SHOP MAN. LINKAGE OK,ADJ. OK, CHECKED OASIS 215 382 421 CONT ED ST
5-May-04	7	5919083	16516	567.66	771.43	2.5	16516 CHECKED AND VERIFIED CAN MOVE SHIFTER FROM PARK POSITION, CHECKED FUSE FOR SHIFT INTERLOCK,FOUND OK MANUALY MO\S TO F
27-Jan-03	2	478693	2194	596.92	683.78	1.2	CHECK IGNITION OPERATION, CHECK STEERING COLUMN OPERATION, CAN NOT GET COLUMN TO LOCK, REMOVE TRIM PANELS AT STEERING
24-May-04	19	6126296	26748	438.59	642.51	2.2	ACTUATOR IN STEERING COLUM IS STICKING. HAD TO INSTALL NEW STEERING COLUM AND ACTUATOR ASSY.
16-Dec-03	15	3826208	30551	438.59	498.71	1.2	SHIFT INTERLOCK SOLINOID BINDING DIAG TO SHIFT SOL WORKING TOO SLOW,PART NOT AVAILABLE,NECESSARY TO
28-Jan-03	5	524194	8857	638.3	915.8	3.4	8857 PERFORMED A BODY CHASSIS ELECTRICAL TEST AND FOUND SHIFT ACTUATOR TO BE BAD HAD TO REMOVE STEERING WHEEL, AIRBAC UGH A
6-Apr-04	3	5559649	1392	438.59	574.31	2.2	THUMP GOING OVER BUMPS IN THE STEERING COLUMN RUN OASIS SSM 17276 RAISE ON HOIST HOOK UP CHASSIS EARS, RETEST NOISE 18 ILL HA
17-May-04	12	6048044	15397	438.59	529.39	1.2	VERIFIED NOISE WHEN RELEASING BRAKE, FOUND EXCESSIVE NOISE COMING FROMSHIFT LOCK ACTUATOR ON STEERING COLUMN, PART O ILE NC
16-Jul-03	6	1805031	15807	438.59	617.01	2.4	MT TIME TO CHECK IGNITION CYLINDER SYSTEM IGNITION CYLINDER IS OK SHIFT INTERLOCK SYSTEM PREVENTING KEY REMOVAL REMOVEL CK ST
18-Mar-04	18	5163848	33463	438.59	528.66	1.1	STEERING COLUMN BINDING DIAG INSP VERIFIED CONCERN FOUND STEERING COLUMN BAD INOP MT TIME TO REPLACE IT NO SLTS
31-Jul-03	0	2060375	13	474.99	647.19	1.8	FAILED STEERING COLUMN AND SWITCH REPLACED Y
11-Mar-04	9	4878002	13766	535.71	650.85	1.4	CONFIRMED TILT WHEEL NOT LOCKING FOUND COLUMN BROKEN INSIDE LOCATE AND DIAG, NESSASARY TO REMOVE AIR BAG, STEERING WHEEL A
5-Jan-04	9	4036235	23711	438.59	642.67	3.1	VERIFIED. SHIFT LOCK ACTUATOR BINDING INSIDE THE STEERING COLUMN VERIFIED CONCERN. ORDERED AND REPLACED THE STEERING COLUMI
1-Oct-03	6	3719152	8710	442.57	1044.96	8.7	CUSTOMER HAD SWAPPED FUSE 24 INTO F223 POSITION SO TRUCK COULD MOVE PUT 5 AMP FUSE IN F2.23 FUSE AND CHECKED WIRING UNC FUSE
23-Feb-04	15	4736973	20080	438.59	623.46	1.8	INTO PARK EEC TEST NO GEM CODES ,NO PCM CODES R AND R STERRING COULUME PINPOINT TO TRIM BEZEL SHIFT INTERLOCK SLUG GISH. R AN
8-Apr-04	18	5452603	22327	438.59	542.02	1.2	TECH FOUND SHIFT INTERLOCK BINDING AND STICKING TECH R R AND REPLACED FAULTY STEERING COLUMN
24-Jun-04	22	6572460	17540	438.59	604.4	1.8	INOP BODY CHASSIS ELECTRIAL (BCE) TEST
17-Oct-03	0	2973659	60	438.59	620.25	2.7	PERFORM BODY CHASSIS ELECTRICAL TEST RR STEERING COLUMN REPLACE COLUMN AND ROAD TEST
24-Mar-04	9	5249826	14730	438.59	540.59	1.2	REMOVED AND REPLACED SHIFT COLUMN RECHECK OK
3-Jun-03	1	1494902	278	0	56.96	0.8	DASH BRACKET TIME TO TRACE TO AND RETORQUE STEERING COLUMN SUPPORT
23-Sep-03	6	2715160	4641	438.59	532.57	1.2	RAN OASIS AND FOUND NO MESSAGES. FOUND SHIFT INTERLOCK ACTUATOR TO BE MAKING THE NOISE. REPLACED STEERING COLUMN, THA ECH H
1-Jun-04	14	6262666	26327	438.59	656.39	3	REPLACE STEERING COLUMN
3-Mar-04	13	5306854	19758	438.59	515.47	1.2	25 CHECK SHIFT LEVEL OPERATION STICKS CHECK ALL LINKAGE ALL FREE EXCEPT FOR IN STEERING COLUMN CALL TECH HOT LINE AND WA NOW
29-May-03	1	1594719	62	598.74	676.85	1.4	REPALCED COULUN
20-May-04	11	6309642	13824	438.59	537.85	1.2	DIAGNOSE AND REPLACE COLUMN
1-Mar-04	16	4887770	29142	632.73	763.65	1.4	CHECK SHIFT,R I COLUMN COVER TO INSPECT SHIFT LINKAGE,BINDING,NEEDS COULMN.REPLACE COULUMN AND TRANSFER ALL PARTS TO NEW C
21-Oct-03	10	3176246	8564	520.04	625.04	1.2	SHIFTER BINDING IN COLUMN REPLACE STEERING COLUMN
30-Dec-03	6	4128020	8451	438.59	585.52	2.6	CHECKED AND FOUND BRAKE SHIFT INTERLOCK SOLENOID NO OPERATIN G. REPLACED STEERING COLUMN AND RECHECKED OK.
10-Mar-03	3	706012	3522	626.74	705.27	1.2	
9-Jan-04	10	4313938	9658	438.59	509.39	1.2	REPLACE THE STEERING COLUMN W/ UPDATED UNIT
5-May-04	18	5863946	30075	557.33	656.59	1.2	STICKING.... STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
14-Apr-04	18	5517855	17167	438.59	540.59	1.2	CHECK SHIFTER HARD TO MOVE INTO PARK. VERIFY CONCERN R&R STEERING COLUMN ASSEMBLY
23-Jun-04	12	6602919	22855	438.59	515.26	1.4	CANT GET OUT OF PARK LOCK SOLINOID NOT WORKING CALLED HOTLINE SAID TO REPLACE COLUMN 3C529 REPLACE COLUMN CONCERN RESOLV
12-May-04	12	5987583	8449	438.59	528.58	1.2	8449 42 INOP WAR BASIC. REPLACED STEERING COLUMN. RETEST PASS.
8-Jun-04	17	6370305	35998	438.59	541.54	1.2	REPLACED STEERING COLUMN.
30-Jan-03	1	501896	212	596.92	1039.4	5.4	212 WARRANTY VERIFIED CONCERN.FOUND RATTLE FROM DASH AREA. USED CHASSIS EARS TO BETTER HELP ISOLATE NOISE CONCERN.R CAUS
19-Apr-04	16	5651627	28455	551.37	704.17	1.8	SHIFTING TO PARK IS HARD REPACED STEERING COLUME
25-Nov-02	1	388260	1463	576.73	870.83	4.4	PULL COMPLETE COULOM SWITCH ALL PARTS REASSEMBLE RETEST OK ELECTRICAL DIAG PINPOINT TEST TO TEST IGNITION SWITCH LOCK INKAC
4-Mar-04	9	4806995	5788	443.29	600.41	2.2	R AND R KNEE POLSTER TRIM PANEL AND LOWER STERRING COLUMN. SPRING FOR TILT STERRING. CALLED PARTS COULD NOT FIND RING T ND CL
3-May-04	13	5841028	25872	438.59	533.66	1.6	25872 TEST DROVE VEH. REMOVED STEERING COLUMN TRIM AND INSP. FOUND SHIFTER GATE DEFORMED. REMOVED STEERING COLUMN A O VEH
31-Mar-04	15	5496175	22052	0	11.15	0.2	RI TRIM UNDER STEERING WHEEL TO TIGHTEN NUT FOR TILT WORKS OK
15-Mar-04	15	5000174	6865	438.59	528.01	1.2	ACCESS AND RPL UPPER COLUMN ASSEMBLY
6-Jan-04	13	4232466	11933	0	83.58	1	CHECK VERIFY CONCERN RUN OASIS FOUND SSM15030 ORDER STEERING COLUNM
3-Mar-04	15	5130167	14032	438.59	605.75	2	1 REMOVE AND REPLACE STEERING COLUNM AS PER SSM 15030
20-May-04	19	6069139	16888	438.59	547.98	1.2	REPLACE STEERING COLUMN ASSY
18-Mar-03	4	910108	5103	596.92	691.12	1.5	5103 TEST SHIFTER INTERLOCK CIRCUIT FOR PROPER GROUND AND POWER CIRCUITS FOUND OPEN CIRCUIT IN INTERLOCK SOLIEND INSTALL NE
23-Feb-04	17	4667929	15759	438.59	530.54	1.6	CHECK OPERSTION, CHECK AND ADJUST SHIFT INTERLOCK OPERATION CHECK FORD ONLINE FOR ANY UPDATE MESSAGES ,NONE FOUND. R WITH
9-Sep-03	11	2663745	32164	438.59	524.67	1.2	CHECKED FOR CONCERN,FOUND INTERLOCK STICKING FOUND OUT INTERLOCK COMES AS WHOLE COLUMN ORDERED NEW COLUMN.PUT T D LOV
2-Oct-02	0	182871	81	576.73	659.53	1.2	REPLACXED STEERING COLUMN

5-Apr-03	4	976042	3081	596.92	680.01	1.2	REPLACE STEERING COLUMN ASSEMBLY
10-Feb-04	18	4465888	25984	438.59	666.06	3.3	SHIFT LOCK NOT RELEASING REPLACED STEERING COLUMN TEST SYSTEM FOR CODE FOUND BAD STEERING COLUMN
9-Dec-03	1	3795616	871	586.77	671.56	1.2	
27-Apr-04	15	5719993	22754	457	695.24	3.1	REMOVED TRANSMISSION PAN INSPECT INTERNAL MANUAL VALVE AND DETENTS REALIGNED STILL TIGHT FROM DRIVE TO NEUTRAL REMOV TTEN
13-Mar-04	15	5003472	14849	473.95	724.87	3	STICKY COLUUM R&R STEERING COLUMEM ASSY.REPLACE HOUSING & SHIFTER HANDLE.. TRANSFER IGN KEY & TUMBLER,PATS DECODER,ETC,AD
2-Jan-03	1	477952	2072	596.92	778.69	2.5	PERFORMED IGNITION SWITCH PINPOINT TEST DCL/MONITOR TESTED SENSOR PIDS INSTALLED NEW STEERING COLUMN REQUEST ACTUAL TIME N
28-Oct-02	1	179454	1090	576.73	663.85	1.2	N57 STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
4-Dec-03	1	3616422	4999	474.99	568.35	1.8	IGNITON CYLINDER BINDS UP DEACTIVATE AIR BAG SYSTEM R&R STEERING COLUMN BUILD IGNITION CYLINDER R&R KEY CYLINDER REACTIVATE A
7-Feb-03	5	597708	5178	596.92	893.92	3.3	REPLACED CLOCK SPRING ASSEMBLY
15-Dec-03	15	4277169	29451	449.59	679.37	2.4	CHECK FOR TRANS IS HARD TO GET OUT OF PARK EEC TEST SYSTEMS PASS MONATER BOO PID IS OK CAN HER NOISE FROM ACUATOR AND WITCH
10-Jun-04	11	6363372	13396	438.59	594.31	2	3C529 N57 42 VERIFIED STEERING COLUMN TILT INOP. REMOVED COLUMN COVERS TO INSPECT, UNABLE TO REPAIR COLUMN TILT, REPLACED STE
4-May-04	15	6334510	26704	438.59	597.98	2.2	EXTENDED TESTING TO DUPLICATE CONCERN, PARTIAL TEAR DOWN OF COLUMN FOUND INTERNAL SHIFT INTERLOCK BINDING CK SHIFTER (NCER
10-May-04	14	6238420	10808	473.95	830.4	1.7	BROKEN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL REFUND FOR RENTAL WHILE VEHICLE BEING REPAIRED
8-Apr-03	3	895368	2789	0	10.72	0.2	INSP LOOSE TRIM SECURE TRIM AROUND IGN LOCK AND GEAR LEVER
10-Nov-03	12	3311910	24285	438.59	528.48	1.2	W P 69 BINDING 3C529 OASIS CONTACT NO 313 310 789 CHECKED OUT SHIFTER WOULD BIND AND NOT GO INTO PARK 2 OUT OF 3 TIMES COLUND SH
9-Oct-03	11	2886007	22250	438.59	538.47	1.4	BINDING INOP REPLACE SPECIAL ORDERED STEERING COLUMN AND RETEST OK
24-Mar-04	16	5359067	21649	438.59	774.99	5	VERIFIED CATCH IN SHIFT LEVER. BINDING UP. SHIFT INTERLOCK IS NOT PULLING ALL THE WAY BACK. UNABLE TO SERVICE SEPARATE ACCOD.
12-May-03	4	1177087	1745	596.92	750.32	2.6	SHIFT INTERLOCK SOLENOID BODY CHASSIS ELECTRIAL (BCE) TEST
27-Oct-03	13	3100211	12445	438.59	853.33	4.6	12300 SOP STEERING COLUMN REMOVE AND INSTALL STEERING COLUMN ROADTEST CHECK ALL ACCESORYS OK AT THIS TIME SSM FOR THIS PR
16-Jun-04	17	6470196	16550	438.59	591.08	1.2	3L2Z 3C529 BA P01 42. ROAD TESTED, VERIFIED CONCERN, SHIFTER LEVER HANGING UP, R&R TRIN FROM STEERING COLUMN TO INSPECT, R ING), I
2-Jan-04	16	3956435	27525	541.97	715.41	2	VEH JAMS UP WHEN GOING INTO PARK ACCESS STRNG COLUMN,M TO REPL STRNG SWITCHES
21-May-04	18	6126179	16974	438.59	567.69	1.4	VERFIY CONCERN OF HARD GOING INTO PARK,REPLACED STEERING COLUMN
23-Jun-04	17	6557182	18154	438.59	577.02	1.9	STICKY BRAKE SHIFT INTERLOCK SOLONOID RT VERIFIED CONC DICONNECTED SHIFTER CABLE AT TRANS CONC STILL EVIDENT REMOVE KNEE BC
30-Mar-04	13	5325832	32392	438.59	559.54	1.4	DIAGNOSE AND REPAIR SHIFTER REPLACE COLUMN ASM
3-Mar-03	6	671227	6899	699.85	844.91	2.4	DIAG NIOSE IN STERRING REMOVE AND REPLACE UPPER STERRING COLUMN ROAD TEST DIAG NOISE IN STERRING REMOVE AND REPLACE LOWER
19-May-03	0	1276323	11	596.92	780.84	2.4	VERIFIED CONCERN PERFORMED DIAGNOSIS CHECKED BRAKE SWITCH OK PINPOINT TEST AS PER SHOP MANUAL FOUND CONNECTOR NOT PART
28-Apr-04	13	5792108	14222	557.18	902.14	4	M TO REMOVE BROKEN BOLTS TECH TESTED AND REPLACED COLUMN AND SHIFT INDICATOR AND RETESTED
15-Mar-04	16	4954789	11212	0	12.83	0.2	ROAD TESTED VEHICLE FOR OPERATION. INSPECTED STEERING COLUMN. FOUND BOLT LOOSENED. RETORQUED STEERING COLUMN BOLT
28-Apr-04	18	5775896	15173	438.59	601.39	2.2	15000 STEERING COLUMN BRAKE SHIFT INTERLOCK ASSEMBLY DID NOT VERIFY CONCERN AT FIRST BUT SERVICE ADVISOR DID CHKD OASI: PLACE
26-Feb-04	5	4764239	9501	438.59	622.32	2.5	REPLACE STEERING COLUMN ASSEMBLY
26-Dec-03	16	3917622	30395	438.59	627.21	2.7	STEERING COLOUM TAB BROKE STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
7-Jan-04	9	4054920	11388	469.92	563.16	1.2	BCE TEST PASS, PNPNT TEST SHFT INTERLOCK LAZY, RPLC TILT COLUMN, RETEST ORADTEST
14-Nov-02	0	215927	15	576.73	658.08	1.2	ROAD TEST WITH CHASIS EAR,RUBBING NOISE COMING FROM UPPER PART OF COLUMN. REPLACE STEERING COLUMN ASSY. ROAD TEST,OK.
7-Oct-02	0	183558	10	598.47	1059.99	7.2	
21-May-04	17	6252730	16765	438.59	567.91	2.2	VERIFIED CONCERN DIAGNOSED FOUND A BAD SHIFT INTERLOCK SWITCH REPLACED STEERING COLUMN AND SWITCHES RETESTED WORKING
3-Apr-03	2	860160	1191	596.92	665.14	1.2	. CHECKED FOUND SHIFTER LOCKOUT SOLENOID LOUDER THAN NORMAL HAD TO REPLACE COMPLETE STEERING COLUMN TO CORRECT PROBLEN
20-Mar-03	4	767933	4487	596.92	706.93	1.8	VERIFIED CONCERN, EEC TEST, NO CODES, REMOVED IGNTION LOCK CYLINDER, PLUNGER ON STEERIGN COLUMN STICKING, MUST REPLACE REPLA
3-Sep-03	1	2773256	1385	493.34	607.58	1.8	DEFECTIVE STEERING COLUMN AND TRANSMISSION SHIFTER ..... TEST TRANSMISSION SHIFTER OPERATION REPLACE STEERING COLUMN AND TI
10-Sep-03	10	2442175	24087	438.59	514.03	1.2	DIAGNOSED AND CONFIRMNED CONCERN VEICHLE WILL NOT COME OUT OF PARK SHIFT INNER LOCK INOP REMOVED UPPER STEERING COLUMN
2-Apr-04	4	5428243	1133	438.59	539.87	1.2	VERIFIED CONCERN ON PREVIUOS RO REPLACED STEERING COLOUMN SHIFT INTER LOCK
2-Jun-03	2	1346788	5778	0	82.6	1.2	VERIFY CONCERN, FOUND PIVOT BOLT LOOSE, HAD TO REMOVE AND INSTALL KNEE BOLSTER AND COLUMN TRIM FOR ACCESS
18-Dec-03	9	3790534	29013	438.59	651.96	3.1	VERIFY CONCERN, CHECK OUT SHIFT CABLE, OK, CHECK STEERING COLUMN CIRCUIT, FOUND SOLENOID ON SHAFT ABD, HAVE TO GET AS AN ASY,
7-Nov-03	12	3405893	27505	438.59	618.64	2.3	TEST DROVE VERIFIED CONCERN ONCE COULD NOT GET IT TO HAPPEN AGAIN RAN OASIS HAD SECOND TECH W ATTEMPTED TO DUPLICATE AT IT
5-Mar-03	0	686345	12	596.92	819.62	3.4	VERFIED CONCERN PERFORMED PINPOINT REPLACED DRIVERS AIR BAG MODULE
15-Jun-04	19	6435013	20110	438.59	538.98	1.4	WORN BUSHINGS STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
27-May-04	19	6297913	33315	438.59	520.45	1.2	SHIFT INTERLOCK SOLONOID NOT WORKING CORRECTLY. UNABLE TO BUY SOLONID SEPPERATLY. CONTACTED HOTLINE AND WAS TOLD TO
14-Apr-03	2	1131037	4103	596.92	671.12	1.4	CUSTOMERS COMPLAINT COULD ONLY BE IN COLUMN, DUE TO IGNITION LOCK CYLINDER WAS REPLACED. REMOVED AND REPLACED STEERING CC
30-Oct-03	2	3238247	4074	438.59	516.84	1.2	REPLACE STEERING COLUMN FOR BINDING CONDITION
17-Mar-04	10	5814537	27544	573.3	673.18	1.2	ADD ON BY AT CK AND DIAG PINPOINT COMPLETE DIAG REPLACED STEERING COLUMN RETEST OK
2-Feb-04	13	4357565	9002	610.27	709.77	1.2	NOISY NOISE FROM SHIFT SOLENOID REPL UPPER STEERING COLUMN
26-Sep-02	0	120682	13	576.73	641.83	1.2	R & R STEERING COLUMN ASSY
5-Aug-03	11	2094426	12783	438.59	927.52	6.2	CHECK SHIFTER OPERATION VERIFY CONCERN INTERMITANTLY STICKING WILL NOT SHIFT INTO OR OUT OF PARK DIAGNOS SYSTEM FOUND ERATI
24-May-04	17	6187969	19213	438.59	555.44	1.2	INSTALL THE UPDATED STEERING COLUMN, SOLENOIDS STICKING
5-Jun-04	10	6364207	12301	557.01	817.31	2.9	X PERFORM SSM
9-Jul-03	5	1728521	8000	438.59	545.25	1.4	42 H20 3C529 CHECKED FOR NOISE WHEN DEPRESSING BRAKE FOUND THAT SHIFT INTER LOCK MAKING NOISE NECC TO REMOVE SHIFT INT RETE
2-Jun-03	1	1381714	14	596.92	874.32	4	VERIFIED KEY WILL NOT COME OUT OF IGNITION RUN DIAG FOR ANY PATS CODESREMOVED STEERING COLUMN COVERS AND FOUND BROKEVED S
16-Mar-04	10	4976677	13484	438.59	641.77	2.7	13484 INSP COLUMN OPERATION AND INSTALLED NEW COLUMN CC 42 REQUEST EXTRA TIME NECASSARY TO TRANSFER ALL HARDWARE AND HAF
22-May-04	15	6113921	19693	438.59	550.61	1.2	19693 VERIFIED CONCERN FOUND FAULTY STEERING COLUMN REMOVED AND REPLACED STEERING COLUMN
17-Jun-03	5	1841067	10738	596.92	689.34	1.2	10738 REMOVED LOWER PANEL TO INSPECT,REMOVED LOWERED DOWN COULUM NEEDS COULUM SIDE LOCKS ARE CRACKED AND SRE PAINTS, F
27-Jan-04	15	4425479	25067	438.59	575.59	2	25067 ROAD TESTED. VERIFIED CONCERN. GEAR LEVER STICKS AT TIMES WHEN SHIFTING. RAISED VEHICLE. INSPECTED LINKAGE AT TRANSTO IN
5-Apr-04	17	5653217	15857	469.92	529.5	1.2	REPLACE STEER COLUM PER HOTLINE. CHECK CONCERN. CALL HOTLINE. R&R STEERING COLUMN ASSEMBLY. ROAD TEST,OK, REPORT #4DEBU00
17-Oct-02	1	164234	1007	576.73	673.93	1.2	FC D4 CC N58 BASE#3C529 CHECKED AND REPLACED STEERING COLUMN ASSEMBLY
20-May-04	7	6207945	9629	473.95	641.41	2.2	RR COMPLETE STEERING COLUNM REPLACED COLUNME TRANSFER ALL NEC PARTS REINSTALL
18-Nov-03	9	3824113	11186	438.59	544.06	1.9	CHECKED OUT, REMOVED SHIFT CABLE, STILL WOULDN'T WORK, R&I AIR BAG.STG WHEEL, REPLACED STEERING COLUMN.
18-Jun-04	16	6471270	17998	438.59	516.15	1.2	SHIFT INTERLOCK IN CLOUMN DEFECTIVE CK AND VERIFY AND REPLACE SHIFTER COLUMN

29-Nov-02	2	273531	1315	576.73	687.66	1.7	1315 VERIFY IGNITION KEY WILL NOT COME OUT OF IGNITION,REMOVE COLUMN COVERS TO CK KEY SWITCH PERFORM COMPONENT TEST (LOWE
25-Jun-04	14	6593434	33741	438.59	531.13	1.2	NOTE SPOKE WITH TENESHA AT WARRANTY HOTLINE ON 6 25 04 AT 1:55PM. SHE STATED THAT SINCE THE PROI RTS T
21-Nov-03	8	3578875	5864	474.99	553.24	1.2	. REPLACED STEERING COLUMN AND IGNITION CYLINDER
5-Apr-04	9	5322033	9543	548.24	652.56	1.2	BRAKE SHIFT INTERLOCK ACTUATOR STEERING COLUMN ASSEMBLY SSM 15030
9-Apr-04	16	5442854	34635	545.42	671.69	1.4	DIAG. FOUND INTERLOCK BINDING. NOT SERVICED SEPARATELY. REPL COLUMN ASSY.
16-Oct-03	1	3099761	659	438.59	529.26	1.2	TEST DROVE AND VERIFIED CONCERN REMOVED COLUMN TRIM AND TEST DROVE FOUND SHIFT INTERLOCK PIN RATTLEING REPALCED STEERING
15-Mar-04	14	4946795	31425	438.59	659.06	3	31425 42 3.0 INSP AN CONFERMED PROBLEM WAS NOT DUE TO BRAKE LIGHT PROBLEM.AFTER REPAIR ON BRAKE LIGHTS WAS COMPLETE P ED AN
8-Apr-03	0	1013596	4	596.92	870.52	2	IN TRANSIT VEHICLE WILL NOT SHIFT OUT OF PARK TEST SHIFT INTERLOCK SOLONOID AND REPLACE SCOLUMN
28-Nov-03	13	3521331	19559	573.3	687.24	1.5	P01 42 DIAGNOSE AND REPLACE STEERING COLUMN SHIFT TUBE, RECHECK OK
17-Jun-04	19	6512460	17203	438.59	565.19	1.7	REPLACE STEERING COLUMN ASSY
22-Sep-03	9	2627656	18310	438.59	575.75	1.8	NGS TEST, PINPOINT TEST, VERIFY CONCERN. CHECK SHIFT INTERLOCK, GOOD. REMOVE STEERING COLUMN. XFER COMPONENTS TO COLUMN. RE
8-Mar-04	11	4824029	17217	438.59	522.29	1.2	STEERING COLUMN IS LOOSE TILT WHEEL WILL NOT STAY PUT. R AND R STEERING COLUMN COVERS AND LOWER DASH TRIM, INSPECTED, ALLEI
24-May-04	16	6167995	21025	438.59	527.71	1.2	REPLACE STEERING COLUMN ASSY SHIFTER ACTUATOR STICKING.
3-Jan-03	1	402987	338	596.92	759.34	2.5	TYPE 1, CUST. P01, COND 42, CAUSAL LINE 1, M TIME FOR AB NORMAL DIAG. ON SHIFT COLUMN TRACE SYSTEM TO INOP SHIFT INTERLOCK SOLENC
22-Sep-03	12	3076490	24534	438.59	509.39	1.2	FAILED STEERING COLUMN REPLACE
4-Mar-04	9	4972371	12726	438.59	577.04	1.9	CCC P01 INSTALL STEERING COLUMN DUE TO STICKING
15-Mar-04	13	4973229	34831	508.92	648.78	1.8	HKD IGNITION SYSTEM BUILT & RPLCD KEY CYLINDER & STEERING COLUMN
6-Oct-03	11	2854766	8658	449.59	533.78	1.2	STEERING COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
6-Feb-04	14	4497457	11651	438.59	566.67	1.8	CC 41 CP 3C529 R&R RADIO AND TRIM BEZELS TO REPLACE STEERING COLUMN ASSEMBLY, BINDING WHEN SHIFTING INTO OR OUT OF PARK. RETE
24-Jan-03	0	470850	285	699.85	818.82	1.7	SLACK IN STEERING COLUMN & LOWER SHAFT REPLACED STEERING COLUMN & LOWER STEERING SHAFT.
6-Mar-03	5	685839	6991	596.92	734.97	2.2	A REPLACE STEERING COLUMN ASSY
18-Oct-02	0	270613	21	576.73	656.71	1.2	VERIFIED CONCERN OF NOISE COMING FROM STEERING COLUMN CHECKED OASIS FOR MESSAGES NOE PRESENT CALLED HOT LINE WAS TOLD TC
30-May-03	3	1406996	2643	699.85	980.57	4.4	REMOVED AND REPLACED STEERING COLUMN ASSEMBLY PER TECH LINE
10-Feb-04	12	4465304	20040	438.59	590.09	2	STICKING SHIFTER INTERLOCK. DEACTIVATE AIR BAG SYSTEM. R&I STEERING WHEEL. R&I STEERING COLUMN. M TIME IS LBR TO TRANSFER ERATI
16-Jan-03	0	431858	5	596.92	809.7	3.2	ROAD TEST AND DIAG ALL FRONT SUSPENSION AND INSPECT UPPER AND LOWER STEERING SHAFTS AND DEACTIVATE AIR BAGS AND
13-Jan-04	11	4175352	11113	438.59	521.92	1.1	HARD TO SHIFT, COLUMN IS BINDING. REPLACED THE STEERING COLUMN ASSEMBLY AND RETEST OK.
31-Oct-03	12	3224490	9956	498.54	622.56	1.8	REPLACED AND REPINNED IGNITION SWITCH. REPLACED COLUMN ASSEMBLY.
10-Feb-04	13	4516055	26452	438.59	529.39	1.2	REPLACED STEERING COLUMN ASSEMBLY. 02 13 1344 1644.
22-Jun-04	18	6573286	31147	469.92	602.43	2	INTERLOCK FAULTY STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
18-Jul-03	10	1864862	28187	438.59	617.38	2.7	ELECTRONIC TRANS DIAGNOSIS PINPOINT TESTS REPL ACED STEERING COLUMN & RETESTED (SHIFT INTERLOCK
3-Sep-03	3	2411612	4434	438.59	529.09	1.2	1 399 INSTALLED SPECIAL ORDER PART, ACCESSED DRIVER S AIR BAG HOOKED UP AIR BAG SIMULATORS, ACCESSED STEERING WHEEL, REPLAC
27-Jan-04	15	4316803	28274	438.59	559.56	1.7	PERFORM GEM TESTS, PINPOINT TEST NO CODES. REPLACE STEERING COLUMN, SHIFT INTERLOCK SOLENO ID JAMMING INTERMITTENTNLY
5-Feb-04	14	4500426	11935	438.59	522.69	1.2	11935 KEY WILL NOT COME OUT OF IGN INSPECT FOUND IGN KEY WILL NOT TURN BACK TO OFF POSTION WILL NOT ALLOW KEY TO COME OI T LOC
26-Feb-04	7	4692471	7018	438.59	514.89	1.2	IGNITION KEY HARD TO PUT IN OR TUSTEERING COLUMN ASSEMBLY REMOVE AND INSTALL
4-Mar-04	16	5135066	7482	438.59	584.48	2.5	1 REPLACED STEERING COLUMN FOUND SHIFT SOLONOID INOP
2-Apr-04	18	5377932	24074	438.59	525.53	1.2	KEY WILL NOT COME OUT OF IGNITIONKEY RELEASE SWITCH BROKEN, REPLACED COMPLETE STEERING COLUMN
29-Apr-03	5	1090198	3045	775.8	1182.36	5.6	3048 LOOSE BINDING CK AND VERIFY. DIAG STEERING SYSTEM (ABNORMAL DIAG). STARTING W LOWER STEERING SHAFT, CK LOO SENESS TSBS
1-Nov-02	0	186234	14	576.73	672.98	1.4	VERIFIED CONCERN NOISE DIAG STEERING COLUMN SHAFT HOUSING MAKING POPPING NOISE DISASSEMBLED AIR BAG SYSTEM PER MANUAL REP
9-Oct-02	0	238949	38	712.37	902.44	2.9	1 FOUND SHIFT LOCK ACTUATOR SHORTED FOUND FUSE BOX WITH INTERNAL SHORT REPLACE COLUMN, FUSE BOX AND COVERS AS NEEDED
30-Jun-03	1	1697854	187	596.92	790.67	2.6	STEERING COLUMN DIAG,PINPOINT,REPLACE STEERING COLUMN ASSY,REINSTALL, RETEST,TEST DRIVE OK
5-May-04	17	5889883	19353	438.59	619.89	2.5	DIAG AND REPLACE STEERING COLOUM OUT OF ADJUSTMENT
22-Apr-03	0	1031169	48	634.4	880.54	3.4	N REPLACED SHIFTER LOCK ACTUATOR
27-May-04	12	6207175	13085	438.59	567.22	1.7	PERFORMED BCE TEST AND PIN POINT TEST. TRACED CONCERN TO SHIFT INTERLOCK SOLENOID. REPLACED STEERING COLUMN ASSEMBLY.
29-Mar-04	14	5320801	23447	438.59	518.38	1.2	SHIFTER IS HARD STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
28-Aug-03	4	2302893	7009	438.59	530.5	1.2	REPLACED STEERING COLUMN
14-Nov-03	12	3409302	18949	438.59	530.5	1.2	REPLACE STEERING COLUMN ASSY.
9-Jul-03	0	1747152	108	438.59	504.45	1.1	TEST & REPLACE UPPER STEERING COLUMN, RETEST OK
22-Mar-04	12	5089737	6704	438.59	665.13	2.6	SHIFT INTERLAOCK SOLENOID INOP VERIFIED CONCERN. DASH SWITCH DIAG. FOUND SHIFT INTERLOCL SOLENOID NOT FUNCTIONING. MUST REPL
14-May-04	13	6011250	7648	0	157.63	0.2	W REPOSITION WIRES AT LOWER COLUMN
30-Jan-04	17	5221106	20292	628.21	760.42	1.9	REPLACED STEERING COLUMN ASSY AND STEERING WHEEL, DELAY IN SUBMISSION DUE TO PART NOT AVAILABLE, REPAIR COMPLETED ON RO 166
14-Jun-04	14	6421079	20305	438.59	562.97	1.8	20305 42 W VERIFY CONCERN PIN POINT TEST BCE DIAG CHECK RESISTANCE OF SHIFT LOCK SOLENOID OK REMOVE TRIM PANELS TO CHECI MN CI
31-Oct-02	0	253934	20	698.71	833.71	2.5	DIAGNOSED VERIFIED LOWER STEERING SHAFT AND COLUMN BINDING REPLACED COLUMN ASSEMBLY AND LOWER STEERING SHAFT
7-Jun-04	14	6359982	24100	469.92	610.8	1.8	ROAD TEST VERIFIED COMPLAINT. STEERING COLUMN BINDS. DEACTIVATE AIR BAG SYS. DISCONNECT BATT. R&R STEERING COLUMN AN T. RO/
18-Oct-03	13	3000799	12214	438.59	579.96	1.2	STEERING COLUMN ASSEMBLY REMOVE AND INSTALL (3524)
16-Jan-04	5	4130584	6353	438.59	662.69	2.7	6353 CP 3C529 CC 33 PART REF. 5507 13300D 0.4 3600A 0.7 14200A 0.4 3514A 1.2 2.7 STEERING COLUNM LOOSE AT LOWER COLUMN BEARING UNCT
14-Apr-04	9	6287383	12474	469.92	562.98	1.2	INSPECT AND FOUND SHIFTER INTERLOCK NOISY. ONLY AVAILABLE IN COLUMN. REPLACE COLUMN
5-May-04	12	5890653	9598	474.99	683.07	2.5	NA DRILL OUT CYLINDER ASSEMBLY REPLACED STEERING COLUMN ASSEMBLY REPL
10-Mar-04	17	4933568	28922	438.59	579.01	2.7	VERIFY,PERFORMED TEST, FOUND SHIFT INTERLOCK FAULTY.R&I STEERING COLOUM ,STEERING WHEEL,CLOCK SPRING,TRANSFERED CONPON
28-Jan-04	15	4748147	27868	438.59	574.41	2	SOLENOID FAILURE. REMOVE AND REPLACE STEERIG COLUMN.
29-Oct-03	1	3143848	1778	438.59	522.69	1.2	1778 IGN KEY WILL NOT COME OUT OF IGN CYLINDER INSPECT FOUND IGN ACTUATOR WILL NOT RELEASE TO ALLOW KEY TO COME BACK AI PART
2-Feb-04	13	4391911	12611	438.59	729.62	4.1	3290 VEHICLE WONT GO PAST REVERSE. ROAD TEST, ELECTRANS TEST, FOUND SHIFTER HOUSING AT COLUMN BINDI NG, REPLACE STEERING COL
17-May-04	20	6165092	32781	438.59	506.83	1.2	DIAG AND VERIFY R AND I STEERING COLUMN COVER FOUND SHIFT INTERLOCK ACT BAD PER SERVICE MANUAL REPL COLUMN ASSY
21-Feb-03	6	631263	14767	596.92	678.16	1.2	REPLACE SHIFTER COLUMN
17-Jun-04	13	6496411	25671	438.59	528.71	1.2	FAULTY STEERING COLUMN REPLACE STEERING COLUMN ASSY.
30-Mar-04	13	5332718	17749	438.59	682.87	3.1	MT TO TAKE OUT STEERING WHEEL, CLOCK SPRING, MULTIFUNCTION SWITCH, AND WIRE LOOM TO REPLACE STEERING COLUMN ASSEMBLY RELE

7-Aug-03	4	2117650	7059	438.59	519.33	1.2	7059 CK. UNIT REPLACED STEERING COL. ASSY. AS PER HOTLINE INSTRUCTION REP.NO. 3HGHE004
13-Mar-03	2	722165	7530	596.92	676.12	1.2	STEERING COLUMN INOP STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
4-Mar-04	14	4889378	35740	438.59	527.39	1.2	COULD NOT REMOVE KEY FROM LOCK CYLINDER. REMOVED COLUMN, FOUND LOCK CYLINDER SOLENOID BROKEN. INSTALLED NEW COLUMN, WOF
2-Mar-04	14	4831319	35740	438.59	667.99	3.1	CHECKED INTERLOCK SWITCH, FOUND SWITCH TO BE INTERMITTENTLY GETTING STUCK. INSTALLED NEW STEERING COLUMN. KEY WONT COME
24-Feb-04	16	4634065	27086	438.59	589.73	2.2	INTERNAL BIND REPLACED STEERING COLUMN ASSY.
11-Dec-03	9	3812175	18275	438.59	530.28	1.8	REPLACED SHIFT INTERLOCK SOLENOID
8-Dec-03	12	3851393	22786	438.59	628.33	3.5	REMOVED STEERING COULMN AND REPLACED NEW ASSY ROADTESTED AND RECHECKED GOOD
25-May-04	13	6240934	13758	438.59	600.26	2	CCM01 DIAG, REPLACED STEERING COLUMN
15-Apr-04	11	5535230	11256	438.59	567.86	1.2	STEERING COLUMN BINDING SHIFT LEVER, HIGH EFFORT SHIFTING FROM REV TO PARK, R AND REPLACE STEERING COLUMN ASSY TO CORRECT R
14-Jun-04	18	6542164	35261	438.59	505.35	1.2	VERIFIED CONCERN INSPECTED LINKAGE FOUND FAULTYSHIFT INTERLOCK ASSEMBLY RESTRICTED REPLACEDSTERRING COLUMN ASSEMBLY VEF
5-Nov-03	11	3276459	14263	438.59	609.53	2.1	VERIFIED CONCERN, NECESSARY TO REPLACE STEERING COLUMN AND TRANSFER PARTS
14-Nov-03	13	3365685	27594	438.59	531.99	1.4	41 STICKING REPLACED STEERING COLUMN ASSEMBLY
11-Dec-02	3	333485	3010	721.03	938.83	3.6	FOUND NOISE COMING FROM CLOCKSPRING AREA RPL AIRBAG CLOCK SPRING. TESTED NOISE STILL THERE. RPL STEERING COLUMN ASSY AND
7-May-04	10	5951165	22244	438.59	597.28	2.2	TEST.REPLACED STEERING COLUMN.ERRATRIC OPERATION OF SHIFT INTERLOCK ASSY.
16-Mar-04	11	5005212	15652	438.59	655.37	3	SHIFT INTERLOCK SOLENOID INOP RR STEERING COLUMN, WHEEL, MULTI SWITCH AND REPL NEW UNIT
30-Jan-04	9	4376849	19237	438.59	666.36	3.7	SHIFT INTERLOCK DAMAGED ELECTRONIC TRANS DIAG RUN PINPOINT TEST PRESSURE TEST FOUND SHIFT INTERLOCK DAMAGED ONLY COMES W
15-Oct-03	10	3198741	12062	438.59	575.79	2.5	CK SHIFT LOCK ATUATOR HANGING UP RR COLUMN ASSEMBLY ROAD TEST KW
2-Dec-03	3	3559592	4285	438.59	560.37	1.8	BCE DIAG,PP TESTS,DEACTIVATE AIRBAG,REPL STEERING COLUMN,RETEST
7-May-03	5	1118929	9667	596.92	662.92	1.2	CK AND RUN OASIS NO SSM CK AND REPLACE STEERING COLUMN ASSY AND RECK TURNS FREELY CCCL13,CC42,3C529
9-Sep-03	11	2435067	11122	438.59	582.29	2.2	3C524 42 VERIFY CONCERN, DIAG, SHIFT INTERLOCK INTERMIT INOP,. REPL STEERING COLUMN ASSY. REASS AND RETEST. OK AT THIS TIME.
19-Feb-04	15	4613448	19205	469.92	609.09	2.1	PERFORMED DIAG FOUND SHIFT LEVER TO APPEAR TO BE BINDING ON SHIFT INTERLOCK SWITCH,SWITCH NOT AVAILABLE SEPERATELY REMOVE /
22-Oct-03	0	3079047	5983	438.59	504.59	1.2	DIAG AND REPLACED COLUMN
10-Feb-04	16	4496185	24669	438.59	593.43	2.4	24669 BODY CHASIS DIAG REPLACE STEERING COLUMN RETEST
31-Jul-03	0	2034991	28	438.59	556.49	1.7	28 PERFORM PINPOINT TEST,REPLACE FUSE,RETEST FUSE BLEW AGAIN,PERFORM PINPOINT TEST REPLACE STEERING COLOMN ASSY.
15-Jun-04	9	6471655	10112	438.59	521.67	1.2	R AND REPLACE STEERING COLUMN ASSY FOR BINDING LOCK ACTUATOR, BINDING WHEN SHIFTING FROM REV TO PARK RETEST OK
21-Jun-04	10	6521473	21252	438.59	528.72	1.2	21256 LEVER STICKS VERIFIED CONCERN FOUND LEVER SAFETY SOLENOID FO SHIFTER STICKS AND BINDS NECC TO REPL STRG COLUMN / ED RE
11-May-04	15	5969144	34125	438.59	580.78	2	PERFORM DIAG, ELECTRICAL TEST. PINPOINT TEST, R&R STEERING COLUMN, REPLACE AND RETEST. 1
18-Nov-02	0	233986	35	578.63	823.56	3.5	COLUMN SHIFT INTERLOC SWITCH MT TO REPLACE SHIFT INTERLOC SWITCH BCE TEST , PINPOINT, R&I STEERING COLUMN AND DISAMBLE REPLAC
31-Mar-04	10	5304131	20532	438.59	575.87	1.2	20532 PIN POINT TESTED RR STRERRING SHROUD RR TILT LEVER RR MULTI FUNCTION SWITCH RR AIR BAG RR STEERING WHEEL RR BOTTO ASSEI
6-Oct-03	9	3040213	15904	438.59	818.49	4.7	CCP55 DUPLICATED CONCERN, REPLACED STEERING COLUMN PER SSM 15030
16-Feb-04	5	4748224	4938	438.59	654.72	3.5	DIAG SHIFTER AND REPLACED STEERING COLUMN AND DIAG RATTLE AN D NEUTRALIZED EXHAUST, ROAD TEST, REPOSTIONED TRANS MOUI , REP(
17-May-04	10	6052992	8374	438.59	523.78	1.4	TECH INSPECTED, FOUND NOISE IN STEERING COLUMN, REPLACEMENT PART IS PART OF ASSEMBLY (STEERING COLUMN) TECH REPLACED STEER
12-May-03	2	1181014	6009	633.96	667.56	0.6	RPL SHIFTER & STEERING COLUMN GEAR SELECTOR LEVER REPLACE
8-Nov-02	1	291366	181	576.73	655.16	1.2	INOP SHIFTER STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
5-Nov-02	1	260651	180	792.83	903.94	1.7	STICKING REPLACE STERING SHAFT INTERMEDIATE AND LOWER
8-Jan-04	16	4137682	28975	438.59	697.41	3.1	FAULTY STEERING COLUMN W SHIFTER INTERLOCK SYS. TECH#175.CC42,CP3C529. PERFORM SW TEST ON IGN SW & SHIFTER INTERLOCK SYS.STE
11-Feb-04	13	4486883	9015	438.59	580.43	1.8	NGS TEST NO CODES; STEERING COLUMN TEST; PINPOINT TEST SHIFT LOCK ACTUATOR IS STICKING; REMOVED AND RE INSTALLED LOWE FER P
8-Sep-03	8	2496508	20984	489.31	685.52	2.5	20984 2.5 DIAG AIR BAG LIGHT ON CODE #B2293 DRIVERS SIDE #14056D (0.7) REMOVE AND INSTALL MODULE CLOCK SPRING (0.6) FOUND STEERINC
12-Apr-04	8	5497629	7750	438.59	537.29	1.4	CP 3Z719 C 41.SHIFT INTERLOCK SOLENOID IS BINDING DISARM AIR BAG SYSTEM.REPLACED STEERING COLUMN
21-May-04	15	6106542	17758	438.59	588.67	2	VERIFY CONCENR. SHIFT INTERLOCK STICKING, REMOVE STEERING CO LUMN, REPLACE SHIFT INTERLOCK 1
15-Jan-04	13	4091782	27425	438.59	508.19	1.2	CHECK AND REPLACE STEERING COLUMN TO REPAIR SHIFTER.
29-Dec-03	14	4042194	20096	464.91	639.15	2.8	1 FOUND STEERING COLMN LOCK ACTUATOR BAD R&R STEERING COLMN AND SHIFT ACTUATOR
2-Jan-04	13	3997067	13069	441.84	585.84	2	CHECKED SHIFT OPERATION CHECKED FUSES # F2.23 AND FUSE F2.26 FUSES OK RAN ON OASIS PERFORMED CIRCUIT TEST ON WIRE
26-May-04	18	6331092	21757	438.59	528.43	1.2	BINDS REPLACE STEERING COLUMN SHIFT TUBE
1-Jun-04	19	6344947	20892	438.59	782.9	3	STEERING COLUMN STEERING COLUMN SWITCH ASSEMBLIES DIAGNOSIS
26-May-04	19	6327118	27508	438.59	778.99	4.6	DIAG AND R&R STEERING COLUMN AND TRANSFER ALL PARTS TO NEWSHAFT LOOSE AND BINDING
24-Mar-04	10	5159489	12573	438.59	520.12	1.2	12573 STEERING COLUMN RUN NGS TEST PINPOINT TEST REPLACE STEERING COLUMN ASSEMBLY WITH UPDATED COLUMN INCLUDE R&R ALL ELI
5-Mar-04	18	4901270	29179	438.59	517.23	1.2	VERIFIED STEERING WHEEL LEVER WILL NOT LOCK. IN SPECT AND FOUND TILT LOCK BROKEN. REPLACED STEE RING COLUMN ASSEMBLY AND VE
14-Aug-03	1	2133426	519	438.59	644.22	2.7	524 LOWER BEARING CAME APART, SHAFT DAMAGED REMOVE STEERING COLUMN AND TRANSFER PARTS. INSTALL NEW COLUMN AND RETEST, O
21-Apr-04	20	5695190	25293	438.59	545.33	1.5	CONCERN HARD TO SHIFT INTO PARK FROM ANY GEAR. BODY CHASSIS ELECTRICAL PIN POINT DIAG. DIAG REVEALED SHIFT LOCK ACUUATOR
1-Jun-04	11	6223677	20565	0	14.41	0.2	20565 STEERING COULUMN TILT ADJUSTER BOLT LOOSE 33 3C529 RR TRIM COVER TIGHTEN ADJUSTER NUT
17-Nov-03	1	3467386	4075	438.59	523.43	1.2	REMOVE STEERING WHEEL FOR ACCESS, R&R STEERING COLUMN (BIDNING OPEN CKT IN SHIFT SOLENOID)
22-Apr-03	1	1078954	13	655.93	768.53	2	13 TEST KEY IGNITION WARNING SYSTEM, REMOVE STEERING COLUMN COVERS, CALLED HOTLINE ADVISED BY HOTLINE TO REPLACE IGNITI STUCI
28-Apr-04	17	5910112	16653	0.84	41.35	0.5	WIRES HANGING DOWN WIRES REROUTE WIRE OVER STRG COLUMN MAIN HARNESS WIRES MT NO LABOR TIME AVA ILABLE
27-Dec-02	4	351536	2999	576.73	651.96	1.2	STEERING WHEEL WILL NOT LOCK. STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
30-Dec-02	0	383178	25	621.59	810.09	2.7	COMING APART STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
13-May-04	15	6028630	19169	438.59	695.77	3.5	LOCK ACTUATOR WILL NOT DISENGAGE
1-Nov-02	1	187355	884	596.92	690.11	1.4	REPLACED COLUMN ASSEMBLY.
15-Jun-04	9	6443288	4588	438.59	604.97	2	VERFIED COMPLAINT INSPECT VEHICLE NOT SECURE NESC TO REPALCE COLOMN AND RETEST AFTER REPAIR
26-Mar-03	4	793370	2557	596.92	685.72	1.2	BINDING AND NOISEY STEERING COLUMN ASSEMBLY REMOVE AND REPLACE
25-Mar-03	1	803480	1242	699.85	825.65	1.7	NOISE FROM COLUMN ANDBINDING STEERING COLUMN A SSEMBLY REMOVE AND REPLACED COLUMN AND SHAFT
10-Feb-04	13	4620049	12725	438.59	693.2	4	CHECK WON'T COME OUT OF PARK. FOUND SHIFT LOCK ACTURATOR BAD REPLACE COMPLETE STEERING COLUMN REPLACE ACTUATOR RETI
22-Dec-03	6	3912655	4076	438.59	529.32	1.2	VERIFIED CUSTOMER CONCERN AND TEST STEERING COLUMN SHIFT ACTUATOR AND FOUND IT WAS BINDING UP AND CAUSING A CLICK BUZ TUAT(
19-Dec-02	0	438103	50	676.17	791.28	1.7	NOISEY STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
20-Feb-04	11	4628795	9203	469.92	572.39	1.2	REPLACED STEERING COLUMN PER TSB

24-Jan-04	14	4315353	35558	438.59	645.7	2.9	CPART# 3C529 CCODE 01 PERF TRANS DIAG ISOLATE ROOT CAUSE TO SHIFT INTERLOCK SOLON OID PART OF STG CLMN ASSY,NECESSARY TO RE
8-Sep-03	9	2430403	19633	438.59	513.42	1.2	1 VERIFIED CONCERN PERFOMRED PINPOINT TEST FOUND SHIFT INTERLOCK SWITCH FAILED REPLACED FAILED STEERING SOLOMN AS
30-Sep-03	11	2874020	20566	469.92	558.25	1.2	SHIFTER INTERLOCK BROKEN STEERING COLUMN ASSEMBLY REPLACE
2-Dec-03	0	3636673	129	469.92	574.81	1.2	REPL THE COLUMN ASSY CLOSED BY WPI
4-Aug-03	0	2046928	947	438.59	526.77	1.2	DIAGNOISE TRANS EXTERNAL CONTROLS, PIN POINT TEST G SHIFT INTERLOCK STICKING. REPLACED STEERING COLUMN RETEST
1-Apr-03	4	886796	4558	596.92	946.92	5	KEY CYL, AIRBAG , CLOCKSPRING, PATS ETS, RETESTED.
17-Feb-04	6	4628924	5453	438.59	579.45	2.4	REMOVED STEERING COLUMN TRIM FOUND SHIFT INTERLOCK CLIPS BROKEN REMOVED AIR BAG REMOVED STEERING WHEEL AND CLOCK
2-Feb-04	12	4401825	31810	438.59	530.49	1.2	INSPECT AND FOUND SHIFT LOCK SOLONOID IS STICKING, FOUND BAD SOLONOID AFTER PID MONITOR WITH WDS. REMOVE STEERING COLU OLUM
9-Jan-04	16	4205049	13329	375.94	435.94	1.2	
30-Sep-03	11	2753219	26841	438.59	522.67	1.2	VERIFED COMPLAINT CHECKED BROAD CAST MESSAGES NONE NOTHING IN OASIS, WENT ON LINE, FOUND TALK ABOUT CONCERN , FOUND INTERI
18-May-04	9	6256548	16673	438.59	438.59	0	REPLACED COLUMN ASSEMBLY, DUE TO TILT STEERING COLUMN WILL NOT STAY LOCKED
21-May-04	7	6243436	11044	500.12	801.57	5	CHECKED CONCERN, FOUND GEAR SHIFT POSITION SENSOR HAD COME OUT OF RETAINER IN STEERING COLUMN. THIS SHORTED OUT IGNIT &R ST
21-May-04	15	6103198	22281	511.39	924.12	5.5	22281 CHECKED FOR CONCERN AND DID VERIFY REMOVED STEERING WHEEL COVER TO GAIN ACCESS TO THE IGN SWITCH, REMOVED IGN. COME
24-Dec-03	12	3865862	15083	438.59	597.69	1.1	15083 SHIFT LEVER HOUSING IS BROKEN CC 01 REPL COLUMN PART#3L2Z 3C529 BA
13-Jan-04	15	4124070	17152	438.59	544.8	1.4	INTERLOCK SOLENOID VERIFEID THE COMPLAINT LET VEHICLE SIT FOR A WHILE IN PARKING LOT VERIFIED THAT IS WAS HARD TO GET
28-Oct-02	0	179595	55	576.73	693.5	1.6	57 42 W PERFORM STEERING COLUMN DIAG,PINPOINT TESTS, OKAY.PER SERVICE MGR REPLACE STEERING COLUMN ASSEMBLY AND TRANSFER /
31-Jan-04	12	4359392	8974	438.59	523.47	1.2	8974 INSPECT AND REPLACE STEEARING COLUM ACCEMBLEY AND TRANSPHER ALL WIRRING AND SWITCHES AND TEST WTY 01 587
1-Dec-03	11	3625132	11718	438.59	668.36	3	11718 SHIFT INTERLOCK BINDING DIAG AND ORDERED STEERING COLUME REPLACED STEERING COLUME ASSEMBLY CHECKED OPERATION OK
30-May-03	1	1385712	1577	641.78	969.56	2.5	1577 BINDING CC41 3514A 14056D D6 2.7 CK VERIFY CLICKING SOUND REMOVE STTERING WHEEL TO REMOVE CLOCK SPRING REINSTALL WI PEINC
9-Feb-04	12	4499101	19513	438.59	599.45	2.1	REMOVED THE STEERING WHEEL AND AIR BAG ASSY, REMOVED AND REPLACED THE STEERING COLUMN ASSY
4-Mar-04	18	5844753	9011	375.94	525.94	3	REMOVED STEERING COLUMN TO REPLACE BROKEN SHIFTER
30-Jan-04	7	4317896	2818	438.59	521.62	1.2	REPLACE STRG COLUMN
12-Dec-03	13	3707127	31816	469.92	561.83	1.2	STEERING COLUMN STEERING COLUMN ASSEMBLY REPLACE
31-Mar-04	12	5449813	16725	500.12	815.46	2.2	16725 STICKING IGN CYL, COLUMN INTERNAL DEFECT CHECKED AND VERIFIED CONCERN. REMOVED IGNITION CYLINDER. REKEYED NEW CYON, KI
3-Mar-04	15	5251765	31515	438.59	539.32	1.7	VERIFY CONCERN INTERMINENT FUNCTION OF SHIFTER INTERLOCK CKED BRALE LIGHT CIRCUIT OK REPLACED SHIFTER LOCK ASSY VERIFY REPAI
25-Feb-04	16	4695746	23294	438.59	507.94	1	23294 FOUND THAT PARK RELEASE SOLNIOD IN STEERING COLUME WAS BAD.REPLACED SOLNIOD
20-Nov-02	2	273168	183	726.49	905.52	3.3	REPLACED THE STEERING COLUMN ASSY REPLACED THE LOWER SECTOR SHAFT ASSY.
8-Aug-03	6	2085775	12609	438.59	627.7	2.2	3C529 CODE 42 TECH 1009 TEST STEERING COLUMN SWITCHES, FOUND INOPERATIVE TILT MECHANISM, REMOVE STEERING COLUMN, TRANSFER C
12-Dec-03	14	3785412	26200	469.92	577.15	1.4	FAULTY COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
16-Dec-02	0	370704	193	621.59	823.04	3	193 POPING W VERFIY CONCERN FOUND BEARING TO HAVE WENT OUT IN COLUMN AND HAD DROP SOME AND WAS MAKING NOISE AND WAS UMN F
23-Dec-02	0	594407	193	676.17	1065.65	5.8	193 NOISE W VERFIY CONCERN FOUND NEW COLUMN TO BE BAD REMOVED STREEING WHEEL AIR BAD LOWER PANEL REMOVED ALL CONN MN IN
14-Jun-04	11	6420861	12572	438.59	576.13	1.4	CC28 3C529 VERIFY THE KEY STUCK REMOVE COLUMN SHROUD INSPECT BCE DIAG FOUND THE SHIFTER LEVER TRIGGER SWITCH HAD COM T OK
25-Feb-04	14	4716548	33272	438.59	545.26	1.6	33272 42 W CHECK SHIFTER INTERLOCK,INTERLOCK SWITCH INOP, CHECK POWER FROM BRAKE SWITCH,OK.DEACTIVATE AIR BAG SYSTEM.F TERLO
26-Dec-02	1	339491	344	576.73	664.59	1.2	REPLACE STEERING COLUMN
25-Aug-03	5	2273851	12657	438.59	557.2	1.8	VERIFIED CONCERN,ELECTRICAL SYSTEM DIAG,PINPOINT TEST SHIFTER INTERLOCK ACTUATOR BAD,REPLACED STEERING COLUMN
2-Sep-03	12	2490724	16420	438.59	521.27	1.2	LOCK OUT STRIKER WAS STICKING & CATCH ON LEVER REMOVED AIR BAG,STEERING WHEEL,COVERS,LOWER COWL PANEL REMOVED CABL UM &
3-Mar-04	9	5009784	17222	438.59	714.96	2.7	CHECK FOR HARD TO SHIFT OUT OF PARK AND VERIFIED THE CONCERN INSPECTED AND FOUND THE SHIFT LOCK ACTUATOR STICKY AND REPLAC
25-Nov-03	6	3546438	16900	438.59	546.37	1.2	INSP VEH AND VERIFIED CONCERN REMOVED STEER CHECKED FUSES AND FUSES OK REMOVED STEER COLUMN TRIM AND CHECKED POWRING
9-Jul-03	1	1793477	718	438.59	673.51	3.1	INSPECT AND REPLACE STEERING COLUMN
10-Jan-03	0	400854	319	596.92	721.21	1.9	REPLACE STEERING COLUMN ASSEMBLY SLOCK IN TILT COUPLING
16-Jun-04	19	6600552	30754	438.59	551.23	2	TEST AND REPLACED COLUMN
20-Jan-04	10	4294288	7616	597.34	755.43	2.7	TESTED AND FOUND IGNITION CYLINDER BAD, REKEYED REPLACEMENT CYLINDERINSPECTED STEERING COLUMN AND FOUND IT BINDING. REMOV
12-Jan-04	10	4075761	13773	438.59	553.17	2	CHECKED OUT AND VERIFY THE COMPLAINT, CHEKCED O ASIS FOR TECH BULLETINS, NONE LISTED. CALLED TE CH HOTLINE RPT 4ALDY009 R. DIS
10-Jan-04	16	4205048	11792	375.94	435.94	1.2	
2-Jan-03	3	378087	2277	641.78	783.86	1.8	CUST STATE THAT THE STEERING COLUMN HAS A THUMPING NOISE WHILE TURNINGCAUSE: NVH DIAGNOSIS AIRBAG DEACTIVATION R R AIRI ACT C
31-Oct-02	1	179924	195	576.73	672.98	1.4	NOISY STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
4-Jun-03	0	1408576	10	596.92	678.52	1.2	BROKEN SWITCH ON STEERING REPLACE STEERING COLUMN
17-Mar-04	16	5737100	29827	469.92	558.78	1.2	REPLACED STEERING COLUMN
5-Aug-03	11	2069467	20894	438.59	652.18	3.1	INTER LOCK STRIKER WOULD STICK & CHATCH GOING IN TO REV SSM#15030 REPLACE STEERING COL. TRASFER ALL SWITCHS STEERING WHEEL&
5-Feb-04	16	4677117	15988	438.59	625.51	1.4	BINDING WOULDNT GO INTO PARK REPLACED COLUMN
20-Apr-04	15	5678952	1011	438.59	570.26	1.9	1011 CHECK AND INSPECT FOR SHIFTER FAULT. REPLACED CLOUMN ASSY 3C529 01. ROAD TEST AFTER REPAIR. ALL OK.
3-Jun-04	20	6348611	20733	474.62	552.62	1.2	CK CONCERN OF NOT GOING INTO PARK ,VERIFIED OPERATON .FOUNDBRAKE SHIFT INTERLOCK SOLENIOD FAULTY .REPLACE COLUMN ASSYBECA
4-May-04	15	5934708	33951	438.59	520.56	1.2	REMOVE AND REPLACED THE STEERING COLUMN TO ELIMINATE HARD TO SHIFT CONCERN.
22-Jan-04	12	4464669	11816	0	153.5	2	11816 VERIFIED CUSTOMER CONCERN, NOISE ORIGINATING FROM STEERING COLUMN, REMOVED TRIM PIECES AROUND STEERING COLUMN , FOUI
3-Nov-03	2	3308376	251	469.92	660.52	2.3	PERFORM INSPECTION VEHICLE WILL NOT COME OUT OF PARK INSPECT OPERATION OF SHIFTER OK CHECK BRAKE LIGHT SWITCH OK.DID NO INTER
31-Jul-03	8	2004585	3871	438.59	574.47	2	ELEC. TEST. REPLACED SHIFTER INTERLOCK ASSY
3-Mar-03	5	721061	3349	697.34	799.5	1.2	STEERING COLUMN SHAFT BROKEN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
29-Apr-04	17	5832433	33472	438.59	513.59	1	33570 3C529 41 42 W BCE DIAG PINPOINT TESTING OF BRAKE SW AND INTERLOCK SOLENOID CONNECTORS 12 VOLTS PRESENT GOOD GROU SHIFT
7-Apr-04	12	5401611	24402	438.59	561.39	1.6	24402 SHIFTER INTERLOCK SYSTEM DEFECTIVE PERFORMED STEERING COLUMN SWITCHES DIAGNOSIS REMOVED STEERING COLUMN AND #3C52
12-Feb-03	0	628011	3	619.53	704.71	1.2	3 SWITCHES BAD BLUE ON COLUM CK FUSES OK REMOVE SREERING COVER REPLACE SWITCH NOT FIXED CK SWITCH OK TRACE WIRING RE UT 37
24-May-04	18	6175936	20345	438.59	609.38	2.2	VERIFIED REMOVED WHEEL COVERS ADJUSTED SHIFT CABLE ADJUSTMENT, NEEDS STEERING COLUMN. REMOVED COLUMN AND TRANSFERRED C
2-Mar-04	16	4789820	32631	438.59	651.11	3	32631 08 INSPECT AND SHIFTING FINE AS LONG AS YOU PULL SHIFT HANDLE TOWARDS YOU TO STOP BEFORE MOVING AND HOLD TO STOP IE. GO
15-Mar-03	3	712455	4004	596.92	687.29	1.2	BINDING STEERING COLUMN REPLACE COLUMN
25-Mar-04	16	5447552	34564	438.59	505.77	1.2	FAULTY INTERLOCK SWITCH STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
18-Mar-04	14	5314550	2110	587.71	856	3.4	CAN MOVE GEAR SELECT HANDLE REMOVED AND REPLACED STEERING COLUMN

12-Aug-03	9	2267041	23387	438.59	676.68	4.3	INSPECT SHIFT LEVER OPERATION,SHIFT INTERLOCK NOT WORKING, SERVICED IN COLUMN,REPLACED COLUMN,TRANSFER COMPONENTS
2-Oct-02	0	161169	20	576.73	1158.8	6.9	CK VEHICLE VERIFY KEY STUCK IN ING.R R&R STEERING TRIM BEZEL TO INSPECT COULD NOT SEE ANY PROBLEM R&R STEERING COLUNM SWITCH
20-Nov-03	6	3493408	15183	0	48.54	0.8	VERIFIED CONCERN FOUND TILT COLUMN BOLT LOOSE TIGHTEN BOLT MT R&R LOWER DASH PANEL & LOWER CO LUMN SHROUD TO ACCESS OK A
24-Dec-02	0	372632	493	606.55	795.15	2.6	VERIFY CONCERN R&R BROKEN LOCK HOUSING WITH UPPER STEERING SHAFT AND SHIFT HANDLE BROKEN FROM BINDING SHAFT
25-Nov-03	11	4332992	9725	573.3	664.45	1.2	P01 42 DIAGNOSE AND REPLACE STEERING COLUMN ASSEMBLY, RECHECK OK
12-Nov-02	2	213293	2827	693.39	808.97	1.9	VERIFIED CONCERN FOUND NOISE COMING FROM STEERING R.R. STEERING COLUMN AND LOWER COLUMN SHAFT WITH NEW OK
27-Jun-03	4	1688377	6114	596.92	752.32	2.6	3C529 01 (MTIME NO LAB OP TO TRANSFER PARTS & REPL STR COLUMN) BCE TEST, NO CODES. REPLACED STEERING COLUMN ASSY (BECAUSE BR
27-Oct-03	13	3325796	12142	438.59	509.55	1.2	
19-Feb-03	3	1524947	5	596.92	744.79	1.4	COVERS ON COLUMN.R&R STEERING WHEEL.CLOCK SPRING AIR BAG ALL NECESSARY SWITCHES AND REPLACE ON NEW COLUMN.
25-Aug-03	1	2459011	321	438.59	540.84	1.2	DIAG NOISE R R STEERING COLUMN REPLACE STEERING COLUMN ASSY ROAD TEST SOME NOIS
24-Oct-03	14	3224421	9159	438.59	508.14	1.2	STR COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
28-Oct-03	11	3107204	14045	0	110.25	1.3	14045 WARRANTY VERIFIED CONCERN, USED WDS TESTED FOR CODES RECIEVED CODE C1278 FOR STEERING WHEEL POSITION SENSOR, F PER F
7-Jul-03	8	2064737	6787	438.59	552.66	1.6	OPEN BODY CHASSIS ELECTRICAL DIAG;BCEPP TEST;ORDERED BRAKE SHIFT ACUATOR;;REPLACED STEERING COLUNM;REMOVED AIR BAG STEER
20-Nov-03	8	3469228	6824	470.02	604.37	2.4	FAULTY LEVER MECHANISM ADDITIONAL TIME,GET INTO SHOP,SWAP PARTS, ETC.SEE PUNCH TIME
24-Mar-03	0	803206	153	596.92	690.16	1.2	BINDING REPLACED STEERING COLUMN SHAFT
7-Oct-03	2	2907300	3653	438.59	648.2	2.7	DEFECTIVE SHIFT INTERLOCK SOLENOID VERIFY INTERMITTENT FAILURE OF SHIFT INTERLOCK SYSTEM, SHIFTER STICKING IN PARK. PPT TEST FO
27-Nov-02	0	265799	30	725.03	930.08	2.5	DOES NOT OPERATE PROPERLY DIAGNOSE AND REPLACE STEERING COLUMN
5-Dec-03	14	3676189	16803	438.59	543.44	1.4	16803 INSPECT & REPLACE STEERING COLMN FOR SHIFT INTERLOCK STICKING
26-Dec-03	0	4521484	4091	0.25	23.05	0.4	ROAD TEST FOR NOISE. FOUND WIRE HARNESS HITTING STEERING COLUMN. MOVE WIRE HARNESS AND RETEST DRIVE.
27-Oct-03	11	3237616	8520	438.59	810.39	5.3	1 INSPECT AND FOUND AT TIME SHIFT LEVER WILL NOT GO INTO PARK RR RADIO BEZEL RR CLUSTER TRIM AND KNEE DASH PANEL INSPECT
11-Mar-04	19	5444630	25211	469.92	529.5	1.2	HOTLINE SAYS BURR ON CAM IN COLUMN, NEEDS REPLACED. CHECK CONCERN. CONTACT HOTLINE, TOLD TO REPLACE STEER COLUMN. R&R STE
21-Nov-02	2	238002	1389	617.93	795.91	2.7	VERIFY CONCERN MTIME TO USE CHASIS EARS FOUND NOISE COMING FROM STEERING COLUMN REMOVED SHROUDS CHECK TIGHTNESS F(FOR I
29-Mar-04	13	5294269	11100	690.66	1063.55	4.3	VEH IS STUCK IN PARK REPL COLUMN AND FISE BOX,M TIME NO SLSTS
26-Nov-02	0	302107	15	613.13	702.53	1.1	CHECK AND REPLACED COLUMN AND SWITCH
21-May-04	13	6105547	12680	438.59	547.98	1.2	REPLACE STEERING COLUMN
23-Feb-04	18	4653135	25690	438.59	548.28	1.2	VERIFY CUSTOMER CONCERN PERFORM DIAGNOSIS AND FOUND STEERING COLUMN NO GOOD INSTALL UPDATED STEERING COLUMN ASSEMBLY
3-Feb-03	0	517457	110	596.92	702.04	1.4	NOISEY STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
30-May-03	7	1400703	9782	596.92	879.01	3.4	3C529 42 DIAGNOSIS AND REPLACED STEERING COLUMN
2-Jan-04	4	4000441	3201	620.5	736.58	1.4	STICKING INTERLOCK SOLENOID STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
12-May-04	17	5970101	25211	469.92	561.83	1.2	INTER LOCK ON STEERING COLOUM TECH 763391 3C529 CC 42 INTERLOCK ON STEERING COLOUM NOT WORKING ONLY WAY TO GET INTERLOCK IS
1-Jun-04	19	6266393	30966	438.59	739.06	4.2	VERIFIED CONCERN SHIFTER INTERLOCKNOT SERVICABLE RAND R STREERING
8-Oct-03	11	2805786	12847	438.59	546.39	1.4	PARK; CHECK AND FOUND SHIFT INTERLOCK HAS INTERNAL FAILURE REPLACE SOP STEERING COLUMN
4-Jun-04	18	6290664	25569	438.59	623.58	2.1	DIAGONOIS CONCER FOUND LEVER BINDING. FOUND STEERING COLUM BINDING UP . REMOVE STEERING COLUMN AND REPLACE WITH NEW ONE
31-Mar-03	2	839467	3504	596.92	800.68	2.6	3504 CK OUT DO DIAGNOSIS OF SHIFTLOCK SYSTEM POWER TO SOLONOID BUT INOPERATIVE CK GROUNDS AND POWER SUPPLY O.K. NEEC PART
19-Jan-04	16	4407967	32066	500.12	686.18	3.5	KEY IS OUT OF SWITCH DIAGNOSED, REMOVED AND RPELACED STEERING
14-Nov-03	14	3692463	27704	59.95	304.49	4.6	EVEN WHEN KEY IS OUT ALSO, DRIVERS DOOR WILL NOT LOCK
15-Dec-03	9	3893307	20331	548.8	1354.02	8.6	DIAGNOSE FOR IGNITION KEY WILL NOT TURN, MT NO LABOR OPERATION TO DRILL OUT OLD IGNITION KEY CYLINDER & INSPECT STEERING (G COL
4-Nov-03	5	3329549	9958	469.92	588.57	1.7	BEC DIAG, PINPOINT TEST MONITOR, RR STEERING COLUMN TRANSFER ALL PARTS RETEST
26-Apr-04	13	5838012	23268	438.59	545.77	1.4	DIAGNOSE, DISCONNECT SHIFT CABLE, REPLACE STEERINGCOLUMN TRANSFER PARTS PER HOTLINE
15-Jun-04	19	6441952	22798	438.59	602.56	1.8	INTERLOC SOLENOID PLUNGER STICKING DIAGNOSIS FOR AUTOMATIC TRANSMISSION CONCERNS CHECKED INTERLOCK SYSTEM, FOUND SOLENC
31-Jan-03	3	505378	2470	596.92	698.34	1.4	VERIFIED CUSTOMERS CONCERN. INSPECTED POWERS AND GROUNDS PASSED. CHECKED POWER TO SHIFT LOC K ACTUATOR PASSED. F OLUM
11-May-04	13	5970821	8917	438.59	523.98	1.2	VERIFY CONCERN. WHEN SHIFTING BACK TO PARK, HANGS UP AT REVERSE, NOT SHIFTING INTO PARK. REMOVE & REINSTALL STEERING CO RELEA
25-Aug-03	8	2322819	12555	438.59	536.71	1.4	STEERING COLUMN NVH,REMOVED STEERING COLUMN,REPLACED COLUMN ASSY.
19-May-04	20	6100082	19272	470.78	538.72	1.2	STEER COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
2-Apr-03	1	878168	885	596.92	902.05	2.1	SHIFTER INTERLOCK SLOENOID NOISE VIBRATION HARSHNESS DIAGNOSIS
19-May-03	3	1241628	2877	596.92	875.56	3.3	SHIFT INTERLOCK STEERING COLUMN NOISE VIBRATION HARSHNESS DIAGNOSIS
24-Jul-03	5	1940207	15290	438.59	636.13	2	15290 STEERING COLUMN REMOVED OLD STEERING COLUMN ASSY AND INSTALLED NEW UPDATED COLUMN ASSY. REASSEMBLED COMPLETE RO/
10-Mar-04	16	4866452	25837	438.59	470.01	0.5	STEERING SHAFT REPLACE
7-Jun-03	0	1838797	10	596.92	721.45	2.1	TST KEY CYL SWITCH SHIFT LINKAGE AND WIRING REPLACED STEERING COLUMN IN ORDER TO REPLACE KEY LOCK SWITCH
24-May-04	17	6129540	26995	438.59	567.12	1.7	TESTED SHIFTER INTERLOCK SOLENOID OPERATION AND FOUND MECHANICALLY BINDING SHIFT INTER LOCK SOLENOID NECESSARY TO REPLACE
3-Mar-04	8	4770529	12562	438.59	526.18	1.2	VERIFIED CONCERN INSPECTED AND FOUND SHIFTER HANDLE BROKEN CABLE CHECKED OK SHIFT TUBE ONLYAVAILABLE WITH COLUMN D REC
6-Apr-04	9	5560882	13562	438.59	543.63	1.6	SHIFT LOCK OUT WILL OT RELEASE PART NOT AVAILABLE. NECCESSARY TO REPLACE STEERING COLUMN ASSY
25-Jun-04	12	6570580	17723	439.29	611.91	2.2	SHIFT LOCK SHORTED OUT NGS DIAG REPLACE COLUM AND FUSE
17-Feb-03	1	567529	4120	699.85	907.1	1.7	284643 TESTED SYSTEM FOR NOISE, ROAD TEST INTALLED CHASSIS EARS NOISE IN COLUMN REPLACE LOWER STEERING COLUMN. NOISE LESS
16-Oct-03	0	85427	3	591.52	747.57	2.5	COULMN BAD BEARING NOT IN FROM FACTORY REPLACED STEERING COLUMN BEARING AND LOWER SHAFT THERE WAS NO BEARING IN COLUMN
20-Apr-04	0	740895	36	474.99	630.13	1.8	VERIFY IGN KEY STUCK IN CYLINDER FOUND CYLINDER BROKEN REPLACED COLUMN AND CYLINDER
16-Feb-04	0	421322	11	469.92	541.96	1.2	CHECKED KEY NOT COMING OUT, TRANSMISSION SOLENOID & POSITION SWITCHES BAD, TOOK COLUMN APART TO FIND PART NUMBERS, PART NO
2-Feb-04	0	429778	10	477.8	564.12	1.2	INOP STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
13-May-04	6	1138529	7450	440.94	519.62	1.2	FOUND SPRING CAME APART FOR STEERING COLUMN TILT, SPRING SERVICED ONLY IN COLUMN ASSEMBLEY, REPLACED STEERING COLUMN
17-Feb-04	0	414227	27	616.81	789.58	2.3	31 KEY STUCK IN IGNITION. CHIESEL OUT IGNITION. R&R LOCK CYLINDER. BINDS INTERMITTANLY NOW. R&I LOCK CYLINDER. FOUND STEERING CO
3-May-04	7	1056482	9544	863.61	1107.39	3.2	9550 ROAD TESTED ANDINSP. EXCESSIVE PLAY IN UPPER STEERING COLUMN. BUSHING WORN. REPLACED COLUMN ROAD TESTED AGAIN. P CHEC
26-Feb-04	2	469718	3225	508.92	659.61	1.8	AND INSPECT FOUND LOCK CYL DAMAGED STEERING COLUMN SEIZED AT STEERING WHEEL LOCK REPLACESTEERING COLUMN AND LOCK CYL I
9-Jan-04	1	344248	437	375.94	472.11	1.4	REPLACE STEERING COLUMN
20-Oct-03	2	76053	7473	503.6	703.18	2.6	REPLACED SHIFT LEVER AND STEERING COLUMN. RETEST OPERATION OK.
15-Jun-04	-1	1184924	3	0	238.52	3.1	BY PASS SHIFT INTER LOCK SOLINOID AND REMOVE STEERING COLUMN AND TEST ALL CIRCUITS AND FOUND GROUND POOR CONNECTION

25-Jun-04	5	1187256	2750	440.94	552.64	1.2	REPLACE STEERING COLUMN
4-Jun-04	9	1154182	22275	438.59	533.72	1.4	STEERING COLUMN JAMMED STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
9-Apr-04	7	862360	21320	438.59	558.28	1.8	ACTUATORS INOPERATIVE STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
18-Jun-04	6	1134232	4298	438.59	550.29	1.2	REPLACED STEERING COLUMME C
3-May-04	1	1127532	11	445.94	549.59	1.5	11 CHK SHIFTER OPR IMPROPER ON TRIM PANEL VEH NOT COMING OUT OF PARK DISSESEMBLE STEERING COLUMN FOR SHIF ACTUATOR REPAL
12-Feb-04	1	420484	824	599.3	918.98	4.5	STEERING WHEEL MAKING NOISE WHEN TURNING TEST DROVE OK MAKES NOISES WHEN ROCKING WHEEL SIDE TO SIDE CHECK ALL BOLTS TIGHT
2-Jun-04	6	1018515	4237	581.13	834.93	3	INSTALL STEERING COLUMN ASSY AND HARNESS AND PERFORM PIN POINT TEST.
27-Apr-04	1	859562	1120	469.92	553.93	1.2	REPLACE STEERING COLUMN WPI
17-May-04	4	936750	2261	572.96	693.45	1.4	REPLACE STEERING COLUMN, COMPLETE OK ON RECHECK
10-Feb-04	-1	408246	4	438.59	510.63	1.2	1 CK OUT RUN OASIS, CALL HOTLINE, R&R STEERING COLUMN SHROUDS FOUND MICRO SWITCH BAD, REPLACED STEERING COLUMN, RETEST
21-Apr-04	3	860132	5538	375.94	440.74	1.2	5538 BAD SHIFTER LOCKOUT ACTUATOR CHECKED FOR POWER AT BRAKE SWITCH OK 12V CHECKED FOR 12V AT SHIFTER LOCKOUT ACTUA TEERI
2-Jun-04	3	1155947	3245	662.27	881.2	4	CHECKED FOR NOISE IN STRG,FOUND NOISE IN UPPER STRG COLUMN. INSTALLED NEW STRG COLUMN.ALSO FOUND LOWER SHAFT MAKING NOIS I
12-Feb-04	4	628008	4046	0	21.94	0.6	PULLED KEY CYLINDER AND LUBED INTERNALS
30-Mar-04	3	874373	485	438.59	699.63	3.7	41 STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
1-Jun-04	4	1001699	2932	438.59	574.86	1.4	VERIFIED NOISE WHEN SHIFTING INTO REVERSE, INSPECTED FOUND NOISE COMING FROM SHIFT LOCK ACTUATOR, ACTUATOR ONLY SER ST O
13-Feb-04	1	475190	757	379.54	453.64	1.2	R R STEERING COLUMN ASSEMBLY
27-Apr-04	5	782582	6158	438.59	583.79	2.2	DIAG INTERNAL STEERING COLUMN LOOSENESS REPLACE COLUMN ASSEMBLY
25-Mar-04	7	613101	15047	438.59	527.44	1.2	VERIFY TILT WONT HOLD POSITION ON STEERING COLUMN ACCESS COLUMN PINPOINT TILT LEVER BROKE REPLACE STEERING COLUMN ONLY AVII
26-May-04	7	992477	3005	563.9	760	2.4	INTER LOCK BINDING. REPAIRED AS PER HOTLINE INSTRUCTIONS
1-Apr-04	1	771735	1027	541.52	653.84	1.7	REPLACE DEFECTIVE STEERING COLUMN AND STEERING SHAFT VERIFY REPAIR PREVIOUS REPAIR TIGHTEN BOLTS THIS REPAIR REPLACE PART:
3-Feb-04	1	477648	383	438.59	661.98	2.8	COND CODE 33 CHECK TRANS SHIFT OPERATION PINPOINT TO STEERING COLUNM REPLACE COLUNM AND TRANSFER PARTS ALSO REMOVE AND I
22-Apr-04	5	877392	15606	438.59	614.99	2.4	MT TIME TO SWAP PARTS TO NEW STEERING COLUMN SWITCHES LINKAGES ETC NO SLTS FOR REPLACE PARTS TO REPAIR COLUMN NOT AVAILA
7-Jun-04	6	1200183	20053	507.81	598.59	1.4	VERIFIED CONCERN FOUND SHIFTER AND IGN LOCK CYLINDER BROKEN PARTS UNAVAILABLE NECESSARY TO REPLACE COMPLETE COLUMN TO G
7-Jun-04	1	1216916	23	438.59	699.62	3.5	STEERING COLUMN HOUSING INTERMITTENTLY DOES NOT OPERATE PROPERLY. DEACTIVATE AIR BAG SYSTEM. REMOVE AIR BAG, STEERIN FER A
3-Mar-04	1	553962	1833	474.99	739.16	3.8	MT3514 ABNORMAL DIAGNOSIS, HOTLINE CALL SPECIAL ORDER PARTS INSTALLED ON 03 12 04 AT 2346 MILES KEY TUMBLER JAMMED, ORDERED NE
29-Jan-04	-1	387667	6	438.59	514.73	1.2	9 DIAG AND REPLACE STEERING COLUMN DUE TO IGN CYL NOT TURNING PROPERLY
4-Jun-04	3	1066508	6000	438.59	586.17	2	SHIFTER BROKEN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
18-Mar-04	1	570308	4412	473.95	729.53	4.2	HAD TO TAKE APART TO CHECK OUT SHIFT & HOLDER, BROKEN OFF, ORDERED COMPLETE STEERING COLUMN, HAD TO REMOVE LEVER THA STALL
14-Feb-04	1	443499	25	499.71	863.8	5.6	TO REMOVE BOLT
19-Apr-04	2	752862	2316	438.59	523	1.4	VERIFIED CONCERN PINPOINT TESTS REPLACED STEERING COLUMN RETEST OK
15-Jun-04	4	1154121	5653	474.99	598.22	2	DIAGNOS NOISE COMING FROM INSIDE STEERING COLUMN REPLACE COLUMN ASSY PER SERVICE PART WARRANTY
30-Apr-04	1	812963	443	438.59	711.29	2	443 STEERING COLUMN WARR VERIFIED SHIFTER NOT COMING OUT OF PARK, CHECKED AND FOUND THE SHIFT INTERLOCK SOLONOID TO E NEW (
19-May-04	5	953266	8291	438.59	505.3	1.2	
11-May-04	-1	947055	7808	473.95	651.75	2.6	STEERING JAMMED,CAUSED CRACKED SHIFT LEVER,STEE RING COLUMN DAMAGE,REMOVE AND REPLACE STEERING GEAR AND STEERING COLUI
23-Mar-04	2	599876	3316	438.59	508.51	1.2	3316 REMOVE AND REPLACED STEERING COLUMN MAKING NOISE
2-Dec-03	2	237523	1675	375.94	434.74	1.2	R AND R STEERING COLUMN
25-Mar-04	1	598806	1011	438.59	593.43	2.4	1011 42 NVH DIAG, REMOVE STEERING COLUM, TRANSFER PARTS TO NEW COLUM, INSTALL NEW STEERING COLUM
31-May-04	7	1188010	9004	438.59	518.08	1.2	LOCK ACTUATOR R&I STEERING COLUMN TO ADJUST LOCK ACTUATOR
27-Jan-04	1	358819	1472	438.59	568.26	1.6	MICRO SWITCH FOR IGNITION LOCK (ELECTRONIC SWITCH OR STEERIN COLUMN BROKEN) TEST STEERING REPLACE ENTIRE STEERING COLUMN
9-Mar-04	2	521750	1736	0	75.32	1.2	DIAG REMOVE STEERING COLUMN RETORQUE SHIFTER ONTO COLUMN AND REINSTALLCOLUMN RETEST OK CC 07
15-Apr-04	6	706094	4692	0	86.71	1.2	LOOSE STEERING COLUMN ASSEMBLY REMOVE TIGHTEN LOOSE TILT BRACKET
12-Feb-04	-1	573195	7	438.59	657.3	2.9	7 3C529 42; GEAR SHIFT INTERLOCK MALFUNCTION INTE CAUSING KEY TO BIND 7000F 1.7; 3514A 1.2; CORECTION : VERIFIED CUSTOMER CON MED F
29-Apr-04	3	793819	1696	438.59	459.61	0.3	INOP REPLACED SHIFTER SOLONOID
10-Dec-03	1	207872	78	462.14	602.3	2	BROKE REPLACED STEERING SHAFT ASSEMBLY
17-Feb-04	3	588256	3919	438.59	513.03	1.2	3919 41 BINDING COLUMN BEARINGS FOUND STEERING COLUMN BEARINGS NOISY INSTALLED NEW COLUMN
11-Mar-04	7	535049	26115	438.59	549.86	1.7	BROKEN PARK SWITCH IN STEERING WHEEL WIRING HARNESS 4.6 LITER SOHC PREFORMED BODY CHASI ELECTRICAL DIAG PINPOINTT TEST REMO
10-Feb-04	-1	421229	2	463.72	846.47	7.2	REPLACE ST COLUMN AND TRANSFR PARTS AND ADDITION
7-Jun-04	7	1046559	4081	438.59	530.65	1.2	3C529 01 PINPOINT AND REPL STEERING COLUMN FOR BROKEN SWITCH ON SHIFT INTERLOCK. ONLY SERVICED W STEERING COLUMN.
14-Nov-03	1	150196	872	438.59	531.13	1.4	3C529 CC42 REQUEST MT DIAG,ACCESS&REPLACE SFT LCK ACTUATOR TRACED NOISE COMING FROM SHIFT LOCK ACTUATOR. REPLACED SHIFT L
17-Oct-03	0	82466	13	462.14	799.25	5.1	3C529 CC01 REQUEST MT R&R INNER ASSY,ADDL R&I OF COLUMN AND IGN SWITCH CHASSIS ELEC DIAG WILL NOT SHIFT FROM PARK AND K D INTE
1-Nov-03	0	127211	3	438.59	503.62	1.2	SHIFTER PIVOT ON STEERING COLUMN BROKEN. REPLACE STEERING COLUMN ASSY
1-Mar-04	2	540126	1244	469.92	553.43	1.4	VERIFIED CONCERNS, THUMPING NOISE COMING FROM LOWER PORTION OF STEERING COLUMN, BEARING AREA. ALSO VERIFIED SHIFT HAN SHFTI
12-Mar-04	1	539547	145	473.95	647.1	1.8	PERFORMED DIAGNOSIS HAD TO REMOVE AND REPLACE STEERING COLUMN
8-Jun-04	3	1126189	7576	438.59	518.43	1.2	7576 SHIFT INTERLOCK AND LEVER BROKEN R&R STEERING COLUMN AND REPLACED. COMPONANTS ONLY SERVICED IN COLOMN PART PER FORI
8-Mar-04	4	546976	5983	438.59	647.77	2.9	PERFORM STEERING DIAG AND TESTS. BINDING. ISOLATE TO STEERING COLUMN, DISASSEMBLE AIR BAG SYSTEM, REMOVE AND
28-Apr-04	1	794885	136	438.59	525.53	1.2	136 FOUND SHIFT LEVER LOCKED AND UNABLE TO MOVE. PERF PINPOINT TEST ON BRAKE SWITCH AND CBJ POWER. OK. REMOVED STEERIN CK SC

CUSTOMER

STEERING COLUMN TILT WONT LOCK FLOPS UP AND DOWN
CUSTOMER STATES GEAR SELECTOR CATCHES WHEN SHIFTING FROM DRIVE TO PARK
CUSTOMER STATES STEERING WHEEL SCREECHES WHEN TILTED DOWN
CUSTOMER REPORTS TRANS LINKAGE SEEMS TO BIND GOING INTO PARK
CUST ST HARD TO PUT IN PARK
CUSTOMER STATES CHECK STEERING COLUMN MAKES NOISE_SOP PART
CUST SHIFT FROM DRIVER TO PARK GETS STUCK IN RVEARSE NOT GOING INTP PARK MUST PLAY WITH GEAR SHIFT
VEHICLE TOWED TO SHOP WONT COME OUT OF PARK CUSTOMER HAS BEEN ABLE TO GET VEHICLE OUT OF PARK BY FOLLOWING PROCEDURE IN MANUAL
CHECK SHIFTER LEVER LOOSE
CHECK GEARSHIFT LEVER STICK WHEN PUTTING BACK INTO PARK
WOULDNT SHIFT OUT OF PARK BUT NOW SHIFT INTER LOCK IS INOP
AFTER TAKING FOOT OFF BRAKE AIR RUSH NOISE INSTRUMENT PANEL
CUST STATES CHECK WHEN GOING FRON DRIVE TO REVERSE VEH GETS STUCK AT LINKAGE DOES NOT ALOW VEH TO GO TO REVERSE OR DRIVE ..
CHECK GEAR SHIFT BINDS UP SOP PART
P09 WILL NOT COME OUT OF PARK
WHEN GOING TO PARK, GEAR SHIFTER STOPS AT REVERSE AND HAVE TO PULL BACK TO DRIVE TO MAKE GO IN PARK
VEHCLE WILL NOT COME OUT OF PARK
CUSTOMER STATES HARD TO SHIFT IN OUT PARK
CUSTOMER STATES WONT START,SHIFTER BROKE OFF KEY WONT TURN
CHECK FOR NO SHIFT FROM PARK
CUSTOMER STATES THE VEHICLE WILL NOT COME OUT OF PARK.
CUSTOMER STATES S O PART FOR CLUNK TYPE NOISE WHEN TURNING SOP
CUSTOMER STATES POPPING NOISE IN STEERING SEE SONNY
(N59) CUST STATES THAT THERE IS A KNOCKING NOISE IN THE STEERING WHEN TURNING
CHECK CAUSE AFTER DRIVING VEHICLE AND GO TO SHIFT INTO PARK WILL NOT GO INTO PARK. STAYS IN REVERSE
TOWED IN SHIFTER BROKEN NO START
SHIFTER IS DIFFICULT TO PUT IN PARK
CUST STATES KEY IS HARD TO REMOVE FROM IGINITION
BRAKE LOCK SHIFT NOT WORKING
CUST STATES WHEN APPLYING BRAKES VEHICLE MAKES A CLICKING NOISE CJECK AND ADVISE
SHIFTER WILL NOT COME OUT OF PARK.
CK WONT SHIFT OUT OF PARK

WHEN KEY WAS REMOVED FROM IGNIT TUMBLER CAME OUT TOO
TRANS SHIFT LEVER OR TRANS HARD TO SHIFT IN PARK POSITION
CUSTOMER STATES THAT BRAKE INTERLOCK DID NOT SEEM TO BE WORKING VEHICLE WAS ABLE TO BE SHIFTED FROM PARK WITHOUT FOOT ON BRAKE
VEHICLE IS DIFFICULT TO GET IN PARK
CUST STATES STEERING COLUMN WONT STAY IN POSITION TECH 232
CHECK FOR SHIFT LEVER JAMS WHEN GOING FROM DRIVE TO PARK CODE P01
CUSTOMER STATES THAT THE STEERING WHEEL WILL NOT LOCK IN POSITION
VEHICLE IS STUCK IN PARK
CUST STATES THAT THE KEY WILLNOT ALWAYS TURN IN CYLINDER
STEERING WHEEL DOES NOT LOCK AND IS NOT CENTERED.
STEERING WHEEL IS NOT LOCKING SPW
CUSTOMER STATES THAT KEY IS STILL ACTING UP AND WILL NOT TURN AT TIME WHEN ACTING UP KEY IS HARD TO REMOVE FROM IGN
STEERING WHEEL DOES NOT LOCK AFTER REMOVING KEYS
SHIFT LEVER WILL NOT GO INTO PARK AT TIMES
CUST STS CHECK SHIFTER
CUST STATES WILL NOT GO DIRESCTLY TO PARK FROM DRIVE
CUSTOMER STATES KEY STICKING IN IGNITION
CUSTOMER STATES THAT VEHICLE WILL NOT GO INTO PARK
C S VEHICLE WILL NOT COME OUT OF PARK
THE CUSTOMER STATES DOESNT GO INTO PARK
C S GEAR SHIFTER HANGS IN REVERSE WHEN RETURNING FROM DRIVE SEE ADVISOR
WHEN PUTTING VEHICLE IN TO PARK IT WILL JAM IN REVERSE, HAVE TO SHIFT BACK DOWN AND THEN BACK TO PARK TO GET IN GEAR
CUST STATES SOMETIMES SHIFTING INTO PARK IS HARD
SHIFT INDICATOR IS OUT OF ALIGNMENT. 3C529 33
SHIFTER STUCK IN PARK , WILL NOT MOVE
CUSTOMER STATES COULD NOT GET CAR OUT OF GEAR.
CUSTOMER STATES LOW CLICKING NOISE WHEN SHIFT FROM PARK TO REVERSE AND START BACKING. CUSTOMER HAS FOOT RESTING ON
CUSTOMER STATES CLICKING NOISE WHEN PUT INTO REVERSE AND TAKE FOOT OFF BRAKE. HAS BEEN IN 3 TIMES BEFORE. SEE WAYNE.
P01, CUSTOMER STATES WHEN DRIVING SHIFTER WILL MOVE FROM PARK TO NEUTRAL ON ITS OWN
STRANGE RATTLING NOISE COMING FROM DASH, WHEN VEHICLE IS IN REVERSE, AND YOU APPLY THE BRAKES.
CUSTOMER STATES GETS STUCK WHEN GOING FROM PARK TO DRIVE INSTALL SOP

CUSTOMER STATES KEY STUCK IN IGNITION.
ENGINE WOULD NOT START
VEHICLE IS HARD TO GET IN AND OUT OF PARK SEE TSB
CUSTOMER STATES TILT STEERING COLUMN WILL NOT LOCK IN PLACE.
GEAR SHIFTER HANGINGS UP GOING INTO PARK.
ABS LIGHT COMES AND GOES
CHECK TRANS. NOT COMING OUT OF PARK
FORD WARRANTY CUSTOMER STATES TRANSMISSION IS DIFFICULT TO PUT INTO PARK FROM DRIVE, SEEMS TO HANG UP ON REVERSE
CUSTOMER STATES KEY IS STUCK IN IGNITION
CUSTOMER STATES TRUCK HARD TO GET INTO PARK, ADVISE
C S NOISE IN STEERING COLUMN W TURNING WHEEL BACK AND FORTH, JOHN C HEARD NOISE
C S WONT SHIFT OUT OF PARK
C S HAVING TROUBLE SHIFTING INTO PARK
CUSTOMER STATES THAT A SPRING WAS FOUND ON DRIVES SIDE FLOOR BOARD PLEASE FIND ITS HOME
CUSTOMER STATES IGNITION STICKS ERRATIC
WILL NOT GO INTO PARK SOP
CUSTOMER STATES AT TIMES SHIFTER HARD GOING INTO PARK POSITION
CUST STATES THAT THE STEERING WHEEL WILL MOVE WHEN TILT IS LOCKED
VEHICLE GETS STUCK IN REVERSE FROM DRIVE TO PARK
TILT WHEEL WONT LOCK INTO PLACE
CUST STATES SHIFTER WILL NOT COME OUT PARK AND WILL ALSO STICK GOING INTO PARK
WHEN MAKING SLOW TURNS, THERES A GRINDING NOISE IN STEERING COLUMN
CUSTOMER STATES THERES A VIBRATION IN STEERING COLUMN
CUSTOMER STATES THE STEERING WHEEL TILT MECHANISM IS BROKEN,STEERING JUST FLOPS UP AND DOWN
SHIFT LOCK ACUATOR BINDS
TRANS SHIFT LEVER SNAPPED OFF
C.S CHECK FOR SHIFTER DIFFICULT TO SHIFT FROM REVERSE TO PARK
CUST STATES WHEN PUTTING INTO PARK SHIFTER JAMS UP
CUST STATES THAT GEAR SELECTOR DOES NOT ALWAYS GO BACK INTO PARK
CUSTOMER STATES VEHICLE WILL NO SHIFT FROM PARK,HEARD CLUNK UNDERNEATH,THEN SHIFTER BROKE
WONT GO INTO PARK AND SHIFTER BROKEN OFF
SHIFT SELECTOR STICKS GOING BACK INTO PARK AFTER DRIVING FOR AWHILE
CHECK FOR CLICK NOISE FROM BEHIND INSTRUMENT CLUSTER, OCCURS ALL THE TIME BACKING UP
TOW IN STUCK IN PARK
HARD TO GET OUT OF REVERSE WHEN PUT IN FROM DRIVE
PO1 CUSTOMER STATES SHIFTER IS HAD TO GET IN PARK IT CATCHES BEFOR IT GOES UP, MAY HAVE TO PICK UP ON SHIFTER MORE TO GET
HARD TO GET INTO PARK SEE DAN
CUSTOMER STATES VEHICLE IS HARD TO GET OUT OF PARK
WONT COME OUT OF PARK
C S IGNITION KEY WILL NOT COME OUT OF CYLINDER ***KEY PAD #5461***
CUSTOMER STATES SHIFTS ARE ROUGH FROM PARTECHNICIAN STATES INTERLOCK BROKEN
SHIFTER RATTLES WHEN IN GEAR..HARD TO REMOVE KEY AT TIMES..
RUBBER BOOT ON STEERING WHEEL RUBS
CUSTOMER STATES THERE IS A FLUID LEAK COMING DOWN ON DRIVERS FRONT
CUST STATES KEY WONT COME OUT OF IGNITION
CANNOT SHIT OUT OF PARK
CUSTOMER STATES VEHICLE WONT SHIFT OUT OF PARK.
CUSTOMER STATES HARD TO GET INTO PARK
THE TILT WHEEL IS NOT LOCKING IN PLACE

SHIFTER IS GETTING STUCK BETWEEN PARK AND REVERSE
CUSTOMER STATES SHIFTER STICK WHEN SHIFTING INTO PARK
SOP CUSTOMER REPORTS WHEN SHIFTING VEHICLE INTO PARK SHIFTER STICKS PARTS ARE HERE
C S SHIFTER WONT GOO INTO PARK HAVE TO PULL INTO PARK WITH FORCE
KEY IS STUCK IN IGNITION FROM TRUCK DELIVERY
CUSTOMER STATES SHIFTER NOT SMOOTH FROM DRIVE TO PARK
THE TRANS GEAR SHIFTER IS LOOSE INTERM WILL NOT GO INTO GEAR SA DUP
OCC SHIFTER WONT COME OUT OF PARK AND CAN HEAR CLINK NOISE
CUSTOMER STATES WHEN YOU SHIFT FROM DRIVE TO PARK INDICATOR WILL NOT GO ALL THE WAY TO THE LEFT NO SHIFTING
KEY STUCK IN IGNITION
CUST STS THAT THE VEHICLE CANNOT SHIFT OUT OF PARK WITHOUT USING
TILT ON THE STEERING WHEEL WILL NOT LOCK, THE WHEEL JUST MOVES UP AND DOWN
CUST. STATES: TILT WHEEL DOES NOT LOCK INTO POSITION
DIFFICULT TO SHIFT LEVER FORM PARK TO GEARS AND BACK INTO PARK. THE LEVER LOCKS IN PARK.
C S CAN NOT SHIFT INTO DRIVE FROM PARK

CUST STAETS KEY WONT COME OUT OF IGNITION
WHEN TRYING TO PUT THE GEAR SELECTOR BACK INTO PARK REVERSE THE NEEDLE IS STICKING CAUSING THE GEAR TO BE INCORRECT ON DISPLAY
CUST STATES TRANS SHIFTER IS HARD TO GET INTO PARK
ESP NINE DAY RENTAL
CUSTOMER COMPLAINS OF KNOCKING NOISE FROM STEERING COLUMN WHILE DRIVING
SHIFTER DOESNT STAY IN DRIVE POSITION E
TICKING SOUND HEARD WHEN OPENING
CUSTOMER STATES GEARSHIFT IS DIFFICULT TO GO INTO PARK AT TIMES
YOU CAN SHIFT VEHICLE OUT OF PARK WITHOUTKEY IN IGNITION
CUST STATES SHIFTER DOES NOT LOCK IN PLACE
C S TRUCK WONT GO INTO PARK,SHIFTER BROKEN
WHEN PUT INTO REVERSE AND BACKING UP THERE IS A CLICKING NOISE HEARD AND CAN ALSO HEAR WHEN SHIFTING
CUST ST VEHICLE NOT SHIFTING INTO PARK PROPERLY OR REVERSE
3 36 REPAIR VEH WILL NOT COME OUT OF GEAR HAVE TO USE OVERRIDE
CUSTOMER STATES THAT WHILE PUTTING INTO PARK IT BINDS UP,LET THE PRESSURE OFF AND THEN IT GOES IN.HARD TO OPERATE SHIFT LEVER, CHECK AND ADVISE
CK SHIFTER OPERATION FEELS LOOSE
WHEN TEST DRIVING FOUND SHIFT LEVER HARD TO GET INTO GEAR.
TOWED TO SHOP CUST STS CANNOT GET OUT OF PARK. PRIOR TO STEERING WHEEL WAS ABLE TO BE FREE TURNED 360 CCC L13
L15 IGN LOCKS FOR NO REASON AFTER PARKED HAVE TO WRENCH ON WHEEL TO GET TO RELEASE HAS HAPPENED 3 TIMES IN LAST 2 WEEKS
CUSTOMER STATES: SHIFTER BIND BETWEEN REVERSE AND PARK.
HARD TO GET IN PARK
WILL NOT COME OUT OF PARK
NOISE IN STEERING WHEN TURNING
3 36 DIAG NOISE FROM BRAKE PEDAL WHEN RELEASING SEE JAMES C. CLICKING UNDER DASH VERIFIED SEE HISTORY T108
CUSTOMER STATES KEY IS STUCK IN IGNITION CHECK AND ADVISE

KEY IS STUCK IN IGN
C S THAT TILT WHEEL IS INOP, SOP PARTS
CUSTOMER STATES. THAT THE GEARSHIFT APPEARS TO STICK AND OR BIND OR CATCH WHEN ATTEMPTING TO PLACE INTO PARK AFTER STOPS
C S SHIFTER WILL NOT COME OUT OF PARK
SHIFTER JAMS WHEN PUT INTO PARK ADVISE INSPECTED AND VERIFYED CONCERN SHIFTER HANGS UP AND WONT GO
MUST JIGGLE SHIFTER TO PUT CAR IN PARK
CHECK THE SHIFTER LEVER HANGS UP SOMETIMES WHEN TRY TO PUT IN PARK DAN DID DULP ALSO KEY WILL NOT TURN BACK SOMETIMES
VEHICLE WILL NOT COME OUT OF PARK

CUSTOMER STATES CHECK FOR RATTLE NOISE IN STEERING COLUMN
ANY TIME STEP ON THE BRAKE GET A CLICK FROM UNDER DASH SOUNDS LIKE A RELAY SEE STEVE KING
CHECK SHIFTER STICKS FROM DRIVE TO PARK (SEE BERNIE.R)
CHECK AND ADVISE ON SHIFT HANDLE DOES NOT COME OUT OF PARK AND HARD TO PUT INTO PARK
WONT SHIFT OUT OF PARK
CUSTOMER STATES FRONT END HARD TO TURNTECHNICIAN STATES STEERING COLUMN BINDS
TRANI SHIFTER SEEMS LIKE IT IS GOING INTO PARK, BUT IT IS GETTING HUNG UP IN REVERSE.
CUSTOMER STATES WHEN PUTTING INTO PARK SEEMS LIKE SHIFTER GETS STUCK THROUGH REV TO PARK CHECK AND ADVISE
HARD TO GET INTO PARK OUT OF REVERSE AT TIMES
CUSTOMER STATES WHEN VEHICLE IS PARKED AND KEY IS NOT IN IGNTION SHIFT LEVER CAN BE MOVED FROM PARK
THE SIFTE HANGS UP, GOING INTO PARK
CUSTOMER STATES VEH. STICKS WHEN PUTTING IT IN PARK
WHEN TRYING TO PUT VEHICLE IN GEAR THE SHIFT SELECTOR IS HARD TO MOVE
CANT GET OUT OF PARK INTERMITTENT
STEERING WHEEL MOVES UP DOWN BY ITSELF $80DX
CUSTOMER STATES THE COLUMN SHIFTER WILL NOT GO INTO PARK AFTER DRIVING FORWARD EVEN A SHORT DISTANCE.
DASH RATTLE LEFT OF STEERING COLUMN
CUST ST WHEN SHIFTING BACK INTO PARK GIVING A HARD TIME
VEHICLE WONT GO INTO PARK
C STATES THAT THERE WAS A SPRING RETAINER CLIP THAT FELL ON HIS FOOT
CUSTOMER STATES THE SHIFTER LEVER WILL POP INTO DRIVE WHILE DRIVING,DOES NOT CATCH CORRECT SPOT ALL THE TIME
MISCELLANEOUS FIX TILT STEERING BROKEN
COLUMN NOISE
CHECK TRANS SHIFTER HARD TO GET BACK INTO PARK
GEAR SHIFTER HARD TO GO INTO PARK INSTALL SOP STEERING COLUMN SSM 15030...
C S SHIFTER STCK BETWEEN REVERSE AND PARK
CHECK GEAR SHIFTER WILL NOT COME OUT OF PARK
CUSTOMER STATES SHIFT LEVER WONT GO ALL THE WAY INTO PARK UNLESS YOU BACK IF OFF AND ATTEMPT AGAIN SEE BOB
HARD TO ENGAGE SHIFTER INTO PARK
PARTS/SERVICE MANAGER STATES CRUNCHING NOISE/FEELWHEN TURNING

CUSTOMER STATES THERE IS A STILL A ROLLING NOISE IN THE STEERING WHEEL WHEN TURNING OR DRIVING DOWN A BUMPY ROAD
CHECK FOR TRANS WONT SHIFT
SHIFT INDICATOR DOES NOT MOVE
CUSTOMER STATES THAT SHIFT LEVER STICK BETWEEN NEUTRAL AND REVERSE, DOES NOT GO INTO PARK W O FORCING IT
CUSTOMER STATES SHIFTER IS BROKEN UNABLE TO CHANGE GEARS.. KEY IS STUCK IN IGN. CHECK ADVISE
KEY WILLNOT COME OUT OF THE IGNITION
A CLICK NOISE OCCURS AT THE STEERING COLUMN WHEN YOU RUT IT IN REVERSE,ANDBACK UP IT CLICKS WHEN YOU RELEASE THE BRAKE PEDAL POSSIBLE SHIFT SOLINOID
IR BAG SYSTEM RETES
STEERING WHEEL NOT LOCK WHEN ADJUSTING
CHECK FOR HARD TO GET OUT OF GEAR INTERMITTENT SEE WAYNE
CUST STATES THE SHIMS THAT HELP LOCK STEERING WHEEL INTO PLACE KEEP FALLING OUT, TILT STEERING DOESN T LOCK IN
HARD TO GET INTO PARK INTERMITTENLY. WHOLE SHIFTER LOOSE DELAYED INTO GEAR AFTER PUTTING INTO D OR R ETC.
C S GEAR SHIFTER LOOSE DIFFICULT TO SHIFT GEARS.TOWED IN.
CUST STATES TRIM PIECE ON STEERING COLUME NEAR IGNITION SWITCH LOOSE
CUST STATES THAT WHEN TRYING TO SHIFT FROM PARK TO REVERSE SHIFTER INTERM STICKS , CCA85
REPLACE SOP STEERING COLUMN WILL NOT SHIFT AT TIMES ORERED PARTS
SHIFT LEVER HAS CATCH IN IT WHEN SHIFTING.
CUSTOMER STATES VEHICLE WILL NOT COME OUT OF PARK.
C S THE SHIFTER IS GETTING STUCK WHEN GOING FROM REV TO PARK SOP
CUSTOMER STATES WON'T INTO PARK WHEN HOT
CUST STATES WHEN GOING TO PUT THE VEHICLE INTO PARK IT JAMBS UP
CUSTOMER STATES HARD GETTING TO PARK SOP STEERING COLUMN
CUSTOMER STATES HAS A HARD TIME PUTTING VEH INTO PARK. ONLY FROM DRIVE, HAVE TO MOVE VEHICLE TO MAKE HAPPEN.
CUSTOMER STATES SHIFTS ARE ROUGH FROM PARTECHNICIAN STATES SHIFTER GATE AT STEERING COLUMN BINDS
POP HEARD IN FRONT END WHILE TURNING.
CUST STATES GEAR SHIFT WILL NOT COME OUT OF PARK UNLESS STEERING WHEEL IS IN THE UPTILT POSITION
C S HARD TO PUT VEHICLE BACK INTO PARK
CUST STATES HAS RATTLE NOISE LIKE SOMETHING IN STEERING COLUMN LOOSE WHEN TURNS WHEEL BACK AND FORTH SEE ME IF ?..
CUSTOMER RPEOERTS SHIFTER WILL GET STUCK AT REVERSE GOING FROM DRIVE TO PARK
SHIFTER DOES NOT ENGAGE PARK EASILY
CUSTOMER STATES SHIFTER BINDS GOING INTO PARK
SHFTR WONT GO INTO PARK EASILY
C S THERE IS A CLUNKING NOISE WHEN TRUNING TO THE LEFT, SOUNDS LIKE FROM THE COLUMN
KEY WON T COME OUT OF IGNITION
CUST STATES EVERY TWO OR TIMES THE KEY WON T TURN IN THE KEY CYL CHECK AND ADVISE
CUST STATES SLIGHT CLICK IN GEAR SELECTOR WHEN PUT IN NEUTRAL FROM REVERSE PART IS HERE
CHECK FOR KEY CHIME GOING OFF WITH KEY OUT, DOOR WON T LOCK
CUSTOMER STATES THE SHIFTER HANDLE DOES NOT OPERATE PROPERLY
CUSTOMER STATES: SHIFTER WILL NOT GO INTO DRIVE
REPAIR FOR GEAR SHIFTER IS HARD TO COME OUT OF PARK AND PARTS ARE IN
CUSTOMER STATES STEERING COLUMN FLOPS AROUND
CUSTOMER STATES GEAR SHIFT STICKS BINDS GOING FROM PARK TO REVERSE WHEN WARM
CUST STATES SHIFTER INTERMITTANTLY HANGS UP WHEN PUTTING FROM DRIVE TO PARK, STOPS JUST BEFORE REACHING PARK
SHIFTER IS HARD TO GET OUT OF PARK
STEERING COLUMN AND WHEEL LOOSE
CUSTOMER STATES THAT THE SHIFTER WILL STICK BETWEEN RVERSE AND PARK AFTER BEING IN DRIVE. WILL NOT GO PAST REVERSE.
LUMN ASSY, TEST OPERATION CLOSED BY WP
CUSTOMER STATES AT TIMES HARD TO PUT INTO PARK AND AT TIMES POPS OUT OF PARK
CUSTOMER STATES STEERING SHUTTERS WHEN TURNED
C S INSTALL SOP (STEERING COLUMN)
CUSTOMER STATES POPPING NOISE WENT TURNING PER SONNY SOLD TO TEC
CUST STATES SHIFTER IS STICKING WHEN TRYING TO SHIFT FROM DRIVE TO PARK SHIFTER GETS HUNG UP SOMETIMES AT NEUTRAL..VERY HARD TO GET BACK INTO PARK
SHIFTING FROM DRIVE TO PARK GETS STUCK ING REVERSE
C S WHEN PUT VEHICLE INTO GEAR SHIFTER GETTING STUCK
WHEN DEPRESSING THE BRAKE PEDAL OR RELEASING, A CLICKNOISE IS EVIDENT IN STEERING COLUMN. IDLING
KEYS WILL NOT COME OUT OF ING.
STEERING COLUMN WILL NOT LOCK
CUSTOMER STATES SHIFTER IS DIFFICULT TO SHIFT
CHECK TILT WHEEL INOP
VEHICLE STICKS WHEN TRYING TO GET BACK INTO PARK FROM DRIVE
SHIFTER STICKS FROM REVERSE TO PARK.
CUSTOMER STATES HEARS A NOISE IN STEERING COLUMN
CUSTOMER STATES SHIFT LEVER BROKE SHIFTING INTO PARK TOWED IN BY ROADSIDE ASSISTANCE
HARD TO SHIFT INTO GEAR, WILL NOT GO INTO PARK.
CUST STATES SHIFTER STIFF STICKS BETWEEN PARK REVERSE PLEASE CK ADVISE.

KEY STUCK IN IGNITION. TURNS TO RUN TRUCK THOUGH
CUST STATES HARD TO PUT INTO PARK AT TIMES BE SURE TO DRIVE IT THEN TRY PUTTING INTO PARK
IGNITION LOCKING AT TIMES, SOMETIMES AFTER WIGGLING STEERING WHEEL IT MAY COME LOOSE IN 5 30 MINUTES LATER
CUSTOMER STATES SHIFTER WILL NOT GO INTO PARK AT TIMES
CUST STATES SHIFTING INTO PARK ARM STOPS ON LETTER BEFOR PARK
N59 RATTLE FROM THE STEERING COLUMN
CK FOR VEHICLE NOT COMING OUT OF PARK
TOW TO SHOP AND RETURN TOW RAILRAMP ACTIVE CARRIER TWIN OAKS, PA.
P01 HARD TO SHIFT INTO PARK
CHEK GEAR SHIFTER SEEMS TO GET HANG UP SHIFTING FROM REVERSE TO PARK AND PARK TO REVERSE
CUST STATES THE TRUCK IS HARD TO GET OUT OF GEAR INTERMITTENTLY
CUST STATES STEERING TILT LOOSE
IGNITION KEY HARDER TO TURN AT TIMES AND SHIFTER HARD TO PUT IN PAEK AT TIMES.
TRANS WILL NOT SHIFT OUT OF PARK
AT CERTAIN POSITIONS IN THE TILT CANT PUT IT IN PARK
CHECK HARD TO SHIFT INTO PARK
IGNITION KEY STUCK INSIDE CYLINDER
CUSTOMER REPORTS DIFFICULTY IN PUTTING GEAR SELECTOR INTO PARK
P1 CUSTOMER STATES TRANS HARD TO GET INTO PARK
T90 CLUNKING IN STEERING COLUMN WHEN MOVING WHEEL SIDE TO SIDE
CK POPPING IN STEERING COLUMN SOP
ADVISE ON CREAKING NOSIE COMING FROM STEERING COLOUMN
CUST STATES WHEN TURNING STEER WHEEL COLUMN MAKES NOISES TECH LINE CONTACT # 3E4C7014
AT TIMES ITS HARD TO SHIFT INTO PARK.
N58 STEERING WHEEL BINDS AND IS NOISY
CUSTOMER STATES THE SHIFTER BINDS WHEN SHIFTING FROM DRIVE TO PARK.
STATES IGNITON CHIME STILL ACTIVATES AFTER KEY IS REMOVED
CUSTOMER STATES THAT TRANS IS HARD TO SHIFT OUT OF PARK
CUSTOMER STATES GEARSHIFT STICKS IN REVERSE WHEN TRIES TO PUT BACK IN PARK
WHEN TRYING TO ENGUAUGE INTO PARK LEVER HANGS UP
CUST STATES KEY IS GETTING STUCK IN IGNITION AGAIN TECH 416 RO 447370. CHECK AND ADVISE
C STATES SHIFTER IS HARD TO GET INTO PARK INTERMITTENTLY
L23 QCP KEY WILL NOT COME OUT OF CYLINDER
CK FOR IGNITION KEY HARD TO PUT IT IN AND TURN AT TIMES
CUST STATES STUCK IN PARK
KEY WILL NOT COME OUT OF IGNITION
C50 CUSTOMER STATES STEERING WHEEL WOBBLES(SEE HISTORY)
POPPING RUBBING SOUMD STEERING WHEEL TURNIING LRFT TO RIGHT
P01 WILL NOT SHIFT OUT OF GEAR
CUSTOMER REPORTS WILL NOT COME OUT OF PARK UNLESS YOU USE A SCREW DRIVER
CUST STATES SHIFTER IS VERY HARD TO GET INTO PARK
CHECK SHIFTER HARD TO TAKE OUT OF REVERSE
CUSTOMER STATES VEHICLE WILL NOT COME OUT OF PARK CHECK AND ADVISE SPO PART IN STOCK
SHIFT IS HARD TO MOVE BACK INTO PARK AFTER DRIVING TRUCK
CUST STATES CLICKING NOISE FROM STEERING, T90 RO272958 1 FO3L2Z 3C529 BA COLUMN ASY STNG
CUSTOMER STATES PRESS BRAKE PEDAL AND PEDAL SQUEEKS SOP IS IN, RO# 283422
CUST STATES CHECK NOISE IN STEERING COLUMN
C50 CUSTOMER STATES THAT VEHICLE WILL NOT GO INTO PARK.
CK FOR WHEN BACKING AND TURNING, CUST REPORTS SOUNDS LIKE WIRES RUBBING IN STEERING COLUMN, HAPPENS AT ALL TIMES.
TILT STEERING IS LOOSE AND STEERING WHEEL WRAP IS LOOSE
SOP# 383301 STEERING COLUMN
CHECK VEHICLE MAKES A GRINDING NOISE WHEN TURNING
CUST STATES STEERING WHEEL BINDS UP AND POPS, WORSE TURNING LEFT TECH#106
CUST STATES AT TIMES WHEN MOVING SHIFTER FROM DRIVE BACK TO IT BINDS BETWEEN REVERSE AND PARK CC G29
N57 STEERING COLUMN NOISE SOP IN
CLICKING SOUND FROM DASH AREA WHEN RELEASING BRAKE PEDAL IN REVERSE OR IN PARK
VEHICLE TOWED IN KEY STUCK IN IGNITION AND SHIFTER LEVER LINKAGE IS BROKEN ADVISE CUSTOMOER UNREACHABLE UNTILL 5 6 04
CUSTOMER STATES WILL NOT COME OUT OF PARK
WHEN DRIVING, STOPPING, AND PUTTING GEARSHIFT INTO PARK, SHIFTER WINT GO PAST REVERSE.
QCP CK IGN HAS KEY LOCKED INSIDE WONT COME OUT
CUST STATES WHEN IN LOWER GEARS AND GO UP TO PARK WILL NOT GO PAST REVERSE UNLES YOU LET ENGAGE INTO REVERSE THEN WILL SHIFT TO PARK. SEE JOHN
CS SHIFT INTO REVERSE OR PARK IS DIFFICULT SEE PHILLIP FOR OPEREATIONS
OWNER REPORTS SHIFTER WONT COME OUT OF PARK CCP01
N58 CK.FOR RUBBING NOISE COMING FROM STEERING WHEN TURNING BOTH WAYS
TOW IN..VEH STARTS BUT UNABLE TO GET KEY OUT OF IGNITION WHEN TURN OFF ENGINE

WP CUST ADVISES IGNITION LOCKS UP AND KEY WONT TURN AFTER UNIT IS SHUT OFF WITH WHEELS CUT JUST SLIGHTLY
CHECK FOR RUBBING NOISE IN STEERING COLUMN WHEN TURNING PARTS HERE TECH 910
SERVICE PARTS WARRANTY STEERING COLUMN.
CUSTOMER STATES: SHIFTER FEELS DIFFICULT TO GO FROM DRIVE TO PARK. WHEN YOU HIT REVERSE IT FEELS STIFFER.
CUST STATES WHEN PUTTING SHIFTER FROM DRIVE TO PARK THE SHIFTER JAMS SOP HERE
CHECK HARD TO GET IN PARK
CUST STATES CAR IS HARD TO GET INTO PARK
P68. C/S INTERMITTENTLY SHIFTER DIFFICULT TO SHIFT OUT OF PARK AND MAKES THUDDING NOISE FROM TRANSMISSION
CUSTOMER STATES SHIFTER HARD TO GET INTO PARK
GEAR SHIFTER HANGS IN PARK PER CUST
CUST STATES GEAR SHIFT LEVER BINDS GOING FROM DRIVE INTO PARK
INTO PARK HAVE TO PLAY WITH SHIFTER TO GET INTO PARK
CLUNKING NOISE FROM STEERING COLUMN WHEN TURNING WHEEL AFTER VEHICLE WARMS UP
VEH WONT COME OUT OF PARK AT TIMES SEE BRIAN
CUSTOMER STATES THAT WHEN SHIFTING FROM REVERSE TO DRIVE LIKE IF TURNING AROUND GETS A CLUNK UNDRE VEHICLE FROM DRIVESHAFT OR TRANS AREA
CUSTOMER HAD CONCERN WITH SHIFTER GOING INTO PARK LAST WEEK WORK DONE HERE NOW 3 TIMES HAS HAD TROUBLE GETTING IT OUT O
VERY HARD TO SHIFT INTO PARK TRANS HAS TO ENGAGE REVERSE PRIOR TO GOING INTO PARK
P01 CUST STATES STUCK IN PARK
CK KEY HARD TO TURN STEERING WHEEL LOCKS UP
CUSTOMER STATES INTERMITTENTLY WHEN SHIFTING INTO PARK SHIFTER WILL GET STUCK IN REVERSE
CUST STATES AFTER COMING TO A STOP, IT SOMETIMES IS DIFFICULT TO PUT SHIFTER INTO PARK, WILL NOT GO PAST
C/S NOISE COMING FROM STEERING COLUMN
CK WHEN GO FROM DRIVE TO PARK SHIFTER CATCHES, HAVE TO FIDDLE WITH IT TO GET INTO PARK ADVISE
P01 CAN NOT GET VEHICLE OUT OF PARK
CUST STATES SHIFTER HANGS UP BETWEEN REV AND PARK AT TIMES
CUST STATES AT TIMES SHIFT LEVER IS VERY DIFFICULT TO PUT VEHICLE IN PARK AND WHEN IT WONT GO INTO PARK IF YOU PULL LEVER BACK AND TRY AGAIN IT WILL GO INTO PARK
GEAR SHIFT WILL NOT COME OUT OF PARK AT TIMES
CK.FOR VEHICLE WILL NOT COME OUT OF PARK
P01 CK VEHICLES SHIFT LEVER IS HARD TO SHIFT OUT OF GEAR SOP
CUST STATES WHEN SHIFT FROM DRIVE TO PARK HOLDING TOWARD DRIVER THE WHOLE WAY THE SHIFTER BINDS ON REVERSE AND MUST PUSH HARD TO GET ACROSS
REF 218421, THE SHIFTER INTERLOCK IS INOP AND NOW THERE IS A RATTLE NOISE IN THE FRONT WHEN GOING SLOW
CUSTOMER STATES NOISE IN STEERING COLUMN WHEN DEPRESS BRAKES (SOP)
SHIFTER IS BROKEN
SERVICE INSTALL PART REFERENCE RO11461 11 05 02
POPPING NOISE IN STEERING COLUMN
CUSTOMER STATES INTERMITTENTLY WHEN ATTEMPTING TO START VEHICLE THE KEY WILL NOT TURN IN IGNITION, OR CAR WILL
CUST STATES THE GEAR SHIFTER IS HARD TO GET INTO REVERSE 182 INSTALL SOP
USED VEHICLE DEPT CUSTOMER STATES AIRBAG LIGHT IS ON
CUST STATES,, SOMETIMES GEAR SHIFTER GETS STUCK BETWEEN PARK AND REVERSE,,AND SOMETIMES BETWEEN DRIVE AND PARK
L13 CANNOT GET IGNITION KEY OUT OF KEY CYLINDER
GEAR SHIFT HANGS WHEN PUTTING INTO PARK SOP
IT WILL JUMP OUT OF PARK INTO REVERSE AND NEUTRAL AND THEN LIGHTS ALSO WILL GO OUT
CUSTOMER STATES TRANS WILL NOT COME OUT OF PARK
GEAR SELECTOR BINDS AT REVERSE ON THE WAY TO BEING PUT INTO PARK.
HARD TO GET IN TO PARK FROM DRIVE SEE HISTORY
CUSTOMER STATES GEAR SHIFT FROM DRIVE TO PARK WILL NOT ENGAGE W O GOING TO REVERSE FIRST
AFTE ABOUT 15 MIN OF DRIVING AND TRY TO PUT THE VEHICLE INTO PARK WILL NOT GO AL THE WAY IN STOPS JUST ABOVE REVERSE
CUSTOMER STATES THAT THE STEERING WHEEL LEVER WILL NOT LOCK THE STEERING WHEEL YOU CAN PULL OR PUSH STEERING WHEEL UP OR DOWN CHECK AND ADVISE
CUSTOMER FEELS GRINDING IN STEERING WHEEL SOP IN
P01 HARD TO SHIFT INTO PARK FROM ANY GEAR
C50TILT STEERING WHEEL WONT LOCK IN PLACE
H21 CUST. STATES VEHICLE IS GUAGE IS DOSE NOT COME OUT OF PARK
CHECK WARNING CHIME STAYS ON WHEN KEY IS OUT OF IGNITION,DOOR OPEN
WIRING HANGING UNDER DASH
CK STEERING WHEEL WILL NOT LOCK.
O.R THAT THERE IS A NOISE IN THE STEERING WHEEL, NOT FRONT END IN THE WHEEL IT SELF, GROANING NOISE
C S THAT THE SHIFTER IS HARD TO COME OUT OF PARK,TOOK CUST 20 MINS.THIS MORNING TO GET OUT PARK. OTHER STEERING HANDLING AND RIDE TROUBLES
CUSTOMER STATES THAT WHEN TURNING THE STEERING WHEEL IT POPS
CUST STATES GEAR SELECTOR BINDS AT TIMES
CUST.REPORTS NOISE IN STEERING COLUMN WHEN TURNING,ADVISE IF NEEDED
CUST SAYS THE STEERINGWHEEL MAKING A POPPING SOUNDWHEN TURNING RIGHT OR LEFT, NOISE IN STEERING GEAR
GEAR SHIFT LEVEL DOESN'T WORK
CUST STATES THAT THERE IS A BUZZING NOISE IN THE STEERING WHEEL
CUSTOMER STATES FRONT END CLICKS CLUNKS WHEN TURNING DOES NOT FEEL WRITE ADVISE
CUSTOMER STATES THAT THE SHIFTER IS HARD TO GET OUT OF PARK AT TIMES SOP #7026

C S HARD TO GET OUT OF PARK WHEN COLD
CUST STATES THE CAR CAN BE TAKEN OUT OF PARK WITH OUT PUSHING BRAKE PEDAL ADVISE
CUST STATES VEH CAN BE PULLED OUT OF GEAR WITH KEY IN OFF POSITION
WHEN STEERING COLUMN AT HIGHEST POSITION SHIFT LEVER WILL NOT MOVE
CUST STATES THAT VEHICLE WILL NOT COME OUT OF PARK
WILL NOT SHIFT OUT OF PARK
KEY STUCK IN IGNITION
TRANS IS HARD OR WONT SHIFT IN OR OUT OF REVERSE ADVISE

CUST STATES GEARSHIFTER HARD TO GET INTO PARK
RECHECK STEERING COLUMN MOVES WHEN IN SET AND LOCKED SEE HISTORY
CUST HAD KEY IN THE IGNITION
IGNITION KEYS STUCK IN LOACK CYLINDER WONT COME OUT
GEAR SHIFT LEVER IS INOP
CUSTOMER STATES MAINLY WHEN VEHICLE IS COLD; VEHICLE IS HARD TO GET FROM PARK TO DRIVE; PLEASE CHECK AND ADVISE
CUSTOMER STATES THERE IS A CLUNK FELT IN THE STEERING COLUM WHEN TURNING THE WHEEL. PLEASE INSPECT.
L15 VEH TOWED IN, CUST STATES WHIFTER LEVER MOVES FREELY WITHOUT ENGAGING GEARS, INSPECT AND ADVISE
CUST STATES KEY HARD TO GET OUT AND SHIFTER GETS STUCK
CUSTOMER STATES FRONT END SUSPENSION CRACKING NOISE WHEN MAKING TURNS AT ALL TIMES INSPECT DIAGNOSE AND ADVISE

CUST STATES A PIECE OF PLASTIC FELL OUT OF THE STEERING COLUMN AND NOW WONT LOCK PROPERLY ON TILT
CUST STATES GEAR SHIFT STICKS BEWEEN PARK AND REVERSE SPO IS HERE USE SPO 03340001
CHECK AND ADVISE KEY WILL NOT RELEASE OUT OF IGNITION CYCLINDER
CK THE TRANSMISSION LEVER, MAKES NOISE WHEN PUT FROM DRIVE TO PARK, LEVER GETS STUCK IN REVERSE
P01 CANNOT GET SHIFTER OUT OF PARK
CUST STATES THAT THERE IS A POPPING NOISE IN THE STEERING COLUMN (N58)
STEERING WHEEL TILT MECHINISM IS INOP SOP HERE
CUSTOMER STATES GEAR SHIFTER HANGS BETWEEN PARK AND DRIVE
C S HAS POPING NOISE IN STEERING WHEEL WHEN TURNING
C S HAS POPING NOISE IN STEERING WHEEL WHEN TURNING
KEY IS STUCK IN IGNITION CYLINDER ADVISE V
C S VEHICLE HARD TO GET FROM DRIVE TO PARK SOP COLUMN
WHEN TURNS HEARS STEERING WHEEL AT SLOW SPEEDS FEELS CLICKING
CHECK VEHICLE WILL NOT COME OUT OF PARK.
CUSTOMER STATES SHIFT LEVER HARD TO PUT INTO PARK.MUST MAKE SEVERAL ATTEMPTS.CC P01
CUSTOMER REPORTS THE VEHICLE IS HARD TO SHIFT OUT OF PARK, AND HARD TO FIND PARK GEAR,INTERMITTENT.
C S ENGINE WILL START BUT SHIFTER WILL NOT MOVE CK AND ADV TOWED IN
WHILE DRIVING STEERING WILL LOCK UP
CUST STATES THERE IS A KNOCKING NOISE FROM THE STEERING WHEEL WHEN TURNING
CHECK WILL NOT COME OUT OF PARK
CUSTOEMR STATES KEY WILL NOT COME OUT OF IGNITION
HAVING A HARD TIME GETTING OUT OF PARK AND GETTING INTO PARK ADVISE

CUST STATES THAT THE STEERING CLUMN HAS A THUMPING NOISE WHILE TURNING
C S STEERING WHEEL IS NOISY...SPO IN...TECH 001
IGN KEY WIL NOT REMOVE FROM CYCLINDER
SHIFTER GETS HUNG UP WHE TRYING TO GO INTO PARK , STOPS AT REV
CC P01 SHIFTER HANGS UP BETWEEN REVERSE AND PARK. SOMETIMES DIFICULT TO GET IN PARK.
AT TIMES CANT GET OUT OF PARK WAS REPAIRED AT JACKSON FORD IN DEC
P01. C S WHEN VEHICLE WAS ON TOW TRUCK AND ATTEMPTING TO SHIFT GEAR LEVER INTO NEUTRAL THE LEVER BROKE OFF.
CUSTOMER STATES CAN'T GET LEVER TO GO INTO PARK HAVE TOWORKSOMETIME TO GET INTO PARK
INSTALL S O SHIFTER COLUMN
CUSTOMER STATES THAT THERE IS A RATTLE UNDER THE GLOVE BOX, CHECK ADN ADIVSE
CUSTOMER STATES VEHICLE WILL NOT COME OUT OF PARK. .
CHECK VEH HARD TO GO IN PARK
CUST STATES CK FOR EXCESSIVE NOISE HEARD WHEN TURNING SOP
P01 CUSTOMER STATES TRANSMISSION DIFFICULT TO OPERATE SHIFT LEVER OR CHANGE GEARS HAS TO PUSH VERY HARD ON THE BRAKE PEDAL TO CHANGE FROM PARK
CUSTOMER STATES THAT WHEN SHIFTING FROM DRIVE TO PARK IT HANGS UP AT TIMES IN REVRSE, CHECK AND ADVISE
KEY STUCK IN IGNITION
CUST STATES WHEN GOING FROM REVERSE TO DRIVE THE SHIFT LEVER STICKS WHEN MOVING INTO THE DRIVE
WHEN SHIFTING INTO PARK FROM DRIVE, THE LEVER ALWAYS HANGS UP GOING BE REVERSE
CUSTOMER STATES: TRUCK WOULD NOT GO INTO GEAR SEE HISTORY INSTALL SOP
DIAG SHIFTER HARD TO OPERATE
THE GEAR SELECTOR IS HARD TO HARD TO REMOVE FROM PARK AT TIMES

TRANS WONT SHIFT FROM PARK
IGNITION KEY STUCK IN IGNITION. (NOTED UPON ARRIVAL)
CUSTOMER STATES WHEN KEY IS OUT OF IGNITION.THE STEERING WHEEL WILL NOT LOCK
THE VEHCILE WILL NOT COME OUT OF PARK 3 36
P01 HARD TO SHIFT INTO PARK
CS THERE IS A CLUNKING NOISE FROM THE STEERING COLUMN WHEN TURNING
WILL NOT COME OUT OF PARK P09

STEERING COLUMN CONCERN REMOVE STEERING COLUMN FROM INSIDE.R&R INSTR. PANEL COVER
INSTALL SOP FOR STEERING COLUMN SQUEAK
CUST STATES SHIFTER HANGS UP WHEN SHIFTING FROM DRIVE TO PARK
VEHICLE MADE A CHATTERING NOISE AND NOW ADVANCE TRAC WARNING LIGHT IS ON
STATES WILL NOT COME OUT OF PARK WITHOUT USING OVERRIDE
SHIFT LEVER BROKE AT STEERING COLUMN,UNABLE TOO SHIFT
C S CK KNOCK FELT THROUGH THE STEERING WHEEL WHEN MAKING ANY TURNS
TRANS WONT SHIFT UNLESS YOU PUT KEY UNDER COLUMN
CUST ST STEERING CLICKS BAD
CHECK TRANS GEAR SHIFTER HARD TO GET INTO PARK SEEMS TO BE STIFF
CUSTOMER SAID THAT WHEN YOU TURN STEERING THERE IS A NOISE. MORE TO THE LEFT. WILL DO IT ALSO TO THE RIGHT.
WHEN PUTTING SELECTOR FROM DRIVE TO REVERSE INDICATOR NEED LE STAYS IN REVERSE
TRANSMISSION SHIFTER STICKS BETWEEN PARK AND REVERSE INTERMITTENLY.
CUST STATES THAT THERE IS A POP NOISE IN THE STEERING
CUST STATES VEHICLE STUCK IN PARK
KEY IS STUCK IN IGNITION
C S SHIFTER WILL NOT COME OUT OF PARK
CUSTOMER STATES WHEN SHIFTING GEAR SHIFTER BACK TO PARK SHIFTER VERY HARD TO GET INTO PARK NOT SMOOTH
CHECK POWER STERING SOUNDS FUNNY THUD SOUND WHILE TURNING
ADVISE WILL NOT COME OUT OF PARK
CUST STS IGNITION KEY STICKS INSIDE COLUMN
C S THAT VEH WILL NOT GO FROM DRIVE TO PARK AFTER DRIVING FROM TIME TO TIME SOP PART HERE
INSPECT FOR HARD SHIFTING DOESNT SEEM TO GO INTO PARK
REPLACE SOP STEERING COLUMN CUSTOMER STATES GEAR SHIFTER NOT ABLE TO SHIFT IN AND OUT OF
CLUNKING NOISE WHEN COMING IN AND OUT OF GEAR HARD TO PUT IN PARK INTERMITTENT
CUST STATES THE CAR WONT COME OUT OF PARK
IGNITION SWITCH ALARM GOES OFF EVEN WHEN
IGNITION SWITCH ALARM GOES OFF
INSP FOR KEY WONT TURN IN TUMBLER
CUSTOMER STATES GEAR SHIFT LEVER HANGS UP WHEN SHIFTING TO PARK
STATES SHIFTER HAS A PROBLEM GETTING BACK INTO PARK
DIAGNOSIS OF ELECTRONIC TRANSMISSION CONCERN GEAR SHIFT INDICATOR NOT QUITE LINED UP. SOMETIMES HARD TO
PO1 CHECK CUSTOMER STATES, HE CAN NOT SHIFT OUT OF PARK CHECK AND ADVISE
SHIFT LEVER STICKS , ,WHEN SHIFT INTO PARK , VEHCIEL ROLLS BACK , DOES NOT OCCUR ALL TIME , WORSE THE VERY FIRST TIME USED
FEELS STRANGE VIBRATION IN STEERING COLUMN WHEN HITTING BUMPS
DIFFICULT TO REMOVE KEY FROM IGN SWITCH
A BUZZING NOISE OCCURS WHEN YOU PUT VEHICLE INTO REVERSE INSTALL SOP PART
NOISE IN DASH BACKING UP CLICKING SEE DAVE SUMMERS
CUST STATES WHEN MOVING FROM DRIVE TO PARK IT BINDS CHECK AND ADVISE PER RO 375391
C S VEH HANGS UP IN REVERSE WHEN TRYING TO PUT VEH IN PARK PART IS IN
KEY IS STUCK IN IGNITION
C S THAT SHIFTER GETS STUCK PARK & REVERSE
CHECK SHIFTER HANDLE BROKEN
OWNER STATES THE TRANS SHIFTER HANGS UP IN REVERSE WHEN SHIFTING INTO PARK
VEHICLE WILL NOT COME OUT OF PARK
STEERING WHEEL MADE POP NOISE WHEN UNLOCKED NOW CLANKING NOISE WHEN TURN T90
STEERING COLUMN LOOSE MOVES UP AND DOWN
CUSTOMER STATES KEY IS STUCK IN IGN.
CUSTOMER STATES KEY WILL NOT COME OUT OF IGNITION
SHIFTING MECHANISM BROKE WILL NOT SHIFT PROPERLY
SPRING FOR TILT BROKE OFF
KEY IS STUCK IN THE IGNITION
STEERING LOOSE AND WOBBLES WORSE OVER BUMPS
KEY WILL NOT TURN IN IGNITION
IGNITION KEY WILL NOT COME OUT
SHIFT LE4VER WAS VERY HARD TO PUT INTO GEARS CAUSING LEVER TO BREAK.....
CUSTOMER STATES VEHILCE WILL NOT COME OUT OF PARK AFTER STARTING. CHECK AND ADVISE.

C R REPLACE STEERING COLUMN RING SOP PART
CUST STATES SHIFT IND INTER MISALIGNED
CUSTOMER STATES GEARSHIFT LEVER HARD TO MOVE
C S WHEN OPEN DOOR WARNING SOUND COMES ON ALL THE TIME
REPLACE STEERING COLUMN SCHROUD
STEERING WHEEL MAKING NOISE WHEN TURNING LARGE TRAVEL
CHECK SHIFTER WILL NOT RELEASE AT TIMES.

C S VEHICLE COULD NOT BE REMOVED FROM PARK FUSE BLEW TOW TRUCK OPERATOR TRANSFERRED FUSE FROM SEAT HEATER
KEY WONT COME OUT OF IGN WHEN TURNED OFF
WONT COME OUT OF PARK
CUSTOMER STATES POPPING IN STEERING WHEN TURNING LEFT SHARP AND BACKING UP
STEERING COLUMN LOCKING, HARD TO TUNR KEY
VEHICLE WILL NOT SHIFT OUT OF PARK AND HAS NO BRAKE LIGHTS
3 36 REPAIR CK WHEN VEH IS PUT INTO REVERSE SHIFTER HAS ALOT OF PLAY ALSO MAKES CLICKING TYPE NOISE FROM COLUMN AREA WHEN MOVING IN REV. SEE DENNIS
KEY WONT RELEASE FROM IGNITION
ST COLUMN WILL NOT LOCK INTO GEAR, LEVER JUST SLIDES FROM REVERSE TO DRIVE
TILT MECHANISM WILL NOT LOCK IN PLACE
CS STS SOMETIMES THE KEY WONT TURN AND HARD TO GET COLUMN LOCK TO DISENGAUGE
CUSTOMER STATES KLUNK IN THE STEERING WHEEL HEAR IT AND FEEL IT....BEGINING OF ANY TURN LFT OR RT
NSTALI
TILT STERRING LOCK IS TOO LOOSE
CUSTOMER STATES THE SHIFTER IS BROKEN PLEASE CHECK AND ADVIS
CUSTS STATES STEERING WHEEL WILL NOT LOCK
KEY WILL NOT COME OUT OF IGNITION
C S IGNITION KEY IS STUCK IN TUMBLER
SHIFTER BROKEN
CUSTOMER STATES GEAR SHIFTER BROKEN AND KEY WILL NOT COME OUT
CHK IGN CLYN POPPED KEY WONT TURN
DIAGNOSE NOISE IN STEERING POPPING WHEN TURNING
DIAGNOSE CLUNKING AND POPPING IN STEERING COLUMN WHEN TURNING
CAR WILL NOT COME OUT OF PARK, INSTALL SOP PART.
PIECES FELL OUT OF STEERING COLUMN
P01 GEAR SHIFT BROKE LEVER BROKE OFF
NOISE IN STEERING COLUMN SOP
TITLE STEERING COLUMN WONT LOCK
CUST STATES CHECK STEERING POPS WHEN TURNING EASY
CHECK FOR SPRING TYPE NOISE AT BRAKE OR GAS PEDAL
CUST STATES IGNITION KEY STUCK IN IGNITION WILL NOT COME OUT
GEAR SHIFT INDICATOR NOT RIGHT, FEELS LOOSE AND POINTS TO WRONG GEAR
CUST STATES TILT STEERING WILL NOT LOCK INTO PLACE
L13 CHECK AND ADVISE ON KEY GETTING STUCK HARD TIME COMING OUT OF IGNITION
CUSTOMER STATES THAT SILINIOD FOR STEERING COLUMN NEED REPLACE PER RANDY ADVISE
CUSTOMER STATES IGNITION KEY CANOT BE REMOVED
CAN HEAR POPPING NOISE IN STEERING COLUMN WHEN TURNING
CUSTOMER STATES KEY WILL NOT COME OUT OF IGNITION.

CHECK AND ADVISE KEY WONT COME OUT OF IGNITION SWITCH L23
WHEN BRAKE RELEASED A CLICKING IS HEARD
WHEN DOOR IS OPENED AND KEY IS OUT OF IGN A DING SOUND IS HEARD
SHIFTS HARD OUT OF PARK
CK STEERING COLUMN WHEN TURNING STEERING WHEEL HEAR AND FEEL THUMP IN STEERING WHEEL ITS SELF
CUSTOMER STATES:THE SHIFTER HANDLE IS BROKEN
CUSTOMER STATES GEAR SHIFTER DOES NOT LOCK IN PARK SEE JENNIFER
STATES THAT WHEN TURNING THE STEERING WHEEL THAT IT MAKES A FUNNY NOISE WHEN YOU ARE TURNING IN EITHER DIRECTION
P09 CUSTOMER STATES SHIFT LEVER STUCK IN PARK

Report Info Status=Fin Request Na Description Run Date / Completior Job Size=3 Execution ~ Precalc Pr(Cut Off Da Load Date= Currency E Generated By=CWELKER1
Data Selec Model Yea Cost Categ Region Sol Country Sc Part Num E Vehicle Line Aws = EXPLORER[U2]
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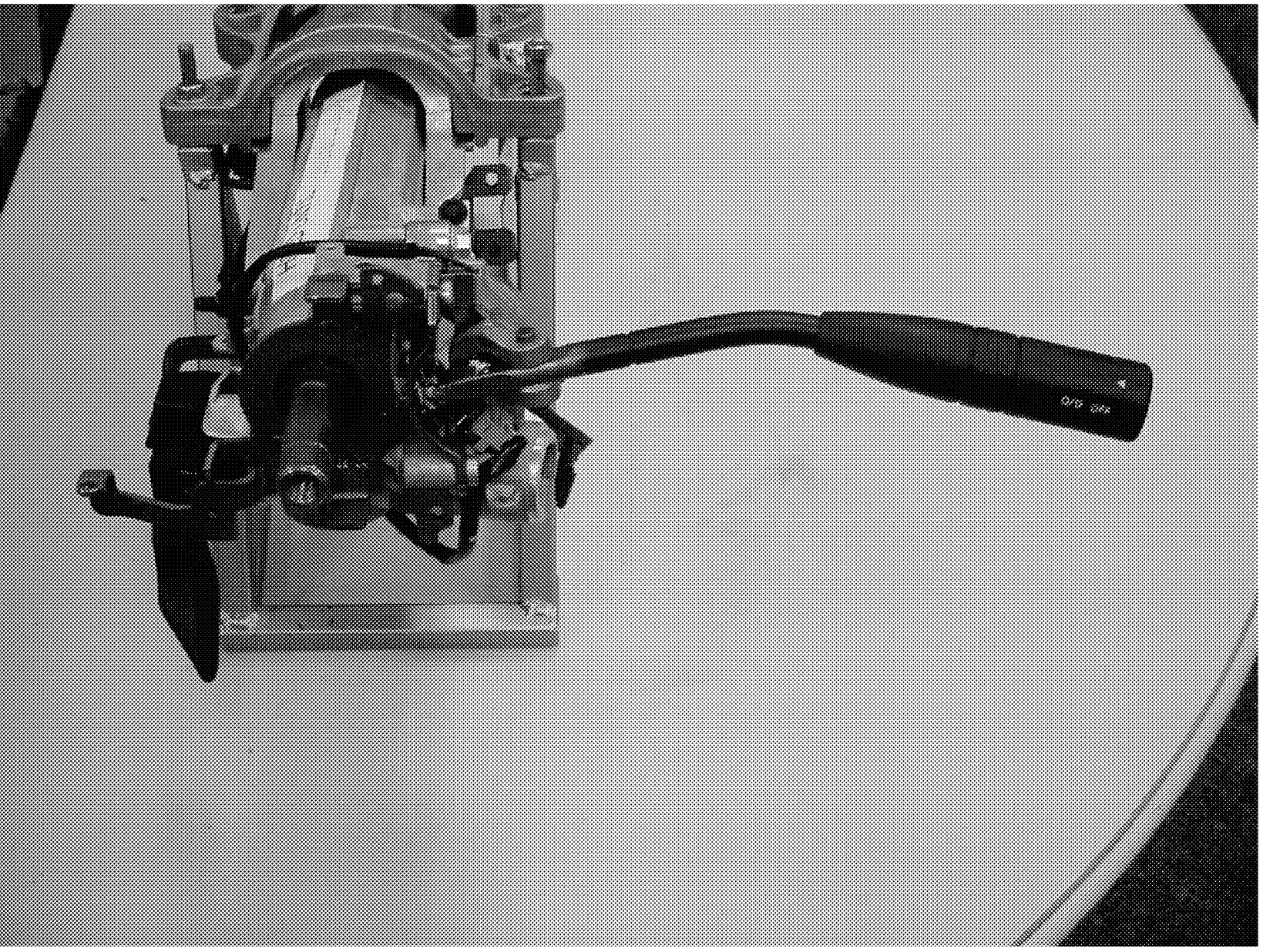

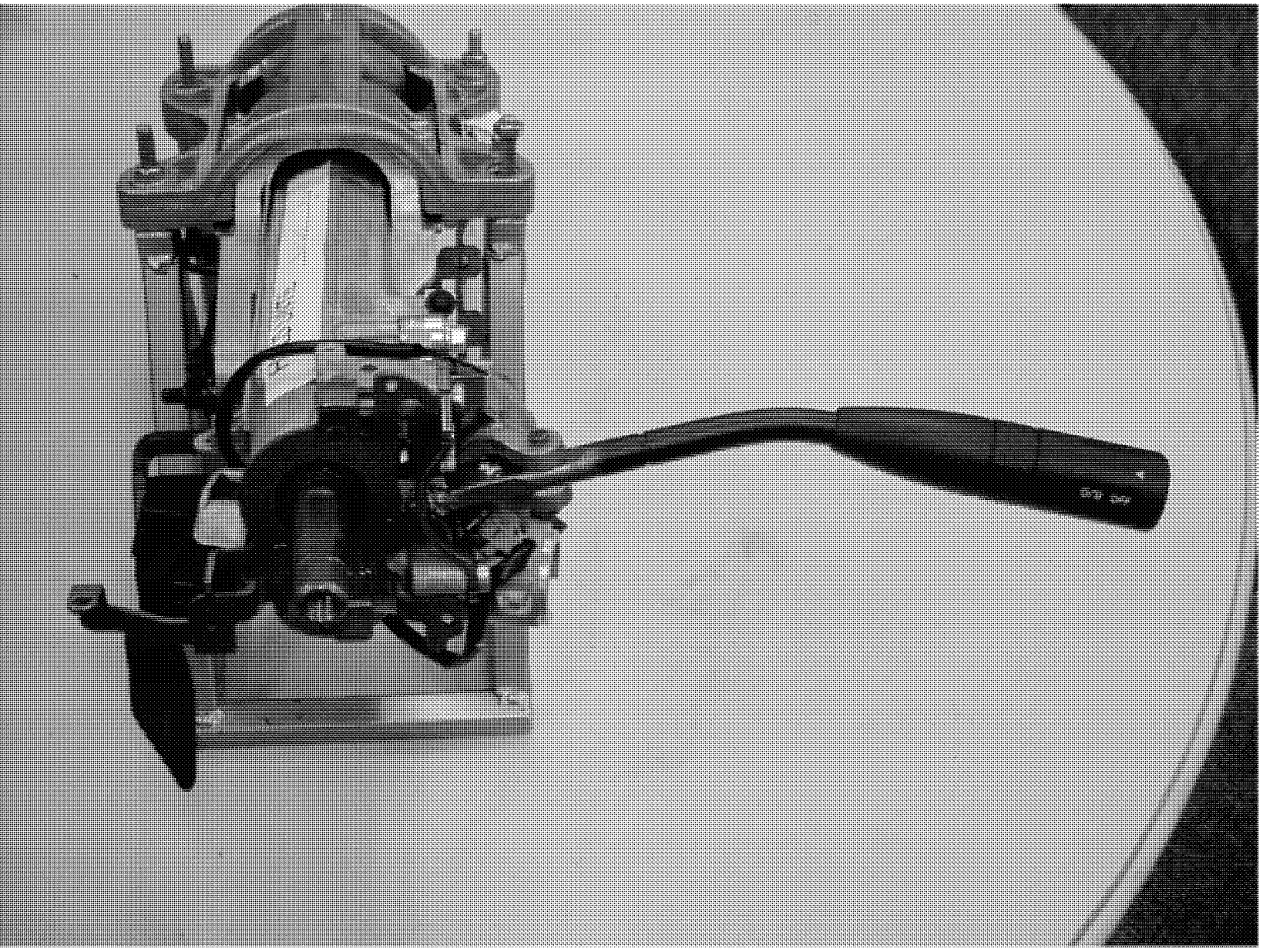

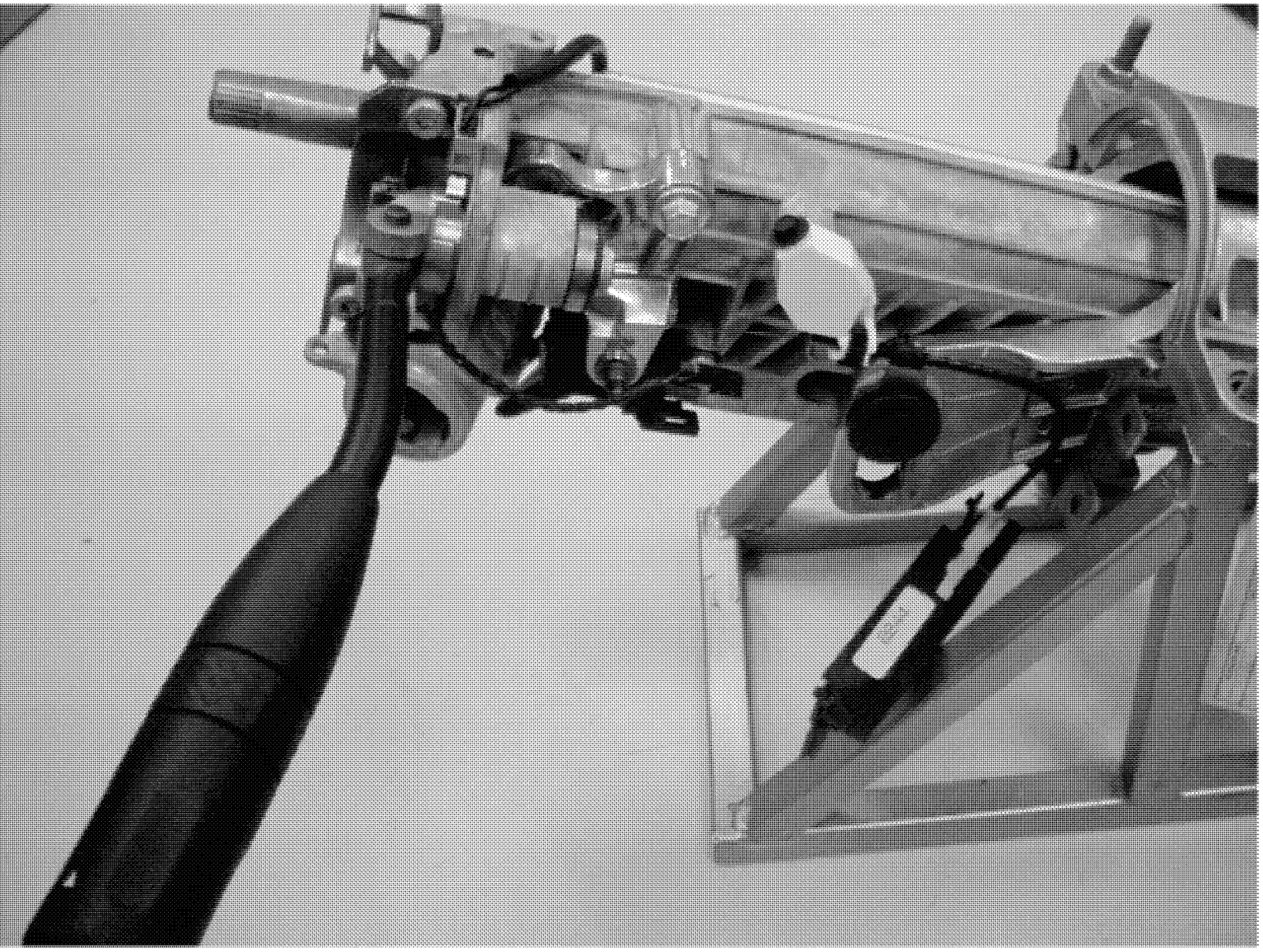

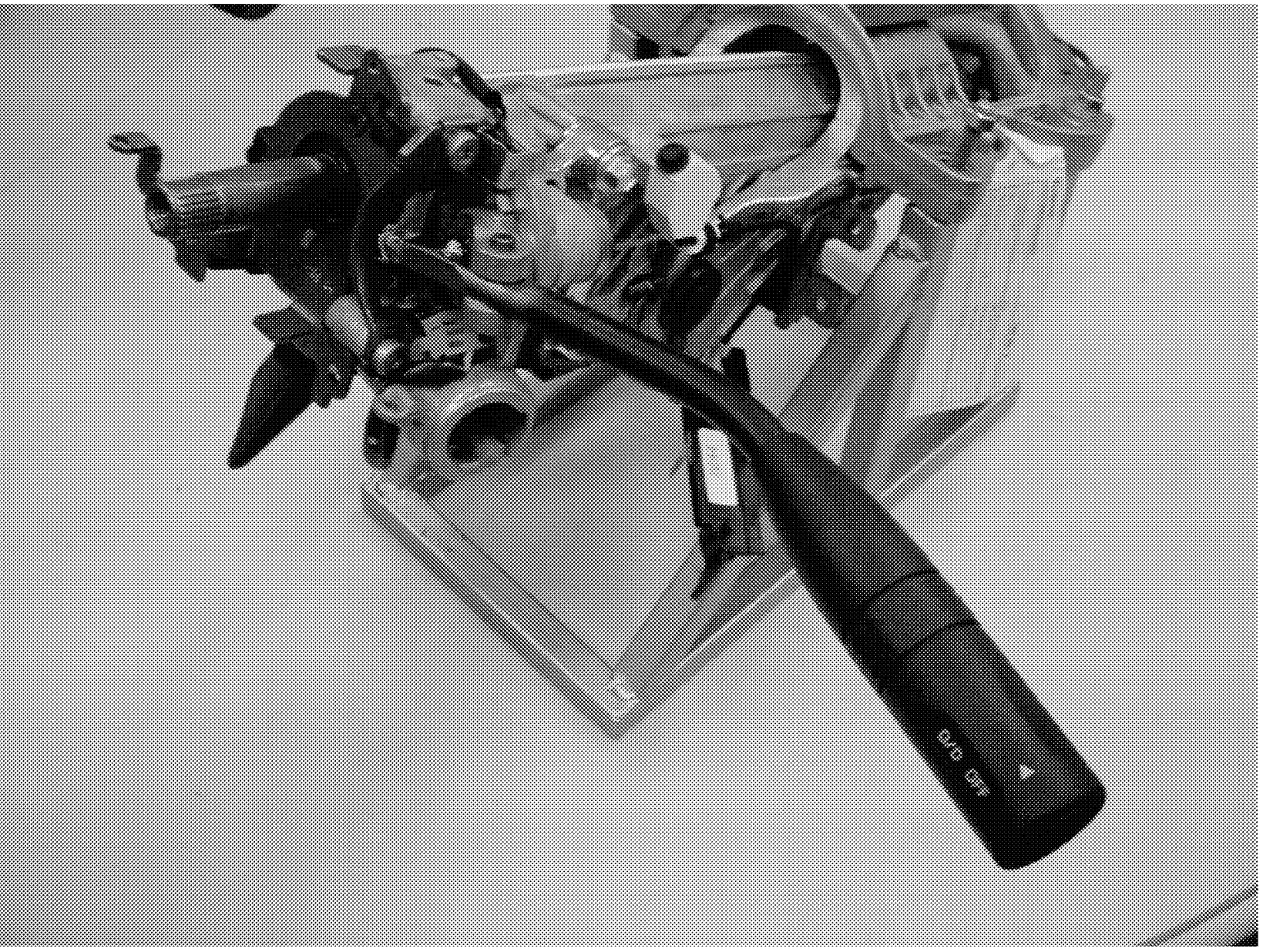

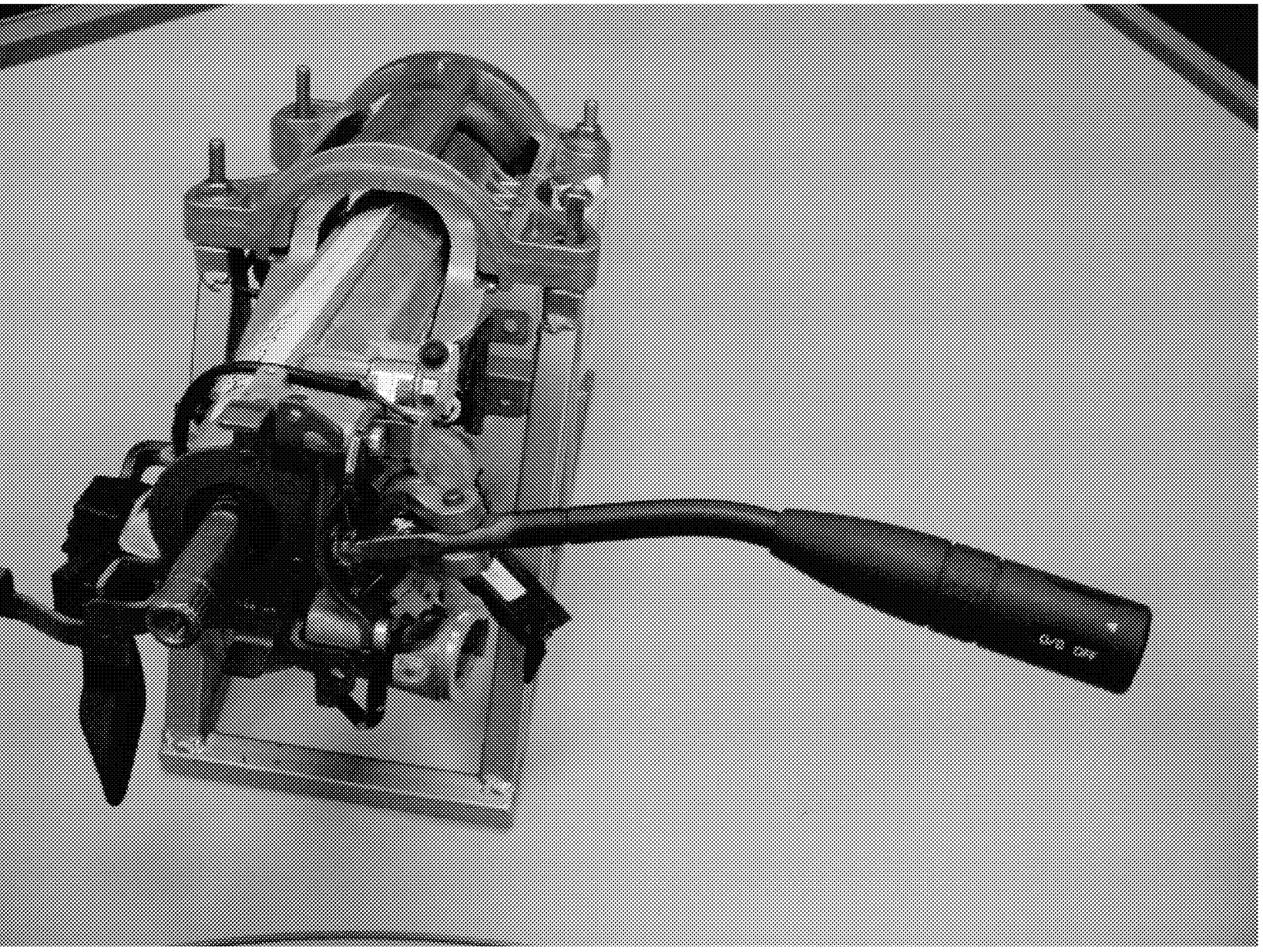

PE09-020 1528

From: Linnansalo, Vera (V.)
Sent: Thursday, November 18, 2004 3:39:19 PM
To: Chadwick, Cheryl (C.L.)
CC: Snider, Tim (T.O.); Porter, Alan (A.J.); Surella, Matthew (M.M.)
Subject: GB Verification - Tim Snider

Cheryl,

I have been working with Tim Snider on BB Project # 24784.

To achieve his GB verification, Tim has completed the "Define" portion of the 6-panel and has successfully demonstrated knowledge and use of various tools (Warranty system, histograms, etc.)

I hereby approve and sign-off on Tim having delivered his Green Belt deliverables.

Sincerely,

Vera Linnansalo

Ford Black Belt
Chassis Performance Cell
PDC 1F-L24
phone: 313-59-44285
e-mail: vlinnans@ford.com

From: Thornton, James (J.W.) <jthornt2@ford.com>
Sent: Monday, November 8, 2004 10:14 AM
To: Snider, Tim (T.O.) <tsnider1@ford.com>
Subject: FW: WARRANTY PARTS RETURN 5-23-02.xls
Attach: WARRANTY PARTS RETURN 5-23-02.xls

From back in March.
I will get the last version from Admiral.

Regards,

Jim Thornton
(313) 845-9249
Ford Motor Company Steering

-----Original Message-----
From: Guillory, Kasandra (K.N.)
Sent: Monday, March 01, 2004 9:50 AM
To: Thornton, James (J.W.)
Subject: FW: WARRANTY PARTS RETURN 5-23-02.xls

fyi...

-----Original Message-----
From: Brandy Clemens [mailto:bclemens@admiral-liv.net]
Sent: Monday, March 01, 2004 9:36 AM
To: Myron Carrier; Wayne Avers; Alan Johnston (E-mail); Porter, Alan (A.J.); Guillory, Kasandra (K.N.); Mohammad Azeem (E-mail)
Subject: WARRANTY PARTS RETURN 5-23-02.xls

Rev. Date: 01/27/04

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
1	Robberson Ford Sales Inc. 2100 E Third St Bend Or 97701	541-382-4521	1FMZU73E02Z[redacted]	U152	12580	12/01/03	10/2/01	Caught in Reverse	Column	Yes	Dent, Burr on Swing arm	11319770	1
2	Jim Doyle Ford Inc. 3330 Delaware Ave Kenmore, NY 14217	716-875-6100	1FMZU72EX2U[redacted]	U152	12100	12/09/03	10/17/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11335111	1
3	Ford of Westfield 99 Spring field Rd. Westfield, MA 01085	413-568-2000	1FMDU74EX2Z[redacted]	U152	31153	12/10/03	3/22/01	Vehicle will not come out of park	Column	Yes	BSI plunger sticks in slot of casting with pressure on BSI ignition switch missing	81091582	
4	Carville Ford , Inc. 2686 Middle Country Rd. Center reach, NY 11720	631-585-5100	1FMDU73W42U[redacted]	U152	20500	12/02/03	1/14/02	Will not shift into park	Column	Yes	BSI ok wear mark p-nut brk't stick in rev.	11464051	
5	Mullahey Ford 330 Traffic way Arroyo Grande, CA 93420		1FMDU65W22Z[redacted]	U152	22245	12/05/03	11/20/01	Ignition key will not come out of tumbler, shifter will not go into park	Column	Yes	BSI ok wear mark p-nut brk't stick in rev.	11427281	1
6	Perry Ford 12740 Poway Rd. Poway, CA 92064	858-748-1400	1FMZU62EX2Z[redacted]	U152	29607	11/26/03	12/17/01	Key is stuck in ignition, will not come out	Column	Yes	BSI ok, damage to PD switch, BSI switch, casting at key cyl, insert plate removed	11320979	1
7	Holman Ford-Mount Laurel 1301 Route 73 Mount Laurel, NJ 080545100	609-866-0110	1FMZU73EX2U[redacted]	U152	10191	12/04/03	10/16/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	81341445	1
8	John Elway Ford Boulder 3200 28th Street Boulder, CO 80301	303-939-8600	1FMDU73WXZ[redacted]	U152	16803	12/05/03	9/20/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't stick in rev.	12703250	1
9	Shepard Bros., Inc. 20 Eastern Blvd. Canandaigua, NY 14424	585-394-1000	1FMZU73E82U[redacted]	U152	22234	10/07/03	3/26/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev., insert plate missing, p-nut brk't bolt not in place	12572860	1
10	Jack Demmer Ford, Inc. 37300 Michigan Ave. Wayne, MI 48184		1FMZU62E12Z[redacted]	U152	19359	12/30/03	2/12/02	Shifter stuck going from drive to park, hang up in reverse	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	12514166	
11	North Bros. Ford, Inc. 33300 Ford Rd Westland, MI 48185	734-421-1300	1FMZU73K92Z[redacted]	U152	26491	12/31/03	6/4/02	Sticks when going in park, between reverse and park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	12653552	
12	R E Barber Ford 3440 East Main St Ventura, CA 93003	805-642-6701	1FMDU63W6Z[redacted]	U152	24824	12/08/03	9/7/01	gearshift lever hard to move and popping like changing detents. Hard to get back into park, inter.	Column	Yes	BSI ok, wear mark p-nut brk't stick in rev.	11295081	1

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
13	Don Sanderson Ford, Inc. 6400 N 51st Ave Glendale, AZ 85301	623-842-8685	1FMDU73E02Z	U152	35850	12/06/03	7/26/01	Shifter came apart, and linkage is disconnected at trans	Column	Yes	BSI ok, shift socket broken, small rad. On shift socket	11237323	1
14	Albany Ford Inc. 718 San Pablo Ave Albany, CA 94706	510-528-1244	1FMZU73E32Z	U152	51025	11/25/03	11/6/01	Shifter will not go into park and the keys cannot be removed	Column	Yes	BSI ok, wear mark on p-nut brk't sticks in rev.	11412091	
15	Don Sanderson Ford, Inc. 6400 N 51st Ave Glendale, AZ 85301	623-842-8685	1FMZU63K92Z	U152	13059	12/01/03	8/21/02	hard to shift out of park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12742960	1
16	Lance Cunningham Ford 4101 Clinton Highway Knoxville, TN 37912	865-687-1400	1FMZU72E02U	U152	15214	12/09/03	2/12/01	Gear shifter fell off in hand front column	Column	Yes	BSI ok shift socket broken, small rad. On shift socket	11026364	1
17	Allan Vigil Ford of Fayetteville 275 North Glynn St. Fayetteville, GA 3021400621	770-460-9545	1FMZU6W72U	U152	35858	11/28/03	1/10/02	Hard to get into park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev. sometimes	12479132	1
18	Gene Evans Team Ford 4355 Jonesboro Rd Union City, GA 30291	770-964-9801	1FMZU62K53U	U152	31816	12/12/03	10/30/02	Gear shift sticks between park and reverse	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12838786	
19	Lake City Ford Lincoln-Mercury 315 Clayton Ave. Coeur D'Alene, ID 83815	208-664-9211	1FMZU75W8Z	U152	30974	12/08/03	11/21/01	Have to wiggle shift handle and force into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11405523	
20	Kelly Ford 776 Magnolia Ave. Melbourne, FL 32935	321-254-4283	1FMZU62K92U	U152	8884	12/02/03	6/27/02	Will not shift from drive to park, when hot after driving	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12692505	1
21	Tri-County Ford Mercury, Inc. 5101 West Highway 146 Buckner, KY 40010	502-241-7333	1FMZU73E72U	U152	40468	11/24/03	3/22/01	Ignition is hard to turn	Column	Yes	BSI ok	81092392	1
22	Lamoureux Ford, Inc. 366 Main St. East Brookfield, MA 01515	508-867-5000	1FMDU74E52U	U152	50022	11/14/03	8/10/01	Hard to get into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. sometimes	11250673	
23	Balise Ford of Wilbraham 1979 Boston Rd. Wilbraham, MA 01095		1FMZU72E82U	U152	32497	12/04/03	10/25/01	Shifter catches every time it is shifted from drive into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11013029	1
24	Ozark Ford Lincoln Mercury 172 N. Hwy 5 Camdenton, MO 65020		1FMZU74E02Z	U152	25783	12/09/03	9/5/01	Gear shifter loose	Column	Yes	BSI ok slight play in shift socket (press)	11294405	1

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
25	Simi Valley Ford 2440 First Street Simi Valley, CA 93065		1FMZU63W82Z[redacted]	U152	33434	12/08/03	8/27/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11275385	1
26	Plaza Ford, Lincoln-Mercury, Inc. 98 New Highway 64 West Lexington, NC 27292	336-243-2731	1FMZU73W22U[redacted]	U152	31711	12/11/03	5/30/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in reverse sometimes	1266303	1
27	Alexander Ford-Mercury, Inc. 1129 Murfreesboro Rd. Franklin, TN 37064	615-794-4585	1FMDU73W82U[redacted]	U152	30437	12/08/03	11/12/01	Gear shifter will not go into park when driving	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11415459	
28	Mtn. View Ford, Inc. 301 East Twentieth St. Chattanooga, TN 37408	423-756-1331	1FMDU73EX2U[redacted]	U152	36911	12/05/03	1/31/02	Gear shifter is hanging up between reverse and park	Column	Yes	BSI ok	12500385	
29	Courtesy Ford 8252 S Broadway Littleton, CO 80122	303-797-3673	1FMDU74E32Z[redacted]	U152	31792	12/10/03	3/22/01	Trans shifter won't come out of park	Column	Yes	BSI ok, insert plate removed p-nut brk't bolt removed	11092155	1
30	West-Herr Ford, Inc. 5025 Camp Road Hamburg, NY 14075	716-649-5701	1FMZU73E72U[redacted]	U152	31741	12/10/03	12/13/01	Key will not come out of ignition	Column	Yes	BSI ok	11421765	1
31	Towne Ford, Inc. 3535 Southwestern Blvd Orchard Park, NY 14127	716-662-6500	1FMZU73W23U[redacted]	U152	14843	11/28/03	9/16/02	Shifts hard going into park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	12764113	1
32	Northport Ford, Inc. 6233 Jericho Turnpike Commack, NY 11725	631-499-6400	1FMZU72E92U[redacted]	U152	23364	12/08/03	11/29/01	Shifter gets jammed between reverse and park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	1142874	
33	Albion Motors Ford-Mercury, Inc. P.O. Box 218 Albion, MI 49224-0218		1FMZU72E82U[redacted]	U152	27416	11/12/02	2/9/01	Trouble with ignition switch	Column	Yes	BSI ok, small rad. On shift socket	12895848	
34	West-Herr Ford, Inc. 5025 Camp Road Hamburg, NY 14075	716-649-5701	1FMZU73EX2U[redacted]	U152	20349	12/10/03	10/8/01	Shift lever broken	Column	Yes	BSI ok, BSI switch broken, shift socket broken	11333665	
35	Ripon Ford-Mercury, Inc. 1036 W Fond Du Lac St. Fond Du Lac, WI 54971		1FMPU16W83L[redacted]	U222	15368	12/20/02	3/20/02	Brakes noisy, U222	Column	Yes	BSI ok, noisy, ignition switch missing, no delay on BSI	122005509	
36	Capistrano Ford 33949 Doheny Park Rd. San Juan Capistrano, CA 92675	949-240-7000	1FRMU17L23L[redacted]	U222	105	03/07/03	4/26/02	Transmission trouble, U222	Column	Yes	BSI damaged, shift socket broken, no delay on BSI, U222	222020308	

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37	Bill Collins Ford, Inc. 4220 Bardstown Rd. Louisville, KY 40218	502-459-9550	1FMZU75E32U	U152	11000	11/12/02	3/26/02	Steering Noisy	Column	Yes	BSI ok	11436998	
38	Glenn Bush Ford, Inc. Route 56 Apollo, PA 15613	724-478-4113	1FMPU16L63L	U222	8331	03/10/03	3/26/02	Steering/Handling and ride troubles	Column	Yes	BSI ok, no delay on BSI, U222	122007992	
39	Dick Edwards Ford Lincoln Merc. 7929 East Hwy #24 Manhattan, KS 66502		1FMPU18LX3L	U222	4929	01/20/03	10/7/02	Warning light on for air bag	Column	Yes	BSI ok, has delay, U222	222138058	1
40	Planet Ford 20403 I-45 North Spring, TX 77388		1FMRU15W83L	U222	25	01/20/03	11/27/02	Difficult to shift	Column	Yes	BSI broken, has delay, shift socket broken, U222, large rad., on shift socket	222497578	1
41	Haldeman Ford, Inc. 1741 Tilghman St. Allentown, PA 18104	610-776-7800	1FMDU73E92	U152	17439	12/09/03	9/118/01	Shifter must be put in neutral then park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	11309908	1
42	Best Ford Inc. 1901 N Mayfair rd. Wauwatosa, WI 53226	414-453-9785	1FMZU72EX2Z	U152	27881	12/09/03	9/5/01	Shifter is sticking when putting into gear	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev. sometimes	11293743	1
43	Al Long Ford, Inc. 13711 E 8 Mile Rd. Warren, Mi 48089	586-777-2700	1FMZU73K02U	U152	30035	12/10/03	6/21/02	Shifts hard going into park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	12692324	
44	East Ford, Inc. 3940 Highway 80 W Jackson, MS 39209	601-922-3311	1FMZU63E62U	U152	27141	12/09/03	2/12/02	Shifts hard going into park	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	1251649	
45	Champion Ford Lincoln-Mercury 706 highway 74 East Rockingham, NC 28379	910-582-8383	1FMRU15W93L	U222	328	01/24/03	8/6/02	Engagement troubles	Column	Yes	BSI ok, shaft retaining clip missing, U222	222084192	
46	Miller Ford, Inc. 960 Kings Highway Fairfield, CT 06432	203-335-3185	1FMZU73W12U	U152	22914	12/03/03	6/3/02	Shifter handle is loose	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev., shaft retaining clip missing	12653113	
47	McCoy & Mills Ford 700 W Commonwealth Fullerton, CA 928321302	714-526-5501	1FMRU15W53L	U222	1969	03/06/03	6/20/02	Knock in steering	Column	Yes	BSI ok, has delay, U222	222063671	
48	Sutliff Capitol Ford 1000 Paxton St. SW Harrisburg, PA 17104		1FMZU75EX2U	U152	16304	12/08/03	8/6/01	Gear shift lever not aligned up with positions	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev.	11245437	1

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49	Morris Ford-Mercury, Inc. 872 Saratoga Rd. Burnt Hills, NY 12019	518-3999188	1FMZU73E22ZB33204	U152	32982	12/11/03	10/18/01	Gets stuck in reverse, will not go into park	Column	No	BSI ok, old BSI on new column, column never in auto	11785077	1
50	Echelon Ford, Inc. #4 South White Horse Pike Stratford, NJ 08084	856-627-8400	1FMZU73EX2UC33533	U152	22319	12/09/03	2/27/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12536436	1
51	Ron Bortnick Ford, Inc. 5701 Crain Highway Upper Marlboro, MD 20772	301-627-5600	1FMDU75W32ZB02463	U152	35233	12/26/03	9/26/01	Shifter hard to move gears	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11315075	1
52	Ray Seraphin Ford, Inc. 100 Windsor Ave Rockville, CT 06066	860-875-3369	1FMZU73K82UD34429	U152	21347	12/03/03	7/17/02	Car won't shift out of park into gear	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. sometimes	12542590	1
53	Hill & Sanders Ford, Inc. 11250 Viers Mill Rd. Wheaton, MD 20902	301-929-8855	1FMDU73E22UB06267	U152	35156	12/12/03	9/6/01	Hard to shift	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11283911	1
54	John Meegan Ford, Inc. Old Route 119 and 477 Mount Pleasant, PA 15666	724-547-3553	1FMZU75W72ZB31003	U152	17989	12/29/03	10/17/01	Hard to put in park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11337784	
55	Autofair Ford, Inc. 1475 S Willow St. Manchester, NH 03103	603-625-2540	1FMZU72E02UA85202	U152	30065	12/29/03	8/2/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11246698	
56	Pacifico Marple Ford 3015 West Chester Pike Broomall, PA 19008		1FMDU73E32ZB80882	U152	6943	12/22/03	1/29/02	Key jamming in ignition	Column	Yes	BSI ok, ignition switch ok	12500767	1
57	Court Street Ford, Inc. 558 Latham Drive Bourbonnais, IL 60914	815-939-2600	1FMDU74EX2UB55585	U152	27245	12/29/03	11/1/01	Key sticking in ignition	Column	Yes	BSI screw missing insert plate removed	11005816	
58	McCafferty Ford of Mechanicsburg 6320 Carlisle Pike Mechanicsburg, PA 17055		1FMZU73EX2UA69698	U152	28000	11/14/03	6/18/01	C-S hard to get in park	Column	Yes	BSI ok wear mark p-nut brk't does not stick in rev.	11212006	
59	Willey Ford-Bountiful 1800 South Main Bountiful, UT 84010		1FMZU73E72ZB72872	U152	35984	12/12/03	1/7/02	Steering wheel has a lot of play in it	Column	Yes	Everything ok	128358333	1
60	Planet Ford, Inc. 2601 east Alex-Bell Road Centerville, OH 45459		1FMZU73W4ZA46351	U152	11845	12/02/03	11/21/02	Key will not always turn in cylinder	Column	Yes	BSI ok, tried key cly. Ok (new), didn't have original key cly.	11559285	1
61	Kenosha Ford 8200-120th Ave. Kenosha, WI 53142	262-857-2134	1FMZU75E02ZA74084	U152	25493	12/23/03	8/20/01	Shifter lever gets stuck	Column	Yes	BSI (removed) wear mark p-nut brk't	11255402	1

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62	World of Ford Sales, Inc. 6129 Richmond Highway Alexandria, VA 22303	703-660-0450	1FMDU73E32UB68597	U152	25082	12/26/03	12/14/01	Would not come out of park(shifter)	Column	Yes	BSI ok, column out of park, wear mark p-nut brk't sticks in rev.	11409586	1
63	Latham Motors, Inc. 637 Columbia street, Route 9R Latham, NY 12110	518-785-4161	1FMZU74E52ZB01877	U152	35989	12/29/03	9/20/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in a rev.	11306847	1
64	Sunset Auto Company, Inc. 11700 Gravois Rd. St Louis, MO 63127		1FMZU62E92ZB84971	U152	28955	12/09/03	1/25/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't	12495850	1
65	Fullerton Ford 1044 U.S. Route 22 East Somerville, NJ 08876	908-722-2500	1FMZU73K13UA14239	U152	27525	01/02/04	9/4/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12757787	1
66	C Basil Ford, Inc. 1540 Walden Ave. Cheektowaga, NY 14225	716-897-3673	1FMZU72E02ZB19447	U152	30790	10/13/03	9/19/01	Shifts hard going into park	Column	Yes	BSI ok shifts hard out of park	11310150	
67	Middlekauff Ford 4400 W Plano Parkway Plano, TX 75093	972-758-8035	1FMZU63K2ZD01247	U152	35999	12/29/03	8/21/02	C-S hard to get in park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12749230	1
68	El Cajon Ford 1595 E Main El Cajon, CA 92021	619-579-8989	1FMZU62KX3ZB19490	U152	4076	12/22/03	4/28/03	Buzzing noise in steering wheel	Column	Yes	BSI removed from column	11753149	1
69	North Central Ford 1819 North Central Expressway Richardson, TX 750803507		1FMZU64E62ZB62178	U152	29292	12/30/03	12/20/01	Shifter catches and will not go into park with ignition off	Column	Yes	BSI ok wear mark on p-nut brk't sticks in rev.	11455261	
70	Sunset Ford 5440 Garden Grove Westminster, CA 926831898	714-372-4520	1FMZU63E12ZB90584	U152	20915	02/11/03	2/7/02	Difficult to shift lever change gears	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12506159	1
71	Russell & Smith Ford, Inc. 3440 S Loop West Houston, TX 77025	713-663-4205	1FMZU63E02ZA26954	U152	24730	12/04/03	3/19/01	Shifter won't come out of park	Column	Yes	BSI ok not column related	11086451	
72	Roy O'Brien, Inc. 22201 Nine Mile Rd St Clair Shores, MI 48080	586-776-7600	1FMZU63E02ZB96411	U152	16492	12/8/03	2/12/02	Shifter is hard to get into park	Column	Yes	BSI ok light mark p-nut brk't does not stick in rev.	12500352	1
73	Bill Brown Ford, Inc. 32222 Plymouth Rd Livonia, MI 48150	734-421-7116	1FMZU73E22ZB39889	U152	35436	12/29/03	11/12/01	Gear shifter sticks when going from reverse to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev	11416353	

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74	Towne Ford Sales 1601 El Camino Real Redwood City, CA 94063	650-366-5744	1FMDU73W52U[redacted]	U152	18166	12/19/03	2/13/02	Shift levers bind	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12513801	
75	Greenway Ford, Inc. 9001 East Colonial Drive Orlando, FL 32817	407-249-3324	1FMZU63E12U[redacted]	U152	42525	12/8/03	3/20/01	Shifter broken at column-advise	Column	Yes	BSI ok removed shift socket broken small rad. Shift socket	11086237	
76	Sioux Falls Ford 4101 West 41st St Sioux Falls, SD 57106	605-361-9601	1FMZU73E4U[redacted]	U152	35275	12/12/03	9/13/01	Shifts hard going into park	Column	No	BSI ok no mark p-nut brk't, BSI switched Column never in auto	11759003	
77	Matthews Paoli Ford 100 West Lancaster Avenue Paoli, PA 19301		1FMZU73E32Z[redacted]	U152	33512	12/5/03	1/25/02	Engine won't crank unless shift lever is moved slightly out of position	Column	Yes	BSI works insert plate removed	12496656	
78	Doug Stanley Ford 515 I-35E South De Soto, TX 75115	972-223-8050	1FMZU62K13Z[redacted]	U152	16671	12/22/03	3/27/03	Shifter lever broke off and now will not come out of gear and key is stuck in ignition	Column	Yes	BSI works PDS switch broken	11532000	1
79	Willey Ford-Bountiful 1800 South Main Bountiful, UT 84010		1FMZU73E02U[redacted]	U152	19704	12/18/03	3/8/02	Vehicle comes out of gear even when you don't press the brake pedal	Column	Yes	BSI ok	12550231	1
80	Columbia Ford Lincoln-Mercury 234 Route 6 Columbia, CT 06237	860-228-2886	1FMZU73K03U[redacted]	U152	30395	12/26/03	8/21/02	Shifter binds going into park	Column	Yes	BSI ok found grease on plunger and p-nut brk't		1
81	Tower Ford, Inc. 124A South Middle Neck Rd Great Neck, NY 11021	516-466-6400	1FMZU73K32Z[redacted]	U152	30419	12/11/03	8/1/02	Hard to put into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12705490	1
82	Litchfield Ford Route 202 Litchfield, CT 06759	860-567-4561	1FMZU74EX2Z[redacted]	U152	35546	11/28/03	1/18/02	cust, states install SOP steering column parts	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12489722	1
83	Planet Ford 20403 I-45 North Spring, TX 77388		1FMZU64W22Z[redacted]	U152	28081	12/19/03	12/12/01	Trans shifter won't go from drive to park without stopping in reverse after veh. Driven	Column	Yes	BSI ok, wear mark p-nut brk't sticks in rev. Shaft retainer off shaft not pressed into bearing(upper)	11448291	1
84	Marshal Mize Ford, Inc 5348 Hwy 153 Chattanooga, TN 37343	423-875-2058	1FMZU63K02U[redacted]	U152	16421	12/23/03	8/2/02	Shifter will not return to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12721076	1
85	Clevenger Ford 701 North Main St Porterville, CA 93257	559-784-6000	1FMZU63E42Z[redacted]	U152	23232	10/29/03	3/28/02	Gearshift hard to get out of park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12578882	1

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86	Kelly Ford 776 Magnolia Ave. Melbourne, FL 32935	321-254-4283	1FMZU63W62U	U152	31520	12/30/03	11/2/01	Shift selector will not go into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11404611	
87	Friendly Ford, Inc. 3241 S Glenstone Springfield, MO 65804		1FMZU73W62Z	U152	33826	12/18/03	8/28/01	Will not shift into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11280885	1
88	Ron Blackwell Ford, Inc. 2609 South Walton Boulevard Bentonville, AR 72712	479-273-9022	1FMZU74E02Z	U152	26168	12/19/03	7/26/01	Electrical accessory troubles	Column	Yes	BSI ok ignition switch ok	81234715	1
89	Freedom Ford, Inc. 24825 U.S. Highway 19 North Clearwater, FL 33763	727-797-6770	1FMDU64E62U	U152	35849	1/2/04	2/28/02	Has to pull gearshift forward to get into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12543543	1
90	World of Ford Sales, Inc. 6129 Richmond Highway Alexandria, VA 22303	703-660-0450	1FMZU73W32Z	U152	26275	1/2/04	3/26/03	Steering/handling and ride troubles	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12567293	1
91	Suburban Ford of Waterford, LL 5900 Highland Rd Waterford, MI 48327		1FMZU72E12U	U152	25797	12/29/03	12/11/01	Difficult to operate shift lever, change gears	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11428685	1
92	Perry Ford 12740 Poway Rd. Poway, CA 92064	858-748-1400	1FMZU72E6U	U152	8186	12/16/03	10/1/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11324465	1
93	Toms Ford, Inc. 200 State Hwy 35 Keyport, NJ 07735	732-264-1640	1FMZU73EX2U	U152	14966	12/18/03	9/17/01	Shifts hard going into park	Column	Yes	BSI ok no mark on p-nut brk't goes into park fine	11759647	1
94	Adams Ford Belton, Inc. 800 Quick Trip Way Belton, MO 64012		1FMZU73E42Z	U152	31390	12/29/03	12/14/01	Shifts hard going into park	Column	No	BSI switched column never in auto	11778791	
95	Smithtown Ford, Inc. 440 East Jericho Turnpike Smithtown, NY 117870865	631-265-2340	1FMDU73E92Z	U152	27569	1/5/04	8/20/01	Steering column/wheel squeak/rattle	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. can't remark on customer problem	11259749	
96	Parkway Motors 1010 North Main Cedar City, UT 84720	435-865-1502	1FMZU73EX2Z	U152	29008	10/28/03	11/8/01	Shifter hard to move	Column	Yes	BSI ok wear make p-nut brk't sticks in rev.	11415227	1
97	Koons Sterling Ford 46869 Harry Byrd Highway Sterling, VA 20164	703-444-5750	1FMZU73E22U	U152	35937	11/19/03	4/26/02	Hard to get gear shift out of park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	12598460	1

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98	Academy Ford Sales 13401 Washington Blvd. Laurel, MD 20707	301-419-2700	1FMDU74W52U	U152	34700	12/30/03	11/14/01	Gear shifter hangs up going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev.	11424114	1
99	Academy Ford Sales 13401 Washington Blvd. Laurel, MD 20707	301-419-2700	1FMZU73E42U	U152	30280	12/29/03	4/3/02	Gear shifter seems to hang up in rev. when going from drive to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. sometimes	12579612	1
	Mike Ognibene Ford, Inc 5072 East Main Street Batavia, NY 14020		1FMZU73E62Z	U152	26082	1/26/04	2/13/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev. column scraped	11033345	1
	McCafferty Ford of Mechanicsburg 6320 Carlisle Pike Mechanicsburg, PA 17055		1FMZU75K32U	U152	18000	1/23/04	5/23/02	Sticks in park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12646471	1
	Cavalier Ford 1515 South Military Highway Chesapeake, VA 23320	757-424-1111	1FMZU72E92U	U152	28793	1/26/04	9/4/01	C-S when putting vehicle into park you have to put the lever into neutral and try again	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11291224	1
	Simon Ford, Inc 401 North Main St Norwich, CT 06360	860-889-2608	1FMDU73E82Z	U152	35925	12/12/03	1/7/02	Sometimes won't shift into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11405081	1
	Sam Pack's Five Star Ford 1635 I-35 East Carrollton, TX 75006	972-242-6415	1FMZU63E42Z	U152	35215	1/29/04	12/10/01	Will not go back into park from drive	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11432030	1
	Marshall Ford 6200 Mayfield Road Mayfield Heights, OH 44124	440-449-1000	1FMZU72E12Z	U152	26222	2/2/04	11/27/01	C-S when shifting from reverse or drive into park, shifter will not go into park unless shifter is put back into gear	Column	Yes	BSI ok wear mark p-nut brk't stick in rev sometimes column scraped	11435631	1
	El Cajon Ford 1595 E Main El Cajon, CA 92021	619-579-8989	1FMZU63E22Z	U152	26174	11/22/04	11/28/01	Will not go into park all the way	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11435652	1
	Mullinax Ford East 28825 Euclid Ave Wickliffe, OH 44092	440-585-8000	1FMZU72E62Z	U152	26279	1/26/04	3/1/02	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12543631	1
	Bob Turner's Ford Country 1101 Montano N.E. Albuquerque, NM 871074942	505-224-1234	1FMZU62K73Z	U152	31810	2/2/04	1/10/03	Trans is hard or won't shift in or out of reverse	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev BSI bolts missing	12918014	1
	Sunbury Motor Company 943 North Fourth Street Sunbury, PA 17801	570-286-7746	1FMZU74W12U	U152	23624	1/15/04	8/29/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11288167	1

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	Sycamore Auto Center, Inc 1370 DeKalb Ave Sycamore, IL 60178	815-895-4585	1FMDU74E92Z	U152	27421	1/27/04	8/2/01	Sticks going back into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11247165	1
	Toms Ford, Inc. 200 State Hwy 35 Keyport, NJ 07735	732-264-1640	1FMDU75W42U	U152	23256	1/16/04	2/26/02	Shifter will not go into park at times	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	122002843	1
	McDaniel Ford 430-440 Plainview Rd Hicksville, NY 11801	516-681-9006	1FMDU73E82U	U152	40097	2/2/04	8/3/01	Hard to shift gears	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11249194	1
	Franklin Ford, Inc 4910 Sylva Rd Franklin, NC 287346775		1FMFU18L53L	U222	11911	1/5/04	10/5/02	Difficult to operate shift lever, change gears hard to get out of park	Column	Yes	BSI ok	222138002	
	Kenny Ross Ford South, Inc 3200 Library Road Pittsburgh, PA 15234		1FMZU72E32U	U152	21238	1/30/04	9/10/01	Shifter gets stuck going into rev., when going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11296766	1
	Rainbow Ford Lincoln-Mercury 6980 Niagara Falls Blvd Niagara Falls, NY 14304	716-693-1400	1FMZU73E92Z	U152	26789	1/15/04	12/6/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11434972	1
	Don Davis Ford, Inc 633 N Hwy 360 Arlington, TX 76011	817-261-4261	1FMRU15WX3L	U222	26980	2/2/04	4/22/04	Clicking noise coming from steering column area when pressing the brakes	Column	Yes	BSI cycles ok no time delay	BSI ONLY	
	Northland Lincoln-Mercury 20839 Route 19 North Cranberry Township, PA 16066		1FMZU72E32Z	U152	26875	2/2/04	8/13/01	Steering/Handling and ride troubles	Column	Yes	Shift socket broken small rad.	11259340	
	Liberty Ford Lincoln Mercury 4215 east liberty Ave Vermillion, OH 44089	440-967-6191	1FMZU73E92Z	U152	39503	2/4/04	9/19/01	Ignition key will not come out..key is stuck	Column	Yes	PDS switch broken off insert plate	11311607	
	Irwin Lincoln Mercury Sales& Freehold Circle Rte 7 & 33 Freehold, NJ 077280008	732-462-1818	1FMZU73K8U	U152	18000	1/23/04	6/18/02	Shifter binds	Column	Yes	BSI ok wear mark p-nut brk't stick in rev column scraped	12676269	
	Healey Ford of Ansonia, Inc 500 Main Street Ansonia, CT 06401	203-732-5000	1FMZU73KX2U	U152	11271	1/20/04	6/3/02	Shifts rough	Column	Yes	BSI ok shifts fine from park wear mark p-nut brk't sticks in rev column scraped	12653954	
	Liberty Ford Lincoln Mercury 4215 east liberty Ave Vermillion, OH 44089	440-967-6191	11FMZU73E62Z	U152	27240	1/28/04	12/20/01	Hard to get out of park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11460902	

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
	Maplecrest Lincoln-Mercury, Inc 2800 Springfield Ave Union, NJ 07088		1FMZU72E52U[redacted]	U152	24941	11/15/03	6/15/01	Veh. Will not come out of park	Column	Yes	BSI missing clock spring brk't loose shaft retainer missing	11754940	
	Leif Johnson Ford 501 E Koenig Lane Austin, TX 78751	512-454-3767	1FMZU63E42Z[redacted]	U152	15250	2/3/04	2/28/02	Gear shifter sticks when going from reverse to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12536273	
	Friendly Ford, Inc 2800 N Telegraph Monroe, MI 48162	734-243-6000	1FMZU73K72U[redacted]	U152	20974	1/26/04	6/24/02	Gear shifter sticks halfway in park from drive	Column	Yes	BSI ok wear mark p-nut brk't stick in rev column scraped	12687210	
	Pearson Ford 4300 El Cajon Blvd San Diego, CA 92105	619-521-2480	1FMZU74W42Z[redacted]	U152	13419	2/4/04	6/4/02	At times when in drive will not shift into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12664383	
	Noble Ford of Newton, Inc 3020 First Ave. East Newton, IA 50208		1FMZU73E12Z[redacted]	U152	29226	12/4/03	2/19/02	Will not shift out of park	Column	Yes	BSI ok shifts out of park ok wear mark p-nut brk't sticks in rev column scraped	12527622	
	All American Ford 243 North Magnolia Drive Tallahassee, FL 32301		1FMDU64W32U[redacted]	U152	26574	1/26/04	11/1/01	Shifter sticks when going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11422781	
	Planet Ford 20403 I-45 North Spring, TX 77388		1FMZU63E62Z[redacted]	U152	21906	1/6/04	1/24/02	Trans shifter hard to get into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12483903	
	Red Bluff Ford-Mercury, Inc 2950 Main Street Red bluff, CA 96080	530-527-2816	1FMPU16L83L[redacted]	U222	32814	1/28/04	3/7/02	Can not get vehicle out of park	Column	Yes	BSI ok shifter comes out of park	122002510	
	Brighton Ford-Mercury, Inc 8240 W Grand River Brighton, MI 48114	810-227-1171	1FMZU75E52Z[redacted]	U152	34868	2/2/04	8/15/01	C-S makes a clunk when going into park from steering column area	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11268658	
	Metro Ford 1651 New State Highway Rayham, MA 02767		1FMZU73W02Z[redacted]	U152	29502	1/19/04	10/30/01	C-S shifter inop	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11401832	
	Byerly Ford, Inc 4041 Dixie Hwy Louisville, KY 40216	502-448-1661	1FMZU73E4U[redacted]	U152	30162	1/29/04	10/15/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11337541	
	Sebring Ford Lincoln Mercury 3201 U.S. 27 South Sebring, FL 33870		1FMZU65E92Z[redacted]	U152	35882	2/2/04	11/20/01	Hard to put into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12530913	

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
	Hayward Ford 25501 Mission Blvd Hayward, CA 94544	510-881-1200	1FMPU17L03L	U222	7031	1/19/04	2/11/03	C-S when moving shifter from park to drive the shifter does not lock into drive	Column	Yes	BSI ok shift socket loose	223252700	
	Port Angeles ford-Lincoln-Mercury 1527 East Front Street Port Angeles, WA 98362		1FMZU73EX2U	U152	21129	1/28/04	4/26/02	Will not go into park after driving in gear	Column	Yes	BSI works BSI screws loose wear mark p-nut brk't sticks in rev column scraped	12609242	
	Mock's Ford Sales 913 S E Sixth St Grants Pass, OR 97526	541-476-6656	1FMZU72K72Z	U152	11870	1/5/04	8/22/02	Vehicle at times won't shift into park	Column	No	BSI ok p-nut brk't ok column never in auto	11758864	
	Ray Whitfield Ford Inc 10725 S Telegraph Road Taylor, MI 48180	313-291-0379	1FMZU72K92Z	U152	18205	1/21/04	7/15/02	Difficult to put into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12677765	
	Dick Smith Ford, Inc 9505 E 350 Hwy Raytown, MO 64133		1FMZU73K43Z	U152	13620	1/9/04	10/10/02	Steering column clinks when turning	Column	Yes	BSI ok shaft turns ok	11845888	
	Ramey Ford Lincoln Mercury 615 North Eisenhower Drive Beckley, WV 25801		1FMZU72E32U	U152	14501	1/20/04	1/31/02	Gets hung up in rev when trying to go into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12495426	
	Geo M Yocum, Inc 323 East Main Street Lansdale, PA 19446	215-855-1153	1FMDU73E12Z	U152	29680	1/29/04	10/29/01	Shifts hard going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11402149	
	Mike Finnin Ford, L.L.C. 3600 Dodge Street Dubuque, IA 52003	563-556-1010	1FMZU73E12U	U152	32893	12/22/03	3/26/02	Shifter seems to get caught between R and P	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12574214	
	Marshall Ford 6200 Mayfield Road Mayfield Heights, OH 44124	440-449-1000	1FMFU16L13L	U222	16323	2/9/004	10/16/02	Engine will not start, no crank, dash board light comes on	Column	Yes	Unable to test BSI (in pieces)	BSI only	
	Santa Margarita Ford 30031 Santa Margarita Parkway Rancho Santa Margari, CA 92688	949-888-4348	1FMRU15W23L	U222	9588	2/12/04	1/15/03	Squeak in steering column	Column	Yes	BSI ok	222220777	
	Mac Haik Ford 10333 Katy Freeway Houston, TX 77024	713-932-5065	1FMDU64W12Z	U152	43207	1/19/04	7/30/01	Trans binds when going into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11238298	
	Tom Ford, Inc 98 Walker's Brook Drive Reading, MA 01867	617-944-7760	1FMDU85W73U	U152	28681	1/27/04	11/4/02	Shifter will not come out of park	Column	Yes	BSI ok shift socket broken	12893645	

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P
	J&S Ford, Inc 315 Clendenny Ave @ Route 440 Jersey City, NJ 07304		1FMZU72E52U[redacted]	U152	17787	2/4/04	4/29/02	Shifter gets stuck in reverse from drive to park, but in reverse goes right into park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	12613802	
	Michael Stead's Martin Ford 619 Francisco Blvd San Rafael, CA 94901		1FMFU18L93L[redacted]	U222	12255	1/27/04	9/7/02	Whine in steering wheel when turning it sound's like it's coming from the column	Column	Yes	BSI ok	222112596	
	Ford of Walla Walla, Inc 11 N Colville Walla Walla, WA 99362		1FMZU74E52U[redacted]	U152	28039	2/2/04	9/10/01	Shifter catches hard to get into park	Column	No	BSI ok column never in auto	11846546	
	Country Ford Limited 210 Gardiners Ave Levitton, NY 11756	516-735-7406	1FMZU73K53Z[redacted]	U152	4986	2/3/04	1/23/03	C-S shifter does not lock into place	Column	Yes	BSI plunger sticks park det-switch bent BSI switch broken	13939711	
	Sprint Ford, Inc 4402 Ann Arbor Road Dundee, MI 48131		1FMZU72E72Z[redacted]	U152	27925	1/19/04	3/7/02	Transmission troubles	Column	Yes	BSI ok wear mark p-nut brk't column scraped	12542652	
	Lithia Ford of Boise 8853 West Fairway Avenue Boise, ID 83704		1FMZU73E12Z[redacted]	U152	34043	1/14/04	11/8/01	Shifter gets stuck from drive to park	Column	Yes	BSI ok wear mark p-nut brk't sticks in rev column scraped	11415614	

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P

	SVC AGENT	PHONE NO.	VIN NO.	Vehicle Type	ODOM NO.	RO Date	Vehicle Build Date	Customer Complaint	PART RETURNED	Return From Vehicle	Remarks	ATM Number	R2P

Probable R to Park issue

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From: Kroll, Susan (S.E.)
Sent: Friday, October 29, 2004 11:48:23 AM
To: Snider, Tim (T.O.); Linnansalo, Vera (V.); Thornton, James (J.A.)
Subject: RE: U152 Greenbelt Project Update

Vera, Tim, Jim:

I recently started a new position and moved to Building #1. I don't think I'm going to be able to adequately support the green belt project with my background and my new responsibilities. I have an opportunity to join a project that is just starting in my department and I think I would be better suited for it. If this is going to create a problem, please let me know and I will prioritize things so that I can become more involved in the chassis project.

Regards,

Susan Kroll
Body CAD Sheet Metal Supervisor
D219/258/333 & S197
Building #1, 12G023
Phone: (313) 24-82543

-----Original Message-----
From: Snider, Tim (T.O.)
Sent: Wednesday, October 27, 2004 3:13 PM
To: Linnansalo, Vera (V.); Porter, Alan (A.J.); Thornton, James (J.A.); Kroll, Susan (S.E.)
Subject: U152 Greenbelt Project Update

Everyone,

Attached is the U152 Hard to Shift Greenbelt project. I added warranty information and charts, from the Chassis Quarter Back web page, to the Define section, as well as pictures to the cover page.

Veera,

How do the slides look and what is a good next step in completing the project?

Susan,

Are you working on the RTDA R&P Teardown chart?

<< File: Project24784.U152 Hard to Shift.tsnider1.ppt >>

Regards,
Tim Snider (tsnider1@ford.com)
U293/U251 Ford Steering Engineering
2B-C62 Product Development Center, 313-594-4129
Dearborn, MI 48121 USA

From: Welker, Cindy (C.)
Sent: Wednesday, October 27, 2004 7:30:21 AM
To: Snider, Tim (T.O.)
Subject: RE: U152 Steering Column Greenbelt Project

Tim,

I don't use GQI for my data, I use AWS-Analytical Warranty System so I can't help you with the website.

-----Original Message-----
From: Snider, Tim (T.O.)
Sent: Tuesday, October 26, 2004 9:44 AM
To: Smith, Garry (G.R.); Welker, Cindy (C.)
Subject: U152 Steering Column Greenbelt Project

Garry/Cindy,

I am working with Jim Thornton and Alan Porter on a Greenbelt project titled "Service Fix for U152: Hard to Shift Into and Out of Park". Jim showed me graphs of the Explorer Steering Column, 3C529, Cost per Unit and R/1000 from Chassis Quarterback, which apparently were either created or authorized by one of you. For the Define portion of the Greenbelt project, I would like to recreate these graphs and see if there are any others I can create to show that a warranty issue is forming. Do either of you have time to show me how you created these graphs? I can come to your desk. I have just become familiar with the Global Quality website (http://www.quality.ford.com/cognos/cgi-bin/upfcgi.exe), but am still learning my way around. Thanks.

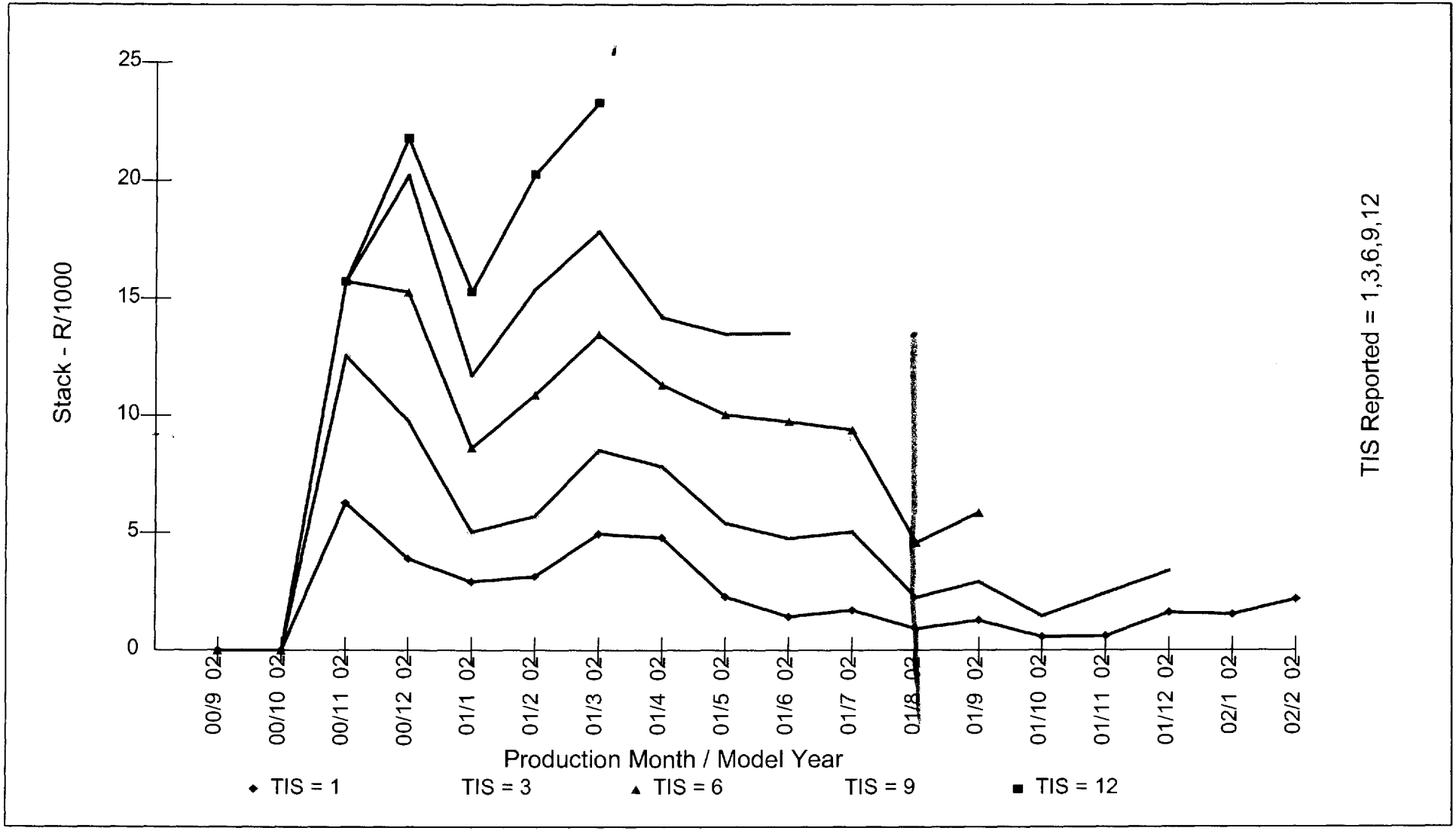
Regards,
Tim Snider (tsnider1@ford.com)
U293/U251 Ford Steering Engineering
2B-C62 Product Development Center, 313-594-4129
Dearborn, MI 48121 USA

STACK CHART

Date/Time Printed : May 28, 2002 / 14.34
Model Years : 2002
Statistic : R/1000
Y Value(s) : TIS Reported = 1,3,6,9,12
Unique : MODEL YEAR MATRIX

Cutoff Date: Apr 30, 2002
Logic : Corporate

Result ID: 38230161
Page Number : 3
Min Divisor : 100



AWS

STACK CHART

Cutoff Date: Apr 30, 2002
Last Load Date: May 20, 2002

Request Name: U152_STeering WCC
Description:

Date/Time Run: May 22, 2002 / 14.25
Date/Time Printed: May 28, 2002 / 14.34

Result ID: 38230161
Generated By: AQADDOUR

Data Selection Criteria :

Cost Category	=	All Paid Claims[%,%,%]
Country Sold / Repaired [typed]	=	[USA,USA], [CAN,CAN]
Model Year	=	MY_02[2002]
Region Sold	=	North America[NA]
Vehicle Line AWS	=	EXPLORER[U2], MOUNTAINEER[U3]
WCC	=	STEERING COLUMN - CONVTL[5R01], STEERING COLUMN - TILTAWAY[5R03], TRANS. LINKAGE-COL MTD AUTO[5R05], STEERING COLUMN LOCK - CONV[5R08], STEERING COLUMN LOCK -TLTWY[5R09]

Report Selection Criteria :

Model Year(s)	=	2002
Logic	=	Corp
Order By	=	Grand Total
TIS Rows Selected	=	All
YTD Column Only	=	No
Minimum Divisor	=	1
Cost Type	=	Total Cost Gross
Use Group	=	No
Descriptions	=	Yes

Globalization Information:

Distance Reported	=	Miles
Distance Requested	=	Miles
Currency Reported	=	US DOLLAR
Currency Requested	=	US DOLLAR
Currency Exchange Version	=	v5

STACK CHART

Date/Time Printed : May 28, 2002 / 14.34
Model Years : 2002
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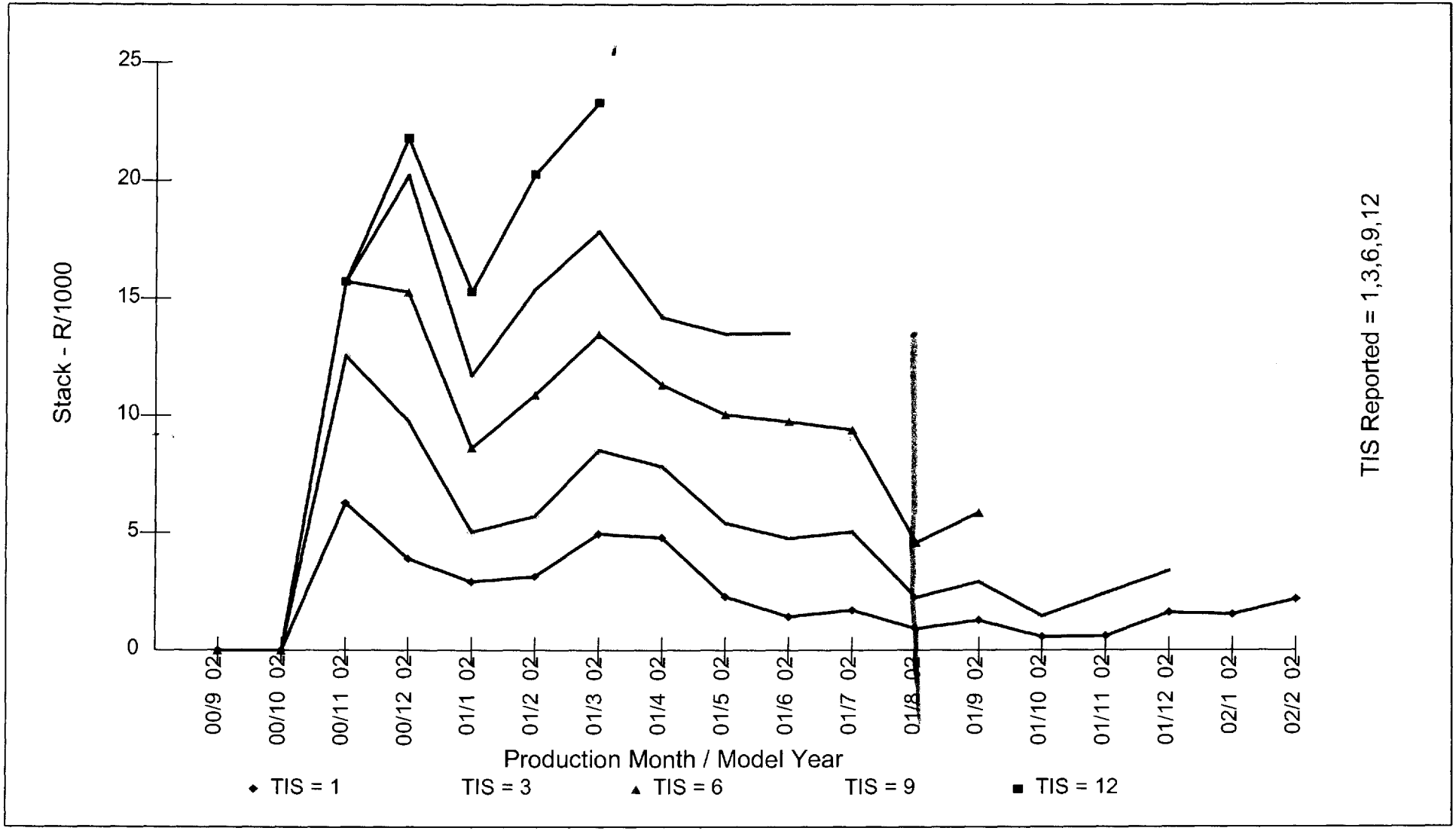
Y Value(s) : TIS Reported = 1,3,6,9,12
Unique : MODEL YEAR MATRIX

Cutoff Date: Apr 30, 2002
Logic : Corporate

Result ID: 38230161
Page Number : 3
Min Divisor : 100



AWS

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Model Year	=	MY_02[2002]
Region Sold	=	North America[NA]
Vehicle Line AWS	=	EXPLORER[U2], MOUNTAINEER[U3]
WCC	=	STEERING COLUMN - CONVTL[5R01], STEERING COLUMN - TILTAWAY[5R03], TRANS. LINKAGE-COL MTD AUTO[5R05], STEERING COLUMN LOCK - CONV[5R08], STEERING COLUMN LOCK -TLTWY[5R09]

Report Selection Criteria :

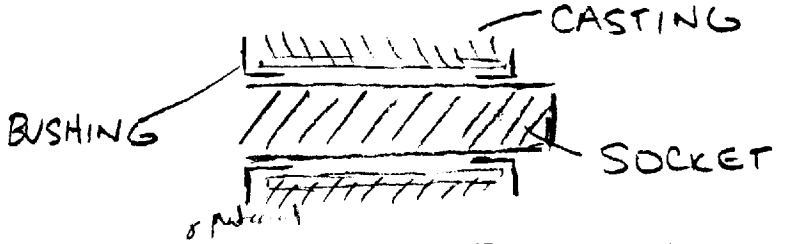
Model Year(s)	=	2002
Logic	=	Corp
Order By	=	Grand Total
TIS Rows Selected	=	All
YTD Column Only	=	No
Minimum Divisor	=	1
Cost Type	=	Total Cost Gross
Use Group	=	No
Descriptions	=	Yes

Globalization Information:

Distance Reported	=	Miles
Distance Requested	=	Miles
Currency Reported	=	US DOLLAR
Currency Requested	=	US DOLLAR
Currency Exchange Version	=	v5

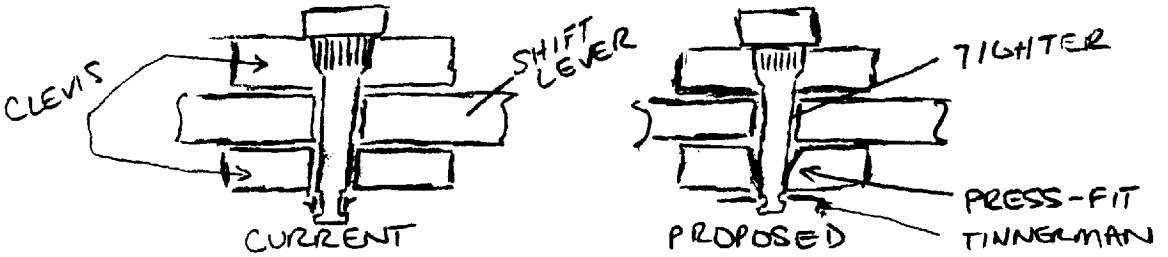
STEERING COLUMN LASH RESOLUTIONS

1) **Socket Tightness**
   Issue: Clearance between bushing, casting, and socket allows cocking of socket



   Solution: change diameter of bushing and casting ID to decrease clearance
   Timing: parts with changes (Norton) and casting (Contech) by 12/4. Columns from Indy 12/6.
   Testing:
   - Test #28 (normally 45 days, accelerated is 20 days)
   - Post-test lash measurements (after Test #28)
   - Shift lever ultimate – 1 day
   - BSI fatigue – 8 days

2) **Clevis / Shift Lever / Pin Interface**
   Issue: Shift lever with cycles can cock in the pin / clevis joint



   Solution: a) Reduce interface of pin and shift lever
   b) Change pin press fit into clevis and add bullet nose for assembly into the press fit
   c) Delete pin clip and add Tinnerman clip for back-up retention
   Timing:
   - Shift Lever change – 1 week to revise diameter and machining tools that locate off of diameter
   - Pin change – 2-3 weeks to add bullet nose and Tinnerman holder
   - Tinnerman Clip timing – TBD, BUT QUICK
   - Clevis change – ~~TBD for timing~~ to change casting to add press-fit PARTS BY 12/4

   Testing:
   - Test #28 (normally 45 days, accelerated is 20 days)
   - Post-test lash measurements (after Test #28)
   - Shift lever ultimate – 1 day
   - BSI fatigue – 8 days

3) **Deflection of Shift Lever**
   Proposed Issue: Shift lever was thought to be deflecting – thus required either shortening or cross-section changes
   Conclusion: CMM data taken under load and demonstrated no deflection of shift lever (with and without added weld reinforcement) – NO ISSUE

4) **Further Deflection Investigations**
   - Investigating possible other sources of deflection – using CMM to diagnose (on-going today)
     - Theory of largest source is cocking of pin within clevis on lower end – change above will resolve
   - Utilizing FEA of column components to verify CMM conclusions – work is on-going today

Levine, Julie (J.A.)

Subject: Steering Column Materials Discussion
Location: PDC1dh36

Start: Tue 07/25/2000 11:00 AM
End: Tue 07/25/2000 12:00 PM

Recurrence: (none)

Meeting Status: Meeting organizer

Required Attendees: Levine, Julie (J.A.); Horoszy, Ted (T.B.); Brohl, Jerry (G.G.); Allard, Chris (C.E.); Villar, Daniel (D.A.); Porter, Alan (A.J.); Clary, Robert (R.C.); Chernenkoff, Russ (R.A.); Krause, Albert (A.R.); LeBrell, Charles (C.R.); Payapilly, Abe (A.); PDC, Conf Rm 1D-H36(10)

Optional Attendees: Whitbeck, Rod (R.G.)

powder metal in Europe

Per the 7/20 G. Bedi / S. Rushwin U152 meeting, Gurminder requested that Abe's contacts provide an additional set of eyes in reviewing the steering column for a couple of material issues.

1) The heat treat on the shift lever and the insert plate - wear condition in Shift System Fatigue Test
   Questions were:
   1) The right delta of heat treat between shift lever and insert plate?
   2) The ability for a supplier to hold 60-63 Rc in tolerance in production?
   3) Is a different finish required?

2) A cam surface part which is zinc and has a wear condition. (investigating powdered metal alternative)
   Questions were:
   1) Best source/timing for powdered metal - discuss the application?
   2) The backside interface with the magnesium casting - corrosion implications?

3) Plastic bushings and their compression set

(1) ISSUE: CAPABILITY SHIFT LEVER MAT'L PROPERTY AT MICROSTRUCTURE LEVEL

(A) WHY IT FAILED?
(B) IMPROVEMENTS ACCEPTABLE?
(C) NITRIDE REQUIRED? (FERRITIC?) → case depth

(2) Jeff Helms → plastic people → recommend
CLARK THOMAS - TVC
↳ callout (*) to ABE

(3) zinc
(*) get part & callout

1) CELCON S00 @ 20% TEFLON
2) ZYTEL 70K20 HS1L 20% KEVLAR FILLED NYLON

PE09-020 1554

NAME	ORG	EXPERTISE	CID
ABE PAYAPILLY	AME	MANUF	APAYAPIL
CLAUDE MACK	AMTD	Heat treating	CMACK1 (32-29149) 592-2665
ROD WHITBECK	AMTD-MET PROC.	Casting + HT.	rwhitbec 22535
AL KRAUSE	SRL	MATERIAL/FATIGUE	AKRAUSE K39412
JOHN A. DAINTER	DURA	Systems Eng	
Dan Villar			
Charles LeBrell	AMTD	VEHICLE ASSEMBLY	CLEBRELL 2226
TED HOROSZY	RVT-TV	MAT'L ENG	THOROSZY 5829
Chris Allard	U152 Chassis	Design & Release	CALLARD1 8315
JERRY BROHL	"		JBROHL 31725
JULIE LEVINE	"		

Include Ziad
Alan
Vicki
Admiral

Summary of Design Resolutions and Timing

RESOLUTIONS TO PRIOR ISSUES:

1) Issue: Passing DV on Tilt mechanism fatigue test (TEST #46)
Resolution / Root Cause:

A. Wear
- Based on analysis of former test parts, we have found the zinc retainer was being extruded – catastrophically deformed, not fatigue wear.
  In using P=F/A,
  - F= bolt load (anywhere from 4,000N to 9,000N)
  - A is almost a point load or a fine line load (area estimated)
  - P is 300,000 to 500,000 psi
  - Zinc compressive strength is max of 50,000 psi
- The retainer cam profile and lever lobes have been changed to increase the contact area by 10x.
- The material has been changed to powder metal retainer and powder metal lever lobes with process changes to maximize compressive strength (approx 130,000 psi).

B. Noise / Creep
- The surface area in the clamp joint was increased for better loading
- The material chosen for the plastic was optimized for creep and NVH performance

Verification:
Test #46 has passed the requirements of 36, 000 cycles (10 shifts / day for 10 years) at hot, cold, ambient and post-test load to slip of above 100lbs.

2) Issue: Not passing DV on Shift System Fatigue test (TEST #28)
Resolution:

1) Lubricant – grease added to shift lever in interface locations with the insert place and clevis joint

B. Hardness Requirement – reviewed hardness of insert plate and shift lever with metal experts and targeted an overlap of hardnesses – approximately the same of the interfacing components and added control plan requirement of effective case depth measurements.
   Callout:
   - Insert plate - Rockwell C 58 – 60
   - Shift lever – Rockwell 15 N 89.5 Minimum (approx Rockwell C 59)

Verification:
Test #28 has passed the requirements of not breaking through case depth during the 330 cycles of going P to D1 and down the waterfall to N and then back to P.

PSW TIMING:

1) PV Testing – started 10/13, completes 11/27 running all tests with IB parts
2) PSW timing of 11/27

UNRESOLVED ISSUES:

1) Lock cylinder fit with column – quality issue on lock cylinder (Strattec) and GDT callout correction on steering column. Strattec sorting for IB until their change is in place (timing TBD), casting GDT callout will be in place for 11/9 tool for lock cylinder.

2) BSI rattle when not energized -

3) Telescoping implementation – PSW estimate of 2/20/01. Design concept of powder metal insert in a zinc telescoping retainer.

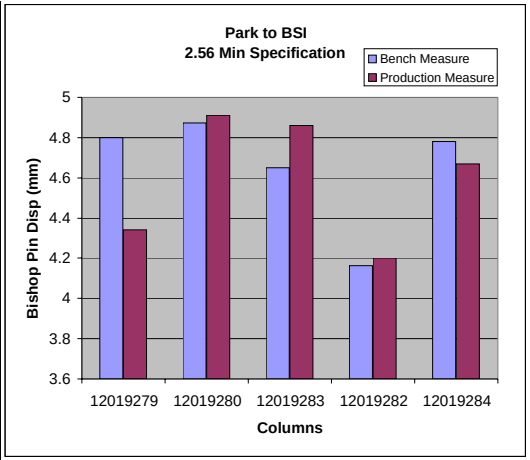
4) Number of locks for steering shaft – reduced number of stops (7 to 2) for customer satisfaction improvement

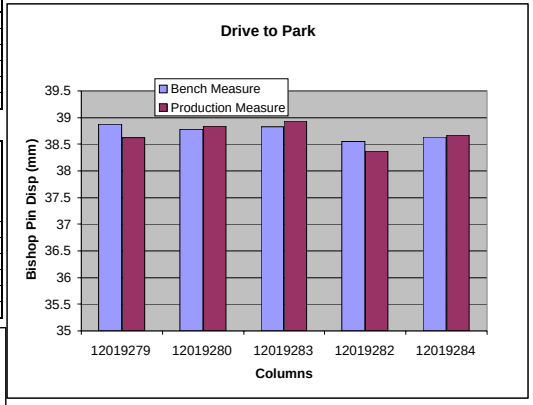
		Drive to Park					BSI to Drive					BSI to Park				
Column	ID	Production	Returned	New SA	Red SA	Purple SW	Production	Returned	New SA	Red SA	Purple SW	Production	Returned	New SA	Red SA	Purple SW
8.00	11295081		39.54	38.90	38.68	38.84		35.53	35.39	35.47	35.22		3.27	3.55	3.24	3.60
			38.70	38.88	38.77	38.85		35.50	35.41	35.56	35.27		3.32	3.53	3.26	3.58
			38.78	38.95	38.74	38.77		35.56	35.47	35.52	35.24		3.27	3.53	3.25	3.56
Average		37.91	39.01	38.91	38.73	38.82	35.20	35.53	35.42	35.52	35.24	2.71	3.29	3.54	3.25	3.58
Sigma			0.46	0.036	0.05	0.04		0.03	0.04	0.05	0.03		0.03	0.01	0.01	0.02
Notes		No Stick	No Stick			No Stick										
12.00	12703250		38.11	38.22	38.02	38.03		35.56	35.41	35.56	35.51		2.60	2.78	2.47	2.88
			38.10	38.22	38.13	37.99		35.51	35.40	35.68	35.17		2.60	2.77	2.50	2.80
			38.06	38.15	38.12	38.05		35.47	35.37	35.70	35.23		2.60	2.76	2.47	2.86
Average		39.44	38.09	38.20	38.09	38.02	35.83	35.51	35.39	35.65	35.30	3.61	2.60	2.77	2.48	2.85
Sigma			0.03	0.04	0.06	0.03		0.05	0.02	0.08	0.18		0.00	0.01	0.02	0.04
Notes		No Stick	No Stick	No Stick		No Stick										
23.00	11013029		38.62	38.68	38.80	38.51		35.36	35.78	35.59	35.12		3.30	2.94	3.22	3.38
			39.50	38.62	38.75	38.44		35.50	35.71	35.51	35.07		3.16	2.94	3.26	3.35
			38.80	38.71	38.75	38.55		35.46	35.79	35.48	35.19		3.30	3.01	3.30	3.33
Average			38.97	38.67	38.77	38.50		35.44	35.76	35.53	35.13		3.25	2.96	3.26	3.35
Sigma			0.46	0.05	0.03	0.06		0.07	0.04	0.06	0.06		0.08	0.04	0.04	0.03
Notes		No Stick	No Stick			No Stick										
25.00	11275385		38.09	38.50	38.32	38.30		35.51	36.00	35.85	35.43		2.52	2.50	2.50	2.83
			38.13	38.45	38.24	38.19		35.55	36.00	35.79	35.44		2.57	2.49	2.43	2.82
			38.18	38.20	38.21	38.30		35.64	35.79	35.77	35.57		2.61	2.47	2.45	2.86
Average		38.26	38.13	38.38	38.26	38.26	35.00	35.57	35.93	35.80	35.48	3.28	2.57	2.49	2.46	2.84
Sigma			0.05	0.16	0.06	0.06		0.07	0.12	0.04	0.08		0.05	0.02	0.04	0.02
Notes		No Stick	No Stick			No Stick										
32.00	11427874		38.95	38.91	38.91	38.88		35.25	35.60	35.53	35.03		3.56	3.34	3.39	3.85
			38.77	38.74	38.95	38.90		35.20	35.57	35.55	35.11		3.59	3.33	3.38	3.82
			38.89	38.89	39.12	39.03		35.31	35.61	35.66	35.22		3.59	3.37	3.30	3.85
Average		39.64	38.87	38.85	38.99	38.94	34.95	35.25	35.59	35.58	35.12	4.74	3.58	3.35	3.36	3.84
Sigma			0.09	0.09	0.11	0.08		0.06	0.02	0.07	0.10		0.02	0.02	0.05	0.02
Notes		No Stick	No Stick			No Stick										

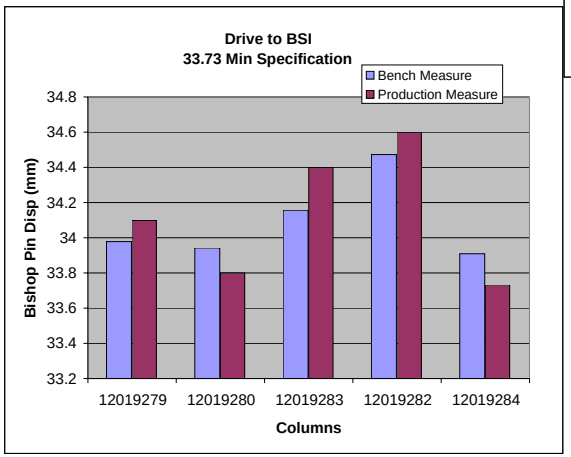
		Drive to Park					BSI to Drive					BSI to Park				
		Production	Returned	New SA	Red SA	Purple SW	Production	Returned	New SA	Red SA	Purple SW	Production	Returned	New SA	Red SA	Purple SW
8	11295081	37.91	39.00667	38.91	38.73	38.82	35.2	35.53	35.423333	35.516667	35.2433333	2.71	3.2866667	3.5366667	3.25	3.58
12	12703250	39.44	38.09	38.19667	38.09	38.023333	35.83	35.513333	35.393333	35.646667	35.3033333	3.61	2.6	2.77	2.48	2.8466667
23	11013029		38.97	38.67	38.77	38.50		35.44	35.76	35.53	35.13		3.25	2.96	3.26	3.35
25	11275385	38.26	38.13333	38.38333	38.25667	38.263333	35	35.566667	35.93	35.803333	35.48	3.28	2.5666667	2.4866667	2.46	2.8366667
32	11427874	39.64	38.87	38.85	38.99	38.94	34.95	35.25	35.59	35.58	35.12	4.74	3.58	3.35	3.36	3.84

Column	ID	Drive to Park		Drive to BSI		Park to BSI	
		Production Measure	Bench Measure	Production Measure	Bench Measure	Production Measure	Bench Measure
12019279	12019279	38.62	38.90	34.1	33.84	4.34	4.85
			38.89		33.98		4.8
			38.84		34.11		4.75
Average		38.62	38.88	34.10	33.98	4.34	4.80
Sigma		#DIV/0!	0.03	#DIV/0!	0.14	#DIV/0!	0.05
Notes							
12019280	12019280	38.84	38.76	34.7	33.96	4.91	4.85
			38.79		34		4.97
			38.79		33.87		4.8
Average		38.84	38.78	33.80	33.94	4.91	4.87
Sigma		#DIV/0!	0.02	#DIV/0!	0.07	#DIV/0!	0.09
Notes							
12019283	12019283	38.94	38.75	34.77	34.04	4.86	4.63
			38.81		34.12		4.68
			38.94		34.31		4.64
Average		38.94	38.83	34.40	34.16	4.86	4.65
Sigma		#DIV/0!	0.10	#DIV/0!	0.14	#DIV/0!	0.03
Notes							
12019282	12019282	38.37	38.40	34.6	34.53	4.2	4.17
			38.64		34.47		4.16
			38.63		34.42		4.16
Average		38.37	38.56	34.60	34.47	4.20	4.16
Sigma		#DIV/0!	0.14	#DIV/0!	0.06	#DIV/0!	0.01
Notes							
12019284	12019284	38.67	38.68	33.73	33.98	4.67	4.73
			38.60		33.88		4.79
			38.63		33.87		4.82
Average		38.67	38.64	33.73	33.91	4.67	4.78
Sigma		#DIV/0!	0.04	#DIV/0!	0.06	#DIV/0!	0.05
Notes							

	Drive to Park		Drive to BSI		Park to BSI	
	Production Measure	Bench Measure	Production Measure	Bench Measure	Production Measure	Bench Measure
12019279	38.62	38.87667	34.1	33.97667	4.34	4.8
12019280	38.84	38.78	33.8	33.94333	4.91	4.87333
12019283	38.94	38.83333	34.40	34.15667	4.86	4.65
12019282	38.37	38.55667	34.6	34.47333	4.2	4.16333
12019284	38.67	38.63667	33.73	33.91	4.67	4.78





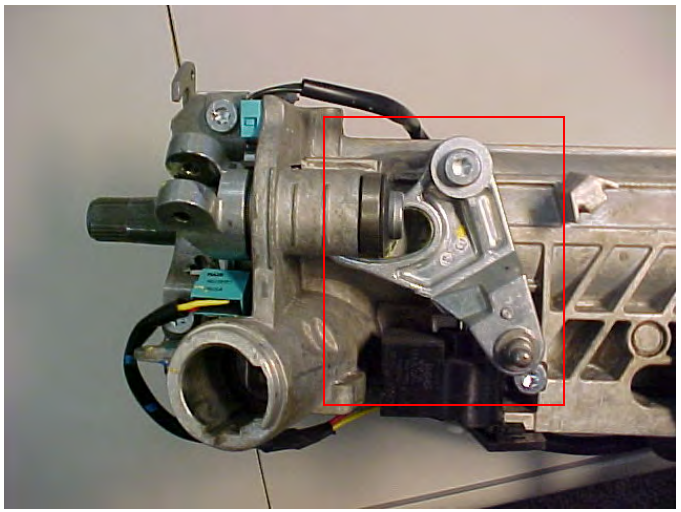


WEKorzan 5/7/04

		Drive to Park			BSI to Drive			BSI to Park		
Column	ID	Rebuilt/ New BSI #1	Rebuilt/ New BSI #2	Rebuilt/ New BSI #3	Rebuilt/ New BSI #1	Rebuilt/ New BSI #2	Rebuilt/ New BSI #3	Rebuilt/ New BSI #1	Rebuilt/ New BSI #2	Rebuilt/ New BSI #3
8.00	11295081	38.46	38.92	38.82	34.96	35.62	35.53	3.33	3.26	3.27
		38.59	38.81	38.71	35.25	35.57	35.46	3.40	3.23	3.29
		38.78	38.86	38.63	35.31	35.65	35.39	3.40	3.22	3.29
Average		38.61	38.86	38.72	35.17	35.61	35.46	3.38	3.24	3.28
Sigma		0.16	0.06	0.10	0.19	0.04	0.07	0.04	0.02	0.01
Notes		No Stick	No Stick	No Stick						
12.00	12703250	38.09	38.45	38.27	35.52	35.70	35.58	2.51	2.61	2.70
		38.00	38.36	38.27	35.46	35.63	35.55	2.53	2.62	2.69
		38.12	38.30	38.23	35.49	35.61	35.53	2.53	2.69	2.67
Average		38.07	38.37	38.26	35.49	35.65	35.55	2.52	2.64	2.69
Sigma		0.06	0.08	0.02	0.03	0.05	0.03	0.01	0.04	0.02
Notes		No Stick	No Stick	No Stick						
23.00	11013029	38.64	38.75	38.77	35.86	35.84	35.97	2.78	2.89	2.80
		38.60	38.69	38.79	35.82	35.79	36.00	2.73	2.91	2.79
		38.76	38.75	38.78	35.98	35.86	36.01	2.77	2.89	2.78
Average		38.67	38.73	38.79	35.89	35.83	36.01	2.76	2.90	2.79
Sigma		0.08	0.03	0.01	0.08	0.04	0.01	0.03	0.01	0.01
Notes		No Stick	No Stick	No Stick						
25.00	11275385	38.41	38.43	38.38	35.56	35.66	35.72	2.83	2.75	2.69
		38.48	38.41	38.46	35.61	35.59	35.77	2.72	2.75	2.70
		38.43	38.34	38.41	35.64	35.57	35.72	2.81	2.74	2.71
Average		38.44	38.39	38.42	35.60	35.61	35.74	2.79	2.75	2.70
Sigma		0.04	0.05	0.04	0.04	0.05	0.03	0.06	0.01	0.01
Notes		No Stick	No Stick	No Stick						
32.00	11427874	38.56	38.80	38.74	34.82	35.45	35.46	3.76	3.29	3.32
		38.47	38.84	38.83	34.71	35.49	35.46	3.63	3.33	3.36
		38.47	38.82	38.73	34.68	35.43	35.38	3.82	3.32	3.35
Average		38.50	38.82	38.77	34.74	35.46	35.43	3.74	3.31	3.34
Sigma		0.05	0.02	0.06	0.07	0.03	0.05	0.10	0.02	0.02
Notes		No Stick	No Stick	No Stick						

		Drive to Park			BSI to Drive			BSI to Park		
		Rebuilt/ New BSI #1	Rebuilt/ New BSI #2	Rebuilt/ New BSI #3	Rebuilt/ New BSI #1	Rebuilt/ New BSI #2	Rebuilt/ New BSI #3	Rebuilt/ New BSI #1	Rebuilt/ New BSI #2	Rebuilt/ New BSI #3
8	11295081	38.61	38.86333	38.72	35.173333	35.613333	35.46	3.3766667	3.236667	3.28333
12	12703250	38.07	38.37	38.25667	35.49	35.646667	35.55333	2.5233333	2.64	2.68667
23	11013029	38.66667	38.73	38.785	35.886667	35.83	36.005	2.76	2.896667	2.785
25	11275385	38.44	38.39333	38.41667	35.603333	35.606667	35.73667	2.7866667	2.746667	2.7
32	11427874	38.5	38.82	38.76667	34.736667	35.456667	35.43333	3.7366667	3.313333	3.34333

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix



Swing arm Replacement

1) Check for difficult to reach Park
2) Remove column shrouds
3) Visually inspect for swing arm divot/wear
4) Disconnect transmission shift cable from Swing Arm
5) Disconnect PRNDL cable from Swing Arm
6) Remove shift Arm pin
7) Pull shift arm out of detent plate but still engaged in shift socket
8) Slowly push shift arm downward until ball pops out of swing arm
9) Continue applying pressure until swing arm drops downward
10) Use 10mm socket to remove swing arm fastener
11) Remove swing arm

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

12) Inspect ball for any burrs caused by swing arm removal

13) Remove any burrs with needle nose pliers (if necessary)

14) Install new plated swing arm

15) Push swing arm upward to half engage the ball

16) Push ball into socket by hand or use shift lever in socket if extra leverage is required

17) Install new shift arm pin

18) Coat swing arm fastener with locktight and install with 7.5Nm of torque

19) Reconnect PRNDL cable to swing arm

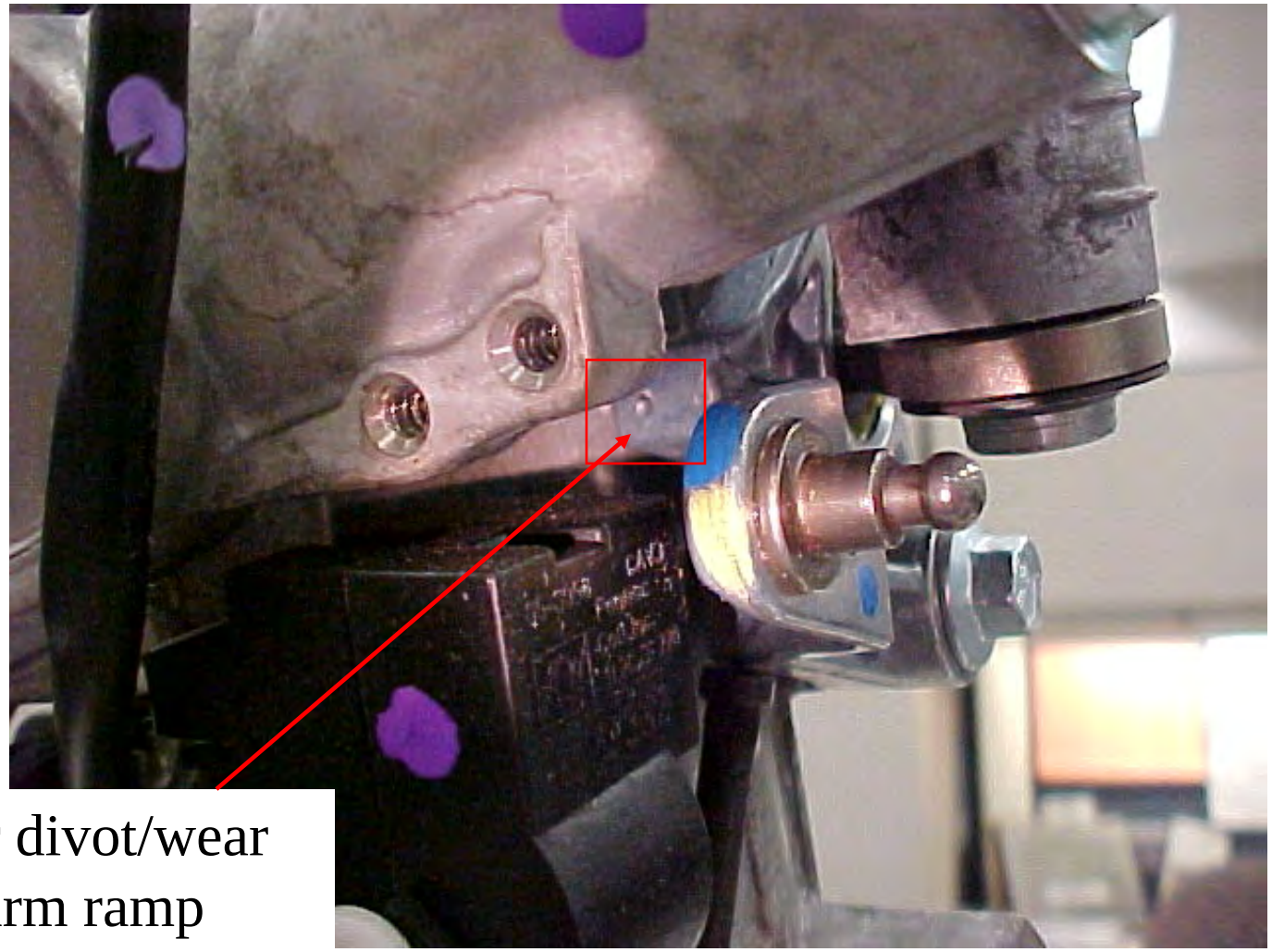
20) Reconnect transmission shift cable to the swing arm

21) With engine running and parking brake fully on, check that vehicle can not be shifted out of Park without a foot on the brake. (Warning: Ensure parking brake is ON)

22) Shift out of Park into Drive. With parking brake fully on, remove foot from the brake and shift into Park. Shift system should not have any noticeable sticking when shifting into Park.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

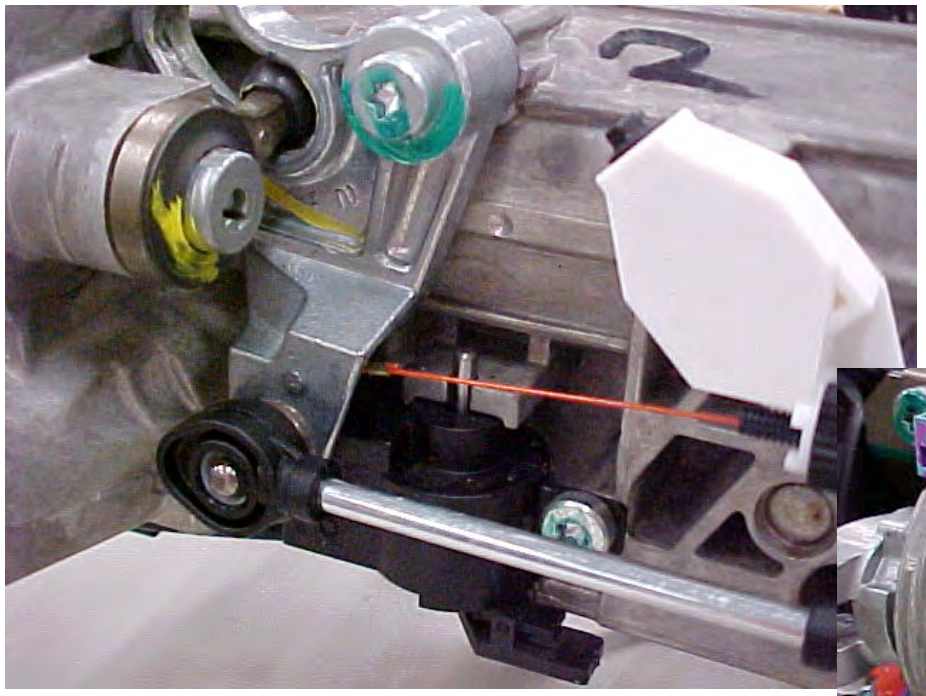
Swing arm Replacement

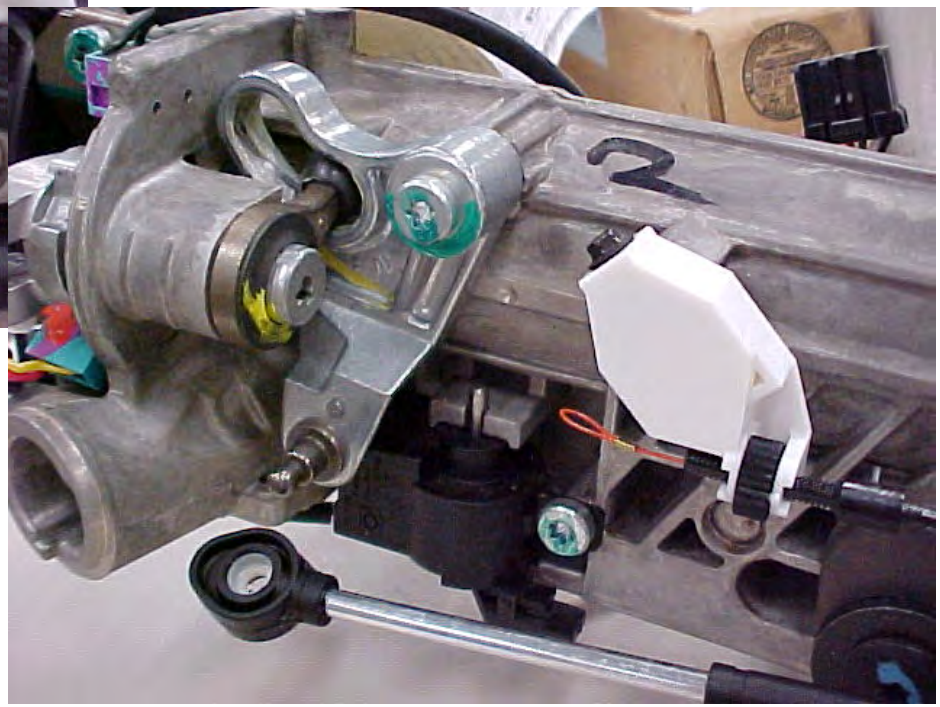


Inspect for divot/wear on swing arm ramp

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

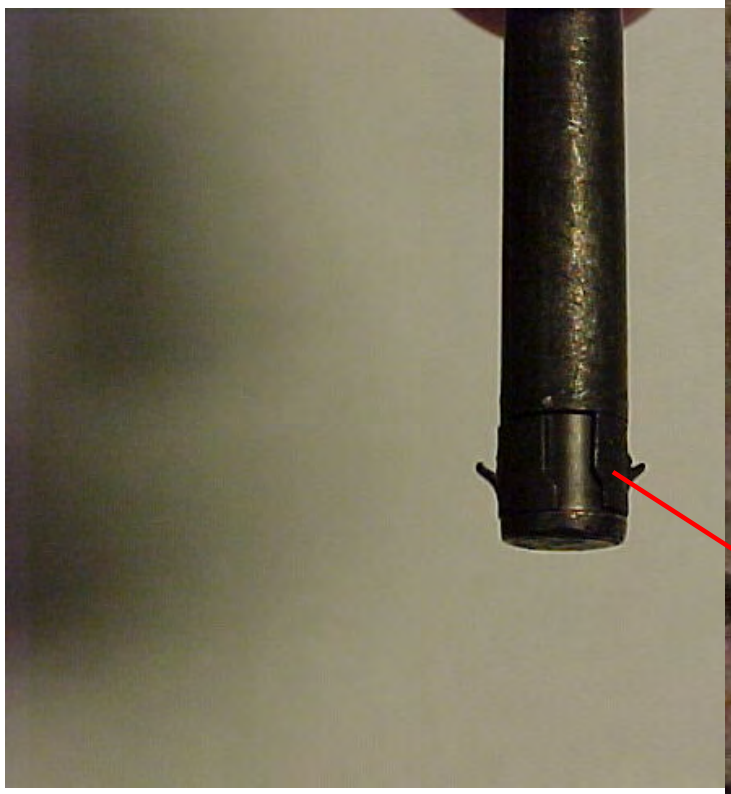




Remove PRNDL and Transmission Cables from Swing Arm

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

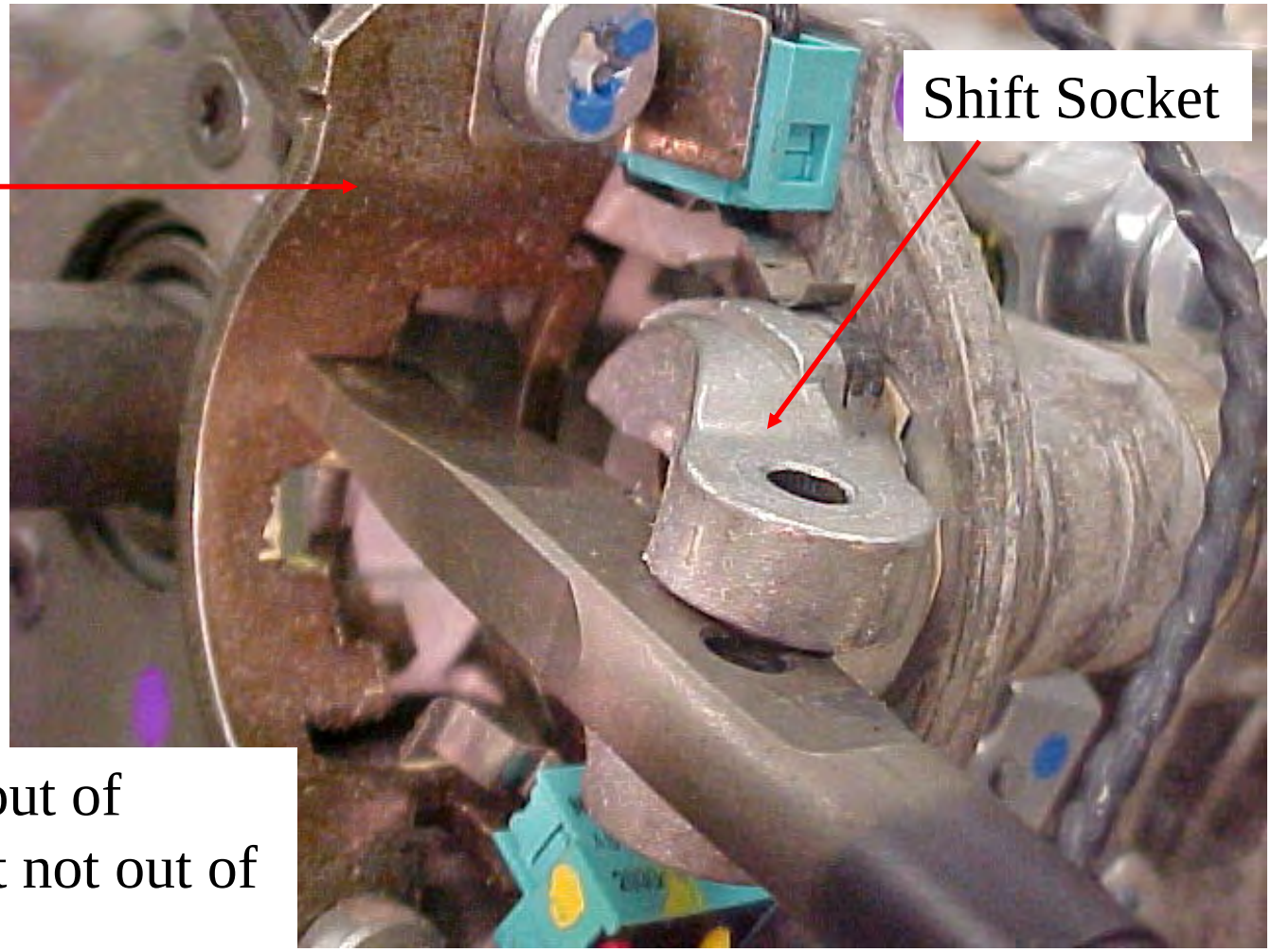


Remove shift arm pin locking tabs to enable pin removal

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

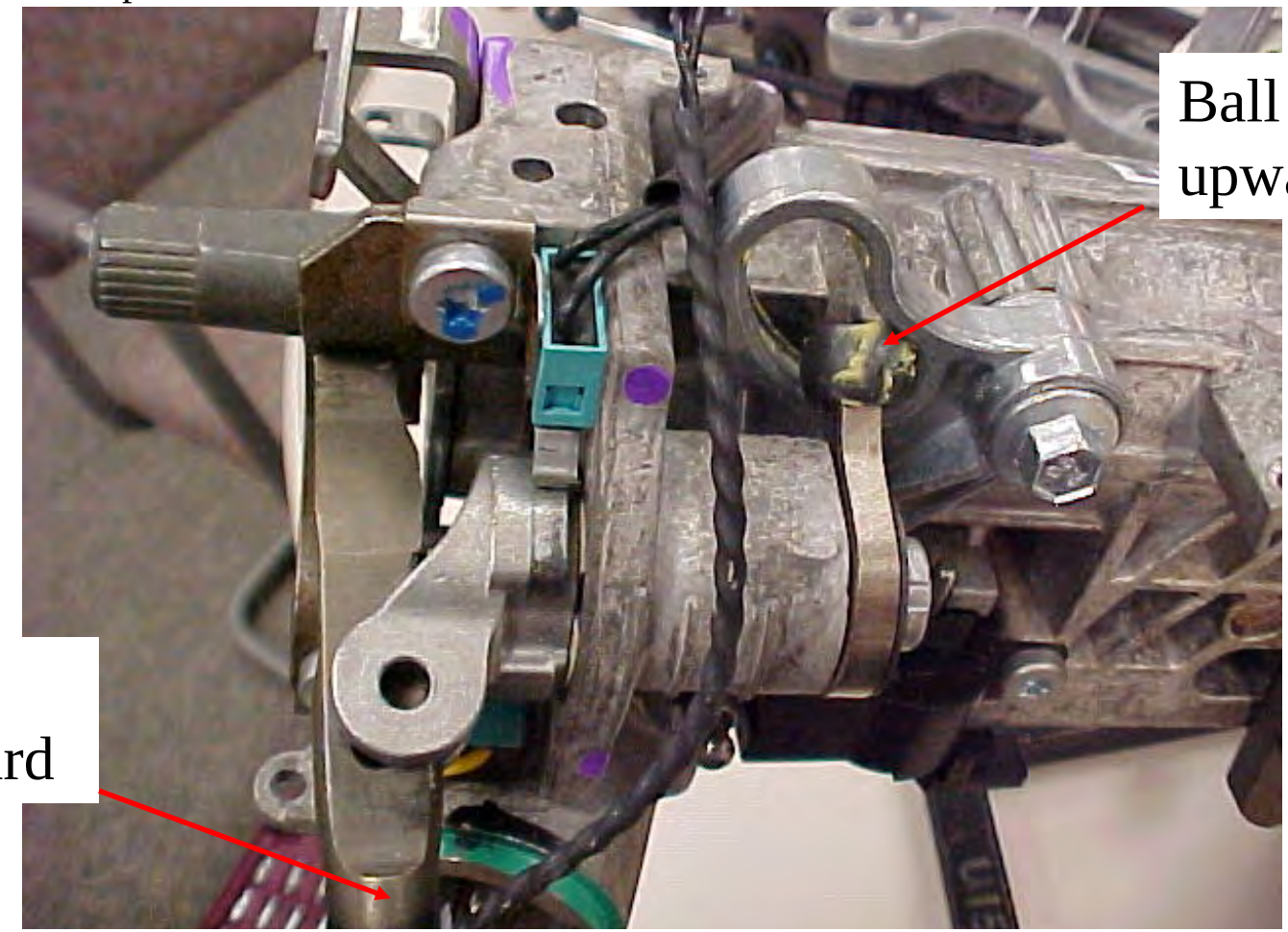
Detent Plate



Pull shift arm out of detent plate but not out of shift socket

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

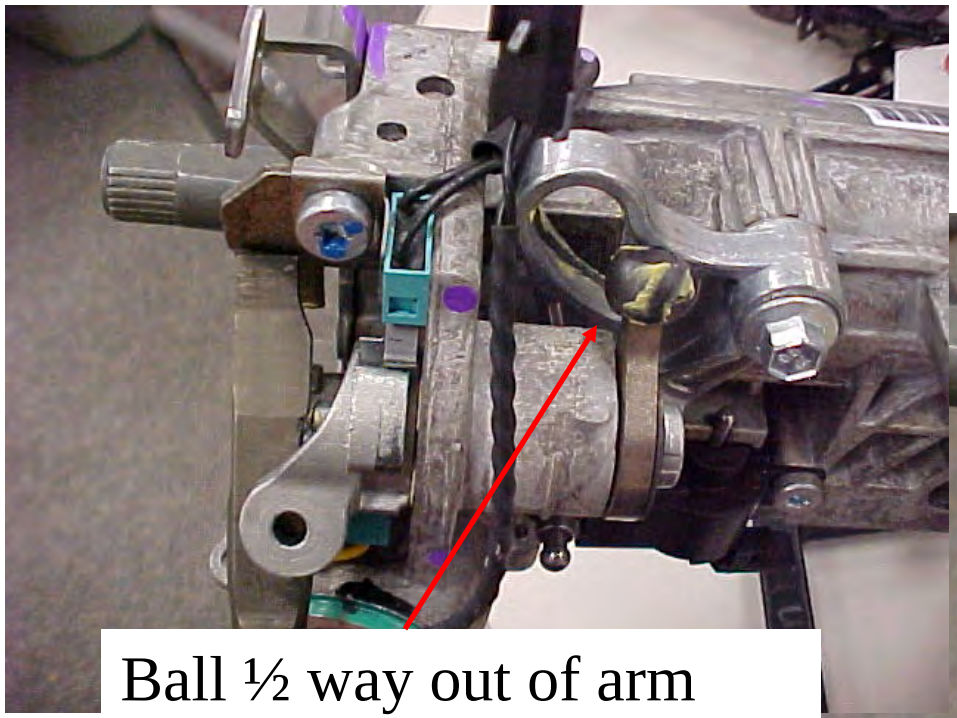
Swing arm Replacement



Slowly push downward on the shift arm until the ball “pops” out of the swing arm

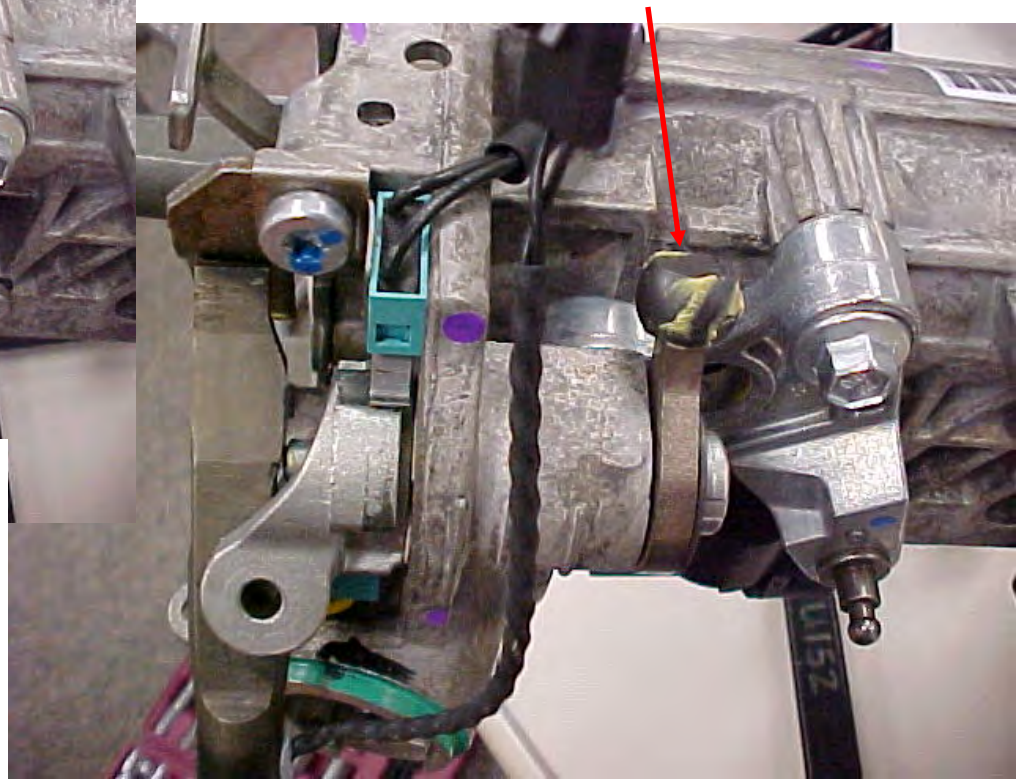
U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement



Ball ½ way out of arm

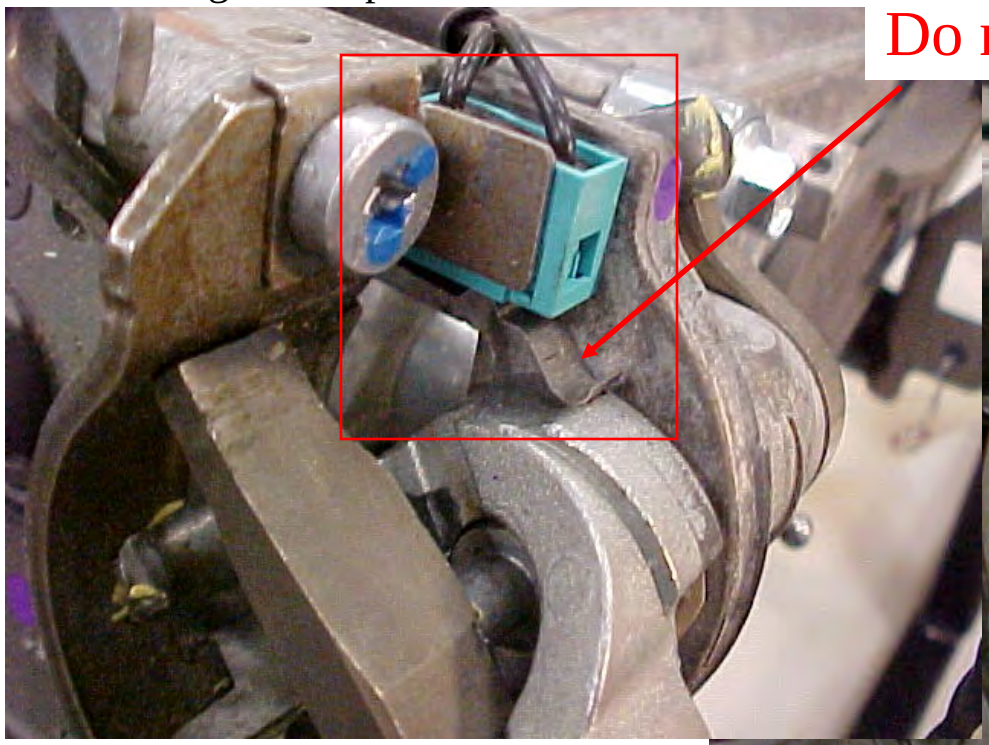
Ball fully out of swing arm. Swing arm will rotate CCW once ball pops free.



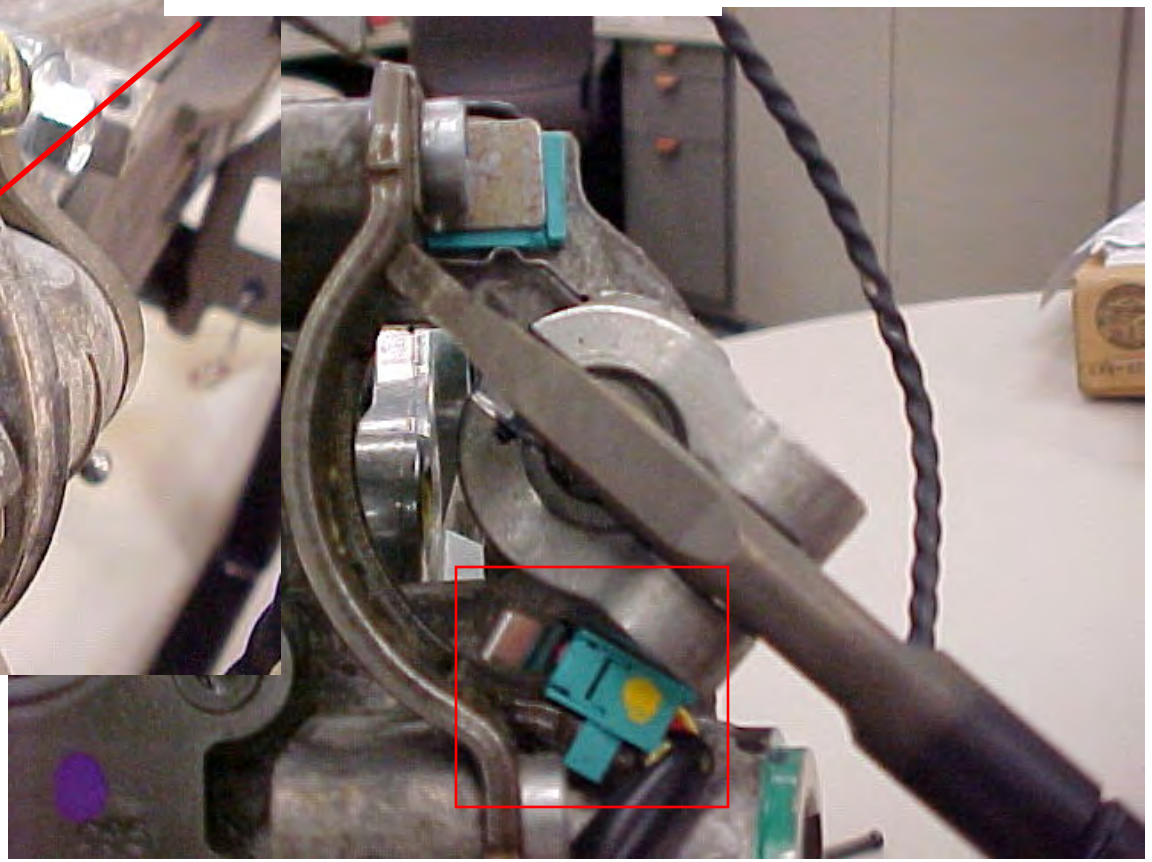
Slowly push downward on the shift arm until the ball “pops” out of the swing arm

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement



Do not bend this tab

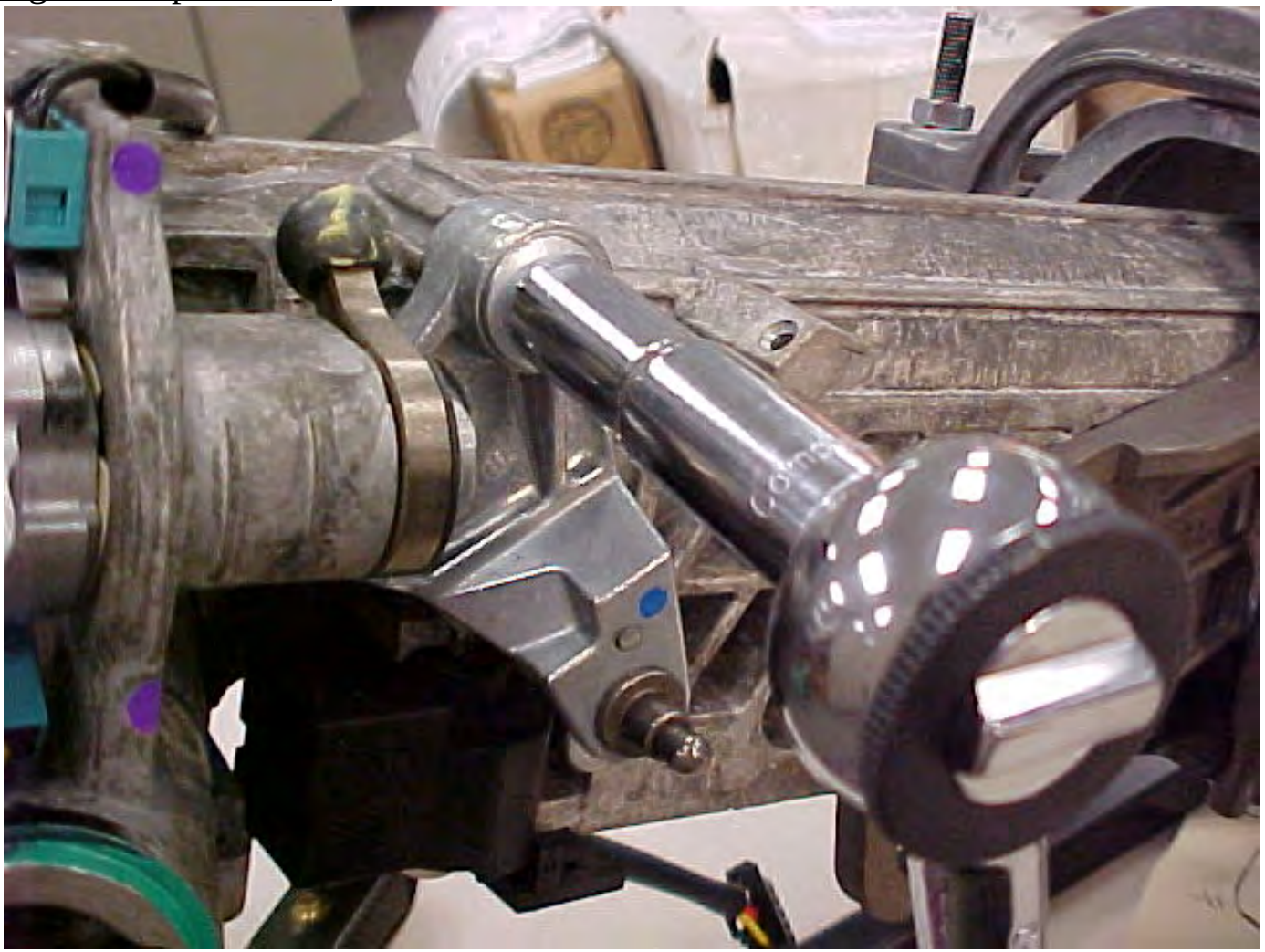


Warning:

Be careful not to damage the two switches or bend the tabs. Slight pressure from the socket onto the lower switch housing is OK.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement



Using a 10mm socket, remove swing arm fastener

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

Remove Old swing arm

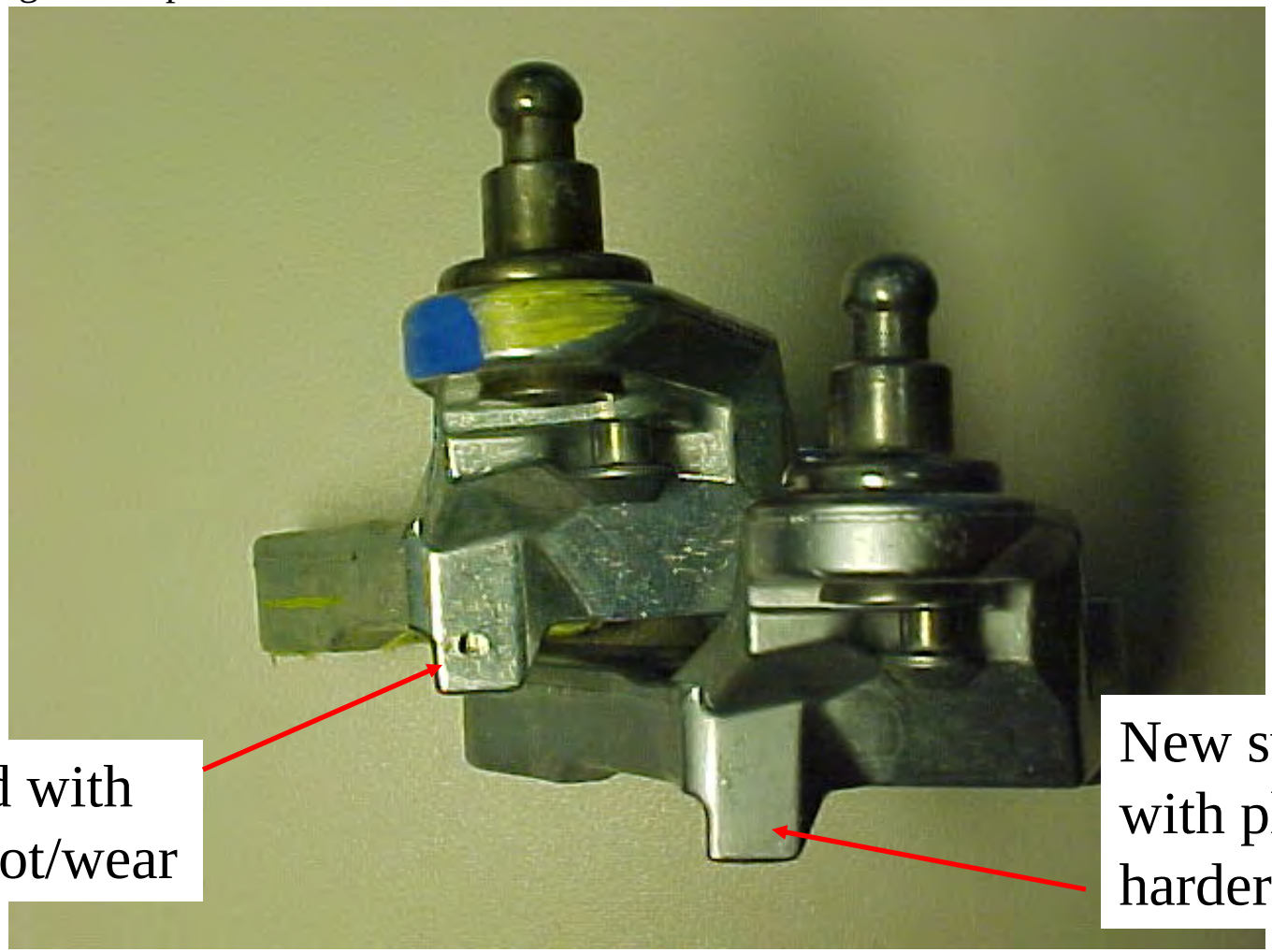
U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

Inspect shift socket ball for burrs. Remove any burrs with needle nose pliers if necessary. Do not sand and do not remove grease.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

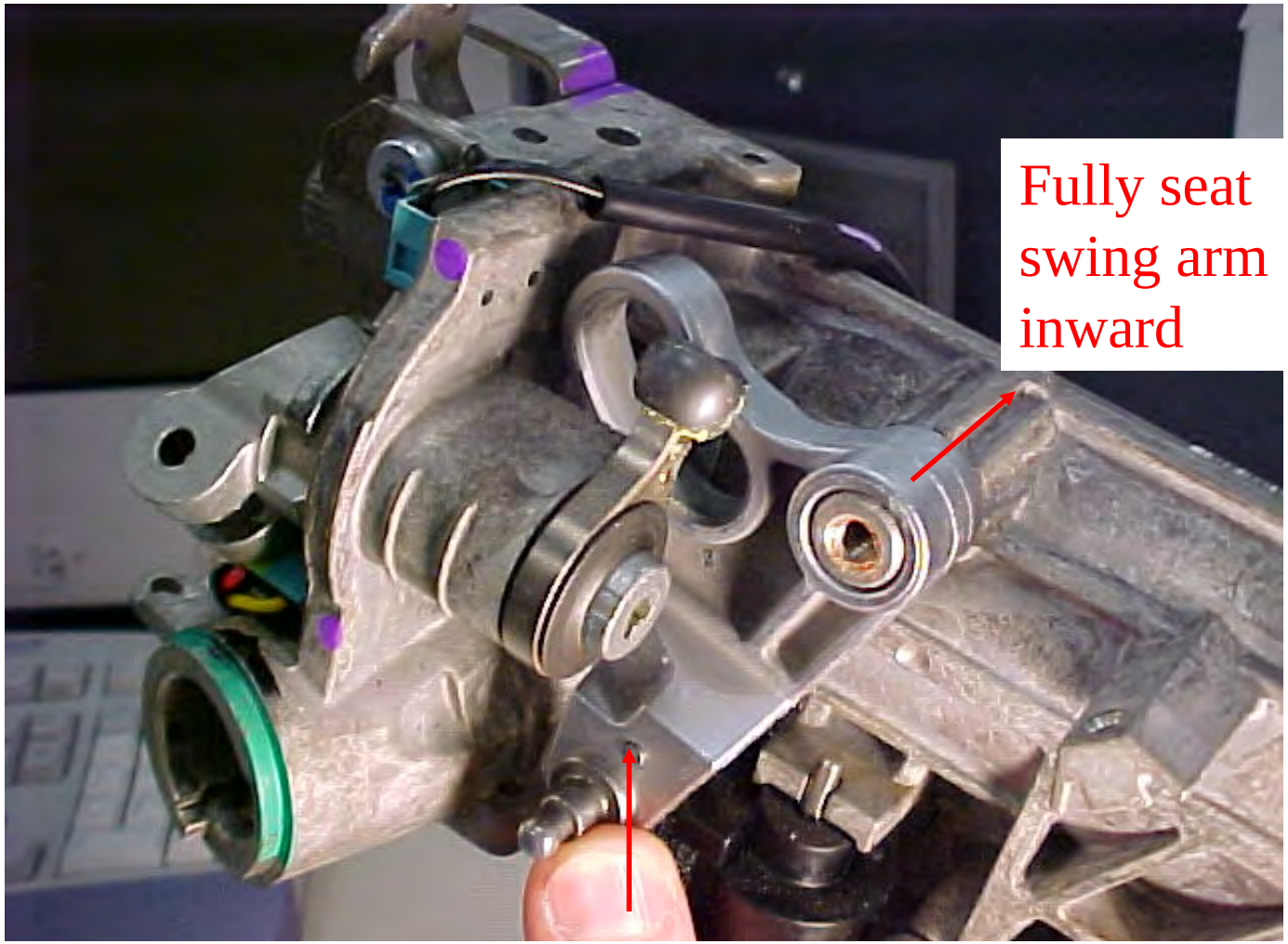
Swing arm Replacement



View of new versus old worn swing arm.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

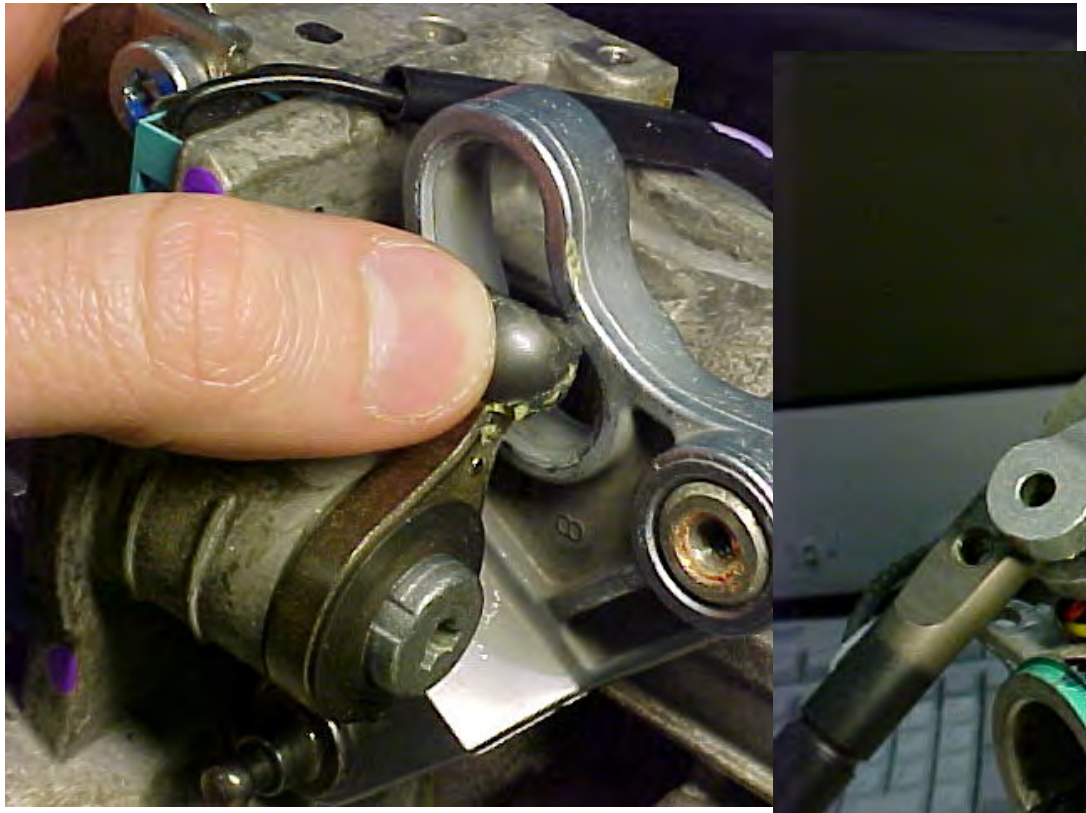
Swing arm Replacement

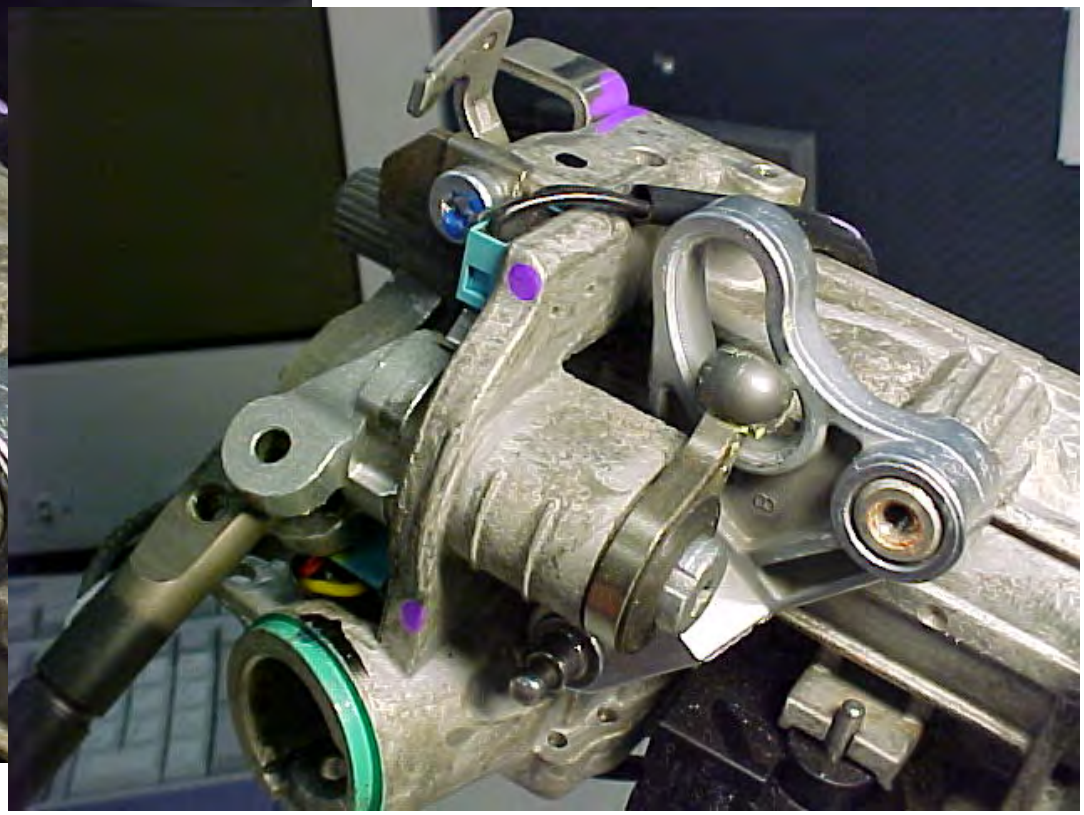


Install new swing arm. Fully seat onto casting. Then, push upward until ball half engages into swing arm.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement

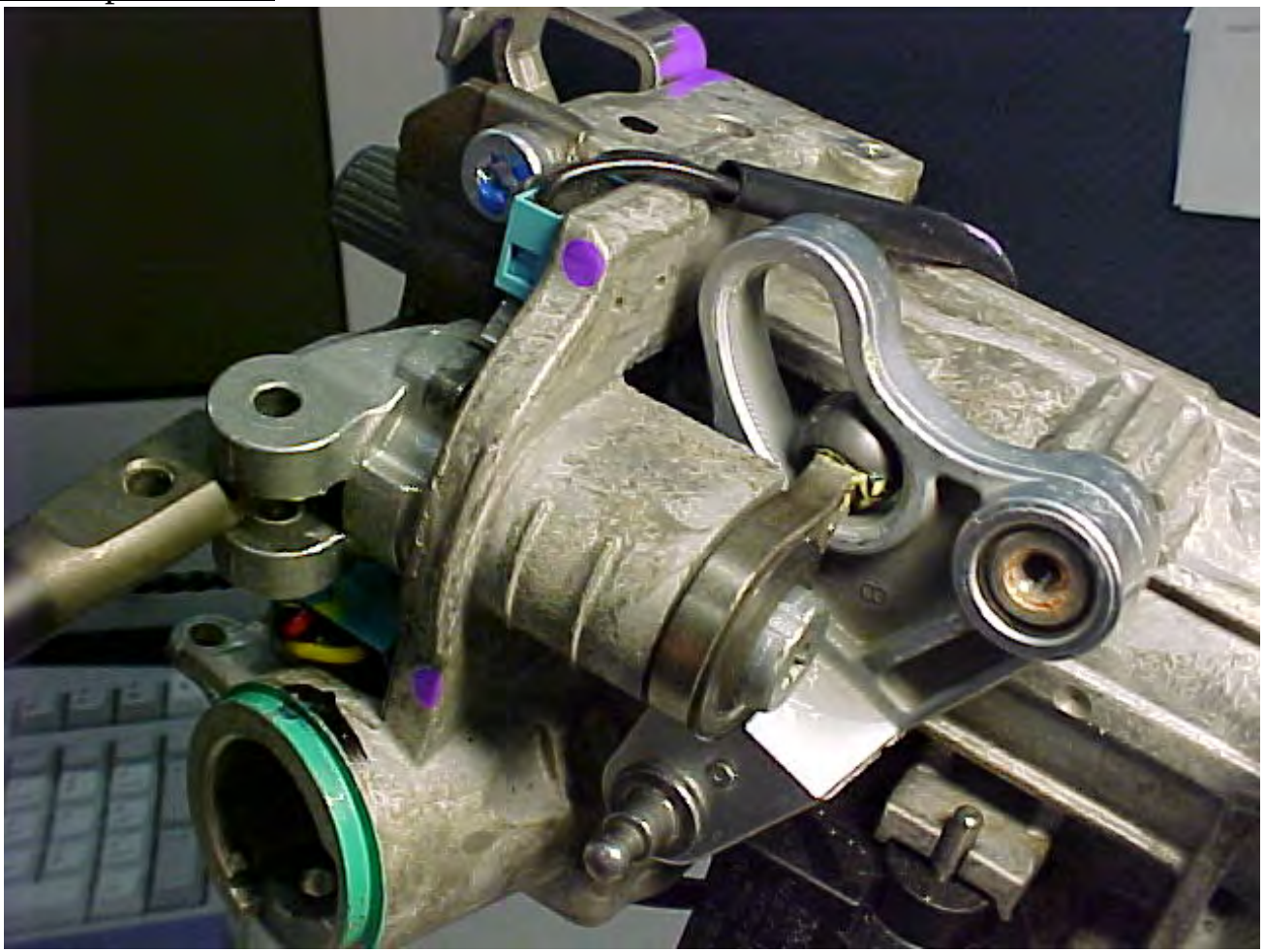




With swing arm rotated full CW and ball half engaged, push the ball into the swing arm. (use shift arm if more leverage is required)

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

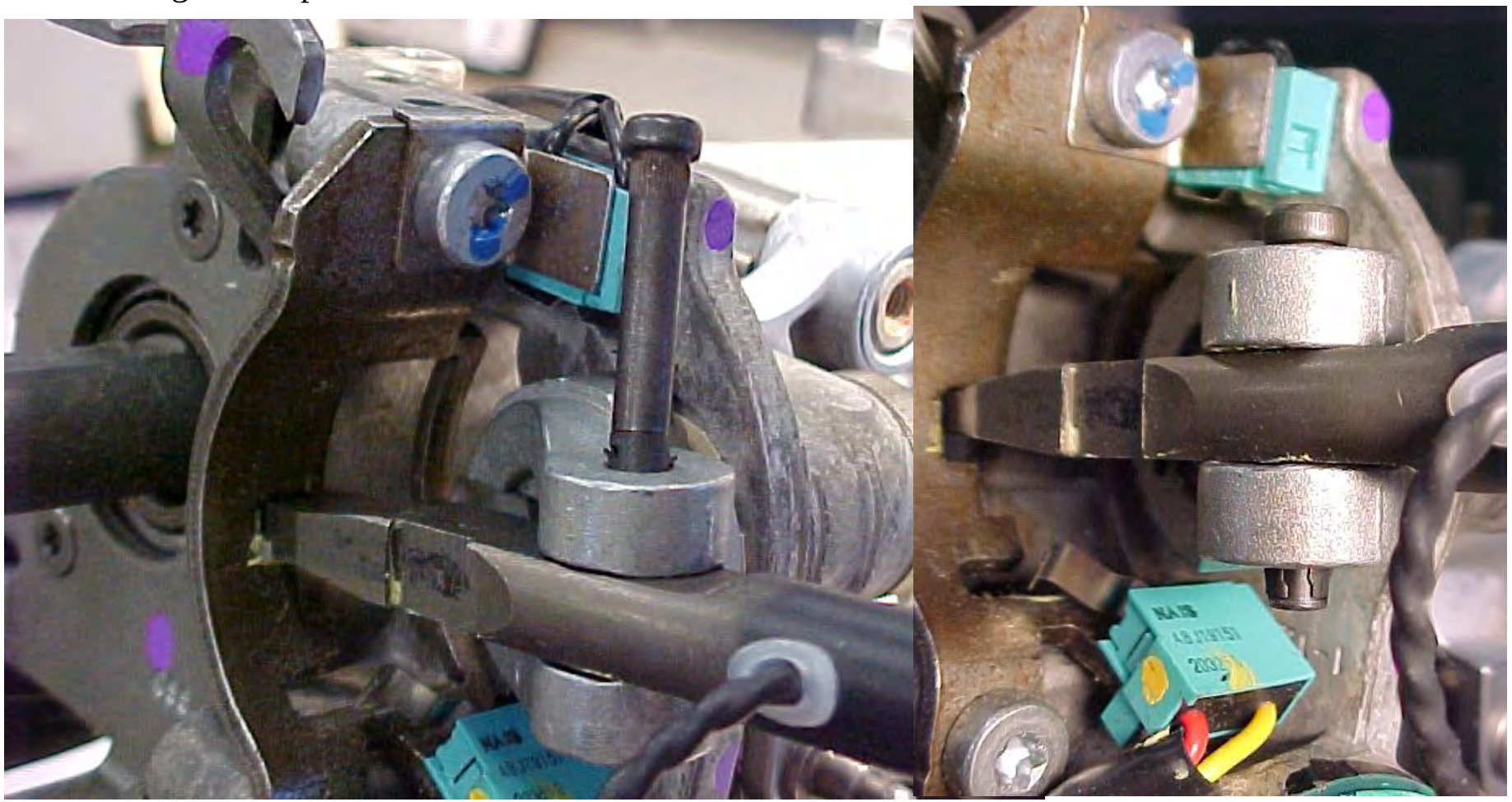
Swing arm Replacement



Ball back into swing arm slot. (Swing arm slot will already be greased before shipping for service but grease is not shown in this picture.)

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

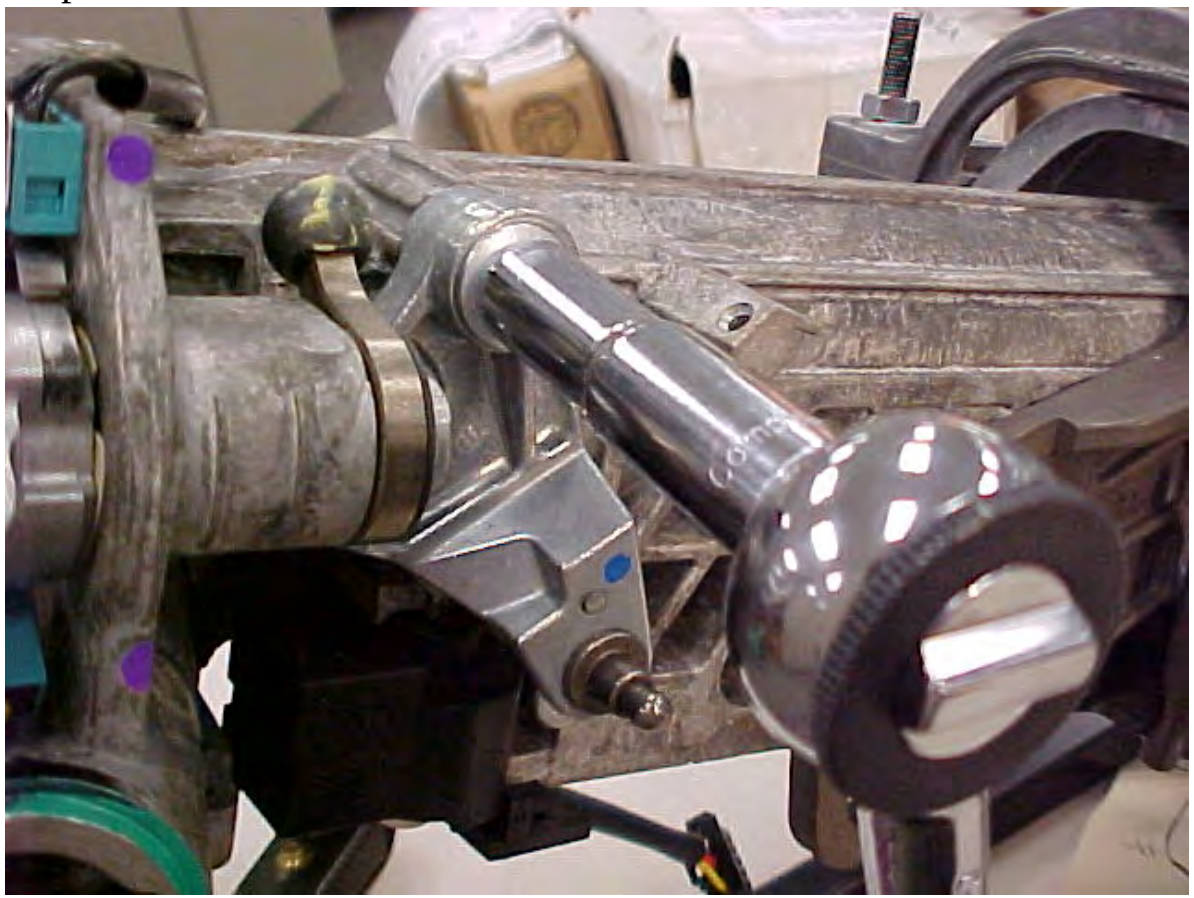
Swing arm Replacement



With the shift arm in the Drive detent slot, install a new Pin.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

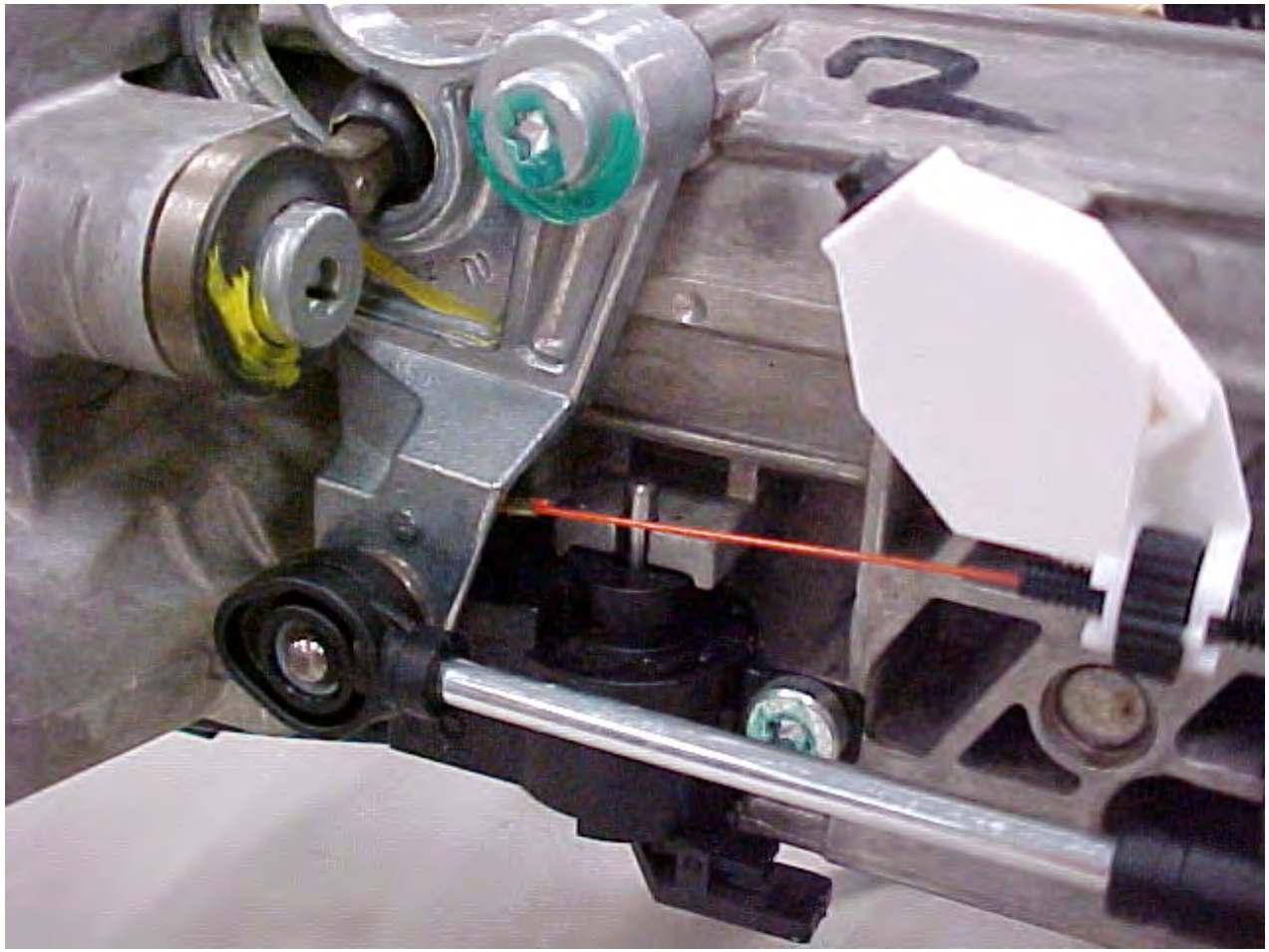
Swing arm Replacement



Put lock tight on swing arm fastener and tighten to 7.5Nm.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Swing arm Replacement



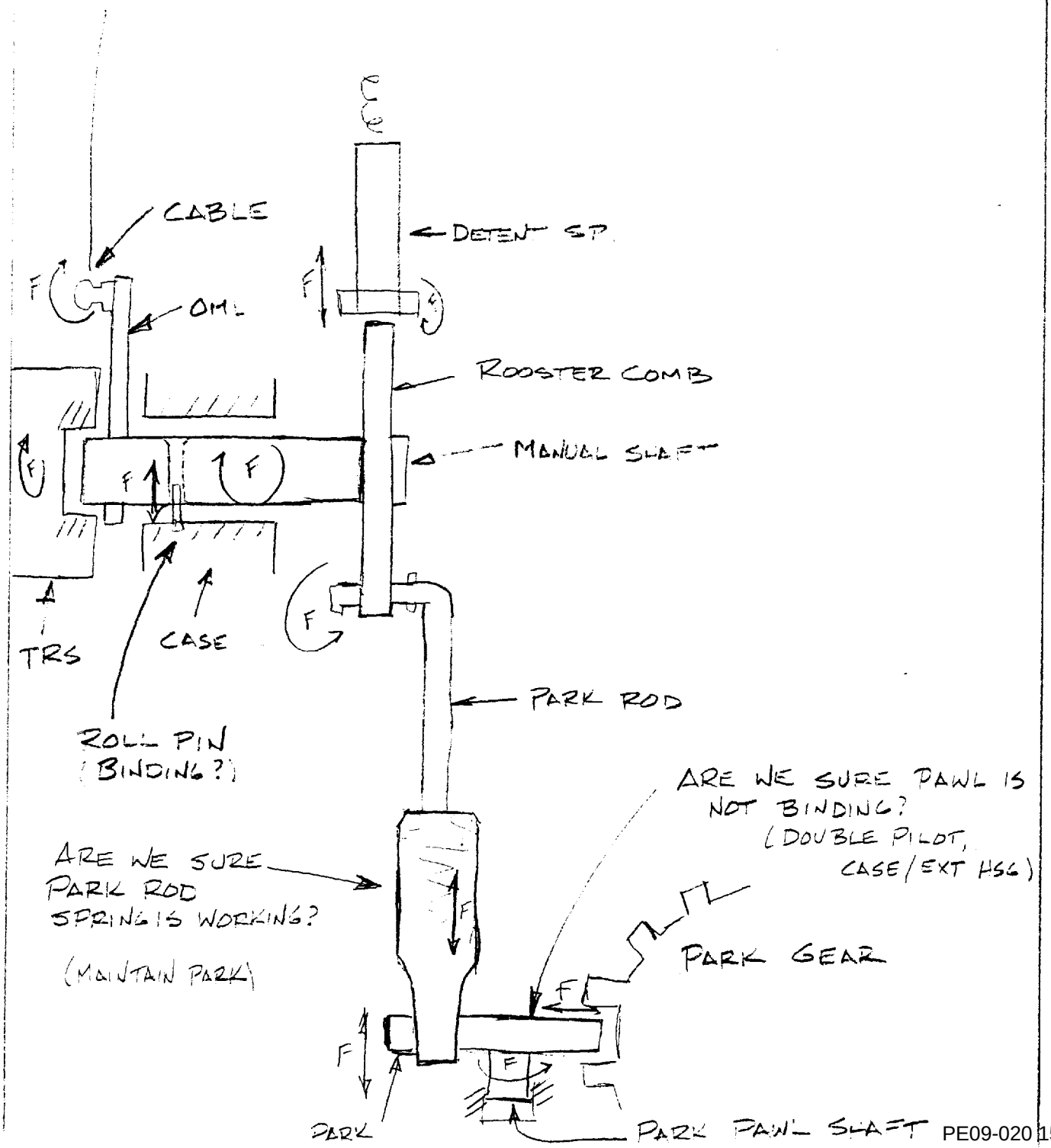
Reconnect PRNDL and Transmission cables.

SYSTEM FUNCTION | SCHEMATIC | 9/9/2000

- DOESN'T HOLD PARK

INSTRUMENTATION

- PAWL MOVEMENT / VIDEO
- OML MOVEMENT / VIDEO
- OML MOVEMENT / ANGLE
- COLUMN ROTATION / ANGLE



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

~~W/0.100" GAP W (PARK ENG) = 35.91°~~

~~5.67V = 34.50~~

~~5.82 = 35.55~~

3/5/01 #3 ROD

W/2.5mm GA BLOCK = 5.52 V = 33.47

) = 5.52 = 33.47

) = 5.52 = 33.47

) = 5.54 = 33.61

) = 5.51 = 33.40

) = 5.54 = 33.61

$\bar{\psi}$ = 33.50° σ = 0.08° @ 2.50mm OFF BOTTOM OF GEAR TOOTH

$\frac{2.5}{4.0} \cdot \frac{33.47}{29.25}$ 87%

1.6 62% 1.14

~~+ 1.5~~ ~~- 4.2°~~

1) W/4.0mm GA BLOCK = 4.89 = 29.25°

2) = 4.89

3) = 4.89

4) = 4.89

5) = 4.89

6) = 4.89

W/#3 ROD

~~W~~ .040" GAP BETWEEN BOTTOM OF TOOTH & PAWL

PE09-020 1580

Powertrain Operations
Automatic Transmissions
DYNAMICS & CONTROL CAE REPORT

CAD/CAE Dept.
Dynamics and Control Section
Project # CAE-8-2005-13348

SUBJECT: 5R55S Torque to Turn Analysis
REQUESTER: K. Ahmed

cc: Matt Defore, L. Greene, L. Retallack
P. Troy, C. Renneker

PART ANALYZED:

Transmission: 5R55S
Part Name: DETENT LEVER ASSY
Part Number: 1L2P-7C494-BA

ANALYSIS INTENT :

- 5R55S detent system torque to turn w/o drag and with 1000 N-mm of drag.
- Including the maximum (29N preload), minimum (25N preload) torque to turn plots overlaid on the same graph. 2 graphs total - one w/o drag and one with drag.
- Each graph will also identify the detent valley and peak positions.

RESULTS

Table 1 and 2 summarize the peak values of torque to turn and corresponding positions. Units are Newton-mm for all the values. Figure 2 and 3 display the torque to turn with the rotation angle. The roller position starts at Reverse valley which define as 0 degree and it rolls to park (-20 deg) and then from park to 3. This is the reason why there are 2 curves for each red and blue colors between 0 and -20 degrees in Figure 2. The corresponding peak angles are noted in the plot.

TABLE 1. Torque to Turn w/o Drag

Positions	P--R	R--N	N--D	D--3	3--2	2--1
Maximum (29N)	1627.2	1511.5	1498.3	1421.9	1436.0	1411.9
Minimum (25N)	1406.6	1310.4	1293.3	1233.6	1244.3	1221.1

TABLE 2. Torque to Turn with 1000 N-mm Drag

Positions	P--R	R--N	N--D	D--3	3--2	2--1
Maximum (29N)	2627.2	2511.5	2498.3	2421.9	2436.0	2411.9
Minimum (25N)	2406.6	2310.4	2293.3	2233.6	2244.3	2221.1

ADAMS MODELING:

Figure 1 shows the Adam model built, and the joint between the rooster comb and the ratcheting rod was disconnected in this analysis to examine the detent lever assembly torque to turn only.

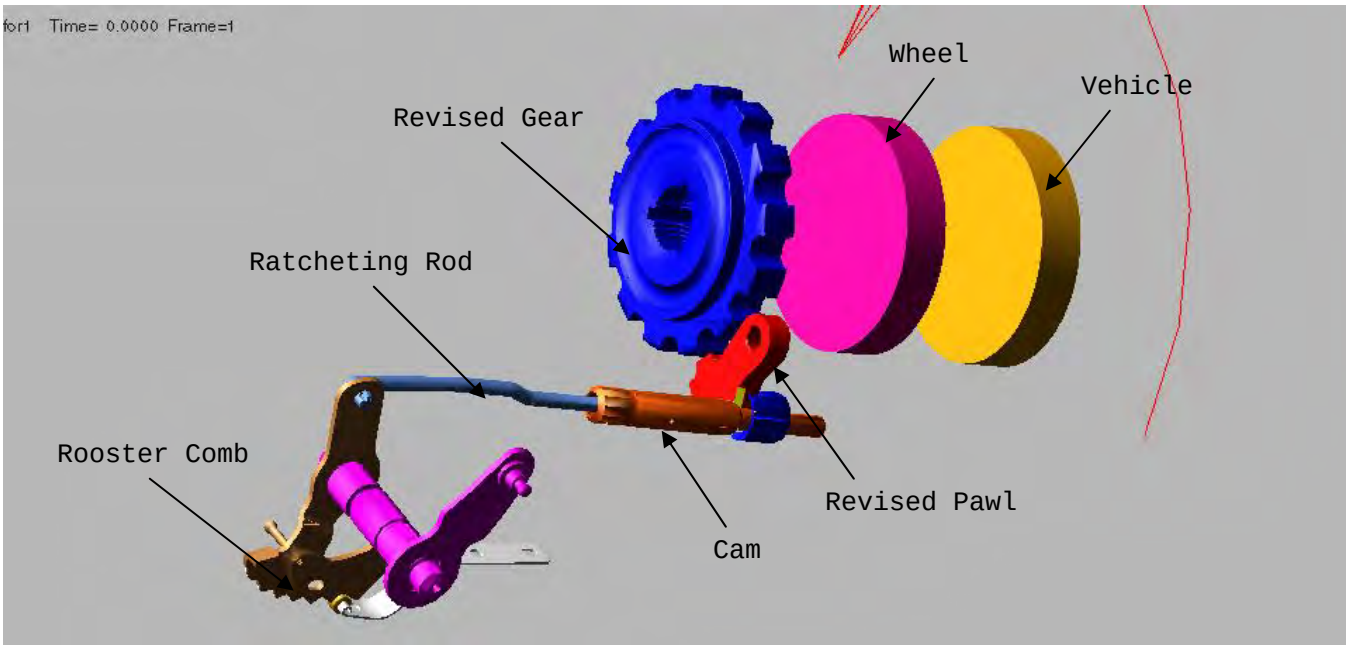


Figure 1. 5R55S Park ADAMS Model

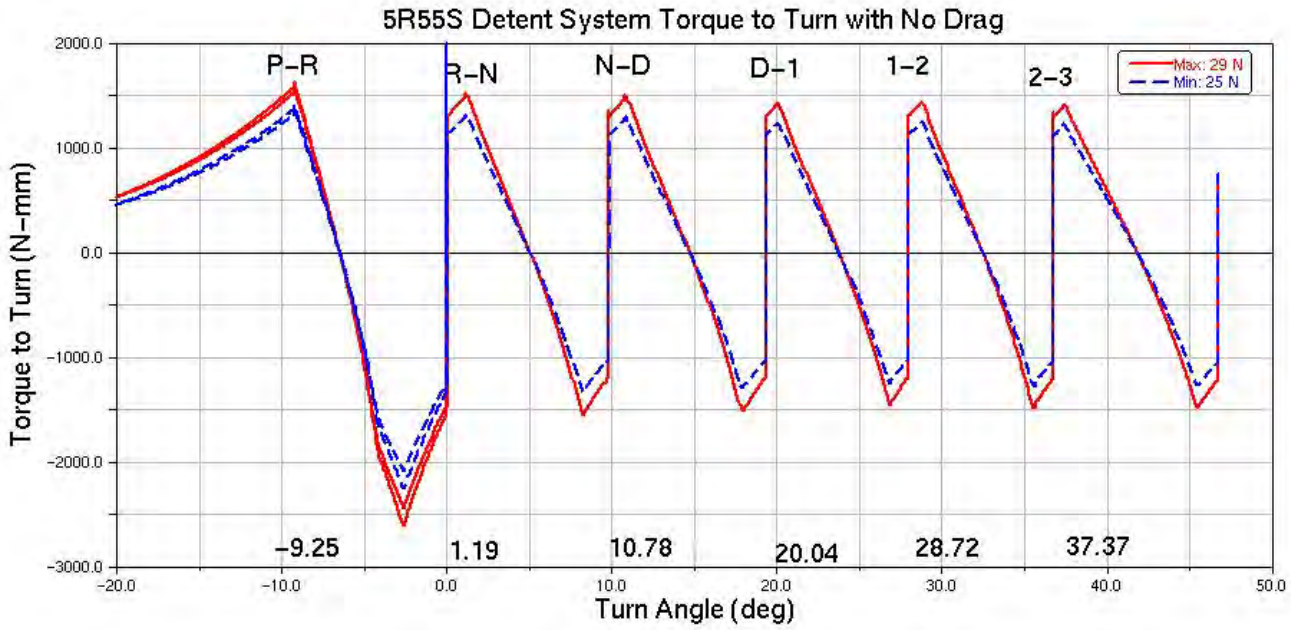


Figure 2. Torque to Turn without Drag

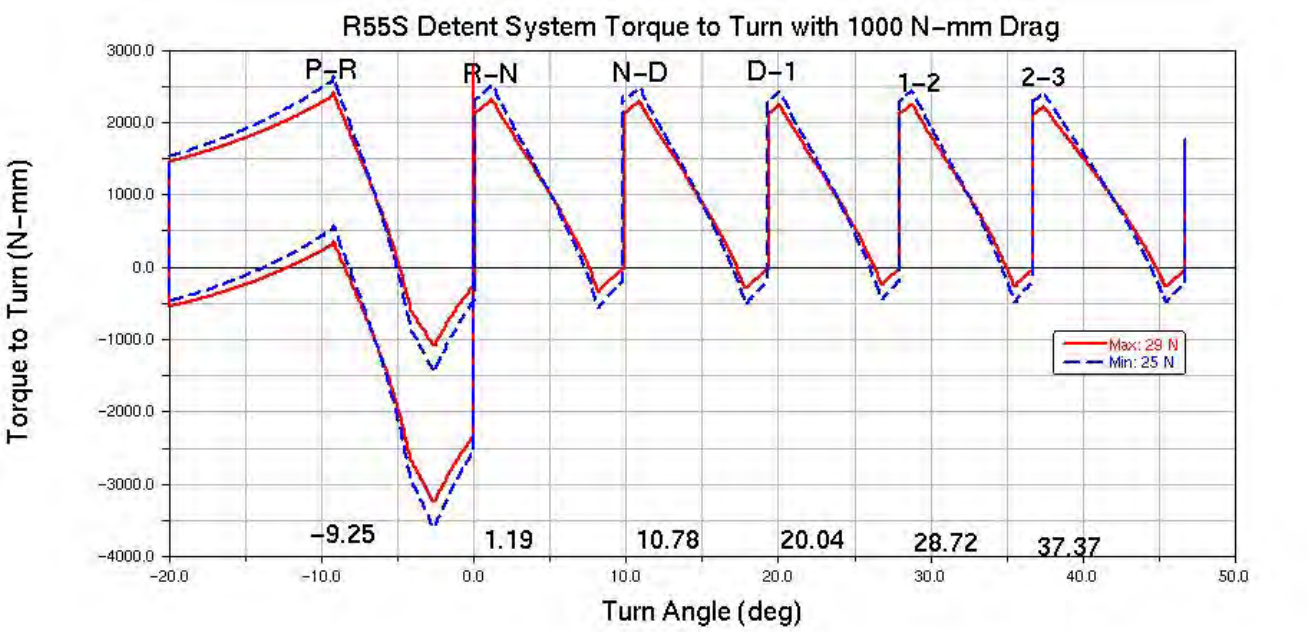


Figure 3. Torque to Turn with 1000 N-mm Drag

Appendix

Detent Spring: k=231.5 N-mm/deg; Preload 25 N and 29 N

CAE Engineer: Xiaoyong Lu (x-34080), CAD/CAE/NDE Dept. Date: Sept. 15 2004

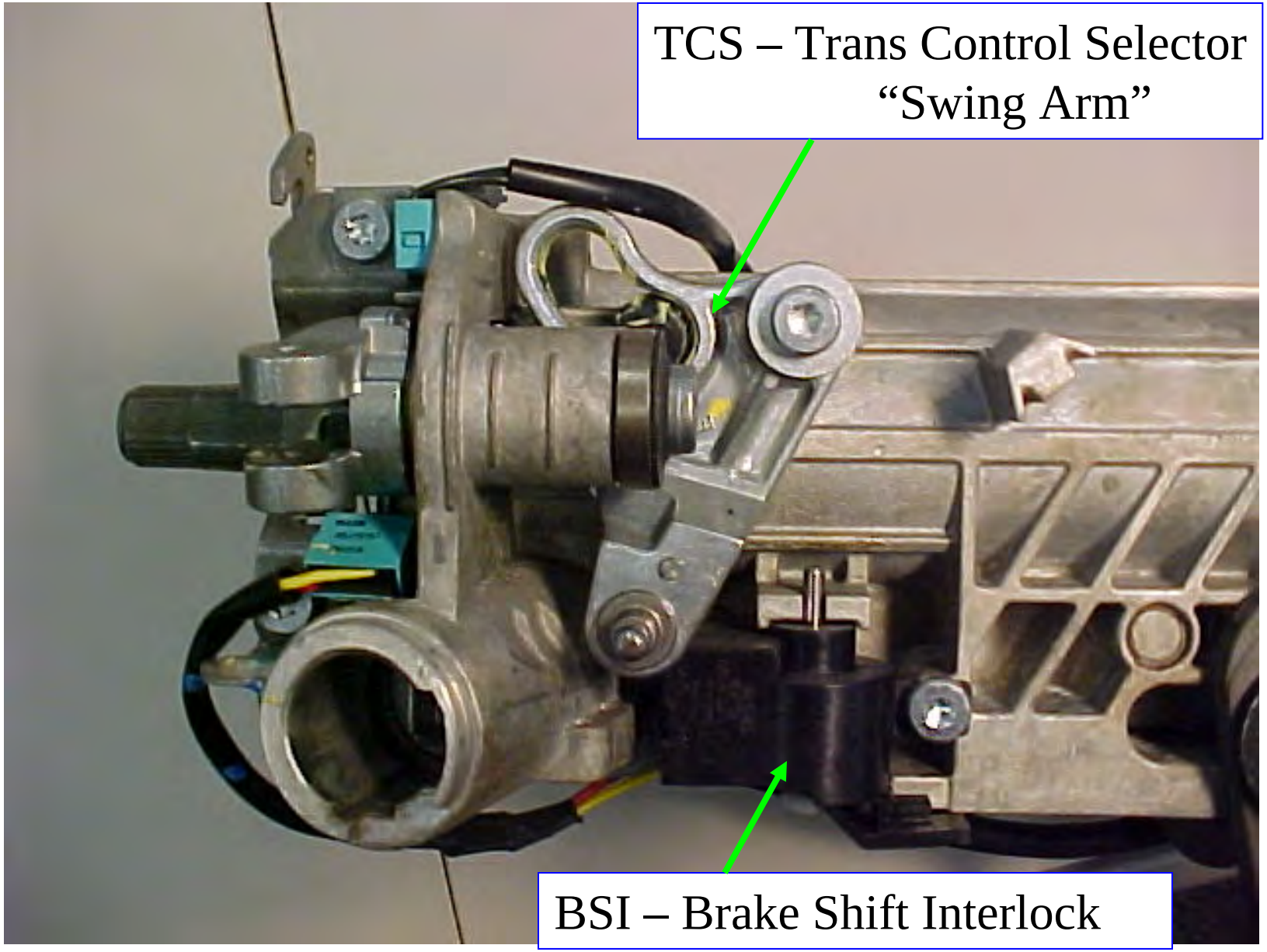
Concurred: _____ (Chin-Yuan Perng)

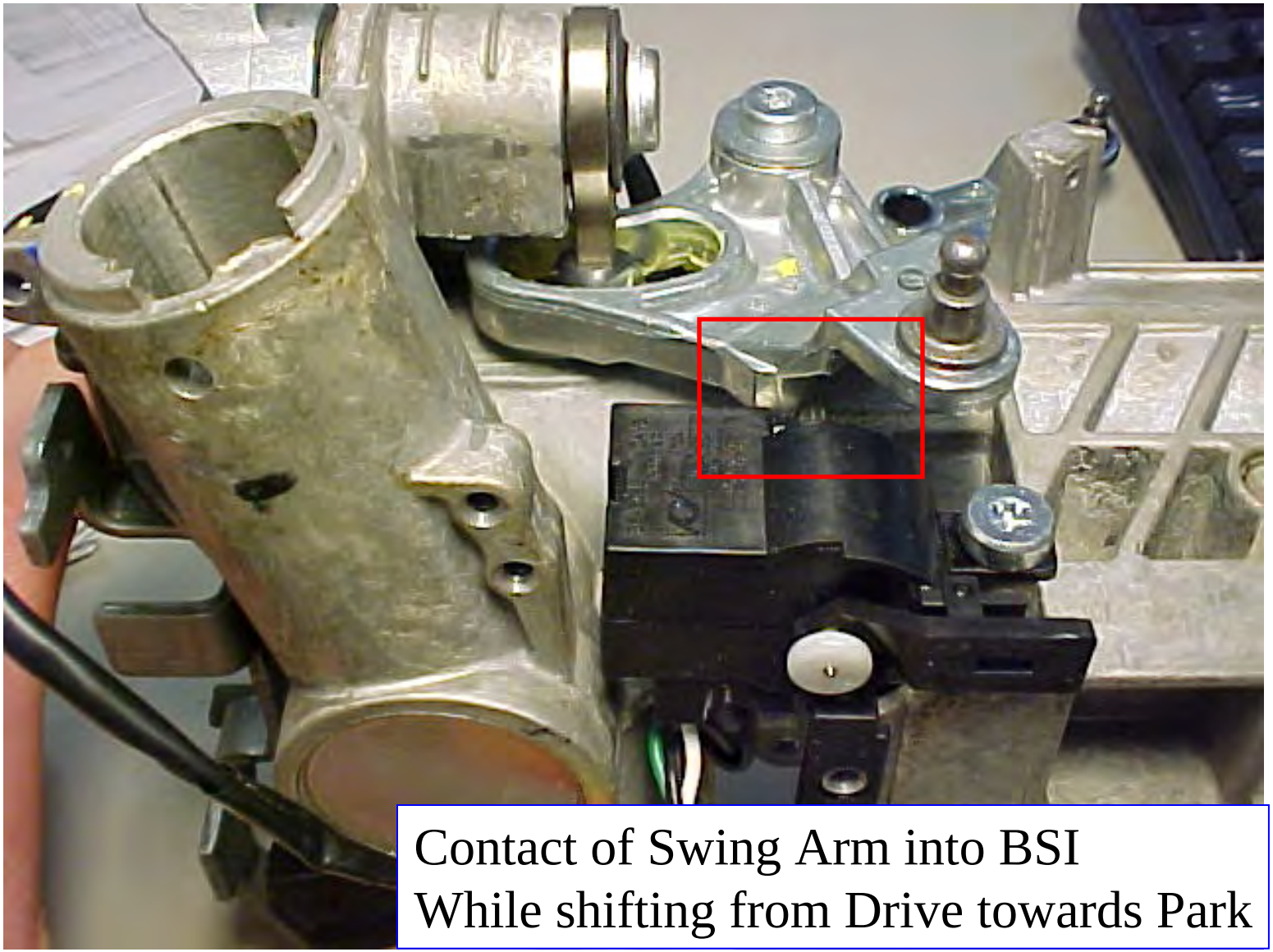
Technician Panel discussion of Explorer Steering column

Thursday, March 18, 2004

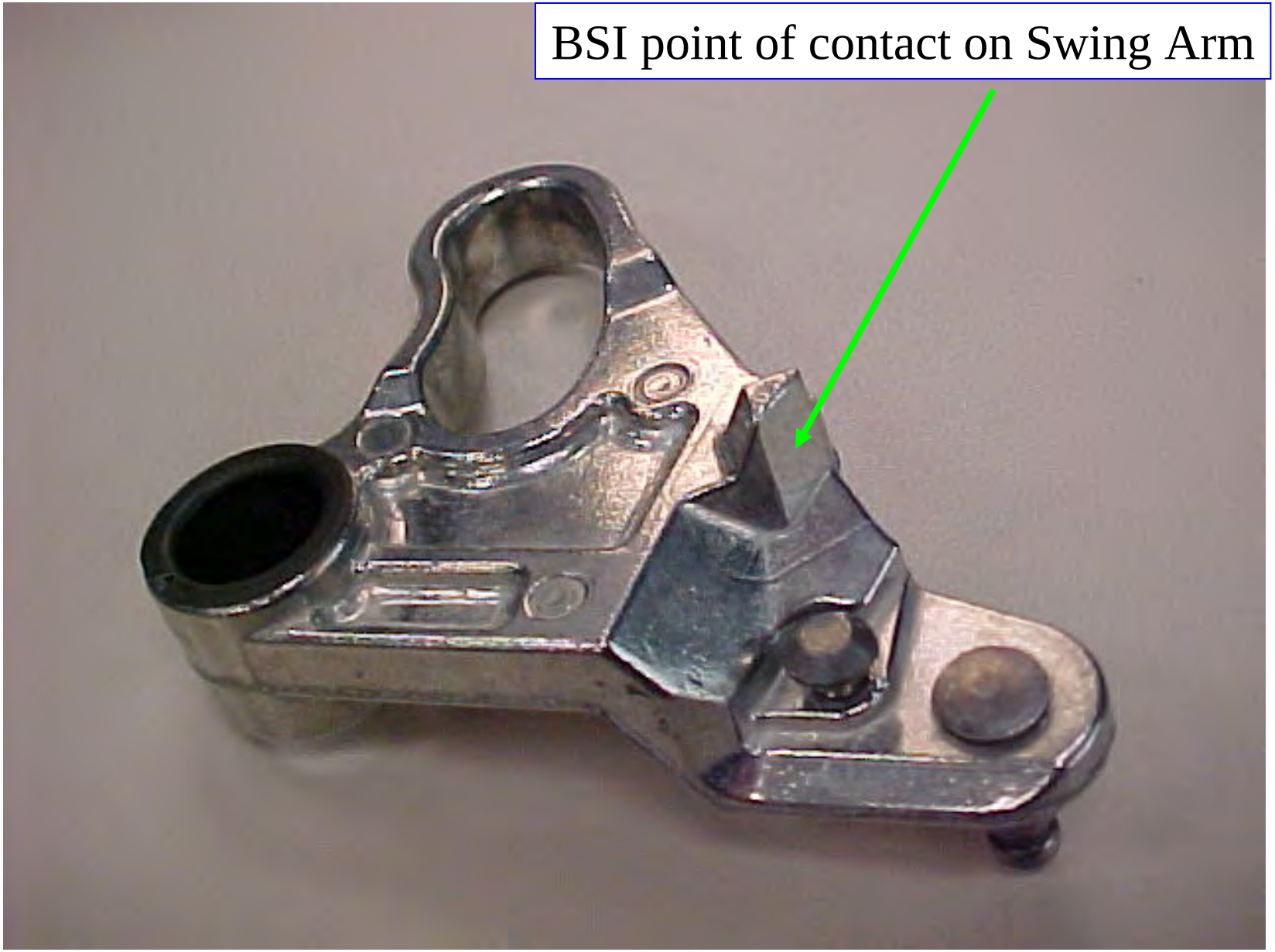
Ford Technical Institute

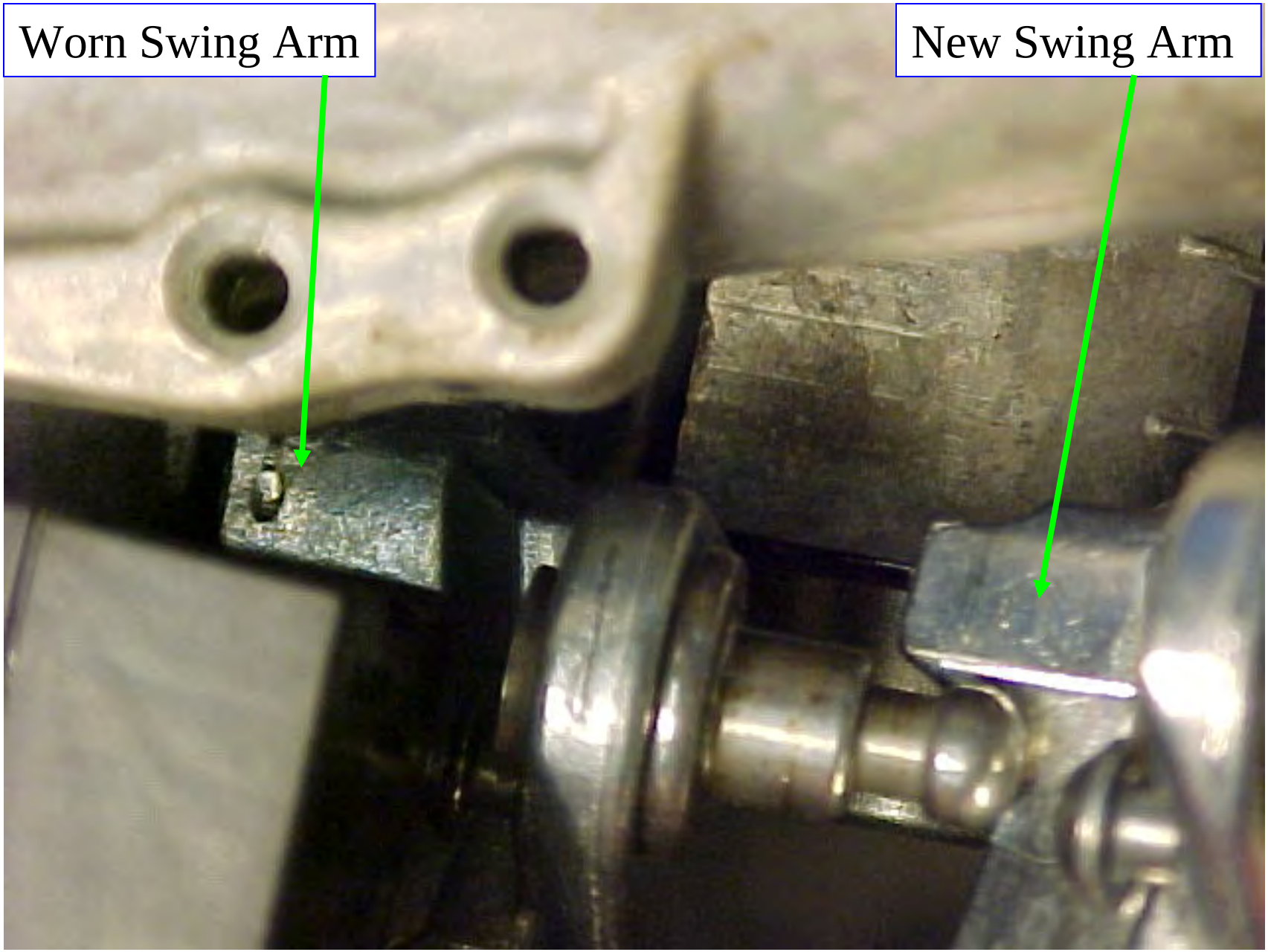
	Blue Team	Green Team	
8:15 - 9:30	Seat Track Noise	8:15 - 9:00	Steering Column (Explorer)
9:30 - 9:45	Break	9:00 - 9:30	Satellite Radio Diagnostics
9:45 - 10:30	**Steering Column (Explorer)**	9:30 - 9:45	Break
10:30 - 11:00	**Satellite Radio Diagnostics**	**9:45 - 11:00**	**Seat Track Noise**
11:00 - 11:45	Lunch	11:00 - 11:45	Lunch
11:45 - 1:45	Axle	11:45 - 2:15	Ford 500/Freestyle
1:45 - 2:15	AC Coil/Clutches	2:15 - 2:45	AC Coil/Clutches
2:15 - 4:45	Ford 500/Freestyle	2:45 - 4:45	Axle

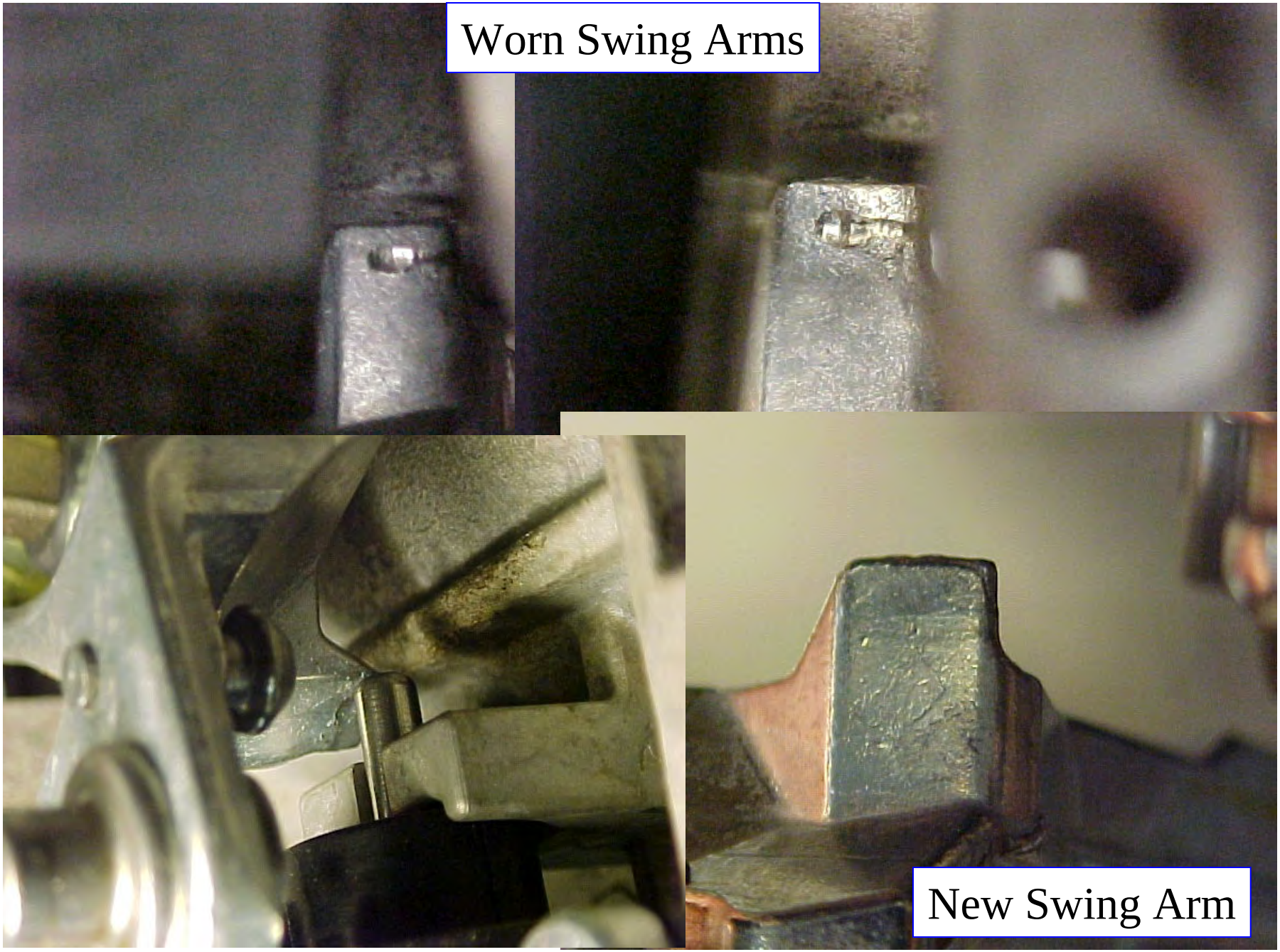

TCS – Trans Control Selector
"Swing Arm"
BSI – Brake Shift Interlock



Contact of Swing Arm into BSI
While shifting from Drive towards Park


BSI point of contact on Swing Arm


Worn Swing Arm
New Swing Arm


Worn Swing Arms
New Swing Arm

From: Thornton, James (J.W.)
Sent: Tuesday, June 15, 2004 1:38 PM
To: Case, Robert (R.G.)
Cc: 'mazeem@visteon.com'; 'jcorley@pontiaccoil.com'; Porter, Alan (A.J.)
Subject: U152 BSI for service

Bob,
The U222 BSI part which is released for service is part number 2L1C-3F770-AJ. Kasandra is saying the part number changes for service and is different from what I see in WERS but I am not sure how to look up that part number.

For both U152 and U222, the column supplier is Visteon and here is the contact:

Mohammad Azeem
Product Design Engineer
Visteon Chassis Systems
Cube NW 62-016
Tel:313-7550981 Fax:313-7554098
e-mail:mazeem@visteon.com

Pontiac Coil is the supplier of the BSI to Visteon for production.

The only Pontiac Coil contact I have is:

Jack Corley

(248)922-2203

jcorley@pontiaccoil.com

I will be out of the office next week and so Alan will be able to help with any questions between June 21st and June 30th.

Regards,
Jim Thornton
Outfitters Steering
Ford Motor Company
(313) 845-9249 PDC 2B-F64
Email: jthornt2@ford.com
Text pager: JTHORNT2 or (313)851-3896

From: Thornton, James (J.W.)
Sent: Friday, September 24, 2004 10:14 AM
To: Snider, Tim (T.O.); Linnansalo, Vera (V.)
Subject: U152 BTSI

Attachments: 3C529-SHIFT EFFORTS VERBATIMS.xls; TCS_BSI_wear.ppt; BSI service.ppt; Steering column repair_BC_May11th.doc

Here are some of the files with some background info. Please forward to the other person who was at the Monday meeting as I don't remember her name. Thanks.

3C529-SHIFT FORTS VERBATIMS.

TCS_BSI_wear.ppt (541 KB)

BSI service.ppt (337 KB)

Steering column repair_BC_May1...

Regards,
Jim Thornton
(313) 845-9249
Ford Motor Company Steering

EXPLORER	
MY	03-04
REPAIRS	575
IN AND OUT OF **PARK** ISSUES	311
SHIFT STICKING - REVERSE TO DRIVE, ETC	25
SHIFT BINDING	11
SHIFT BROKE	19
SHIFT LEVER LOOSE	9
SHIFTER DOESN'T LOCK	7
SHIFT OUT OF ALIGNMENT	6
KEY/IGNITION ISSUE - STICKING	70
TILT WHEEL - BROKEN/LOOSE/ NOT LOCKING/NOISE	44
BRAKE RELATED	12
HARD TO TURN WHEEL/NOISE/VIBRATION	44
LOOSE TRIM AROUND COLUMN	4
NOISE IN STEERING COLUMN	24
NOISE AFTER SHIFTING	9
VIBRATION IN STEERING	2
LEAKING FLUID ON FLOOR	1
LOCKS WHILE DRIVING	1
OTHER	17
WIRING HANGS	11

SOME OF THE VERABTIMS CONTAIN MORE THEN ONE ISSUE WHEN BRINGING THE CAR IN FOR SERVICE, THERE WILL BE MORE NUMBER OF REPAIRS THEN ACTUALLY LINE NUMBER OF REPAIRS

MDL_YR	VIN_CD	LBR_COST	VEH_LINE_CD	MKT_DERIVE	BOD_CAB_ST	ER_SERIES_C	DRIVE_CD	ENG_CD	TRANS_CD	PLANT_CD	PRODN_DT	WRTY_START_DT	NAME	DOC_NUM	PH_NUM	WCC_CD	_NUM_CAUS_
2003	ZU85W63UC1	100.3	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	28-Apr-03	30-Sep-03	KEHOE FORI	92453901	6344444	5R01	3L2Z
2003	ZU85K93ZA4	87.97	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AV	12-Dec-02	18-Dec-02	ORD-MT. VER	9615256	8958500	5R01	3L2Z
2003	ZU84K73UB0	12.5	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	10-Dec-02	17-Dec-02	FORD LINC I	6061006	4322418	5R01	*
2003	ZU83W93UB2	108.96	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	8-Jan-03	31-Jan-03	HEAD MOTOR	12401901	7272200	5R01	3L2Z
2003	ZU83K43ZA1	101.87	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AV	27-Sep-02	8-Nov-02	OASIS FORD	1200051	5911111	5R01	3L2Z
2003	ZU83K23UA3	102.89	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	17-Sep-02	23-Nov-02	I-CAIRNS FOF	302096A	3778100	5R01	3L2Z
2003	ZU83K03UB5	106.49	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	4-Feb-03	31-Jul-03	I-CAIRNS FOF	356231A	3778100	5R01	3L2Z
2003	ZU75WX3ZA2	108.12	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	1-Nov-02	18-Nov-02	ENEY-WEST H	203728A	9224500	5R01	3L2Z
2003	ZU75W93UC2	82.49	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	23-Apr-03	25-Aug-03	Y O'BRIEN, IN	35061201	7767600	5R01	3L2Z
2003	ZU75W83ZA4	281.15	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	17-Dec-02	19-Dec-02	ALIER FORD,	4077001	6452780	5R01	3L2Z
2003	ZU75W03ZB1	87.92	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	22-May-03	3-Nov-03	RWOOD FORI	213532B	4295478	5R01	3L2Z
2003	ZU75K73ZA8	67.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	27-Feb-03	4-Apr-03	JESS FORD	4840801	6330110	5R01	3L2Z
2003	ZU75K43ZA8	93.37	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Feb-03	14-Apr-03	RSON FORD, I	026464A	3638100	5R01	3L2Z
2003	ZU74WX3ZA4	369.9	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	22-Nov-02	27-Nov-02	FORD OF AM	157468A	6885464	5R01	3L2Z
2003	ZU74W83UB5	173.9	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	6-Feb-03	30-Sep-03	L WOODS FO	210873A	4544200	5R01	3L2Z
2003	ZU74W83UA4	86.85	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	30-Sep-02	7-Oct-02	TINGS FORD,	043174C	7580114	5R01	3L2Z
2003	ZU74W33UA4	153.63	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	1-Oct-02	12-Mar-03	FORD AT OXI	304388A	4262500	5R01	3L2Z
2003	ZU74KX3UA7	75.91	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	30-Nov-02	STER FORD,	3287101	7871700	5R01	3L2Z
2003	ZU74K73UB8	306.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Mar-03	26-Mar-03	FORD-MERCU	53490705	3293673	5R01	3L2Z
2003	ZU74K63UA3	83.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-02	26-Dec-02	RY MOTOR CO	105044A	2867746	5R01	1L2Z
2003	ZU74K53ZA3	175.78	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Nov-02	14-Jan-03	FORD OF DE	60870701	9323673	5R01	3L2Z
2003	ZU74K53ZA1	163.78	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Oct-02	9-Oct-02	FORD LINCO	5821951	8273566	5R01	3L2Z
2003	ZU74K53UA4	75.95	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	1-Oct-02	7-Mar-03	AIRWAY FOR	9428101	5783600	5R01	3L2Z
2003	ZU74K53UA4	92.23	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	1-Oct-02	7-Mar-03	AIRWAY FOR	9564301	5783600	5R01	3L2Z
2003	ZU74K43UA8	165.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Nov-02	13-Nov-02	STONE FORI	21260801	4344141	5R01	3L2Z
2003	ZU74K33UB3	200.38	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Jan-03	31-Jan-03	N SQUARE FO	5374401	4819400	5R01	3L2Z
2003	ZU74K13UA0	80.11	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Aug-02	31-Mar-03	JRE FORD OF	048061A	6255600	5R01	3L2Z
2003	ZU74K03UB7	97.96	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	5-Mar-03	20-Sep-03	N & LARKIN FO	5215452	8922300	5R01	3L2Z
2003	ZU73WX3ZA5	143.17	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	6-Jan-03	14-Feb-03	ENDLY FORD,	092849B	2436000	5R01	3L2Z
2003	ZU73WX3UC5	70.28	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	11-Jun-03	14-Jul-03	AVISTA MOTO	180309E	3696681	5R01	*
2003	ZU73WX3UA1	130.15	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	27-Aug-02	10-Oct-02	H BROS. FOR	10968501	4211300	5R01	3L2Z
2003	ZU73W93ZA9	503.65	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	10-Mar-03	18-Feb-04	AMONTE FOR	095129A	7557007	5R01	3L2Z
2003	ZU73W93ZA2	180.69	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	15-Oct-02	27-Nov-02	SON MOTORS	1161071	8733449	5R01	3L2Z
2003	ZU73W73ZA5	113.2	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	11-Dec-02	22-May-03	/E ROGERS F	16481	8788151	5R01	3L2Z
2003	ZU73W73UA4	98.47	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	30-Sep-02	31-Mar-03	FORD-MERCI	075435A	6474151	5R01	3L2Z
2003	ZU73W63ZA9	131.51	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	18-Mar-03	13-Jun-03	ERIOR FORD,	167530G	7822400	5R01	3L2Z
2003	ZU73W63ZA3	67.92	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	15-Oct-02	22-Oct-02	/E ROGERS F	15043	8788151	5R01	3L2Z
2003	ZU73W63UA4	73.02	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	4-Oct-02	14-Oct-02	STATE FORI	14015802	8660781	5R01	3L2Z
2003	ZU73W63UA4	80.76	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	2-Oct-02	12-Jan-03	I NOLAN FOR	185140B	6312000	5R01	3L2Z
2003	ZU73W53UC5	80.06	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	18-Jun-03	27-Jun-03	JLTS FORD, I	29978903	9342388	5R01	3L2Z
2003	ZU73W53UA5	238.07	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	24-Oct-02	22-Aug-03	AN FORD SAL	121733A	5347651	5R01	3L2Z
2003	ZU73W43ZA4	77.33	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	21-Nov-02	18-May-03	ANET FORD, I	15973402	4323673	5R01	3L2Z
2003	ZU73W43ZA4	77.33	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	21-Nov-02	18-May-03	ANET FORD, I	16160701	4323673	5R01	3L2Z
2003	ZU73W43ZA4	77.33	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	21-Nov-02	18-May-03	ANET FORD, I	16293501	4323673	5R01	3L2Z
2003	ZU73W43ZA4	90.22	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	21-Nov-02	18-May-03	ANET FORD, I	15400002	4323673	5R01	3L2Z
2003	ZU73W43ZA1	187.5	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	26-Sep-02	23-Dec-02	CHMID FORD	272719B	3991000	5R01	3L2Z
2003	ZU73W43UA2	142.98	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	26-Sep-02	11-Dec-02	ORNO BROS II	266882A	6762200	5R01	3L2Z

2003	ZU73W33ZA6	100.21	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	23-Jan-03	8-Feb-03	EHOLD FORD	7321651	4623131	5R01	3L2Z
2003	ZU73W33ZA5	68.58	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	16-Dec-02	23-Jan-03	IEWLON FORI	057214A	3425146	5R01	3L2Z
2003	ZU73W33ZA4	136.73	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	9-Dec-02	17-Dec-02	VINNER FORI	2026451	4284000	5R01	3L2Z
2003	ZU73W33ZA4	172.13	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	27-Nov-02	2-Jan-03	OHERTY FOR	7544101	3573114	5R01	3L2Z
2003	ZU73W33ZA0	101.87	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	19-Sep-02	11-Dec-02	OASIS FORD	5468451	5911111	5R01	3L2Z
2003	ZU73W33UA5	81.35	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	17-Oct-02	29-Oct-02	WNE FORD, II	260230A	6626500	5R01	3L2Z
2003	ZU73W23ZA6	103.81	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	23-Jan-03	12-Feb-03	SINCLAIR FOF	32448102	8922600	5R01	3L2Z
2003	ZU73W23UA7	92.12	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	6-Nov-02	19-Nov-02	HOLZER FORI	179731D	4741234	5R01	3L2Z
2003	ZU73W23UA3	81.35	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	16-Sep-02	29-Nov-02	WNE FORD, II	249134B	6626500	5R01	3L2Z
2003	ZU73W13UB7	118.98	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	6-Mar-03	12-Jun-03	TIS FORD, IN	12649901	6534000	5R01	*
2003	ZU73W13UA8	78.43	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	8-Nov-02	21-Aug-03	PITAL FORD I	2506151	7904600	5R01	3L2Z
2003	ZU73W13UA2	97.73	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	11-Sep-02	26-Nov-02	FORD SALES	161522A	5343673	5R01	3L2Z
2003	ZU73KX3ZB1	107.9	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Apr-03	30-Apr-03	IULTZ FORD,	17209301	6243600	5R01	3L2Z
2003	ZU73KX3ZB1	485.56	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Apr-03	30-Apr-03	IULTZ FORD,	17767401	6243600	5R01	3L2Z
2003	ZU73KX3ZA8	142.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Mar-03	18-Mar-03	OUGHBRED	20134001	5051818	5R01	3L2Z
2003	ZU73KX3ZA5	159.51	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	12-Dec-02	30-Jun-03	SE FORD SAL	10550001	7566655	5R01	3L2Z
2003	ZU73KX3ZA4	97.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Nov-02	25-Apr-03	W BEAVERT	91774201	6441131	5R01	3L2Z
2003	ZU73KX3ZA4	426.51	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Nov-02	23-Nov-02	RD OF FAIRFI	1444951	4213300	5R01	3L2Z
2003	ZU73KX3ZA2	137.07	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Oct-02	30-Jul-03	IETTE FORD,	028972A	8351190	5R01	3L2Z
2003	ZU73KX3ZA1	109.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Oct-02	19-Oct-02	AYVILLE FOR	45938805	5894800	5R01	3L2Z
2003	ZU73KX3ZA0	184.16	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Sep-02	12-Sep-02	NN FORD IN (	38505301	9984000	5R01	3L2Z
2003	ZU73KX3UB2	88.55	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Dec-02	3-Jan-03	RSCH FORD I	607503	8795381	5R01	3L2Z
2003	ZU73KX3UA8	94.5	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	22-Nov-02	RVIS FORD, II	082093B	8983000	5R01	*
2003	ZU73KX3UA8	80.68	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	29-Nov-02	STON MOTOR	41297701	9623941	5R01	3L2Z
2003	ZU73KX3UA6	79.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Oct-02	25-Nov-02	LSON MOTOI	7207952	7524201	5R01	3L2Z
2003	ZU73KX3UA5	192	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Oct-02	25-Nov-02	FORD INCORI	138264A	5623315	5R01	3L2Z
2003	ZU73KX3UA4	144.81	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Oct-02	27-Nov-02	IIVERSAL FOI	9293851	2739700	5R01	3L2Z
2003	ZU73KX3UA2	243.97	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Sep-02	29-Oct-02	WNS FORD, II	8153451	3492240	5R01	3L2Z
2003	ZU73KX3UA1	197.03	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Aug-02	31-Jul-03	FORD & MER	024400A	8425416	5R01	3L2Z
2003	ZU73KX3UA0	200.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Aug-02	7-Sep-02	RANKLIN FOR	029827A	5280040	5R01	3L2Z
2003	ZU73K93ZB2	393.53	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-May-03	24-Jun-03	BAY FORD	17595901	8764484	5R01	3L2Z
2003	ZU73K93ZB1	191.13	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	15-Apr-03	10-Jun-03	AND FORD, II	3978501	3866120	5R01	3L2Z
2003	ZU73K93ZA4	168.26	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	6-Dec-02	11-Dec-02	NELL MOTOR	068850A	7299700	5R01	3L2Z
2003	ZU73K93ZA4	107.23	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	22-Nov-02	4-Apr-03	SS BROS. FC	7754503	8251212	5R01	3L2Z
2003	ZU73K93ZA4	89.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	7-Nov-02	23-Nov-02	EY/BARR FO	7366752	2263673	5R01	3L2Z
2003	ZU73K93ZA3	118.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	22-Oct-02	21-Dec-02	HGATE FORI	110937A	9845011	5R01	3L2Z
2003	ZU73K93ZA2	67.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Oct-02	18-Oct-02	Y O'BRIEN, IN	34263301	7767600	5R01	*
2003	ZU73K93ZA1	200.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	26-Sep-02	26-Nov-02	ASI MOTORS	21368701	8986100	5R01	3L2Z
2003	ZU73K93ZA1	91.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	26-Sep-02	21-May-03	AN SELLERS	4672152	6437500	5R01	3L2Z
2003	ZU73K93ZA1	188.08	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	20-Sep-02	31-Oct-02	RD LINCOLN	044657A	2261600	5R01	3L2Z
2003	ZU73K93UC6	75.89	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Jul-03	6-Aug-03	HMONT FOR	293825A	7526611	5R01	3L2Z
2003	ZU73K93UC3	198.65	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-May-03	28-May-03	FORD OF AM	161566B	6885464	5R01	3L2Z
2003	ZU73K93UB9	83.46	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	27-Mar-03	11-Apr-03	AC-JACKSON	96735401	*	5R01	3L2Z
2003	ZU73K93UB8	108.06	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Mar-03	4-Jun-03	SDALE FORI	7479552	4729500	5R01	3L2Z
2003	ZU73K93UB8	167.31	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Mar-03	28-Apr-03	ASI MOTORS	21584401	8986100	5R01	3L2Z
2003	ZU73K93UB2	69.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Jan-03	4-Mar-03	RO FORD-L/M	15167103	4526334	5R01	3L2Z
2003	ZU73K93UB2	243.57	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Dec-02	1-Jan-03	THAM FORD,	16789401	8948000	5R01	3L2Z
2003	ZU73K93UA7	175.48	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	4-Dec-02	ORD LINCOLI	1540701	3913000	5R01	3L2Z

2003	ZU73K93UA1	225.22	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Aug-02	28-Dec-02	TROSE FORI	35743001	6660711	5R01	3L2Z
2003	ZU73K83ZB4	244.36	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Jul-03	23-Aug-03	NN MOTOR C	34267801	9466611	5R01	*
2003	ZU73K83ZA4	69.34	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Nov-02	28-Nov-02	AC - SALT LA	75655901	*	5R01	1L2Z
2003	ZU73K83ZA3	76.37	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Nov-02	23-Nov-02	D LINCOLN M	35130101	3481400	5R01	3L2Z
2003	ZU73K83ZA1	80.77	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Sep-02	5-Oct-02	RD LINCOLN	3316401	2823000	5R01	3L2Z
2003	ZU73K83ZA0	79.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Sep-02	24-Oct-02	SA AUTO GR	3406501	2806000	5R01	3L2Z
2003	ZU73K83ZA0	85.48	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Sep-02	26-Jul-03	CLASSIC FOR	81997601	9423898	5R01	3L2Z
2003	ZU73K83UC6	114.45	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Jul-03	8-Aug-03	RTZ RAC - MI	33314401	*	5R01	3L2Z
2003	ZU73K83UB9	114.18	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Apr-03	19-Apr-03	MIER FORD,	5328151	2587200	5R01	3L2Z
2003	ZU73K83UA6	207.33	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Oct-02	17-Dec-02	ORD OF ANS	13521101	7325000	5R01	3L2Z
2003	ZU73K73ZB5	57.9	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	30-Jul-03	29-Sep-03	NTRYSIDE F	58251	5489676	5R01	*
2003	ZU73K73ZA6	12.05	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Jan-03	25-Jan-03	NIS FORD CO	10944306	4640661	5R01	*
2003	ZU73K73ZA6	84.46	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Jan-03	5-Dec-03	ALITY FORD, I	1860901	8827000	5R01	*
2003	ZU73K73ZA6	198.51	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	9-Jan-03	19-Feb-03	VALLEY FORI	19452901	2822350	5R01	3L2Z
2003	ZU73K73ZA3	184.77	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Nov-02	23-Nov-02	FORD CENTE	65221	2353636	5R01	3L2Z
2003	ZU73K73ZA3	83.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Oct-02	28-May-03	HN MARKEL, I	290671A	3939700	5R01	3L2Z
2003	ZU73K73ZA2	112.61	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Oct-02	24-Oct-02	SA AUTO GR	99772601	2806000	5R01	3L2Z
2003	ZU73K73ZA2	162.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Oct-02	24-Jan-03	MS MOTOR C	2095851	2342770	5R01	3L2Z
2003	ZU73K73UB2	60	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Jan-03	18-Jan-03	ELLY MOTOR	59051101	2372757	5R01	3L2Z
2003	ZU73K73UA7	128.53	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Nov-02	2-Jan-03	ILLIKEN FORI	141202C	2553100	5R01	3L2Z
2003	ZU73K73UA6	28.01	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Oct-02	27-Nov-02	BLE FORD, IN	016231A	7660700	5R01	*
2003	ZU73K73UA6	112.02	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Oct-02	27-Nov-02	BLE FORD, IN	017009A	7660700	5R01	3L2Z
2003	ZU73K73UA3	189.17	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-02	12-Nov-02	AN FORD SAL	314770B	5433333	5R01	3L2Z
2003	ZU73K73UA2	143.02	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Sep-02	18-Oct-02	ITE FORD, IN	3722901	7591200	5R01	3L2Z
2003	ZU73K73UA1	107.9	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	29-Aug-02	24-Sep-02	IULTZ FORD,	18408102	6243600	5R01	3L2Z
2003	ZU73K63ZA8	75.55	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Feb-03	1-Mar-03	ORDAN FORI	621430A	2591981	5R01	3L2Z
2003	ZU73K63ZA5	89.99	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Dec-02	28-Feb-03	Y O'BRIEN, IN	34214801	7767600	5R01	3L2Z
2003	ZU73K63ZA3	186.29	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	1-Nov-02	31-Jan-03	E FORD SALE	21553501	3473111	5R01	3L2Z
2003	ZU73K63ZA3	130.98	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Oct-02	31-Dec-02	RNE FORD & M	287640A	6649841	5R01	3L2Z
2003	ZU73K63ZA1	246.05	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Sep-02	4-Nov-02	OASIS FORD	4216951	5911111	5R01	3L2Z
2003	ZU73K63ZA0	76.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Sep-02	26-Sep-02	OCHRANE MO	20348501	6561100	5R01	*
2003	ZU73K63UC2	40.89	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-May-03	19-Jun-03	RDON FORD	4559602	9472500	5R01	*
2003	ZU73K63UA7	219.15	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	31-Oct-02	2-Jan-03	ILLIKEN FORI	126067A	2553100	5R01	3L2Z
2003	ZU73K63UA7	115.25	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	31-Oct-02	29-Sep-03	MIAMI FORD, I	12053302	6433673	5R01	3L2Z
2003	ZU73K63UA6	144	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Oct-02	19-Apr-03	N FORD SALE	8943002	2645104	5R01	3L2Z
2003	ZU73K63UA6	160.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Oct-02	20-Dec-02	IRN MOTOR S	474816A	7842321	5R01	3L2Z
2003	ZU73K63UA5	188.02	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	16-Oct-02	28-Dec-02	ERICK MOTOR	384980A	6636111	5R01	3L2Z
2003	ZU73K63UA2	0	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Sep-02	11-Nov-02	WLES FORD, I	8890304	6909200	5R01	*
2003	ZU73K63UA2	187.61	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Sep-02	11-Nov-02	WLES FORD, I	8890302	6909200	5R01	3L2Z
2003	ZU73K53ZB2	402.27	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	23-May-03	7-Jun-03	IERRE FORD	14735407	3642200	5R01	3L2Z
2003	ZU73K53ZB2	593.14	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	6-May-03	12-Sep-03	HPORT FORD	128153B	4995300	5R01	3L2Z
2003	ZU73K53ZB0	103.28	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Apr-03	14-Apr-03	ERICAN FOR	157343B	4876700	5R01	3L2Z
2003	ZU73K53ZA9	99.34	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	24-Mar-03	19-May-03	ALDEMAN FOI	22612503	5867600	5R01	3L2Z
2003	ZU73K53ZA6	158.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	23-Jan-03	30-Sep-03	UNTRY FORD	5658951	7357400	5R01	3L2Z
2003	ZU73K53ZA4	156.5	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Dec-02	21-Dec-02	RLD OF ROSE	116118A	2456100	5R01	3L2Z
2003	ZU73K53ZA4	92.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	8-Nov-02	23-Nov-02	T FORD SALE	503354B	8386000	5R01	3L2Z
2003	ZU73K53ZA3	101.87	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	29-Oct-02	12-Jun-03	OASIS FORD	1958151	5911111	5R01	3L2Z
2003	ZU73K53ZA3	105.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Oct-02	27-Jan-03	LAGE FORD I	570051	5653900	5R01	3L2Z

2003	ZU73K53ZA2	283.17	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	7-Oct-02	10-Dec-02	RPER MOTO	7826101	4437311	5R01	3L2Z
2003	ZU73K53UC7	127.31	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Jul-03	26-Sep-03	R BLOOMFIEL	625751	7466900	5R01	3L2Z
2003	ZU73K53UC6	158	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Jul-03	28-Jul-03	LOUF FORD, I	247667C	9510300	5R01	3L2Z
2003	ZU73K53UC2	203.77	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-May-03	11-Oct-03	OMS FORD, IN	324677A	2641600	5R01	3L2Z
2003	ZU73K53UA8	86.86	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Nov-02	26-Dec-02	ORD OF WAT	39009801	6744781	5R01	3L2Z
2003	ZU73K53UA6	203.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Oct-02	7-Nov-02	ORD OF MT. V	10975801	6646900	5R01	3L2Z
2003	ZU73K53UA6	60.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Oct-02	22-Oct-02	NETT FORD,	1327651	2862191	5R01	3L2Z
2003	ZU73K53UA0	277.5	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Aug-02	5-Sep-02	MON'S TYSON	749711A	4480100	5R01	3L2Z
2003	ZU73K43ZB5	135.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	14-Aug-03	30-Jan-04	M OF PARKEF	061345A	4858585	5R01	3L2Z
2003	ZU73K43ZA7	90.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Feb-03	13-Jun-03	LAGE FORD I	4111951	5653900	5R01	3L2Z
2003	ZU73K43ZA6	178.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Jan-03	25-Jan-03	LONG FORD	63519102	6336661	5R01	3L2Z
2003	ZU73K43ZA0	90.07	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Sep-02	26-Sep-02	RY GEWEKE F	6341403	8212121	5R01	3L2Z
2003	ZU73K43UC7	172.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Jul-03	13-Aug-03	FORD OF WIL	123260A	5434300	5R01	3L2Z
2003	ZU73K43UC6	115.14	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Jun-03	7-Jul-03	ITE FORD, IN	5437101	7591200	5R01	3L2Z
2003	ZU73K43UB6	204.08	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Feb-03	11-Apr-03	H'S F-L-M OF	7615601	4228071	5R01	3L2Z
2003	ZU73K43UB2	602.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Dec-02	30-Apr-03	SCO BAY FO	14157303	8465577	5R01	3L2Z
2003	ZU73K43UA3	184.87	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-02	13-Dec-02	AYWARD FOR	43348503	8811200	5R01	3L2Z
2003	ZU73K43UA3	103.43	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Sep-02	18-Oct-02	KOLB JR. FC	21266602	3598100	5R01	3L2Z
2003	ZU73K43UA2	137.81	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Sep-02	25-Sep-02	MILNE FORD	4544151	9487700	5R01	3L2Z
2003	ZU73K33ZB5	181.66	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Jul-03	20-Nov-03	OUNG FORD II	30062501	5982599	5R01	3L2Z
2003	ZU73K33ZB3	102	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	29-May-03	15-Jul-03	OWN FORD, I	2465804	5990600	5R01	3L2Z
2003	ZU73K33ZB0	56.96	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	2-Apr-03	24-May-03	ICO MARPLE	1900251	3535500	5R01	*
2003	ZU73K33ZA6	93.98	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Jan-03	5-Apr-03	RHAR MOTOI	1564852	4691801	5R01	3L2Z
2003	ZU73K33UB7	217.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	10-Mar-03	30-Apr-03	IM HILL FORD	6527901	4523900	5R01	3L2Z
2003	ZU73K33UB4	76.88	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	27-Jan-03	11-Feb-03	ORN MOTOR	036010B	7232131	5R01	3L2Z
2003	ZU73K33UB2	78.11	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Jan-03	27-May-03	ANDA FORD	74951	5322208	5R01	3L2Z
2003	ZU73K33UB0	99.26	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Dec-02	30-Jun-03	RD OF NEW C	16977301	9664546	5R01	3L2Z
2003	ZU73K33UA8	130.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Nov-02	15-Nov-02	OM LAKE FOR	40449801	3532000	5R01	3L2Z
2003	ZU73K33UA6	105	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Oct-02	30-Dec-02	ARNEY FORD	11865202	3861771	5R01	3L2Z
2003	ZU73K33UA4	146.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	1-Oct-02	24-Jul-03	NBERG MOTC	047091A	4592154	5R01	3L2Z
2003	ZU73K33UA3	78.53	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Sep-02	26-Dec-02	DAY FORD	127716A	2429900	5R01	3L2Z
2003	ZU73K33UA2	70.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Sep-02	25-Mar-03	MARA FORD	7273502	2758922	5R01	3L2Z
2003	ZU73K33UA2	99.26	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Sep-02	13-Nov-02	CARDI FORD	6021351	5617500	5R01	3L2Z
2003	ZU73K33UA1	102	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	29-Aug-02	30-Oct-02	OWN FORD, I	2520901	5990600	5R01	3L2Z
2003	ZU73K23ZB4	76.67	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	24-Jun-03	1-Jul-03	ERT-FOX FOR	557401	6531350	5R01	3L2Z
2003	ZU73K23ZA8	89.99	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Mar-03	19-May-03	VIS FORD, IN	245015A	3557500	5R01	3L2Z
2003	ZU73K23ZA5	102.95	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	7-Jan-03	22-Jan-03	ER MOTORS	17360301	9255500	5R01	3L2Z
2003	ZU73K23ZA5	442.48	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Dec-02	19-Jan-03	OMARK FORD	486338A	6391131	5R01	3L2Z
2003	ZU73K23ZA4	152.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	12-Nov-02	25-Jan-03	OASIS FORD	1660952	5911111	5R01	3L2Z
2003	ZU73K23ZA2	294.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	9-Oct-02	28-Oct-02	AN FORD CO	2097201	8473673	5R01	3L2Z
2003	ZU73K23UC1	157.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	28-Apr-03	23-Jun-03	NEENAH-ME	4186801	7279000	5R01	3L2Z
2003	ZU73K23UC0	95.07	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	2-Apr-03	18-Apr-03	ZEIGLER FO	084893B	8978431	5R01	3L2Z
2003	ZU73K23UB0	11.15	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Dec-02	8-Jan-03	CKMAN MOTO	63202	5772142	5R01	*
2003	ZU73K23UB0	89.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Dec-02	31-Dec-02	BASS FORD,	141652	9346591	5R01	3L2Z
2003	ZU73K23UA9	83.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Nov-02	31-Dec-02	CMAHON FOF	9357402	8384801	5R01	*
2003	ZU73K23UA9	167.16	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Nov-02	31-Dec-02	CMAHON FOF	9488801	8384801	5R01	3L2Z
2003	ZU73K23UA8	109.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Nov-02	26-Nov-02	WER FORD II	167750C	4666400	5R01	3L2Z
2003	ZU73K23UA6	94.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Oct-02	27-Nov-02	ERST MOTOR	128266A	9467761	5R01	3L2Z

2003	ZU73K23UA5	91.95	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Oct-02	21-Oct-02	)NS FORD, IN	25403101	7971520	5R01	3L2Z
2003	ZU73K23UA4	86.08	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Oct-02	23-Oct-02	FORD TRUCK	051014A	6563160	5R01	3L2Z
2003	ZU73K23UA2	82.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	16-Sep-02	29-Mar-03	.N HOSKINS F	11379101	3844242	5R01	3L2Z
2003	ZU73K23UA1	83.09	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Sep-02	19-Dec-02	LINCOLN-ME	144075A	2253700	5R01	3L2Z
2003	ZU73K23UA0	227.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Aug-02	7-Sep-02	MPERIAL FOR	2886701	4732800	5R01	3L2Z
2003	ZU73K13ZB1	84.79	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	1-May-03	26-Nov-03	WE FORD SAI	31768501	8542555	5R01	3L2Z
2003	ZU73K13ZA7	238.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Jan-03	12-Feb-03	LONG FORD	67196501	6336661	5R01	3L2Z
2003	ZU73K13ZA5	250.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Dec-02	31-Dec-02	S MINNETON	31834101	5465441	5R01	3L2Z
2003	ZU73K13ZA3	181.77	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Oct-02	31-Dec-02	)RNO BROS II	240852C	6762200	5R01	3L2Z
2003	ZU73K13ZA0	87.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Sep-02	15-Oct-02	AN SELLERS	3452651	6437500	5R01	3L2Z
2003	ZU73K13ZA0	93.36	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	5-Sep-02	6-Nov-03	SON FORD-M	60628401	9953537	5R01	3L2Z
2003	ZU73K13ZA0	297	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Sep-02	26-Sep-02	UTURE FORI	040899B	7863673	5R01	3L2Z
2003	ZU73K13ZA0	229.78	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	12-Sep-02	28-Sep-02	)RD LINCOLN	2468463	5437300	5R01	3L2Z
2003	ZU73K13UC7	155.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Jul-03	8-Aug-03	)ME-DUNCAN	23671701	2687500	5R01	3L2Z
2003	ZU73K13UB5	159.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Feb-03	18-Feb-03	ENDALL FOR	50613103	3422151	5R01	3L2Z
2003	ZU73K13UB2	160.45	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Jan-03	2-Apr-03	IIVERSAL FOI	9389651	7861660	5R01	3L2Z
2003	ZU73K13UB0	10.72	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Dec-02	7-Feb-03	FORD LINCOL	16915402	4840121	5R01	162Z
2003	ZU73K13UB0	89.89	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Dec-02	12-Dec-02	FORD OF WAT	53155003	6744781	5R01	3L2Z
2003	ZU73K13UA8	99.88	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Nov-02	26-Nov-02	ELL MOTORS	16954001	9824500	5R01	3L2Z
2003	ZU73K13UA8	336.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Nov-02	12-Dec-02	.L FORD-MER	21762101	5812356	5R01	3L2Z
2003	ZU73K13UA7	153.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Oct-02	3-Feb-03	ORD LINCOL	5191551	6848300	5R01	3L2Z
2003	ZU73K13UA6	414.74	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Oct-02	31-Oct-02	CDANIEL FOF	027485A	6819000	5R01	3L2Z
2003	ZU73K13UA4	152.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Oct-02	25-Jan-03	PPLE FORD IN	649301	2901100	5R01	3L2Z
2003	ZU73K13UA1	173.44	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Sep-02	28-Sep-02	LLERTON FO	9332951	7222500	5R01	3L2Z
2003	ZU73K03ZA3	129.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	30-Oct-02	23-Dec-02	BAY SHORE F	29120301	6651300	5R01	3L2Z
2003	ZU73K03ZA3	138.43	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Oct-02	6-Feb-03	BOXTEL FORI	5970001	4993131	5R01	3L2Z
2003	ZU73K03ZA2	120.95	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Oct-02	18-Mar-03	ORD OF ANS	34241401	7325000	5R01	3L2Z
2003	ZU73K03ZA0	145.06	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	9-Sep-02	1-Oct-02	NGDALE FOR	9990951	7515766	5R01	3L2Z
2003	ZU73K03UC1	183.92	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Apr-03	31-May-03	)URTESY FOI	10968901	2551771	5R01	3L2Z
2003	ZU73K03UB3	344.96	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Jan-03	21-Apr-03	K AVENUE FO	8242501	5689205	5R01	3L2Z
2003	ZU73K03UB0	12.83	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Dec-02	12-Dec-02	FORD LINCOL	10091101	4421840	5R01	*
2003	ZU73K03UA6	162.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	29-Oct-02	22-Nov-02	ZZO FORD, IN	245890C	3532300	5R01	3L2Z
2003	ZU73K03UA3	183.73	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-02	9-Oct-03	AN MOTORS	085645A	3632870	5R01	3L2Z
2003	ZU73K03UA0	188.62	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Aug-02	7-Sep-02	FORD LINCOL	2393351	2282886	5R01	3L2Z
2003	ZU72KX3ZB0	93.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Apr-03	30-Apr-03	ON BROS. FC	58173001	7957900	5R01	3L2Z
2003	ZU72KX3ZA1	81.35	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Oct-02	12-May-03	BRADY FORD	5722201	3416655	5R01	3L2Z
2003	ZU72KX3UA2	461.52	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Sep-02	27-Nov-02	FORD SALES	569201	5372301	5R01	3L2Z
2003	ZU72KX3UA2	129.32	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Sep-02	31-Dec-02	& L FORD, IN	8642301	2527255	5R01	3L2Z
2003	ZU72KX3UA1	68.22	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Aug-02	25-Feb-03	ES FORD OF H	6886501	3896325	5R01	3L2Z
2003	ZU72KX3UA0	110.01	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Aug-02	9-Dec-02	STER FORD,	1729405	7871700	5R01	3L2Z
2003	ZU72K93ZB3	114.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Jun-03	23-Aug-03	R MOTOR COI	6232301	2672118	5R01	3L2Z
2003	ZU72K93ZA4	75.44	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Nov-02	3-Dec-02	FORD OF SYR	7346601	4744275	5R01	3L2Z
2003	ZU72K93UB8	101.28	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Mar-03	13-Dec-03	ORTHINGTON	24359201	2765300	5R01	3L2Z
2003	ZU72K83ZA9	82.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Mar-03	8-Apr-03	NT MOTOR CO	054284A	*	5R01	*
2003	ZU72K83ZA9	213.37	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Mar-03	8-Apr-03	NT MOTOR CO	056241A	*	5R01	3L2Z
2003	ZU72K83ZA3	180.05	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	24-Oct-02	9-Dec-02	CHESTER FO	53015201	2887564	5R01	3L2Z
2003	ZU72K83UA8	222.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Nov-02	23-Sep-03	MIAMI FORD, I	8363001	6433673	5R01	3L2Z
2003	ZU72K83UA8	100.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Nov-02	29-Nov-02	NORRIS FORI	2972252	2850200	5R01	3L2Z

2003	ZU72K73ZA4	81.86	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	19-Nov-02	4-Dec-02	JPUS FORD, I	5340701	3471830	5R01	3L2Z
2003	ZU72K73ZA2	74.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Oct-02	8-Mar-03	N OF SPIRIT	12658701	3362701	5R01	3L2Z
2003	ZU72K73UC8	78.25	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Jul-03	4-Sep-03	ORD OF EAST	3635801	4791000	5R01	3L2Z
2003	ZU72K73UC3	99.88	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-May-03	13-Jun-03	S FORD CORF	7652302	2736060	5R01	3L2Z
2003	ZU72K73UB3	99.5	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Jan-03	25-Jan-03	MAN FORD, II	9692051	6363200	5R01	3L2Z
2003	ZU72K73UA3	65.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	18-Sep-02	18-Oct-02	AIRWAY FOR	9385601	5783600	5R01	3L2Z
2003	ZU72K73UA1	488.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Sep-02	7-Oct-02	ILIA MOTORS	041462A	9312800	5R01	3L2Z
2003	ZU72K63ZA2	88.85	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	11-Oct-02	20-Jan-03	HGATE FORD	111126A	9845011	5R01	3L2Z
2003	ZU72K63UB2	260.3	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Jan-03	5-Sep-03	O OF NEW JEI	5106651	4672900	5R01	3L2Z
2003	ZU72K63UA9	106.66	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Nov-02	3-Mar-03	OME-DUNCAN	18924202	2687500	5R01	3L2Z
2003	ZU72K63UA7	277.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Oct-02	31-May-03	). M. YOCUM,	59551	8551153	5R01	3L2Z
2003	ZU72K53ZA8	203.18	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	4-Mar-03	6-Jun-03	ORNO BROS II	269729A	6762200	5R01	3L2Z
2003	ZU72K53UB5	112.02	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Feb-03	6-Mar-03	BLE FORD, IN	019398D	7660700	5R01	3L2Z
2003	ZU72K53UB2	92.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Jan-03	21-Jan-03	ORK FORD IN	302754A	2311945	5R01	3L2Z
2003	ZU72K53UA8	137	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Nov-02	22-Nov-02	FORD OF AM	161297B	6885464	5R01	3L2Z
2003	ZU72K53UA3	59.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Sep-02	22-Nov-02	, FORD MERC	1669601	6659526	5R01	3L2Z
2003	ZU72K53UA2	97.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Sep-02	26-Sep-02	C&C FORD	4289901	9439000	5R01	3L2Z
2003	ZU72K43ZB4	167.46	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	18-Jul-03	7-Nov-03	THAM FORD,	16824101	8948000	5R01	3L2Z
2003	ZU72K43UB0	105.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Dec-02	21-Mar-03	ORD-LINCOLN	1581702	3727272	5R01	3L2Z
2003	ZU72K43UA6	77.56	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Oct-02	26-Feb-03	RTESY FORD	14991101	4552436	5R01	3L2Z
2003	ZU72K43UA0	110.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Aug-02	24-Oct-02	FORD OF AM	123809A	6885464	5R01	3L2Z
2003	ZU72K33ZA6	92.54	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Jan-03	30-May-03	LINAX FORD I	104819A	5858000	5R01	3L2Z
2003	ZU72K33UB4	78.25	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Jan-03	25-Apr-03	RNE FORD, II	4314451	6692121	5R01	3L2Z
2003	ZU72K33UA6	104.32	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Oct-02	25-Jul-03	DIUM FORD, L	1646752	9352400	5R01	3L2Z
2003	ZU72K33UA4	126.27	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Oct-02	31-Dec-02	_SIDE FORD,	186529A	9234100	5R01	3L2Z
2003	ZU72K23ZA7	90.67	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	25-Jan-03	3-Oct-03	NTERSTATE F	018459A	8336700	5R01	3L2Z
2003	ZU72K23ZA5	220.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	13-Dec-02	13-Feb-03	TASCA FORD	164763A	6811300	5R01	3L2Z
2003	ZU72K23UB9	138.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	27-Mar-03	9-May-03	FORD OF NEV	2052851	*	5R01	3L2Z
2003	ZU72K13UA7	113.94	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	1-Nov-02	29-Nov-02	ELON FORD,	17249302	6278400	5R01	3L2Z
2003	ZU72K13UA5	126.6	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Oct-02	14-Dec-02	HY FORD CO	6591304	4948800	5R01	3L2Z
2003	ZU72K13UA3	137.16	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	23-Sep-02	29-Dec-02	N M. LANCE F	026793A	8718600	5R01	3L2Z
2003	ZU72K03ZB1	83.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	16-Apr-03	28-Apr-03	RLES GABUS I	247619A	2700707	5R01	3L2Z
2003	ZU72K03ZA6	89.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Jan-03	27-Feb-03	KWELL FORD	11983101	4531100	5R01	3L2Z
2003	ZU72K03ZA3	162.42	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Oct-02	23-Dec-02	ESSWAY FOR	3517601	6865900	5R01	3L2Z
2003	ZU72K03ZA1	70.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	27-Sep-02	18-Oct-02	AMARA FORD	7023001	2758922	5R01	3L2Z
2003	ZU72K03UB6	138.45	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Feb-03	8-Jul-03	HY FORD CO	6129701	4948800	5R01	3L2Z
2003	ZU72K03UB5	139.86	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Feb-03	18-Mar-03	ON BROS. FC	58242801	7957900	5R01	3L2Z
2003	ZU72K03UA6	84.19	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	26-Oct-02	27-Nov-02	IFICO'S ARDI	449752	6493700	5R01	3L2Z
2003	ZU65K83UB0	128.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	4-Dec-02	27-Dec-02	PLANET FORI	26718301	7193700	5R01	3L2Z
2003	ZU64KX3ZA2	118.97	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Oct-02	8-Feb-03	VERT FORD, I	6273501	3454343	5R01	3L2Z
2003	ZU64KX3UA3	138.05	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Sep-02	4-Nov-02	EWAY FORD	9372751	5633023	5R01	3L2Z
2003	ZU64K73ZA1	79.98	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Oct-02	4-Nov-02	/DITCH FORD	167952A	5952211	5R01	3L2Z
2003	ZU64K73UB2	280.72	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Jan-03	25-Mar-03	FORD-MERCU	18787702	4539391	5R01	3L2Z
2003	ZU64K63UB2	151.5	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	8-Jan-03	1-Mar-03	ANDERS FOR	10680205	8543673	5R01	3L2Z
2003	ZU64K03UB0	212.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Dec-02	24-Sep-03	ORD - ST. PE	16105501	3233400	5R01	3L2Z
2003	ZU63WX3ZA8	83.33	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	26-Feb-03	12-Mar-03	ANDERS FOR	10524401	8543673	5R01	3L2Z
2003	ZU63W83ZA3	124.02	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	25-Oct-02	25-Nov-02	NE STAR FOI	35464601	9313300	5R01	3L2Z
2003	ZU63W73ZA3	90.8	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	22-Oct-02	28-Jan-03	VANTAGE FO	9922906	3599689	5R01	3L2Z

2003	ZU63W63UB0	132.51	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	4-Dec-02	31-Dec-02	BINS FORD L	3461953	9229131	5R01	3L2Z
2003	ZU63W43UA1	178.79	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	30-Aug-02	27-Sep-02	D MOTORS, I	2085571	8770711	5R01	3L2Z
2003	ZU63W33ZA9	90.5	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	13-Mar-03	30-Jun-03	CITRUS FORI	45164602	3900930	5R01	3L2Z
2003	ZU63W13UA0	120.97	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	21-Aug-02	15-Nov-02	REE FORD, II	473189B	3371529	5R01	3L2Z
2003	ZU63W03ZA2	84.1	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	18-Oct-02	30-Dec-02	E MYERS FOI	443606A	8968200	5R01	3L2Z
2003	ZU63KX3ZB0	76.3	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	1-Apr-03	27-Aug-03	LLS FORD LII	2230052	6921121	5R01	3L2Z
2003	ZU63KX3ZA4	145.89	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	11-Nov-02	18-Nov-02	EDGAR FOR	6561201	3322145	5R01	3L2Z
2003	ZU63KX3ZA3	86.94	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	31-Oct-02	9-Nov-02	UTTER FORD	5610051	3217400	5R01	3L2Z
2003	ZU63KX3ZA3	406.56	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	22-Oct-02	26-Dec-02	ADERSHIP FC	328171C	3618100	5R01	3L2Z
2003	ZU63KX3ZA2	96.25	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Oct-02	7-Nov-02	PLANET FORI	20571301	7193700	5R01	3L2Z
2003	ZU63KX3ZA1	190.07	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Sep-02	26-Apr-03	ON MOTORS,	10891801	3505600	5R01	3L2Z
2003	ZU63KX3UA6	193.75	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	25-Oct-02	24-Jun-03	ORD STONE M	4079651	3443300	5R01	3L2Z
2003	ZU63KX3UA5	181.3	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Oct-02	31-Dec-02	EDOM FORD,	9211603	7972277	5R01	3L2Z
2003	ZU63K93ZA8	246.14	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Feb-03	22-Apr-03	_ MONTE FOF	6456951	4487681	5R01	3L2Z
2003	ZU63K93ZA8	128.63	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	21-Feb-03	18-Jun-03	VANTAGE FO	10729901	3599689	5R01	3L2Z
2003	ZU63K93ZA5	79.79	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Dec-02	12-Feb-03	STATE FORD	1747051	2995900	5R01	3L2Z
2003	ZU63K93ZA5	91.91	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Jan-03	6-May-03	BBS FORD, II	27783603	3626364	5R01	3L2Z
2003	ZU63K93ZA4	91.91	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	20-Nov-02	15-Dec-02	BBS FORD, II	28363901	3626364	5R01	3L2Z
2003	ZU63K93UA4	65.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Oct-02	4-Aug-03	OOK MOTOR (	21015302	7622641	5R01	3L2Z
2003	ZU63K83ZB0	226.54	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	19-Mar-03	19-Apr-03	TH BAY FORD	4386401	6440211	5R01	3L2Z
2003	ZU63K83ZA9	17.63	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	21-Mar-03	26-Apr-03	SUNSET FORI	9597151	8980744	5R01	*
2003	ZU63K83ZA0	132.21	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	13-Sep-02	28-Sep-02	J FORD GULF	163913D	3714000	5R01	3L2Z
2003	ZU63K83UB1	124.38	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	10-Dec-02	23-Apr-03	ULLINAX FOF	383666A	8897600	5R01	3L2Z
2003	ZU63K83UA2	135	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Sep-02	12-Dec-02	ALD FORD LII	171632	4238787	5R01	3L2Z
2003	ZU63K83UA1	140.88	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	27-Aug-02	9-May-03	FORD OF MAI	6311451	4221100	5R01	3L2Z
2003	ZU63K83UA0	85.37	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	28-Aug-02	28-Sep-02	KE SHAD FOI	4147801	7773673	5R01	3L2Z
2003	ZU63K73ZB4	224.1	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Jul-03	28-Aug-03	MARGARITA	279415A	4596800	5R01	3L2Z
2003	ZU63K73ZB3	93.06	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	27-May-03	16-Aug-03	OTORS FRAN	198543A	4791100	5R01	3L2Z
2003	ZU63K73ZA6	208.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	24-Jan-03	16-May-03	PACIFIC FORI	9659951	4263301	5R01	3L2Z
2003	ZU63K73ZA4	140.42	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Nov-02	12-Nov-02	ERT & BAKER	2812051	8913000	5R01	3L2Z
2003	ZU63K73ZA1	135.82	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	25-Sep-02	25-Nov-02	OURTESY FOI	13188601	3286000	5R01	3L2Z
2003	ZU63K73UC7	84.1	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	30-Jul-03	30-Sep-03	E MYERS FOI	435319A	8968200	5R01	3L2Z
2003	ZU63K73UA4	291.03	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	21-Oct-02	4-Feb-03	CKER FORD '	106542A	7901100	5R01	3L2Z
2003	ZU63K73UA4	68.24	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Oct-02	18-Oct-02	FORD LINC M	210492D	9771234	5R01	3L2Z
2003	ZU63K73UA0	81.24	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	20-Aug-02	7-Sep-02	CURRIE FORI	56686606	8725555	5R01	3L2Z
2003	ZU63K63ZB1	90.12	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-May-03	31-May-03	VERT FORD, I	10400502	3454343	5R01	3L2Z
2003	ZU63K63ZA8	244.28	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Mar-03	22-Mar-03	VISTA FORD	7663251	8847600	5R01	3L2Z
2003	ZU63K63ZA8	80.74	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	17-Feb-03	5-May-03	LINCOLN-ME	086465A	3326161	5R01	3L2Z
2003	ZU63K63ZA2	79.2	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Oct-02	10-Feb-03	NOLLER FOR	1193951	2359211	5R01	3L2Z
2003	ZU63K63UB3	88.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	22-Jan-03	6-Feb-03	IS AUTO CEN	11151601	4265585	5R01	3L2Z
2003	ZU63K63UB3	229.4	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	22-Jan-03	6-Feb-03	IS AUTO CEN	11141602	4265585	5R01	3L2Z
2003	ZU63K63UA8	151.14	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Nov-02	27-Nov-02	ORD-LINCOLN	6672501	2945126	5R01	3L2Z
2003	ZU63K63UA6	91.69	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Oct-02	31-Mar-03	ORD-MERCUI	044609A	2344661	5R01	3L2Z
2003	ZU63K63UA2	189.74	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Sep-02	30-Dec-02	FORD LINCOL	124909E	2373673	5R01	3L2Z
2003	ZU63K53ZB2	161.67	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	7-May-03	30-May-03	GALPIN FORI	7566091	7873800	5R01	3L2Z
2003	ZU63K53ZA7	81.29	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	4-Feb-03	30-May-03	ENTRAL FOR	592854	9609800	5R01	3L2Z
2003	ZU63K53ZA3	66.76	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	23-Oct-02	2-Jan-03	LIVER FORD-	2197603	8642611	5R01	3L2Z
2003	ZU63K53ZA3	170.94	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	24-Oct-02	14-Dec-02	ORT MARINA	29870501	6493673	5R01	3L2Z

2003	ZU63K53ZA2(	93.4	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	2-Oct-02	26-Oct-02	TLER FORD, I	19537001	5319911	5R01	3L2Z
2003	ZU63K53ZA1:	217.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Sep-02	5-Oct-02	OFFPAUIR, IN	7909401	5563631	5R01	3L2Z
2003	ZU63K53UC2-	158.69	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	6-May-03	21-Jul-03	NCHO FORD I	37450301	6991302	5R01	3L2Z
2003	ZU63K53UB9:	216.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	19-Mar-03	28-Apr-03	ENWAY FORD	4427751	2753200	5R01	3L2Z
2003	ZU63K53UB8!	227.77	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Mar-03	30-May-03	ELDE FORD IN	22833701	5693400	5R01	3L2Z
2003	ZU63K53UB0:	137.2	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Dec-02	23-Dec-02	OTT'S FORD I	229241	8596627	5R01	3L2Z
2003	ZU63K53UA9:	121.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	14-Nov-02	22-Sep-03	PITAL FORD I	023207A	7904600	5R01	3L2Z
2003	ZU63K53UA8(	66	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Nov-02	2-Jan-03	SEATON FOF	6330801	9892121	5R01	3L2Z
2003	ZU63K53UA6	143.7	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Oct-02	11-Nov-02	IAX FORD-ME	14927801	4289094	5R01	3L2Z
2003	ZU63K53UA5:	139.17	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Oct-02	24-Dec-02	VIS MOTOR C	35556001	9250234	5R01	3L2Z
2003	ZU63K53UA4(	66	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Oct-02	22-Oct-03	ACEWAY FOR	1573501	3935000	5R01	3L2Z
2003	ZU63K53UA2:	154.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	11-Sep-02	28-Oct-02	ORT MILL FOF	066533B	5475454	5R01	3L2Z
2003	ZU63K43ZB1(	117.9	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Apr-03	30-Aug-03	IBALL FORD,	272844A	3513000	5R01	3L2Z
2003	ZU63K43ZB0!	83.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	2-Apr-03	10-Oct-03	ENTRAL FOR	929352	9609800	5R01	3L2Z
2003	ZU63K43ZA9-	90.13	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	13-Mar-03	1-Sep-03	UNTRY OF LE	559322B	2212900	5R01	3L2Z
2003	ZU63K43ZA6(	142.19	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	22-Jan-03	17-Feb-03	IUNDAY FORI	9955101	3033000	5R01	3L2Z
2003	ZU63K43ZA4:	244.93	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	6-Nov-02	7-Dec-02	VERT FORD, I	5682701	3454343	5R01	3L2Z
2003	ZU63K43ZA3(	81.28	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	1-Nov-02	14-Jun-03	CARTER FORI	089939B	3318111	5R01	3L2Z
2003	ZU63K43ZA2(	379.9	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Oct-02	19-Jan-03	GALPIN FORD	7211761	7873800	5R01	3L2Z
2003	ZU63K43UB5!	216.13	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	14-Feb-03	7-Oct-03	S FORD OF T	21951401	3867800	5R01	3L2Z
2003	ZU63K43UB3!	85.19	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	22-Jan-03	25-Jul-03	HETLER FOR	2969201	6253030	5R01	3L2Z
2003	ZU63K43UB1!	33.6	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Jan-03	29-Mar-03	/ANS FORD IN	1402751	5223673	5R01	3L2Z
2003	ZU63K43UA3!	78.43	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	19-Sep-02	2-Nov-02	PITAL FORD I	1229851	7904600	5R01	3L2Z
2003	ZU63K43UA3!	111.11	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	19-Sep-02	2-Nov-02	PITAL FORD I	1146151	7904600	5R01	3L2Z
2003	ZU63K43UA1!	258.82	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Sep-02	27-Sep-02	TLE-CLICK FO	43689201	7685888	5R01	3L2Z
2003	ZU63K33ZA6:	141.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Jan-03	16-Feb-03	VISTA FORD	7137251	8847600	5R01	3L2Z
2003	ZU63K33ZA5!	196.21	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Jan-03	25-Jan-03	TH COUNTY F	311882A	9459900	5R01	3L2Z
2003	ZU63K33UB3:	98.7	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	15-Jan-03	2-Sep-03	EV SMITH FOF	38542103	8452900	5R01	3L2Z
2003	ZU63K33UB0!	150.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Dec-02	21-Mar-03	TH CENTRAL I	68439401	2313491	5R01	3L2Z
2003	ZU63K33UA7-	69.6	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	30-Oct-02	26-Dec-02	RD LINCOLN M	14294901	7567111	5R01	3L2Z
2003	ZU63K33UA6(	174.24	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	18-Oct-02	13-Nov-02	W SOUTH FO	9682001	6936821	5R01	3L2Z
2003	ZU63K33UA2:	144	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Sep-02	13-Dec-02	E JARRETT F(	20546101	2838521	5R01	3L2Z
2003	ZU63K23ZA4!	89.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Nov-02	22-Dec-02	ER HELLER F	4032752	7453361	5R01	3L2Z
2003	ZU63K23ZA3!	260.31	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	25-Oct-02	7-Dec-02	OWNEY FOR	7586052	8616771	5R01	3L2Z
2003	ZU63K23ZA1(	340.4	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	30-Sep-02	19-Nov-02	TOMES FORD	20629402	6991010	5R01	3L2Z
2003	ZU63K23UB3!	81.53	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	24-Jan-03	14-Jun-03	AGE FORD OF	455474A	2870955	5R01	3L2Z
2003	ZU63K23UA2(	78.64	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Sep-02	27-Sep-02	FORD OF AN	178980A	2254151	5R01	3L2Z
2003	ZU63K13ZB1(	205.63	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-May-03	30-Jul-03	DLEKAUFF FO	580112A	9853600	5R01	3L2Z
2003	ZU63K13ZA0(	106.74	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	13-Sep-02	28-Sep-02	PLANET FORD	27677901	7193700	5R01	3L2Z
2003	ZU63K13UC6-	14.41	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	26-Jun-03	25-Jul-03	ON QUALITY	204469A	9567000	5R01	*
2003	ZU63K13UB8-	84.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	11-Mar-03	9-Nov-03	ONE FORD OF	505129C	5576500	5R01	3L2Z
2003	ZU63K13UB6(	112.6	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	28-Feb-03	21-Apr-03	E PATTON FO	015687A	7498113	5R01	3L2Z
2003	ZU63K13UA8(	40.51	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Nov-02	15-Dec-02	OY & MILLS F	966827A	5265501	5R01	*
2003	ZU63K13UA2	75.23	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Sep-02	18-Sep-02	COUNTRY FO	6789351	9648131	5R01	3L2Z
2003	ZU63K13UA0(	188.5	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	21-Aug-02	4-Mar-03	ENWAY FORD	5545551	2753200	5R01	3L2Z
2003	ZU63K03ZA7(	257.18	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	22-Jan-03	15-Mar-03	AXWELL FOR	689212A	4435000	5R01	3L2Z
2003	ZU63K03ZA0!	93.19	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	20-Sep-02	17-Oct-02	NE STAR FOI	31585401	9313300	5R01	1L2Z
2003	ZU63K03UC7:	166.38	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	25-Jul-03	26-Sep-03	ORT MARINA	31462202	6493673	5R01	3L2Z

2003	ZU63K03UA5	88.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	12-Oct-02	26-Dec-02	ACHTREE FO	5915651	4557673	5R01	3L2Z
2003	ZU63K03UA2	125.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	13-Sep-02	13-Mar-03	ACHTREE FO	5907251	4557673	5R01	3L2Z
2003	ZU63K03UA1	254.61	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	28-Aug-02	3-Feb-03	INCOLN-MER	160821	7737339	5R01	3L2Z
2003	ZU62KX3ZB1	90.73	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	28-Apr-03	11-Jul-03	L CAJON FOR	6054752	5798888	5R01	3L2Z
2003	ZU62KX3UA2	115.11	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	11-Sep-02	23-Dec-02	LAMMER FO	2504651	9375131	5R01	3L2Z
2003	ZU62K93ZA6	102.47	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Jan-03	14-Apr-03	NCH FORD, I	45341501	7947100	5R01	3L2Z
2003	ZU62K93ZA1	207.11	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	19-Sep-02	7-Dec-02	ALL FORD-ME	12840502	2902200	5R01	3L2Z
2003	ZU62K93UB2	74.83	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	20-Dec-02	4-Jan-03	ERITAGE FOF	18062302	9077800	5R01	3L2Z
2003	ZU62K93UA9	88.33	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	18-Nov-02	2-Dec-02	ORD CORPO	7166455	8679136	5R01	3L2Z
2003	ZU62K83ZB1	104.89	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	28-Apr-03	26-Jan-04	NEINMAN FOI	037707A	3279000	5R01	3L2Z
2003	ZU62K83ZA7	88.18	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	6-Feb-03	14-Oct-03	JOHNSON F	57490901	4543711	5R01	3L2Z
2003	ZU62K83ZA3	350	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	12-Nov-02	23-Dec-02	UTTER FORD	2613551	3217400	5R01	3L2Z
2003	ZU62K73ZB3	140.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	21-May-03	22-Aug-03	UITT FORD, L	12662101	5695226	5R01	3L2Z
2003	ZU62K73ZA6	91.9	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Jan-03	1-Mar-03	NER'S FORD (	33436901	7666600	5R01	3L2Z
2003	ZU62K73ZA1	60	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Sep-02	11-Oct-02	RT CAB-LAS V	6098901	*	5R01	3L2Z
2003	ZU62K73UA1	84.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	27-Aug-02	10-Nov-02	HAIRE FORD	3598752	9336571	5R01	3L2Z
2003	ZU62K63ZB5	0	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	11-Aug-03	27-Aug-03	& COUNTRY	295555A	4813673	5R01	3L2Z
2003	ZU62K63ZA7	301.45	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Feb-03	25-Oct-03	RT LAVACA FC	156669A	5521155	5R01	3L2Z
2003	ZU62K63ZA5	412.73	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Dec-02	27-Feb-03	ORD LINCOLN	152215C	9676191	5R01	3L2Z
2003	ZU62K63ZA3	159.1	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	24-Oct-02	2-Jan-03	CHMID FORD	288945A	3991000	5R01	3L2Z
2003	ZU62K63ZA1	106.21	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	28-Sep-02	9-Nov-02	SON FORD SA	9491901	2920000	5R01	3L2Z
2003	ZU62K63ZA1	116.77	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Sep-02	20-Jan-03	HITFIELD FOI	092647A	2910300	5R01	3L2Z
2003	ZU62K63UB2	84.88	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	7-Jan-03	23-Feb-03	NE FORD OF	046087A	2780303	5R01	3L2Z
2003	ZU62K63UA3	229.77	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Sep-02	15-Jan-03	DEN FORD S	223455C	7624200	5R01	3L2Z
2003	ZU62K53ZB0	187.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Apr-03	4-May-03	WONDRIES F	269070A	2893591	5R01	3L2Z
2003	ZU62K53ZA7	160.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	24-Jan-03	19-Feb-03	) OF MONTEB	84665501	8386920	5R01	3L2Z
2003	ZU62K53ZA1	150	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Sep-02	11-Oct-02	RT CAB-LAS V	6121801	*	5R01	3L2Z
2003	ZU62K53UC5	83.03	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	10-Jun-03	31-Jul-03	FORD AT TH	3739403	2923325	5R01	3L2Z
2003	ZU62K53UA7	91.91	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	30-Oct-02	19-Nov-02	EVANS TEAM	8420251	9649801	5R01	3L2Z
2003	ZU62K43ZA8	175.34	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	27-Feb-03	2-May-03	TTS FORD-MI	116834A	6695200	5R01	3L2Z
2003	ZU62K43ZA5	100.73	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	2-Dec-02	18-Dec-02	EZ FORD SALI	7431253	4872582	5R01	3L2Z
2003	ZU62K43ZA3	69.35	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	31-Oct-02	30-Nov-02	IBALL FORD,	286767A	3513000	5R01	3L2Z
2003	ZU62K43UA3	179.03	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Sep-02	18-Oct-02	AIRWAY FOR	9568001	5783600	5R01	3L2Z
2003	ZU62K33ZA8	161.11	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Feb-03	8-Mar-03	VE STAR FOF	22702701	9463900	5R01	3L2Z
2003	ZU62K33UA4	107.23	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Oct-02	30-Oct-02	OURTESY FOI	4391451	9222700	5R01	3L2Z
2003	ZU62K33UA3	201.45	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Sep-02	26-Apr-03	RMANCE FOI	201462A	2974111	5R01	3L2Z
2003	ZU62K33UA3	389.48	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	17-Sep-02	26-Apr-03	RMANCE FOI	201956A	2974111	5R01	3L2Z
2003	ZU62K23ZA9	109.54	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	18-Mar-03	28-Jul-03	H BROS. FOR	12215401	4211300	5R01	3L2Z
2003	ZU62K23ZA5	106.67	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	12-Dec-02	23-Jan-03	ERLY FORD I	312786A	4481661	5R01	3L2Z
2003	ZU62K23ZA1	87.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	1-Oct-02	19-Dec-02	EARSON FOR	228142A	2837181	5R01	3L2Z
2003	ZU62K23UC1	118.61	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	7-Apr-03	22-Apr-03	MCCARTY F	14508701	6633831	5R01	3L2Z
2003	ZU62K23UA2	82.68	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	24-Sep-02	2-Oct-02	LINCOLN-ME	7462401	2404020	5R01	3L2Z
2003	ZU62K13ZB2	276.37	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	14-May-03	18-Jun-03	BANY FORD I	19186401	5281244	5R01	3L2Z
2003	ZU62K13ZB1	107.78	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	30-Apr-03	31-May-03	ACIENDA FOF	11951701	3831615	5R01	3L2Z
2003	ZU62K13ZB0	234.92	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	7-Apr-03	30-Jun-03	EARSON FOR	242283A	2837181	5R01	3L2Z
2003	ZU62K13ZA1	124.29	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	17-Sep-02	24-Jul-03	A PORTE FOR	144342B	4711642	5R01	3L2Z
2003	ZU62K13UA8	112.64	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	8-Nov-02	21-Dec-02	NSON FORD,	1096701	3682135	5R01	3L2Z
2003	ZU62K13UA2	158.09	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	24-Sep-02	22-Apr-03	ORY FORD L-	5628701	8878571	5R01	3L2Z

2003	IZU62K03ZA9	114.58	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	10-Mar-03	2-Apr-03	COUNTY FOR	125824A	3292120	5R01	3L2Z
2003	IZU62K03ZA1	60	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Sep-02	11-Oct-02	RT CAB-LAS V	6099001	*	5R01	3L2Z
2003	IZU62K03ZA0	142.08	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	16-Sep-02	16-Oct-02	LLOVIO FORD	2785751	9277888	5R01	3L2Z
2003	IZU62K03ZA0	96.25	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	4-Sep-02	19-Oct-02	OLLINS FORD	2270351	6043673	5R01	3L2Z
2003	ZU62K03UB3	81.6	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Jan-03	19-Sep-03	FITZPATRICK	1580851	5023673	5R01	3L2Z
2003	ZU62K03UA9	88.86	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Nov-02	11-Dec-02	BY JONES FO	8135252	7388000	5R01	3L2Z
2003	ZU62K03UA2	213.59	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Sep-02	2-Oct-02	LINCOLN-ME	7365801	2404020	5R01	3L2Z
2003	DU85W93ZA0	130.92	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AV	3-Sep-02	27-Oct-02	OM LAKE FOR	40229602	3532000	5R01	3L2Z
2003	DU85W53ZA5	131.67	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AV	23-Jan-03	3-Feb-03	LLER FORD II	114288C	4251000	5R01	3L2Z
2003	DU85K83ZA1	78	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AV	18-Sep-02	15-Oct-02	IOTOR COMP	104327B	3522162	5R01	4L2Z
2003	DU85K33UB1	81.97	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	11-Dec-02	13-Feb-03	ID SONS MOT	208208A	6523000	5R01	3L2Z
2003	DU84W53ZA3	153.5	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AV	11-Nov-02	22-Feb-03	URTESY FOR	557871B	7944343	5R01	*
2003	DU84W33UB4	190.6	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	28-Jan-03	30-Sep-03	NN FORD IN (	43705101	9984000	5R01	3L2Z
2003	DU84W13UB0	135.88	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	2-Dec-02	30-Dec-02	RIVERS FORD	2780931	8899215	5R01	3L2Z
2003	DU83K83ZA2	102.16	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AV	7-Oct-02	22-Oct-02	SDALE FORD	5381252	4729500	5R01	3L2Z
2003	DU75WX3ZA1	75	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	14-Oct-02	2-Jan-03	SON FORD SA	011000E	6979161	5R01	3L2Z
2003	DU75W93ZA5	122.8	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	16-Jan-03	22-Apr-03	URTESY FOR	566759B	7944343	5R01	3L2Z
2003	DU75W83ZA7	85.18	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	5-Feb-03	21-Apr-03	OB BELL FOR	323277B	7663600	5R01	3L2Z
2003	DU75W73ZA4	170.79	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	26-Nov-02	14-Dec-02	ERGREEN FO	25944201	3926900	5R01	3L2Z
2003	DU75W73ZA2	212.52	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	1-Oct-02	16-Nov-02	DLE FORD SA	248156B	4844800	5R01	3L2Z
2003	DU75W73UA1	90.37	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	28-Aug-02	26-Dec-02	LLER FORD II	21021403	3353181	5R01	3L2Z
2003	DU75W63ZA4	67.18	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	26-Nov-02	5-Dec-02	ORD AUTO SA	6296851	8411000	5R01	3L2Z
2003	DU75W33ZA6	268.29	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	8-Feb-03	15-Feb-03	WNS FORD, II	1580653	3492240	5R01	3L2Z
2003	DU75W33ZA3	238.09	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	12-Nov-02	19-Nov-02	FORD LINC-M	5133601	3566366	5R01	3L2Z
2003	DU75W33UA1	582.07	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	23-Sep-02	31-Dec-02	K GROVE FOI	24593502	4787000	5R01	3L2Z
2003	DU75W23ZA5	48.54	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	24-Jan-03	2-Jun-03	AD FORD ME	049563A	2633127	5R01	*
2003	DU75W23ZA1	188.6	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	23-Sep-02	26-Dec-02	DREW FORD	9406451	4647777	5R01	3L2Z
2003	DU75K43ZA0	91.15	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Jan-03	18-Jan-03	ELON FORD,	17234901	6278400	5R01	3L2Z
2003	DU75K23ZA0	115.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	3-Sep-02	18-Sep-02	URTESY FOR	184392A	9423000	5R01	3L2Z
2003	DU74WX3ZA3	155.4	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	4-Nov-02	10-Mar-03	TALLINGS FC	28705901	4834352	5R01	3L2Z
2003	DU74WX3UA4	70.96	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	3-Oct-02	17-Oct-02	LLSBORO FO	9786102	9348100	5R01	3L2Z
2003	DU74W93UA7	147.87	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	6-Nov-02	13-Dec-02	IONROE FOR	11236701	7828291	5R01	3L2Z
2003	DU74W53ZA9	102.25	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	13-Mar-03	11-Aug-03	ONS FORD, II	4108351	2417200	5R01	3L2Z
2003	DU74W33UA2	69.55	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	18-Sep-02	27-Sep-02	ANS FORD IN	2044251	5223673	5R01	3L2Z
2003	DU74W13UA9	110.25	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	27-Nov-02	24-Dec-02	OMARK FORD	515903A	6391131	5R01	*
2003	DU74W03ZA2	114.07	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	31-Oct-02	30-Nov-02	BOXTEL FORD	3161401	4993131	5R01	3L2Z
2003	DU74KX3UB0	134.35	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	16-Dec-02	11-Apr-03	ROTHERS FC	2578751	6936730	5R01	3L2Z
2003	DU74K83ZA1	93.24	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	2-Oct-02	29-Mar-03	RD OF SPRIN	40991501	9227900	5R01	3L2Z
2003	DU74K43UC7	209.61	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	21-Jul-03	28-Aug-03	CHAMBERS	197606	8481350	5R01	3L2Z
2003	DU74K03ZA1	205.05	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	20-Sep-02	9-Jan-03	OASIS FORD	2885451	5911111	5R01	3L2Z
2003	DU73WX3ZA1	104.85	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	20-Sep-02	12-Oct-02	WAY FORD B	389679C	9398600	5R01	3L2Z
2003	DU73W83ZB2	22.8	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	5-May-03	31-Dec-03	G MIDTOWN	2521902	5642631	5R01	*
2003	DU73W33UA8	371.8	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	14-Nov-02	28-Dec-02	LAND FORD	3196201	6755933	5R01	3L2Z
2003	DU73W23UA1	59.58	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	4-Sep-02	9-Sep-02	FORD MERC	1645305	6659526	5R01	3L2Z
2003	DU73KX3ZA1	177.98	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	23-Sep-02	1-Oct-02	& COUNTRY	2868451	4713673	5R01	3L2Z
2003	DU73KX3UB6	372.89	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Feb-03	26-Mar-03	LLERTON FO	9835051	7222500	5R01	3L2Z
2003	DU73KX3UA9	89.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	19-Nov-02	29-Jan-03	RD OF MAHO	213781A	6288800	5R01	3L2Z
2003	DU73K93UB5	109.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Feb-03	15-May-03	WER FORD II	167776A	4666400	5R01	3L2Z

2003	DU73K93UA2	109.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Sep-02	16-Sep-02	AYVILLE FOR	45942302	5894800	5R01	3L2Z
2003	DU73K63UA4	105.12	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	3-Oct-02	31-Mar-03	RNET FORD I	1285851	3585600	5R01	3L2Z
2003	DU73K53ZA4	282.09	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	12-Nov-02	27-Nov-02	FUSZ FORD,	14290401	5329955	5R01	3L2Z
2003	DU73K53UB7	116.08	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Feb-03	30-Sep-03	MAN FORD, II	9533551	6363200	5R01	3L2Z
2003	DU73K53UA8	91.91	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Nov-02	28-Dec-02	ORD AT NORT	13449001	6495100	5R01	3L2Z
2003	DU73K33UA7	300.47	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Oct-02	15-Nov-02	GE MOTOR C	617351	4895414	5R01	3L2Z
2003	DU73K33UA6	107.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	24-Oct-02	20-Nov-02	OWN FORD, I	2057401	5990600	5R01	3L2Z
2003	DU73K23UB0	184.99	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Dec-02	2-Jan-03	IFFIN FORD, I	174901B	8695000	5R01	3L2Z
2003	DU73K13UA7	203.76	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	31-Oct-02	31-Jan-03	OLONIAL FOR	168275A	7483503	5R01	3L2Z
2003	DU73K13UA3	186.06	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Sep-02	30-Sep-02	' SHAW FORD	813704	5860900	5R01	3L2Z
2003	DU73K13UA3	244.54	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Sep-02	30-Sep-02	' SHAW FORD	707401	5860900	5R01	*
2003	DU72K93ZA5	805.22	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	9-Dec-02	24-Mar-03	JRTIS FORD-I	4886661	7692300	5R01	3L2Z
2003	DU65WX3ZA8	118.65	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	6-Mar-03	30-Jun-03	SOBH FORD,	3358752	6334005	5R01	3L2Z
2003	DU65W93UA2	107.18	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	12-Sep-02	24-Apr-03	AVALIER FOR	825020B	4241111	5R01	3L2Z
2003	DU65W53ZA3	107.97	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	18-Nov-02	25-Nov-02	SE FORD COI	25142402	4616000	5R01	3L2Z
2003	DU64W63ZA4	101.42	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	19-Nov-02	1-Dec-02	/ CENTURY F	087444B	2852221	5R01	3L2Z
2003	DU64W53UB3	85.39	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	24-Jan-03	22-Apr-03	REE FORD, II	479416A	3371529	5R01	3L2Z
2003	DU64K23UA5	98.12	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	25-Oct-02	25-Jan-03	CROWN FORI	3778953	8671121	5R01	3L2Z
2003	DU64K13ZA2	67.94	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	9-Oct-02	16-Oct-02	RAY FORD S/	920652	2831301	5R01	3L2Z
2003	DU63W93UB0	153.13	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	6-Dec-02	7-Mar-03	TEAM FORD	8854051	3955100	5R01	3L2Z
2003	DU63W93UB0	240.64	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AN	6-Dec-02	7-Mar-03	TEAM FORD	9251551	3955100	5R01	3L2Z
2003	DU63W13ZA8	197.54	T/U5	T/F	T/WD	T/EF	T/B	T/VN	T/TL	AV	19-Feb-03	18-Mar-03	GNUSSEN FC	382928B	6515600	5R01	3L2Z
2003	DU63K93UA5	31.42	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	14-Oct-02	20-Nov-02	) FORD-PENS	9798651	4769050	5R01	3L2Z
2003	DU63K73ZB3	124.53	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	2-Jun-03	13-Jun-03	EGEHR MOTO	8322901	2411042	5R01	3L2Z
2003	DU63K43ZA3	128.53	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	25-Oct-02	19-Jan-03	L CAJON FOR	7655951	5798888	5R01	3L2Z
2003	DU63K33ZA8	87.59	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Feb-03	16-Jul-03	SKELTON FO	150804A	8956700	5R01	3L2Z
2003	DU63K23UB2	105.04	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Jan-03	27-Jul-03	CURRIE FOR	5464751	4886787	5R01	3L2Z
2003	DU63K03ZB0	172.62	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	8-Apr-03	6-Jul-03	R FORD VALI	4754801	2556600	5R01	3L2Z
2003	DU63K03UB0	123.25	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	3-Dec-02	22-Jan-03	H CENTRAL I	63019601	2313491	5R01	3L2Z
2004	ZU84WX4UA4	156.05	T/U5	T/F	T/WD	T/EF	T/F	T/VN	T/TL	AN	30-Sep-03	19-Mar-04	ORD LINCOL	15564201	6649211	5R01	3L2Z
2004	ZU83E64UB4	155.14	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	10-Mar-04	23-Apr-04	_ KOLB JR. FC	21320701	3598100	5R01	3L2Z
2004	ZU75W14ZA6	72.04	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	23-Jan-04	15-Mar-04	SALE FORD	3663101	9352335	5R01	3L2Z
2004	ZU74WX4UB2	86.32	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	2-Feb-04	6-Feb-04	LL FORD LIN	5579452	8872311	5R01	3L2Z
2004	ZU74W04UA5	78.68	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	28-Oct-03	26-Nov-03	SEELYE FORI	59266501	3753820	5R01	3L2Z
2004	ZU73W34UB2	172.77	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AN	27-Jan-04	27-Feb-04	FORD - TURN	168452B	*	5R01	3L2Z
2004	ZU73W14ZA1	243.78	T/U5	T/F	T/WD	T/EF	T/E	T/VN	T/TL	AV	24-Sep-03	17-Oct-03	EMMER FOR	320510A	7212600	5R01	3L2Z
2004	ZU73KX4ZA5	150.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	22-Dec-03	6-Jan-04	YAN FORD SA	5170551	3953900	5R01	3L2Z
2004	ZU73KX4ZA4	96.17	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Dec-03	25-Dec-03	RAC - SACRA	31818301	*	5R01	3L2Z
2004	ZU73KX4ZA0	199.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	20-Aug-03	4-Sep-03	RD MERCUR	251367A	6542122	5R01	3L2Z
2004	ZU73K94UA8	238.52	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Dec-03	LUCAS MOTOR COMP/		15259801	3863100	5R01	3L2Z
2004	ZU73K94UA6	111.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	8-Nov-03	21-Feb-04	N SQUARE FC	5633901	4819400	5R01	3L2Z
2004	ZU73K94UA3	95.13	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-03	2-Oct-03	STATE FORD	2315052	2995900	5R01	3L2Z
2004	ZU73K94UA3	119.69	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	17-Sep-03	2-Oct-03	STATE FORD	1853551	2995900	5R01	3L2Z
2004	ZU73K94UA1	111.7	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	20-Aug-03	29-Dec-03	N SQUARE FC	5609602	4819400	5R01	3L2Z
2004	ZU73K74UB0	103.65	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	7-Jan-04	1-May-04	RANKLIN FOR	042360A	5280040	5R01	3L2Z
2004	ZU73K74UB0	319.68	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	6-Jan-04	31-Jan-04	ON FORD NOI	73539401	4824228	5R01	3L2Z
2004	ZU73K74UA0	253.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Aug-03	27-Dec-03	ALDEMAN FOI	017513A	5867600	5R01	3L2Z
2004	ZU73K64ZA7	84.01	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Feb-04	30-Mar-04	/DEN FORD, I	5564201	2482128	5R01	3L2Z

2004	ZU73K64ZA6	120.49	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	6-Feb-04	16-Feb-04	ERICAN FOR	157045A	4876700	5R01	3L2Z
2004	ZU73K54UB1	72.04	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	30-Jan-04		COUNTY MOTOR COMF	15069201	2266301	5R01	3L2Z
2004	ZU73K54UB0	64.8	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Jan-04	27-Jan-04	RAC - CLEVE	041466A	*	5R01	3L2Z
2004	ZU73K44ZA5	218.93	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	6-Jan-04	9-Mar-04	MEY FORD, II	5705101	9882574	5R01	3L2Z
2004	ZU73K44ZA2	21.94	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	24-Oct-03	14-Nov-03	& H MOTOR C	260601	5247267	5R01	*
2004	ZU73K44ZA2	261.04	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	17-Oct-03	27-Jan-04	WLEY FORD,	5763551	2613030	5R01	3L2Z
2004	ZU73K34ZA2	108.27	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	2-Oct-03	14-Feb-04	LAGE FORD I	4268951	5653900	5R01	3L2Z
2004	ZU73K34UB1	74.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	14-Jan-04	29-Jan-04	AC - NEWPOR	33613901	*	5R01	3L2Z
2004	ZU73K24ZA3	145.2	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	28-Oct-03	5-Dec-03	IN FORD SALI	038394A	7334364	5R01	3L2Z
2004	ZU73K24ZA0	88.85	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	21-Aug-03	5-Sep-03	NSET FORD, I	205449A	9778888	5R01	3L2Z
2004	ZU73K24UA3	196.1	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	25-Sep-03	12-Nov-03	EHOLD FORD	7231351	4623131	5R01	3L2Z
2004	ZU73K04ZA5	112.32	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	7-Jan-04	12-Mar-04	ON FORD SAL	19033101	8782500	5R01	3L2Z
2004	ZU72KX4UB0	223.39	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	9-Jan-04	27-Jan-04	THOMAS FOR	6173701	2817500	5R01	3L2Z
2004	ZU72K74UA6	176.4	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	29-Oct-03	4-Dec-03	GAN FORD, II	9772155	3733878	5R01	3L2Z
2004	ZU72K74UA5	90.78	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	22-Oct-03	11-Dec-03	LLS FORD LIN	8429901	6491111	5R01	3L2Z
2004	ZU72K44ZA1	261.03	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	29-Sep-03	5-Jun-04	DIEHL FORD	14657301	7342640	5R01	3L2Z
2004	ZU72K34ZA2	264.17	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	10-Oct-03	6-Feb-04	CHLEY FORD	28541301	5718801	5R01	3L2Z
2004	ZU72K34UB2	76.14	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	27-Jan-04		32 FORD-MERCUR	139994A	7322124	5R01	3L2Z
2004	ZU72K14UB2	147.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	12-Feb-04	13-Mar-04	MON FORD, IN	6871551	8892601	5R01	3L2Z
2004	ZU72K14UB2	255.58	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	4-Feb-04	19-Feb-04	STRONG FOR	103953A	3282223	5R01	3L2Z
2004	ZU72K04UA9	364.09	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	11-Dec-03	13-Feb-04	IDO FORD LIN	6202151	7745678	5R01	3L2Z
2004	ZU64K14UB1	84.41	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Jan-04	28-Feb-04	NORRIS FORI	3855702	8786364	5R01	3L2Z
2004	ZU64K14UB1	123.23	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	16-Jan-04	28-Feb-04	NORRIS FORI	4037302	8786364	5R01	3L2Z
2004	ZU63K54ZA8	160.7	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	25-Feb-04	24-Apr-04	ACH FORD, IN	584074A	4862717	5R01	3L2Z
2004	ZU63K54UA6	66.71	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	29-Oct-03	30-Dec-03	ER & LIMBAUC	7071101	2455271	5R01	3L2Z
2004	ZU63K34UA6	177.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	30-Oct-03		ATLANTIC FORD TRUCK	067835A	5878220	5R01	3L2Z
2004	ZU63K14UB1	69.92	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	15-Jan-04	7-Feb-04	E PATTON FC	027843A	7498113	5R01	3L2Z
2004	ZU63K14UA4	58.8	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	7-Oct-03	22-Oct-03	ET RAC - FT M	6905141	*	5R01	3L2Z
2004	ZU62KX4ZA6	154.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	22-Dec-03	1-Mar-04	ORT MILL FOF	068524C	5475454	5R01	3L2Z
2004	ZU62KX4ZA0	79.49	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	3-Sep-03	29-Nov-03	ILLESPIE FOF	7230753	5091000	5R01	3L2Z
2004	ZU62K94ZA6	129.67	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	15-Dec-03	30-Dec-03	STAR FORD	62618601	9560977	5R01	3L2Z
2004	ZU62K94ZA1	75.32	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	11-Sep-03	7-Feb-04	NDALL FORD	7429151	4521311	5R01	*
2004	ZU62K94UA3	86.71	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	9-Sep-03	2-Nov-03	ENWAY FORD	5022751	2753200	5R01	*
2004	ZU62K84ZA7	218.71	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	26-Jan-04		BOB BAKER FORD-MISSI	493090A	2975001	5R01	3L2Z
2004	ZU62K84UA7	21.02	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	19-Nov-03	29-Feb-04	FLAMMER FO	6027353	9375131	5R01	3L2Z
2004	ZU62K74UA1	140.16	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	29-Aug-03	8-Dec-03	FLAMMER FO	5020651	9375131	5R01	3L2Z
2004	ZU62K74UA1	74.44	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	21-Aug-03	26-Nov-03	TINGS FORD,	042099A	7580114	5R01	3L2Z
2004	ZU62K54UA0	111.27	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	5-Aug-03	10-Sep-03	AMERICAN F	10858001	*	5R01	3L2Z
2004	ZU62K44ZA7	382.75	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	4-Feb-04		GILDNER FORD-LINCOLN	10201	2464508	5R01	3L2Z
2004	ZU62K14ZA2	92.06	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	7-Oct-03	17-Nov-03	LONG FORD,	9967101	7772700	5R01	3L2Z
2004	DU83K04UA4	92.54	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	2-Oct-03	17-Oct-03	ORD LINCOLN	19944401	6310040	5R01	3L2Z
2004	DU83K04UA4	337.11	T/U5	T/F	T/WD	T/EF	T/F	T/NE	T/TL	AN	2-Oct-03	17-Oct-03	ORD LINCOLN	19849001	6310040	5R01	3L2Z
2004	DU75K14UA5	65.03	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	15-Oct-03	10-Dec-03	APITAL MOTO	125254A	2247378	5R01	3L2Z
2004	DU73K04UB1	83.51	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AN	13-Jan-04	28-Jan-04	IGFIELD FORI	2995651	8260058	5R01	3L2Z
2004	DU72K14ZA7	166.84	T/U5	T/F	T/WD	T/EF	T/E	T/NE	T/TL	AV	2-Feb-04	17-Feb-04	ORD OF MT. V	10709201	6646900	5R01	3L2Z
2004	DU63K34UB6	79.84	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	23-Mar-04	7-Apr-04	SANDLER FLI	250049C	9702500	5R01	3L2Z
2004	DU63K14ZA0	209.18	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AV	27-Aug-03	16-Nov-03	NCHO FORD I	36874301	6991302	5R01	3L2Z
2004	DU62K94UA3	86.94	T/U5	T/F	T/WD	T/EF	T/B	T/NE	T/TL	AN	22-Sep-03	23-Apr-04	ON BOHN FOF	319180A	3477000	5R01	3L2Z

_NUM_CAUS	_NUM_CAUS_JST_CONC_C	COND_CD	RPR_DT	TIS_WSD	CLM_KEY	MILGE	MTRL_COST	T_COST_GRC	LBR_HRS
3C529	CA	C50	1	8-Jan-04	4	4217977	9361	632.73	733.03	1.6
3C529	BA	P01	41	13-Apr-04	17	5810164	19827	438.59	526.56	1.4
3C529	*	N58	42	29-Jan-04	14	4349824	17781	0	12.5	0.2
3C529	BA	P01	69	9-Mar-04	14	4824430	20794	438.59	547.55	1.2
3C529	BA	P01	42	2-Mar-04	17	5560970	24500	551.37	653.24	1.2
3C529	BA	N57	30	3-Dec-02	1	265808	219	576.73	679.62	1.2
3C529	BA	P01	1	19-Apr-04	9	5607123	8690	438.59	545.08	1.2
3C529	BA	A85	28	29-Nov-02	1	287174	627	576.73	684.85	1.7
3C529	BA	T90	1	11-Dec-03	4	3733327	6451	470.02	552.51	1.1
3C529	BA	P01	42	18-Dec-03	13	3834119	25430	438.59	719.74	3.1
3C529	BA	P66	41	7-Nov-03	1	3385887	183	438.59	526.51	1.2
3C529	BA	N33	42	10-Sep-03	6	2434065	3171	438.59	506.28	1.2
3C529	BA	P01	41	11-Feb-04	11	4474206	7758	574.24	695.61	1.2
3C529	BA	P09	41	9-Dec-03	13	3866078	11175	438.59	808.49	5.4
3C529	BA	P09	28	22-Jun-04	9	6576621	26227	439.29	613.19	2.3
3C529	BA	P09	42	6-Mar-04	18	4983910	11423	438.59	525.44	1.4
3C529	BA	P01	42	29-Dec-03	10	3891661	18311	438.59	592.22	2.3
3C529	BA	P01	41	19-Apr-04	17	5590315	30379	438.59	514.5	1.2
3C529	BA	D02	1	19-Apr-04	14	5612058	14364	473.95	780.67	6
3C529	JA	P01	42	18-Oct-02	0	159520	699	596.92	680.12	1.6
3C529	BA	P01	28	23-Aug-03	8	2321921	9491	438.59	614.37	2.2
3C529	BA	N58	33	23-Nov-02	2	254190	2744	576.73	740.51	2.5
3C529	BA	N58	42	10-Oct-02	0	152259	29	576.73	652.68	1.4
3C529	BA	N59	42	19-Nov-02	0	355032	1255	726.49	818.72	1.7
3C529	BA	P01	42	8-Apr-04	18	5475049	15917	438.59	604.19	2.5
3C529	BA	A88	1	15-Apr-04	15	5720884	11921	473.95	674.33	2.2
3C529	BA	P01	42	26-Apr-04	14	5830873	21192	438.59	518.7	1.2
3C529	BA	L13	41	6-Oct-03	1	3126948	6483	438.59	536.55	1.5
3C529	BA	P01	42	29-Mar-04	14	5378258	35680	438.59	581.76	1.9
3C529	*	N17	42	23-Feb-04	8	4632219	18487	0	70.28	1
3C529	BA	P01	42	22-Dec-03	15	3827663	12013	438.59	568.74	1.7
3C529	BA	P01	42	14-Nov-03	0	3428681	5	470.02	973.67	4.6
3C529	BA	P01	42	9-Jan-04	14	4082379	19800	438.59	619.28	3
3C529	BA	L13	42	9-Jan-04	8	4161534	15056	474.99	588.19	2
3C529	BA	P01	42	11-May-04	14	6419414	20904	469.92	568.39	1.6
3C529	BA	P01	69	2-Dec-03	6	3707453	7710	438.59	570.1	1.8
3C529	BA	P01	42	13-Jan-04	15	4182768	14783	438.59	506.51	1.2
3C529	BA	C50	42	23-May-03	8	1592428	7192	596.92	669.94	1.2
3C529	BA	P01	41	16-Mar-04	15	5026619	21514	438.59	519.35	1.2
3C529	BA	C50	33	15-Apr-04	10	5536476	19792	438.59	518.65	1.2
3C529	BA	P01	42	2-Sep-03	1	2363712	519	438.59	676.66	3.5
3C529	BA	L23	41	2-Dec-03	7	3945813	11845	438.59	534.57	1.2
3C529	BA	C50	42	7-Feb-04	9	4481964	11846	438.59	515.92	1.2
3C529	BA	C50	42	16-Mar-04	11	5003307	11864	438.59	515.92	1.2
3C529	BA	L13	42	17-Jun-03	2	1672430	2298	596.92	743.14	1.4
3C529	BA	T90	39	13-Jan-03	1	406576	442	596.92	784.42	2.6
3C529	BA	P01	42	29-Jan-04	14	4314480	18366	438.59	581.57	1.9

3C529	BA	P01	41	16-Jun-04	17	6451266	20013	563.9	664.11	1.2
3C529	BA	P01	42	22-Dec-03	12	3984997	14325	438.59	507.17	1.2
3C529	BA	L13	42	2-Apr-04	16	5438119	15776	598.49	735.22	1.8
3C529	BA	P01	41	24-Jun-04	18	6627959	22226	438.59	610.72	2.2
3C529	BA	P01	42	18-Sep-03	10	2570327	12980	551.37	653.24	1.2
3C529	BA	P01	41	14-Apr-04	18	5512435	9306	438.59	519.94	1.2
3C529	BA	P01	41	16-Feb-04	13	4678045	24293	438.59	626.4	1.2
3C529	BA	P09	42	16-Jun-04	20	6594463	17043	438.59	530.71	1.2
3C529	BA	P01	41	28-Nov-03	13	3689729	14843	438.59	519.94	1.2
3C529	*	P01	33	2-May-03	0	1091385	4	0	118.98	1.5
3C529	BA	P01	42	14-Jan-03	0	423572	253	596.92	675.35	1.2
3C529	BA	P24	42	15-Jan-03	2	431796	3786	639.56	737.29	1.5
3C529	BA	N58	42	11-Jun-03	2	1455994	761	596.92	704.82	1.2
3C529	BA	N33	42	21-Oct-03	6	3047189	3501	438.59	924.15	5.4
3C529	BA	P09	42	17-May-04	15	6090003	28494	438.59	637.17	1.9
3C529	BA	N33	42	13-Jan-04	7	4779763	6338	438.59	598.1	2.3
3C529	BA	P01	7	13-Feb-04	10	4542352	15655	438.59	535.83	1.2
3C529	BA	L13	41	17-Jul-03	8	1904122	24161	438.59	865.1	4.6
3C529	BA	D02	42	30-Dec-02	0	440760	55	576.73	713.8	2.6
3C529	BA	P01	41	23-Feb-04	17	4750976	19733	438.59	548.28	1.2
3C529	BA	C50	41	18-Mar-03	7	763834	13559	639.56	823.72	2.3
3C529	BA	P01	42	24-Nov-03	11	3564464	22435	469.92	558.47	1.2
3C529	*	P01	42	26-Apr-04	18	5714632	30701	16.13	110.63	1.4
3C529	BA	P09	X4	8-Jan-03	2	373057	1705	596.92	677.6	2
3C529	BA	P01	42	21-Jan-04	15	4380348	17890	438.59	518.08	1.2
3C529	BA	L13	42	15-Mar-03	4	738301	5247	619.53	811.53	3.2
3C529	BA	P09	42	29-Aug-03	10	2617521	19039	438.59	583.4	2.1
3C529	BA	N57	42	15-Nov-02	1	263955	503	772.82	1016.79	3.2
3C529	BA	P01	1	17-Feb-03	0	573724	3	596.92	793.95	3.4
3C529	BA	P01	42	13-Aug-03	12	2195417	16730	529.11	729.5	2.9
3C529	BA	N57	33	15-Aug-03	2	2378368	3351	443.13	836.66	5.5
3C529	BA	L13	42	22-Dec-03	7	3915105	7419	438.59	629.72	3.5
3C529	BA	P01	42	5-Apr-04	17	5410430	21670	438.59	606.85	2.2
3C529	BA	P01	41	5-Apr-04	13	5423296	12429	438.59	545.82	1.4
3C529	BA	C50	41	2-Apr-03	5	897238	8731	596.92	686.52	1.2
3C529	BA	P09	28	17-May-04	18	6145891	19850	438.59	557.06	1.6
3C529	*	T90	33	17-Jul-03	10	1819102	12373	0	67.49	0.9
3C529	BA	P01	42	6-Apr-04	17	5380041	12492	438.59	638.69	2.2
3C529	BA	N57	42	2-Jun-03	1	1371054	1186	626.74	718.14	1.2
3C529	BA	C50	42	6-May-03	7	1240586	6433	699.85	887.93	3.1
3C529	BA	B74	42	6-Apr-04	9	5419823	29322	438.59	514.48	1.2
3C529	BA	P09	42	30-Jan-04	9	4425482	6642	438.59	637.24	2.9
3C529	BA	C50	42	19-Sep-03	6	3686622	14026	402.88	486.34	1.2
3C529	BA	P01	1	17-Jun-04	13	6534827	12001	438.59	546.65	1.2
3C529	BA	P01	42	22-Jun-04	15	6495316	11283	438.59	605.9	1.8
3C529	BA	P01	41	19-Apr-04	14	5604855	15046	438.59	508.51	1.2
3C529	BA	P01	1	12-May-04	17	6030212	25540	483.26	726.83	3.2
3C529	BA	L13	1	7-Jun-04	19	6407304	17654	591.76	767.24	2.4

3C529	BA	P01	42	16-Mar-04	15	4926510	19121	445.95	671.17	3.2
3C529	*	N33	7	31-Mar-04	8	5523947	13073	0	244.36	2.8
3C529	JA	C50	42	31-Dec-02	2	410322	54	511.64	580.98	1.2
3C529	BA	C50	42	17-Dec-03	13	3789101	21935	438.59	514.96	1.2
3C529	BA	P01	42	14-Aug-03	11	2228789	21582	438.59	519.36	1.4
3C529	BA	P01	42	11-Mar-04	17	4902951	33113	438.59	518.08	1.2
3C529	BA	P01	69	7-Oct-03	3	2840857	3630	438.59	524.07	1.2
3C529	BA	P01	42	24-Jan-04	6	4664588	7594	375.94	490.39	2.1
3C529	BA	L07	41	19-Feb-04	11	4652775	22873	438.59	552.77	1.2
3C529	BA	P68	1	18-Jul-03	8	1868143	12259	474.99	682.32	2.4
3C529	*	N59	42	14-Jan-04	4	4096095	2725	0	57.9	1
3C529	*	N57	42	22-Apr-04	16	5725832	31135	0	12.05	0.2
3C529	*	C50	D1	27-Aug-03	0	2343871	20	0	84.46	1.2
3C529	BA	D03	42	17-Apr-03	2	1042824	1379	596.92	795.43	3
3C529	BA	P01	42	22-Dec-03	14	3842333	23773	438.59	623.36	3.5
3C529	BA	P01	42	19-Jun-03	1	1568215	770	596.92	680.34	1.2
3C529	BA	P01	42	3-Nov-03	13	3183175	25151	438.59	551.2	1.7
3C529	BA	C50	7	1-Mar-04	14	4730619	13252	438.59	601.39	2.2
3C529	BA	N57	42	26-Feb-04	14	4668020	20208	438.59	498.59	1.2
3C529	BA	P01	41	12-Jan-04	13	4173819	15487	450.9	579.43	1.7
3C529	*	P01	69	20-Mar-04	16	5044982	21276	0	56.01	0.3
3C529	BA	P01	41	5-Apr-04	17	5365094	22003	438.59	578.61	1.2
3C529	BA	P01	41	4-Sep-03	10	2558635	15000	449.59	778.76	2.5
3C529	BA	C50	1	7-Oct-02	0	125908	4	728.31	871.33	1.8
3C529	BA	P01	41	13-Apr-04	19	5530154	14551	438.59	546.49	1.2
3C529	BA	P01	33	15-Mar-04	13	5068201	19301	469.92	545.47	1.2
3C529	BA	T90	41	10-Jul-03	5	1714751	8583	438.59	528.58	1.2
3C529	BA	P09	42	4-Jun-04	17	6338675	19235	469.92	656.21	2.8
3C529	BA	L13	42	2-Mar-04	15	4874826	16502	481.17	612.15	2
3C529	BA	P01	42	2-May-03	6	1104369	10509	751.08	997.13	3
3C529	*	C50	7	23-Jan-04	17	4238283	27651	0	76.58	1.2
3C529	*	N57	33	9-Apr-04	10	5433099	5161	0	40.89	0.5
3C529	BA	P01	42	1-Apr-03	3	847590	2848	596.92	816.07	3
3C529	BA	P01	28	1-Mar-04	6	4860937	2983	438.59	553.84	1.7
3C529	BA	A85	1	24-Apr-03	1	1042959	294	596.92	740.92	2.4
3C529	BA	P01	41	8-Oct-03	10	3334572	15412	470.02	770.82	2.4
3C529	BA	P01	42	30-Dec-03	13	4207479	15538	438.59	626.61	2.5
3C529	*	N57	82	5-Feb-03	3	602371	2337	0	252	0
3C529	BA	N57	33	5-Feb-03	3	545272	2337	775.8	963.41	2.6
3C529	BA	P09	42	26-May-04	12	6262250	21476	648.95	1051.22	5.3
3C529	BA	N57	7	17-May-04	9	6169489	8445	614.54	1207.68	6.5
3C529	BA	P01	41	21-May-04	14	6146049	9466	572.05	675.33	1.2
3C529	BA	P01	42	24-Nov-03	7	3579214	7479	581.13	680.47	1.2
3C529	BA	P01	33	3-Feb-04	5	4409178	4986	438.59	597.29	1.7
3C529	BA	P01	42	19-Jun-03	7	1561700	6589	788.78	945.28	1.8
3C529	BA	N57	42	29-Dec-03	14	3956094	23471	438.59	531.31	1.2
3C529	BA	P01	42	19-May-04	12	6087584	7019	551.37	653.24	1.2
3C529	BA	P01	28	16-Jun-03	5	1475852	10149	596.92	702.85	1.4

3C529	BA	P01	42	3-Feb-04	15	4560861	21650	438.59	721.76	3.8
3C529	BA	P01	1	17-Jun-04	9	6545866	11139	575.81	703.12	1.4
3C529	BA	P01	69	26-Feb-04	8	4813839	15486	570.48	728.48	1.9
3C529	BA	L13	D4	5-May-04	7	5919083	16516	567.66	771.43	2.5
3C529	BA	L13	42	27-Jan-03	2	478693	2194	596.92	683.78	1.2
3C529	BA	P01	42	24-May-04	19	6126296	26748	438.59	642.51	2.2
3C529	BA	P01	42	16-Dec-03	15	3826208	30551	438.59	498.71	1.2
3C529	BA	P09	42	28-Jan-03	5	524194	8857	638.3	915.8	3.4
3C529	BA	N58	42	6-Apr-04	3	5559649	1392	438.59	574.31	2.2
3C529	BA	N59	33	17-May-04	12	6048044	15397	438.59	529.39	1.2
3C529	BA	L15	41	16-Jul-03	6	1805031	15807	438.59	617.01	2.4
3C529	BA	P24	42	18-Mar-04	18	5163848	33463	438.59	528.66	1.1
3C529	BA	L13	41	31-Jul-03	0	2060375	13	474.99	647.19	1.8
3C529	BA	C50	1	11-Mar-04	9	4878002	13766	535.71	650.85	1.4
3C529	BA	C50	42	5-Jan-04	9	4036235	23711	438.59	642.67	3.1
3C529	BA	A85	28	1-Oct-03	6	3719152	8710	442.57	1044.96	8.7
3C529	BA	P01	41	23-Feb-04	15	4736973	20080	438.59	623.46	1.8
3C529	BA	P01	42	8-Apr-04	18	5452603	22327	438.59	542.02	1.2
3C529	BA	D50	42	24-Jun-04	22	6572460	17540	438.59	604.4	1.8
3C529	BA	P01	69	17-Oct-03	0	2973659	60	438.59	620.25	2.7
3C529	BA	P01	41	24-Mar-04	9	5249826	14730	438.59	540.59	1.2
3C529	*	N33	33	3-Jun-03	1	1494902	278	0	56.96	0.8
3C529	BA	N57	42	23-Sep-03	6	2715160	4641	438.59	532.57	1.2
3C529	BA	P01	41	1-Jun-04	14	6262666	26327	438.59	656.39	3
3C529	BA	P01	69	3-Mar-04	13	5306854	19758	438.59	515.47	1.2
3C529	BA	P01	42	29-May-03	1	1594719	62	598.74	676.85	1.4
3C529	BA	H22	41	20-May-04	11	6309642	13824	438.59	537.85	1.2
3C529	CA	P01	41	1-Mar-04	16	4887770	29142	632.73	763.65	1.4
3C529	BA	P01	41	21-Oct-03	10	3176246	8564	520.04	625.04	1.2
3C529	BA	P01	42	30-Dec-03	6	4128020	8451	438.59	585.52	2.6
3C529	BA	L13	41	10-Mar-03	3	706012	3522	626.74	705.27	1.2
3C529	BA	P01	42	9-Jan-04	10	4313938	9658	438.59	509.39	1.2
3C529	BA	P01	41	5-May-04	18	5863946	30075	557.33	656.59	1.2
3C529	BA	P01	42	14-Apr-04	18	5517855	17167	438.59	540.59	1.2
3C529	BA	P01	42	23-Jun-04	12	6602919	22855	438.59	515.26	1.4
3C529	BA	C50	42	12-May-04	12	5987583	8449	438.59	528.58	1.2
3C529	BA	P01	42	8-Jun-04	17	6370305	35998	438.59	541.54	1.2
3C529	BA	N33	33	30-Jan-03	1	501896	212	596.92	1039.4	5.4
3C529	BA	P01	42	19-Apr-04	16	5651627	28455	551.37	704.17	1.8
3C529	BA	P01	41	25-Nov-02	1	388260	1463	576.73	870.83	4.4
3C529	BA	N57	1	4-Mar-04	9	4806995	5788	443.29	600.41	2.2
3C529	BA	P01	42	3-May-04	13	5841028	25872	438.59	533.66	1.6
3C529	*	N57	1	31-Mar-04	15	5496175	22052	0	11.15	0.2
3C529	BA	N58	30	15-Mar-04	15	5000174	6865	438.59	528.01	1.2
3C529	*	P01	42	6-Jan-04	13	4232466	11933	0	83.58	1
3C529	BA	P01	41	3-Mar-04	15	5130167	14032	438.59	605.75	2
3C529	BA	P01	42	20-May-04	19	6069139	16888	438.59	547.98	1.2
3C529	BA	P01	42	18-Mar-03	4	910108	5103	596.92	691.12	1.5

3C529	BA	P01	41	23-Feb-04	17	4667929	15759	438.59	530.54	1.6
3C529	BA	P01	41	9-Sep-03	11	2663745	32164	438.59	524.67	1.2
3C529	BA	L20	42	2-Oct-02	0	182871	81	576.73	659.53	1.2
3C529	BA	N58	42	5-Apr-03	4	976042	3081	596.92	680.01	1.2
3C529	BA	P01	42	10-Feb-04	18	4465888	25984	438.59	666.06	3.3
3C529	BA	P01	41	9-Dec-03	1	3795616	871	586.77	671.56	1.2
3C529	BA	P01	42	27-Apr-04	15	5719993	22754	457	695.24	3.1
3C529	BA	P01	1	13-Mar-04	15	5003472	14849	473.95	724.87	3
3C529	BA	L13	1	2-Jan-03	1	477952	2072	596.92	778.69	2.5
3C529	BA	N57	42	28-Oct-02	1	179454	1090	576.73	663.85	1.2
3C529	BA	L13	41	4-Dec-03	1	3616422	4999	474.99	568.35	1.8
3C529	BA	N57	42	7-Feb-03	5	597708	5178	596.92	893.92	3.3
3C529	BA	P01	42	15-Dec-03	15	4277169	29451	449.59	679.37	2.4
3C529	BA	N57	42	10-Jun-04	11	6363372	13396	438.59	594.31	2
3C529	BA	P01	41	4-May-04	15	6334510	26704	438.59	597.98	2.2
3C529	BA	P01	1	10-May-04	14	6238420	10808	473.95	830.4	1.7
3C529	JA	T90	33	8-Apr-03	3	895368	2789	0	10.72	0.2
3C529	BA	P01	41	10-Nov-03	12	3311910	24285	438.59	528.48	1.2
3C529	BA	P01	42	9-Oct-03	11	2886007	22250	438.59	538.47	1.4
3C529	BA	P01	41	24-Mar-04	16	5359067	21649	438.59	774.99	5
3C529	BA	P01	42	12-May-03	4	1177087	1745	596.92	750.32	2.6
3C529	BA	P01	42	27-Oct-03	13	3100211	12445	438.59	853.33	4.6
3C529	BA	P01	42	16-Jun-04	17	6470196	16550	438.59	591.08	1.2
3C529	BA	P01	42	2-Jan-04	16	3956435	27525	541.97	715.41	2
3C529	BA	P24	42	21-May-04	18	6126179	16974	438.59	567.69	1.4
3C529	BA	P01	41	23-Jun-04	17	6557182	18154	438.59	577.02	1.9
3C529	BA	P68	41	30-Mar-04	13	5325832	32392	438.59	559.54	1.4
3C529	BA	N58	42	3-Mar-03	6	671227	6899	699.85	844.91	2.4
3C529	BA	P68	42	19-May-03	0	1276323	11	596.92	780.84	2.4
3C529	BA	P01	42	28-Apr-04	13	5792108	14222	557.18	902.14	4
3C529	*	N57	33	15-Mar-04	16	4954789	11212	0	12.83	0.2
3C529	BA	P01	41	28-Apr-04	18	5775896	15173	438.59	601.39	2.2
3C529	BA	P01	42	26-Feb-04	5	4764239	9501	438.59	622.32	2.5
3C529	BA	P68	42	26-Dec-03	16	3917622	30395	438.59	627.21	2.7
3C529	BA	P01	42	7-Jan-04	9	4054920	11388	469.92	563.16	1.2
3C529	BA	N58	D4	14-Nov-02	0	215927	15	576.73	658.08	1.2
3C529	BA	L13	42	7-Oct-02	0	183558	10	598.47	1059.99	7.2
3C529	BA	L13	42	21-May-04	17	6252730	16765	438.59	567.91	2.2
3C529	BA	P09	42	3-Apr-03	2	860160	1191	596.92	665.14	1.2
3C529	BA	L07	X1	20-Mar-03	4	767933	4487	596.92	706.93	1.8
3C529	BA	P01	41	3-Sep-03	1	2773256	1385	493.34	607.58	1.8
3C529	BA	P01	41	10-Sep-03	10	2442175	24087	438.59	514.03	1.2
3C529	BA	P01	69	2-Apr-04	4	5428243	1133	438.59	539.87	1.2
3C529	*	C50	33	2-Jun-03	2	1346788	5778	0	82.6	1.2
3C529	BA	P01	42	18-Dec-03	9	3790534	29013	438.59	651.96	3.1
3C529	BA	P01	42	7-Nov-03	12	3405893	27505	438.59	618.64	2.3
3C529	BA	P01	12	5-Mar-03	0	686345	12	596.92	819.62	3.4
3C529	BA	N57	30	15-Jun-04	19	6435013	20110	438.59	538.98	1.4

3C529	BA	H22	42	27-May-04	19	6297913	33315	438.59	520.45	1.2
3C529	BA	L15	69	14-Apr-03	2	1131037	4103	596.92	671.12	1.4
3C529	BA	P01	41	30-Oct-03	2	3238247	4074	438.59	516.84	1.2
3C529	BA	N58	41	17-Mar-04	10	5814537	27544	573.3	673.18	1.2
3C529	BA	N57	42	2-Feb-04	13	4357565	9002	610.27	709.77	1.2
3C529	BA	N57	42	26-Sep-02	0	120682	13	576.73	641.83	1.2
3C529	BA	P01	42	5-Aug-03	11	2094426	12783	438.59	927.52	6.2
3C529	BA	P01	42	24-May-04	17	6187969	19213	438.59	555.44	1.2
3C529	BA	P09	42	5-Jun-04	10	6364207	12301	557.01	817.31	2.9
3C529	BA	H20	42	9-Jul-03	5	1728521	8000	438.59	545.25	1.4
3C529	BA	G29	1	2-Jun-03	1	1381714	14	596.92	874.32	4
3C529	BA	L15	69	16-Mar-04	10	4976677	13484	438.59	641.77	2.7
3C529	BA	H22	41	22-May-04	15	6113921	19693	438.59	550.61	1.2
3C529	BA	A85	41	17-Jun-03	5	1841067	10738	596.92	689.34	1.2
3C529	BA	P09	42	27-Jan-04	15	4425479	25067	438.59	575.59	2
3C529	BA	P01	42	5-Apr-04	17	5653217	15857	469.92	529.5	1.2
3C529	BA	N58	D4	17-Oct-02	1	164234	1007	576.73	673.93	1.2
3C529	BA	P01	1	20-May-04	7	6207945	9629	473.95	641.41	2.2
3C529	BA	P01	41	18-Nov-03	9	3824113	11186	438.59	544.06	1.9
3C529	BA	P01	41	18-Jun-04	16	6471270	17998	438.59	516.15	1.2
3C529	BA	L13	42	29-Nov-02	2	273531	1315	576.73	687.66	1.7
3C529	BA	P09	42	25-Jun-04	14	6593434	33741	438.59	531.13	1.2
3C529	BA	L13	7	21-Nov-03	8	3578875	5864	474.99	553.24	1.2
3C529	BA	P01	42	5-Apr-04	9	5322033	9543	548.24	652.56	1.2
3C529	BA	P01	41	9-Apr-04	16	5442854	34635	545.42	671.69	1.4
3C529	BA	N59	33	16-Oct-03	1	3099761	659	438.59	529.26	1.2
3C529	BA	P01	42	15-Mar-04	14	4946795	31425	438.59	659.06	3
3C529	BA	P01	42	8-Apr-03	0	1013596	4	596.92	870.52	2
3C529	BA	P01	42	28-Nov-03	13	3521331	19559	573.3	687.24	1.5
3C529	BA	P01	42	17-Jun-04	19	6512460	17203	438.59	565.19	1.7
3C529	BA	P01	42	22-Sep-03	9	2627656	18310	438.59	575.75	1.8
3C529	BA	C50	33	8-Mar-04	11	4824029	17217	438.59	522.29	1.2
3C529	BA	L13	41	24-May-04	16	6167995	21025	438.59	527.71	1.2
3C529	BA	P01	42	3-Jan-03	1	402987	338	596.92	759.34	2.5
3C529	BA	C50	42	22-Sep-03	12	3076490	24534	438.59	509.39	1.2
3C529	BA	P01	41	4-Mar-04	9	4972371	12726	438.59	577.04	1.9
3C529	BA	L13	41	15-Mar-04	13	4973229	34831	508.92	648.78	1.8
3C529	BA	P01	42	6-Oct-03	11	2854766	8658	449.59	533.78	1.2
3C529	BA	P01	41	6-Feb-04	14	4497457	11651	438.59	566.67	1.8
3C529	BA	C50	33	24-Jan-03	0	470850	285	699.85	818.82	1.7
3C529	BA	N25	69	6-Mar-03	5	685839	6991	596.92	734.97	2.2
3C529	BA	N57	41	18-Oct-02	0	270613	21	576.73	656.71	1.2
3C529	BA	N58	69	30-May-03	3	1406996	2643	699.85	980.57	4.4
3C529	BA	P01	41	10-Feb-04	12	4465304	20040	438.59	590.09	2
3C529	BA	N58	41	16-Jan-03	0	431858	5	596.92	809.7	3.2
3C529	BA	P01	42	13-Jan-04	11	4175352	11113	438.59	521.92	1.1
3C529	BA	L19	41	31-Oct-03	12	3224490	9956	498.54	622.56	1.8
3C529	BA	P01	42	10-Feb-04	13	4516055	26452	438.59	529.39	1.2

3C529	BA	P01	D4	22-Jun-04	18	6573286	31147	469.92	602.43	2
3C529	BA	P01	42	18-Jul-03	10	1864862	28187	438.59	617.38	2.7
3C529	BA	L13	41	3-Sep-03	3	2411612	4434	438.59	529.09	1.2
3C529	BA	P01	69	27-Jan-04	15	4316803	28274	438.59	559.56	1.7
3C529	BA	L23	42	5-Feb-04	14	4500426	11935	438.59	522.69	1.2
3C529	BA	L23	41	26-Feb-04	7	4692471	7018	438.59	514.89	1.2
3C529	BA	C50	42	4-Mar-04	16	5135066	7482	438.59	584.48	2.5
3C529	BA	L13	2	2-Apr-04	18	5377932	24074	438.59	525.53	1.2
3C529	BA	C50	41	29-Apr-03	5	1090198	3045	775.8	1182.36	5.6
3C529	BA	N58	33	1-Nov-02	0	186234	14	576.73	672.98	1.4
3C529	BA	P01	42	9-Oct-02	0	238949	38	712.37	902.44	2.9
3C529	BA	P01	42	30-Jun-03	1	1697854	187	596.92	790.67	2.6
3C529	BA	P01	42	5-May-04	17	5889883	19353	438.59	619.89	2.5
3C529	BA	P01	41	22-Apr-03	0	1031169	48	634.4	880.54	3.4
3C529	BA	P01	42	27-May-04	12	6207175	13085	438.59	567.22	1.7
3C529	BA	P69	41	29-Mar-04	14	5320801	23447	438.59	518.38	1.2
3C529	BA	T90	42	28-Aug-03	4	2302893	7009	438.59	530.5	1.2
3C529	BA	T90	42	14-Nov-03	12	3409302	18949	438.59	530.5	1.2
3C529	BA	N58	42	9-Jul-03	0	1747152	108	438.59	504.45	1.1
3C529	BA	L13	69	22-Mar-04	12	5089737	6704	438.59	665.13	2.6
3C529	*	N57	7	14-May-04	13	6011250	7648	0	157.63	0.2
3C529	BA	C50	33	30-Jan-04	17	5221106	20292	628.21	760.42	1.9
3C529	BA	C50	42	14-Jun-04	14	6421079	20305	438.59	562.97	1.8
3C529	BA	N58	41	31-Oct-02	0	253934	20	698.71	833.71	2.5
3C529	BA	H22	69	7-Jun-04	14	6359982	24100	469.92	610.8	1.8
3C529	BA	G29	42	18-Oct-03	13	3000799	12214	438.59	579.96	1.2
3C529	BA	N58	33	16-Jan-04	5	4130584	6353	438.59	662.69	2.7
3C529	BA	N33	42	14-Apr-04	9	6287383	12474	469.92	562.98	1.2
3C529	BA	L13	41	5-May-04	12	5890653	9598	474.99	683.07	2.5
3C529	BA	P01	42	10-Mar-04	17	4933568	28922	438.59	579.01	2.7
3C529	BA	P01	42	28-Jan-04	15	4748147	27868	438.59	574.41	2
3C529	BA	A85	28	29-Oct-03	1	3143848	1778	438.59	522.69	1.2
3C529	BA	P01	69	2-Feb-04	13	4391911	12611	438.59	729.62	4.1
3C529	BA	P01	69	17-May-04	20	6165092	32781	438.59	506.83	1.2
3C529	BA	P01	69	21-Feb-03	6	631263	14767	596.92	678.16	1.2
3C529	BA	N58	41	17-Jun-04	13	6496411	25671	438.59	528.71	1.2
3C529	BA	L13	1	30-Mar-04	13	5332718	17749	438.59	682.87	3.1
3C529	BA	L23	42	7-Aug-03	4	2117650	7059	438.59	519.33	1.2
3C529	BA	N57	42	13-Mar-03	2	722165	7530	596.92	676.12	1.2
3C529	BA	L13	1	4-Mar-04	14	4889378	35740	438.59	527.39	1.2
3C529	BA	L13	28	2-Mar-04	14	4831319	35740	438.59	667.99	3.1
3C529	BA	P01	41	24-Feb-04	16	4634065	27086	438.59	589.73	2.2
3C529	BA	P01	42	11-Dec-03	9	3812175	18275	438.59	530.28	1.8
3C529	BA	N58	46	8-Dec-03	12	3851393	22786	438.59	628.33	3.5
3C529	BA	P01	69	25-May-04	13	6240934	13758	438.59	600.26	2
3C529	BA	P01	41	15-Apr-04	11	5535230	11256	438.59	567.86	1.2
3C529	BA	P01	42	14-Jun-04	18	6542164	35261	438.59	505.35	1.2
3C529	BA	P01	42	5-Nov-03	11	3276459	14263	438.59	609.53	2.1

3C529	BA	P09	41	14-Nov-03	13	3365685	27594	438.59	531.99	1.4
3C529	BA	N57	42	11-Dec-02	3	333485	3010	721.03	938.83	3.6
3C529	BA	A85	42	7-May-04	10	5951165	22244	438.59	597.28	2.2
3C529	BA	N18	42	16-Mar-04	11	5005212	15652	438.59	655.37	3
3C529	BA	P01	42	30-Jan-04	9	4376849	19237	438.59	666.36	3.7
3C529	BA	P01	42	15-Oct-03	10	3198741	12062	438.59	575.79	2.5
3C529	BA	P01	42	2-Dec-03	3	3559592	4285	438.59	560.37	1.8
3C529	BA	L13	42	7-May-03	5	1118929	9667	596.92	662.92	1.2
3C529	BA	P09	42	9-Sep-03	11	2435067	11122	438.59	582.29	2.2
3C529	BA	L15	41	19-Feb-04	15	4613448	19205	469.92	609.09	2.1
3C529	BA	N58	42	22-Oct-03	0	3079047	5983	438.59	504.59	1.2
3C529	BA	P83	42	10-Feb-04	16	4496185	24669	438.59	593.43	2.4
3C529	BA	P01	42	31-Jul-03	0	2034991	28	438.59	556.49	1.7
3C529	BA	P01	41	15-Jun-04	9	6471655	10112	438.59	521.67	1.2
3C529	BA	C50	42	21-Jun-04	10	6521473	21252	438.59	528.72	1.2
3C529	BA	P01	1	11-May-04	15	5969144	34125	438.59	580.78	2
3C529	BA	P01	42	18-Nov-02	0	233986	35	578.63	823.56	3.5
3C529	BA	P01	42	31-Mar-04	10	5304131	20532	438.59	575.87	1.2
3C529	BA	P01	42	6-Oct-03	9	3040213	15904	438.59	818.49	4.7
3C529	BA	P01	42	16-Feb-04	5	4748224	4938	438.59	654.72	3.5
3C529	BA	N58	42	17-May-04	10	6052992	8374	438.59	523.78	1.4
3C529	BA	P09	7	12-May-03	2	1181014	6009	633.96	667.56	0.6
3C529	BA	P24	42	8-Nov-02	1	291366	181	576.73	655.16	1.2
3C529	BA	N57	41	5-Nov-02	1	260651	180	792.83	903.94	1.7
3C529	BA	L13	42	8-Jan-04	16	4137682	28975	438.59	697.41	3.1
3C529	BA	P01	41	11-Feb-04	13	4486883	9015	438.59	580.43	1.8
3C529	BA	S39	1	8-Sep-03	8	2496508	20984	489.31	685.52	2.5
3C529	BA	P01	41	12-Apr-04	8	5497629	7750	438.59	537.29	1.4
3C529	BA	L13	1	21-May-04	15	6106542	17758	438.59	588.67	2
3C529	BA	P01	12	15-Jan-04	13	4091782	27425	438.59	508.19	1.2
3C529	BA	P09	42	29-Dec-03	14	4042194	20096	464.91	639.15	2.8
3C529	BA	P01	42	2-Jan-04	13	3997067	13069	441.84	585.84	2
3C529	BA	P01	41	26-May-04	18	6331092	21757	438.59	528.43	1.2
3C529	BA	P68	14	1-Jun-04	19	6344947	20892	438.59	782.9	3
3C529	BA	P01	41	26-May-04	19	6327118	27508	438.59	778.99	4.6
3C529	BA	P01	42	24-Mar-04	10	5159489	12573	438.59	520.12	1.2
3C529	BA	C50	1	5-Mar-04	18	4901270	29179	438.59	517.23	1.2
3C529	BA	N59	33	14-Aug-03	1	2133426	519	438.59	644.22	2.7
3C529	BA	P01	41	21-Apr-04	20	5695190	25293	438.59	545.33	1.5
3C529	*	C50	33	1-Jun-04	11	6223677	20565	0	14.41	0.2
3C529	BA	P01	41	17-Nov-03	1	3467386	4075	438.59	523.43	1.2
3C529	BA	G29	42	22-Apr-03	1	1078954	13	655.93	768.53	2
3C529	*	A88	42	28-Apr-04	17	5910112	16653	0.84	41.35	0.5
3C529	BA	T90	42	27-Dec-02	4	351536	2999	576.73	651.96	1.2
3C529	BA	T90	1	30-Dec-02	0	383178	25	621.59	810.09	2.7
3C529	BA	C50	42	13-May-04	15	6028630	19169	438.59	695.77	3.5
3C529	JA	N58	42	1-Nov-02	1	187355	884	596.92	690.11	1.4
3C529	BA	B95	42	15-Jun-04	9	6443288	4588	438.59	604.97	2

3C529	BA	N58	41	26-Mar-03	4	793370	2557	596.92	685.72	1.2
3C529	BA	N58	42	25-Mar-03	1	803480	1242	699.85	825.65	1.7
3C529	BA	P01	42	10-Feb-04	13	4620049	12725	438.59	693.2	4
3C529	BA	N58	42	22-Dec-03	6	3912655	4076	438.59	529.32	1.2
3C529	BA	C50	12	19-Dec-02	0	438103	50	676.17	791.28	1.7
3C529	BA	P01	69	20-Feb-04	11	4628795	9203	469.92	572.39	1.2
3C529	BA	P01	1	24-Jan-04	14	4315353	35558	438.59	645.7	2.9
3C529	BA	H04	42	8-Sep-03	9	2430403	19633	438.59	513.42	1.2
3C529	BA	L13	1	30-Sep-03	11	2874020	20566	469.92	558.25	1.2
3C529	BA	C50	69	2-Dec-03	0	3636673	129	469.92	574.81	1.2
3C529	BA	P01	41	4-Aug-03	0	2046928	947	438.59	526.77	1.2
3C529	BA	T90	30	1-Apr-03	4	886796	4558	596.92	946.92	5
3C529	BA	L13	1	17-Feb-04	6	4628924	5453	438.59	579.45	2.4
3C529	BA	P01	41	2-Feb-04	12	4401825	31810	438.59	530.49	1.2
3C529	BA	P01	1	9-Jan-04	16	4205049	13329	375.94	435.94	1.2
3C529	BA	P01	42	30-Sep-03	11	2753219	26841	438.59	522.67	1.2
3C529	BA	N57	42	18-May-04	9	6256548	16673	438.59	438.59	0
3C529	BA	L13	42	21-May-04	7	6243436	11044	500.12	801.57	5
3C529	BA	L13	42	21-May-04	15	6103198	22281	511.39	924.12	5.5
3C529	BA	T90	1	24-Dec-03	12	3865862	15083	438.59	597.69	1.1
3C529	BA	P01	41	13-Jan-04	15	4124070	17152	438.59	544.8	1.4
3C529	BA	N57	42	28-Oct-02	0	179595	55	576.73	693.5	1.6
3C529	BA	L15	1	31-Jan-04	12	4359392	8974	438.59	523.47	1.2
3C529	BA	L23	42	1-Dec-03	11	3625132	11718	438.59	668.36	3
3C529	BA	N58	41	30-May-03	1	1385712	1577	641.78	969.56	2.5
3C529	BA	C50	33	9-Feb-04	12	4499101	19513	438.59	599.45	2.1
3C529	BA	P01	1	4-Mar-04	18	5844753	9011	375.94	525.94	3
3C529	BA	N58	42	30-Jan-04	7	4317896	2818	438.59	521.62	1.2
3C529	BA	P01	42	12-Dec-03	13	3707127	31816	469.92	561.83	1.2
3C529	BA	L13	42	31-Mar-04	12	5449813	16725	500.12	815.46	2.2
3C529	BA	P01	42	3-Mar-04	15	5251765	31515	438.59	539.32	1.7
3C529	BA	P01	42	25-Feb-04	16	4695746	23294	438.59	507.94	1
3C529	BA	N58	42	20-Nov-02	2	273168	183	726.49	905.52	3.3
3C529	BA	C50	42	8-Aug-03	6	2085775	12609	438.59	627.7	2.2
3C529	BA	B95	42	12-Dec-03	14	3785412	26200	469.92	577.15	1.4
3C529	BA	N58	33	16-Dec-02	0	370704	193	621.59	823.04	3
3C529	BA	N57	42	23-Dec-02	0	594407	193	676.17	1065.65	5.8
3C529	BA	L23	28	14-Jun-04	11	6420861	12572	438.59	576.13	1.4
3C529	BA	P67	42	25-Feb-04	14	4716548	33272	438.59	545.26	1.6
3C529	BA	N57	42	26-Dec-02	1	339491	344	576.73	664.59	1.2
3C529	BA	A85	42	25-Aug-03	5	2273851	12657	438.59	557.2	1.8
3C529	BA	P01	41	2-Sep-03	12	2490724	16420	438.59	521.27	1.2
3C529	BA	P01	42	3-Mar-04	9	5009784	17222	438.59	714.96	2.7
3C529	BA	P01	42	25-Nov-03	6	3546438	16900	438.59	546.37	1.2
3C529	BA	N57	42	9-Jul-03	1	1793477	718	438.59	673.51	3.1
3C529	BA	T90	42	10-Jan-03	0	400854	319	596.92	721.21	1.9
3C529	BA	P01	42	16-Jun-04	19	6600552	30754	438.59	551.23	2
3C529	BA	L13	42	20-Jan-04	10	4294288	7616	597.34	755.43	2.7

3C529	BA	P01	42	12-Jan-04	10	4075761	13773	438.59	553.17	2
3C529	BA	P01	1	10-Jan-04	16	4205048	11792	375.94	435.94	1.2
3C529	BA	L66	42	2-Jan-03	3	378087	2277	641.78	783.86	1.8
3C529	BA	N57	42	31-Oct-02	1	179924	195	576.73	672.98	1.4
3C529	BA	L13	1	4-Jun-03	0	1408576	10	596.92	678.52	1.2
3C529	BA	P01	42	17-Mar-04	16	5737100	29827	469.92	558.78	1.2
3C529	BA	P01	41	5-Aug-03	11	2069467	20894	438.59	652.18	3.1
3C529	BA	H21	41	5-Feb-04	16	4677117	15988	438.59	625.51	1.4
3C529	BA	P01	1	20-Apr-04	15	5678952	1011	438.59	570.26	1.9
3C529	DA	P01	42	3-Jun-04	20	6348611	20733	474.62	552.62	1.2
3C529	BA	P01	42	4-May-04	15	5934708	33951	438.59	520.56	1.2
3C529	*	N50	42	22-Jan-04	12	4464669	11816	0	153.5	2
3C529	BA	P01	42	3-Nov-03	2	3308376	251	469.92	660.52	2.3
3C529	BA	P01	42	31-Jul-03	8	2004585	3871	438.59	574.47	2
3C529	BA	N58	1	3-Mar-03	5	721061	3349	697.34	799.5	1.2
3C529	BA	P01	41	29-Apr-04	17	5832433	33472	438.59	513.59	1
3C529	BA	P01	69	7-Apr-04	12	5401611	24402	438.59	561.39	1.6
3C529	BA	L13	42	12-Feb-03	0	628011	3	619.53	704.71	1.2
3C529	BA	P01	42	24-May-04	18	6175936	20345	438.59	609.38	2.2
3C529	BA	P01	42	2-Mar-04	16	4789820	32631	438.59	651.11	3
3C529	BA	P01	42	15-Mar-03	3	712455	4004	596.92	687.29	1.2
3C529	BA	P01	69	25-Mar-04	16	5447552	34564	438.59	505.77	1.2
3C529	BA	P01	42	18-Mar-04	14	5314550	2110	587.71	856	3.4
3C529	BA	P01	42	12-Aug-03	9	2267041	23387	438.59	676.68	4.3
3C529	BA	A85	63	2-Oct-02	0	161169	20	576.73	1158.8	6.9
3C529	*	C50	33	20-Nov-03	6	3493408	15183	0	48.54	0.8
3C529	BA	P01	1	24-Dec-02	0	372632	493	606.55	795.15	2.6
3C529	BA	P01	42	25-Nov-03	11	4332992	9725	573.3	664.45	1.2
3C529	BA	N58	42	12-Nov-02	2	213293	2827	693.39	808.97	1.9
3C529	BA	P09	1	27-Jun-03	4	1688377	6114	596.92	752.32	2.6
3C529	BA	P01	69	27-Oct-03	13	3325796	12142	438.59	509.55	1.2
3C529	BA	C50	41	19-Feb-03	3	1524947	5	596.92	744.79	1.4
3C529	BA	N57	42	25-Aug-03	1	2459011	321	438.59	540.84	1.2
3C529	BA	P09	41	24-Oct-03	14	3224421	9159	438.59	508.14	1.2
3C529	*	G29	42	28-Oct-03	11	3107204	14045	0	110.25	1.3
3C529	BA	P01	42	7-Jul-03	8	2064737	6787	438.59	552.66	1.6
3C529	BA	P01	1	20-Nov-03	8	3469228	6824	470.02	604.37	2.4
3C529	BA	C50	69	24-Mar-03	0	803206	153	596.92	690.16	1.2
3C529	BA	P31	42	7-Oct-03	2	2907300	3653	438.59	648.2	2.7
3C529	BA	N57	42	27-Nov-02	0	265799	30	725.03	930.08	2.5
3C529	BA	P01	41	5-Dec-03	14	3676189	16803	438.59	543.44	1.4
3C529	*	N57	12	26-Dec-03	0	4521484	4091	0.25	23.05	0.4
3C529	BA	P01	42	27-Oct-03	11	3237616	8520	438.59	810.39	5.3
3C529	BA	P01	42	11-Mar-04	19	5444630	25211	469.92	529.5	1.2
3C529	BA	C50	42	21-Nov-02	2	238002	1389	617.93	795.91	2.7
3C529	BA	P01	42	29-Mar-04	13	5294269	11100	690.66	1063.55	4.3
3C529	BA	L13	1	26-Nov-02	0	302107	15	613.13	702.53	1.1
3C529	BA	P01	42	21-May-04	13	6105547	12680	438.59	547.98	1.2

3C529	BA	P01	D4	23-Feb-04	18	4653135	25690	438.59	548.28	1.2
3C529	BA	N58	42	3-Feb-03	0	517457	110	596.92	702.04	1.4
3C529	BA	P01	42	30-May-03	7	1400703	9782	596.92	879.01	3.4
3C529	BA	L13	41	2-Jan-04	4	4000441	3201	620.5	736.58	1.4
3C529	BA	C50	41	12-May-04	17	5970101	25211	469.92	561.83	1.2
3C529	BA	P09	42	1-Jun-04	19	6266393	30966	438.59	739.06	4.2
3C529	BA	P01	42	8-Oct-03	11	2805786	12847	438.59	546.39	1.4
3C529	BA	P01	55	4-Jun-04	18	6290664	25569	438.59	623.58	2.1
3C529	BA	P01	42	31-Mar-03	2	839467	3504	596.92	800.68	2.6
3C529	BA	N58	42	19-Jan-04	16	4407967	32066	500.12	686.18	3.5
3C529	*	H22	69	14-Nov-03	14	3692463	27704	59.95	304.49	4.6
3C529	BA	L13	1	15-Dec-03	9	3893307	20331	548.8	1354.02	8.6
3C529	BA	P01	42	4-Nov-03	5	3329549	9958	469.92	588.57	1.7
3C529	BA	P09	42	26-Apr-04	13	5838012	23268	438.59	545.77	1.4
3C529	BA	P01	42	15-Jun-04	19	6441952	22798	438.59	602.56	1.8
3C529	BA	P01	41	31-Jan-03	3	505378	2470	596.92	698.34	1.4
3C529	BA	P01	69	11-May-04	13	5970821	8917	438.59	523.98	1.2
3C529	BA	N27	42	25-Aug-03	8	2322819	12555	438.59	536.71	1.4
3C529	BA	L13	42	19-May-04	20	6100082	19272	470.78	538.72	1.2
3C529	BA	N11	42	2-Apr-03	1	878168	885	596.92	902.05	2.1
3C529	BA	N33	42	19-May-03	3	1241628	2877	596.92	875.56	3.3
3C529	BA	P01	42	24-Jul-03	5	1940207	15290	438.59	636.13	2
3C529	BA	C50	41	10-Mar-04	16	4866452	25837	438.59	470.01	0.5
3C529	BA	L13	42	7-Jun-03	0	1838797	10	596.92	721.45	2.1
3C529	BA	P24	42	24-May-04	17	6129540	26995	438.59	567.12	1.7
3C529	BA	P01	1	3-Mar-04	8	4770529	12562	438.59	526.18	1.2
3C529	BA	P09	69	6-Apr-04	9	5560882	13562	438.59	543.63	1.6
3C529	BA	C50	46	25-Jun-04	12	6570580	17723	439.29	611.91	2.2
3C529	BA	T90	69	17-Feb-03	1	567529	4120	699.85	907.1	1.7
3C529	BA	N57	1	16-Oct-03	0	85427	3	591.52	747.57	2.5
3C529	BA	L13	41	20-Apr-04	0	740895	36	474.99	630.13	1.8
3C529	BA	A85	42	16-Feb-04	0	421322	11	469.92	541.96	1.2
3C529	BA	P09	42	2-Feb-04	0	429778	10	477.8	564.12	1.2
3C529	BA	C50	1	13-May-04	6	1138529	7450	440.94	519.62	1.2
3C529	BA	L13	41	17-Feb-04	0	414227	27	616.81	789.58	2.3
3C529	BA	H21	30	3-May-04	7	1056482	9544	863.61	1107.39	3.2
3C529	BA	L23	42	26-Feb-04	2	469718	3225	508.92	659.61	1.8
3C529	BA	P01	42	9-Jan-04	1	344248	437	375.94	472.11	1.4
3C529	BA	P01	42	20-Oct-03	2	76053	7473	503.6	703.18	2.6
3C529	BA	P01	46	15-Jun-04	-1	1184924	3	0	238.52	3.1
3C529	BA	N59	14	25-Jun-04	5	1187256	2750	440.94	552.64	1.2
3C529	BA	P01	41	4-Jun-04	9	1154182	22275	438.59	533.72	1.4
3C529	BA	P01	1	9-Apr-04	7	862360	21320	438.59	558.28	1.8
3C529	BA	N59	14	18-Jun-04	6	1134232	4298	438.59	550.29	1.2
3C529	BA	P01	42	3-May-04	1	1127532	11	445.94	549.59	1.5
3C529	BA	N57	42	12-Feb-04	1	420484	824	599.3	918.98	4.5
3C529	BA	P01	42	2-Jun-04	6	1018515	4237	581.13	834.93	3
3C529	BA	N58	42	27-Apr-04	1	859562	1120	469.92	553.93	1.2

3C529	BA	P01	41	17-May-04	4	936750	2261	572.96	693.45	1.4
3C529	BA	L13	69	10-Feb-04	-1	408246	4	438.59	510.63	1.2
3C529	BA	P01	42	21-Apr-04	3	860132	5538	375.94	440.74	1.2
3C529	BA	N57	42	2-Jun-04	3	1155947	3245	662.27	881.2	4
3C529	*	L13	42	12-Feb-04	4	628008	4046	0	21.94	0.6
3C529	BA	L26	41	30-Mar-04	3	874373	485	438.59	699.63	3.7
3C529	BA	N57	33	1-Jun-04	4	1001699	2932	438.59	574.86	1.4
3C529	BA	L13	42	13-Feb-04	1	475190	757	379.54	453.64	1.2
3C529	BA	P01	42	27-Apr-04	5	782582	6158	438.59	583.79	2.2
3C529	BA	C50	42	25-Mar-04	7	613101	15047	438.59	527.44	1.2
3C529	BA	L13	41	26-May-04	7	992477	3005	563.9	760	2.4
3C529	BA	N58	42	1-Apr-04	1	771735	1027	541.52	653.84	1.7
3C529	BA	P01	33	3-Feb-04	1	477648	383	438.59	661.98	2.8
3C529	BA	N57	33	22-Apr-04	5	877392	15606	438.59	614.99	2.4
3C529	BA	N57	30	7-Jun-04	6	1200183	20053	507.81	598.59	1.4
3C529	BA	L15	42	7-Jun-04	1	1216916	23	438.59	699.62	3.5
3C529	BA	L13	42	3-Mar-04	1	553962	1833	474.99	739.16	3.8
3C529	BA	A85	12	29-Jan-04	-1	387667	6	438.59	514.73	1.2
3C529	BA	P01	1	4-Jun-04	3	1066508	6000	438.59	586.17	2
3C529	BA	P01	1	18-Mar-04	1	570308	4412	473.95	729.53	4.2
3C529	BA	L13	69	14-Feb-04	1	443499	25	499.71	863.8	5.6
3C529	BA	N57	42	19-Apr-04	2	752862	2316	438.59	523	1.4
3C529	BA	N57	42	15-Jun-04	4	1154121	5653	474.99	598.22	2
3C529	BA	P09	42	30-Apr-04	1	812963	443	438.59	711.29	2
3C529	BA	N58	1	19-May-04	5	953266	8291	438.59	505.3	1.2
3C529	BA	P01	1	11-May-04	-1	947055	7808	473.95	651.75	2.6
3C529	BA	N58	41	23-Mar-04	2	599876	3316	438.59	508.51	1.2
3C529	BA	C50	33	2-Dec-03	2	237523	1675	375.94	434.74	1.2
3C529	BA	N58	69	25-Mar-04	1	598806	1011	438.59	593.43	2.4
3C529	BA	N50	42	31-May-04	7	1188010	9004	438.59	518.08	1.2
3C529	BA	L13	41	27-Jan-04	1	358819	1472	438.59	568.26	1.6
3C529	*	P09	7	9-Mar-04	2	521750	1736	0	75.32	1.2
3C529	*	C50	7	15-Apr-04	6	706094	4692	0	86.71	1.2
3C529	BA	L13	42	12-Feb-04	-1	573195	7	438.59	657.3	2.9
3C529	BA	C50	42	29-Apr-04	3	793819	1696	438.59	459.61	0.3
3C529	BA	L13	42	10-Dec-03	1	207872	78	462.14	602.3	2
3C529	BA	N59	41	17-Feb-04	3	588256	3919	438.59	513.03	1.2
3C529	BA	L13	1	11-Mar-04	7	535049	26115	438.59	549.86	1.7
3C529	BA	L13	41	10-Feb-04	-1	421229	2	463.72	846.47	7.2
3C529	BA	L23	1	7-Jun-04	7	1046559	4081	438.59	530.65	1.2
3C529	BA	N58	42	14-Nov-03	1	150196	872	438.59	531.13	1.4
3C529	BA	G29	42	17-Oct-03	0	82466	13	462.14	799.25	5.1
3C529	BA	P01	1	1-Nov-03	0	127211	3	438.59	503.62	1.2
3C529	BA	N58	42	1-Mar-04	2	540126	1244	469.92	553.43	1.4
3C529	BA	P01	1	12-Mar-04	1	539547	145	473.95	647.1	1.8
3C529	BA	N57	42	8-Jun-04	3	1126189	7576	438.59	518.43	1.2
3C529	BA	N58	42	8-Mar-04	4	546976	5983	438.59	647.77	2.9
3C529	BA	P09	41	28-Apr-04	1	794885	136	438.59	525.53	1.2

TECHNICIAN	TECHI
TILT LOCK BROKEN INTERNALLY IN COL DIAG REPLACED COL ASSY MT3C529 TIME TO DIAG	
STEERING COLUMN LINKAGE BINDING STEERING COLUMN ASSEMBLY REMOVE AND INSTALL	
CHECKED OUT TILT WHEEL NOISE. THE SLIDES WERE DRY. LUBED TILT SLIDES, NOISE GONE. ALL OK AT THIS TIME. 999A .2 OK PER DAVE WATTS.	
INTERNAL FAILURE REMOVED STEERING COLUMN AND SWAPPED OVER PARTS,ADJUSTED, CHECKED GOOD	
HARD TO PUT INTO PARK REPLACED STEERING COLUME	
DIAG NOIE INSIDE COLUMN R&R STEERING COLUMN TRANSFER PARTS TO NEW COLUMN	
VERIFY CONCERN CHECK OPERATION FOUND STEERING COLUMN LOCKING PLATE BROKEN BY SHIFTER CAUSING SHIFTERTO LOCK WHEN SHIFTIN	
ELECTRICAL TEST PIN POINT TEST AND REPLACED STERING COLUMNAND SOLENOID	
VERIFIED SHIFTER LOOSE PINPOINT REPLACE COLUMN ASSY SHIFTER EAR BROKEN OFF TRANSFER PARTS REPLACE SHIFTER LEVER BROKEN RET	
CHECK VEHICLE,REPLACE STEERING COLUM ASSEMBLY,LOOSEN LEFT SI DE OF DASH TO REMOVE PINCHED WIRE LOOM PULLED TO TIGHT T GE,RE	
INSPECT SHIFT LOCK OPERATION FOUND LOCK SOLENOID STICKING, REMOVE SHIFT LOCK SOLENOID FROM STK# 31746 AND INSTALL ONTO T2898	
CONFIRMED. FOUND STEERING COLUMN INTERNAL FAILURE (STIFF) EVEN WITH SHIFT CABLE DISCONNECTED. REPLACED STEERING COLUMN ASSY	
11175 CHECK GEARSHIFT INTERLOCK STICKS.REMOVETRIM AND FIND ACTUATOR STICKING.DISARM SRS.REMOVE DASH PANEL AND REPLACE IFT OF	
26227 BRAKE SHIFT INTERLOCK SOLENOID SHORTED BRAKE SHIFT SOLENOID ELECTRICAL DIAGNOSIS. PINPOINT TEST IS INACCURATE. REP EED .6	
11423 SHIFT INTERLOCK NOT WORKING PROPERLY DIAG, FOUND SHIFT INTERLOCK SHORTING CALLED HOTLINE TALKED TO LERON HOTLINE LOCK	
18311 WARR. QUICK TEST PIN POINT TEST COMPUTER TEST FIND OUT THAT INNER LOCK SILINOILD SHORTED OUT BURN WIRE REPAIR WIRE AND F	
REPLACED STEERING COLUMN BINDING, ORDERED TRIM PIECE, OK TO DRIVE	
REPLACE COMPLETE STEERING COLUMN	
VERIFIED INTERLOCK ACTUATOR NOT WORKING. RAN PPT TESTS G, AT G12 TO REPLACE ACTUATOR. CHK OASIS PER SSM 15030 SWITCH NOT SER	
TESTED SYSTME. GETTING POWER FROM BRAKE LIGHT SWITCH. SHIFTER INTERLOCK MICROPROCESSORE WAS OPEN. REPLACED STEERING COLU	
INSTALL SPECIAL ORDERD STEERING SHAFT AND MOUNTING ASSY...REMOVED AND TRANSFERD STEERING WHEEL,CLOCK SPRING MULTIF	
CK FOR NOISE, REPLACED STEERING COLUMN, RETEST	
REPLACED THE STEERING COLUMN AND THE SECTOR SHAFT.	
CHECK SHIFT MECHANISM. CHECK LOCK OUT FOR SHIFTER. REMOVE AND REPLACE STEERING COLUMN	
VERIFIED CUST CONCERN DEFECTIVE SHIFTER AND STEERING COLUMN REMOVED AND REPLACED	
1053TWARRT CK OUT SHIFTER OP;STICKS BETWEEN R& PARK RE PLA CE ENTIRE STEERING COLUMN;TRANSFER STEERING WHE EL;SHIFTER;INGN	
TECH 120 DIAG CHECK IGNITION KEY UNABLE TO REMOVE KEY FOUND SOLONIOD NOT RELEASING ON STEERING COLUMN TRACE OUT WIRIN ING C	
35680 VERIFED CUSTOMER CONCERN REMOVED STEERING COLOUM SHROUD AND FOUND THAT THE SHIFT LOCK SOLENOID WAS AT FAULT CE TH	
FOUND SHIFTER INTERLOCK MAKING NOISE IN DASH AREA REMOVE AND DROP DOWN STEERING COLUMN APPLIED ELECTRIC GREASE AND ADJUSE	
CC42 3C529 CC42, BCE DAIG, VERIFY SHIFTER INOP, PINPOINT TEST, ACCESS DRIVERS AIRBAG, ACCESS STEERING WHEEL, ACCESS KNEE P/ WHICI	
PERFORM TRANSMISSION PRELIMINARY INSPECTION. HOOKUP NGS AND RUN SELF TESTS. READ PIDS DATA. RMEOVE AND INSTALL STEERII HEEL	
INSPECTED AND REPLACED STEERING COLUMN.INSTALLED NEW TUMBLER IN IGNITION	
MT3514 TIME TO DIAG NO OR HARD SHIFTING OF TRANS GEARS WHEN MOVING LEVER TO OR FROM THE NEUTRAL TO REVERSE TO PARK POS VE. RE	
TEST PINPOINT TEST REPLACE STEERING COLUMN SOLENOID STICKING REPLACE COLUMN RETEST OK	
VERF CONCERN.REPLACED STEERING COLUMN.VERF PROPER OPERATION	
CK OUT REPLACED STEERING COLUMN DUE TO NOT STAYING IN POSITION	
21514 VERIFY CONCERN REPLACE ENTIRE STEERING COLUMN FOR SHIFTER BINDING TEST DRIVE OK	
INSPECT VERIFY CONCERN AND REPLACED STEERING COLUMN DUE TO TILT WOULD NOT STAY IN PLACE STEERING COLUMN JUST FLOPPED AROU	
519 TEST BRAKE SHIFT INTERLOCK CIRCUITS, TRACE WIRING CIRCUITS THROUGH CONNECTOR C2008, WORKS INTERMITTENTLY, TRACE CO IR STE	
CHECK OUT AND FOUND NECESSARY TO REPLACE STEERING COLUMN AS PER FORD SPECIAL SERVICE MESSAGE FOR KEY CYLINDER	
CHECK OUT AND FOUND NECESSARY TO REPLACE STEERING COLUMN DUE TO NON LOCKING OF WHEEL CAUSED BY INTERNAL FAILURE	
CHECK OUT AND FOUND NECESSARY TO REPLACE STEERING COLUMN; STEERING COLUMN HAD INTERNAL CONCERN WHICH WOULD NOT AL CORR	
CHECKED OUT RAN OASIS AND CALLED HOTLINE REPLACED STEERING COLUMN BINDING IGNITION LOCK LINKAGE	
442 CC 39 DEACTIVATE AIRBAG SYSTEM FOR ACCESS, REPLACE ST EERING COLUMN ASSY MISBUILT AND TRANSFER ALL PA RTS	
18366 INSPECT CABLE & LINKAGE REMOVE & REPLACE COMPLETE STEERING COLHUM TRANSFER ELECTRICAL COMPONETS & STEERING WHL CON	

STEERING COLUMN BINDING. STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
INSPECTED AND FOUND SHIFT COLUMN WOULD NOT LET YOUGO FROM DRIVE TO PART CONTACTED HOTLINE ADVISED TO REPLACE COLUMN
XXXXX LOCK CYLINDER IGNITION REPLACE AND REPIN WHEN REQUIRED
VERIFY CONCERN. CONSULT OASIS FOR SSM OR TSB, NONE. RNI COLUMN TRIM TO INSPECT. DISCONNECT SHIFT CABLE, PROBLEM STILL EXI TEERI
VEH WONT COME OUT OF PARK RPL STEERING COLUMN
9306 VERIFY CONCERN FOUND THE INTER LOCK ON THE COLUM WAS NOT MOVING ALL THE WAY REPLACED STEERING COLUAM RETESTED ALL OI
STEERING COLUMN ASSEMBLY REMOVE AND INSTALL (3524)
17043 42 TEST AND REPLACED STEERING COLUME RETEST OK
14843 COULD NOT VERIFY CONCERN, SHIFTS INTO PARK WITH NORMAL EFFORT MULTIPLE TIMES. NO INFO ON OASIS FOR CONCERN. INSPE HEN F
R&R STEERING COLUMN, REPAIR SHIFTER ROD ARM TO SHIFTER CABLE REFASTEN TO SHAFT & REPAIRED BROKEN PATS CONNECTOR TO RECEIVE
SWITCH INOP REPL COMPLETE STEERING COLUMN
3790 42 VEHICLE WILL NOT SHIFT OUT OF PARK. BRAKE LIGHT WORK NORMALLY. REMOVED STEERING COLUMN COVERS AND CHECKED CIR ED PC
VERIFY NOISE IN STEERING COLUMN WHEN RELEASE BRAKE PEDAL. FOUND NOISE FROM SHIFT LOCKOUT SOLENOID. SOLENOID IS PART OF STEEF
VERIFY NOISE FROM LEFT SIDE OF DASH AREA. RR INSTRUMENT PANEL FOR ACCESS. FOUND NOISE FROM GEARSHIFT LOCK ACTUATOR. PA RT WA
SHIFT DETENT ON STEERING COLUMN HAS EXCESSIVE PLAY TEST DROVE AND VERIFIED VEHICLE POPS OUT OF DRIVE AND INTO NEUTRAL. INSPE
REPLACED STEERING COLUMN, FOR BAD SHIFT INTERLOCK SWITCH. TEST DROVE. OK.
TECH 976288 INSTALLED SO PART FROM PREVIOUS RO. DISARMED SRS SYSTEM, REMOVED LOWER TRIM PANEL AND STEERING COLUMN TRIM.
SHIFTER INTER LOCK ASSY PERFORM TEST AND INSPECT AND REPLACE INTER LOCK ASSY AND RECHECK
PREFORMED DIAG LOCATED DEFECTIVE INTERLOCK SWITCH CALLED FORD ASSISTANCE HAD TO REPLACE COMPLETE COLUMN FOR PROPER OPEF
CHECKED SHIFT OPERATION IN AND OUT OF PARK, VERIFIED HARD TO SHIFT. RAN OASIS, FOUND TSB 02 17 6, UPDATED STEERING REMOVED AND F
CHECK TILT DOES NOT LOCK IN UNDER DASH PANEL SUPPORT BRACKET SCHROUD FOUND NYLON WASHER FOR TILT BROKE APART NECESSARY T
VERIFIED CUSTOMERS CONCERN. REPLACE STEERING COLUMN ASY.
ABS LIGHT COMES AND GOES VERIFY RETRIEVE DTCS ABS DIAG ROAD TEST WHILE MONITORING PID DATA NO REAR SPEED INPUT R&R SENSOR AN
REPLACED STERRING COLUMN, INTERLOCK SWITCH BAD
AS PER HOTLINE RPRT 4AUCG011 STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
VERIFIED CONCERN REMOVED STEERING COLUMN SHROUD REMOVED IGNITION CYLINDER CK ALL OK REMOVED IGNITUION SWITCH CK KEY SENT
MISC M TIME PLEASE VERIFED COMPLAINT PINPIONT TEST BAD LOCK OUT ACTUATO
NOISE IN STEERING COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
RWEPLACE BROKEN SHIFT COULUM
16730 CK SHIFTER BINDING CK OASIS NO MSGS REMV LOWER DASH TRIM AND COLUMN TRIM INSPECT LINKAGE INTERLOCK SOL BINDING ON LINK
ATTEMPTED TO REPAIR, UNABLE TO GET REPLACEMENT CLIP VERFIED CONCERN, TRIED TO ORDER PART, CALLED HOT LINE FOR HELP. REQUESTE
TECH VERIFIED CONCERN CKD OASIS NO HELP FOUND LOCK CYLINDER HAD ALREADY BEEN REPLACED RO 039146 TECH CALLED FORD TECH H DID
REMOVE KICK PANEL AT DRIVERS COLUMN REMOVED AFTER MARKET WIRING REMOVED COLUMN AND TRANSFERRED AND ELECTRICAL PARTS AN
REPLACED STICKING STEERING COLUMN AND ADJ REPL STREEING COLUMN AND ADJ
STEERING COLUMN VERIFY WILL NOT LOCK FOR TILT INSPECT AND REPLACE STEERING COLUMN
PERFORM COLUMN DIAGS. SOLENOID SHORTED. INSTALL UPDATED STEERING COLUMN ASSY.
DIAG TILT WHEEL RR DRIVERS LOWER DASH TRIM PANEL RR COLUMN C OVERS RR STEERING COLUMN RESECURE TILT WHEEL LEVER RETEST
ROADTEST FOR INT VEHICLE NOT COMING OUT OF PARK.HOOK UP WDS SELF TEST PCM CODE P1000 PASS.DATALOGGER TO MONITOR AND RECO
N57 STEERING COLUMN ASSEMBLY REPLACE
ROAD TEST, RATTLE IN STEERING, CHECKED OASIS, SSM 16427, REPLACED LOWER STEERING SHAFT, ROAD TESTED,NOISE STILL THER, REPLACED
29322 CHECK OPERATION OF THE STEERING COLUMN TILT. REMOVE AND REPLACE THE STEERING COLUMN ASSY. RECHECK OPERATION.
6642 ROAD TESTED. SHIFT LEVER STICKS WHEN MOVING THREW GEARS. RAISED VEHCILE. INSPECTED SHIFT CABLES AND LINKAGES. ALL O ICALL
REPLACED SHIFT LEVER
SHIFTER INTERLOCK BROKEN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
EXTRA TIME TO VERIFY CONCERN NOTHAPPENING WHEN FIRST CHECKED THEN VERIFIED LOWRER DASH TRIM CK 4 VOLTAGE AT INTERLOCK REPL
STEERING COLUMN HAS PROBLEM WITH SHIFT INTERLOCK SWITCH REMOVED STEERING COLUMN TO REPLACE ASSY COLUMN AND SWITCH
REPLACED STEERING CLOUMN DUE TO BENT SHIFTING MECHIINSIM AND HAD TO REPLACE BRAKE LIGHT SWITCH DUE TSB 02 05 01 ALSO HAD TO RI
VERIFIED SHIFT LEVER BROKEN. REMOVED TRIM FOR STEERING COLUMN. FOUND INTERLOCK SWITCH STICKING. REPLACED STEERING COLUMN

VERIFIED SELECTOR STICKING WHEN GOING INTO PARK.CHECKED OASIS.NO TSB S OR SSM.REMOVED STEERING COLUM AND TRANSFERED LUID.
DIAG AND ACCESS SHIFT LOCK ACTUATOR AND LUBE RETEST OK (MT)
REPLACED STEERING COLUMN
CONFIRMED COMPLAINT INSPECTED AND FOUND BRAKE SHIFT INTER LOCK NOT WORKING PROPERLY REPLACED STEERING COLUMN THAT IS THE
CK SHIFTER PROBLEM,REM STEERING COLUMN,DISCONNECT BATT & AIR BAG,REM STEERING WHL,DISCONNECT ALL WIRING,INSTALLED NEW COLL
COULDNT GET INTO PARK UNLESS I STEPPED ON BRAKE P01,42,3C529 ST COLUME BINDING INTERNALLY RAN OASIS CALLED HOTLINE AND SAID TO
REPLACED STEERING COLUMN ASY. CONTAINING SHIFT INTERLOCK
REPLACE THE BRAKE SHIFT INTERLOCK SOLENOID ASSY
IGNITION KEY WONT COME OUT RPL COLUMN
DIAGNOSE AND REPLACE INTERLOCK IGNITION SWICH AND COLUMN
TEST DROVE TO CONFIRM..RATTLING NOISE COMING FRON THE SHIFT INTERLOCK SOLENOID..ADJUSTED THE PARK TO NEUTRAL INTERLOCK E KEY
LUBED LOWER STEERING COLUMN BOOT
FLOOR MAT??? VERIFIED CONCERN. FOUND EXCESSIVE LUBE FROM STEERING COLUMN DRIPPING ON MAT. REMOVED STEERING COLUMN. CLEAN
IGNITION TO GO TO THELOCK POSITION WAS BROKEN OFFSWITCH NEXTTO THE SHIFT LEVER THAT ALLOWS THEREMOVED STEERING COLUI . HAD
DIAGNOSTIC TRACED VOLTAGE, CHECKED GROUND TO SHIFT INTERLOCK SOLENOID.MICROPROCESSOR AND SOLENOID ARE ALL ONE UNIT. R & F
FOUND SHIFT INTERLOCK MICROPROCESSOR HAD INTERNAL OPEN CI.ONLY SERVICEABLE BY STEERING COLUMN RPLCMTREPLACED STEERING CC
THE LEVER IS MADE OF TOO SOFT A METAL AND THE ACTUATER WEARS A HOLE INTO LEVER AND IT JAMS RUN ELECTRICLE DIAG TRACE BINI ED HC
VERIFY TILT WHEEL CONCERN, VK AND FOUND TILT MECHANISM NOT OPERATING PROPERLY M TIME TO TRY TO REPAIR TILT MECHANISM, WOULD I

15487 41 3C529 VERFIY SHIFTER NOT GOING INTO PARK FROM DRIVE BCE, PINPOINT TEST, WDS TESTED NO CODES REPLACE COLUMN PER S NG WI
21276 VERIFY COMPLAINT PERFORMED DIAGNOSTIC ROUTINES NEEDS NEW UPDATED STEERING COLUMN ORDERED PART MILEAGE OUT 21277
22003 INSTALLED SOP STEERING COLUMN RETEST OK MILEAGE OUT 22004
VERIFY SHIFTER NO GO INTO PARK INTERMITTANT AND BRAKE SWITCH HOT REPLACE SWITCH RETEST REMOVE STEER COLUMN AND INSPECT REI
VERIFY CONCERN FOUND CONDITION PRESENT PERFORM NECESSARY DIAG FOR CONDITION MAKE NEW KEY AND REPLACE BINDING CYLINC CH BF
VERIFY SHIFTER GETS STUCK CHK OASIS NO SSM OR TSB CHK SHIFT LOCK ACTUATOR GETS STUCK REPLACE STEERING COLUMN SHIFT LOCK ACT
REPLACE SLOPPY STEERING COLUMN ASSEMBLY.
DIAG PINPOINT REPLACE STEERING COLUMN ASSY SHIFT LOCK ACT BINDING RETEST
SHIFT INTERLOCK BINDING CHECK LINKAGE REMOVE COLUMN COVER FOR ACESS TO SHIFTER INTER LOCK.CHECK OPERATION CONTACT HOTLINE
DIAGNOSE KEY WONT COME OUT OF IGNTION WONT GO TO APARK SHIFTER BROKEN REMOVE AND INSTALL STEERING COLUMN REPLAE REPL SHIF
ACTUATOR NOT OPERATING PROPERLY EEC (QUICK TEST) DIAGNOSIS
TENSION ON STEERING COLUMN BRAKE NEEDS RESET ACCESS DASH AND STEERING COLUMN RESET TENSION ON COLUMN BRAKE REINSTALL TR
CHECK TILT COLUMN MECHANISM AND ADJUST AND SECURE
2850 CK OUT REPL STERERING COLUNM TO REPL COLUNM ASY NESS TO TRANSFER T SIG SWITCH,CLOCKSPRING SHIFT LEVER WIRING HARNESS
VERFIED CONCERN,PINPOINT TEST,FOUND BAD SHIFT SOLENOID REPLACED STEERING COLUMN,RETEST OK
CHECK FOR KEY DISASSEMBLE STEERING COLUMN EXTRA TIME FOR AB NORMAL DIAG FOUND REMOVAL INHIBITANT SWITCH BROKEN CALLED
MOVING FORWARD THEN GOING TO PARK WILL NOT GO.PARK PAWL IS BINDING IN TRANS. WILL NEED TO REMOVE PAN POSSIBLY VALVERO4; VE TO
15538 VERIFY COMPLAINT, FOUND VEHICLE WILL NOT GO INTO PARK UNLESS PRESSURE IS LET OFF SHIFTER ONCE VEHICLE IS IN REVERSE. THE S
ESP NINE DAY RENTAL
REPLACE STEERING WHEEL AND STEERING COLUMN
VERIFY PROBLEM, TRY ADJUSTING CABLE. REPLACE WITH NEW CABLE. CHECK SHIFTER. REPLACE WITH NEW ONE. STILL DROPS OFF. DISABL UNTIN
ROAD TEST VERIFY CONCERN REMOVE AND REPLACE STEERING COLUMN BEARINGS RE TEST SLIGHT NOISE STILL REMOVE AND REPLACE STEERII
REPLACED STEERING COLUMN RECHECKED OK
CONFIRMED CONDITION AND PIN POINTED KEY INTERLOCK SOLENOID NOT FUNCTIONING PROPERLY REPLACEMENT OF COLUMN REQUIRED SHIFT
SHIFTER MOVES IN RUN W OUT STEPPING ON BRAKE CHECK AND VERIFIED CHK FUSES OK FROM C270 TO C2008 OK C278 LG RD POWER CHK TERL(
TESTED REPLACED STEERING COLUMN AS PER SSM 15030
23471 3C529 FOUND OUT THAT THERE WAS A CLICKING NOISE COMIN FROM STEERING COLUMN WHILE SET IN REVERSE. DIAG AND FOUND (ACED
VEH NOT SHIFTING INTO PARK REPACLED COLUMN
INSPECT AND VERIFY VEHICLE WILL NOT SHIFT OUT OF PARK , SHIFT LOCK INOP, REMOVE LOWER COLOUM TRIM , TEST SHIFT LOCK ACCUAT IVATE

DEFECTIVE SHIFT INTERLOCK VERIFIED THE CONCERN.RAN OASIS,NO SSMS.PINPOINT TEST AND FOU ND THAT THE SHIFT INTERLOCK IS NO CK,M
SHIFT COLLAR BROKEN,REPLACE STEERING COLUMN
15486 15499 PERFORMED DIAG FOR SHIFT LINKAGE AS PER 307 05 9 IN SHOP MAN. LINKAGE OK,ADJ. OK, CHECKED OASIS 215 382 421 CONT ED ST
16516 CHECKED AND VERIFIED CAN MOVE SHIFTER FROM PARK POSITION, CHECKED FUSE FOR SHIFT INTERLOCK,FOUND OK MANUALY MOV S TO F
CHECK IGNITION OPERATION, CHECK STEERING COLUMN OPERATION, CAN NOT GET COLUMN TO LOCK, REMOVE TRIM PANELS AT STEERING
ACTUATOR IN STEERING COLUM IS STICKING. HAD TO INSTALL NEW STEERING COLUM AND ACTUATOR ASSY.
SHIFT INTERLOCK SOLINOID BINDING DIAG TO SHIFT SOL WORKING TOO SLOW,PART NOT AVAILABLE,NECESSARY TO
8857 PERFORMED A BODY CHASSIS ELECTRICAL TEST AND FOUND SHIFT ACTUATOR TO BE BAD HAD TO REMOVE STEERING WHEEL, AIRBAG UGH A
THUMP GOING OVER BUMPS IN THE STEERING COLUMN RUN OASIS SSM 17276 RAISE ON HOIST HOOK UP CHASSIS EARS, RETEST NOISE 18 ILL HA
VERIFIED NOISE WHEN RELEASING BRAKE, FOUND EXCESSIVE NOISE COMING FROMSHIFT LOCK ACTUATOR ON STEERING COLUMN, PART OI ILE NO
MT TIME TO CHECK IGNITION CYLINDER SYSTEM IGNITION CYLINDER IS OK SHIFT INTERLOCK SYSTEM PREVENTING KEY REMOVAL REMOVED CK ST
STEERING COLUMN BINDING DIAG INSP VERIFIED CONCERN FOUND STEERING COLUMN BAD INOP MT TIME TO REPLACE IT NO SLTS
FAILED STEERING COLUMN AND SWITCH REPLACED Y
CONFIRMED TILT WHEEL NOT LOCKING FOUND COLUMN BROKEN INSIDE LOCATE AND DIAG, NESSASARY TO REMOVE AIR BAG, STEERING WHEEL A
VERIFIED. SHIFT LOCK ACTUATOR BINDING INSIDE THE STEERING COLUMN VERIFIED CONCERN. ORDERED AND REPLACED THE STEERING COLUMN
CUSTOMER HAD SWAPPED FUSE 24 INTO F223 POSITION SO TRUCK COULD MOVE PUT 5 AMP FUSE IN F2.23 FUSE AND CHECKED WIRING UND FUSE
INTO PARK EEC TEST NO GEM CODES ,NO PCM CODES R AND R STERRING COULUME PINPOINT TO TRIM BEZEL SHIFT INTERLOCK SLUG GISH. R ANI
TECH FOUND SHIFT INTERLOCK BINDING AND STICKING TECH R R AND REPLACED FAULTY STEERING COLUMN
INOP BODY CHASSIS ELECTRIAL (BCE) TEST
PERFORM BODY CHASSIS ELECTRICAL TEST RR STEERING COLUMN REPLACE COLUMN AND ROAD TEST
REMOVED AND REPLACED SHIFT COLUMN RECHECK OK
DASH BRACKET TIME TO TRACE TO AND RETORQUE STEERING COLUMN SUPPORT
RAN OASIS AND FOUND NO MESSAGES. FOUND SHIFT INTERLOCK ACTUATOR TO BE MAKING THE NOISE. REPLACED STEERING COLUMN, THA ECH H
REPLACE STEERING COLUMN
25 CHECK SHIFT LEVEL OPERATION STICKS CHECK ALL LINKAGE ALL FREE EXCEPT FOR IN STEERING COLUMN CALL TECH HOT LINE AND WA NOW
REPALCED COULUN
DIAGNOSE AND REPLACE COLUMN
CHECK SHIFT,R I COLUMN COVER TO INSPECT SHIFT LINKAGE,BINDING,NEEDS COULMN.REPLACE COULUMN AND TRANSFER ALL PARTS TO NEW C
SHIFTER BINDING IN COLUMN REPLACE STEERING COLUMN
CHECKED AND FOUND BRAKE SHIFT INTERLOCK SOLENOID NO OPERATIN G. REPLACED STEERING COLUMN AND RECHECKED OK.

REPLACE THE STEERING COLUMN W/ UPDATED UNIT
STICKING.... STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
CHECK SHIFTER HARD TO MOVE INTO PARK. VERIFY CONCERN R&R STEERING COLUMN ASSEMBLY
CANT GET OUT OF PARK LOCK SOLINOID NOT WORKING CALLED HOTLINE SAID TO REPLACE COLUMN 3C529 REPLACE COLUMN CONCERN RESOLVE
8449 42 INOP WAR BASIC. REPLACED STEERING COLUMN. RETEST PASS.
REPLACED STEERING COLUMN.
212 WARRANTY VERIFIED CONCERN.FOUND RATTLE FROM DASH AREA. USED CHASSIS EARS TO BETTER HELP ISOLATE NOISE CONCERN.RE CAUS
SHIFTING TO PARK IS HARD REPACED STEERING COLUME
PULL COMPLETE COULOM SWITCH ALL PARTS REASSEMBLE RETEST OK ELECTRICAL DIAG PINPOINT TEST TO TEST IGNITION SWITCH LOCK INKAG
R AND R KNEE POLSTER TRIM PANEL AND LOWER STERRING COLUMN. SPRING FOR TILT STERRING. CALLED PARTS COULD NOT FIND RING TI ND CL
25872 TEST DROVE VEH. REMOVED STEERING COLUMN TRIM AND INSP. FOUND SHIFTER GATE DEFORMED. REMOVED STEERING COLUMN A O VEH
RI TRIM UNDER STEERING WHEEL TO TIGHTEN NUT FOR TILT WORKS OK
ACCESS AND RPL UPPER COLUMN ASSEMBLY
CHECK VERIFY CONCERN RUN OASIS FOUND SSM15030 ORDER STEERING COLUNM
1 REMOVE AND REPLACE STEERING COLUNM AS PER SSM 15030
REPLACE STEERING COLUMN ASSY
5103 TEST SHIFTER INTERLOCK CIRCUIT FOR PROPER GROUND AND POWER CIRCUITS FOUND OPEN CIRCUIT IN INTERLOCK SOLIEND INSTALL NE

CHECK OPERSTION, CHECK AND ADJUST SHIFT INTERLOCK OPERATION CHECK FORD ONLINE FOR ANY UPDATE MESSAGES ,NONE FOUND. R WITH
CHECKED FOR CONCERN,FOUND INTERLOCK STICKING FOUND OUT INTERLOCK COMES AS WHOLE COLUMN ORDERED NEW COLUMN.PUT TI D LOV
REPLACXED STEERING COLUMN
REPLACE STEERING COLUMN ASSEMBLY
SHIFT LOCK NOT RELEASING REPLACED STEERING COLUMN TEST SYSTEM FOR CODE FOUND BAD STEERING COLUMN

REMOVED TRANSMISSION PAN INSPECT INTERNAL MANUAL VALVE AND DETENTS REALIGNED STILL TIGHT FROM DRIVE TO NEUTRAL REMOVI TTEN
STICKY COLUUM R&R STEERING COLUMEM ASSY.REPLACE HOUSING & SHIFTER HANDLE.. TRANSFER IGN KEY & TUMBLER,PATS DECODER,ETC,AD
PERFORMED IGNITION SWITCH PINPOINT TEST DCL/MONITOR TESTED SENSOR PIDS INSTALLED NEW STEERING COLUMN REQUEST ACTUAL TIME N
N57 STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
IGNITON CYLINDER BINDS UP DEACTIVATE AIR BAG SYSTEM R&R STEERING COLUMN BUILD IGNITION CYLINDER R&R KEY CYLINDER REACTIVATE AI
REPLACED CLOCK SPRING ASSEMBLY
CHECK FOR TRANS IS HARD TO GET OUT OF PARK EEC TEST SYSTEMS PASS MONATER BOO PID IS OK CAN HER NOISE FROM ACUATOR AND WITCH
3C529 N57 42 VERIFIED STEERING COLUMN TILT INOP. REMOVED COLUMN COVERS TO INSPECT, UNABLE TO REPAIR COLUMN TILT, REPLACED STE
EXTENDED TESTING TO DUPLICATE CONCERN, PARTIAL TEAR DOWN OF COLUMN FOUND INTERNAL SHIFT INTERLOCK BINDING CK SHIFTER C NCER
BROKEN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL REFUND FOR RENTAL WHILE VEHICLE BEING REPAIRED
INSP LOOSE TRIM SECURE TRIM AROUND IGN LOCK AND GEAR LEVER
W P 69 BINDING 3C529 OASIS CONTACT NO 313 310 789 CHECKED OUT SHIFTER WOULD BIND AND NOT GO INTO PARK 2 OUT OF 3 TIMES COLUND SH
BINDING INOP REPLACE SPECIAL ORDERED STEERING COLUMN AND RETEST OK
VERIFIED CATCH IN SHIFT LEVER. BINDING UP. SHIFT INTERLOCK IS NOT PULLING ALL THE WAY BACK. UNABLE TO SERVICE SEPARATE ACCO D.
SHIFT INTERLOCK SOLENOID BODY CHASSIS ELECTRIAL (BCE) TEST
12300 SOP STEERING COLUMN REMOVE AND INSTALL STEERING COLUMN ROADTEST CHECK ALL ACCESORYS OK AT THIS TIME SSM FOR THIS PRO
3L2Z 3C529 BA P01 42. ROAD TESTED, VERIFIED CONCERN, SHIFTER LEVER HANGING UP, R&R TRIN FROM STEERING COLUMN TO INSPECT, R ING), I
VEH JAMS UP WHEN GOING INTO PARK ACCESS STRNG COLUMN,M TO REPL STRNG SWITCHES
VERFIY CONCERN OF HARD GOING INTO PARK,REPLACED STEERING COLUMN
STICKY BRAKE SHIFT INTERLOCK SOLONOID RT VERIFIED CONC DICONNECTED SHIFTER CABLE AT TRANS CONC STILL EVIDENT REMOVE KNEE BO
DIAGNOSE AND REPAIR SHIFTER REPLACE COLUMN ASM
DIAG NIOSE IN STERRING REMOVE AND REPLACE UPPER STERRING COLUMN ROAD TEST DIAG NOISE IN STERRING REMOVE AND REPLACE LOWER
VERIFIED CONCERN PERFORMED DIAGNOSIS CHECKED BRAKE SWITCH OK PINPOINT TEST AS PER SHOP MANUAL FOUND CONNECTOR NOT S PART
M TO REMOVE BROKEN BOLTS TECH TESTED AND REPLACED COLUMN AND SHIFT INDICATOR AND RETESTED
ROAD TESTED VEHICLE FOR OPERATION. INSPECTED STEERING COLUMN. FOUND BOLT LOOSENED. RETORQUED STEERING COLUMN BOLT
15000 STEERING COLUMN BRAKE SHIFT INTERLOCK ASSEMBLY DID NOT VERIFY CONCERN AT FIRST BUT SERVICE ADVISOR DID CHKD OASIS PLACE
REPLACE STEERING COLUMN ASSEMBLY
STEERING COLOUM TAB BROKE STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
BCE TEST PASS, PNPNT TEST SHFT INTERLOCK LAZY, RPLC TILT COLUMN, RETEST ORADTEST
ROAD TEST WITH CHASIS EAR,RUBBING NOISE COMING FROM UPPER PART OF COLUMN. REPLACE STEERING COLUMN ASSY. ROAD TEST,OK.

VERIFIED CONCERN DIAGNOSED FOUND A BAD SHIFT INTERLOCK SWITCH REPLACED STEERING COLUMN AND SWITCHES RETESTED WORKING F
. CHECKED FOUND SHIFTER LOCKOUT SOLENOID LOUDER THAN NORMAL HAD TO REPLACE COMPLETE STEERING COLUMN TO CORRECT PROBLEM
VERIFIED CONCERN, EEC TEST, NO CODES, REMOVED IGNTION LOCK CYLINDER, PLUNGER ON STEERIGN COLUMN STICKING, MUST REPLACE REPLA
DEFECTIVE STEERING COLUMN AND TRANSMISSION SHIFTER ..... TEST TRANSMISSION SHIFTER OPERATION REPLACE STEERING COLUMN AND TF
DIAGNOSED AND CONFIRMNED CONCERN VEICHLE WILL NOT COME OUT OF PARK SHIFT INNER LOCK INOP REMOVED UPPER STEERING COLUMN
VERIFIED CONCERN ON PREVIUOS RO REPLACED STEERING COLOUMN SHIFT INTER LOCK
VERIFY CONCERN, FOUND PIVOT BOLT LOOSE, HAD TO REMOVE AND INSTALL KNEE BOLSTER AND COLUMN TRIM FOR ACCESS
VERIFY CONCERN, CHECK OUT SHIFT CABLE, OK, CHECK STEERING COLUMN CIRCUIT, FOUND SOLENOID ON SHAFT ABD, HAVE TO GET AS AN ASY,
TEST DROVE VERIFIED CONCERN ONCE COULD NOT GET IT TO HAPPEN AGAIN RAN OASIS HAD SECOND TECH W ATTEMPTED TO DUPLICATE AT IT
VERFIED CONCERN PERFORMED PINPOINT REPLACED DRIVERS AIR BAG MODULE
WORN BUSHINGS STEERING COLUMN ASSEMBLY REMOVE AND INSTALL

SHIFT INTERLOCK SOLONOID NOT WORKING CORRECTLY. UNABLE TO BUY SOLONID SEPPERATLY. CONTACTED HOTLINE AND WAS TOLD TO
CUSTOMERS COMPLAINT COULD ONLY BE IN COLUMN, DUE TO IGNITION LOCK CYLINDER WAS REPLACED. REMOVED AND REPLACED STEERING CO
REPLACE STEERING COLUMN FOR BINDING CONDITION
ADD ON BY AT CK AND DIAG PINPOINT COMPLETE DIAG REPLACED STEERING COLUMN RETEST OK
NOISY NOISE FROM SHIFT SOLENOID REPL UPPER STEERING COLUMN
R & R STEERING COLUMN ASSY
CHECK SHIFTER OPERATION VERIFY CONCERN INTERMITANTLY STICKING WILL NOT SHIFT INTO OR OUT OF PARK DIAGNOS SYSTEM FOUND ERATI
INSTALL THE UPDATED STEERING COLUMN, SOLENOIDS STICKING
X PERFORM SSM
42 H20 3C529 CHECKED FOR NOISE WHEN DEPRESSING BRAKE FOUND THAT SHIFT INTER LOCK MAKING NOISE NECC TO REMOVE SHIFT INTI RETE
VERIFIED KEY WILL NOT COME OUT OF IGNITION RUN DIAG FOR ANY PATS CODESREMOVED STEERING COLUMN COVERS AND FOUND BROKE VED S
13484 INSP COLUMN OPERATION AND INSTALLED NEW COLUMN CC 42 REQUEST EXTRA TIME NECASSARY TO TRANSFER ALL HARDWARE AND HAF
19693 VERIFIED CONCERN FOUND FAULTY STEERING COLUMN REMOVED AND REPLACED STEERING COLUMN
10738 REMOVED LOWER PANEL TO INSPECT,REMOVED LOWERED DOWN COULUM NEEDS COULUM SIDE LOCKS ARE CRACKED AND SRE PAF NTS, F
25067 ROAD TESTED. VERIFIED CONCERN. GEAR LEVER STICKS AT TIMES WHEN SHIFTING. RAISED VEHICLE. INSPECTED LINKAGE AT TRANS TO INS
REPLACE STEER COLUM PER HOTLINE. CHECK CONCERN. CALL HOTLINE. R&R STEERING COLUMN ASSEMBLY. ROAD TEST,OK, REPORT #4DEBU00
FC D4 CC N58 BASE#3C529 CHECKED AND REPLACED STEERING COLUMN ASSEMBLY
RR COMPLETE STEERING COLUNM REPLACED COLUNME TRANSFER ALL NEC PARTS REINSTALL
CHECKED OUT, REMOVED SHIFT CABLE, STILL WOULDN'T WORK, R&I AIR BAG.STG WHEEL, REPLACED STEERING COLUMN.
SHIFT INTERLOCK IN CLOUMN DEFECTIVE CK AND VERIFY AND REPLACE SHIFTER COLUMN
1315 VERIFY IGNITION KEY WILL NOT COME OUT OF IGNITION,REMOVE COLUMN COVERS TO CK KEY SWITCH PERFORM COMPONENT TEST C LOWE
NOTE SPOKE WITH TENESHA AT WARRANTY HOTLINE ON 6 25 04 AT 1:55PM. SHE STATED THAT SINCE THE PROE RTS T
. REPLACED STEERING COLUMN AND IGNITION CYLINDER
BRAKE SHIFT INTERLOCK ACTUATOR STEERING COLUMN ASSEMBLY SSM 15030
DIAG. FOUND INTERLOCK BINDING. NOT SERVICED SEPARATELY. REPL COLUMN ASSY.
TEST DROVE AND VERIFIED CONCERN REMOVED COLUMN TRIM AND TEST DROVE FOUND SHIFT INTERLOCK PIN RATTLEING REPALCED STEERING
31425 42 3.0 INSP AN CONFERMED PROBLEM WAS NOT DUE TO BRAKE LIGHT PROBLEM.AFTER REPAIR ON BRAKE LIGHTS WAS COMPLETE PI ED AN
IN TRANSIT VEHICLE WILL NOT SHIFT OUT OF PARK TEST SHIFT INTERLOCK SOLONOID AND REPLACE SCOLUMN
P01 42 DIAGNOSE AND REPLACE STEERING COLUMN SHIFT TUBE, RECHECK OK
REPLACE STEERING COLUMN ASSY
NGS TEST, PINPOINT TEST, VERIFY CONCERN. CHECK SHIFT INTERLOCK, GOOD. REMOVE STEERING COLUMN. XFER COMPONENTS TO COLUMN. RE
STEERING COLUMN IS LOOSE TILT WHEEL WILL NOT STAY PUT. R AND R STEERING COLUMN COVERS AND LOWER DASH TRIM, INSPECTED, F ALLEI
REPLACE STEERING COLUMN ASSY SHIFTER ACTUATOR STICKING.
TYPE 1, CUST. P01, COND 42, CAUSAL LINE 1, M TIME FOR AB NORMAL DIAG. ON SHIFT COLUMN TRACE SYSTEM TO INOP SHIFT INTERLOCK SOLENC
FAILED STEERING COLUMN REPLACE
CCC P01 INSTALL STEERING COLUMN DUE TO STICKING
HKD IGNITION SYSTEM BUILT & RPLCD KEY CYLINDER & STEERING COLUMN
STEERING COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
CC 41 CP 3C529 R&R RADIO AND TRIM BEZELS TO REPLACE STEERING COLUMN ASSEMBLY, BINDING WHEN SHIFTING INTO OR OUT OF PARK. RETE
SLACK IN STEERING COLUMN & LOWER SHAFT REPLACED STEERING COLUMN & LOWER STEERING SHAFT.
A REPLACE STEERING COLUMN ASSY
VERIFIED CONCERN OF NOISE COMING FROM STEERING COLUMN CHECKED OASIS FOR MESSAGES NOE PRESENT CALLED HOT LINE WAS TOLD TO
REMOVED AND REPLACED STEERING COLUMN ASSEMBLY PER TECH LINE
STICKING SHIFTER INTERLOCK. DEACTIVATE AIR BAG SYSTEM. R&I STEERING WHEEL. R&I STEERING COLUMN. M TIME IS LBR TO TRANSFER ERATI
ROAD TEST AND DIAG ALL FRONT SUSPENSION AND INSPECT UPPER AND LOWER STEERING SHAFTS AND DEACTIVATE AIR BAGS AND
HARD TO SHIFT, COLUMN IS BINDING. REPLACED THE STEERING COLUMN ASSEMBLY AND RETEST OK.
REPLACED AND REPINNED IGNITION SWITCH. REPLACED COLUMN ASSEMBLY.
REPLACED STEERING COLUMN ASSEMBLY. 02 13 1344 1644.

INTERLOCK FAULTY STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
ELECTRONIC TRANS DIAGNOSIS PINPOINT TESTS REPL ACED STEERING COLUMN & RETESTED (SHIFT INTERLOCK
1 399 INSTALLED SPECIAL ORDER PART, ACCESSED DRIVER S AIR BAG HOOKED UP AIR BAG SIMULATORS, ACCESSED STEERING WHEEL, REPLAC
PERFORM GEM TESTS, PINPOINT TEST NO CODES. REPLACE STEERING COLUMN, SHIFT INTERLOCK SOLENO ID JAMMING INTERMITTENTNLY
11935 KEY WILL NOT COME OUT OF IGN INSPECT FOUND IGN KEY WILL NOT TURN BACK TO OFF POSTION WILL NOT ALLOW KEY TO COME OUT LOC
IGNITION KEY HARD TO PUT IN OR TUSTEERING COLUMN ASSEMBLY REMOVE AND INSTALL
1 REPLACED STEERING COLUMN FOUND SHIFT SOLONOID INOP
KEY WILL NOT COME OUT OF IGNITIONKEY RELEASE SWITCH BROKEN, REPLACED COMPLETE STEERING COLUMN
3048 LOOSE BINDING CK AND VERIFY. DIAG STEERING SYSTEM (ABNORMAL DIAG). STARTING W LOWER STEERING SHAFT, CK LOO SENESS . TSBS
VERIFIED CONCERN NOISE DIAG STEERING COLUMN SHAFT HOUSING MAKING POPPING NOISE DISASSEMBLED AIR BAG SYSTEM PER MANUAL REPI
1 FOUND SHIFT LOCK ACTUATOR SHORTED FOUND FUSE BOX WITH INTERNAL SHORT REPLACE COLUMN, FUSE BOX AND COVERS AS NEEDED
STEERING COLUMN DIAG,PINPOINT,REPLACE STEERING COLUMN ASSY,REINSTALL, RETEST,TEST DRIVE OK
DIAG AND REPLACE STEERING COLOUM OUT OF ADJUSTMENT
N REPLACED SHIFTER LOCK ACTUATOR
PERFORMED BCE TEST AND PIN POINT TEST. TRACED CONCERN TO SHIFT INTERLOCK SOLENOID. REPLACED STEERING COLUMN ASSEMBLY.
SHIFTER IS HARD STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
REPLACED STEERING COLUMN
REPLACE STEERING COLUMN ASSY.
TEST & REPLACE UPPER STEERING COLUMN, RETEST OK
SHIFT INTERLAOCK SOLENOID INOP VERIFIED CONCERN. DASH SWITCH DIAG. FOUND SHIFT INTERLOCL SOLENOID NOT FUNCTIONING. MUST REPL
W REPOSITION WIRES AT LOWER COLUMN
REPLACED STEERING COLUMN ASSY AND STEERING WHEEL, DELAY IN SUBMISSION DUE TO PART NOT AVAILABLE, REPAIR COMPLETED ON RO 166
20305 42 W VERIFY CONCERN PIN POINT TEST BCE DIAG CHECK RESISTANCE OF SHIFT LOCK SOLENOID OK REMOVE TRIM PANELS TO CHECK MN CH
DIAGNOSED VERIFIED LOWER STEERING SHAFT AND COLUMN BINDING REPLACED COLUMN ASSEMBLY AND LOWER STEERING SHAFT
ROAD TEST VERIFIED COMPLAINT. STEERING COLUMN BINDS. DEACTIVATE AIR BAG SYS. DISCONNECT BATT. R&R STEERING COLUMN AN T. RO
STEERING COLUMN ASSEMBLY REMOVE AND INSTALL (3524)
6353 CP 3C529 CC 33 PART REF. 5507 13300D 0.4 3600A 0.7 14200A 0.4 3514A 1.2 2.7 STEERING COLUNM LOOSE AT LOWER COLUMN BEARING UNCT
INSPECT AND FOUND SHIFTER INTERLOCK NOISY. ONLY AVAILABLE IN COLUMN. REPLACE COLUMN
NA DRILL OUT CYLINDER ASSEMBLY REPLACED STEERING COLUMN ASSEMBLY REPL
VERIFY,PERFORMED TEST, FOUND SHIFT INTERLOCK FAULTY.R&I STEERING COLOUM ,STEERING WHEEL,CLOCK SPRING,TRANSFERED CONPONI
SOLENOID FAILURE. REMOVE AND REPLACE STEERIG COLUMN.
1778 IGN KEY WILL NOT COME OUT OF IGN CYLINDER INSPECT FOUND IGN ACTUATOR WILL NOT RELEASE TO ALLOW KEY TO COME BACK AN PART
3290 VEHICLE WONT GO PAST REVERSE. ROAD TEST, ELECTRANS TEST, FOUND SHIFTER HOUSING AT COLUMN BINDI NG, REPLACE STEERING COL
DIAG AND VERIFY R AND I STEERING COLUMN COVER FOUND SHIFT INTERLOCK ACT BAD PER SERVICE MANUAL REPL COLUMN ASSY
REPLACE SHIFTER COLUMN
FAULTY STEERING COLUMN REPLACE STEERING COLUMN ASSY.
MT TO TAKE OUT STEERING WHEEL, CLOCK SPRING, MULTIFUNCTION SWITCH, AND WIRE LOOM TO REPLACE STEERING COLUMN ASSEMBLY RELE
7059 CK. UNIT REPLACED STEERING COL. ASSY. AS PER HOTLINE INSTRUCTION REP.NO. 3HGHE004
STEERING COLUMN INOP STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
COULD NOT REMOVE KEY FROM LOCK CYLINDER. REMOVED COLUMN, FOUND LOCK CYLINDER SOLENOID BROKEN. INSTALLED NEW COLUMN, WOR
CHECKED INTERLOCK SWITCH, FOUND SWITCH TO BE INTERMITTENTLY GETTING STUCK. INSTALLED NEW STEERING COLUMN. KEY WONT COME
INTERNAL BIND REPLACED STEERING COLUMN ASSY.
REPLACED SHIFT INTERLOCK SOLENOID
REMOVED STEERING COULMN AND REPLACED NEW ASSY ROADTESTED AND RECHECKED GOOD
CCM01 DIAG, REPLACED STEERING COLUMN
STEERING COLUMN BINDING SHIFT LEVER, HIGH EFFORT SHIFTING FROM REV TO PARK, R AND REPLACE STEERING COLUMN ASSY TO CORRECT RE
VERIFIED CONCERN INSPECTED LINKAGE FOUND FAULTYSHIFT INTERLOCK ASSEMBLY RESTRICTED REPLACEDSTERRING COLUMN ASSEMBLY VER
VERIFIED CONCERN, NECESSARY TO REPLACE STEERING COLUMN AND TRANSFER PARTS

41 STICKING REPLACED STEERING COLUMN ASSEMBLY
FOUND NOISE COMING FROM CLOCKSPRING AREA RPL AIRBAG CLOCK SPRING. TESTED NOISE STILL THERE. RPL STEERING COLUMN ASSY AND
TEST.REPLACED STEERING COLUMN.ERRATRIC OPERATION OF SHIFT INTERLOCK ASSY.
SHIFT INTERLOCK SOLENOID INOP RR STEERING COLUMN, WHEEL, MULTI SWITCH AND REPL NEW UNIT
SHIFT INTERLOCK DAMAGED ELECTRONIC TRANS DIAG RUN PINPOINT TEST PRESSURE TEST FOUND SHIFT INTERLOCK DAMAGED ONLY COMES W
CK SHIFT LOCK ATUATOR HANGING UP RR COLUMN ASSEMBLY ROAD TEST KW
BCE DIAG,PP TESTS,DEACTIVATE AIRBAG,REPL STEERING COLUMN,RETEST
CK AND RUN OASIS NO SSM CK AND REPLACE STEERING COLUMN ASSY AND RECK TURNS FREELY CCCL13,CC42,3C529
3C524 42 VERIFY CONCERN, DIAG, SHIFT INTERLOCK INTERMIT INOP,. REPL STEERING COLUMN ASSY. REASS AND RETEST. OK AT THIS TIME.
PERFORMED DIAG FOUND SHIFT LEVER TO APPEAR TO BE BINDING ON SHIFT INTERLOCK SWITCH,SWITCH NOT AVAILABLE SEPERATELY REMOVE A
DIAG AND REPLACED COLUMN
24669 BODY CHASIS DIAG REPLACE STEERING COLUMN RETEST
28 PERFORM PINPOINT TEST,REPLACE FUSE,RETEST FUSE BLEW AGAIN,PERFORM PINPOINT TEST REPLACE STEERING COLOMN ASSY.
R AND REPLACE STEERING COLUMN ASSY FOR BINDING LOCK ACTUATOR, BINDING WHEN SHIFTING FROM REV TO PARK RETEST OK
21256 LEVER STICKS VERIFIED CONCERN FOUND LEVER SAFETY SOLENOID FO SHIFTER STICKS AND BINDS NECC TO REPL STRG COLUMN A ED RE
PERFORM DIAG, ELECTRICAL TEST. PINPOINT TEST, R&R STEERING COLUMN, REPLACE AND RETEST. 1
COLUMN SHIFT INTERLOC SWITCH MT TO REPLACE SHIFT INTERLOC SWITCH BCE TEST , PINPOINT, R&I STEERING COLUMN AND DISAMBLE REPLAC
20532 PIN POINT TESTED RR STRERRING SHROUD RR TILT LEVER RR MULTI FUNCTION SWITCH RR AIR BAG RR STEERING WHEEL RR BOTTOI ASSEI
CCP55 DUPLICATED CONCERN, REPLACED STEERING COLUMN PER SSM 15030
DIAG SHIFTER AND REPLACED STEERING COLUMN AND DIAG RATTLE AN D NEUTRALIZED EXHAUST, ROAD TEST, REPOSTIONED TRANS MOUN , REPO
TECH INSPECTED, FOUND NOISE IN STEERING COLUMN, REPLACEMENT PART IS PART OF ASSEMBLY (STEERING COLUMN) TECH REPLACED STEER
RPL SHIFTER & STEERING COLUMN GEAR SELECTOR LEVER REPLACE
INOP SHIFTER STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
STICKING REPLACE STERING SHAFT INTERMEDIATE AND LOWER
FAULTY STEERING COLUMN W SHIFTER INTERLOCK SYS. TECH#175.CC42,CP3C529. PERFORM SW TEST ON IGN SW & SHIFTER INTERLOCK SYS.STEI
NGS TEST NO CODES; STEERING COLUMN TEST; PINPOINT TEST SHIFT LOCK ACTUATOR IS STICKING; REMOVED AND RE INSTALLED LOWEI FER P
20984 2.5 DIAG AIR BAG LIGHT ON CODE #B2293 DRIVERS SIDE #14056D (0.7) REMOVE AND INSTALL MODULE CLOCK SPRING (0.6) FOUND STEERING
CP 3Z719 C 41.SHIFT INTERLOCK SOLENOID IS BINDING DISARM AIR BAG SYSTEM.REPLACED STEERING COLUMN
VERIFY CONCENR. SHIFT INTERLOCK STICKING, REMOVE STEERING CO LUMN, REPLACE SHIFT INTERLOCK 1
CHECK AND REPLACE STEERING COLUMN TO REPAIR SHIFTER.
1 FOUND STEERING COLMN LOCK ACTUATOR BAD R&R STEERING COLMN AND SHIFT ACTUATOR
CHECKED SHIFT OPERATION CHECKED FUSES # F2.23 AND FUSE F2.26 FUSES OK RAN ON OASIS PERFORMED CIRCUIT TEST ON WIRE
BINDS REPLACE STEERING COLUMN SHIFT TUBE
STEERING COLUMN STEERING COLUMN SWITCH ASSEMBLIES DIAGNOSIS
DIAG AND R&R STEERING COLUMN AND TRANSFER ALL PARTS TO NEWSHAFT LOOSE AND BINDING
12573 STEERING COLUMN RUN NGS TEST PINPOINT TEST REPLACE STEERING COLUMN ASSEMBLY WITH UPDATED COLUMN INCLUDE R&R ALL ELE
VERIFIED STEERING WHEEL LEVER WILL NOT LOCK. IN SPECT AND FOUND TILT LOCK BROKEN. REPLACED STEE RING COLUMN ASSEMBLY AND VE
524 LOWER BEARING CAME APART, SHAFT DAMAGED REMOVE STEERING COLUMN AND TRANSFER PARTS. INSTALL NEW COLUMN AND RETEST, O
CONCERN HARD TO SHIFT INTO PARK FROM ANY GEAR. BODY CHASSIS ELECTRICAL PIN POINT DIAG. DIAG REVEALED SHIFT LOCK ACUUATOR
20565 STEERING COULUMN TILT ADJUSTER BOLT LOOSE 33 3C529 RR TRIM COVER TIGHTEN ADJUSTER NUT
REMOVE STEERING WHEEL FOR ACCESS, R&R STEERING COLUMN (BIDNING OPEN CKT IN SHIFT SOLENOID)
13 TEST KEY IGNITION WARNING SYSTEM, REMOVE STEERING COLUMN COVERS, CALLED HOTLINE ADVISED BY HOTLINE TO REPLACE IGNITI STUCI
WIRES HANGING DOWN WIRES REROUTE WIRE OVER STRG COLUMN MAIN HARNESS WIRES MT NO LABOR TIME AVA ILABLE
STEERING WHEEL WILL NOT LOCK. STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
COMING APART STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
LOCK ACTUATOR WILL NOT DISENGAGE
REPLACED COLUMN ASSEMBLY.
VERFIED COMPLAINT INSPECT VEHICLE NOT SECURE NESC TO REPALCE COLOMN AND RETEST AFTER REPAIR

BINDING AND NOISEY STEERING COLUMN ASSEMBLY REMOVE AND REPLACE
NOISE FROM COLUMN ANDBINDING STEERING COLUMN A SSEMBLY REMOVE AND REPLACED COLUMN AND SHAFT
CHECK WON'T COME OUT OF PARK. FOUND SHIFT LOCK ACTURATOR BAD REPLACE COMPLETE STEERING COLUMN REPLACE ACTUATOR RETE
VERIFIED CUSTOMER CONCERN AND TEST STEERING COLUMN SHIFT ACTUATOR AND FOUND IT WAS BINDING UP AND CAUSING A CLICK BUZ. TUAT(
NOISEY STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
REPLACED STEERING COLUMN PER TSB
CPART# 3C529 CCODE 01 PERF TRANS DIAG ISOLATE ROOT CAUSE TO SHIFT INTERLOCK SOLON OID PART OF STG CLMN ASSY,NECESSARY TO REI
1 VERIFIED CONCERN PERFOMRED PINPOINT TEST FOUND SHIFT INTERLOCK SWITCH FAILED REPLACED FAILED STEERING SOLOMN AS
SHIFTER INTERLOCK BROKEN STEERING COLUMN ASSEMBLY REPLACE
REPL THE COLUMN ASSY CLOSED BY WPI
DIAGNOISE TRANS EXTERNAL CONTROLS, PIN POINT TEST G SHIFT INTERLOCK STICKING. REPLACED STEERING COLUMN RETEST
KEY CYL, AIRBAG , CLOCKSPRING, PATS ETS, RETESTED.
REMOVED STEERING COLUMN TRIM FOUND SHIFT INTERLOCK CLIPS BROKEN REMOVED AIR BAG REMOVED STEERING WHEEL AND CLOCK
INSPECT AND FOUND SHIFT LOCK SOLONOID IS STICKING, FOUND BAD SOLONOID AFTER PID MONITOR WITH WDS. REMOVE STEERING COLUI OLUM

VERIFED COMPLAINT CHECKED BROAD CAST MESSAGES NONE NOTHING IN OASIS, WENT ON LINE, FOUND TALK ABOUT CONCERN , FOUND INTERN
REPLACED COLUMN ASSEMBLY, DUE TO TILT STEERING COLUMN WILL NOT STAY LOCKED
CHECKED CONCERN, FOUND GEAR SHIFT POSITION SENSOR HAD COME OUT OF RETAINER IN STEERING COLUMN. THIS SHORTED OUT IGNIT &R ST
22281 CHECKED FOR CONCERN AND DID VERIFY REMOVED STEERING WHEEL COVER TO GAIN ACCESS TO THE IGN SWITCH, REMOVED IGN. COME
15083 SHIFT LEVER HOUSING IS BROKEN CC 01 REPL COLUMN PART#3L2Z 3C529 BA
INTERLOCK SOLENOID VERIFEID THE COMPLAINT LET VEHICLE SIT FOR A WHILE IN PARKING LOT VERIFIED THAT IS WAS HARD TO GET
57 42 W PERFORM STEERING COLUMN DIAG,PINPOINT TESTS, OKAY.PER SERVICE MGR REPLACE STEERING COLUMN ASSEMBLY AND TRANSFER A
8974 INSPECT AND REPLACE STEEARING COLUM ACCEMBLEY AND TRANSPHER ALL WIRRING AND SWITCHES AND TEST WTY 01 587
11718 SHIFT INTERLOCK BINDING DIAG AND ORDERED STEERING COLUME REPLACED STEERING COLUME ASSEMBLY CHECKED OPERATION OK
1577 BINDING CC41 3514A 14056D D6 2.7 CK VERIFY CLICKING SOUND REMOVE STTERING WHEEL TO REMOVE CLOCK SPRING REINSTALL WH PEING
REMOVED THE STEERING WHEEL AND AIR BAG ASSY, REMOVED AND REPLACED THE STEERING COLUMN ASSY
REMOVED STEERING COLUMN TO REPLACE BROKEN SHIFTER
REPLACE STRG COLUMN
STEERING COLUMN STEERING COLUMN ASSEMBLY REPLACE
16725 STICKING IGN CYL, COLUMN INTERNAL DEFECT CHECKED AND VERIFIED CONCERN. REMOVED IGNITION CYLINDER. REKEYED NEW CY ON, KI
VERIFY CONCERN INTERMINENT FUNCTION OF SHIFTER INTERLOCK CKED BRALE LIGHT CIRCUIT OK REPLACED SHIFTER LOCK ASSY VERIFY REPAI
23294 FOUND THAT PARK RELEASE SOLNIOD IN STEERING COLUME WAS BAD.REPLACED SOLNIOD
REPLACED THE STEERING COLUMN ASSY REPLACED THE LOWER SECTOR SHAFT ASSY.
3C529 CODE 42 TECH 1009 TEST STEERING COLUMN SWITCHES, FOUND INOPERATIVE TILT MECHANISM, REMOVE STEERING COLUMN, TRANSFER C
FAULTY COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
193 POPING W VERFIY CONCERN FOUND BEARING TO HAVE WENT OUT IN COLUMN AND HAD DROP SOME AND WAS MAKING NOISE AND WAS UMN F
193 NOISE W VERFIY CONCERN FOUND NEW COLUMN TO BE BAD REMOVED STREEING WHEEL AIR BAD LOWER PANEL REMOVED ALL CONN F MN IN
CC28 3C529 VERIFY THE KEY STUCK REMOVE COLUMN SHROUD INSPECT BCE DIAG FOUND THE SHIFTER LEVER TRIGGER SWITCH HAD COME T OK
33272 42 W CHECK SHIFTER INTERLOCK,INTERLOCK SWITCH INOP, CHECK POWER FROM BRAKE SWITCH,OK.DEACTIVATE AIR BAG SYSTEM.F TERLC
REPLACE STEERING COLUMN
VERIFIED CONCERN,ELECTRICAL SYSTEM DIAG,PINPOINT TEST SHIFTER INTERLOCK ACTUATOR BAD,REPLACED STEERING COLUMN
LOCK OUT STRIKER WAS STICKING & CATCH ON LEVER REMOVED AIR BAG,STEERING WHEEL,COVERS,LOWER COWL PANEL REMOVED CABLE UM &
CHECK FOR HARD TO SHIFT OUT OF PARK AND VERIFIED THE CONCERN INSPECTED AND FOUND THE SHIFT LOCK ACTUATOR STICKY AND REPLACE
INSP VEH AND VERIFIED CONCERN REMOVED STEER CHECKED FUSES AND FUSES OK REMOVED STEER COLUMN TRIM AND CHECKED POW RING
INSPECT AND REPLACE STEERING COLUMN
REPLACE STEERING COLUMN ASSEMBLY SLOCK IN TILT COUPLING
TEST AND REPLACED COLUMN
TESTED AND FOUND IGNITION CYLINDER BAD, REKEYED REPLACEMENT CYLINDERINSPECTED STEERING COLUMN AND FOUND IT BINDING. REMOVE

CHECKED OUT AND VERIFY THE COMPLAINT, CHEKCED O ASIS FOR TECH BULLETINS, NONE LISTED. CALLED TE CH HOTLINE RPT 4ALDY009 R. DIS

CUST STATE THAT THE STEERING COLUMN HAS A THUMPING NOISE WHILE TURNINGCAUSE: NVH DIAGNOSIS AIRBAG DEACTIVATION R R AIRE ACT C
NOISY STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
BROKEN SWITCH ON STEERING REPLACE STEERING COLUMN
REPLACED STEERING COLUMN
INTER LOCK STRIKER WOULD STICK & CHATCH GOING IN TO REV SSM#15030 REPLACE STEERING COL. TRASFER ALL SWITCHS STEERING WHEEL& A
BINDING WOULDNT GO INTO PARK REPLACED COLUMN
1011 CHECK AND INSPECT FOR SHIFTER FAULT. REPLACED CLOUMN ASSY 3C529 01. ROAD TEST AFTER REPAIR. ALL OK.
CK CONCERN OF NOT GOING INTO PARK ,VERIFIED OPERATON .FOUNDBRAKE SHIFT INTERLOCK SOLENIOD FAULTY .REPLACE COLUMN ASSYBECAI
REMOVE AND REPLACED THE STEERING COLUMN TO ELIMINATE HARD TO SHIFT CONCERN.
11816 VERIFIED CUSTOMER CONCERN, NOISE ORIGINATING FROM STEERING COLUMN, REMOVED TRIM PIECES AROUND STEERING COLUMN , FOUI
PERFORM INSPECTION VEHICLE WILL NOT COME OUT OF PARK INSPECT OPERATION OF SHIFTER OK CHECK BRAKE LIGHT SWITCH OK.DID NO INTER
ELEC. TEST. REPLACED SHIFTER INTERLOCK ASSY
STEERING COLUMN SHAFT BROKEN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
33570 3C529 41 42 W BCE DIAG PINPOINT TESTING OF BRAKE SW AND INTERLOCK SOLENOID CONNECTORS 12 VOLTS PRESENT GOOD GROU SHIFT
24402 SHIFTER INTERLOCK SYSTEM DEFECTIVE PERFORMED STEERING COLUMN SWITCHES DIAGNOSIS REMOVED STEERING COLUMN AND #3C52
3 SWITCHES BAD BLUE ON COLUM CK FUSES OK REMOVE SREERING COVER REPLACE SWITCH NOT FIXED CK SWITCH OK TRACE WIRING RE UT 37
VERIFIED REMOVED WHEEL COVERS ADJUSTED SHIFT CABLE ADJUSTMENT, NEEDS STEERING COLUMN. REMOVED COLUMN AND TRANSFERRED O
32631 08 INSPECT AND SHIFTING FINE AS LONG AS YOU PULL SHIFT HANDLE TOWARDS YOU TO STOP BEFORE MOVING AND HOLD TO STOP U E. GO
BINDING STEERING COLUMN REPLACE COLUMN
FAULTY INTERLOCK SWITCH STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
CAN MOVE GEAR SELECT HANDLE REMOVED AND REPLACED STEERING COLUMN
INSPECT SHIFT LEVER OPERATION,SHIFT INTERLOCK NOT WORKING, SERVICED IN COLUMN,REPLACED COLUMN,TRANSFER COMPONENTS
CK VEHICLE VERIFY KEY STUCK IN ING.R R&R STEERING TRIM BEZEL TO INSPECT COULD NOT SEE ANY PROBLEM R&R STEERING COLUNM SWITCH
VERIFIED CONCERN FOUND TILT COLUMN BOLT LOOSE TIGHTEN BOLT MT R&R LOWER DASH PANEL & LOWER CO LUMN SHROUD TO ACCESS OK A
VERIFY CONCERN R&R BROKEN LOCK HOUSING WITH UPPER STEERING SHAFT AND SHIFT HANDLE BROKEN FROM BINDING SHAFT
P01 42 DIAGNOSE AND REPLACE STEERING COLUMN ASSEMBLY, RECHECK OK
VERIFIED CONCERN FOUND NOISE COMING FROM STEERING R.R. STEERING COLUMN AND LOWER COLUMN SHAFT WITH NEW OK
3C529 01 (MTIME NO LAB OP TO TRANSFER PARTS & REPL STR COLUMN) BCE TEST, NO CODES. REPLACED STEERING COLUMN ASSY (BECAUSE BRA

COVERS ON COLUMN.R&R STEERING WHEEL.CLOCK SPRING AIR BAG ALL NECESSARY SWITCHES AND REPLACE ON NEW COLUMN.
DIAG NOISE R R STEERING COLUMN REPLACE STEERING COLUMN ASSY ROAD TEST SOME NOIS
STR COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
14045 WARRANTY VERIFIED CONCERN, USED WDS TESTED FOR CODES RECIEVED CODE C1278 FOR STEERING WHEEL POSITION SENSOR, F PER F
OPEN BODY CHASSIS ELECTRICAL DIAG;BCEPP TEST;ORDERED BRAKE SHIFT ACUATOR;;REPLACED STEERING COLUNM;REMOVED AIR BAG STEER
FAULTY LEVER MECHANISM ADDITIONAL TIME,GET INTO SHOP,SWAP PARTS, ETC.SEE PUNCH TIME
BINDING REPLACED STEERING COLUMN SHAFT
DEFECTIVE SHIFT INTERLOCK SOLENOID VERIFY INTERMITTENT FAILURE OF SHIFT INTERLOCK SYSTEM, SHIFTER STICKING IN PARK. PPT TEST FOU
DOES NOT OPERATE PROPERLY DIAGNOSE AND REPLACE STEERING COLUMN
16803 INSPECT & REPLACE STEERING COLMN FOR SHIFT INTERLOCK STICKING
ROAD TEST FOR NOISE. FOUND WIRE HARNESS HITTING STEERING COLUMN. MOVE WIRE HARNESS AND RETEST DRIVE.
1 INSPECT AND FOUND AT TIME SHIFT LEVER WILL NOT GO INTO PARK RR RADIO BEZEL RR CLUSTER TRIM AND KNEE DASH PANEL INSPECT
HOTLINE SAYS BURR ON CAM IN COLUMN, NEEDS REPLACED. CHECK CONCERN. CONTACT HOTLINE, TOLD TO REPLACE STEER COLUMN. R&R STEE
VERIFY CONCERN MTIME TO USE CHASIS EARS FOUND NOISE COMING FROM STEERING COLUMN REMOVED SHROUDS CHECK TIGHTNESS FO FOR I
VEH IS STUCK IN PARK REPL COLUMN AND FISE BOX,M TIME NO SLSTS
CHECK AND REPLACED COLUMN AND SWITCH
REPLACE STEERING COLUMN

VERIFY CUSTOMER CONCERN PERFORM DIAGNOSIS AND FOUND STEERING COLUMN NO GOOD INSTALL UPDATED STEERING COLUMN ASSEMBLY
NOISEY STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
3C529 42 DIAGNOSIS AND REPLACED STEERING COLUMN
STICKING INTERLOCK SOLENOID STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
INTER LOCK ON STEERING COLOUM TECH 763391 3C529 CC 42 INTERLOCK ON STEERING COLOUM NOT WORKING ONLY WAY TO GET INTERLOCK IS
VERIFIED CONCERN SHIFTER INTERLOCKNOT SERVICABLE RAND R STREERING
PARK; CHECK AND FOUND SHIFT INTERLOCK HAS INTERNAL FAILURE REPLACE SOP STEERING COLUMN
DIAGONOIS CONCER FOUND LEVER BINDING. FOUND STEERING COLUM BINDING UP . REMOVE STEERING COLUMN AND REPLACE WITH NEW ONE
3504 CK OUT DO DIAGNOSIS OF SHIFTLOCK SYSTEM POWER TO SOLONOID BUT INOPERATIVE CK GROUNDS AND POWER SUPPLY O.K. NEED PART
KEY IS OUT OF SWITCH DIAGNOSED, REMOVED AND RPELACED STEERING
EVEN WHEN KEY IS OUT ALSO, DRIVERS DOOR WILL NOT LOCK
DIAGNOSE FOR IGNITION KEY WILL NOT TURN, MT NO LABOR OPERATION TO DRILL OUT OLD IGNITION KEY CYLINDER & INSPECT STEERING C G COL
BEC DIAG, PINPOINT TEST MONITOR, RR STEERING COLUMN TRANSFER ALL PARTS RETEST
DIAGNOSE, DISCONNECT SHIFT CABLE, REPLACE STEERINGCOLUMN TRANSFER PARTS PER HOTLINE
INTERLOC SOLENOID PLUNGER STICKING DIAGNOSIS FOR AUTOMATIC TRANSMISSION CONCERNS CHECKED INTERLOCK SYSTEM, FOUND SOLENC
VERIFIED CUSTOMERS CONCERN. INSPECTED POWERS AND GROUNDS PASSED. CHECKED POWER TO SHIFT LOC K ACTUATOR PASSED. F(OLUM
VERIFY CONCERN. WHEN SHIFTING BACK TO PARK, HANGS UP AT REVERSE, NOT SHIFTING INTO PARK. REMOVE & REINSTALL STEERING CO RELEA
STEERING COLUMN NVH,REMOVED STEERING COLUMN,REPLACED COLUMN ASSY.
STEER COLUMN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
SHIFTER INTERLOCK SLOENOID NOISE VIBRATION HARSHNESS DIAGNOSIS
SHIFT INTERLOCK STEERING COLUMN NOISE VIBRATION HARSHNESS DIAGNOSIS
15290 STEERING COLUMN REMOVED OLD STEERING COLUMN ASSY AND INSTALLED NEW UPDATED COLUMN ASSY. REASSEMBLED COMPLETE ROA
STEERING SHAFT REPLACE
TST KEY CYL SWITCH SHIFT LINKAGE AND WIRING REPLACED STEERING COLUMN IN ORDER TO REPLACE KEY LOCK SWITCH
TESTED SHIFTER INTERLOCK SOLENOID OPERATION AND FOUND MECHANICALLY BINDING SHIFT INTER LOCK SOLENOID NECESSARY TO REPLACE
VERIFIED CONCERN INSPECTED AND FOUND SHIFTER HANDLE BROKEN CABLE CHECKED OK SHIFT TUBE ONLYAVAILABLE WITH COLUMN D REC
SHIFT LOCK OUT WILL OT RELEASE PART NOT AVAILABLE. NECCESSARY TO REPLACE STEERING COLUMN ASSY
SHIFT LOCK SHORTED OUT NGS DIAG REPLACE COLUM AND FUSE
284643 TESTED SYSTEM FOR NOISE, ROAD TEST INTALLED CHASSIS EARS NOISE IN COLUMN REPLACE LOWER STEERING COLUMN. NOISE LESS
COULMN BAD BEARING NOT IN FROM FACTORY REPLACED STEERING COLUMN BEARING AND LOWER SHAFT THERE WAS NO BEARING IN COLUMN
VERIFY IGN KEY STUCK IN CYLINDER FOUND CYLINDER BROKEN REPLACED COLUMN AND CYLINDER
CHECKED KEY NOT COMING OUT, TRANSMISSION SOLENOID & POSITION SWITCHES BAD, TOOK COLUMN APART TO FIND PART NUMBERS, PART NO
INOP STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
FOUND SPRING CAME APART FOR STEERING COLUMN TILT, SPRING SERVICED ONLY IN COLUMN ASSEMBLEY, REPLACED STEERING COLUMN
31 KEY STUCK IN IGNITION. CHIESEL OUT IGNITION. R&R LOCK CYLINDER. BINDS INTERMITTANLY NOW. R&I LOCK CYLINDER. FOUND STEERING CO
9550 ROAD TESTED ANDINSP. EXCESSIVE PLAY IN UPPER STEERING COLUMN. BUSHING WORN. REPLACED COLUMN ROAD TESTED AGAIN. P(CHEC
AND INSPECT FOUND LOCK CYL DAMAGED STEERING COLUMN SEIZED AT STEERING WHEEL LOCK REPLACESTEERING COLUMN AND LOCK CYL F
REPLACE STEERING COLUMN
REPLACED SHIFT LEVER AND STEERING COLUMN. RETEST OPERATION OK.
BY PASS SHIFT INTER LOCK SOLINOID AND REMOVE STEERING COLUMN AND TEST ALL CIRCUITS AND FOUND GROUND POOR CONNECTION
REPLACE STEERING COLUMN
STEERING COLUMN JAMMED STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
ACTUATORS INOPERATIVE STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
REPLACED STEERING COLUMME C
11 CHK SHIFTER OPR IMPROPER ON TRIM PANEL VEH NOT COMING OUT OF PARK DISSESEMBLE STEERING COLUMN FOR SHIF ACTUATOR REPAL
STEERING WHEEL MAKING NOISE WHEN TURNING TEST DROVE OK MAKES NOISES WHEN ROCKING WHEEL SIDE TO SIDE CHECK ALL BOLTS TIGHT (
INSTALL STEERING COLUMN ASSY AND HARNESS AND PERFORM PIN POINT TEST.
REPLACE STEERING COLUMN WPI

REPLACE STEERING COLUMN, COMPLETE OK ON RECHECK
1 CK OUT RUN OASIS, CALL HOTLINE, R&R STEERING COLUMN SHROUDS FOUND MICRO SWITCH BAD, REPLACED STEERING COLUMN, RETEST
5538 BAD SHIFTER LOCKOUT ACTUATOR CHECKED FOR POWER AT BRAKE SWITCH OK 12V CHECKED FOR 12V AT SHIFTER LOCKOUT ACTUA TEERI
CHECKED FOR NOISE IN STRG,FOUND NOISE IN UPPER STRG COLUMN. INSTALLED NEW STRG COLUMN.ALSO FOUND LOWER SHAFT MAKING NOIS E
PULLED KEY CYLINDER AND LUBED INTERNALS
41 STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
VERIFIED NOISE WHEN SHIFTING INTO REVERSE, INSPECTED FOUND NOISE COMING FROM SHIFT LOCK ACTUATOR, ACTUATOR ONLY SER' ST O
R R STEERING COLUMN ASSEMBLY
DIAG INTERNAL STEERING COLUMN LOOSENESS REPLACE COLUMN ASSEMBLY
VERIFY TILT WONT HOLD POSITION ON STEERING COLUMN ACCESS COLUMN PINPOINT TILT LEVER BROKE REPLACE STEERING COLUMN ONLY AVIL
INTER LOCK BINDING. REPAIRED AS PER HOTLINE INSTRUCTIONS
REPLACE DEFECTIVE STEERING COLUMN AND STEERING SHAFT VERIFY REPAIR PREVIOUS REPAIR TIGHTEN BOLTS THIS REPAIR REPLACE PARTS
COND CODE 33 CHECK TRANS SHIFT OPERATION PINPOINT TO STEERING COLUNM REPLACE COLUNM AND TRANSFER PARTS ALSO REMOVE AND I
MT TIME TO SWAP PARTS TO NEW STEERING COLUMN SWITCHES LINKAGES ETC NO SLTS FOR REPLACE PARTS TO REPAIR COLUMN NOT AVAILA
VERIFIED CONCERN FOUND SHIFTER AND IGN LOCK CYLINDER BROKEN PARTS UNAVAILABLE NECESSARY TO REPLACE COMPLETE COLUMN TO GE
STEERING COLUMN HOUSING INTERMITTENTLY DOES NOT OPERATE PROPERLY. DEACTIVATE AIR BAG SYSTEM. REMOVE AIR BAG, STEERIN (FER A
MT3514 ABNORMAL DIAGNOSIS, HOTLINE CALL SPECIAL ORDER PARTS INSTALLED ON 03 12 04 AT 2346 MILES KEY TUMBLER JAMMED, ORDERED NE
9 DIAG AND REPLACE STEERING COLUMN DUE TO IGN CYL NOT TURNING PROPERLY
SHIFTER BROKEN STEERING COLUMN ASSEMBLY REMOVE AND INSTALL
HAD TO TAKE APART TO CHECK OUT SHIFT & HOLDER, BROKEN OFF, ORDERED COMPLETE STEERING COLUMN, HAD TO REMOVE LEVER THA' STALL
TO REMOVE BOLT
VERIFIED CONCERN PINPOINT TESTS REPLACED STEERING COLUMN RETEST OK
DIAGNOS NOISE COMING FROM INSIDE STEERING COLUMN REPLACE COLUMN ASSY PER SERVICE PART WARRANTY
443 STEERING COLUMN WARR VERIFIED SHIFTER NOT COMING OUT OF PARK, CHECKED AND FOUND THE SHIFT INTERLOCK SOLONOID TO E NEW (

STEERING JAMMED,CAUSED CRACKED SHIFT LEVER,STEE RING COLUMN DAMAGE,REMOVE AND REPLACE STEERING GEAR AND STEERING COLUM
3316 REMOVE AND REPLACED STEERING COLUMN MAKING NOISE
R AND R STEERING COLUMN
1011 42 NVH DIAG, REMOVE STEERING COLUM, TRANSFER PARTS TO NEW COLUM, INSTALL NEW STEERING COLUM
LOCK ACTUATOR R&I STEERING COLUMN TO ADJUST LOCK ACTUATOR
MICRO SWITCH FOR IGNITION LOCK (ELECTRONIC SWITCH OR STEERIN COLUMN BROKEN) TEST STEERING REPLACE ENTIRE STEERING COLUMN
DIAG REMOVE STEERING COLUMN RETORQUE SHIFTER ONTO COLUMN AND REINSTALLCOLUMN RETEST OK CC 07
LOOSE STEERING COLUMN ASSEMBLY REMOVE TIGHTEN LOOSE TILT BRACKET
7 3C529 42; GEAR SHIFT INTERLOCK MALFUNCTION INTE CAUSING KEY TO BIND 7000F 1.7; 3514A 1.2; CORECTION : VERIFIED CUSTOMER CON MED F
INOP REPLACED SHIFTER SOLONOID
BROKE REPLACED STEERING SHAFT ASSEMBLY
3919 41 BINDING COLUMN BEARINGS FOUND STEERING COLUMN BEARINGS NOISY INSTALLED NEW COLUMN
BROKEN PARK SWITCH IN STEERING WHEEL WIRING HARNESS 4.6 LITER SOHC PREFORMED BODY CHASI ELECTRICAL DIAG PINPOINTT TEST REMO
REPLACE ST COLUMN AND TRANSFR PARTS AND ADDITION
3C529 01 PINPOINT AND REPL STEERING COLUMN FOR BROKEN SWITCH ON SHIFT INTERLOCK. ONLY SERVICED W STEERING COLUMN.
3C529 CC42 REQUEST MT DIAG,ACCESS&REPLACE SFT LCK ACTUATOR TRACED NOISE COMING FROM SHIFT LOCK ACTUATOR. REPLACED SHIFT L
3C529 CC01 REQUEST MT R&R INNER ASSY,ADDL R&I OF COLUMN AND IGN SWITCH CHASSIS ELEC DIAG WILL NOT SHIFT FROM PARK AND KI D INTE
SHIFTER PIVOT ON STEERING COLUMN BROKEN. REPLACE STEERING COLUMN ASSY
VERIFIED CONCERNS, THUMPING NOISE COMING FROM LOWER PORTION OF STEERING COLUMN, BEARING AREA. ALSO VERIFIED SHIFT HANI SHFTE
PERFORMED DIAGNOSIS HAD TO REMOVE AND REPLACE STEERING COLUMN
7576 SHIFT INTERLOCK AND LEVER BROKEN R&R STEERING COLUMN AND REPLACED. COMPONANTS ONLY SERVICED IN COLOMN PART PER FORD
PERFORM STEERING DIAG AND TESTS. BINDING. ISOLATE TO STEERING COLUMN, DISASSEMBLE AIR BAG SYSTEM, REMOVE AND
136 FOUND SHIFT LEVER LOCKED AND UNABLE TO MOVE. PERF PINPOINT TEST ON BRAKE SWITCH AND CBJ POWER. OK. REMOVED STEERIN CK SC

CUSTOMER

STEERING COLUMN TILT WONT LOCK FLOPS UP AND DOWN
CUSTOMER STATES GEAR SELECTOR CATCHES WHEN SHIFTING FROM DRIVE TO PARK
CUSTOMER STATES STEERING WHEEL SCREECHES WHEN TILTED DOWN
CUSTOMER REPORTS TRANS LINKAGE SEEMS TO BIND GOING INTO PARK
CUST ST HARD TO PUT IN PARK
CUSTOMER STATES CHECK STEERING COLUMN MAKES NOISE_SOP PART
CUST SHIFT FROM DRIVER TO PARK GETS STUCK IN RVEARSE NOT GOING INTP PARK MUST PLAY WITH GEAR SHIFT
VEHICLE TOWED TO SHOP WONT COME OUT OF PARK CUSTOMER HAS BEEN ABLE TO GET VEHICLE OUT OF PARK BY FOLLOWING PROCEDURE IN MANUAL
CHECK SHIFTER LEVER LOOSE
CHECK GEARSHIFT LEVER STICK WHEN PUTTING BACK INTO PARK
WOULDNT SHIFT OUT OF PARK BUT NOW SHIFT INTER LOCK IS INOP
AFTER TAKING FOOT OFF BRAKE AIR RUSH NOISE INSTRUMENT PANEL
CUST STATES CHECK WHEN GOING FRON DRIVE TO REVERSE VEH GETS STUCK AT LINKAGE DOES NOT ALOW VEH TO GO TO REVERSE OR DRIVE ..
CHECK GEAR SHIFT BINDS UP SOP PART
P09 WILL NOT COME OUT OF PARK
WHEN GOING TO PARK, GEAR SHIFTER STOPS AT REVERSE AND HAVE TO PULL BACK TO DRIVE TO MAKE GO IN PARK
VEHCLE WILL NOT COME OUT OF PARK
CUSTOMER STATES HARD TO SHIFT IN OUT PARK
CUSTOMER STATES WONT START,SHIFTER BROKE OFF KEY WONT TURN
CHECK FOR NO SHIFT FROM PARK
CUSTOMER STATES THE VEHICLE WILL NOT COME OUT OF PARK.
CUSTOMER STATES S O PART FOR CLUNK TYPE NOISE WHEN TURNING SOP
CUSTOMER STATES POPPING NOISE IN STEERING SEE SONNY
(N59) CUST STATES THAT THERE IS A KNOCKING NOISE IN THE STEERING WHEN TURNING
CHECK CAUSE AFTER DRIVING VEHICLE AND GO TO SHIFT INTO PARK WILL NOT GO INTO PARK. STAYS IN REVERSE
TOWED IN SHIFTER BROKEN NO START
SHIFTER IS DIFFICULT TO PUT IN PARK
CUST STATES KEY IS HARD TO REMOVE FROM IGINITION
BRAKE LOCK SHIFT NOT WORKING
CUST STATES WHEN APPLYING BRAKES VEHICLE MAKES A CLICKING NOISE CJECK AND ADVISE
SHIFTER WILL NOT COME OUT OF PARK.
CK WONT SHIFT OUT OF PARK

WHEN KEY WAS REMOVED FROM IGNIT TUMBLER CAME OUT TOO
TRANS SHIFT LEVER OR TRANS HARD TO SHIFT IN PARK POSITION
CUSTOMER STATES THAT BRAKE INTERLOCK DID NOT SEEM TO BE WORKING VEHICLE WAS ABLE TO BE SHIFTED FROM PARK WITHOUT FOOT ON BRAKE
VEHICLE IS DIFFICULT TO GET IN PARK
CUST STATES STEERING COLUMN WONT STAY IN POSITION TECH 232
CHECK FOR SHIFT LEVER JAMS WHEN GOING FROM DRIVE TO PARK CODE P01
CUSTOMER STATES THAT THE STEERING WHEEL WILL NOT LOCK IN POSITION
VEHICLE IS STUCK IN PARK
CUST STATES THAT THE KEY WILLNOT ALWAYS TURN IN CYLINDER
STEERING WHEEL DOES NOT LOCK AND IS NOT CENTERED.
STEERING WHEEL IS NOT LOCKING SPW
CUSTOMER STATES THAT KEY IS STILL ACTING UP AND WILL NOT TURN AT TIME WHEN ACTING UP KEY IS HARD TO REMOVE FROM IGN
STEERING WHEEL DOES NOT LOCK AFTER REMOVING KEYS
SHIFT LEVER WILL NOT GO INTO PARK AT TIMES

CUST STS CHECK SHIFTER
CUST STATES WILL NOT GO DIRESCTLY TO PARK FROM DRIVE
CUSTOMER STATES KEY STICKING IN IGNITION
CUSTOMER STATES THAT VEHICLE WILL NOT GO INTO PARK
C S VEHICLE WILL NOT COME OUT OF PARK
THE CUSTOMER STATES DOESNT GO INTO PARK
C S GEAR SHIFTER HANGS IN REVERSE WHEN RETURNING FROM DRIVE SEE ADVISOR
WHEN PUTTING VEHICLE IN TO PARK IT WILL JAM IN REVERSE, HAVE TO SHIFT BACK DOWN AND THEN BACK TO PARK TO GET IN GEAR
CUST STATES SOMETIMES SHIFTING INTO PARK IS HARD
SHIFT INDICATOR IS OUT OF ALIGNMENT. 3C529 33
SHIFTER STUCK IN PARK , WILL NOT MOVE
CUSTOMER STATES COULD NOT GET CAR OUT OF GEAR.
CUSTOMER STATES LOW CLICKING NOISE WHEN SHIFT FROM PARK TO REVERSE AND START BACKING. CUSTOMER HAS FOOT RESTING ON
CUSTOMER STATES CLICKING NOISE WHEN PUT INTO REVERSE AND TAKE FOOT OFF BRAKE. HAS BEEN IN 3 TIMES BEFORE. SEE WAYNE.
P01, CUSTOMER STATES WHEN DRIVING SHIFTER WILL MOVE FROM PARK TO NEUTRAL ON ITS OWN
STRANGE RATTLING NOISE COMING FROM DASH, WHEN VEHICLE IS IN REVERSE, AND YOU APPLY THE BRAKES.
CUSTOMER STATES GETS STUCK WHEN GOING FROM PARK TO DRIVE INSTALL SOP
CUSTOMER STATES KEY STUCK IN IGNITION.
ENGINE WOULD NOT START
VEHICLE IS HARD TO GET IN AND OUT OF PARK   SEE TSB
CUSTOMER STATES TILT STEERING COLUMN WILL NOT LOCK IN PLACE.
GEAR SHIFTER HANGINGS UP GOING INTO PARK.
ABS LIGHT COMES AND GOES
CHECK TRANS. NOT COMING OUT OF PARK
FORD WARRANTY CUSTOMER STATES TRANSMISSION IS DIFFICULT TO PUT INTO PARK FROM DRIVE, SEEMS TO HANG UP ON REVERSE
CUSTOMER STATES KEY IS STUCK IN IGNITION
CUSTOMER STATES TRUCK HARD TO GET INTO PARK, ADVISE
C S NOISE IN STEERING COLUMN W TURNING WHEEL BACK AND FORTH, JOHN C HEARD NOISE
C S WONT SHIFT OUT OF PARK
C S HAVING TROUBLE SHIFTING INTO PARK
CUSTOMER STATES THAT A SPRING WAS FOUND ON DRIVES SIDE FLOOR BOARD PLEASE FIND ITS HOME
CUSTOMER STATES IGNITION STICKS ERRATIC
WILL NOT GO INTO PARK SOP
CUSTOMER STATES AT TIMES SHIFTER HARD GOING INTO PARK POSITION
CUST STATES THAT THE STEERING WHEEL WILL MOVE WHEN TILT IS LOCKED
VEHICLE GETS STUCK IN REVERSE FROM DRIVE TO PARK
TILT WHEEL WONT LOCK INTO PLACE
CUST STATES SHIFTER WILL NOT COME OUT PARK AND WILL ALSO STICK GOING INTO PARK
WHEN MAKING SLOW TURNS, THERES A GRINDING NOISE IN STEERING COLUMN
CUSTOMER STATES THERES A VIBRATION IN STEERING COLUMN
CUSTOMER STATES THE STEERING WHEEL TILT MECHANISM IS BROKEN,STEERING JUST FLOPS UP AND DOWN
SHIFT LOCK ACUATOR BINDS
TRANS SHIFT LEVER SNAPPED OFF
C.S CHECK FOR SHIFTER DIFFICULT TO SHIFT FROM REVERSE TO PARK
CUST STATES WHEN PUTTING INTO PARK SHIFTER JAMS UP
CUST STATES THAT GEAR SELECTOR DOES NOT ALWAYS GO BACK INTO PARK
CUSTOMER STATES VEHICLE WILL NO SHIFT FROM PARK,HEARD CLUNK UNDERNEATH,THEN SHIFTER BROKE
WONT GO INTO PARK AND SHIFTER BROKEN OFF

SHIFT SELECTOR STICKS GOING BACK INTO PARK AFTER DRIVING FOR AWHILE
CHECK FOR CLICK NOISE FROM BEHIND INSTRUMENT CLUSTER, OCCURS ALL THE TIME BACKING UP
TOW IN STUCK IN PARK
HARD TO GET OUT OF REVERSE WHEN PUT IN FROM DRIVE
PO1 CUSTOMER STATES SHIFTER IS HAD TO GET IN PARK IT CATCHES BEFOR IT GOES UP, MAY HAVE TO PICK UP ON SHIFTER MORE TO GET
HARD TO GET INTO PARK SEE DAN
CUSTOMER STATES VEHICLE IS HARD TO GET OUT OF PARK
WONT COME OUT OF PARK
C S IGNITION KEY WILL NOT COME OUT OF CYLINDER ***KEY PAD #5461***
CUSTOMER STATES SHIFTS ARE ROUGH FROM PARTECHNICIAN STATES INTERLOCK BROKEN
SHIFTER RATTLES WHEN IN GEAR..HARD TO REMOVE KEY AT TIMES..
RUBBER BOOT ON STEERING WHEEL RUBS
CUSTOMER STATES THERE IS A FLUID LEAK COMING DOWN ON DRIVERS FRONT
CUST STATES KEY WONT COME OUT OF IGNITION
CANNOT SHIT OUT OF PARK
CUSTOMER STATES VEHICLE WONT SHIFT OUT OF PARK.
CUSTOMER STATES HARD TO GET INTO PARK
THE TILT WHEEL IS NOT LOCKING IN PLACE

SHIFTER IS GETTING STUCK BETWEEN PARK AND REVERSE
CUSTOMER STATES SHIFTER STICK WHEN SHIFTING INTO PARK
SOP CUSTOMER REPORTS WHEN SHIFTING VEHICLE INTO PARK SHIFTER STICKS PARTS ARE HERE
C S SHIFTER WONT GOO INTO PARK HAVE TO PULL INTO PARK WITH FORCE
KEY IS STUCK IN IGNITION FROM TRUCK DELIVERY
CUSTOMER STATES SHIFTER NOT SMOOTH FROM DRIVE TO PARK
THE TRANS GEAR SHIFTER IS LOOSE INTERM WILL NOT GO INTO GEAR SA DUP
OCC SHIFTER WONT COME OUT OF PARK AND CAN HEAR CLINK NOISE
CUSTOMER STATES WHEN YOU SHIFT FROM DRIVE TO PARK INDICATOR WILL NOT GO ALL THE WAY TO THE LEFT NO SHIFTING
KEY STUCK IN IGNITION
CUST STS THAT THE VEHICLE CANNOT SHIFT OUT OF PARK WITHOUT USING
TILT ON THE STEERING WHEEL WILL NOT LOCK, THE WHEEL JUST MOVES UP AND DOWN
CUST. STATES: TILT WHEEL DOES NOT LOCK INTO POSITION
DIFFICULT TO SHIFT LEVER FORM PARK TO GEARS AND BACK INTO PARK. THE LEVER LOCKS IN PARK.
C S CAN NOT SHIFT INTO DRIVE FROM PARK
CUST STAETS KEY WONT COME OUT OF IGNITION
WHEN TRYING TO PUT THE GEAR SELECTOR BACK INTO PARK REVERSE THE NEEDLE IS STICKING CAUSING THE GEAR TO BE INCORRECT ON DISPLAY
CUST STATES TRANS SHIFTER IS HARD TO GET INTO PARK
ESP NINE DAY RENTAL
CUSTOMER COMPLAINS OF KNOCKING NOISE FROM STEERING COLUMN WHILE DRIVING
SHIFTER DOESNT STAY IN DRIVE POSITION E
TICKING SOUND HEARD WHEN OPENING
CUSTOMER STATES GEARSHIFT IS DIFFICULT TO GO INTO PARK AT TIMES
YOU CAN SHIFT VEHICLE OUT OF PARK WITHOUTKEY IN IGNITION
CUST STATES SHIFTER DOES NOT LOCK IN PLACE
C S TRUCK WONT GO INTO PARK,SHIFTER BROKEN
WHEN PUT INTO REVERSE AND BACKING UP THERE IS A CLICKING NOISE HEARD AND CAN ALSO HEAR WHEN SHIFTING
CUST ST VEHICLE NOT SHIFTING INTO PARK PROPERLY OR REVERSE
3 36 REPAIR VEH WILL NOT COME OUT OF GEAR HAVE TO USE OVERRIDE

CUSTOMER STATES THAT WHILE PUTTING INTO PARK IT BINDS UP,LET THE PRESSURE OFF AND THEN IT GOES IN.HARD TO OPERATE SHIFT LEVER, CHECK AND ADVISE
CK SHIFTER OPERATION FEELS LOOSE
WHEN TEST DRIVING FOUND SHIFT LEVER HARD TO GET INTO GEAR.
TOWED TO SHOP CUST STS CANNOT GET OUT OF PARK. PRIOR TO STEERING WHEEL WAS ABLE TO BE FREE TURNED 360 CCC L13
L15 IGN LOCKS FOR NO REASON AFTER PARKED HAVE TO WRENCH ON WHEEL TO GET TO RELEASE HAS HAPPENED 3 TIMES IN LAST 2 WEEKS
CUSTOMER STATES: SHIFTER BIND BETWEEN REVERSE AND PARK.
HARD TO GET IN PARK
WILL NOT COME OUT OF PARK
NOISE IN STEERING WHEN TURNING
3 36 DIAG NOISE FROM BRAKE PEDAL WHEN RELEASING SEE JAMES C. CLICKING UNDER DASH VERIFIED SEE HISTORY T108
CUSTOMER STATES KEY IS STUCK IN IGNITION CHECK AND ADVISE

KEY IS STUCK IN IGN
C S THAT TILT WHEEL IS INOP, SOP PARTS
CUSTOMER STATES. THAT THE GEARSHIFT APPEARS TO STICK AND OR BIND OR CATCH WHEN ATTEMPTING TO PLACE INTO PARK AFTER STOPS
C S SHIFTER WILL NOT COME OUT OF PARK
SHIFTER JAMS WHEN PUT INTO PARK ADVISE INSPECTED AND VERIFYED CONCERN SHIFTER HANGS UP AND WONT GO
MUST JIGGLE SHIFTER TO PUT CAR IN PARK
CHECK THE SHIFTER LEVER HANGS UP SOMETIMES WHEN TRY TO PUT IN PARK DAN DID DULP ALSO KEY WILL NOT TURN BACK SOMETIMES
VEHICLE WILL NOT COME OUT OF PARK

CUSTOMER STATES CHECK FOR RATTLE NOISE IN STEERING COLUMN
ANY TIME STEP ON THE BRAKE GET A CLICK FROM UNDER DASH SOUNDS LIKE A RELAY SEE STEVE KING
CHECK SHIFTER STICKS FROM DRIVE TO PARK (SEE BERNIE.R)
CHECK AND ADVISE ON SHIFT HANDLE DOES NOT COME OUT OF PARK AND HARD TO PUT INTO PARK
WONT SHIFT OUT OF PARK
CUSTOMER STATES FRONT END HARD TO TURNTECHNICIAN STATES STEERING COLUMN BINDS
TRANI SHIFTER SEEMS LIKE IT IS GOING INTO PARK, BUT IT IS GETTING HUNG UP IN REVERSE.
CUSTOMER STATES WHEN PUTTING INTO PARK SEEMS LIKE SHIFTER GETS STUCK THROUGH REV TO PARK CHECK AND ADVISE
HARD TO GET INTO PARK OUT OF REVERSE AT TIMES
CUSTOMER STATES WHEN VEHICLE IS PARKED AND KEY IS NOT IN IGNTION SHIFT LEVER CAN BE MOVED FROM PARK
THE SIFTE HANGS UP, GOING INTO PARK
CUSTOMER STATES VEH. STICKS WHEN PUTTING IT IN PARK
WHEN TRYING TO PUT VEHICLE IN GEAR THE SHIFT SELECTOR IS HARD TO MOVE
CANT GET OUT OF PARK INTERMITTENT
STEERING WHEEL MOVES UP DOWN BY ITSELF $80DX
CUSTOMER STATES THE COLUMN SHIFTER WILL NOT GO INTO PARK AFTER DRIVING FORWARD EVEN A SHORT DISTANCE.
DASH RATTLE LEFT OF STEERING COLUMN
CUST ST WHEN SHIFTING BACK INTO PARK GIVING A HARD TIME
VEHICLE WONT GO INTO PARK
C STATES THAT THERE WAS A SPRING RETAINER CLIP THAT FELL ON HIS FOOT
CUSTOMER STATES THE SHIFTER LEVER WILL POP INTO DRIVE WHILE DRIVING,DOES NOT CATCH CORRECT SPOT ALL THE TIME
MISCELLANEOUS FIX TILT STEERING BROKEN
COLUMN NOISE
CHECK TRANS SHIFTER HARD TO GET BACK INTO PARK
GEAR SHIFTER HARD TO GO INTO PARK INSTALL SOP STEERING COLUMN SSM 15030...
C S SHIFTER STCK BETWEEN REVERSE AND PARK
CHECK GEAR SHIFTER WILL NOT COME OUT OF PARK

CUSTOMER STATES SHIFT LEVER WONT GO ALL THE WAY INTO PARK UNLESS YOU BACK IF OFF AND ATTEMPT AGAIN SEE BOB
HARD TO ENGAGE SHIFTER INTO PARK
PARTS/SERVICE MANAGER STATES CRUNCHING NOISE/FEELWHEN TURNING
CUSTOMER STATES THERE IS A STILL A ROLLING NOISE IN THE STEERING WHEEL WHEN TURNING OR DRIVING DOWN A BUMPY ROAD
CHECK FOR TRANS WONT SHIFT
SHIFT INDICATOR DOES NOT MOVE
CUSTOMER STATES THAT SHIFT LEVER STICK BETWEEN NEUTRAL AND REVERSE, DOES NOT GO INTO PARK W O FORCING IT
CUSTOMER STATES SHIFTER IS BROKEN UNABLE TO CHANGE GEARS.. KEY IS STUCK IN IGN. CHECK ADVISE
KEY WILLNOT COME OUT OF THE IGNITION
A CLICK NOISE OCCURS AT THE STEERING COLUMN WHEN YOU RUT IT IN REVERSE,ANDBACK UP IT CLICKS WHEN YOU RELEASE THE BRAKE PEDAL POSSIBLE SHIFT SOLINOID
IR BAG SYSTEM RETEST
STEERING WHEEL NOT LOCK WHEN ADJUSTING
CHECK FOR HARD TO GET OUT OF GEAR INTERMITTENT SEE WAYNE
CUST STATES THE SHIMS THAT HELP LOCK STEERING WHEEL INTO PLACE KEEP FALLING OUT, TILT STEERING DOESN T LOCK IN
HARD TO GET INTO PARK INTERMITTENLY. WHOLE SHIFTER LOOSE DELAYED INTO GEAR AFTER PUTTING INTO D OR R ETC.
C S GEAR SHIFTER LOOSE DIFFICULT TO SHIFT GEARS.TOWED IN.
CUST STATES TRIM PIECE ON STEERING COLUME NEAR IGNITION SWITCH LOOSE
CUST STATES THAT WHEN TRYING TO SHIFT FROM PARK TO REVERSE SHIFTER INTERM STICKS , CCA85
REPLACE SOP STEERING COLUMN WILL NOT SHIFT AT TIMES ORERED PARTS
SHIFT LEVER HAS CATCH IN IT WHEN SHIFTING.
CUSTOMER STATES VEHICLE WILL NOT COME OUT OF PARK.
C S THE SHIFTER IS GETTING STUCK WHEN GOING FROM REV TO PARK SOP
CUSTOMER STATES WON'T INTO PARK WHEN HOT
CUST STATES WHEN GOING TO PUT THE VEHICLE INTO PARK IT JAMBS UP
CUSTOMER STATES HARD GETTING TO PARK SOP STEERING COLUMN
CUSTOMER STATES HAS A HARD TIME PUTTING VEH INTO PARK. ONLY FROM DRIVE, HAVE TO MOVE VEHICLE TO MAKE HAPPEN.
CUSTOMER STATES SHIFTS ARE ROUGH FROM PARTECHNICIAN STATES SHIFTER GATE AT STEERING COLUMN BINDS
POP HEARD IN FRONT END WHILE TURNING.
CUST STATES GEAR SHIFT WILL NOT COME OUT OF PARK UNLESS STEERING WHEEL IS IN THE UPTILT POSITION
C S HARD TO PUT VEHICLE BACK INTO PARK
CUST STATES HAS RATTLE NOISE LIKE SOMETHING IN STEERING COLUMN LOOSE WHEN TURNS WHEEL BACK AND FORTH SEE ME IF ?..
CUSTOMER RPEOERTS SHIFTER WILL GET STUCK AT REVERSE GOING FROM DRIVE TO PARK
SHIFTER DOES NOT ENGAGE PARK EASILY
CUSTOMER STATES SHIFTER BINDS GOING INTO PARK
SHFTR WONT GO INTO PARK EASILY
C S THERE IS A CLUNKING NOISE WHEN TRUNING TO THE LEFT, SOUNDS LIKE FROM THE COLUMN
KEY WON T COME OUT OF IGNITION
CUST STATES EVERY TWO OR TIMES THE KEY WON T TURN IN THE KEY CYL CHECK AND ADVISE
CUST STATES SLIGHT CLICK IN GEAR SELECTOR WHEN PUT IN NEUTRAL FROM REVERSE PART IS HERE
CHECK FOR KEY CHIME GOING OFF WITH KEY OUT, DOOR WON T LOCK
CUSTOMER STATES THE SHIFTER HANDLE DOES NOT OPERATE PROPERLY
CUSTOMER STATES: SHIFTER WILL NOT GO INTO DRIVE
REPAIR FOR GEAR SHIFTER IS HARD TO COME OUT OF PARK AND PARTS ARE IN
CUSTOMER STATES STEERING COLUMN FLOPS AROUND
CUSTOMER STATES GEAR SHIFT STICKS BINDS GOING FROM PARK TO REVERSE WHEN WARM
CUST STATES SHIFTER INTERMITTANTLY HANGS UP WHEN PUTTING FROM DRIVE TO PARK, STOPS JUST BEFORE REACHING PARK
SHIFTER IS HARD TO GET OUT OF PARK
STEERING COLUMN AND WHEEL LOOSE

CUSTOMER STATES THAT THE SHIFTER WILL STICK BETWEEN RVERSE AND PARK AFTER BEING IN DRIVE. WILL NOT GO PAST REVERSE.
)LUMN ASSY, TEST OPERATION CLOSED BY WPI
CUSTOMER STATES AT TIMES HARD TO PUT INTO PARK AND AT TIMES POPS OUT OF PARK
CUSTOMER STATES STEERING SHUTTERS WHEN TURNED
C S INSTALL SOP (STEERING COLUMN)
CUSTOMER STATES POPPING NOISE WENT TURNING PER SONNY SOLD TO TEC
CUST STATES SHIFTER IS STICKING WHEN TRYING TO SHIFT FROM DRIVE TO PARK SHIFTER GETS HUNG UP SOMETIMES AT NEUTRAL..VERY HARD TO GET BACK INTO PARK
SHIFTING FROM DRIVE TO PARK GETS STUCK ING REVERSE
C S WHEN PUT VEHICLE INTO GEAR SHIFTER GETTING STUCK
WHEN DEPRESSING THE BRAKE PEDAL OR RELEASING, A CLICKNOISE IS EVIDENT IN STEERING COLUMN. IDLING
KEYS WILL NOT COME OUT OF ING.
STEERING COLUMN WILL NOT LOCK
CUSTOMER STATES SHIFTER IS DIFFICULT TO SHIFT
CHECK TILT WHEEL INOP
VEHICLE STICKS WHEN TRYING TO GET BACK INTO PARK FROM DRIVE
SHIFTER STICKS FROM REVERSE TO PARK.
CUSTOMER STATES HEARS A NOISE IN STEERING COLUMN
CUSTOMER STATES SHIFT LEVER BROKE SHIFTING INTO PARK TOWED IN BY ROADSIDE ASSISTANCE
HARD TO SHIFT INTO GEAR, WILL NOT GO INTO PARK.
CUST STATES SHIFTER STIFF STICKS BETWEEN PARK REVERSE PLEASE CK ADVISE.
KEY STUCK IN IGNITION. TURNS TO RUN TRUCK THOUGH
CUST STATES HARD TO PUT INTO PARK AT TIMES BE SURE TO DRIVE IT THEN TRY PUTTING INTO PARK
IGNITION LOCKING AT TIMES, SOMETIMES AFTER WIGGLING STEERING WHEEL IT MAY COME LOOSE IN 5 30 MINUTES LATER
CUSTOMER STATES SHIFTER WILL NOT GO INTO PARK AT TIMES
CUST STATES SHIFTING INTO PARK ARM STOPS ON LETTER BEFOR PARK
N59 RATTLE FROM THE STEERING COLUMN
CK FOR VEHICLE NOT COMING OUT OF PARK
TOW TO SHOP AND RETURN TOW RAILRAMP ACTIVE CARRIER TWIN OAKS, PA.
P01 HARD TO SHIFT INTO PARK
CHEK GEAR SHIFTER SEEMS TO GET HANG UP SHIFTING FROM REVERSE TO PARK AND PARK TO REVERSE
CUST STATES THE TRUCK IS HARD TO GET OUT OF GEAR INTERMITTENTLY
CUST STATES STEERING TILT LOOSE
IGNITION KEY HARDER TO TURN AT TIMES AND SHIFTER HARD TO PUT IN PAEK AT TIMES.
TRANS WILL NOT SHIFT OUT OF PARK
AT CERTAIN POSITIONS IN THE TILT CANT PUT IT IN PARK
CHECK HARD TO SHIFT INTO PARK
IGNITION KEY STUCK INSIDE CYLINDER
CUSTOMER REPORTS DIFFICULTY IN PUTTING GEAR SELECTOR INTO PARK
P1 CUSTOMER STATES TRANS HARD TO GET INTO PARK
T90 CLUNKING IN STEERING COLUMN WHEN MOVING WHEEL SIDE TO SIDE
CK POPPING IN STEERING COLUMN SOP
ADVISE ON CREAKING NOSIE COMING FROM STEERING COLOUMN
CUST STATES WHEN TURNING STEER WHEEL COLUMN MAKES NOISES TECH LINE CONTACT # 3E4C7014
AT TIMES ITS HARD TO SHIFT INTO PARK.
N58 STEERING WHEEL BINDS AND IS NOISY
CUSTOMER STATES THE SHIFTER BINDS WHEN SHIFTING FROM DRIVE TO PARK.
STATES IGNITON CHIME STILL ACTIVATES AFTER KEY IS REMOVED
CUSTOMER STATES THAT TRANS IS HARD TO SHIFT OUT OF PARK

CUSTOMER STATES GEARSHIFT STICKS IN REVERSE WHEN TRIES TO PUT BACK IN PARK
WHEN TRYING TO ENGUAUGE INTO PARK LEVER HANGS UP
CUST STATES KEY IS GETTING STUCK IN IGNITION AGAIN TECH 416 RO 447370. CHECK AND ADVISE
C STATES SHIFTER IS HARD TO GET INTO PARK INTERMITTENTLY
L23 QCP KEY WILL NOT COME OUT OF CYLINDER
CK FOR IGNITION KEY HARD TO PUT IT IN AND TURN AT TIMES
CUST STATES STUCK IN PARK
KEY WILL NOT COME OUT OF IGNITION
C50 CUSTOMER STATES STEERING WHEEL WOBBLES(SEE HISTORY)
POPPING RUBBING SOUMD STEERING WHEEL TURNIING LRFT TO RIGHT
P01 WILL NOT SHIFT OUT OF GEAR
CUSTOMER REPORTS WILL NOT COME OUT OF PARK UNLESS YOU USE A SCREW DRIVER
CUST STATES SHIFTER IS VERY HARD TO GET INTO PARK
CHECK SHIFTER HARD TO TAKE OUT OF REVERSE
CUSTOMER STATES VEHICLE WILL NOT COME OUT OF PARK CHECK AND ADVISE SPO PART IN STOCK
SHIFT IS HARD TO MOVE BACK INTO PARK AFTER DRIVING TRUCK
CUST STATES CLICKING NOISE FROM STEERING, T90 RO272958 1 FO3L2Z 3C529 BA COLUMN ASY STNG
CUSTOMER STATES PRESS BRAKE PEDAL AND PEDAL SQUEEKS SOP IS IN, RO# 283422
CUST STATES CHECK NOISE IN STEERING COLUMN
C50 CUSTOMER STATES THAT VEHICLE WILL NOT GO INTO PARK.
CK FOR WHEN BACKING AND TURNING, CUST REPORTS SOUNDS LIKE WIRES RUBBING IN STEERING COLUMN, HAPPENS AT ALL TIMES.
TILT STEERING IS LOOSE AND STEERING WHEEL WRAP IS LOOSE
SOP# 383301 STEERING COLUMN
CHECK VEHICLE MAKES A GRINDING NOISE WHEN TURNING
CUST STATES STEERING WHEEL BINDS UP AND POPS, WORSE TURNING LEFT TECH#106
CUST STATES AT TIMES WHEN MOVING SHIFTER FROM DRIVE BACK TO IT BINDS BETWEEN REVERSE AND PARK CC G29
N57 STEERING COLUMN NOISE SOP IN
CLICKING SOUND FROM DASH AREA WHEN RELEASING BRAKE PEDAL IN REVERSE OR IN PARK
VEHICLE TOWED IN KEY STUCK IN IGNITION AND SHIFTER LEVER LINKAGE IS BROKEN ADVISE CUSTOMOER UNREACHABLE UNTILL 5 6 04
CUSTOMER STATES WILL NOT COME OUT OF PARK
WHEN DRIVING, STOPPING, AND PUTTING GEARSHIFT INTO PARK, SHIFTER WINT GO PAST REVERSE.
QCP CK IGN HAS KEY LOCKED INSIDE WONT COME OUT
CUST STATES WHEN IN LOWER GEARS AND GO UP TO PARK WILL NOT GO PAST REVERSE UNLES YOU LET ENGAGE INTO REVERSE THEN WILL SHIFT TO PARK. SEE JOHN
CS SHIFT INTO REVERSE OR PARK IS DIFFICULT SEE PHILLIP FOR OPEREATIONS
OWNER REPORTS SHIFTER WONT COME OUT OF PARK CCP01
N58 CK.FOR RUBBING NOISE COMING FROM STEERING WHEN TURNING BOTH WAYS
TOW IN..VEH STARTS BUT UNABLE TO GET KEY OUT OF IGNITION WHEN TURN OFF ENGINE
WP CUST ADVISES IGNITION LOCKS UP AND KEY WONT TURN AFTER UNIT IS SHUT OFF WITH WHEELS CUT JUST SLIGHTLY
CHECK FOR RUBBING NOISE IN STEERING COLUMN WHEN TURNING PARTS HERE TECH 910
SERVICE PARTS WARRANTY STEERING COLUMN.
CUSTOMER STATES: SHIFTER FEELS DIFFICULT TO GO FROM DRIVE TO PARK. WHEN YOU HIT REVERSE IT FEELS STIFFER.
CUST STATES WHEN PUTTING SHIFTER FROM DRIVE TO PARK THE SHIFTER JAMS SOP HERE
CHECK HARD TO GET IN PARK
CUST STATES CAR IS HARD TO GET INTO PARK
P68. C/S INTERMITTENTLY SHIFTER DIFFICULT TO SHIFT OUT OF PARK AND MAKES THUDDING NOISE FROM TRANSMISSION
CUSTOMER STATES SHIFTER HARD TO GET INTO PARK
GEAR SHIFTER HANGS IN PARK PER CUST
CUST STATES GEAR SHIFT LEVER BINDS GOING FROM DRIVE INTO PARK

INTO PARK HAVE TO PLAY WITH SHIFTER TO GET INTO PARK
CLUNKING NOISE FROM STEERING COLUMN WHEN TURNING WHEEL AFTER VEHICLE WARMS UP
VEH WONT COME OUT OF PARK AT TIMES SEE BRIAN
CUSTOMER STATES THAT WHEN SHIFTING FROM REVERSE TO DRIVE LIKE IF TURNING AROUND GETS A CLUNK UNDRE VEHICLE FROM DRIVESHAFT OR TRANS AREA
CUSTOMER HAD CONCERN WITH SHIFTER GOING INTO PARK LAST WEEK WORK DONE HERE NOW 3 TIMES HAS HAD TROUBLE GETTING IT OUT O
VERY HARD TO SHIFT INTO PARK TRANS HAS TO ENGAGE REVERSE PRIOR TO GOING INTO PARK
P01 CUST STATES STUCK IN PARK
CK KEY HARD TO TURN STEERING WHEEL LOCKS UP
CUSTOMER STATES INTERMITTENTLY WHEN SHIFTING INTO PARK SHIFTER WILL GET STUCK IN REVERSE
CUST STATES AFTER COMING TO A STOP, IT SOMETIMES IS DIFFICULT TO PUT SHIFTER INTO PARK, WILL NOT GO PAST
C/S NOISE COMING FROM STEERING COLUMN
CK WHEN GO FROM DRIVE TO PARK SHIFTER CATCHES, HAVE TO FIDDLE WITH IT TO GET INTO PARK ADVISE
P01 CAN NOT GET VEHICLE OUT OF PARK
CUST STATES SHIFTER HANGS UP BETWEEN REV AND PARK AT TIMES
CUST STATES AT TIMES SHIFT LEVER IS VERY DIFFICULT TO PUT VEHICLE IN PARK AND WHEN IT WONT GO INTO PARK IF YOU PULL LEVER BACK AND TRY AGAIN IT WILL GO INTO PARK
GEAR SHIFT WILL NOT COME OUT OF PARK AT TIMES
CK.FOR VEHICLE WILL NOT COME OUT OF PARK
P01 CK VEHICLES SHIFT LEVER IS HARD TO SHIFT OUT OF GEAR SOP
CUST STATES WHEN SHIFT FROM DRIVE TO PARK HOLDING TOWARD DRIVER THE WHOLE WAY THE SHIFTER BINDS ON REVERSE AND MUST PUSH HARD TO GET ACROSS
REF 218421, THE SHIFTER INTERLOCK IS INOP AND NOW THERE IS A RATTLE NOISE IN THE FRONT WHEN GOING SLOW
CUSTOMER STATES NOISE IN STEERING COLUMN WHEN DEPRESS BRAKES (SOP)
SHIFTER IS BROKEN
SERVICE INSTALL PART REFERENCE RO11461 11 05 02
POPPING NOISE IN STEERING COLUMN
CUSTOMER STATES INTERMITTENTLY WHEN ATTEMPTING TO START VEHICLE THE KEY WILL NOT TURN IN IGNITION, OR CAR WILL
CUST STATES THE GEAR SHIFTER IS HARD TO GET INTO REVERSE 182 INSTALL SOP
USED VEHICLE DEPT CUSTOMER STATES AIRBAG LIGHT IS ON
CUST STATES,, SOMETIMES GEAR SHIFTER GETS STUCK BETWEEN PARK AND REVERSE,,AND SOMETIMES BETWEEN DRIVE AND PARK
L13 CANNOT GET IGNITION KEY OUT OF KEY CYLINDER
GEAR SHIFT HANGS WHEN PUTTING INTO PARK SOP
IT WILL JUMP OUT OF PARK INTO REVERSE AND NEUTRAL AND THEN LIGHTS ALSO WILL GO OUT
CUSTOMER STATES TRANS WILL NOT COME OUT OF PARK
GEAR SELECTOR BINDS AT REVERSE ON THE WAY TO BEING PUT INTO PARK.
HARD TO GET IN TO PARK FROM DRIVE SEE HISTORY
CUSTOMER STATES GEAR SHIFT FROM DRIVE TO PARK WILL NOT ENGAGE W O GOING TO REVERSE FIRST
AFTE ABOUT 15 MIN OF DRIVING AND TRY TO PUT THE VEHICLE INTO PARK WILL NOT GO AL THE WAY IN STOPS JUST ABOVE REVERSE
CUSTOMER STATES THAT THE STEERING WHEEL LEVER WILL NOT LOCK THE STEERING WHEEL YOU CAN PULL OR PUSH STEERING WHEEL UP OR DOWN CHECK AND ADVISE
CUSTOMER FEELS GRINDING IN STEERING WHEEL SOP IN
P01 HARD TO SHIFT INTO PARK FROM ANY GEAR
C50TILT STEERING WHEEL WONT LOCK IN PLACE
H21 CUST. STATES VEHICLE IS GUAGE IS DOSE NOT COME OUT OF PARK
CHECK WARNING CHIME STAYS ON WHEN KEY IS OUT OF IGNITION,DOOR OPEN
WIRING HANGING UNDER DASH
CK STEERING WHEEL WILL NOT LOCK.
O.R THAT THERE IS A NOISE IN THE STEERING WHEEL, NOT FRONT END IN THE WHEEL IT SELF, GROANING NOISE
C S THAT THE SHIFTER IS HARD TO COME OUT OF PARK,TOOK CUST 20 MINS.THIS MORNING TO GET OUT PARK. OTHER STEERING HANDLING AND RIDE TROUBLES
CUSTOMER STATES THAT WHEN TURNING THE STEERING WHEEL IT POPS
CUST STATES GEAR SELECTOR BINDS AT TIMES

CUST.REPORTS NOISE IN STEERING COLUMN WHEN TURNING,ADVISE IF NEEDED
CUST SAYS THE STEERINGWHEEL MAKING A POPPING SOUNDWHEN TURNING RIGHT OR LEFT, NOISE IN STEERING GEAR
GEAR SHIFT LEVEL DOESN'T WORK
CUST STATES THAT THERE IS A BUZZING NOISE IN THE STEERING WHEEL
CUSTOMER STATES FRONT END CLICKS CLUNKS WHEN TURNING DOES NOT FEEL WRITE ADVISE
CUSTOMER STATES THAT THE SHIFTER IS HARD TO GET OUT OF PARK AT TIMES SOP #7026
C S HARD TO GET OUT OF PARK WHEN COLD
CUST STATES THE CAR CAN BE TAKEN OUT OF PARK WITH OUT PUSHING BRAKE PEDAL ADVISE
CUST STATES VEH CAN BE PULLED OUT OF GEAR WITH KEY IN OFF POSITION
WHEN STEERING COLUMN AT HIGHEST POSITION SHIFT LEVER WILL NOT MOVE
CUST STATES THAT VEHICLE WILL NOT COME OUT OF PARK
WILL NOT SHIFT OUT OF PARK
KEY STUCK IN IGNITION
TRANS IS HARD OR WONT SHIFT IN OR OUT OF REVERSE ADVISE

CUST STATES GEARSHIFTER HARD TO GET INTO PARK
RECHECK STEERING COLUMN MOVES WHEN IN SET AND LOCKED SEE HISTORY
CUST HAD KEY IN THE IGNITION
IGNITION KEYS STUCK IN LOACK CYLINDER WONT COME OUT
GEAR SHIFT LEVER IS INOP
CUSTOMER STATES MAINLY WHEN VEHICLE IS COLD; VEHICLE IS HARD TO GET FROM PARK TO DRIVE; PLEASE CHECK AND ADVISE
CUSTOMER STATES THERE IS A CLUNK FELT IN THE STEERING COLUM WHEN TURNING THE WHEEL. PLEASE INSPECT.
L15 VEH TOWED IN, CUST STATES WHIFTER LEVER MOVES FREELY WITHOUT ENGAGING GEARS, INSPECT AND ADVISE
CUST STATES KEY HARD TO GET OUT AND SHIFTER GETS STUCK
CUSTOMER STATES FRONT END SUSPENSION CRACKING NOISE WHEN MAKING TURNS AT ALL TIMES INSPECT DIAGNOSE AND ADVISE

CUST STATES A PIECE OF PLASTIC FELL OUT OF THE STEERING COLUMN AND NOW WONT LOCK PROPERLY ON TILT
CUST STATES GEAR SHIFT STICKS BEWEEN PARK AND REVERSE SPO IS HERE USE SPO 03340001
CHECK AND ADVISE KEY WILL NOT RELEASE OUT OF IGNITION CYCLINDER
CK THE TRANSMISSION LEVER, MAKES NOISE WHEN PUT FROM DRIVE TO PARK, LEVER GETS STUCK IN REVERSE
P01 CANNOT GET SHIFTER OUT OF PARK
CUST STATES THAT THERE IS A POPPING NOISE IN THE STEERING COLUMN (N58)
STEERING WHEEL TILT MECHINISM IS INOP SOP HERE
CUSTOMER STATES GEAR SHIFTER HANGS BETWEEN PARK AND DRIVE
C S HAS POPING NOISE IN STEERING WHEEL WHEN TURNING
C S HAS POPING NOISE IN STEERING WHEEL WHEN TURNING
KEY IS STUCK IN IGNITION CYLINDER ADVISE V
C S VEHICLE HARD TO GET FROM DRIVE TO PARK SOP COLUMN
WHEN TURNS HEARS STEERING WHEEL AT SLOW SPEEDS FEELS CLICKING
CHECK VEHICLE WILL NOT COME OUT OF PARK.
CUSTOMER STATES SHIFT LEVER HARD TO PUT INTO PARK.MUST MAKE SEVERAL ATTEMPTS.CC P01
CUSTOMER REPORTS THE VEHICLE IS HARD TO SHIFT OUT OF PARK, AND HARD TO FIND PARK GEAR,INTERMITTENT.
C S ENGINE WILL START BUT SHIFTER WILL NOT MOVE CK AND ADV TOWED IN
WHILE DRIVING STEERING WILL LOCK UP
CUST STATES THERE IS A KNOCKING NOISE FROM THE STEERING WHEEL WHEN TURNING
CHECK WILL NOT COME OUT OF PARK
CUSTOEMR STATES KEY WILL NOT COME OUT OF IGNITION

HAVING A HARD TIME GETTING OUT OF PARK AND GETTING INTO PARK ADVISE

CUST STATES THAT THE STEERING CLUMN HAS A THUMPING NOISE WHILE TURNING
C S STEERING WHEEL IS NOISY...SPO IN...TECH 001
IGN KEY WIL NOT REMOVE FROM CYCLINDER
SHIFTER GETS HUNG UP WHE TRYING TO GO INTO PARK , STOPS AT REV
CC P01 SHIFTER HANGS UP BETWEEN REVERSE AND PARK. SOMETIMES DIFICULT TO GET IN PARK.
AT TIMES CANT GET OUT OF PARK WAS REPAIRED AT JACKSON FORD IN DEC
P01. C S WHEN VEHICLE WAS ON TOW TRUCK AND ATTEMPTING TO SHIFT GEAR LEVER INTO NEUTRAL THE LEVER BROKE OFF.
CUSTOMER STATES CAN'T GET LEVER TO GO INTO PARK HAVE TOWORKSOMETIME TO GET INTO PARK
INSTALL S O SHIFTER COLUMN
CUSTOMER STATES THAT THERE IS A RATTLE UNDER THE GLOVE BOX, CHECK ADN ADIVSE
CUSTOMER STATES VEHICLE WILL NOT COME OUT OF PARK. .
CHECK VEH HARD TO GO IN PARK
CUST STATES CK FOR EXCESSIVE NOISE HEARD WHEN TURNING SOP
P01 CUSTOMER STATES TRANSMISSION DIFFICULT TO OPERATE SHIFT LEVER OR CHANGE GEARS HAS TO PUSH VERY HARD ON THE BRAKE PEDAL TO CHANGE FROM PARK
CUSTOMER STATES THAT WHEN SHIFTING FROM DRIVE TO PARK IT HANGS UP AT TIMES IN REVRSE, CHECK AND ADVISE
KEY STUCK IN IGNITION
CUST STATES WHEN GOING FROM REVERSE TO DRIVE THE SHIFT LEVER STICKS WHEN MOVING INTO THE DRIVE
WHEN SHIFTING INTO PARK FROM DRIVE, THE LEVER ALWAYS HANGS UP GOING BE REVERSE
CUSTOMER STATES: TRUCK WOULD NOT GO INTO GEAR SEE HISTORY INSTALL SOP
DIAG SHIFTER HARD TO OPERATE
THE GEAR SELECTOR IS HARD TO HARD TO REMOVE FROM PARK AT TIMES
TRANS WONT SHIFT FROM PARK
IGNITION KEY STUCK IN IGNITION. (NOTED UPON ARRIVAL)
CUSTOMER STATES WHEN KEY IS OUT OF IGNITION.THE STEERING WHEEL WILL NOT LOCK
THE VEHCILE WILL NOT COME OUT OF PARK 3 36
P01 HARD TO SHIFT INTO PARK
CS THERE IS A CLUNKING NOISE FROM THE STEERING COLUMN WHEN TURNING
WILL NOT COME OUT OF PARK P09

STEERING COLUMN CONCERN REMOVE STEERING COLUMN FROM INSIDE.R&R INSTR. PANEL COVER
INSTALL SOP FOR STEERING COLUMN SQUEAK
CUST STATES SHIFTER HANGS UP WHEN SHIFTING FROM DRIVE TO PARK
VEHICLE MADE A CHATTERING NOISE AND NOW ADVANCE TRAC WARNING LIGHT IS ON
STATES WILL NOT COME OUT OF PARK WITHOUT USING OVERRIDE
SHIFT LEVER BROKE AT STEERING COLUMN,UNABLE TOO SHIFT
C S CK KNOCK FELT THROUGH THE STEERING WHEEL WHEN MAKING ANY TURNS
TRANS WONT SHIFT UNLESS YOU PUT KEY UNDER COLUMN
CUST ST STEERING CLICKS BAD
CHECK TRANS GEAR SHIFTER HARD TO GET INTO PARK SEEMS TO BE STIFF
CUSTOMER SAID THAT WHEN YOU TURN STEERING THERE IS A NOISE. MORE TO THE LEFT. WILL DO IT ALSO TO THE RIGHT.
WHEN PUTTING SELECTOR FROM DRIVE TO REVERSE INDICATOR NEED LE STAYS IN REVERSE
TRANSMISSION SHIFTER STICKS BETWEEN PARK AND REVERSE INTERMITTENLY.
CUST STATES THAT THERE IS A POP NOISE IN THE STEERING
CUST STATES VEHICLE STUCK IN PARK
KEY IS STUCK IN IGNITION
C S SHIFTER WILL NOT COME OUT OF PARK

CUSTOMER STATES WHEN SHIFTING GEAR SHIFTER BACK TO PARK SHIFTER VERY HARD TO GET INTO PARK NOT SMOOTH
CHECK POWER STERING SOUNDS FUNNY THUD SOUND WHILE TURNING
ADVISE WILL NOT COME OUT OF PARK
CUST STS IGNITION KEY STICKS INSIDE COLUMN
C S THAT VEH WILL NOT GO FROM DRIVE TO PARK AFTER DRIVING FROM TIME TO TIME SOP PART HERE
INSPECT FOR HARD SHIFTING DOESNT SEEM TO GO INTO PARK
REPLACE SOP STEERING COLUMN CUSTOMER STATES GEAR SHIFTER NOT ABLE TO SHIFT IN AND OUT OF
CLUNKING NOISE WHEN COMING IN AND OUT OF GEAR HARD TO PUT IN PARK INTERMITTENT
CUST STATES THE CAR WONT COME OUT OF PARK
IGNITION SWITCH ALARM GOES OFF EVEN WHEN
IGNITION SWITCH ALARM GOES OFF
INSP FOR KEY WONT TURN IN TUMBLER
CUSTOMER STATES GEAR SHIFT LEVER HANGS UP WHEN SHIFTING TO PARK
STATES SHIFTER HAS A PROBLEM GETTING BACK INTO PARK
DIAGNOSIS OF ELECTRONIC TRANSMISSION CONCERN GEAR SHIFT INDICATOR NOT QUITE LINED UP. SOMETIMES HARD TO
PO1 CHECK CUSTOMER STATES, HE CAN NOT SHIFT OUT OF PARK CHECK AND ADVISE
SHIFT LEVER STICKS , ,WHEN SHIFT INTO PARK , VEHCIEL ROLLS BACK , DOES NOT OCCUR ALL TIME , WORSE THE VERY FIRST TIME USED
FEELS STRANGE VIBRATION IN STEERING COLUMN WHEN HITTING BUMPS
DIFFICULT TO REMOVE KEY FROM IGN SWITCH
A BUZZING NOISE OCCURS WHEN YOU PUT VEHICLE INTO REVERSE INSTALL SOP PART
NOISE IN DASH BACKING UP CLICKING SEE DAVE SUMMERS
CUST STATES WHEN MOVING FROM DRIVE TO PARK IT BINDS CHECK AND ADVISE PER RO 375391
C S VEH HANGS UP IN REVERSE WHEN TRYING TO PUT VEH IN PARK PART IS IN
KEY IS STUCK IN IGNITION
C S THAT SHIFTER GETS STUCK PARK & REVERSE
CHECK SHIFTER HANDLE BROKEN
OWNER STATES THE TRANS SHIFTER HANGS UP IN REVERSE WHEN SHIFTING INTO PARK
VEHICLE WILL NOT COME OUT OF PARK
STEERING WHEEL MADE POP NOISE WHEN UNLOCKED NOW CLANKING NOISE WHEN TURN T90
STEERING COLUMN LOOSE MOVES UP AND DOWN
CUSTOMER STATES KEY IS STUCK IN IGN.
CUSTOMER STATES KEY WILL NOT COME OUT OF IGNITION
SHIFTING MECHANISM BROKE WILL NOT SHIFT PROPERLY
SPRING FOR TILT BROKE OFF
KEY IS STUCK IN THE IGNITION
STEERING LOOSE AND WOBBLES WORSE OVER BUMPS
KEY WILL NOT TURN IN IGNITION
IGNITION KEY WILL NOT COME OUT
SHIFT LE4VER WAS VERY HARD TO PUT INTO GEARS CAUSING LEVER TO BREAK.....
CUSTOMER STATES VEHILCE WILL NOT COME OUT OF PARK AFTER STARTING. CHECK AND ADVISE.
C R REPLACE STEERING COLUMN RING SOP PART
CUST STATES SHIFT IND INTER MISALIGNED
CUSTOMER STATES GEARSHIFT LEVER HARD TO MOVE
C S WHEN OPEN DOOR WARNING SOUND COMES ON ALL THE TIME
REPLACE STEERING COLUMN SCHROUD
STEERING WHEEL MAKING NOISE WHEN TURNING LARGE TRAVEL
CHECK SHIFTER WILL NOT RELEASE AT TIMES.

C S VEHICLE COULD NOT BE REMOVED FROM PARK FUSE BLEW TOW TRUCK OPERATOR TRANSFERRED FUSE FROM SEAT HEATER
KEY WONT COME OUT OF IGN WHEN TURNED OFF
WONT COME OUT OF PARK
CUSTOMER STATES POPPING IN STEERING WHEN TURNING LEFT SHARP AND BACKING UP
STEERING COLUMN LOCKING, HARD TO TUNR KEY
VEHICLE WILL NOT SHIFT OUT OF PARK AND HAS NO BRAKE LIGHTS
3 36 REPAIR CK WHEN VEH IS PUT INTO REVERSE SHIFTER HAS ALOT OF PLAY ALSO MAKES CLICKING TYPE NOISE FROM COLUMN AREA WHEN MOVING IN REV. SEE DENNIS
KEY WONT RELEASE FROM IGNITION
ST COLUMN WILL NOT LOCK INTO GEAR, LEVER JUST SLIDES FROM REVERSE TO DRIVE
TILT MECHANISM WILL NOT LOCK IN PLACE
CS STS SOMETIMES THE KEY WONT TURN AND HARD TO GET COLUMN LOCK TO DISENGAUGE
CUSTOMER STATES KLUNK IN THE STEERING WHEEL HEAR IT AND FEEL IT....BEGINING OF ANY TURN LFT OR RT
NSTALL
TILT STERRING LOCK IS TOO LOOSE
CUSTOMER STATES THE SHIFTER IS BROKEN PLEASE CHECK AND ADVIS
CUSTS STATES STEERING WHEEL WILL NOT LOCK
KEY WILL NOT COME OUT OF IGNITION
C S IGNITION KEY IS STUCK IN TUMBLER
SHIFTER BROKEN
CUSTOMER STATES GEAR SHIFTER BROKEN AND KEY WILL NOT COME OUT
CHK IGN CLYN POPPED KEY WONT TURN
DIAGNOSE NOISE IN STEERING POPPING WHEN TURNING
DIAGNOSE CLUNKING AND POPPING IN STEERING COLUMN WHEN TURNING
CAR WILL NOT COME OUT OF PARK, INSTALL SOP PART.
PIECES FELL OUT OF STEERING COLUMN
P01 GEAR SHIFT BROKE LEVER BROKE OFF
NOISE IN STEERING COLUMN SOP
TITLE STEERING COLUMN WONT LOCK
CUST STATES CHECK STEERING POPS WHEN TURNING EASY
CHECK FOR SPRING TYPE NOISE AT BRAKE OR GAS PEDAL
CUST STATES IGNITION KEY STUCK IN IGNITION WILL NOT COME OUT
GEAR SHIFT INDICATOR NOT RIGHT, FEELS LOOSE AND POINTS TO WRONG GEAR
CUST STATES TILT STEERING WILL NOT LOCK INTO PLACE
L13 CHECK AND ADVISE ON KEY GETTING STUCK HARD TIME COMING OUT OF IGNITION
CUSTOMER STATES THAT SILINIOD FOR STEERING COLUMN NEED REPLACE PER RANDY ADVISE
CUSTOMER STATES IGNITION KEY CANOT BE REMOVED
CAN HEAR POPPING NOISE IN STEERING COLUMN WHEN TURNING
CUSTOMER STATES KEY WILL NOT COME OUT OF IGNITION.

CHECK AND ADVISE KEY WONT COME OUT OF IGNITION SWITCH L23
WHEN BRAKE RELEASED A CLICKING IS HEARD
WHEN DOOR IS OPENED AND KEY IS OUT OF IGN A DING SOUND IS HEARD
SHIFTS HARD OUT OF PARK
CK STEERING COLUMN WHEN TURNING STEERING WHEEL HEAR AND FEEL THUMP IN STEERING WHEEL ITS SELF
CUSTOMER STATES:THE SHIFTER HANDLE IS BROKEN
CUSTOMER STATES GEAR SHIFTER DOES NOT LOCK IN PARK SEE JENNIFER
STATES THAT WHEN TURNING THE STEERING WHEEL THAT IT MAKES A FUNNY NOISE WHEN YOU ARE TURNING IN EITHER DIRECTION
P09 CUSTOMER STATES SHIFT LEVER STUCK IN PARK

Report Info Status=Fin Request N Description Run Date / Completior Job Size=3 Execution ˜ Precalc Pr Cut Off Da Load Date= Currency E Generated By=CWELKER1
Data Selec Model Yea Cost Categ Region Sol Country Sc Part Num E Vehicle Line Aws = EXPLORER[U2]
Report Sel Report Nar Model Yea Destination Csv Name= Order By=\ Maximum (Logic=Cor Tis Claims= Claims Wit Requested Reported C Requested Reported D Description Default Claims (no Dat

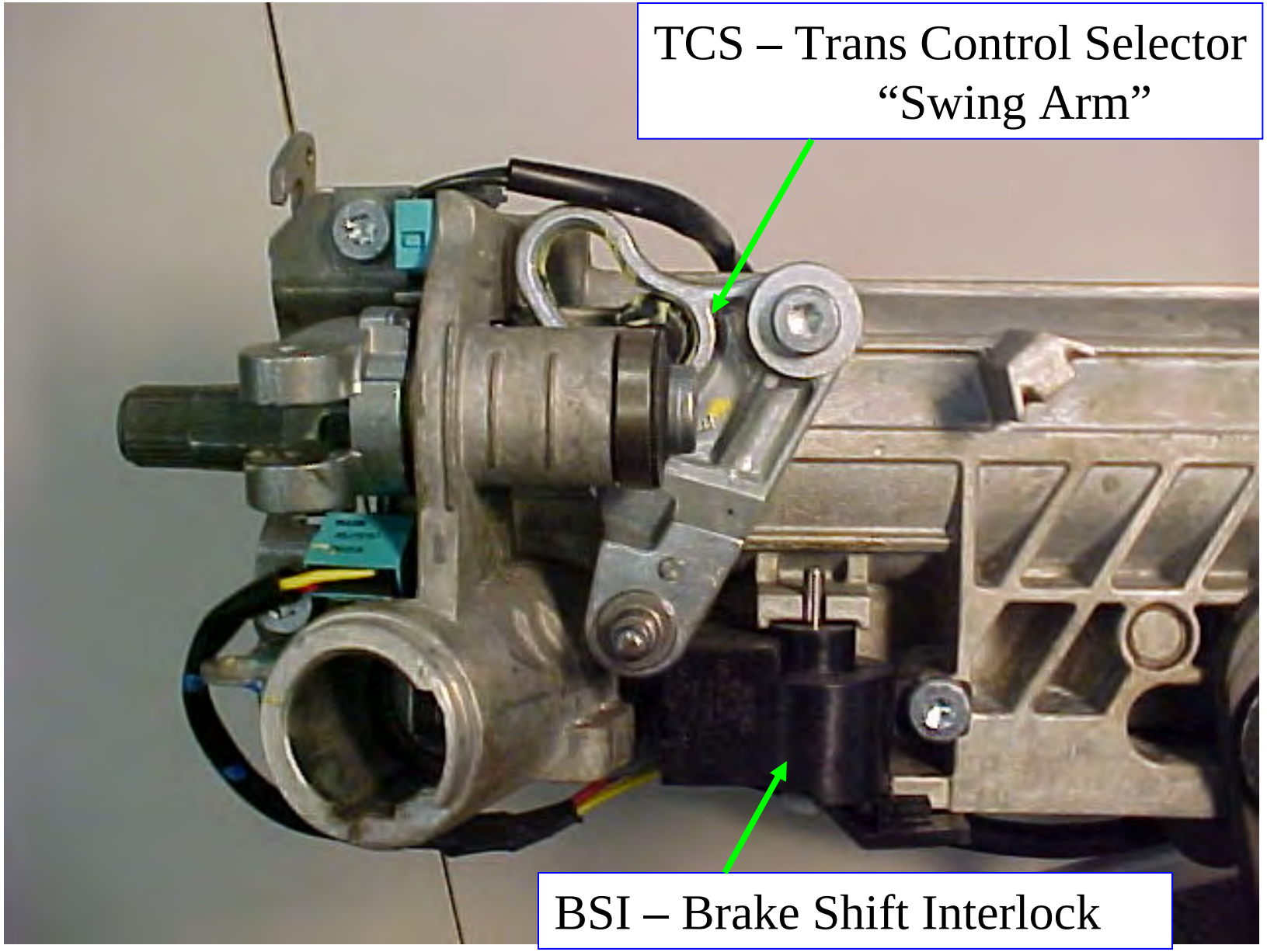
:e Filters)=Up to current cutoff date

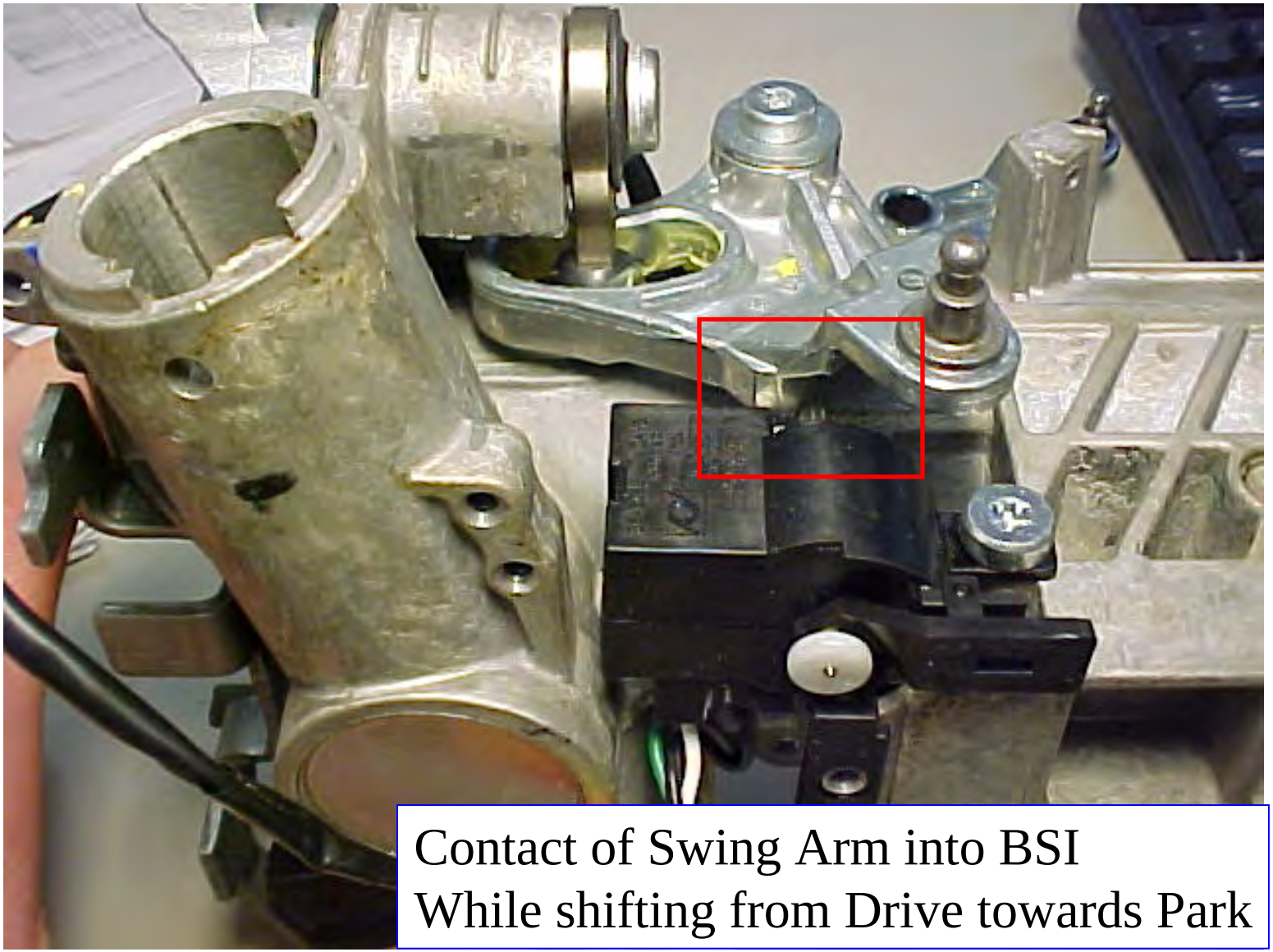
Technician Panel discussion of Explorer Steering column

Thursday, March 18, 2004

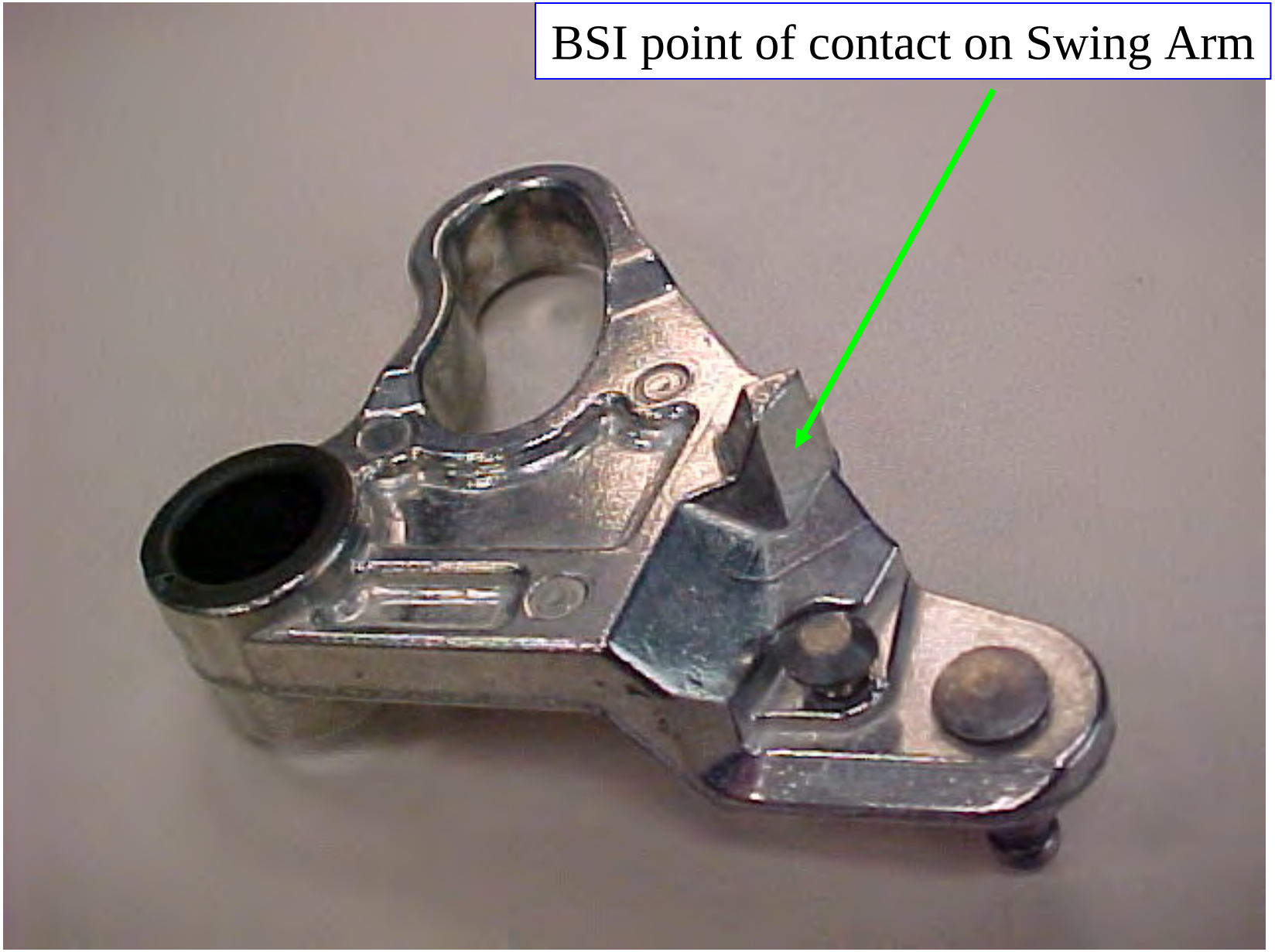
Ford Technical Institute

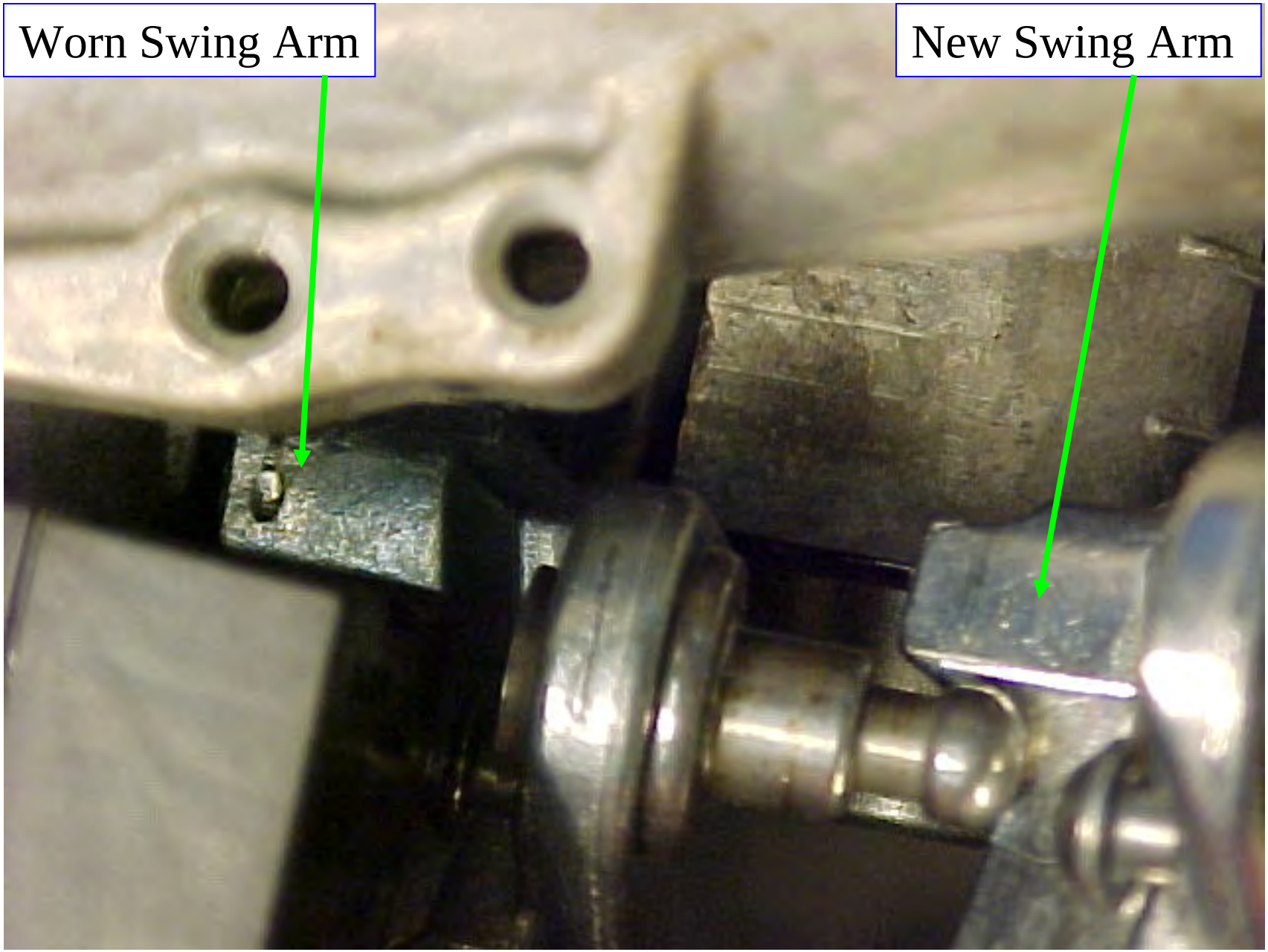
	Blue Team	Green Team	
8:15 - 9:30	Seat Track Noise	8:15 - 9:00	Steering Column (Explorer)
9:30 - 9:45	Break	9:00 - 9:30	Satellite Radio Diagnostics
9:45 - 10:30	**Steering Column (Explorer)**	9:30 - 9:45	Break
10:30 - 11:00	**Satellite Radio Diagnostics**	**9:45 - 11:00**	**Seat Track Noise**
11:00 - 11:45	Lunch	11:00 - 11:45	Lunch
11:45 - 1:45	Axle	11:45 - 2:15	Ford 500/Freestyle
1:45 - 2:15	AC Coil/Clutches	2:15 - 2:45	AC Coil/Clutches
2:15 - 4:45	Ford 500/Freestyle	2:45 - 4:45	Axle

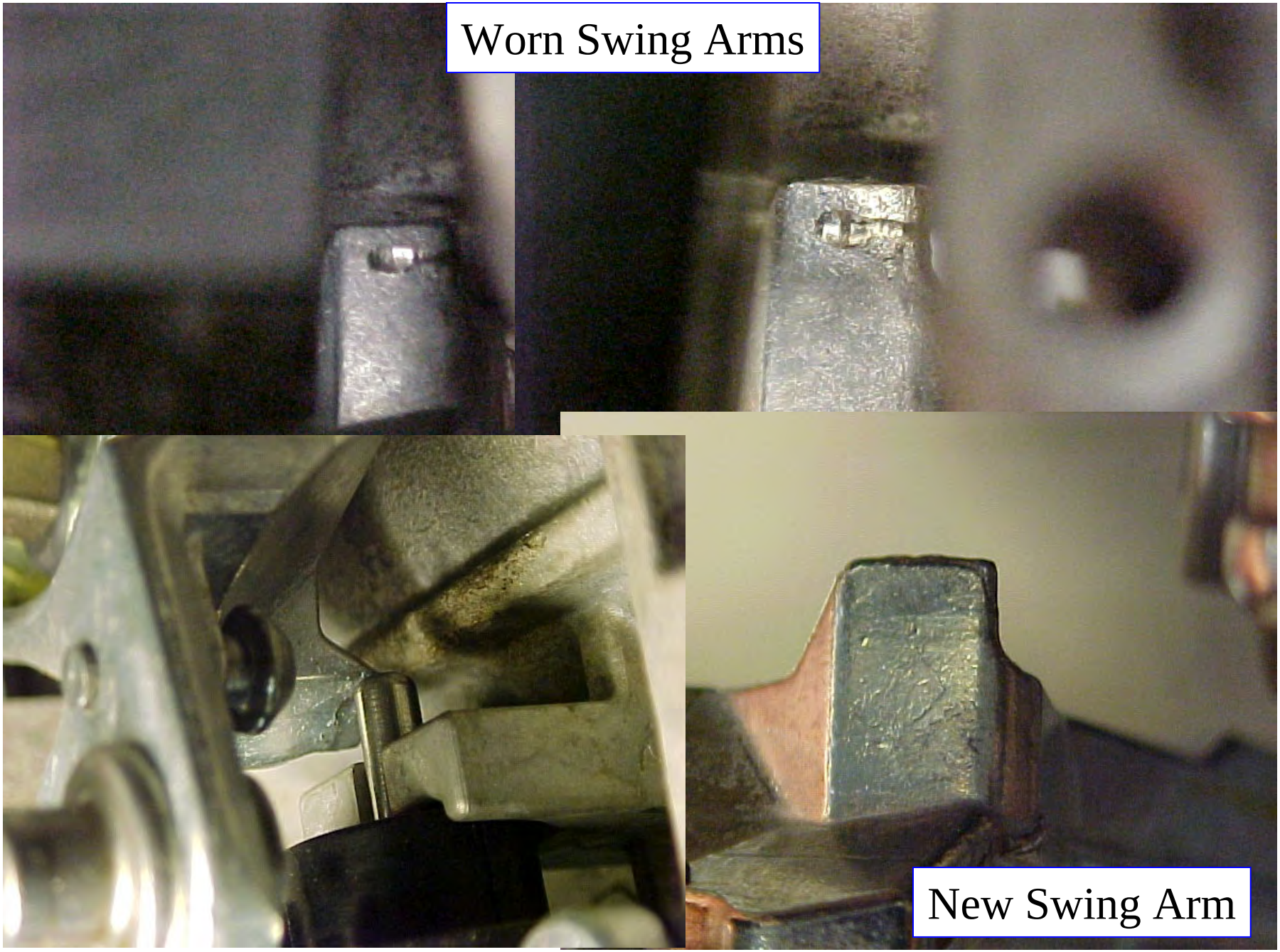

TCS – Trans Control Selector
"Swing Arm"
BSI – Brake Shift Interlock



Contact of Swing Arm into BSI
While shifting from Drive towards Park

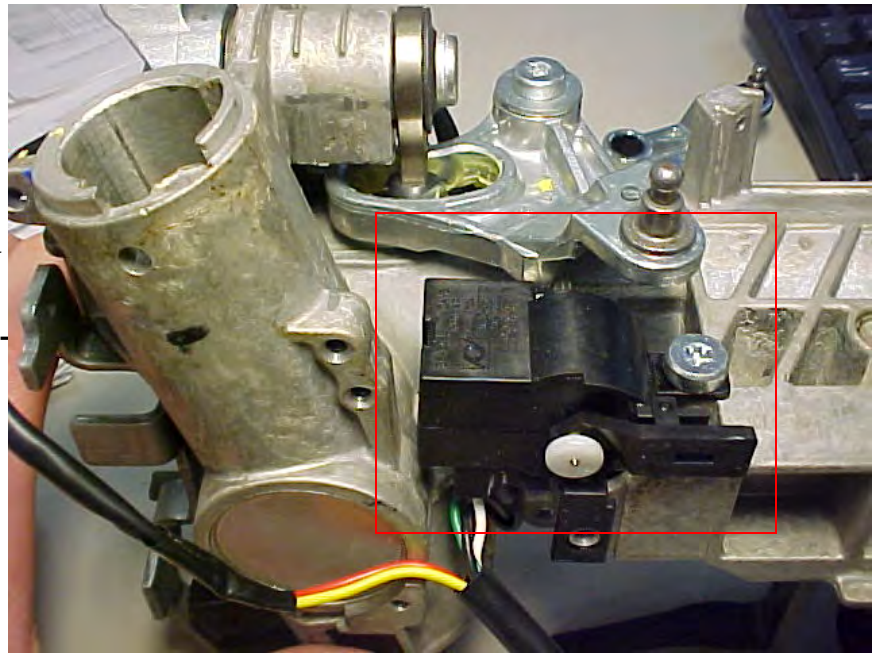

BSI point of contact on Swing Arm


Worn Swing Arm
New Swing Arm


Worn Swing Arms
New Swing Arm

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

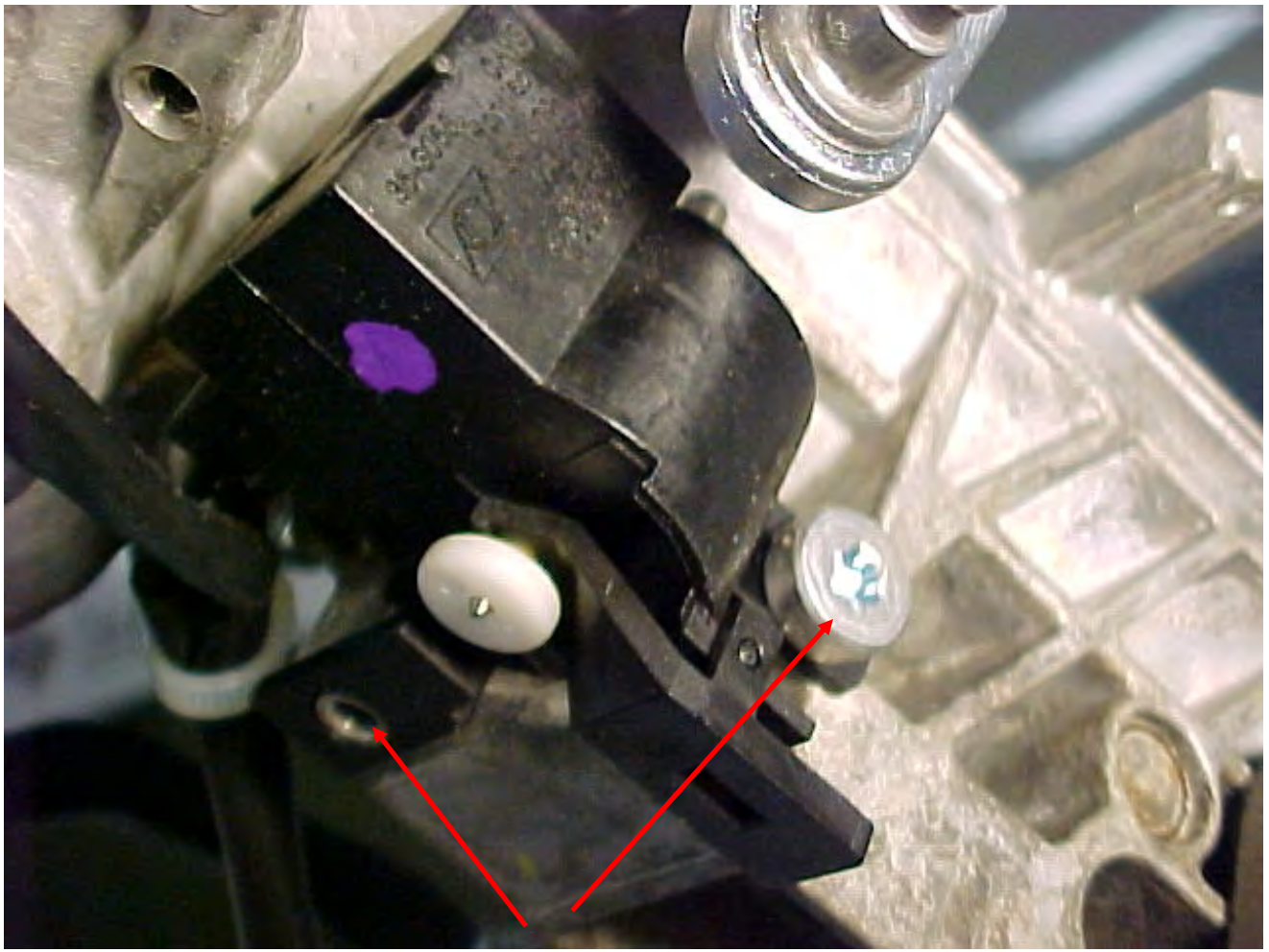
Brake Shift Interlock (BSI) Replacement



1) Check for difficult to reach Park
2) Remove IP knee bolster (7mm socket)
3) Remove column shrouds (#2 phillips screw
3) Remove BSI fasteners (2) (T-30 side and T-
4) Lower wiring bundle (7/32 socket) – 2 or 3
4) Break off the tabs from the BSI housing
5) Push white tab to free wiring connector from BSI housing
6) Connect new BSI to wiring
7) Install new BSI onto column housing
8) With engine running and parking brake fully on, check that vehicle can not be shifted out of Park without a foot on the brake pedal. (Warning: Ensure parking brake is ON)
9) With the parking brake fully On, shift out of Park into Drive. Shift back into Park. Shift system should not have any noticeable sticking when shifting into Park.
10) Reinstall the shrouds.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

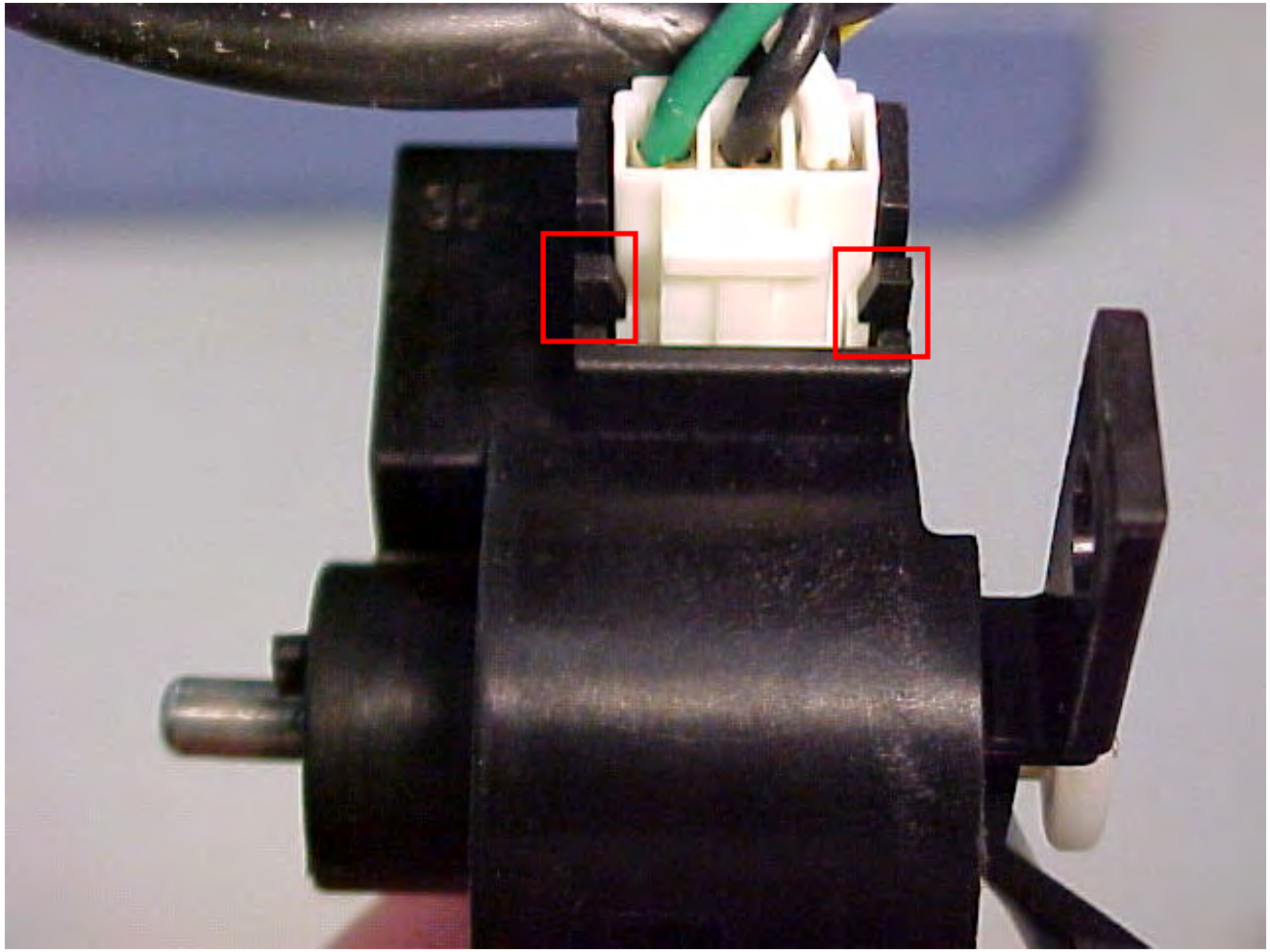
Brake Shift Interlock (BSI) Replacement



Remove BSI fasteners

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

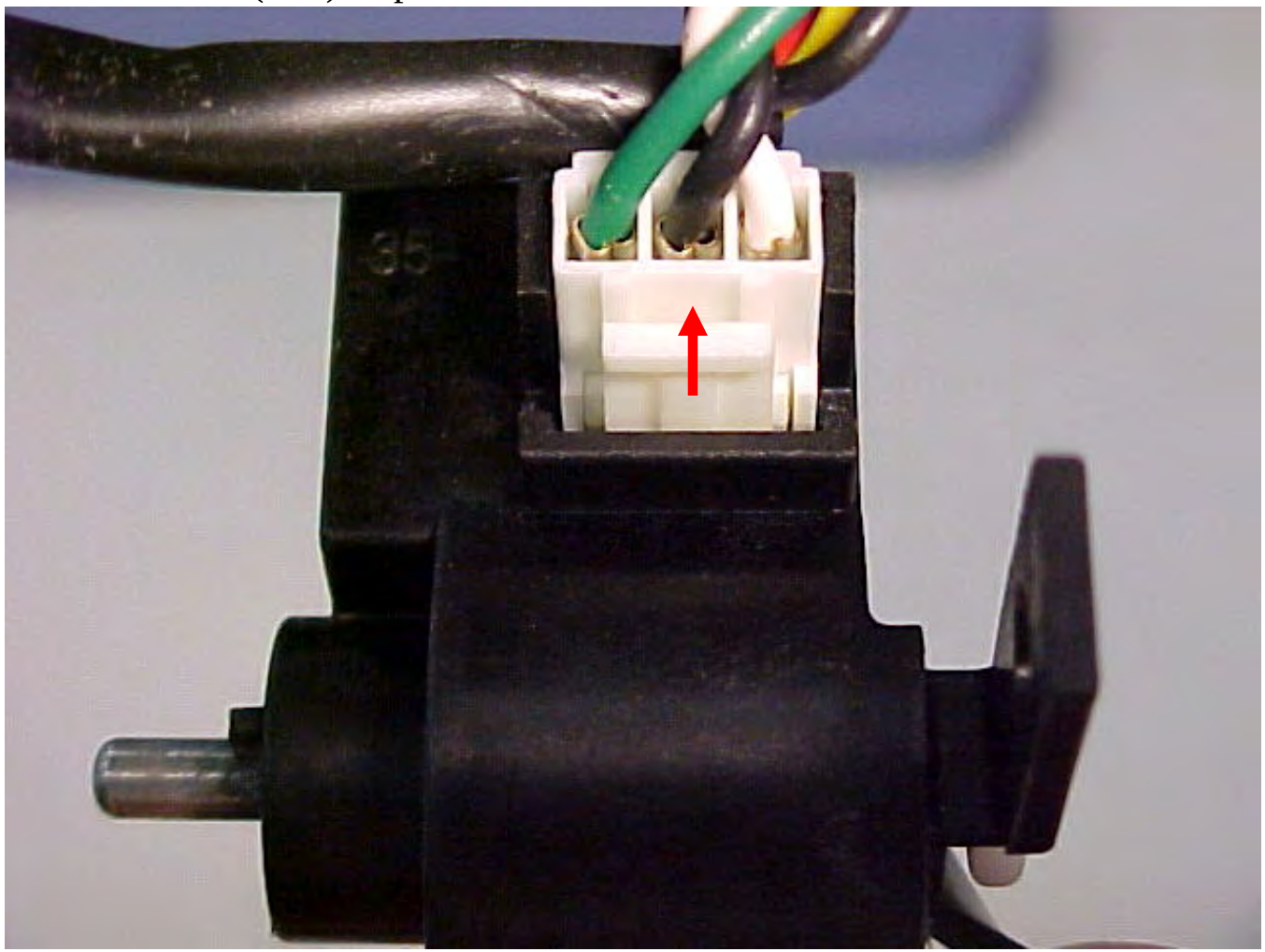
Brake Shift Interlock (BSI) Replacement



Remove BSI connection tabs from black housing.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

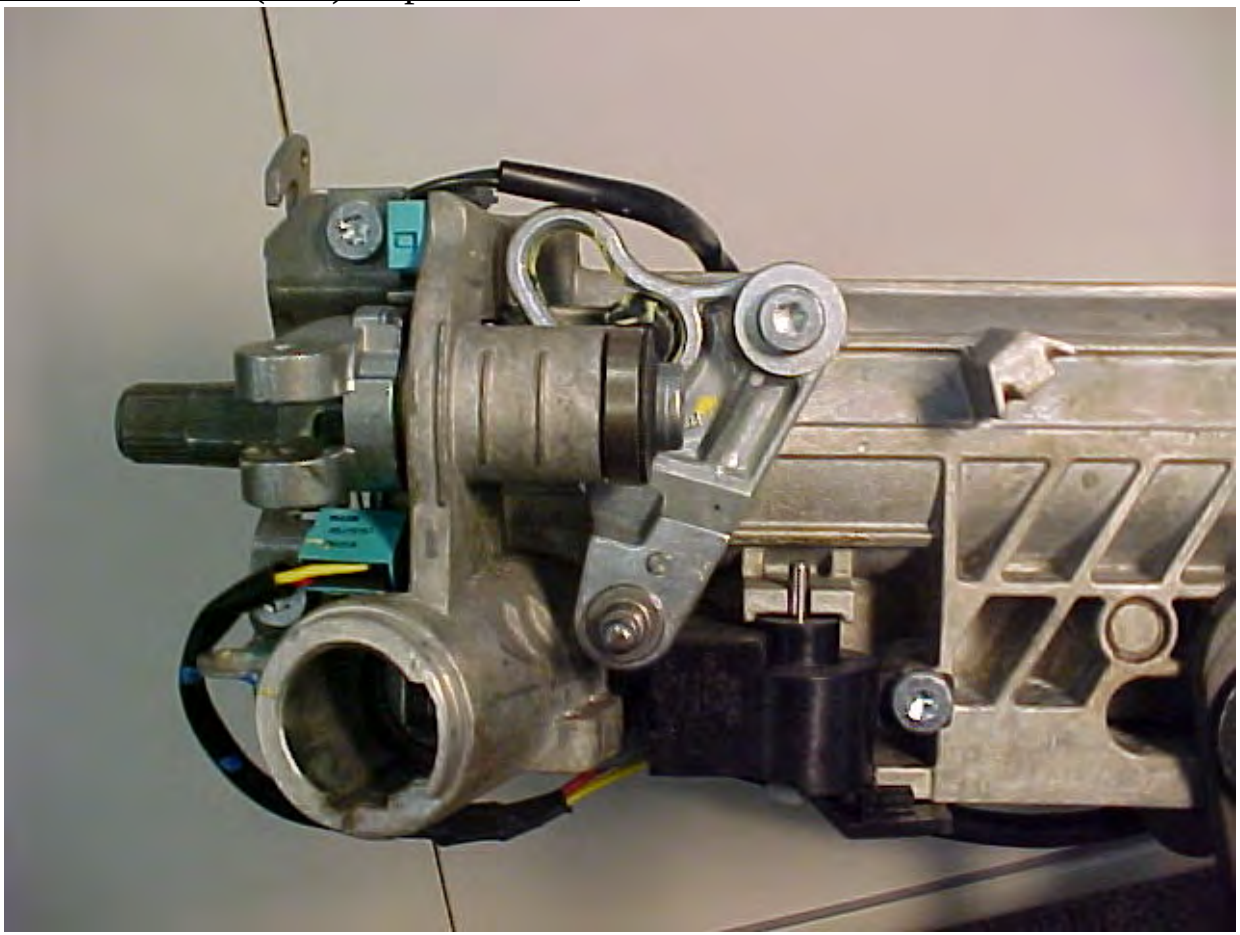
Brake Shift Interlock (BSI) Replacement



With housing tabs removed, remove white connector by pushing white tab towards the wiring.

U152 (Explorer/Mountaineer) Difficult to Reach Park Service Fix

Brake Shift Interlock (BSI) Replacement



BSI reinstalled. PRNDL, transmission cables, and shift arm only removed for clarity. Do not remove to place the BSI.

From: Leo Luce [lluce@futuretool.com]

Sent: Wednesday, April 28, 2004 3:48 PM

To: Thornton, James (J.W.)

Cc: Porter, Alan (A.J.)

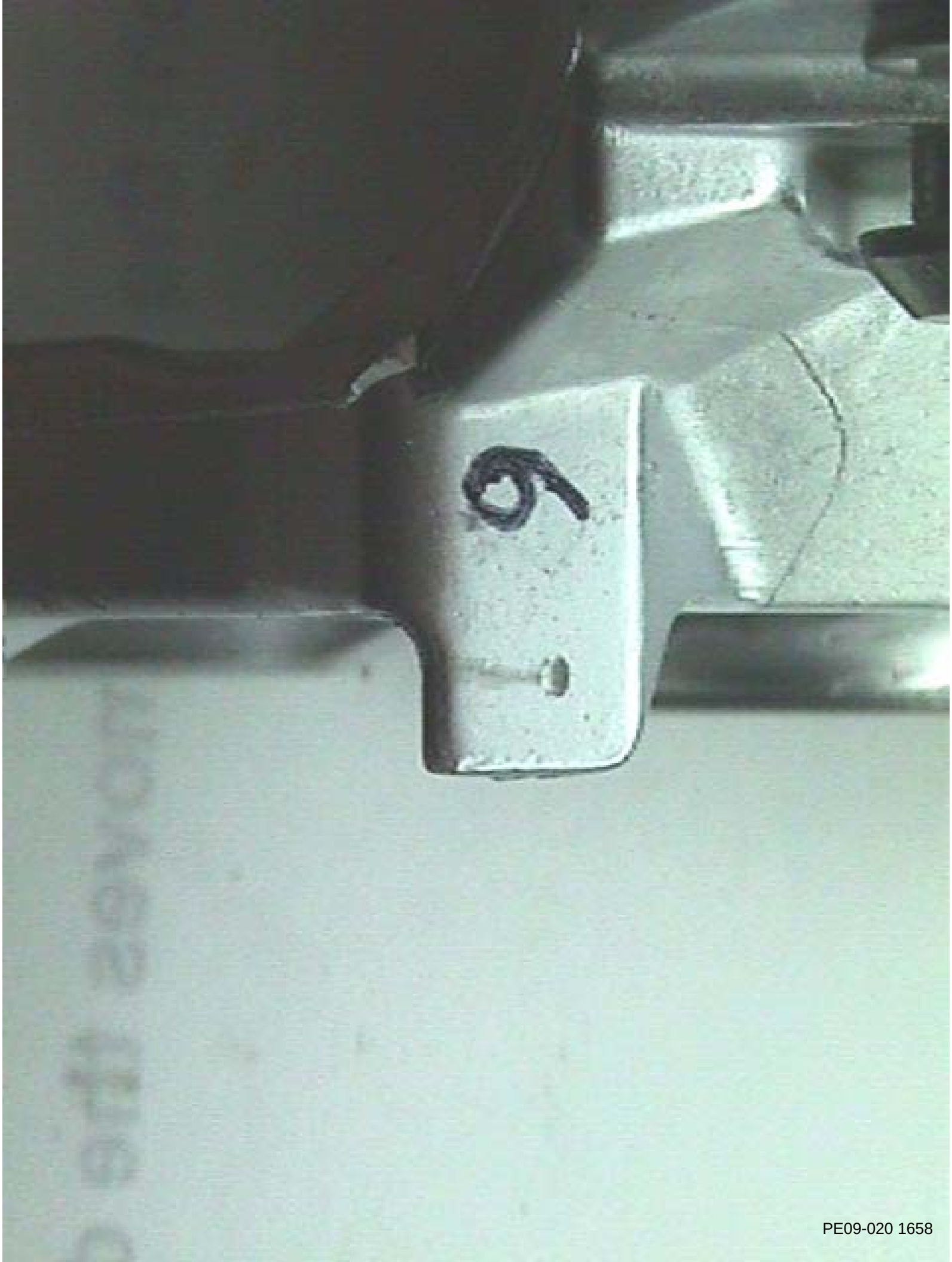
Subject: U152 Column Plated with Silicone grease Post Test Photos - 15k cycles

Attachments: 15K Sample #6 PSG.JPG; 15K Sample #2 PSG.JPG; 15K Sample #4 PSG.JPG; 15K Sample #5 PSG.JPG; 15K Sample #1 PSG.JPG

Jim,
Here are the photos after 15k-cycles on the plated with the silicone grease. I also need to get Sample #3 from you for a photograph unless you have one you can forward to me.

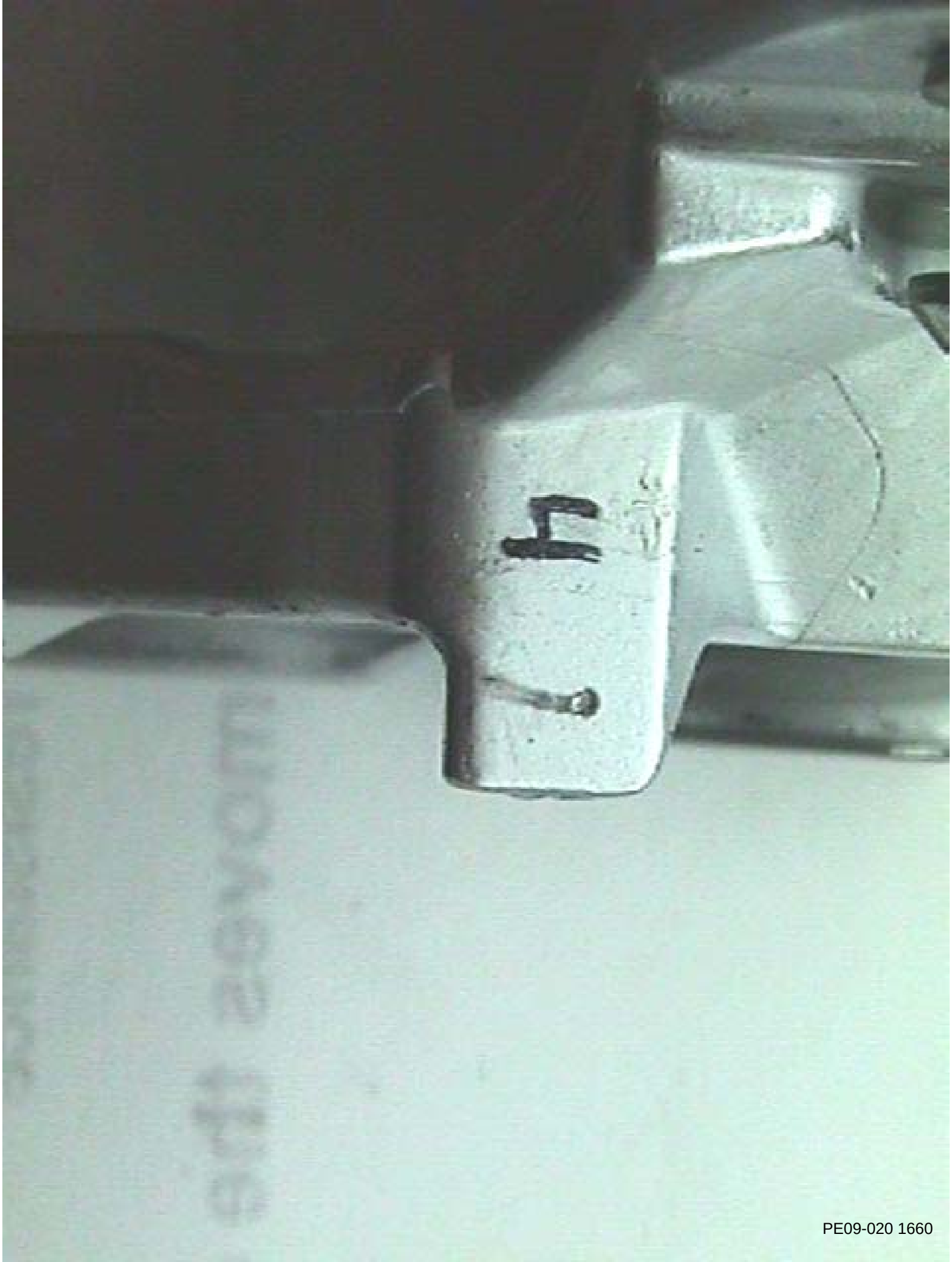
Sincerely,

Leonardo Luce
Test Operations
Phone: 734-946-2100
Fax: 734-946-0922



PE09-020 1658

PE09-020 1659



PE09-020 1660

PE09-020 1661

PE09-020 1662

U152 Column Shift System Review – 7/14/2000

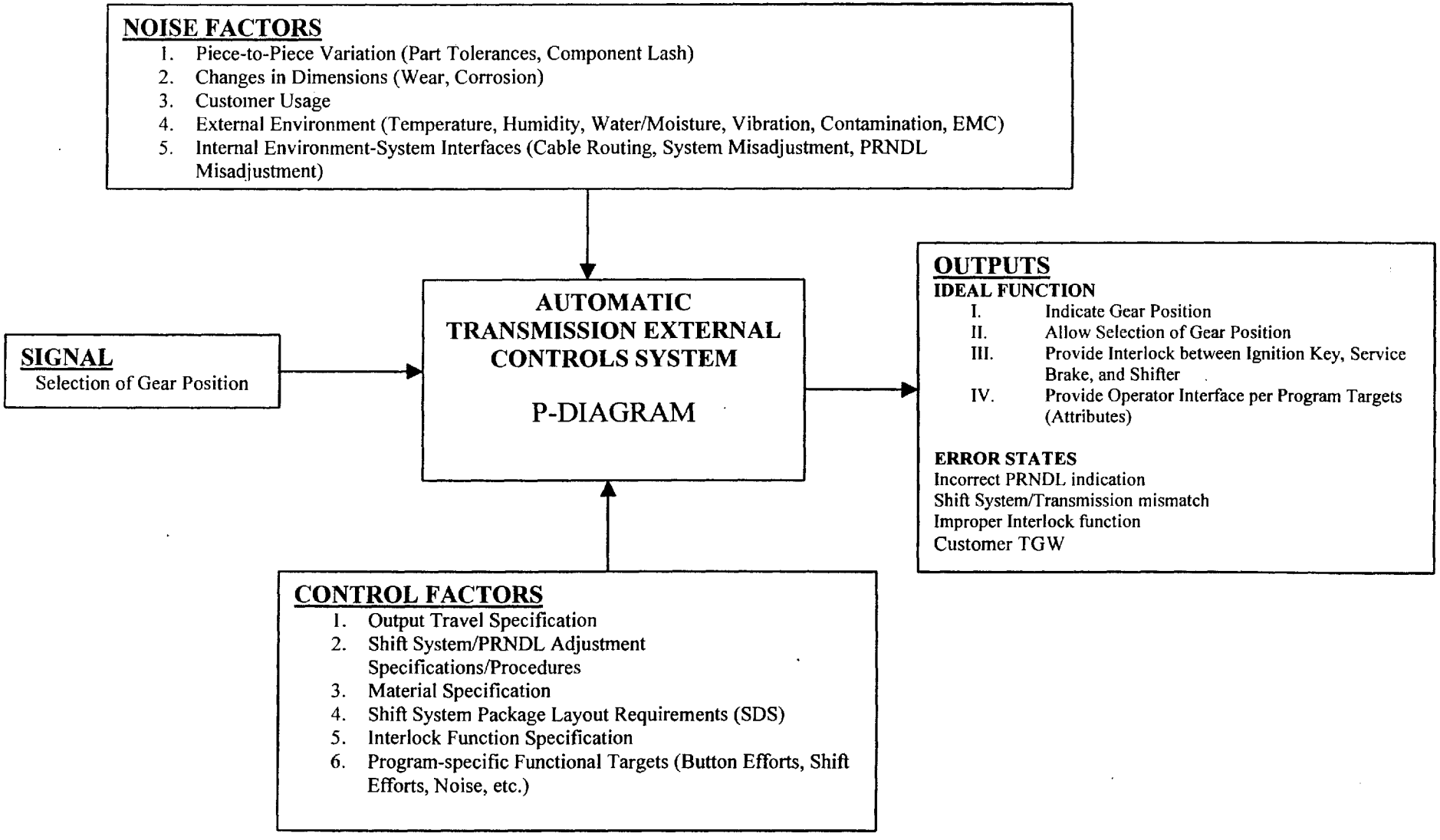
Agenda

- Introductions
- P- Diagram
- Review of U152 Issue on Shifter Buck
- Workplan
- Cognition MA model
  - Hardware Changes
- Verification Testing Results

(1) SHIFT LEVER – CONTROL PLAN
• EXTRAORDINARY HT TREAT CHICS

(2) COLUMN @33.73 → PUT INTO HIGH MILEAGE FLEET

AUTOMATIC TRANSMISSION EXTERNAL CONTROLS SYSTEM P-DIAGRAM



PE09-020 1664

Drive–Park Shift System Design

July 13, 2000

FIGURE 1 - Input at Shifter

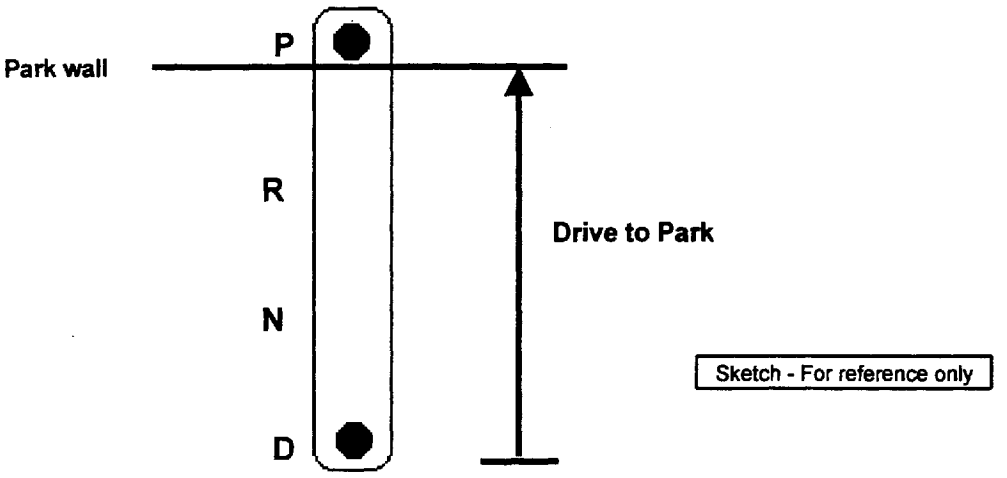
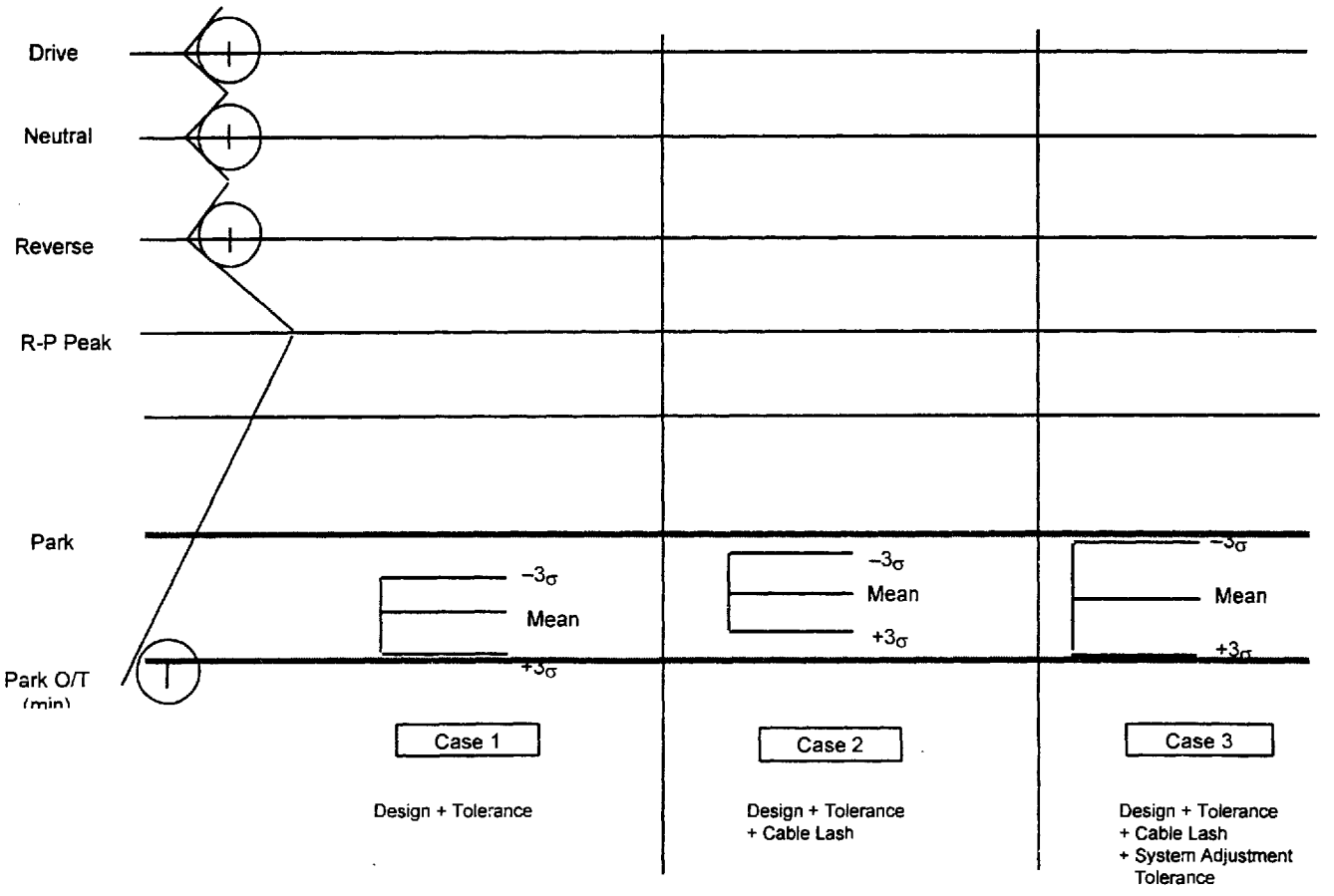


FIGURE 2 - Output at Transmission - Drive to Park



U152 Major Issue Workplan
Issue ID:

Issue Description: Shift System Robustness

Lead Activity: Chassis
Affected Activities: PTO - shift cable, transmission
Visteon - column and cluster
Overall Champion: Julie Levine

Date Opened: 3/14/2000

Date Issue Becomes Minor
(Planned): 5/8/00 (E)
(Actual): 5/15/00 (A)

Workplan:

AIMS / CR Issue Number:

Tasks Required	Champion (Activity)	Start / Fin (Plan) Start / Fin (Act.)	Results / Comments
1) Revise VSA and correlate model	PTO / Visteon	Start: 3/14/00 (A) Finish: 3/24/00 (A)	
2) Using VSA selected design alternatives, trial / measure Drive to Park angles in the craftsmanship truck using both max and min lash cables and the worst case column travel	PTO / Visteon	Start: 3/21/00 (A) Finish:4/6/00 (A)	Resolution is achieved with: 1) OML at 57mm 2) Trans min Park O/T at 41 deg 3) Column at >33.7 deg & new insert plate 4) PRNDL revised to match insert plate
3) Confirm resolution proposal with D&R for feasibility and timing	PTO - shift cable PTO - Trans Visteon - column Visteon - cluster	Start: 3/28/00 (A) Finish: 4/14/00 (E)	All engineering activities asked to provide PSW timing and 2PP support plan by Friday 4/14 COB
4) Evaluate final required detent angles for the column insert plate by VSA and convert to cluster PRNDL angles Note: Cluster will be kicked off based on VSA insert plate in hopes to meet 2PP. It is likely, that once tested in vehicle, the detent plate angles will need to be "tweaked".	Visteon - column Visteon - cluster PTO - shift cable	Start: 3/28/00 (A) Finish: 4/18/00 (E)	Evaluation on final detent angles by 4/14/00 and then creation of cluster angles by 4/18/00
5) Final confirmation on craftsmanship truck with prototype representation of all fixes. Detent Plate Iterations will occur 4/14 - 4/28 Evaluation of all prototype parts will occur 5/4-5/8	PTO - shift cable PTO - Trans Visteon - column Visteon - cluster	Start: 3/28/00 (A) Finish: 5/15/00 (A)	Evaluation of final fixes in craftsmanship truck showed resolution of issue.
6) Final costs, containment plans, CAD and CR (C11075622) to be processed 4/28/00	PTO - Trans Visteon - column Visteon - cluster	Start: 3/28/00 (A) Finish: 5/31/00 (E)	CRs processed by each group

Risk Assessment:

Assessment Date	PESO Readiness 9/20/1999	PESO 1/11/1999	Final S/O 5/1/2000	FEU (~ 7/17/00)	Job 1	No Risk Date
3/14/2000	N/A	N/A	Major	None	None	Verification at 2PP Builds (6/16)

Hardware Changes to address Issue:

1. Column

- Insert Plate (Park Detent)

- Revised Dimensions/Tolerances, Added Critical Characteristics
  - Lock Cylinder Housing
  - Swing Arm
  - Insert Plate
  - Socket
  - Ball Arm

- 100% Production Check for Shift System Travel

2. Transmission

- Outer Manual Lever length changed from 60 mm to 57 mm

- Over Travel Stop increased to 41°

CPE Items

no supplier issues

U152 Daily Meeting
11/14 Meeting Agenda

1. IB Build Status		
• Budd Front Door Quality	20 min.	S. Turner / Budd
i. Detailed timing plan		
• Today's Build / NOVA-C	15 min.	J. Tankesley
2. Technical Must Fixes	20 min.	S. von Foerster
• O/H console heat		
• Shift update		J. Levine / R. Perry
3. Other	5 min.	All

→ Note to Anne Stevens

→ Neutral → impact load what will it endure

→ Relax Tolerances

→ VO adjustments → pre-fire

Wed 6:30

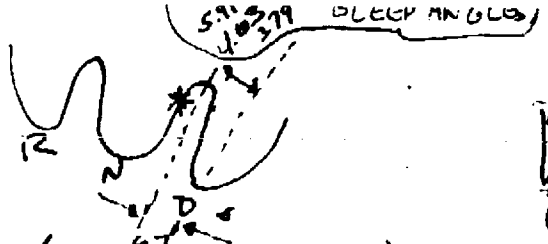
Thurs 4:30

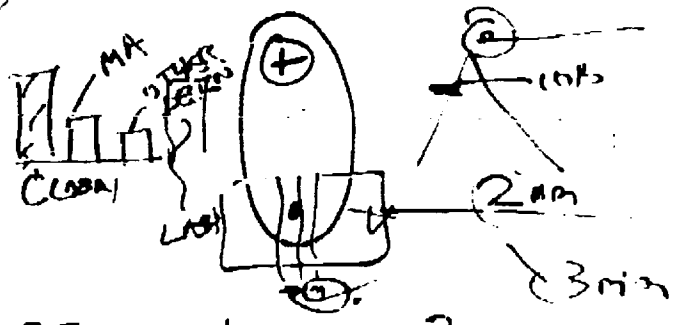
CORRECTIVE ACTION ALTERNATIVES

TRANS.

ACTION	RISK	PROS	CONS	TIMING	REMOVE & REPAIR
• LONGER MANUAL LEVER	HIGH	3MM Δ = .5° Δ	• NO PARK	SHORT	EASY
• INC. DETENT SPRING STIFFNESS (FOR SELF CENTERING)	HIGH	BETTER SELF CENTERING	• HIGH SHIFT EFFORTS • DIRECTIONALLY INCORRECT FOR D → N	SHORT	MAJOR
• CLOSE TRS RANGE FOR REV. FUNCTION					
• BIAS N-R PEAK OF ROOSTER COMB TO R	HIGH [illegible]	• STAY ON IN SIDE OF PEAK	• HOLD IN REVERSE • COMPLEXITY	LONG	MAJOR
• BIAS N-D PEAK TOD		"	• HOLD IN DRIVE • COMPLEXITY	"	"
•					

D-N





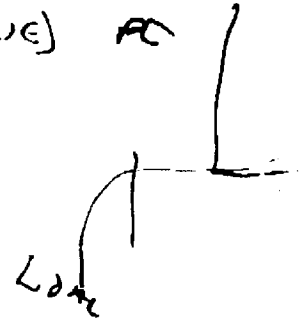
- MAX LASH CABLE (Δ 0.5 from MIN)
- INSERT PLATE w/ 1.35mm ADDED TO N WALL } 3.35
- 2.0mm OF SHIMS
- POSITIVE ADJUST (WORST CASE FOR D-N ISSUE)

1mm = 2°

4.08

N-R (INTO R @ 40 lb LOAD, BUT DIDN'T STAY IN R)

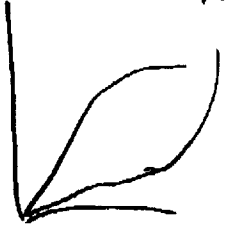
- MIN LASH CABLE
- INSERT PLATE w/ 1.35 mm ADDED TO N WALL (REPRESENTS 1.5 INSERT PLATE w/ -.15 tol)
- NEGATIVE ADJUST (WORST CASE FOR N-R ISSUE)



CORRECTIVE ACTION ALTERNATIVES

COLUMN

Reduce Deflect	Reduce Travel	Shifts Normal	ACTION	RISK	PROS	CONS	TIMING	REMOVE & REPAIR
N	N	Y	• MOVE "N" WALL 1.5 MM			• SHIFTS & DOESN'T REDUCE	SHORT	
Y	X	N	• TIGHTEN SOCKET HOLDING SHIFT LEVER		• REDUCES TRAVEL • APPROACHES DES. INTENT	• TOO MUCH FRICTION IN COLUMN RESTRICTS TRANS TELE CENTERING • INC. WEAR	SHORT	
N	Y	Y	• CHANGE CAM DESIGN		• LESS LINEAR TRAVEL	• NOT SIGNIFICANT GAIN		
Y	N	N	• STIFFEN SOCKET		• LESS DEFLECTION	• MAY NOT BE SIGNIFICANT	LONG	
Y	N	N	• STIFFEN HOUSING		" "	" "	LONG	
Y	Y	N	• " BUSHING		• REDUCED PERMANENT DEFLECTION	" "	SHORT	
			•					



FOLLOW-UP ACTIONS / ISSUES:

* - CHECK TO SEE IF RHD FLOOR SHIFTER EXHIBITS SAME CONCERN — JL

✓ - MAX TOL ON NORTON BSHG .47-.48 ON 30 parts THICKNESS

- CAPABILITY ON OML POS TOLERANCE - DAVE A.

- CAN OML DECREASE TOLERANCE?

- FORCE DEFLECTION CURVE OF COLUMN (ALAN P.)

- ADD FORCE DEFLG. TO MDGL (AUDREY)

- TOLERANCE AROUND FORCE DEFLECTION CURVE - MEASURE A BUNCH (ALAN P.)

- VALIDATE LASH TO SANITY CHECK THE VSA
  - SOCKET JT

Make VSA Smarter

Reduction
Deflection
Rake Barrel
Shifts Nominal

CORRECTIVE ACTION ALTERNATIVES

SHIFT CABLE

	ACTION	RISK	PROS	CONS	TIMING	REMOVE & REPAIR
NNY	• CABLE CONSTRUCTION- REDUCE LASH					
NNY	• CABLE LENGTH/ROUTING	LOW	REDUCES LASH HELPS D-N	HURTS N-R NOMINALLY SHIFTS DOESN'T REDUCE		
NNY	• SPRING ON CABLE TO BIAS LASH			ONLY HELPS TOWARDS P NOMINALLY SHIFTS. DOESN'T REDUCE		

2.19 ± .4

Issues

- I-shaft (PV) → bad test redo by Mon 11/13
- RR Stab-bar (APG) - parts Fri
- Tie link (APG) - parts Mon
- Coil spring (rear) (APG) - parts Mon
- Column (PV) → wrong parts
- ~~Ctrl Arm/ball jt (LAP)~~ ~~QR~~
- ~~shock/spring~~ ~~post PV parts~~ → ~~LAP~~ QR
- Shift boot PV

- 20 col → Saline TONIGHT
- 100 col → Saline rate flow ~~7~~ 11/16
- 128 col → Indy from Admiral 11/17
- Indy ship 128 to Saline FRI 11/17

$$\begin{array}{r} 4\cancel{5}.\overset{18}{\cancel{4}}1 \\ 3.\cancel{7}0 \\ \hline 1.71^\circ \end{array}$$

issue → .69° issue

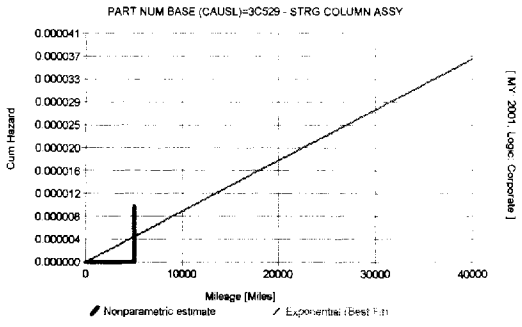
occurs w/ no lash

- Smarter VSA → .69 issue — robustness col & trans
- Fix 1.4 ± .15mm
- Sorting right now insert plates supporting Mon

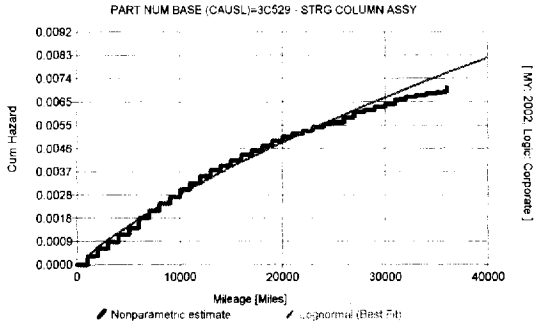
⇒ ADD <SC> → on "N" wall

⇒ PROVE WHY THEY'RE CAPABLE

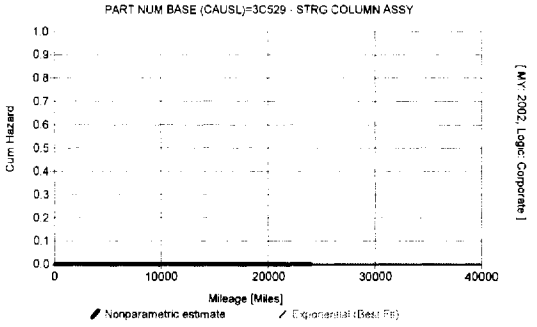
U152 Explorer/Mountaineer 3C529 Steering Column Assy



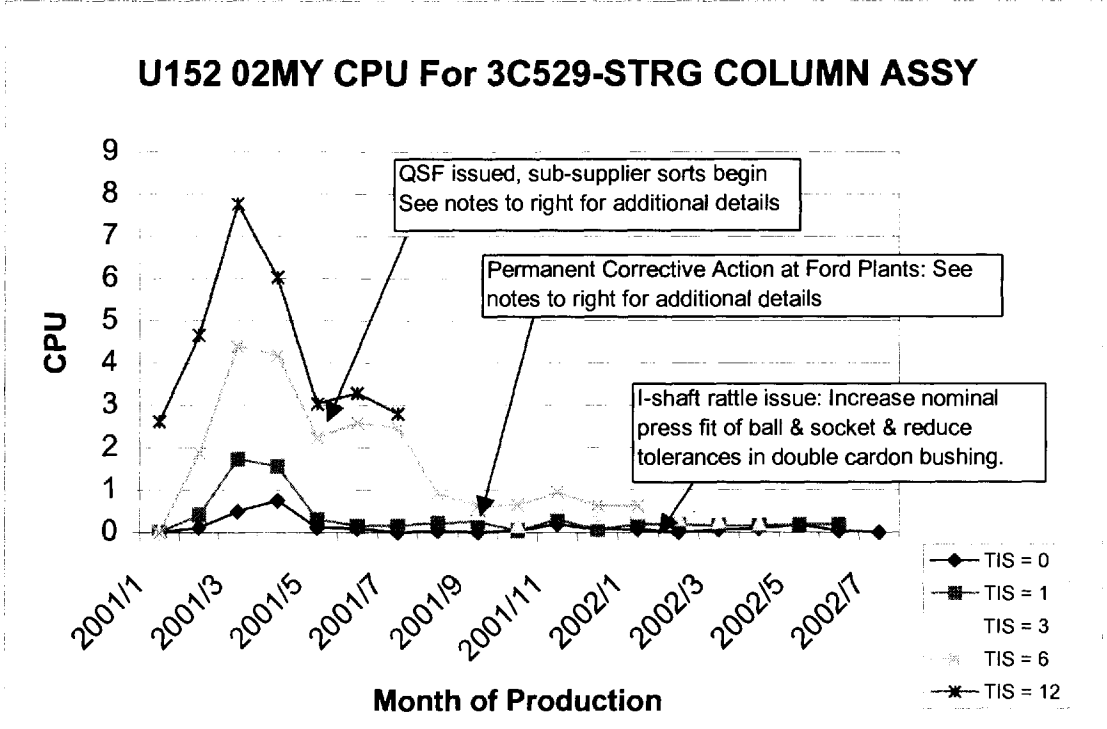
01MY



Decreasing Failure Rate for 02MY
6.5% Fail at 30,000 miles



Constant Failure Rate for => Sept 2001 Build Date. 0% Fail at 30,000 miles



Problem statement: Brake Shift Interlock (BSI) electrical failures peaked in March 2001 causing customers to become stuck in Park. This resulted in a QSF. Also, I-shaft rattle issues binned to -3c529- caused an increase in warranty.

Brake Shift Interlock Issues

April 24, 2001 - BSI issue noted by engineering. QSF issued

May 8, 2001 - BSI sub-suppliers started sorts - 200% & 300% visual inspection of parts at various locations.

May 25, 2001 - Cavities of tool producing defective parts quarantined.

July 9,2001. Permanent corrective actions implemented at subsupplier:

- Improved solder application.
- Lowered tension of wire
- Improved monitoring process
- Minor tool modifications at sub-supplier

Sept. 1, 2001 - Permanent corrective action reaches Ford Plants.

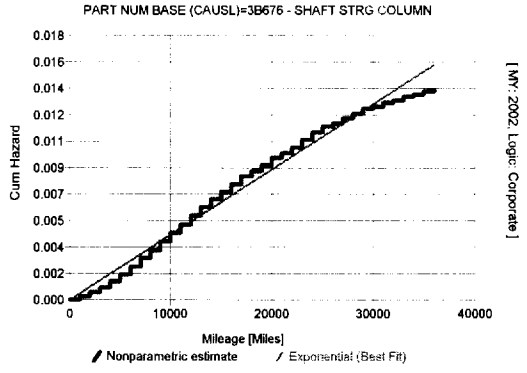
I-shaft rattle issues binned to 3c529 throughout Model year.

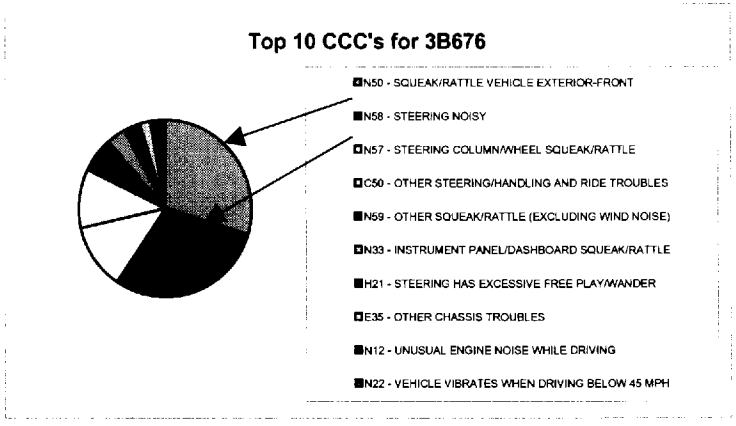
Feb. 1, 2002 - Permanent corrective actions implemented.

Increase nominal press fit of ball & socket and reduced tolerance in the bushing of the double cardon

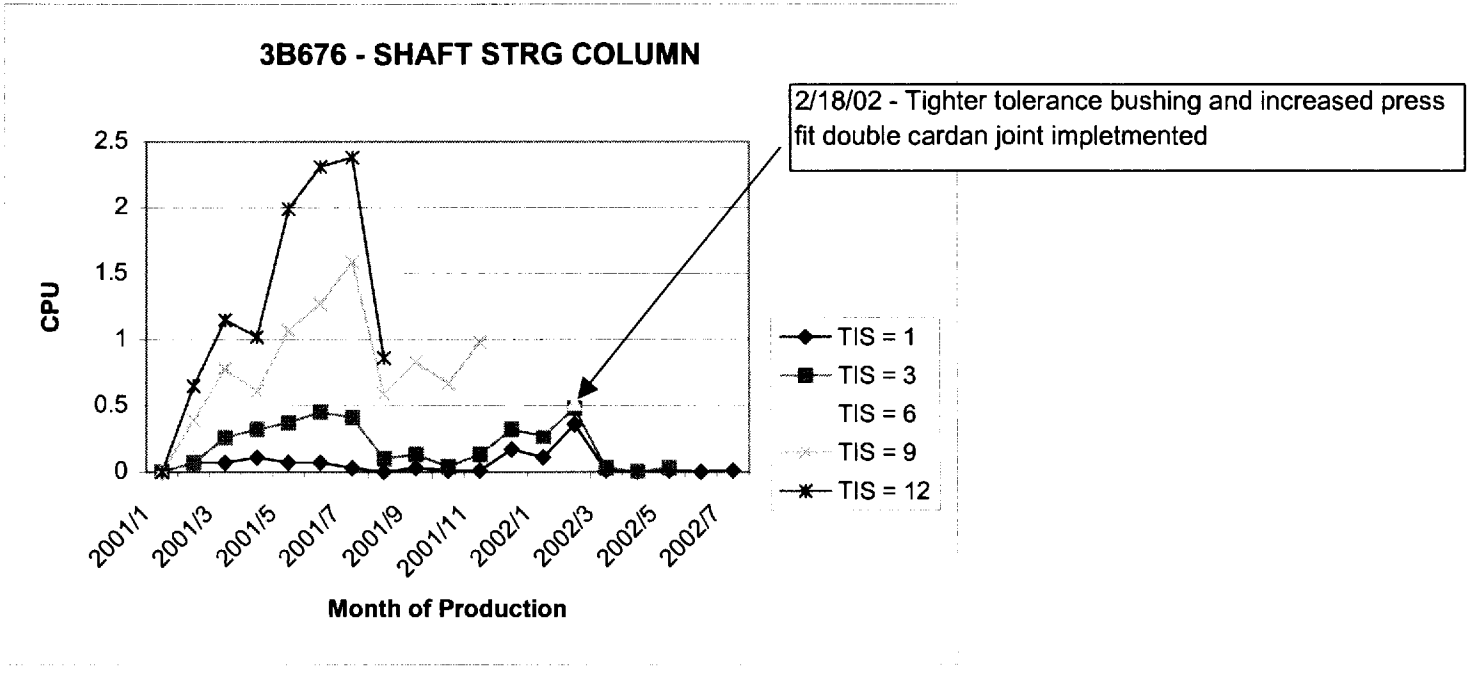
Explorer Top 100 CCC Causal Parts for 2002 MY

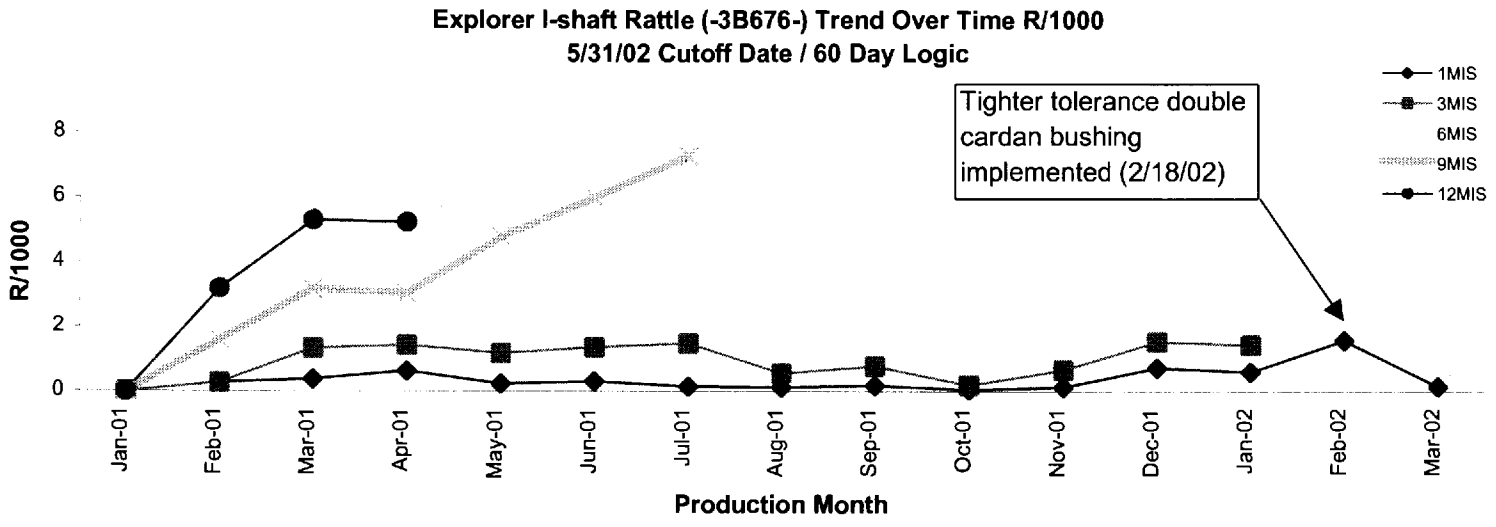
3B676 - SHAFT STRG COLUMN

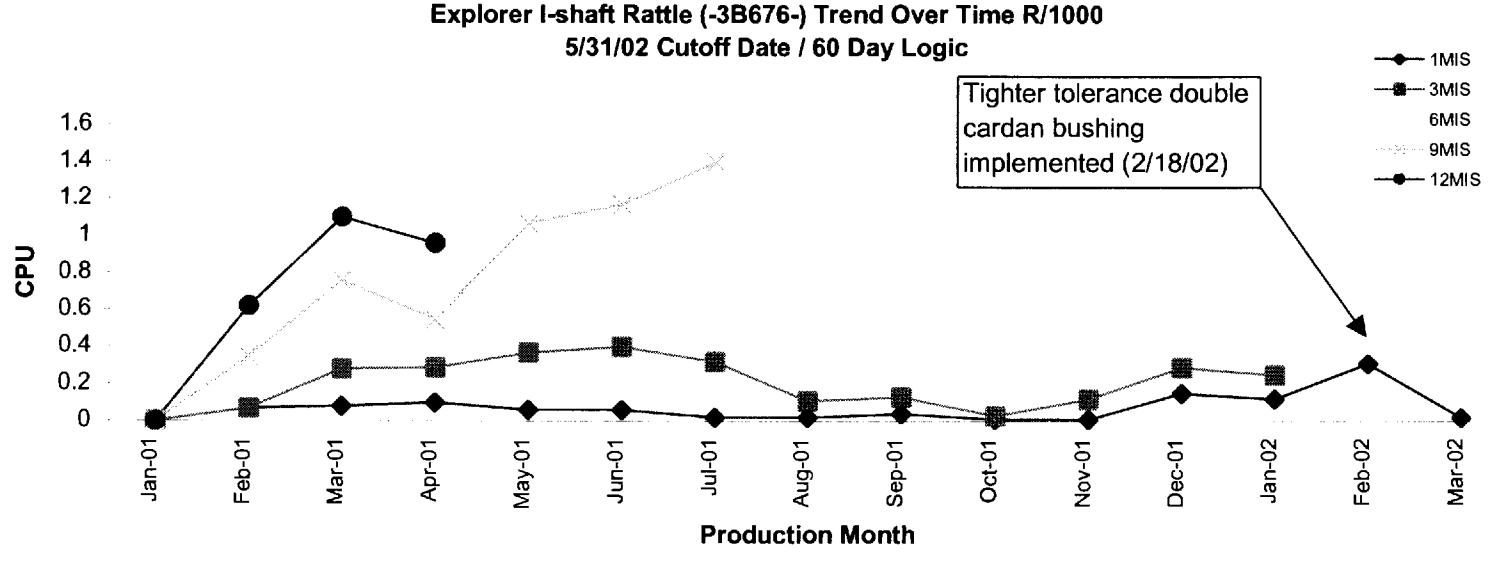




Constant Failure Rate for 2002
1.5% will fail at 36,000 miles.




Explorer I-shaft Rattle (-3B676-) Trend Over Time R/1000
5/31/02 Cutoff Date / 60 Day Logic
Tighter tolerance double cardan bushing implemented (2/18/02)
1MIS
3MIS
6MIS
9MIS
12MIS
R/1000
0
2
4
6
8
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01
Nov-01
Dec-01
Jan-02
Feb-02
Mar-02
Production Month


Explorer I-shaft Rattle (-3B676-) Trend Over Time R/1000
5/31/02 Cutoff Date / 60 Day Logic
Tighter tolerance double cardan bushing implemented (2/18/02)
1MIS
3MIS
6MIS
9MIS
12MIS
CPU
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01
Nov-01
Dec-01
Jan-02
Feb-02
Mar-02
Production Month

Report Inf	Precalc Pr	Cut Off Date=31 Jan 2002	Load Date=18 Feb 2002	Currency Exchange=v5					
Data Selection Criteria:									
Report Sel	Tis Claims	Claims With Comments=ALL	Requested Currency=USD	Reported Currency=USD					
MDL_YR	CPSC_C	TECH_TXT1	TECH_TXT2	CUST_TXT	PRODN_D	PART_NU	RPR_DT	TIS_WSD	MILGE
2002	110401	DIAGNOSED AND REPLACED STEERING INTERMEDIATE SH AFT. RETESTED OK AT THIS TIME.		CHECK AND ADVISE CUSTOMER STATES RATTLE IS FELT IN STEERING WHEN SLOWING DOWN TO STOP OVER SMALL BUMPS	2001-07-16	3B676	2001-11-1	2	2630
2002	110401	STEERING SHAFT STEERING SHAFT REPLACE		INSTALL S.O.P. PER R.O.#93596, CUSTOMER STATES THERE IS A NOISE IN STEERING SHAFT WHILE DRIVING TECH 113	2001-07-17	3B676	2002-01-1	6	9753
2002	110401	RD TEST HEARD RATTLE NOISE FROM COLUMN AREA OVER BUMPS CK OASIS REPLACED STEERING COLUMN ASY PER SSM 14723 RD TEST HEAR NOISE FROM COLUMN AREA BUT LOWER DOWN INSPECT AND TIGHTEN FRONT SUSPENSION NUTS	AND BOLTS RD TEST NO CHANGE PINPOINT NOISE TO STEERING SHAFT REPLACED BINDING STEERING SHAFT AND RD TEST OK	CK FOR RATTLE RUMBLE TYPE NOISE FROM STEERING COLUMN WHILE DRIVING, MORE AT SLOWER SPEEDS	2001-07-17	3B676	2001-10-2	4	3065
2002	110401	STEERING COULM SHAFT CAUSING CLUNK R R SREERING SHAFT AND ATTACKING BOLTS		C S NOISE IN COLUMN (CLUNK) ON TURNS	2001-07-23	3B676	2001-08-2	0	12796
2002	110401	CHECK FOR RATTLE IN STEERING COLUMN,REPLACE LOWER STEERING SHAFT PER JIM K		C S CK FOR A RATTLE IN THE STERING COL WHEN GOING OVER ROUGH PAVEMENT AND CK FOR THE NOISE IN THE LEFT WHEEL	2001-07-24	3B676	2001-12-1	2	1580
2002	110401	4273 3B676 42 ROAD TESTED VEHICLE AND VERIFIED CONCERN. FOUND NOISE COMING FROM LOWER STEERING SHAFT. REPLACED LOWER STEERING SHAFT. ROAD TESTED FOR QUALITY.		N57 STEERING COLUMN FEELS LOOSE WHEN HITTNG BUMPS CUST STATES REPORT	2001-07-24	3B676	2001-11-0	3	4265
2002	110401	ROAD TEST TO VERIFY CONCERN ISOLATE NOISE TO LOWER STEERING SHAFT REPLACE SHAFT VERIFY REPAIR MT TIME BECASUE OF NO LABOR TIME		RATTLE IN LOWER STEERING COLUMN AREA	2001-07-25	3B676	2001-11-2	3	3528
2002	110401	BASE PART 3B676 F C 33 C C N57 REPLACED STEERING SHAFT		RATTLE SOUND FROM STEERING	2001-07-26	3B676	2001-12-2	5	4484
2002	110401	4320 REPLACED STEERING SHAFT		REPLACE STEERING COLUMN PER CUSTOMER POPI	2001-08-24	3B676	2002-01-2	4	4320
2002	110401	ROAD TEST TO VERIFY CONCERN PINPOINT NOISE TO LOWER STEERING SHAFT REP		CUSTOMER STATES RATTLE FROM STEERING COLUMN	2001-08-30	3B676	2001-12-0	2	1691
2002	110401	INSTALLED CHASIS EARS ROADTEST TO PINPOINT NOISE REPLACE STEERING SHIFTER ASSEMBLE		DIAG RATTLE FROM INSIDE THE TRUCK WHEN GOING OVER BUMPS	2001-09-04	3B676	2002-01-1	4	5092
2002	110401	51 REPLACE LOWER STEERING COUPLER PER TECH HOT LINE		INSTALL SOP LOWER STEERING COUPLER TECH 226	2001-09-21	3B676	2001-12-2	3	5639
2002	110401	27026 42 C.C.3B676 TEST DRIVE FOR NVH R&I UPPER STEERING COLUMN FOUND NOISE COMMING FROM LOWER STEERING SHAFT REPLACE SHAFT RETEST DRIVE NO ABNORMAL NOISE HEARD AT THIS TIME		N57 RATTLE COMING FROM STEERING WHEEL WHEN DRIVING AT 10 MPH	2001-09-24	3B676	2002-01-2	4	27026

Report Inf	Precalc Pr	Cut Off Date=31 Jan 2002	Load Date=18 Feb 2002	Currency Exchange=v5					
Data Selection Criteria:									
Report Sel	Tis Claims	Claims With Comments=ALL	Requested Currency=USD	Reported Currency=USD					
MDL_YR	CPSC_C	TECH_TXT1	TECH_TXT2	CUST_TXT	PRODN_D	PART_NU	RPR_DT	TIS_WSD	MILGE
2002	110401	24 3B676 ROAD TESTED VEHICLE, VERIFIED CONCERN. HEARD NOISE COMING FROM LOWER STEERING SHAFT. REPLACED LOWER STEERING SHAFT.		N57 CUST STATES HAS RATTLE IN OR AROUND STEERING COLUMN	2001-11-15	3B676	2001-11-2	0	24

Report Inf	Precalc Pr	Cut Off Date=31 Jan 2002	Load Date=18 Feb 2002	Currency Exchange=v5					
Data Selection Criteria:									
Report Sel	Tis Claims	Claims With Comments=ALL	Requested Currency=USD	Reported Currency=USD					
MDL_YR	CPSC_C	TECH_TXT1	TECH_TXT2	CUST_TXT	PRODN_D	PART_NU	RPR_DT	TIS_WSD	MILGE
2002	110401	VERIFIED CONCERN, NVH DIAG, INSPECT COMPLETE STEERING LINKAGE, REMOVE COMPLETE COLUMN TO INSPECT, FOUND NOISE INTERNAL TO CLOCKSPRING, REMOVE CLOCKSPRING, DISSASEMBLE & ADD DYELECTRIC GREASE TO WINDIN	GS TO DAMPEN NOISE, CONTACT HOTLINE, NO REPAIRS FOR CONCERRN AT THIS TIME, SAME NOISE FROM NEW CLOCKSPRING.	CUST STATES CLICKING NOISE IN STEERING WHEEL	2001-06-01	3524	2001-11-2	6	10160
2002	110401	4603 CHECK FOR STEERING CHATTER OVER BUMPS ROADTEST FELT SLIGHT CVHATTER IN STEERING WHEEL REMOVE LOWER DASH TRIM PANEL INSPECT AND RETORQUE STEERING COLUM MOUNTING BOLTS REINSTALL DASH TRIM RE ROAD	TEST NOW OK	CUST STATES STEERING WHEEL SHIMMYS AND CHATTERS WHEN GOING OVER ROUGH ROAD.	2001-06-12	3524	2001-10-1	4	4603
2002	110401	LOOSE BOLT IN COLUMN REMOVED COLUMN TO REMOVE BOLT WEDGED IN LOWER COLUMN REINSTALLED COLUMN		RATTLING NOISE IN STEERING COLUMN	2001-06-15	3524	2001-06-2	0	21
2002	110401	07 CHECK RATTLE IN COLUMN GOT TO ACT UP TEST DRIVE WITH CUST REMOVE FUSE BOX RATTLING AND TIGHTEN BRACKETS INSTALL FOAM		CHECK RATTLE IN STEERING N57	2001-07-20	3524	2001-12-0	4	8558
2002	110401	LOOSE SCREWS. R R STEERING COLUMN AND TIGHTEN SCREWS		RATTLE IN STEERING WHEEL	2001-08-29	3524	2001-10-2	0	5
2002	110401	619 3600 CC 12 VERIFY CUSTOMER CONCERN.R & R STEERING COLUMN TO GAIN ACCESS.ADJUSTED AMD REINSTALLED.NO CLICKING NOISES AT THIS TIME TECH 4441		N57 CLICKING SOUND FROM STEERING COLUMN WHEN TURNING STEERING WHEEL.	2001-09-04	3524	2001-10-1	1	618
2002	110401	TEST DROVE FOR NOISE USED CHASSIS EARS DIAGNOSED NOISE IN STEERING COLUMN, DISARMED AIR BAG AND REMOVED. FOUND EXTRA BOLT ROLLING AROUND ON TOP OF CLOCK SPRING. REASSEMBLED AND ARMED TEST DROV	E NOISE GONE TRIM CAP MISSING INSTALLED TRIM CAP	RUMBLING NOISE WHEN TURNING EITHER DIRECTION	2001-12-19	3524	2002-01-0	1	5

Report Inf	Precalc Pr	Cut Off Date=31 Jan 2002	Load Date=18 Feb 2002	Currency Exchange=v5					
Data Selection Criteria:									
Report Sel	Tis Claims	Claims With Comments=ALL	Requested Currency=USD	Reported Currency=USD					
MDL_YR	CPSC_C	TECH_TXT1	TECH_TXT2	CUST_TXT	PRODN_D	PART_NU	RPR_DT	TIS_WSD	MILGE
2002	1106XX	VERIFIED CONCERN LOCATED NOISE IN STEERING COLUMN REMOVED STEERING WHEEL AND TIGHTEN SLIDING CONTACT		SOMETHING IS LOOSE IN THE STEERING WHEEL WHEN TURNING IT RATTLES AROUND	2001-07-16	14A664	2001-08-2	0	491
2002	110602	6866 ROAD TEST VEH. VERIFIED CUSTOMER CONCERN.REPLAC ED CLOCK SPRING,CUSTOMER CONCERN IS NO LONGER P RESENT.NOTE THERE SPECIAL SERVICE MESSEAGE ON S TEERING RATTLE 15580 UNDER INVESTIGATION BY FOR D	MOTOR COMPANY.CUSTOMER PRIMARY CONCERN IS NOL ONGER PRESENT.	CUST STATES VEH HAS RATTLE NOISE FROM INSIDE STEERING COLUMN ON SLIGHT TURN TO LEFT WHEN DRIVING.	2001-07-18	14A664	2002-01-2	6	1
2002	110602	REPLACED CLOCK SPRING			2001-07-18	14A664	2001-10-3	4	4685
2002	1106XX	REPLACE CLOCK SPRING		SCRAPING NOISE IN STEERING COLUMN WHEN TURNING STEERING WHEEL	2001-07-26	14A664	2001-08-0	-1	3
2002	1106XX	WF 41 14A664 CCC N57 CONCERN VERIFIED AND DIAGNOSED BY TECH 6239, REPLACED STEERING WHEEL AND CLOCKSPRING WITH PARTS FROM STOCK UNIT, RETEST, OK AT THIS TIME.		UST STS STEERING WHEEL NOISEY WHEN TURNING	2001-07-30	14A664	2001-08-2	0	5
2002	1106XX	CONTACT ASSEMBLY AIR BAG SLIDING REPLACE		STEERING WHEEL IS NOISY	2001-08-02	14A664	2001-09-0	0	15
2002	110602	REPLACED CLOCK SPRING PER SSM 15091		CHECK CLICKING NOISE WHEN TURNING STEERING WHEEL	2001-08-09	14A664	2001-11-2	-1	8
2002	110602	ROADTEST WITH SHOP FORMAN NOISE COMING FROM CLOCK SPRING IN STEERING COLUMN REMOVE AIR BAG CHECK NOISE FROM CLOCKSPRING REPLACE CLOCK		CUSTOMER STATES RATTLE IN STEERING COLUMN THAT OCCURS ON ROUGH PAVEMENT AT SLOW SPEEDS MAKING SHARP PARKING LOT	2001-08-17	14A664	2001-12-1	3	3568
2002	110602	PERFORMED INSPECTION REPLACED CLOCKSPRING ASSM.		PREP CENTER STATES WHEN TURNING THE STEERING WHEEL BACK AND FORTH THERE IS SOMETHING LOSE AND RATTLING IN AREA OF AIR BAG OR HORN CONTAQCT	2001-08-21	14A664	2001-09-2	0	13
2002	110602	VERIFY CONCERN. REMOVE STEERING WHEEL. REMOVE STEERING COLUMN TRIM. R AND R CLOCK SPRING. RE ASSEMBLE. CLOCKSPRING WAS SQUEAKING.		CUST STATES STEERING WHEEL SQEAKS SOP	2001-08-29	14A664	2001-10-1	1	999
2002	110602	9 14A664 33 VERIFIED CONCERN. FOUND NOISE COMING FROM CLOCK SPRING. REPLACED CLOCK SPRING, VERIFIED REPAIR. QC OK.		N57 CK. FOR CLINKING NOISE WHEN TURNING WHEEL ON INSIDE OF VEH.	2001-08-31	14A664	2001-09-1	0	9
2002	110602	1 TESTED FOR NOISE ,R AND I LEFT AIRBAG,STEERING WHEEL , MULTIFUNCTION SWITCH,R AND R CLOCK SPRING ,RETESTED		SCRUBBING NOISE IN STEERING WHEEL	2001-09-04	14A664	2001-09-1	0	5
2002	110602	CHECK FOR CLICKING IN STEERING COULMN REPLACE BROKEN CLOCK SPRING MI 33 01		CHECK STEERING WHEEL COLUMN MAKES CLICKING NOISE WHEN TURNED	2001-09-18	14A664	2001-09-2	0	33
2002	110602	IN STOCK UNIT,GENERIC MILEAGE		CLICKING NOISE FROM STEERING WHEEL ON TURNS. POSSIBLE CLOCK SPRING	2001-10-02	14A664	2001-10-0	0	7

Report Inf	Precalc Pr	Cut Off Date=31 Jan 2002	Load Date=18 Feb 2002	Currency Exchange=v5					
Data Selection Criteria:									
Report Sel	Tis Claims	Claims With Comments=ALL	Requested Currency=USD	Reported Currency=USD					
MDL_YR	CPSC_C	TECH_TXT1	TECH_TXT2	CUST_TXT	PRODN_D	PART_NU	RPR_DT	TIS_WSD	MILGE
2002	110602	ROAD TEST TO VERIFY CONCERN,FOUND NOISE IN STEERING COLUMN DIAG STEERING COLUMN NOISE.FOUND NOISE TO BE COMING FROM		CHECK STEERING WHEEL NOISE	2001-11-12	14A664	2001-12-0	1	52

Data Selection Criteria:	Cost Category = All Vehicle Coverages / Contractual[1,%,%]	Country Sold / Repaired [typed] = [USA,USA]	Customer Concern Code = STEERING NOISY[N58,V87]	Model Year = MY_02[2002]	Region Sold = North America[NA]	Vehicle Line Aws = EXPLORER[U2]				
Report Selection Criteria:	Report Name=Top N	Model Year=2002	Logic=Corp	Order By 1=Part Num Base (Causal)	Order By 2=	Value For N=10	Min Divisor=100	Cost Type=Total Cost Gross	Orderby Category =N / N	Use Group=No
RANK	MOD YEA	LOGIC	Part Num Base (Causal)	R1000S	COSTS	CPRS	CPUS	REPAIRS	VEHICLE	PRE DEL
	2002	Corporate	TOTAL	8.38	225023.2	238.37	1.85	944	220320	0.47
1	2002	Corporate	NPF - NO PROBLEM FOUND (NRTH	1.07	3208.67	46.5	0.05	69	220320	0.02
2	2002	Corporate	3B676 - SHAFT STRG COLUMN	1.04	29461.12	203.18	0.21	145	220320	0.03
3	2002	Corporate	3504 - GEAR ASY-STEERING	0.99	55283.8	464.57	0.46	119	220320	0.05
4	2002	Corporate	14A664 - AIR BAG CLOCK SPRING	0.56	12141.73	126.48	0.07	96	220320	0.13
5	2002	Corporate	3C529 - STRG COLUMN ASSY	0.53	53326.28	795.91	0.42	67	220320	0
6	2002	Corporate	3A674 - PUMP ASY P/STRG	0.48	12407.5	217.68	0.12	57	220320	0.04
7	2002	Corporate	1104 - HUB ASSY-FRONT	0.35	8454.79	281.83	0.11	30	220320	0.01
8	2002	Corporate	5493 - INSULATOR STAB ASY	0.22	894.95	49.72	0.01	18	220320	0
9	2002	Corporate	1007 - WHEEL ASSY	0.19	791.5	87.94	0.01	9	220320	0
10	2002	Corporate	3524 - SHAFT & RACK ASY-STE	0.19	1952.67	84.9	0.02	23	220320	0.02
11	2002	Corporate	3E751 - SHAFT, UPPER STRG ASY	0.12	6393.7	336.51	0.04	19	220320	0

NPF
ISHAT — ISHAT
— DASH SEALI

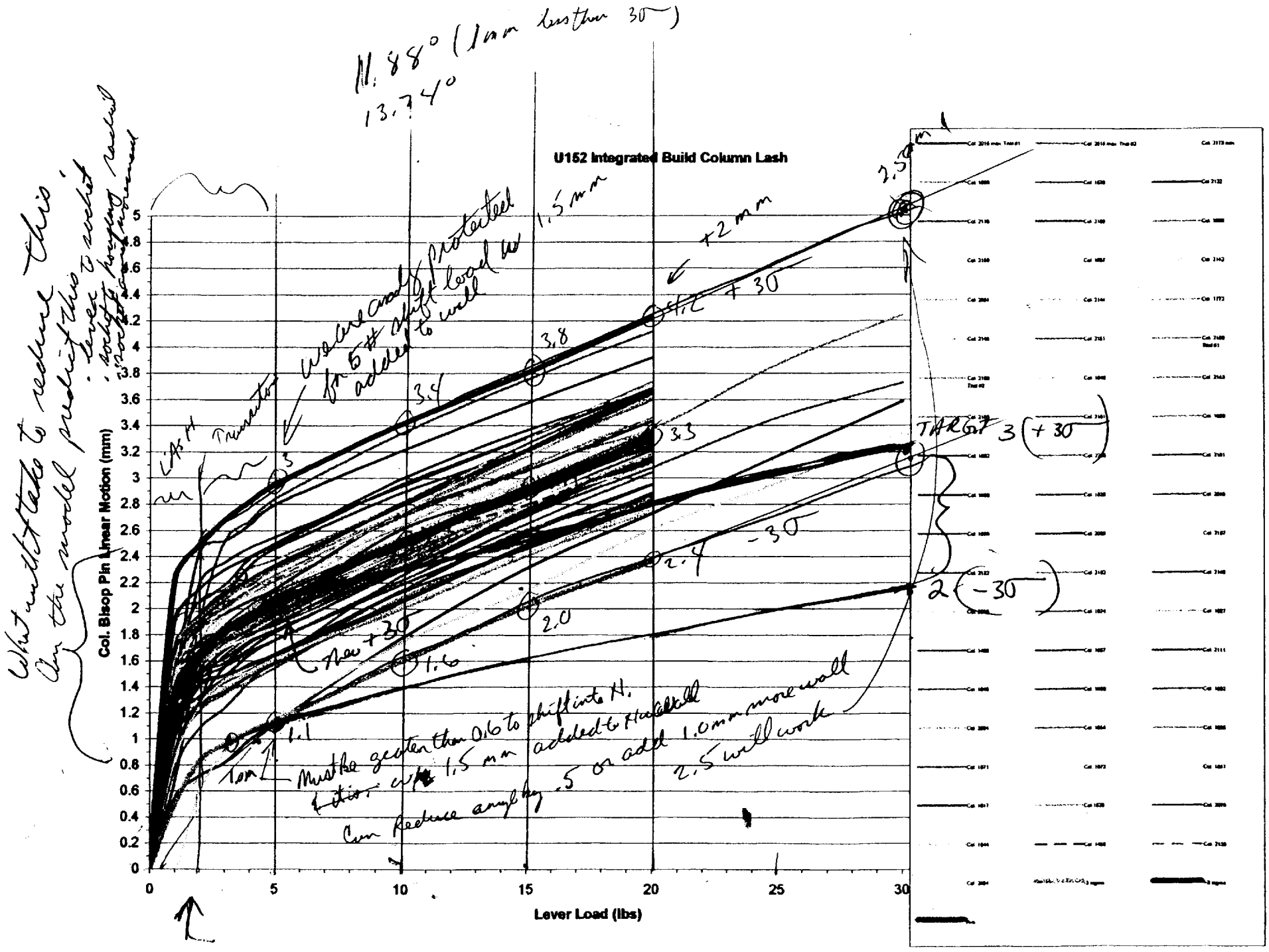
Ahed Qaddoura
x57273
2D_J28

GEAR ?
CLOCK SPRING — CLOCK SPRING Before or after Aug 01
COL. BSI RATTI Before & After June 01

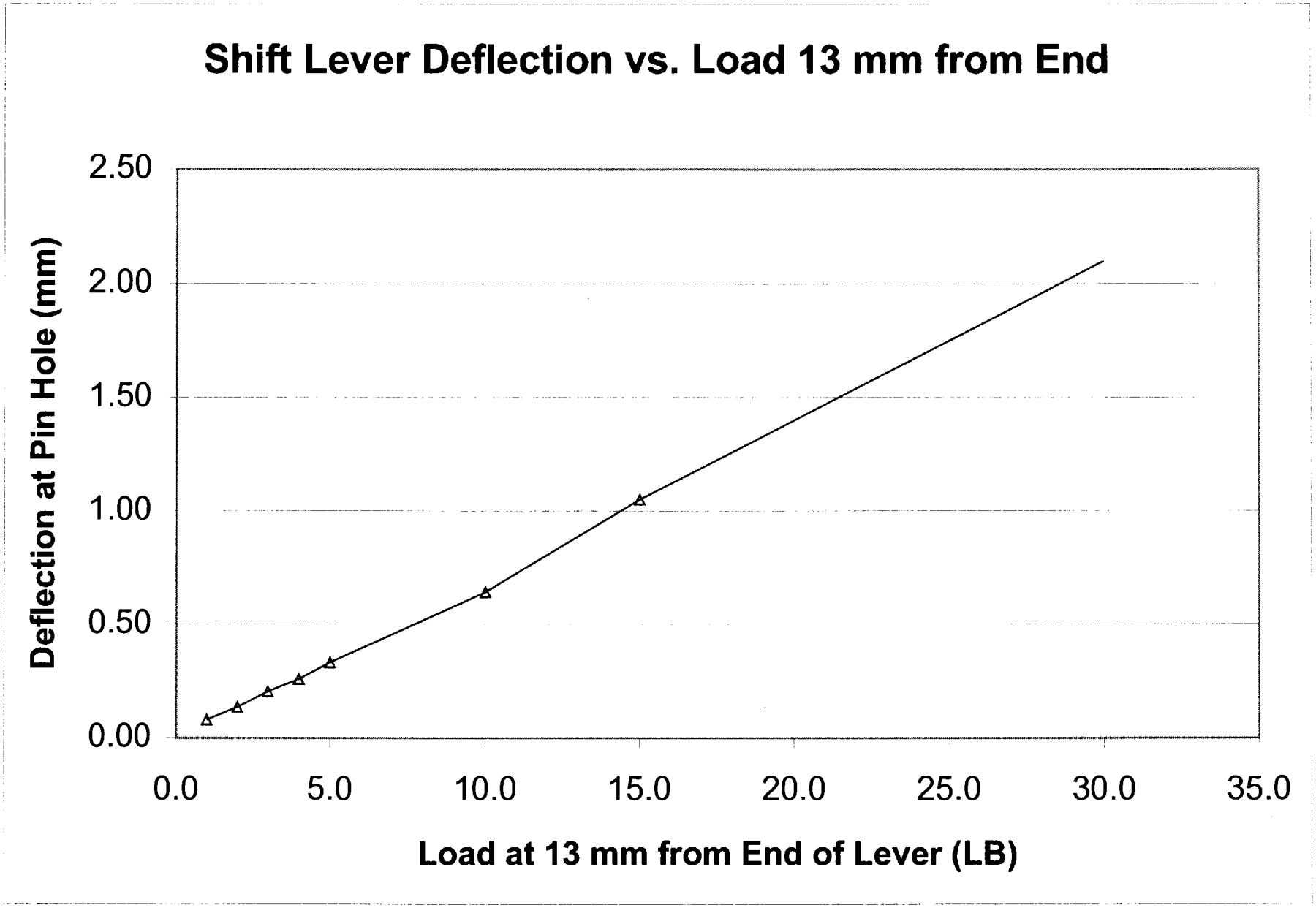
Report Information for Result ID 15545621:	Status=Downloaded	Error=No errors encountered.	Request Name=02 Explorer N58	Description=	Run Date/ Time=18 Feb 2002 17.22	Completion Date/ Time=18 Feb 2002 17.17	Execution Time=1	Queue Name=regular	Precalc Processing=02 VP:02 CP:	Cut Off Date=31 Jan 2002
Data Selection Criteria:	Cost Category = All Vehicle Coverages / Contractual[1,%,%]	Country Sold / Repaired [typed] = [USA,USA]	Customer Concern Code = STEERING NOISY[N58,V87]	Model Year = MY_02[2002]	Region Sold = North America[NA]	Vehicle Line Aws = EXPLORER[U2]				
Report Selection Criteria:	Report Name=Top N	Model Year=2002	Logic=Corp	Order By 1=Part Num Base (Causal)	Order By 2=	Value For N=10	Min Divisor=100	Cost Type=Total Cost Gross	Orderby Category=N / N	Use Group=No
RANK	MOD YEA	LOGIC	Part Num Base (Causal)	R1000S	COSTS	CPRS	CPUS	REPAIRS	VEHICLE	PRE DEL
	2002	Corporate	TOTAL	8.38	225023.2	238.37	1.85	944	220320	0.47
1	2002	Corporate	NPF - NO PROBLEM FOUND (NRTH	1.07	3208.67	46.5	0.05	69	220320	0.02
2	2002	Corporate	3B676 - SHAFT STRG COLUMN	1.04	29461.12	203.18	0.21	145	220320	0.03
3	2002	Corporate	3504 - GEAR ASY-STEERING	0.99	55283.8	464.57	0.46	119	220320	0.05
4	2002	Corporate	14A664 - AIR BAG CLOCK SPRING	0.56	12141.73	126.48	0.07	96	220320	0.13
5	2002	Corporate	3C529 - STRG COLUMN ASSY	0.53	53326.28	795.91	0.42	67	220320	0
6	2002	Corporate	3A674 - PUMP ASY P/STRG	0.48	12407.5	217.68	0.12	57	220320	0.04
7	2002	Corporate	1104 - HUB ASSY-FRONT	0.35	8454.79	281.83	0.11	30	220320	0.01
8	2002	Corporate	5493 - INSULATOR STAB ASY	0.22	894.95	49.72	0.01	18	220320	0
9	2002	Corporate	1007 - WHEEL ASSY	0.19	791.5	87.94	0.01	9	220320	0
10	2002	Corporate	3524 - SHAFT & RACK ASY-STE	0.19	1952.67	84.9	0.02	23	220320	0.02
11	2002	Corporate	3E751 - SHAFT, UPPER STRG ASY	0.12	6393.7	336.51	0.04	19	220320	0

C13

Report I	Status=	Request Na	Description=	Run Dat	Complet	Job Siz	Executi	Precalc	Cut Off	Load D
Data Se	Model Y	Cost Catego	Region Sold = North America[NA]	Country	Vehicle	Customer Concern Code = IGNITION SWIT				
Report	Report	Model Year=	Logic=Corp	Order By	Order B	Value F	Min Divi	Cost Ty	Orderby	Use Gro
RANK	MOD Y	LOGIC	Part Num Base (Causal)	REPAIR	COSTS	CPRS	CPUS	R1000S	VEHICL	MAX MI
	2002	Corporate	TOTAL	2382	287085	120.52	2.59	19.69	220320	13
1	2002	Corporate	11582 - CYL,KEY-IGN SW LOCK	1949	186035	95.45	1.57	16.45	220320	13
2	2002	Corporate	11572 - SWITCH ASY IGNITION	117	7834	66.96	0.05	0.76	220320	13
3	2002	Corporate	3C529 - STRG COLUMN ASSY	94	72176	767.83	0.71	0.93	220320	13
4	2002	Corporate	NPF - NO PROBLEM FOUND (NRTH AMER)	65	1758.8	27.06	0.01	0.37	220320	13
5	2002	Corporate	7822050 - CYL,KEY-IGN SW,DOR	35	1498.2	42.81	0.01	0.21	220320	13
6	2002	Corporate	12A650 - PROCESSOR ASSY	19	6817.6	358.82	0.06	0.18	220320	13
7	2002	Corporate	5422050 - CYL,KEY-IGN SW,DOR	11	1176.7	106.97	0.01	0.05	220320	13
8	2002	Corporate	15K601 - TRANSMITTER REM/CNTL	8	411.58	51.45	0	0.05	220320	13
9	2002	Corporate	3514 - TUBE ASY-STEER COLUM	6	504.5	84.08	0	0.03	220320	13
10	2002	Corporate	3524 - SHAFT & RACK ASY-STE	6	469.85	78.31	0	0.03	220320	13



- What is the load that shifting is neutral
- Launch team needs to audit (Procedure)


Shift Lever Deflection vs. Load 13 mm from End
Deflection at Pin Hole (mm)
2.50
2.00
1.50
1.00
0.50
0.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Load at 13 mm from End of Lever (LB)

From: Perri, Ron (R.J.)
Sent: Tuesday, September 12, 2000 5:04 PM
To: Tsai, Pingfang (P.); McKinnis, Larry (L.N.)
Cc: Spaulding, Todd (T.C.); Dover, Harry (H.)
Subject: U152 Pullout Effort Comparison

Attachments: U152 Pullout Effort Comparison.xls

Attachment:
Excel Spreadsheet with calculations.

I will pass out copies of the following at tomorrow morning's meeting:
Force Diagrams (Transmission, Column Shifter, Floor Shifter)
Layouts (Transmission, Column Shifter, Floor Shifter)

See you there.

U152 Pullout Effort Comparison...

U152 Pullout Effort Comparison.xls

	Shifter Type	*Average Torque-to-Turn **(Nm)****	Average Torque-to-Turn **(lb-ft)**	Torque-to-Turn Standard Deviation **(lb-ft)**	Upper Torque-to-Turn +3 Sigma **(lb-ft)**	OML Length (mm)	OML Length (in)	OML Length (ft)	**Maximum (+3 Sigma)** Perpendicular Force ***at Transmission*** Fd=Torque/OML Length (lbs)	Angle_t Angle between Cable and OML in Park (degrees)	**Maximum (+3 Sigma)** Force in Cable Fc=Fd/cos(angle_t) (lbs)	Angle_s Angle between Cable and Shifter Lever Arm in Park (degrees)	**Maximum (+3 Sigma)** Perpendicular Force ***at Shifter*** Fs=Fc/cos(angle_s) (lbs)	Lever Ratio	**Force at Shift Knob (lbs)**
5R55W U152	**Column**	*7.30*	5.38	1.92	11.14	57.00	2.24	0.187	59.56	32.25	70.42	35.02	85.99	4.00	**21.50**
5R55W U152 RHD	**Floor**	*7.30*	5.38	1.92	11.14	57.00	2.24	0.187	59.56	32.25	70.42	11.11	71.77	2.34	**30.67**

* Measured from 755 samples at Bordeaux with 500 Nm (369 ft-lbs) torque at output shaft

Porter, Alan (A.J.)

From: Nehasil, Linda (L.F.)
Sent: Monday, June 17, 2002 2:04 PM
To: Porter, Alan (A.J.)
Subject: U152 Shift Issue

Alan, I do have some info. for you on how you ended up on our agenda. P01, Difficult to Operate Shift lever is a CCC that is tracked by the PVT. When looking at the top 5 parts under that CCC, Steering Col. Assy, is number 1. We know that some supplier quality actions were implemented 5/30/01 and the warranty for P01 came down drastically after that but it has been on the rise since 10/01. 10/01 R/1000 was at ~.5 and 12/01 is at ~1.5. Again, this is for P01. I want to do a stack chart on 3C529 specifically and hope to have it for the meeting tomorrow.

Quality comes first....
Linda F. Nehasil
Explorer Powertrain Quality
32-38671

@3MIS
R/1000

10/01 ≈ .05
11/01 ≈ .00
12/01 ≈ 0.17
1/02 ≈ .0[illegible]

Brent Sloan BSLOAN July 2nd

Gummadi, Srinivasa (S.R.)

From: Overson, Michael (M.R.)
Sent: Friday, October 11, 2002 3:25 PM
To: Ambaruch, Art (A.H.); Dover, Harry (H.); Greene, Lisa (L.A.); Guillory, Kasandra (K.N.); Gummadi, Srinivasa (S.R.); Guthrie, Phil (P.L.); Lam, Anselm (A.Y.); Levine, Julie (J.A.); Nepal, Nabin (N.P.); Pittel, Kimberly (K.L.); Porter, Alan (A.J.); Radl, Nathan (N.J.); Retallack, Lynn (L.M.); Spaulding, Todd (T.C.); Taylor, James (J.D.); von Foerster, Steve (S.)
Subject: U152 Shift lever troubles-Meeting agenda

Importance: High PDC 2L-59

Agenda for working level team meeting: Oct 15, 2002
Please refer to meeting announcement for location and time details.

1. Introductions -- All
2. Meeting purpose & expectations -- Sri
3. Problem statement & supporting data (TGW, ICCD, Warranty)-- Mike/Nabin/Sri
4. Discussion of scope & objective-- Led by Mike
5. Corp. knowledge and lessons learned -- All
   (any DMAIC, 8D, high mileage projects on related issues??)
6. Wrap-up & next steps

Time permitting, we will
7. Identify and prioritize CTS's and objective metrics --All

NEXT MEETING, WE WILL FOCUS ON unfinished business of 1st meeting and move on to MAPPING CTS Y'S TO SYSTEM CTQ's (function trees), External and Internal benchmark data, targets, etc.

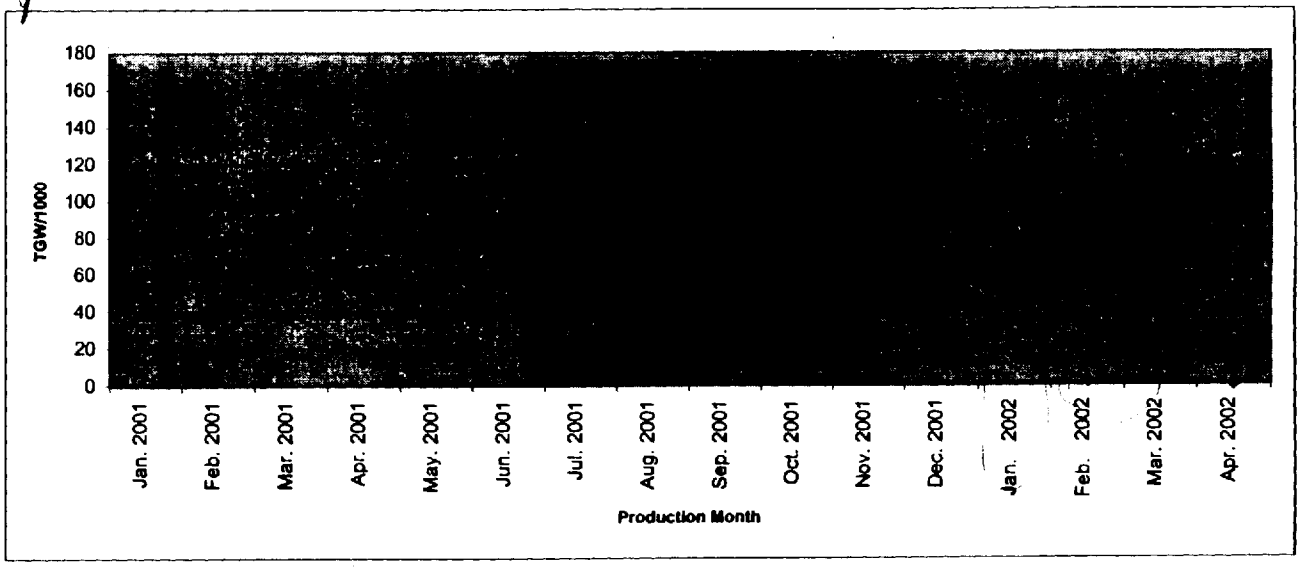
D51
P59
P54
N18

CY 2001
CY 2002

11 TGW
18 TGW

doesn't fire

2002MY U152
DIFFICULT TO OPERATE SHIFT LEVER

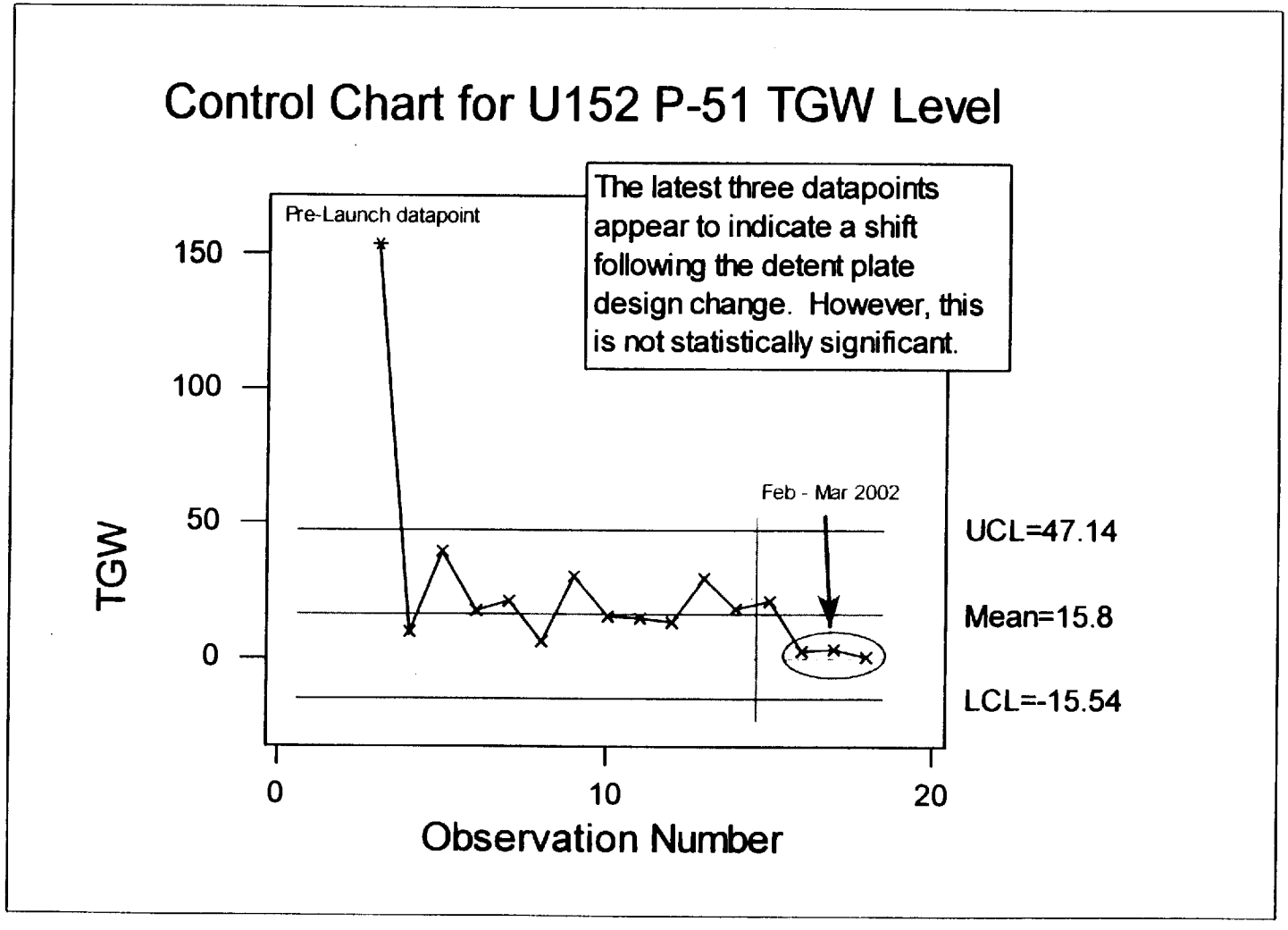


2002 MY YTD GQRS
3 MIS TGW/1000

		Jan. 2001	Feb. 2001	Mar. 2001	Apr. 2001	May. 2001	Jun. 2001	Jul. 2001	Aug. 2001	Sep. 2001	Oct. 2001	Nov. 2001	Dec. 2001	Jan. 2002	Feb. 2002	Mar. 2002	Apr. 2002	Total
	TGW/1000	154	9	39	17	21	6	30	15	14	13	29	18	21	2	3	0	
	Sample Size	82	100	190	222	319	254	338	872	546	500	435	441	454	413	222	68	
	Verbatims																	
CUSTOMER MOVES LEVER TO D, BUT HEARS AND SEES LEVER MOVE INTO SELECTED POSITION AFTER SHORT DRIVE	WHEN PUT IN D & ACCEL, SHIFT LEVER BOUNCES BACK/LOCKS IN TO PLACE/POPPING OR CLICKING SOUND		1	1					3	2					1	1		9
	DIFFICULTY GETTING THE GEAR TO DRIVE/WILL OFTEN BE IN 3/POPS IN TO PLACE			1					2				1	1				5
	DOES NOT LOCK/POP IN TO PLACE; SEE OR HEAR LEVER DROP IN TO PLACE AFTER DRIVING							3				1		1				5
CUSTOMER EXPECTS ENGAGEMENT FEEL - DROPS IN TO DETENT; ENGAGE INTO SLOT; DROP IN TO SLOT; CUSTOMER HUNTS FOR PROPER POSITION AND MAY MISS DESIRED SELECTION	DOES NOT GO IN TO DRIVE POSITION; HAS TO BE PUT IN PROPER POSITION			2			1				1			1		2		7
	DOES NOT FEEL ENGAGE IN TO SLOT/DETENT/DROP IN TO LOCKED POSITION										1		2	1				4
	EASY TO MISS D AND PUT IN 3							1							1			2
	SLIDES POST POSITION WHILE TRYING TO SHIFT														1			1
	DOES NOT CLICK IN TO PLACE			1														1
	DIFFICULT TO OPERATE SHIFT LEVER SOMETIMES								1									1

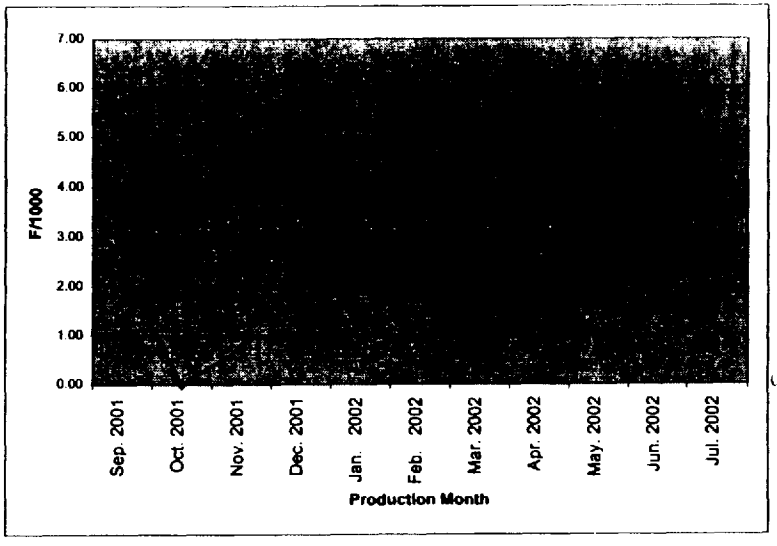
2002MY U152
DIFFICULT TO OPERATE SHIFT LEVER

		Jan. 2001	Feb. 2001	Mar. 2001	Apr. 2001	May. 2001	Jun. 2001	Jul. 2001	Aug. 2001	Sep. 2001	Oct. 2001	Nov. 2001	Dec. 2001	Jan. 2002	Feb. 2002	Mar. 2002	Apr. 2002	Total
	TGW/1000	154	9	39	17	21	6	30	15	14	13	29	18	21	2	3	0	
	Sample Size	82	100	190	222	319	254	338	872	546	500	435	441	454	413	222	68	
	Verbatims																	
	DOES NOT MAKE TRANSITION FROM ONE GEAR PLACEMENT TO OTHER												1					1
	NEVER SURE WHAT GEAR I AM IN SOMETIMES											1						1
STICKY, HARD TO PLACE	STICKS IN SHIFTING FROM PARK	2						1		2	1							6
	PARK TO REVERSE DID NOT ENGAGE - ONLY ONCE															1		1
	HARD TO PLACE INTO REVERSE					1												1
	DIFFICULT TO SHIFT TO PROPER GEAR WHEN PARKED											1						1
INDICTAOR NOT CLEARY VISIBLE	CANNOT SEE GEAR INDICATOR					1			2									3
MISC	HARSH SHIFT/NOISE/DOES NOT SIT WELL IN DASH POSITION				1						1	1		1				4


Control Chart for U152 P-51 TGW Level
The latest three datapoints appear to indicate a shift following the detent plate design change. However, this is not statistically significant.
Pre-Launch datapoint
Feb - Mar 2002
TGW
150
100
50
0
UCL=47.14
Mean=15.8
LCL=-15.54
0
10
20
Observation Number

2002 MY U152
Difficult to operate Shift Lever
ICCD PARETO
build date 11/29/00-8/30/02
call date 03/30/01-10/04/02

ICCD



Verbatim		Jan.2001	Feb. 2001	Mar. 2001	Apr. 2001	May. 2001	Jun. 2001	Jul. 2001	Aug. 2001	Sep. 2001	Oct. 2001	Nov. 2001	Dec. 2001	Jan. 2002	Feb. 2002	Mar. 2002	Apr. 2002	May. 2002	Jun. 2002	Jul. 2002	Aug. 2002	Total by concern
	DETAILED VERBATIM									2.42	0.00	0.74	3.93	2.39	1.26	6.42	2.50	0.89	1.88	3.87		
WHEN LEVER IS PLACED IN D & ACCEL, IT MOVES AND MAKES A CLICKING SOUND; NOT SEATED PROPERLY AND MOVES; SEEMS ADJUSTING TO PROPSER POSITION	WHEN PUT IN D & ACCEL, LEVER MAKES A CLICKING NOISE AND MOVES LITTLE			1				1	1	2		2		1		2						10
	SHIFT LEVER POPS OUT OF DRIVE WHILE DRIVING; TRANS NOES NOT JUMP GEAR								1	1						1	1					4
	WILL NOT SEAT PROPERLY IN D PROPERLY, MOVES A LITTLE; NO NOISES												1	2		1						4
	FEEL/HEAR GEAR SHIFT CLICK AS IF NOT FULLY IN CORRECT SHIFTING POSITION & ADJUSTING TO PROPER POSITION				1	1	1		1							1	1		2	1		9
	JUMPS AFTER SHIFTING INTO P/R/D; NOT SEATING PROPERLY															1						1
DOES NOT SEAT ITSELF IN D; STAYS BETWEEN D & 3	DOES NOT SEAT ITSELF IN D, STAYS BETWEEN D & 3												1									1
	DOES NOT LOCK INTO D; HAS TO MAKE SURE; VEHICLE MOVES EVEN IF NOT LOCKED							1														1
	DIFFICULT TO PUT INTO DRIVE POSITION; HAS TO MOVE LEVER AROUND; DOES NOT MAKE CLICK			1																		1

2002 MY U152
Difficult to operate Shift Lever
ICCD PARETO
build date 11/29/00-8/30/02
call date 03/30/01-10/04/02

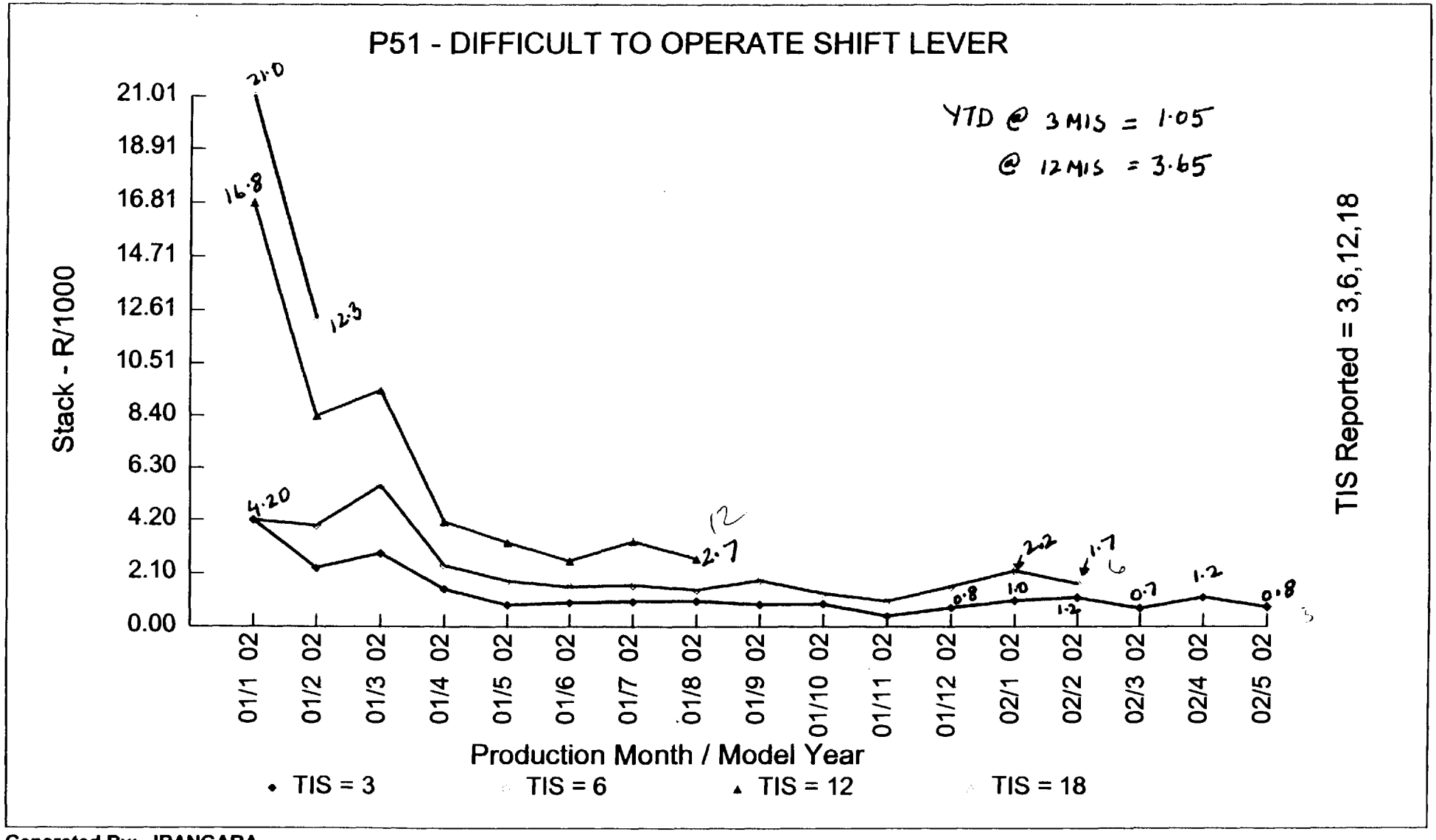
Verbatim		Jan.2001	Feb. 2001	Mar. 2001	Apr. 2001	May. 2001	Jun. 2001	Jul. 2001	Aug. 2001	Sep. 2001	Oct. 2001	Nov. 2001	Dec. 2001	Jan. 2002	Feb. 2002	Mar. 2002	Apr. 2002	May. 2002	Jun. 2002	Jul. 2002	Aug. 2002	Total by concern
	DETAILED VERBATIM									2.42	0.00	0.74	3.93	2.39	1.26	6.42	2.50	0.89	1.88	3.87		
DOES NOT LOCK; HAVE TO MOVE/JIGGLE LEVER AROUND	IS NOT LOCKING IN TO D ; HAS TO SHIFT LEVER SEVERAL TIMES BEFORE IT WILL LOCK INTO PLACE															1						1
	LEVER SEATS BETWEEN N & D; HAVE TO JIGGLE TO MAKE IT GO INTO DRIVE POSITION							1														1
	WHEN PUTTING GEARSHIFT IN TO D, DOES NOT CLICK INTO PLACE UNTIL EFFORT IS APPLIED																1					1
SHIFTER APPEARS TO BE B	LEVER DOES NOT SEAT ITSELF CORRECTLY IN D, APPEARS TO BE BETWEEN NUETRAL AND DRIVE; NO NOISES														1							1
	DOES NOT LOCK INTO POSITION; SLIPPED FROM DRIVE TO NEUTRAL													1								1
	SHIFT LEVER WOULD SLIP OUT OF GEAR				1																	1
	SHIFT LEVER JUMPED OUT OF DRIVE INTO NEUTRAL												1									1
	GETS STUCK BETWEEN NUETRAL AND DRIVE; LEVER SHIFTS INTO POSITION AFTER DRIVI NG A SHORT DISTANCE																	1				1
WOULD NOT COME OUT OF	DIFFICULT TO OPERATE; REQUIRES GREAT AMOUNT OF FORCE															1						1
	WOULD NOT COME OUT OF PARK/TOWED			3																		3
	WOULD NOT COME OUT OF PARK/REQUIRES EXTRA EFFORT			1									2									3
	DIFFICULTY SHIFTING VEHICLE INTO PARK																				1	1
	STICKING WHEN PLACING THE LEVER FROM DRIVE TO PARK																			1		1
	DIFFICULTY SELECTING REVERSE GEAR; HAS TO BE PLAYED		1																	1		2
SHIFTER MAKING NOISES/DIFFICULT TO OPERATE	STICKING AND MAKING A CRANKING NOISE WHEN CHANGING GEARS																				1	1
	SHIFTER MAKING A MODERATE ARKING TYPE NOISE																		1			1
	DIFFICULT TO OPERATE												1									1
	CONERN WHEN BRINGING IT FROM N-D						1															1
Total by MOP		0	1	6	2	1	2	3	3	3	0	2	6	4	1	8	3	1	3	3	2	

Report Specific Information

Date/Time Printed : Oct 15, 2002 / 12.41
Model Years : 2002
Statistic : R/1000
Y Value(s) : TIS Reported = 3,6,12,18
Unique : MODEL YEAR MATRIX

Cutoff Date: Sep 30, 2002
Logic : 60-day

Result ID: 17290233
Page Number : 1
Min Divisor : 100



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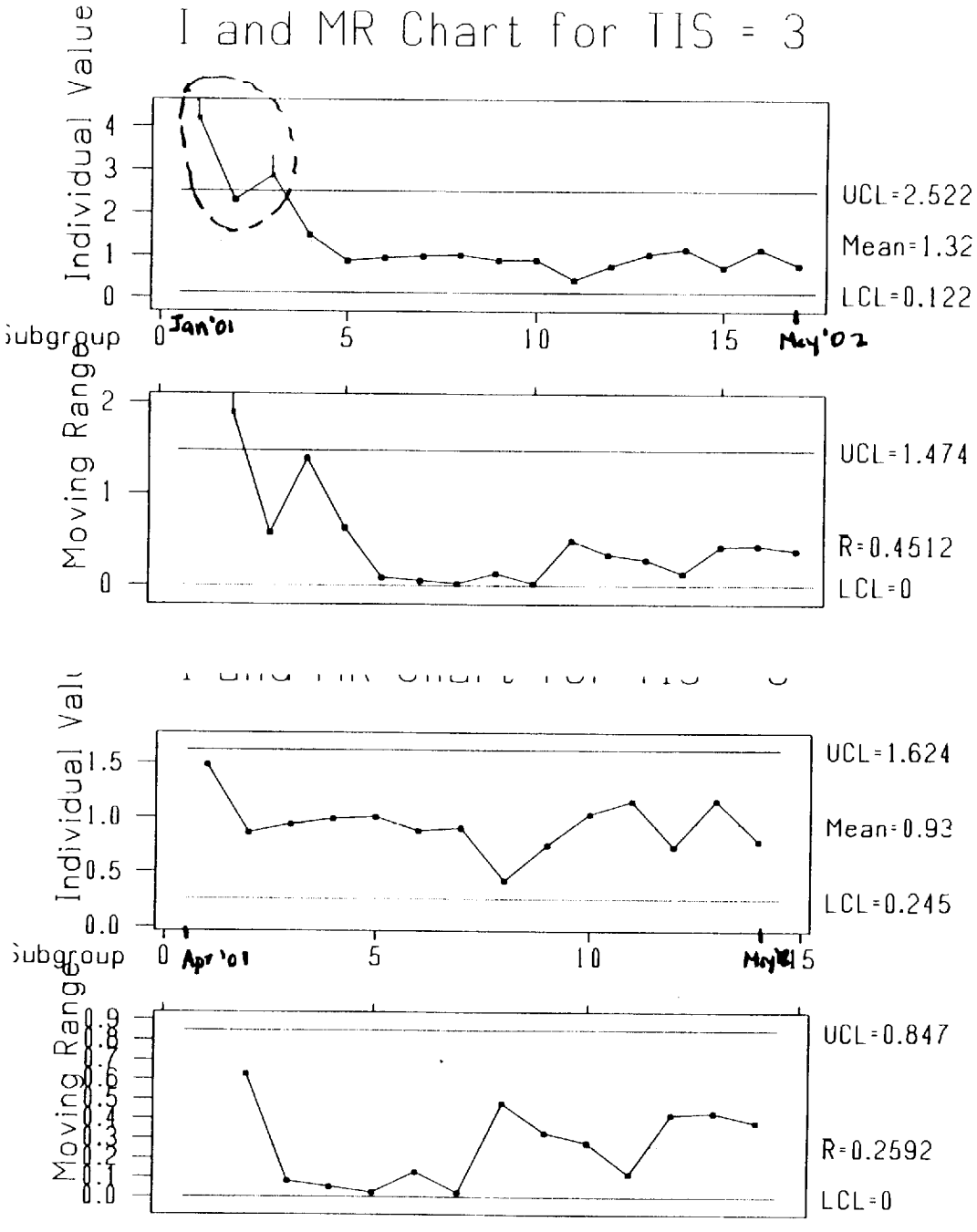
CONTROL CHARTS FOR R/1000



← w/o Jan'01
Feb'01
Mar'01

NO statistically Significant change in R/1000

Report Specific Information

Date/Time Printed : Oct 15, 2002 / 13.03
Model Years : 2002
Statistic : CPU (US DOLLAR)
Y Value(s) : TIS Reported = 3,6,12,18
Unique : MODEL YEAR MATRIX

Cutoff Date: Sep 30, 2002
Logic : 60-day

Result ID: 17290233
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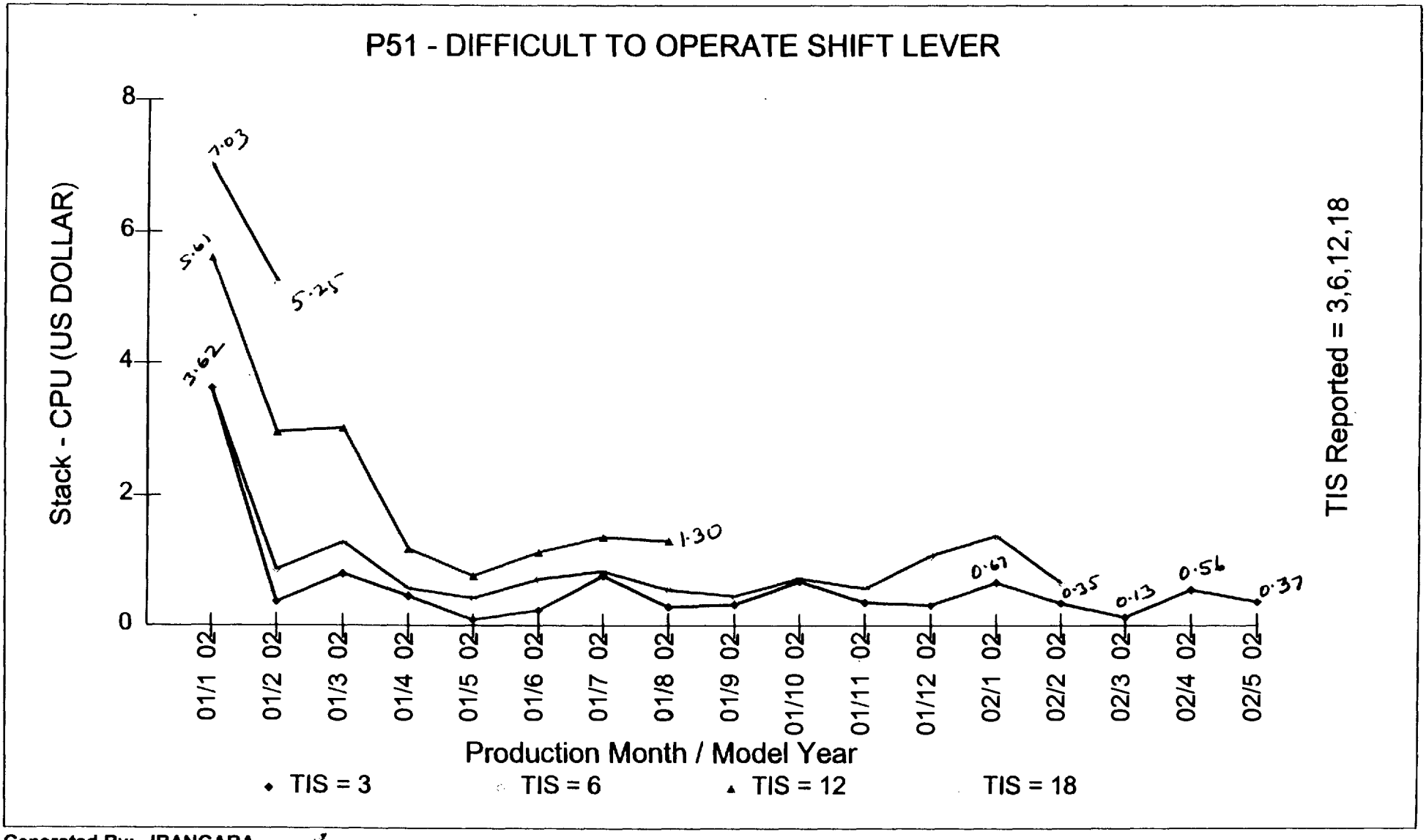

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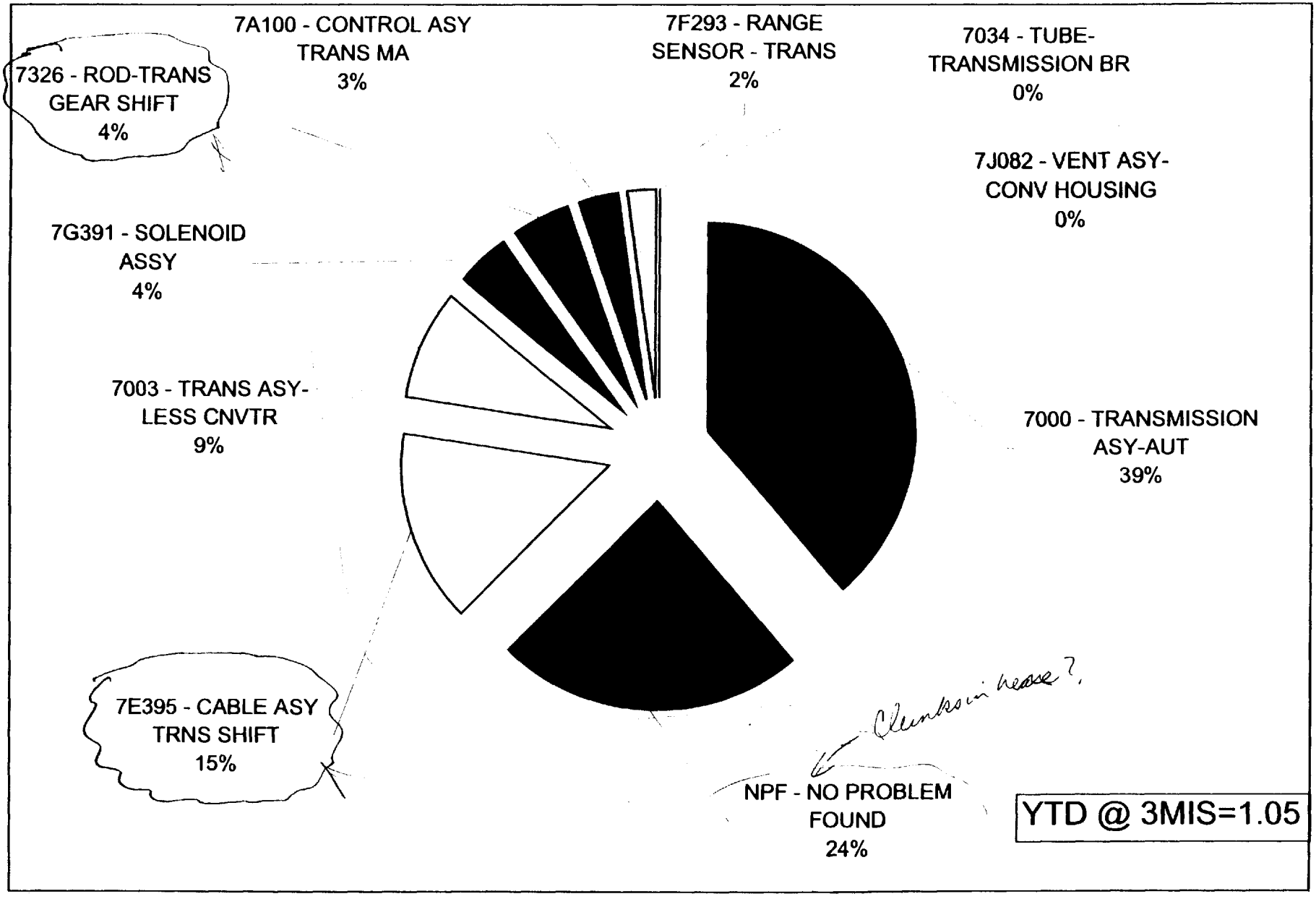
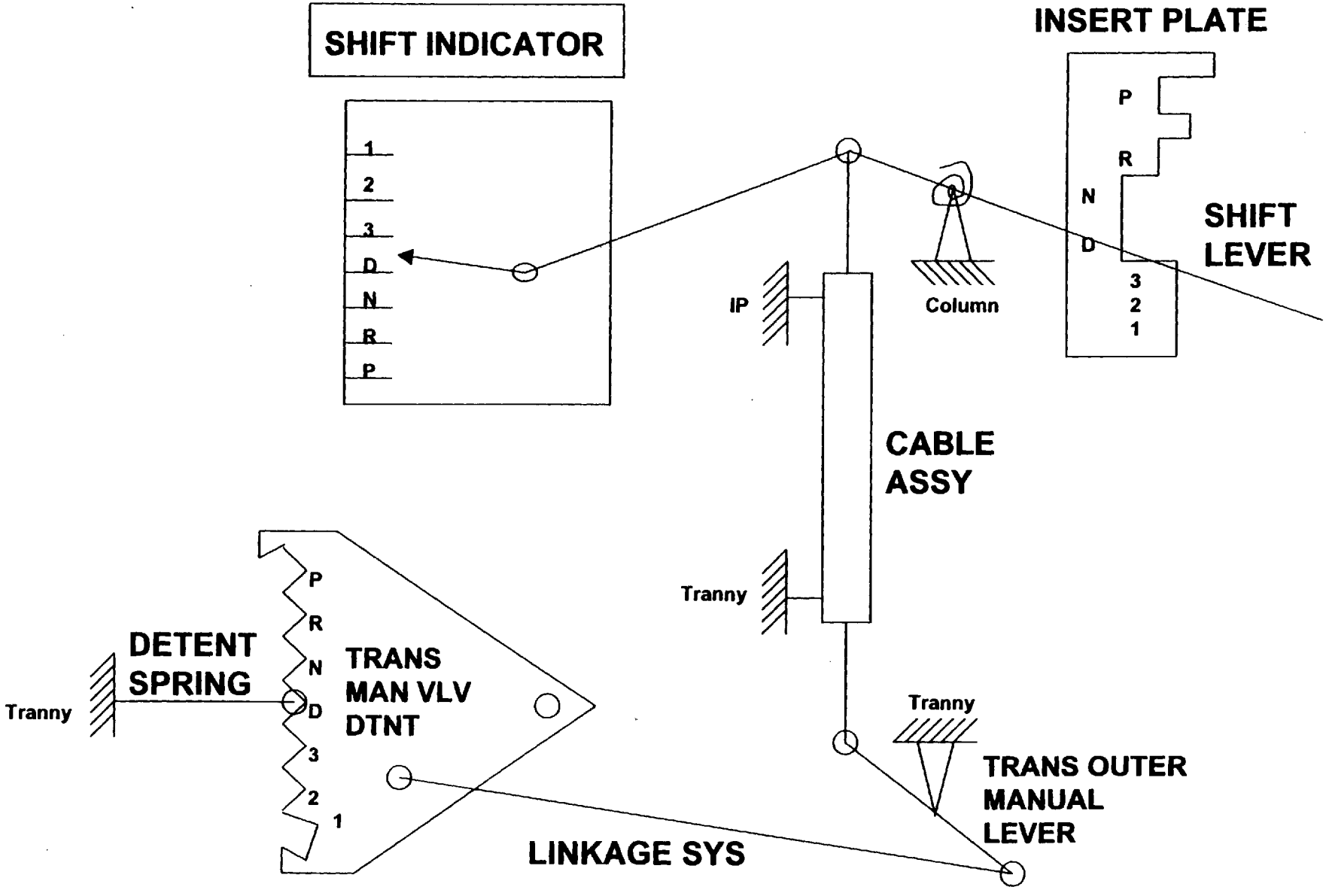
CAUSAL PARTS DISTRIBUTION, R/1000 @ 3MIS

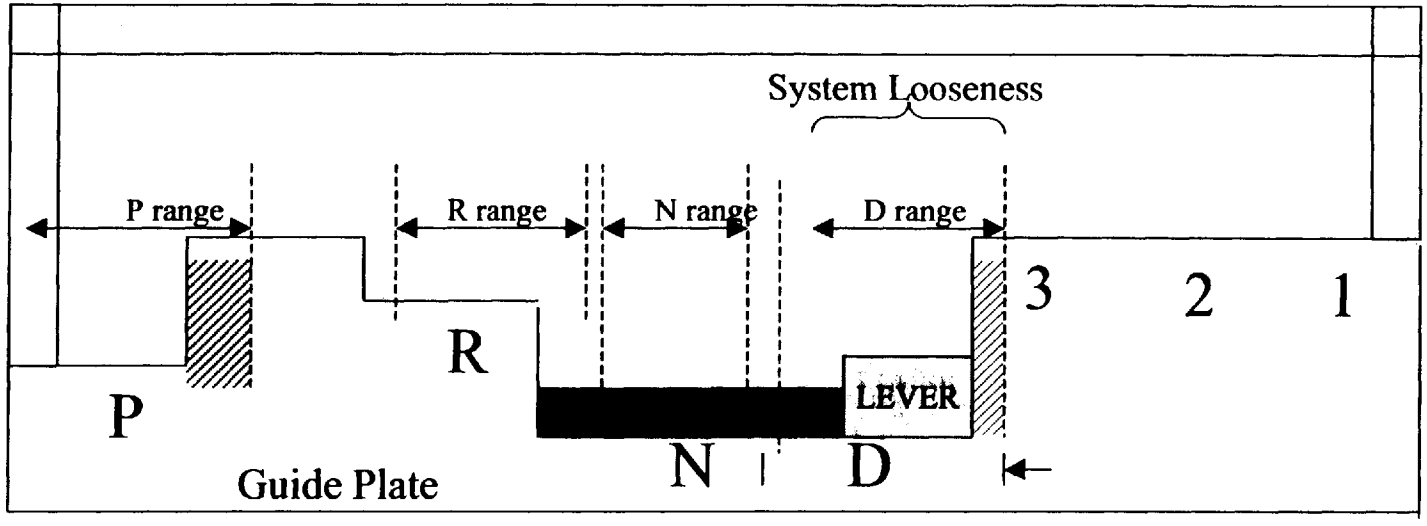


U152 SHIFT LEVER CABLE SYS



PE09-020 1702

U152 COLUMN SHIFT LEVER



LEVER HELD BY
3LB WEIGHT

Originator: A.Lam
Revised: Jan 25, 2002

U152 Static Engagement Improvement Plan:

The improvement plan is a parallel cross-functional focus between systems that can directly impact engagements:

Vehicle System – Lead Scott Lindstrom, Vehicle Integration

- 2004MY U152 1PP VDV Engagement Study – Data processed with preliminary analysis [6/1/03]
- Benchmarking " slow PRNDL movement" Study on Aviator, LS, Expedition – Data processed with preliminary analysis [6/15/03]
- 4.0L Idle Reduction Investigation - Preliminary data shows a reduction in VDV values of approximately 50% on some shifts:

Ex:	735 RPM Idle	625 RPM Idle
o D-R	0.15	0.08
o R-D	0.15	0.08
o N-D	0.06	0.05
o N-R	0.12	0.04

- Establish cross-functional team that includes chassis, auto trans, & vehicle integration to address engagement issues associated with "Shift Lever Clicking" [5/16/03]

Transmission Calibration – Lead Vince LaVoie, 5R55 Trans Calibration

- ✓ 2003MY RC 4.6L Re-Calibration Release –Adaptive Strategy Fix & Improved Rolling Engagements [2/3/03]
- ✓ 2003MY RC 4.0L Re-Calibration Release – Adaptive Strategy Fix [3/26/03]
- 2004 J#1 Calibration using hardware improvements
- Perform vehicle evaluations with ICCD customers –Plan outlined [5/16/03]

Transmission Hardware – Lead Andrea Upshaw-Gibson, 5R55 Trans System

- 2004MY Job#1 hardware changes to help engagements:
  - ✯ Air Bleed Hole in Reverse Piston
  - ✯ High Precision VFS Solenoid Module
  - ✯ Modified Valve Body Separator Plate (improve VFS stability)
- Pursuing parallel paths for possible hardware changes through VSA analysis on the TRS/park System and prototyping valve body casting changes to further improve P-R "slow PRNDL movement" engagement issues. Implementation timing ~ 2006MY.
- Currently testing inverted engagement valves for static/dynamic engagement improvements. Preliminary analysis [Sept 03] Implementation timing ~ 2006MY
- U152 Column Shift/Static Engagement Audit@ LAP – correlation between shift lever hang and static engagement rating. [5/15/03]
- Obtaining field return hardware to evaluate customer concern for Engagement Clunk/Delay

U152 STEERING COLUMN STATUS
9/27/00

ISSUE: Not passing DV on Tilt mechanism fatigue test (TEST #46)

ROOT CAUSES / RESOLUTION / STATUS:

1) Wear
   - Based on analysis of former test parts, we have found the zinc retainer was being extruded – catastrophically deformed, not fatigue wear.
     In using P=F/A,
     - F= bolt load (anywhere from 4,000N to 9,000N)
     - A is almost a point load or a fine line load (area estimated)
     - P is 300,000 to 500,000 psi
     - Zinc compressive strength is max of 50,000 psi
   - The retainer cam profile and lever lobes have been changed to increase the contact area by 10x.
   - The material has been changed to powder metal retainer and powder metal lever lobes with process changes to maximize compressive strength (approx 130,000 psi).
   - While waiting for new geometry parts, we tested process/material changes alone and saw a dramatic improvement in retainer and lever lobe profile life. Of 3 samples, two passed and one failed at 18K (attributed to quality issue in impact bracket).
   - Final version with 12 samples starts test 9/27 and by 9/29 meeting will have at least 27K cycles.

2) Noise / Creep
   - The first creep resolution (delrin with glass fill) caused an NVH issue as the mechanism tilted.
   - The second choice for COF is the Zytel material. This is being used in test 46 and is being creep tested from 9/25-10/2. We will have progress results of strain at the 9/29 meeting.

3) Clamp Load Variability
   - Strain tests with 12 samples set to 17lbs load to lock see a clamp load vary between 4000N to 9000N.
   - Torque / angle testing shows that the torque to achieve 17lbs load to lock (approx 7-10Nm) is right on top of where we overcome the prevailing torque of the nut and at the edge of where we get a linear response.
   - In addition to the method for tightening the column (whether set load to lock, load to unlock, or set to torque), the fastener group has recommended looking at alternate hardware. (Specifically to use a free running nut with fine thread bolt and nuts with locktite. These parts are on order and being expedited, but will take a few weeks to get in.) All of these alternatives are being investigated in detail to understand the optimal combination.
   - Test 46 with the 12 samples will have 6 set low for load to lock and 6 set high – attempting to achieve the maximum spread on clamp load. Depending results of this test, we will know if the tilt mechanism joint is robust to this type of clamp load variability. If it is, we will proceed to IB as is. If it is not, we will implement the fastener recommendation ASAP (likely three weeks +).

ISSUE: Not passing PV on Shift System Fatigue test (TEST #28)

ROOT CAUSES / RESOLUTION / STATUS:

1) We are running DV3 (approx 200K) cycles with no issues, but on PV1 test (approx 100K) we have shift lever failures on 5 of 6 samples.
   Key differences: DV3 and the one passing PV1 sample were run with grease, and the other 5 PV had no grease. Ran without grease due to concerns with switch robustness.

2) To address switch robustness, we are implementing a dry film lubricant on the shift lever and the insert plate. These have required modifications to the temperature of the heat treat process because of the high temperature required to bake on the dry film lubricant. These parts will be added to the PV1 test on 9/27 and by 10/12 we will have approx 120K cycles to know whether we have the wear issue.

3) In case dry film lubricant is not as effective as grease, we are running tests on the microswitches (both DV3 and a separate test) to assess robustness to grease. We will prepare parts of both the dry film lubricant and the greased version to be able to go either way on 10/12 for IB.

4) To proveout shift system fatigue in whole, we need to run a PV2 (the whole 45 day test) from beginning to end. We will run this with IB parts – starting 10/13 and will finish by 11/17. (6 w/ grease and 6 w/ dry lube)

PE09-020 1705

GENERAL TIMING:

1) Pending test 46 results on 9/29 (assumes robustness to the clamp load variability) and pending test 28 status on 10/12, the design will be final for 1B / job1. The following dates assume these are passes.

2) 1B build columns will be built the week of 10/9. Columns from this PSW run will be put through all the PV tests again as they are the final design level.

3) PV timing – start 10/13 and finish 11/17.

4) PSW timing 11/17.

→ PV detail schedule
→ PSW data & capability
→ schedule capability review
up to 20c units

8:30 @ NK's office

Nora C, trans column
ramp-up of 1/shift

U152...Building on the Best

U152 Steering Column

ISSUES:

- DV Testing (total of 26 tests – 22/26 passed)
  - 4/26 tests failed
    - Shift System Fatigue
    - Tilt Mechanism Fatigue
    - Brake Shift Interlock Ultimate Load
    - Ignition Actuation Efforts Rotational Fatigue
- AIMS/NOVA Calls
  - Brake Shift Interlock Noise
  - Park Detect Switch (key does not come out in park)
  - Locking Effort Variation (tilt / telescoping)

TIMING:

- DV2 Testing: 7/15- 8/30
- DV3 Testing: 7/30-9/20 (one test only - Shift System Fatigue)
- PV (8/17-9/30)
- PSW Completion (10/7)

U152 Steering Column - continued

ACTION PLANS ON DV TESTING FAILURES:

- Shift System Fatigue (4/4 failed – wear issue between shift lever and insert plate)
  - Revised heat treat of shift lever
  - DV2 to be completed 8/15/00

- Tilt Mechanism Fatigue (5/6 failed – load to slip below 100 lbs)
  - B5 life = 95,000 miles (target 150K)
  - Investigating revision of duty cycle with reliability experts
  - Evaluating VW Passat performance for benchmark (to complete 7/21)
  - Investigating powder metal component for further robustness

- BSI Ultimate Load Test (6/6 failed – swing arm broke at 80 lbs, target 100 lbs)
  - Increased thickness of swing arm by 3mm (50% strength improvement)
  - DV2 to be completed 8/9/00

- Ignition Switch Actuation (1/6 failed - 70K cycles)
  - Category 3 part - ignition switch failed
  - Merit-Malta and RVT conducting Reliability review with Tim Davis on 8/1/00

U152 Steering Column - continued

ACTION PLANS ON AIMS / NOVA CALLS:

- BSI Noise
  - Resolved noise by adding additional switch to shut off in forward gears and dampening in switch
  - Demonstrated fix at FESO drive and 2PP SLAP (+ last 4 2PP LAP)
  - DV3 testing to complete 9/20/00

- Park Detect Switch (key does not come out in park)
  - Interim Fix (2PP LAP, SLAP and FEU LAP) with shortened shift pin
  - Long Term Fix (FEU SLAP) with revised insert plate and shift lever
  - DV3 testing to complete 9/20/00

- Locking Effort Variation
  - Revised clamp surface areas and improved dimensional control of tapers
  - DV2 testing to complete 8/15/00

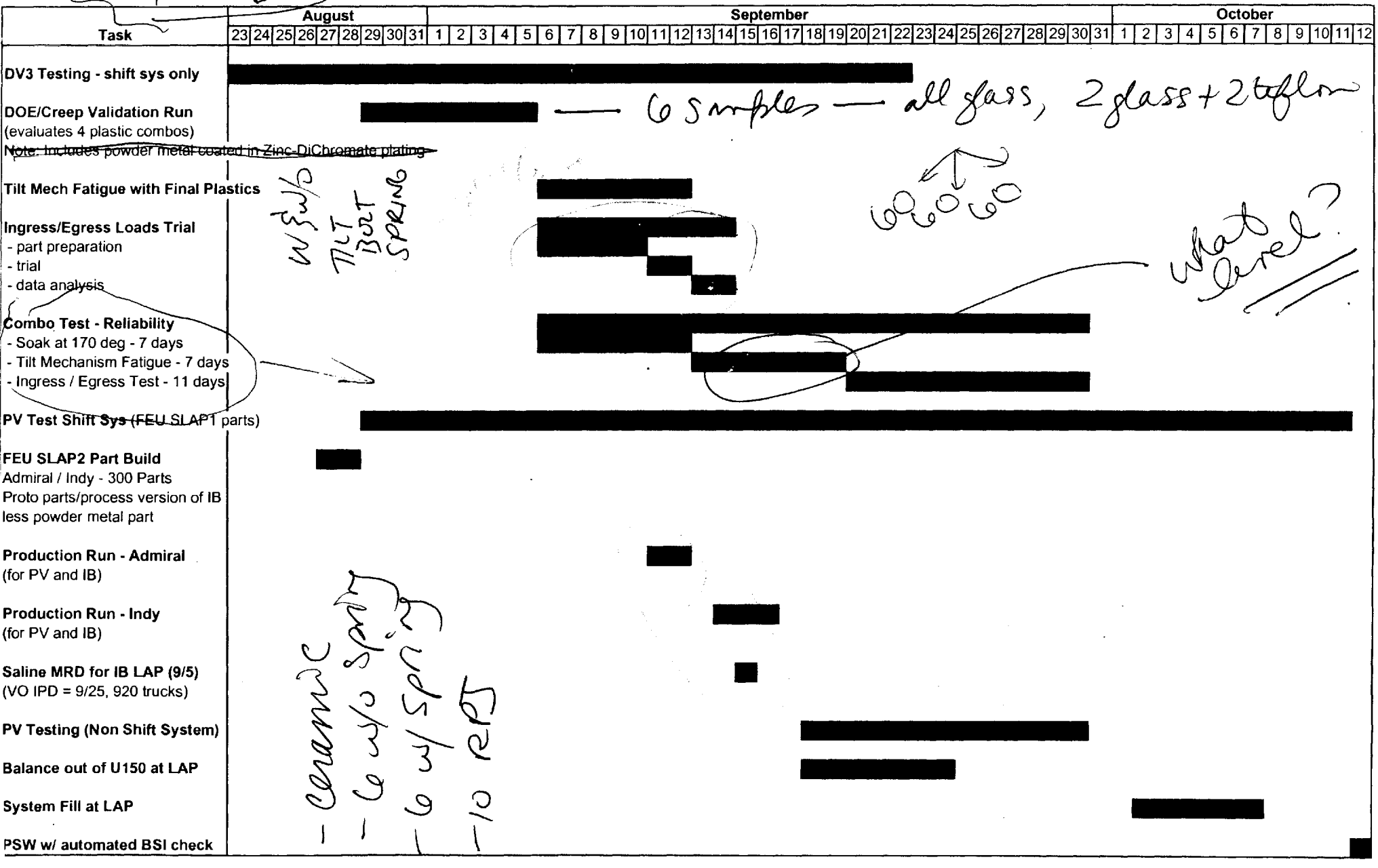
U152 Steering Column - continued

ACTION PLANS ON PROVE-OUT:

- DV and design reviews with reliability experts – on-going
- STA deep dive and Level 5 PSW at component level plants
- 25,000 Extraordinary Launch on Part characteristics
- Timing
  - DV2 Testing 7/15-8/30
  - DV3 Testing 7/30-9/20 (one test only – shift system fatigue)
  - Production run at Admiral
    - 8/15 Manual Shift Check
    - 10/6 Automated Check
  - Production run at Indianapolis 8/16-8/17
  - PV testing 8/17-9/30
  - PSW 10/7/00

TRUCK W/O RMS BDS

U152 Tilt Only Steering Column - Key Dates



DOE SUMMARY

Details of DOE:

3 Factor DOE with 8 run combinations
Running 3 sets of runs from 8/7 - 8/14 = A, B, C
From 8/7 - 8/14 for speed, tests will be run at ambient only
For the confirmation run, tests will be run at ambient, -40C, and 65C

Results (Cycles to Failure):

	A	B	C		Machine Surface	Effort to Lock	Cam Profile
1		34501	34501	**Run 1**	Rough	10 lbs	tilt only
2	13501	21001		**Run 2**	Smooth	10 lbs	tilt only
3	39001	37501	69001	**Run 3**	Rough	20 lbs	tilt only
4	24001	21001		**Run 4**	Smooth	20 lbs	tilt only
5	13501	13501	4501	**Rim 5**	Rough	10 lbs	tilt/tele
6	21201	4551		**Run 6**	Smooth	10 lbs	tilt/tele
7	18001	24001	21001	**Run 7**	Rough	20 lbs	tilt/tele
8	18115	4501		**Run 8**	Smooth	20 lbs	tilt/tele

Summary of Results:

Parameters	Average Cycles
Rough	28,626
Smooth	15,984
Tilt	30,689
Tilt/Tel	13,921
10 lb	18,782
20 lb	25,827
Rough, Tilt 20 lbs	48,501
Rough, 20lbs Tilt/Tel (Reference)	21,001

Recommendations:

Tilt Only
Rough Surface
Higher Lever Efforts

Column Testing At Defiance Test #46 U-152				
7:00AM		Rough Surface		08/25/00
Sample	**Stand**	**Started**	**Completed Cycles**	**Status**
1A	1	08/06/00		**Suspended**
Nut backed off @ 20512 was retighten and continue testing				
1B	5	08/06/00	34500 - 36000	**Sample Slipped**
1C	9	08/06/00	34500 - 36000	**Sample Slipped**
3A	2	08/10/00	39000 - 42058	**Sample Slipped**
3B	6	08/06/00	37500 - 39000	**Sample Slipped**
3C	10	08/06/00	69000 - 72038	**Sample Slipped**
5A	3	08/10/00	9000 - 18000	**Sample Slipped**
5B	7	08/10/00	9000 - 18000	**Sample Slipped**
5C	11	08/12/00	0 - 9034	**Sample Slipped**
7A	4	08/10/00	18000 - 21587	**Sample Slipped**
7B	8	08/10/00	24000 - 27012	**Sample Slipped**
7C	12	08/12/00	21000 - 22015	**Sample Slipped**

Column Testing At Defiance Test #46 U-152				
Smooth Surface				
Sample	**Stand**	**Started**	**Completed Cycles**	**Status**
2A	1		9000 - 18000	**Sample Slipped**
2B	5		21000 - 24000	**Sample Slipped**
4A	2	08/12/00	24000 - 27018	**Sample Slipped**
4B	6	08/12/00	21000 - 24014	**Sample Slipped**
6A	3	08/18/00	21201 - 24067	**Sample Slipped**
6B	7		0 - 9101	**Sample Slipped**
8A	4	08/18/00	18114 - 21104	**Sample Slipped**
8B	8	08/18/00	0 - 9000	**Sample Slipped**

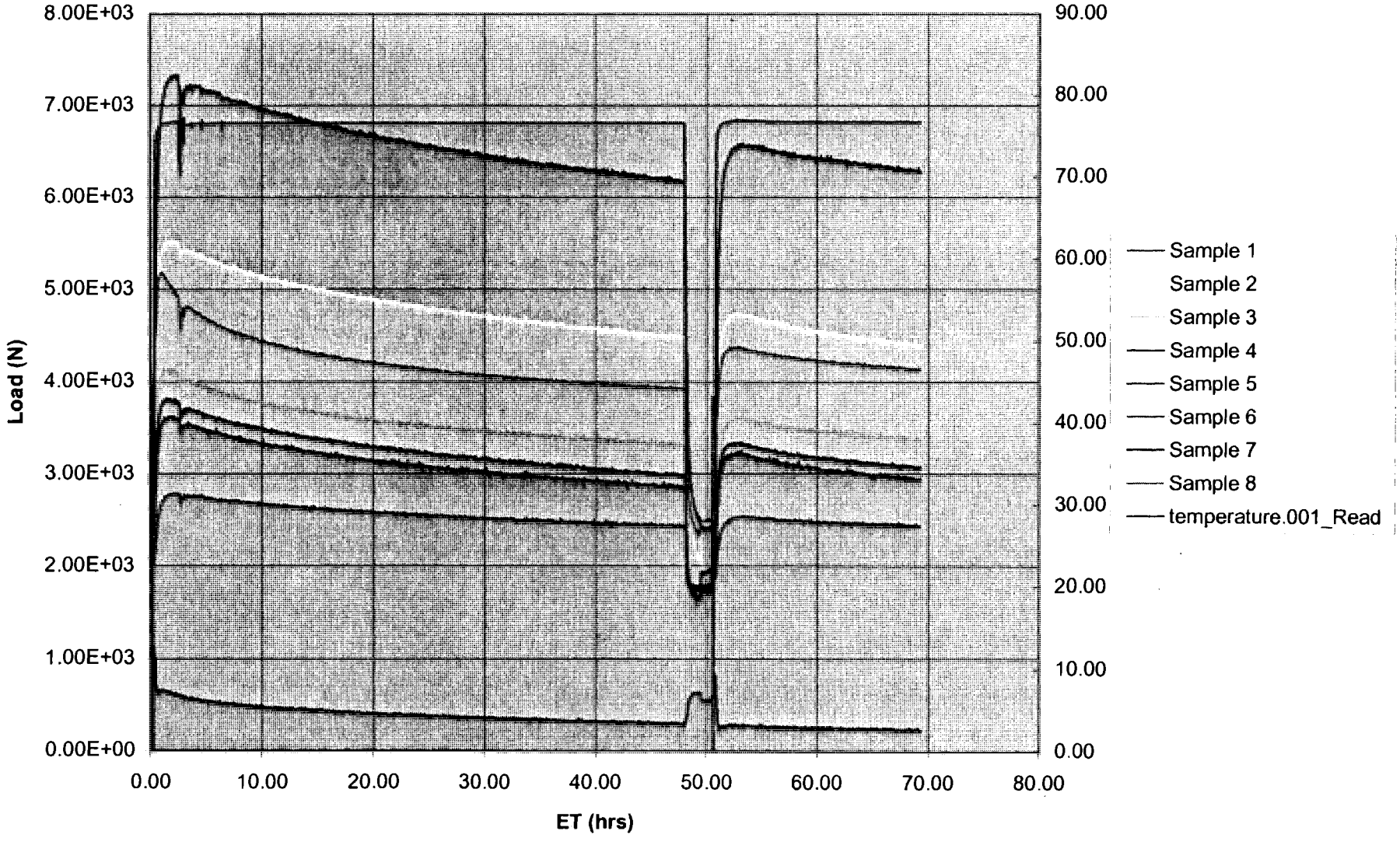
All 4 samples started to bake at 2.00pm on 08/19/00:

S.No.	*Strain Gage number*	*Spring Retainer*	*Plastic Washer-1*	*Lever Bushing*	*Banana Bushing*	*Plastic Washer-2*	*Load to lock/unlock*
1.	419	Metal	Present (ID was increased by filing)	Present	Present	Present	14 / 7
2.	418	Metal	Delrin 500 (ID was increased by filing)	Delrin 500	Delrin 500	Delrin 500	14 / 7
3.	417	Metal	Delrin – 25% Glass (ID was increased by filing)	Delrin – 25% Glass	Delrin 500	Delrin – 25% Glass	14 / 8.5
4.	416	Metal	Delrin with 25% Glass (ID was increased by filing)	Delrin – 25% Glass	Delrin 100	Delrin – 25% Glass	20 / 11

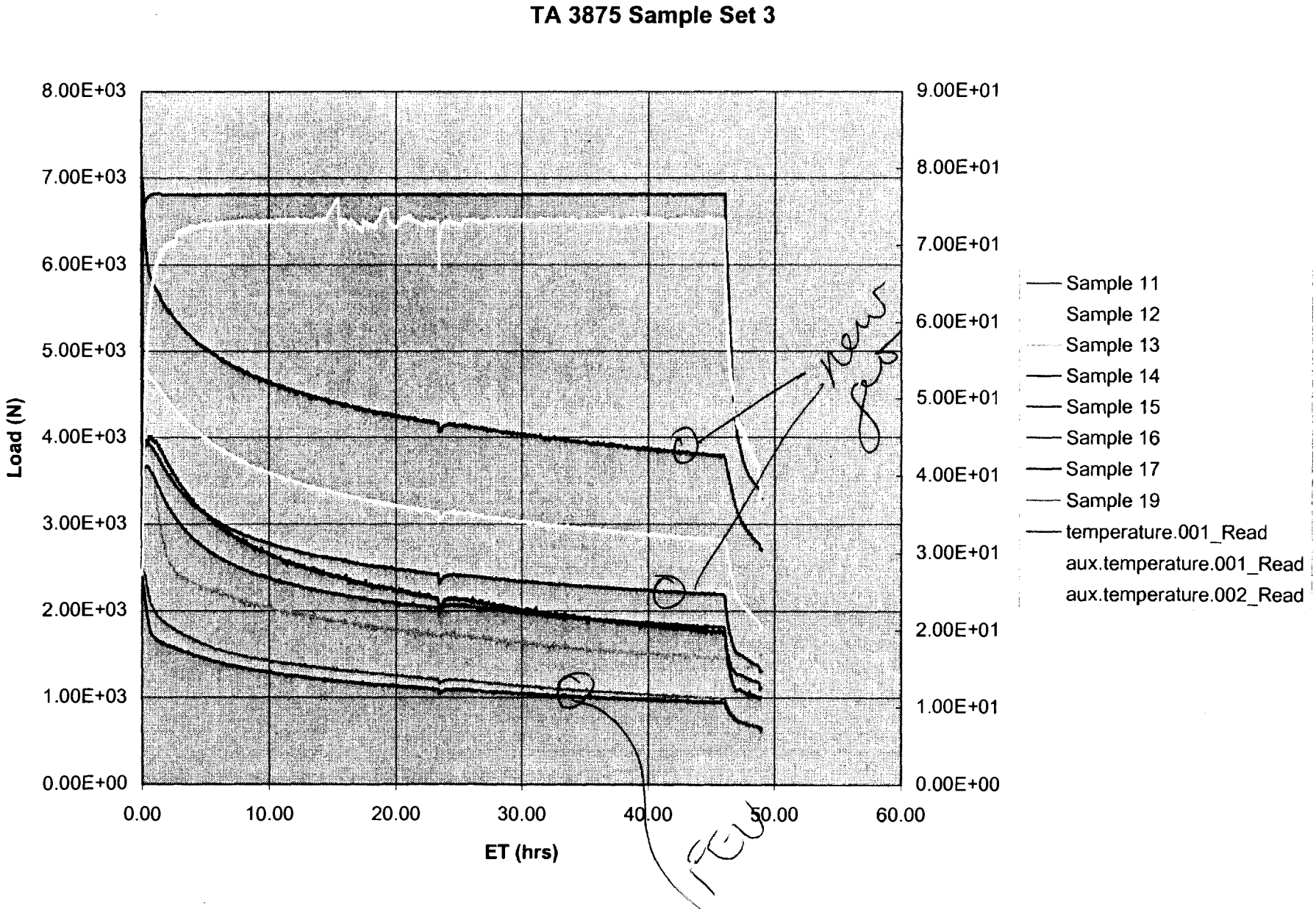
All 6 samples started to bake at 6.00 pm on 08/24/00:

S.No.	*Parts Type*	*Strain Gage number*	*Spring Retainer*	*Plastic Washer-1*	*Lever Bushing*	*Banana Bushing*	*Plastic Washer-2*	*Load to lock/unlock*
11.	Present	407K	Metal	Zytel-20% Kevlar	Delrin – 20% Teflon	Delrin – 20% Teflon	Zytel-20% Kevlar	20, 14
12.	Present	408K	Metal	Zytel-20% Kevlar	Delrin – 20% Teflon	Delrin – 20% Teflon	Zytel – 20% Kevlar	14, 9.5
13.	Delrin 500	416K	Metal	Delrin 500	Delrin 500	Delrin 500	Delrin 500	20, 13
14.	Delrin 500	428K	Metal	Delrin 500	Delrin 500	Delrin 500	Delrin 500	14, 9.5
15.	Delrin – 25% Glass	433K	Metal	Delrin – 25% Glass	Delrin – 25% Glass	Delrin – 25% Glass	Delrin – 25% Glass	20, 14
16.	Delrin – 25% Glass	426K	Metal	Delrin – 25% Glass	Delrin – 25% Glass	Delrin – 25% Glass	Delrin – 25% Glass	14, 10.5
17.	FEU	419K	Metal	FEU	FEU	FEU	FEU	20, 11
19.	FEU	420K	Metal	FEU	FEU	FEU	FEU	14, 7.5

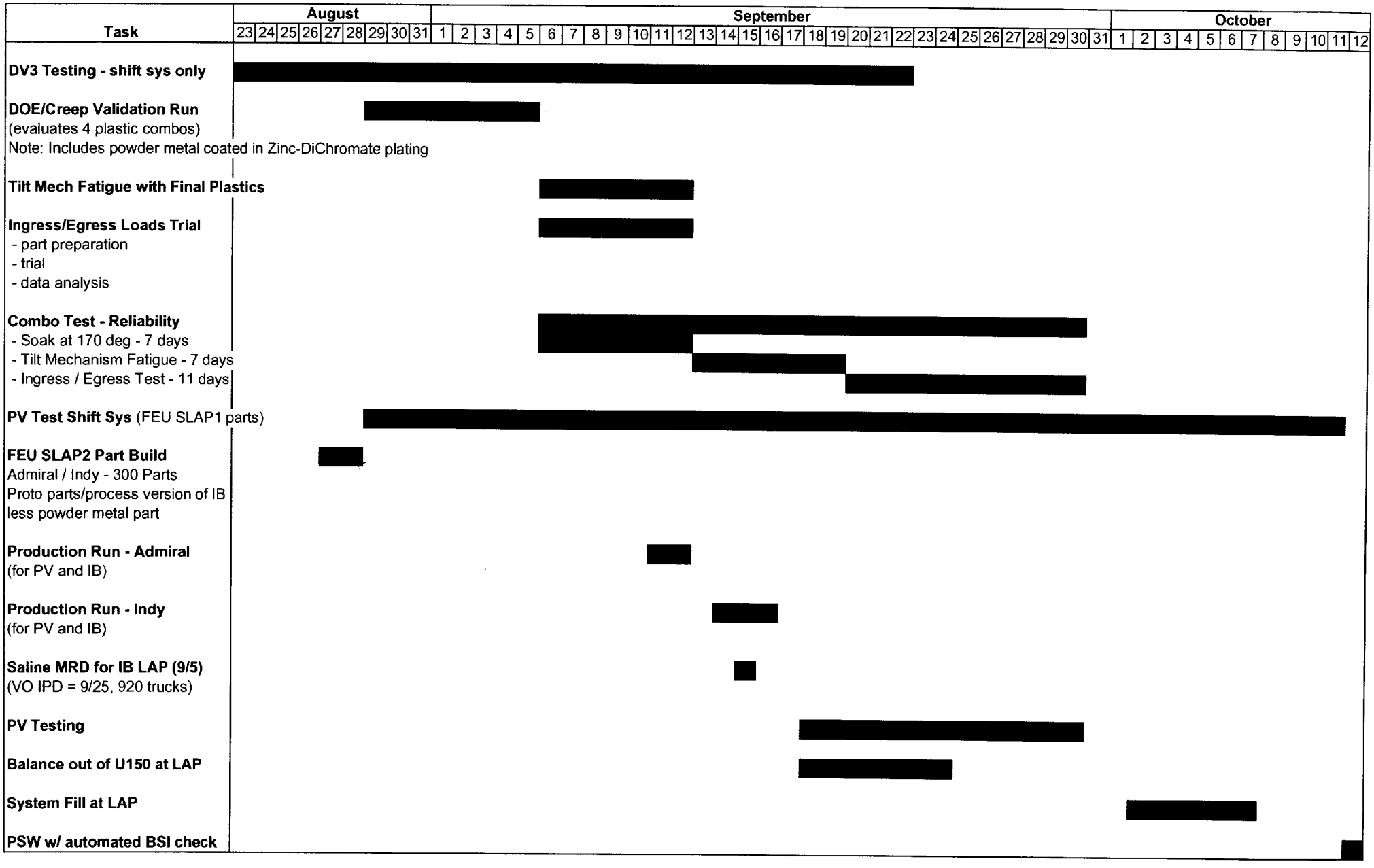
TA 3875 Sample Set 4 Load vs. Time



8


TA 3875 Sample Set 3
8.00E+03
7.00E+03
6.00E+03
5.00E+03
4.00E+03
3.00E+03
2.00E+03
1.00E+03
0.00E+00
Load (N)
9.00E+01
8.00E+01
7.00E+01
6.00E+01
5.00E+01
4.00E+01
3.00E+01
2.00E+01
1.00E+01
0.00E+00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
ET (hrs)
Sample 11
Sample 12
Sample 13
Sample 14
Sample 15
Sample 16
Sample 17
Sample 19
temperature.001_Read
aux.temperature.001_Read
aux.temperature.002_Read

Steering Column - Key Dates



Whittlesea Taxi
- Instrument counter / installed in vehicles
- Timing for vehicle start - TBD

3 days

U152 COULMN TIMING SUUMMARY – REVISED 7/31/00

The following plan allows the team enough time to build FEU parts, get the test #28 up and running correctly and time to determine the correct factor levels for the DOE.

- Test #28 Shift System Fatigue
  - Accelerated test (DV2) to verify hardness compatibility (7/18-7/31)
  - Revisit test procedure and acceptance criteria. Set up test stand so over travel and over loading does not occur and the test is run consistently for its duration.(7/28-8/3)
  - Build shift system DV3 test and FEU LAP parts at Admiral (7/31 – 8/9) and Indy (8/2 – 8/11)
  - Start DV3 test (8/3 – 9/22)
  - Build shift system PV test and FEU SLAP parts at Admiral (8/14 – 8/15) and Indy (8/16 – 8/17)
  - Start shift system PV testing (8/18 – 9/30)
- Test #46 Tilt Mechanism Fatigue
  - Determine DOE factor levels for lever efforts and surface finish roughness and make parts (7/31 – 8/6)
  - Run DOE (8/7 –8/14)
  - DOE Validation Run (8/15 –8/22)
  - ~~DV Test PM retainers (9/3 – 9/10)~~
  - Build Tilt mechanism Fatigue PV test and IB LAP parts at Admiral (9/5 – 9/7) and Indy (9/8 – 9/10)
  - Start Tilt Mechanism Fatigue PV testing (9/11 – 9/18).
- BSI Ultimate Load
  - Build shift system PV test and FEU SLAP parts at Admiral (8/14 – 8/15) and Indy (8/16 – 8/17)
  - Test complete 8/18

~ w/ simulated top hat

Surface Area/cup Top hat & Impact Bracket change (9/4)

- MAKE DOE parts 8/3 – 8/6
- DOE RUNS 1-8 8/7 – [illegible]
- ~~RE-BASELINE FEU WITH~~ – 3 temps

- initial (9/15) DV (10/30)
- 45 days
- crash sled
- (Mid-Nov if no issues)

- Quality issues on shift lever
  - softness
  - fracture

From: Montgomery, Kerry (K.P.)
Sent: Friday, June 18, 2004 2:16 PM
To: 'Bill Babcock'; 'Bill Georgaros'; 'Bill Wood'; 'Brad Oliver'; 'Byron Rothenhoefer'; 'Chip Williams'; 'Frank Hansen'; 'Gary Martin'; 'John Payne'; 'Jonathan Chavez'; 'Keith Vergien'; 'Kevin Crouder'; 'Louis Haddad'; 'Michael Everitt'; 'Mitch Wyborny'; 'Ralph Schoeder'; 'Rick Harrison'; 'Ryan O'Neil'; 'Scott Churchill'; 'Todd Jones'; 'Victor Dugas'
Cc: Bandoske, Pete (P.F.); Johnson, David (D.J.); Case, Robert (R.G.)
Subject: Update on Explorer Steering Column High Shift Effort

March TRP Panel Members,

In March, you reviewed potential repair procedures for Explorer steering column high shift effort. Listed below is the background, update and revised direction for repairing the steering column:

Background:

- The steering column high shift effort was reviewed with the March tech panel.
- Several potential repair options were reviewed.
- At that time the prime direction would be to remove the bur from the swing arm and lubricate the surface. This would be accomplished by removal of the brake shift interlock switch (BSI).
- Engineering indicated that we need to validate the long term effectiveness of the potential repair.

Update

- Several sample parts were tested with the bur removed and a lubricant added to the surface.
- The cycle testing confirmed that the addition of a lubricant does help to minimize the creation of a bur and improve the component durability.
- However, testing confirmed that the addition of a lubricant will not provide the anticipated long term repair effectiveness.
- As a result, this repair approach has been cancelled.

Revised Direction

- We have gained concurrence from engineering to permit the service of the brake shift interlock switch (BSI)
- The BSI switch has been enhanced to provide a quicker cycle time for pin pull down.
- This modified switch will be available as a stand alone service part.
- A TSB will be released to support this action (ETA, end of July).

Kerry Montgomery
Technical Meeting Specialist
Ford Customer Service Division
1555 Fairlane Dr. Room 155F
Allen Park, MI 48101
Tel: 313-248-3164 Fax: 313-322-2040
kmontgo1@ford.com

Kerry Montgomery
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kmontgo1@ford.com

VISTEON STEERING SYSTEMS
U152 COLUMN ISSUES

1) Saleability of FEU Vehicles

- Parts supplied for FEU will not be saleable for the following reasons:
  - Will not be PSW'd
  - Incomplete PV testing & DV testing
  - Not all components will be PSW'd
  - Will not be made from the PSW run

350 units

2) BRAKE SHIFT INTERLOCK NOISE:

Issue: The brake shift interlock solenoid actuates every time the brake is applied. The solenoid is too noisy and is located in close proximity to the driver which will cause customer complaints.

Actions: Reduce the amount of noise the solenoid makes when actuated and shut it off when in the neutral and forward gears.

Status:

- Actuation noise has been significantly reduced by slowing the solenoid down, minimizing clearances, and managing hard surface contacts.
- A package area of a second switch has been identified. A quiet BSI that does not require a second switch won't pass durability testing. Verification of the package and function is complete (6/23). Vehicle for RPJ drive updated on 6/24.

6/20

Program Support: 2PP @ SLAP will be supported with quieter BSI and second switch. Design complete 6/30/00.

3) HOMOLOGATION:

Issue: Column tilt/tele handle position and shape in relation to the column shroud and I/P does not meet a European knee clearance requirement.

Status:

- Design resolutions are in progress. Prototype of new handle is due week of 6/5. Design complete 6/30. These changes include increasing handle strength, improved shroud clearance, lever orientation to shroud bottom, improved handle feel and improved handle attachment to lever. New handle will be used across the board. PSW planned for 10/31/00. FEU will be supported with current handle.
- Export (EC) vehicles will be supported with current lever until new lever is available
- EC vehicles built with current lever will have to be retrofitted.
- SDS and lessons learned need to be updated with this requirement.

4) **BRAKE SHIFT INTERLOCK (BSI) MALFUNCTIONS:**

ISSUE: Two conditions occur which allows the vehicle to be shifted out of park without depressing the brake pedal or when the vehicle is off. The first condition violates a corporate requirement while the second does not satisfy FMVSS.

Resolution:

- Optimize dimensioning scheme by tying key dimensions of key components (insert plate, swing arm, housing) together and significantly reduce tolerances.
- Modify the insert plate and swing arm to allow blocking feature to pass by the solenoid pin and always prevent the vehicle from rolling.
- Conduct a stack-up on the shift system including the column, shift cable, and transmission.

1PP/2PP Support:

- 1PP builds was supported with laser cut insert plates and modified swing arms.
- All columns were 100% inspected to a new test procedure to assure brake and park interlock functions are achieved.
- Verified in vehicle prior to shipping parts for the build.

Production Support:

- Support FEU with PSW'd components with above design actions.
- All dimension in shift system stack-up will be CC's
- Continue 100% column sub-assembly check for shift system travel.
  - Manual operation until production equipment comes in (Oct. ??)
  - Data will be recorded and must pass min. requirements.

Status:

- Program moved this from a major to a minor issue when shift system max/min part testing was successfully completed.
- Program will take this off minor issue list 6/12 when 2PP vehicles are built with column and transmission changes.
- Wear assumptions will be confirmed after DV testing is completed.

Back Up Plans:

- All programs beyond '2002 will block the shift lever in the park.

5) **SHIFT CABLE BRAKET NEEDS TO BE STIFFER TO IMPROVE SHIFT FEEL (RPJ WANT)**

- The bracket evaluated for shift feel improvements is not production feasible.
- Investigating production feasible and program conatianable methods to stiffen the bracket.
- Job #1 plus 60 days change
- Need to add force/deflection targets in SDS.
- Vehicle updated for RPJ drive with production representative stiff bracket on 6/24.

6) **REDUCE QUILL SPRING TO REDUCE KEY INSERTION EFFORTS. (RPJ Want)**

- This change will not be considered until DV testing is complete with the current spring. Reducing the load of the quill spring jeopardizes column lock and key chime functions, both FMVSS requirements.
- Job #1 plus 60 days change

7) **TELESCOPE EFFORT VARIATION WITH TILT POSITION:**

Issue: The effort to telescope increases when the column is tilted from the up to the down position. This is due to the heavy load required of the spring to bias the column if the full up position.

Status: The spring configuration has been changed to a prior design level to bias the column at the lever release position. Plastic wear pads and contact area has also been increased to reduce variation.

Program Support:

- 2PP LAP & SLAP will be supported with the new spring configuration and 2PP SLAP will be supported with bushings to simulation production intent
- FEU builds will be supported with columns built with PSW level components. Column PSW is scheduled for 9/30/00.

8) **LOCKING LEVER EFFORT VARIATION WITH TILT AND TELE. POSITION:**

Issue: Lever locking efforts are too high for 1PP and 2PP builds. This due to the fact that the lock cylinder housing and the impact bracket have a taper in the parts. Since load to slip was deemed more important to maintain, lever efforts were set at the thinnest part of the taper (full in and full up). This results in higher lever efforts as the parts thicken (full down, full out).

Status:

- Prints updated to improve control of taper.
- 2PP SLAP will be supported with impact brackets and lock cylinder housings machined to the new print tolerances.

9) **ANODIZED BRACKET MAY NOT BE DARK ENOUGH.**

- Investigate ECOAT capability.
- Paint reduces the friction and negatively affects load to slip. Ecoat or paint is not feasible.

10) **RELIABILITY PROVE-OUT:**

Issue: Reliability of the column will not be proven until PV testing is complete.

Status:

- DV Testing is 2 weeks behind schedule due to component quality issues at 2PP
- Some noise factors & key life tests will not be included in DV testing.
- Testing to satisfy PSW requirements will not be complete by FEU. Additional testing to further demonstrate reliability will continue after PSW to increase our confidence and to benefit subsequent programs.

U152 COLUMN LAUNCH PLAN

- Kick off of the lauch plan will take place with the following key suppliers during all day reviews on 6/14 &6/15:
  - Admiral
  - Contech
  - Meridian
  - Diemakers
  - Presta
  - Visteon/Indy
- Team membership will be a composite of Visteon and supplier personnel from engineering, manufacturing, STA, and quality (Proposed list: A. Porter, B. Clary, V. Marotzke, Z. Daker, L. Shallow (Ann Renton, Dawanye Bowen), A. Hull, J. Meade, suppliers.)
- The first 5K parts will be 100% inspected for all "Extraordinary Effort"identified dimensions. All CC's and SC's are automatically included on this list.
  - Periodic checks for functional and pass thru items will also be conducted.
  - Inspections will continue until all issues are resolved and 1.66 Cpk capability is obtained.
- Level 5 PSW
  - Visteon STA on site during PSW
  - Conduct internal Level 5 at during Indy's PSW
  - Additional onsite support at Indy during PSW run:
    - Engineering
    - Admiral
    - Contech
  - Additional onsite support at Admiral during PSW run:
    - Visteon Engineering
    - Visteon Manufacturing
    - Indy Quality
- Need a list of what our customers would like us to do during our launch of the U152 column. Need comments by 6/26/00.
  - U152 Program
  - U152 Launch Team
  - Saline Plant

- LR Reviews scheduled at Admiral (8/7) and Indy (8/8).

U152 COLUMN ENGINEERING TEAM LIST

Engineering:

Alan Porter	Supervisor
Robert Clary	Column Design, Indy and Admiral launch support
Ziad Daker	Column Design, DV/PV Testing
Balan Sadasivam	Column Design, DV/PV Testing
Vicki Marotzke	Column Design, System DVP&R
Spencer Lyons	Column Design, Saline Suport
*Paul Breakey	DV/PV Testing ——> TOP PRIORITY
*William Korzan	Roller Lever Design
Tom Shafer	Launch Support

Design:

Dan Korona	Program Primary
Bruce Bosman	Column Core Primary
Jerry Scharboneau	Designer
Joe Platz	Designer
Alex Bossidis	Designer
Mike Schanck	Desinger

* additional head count added since 6/20/00

- STA - experience
- RIE

VISTEON STEERING SYSTEMS
U152 COLUMN ISSUES-8/29/00

- **Load to Slip**
  - DOE Results 17lbs
    - Best combination is tilt only, higher lever efforts and rougher surface finishes.
    - Confirmation run on tilt [redacted] Col. with PM retainer, latest design and creep study results (8/29 – 9/5)
  - Creep Study Results
    - New design is significantly better:
      - Larger surface area of plastic bushings
      - Machined impact bracket surfaces
      - Steel washers backing up plastic bushings
    - Currently released materials have highest clamp loads
    - Creep rate is about the same for all materials
    - Parts are still creeping (less than a week)
- **BSI Noise**
  - Noise during BSI activation and rattle while driving
    - NVH sleeve was removed due to a binding condition when the wire harness was attached to the column
    - Permanent fixes include:
      - changing the wire harness casket to provide increased clearance to the BSI
      - adding an additional mounting tab to the BSI housing
      - adding a sleeve back in with increased clearances and increased temperature capability
    - Timing is being developed. Planning pulling changes in the second to third week of IB
  - Noise while shifting out of park
    - As you shift out of park the BSI de-energizes and the pin hits the back of the blocking feature.
    - Clocking the cam on the shift socket so the BSI shuts off in reverse and neutral so pin misses blocking feature.
    - Timing is being investigated.

PE09-020 1726

- **Can't Remove Key from Ignition**
  - 2PP LAP: had a second bracket to hold the PDS. This position caused an interference with the shift lever pin. The pin pushed the switch out of position. Cut 2mm off pin for containment and 2PP SLAP
  - FEU LAP: put the switch back on the insert plate. This design was marginal for switch activation. The recommended hole for the PDS was not adequate for retention allowing switches to pass the initial test and fail later on. Columns were sorted at Saline and LAP making sure switches were secure and the switch activates.
  - FEU SLAP: This build will have the production design with PSW'd components. The blade activation is robust due to a increased bump on the shift lever. The switch has improved clearance to adjacent components. The switch is now a press fit to the insert plate for improved retention. Max/min press fit studies are planned. 2mm shorter pin is also in production.
- **Bent Tilt Levers**
  - Tilt levers are being bent on fleet and media vehicles in California as well as one launch drive vehicle
  - Investigation of cause of bending is being investigating
  - Investigating use of higher strength steel (30% improvement) as well as heat treating for increased strength.
  - Homoligation lever has increase cross sections.

From: Leo Luce [lluce@futuretool.com]

Sent: Thursday, April 29, 2004 9:25 AM

To: Thornton, James (J.W.)

Cc: Porter, Alan (A.J.)

Subject: Warranty Return Column Test Status 4/29/04 - 3 plated & 3 production

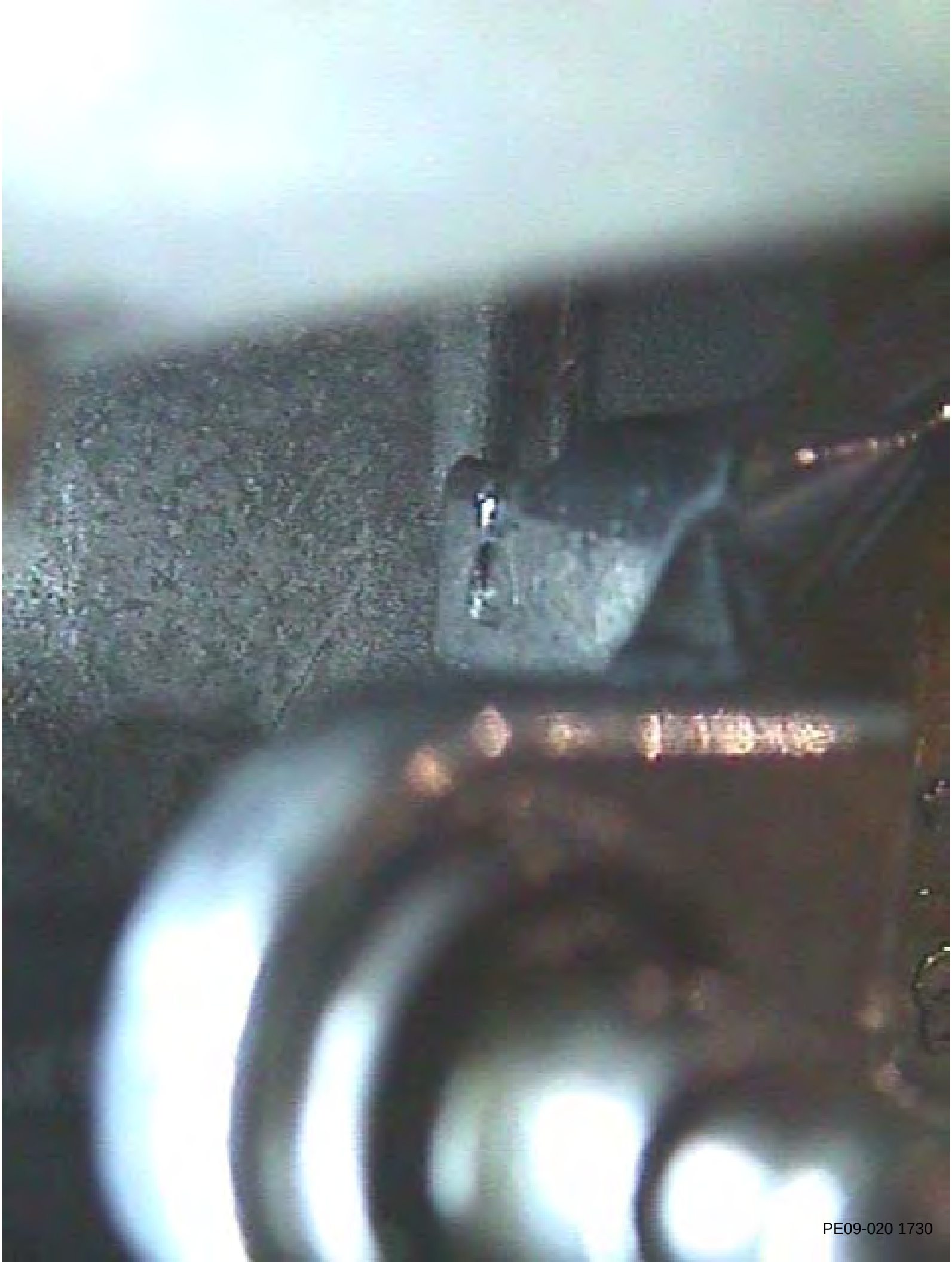
Attachments: 25K Sample #27-Prd.JPG; 20K Sample #19-Prd.JPG; 20K Sample #27-Prd..JPG; 25K Sample #11-Prd.JPG; 20K Sample #11-Prd.JPG

Jim,
All columns except one has completed 25,000 cycles. The last one has 1800 cycles on it and is shutting down and re-starting from every other to every fifth cycle.
Here are some photographs of the swing arms after 20K & 25K cycles.

Sincerely,

Leonardo Luce
Test Operations
Phone: 734-946-2100
Fax: 734-946-0922

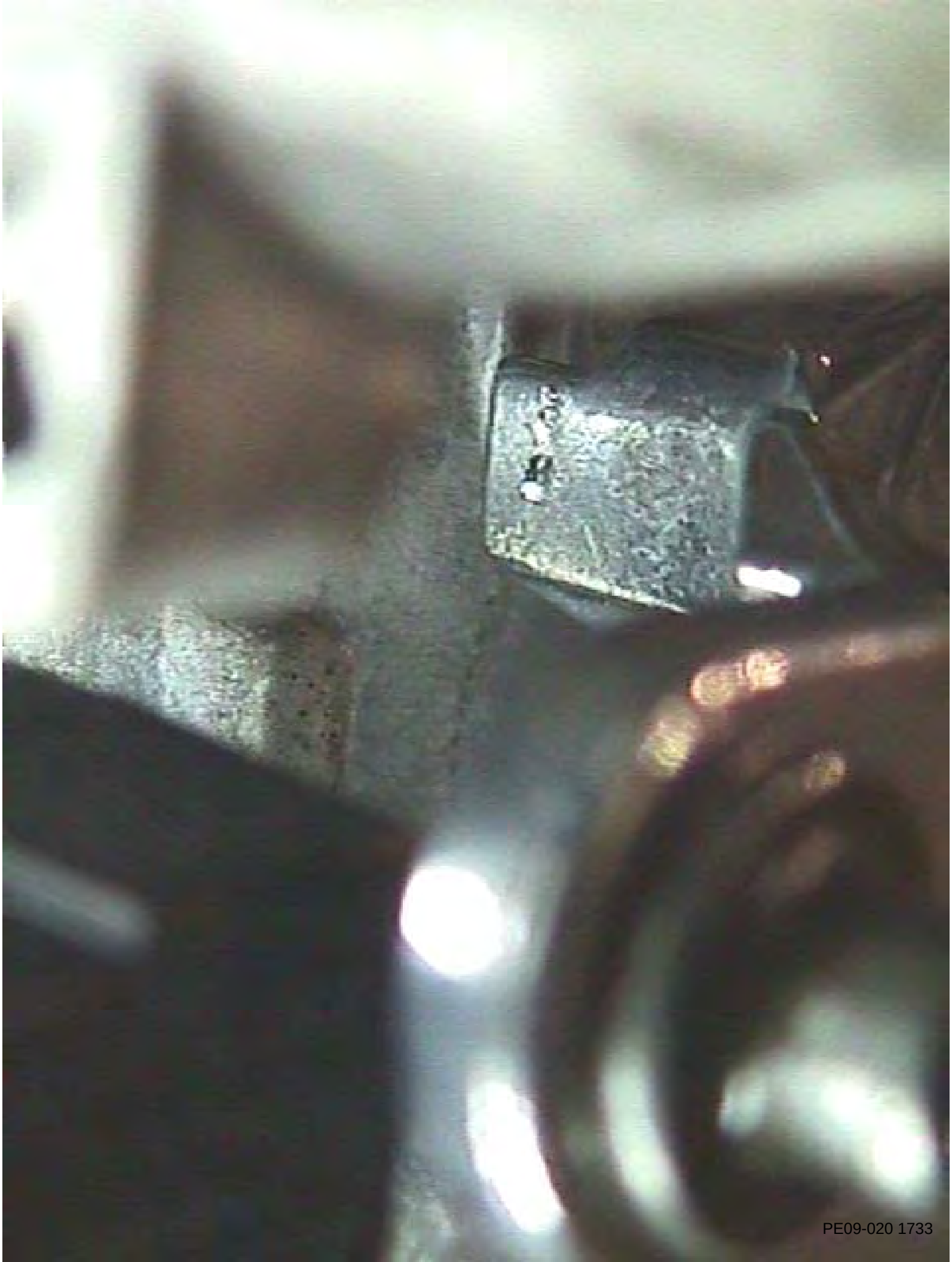
PE09-020 1729



PE09-020 1730

PE09-020 1731

PE09-020 1732



PE09-020 1733

From: Leo Luce [lluce@futuretool.com]
Sent: Wednesday, April 28, 2004 12:15 PM
To: Thornton, James (J.W.)
Cc: Porter, Alan (A.J.)
Subject: Warranty return column testing update - 10k cycles
Attachments: 10K Sample #27.JPG; 10K Sample #11.JPG; Warranty Col. w-plated & prd.swing arms.xls

Jim,
Here is the update after 10K-cycles some columns did not reach the 10k-cycles due to the swing arm hanging up. I took photos of the production columns only.
Let me know if you want me to go ahead and remove the swing arms that are plated with grease so I can take photos of them or do you plan on looking at them.

Sincerely,

Leonardo Luce
Test Operations
Phone: 734-946-2100
Fax: 734-946-0922

PE09-020 1735

PE09-020 1736

Test Tech: J.R. & L.L.
Test Engineer: L.Benfant
Contact : J. Thornton
Phone No: 313-845-9249

Clients Company Name: **Ford Motor Company**

Sample Description & Identification: P/N 3L24-3C529-BA
U152 Warranty return column & BSI solenoid
Plated swing arms with silicone grease & prd. Swing arms
Test Specification: Swing arm efforts meas. at cable connection

Job No: 401643-01
Sheet No: ___ of ___
Date: _____

Total Cycles	Sample #10 Plated with silicone grease Swing arm effort	Sample #11 Production w/o grease Swing arm effort	Sample #18 Plated with silicone grease Swing arm effort	Sample #19 Production w/o grease Swing arm effort	Sample #27 Production w/o grease Swing arm effort	Sample #50 Plated with silicone grease Swing arm effort					Notes
No.	(N)	(N)	(N)	(N)	(N)	(N)					
0	3.4 to 7.8	0.2	1.4 to 7.5	1.4 to 9.6	1.8 to 2.8	0.5					1
5000	0.2	0	1.4 to 4.3	66	.3 to 13	0.2					2
10000	.5 to 1.2	2.2 to 3.7	8827cyc./55.4		9136cyc./ 57	7942 cyc./ 55.8					3
15000											
20000											
25000											
30000											
35000											
40000											
45000											
50000											

Equipment Log

Pos #	Test Equipment Description Make & Model	Ref. Equip. (X)	EQ #	DATE OF CALIBRATION Last	DATE OF CALIBRATION Next	Certification No.	Transducer Cal. Information Shunt Value (K OHMS)	Transducer Cal. Information Pre-Test Output (EU)/V	Transducer Cal. Information Post Test Output (EU)/V
1	Trans Tech MLP-50-CO Load Cell		139	3/22/2004	3/22/2005	58664001	60	159.4N	
2	Trans Tech MLP-50-CO Load Cell		138	3/20/2004	3/20/2005	58664002	60	159.9 N	
3	Trans Tech MLP-50-CO Load Cell		247	3/15/2004	3/15/2005	40871	60	161.2 N	
4	Trans Tech MLP-50-CO Load Cell		245	3/15/2004	3/15/2005	40871	60	160.1 N	
5	Trans Tech MLP-50-CO Load Cell		246	3/15/2004	3/15/2005	40871	60	160.1 N	
6	Trans Tech MLP-50-CO Load Cell		248	3/15/2004	3/15/2005	40871	60	161.2 N	
	Imada AXT-44 Force Gauge		19	7/4/2003	7/4/2004	52437002			

NOTES

NO.	
1	Sample #50 initially measured at 1.9N to 51.2N. Requester inspected sample and rotated the BSI pin manually causing the swing arm effort to drop.
2	Sample #19 swing arm effort 66N did not break away, sample completed testing.
3	Samples #18,27 & 50 shut down swing arms did not break away during performance test, samples completed testing.

		2005 MY	2004 MY	2003 MY			
	Total R/1000 (3 Mis)	19.0					
Rank	Issue	Start of Issue	Analysis	Containment Action	Incorp Date	PCA	PCA Incorp Date
1							
2							
3							
4							
5							

2005 STP 5R55S Car 3-MIS Warranty

	2005 MY	2004 MY	2003 MY
Total R/1000 - 3 Mis Target 7.5	19.0	9.9	68.1

Rank	Issue	Start of Issue	Analysis	Root Cause	Containment Action	Incorp Date	PCA	PCA Incorp Date
1	Cooler Lines 2005 3-MIS R/1000 11.28 2004 3-MIS R/1000 3.28 2003 3-MIS R/1000 0.92	8/04	Leaks at tube/hose connection at Wixom	excessive roundness on tube at seam allows leak path between tube & hose	Deleted CTC clamp and added worm/screw clamp Added second worm/srew clamp	8/18/2004 12/04	- Capped end hose to reduced roundness variability - Changed tube mat'l and added rolled grooves	11/04 12/04
2	Front Pump Seal (7A248) 2005 3-MIS R/1000 2.38 2004 3-MIS R/1000 0.24 2003 3-MIS R/1000 0.28	12/04	- (2) units returned to STP verified not to leak - sort at Wixom shows oil at bottom of bellhousing on V8 - sort at STP shows oil at bottom of bellhousing on V8	Trans end of line washer does not remove oil in V8 bellhousing behind adapter plate	Eliminated spray anti-rust coasting on conv Started wiping bellhousing Started single jet wash prior to adapter plate installation	1/28/05 2/10/05 2/10/05	Add 5 nozzle spary to trans washer Add 14 jet flush ring wash to bellhousing prior to adapter plate installation	2/13/05 2/15/05
3	TRS (7F293) 2005 3-MIS R/1000 2.21 2004 3-MIS R/1000 0.64 2003 3-MIS R/1000 0.64	9/04	(3) connectors not seated (3) replaced (1) adjusted	New operator was not using alignment tool	reduced number of operators on Job & reinstruction to use alignment tool	9/04	incorporated new TRS test station	5/05
4	Solenoid (7G391) 2005 3-MIS R/1000 0.94 2004 3-MIS R/1000 1.20 2003 3-MIS R/1000 3.68	9/04						
5	Trans Assy (7000) 2005 3-MIS R/1000 0.70 2004 3-MIS R/1000 2.63 2003 3-MIS R/1000 5.17	8/04	(7) total trans replaced - (3) No problem found - (1) Broken input shaft - (1) Broken rev level strut - (1) mis-assembled coast clutch adapter plate	(2) NPF trans were leaks in bellhousing Broken Input Shaft - awaiting analysis Broken rev lever strut - awaiting analysis	Leaks in bellhousing attributed to residual oil (see below)			

2005 BDX 5R55S Car 3-MIS Warranty

	2005 MY	2004 MY	2003 MY
Total R/1000 (3 Mis)	19.0		

Rank	Issue	Start of Issue	Analysis	Root Cause	Containment Action	Incorp Date	PCA	PCA Incorp Date
1	Cooler Lines 2005 3-MIS R/1000 8.98 (47%) 2004 3-MIS R/1000 2003 3-MIS R/1000	8/04	Leaks at tube/hose connection at AAI	insufficient clamp load	Added second screw clamp	10/21/2004	Investigating quick connect or weave construction hose	Projected Job #2 06 MY
2	Shifter 2005 3-MIS R/1000 2.82 (15%) 2004 3-MIS R/1000 2003 3-MIS R/1000	Job #1 2005	Appearance Damage (36%) - 19% shifter hard to move or indicator does not move - 8% due to override cap missing - 7% due to warped bezel BTSI & Park Switch (24%) - 10% due to stuck in park - 14% key stuck in ignition	Prod Engr & Supplier Analysis ongoing Analyzing assy process for potential issues	100% inspect BTSI on supplier test stand	Nov '04		
3	Trans assy 2005 3-MIS R/1000 2.60 (14%) 2004 3-MIS R/1000 2003 3-MIS R/1000	8/04	12 Already investigated at Bdx: - 7 Coast down whine noise - 2 Bell Hsg broken - 2 Leaks at Bell Hsg - 1 Noise enter Support	- Race 7D171 - Extra nut AAI responsibility - 1 TC bad weld - 1 NPF Bdx - Bad machining	- 2 Grindings operation - Operators informed - 8D from STP - 8D from Bdx	Feb 9, 05 Sept 04 Dec 19, 04 Sept 04	Improved water leak test New drilling tool	TBD Dec 20, 04 Sept 04

2005 BDX 5R55S Truck 3-MIS Warranty

	2005 MY	2004 MY	2003 MY
Total R/1000 (3 Mis)	6.5	8.9	6.9

Rank	Issue	Start of Issue	Analysis	Root Cause	Containment Action	Incorp Date	PCA	PCA Incorp Date
1	VFS Exchanged 2005 3-MIS R/1000 3.18 (49%) 2004 3-MIS R/1000 0.41 2003 3-MIS R/1000 0.80	Aug 04	16 VFS currently investigated: - 9 NPF (6 Shifting-3 Flashing) - 3 Aluminium Flange broken - 3 Bad function low mileage - 1 Black plastic contamin	- Park hang up or TBD - Supplier issue worn fixture - Not known NPF at Bosch - Dunnages and frame design	- Calibrators at local dealerships - Fixture replaced - Bosch at Bdx 3/2 & 3/3 for invest. - daily cleaning of dunnage	3/2 9/04 3/2/04 8/04	- New fixture design and revised prev Maintenance - TBD - Bdx audits and task force at Bosc for contamination	9/04 11/04

PE09-020 1744

PE09-020 1745

PE09-020 1746

PE09-020 1747

PE09-020 1748

PE09-020 1749

From: Case, Robert (R.G.)
Sent: Tuesday, June 15, 2004 1:50:30 PM
To: Kaercher, Don (D.F.)
CC: Case, Robert (R.G.)
Subject: Service part

Don, need some help please. We are working on a large QB project involving a steering column issue for Explorer. The fix will involve replacement of a revised brake shift interlock switch (BSI). Currently, the switch is a component to the column and was not released for service.

We will now service the BSI and a TSB is being developed.

I'm told the BSI switch has been released as follows:

- Concern number C11649395 and Notice NL00-E-11649395-000
- The switch is listed as 1L24-3F770-DA.

Could you please request someone in your shop to review the above information to get the ball rolling in the right direction.

Thanks in advance.

Bob Case
FCSD x00937
Warranty Program Manager

Test Tech: J.R. & L.L.
Test Engineer: L.Benfant
Contact : J. Thornton
Phone No: 313-845-9249

Clients Company Name: **Ford Motor Company**

Sample Description & Identification: P/N 3L24-3C529-BA
U152 Warranty return column & BSI solenoid
Plated swing arms with silicone grease & prd. Swing arms
Test Specification: Swing arm efforts meas. at cable connection

Job No: 401643-01
Sheet No: ___ of ___
Date: _____

Total Cycles	Sample #10 Plated with silicone grease Swing arm effort	Sample #11 Production w/o grease Swing arm effort	Sample #18 Plated with silicone grease Swing arm effort	Sample #19 Production w/o grease Swing arm effort	Sample #27 Production w/o grease Swing arm effort	Sample #50 Plated with silicone grease Swing arm effort					Notes
No.	(N)	(N)	(N)	(N)	(N)	(N)					
0	3.4 to 7.8	0.2	1.4 to 7.5	1.4 to 9.6	1.8 to 2.8	0.5					1
5000	0.2	0	1.4 to 4.3	66	.3 to 13	0.2					2
10000	.5 to 1.2	2.2 to 3.7	8827cyc./55.4		9136cyc./ 57	7942 cyc./ 55.8					3
15000											
20000											
25000											
30000											
35000											
40000											
45000											
50000											

Equipment Log

Pos #	Test Equipment Description Make & Model	Ref. Equip. (X)	EQ #	DATE OF CALIBRATION Last	DATE OF CALIBRATION Next	Certification No.	Transducer Cal. Information Shunt Value (K OHMS)	Transducer Cal. Information Pre-Test Output (EU)/V	Transducer Cal. Information Post Test Output (EU)/V
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5	Trans Tech MLP-50-CO Load Cell		246	3/15/2004	3/15/2005	40871	60	160.1 N	
6	Trans Tech MLP-50-CO Load Cell		248	3/15/2004	3/15/2005	40871	60	161.2 N	
	Imada AXT-44 Force Gauge		19	7/4/2003	7/4/2004	52437002			

NOTES

NO.	
1	Sample #50 initially measured at 1.9N to 51.2N. Requester inspected sample and rotated the BSI pin manually causing the swing arm effort to drop.
2	Sample #19 swing arm effort 66N did not break away, sample completed testing.
3	Samples #18,27 & 50 shut down swing arms did not break away during performance test, samples completed testing.

DATE: 10/24/00 1L2C-7302-BF PRINT DATE: 001006 REV. E14 CAVITY ONE (1) ONLY

Supplier Intermet Monroe City STA Engineer Brent Dudgeon/Chris Markatos DCP Copy Available? Yes X No ___

Part # 1L2C-7302-BF (34918) Part Name Arm Assembly Page 1

				Frequency of Measuring								
FE# C/CC		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	I.B. Frequency	I.B. CPK Results	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
166 SC		Variable	NO	100 pcs	1.707	N/A	N/A	4 ea. Cav. Cmm per 8 hr shift		Basic 5.06	A & B	Variable gage on order due 1/12/01. Ref. Capability Study
168 SC		Variable	NO	100 pcs	1.727	N/A	N/A	4 pcs/cav hrly (Disc Mic)		17.025/ 16.950	A & B	Ref. Capability Study Ref. SREA #429291
169 SC		Variable	NO	100 pcs	1.694	N/A	N/A	4 ea cav./hrly Location gage		⊕ .25 Bishop Head Pin	A & B	Ref. Capability Study Ref. SREA #429290
170 SC		Variable	NO	100 pcs	2.906	N/A	N/A	4 ea cav CMM Per 8 hr. shift		Profile of Peanut Shape	A&B	Currently designing and will build a gage to check variably/also redimensionir print to show proper swing points (SREA Pending)This data is based on what told Visteon Designer Mike Schank the tangent points should be on the redimensioned print. In tool steel.
171 SC		Variable Ø	NO	100 pc	5.03	N/A	N/A	4 pcs/cav hrly Go/No Go		Ø13.98/ 13.9	A & B	In tool steel.
171 SC		⊥ Variable	NO	100 pc	3.04	N/A	N/A	4 pcs cav CMM per 8 hr. shift	-----	⊥ pivot Bore	A & B Automated	In tool steel.

DATE: 10/24/00 1L2C-7302-BF PRINT DATE: 001006 REV. E14 CAVITY ONE (1) ONLY

174		100% Visual	Yes	300 pcs	N/A	N/A	N/A	100% Automated		PIN Presence	A&B	No Action Required
175		Up front load study	NO	50 pcs	N/A	N/A	N/A	2 pcs/cav at setup		Stake Loads	A&B	Verification of test methode required from Bob Clary Intermet has requested new spec. Parts currently meet print ES.
176		Visual	NO	300 pcs	N/A	N/A	N/A	16 pcs each hour		Stake Loads	A&B	Same as Above
177		Ref EE#166	NO		REF EE#166	N/A	N/A	NO On Going				
178		Ref EE#166	NO		REF EE#166	N/A	N/A	NO On Going				

U152 PROGRAM

Supplier INTERMET MONROE CITY STA Engineer Brent Dudgeon/Chris MarkatosDCP Copy Available?Yes X No ___

Part # 1L2C-7228-CD (34916) Part Name Selector Lever Socket Page 1

EE# SC/CC		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	Frequency of Measuring I.B. Frequency	I.B. CPK	5,000 pc (for Nonshifting Characteristics) Frequency Results		25,000 pc (for Shifting Characteristics) Frequency Results		Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
71		Variable	No	~~300 pcs~~ 100	C1 - .997 C2 – 1.16	N/A	N/A	4 pcs per cav. 1/2 hour		8.8	A & B	Currently building new inserts designed to be capable to print and leadtime for tooling (TO PRINT / TIMING?)
72		Variable	NO	30 pcs	C1-2.722 C2-1.681	N/A	N/A	4 pcs. Per cav. 8 Hours		17.4	A & B	(Ref SREA 429289) Functional gage is currently on order Gage due date 12-21-00 (Ref capability study) In tool steel.
73		Variable	NO	100 pc	C1 3.386 C2 2.54	N/A	N/A	4 pcs per cav 5 hour	Go/No Go	14.65/ 14.55Ø	A & B	In tool steel.
74 SC		Variable	NO	100 pc	C1 2.02 C2 3.10	N/A	N/A	4 pcs per cav 5 hour	Go/ No Go	17.6/ 17.5Ø	A & B	100% on going with go gage at machining center In tool steel.
75 SC		Attribute Variable	NO	300 pcs	C1- 2.402 C2- 1.964	N/A	N/A	4 pcs per cav 5 hour	Func. Gage	8.51/ 8.61Ø	A & B	In tool steel.
~~76~~		Attribute Variable	NO	300 pcs	C1- 1.689 C2- 1.697	N/A	N/A	4 pcs per cav 5 hour	Go/No Go	5.21/ 5.11Ø	A & B	In tool steel.
77		Variable	NO	100 pc	C1 2.764 C2 4.322	N/A	N/A	Functional 4 pcs per cav 5 hr.	Go Gage	⊥	A & B	In tool steel.

DATE: 10/19/00 1L2C-7302-BF PRINT DATE: 001006 REV. E14 CAVITY ONE (1) ONLY

Supplier Intermet Monroe City STA Engineer Brent Dudgeon/Chris Markatos DCP Copy Available? Yes X No ___

Part # 1L2C-7302-BF (34918) Part Name Arm Assembly Page 1

			Frequency of Measuring								
EE# SC/CC		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	PSW Frequency Results	PSW CPK Results	5,000 pc (for Nonshifting Characteristics) Frequency Results	5,000 pc (for Nonshifting Characteristics) Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc (for Shifting Characteristics) Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
166		Variable	NO	100 pcs	1.707	N/A	N/A	4 ea. Cav. Cmm per 8 hr shift		Basic 5.06	A & B	Variable gage on order due 1/12/01. Ref. Capability Study
168		Variable	NO	100 pcs	1.727	N/A	N/A	4 pcs/cav hrly (Disc Mic)		17.025/ 16.950	A & B	Ref. Capability Study Ref. SREA #429291
169		Variable	NO	100 pcs	1.694	N/A	N/A	4 ea cav./hrly Location gage		⊕ .25 Bishop Head Pin	A & B	Ref. Capability Study Ref. SREA #429290
170		Variable	NO	100 pcs	2.906	N/A	N/A	4 ea cav CMM Per 8 hr. shift		Profile of Peanut Shape	A&B	Currently designing and will build a gage to check variably/also redimensionir print to show proper swing points (SREA Pending)This data is based on what told Visteon Designer Mike Schank the tangent points should be on the redimensioned print.
171		Variable Ø	NO	100 pc	5.03	N/A	N/A	4 pcs/cav hrly Go/No Go		Ø13.98/ 13.9	A & B	Ref. Capability Study
171		⊥ Variable	NO	100 pc	3.04	N/A	N/A	4 pcs cav CMM per 8 hr. shift	-----	⊥ pivot Bore	A & B Automated	Ref. Capability Study

DATE: 10/19/00 1L2C-7302-BF PRINT DATE: 001006 REV. E14 CAVITY ONE (1) ONLY

174		100% Visual	Yes	300 pcs	N/A	N/A	N/A	100% Automated		PIN Presence	A&B	No Action Required
175		Up front load study	NO	50 pcs	N/A	N/A	N/A	2 pcs/cav at setup		Stake Loads	A&B	Verification of test methode required from Bob Clary Intermet has requested new spec. Parts currently meet print ES.
176		Visual	NO	300 pcs	N/A	N/A	N/A	16 pcs each hour		Stake Loads	A&B	Same as Above
177		Ref EE#166	NO		REF EE#166	N/A	N/A	NO On Going				
178		Ref EE#166	NO		REF EE#166	N/A	N/A	NO On Going				

Supplier Intermet Monroe City STA Engineer Bob Pryzma/Chris Markatos DCP Copy Available? Yes X No ___

Part # 1L2C-11A599 (34919) Part Name Rod-Ignition Switch Actuator Page 1

			Frequency of Measuring								
EE# SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	PSW Frequency	PSW CPK Results	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
132	Variable	NO	100 pcs	1.779	5 pcs every 4 hrs CMM		N/A	N/A	R10.8	A&B	REF. CAPABILITY STUDY
132	Variable	NO	100pcs.	2.00	5 pcs every 4 hrs CMM		N/A	N/A	POSITION	A&B	REF. CAPABILITY STUDY
133	Variable	NO	100 pcs	1.912	5 pcs every 2 hrs CALIPERS		N/A	N/A	61.62	A&B	REF. CAPABILITY STUDY
134	Variable	NO	100 pcs	1.847	5 pcs every 2 hrs CALIPERS		N/A	N/A	55.4	A&B	Method of measurement – calipers
135	DATUM LOCATION	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
136	Variable	NO	100 pcs	.682	5 pcs every 4 hrs CMM		N/A	N/A	45.78	A&B	SREA REQ'D FOR TOLERANCE TO BE 1.67 OR NEW TOOLING AT VISTEON'S EXPENSE
137	Variable	NO	100 pcs	1.809	5 pcs every 4 hrs. CMM		N/A	N/A	70.35	A&B	REF. CAPABILITY STUDY
138	Variable	NO	100 pcs	1.914	5 pcs every 2 hrs Calipers		N/A	N/A	89.61	A&B	REF. CAPABILITY STUDY
139	Variable	NO	100 pcs	3.369	5 pcs every 4 hrs CMM		N/A	N/A	PROFILE	A&B	REF. CAPABILITY STUDY

Cp 2.197

+/- .1 45.78 +/- .15 or MOVE NOMINAL 45.71 +/- .1

TO PRINT, BUT NOT CAPABLE

Cp = .957

DATE: 10/19/00 PRINT DATE: 000504 REV. F5 1L2C-11A599-BC

140	REF. 139						N/A	N/A		A&B	
141	REF. 139						N/A	N/A		A&B	
142	Variable	NO	100 pcs	2.857	5 pcs every 4 hrs CMM		N/A	N/A	POSITION	A&B	REF. CAPABILITY STUDY
150	Variable	NO	100 pcs	.658	5 pcs every 4 hrs CMM		N/A	N/A	PROFILE KEY HOLE SHAPE	A&B	SREA FOR TOTAL TOLERANCE TO BE .1 TO MEET 1.67
150	Attribute	NO	N/A	N/A	10 pcs every hour		N/A	N/A	Keyend form functional gage	A&B	

- TO PRINT NOT CAPABLE - IN TOOLSTEEL .05 to .10

U152 PROGRAM

Supplier INTERMET MONROE CITY STA Engineer Brent Dudgeon/Chris MarkatosDCP Copy Available?Yes X No ___

Part # 1L2C-3F528-AB (34935) Part Name Lever Page 1

				Frequency of Measuring								
EE# SC/CC		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	PSW Frequency	PSW CPK	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
78		Variable	No	100 pcs	C1 2.589 C2 1.997	4 PCS PER CAV PER SHIFT				3X0.40	A & B	Ref Capability Study
79		Variable	NO	100 pcs	C1-2.321 C2- 1.95	4 PCS PER CAV PER SHIFT				2X3.25	A & B	Ref Capability Study
80		Variable	NO	100 pc	C1 1.975 C2 4.95	5 PCS PER CAV EVERY 4 HRS				2.31	A & B	Ref Capability Study
81		Variable	NO	100 pc	C1 2.12 C2 2.45	4 PCS PER CAV PER SHIFT				0.20	A & B	Ref Capability Study
82		VARIABLE	NO	100 pcs	C1- 1.76 C2- 3.307	N/A				6.00	A & B	Ref Capability Study
83		VARIABLE		100 pcs	C1 2.16 C2 2.40	5 PCS PER CAV EVERY 4 HRS				8.00		Ref Capability Study
84		VARIABLE		100 pcs	C1 2.61 C2 2.70	5 PCS PER CAV EVERY 4 HRS				13.54		Ref Capability Study
85		VARIABLE	NO	100 pcs	C1- 2.245 C2- 2.09	5 PCS PER CAV EVERY 4 HRS				15.54	A & B	Ref Capability Study
86		Variable	NO	100 pcs	C1 2.12 C2 1.85	5 PCS PER CAV EVERY 4 HRS				19.35	A & B	Ref Capability Study

U152 PROGRAM

Supplier INTERMET MONROE CITY STA Engineer Brent Dudgeon/Chris Markatos DCP Copy Available? Yes X No ___

Part # 1L2C-7228-CD (34916) Part Name Selector Lever Socket Page 1

EE# SC/CC		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	Frequency of Measuring: PSW Frequency	PSW CPK	5,000 pc (for Nonshifting Characteristics) Frequency	Results	25,000 pc (for Shifting Characteristics) Frequency	Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
71		Variable	No	300 pcs	C1 - .997 C2 - 1.16	N/A	N/A	4 pcs per cav. 1/2 hour		8.8	A & B	Currently building new inserts designed to be capable.
72		Variable	NO	30 pcs	C1-2.722 C2-1.681	N/A	N/A	4 pcs. Per cav. 8 Hours		17.4	A & B	(Ref SREA 429289) Functional gage is currently on order Gage due date 12-21-00 (Ref capability study)
73		Variable	NO	100 pc	C1 3.386 C2 2.54	N/A	N/A	4 pcs per cav 5 hour	Go/No Go	14.65/ 14.55Ø	A & B	Ref Capability Study
74		Variable	NO	100 pc	C1 2.02 C2 3.10	N/A	N/A	4 pcs per cav 5 hour	Go/ No Go	17.6/ 17.5Ø	A & B	100% on going with go gage at machining center
75		Attribute Variable	NO	300 pcs	C1- 2.402 C2- 1.964	N/A	N/A	4 pcs per cav 5 hour	Func. Gage	8.51/ 8.61Ø	A & B	(Die set) Ref Capability Study
76		Attribute Variable	NO	300 pcs	C1- 1.689 C2- 1.697	N/A	N/A	4 pcs per cav 5 hour	Go/No Go	5.21/ 5.11Ø	A & B	Ref Capability Study
77		Variable	NO	100 pc	C1 2.764 C2 4.322	N/A	N/A	Functional 4 pcs per cav 5 hr.	Go Gage	⊥	A & B	Ref Capability Study

TO PRINT, NOT CAPABLE → COMING IN WITH ?

			Note:	Intermet has requested any informa-tion on pass through to B&A from admiral tool.								

③ MERIDIAN

#102

- OK, NOT OK ??
- #153 ? ~~PRINT NOT ATTACH~~ ? QUAL ALERT ?
- ADD SUFFIX
- IB ??
- #157

U152 PROGRAM

Supplier: Meridian Jutras Division | STA Engineer Brent Dudgeon | DCP Copy Available? Yes X No ____

Part # 1L2C – 3E646 | Part Name Bracket Column Impact Absorber | Page 1

IB

SC/CC	Characteristics (Variable, Attribute, Visual)	Through to B&A Yes/No	Frequency of Measuring: PSW Frequency	PSW Results	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
183	Variable	No	3/PSW	ok					32.4	B	
184	Variable	No	3/Cav	OK					34.85	B	Initial layout only
185	Variable	No	3/Cav	OK					77.66	B	
186	Attribute	No	300/PSW	OK	100%				4.88 – 4.98	A	new insert 12/8
187	Attribute	No	300/PSW	Not ok	100%				0.25 Position	A	Submitting SREA for more tolerance.
188	Variable	No	3/Cav	OK					0.05 Profile	B	Initial layout only
189	Variable	No	3/Cav	OK					62.24	B	Initial layout only
190	Variable	No	3/Cav	OK					95.57	B	Initial layout only
191	Variable	No	3/Cav	OK					R326.9	B	Initial layout only
192	Variable	No	3/Cav	OK					R8.25	B	Initial layout only
193	Variable	No	3/Cav	OK					115.47	B	Initial layout only
194	Variable	No	3/Cav	OK					121.12	B	Initial layout only
195	Variable	No	100/PSW	OK CPK 0.76					1 Deg	B	Parts are to print, approved by B.Clary.

U152 PROGRAM

Supplier: Meridian Seat Division — STA Engineer Brent Dudgeon — DCP Copy Available? Yes X No

Part # 1L2C – 3E646 — Part Name Bracket Column Impact Absorber — Page 2

				Frequency of Measuring								
EE# SC/CC		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	PSW Frequency	PSW Results	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
196		Variable	No	3/Cav	OK					8.95	B	Initial layout only
197		Variable	No	30/PSW	OK	→ ppk ?				0.02 Flatness	B	Initial layout only
198		Variable	No	~~100%~~ 3/CAV	NOT OK					108.56 – 108.81		100% checked per load. -INSPCTS 12/8
199		Attribute	No	300/PSW	Not ok	100%				88.56 – 88.81	A	100% checked per load. -INSPCTS 12/8
200		Variable	No	100/PSW	OK	→ cpk ?				25.0	A	
201												Eliminated
202		Variable	No	3/Cav	OK					62.8	B	Initial layout only
203		Variable	No	3/Cav	OK					66.2	B	Initial layout only his Dimension captured in660 print and / or Eliminated.
204												Eliminated
205												Eliminated
206												Eliminated
207		Attribute	No	3/Cav	OK					Spring pocket	B	Initial layout only
208		Variable	No	3/Cav	OK					62.24	B	Initial layout only

U152 PROGRAM

Supplier: Meridian Jutras Division STA Engineer Brent Dudgeon DCP Copy Available? Yes X No

Part # 1L2C – 3E646 Part Name Bracket Column Impact Absorber Page 3

				Frequency of Measuring								
EE# SC/C C		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	PSW Frequency	Results	5,000 pc (for Nonshifting Characteristics) Frequency	Results	25,000 pc (for Shifting Characteristics) Frequency	Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
209		Variable	No	3/Cav	OK					R6	B	Initial layout only
210		Variable	No	3/Cav	OK					95.57	B	Initial layout only
211		Variable	No	3/Cav	OK					R307.8	B	Initial layout only
212		Variable	No	3/Cav	OK					115.47	B	Initial layout only
213		Variable	No	3/Cav	OK					121.12	B	Initial layout only
214	SC	Variable	No	30/PSW	OK CPK 1.75					Surface finish 4	B	Initial layout only. Moved to 660 print, item 163.

what is new dimension?

U152 PROGRAM

Supplier: Meridian Jutras Division | STA Engineer Brent Dudgeon | DCP Copy Available? Yes X No ____

Part # 1L2C – 3E660 | Part Name Mount / Impact Bracket Assembly | Page 1

EE# SC/CC		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	Frequency of Measuring: PSW Frequency	PSW Results	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
151		Attribute	No	300/PSW	OK	100%				86.57 – 86.87	A	PSW parts reworked to dimension, tool being modified.
152												Eliminated
153		Variable	No	300/PSW	Not ok	100%				38.0 – 38.25	A	Quality alert
154		Attribute	No	3/Cav	OK					12.0 – 12.2	A	
155		Attribute	No	300/PSW	OK	100%				0.20 Position	A	Print to be changed, PSW parts okay.
156	Sc	Attribute	No	300/PSW	OK	100%				66.04 – 66.44	A	Clamping being improved on checking fixture.
157		Variable	No	300/PSW	OK	100% CPK 1.28				0.40 Perpend	A	
158		Attribute	No	300/PSW	OK	100%				Note	A	
159		Attribute	No	300/PSW	OK	100%				Note	A	
160		Variable	No	3/Cav	OK					15.6 Min	A	
161		Variable	No	3/Cav	Not ok See remarks	100%				// 0.05	A	SREA will be submitted
162		Variable	No	3/Cav	OK	100%				4.53 +0.20	A	
163		Variable	No	3/Cav	OK	100%				Visual	A	Replaces 214 on 646 DWG. Need data from Visteon

U152 PROGRAM

Supplier: Meridian Jutras Division STA Engineer Brent Dudgeon DCP Copy Available? Yes X No ____

Part # 1L2C – 3N720 Part Name Steering Column Mounting Bracket Page 1

				Frequency of Measuring								
EE# SC/CC		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	PSW Frequency	PSW Results	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
102		Variable	No	3/Cav	OK					4.35	B	Initial layout only
103		Variable	No	3/Cav	OK					5.70	B	Initial layout only
104		Variable	No	3/Cav	OK					18.48	B	Initial layout only
105	SC	Variable	No	3/Cav	OK					1.6 Surface finish	B	Initial layout only
106	SC	Variable	No	100/PSW	OK					1 Deg	B	Print tolerance to be added.
107		Variable	No	3/Cav	OK					6.55 – 6.70	B	Initial layout only
108		Variable	No	3/Cav	OK					0.038 Profile	B	Initial layout only
109		Variable	No	3/Cav	OK					17.3	B	Initial layout only
110		Variable	No	3/Cav	OK					11.3	B	Initial layout only
111		Attribute	No	300/PSW	OK	100%				Note	A	
112		Attribute	No	300/PSW	OK	100%				10.1 – 10.2	A	
113		Attribute	No	300/PSW	OK	100%				0.20 Position	A	
114		Variable	No	3/Cav	OK					109.40 – 109.70		

U152 PROGRAM

Supplier: Meridian Jutras Division | STA Engineer Brent Dudgeon | DCP Copy Available? Yes X No ____

Part # 1L2C – 3N720 | Part Name Steering Column Mounting Bracket | Page 2

				Frequency of Measuring								
EE# SC/CC		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	PSW Frequency	Results	5,000 pc (for Nonshifting Characteristics) Frequency	Results	25,000 pc (for Shifting Characteristics) Frequency	Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
115		Variable	No	3/Cav	OK					0.20 Flatness	B	Initial layout only
116		Variable	No	3/Cav	OK					0.20 Profile	B	Initial layout only
117		Attribute	No	300/PSW	OK	100%				88.87 – 89.12	A	100% checked per load.
118												TBD
119		Variable	No	3/Cav	OK					156.05	B	Initial layout only
120		Attribute	No	300/PSW	OK	100%				86.57 – 86.87	A	
121		Attribute	No	300/PSW	OK	100%				Note	A	
122		Attribute	No	300/PSW	OK	100%				4.88 – 4.98	A	
122a		Variable	No	3/Cav	OK					0.20 Position	B	Initial layout only
123		Attribute	No	300/PSW	OK	100%				12.0 – 12.2	A	
124		Variable	No	3/Cav	OK					0.20 Position	B	Initial layout only
125		Variable	No	3/Cav	OK					131.82	B	Initial layout only
126		Variable	No	3/Cav	OK					23.17	B	Initial layout only

U152 PROGRAM

Supplier: Meridian Jutras Division STA Engineer Brent Dudgeon DCP Copy Available? Yes X No ____

Part # 1L2C – 3N720 Part Name Steering Column Mounting Bracket Page 3

				Frequency of Measuring								
EE# SC/C C		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	PSW Frequency	PSW Results	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
127		Variable	No	3/Cav	OK					0.88	B	Initial layout only
128		Variable	No	3/Cav	OK					168.05	B	Initial layout only
129		Attribute	No	300/PSW	OK	100%				12.0 – 12.2	A	
130		Variable	No	3/Cav	OK					16.2 – 16.0	B	Initial layout only
131		Variable	No	3/Cav	OK					0.20 Position	B	Initial layout only

FUTURE TESTING AND
MANUFACTURING, LLC.
DEVELOPMENTAL TESTING AND PRECISION MANUFACTURING

28900 Goddard Road, Romulus, MI 48174 Phone: (734) 946-6670 Fax: (734) 947-9401

A Joint Venture with Future Tool & Machine, Inc.

Jim Thorton
Ford Motor Company
Phone: 313-845-9249

Explorer Transmission Control Selector (TCS) Wear Test
Quote Number: 11287

Future Testing & Manufacturing, LLC., is pleased to submit this quotation to perform the "TCS Wear Test" on (6) steering columns. It is understood that Ford Motor Company shall provide the steering columns, shift cables, BSI connectors and circuit schematic. Six columns shall be cycled and monitored simultaneously as follows:

- Begin with the TCS rotated approximately 20º CW so that the TCS ramp is fully forward of the BSI pin ("home position")
- Rotate the TCS CCW to the "Park" position and apply a 50N load. The TCS ramps shall slide along the top of the BSI pin
- Verify that the TCS is in the "Park" position.
- Energize the BSI solenoid and rotate the TCS back to the "home position"
- Repeat for 100,000 cycles or (10) faults…which ever occurs first. Note: A fault is failure to reach "Park" when the 50Nload is applied to the TCS.

Cost to set-up and run lot of six columns……..$13201.00
Cost to run each subsequent lot of six columns……...……$ 3040.00

This project can begin after receipt of your purchase order and all related test components. It shall require approximately 3 weeks to set-up the test stand. If you have any questions or require additional information regarding this quotation, please contact me at (734) 946-2100.

Sincerely,

Leonard Benfant

Test Operations

Note: This quote is valid for thirty days from the above date. Terms are net thirty days from receipt of invoice.
W:\OGC\ogcdis\alange11\NHTSA Investigations\PE09-020\Electronic Sweep Documents\JThorton Docs\Future Tool 11287 quote.doc

SK

10-24-00 1L2C-3F528-AB Print Date 991220 Rev B11

U152 PROGRAM

Supplier INTERMET MONROE CITY STA Engineer Brent Dudgeon/Chris MarkatosDCP Copy Available?Yes X No ___

Part # 1L2C-3F528-AB (34935) Part Name Lever Page 1

			Frequency of Measuring								
EE# SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	I.B. Frequency	I.B. CPK	5,000 pc (for Nonshifting Characteristics) Frequency Results		25,000 pc (for Shifting Characteristics) Frequency Results		Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
78	Variable	No	100 pcs	C1 2.589 C2 1.997	4 PCS PER CAV PER SHIFT				3X0.40	A & B	In tool steel.
79	Variable	NO	100 pcs	C1-2.321 C2- 1.95	4 PCS PER CAV PER SHIFT				2X3.25	A & B	In tool steel.
80	Variable	NO	100 pc	C1 1.975 C2 4.95	5 PCS PER CAV EVERY 4 HRS				2.31	A & B	
81	Variable	NO	100 pc	C1 2.12 C2 2.45	4 PCS PER CAV PER SHIFT				0.20	A & B	In tool steel.
82	VARIABLE	NO	100 pcs	C1- 1.76 C2- 3.307	N/A				6.00	A & B	In tool steel.
83	VARIABLE		100 pcs	C1 2.16 C2 2.40	5 PCS PER CAV EVERY 4 HRS				8.00		In tool steel.
84	VARIABLE		100 pcs	C1 2.61 C2 2.70	5 PCS PER CAV EVERY 4 HRS				13.54		In tool steel.
85	VARIABLE	NO	100 pcs	C1- 2.245 C2- 2.09	5 PCS PER CAV EVERY 4 HRS				15.54	A & B	In tool steel.
86	Variable	NO	100 pcs	C1 2.12 C2 1.85	5 PCS PER CAV EVERY 4 HRS				19.35	A & B	In tool steel.

10/19/00

ADMIRAL - LIV

FEU

STA Engineer: Vincent Barone

DCP Copy Available? Yes

Part # 1L2C-3B661-CF

Part Name LOCK LEVER ASSEMBLY

EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	Frequency of Measuring: ~~FEU 1~~ IB Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
214	VARIABLE	NO	100%	100%	100%	TBD (STACKUP 26.81–27.87)	DCP	100% at PSW & until proven capable. Ppk based on limits of 27.0 +/- 0.30.
			Ppk 2.174					
215	VARIABLE	NO	100%	100%	100%	⌖ Ø 0.08 A B	DCP	
			Ppk 2.031					
216	VARIABLE	NO	100%	100%	100%	⌖ Ø 0.08 A	DCP	100% inspection until proven capable. Requested change to print dimension from 0.08 to 0.10. Admiral's process capability would yield a Ppk of 1.702.
			Ppk 0.930					
217 SC	VARIABLE	NO	100%	5 pcs per hour	5 pcs per hour	// 0.1 A	DCP	100% inspection until proven capable. Requested change to print dimension from 0.10 to 0.30. Admiral's process capability would yield a Ppk of 2.118.
			Ppk 0.423					
218	VARIABLE	NO	30 PCS	5 pcs per hour	5 pcs per hour	⌓ 0.25 A	DCP	100% inspection until proven capable. Requested change to print dimension from 0.25 to 1.25. Admiral's process capability would yield a Ppk of 1.753.
			Ppk -0.066					
219 SC	VARIABLE	NO	30 PCS	5 pcs per hour	5 pcs per hour	50.88	DCP	100% inspection until proven capable. 30 pcs at PSW & until proven capable. Ppk based on limits of 49.8 +/- 0.5.
			Ppk 0.004					

Admiral

FEU

IB

Livonia

- Asy (1-7)
- ~~Insert plate (151-162)~~ — out on #1
- lock lever (214-224) - out on 7/11
- tube & brkt (89-96) - OK

3

Chicago

- Insert Plate (151-162) - ?

1

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # 1L2C-3B139-BL Part Name SUPPORT BRACKET (COLUMN SHIFT) PAGE 1 OF 2

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	FEU 1 Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
1 SC	VARIABLE	YES	100% Ppk 1.410	100%	100%	33.73mm min travel from drive to bsi stop	DCP	100% inspection until proven capable
2 SC	ATTRIBUTE	YES	100% 100% PASS	100%	100%	Functional check of BSI pin to shift Arm post	DCP	
3	ATTRIBUTE	NO	100% 100% PASS	100%	100%	Check shift lever (min width) will fully seat into insert groove (park)	DCP	
4 SC	VARIABLE	YES	100% Ppk 4.329	100%	100%	Check travel from drive to park overtravel (2.56mm min)	DCP	

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # 1L2C-3B139-BL Part Name SUPPORT BRACKET (COLUMN SHIFT) PAGE 2 OF 2

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	FEU 1 Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
5	VISUAL	NO	100% 100% PASS	100%	100%	Check clearance between PDS Brkt. & LCH lock barrel	DCP	
6 SC	VARIABLE	NO	100% PPK 2.429	100%	100%	500 Lb. Min	DCP	
	ATTRIBUTE	YES	100% 100% PASS	100%	100%	Push/Pull socket lash. (Spec. TBD)	DCP	If a lot change accrues during the 5,000 or 25,000 piece run, Admiral will inspect 1 piece for the lot change

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # 1L2C-3B661-CF Part Name LOCK LEVER ASSEMBLY

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	FEU 1 Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
220	VARIABLE	NO	layout	use as datum	use as datum	⌓ 0.1 A B C	DCP	
			Ppk 1.783					
221 SC	VARIABLE	NO	layout	use as datum	use as datum	70.8°	DCP	100% inspection until proven capable.
			Ppk 1.078					
222	VARIABLE	NO	3 pcs per cav	3 pcs hour	3 pcs hour	170.18	DCP	100% inspection until proven capable. Requested change to print dimension from 170.18 +/- 0.1 to +/- 0.25. Admiral's process capability would yield a Ppk of 2.477.
			Ppk 1.460					
223	VARIABLE	NO	24 pcs	3 pcs hour	3 pcs hour	42.2	DCP	
			Ppk 13.027					
224	VARIABLE	NO	24 pcs	3 pcs hour	3 pcs hour	⌓ 0.25 A B C	DCP	100% inspection until proven capable. Requested change the print dimension from 0.25 (max) to 0.50 (max). Admiral's process capability would yield a Ppk of 1.953.
			Ppk -.006					

Supplier: Admiral Tool & Mfg. Co. | STA Engineer: Vincent Barone | DCP Copy Available? Yes

Part # 1L2C-3F668-DE | Part Name TUBE & BRKT ASY - STNG COL | PAGE 1 OF 2

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	FEU 1 Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
89	VARIABLE	NO	100% Ppk 1.677	100%	100%	⌖ 0.4 A B	DCP	
90	VARIABLE	NO	100% Ppk 1.783 Ppk 1.700 Ppk 1.749	100%	100%	(2X Ø 14.25–14.10) ⌖ Ø0.4 Ⓜ A	DCP	
91 SC	VARIABLE	NO	100% Ppk 11.497 Ppk 4.222	3 HOURLY / TC	3 HOURLY / TC	Ø 39.6 – 39.5 ⌭ 0.1 A	DCP	
92	VISUAL Tube Chamfer Depth	NO	100% 100% PASS	100%	100%	0.3 – 0.2	DCP	
93	VARIABLE	NO	100% Ppk 1.989	100%	100%	5.4 – 4.4	DCP	

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # [illegible] Part Name TUBE & BRKT ASY - STNG COL

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	FEU 1 Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
94 SC	VARIABLE	NO	100% Ppk 1.686	100%	100%	13.5	DCP	
95	VISUAL	NO	100% 100% PASS	100%	100%	No material Sag permissible after welding	DCP	
96	VARIABLE	NO	100% Pull 4.534	100% Pull	100% Pull	After 24 Hours - 10# Max	DCP	

U152 PROGRAM

Supplier: Meridian Jutras Division | STA Engineer Brent Dudgeon | DCP Copy Available? Yes X No ____

Part # 1L2C – 3E660 – D# | Part Name Mount / Impact Bracket Assembly | Page 1

				Frequency of Measuring								
EE# SC/C C		Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	PSW Frequency	PSW Results	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
151		Attribute	No	300/PSW	~~OK~~ NOT OK	100%				86.57 – 86.87	A	Not to print. Quality alert 85.9 – 87.3 IN DC
~~152~~												Eliminated
153		Variable	No	300/PSW	Not ok	100%	By how much?			38.0 – 38.25	A	Not to print. Quality alert By
154		Attribute	No	3/Cav	OK					12.0 – 12.2	A	
155		Attribute	No	300/PSW	OK	100%				0.20 Position	A	Print to be changed, PSW parts okay.
156	Sc	Attribute	No	300/PSW	OK	100%				66.04 – 66.44	A	Clamping being improved on checking fixture.
157	SC	Variable	No	300/PSW	OK	100% CPK 1.28				0.40 Perpend	A	Clamping being improved on checking fixture. C.I.
158		Attribute	No	300/PSW	OK	100%				Note	A	
159		Attribute	No	300/PSW	OK	100%				Note	A	
160		Variable	No	3/Cav	OK					15.85 +/- 0.25	A	
161	SC	Variable	No	3/Cav	Not ok See remarks	100%				// 0.05	A	Not to print. Quality alert 0.06 / 0.18
162		Variable	No	3/Cav	OK	100%				7.25 +/- 0.25	A	
163		Variable	No	3/Cav	OK	100%				Visual	A	

Supplier Intermet Monroe City STA Engineer Bob Pryzma/Chris Markatos DCP Copy Available? Yes X No ___

Part # 1L2C-11A599-BC (34919) Part Name Rod-Ignition Switch Actuator (QUILL) Page 1

			Frequency of Measuring								
EE# SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass Through to B&A Yes/No	I.B. Frequency Results	I.B. CPK Results	5,000 pc (for Nonshifting Characteristics) Frequency	5,000 pc (for Nonshifting Characteristics) Results	25,000 pc (for Shifting Characteristics) Frequency	25,000 pc (for Shifting Characteristics) Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
132	Variable	NO	100 pcs	1.779	5 pcs every 4 hrs CMM		N/A	N/A	R10.8	A&B	In tool steel.
132	Variable	NO	100pcs.	2.00	5 pcs every 4 hrs CMM		N/A	N/A	POSITION	A&B	In tool steel.
133	Variable	NO	100 pcs	1.912	5 pcs every 2 hrs CALIPERS		N/A	N/A	61.62	A&B	
134	Variable	NO	100 pcs	1.847	5 pcs every 2 hrs CALIPERS		N/A	N/A	55.4	A&B	Method of measurement – calipers
135	DATUM LOCATION	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
136	Variable	NO	100 pcs	.682	5 pcs every 4 hrs CMM		N/A	N/A	45.78	A&B	SREA REQ'D FOR TOLERANCE TO BE 1.67 OR NEW TOOLING AT VISTEON'S EXPENSE Parts to print But not Capable
137	Variable	NO	100 pcs	1.809	5 pcs every 4 hrs. CMM		N/A	N/A	70.35	A&B	
138 SC	Variable	NO	100 pcs	1.914	5 pcs every 2 hrs Calipers		N/A	N/A	89.61	A&B	
139	Variable	NO	100 pcs	3.369	5 pcs every 4 hrs CMM		N/A	N/A	PROFILE	A&B	In tool steel.

DATE: 10/24/00 PRINT DATE: 000504 REV. F5 1L2C-11A599-BC

140		REF. 139						N/A	N/A		A&B	
141		REF. 139						N/A	N/A		A&B	
142		Variable	NO	100 pcs	2.857	5 pcs every 4 hrs CMM		N/A	N/A	POSITION	A&B	REF. CAPABILITY STUDY
150		Variable	NO	100 pcs	.658	5 pcs every 4 hrs CMM		N/A	N/A	PROFILE KEY HOLE SHAPE	A&B	SREA FOR TOTAL TOLERANCE TO BE .1 TO MEET 1.67 Die Set Parts to print But not capable
150		Attribute	NO	N/A	N/A	10 pcs every hour		N/A	N/A	Keyend form functional gage	A&B	

GNG TO DO STARK-UP

(1)

U152 PROGRAM

Supplier __Krupp Hoesch Automotive of America_ STA Engineer Stephan Metzmacher_____

DCP Copy Available? Yes _X__ No ____

Part # __1L24-3524-DA_____ Part Name Shaft Assy U152 VSC1_____ Page___1____

			Frequency of Measuring								
EE# SC/CC	Type of tics (Variable, Attribute, Visual)	Pass Throug h to B&A Yes/No	PSW Frequency Results		5,000 pc (for Nonshifting Characteristics) Frequency Results		25,000 pc (for Shifting Characteristics) Frequency Results		Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
240	Attribute		6 pieces at start of production	0.017, 0.021, 0.013, 0.018, 0.017, 0.020	6 pieces at start of production		6 pieces at start of production	N/A	0.03 A		
241	Attribute		6 pieces incoming material, 100% check at subcon-tractor	75.98, 75.93, 76.01, 76.02, 75.99, 75.93	6 pieces incoming material, 100% check at subcon-tractor		6 pieces incoming material, 100% check at subcon-tractor	N/A	75.94 ±0.2		
242	Variable		3 pieces at start of production 100% check	38.08 38.18 38.23 Cpk=3.81	3 pieces at start of production 100% check	38.10 37.99 38.07	3 pieces at start of production 100% check	N/A	38.25±0.75		how calc stats on 3 items ??
243 SC	Variable		With 358.04 and 464.33 checked 100%	Ok PPK 1.87	With 358.04 and 464.33 checked 100%	Ok 1.87	With 358.04 and 464.33 checked 100%	N/A	358.04 ±0.8 464.33		

sample size?

244		Attribute		3 pieces at start and end of production	0.25 0.20 0.30	3 pieces at start and end of production, 50 piece capability study	0.45 0.60 0.55	3 pieces at start and end of production	N/A	1.5 A E	
245		Attribute		3 pieces at start of production, each shift	0.15 0.18 0.25	3 pieces at start of production, start and end of each shift, 50 piece capability study	0.11 0.12 0.19	3 pieces at start of production each shift	N/A	0.6 A/B	
247 SC		Attribute		3 pieces at start of production and each 2h, 100% check	Ok	3 pieces at start of production and each 2h, 100% check	Ok	3 pieces at start of production and each 2h, 100% check N/A	N/A	M10x1.5 (H6) gängig	
248 SC		Attribute		3 pieces at start of production and each 2h, 100% check	Ok	3 pieces at start of production and each 2h, 100% check	Ok	3 pieces at start of production and each 2h, 100% check	N/A	min. 21 full thds min. 21 go	
249		Attribute		1 piece each 1h, 100% weight check	24.9-27.0, 24.4-27.0, 24.8-26.9, 24.5-26.7, 25.1-27.0, 24.5-26.7	1 piece each 1h, 100% weight check	24.9-27.0, 24.4-27.0, 24.8-26.9, 24.5-26.7, 25.1-27.0, 24.5-26.7	1 piece each 1h, 100% weight check	N/A	min. ø23.5 max.ø27.5	
250		Attribute		1 piece each 1h, 100% weight check	24.9-27.0, 24.4-27.0, 24.8-26.9, 24.5-26.7, 25.1-27.0, 24.5-26.7	1 piece each 1h, 100% weight check	24.9-27.0, 24.4-27.0, 24.8-26.9, 24.5-26.7, 25.1-27.0, 24.5-26.7	1 piece each 1h, 100% weight check	N/A	min. ø23.5 max.ø27.5	
251		Attribute		3 pieces each coldforging tool	23.59-26.42, 23.66-26.26, 23.69-26.41, 23.64-26.37, 23.63-26.35, 23.71-26.30	3 pieces each coldforging tool	23.59-26.42, 23.66-26.26, 23.69-26.41, 23.64-26.37, 23.63-26.35, 23.71-26.30	3 pieces each coldforgin g tool	N/A	min. ø23 max.ø27.5	

252		Attribute		3 pieces each coldforging tool	23.59-26.42, 23.66-26.26, 23.69-26.41, 23.64-26.37, 23.63-26.35, 23.71-26.30	3 pieces each coldforging tool	23.59-26.42, 23.66-26.26, 23.69-26.41, 23.64-26.37, 23.63-26.35, 23.71-26.30	3 pieces each coldforgin g tool	N/A	min. ø23 max.ø27.5		
253		Attribute		6 pieces at start of production	19.95-19.96, 19.95-19.96, 19.95-19.96, 19.95-19.96, 19.95-19.96, 19.95-19.96, 19.95-19.96,	6 pieces at start of production, 50 piece capability study		6 pieces at start of production	N/A	Ø20 -0.15 /-0.02 (AREA A)		
254		Attribute		6 pieces at start of production	19.94-19.96, 19.95-19.96, 19.95-19.96, 19.95-19.96, 19.95-19.96, 19.94-19.96	6 pieces at start of production, 50 piece capability study		6 pieces at start of production	N/A	Ø20 -0.15 /-0.02 (AREA C)		
255		Attribute		3 pieces at start of production	14.5, 14.52, 14.53, 14.52, 14.52, 14.53	3 pieces at start of production, 50 piece capability study		3 pieces at start of production	N/A	14.4 ±0.5		
256 SC		~~Attribute~~ Variable		6 pieces at start of production	Cpk= 3.57	6 pieces at start of production, 50 piece capability study	Cpk= 3.57	6 pieces at start of production	N/A	Ø20 -0.15 /-0.02 (AREA B)		
257 SC		~~Attribute~~ Variable		3 pieces at start of production	Cpk= 1.84	3 pieces at start of production, 50 piece capability study	Cpk= 1.84	3 pieces at start of production	N/A	Ø19.15 –0.13		
258		~~Attribute~~ Variable		3 pieces at start and end of production, each shift	Cpk= 2.05	3 pieces at start and end of production, each shift, 50 piece capability study	Cpk= 2.05	3 pieces at start and end of production , each shift	N/A	Ø19.15 –0.09		

7.15 ± 2.25

259		Variable		3 pieces at start and end of production, each shift	7° 30' 7° 05' 7° 40' Cpk=3.17	3 pieces at start and end of production, each shift,	7° 43' 7° 17' 6° 97' 7° 30' 7° 05' 7° 40'	3 pieces at start and end of production , each shift	N/A	Position of Datum N in Relation to Datum D ±2.25°		
260		~~Variable~~ ATTRI.		100% check	ok.	100% check		100% check	N/A	70 N max. 1.1		
261		~~Variable~~ ATTRIBUTO		5 pieces in the lab at start and end of production and each 10.000 parts	0.710 0.744 0.803 0.821 0.723	5 pieces in the lab at start and end of production and each 10.000 parts		5 pieces in the lab at start and end of production and each 10.000 parts	N/A	±10Nm for the slider ES TEST		
262		~~Variable~~ ATTRIBUTO		3 pieces of each production, 100% check	1.120 1.163 1.247	3 pieces of each production, 100% check		3 pieces of each production 100% check	N/A	±10Nm for the whole shaft ES TES		

10/23/00

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # 1L2C-3B139-BL Part Name SUPPORT BRACKET (COLUMN SHIFT) PAGE 1 OF 2

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	1B Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
1 SC	VARIABLE	YES	100% Ppk 4.034	100%	100%	33.73mm min travel from drive to bsi stop	DCP	100% inspection until proven capable
2 SC	ATTRIBUTE	YES	100% 100% PASS	100%	100%	Functional check of BSI pin to shift Arm post	DCP	
3	ATTRIBUTE	NO	100% 100% PASS	100%	100%	Check shift lever (min width) will fully seat into insert groove (park)	DCP	
4 SC	VARIABLE	YES	100% Ppk 1.796	100%	100%	Check travel from drive to park overtravel (2.56mm min)	DCP	

10/23/00

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # 1L2C-3B139-BL Part Name SUPPORT BRACKET (COLUMN SHIFT) PAGE 2 OF 2

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	1B Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
5	VISUAL	NO	100% 100% PASS	100%	100%	Check clearance between PDS Brkt. & LCH lock barrel	DCP	
6 SC	VARIABLE	NO	100% PPK 2.429	100%	100%	500 Lb. Min	DCP	
7	ATTRIBUTE	YES	100% 100% PASS	100%	100%	Push/Pull socket lash. (Spec. TBD)	DCP	If a lot change accrues during the 5,000 or 25,000 piece run, Admiral will inspect 1 piece for the lot change

10/23/00

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # 1L2C-3F668-DE Part Name TUBE & BRKT ASY - STNG COL PAGE 1 OF 2

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	1B Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
89	VARIABLE	NO	100% Ppk 1.701	100%	100%	⌖ 0.4 A B	DCP	
90	VARIABLE	NO	100% Ppk 1.703 Ppk 1.813 Ppk 1.691	100%	100%	(2X ∅ 14.25--14.10) ⌖ ∅0.1 Ⓜ A	DCP	
91 SC	VARIABLE	NO	100% Ppk 11.901 Ppk 4.332	3 HOURLY / TC	3 HOURLY / TC	∅ 39.6 - 39.5 ⌰ 0.1 A	DCP	
92	VISUAL Tube Chamfer Depth	NO	100% 100% PASS	100%	100%	0.3 - 0.2	DCP	
93	VARIABLE	NO	100% Ppk 2.069	100%	100%	5.4 - 4.4	DCP	

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10/23/00

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # 1L2C-3F668-DE Part Name TUBE & BRKT ASY - STNG COL

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	1B Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
94 SC	VARIABLE	NO	100% Ppk 1.793	100%	100%	13.5	DCP	
95	VISUAL	NO	100% 100% PASS	100%	100%	No material Sag permissible after welding	DCP	
96	VARIABLE	NO	100% Pull PpK 4.668	100% Pull	100% Pull	After 24 Hours - 10# Max	DCP	

10/23/00

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # 1L2C-3B661-CF Part Name LOCK LEVER ASSEMBLY

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	1B Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
214	VARIABLE	NO	100% Ppk 1.694	100%	100%	TBD (STACKUP 26.81-27.87)	DCP	100% at PSW & until proven capable. Ppk based on limits of 27.0 +/- 0.30.
215	VARIABLE	NO	100% Ppk 2.178	100%	100%	⌖ Ø 0.08 A B	DCP	
216	VARIABLE	NO	100% Ppk 0.960	100%	100%	⌖ Ø 0.08 A	DCP	100% inspection until proven capable. Requested change to print dimension from 0.08 to 0.10. Admiral's process capability would yield a Ppk of 1.702.
217 SC	VARIABLE	NO	100% Ppk 0.450	5 pcs per hour	5 pcs per hour	// 0.1 A	DCP	100% inspection until proven capable. Requested change to print dimension from 0.10 to 0.30. Admiral's process capability would yield a Ppk of 2.118.
218	VARIABLE	NO	30 PCS Ppk -0.006	5 pcs per hour	5 pcs per hour	⌓ 0.25 A	DCP	100% inspection until proven capable. Requested change to print dimension from 0.25 to 1.25. Admiral's process capability would yield a Ppk of 1.753
219 SC	VARIABLE	NO	30 PCS Ppk 0.019	5 pcs per hour	5 pcs per hour	50.88	DCP	100% inspection until proven capable. 30 pcs at PSW & until proven capable. Ppk based on limits of 49.8 +/- 0.5

10/23/00

Supplier: Admiral Tool & Mfg. Co. STA Engineer: Vincent Barone DCP Copy Available? Yes

Part # 1L2C-3B661-CF Part Name LOCK LEVER ASSEMBLY PAGE 2 OF 2

			Frequency of Measuring					
EE # SC/CC	Type of Characteristics (Variable, Attribute, Visual)	Pass-Through to B&A Yes/No	1B Frequency Results	5,000 pc Frequency Results	25,000 pc Frequency Results	Print Dimension	Characteristics Monitored by A. DCP B. Other Method	Remarks
220	VARIABLE	NO	layout Ppk 2.855	use as datum	use as datum	⌓ 0.1 A B C	DCP	
221 SC	VARIABLE	NO	layout Ppk 1.078	use as datum	use as datum	70.8	DCP	100% inspection until proven capable.
222	VARIABLE	NO	3 pcs per cav Ppk 1.524	3 pcs hour	3 pcs hour	170.18	DCP	100% inspection until proven capable. Requested change to print dimension from 170.18 +/- 0.1 to +/- 0.25. Admiral's process capability would yield a Ppk of 2.477.
223	VARIABLE	NO	24 pcs Ppk 13.612	3 pcs hour	3 pcs hour	42.2	DCP	
224	VARIABLE	NO	24 pcs Ppk -.004	3 pcs hour	3 pcs hour	⌓ 0.25 A B C	DCP	100% inspection until proven capable. Requested change the print dimension from 0.25 (max) to 0.50 (max). Admiral's process capability would yield a Ppk of 1.953.

The Office of Design Analysis

Parklane Tower West, Suite 500
3 Parklane Boulevard
Dearborn, MI 48126
313 594-0563

August 6, 2007

J. Kenneth Carter, Jr.
Turner Padget Graham & Laney, PA
Bank of America Plaza 17th floor
1901 Main Street
Columbia, SC 29202

Marie Clapp v. Ford Motor Company 2002 Explorer, VIN 1FMZU63E32UA65535

Facts in Brief:
As you requested, I reviewed the above referenced matter involving a claim of unintended vehicle movement. In this regard, I have reviewed the following for this matter:

- The subject 2002 Ford Explorer, 1FMZU63E32UA65535
- The service history of the vehicle.
- Technical service bulletins
- Process and quality sheets for the 2002 Explorer
- Detailed drawings of the shift system components
- Engineering specification for the 2002 Explorer
- Owner guide for the 2002 Explorer
- Service manual for the 2002 Explorer
- FMVSS 102, 114 & 105/135 for the 2002 Ford Explorer
- The depositions of Marie Clapp, Edna Cooler, and William Furman
- The expert report authored by Milton Chace and Allen Kovacs
- Ford's responses to plaintiff's interrogatories and requests for production
- Plaintiff's complaint
- Plaintiff's interrogatory responses
- S.C. Traffic Collision Report and
- The claim inspection report from CNA

I understand the allegation from plaintiff's complaint and deposition to be that Marie Clapp exited the running vehicle to place her grandchild into a child seat that was in the 3rd row seating position. The vehicle started to move rearward. Ms. Clapp tried to enter the moving vehicle to stop the vehicle and was knocked down by the door. The vehicle

continued moving rearward, trapping Ms. Clapp under the left front tire of the vehicle. The vehicle came to rest on Ms. Clapp's pelvis. The vehicle's engine was then shut off by the housekeeper, Ms. Cooler, and Ms. Clapp was able to remove herself from under the vehicle.

Qualifications:

I hold a BSME from the University of Missouri, 1986. I am a graduate of Northern Michigan University Trade School with a certificate in Automatic Transmission Theory and Repair, 1977. I have been an employee of Ford Motor Company Since 1988. I have designed, developed, and tested shift systems and steering column component that are at issue in this litigation. I have worked in the Design Analysis Department of Ford Motor Company for almost 15-years, and have worked as a Design Analysis Engineer for the past 12-Years, assisting Ford's Office of General Council in matters of litigation.

Background:

The shift system of the 2002 Ford Explorer is comprised of a series of components that convert rotational motion to transverse motion to engage the parking mechanism in the automatic transmission. The shift system is controlled by the operator of the vehicle.

The subject vehicle is equipped with shift system interlock (so that the key cannot be removed from the ignition unless the transmission is in the park latch position) and the vehicle cannot be started with the key in any selector lever position, except park latch and neutral. This protects the vehicle from being moved without the key by locking the steering column and the shift selector lever. Starting a vehicle in the neutral position allows a moving vehicle to potentially restart after a stall without bringing the vehicle to a complete stop, versus, bringing a vehicle to a complete stop, placing the shift selector lever in the park position, and then restarting the vehicle.

The vehicle also has brake shift interlock, so the transmission shift selector lever cannot be moved from the park latch position with the vehicle running unless the brake pedal is depressed. The brake shift interlock protects the operator from unintended powered vehicle movement.

This vehicle was not subject to any safety recalls involving the shift system, the key interlock, the steering column, or transmission park mechanism.

Plant Installation Process:

- The transmissions are built at a transmission assembly plant and shipped to the vehicle assembly plant. Each transmission is individually tested for function, including park engagement and manual lever position sensor prior to leaving the transmission plant. This ensures proper park function and start function in the appropriate gear selection.
- The steering column is built at a steering column plant and shipped to the vehicle assembly plant in the overdrive position (D). The steering column on the Explorer is assembled into the instrument panel at the assembly plant.

- The connection is made between the column and the transmission, using a shift cable and the transmission is adjusted. This adjustment is done with the transmission in the overdrive position and the steering column in the overdrive position, using a 3-pound weight to bias the entire shift system towards 1st gear.
- The completed vehicle is tested prior to leaving Ford's control at the assembly plant for park engagement, shift lever position start function, and key function.

Inspection:

The inspection of the vehicle took place at Summerville, South Carolina at Lowcountry Ford on December 2, 2003. The inspection included, but was not limited to the following:

- PRNDL: the PRNDL was checked for proper installation and function. The PRNDL was correctly installed, adjusted, and functioned correctly.
- Shift System: the shift system, including the shift lever, all steering column related shift system components, the shift cable, transmission bracket, and outer manual lever were all present and installed correctly.
- Shift System Adjustment: the shift system adjustment was checked and found to meet specifications.
- Neutral Start Switch: the neutral start switch was checked for function and proper installation. The neutral start switch functioned properly, only allowing the vehicle to start in the neutral and the park latch position.
- Ignition Cylinder: the key ignition cylinder was checked and functioned appropriately in the 4-positions.
- Shift System Interlock: the vehicle was inspected for proper key interlock. The key could not be removed from the vehicle unless the shift lever was fully in the park latch position.
- Vehicle: the vehicle was tested for park engagement in both directions on an incline. The vehicle would not move in park.
- Brake Shift Interlock: the brake shift interlock was tested and worked properly.
- Parking Brake: The foot pedal operated parking brake was checked in both directions on an incline. The vehicle would not move on the incline with the parking brake set in either direction. The foot pedal parking brake had a pull-handle release that was also inspected for proper installation and function; the pull-handle release for the parking brake was installed correctly and functions appropriately.
- Parking Brake Light: the parking brake malfunction indicator lamp (MIL) illuminated when the parking brake pedal was depressed.
- Test Drive: the vehicle was driven to check for proper up shifts and downshifts and both the 2 to 3 and the 3 to 4 up shifts were slow. The vehicle was also noted to have delayed engagement of the transmission in both reverse and forward.

My personal inspection of the vehicle showed the vehicle will not move if any or all of the following conditions are present.

1. The shift selector lever is in the park latch position
2. The parking brake is set fully
3. The key is out of the vehicle

Conclusion:

Based upon my education, training, experience and review of all of the evidence, I have the following opinions to a reasonable degree of engineering certainty:

1. The component parts of the automatic transmission, shift control system, and key interlock system of the subject 2002 Ford Explorer were appropriately manufactured and met the general state of the art in the industry,
2. The 2002 Ford Explorer met all applicable Federal Motor Vehicle Safety Standards,
3. The subject vehicle was reasonably safe for its intended use and was not defective,
4. The vehicle will not move when the vehicle's transmission is in park,
5. The vehicle will not move if the parking brake is set,
6. The injury could have been avoided had Marie Clapp taken any or all of the following preventative measures, all of which are outlined in the owners guide or intuitive to the operator;
    - Place the gear selector lever full in the park latch position
    - Set the parking brake fully
    - Removed the key from the vehicle

I anticipate that I may use the following exhibits as a summary or to support of my opinions herein:

- Diagrams and drawings of the 2002 Ford Explorer steering column, automatic transmission and shift system.
- Photographs/videotape of the subject vehicle
- Applicable engineering drawings
- Engineering standards and specifications
- Process and quality specification sheets
- The subject 2002 Ford Explorer and its automatic transmission and shift control system
- A mock-up and/or exemplar components of the 2002 Ford Explorer steering column, automatic transmission, and shift control system.

I am not being compensated specifically for the time involved in my research and testimony in this case, however, as a Design Analysis Engineer at the Ford Motor Company; I do receive an annual salary as a Ford employee.

If necessary, I may supplement this report, as I understand that discovery is ongoing, and my investigation into this case continues.

Respectfully Submitted,

Mark K. Taylor
Design Analysis Engineer

SHIFTED P-R
3-SEC. DELAYED REVERSE ENGAGEMENT

Transmission Function:

Park ✓	Drive	Overdrive
Reverse	Second	Third
Neutral	Low	First
Detent Feel		

3/4 Shift Slow
2/3 Shift

Roll # 1
N→R HR ✓ Frame # 3
R→P HN ✓ Frame # 4
R→P PT ✓ Frame # 6
P→R HR ✓ Frame # 5

P R N D 3 2 1

Park Engagement: ✓

Hold Downhill: ✓ Grade: 4° Uphill Hold: ✓ Grade: 4°

Rolling: 1-MPH Forward: ✓ 1-MPH Rearward: ✓

Park Gear Teeth: NOT INSPECTED Pawl Actuation:

BSI - FUNCTIONS PROPERLY Pawl Return:

Parking Brake: FOOT

Type: ✓

Hold at Idle: Forward YES Reverse YES

Hold at ¼ Throttle: 2000RPM Forward ✓ Reverse ✓

Hold on Hill: Forward ✓ Grade 40 Reverse 40 ✓ Grade 40

Linkage Condition:

Grommets at: Column
Manual Lever

Bellcrank: Inboard Bushing
Outboard Bushing
Inboard Grommet
Outboard Grommet

Cable Isolators
Cable Retaining Clip

Column Centering: Steering Returnablity:

Others Present:

TEST DRIVE VEHICLE

Trans Fluid Level

Case Name & Number: CLAPP 488736 Inspection Date: 12/2/2003

MY & Vehicle Line: 2002 EXPLORER VIN: 1FMZU63E32UA65535

Trans I.D. _____

Column Type: ___ Fixed ✓ Tilt Cable Linkage: ✓ Rod Linkage: _____ Floor Mount: _____ Column Mount: ✓

Vehicle Still in Use: ___ Yes ✓ No Odometer: 46252.6

Options: A/C ✓ P/S ✓ P/B ✓ Other Options: _____

Auto Park Brake Release: ___ Yes ✓ No

Roll# 1 1/1
R→P Hold ✓ Frame # 1
P→R Release ✓ Frame # 2

Function: Hold in P NA, Release in R A
Hold in N _____, Release in D _____

Backup Light Function:

Roll# 1
R→P Off ✓ Frame # 1
P→R On ✓ Frame # 2

From Park to R ✓
From N to R ✓
In P ✓
From R to N _____
From D to N ✓

Owners manual NO Cert Label YES

Evidence of Accident(s)-Describe: NONE

Idle Condition

Insert Plate ✓

Shift Efforts ✓

Selector Lever Roll Pin

Selector Lever Return Spring

PRNDL Light ✓

Linkage Adj. (±1/8, ± 1/16, other) -1/16

Evidence of Readings Cathen Edge of T-PLATE

Indicator Position (Center of Drive Detent)

Start Function: ✓ Park ✓ Neutral NONE Other

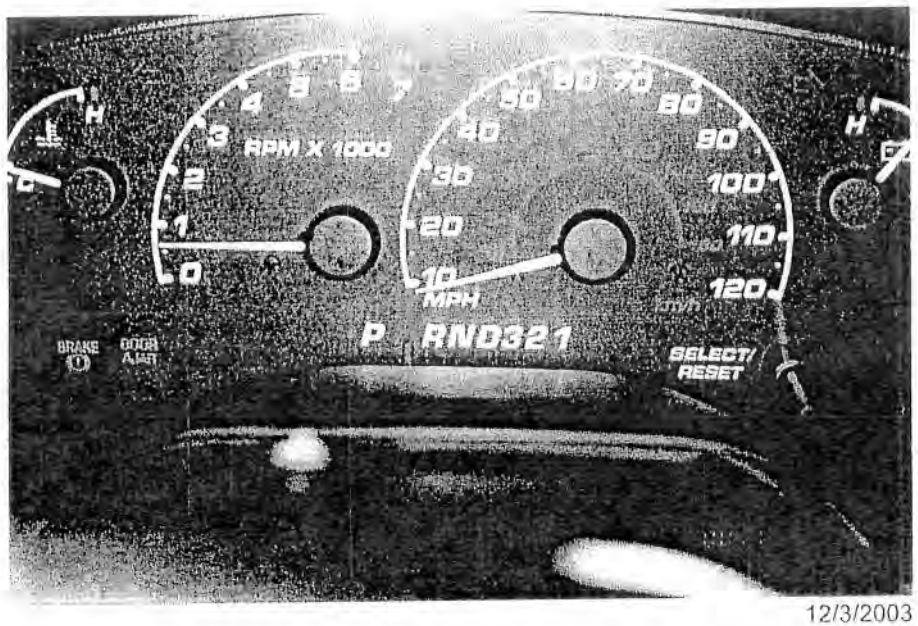
Key Warning Buzzer ✓ Parking Brake MIL ✓

Incident Location: _____ Grade: _____

Surface Condition (Pavement type, moisture, etc): _____

Inspection Location: _____ Grade: _____

Surface Condition (Pavement type, moisture, etc): _____



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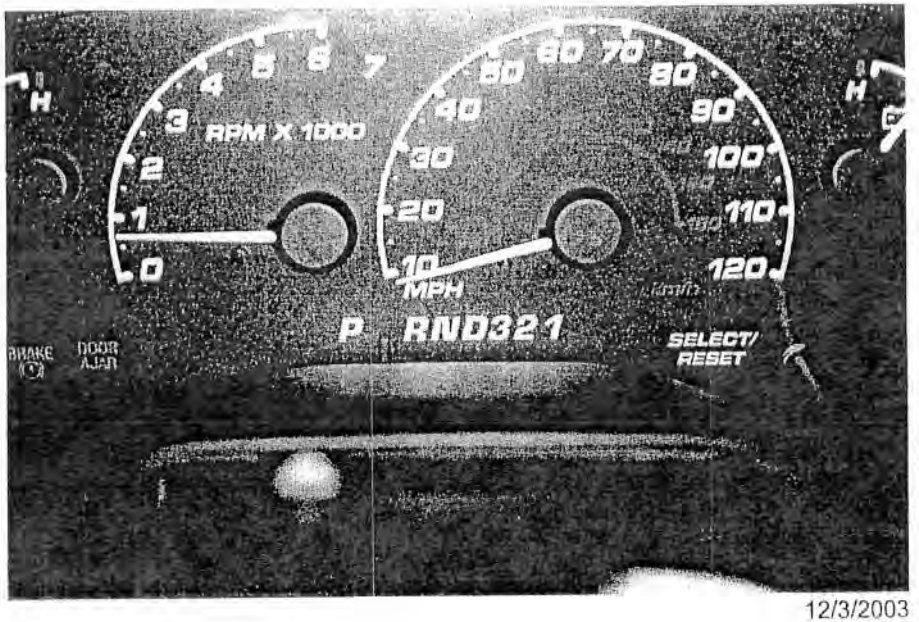

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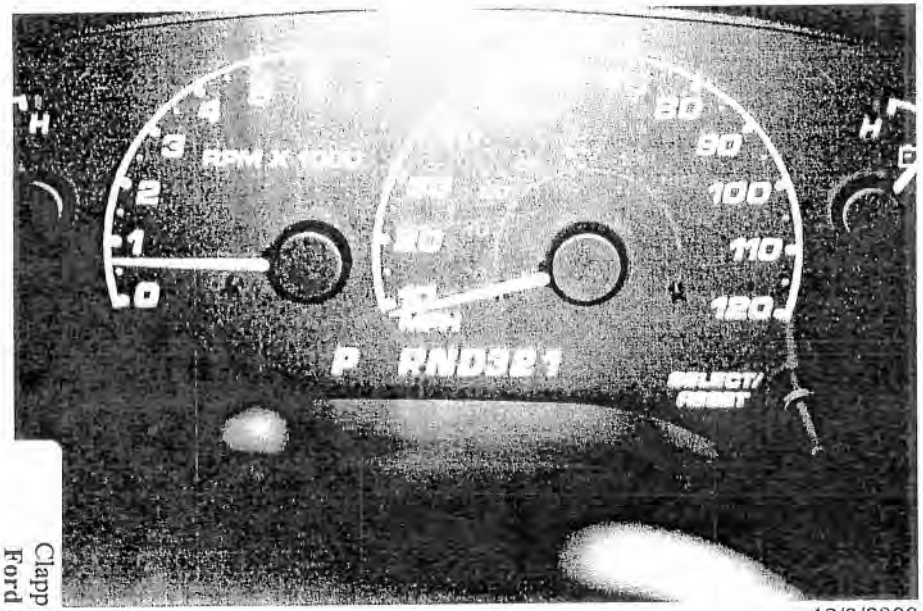

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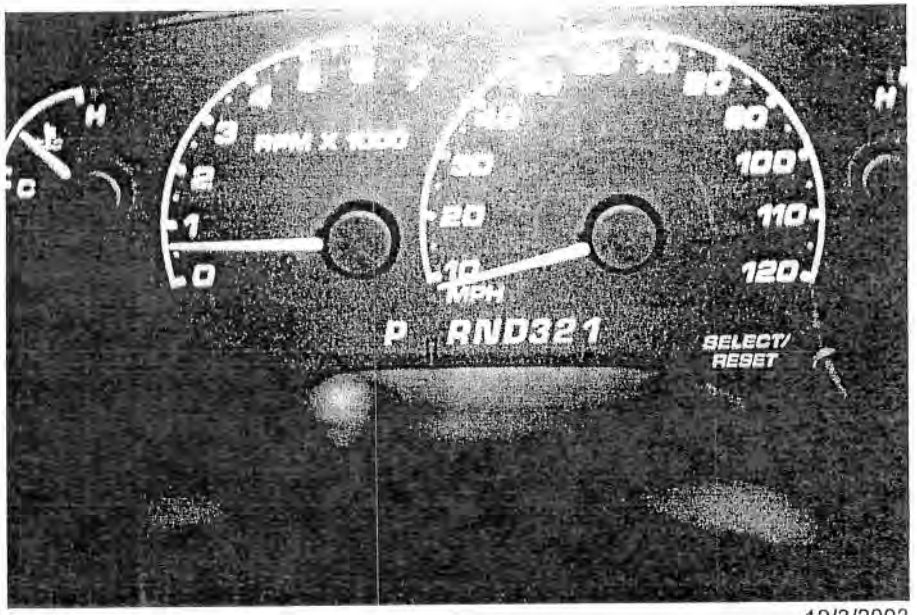

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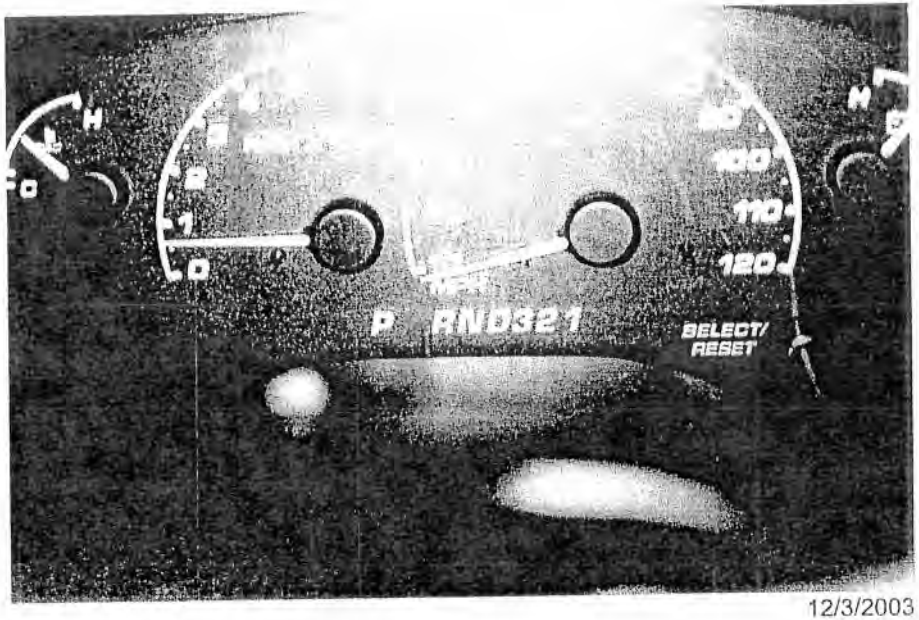
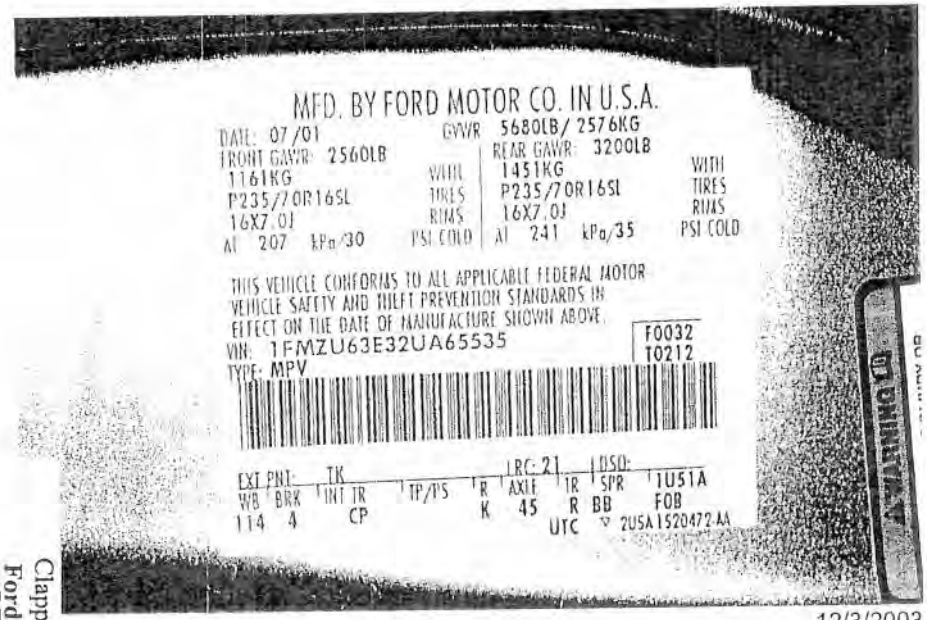
Clapp v. Ford
Ford 000006
PE09-020 1798

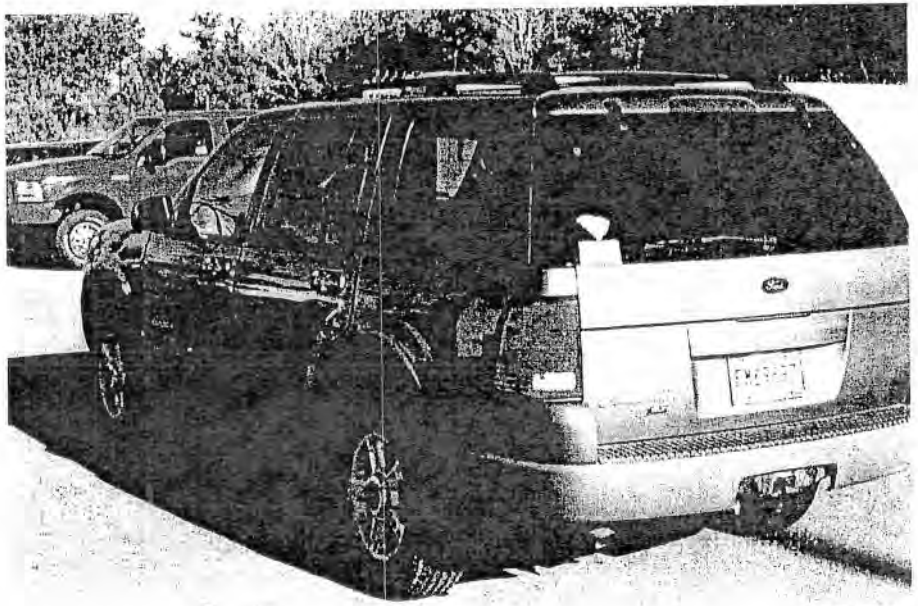


12/3/2003

12/3/2003



12/3/2003



12/3/2003

Clapp v. Ford
Ford 000007
PE09-020 1799

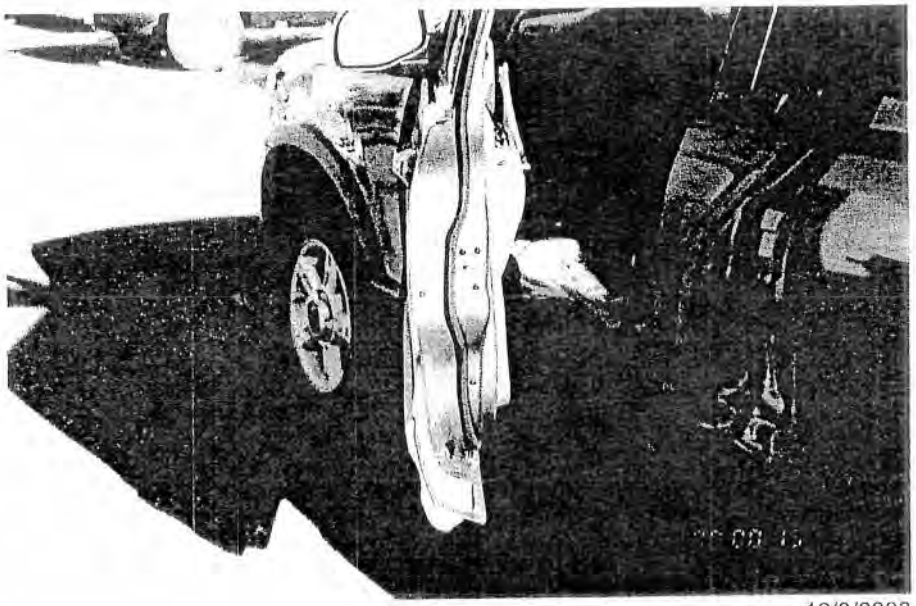
12/3/2003

12/3/2003

12/3/2003

12/3/2003

Clapp v. Ford
Ford 000008
PE09-020 1800



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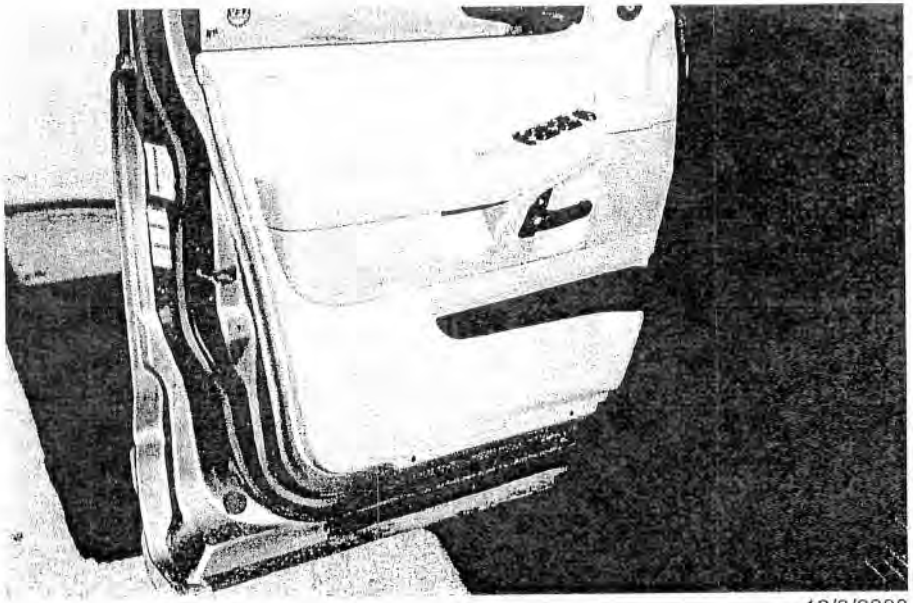

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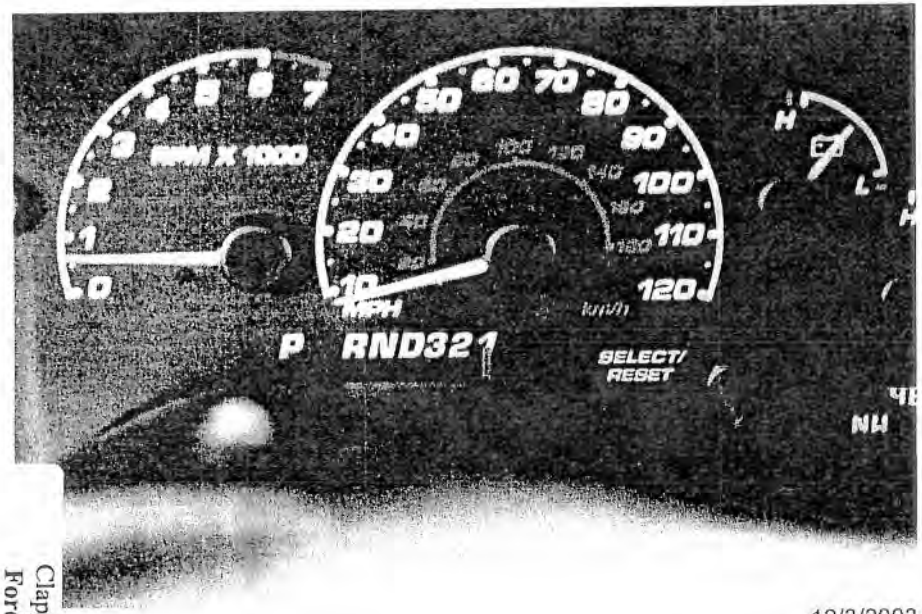

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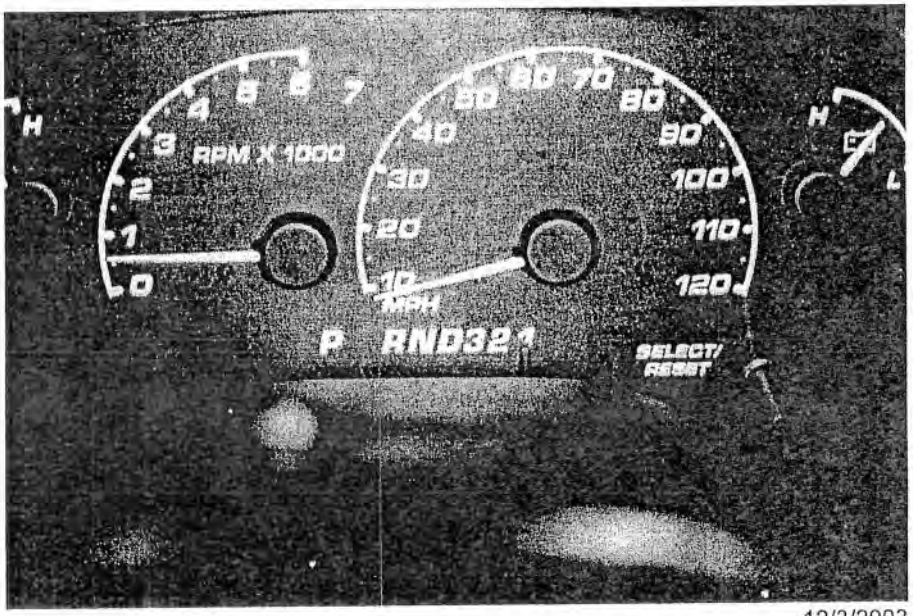

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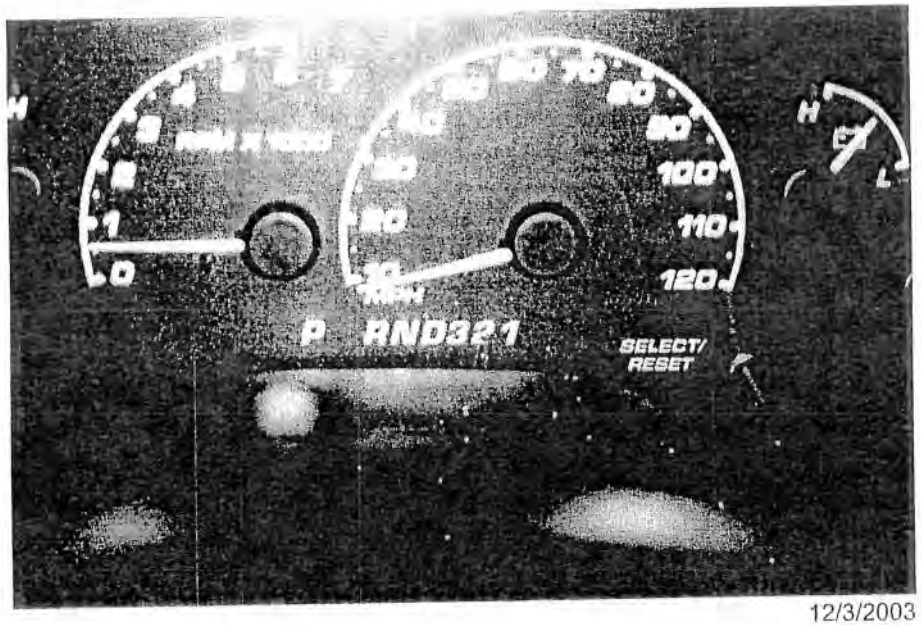
Clapp v. Ford
Ford 000009
PE09-020 1801



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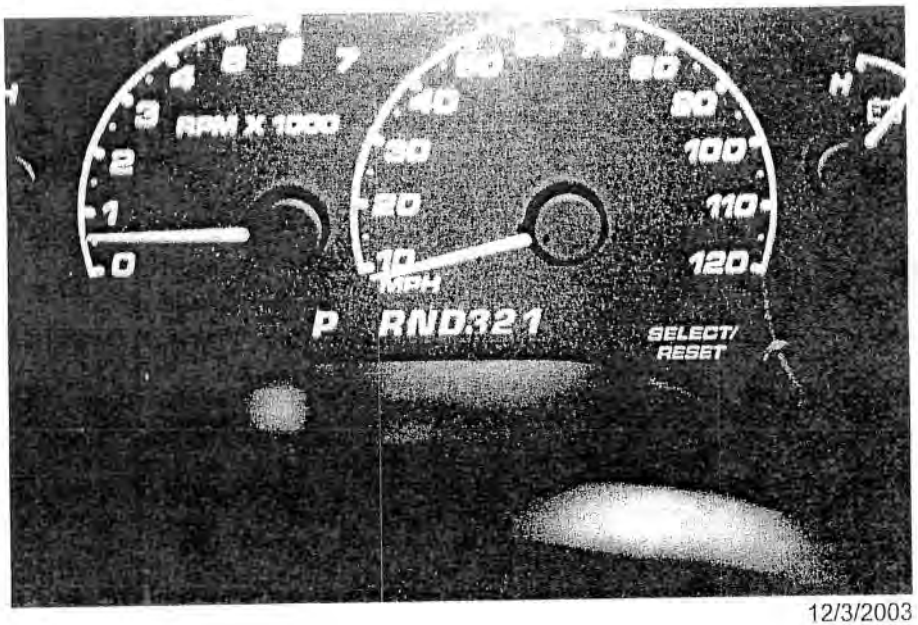

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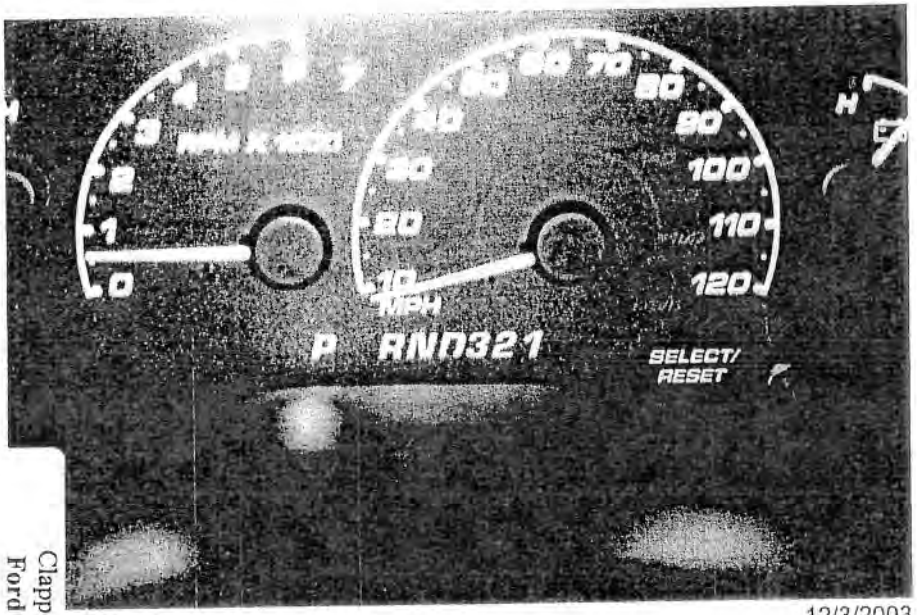

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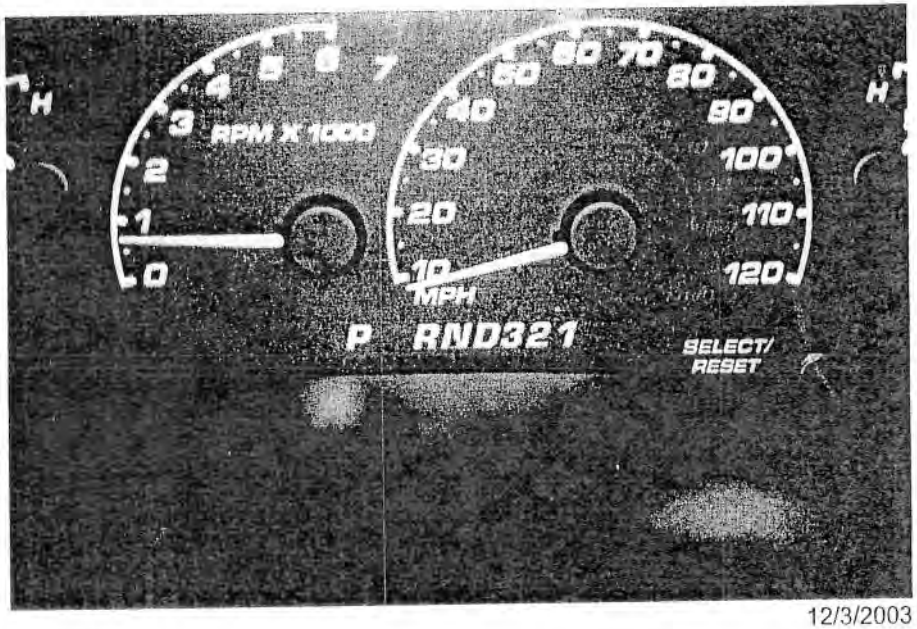

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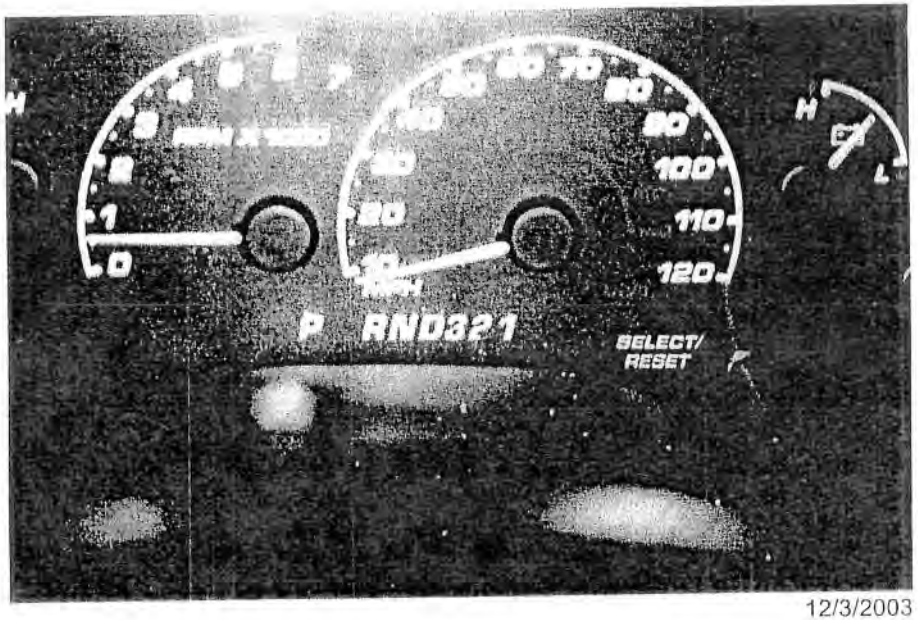
Clapp v. Ford
Ford 000010

PE09-020 1802



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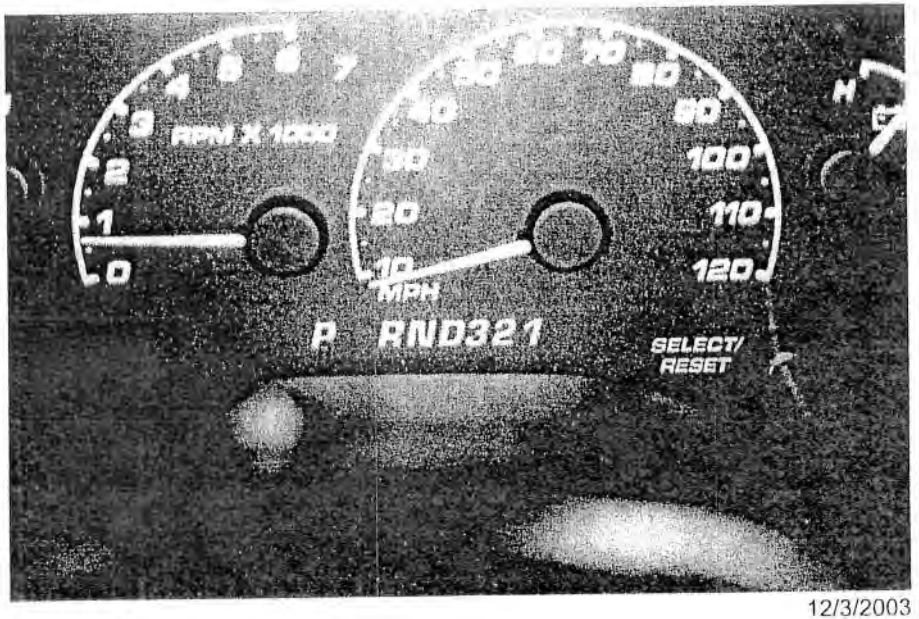

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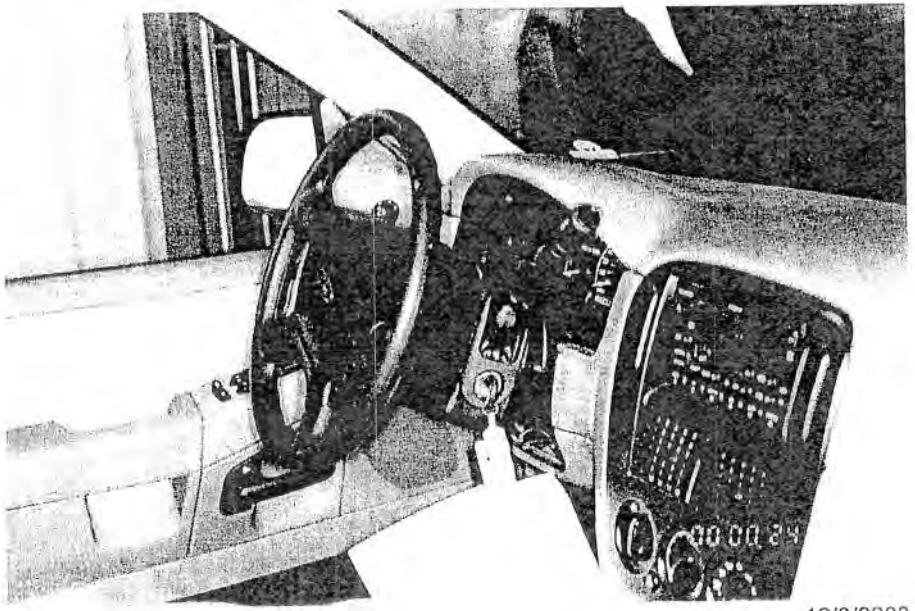

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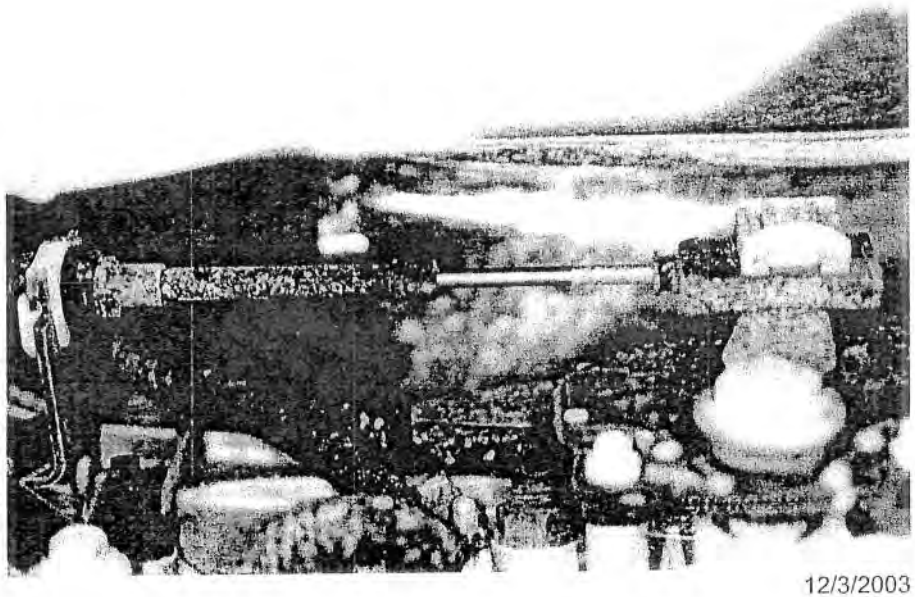
Clapp v. Ford
Ford 000011
PE09-020 1803

Clapp v. Ford
Ford 000012



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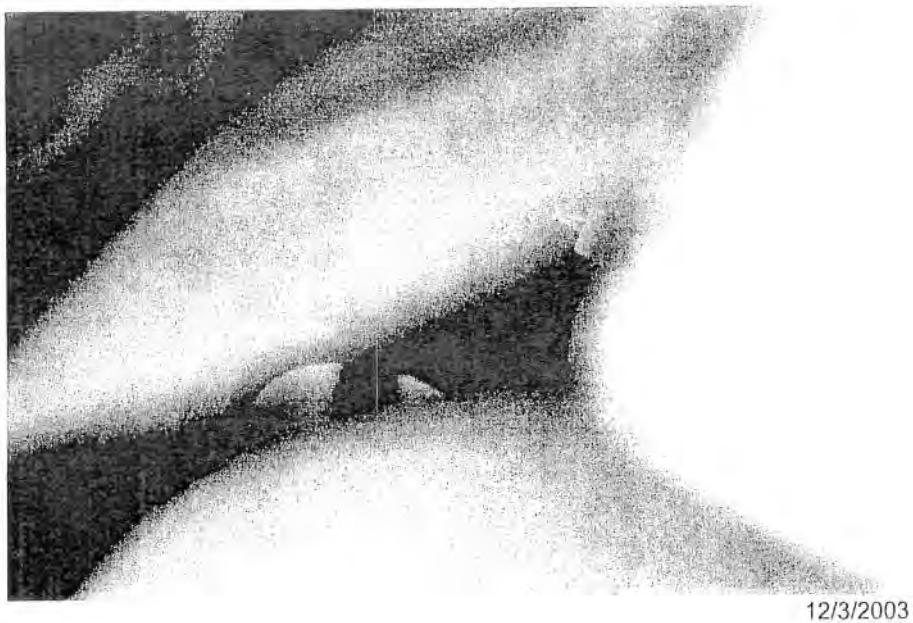

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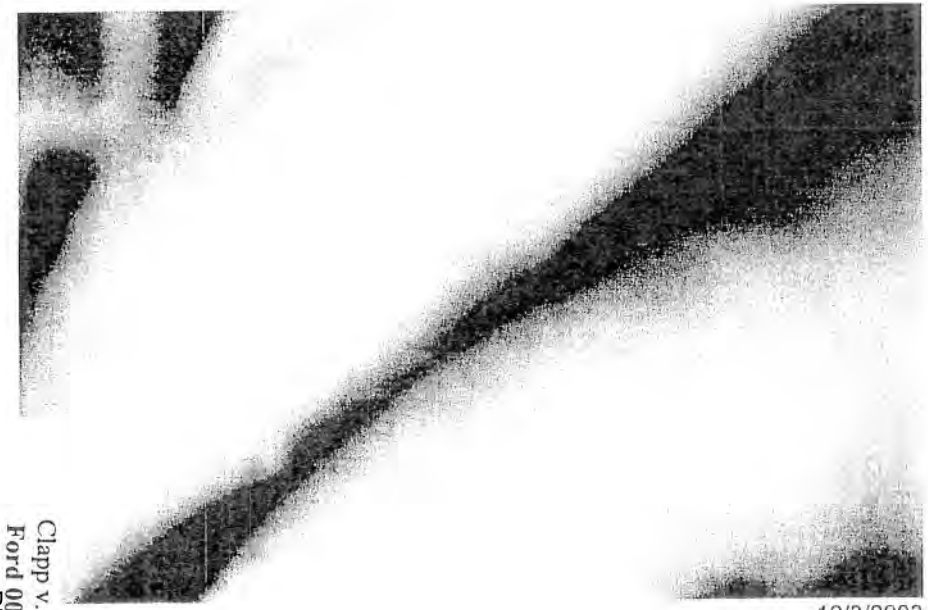

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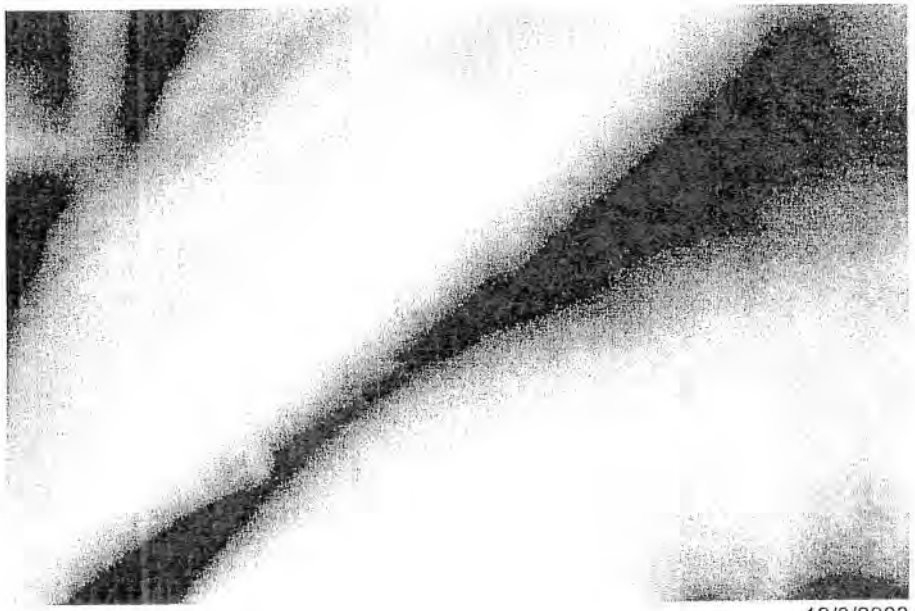

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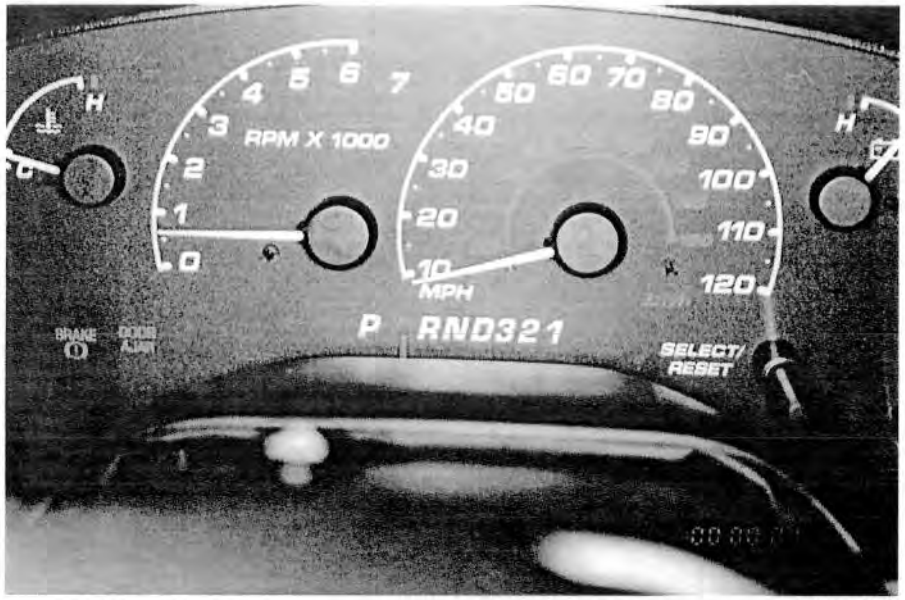
Clapp v. Ford
Ford 000013
PE09-020 1805

12/3/2003

12/3/2003



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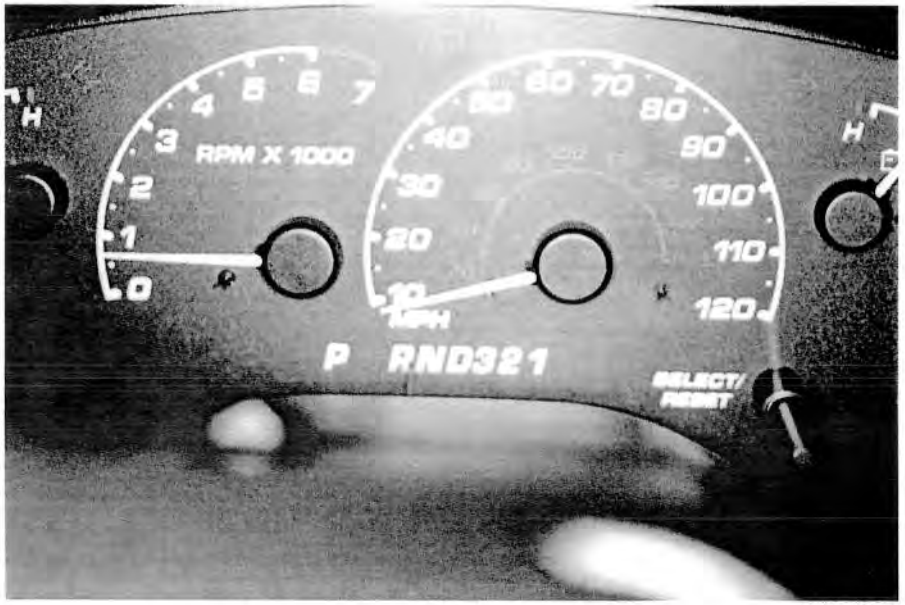

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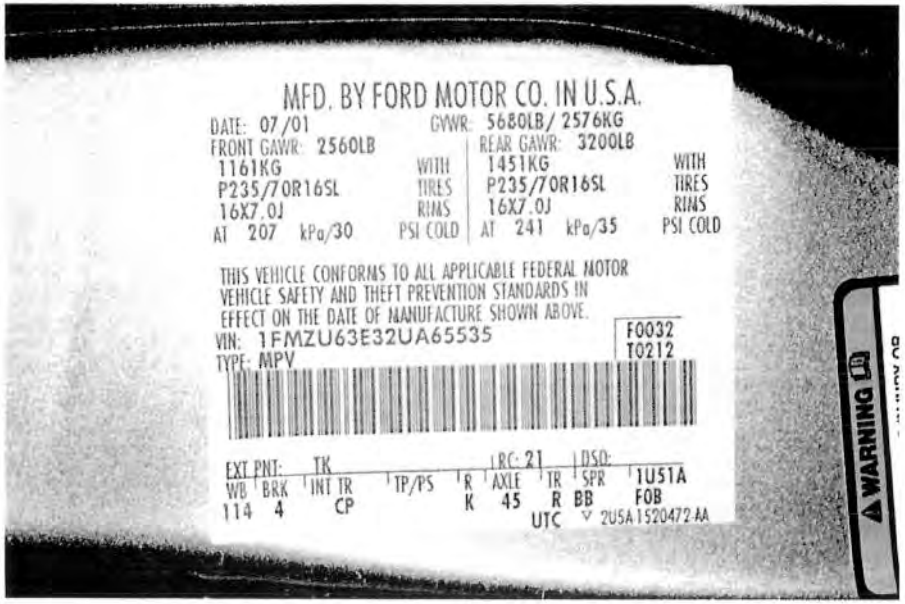

12/3/2003

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PE09-020 1809

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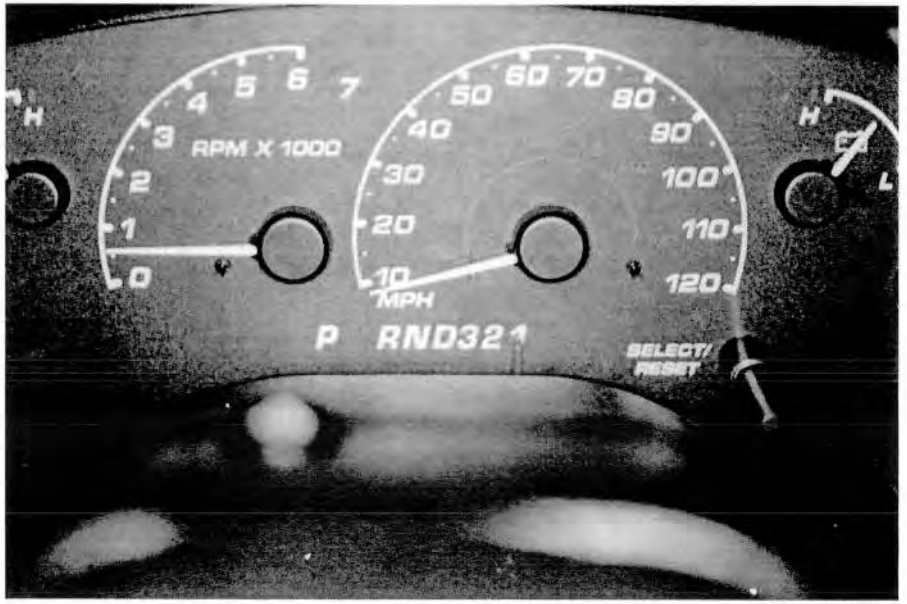
12/3/2003



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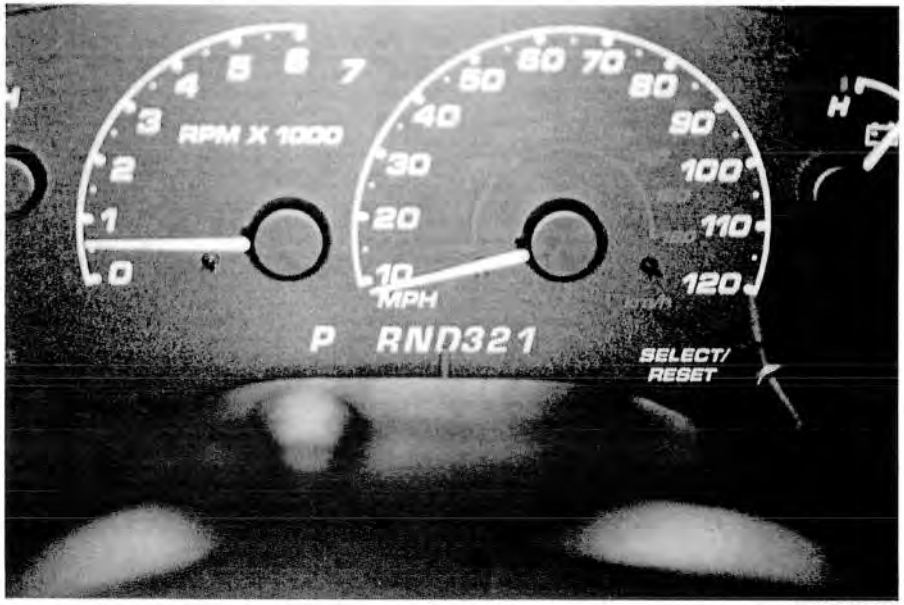

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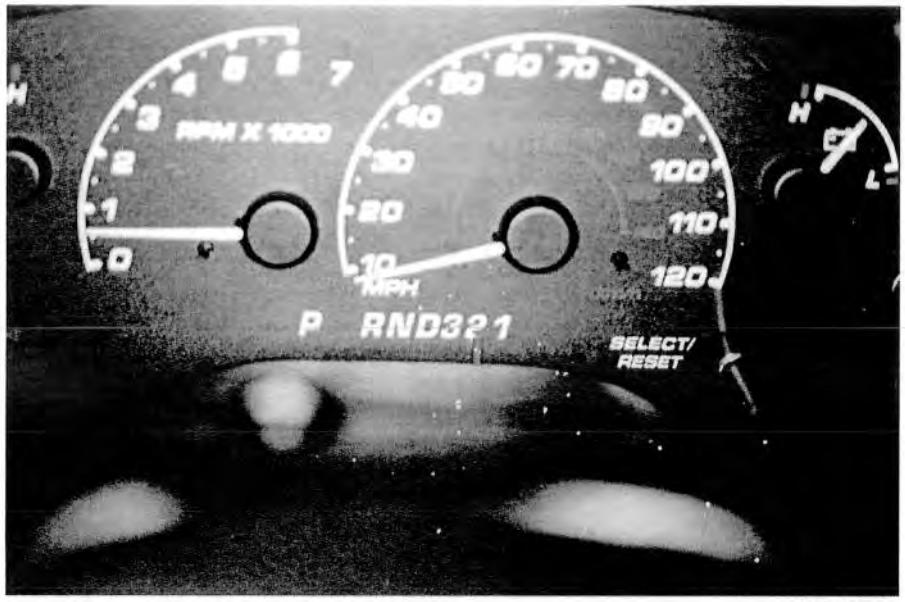
PE09-020 1811



12/3/2003

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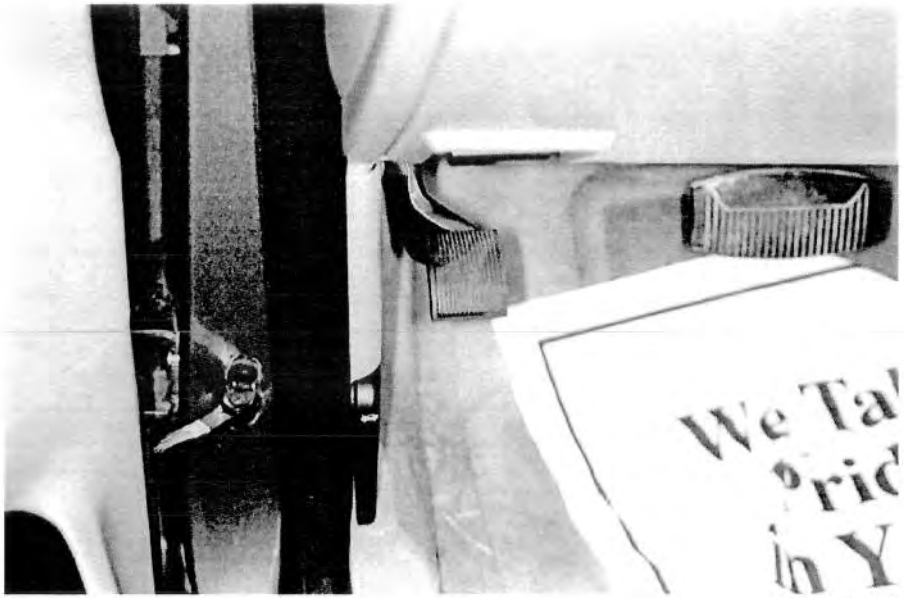
12/3/2003

PE09-020 1812



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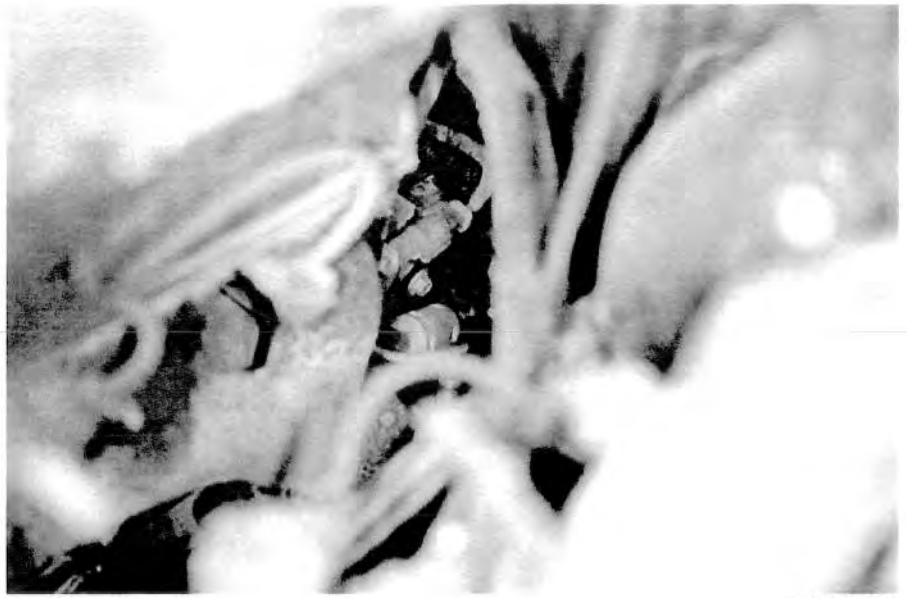

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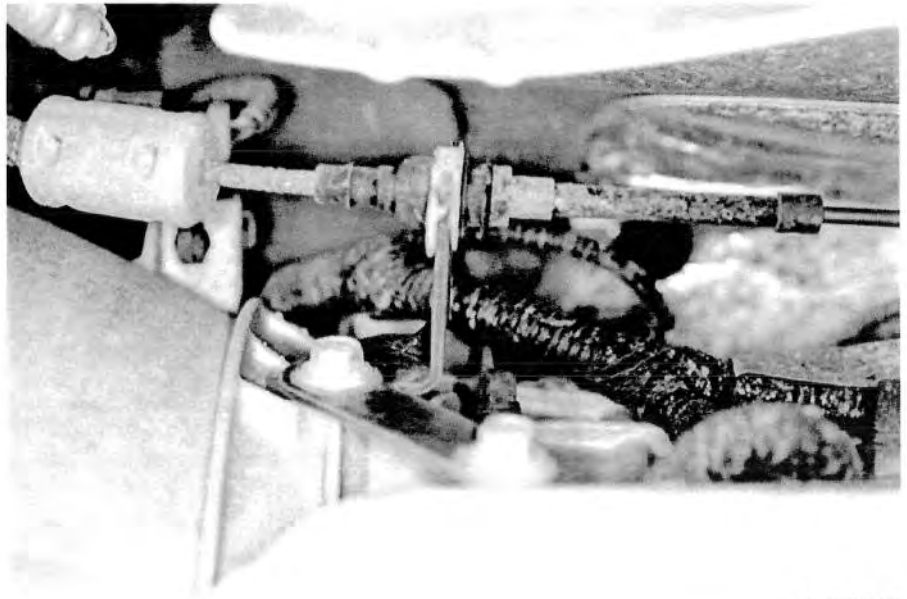

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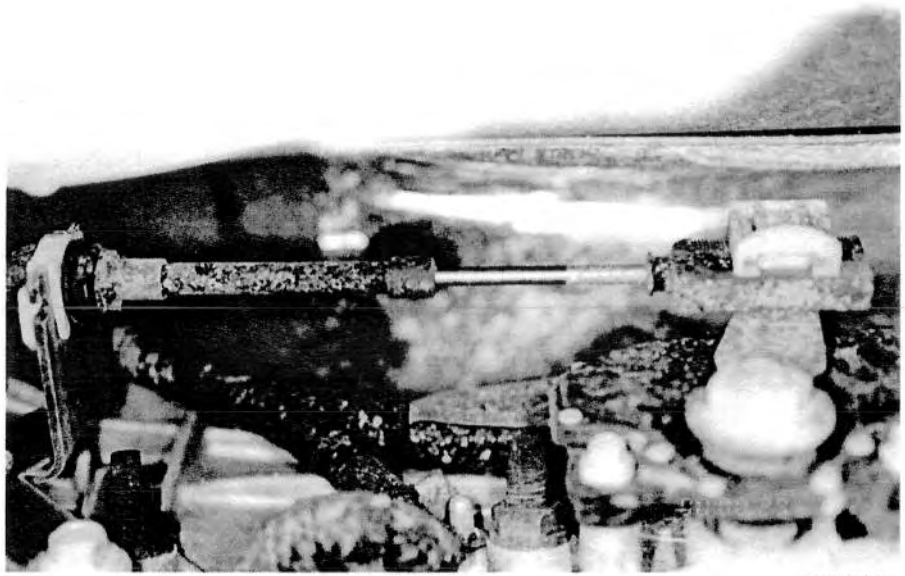
PE09-020 1813



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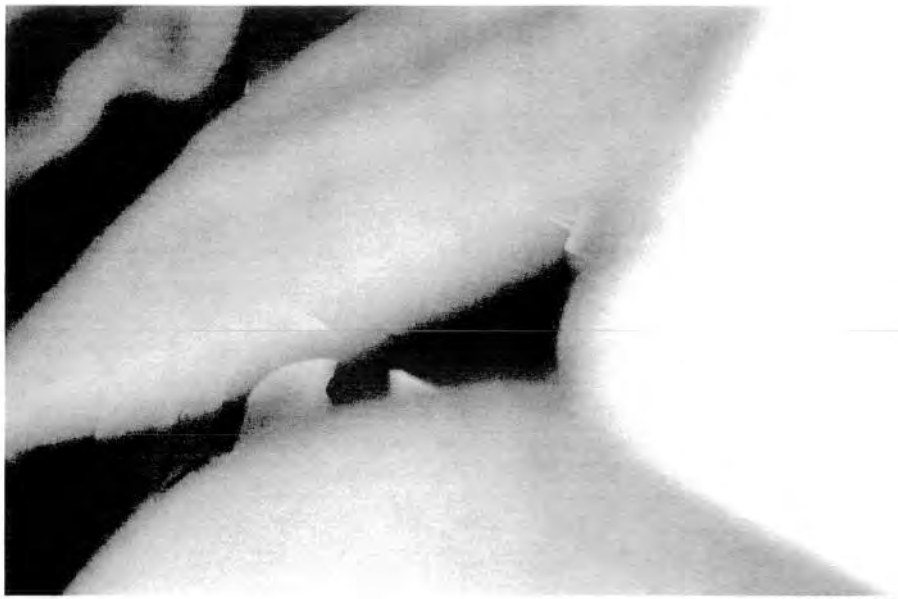

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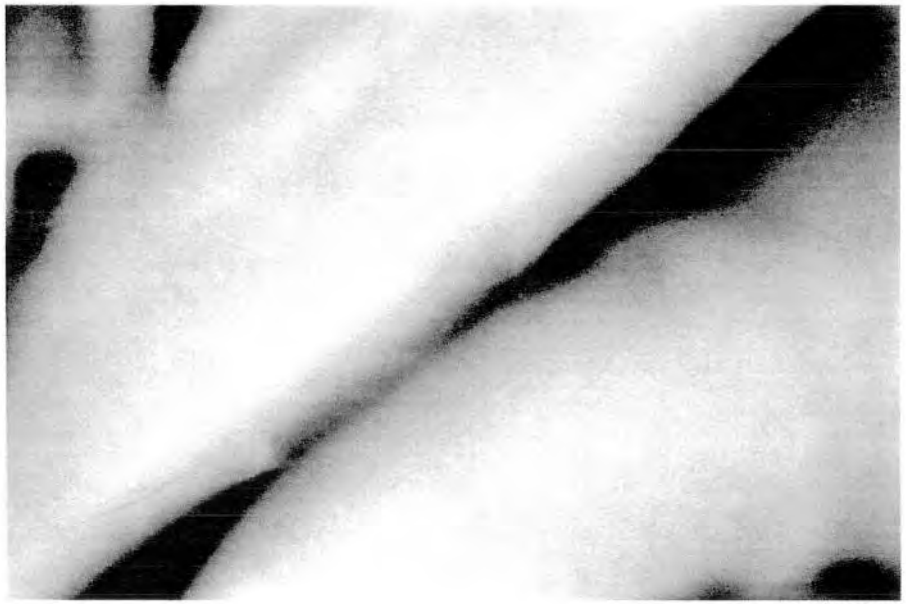

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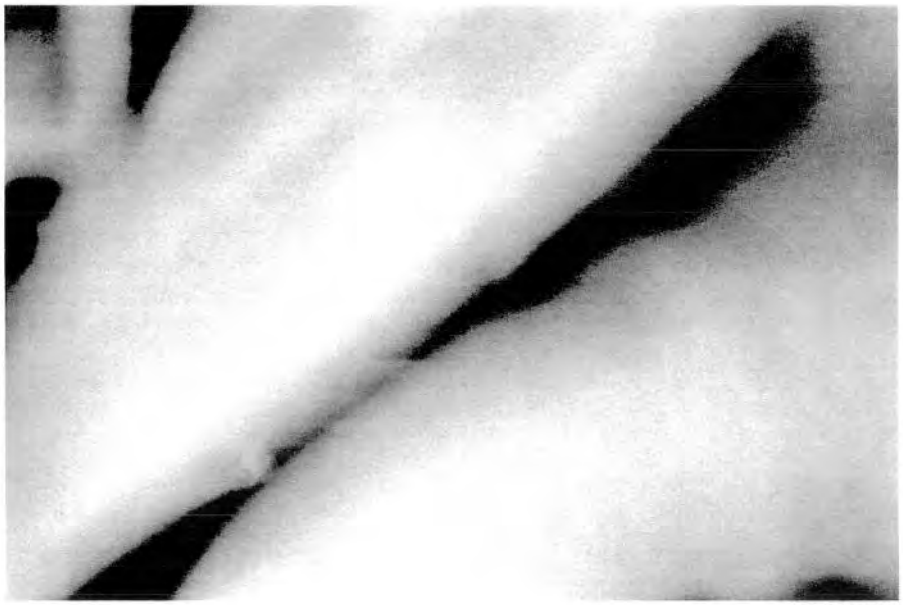

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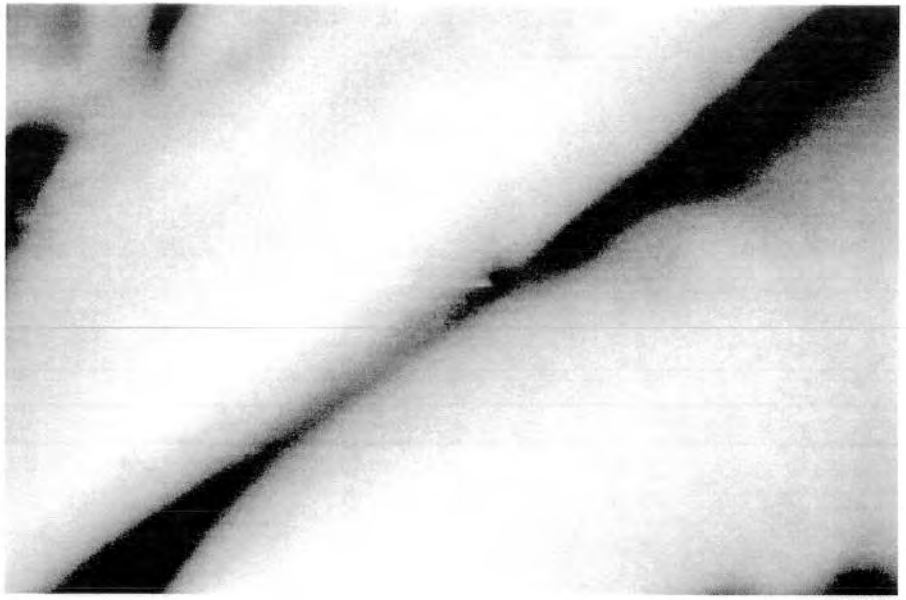

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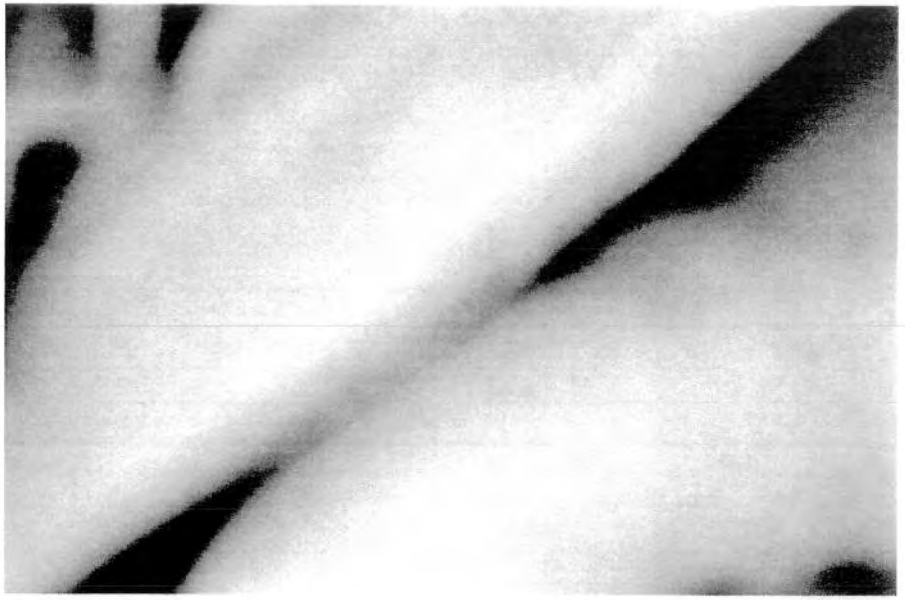

12/3/2003

PE09-020 1815

Office of the General Counsel

Ford Motor Company
Parklane Towers West
Suite 300
Three Parklane Boulevard
Dearborn, Michigan 48126-2568

November 20, 2003

VIA FACSIMILE

Matthew Hamrick
2001 Harrell Square
Charleston, S.C. 29407

Re: Richard and Marie Clapp
2002 Explorer

Dear Mr. Hamrick:

Pursuant to my recent message, please be advised that our design analysis engineer Mark Taylor will be inspecting your client's 2002 Explorer at Lowcountry Ford on Tuesday, December 2, 2003 starting at 9:00 a.m. Further, please be advised that I am authorized to issue a rental vehicle to your clients until our inspection is completed. If your clients wish to accept our rental offer, please contact me with the number of the local Enterprise Rental Company they wish to use and I will arrange the rental to be directly billed to us.

Should you have any questions or concerns, please feel free to contact me at (313) 337-3323.

Sincerely,

Julie Szymanski
Claims Analyst

cc: Chad Pollock/Lowcountry Ford

Per Chad Pollak

10/8/03 - vehicle came in
for trans shutters on takeoff
won't go into reverse
will jump from part
to reverse
won't accelerate

trans shuttering

46,000.

National ~~exte~~ aftermarket not Ford.
extended warranty.

no warranty through Ford.

vehicle has been worked on
at another dealer.

4/10/03 vehicle was running ?
engine running..
driveway.
stepped out went into
reserve

Out of town Nov 24 ? 22,8 tx.

SHIFTED P-R
3-SEC. DELAYED REVERSE ENGAGEMENT

Transmission Function:

Park	Drive	Overdrive
Reverse	Second	Third
Neutral	Low	First
Detent Feel		

3/4 Shift Slow
2/3 Shift

Roll # 1

N→R HR ✓ Frame # 3
R→P HN ✓ Frame # 4
R→P PT ✓ Frame # 6
P→R HR ✓ Frame # 5

P / RNDBZ

Park Engagement: ✓

Hold Downhill: ✓ Grade: 4° Uphill Hold: ✓ Grade: 4°

Rolling: 1-MPH Forward: ✓ 1-MPH Rearward: ✓

Park Gear Teeth: NOT INSPECTED Pawl Actuation:

BSI - FUNCTIONS PROPERLY Pawl Return:

Parking Brake: FOOT

Type: ✓

Hold at Idle: Forward YES Reverse YES

Hold at ¼ Throttle: Forward ✓ Reverse ✓ 2000RPM

Hold on Hill: Forward ✓ Grade 4° Reverse 4° ✓ Grade 4°

Linkage Condition:

Grommets at: Column
Manual Lever

Bellcrank:
Inboard Bushing
Outboard Bushing
Inboard Grommet
Outboard Grommet

Cable Isolators
Cable Retaining Clip

Column Centering: Steering Returnablity:

Others Present:

TEST DRIVE VEHICLE

Trans Fluid Level

Case Name & Number: CLAPP 488136 Inspection Date: 12/2/2003

MY & Vehicle Line: 2002 EXPLORER VIN: 1FMZU63E32UA65535

Trans I.D. _____

Column Type: ___Fixed ✓Tilt Cable Linkage: ✓ Rod Linkage: _____ Floor Mount: _____ Column Mount: ✓

Vehicle Still in Use: ___Yes ✓No Odometer: 46252.6

Options: A/C ✓ P/S ✓ P/B ✓ Other Options: _____

Auto Park Brake Release: ___Yes ✓No

Roll# 1 N/A
R→P Hold ✓ Frame # 1
P→R Release ✓ Frame # 2

Function: Hold in P NA, Release in R A
Hold in N _____, Release in D _____

Backup Light Function:

Roll# 1
R→P Off ✓ Frame # 1
P→R On ✓ Frame # 2

From Park to R ✓
From N to R ✓
In P ✓
From R to N _____
From D to N ✓

Owners manual NO Cert Label YES

Evidence of Accident(s)-Describe: NONE

Idle Condition

Insert Plate ✓

Shift Efforts ✓

Selector Lever Roll Pin

Selector Lever Return Spring

PRNDL Light ✓

Linkage Adj. (±1/8, ± 1/16, other) -1/16

Evidence of Readings Cutting Edge of I-PLATE

Indicator Position (Center of Drive Detent)

Start Function: ✓ Park ✓ Neutral NONE Other

Key Warning Buzzer ✓ Parking Brake MIL ✓

Incident Location: _____ Grade: _____

Surface Condition (Pavement type, moisture, etc): _____

Inspection Location: _____ Grade: _____

Surface Condition (Pavement type, moisture, etc): _____

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Parklane Towers West
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National ~~exte~~ aftermarket not Ford.
extended warranty.

no warranty through Ford.

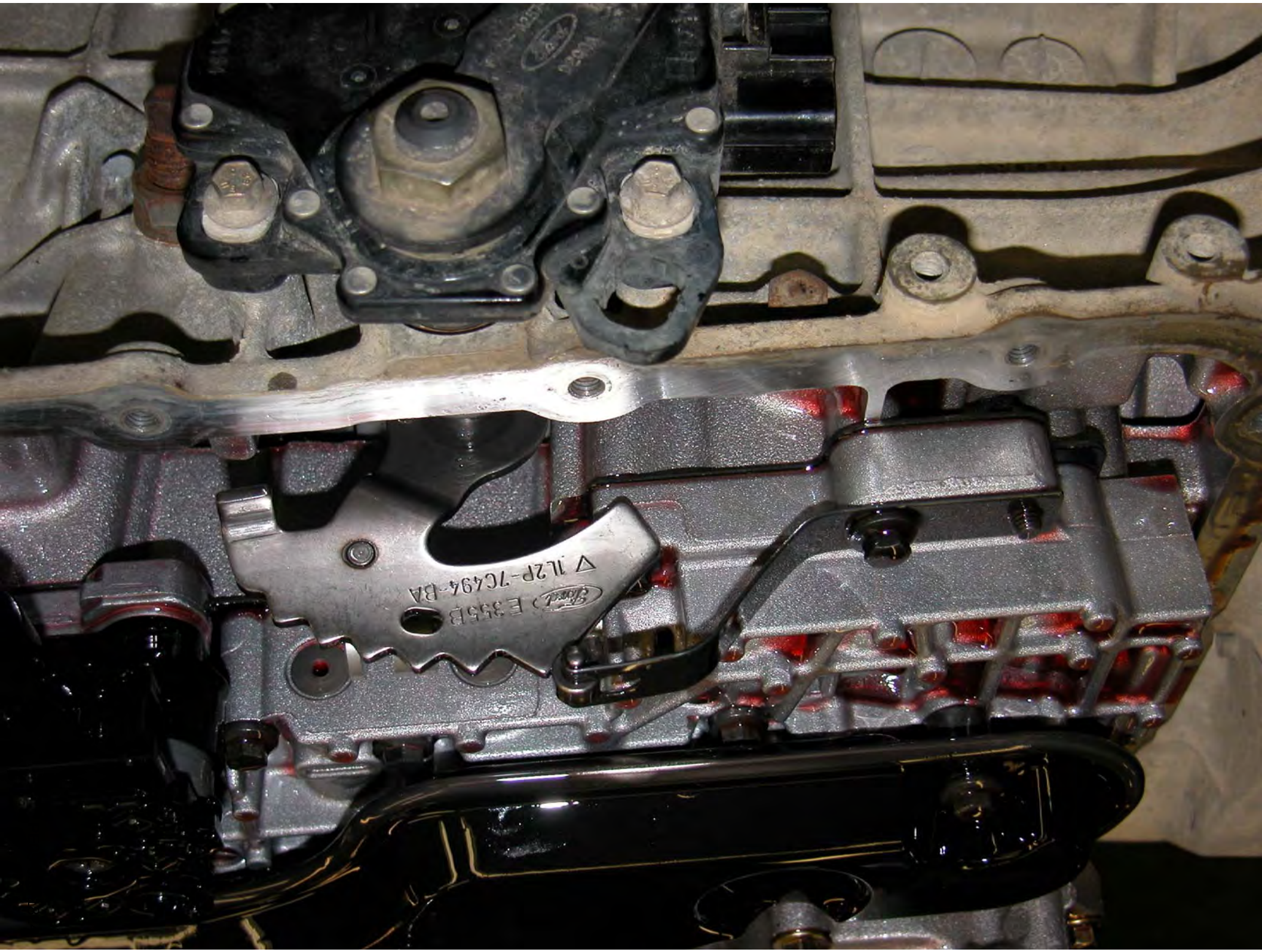
vehicle has been worked on
at another dealer.

4/10/03 vehicle was running ?
driveway. engine running.
stepped out went into
reverse.

out of town Nov 24 ? 27,8 tc.

PE09-020 1822

PE09-020 1823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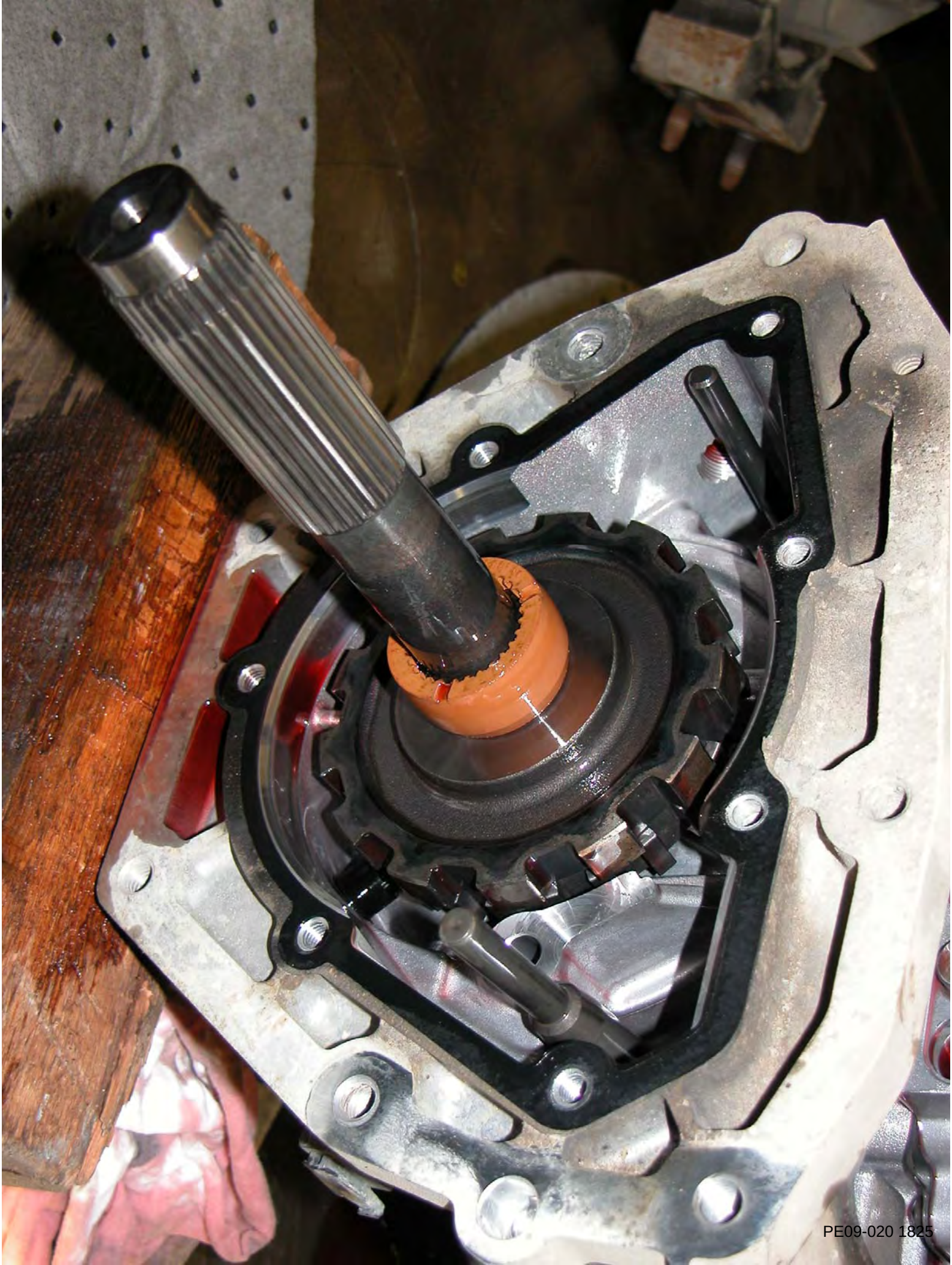
E355B



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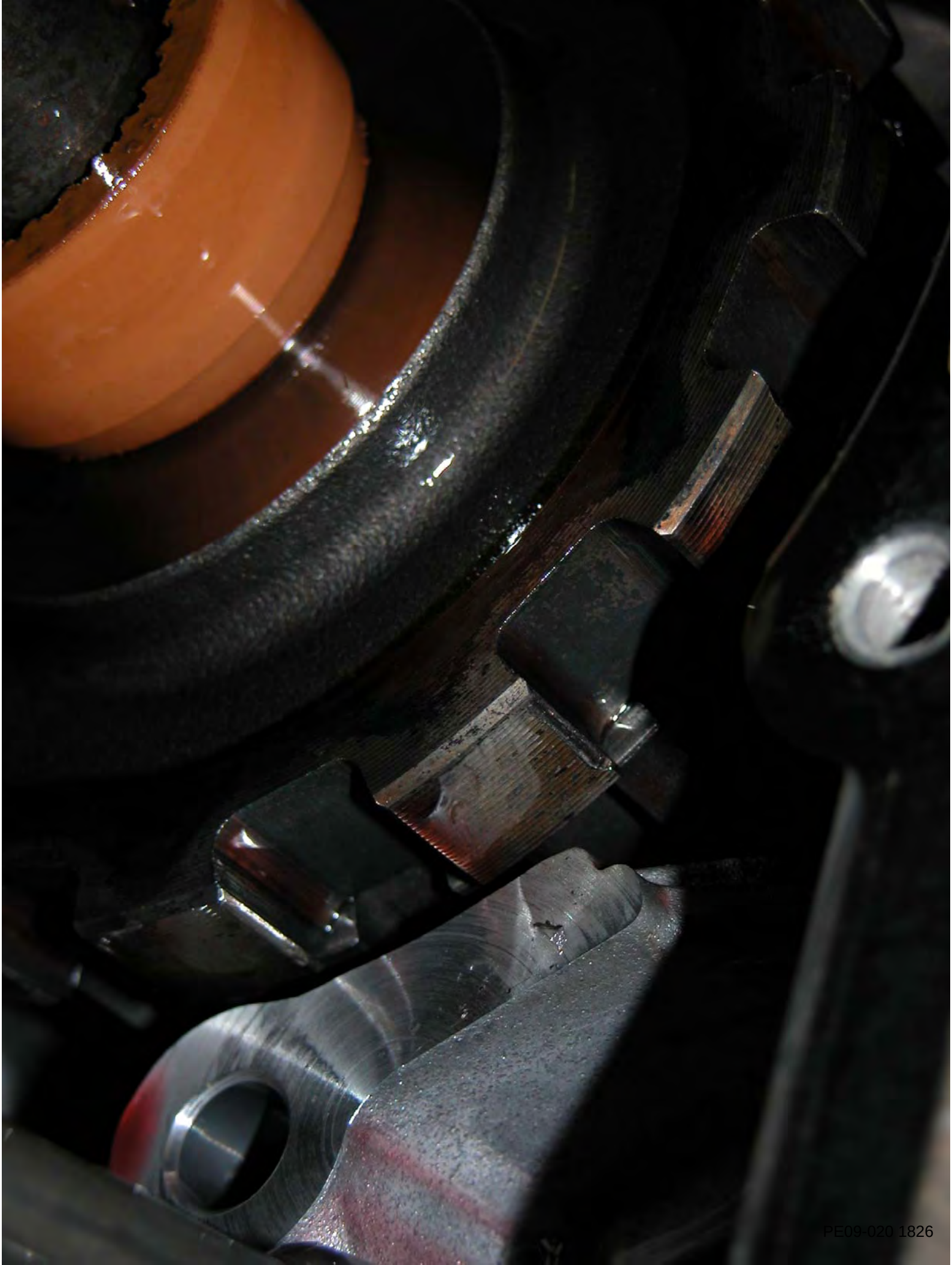

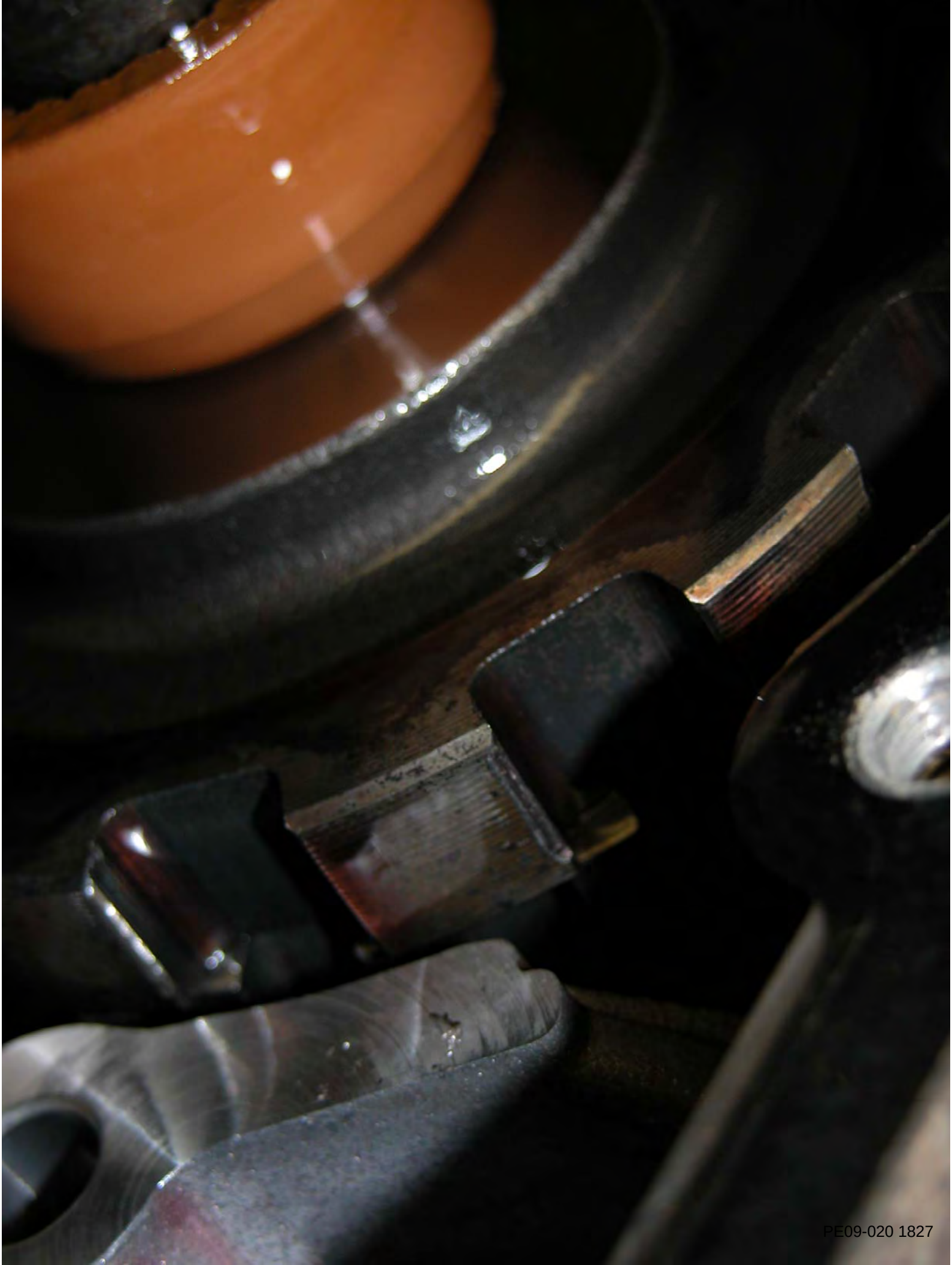

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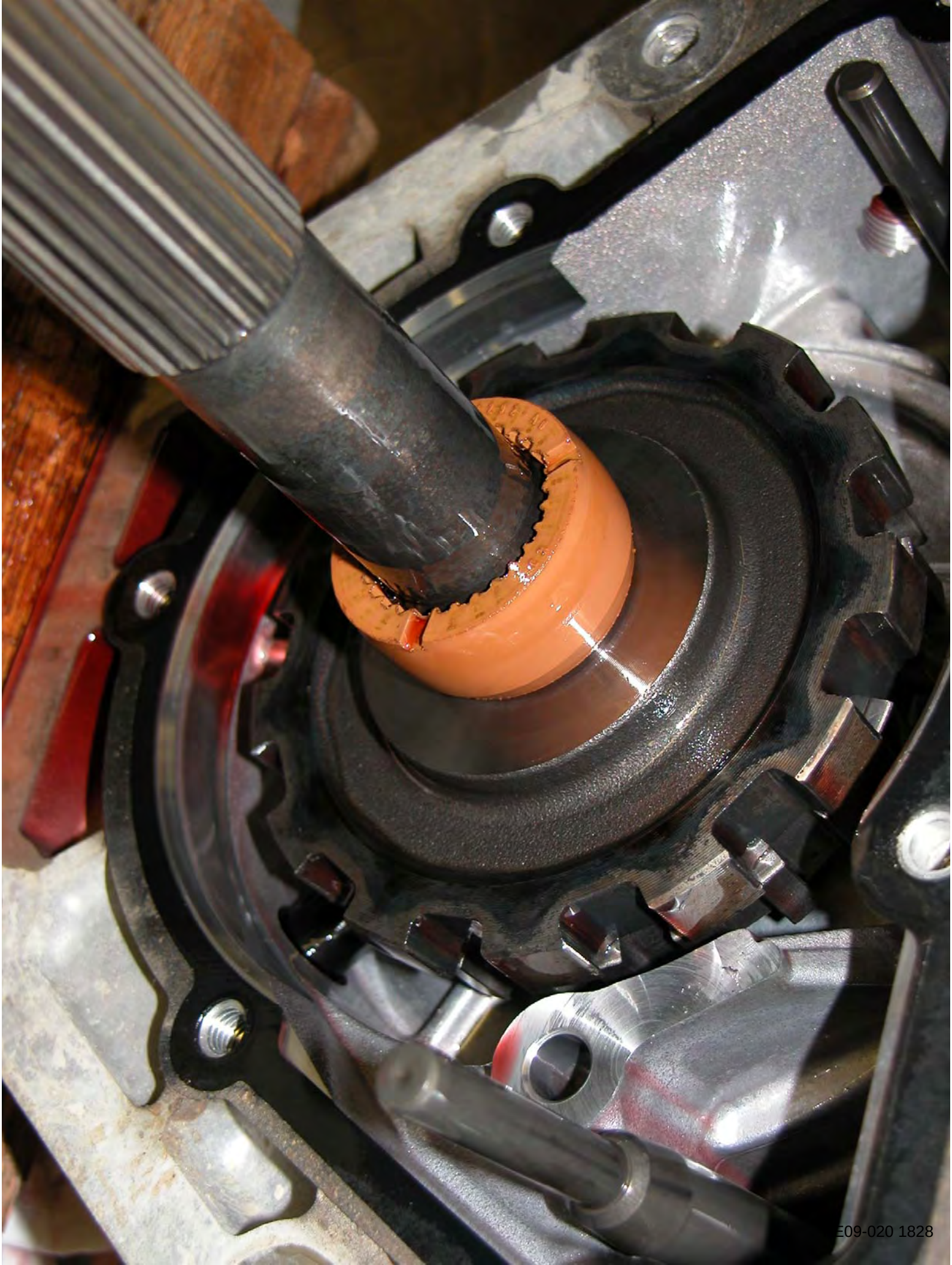
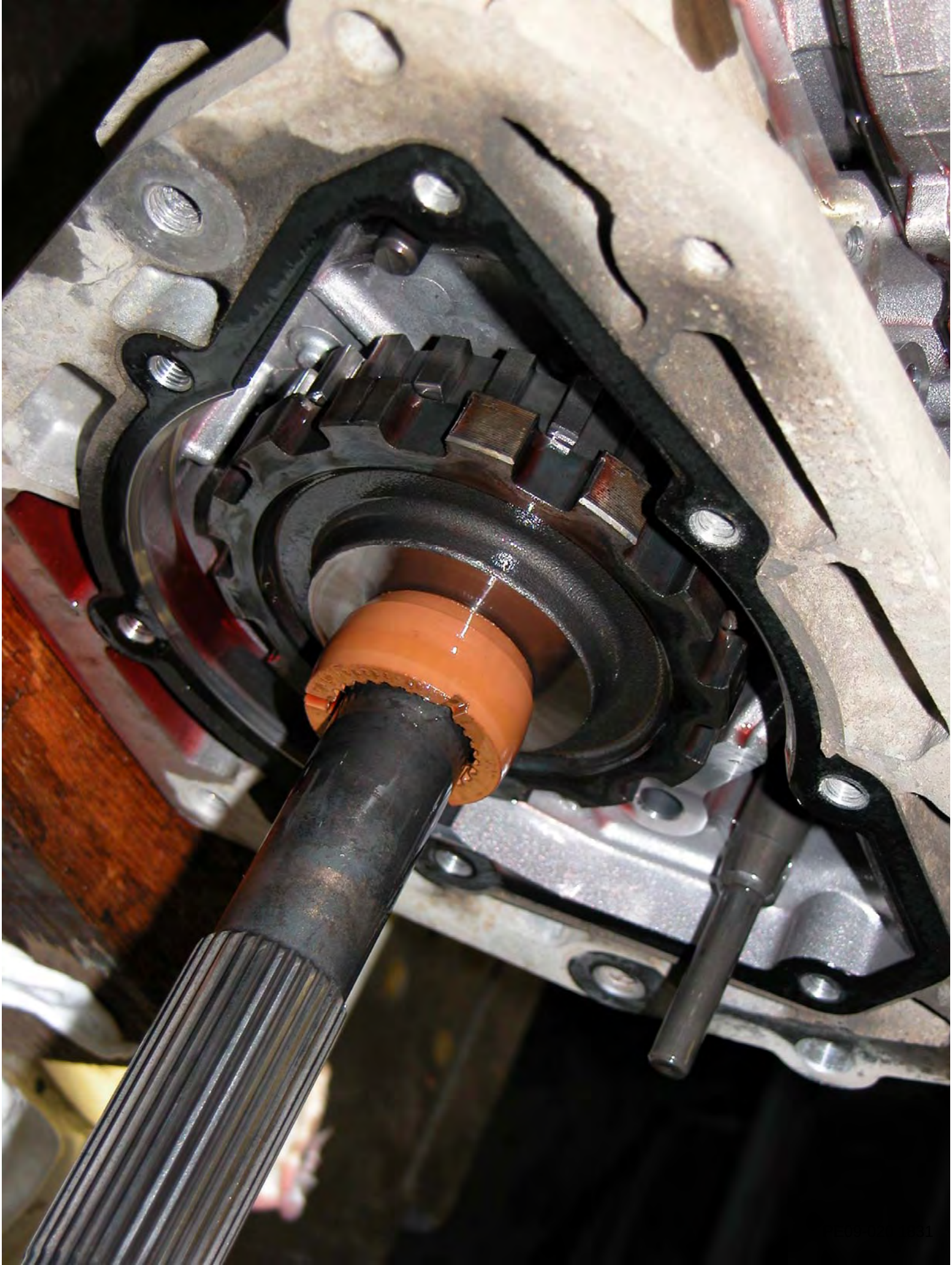

E09-020 1828

PE09-020 1829



PE09-020 1832

PE09-020 1833

PE09-020 1834

PE09-020 1835

PE09-020 1836

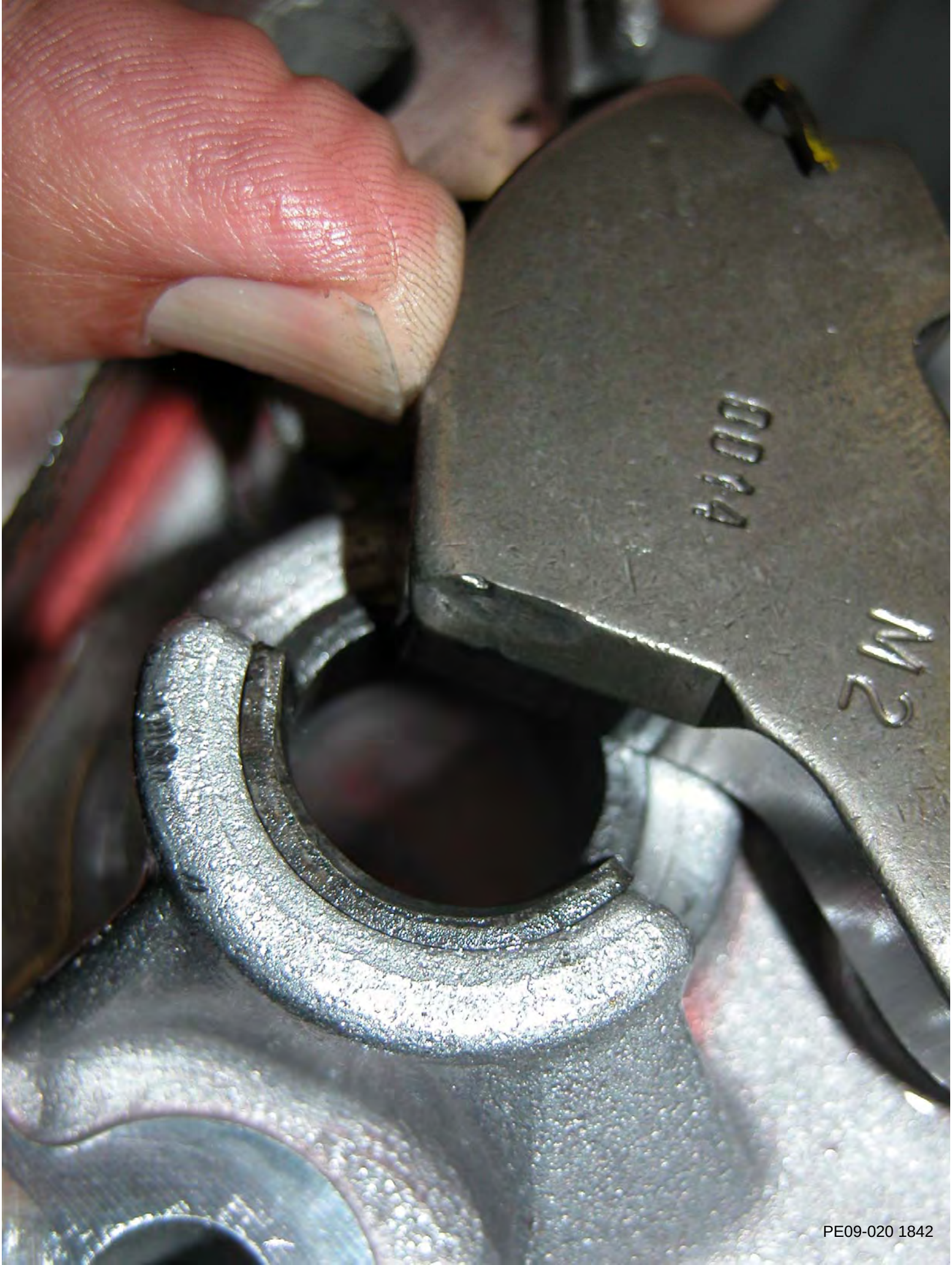
PE09-020 1837

PE09-020 1838

PE09-020 1839

PE09-020 1840

PE09-020 1841

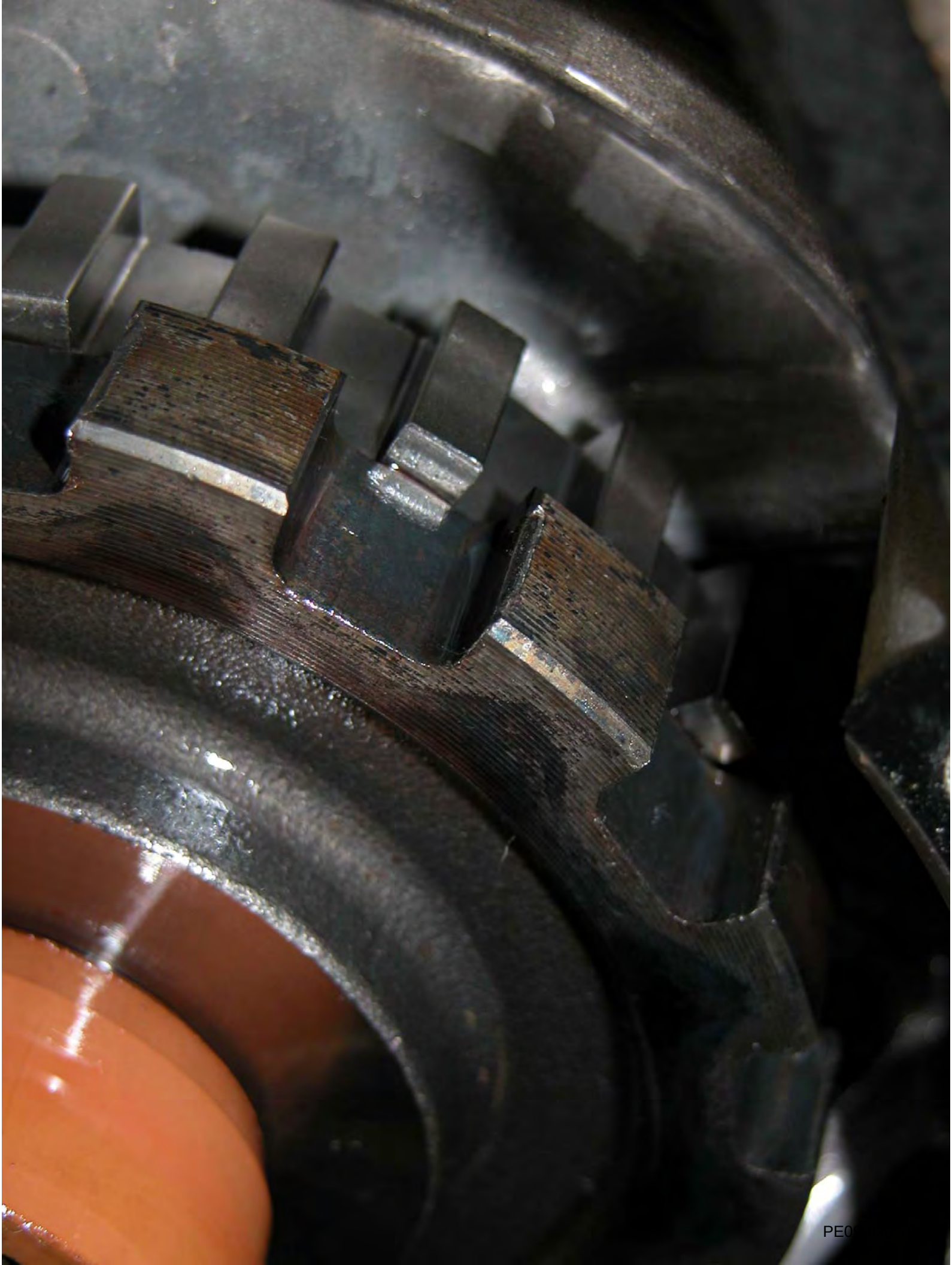


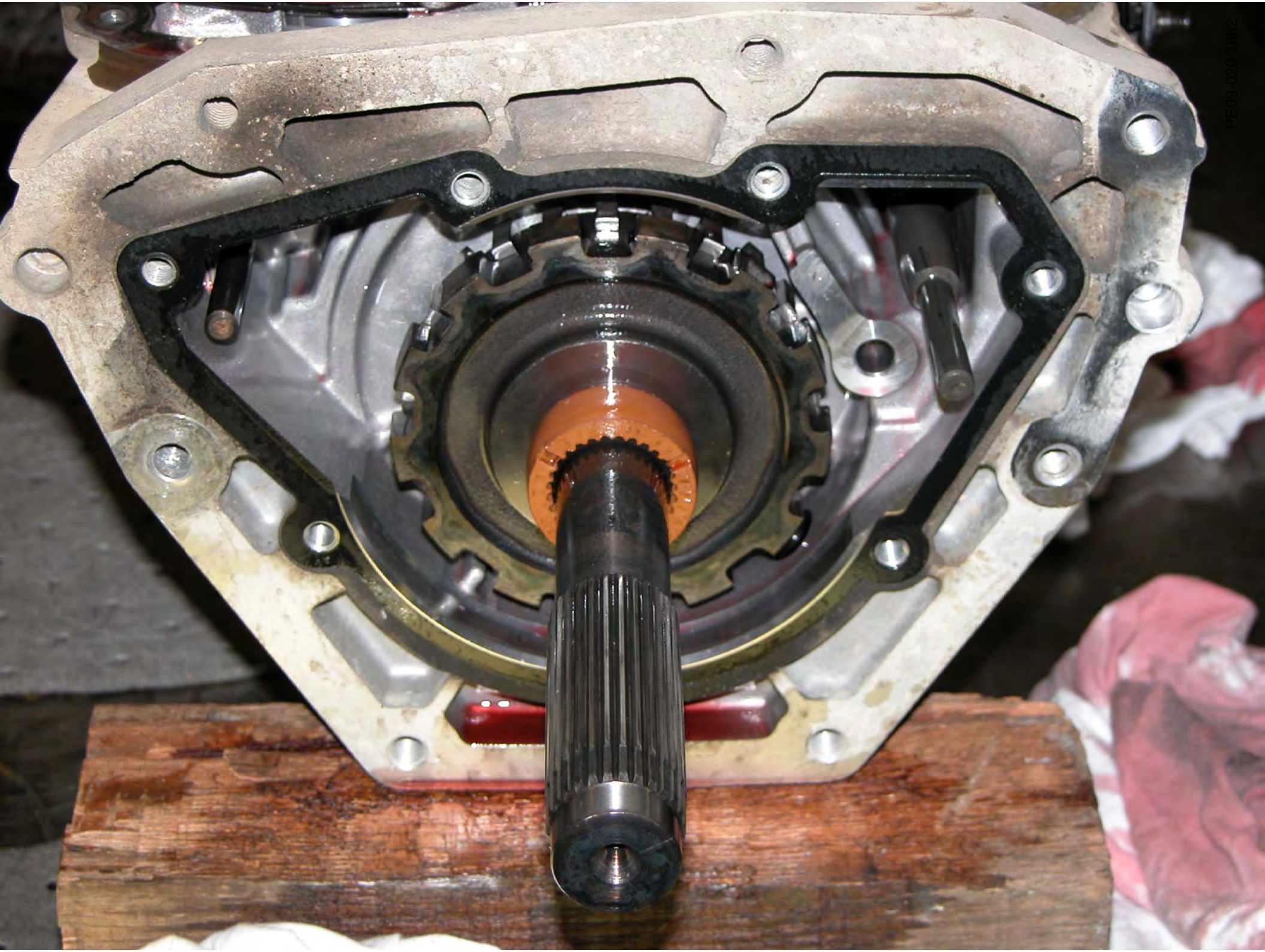
PE09-020 1842

PE09-020 1843

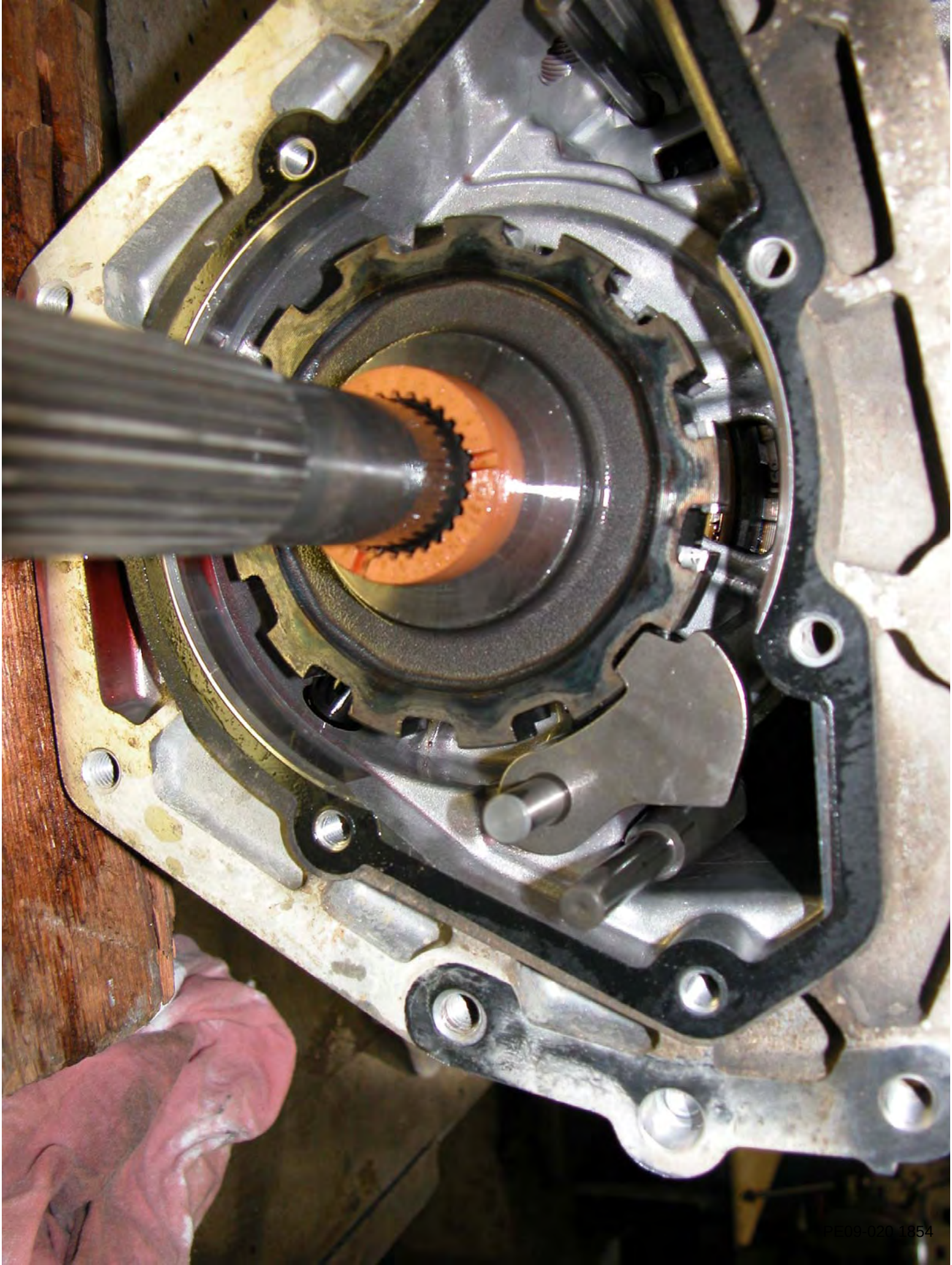
PE09-020 1844

9-020 1845

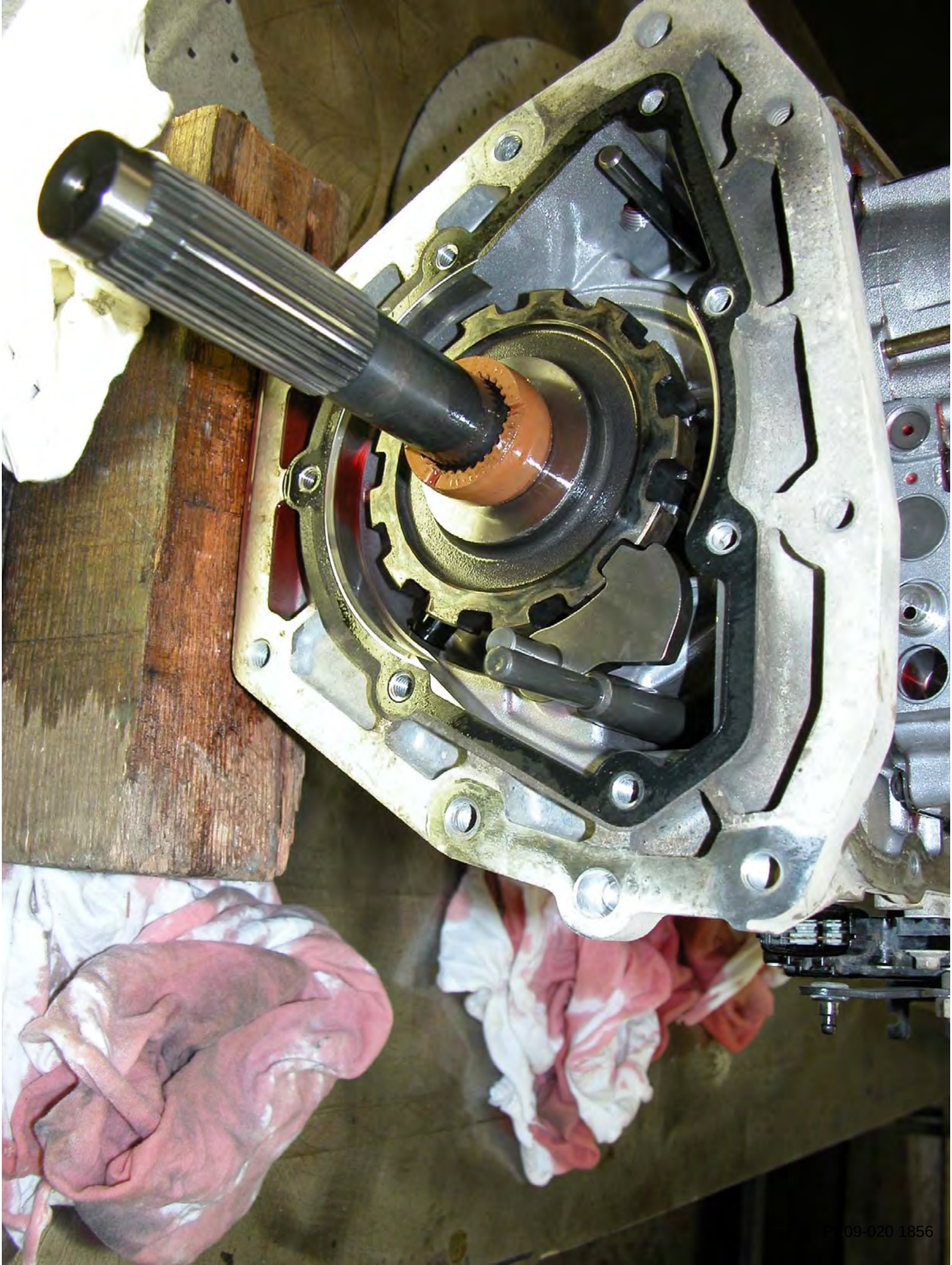




PE09-020 1853


PE09-020-1854

PE09-020 1855


P: 09-020 1856

PE09-020 1857

PE09-020 1858

PE09-020 1859

PE09-020 1860

PE09-020 1861

Case Name & Number: MUNDY 542489 Inspection Date: 2/5/08

MY & Vehicle Line: 04 FORD EXPLORER VIN: 1FM2U62KX4UB55825

Trans I.D. _____

Column Type: ___ Fixed ✓ Tilt Cable Linkage: ✓ Rod Linkage: _____ Floor Mount: _____ Column Mount: ✓

Vehicle Still in Use: ___ Yes X No Odometer: 33266

Options: A/C ✓ P/S ✓ P/B ✓ Other Options: _____

Auto Park Brake Release: ___ Yes ✓ No Roll# _____
R→P Hold _____ Frame #
P→R Release _____ Frame #

Function: Hold in P _____, Release in R _____
Hold in N _____, Release in D _____

Backup Light Function: Roll# _____
R→P Off _____ Frame #
P→R On _____ Frame #

From Park to R _____
From N to R _____
In P _____
From R to N _____
From D to N _____

Owners manual NO Cert Label ✓

Evidence of Accident(s)-Describe:

L.F. DOOR HAND PRINT

Idle Condition 800± Insert Plate

Shift Efforts NORMAL Selector Lever Roll Pin N/A

Selector Lever Return Spring OK PRNDL Light ✓

Linkage Adj. (±1/8, ± 1/16, other) -1/16 Evidence of Readings EDGE OF I-PLATE

Indicator Position (Center of Drive Detent)

Start Function: ✓ Park ✓ Neutral NO Other

Key Warning Buzzer _____ Parking Brake MIL YES

Incident Location: McDonough POST OFFICE Grade: 2° ±

Surface Condition (Pavement type, moisture, etc): Asp.

Inspection Location: _____ Grade: _____

Surface Condition (Pavement type, moisture, etc): _____

Taylor
EXHIBIT NO. 4
3/24/09
M. MOORE

Transmission Function:

Park	Drive	Overdrive
Reverse	Second	Third
Neutral	Low	First
Detent Feel		

Roll #____

N→R HR ✓ Frame #
R→P HN ✓ Frame #
R→P PT ✓ Frame #
P→R HR _____ Frame #

Park Engagement:

Hold Downhill:_____ Grade:____ Uphill Hold:_____ Grade:_____

Rolling: 1-MPH Forward:_____ 1-MPH Rearward:_____

Park Gear Teeth:_____ Pawl Actuation:_____

Pawl Return:_____

Parking Brake:

Type: FOOT

Hold at Idle: Forward_____ Reverse_____

Hold at ¼ Throttle: Forward_____ Reverse_____

Hold on Hill: Forward_____ Grade_____ Reverse_____ Grade_____

Linkage Condition:

Grommets at: Column
Manual Lever

Bellcrank: Inboard Bushing
Outboard Bushing
Inboard Grommet
Outboard Grommet

Cable Isolators_____
Cable Retaining Clip _____

Column Centering:_____ Steering Returnablity:_____

Others Present:_____

Trans Fluid Level NO STICK

4L2P 7000 AB BL2 401

A6G12

Vehicle Inspection Notes

Name: J. MUNDY Number: 542489

DAE/Rep: M.K. TAYLOR Inspection Date: 2/5/08

Inspection Location: Hoschton, GA SAFETY STORAGE VIN: 1FMZU62EX4UB55825

DOOR BUILD DATE: 03/04

Vehicle Make: FORD Vehicle Model: EXPLORER

Vehicle Color: BLUE Mileage 33266

License Plate: ATL5349

GENERAL ALLEGATIONS	P-R
VEHICLE EXTERIOR OBSERVATIONS	
VEHICLE INTERIOR OBSERVATIONS	
UNDERHOOD OBSERVATIONS	
UNDERBODY FRONT/REAR OBSERVATIONS	
TRUNK/PICKUP BED OBSERVATIONS	
OTHER OBSERVATIONS	

Police Video —

18: 10:24 - Start - Left in "R"

$\boxed{18:11:33}$ thought in "P" But it was obviously in REV

18:12:

18:14:38 —

Taylor

EXHIBIT NO. 6

3/24/09

M. MOORE

Plaintiffs

Jessica Mundy EXITED VEH. got to Sidewalk 47 64

Kenneth Mundy

Legacy Ford

Gregory Adams

Scott Phillips

Wayne Wright

Eye Witnesser

Joy Cumbie Called on phone

~~[illegible]~~ Nina Hart 3/10/2009 36 38 [Put carrier Park]

Police

Officer Robert Gardner got out not in Park

Sgt Scott Cumbie

Harry Skaggs Saw Backup lights (E)

EMT/FIREFIGHERS

Jason McCullough (EMT)

Michael GERMAN (EMT)

Chief Tom Gardner (EMT)

James Dame (EMT)

David Sterner

Natalie Sterner

McDonough Fire Dept/First Responder

ROBERT DUNCAN

Buddy Jenkins

~~David~~ Williams

Medical

Dr. Bowman

Plaintiff Experts

John Brown PH.D (Economics)

KELLY KENNETT (BIOMECHANICS) Car in "R" Not "N" 77L

GERALD ROSENBLUTH (FAILURE ANALYSIS)

KATHY WILLARD (LIFE PLAN)

DEFENCE EXPERTS

HUGH MAULDIN MARK LEE EDWARDS

TIM RHOADES

Hank LE

MATTHEW KAPLAN

Taylor
EXHIBIT NO. 11
3/24/09
M. MOORE

PE09-020 1866

3.16.09

- Remove & Measure INNER MANUAL LEVER SPRING (30N)
- ADD SECONDARY INNER MANUAL LEVER SPRING TO MAKE/PRODUCE A 15 lb.f
- Set on top of R/COMB AT P/R PEAK (MULTIPLE TIMES)
- NOT ABLE TO SHAKE VEHICLE/BUCK TO FALL INTO PARK OR REV + HIT WHEEL - HIT TRANS W/RUBBER MALLET — DID NOT MOVE
- EASIER TO OVERSHIFT TO 3 OR 2 WHEN SHIFTING FROM P—D
- MEASURE R-P ABBUTTED 10.3 lbs [15LBF]
- MEASURE R-P ABBUTTED W/30N Spring → 5.3 lbs

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

Taylor
EXHIBIT NO. 9
3/24/09
M. MOORE

Electronic	5R55E	Bordeaux	Bel	3 Bands
L/S only	52 55N	.71/(5th) Shannonville OH	"	"
Wide Ration EX/Mount only	5R 55 W	.75/5th Bordeaux	"	"
Synchronous	5R 555	.71/5th Shannonville cars	"	"
Synchronous	5R 55 S	.71/5th Bordeaux	"	"

E 99
N LS only
W 02' Jet 1 to Jet 2 only
S 02/ truck
03/ car

Taylor
EXHIBIT NO. 16
3/24/09
M. MOORE

Pg 22/L21 Not Mean. Design Defect

Page 169 L10 Defective False Park – any vehicle

① 167:14 opinion #1 Defective – False Park
168 Bleed on self shift – Self Shift

② 170 · Spring not Robust Enough

③ 170:17 170:13 Hydraulic ~~release~~ release of Reverse

187:12 15#

230:20 · What caused Accl.

231:1 In park – stays in Park

232: False Park

Not @ Park warning device

Taylor
EXHIBIT NO. 13
3/24/09
M. MOORE

PROCEDURE: 07.00-160
TITLE: TRANSMISSION SHIFT LEVER SEQUENCE, STARTER INTERLOCK, AND TRANSMISSION BRAKING EFFECT; AND TRANSMISSION CONTROL PARKING MECHANISM
REV. DATE: 30 Apr 1996

1. INTRODUCTION. This standard establishes requirements for the transmission shift lever, starter interlock and automatic transmission braking effect.

2. APPLICATION. Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses.

3. DEFINITIONS.

3.1 PASSENGER CAR, MULTIPURPOSE PASSENGER VEHICLE, TRUCKS, AND BUSES. See Vehicle Classification Reference, DR 0.00-180.

3.2 STARTER INTERLOCK is a control which is designed to prevent starting of the engine when the transmission gear selector is in any of the transmission drive gear positions.

3.3 TRANSMISSION SHIFT LEVER is the hand-operated control lever used to position the automatic transmission in park, neutral, and drive ranges, and to position the manual transmission in neutral or in the drive gears.

4. FEDERAL, STATE AND CANADIAN REQUIREMENTS.

4.1 Federal Motor Vehicle Safety Standards 102 and 105. Following is the exact text of Standard 102 issued February 3, 1967, effective January 1, 1968. Paragraph 4.1.2 sets forth portions of Standard 105, Hydraulic Brake Systems, which affect the transmission control parking mechanism when applicable, effective January 1, 1976.

4.1.1 Federal Motor Vehicle Safety Standard 102

S1. Purpose and Scope. This standard specifies the requirements for the transmission shift lever sequence, a starter interlock, and for a braking effect of automatic transmissions, to reduce the likelihood of shifting errors, starting engagement with vehicle in drive position, and to provide supplemental braking at speeds below 25 miles per hour.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

S3. Requirements.

S3.1 Automatic transmissions.

S3.1.1 Location of transmission shift lever positions on passenger cars. A neutral position shall be located between forward drive and reverse drive positions. If a steering column-mounted transmission shift lever is used, movement from

PE09-020 1870

neutral position to forward drive position shall be clockwise. If the transmission shift lever sequence includes a park position, it shall be located at the end, adjacent to the reverse drive position.

S3.1.2 Transmission braking effect. In vehicles having more than one forward transmission gear ratio, one forward drive position shall provide a greater degree of engine braking than the highest speed transmission ratio at vehicle speeds below 25 miles per hour.

S3.1.3 Starter interlock. The engine starter shall be inoperative when the transmission shift lever is in a forward or reverse drive position.

S3.1.4 Identification of shift lever positions.

S3.1.4.1 Except as specified in S3.1.4.3, if the transmission shift lever sequence includes a park position, identification of shift lever positions, including the positions in relation to each other and the position selected, shall be displayed in view of the driver whenever any of the following conditions exist:

(a) The ignition is in a position where the transmission can be shifted.

(b) The transmission is not in park.

S3.1.4.2 Except as specified in S3.1.4.3, if the transmission shift lever sequence does not include a park position, identification of shift lever positions, including the positions in relation to each other and the position selected, shall be displayed in view of the driver whenever the ignition is in a position in which the engine is capable of operation.

S3.1.4.3 Such information need not be displayed when the ignition is in a position that is used only to start the vehicle.

S3.1.4.2 Effective September 23, 1991, all of the information required to be displayed by S3.1.4.1 or S3.1.4.2 shall be displayed in view of the driver in a single location. At the option of the manufacturer, redundant displays providing some or all of the information may be provided.

S3.2 Manual transmissions. Identification of the shift lever pattern of manual transmissions, except three forward speed manual transmissions having the standard "H" pattern, shall be displayed in view of the driver at all times when a

driver is present in the driver's seating position.

4.1.2 Federal Motor Vehicle Safety Standard 105 - excerpts.

NOTE: Changes to paragraph 4.1.2 must be coordinated with Design Standard DD 6.00-151, Hydraulic Brake Systems.

S5.2.1 Except as provided in S5.2.2, the parking brake system on each passenger car, and on each multipurpose passenger vehicle, truck or bus, with a GVWR of 10,000 pounds or less, shall be capable of holding the vehicle stationary (to the limit of traction of the braked wheels) for 5 minutes, in both a forward and reverse direction on a 30 percent grade.

S5.2.2 A vehicle of a type described in S5.2.1 at the option of the manufacturer may meet the requirements of S5.2.2.1, S5.2.2.2, and S5.2.2.3 instead of the requirements of S5.2.1 if:

(a) The vehicle has a transmission or transmission control which Incorporates a parking mechanism, and

(b) The parking mechanism must be engaged before the ignition key can be removed.

S5.2.2.1 The vehicle's parking brake and parking mechanism when both are engaged, shall be capable of holding the vehicle stationary (to the limit of traction of the braked wheels) for 5 minutes, in both forward and reverse directions, on a 30 percent grade.

S5.2.2.2 The vehicle's parking brake, with the parking mechanism not engaged, shall be capable of holding the vehicle stationary for 5 minutes, in both forward and reverse directions, on a 20 percent grade.

S5.2.2.3 With the parking mechanism engaged and the parking brake not engaged, the parking mechanism shall not disengage or fracture in a manner permitting vehicle movement, when the vehicle is impacted at each end, on a level surface, by a barrier moving at 2-1/2 mph.

4.2 STATE REQUIREMENTS.

4.3 CANADIAN REQUIREMENTS. CMVSS 102 is substantially the same as FMVSS 102, therefore compliance with the Federal Standard will assure compliance with the Canadian Standard.

4.3.1 Following is the exact text of Canadian Motor Vehicle Safety Standard 102 - Transmission Shift Control Sequence as published in the Canada Gazette on November 25, 1970.

(1) With respect to vehicles equipped with an automatic transmission,

(a) the transmission control positions shall be located in

such a manner that, in the case of a passenger car,

(i) control movement between any forward and reverse drive position is impossible except through a neutral position,

(ii) a steering column mounted control lever, if used, moves clockwise from the neutral position to any forward drive position, and

(iii) a park position, if included in a control lever sequence is located at the end adjacent to the reverse drive position;

(b) one forward drive position shall provide a greater degree of engine braking than the highest speed transmission ratio at vehicle speeds below 25 miles per hour in vehicles having more than one forward transmission gear ratio; and

(c) the engine starter shall be inoperative when the transmission control is in a forward or reverse drive position.

(2) Identification of automatic transmission control positions and of the shift lever pattern of manual transmissions, except manual transmissions having three forward speeds and the standard "H" pattern, shall be permanently displayed in view of the driver of a vehicle.

5. LEGAL AND SAFETY INTERPRETATIONS.

5.1 In addition to the regulatory text for Federal and Canada Motor Vehicle Safety Standards and Regulations - as printed in this Regulatory Manual - interpretations may have been issued by the respective agencies. Also, the Automotive Safety Office has issued formal interpretative language on many of the Standards and Regulations. Because of the volume of these interpretations, it is not practical to include even a summary in this manual.

Persons interested in obtaining clarification of specific regulatory requirements should contact:

Executive Engineer, Advanced Vehicle Safety & Regulations,
Automotive Safety Office
Suite 500
Fairlane Plaza South
Dearborn, Michigan 48121-1899

Tel: (313) 322-0529

6. ENGINEERING REQUIREMENTS.

6.1 For FMVSS 102, test in accordance with the following Engineering Test Procedures:

6.1.1 SC-3, Starter Interlock Qualification Test relating to paragraph S3.1.3.

6.2 For FMVSS 105, test in accordance with Engineering Test Procedure ST-3, Transmission Parking Pawl Impact Test.

6.3 Compliance documentation shall be provided in accordance with Product Engineering Procedure FA03-202 Design Sign-off For, Federal, Canadian, and Export Motor Vehicle Safety Standards Design Sign-Off and Ford Safety Design Guidelines.

6.4 Compliance Test Plans for Federal/Canadian Motor Vehicle Safety Standards shall be as outlined in Product Engineering Procedure FA03-202.

* * * *

6HP26 — Bought Design 6R60

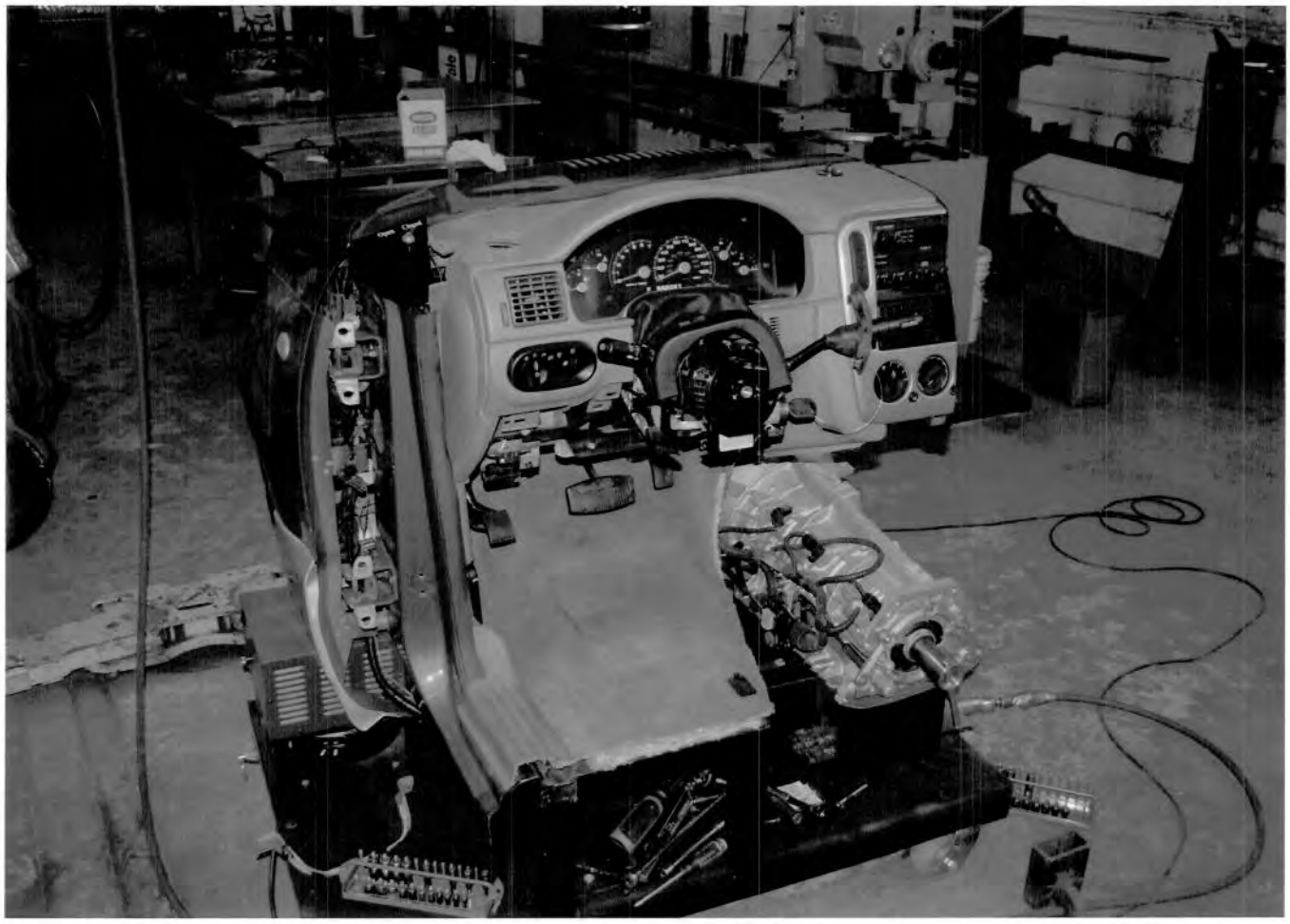
6R60 Explorer Floor Shift 06'
6R75 Exp. / Navigator 100% 07'
6R80 F-150 Floor or Column 09' Delphi

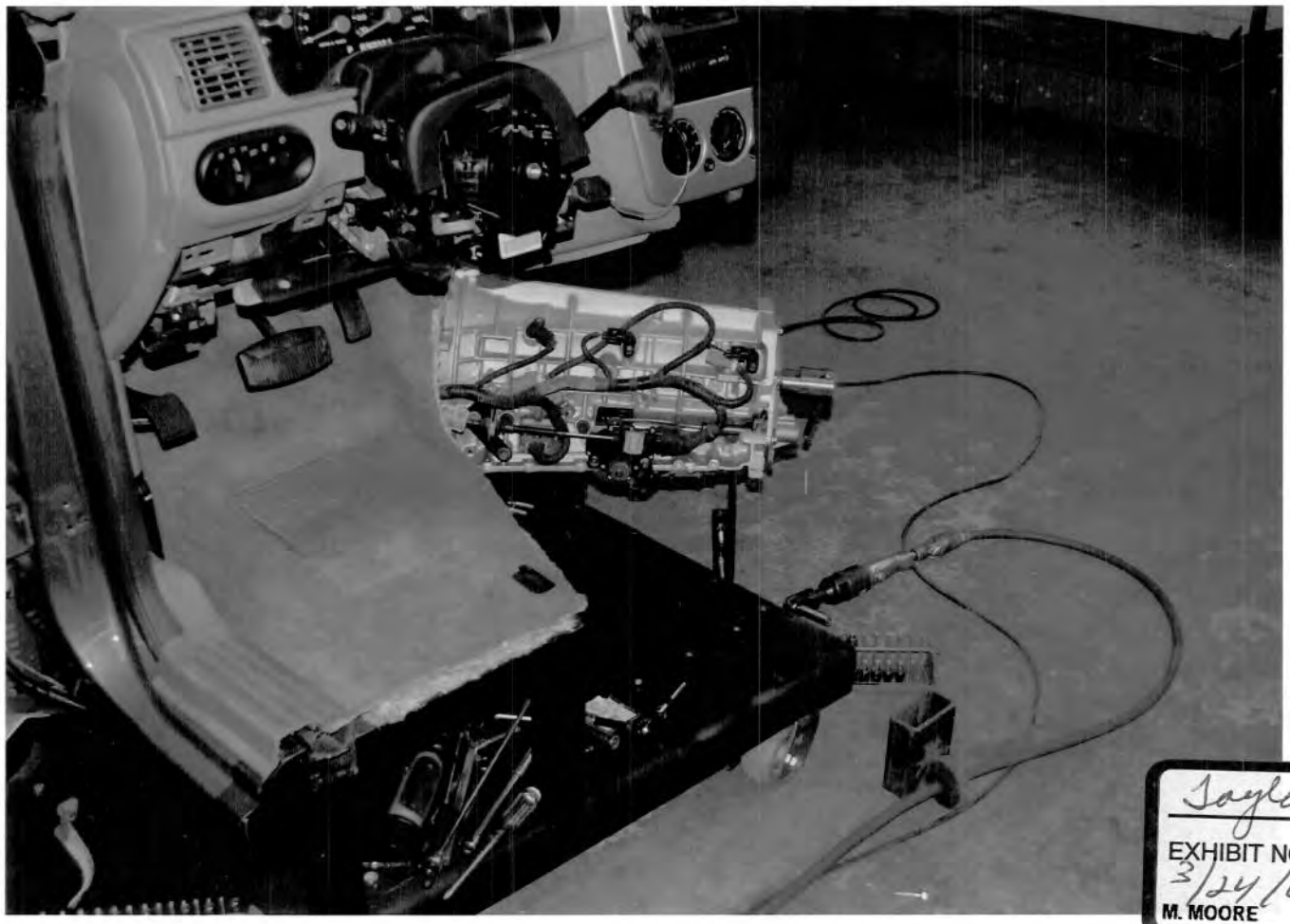
- Increases travel in System as mechanical advantage improves
- Ergonomics — for all Customers
- 201 issues

130 N Max
30% good
29#

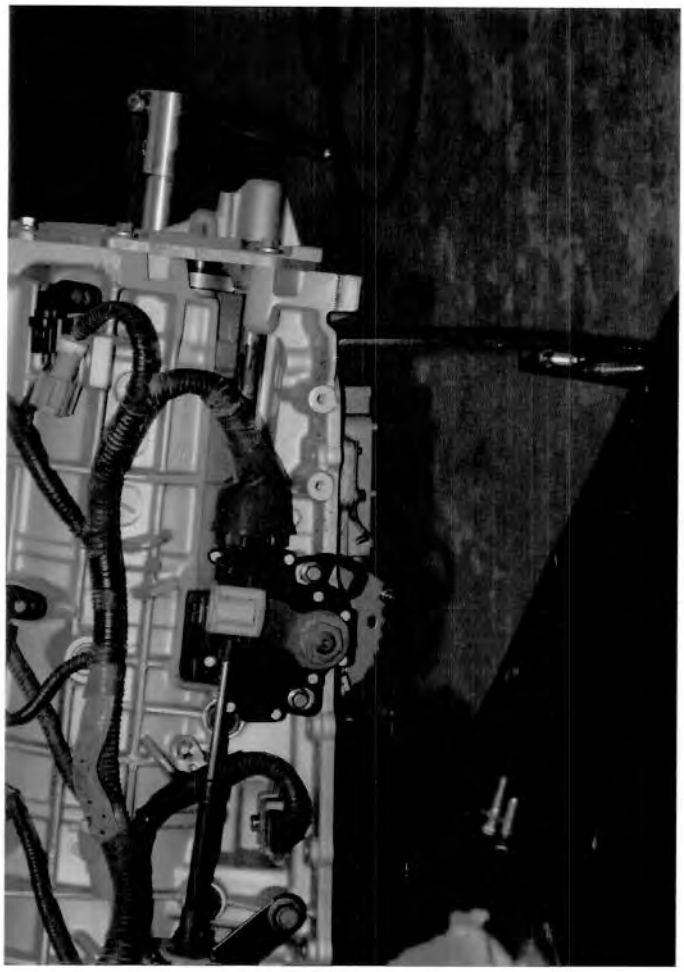
15-38
3.7 8.5

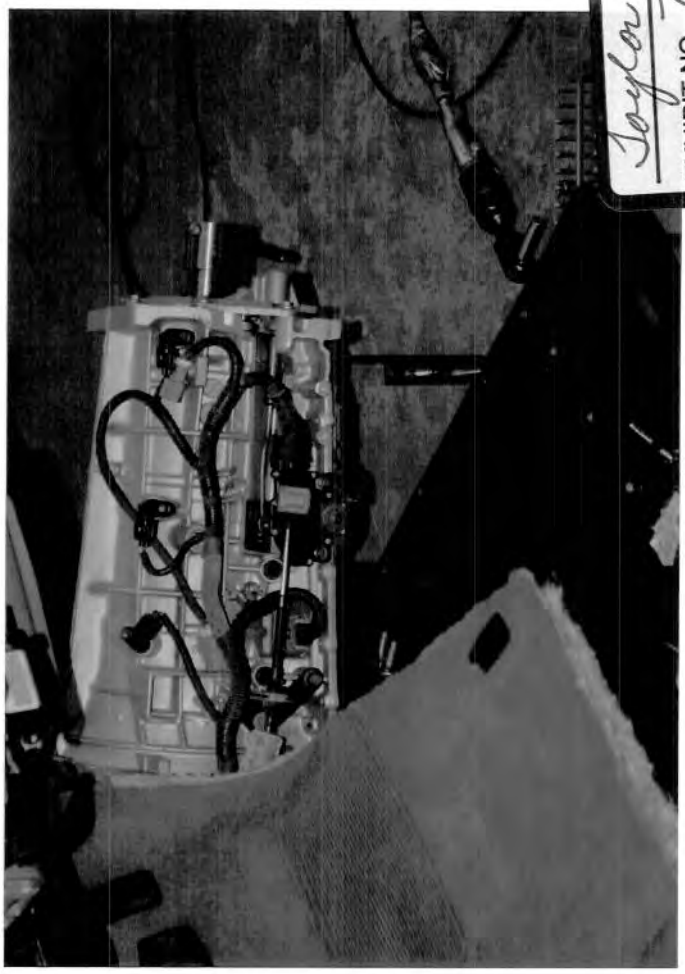
1. Read Repo
2. Check Feed's Fo



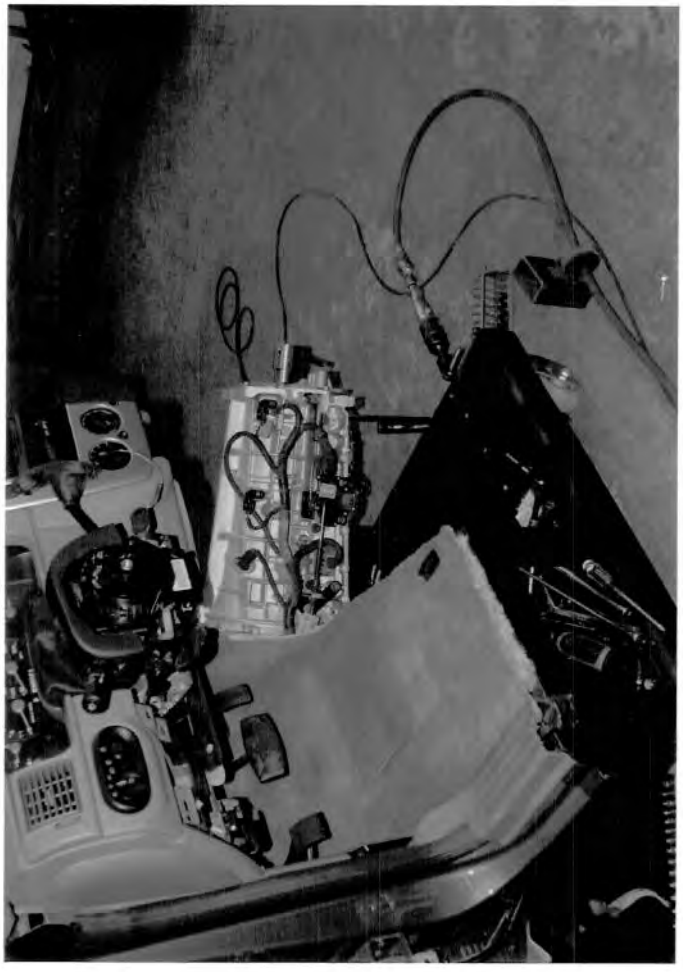


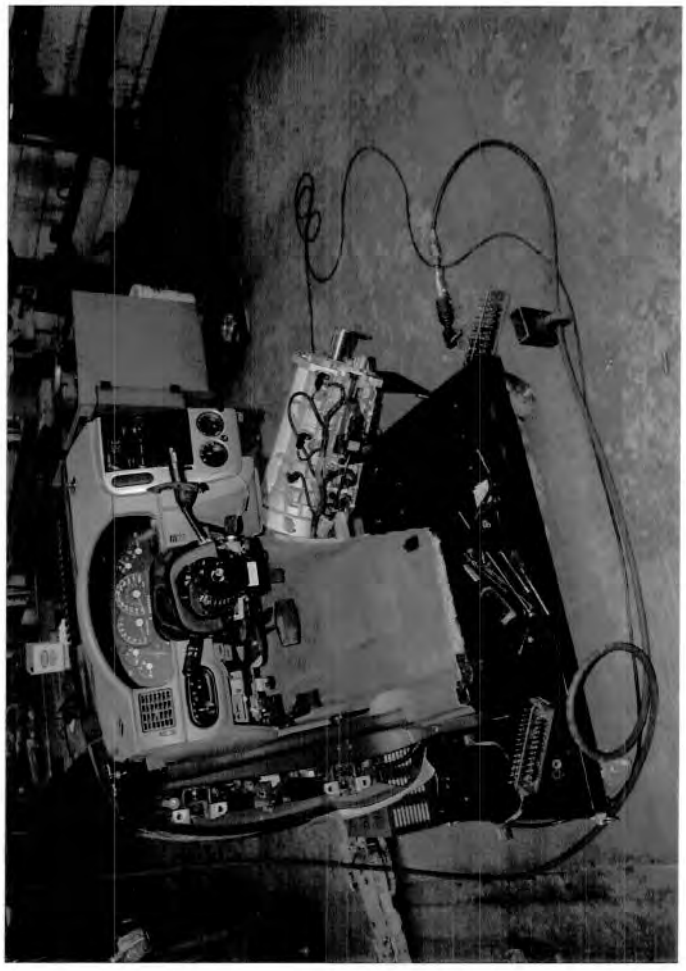
Taylor
EXHIBIT NO. 8
3/24/09
M. MOORE
PE09-020-1876





Taylor
EXHIBIT NO. 7
3/24/09
M. MOORE





Mundy ~~D Renathy 99 F-250~~ (205) 874-3475

Taylor, Mark (M.K.)

From: Taylor, Mark (M.K.)
Sent: Tuesday, November 11, 2008 2:49 AM
To: 'Mavis, John L.'
Cc: 'Ozog, Nicole M.'
Subject: Mundy

Attachments: 01-08 5R55.xls

Taylor
EXHIBIT NO. 15
3/24/09
M. MOORE

I did some work on all the 5R55 transmissions that are out there……but not included on the list. All the cars are floor shift.
97' 5R55E Aerostar, Ranger, and Explorer
98' 5R55E Ranger, Explorer and Mountaineer
99' 5R55E Ranger, Explorer and Mountaineer
00' 5R55N Lincoln LS
00' 5R55E Ranger, Sport Trac, Explorer, Mountaineer
01' 5R55N Lincoln LS
02' 5R55N Lincoln LS
03' 5R55N Lincoln LS, T-Bird 03 5
04' 5R55S Lincoln LS, T-Bird
05' 5R55S Lincoln LS, T-Bird, Mustang
06' 5R55S Lincoln LS, T-Bird, Mustang
07' 5R55S Mustang
08' 5R55S Mustang

I have also included the 01-08 list as an excel file, I need to confirm my part number with someone in Jim's group.

01-08 5R55.xls (30 KB)

Aviator 03/04/05

This took a lot longer than it should

N Lincoln 2000 – 2002

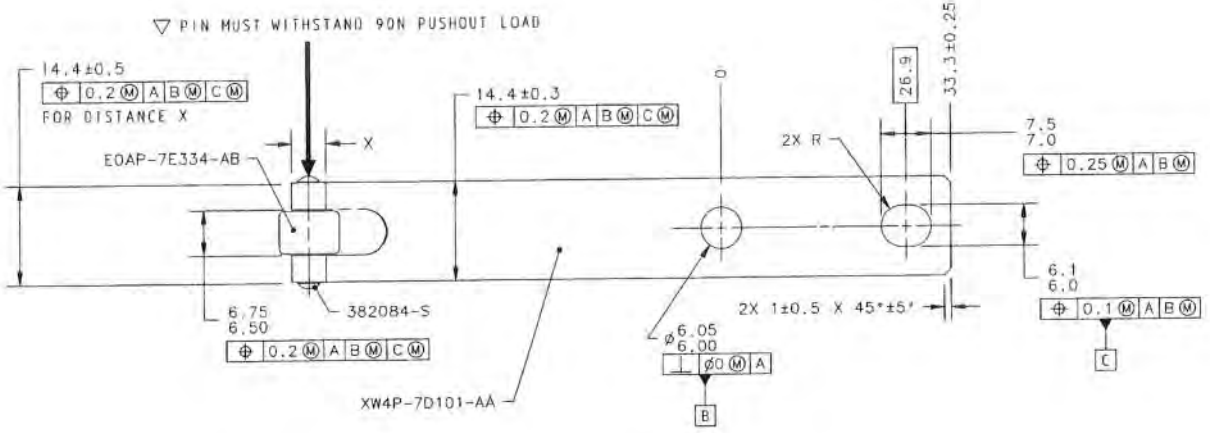
XW4P-7A441-BC Pawl
XW4P-7C494-AC Inner Manual Lever
X 7E332 - AA Spring
XW4P-7D410 -AC Apply Rod

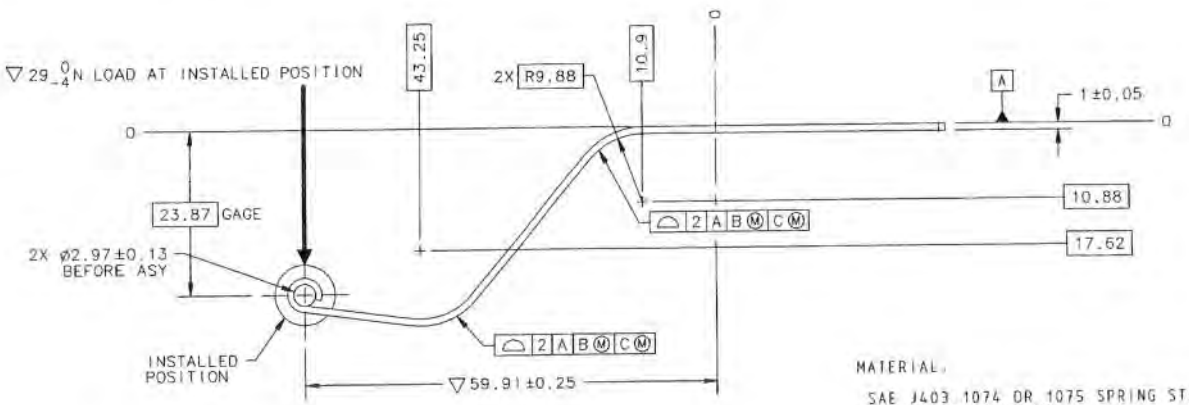
N 1. Park Pawl Different
2. Inner Manual Lever Different
3 Spring – Same
4. Pawl – Same

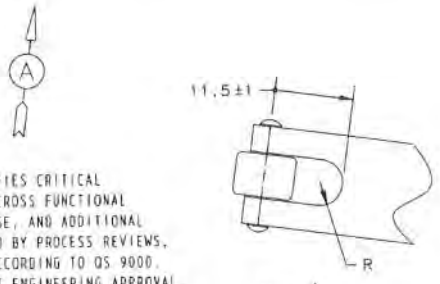
A X, R, E B
97
98
99
00
01
02
03
04
05
06
07
08
09

Vehicle and Year	Pawl	Detent Spring	Inner Manual Lever	Park Apply Rod
2001 Explorer	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2001 Mountaineer	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2001 Ranger	92GT-7A441-AA	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2001 Sport Trac	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2001 Expl. Sport	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2002 Explorer until 3/04/02	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	1L2P-7D410-AB
2002 Mountaineer until 3/04/02	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	1L2P-7D410-AB
2002 Ranger	92GT-7A441-AA	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2002 Sport Trac	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2002 Expl. Sport	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
3/4/02 Forward 02' & 2003 Explorer	1L2P-7A441-AC	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
3/4/02 Forward 02' & 2003 Mountaineer	1L2P-7A441-AC	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2003 Ranger	92GT-7A441-AA	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2003 Sport Trac	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2003 Expl Sport	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2004 Explorer	1L2P-7A441-AC	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2004 Mountaineer	1L2P-7A441-AC	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2004 Ranger 4.0L	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2004 Ranger 3.0L/2.3L	92GT-7A441-AA	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2004 Sport Trac	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2005 Explorer	1L2P-7A441-AC	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2005 Mountaineer	1L2P-7A441-AC	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2005 Ranger 4.0L	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2005 Ranger 3.0L/2.3L	92GT-7A441-AA	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2005 Sport Trac	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2006 Explorer until 1/06/06	1L2P-7A441-AC	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2006 Mountaineer until 1/06/06	1L2P-7A441-AC	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2006 Ranger 4.0L	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2006 Ranger 3.0L/2.3L	92GT-7A441-AA	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
1/06/06 06' & 2007 Explorer	6L2P-7A441-CA	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
1/06/06 06' & 2007 Mountaineer	6L2P-7A441-CA	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2007 Ranger 4.0L	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2007 Ranger 3.0L/2.3L	92GT-7A441-AA	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2007 Sport Trac	6L2P-7A441-CA	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2008 Explorer	6L2P-7A441-CA	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2008 Mountaineer	6L2P-7A441-CA	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB
2008 Ranger 4.0L	92GT-7A441-BB	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2008 Ranger 3.0L/2.3L	92GT-7A441-AA	95GT-7E332-AA	95GT-7C494-AA	97GT-7D410-AA
2008 Sport Trac	6L2P-7A441-CA	XW4P-7E332-AA	1L2P-7C494-BA	1L2P-7D410-AB

PE09-020 1879







▽ CONTROL ITEM - THE ▽ ALSO IDENTIFIES CRITICAL CHARACTERISTICS DESIGNATED BY THE CROSS FUNCTIONAL TEAMS DEVELOPING THE PRODUCT. THESE, AND ADDITIONAL CRITICAL CHARACTERISTICS IDENTIFIED BY PROCESS REVIEWS, MUST APPEAR ON THE CONTROL PLANS ACCORDING TO QS 9000. THESE CONTROL PLANS REQUIRE PRODUCT ENGINEERING APPROVAL.

MATERIAL:

SAE J403 1074 OR 1075 SPRING STEEL
HARDEN TO 42-47 HRc

CHANGES AFFECTING DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION REQUIRE PRIOR APPROVAL FROM FORD PRODUCT ENGINEERING. REFER TO QS-9000

FOR CURRENT RELEASE STATUS -
SEE THE WERS ENGINEERING NOTICE

FOR ENGINEERING APPROVED SOURCE,
SEE THE WERS ENGINEERING NOTICE

DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M-1994

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	
RELEASED				CAD: Y
NT00-E-10740109-038	970924			METALLIC
MFG APPROVAL	DHELTON 971007			NON-MET
MEIZLER	WBURDIS	JGOODEN		CORROSION

REDRAWN AFTER REV $ DATED
970924 WITH FOLLOWING REVISION
WAS CV DRAWING

A1 ADDED XW4P-7D101-AA WAS S/O SELF
REVISED & REDRAWN

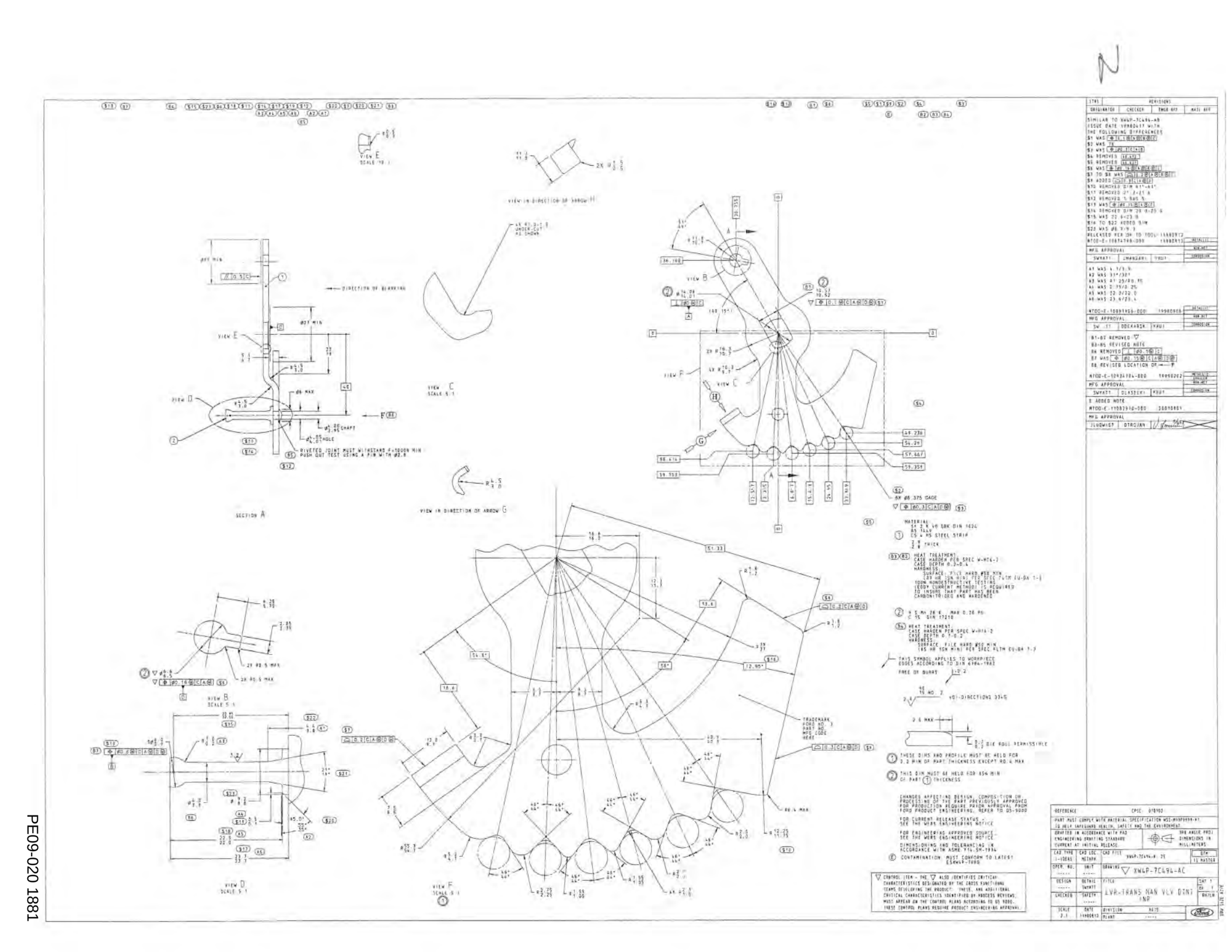
				CAD: Y
NT00-E-10816413-000	980126			METALLIC
MFG APPROVAL				NON-MET
MBROCKWA	DLASECKI			CORROSION

REFERENCE	PL-XW4P-070102-95329		
PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.			
DRAFTED IN ACCORDANCE WITH FAO ENGINEERING DRAFTING STANDARD CURRENT AT INITIAL RELEASE.		3RD ANGLE PROJ DIMENSIONS IN MILLIMETERS	
CAD TYPE S-SDRC	CAD LOC. TDM	CAD FILE XW4P-7E332-A	MICROFILM IS MASTER
OPER. NO. -----	UNIT -----	DRAWING ▽XW4P-7E332-AA	
DESIGN -----	DETAIL MEISLER	TITLE SPG ASY-TRANS MAN VLV DTNT	SHT 1 OF 1
CHECKED	SAFETY -----		RH/LH
SCALE 2:1	DATE 970917	DIVISION N61S	
		PLANT -----	

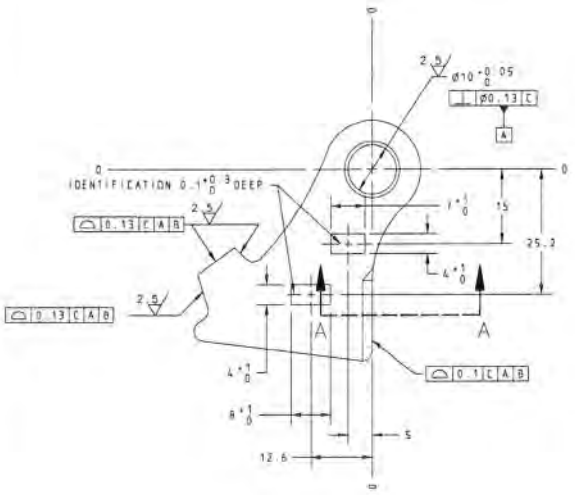
(A1) SPG XW4P-7D101-AA

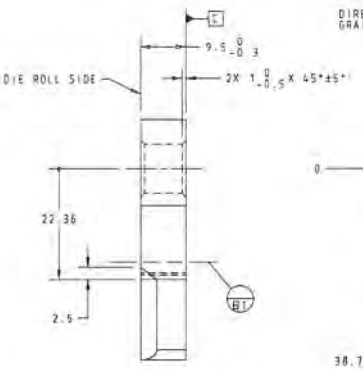
ORD SIZE A2/C

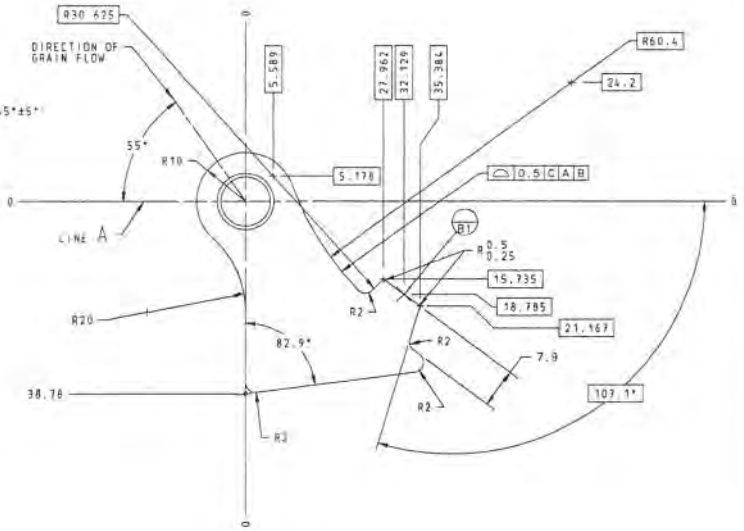
PE09-020 1880

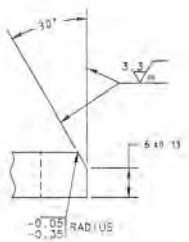


PE09-020 1881









SECTION A

▽ MATERIAL:
SAE J1268 8620-H

▽ HEAT TREATMENT:
CASE HARDENED ACC TO W-HT4-1
CASE DEPTH 0.6-0.9
HARDNESS: SURFACE: FILEHARD (SAE 1864) #58 FILE MIN
CASE HARDNESS: 58 HRC MIN
CORE: 360-520 HV 10 (MEASURED IN CROSS SECTION OF LINE A)

▽ 100% NONDESTRUCTIVE TESTING (EDDY CURRENT METHOD) IS REQUIRED TO INSURE THAT PART HAS BEEN CARBURIZED AND HARDENED

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ±0.25
ANGLES ±1°

THIS SYMBOL APPLIES TO WORKPIECE EDGES ACCORDING TO DIN 6784-1982

REMOVE ALL BURRS AND SHARP EDGES

CHANGES AFFECTING DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION REQUIRE PRIOR APPROVAL FROM FORD PRODUCT ENGINEERING. REFER TO QS-9000

FOR ENGINEERING APPROVED SOURCE, SEE THE WERS ENGINEERING NOTICE

FOR CURRENT RELEASE STATUS - SEE THE WERS ENGINEERING NOTICE

DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M-1994

Ⓐ CONTAMINATION: MUST CONFORM TO LATEST FSXW4P-7000

▽ CONTROL ITEM - THE ▽ ALSO IDENTIFIES CRITICAL CHARACTERISTICS DESIGNATED BY THE CROSS FUNCTIONAL TEAMS DEVELOPING THE PRODUCT. THESE, AND ADDITIONAL CRITICAL CHARACTERISTICS IDENTIFIED BY PROCESS REVIEWS, MUST APPEAR ON THE CONTROL PLANS ACCORDING TO QS 9000. THESE CONTROL PLANS REQUIRE PRODUCT ENGINEERING APPROVAL.

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	

RELEASED NT00-E-10740109-102 19980223 — CAD: Y, METALLIC, NON-MET, CORROSION

MFG APPROVAL
TSCHAFFE YXU1

A ADDED NOTE

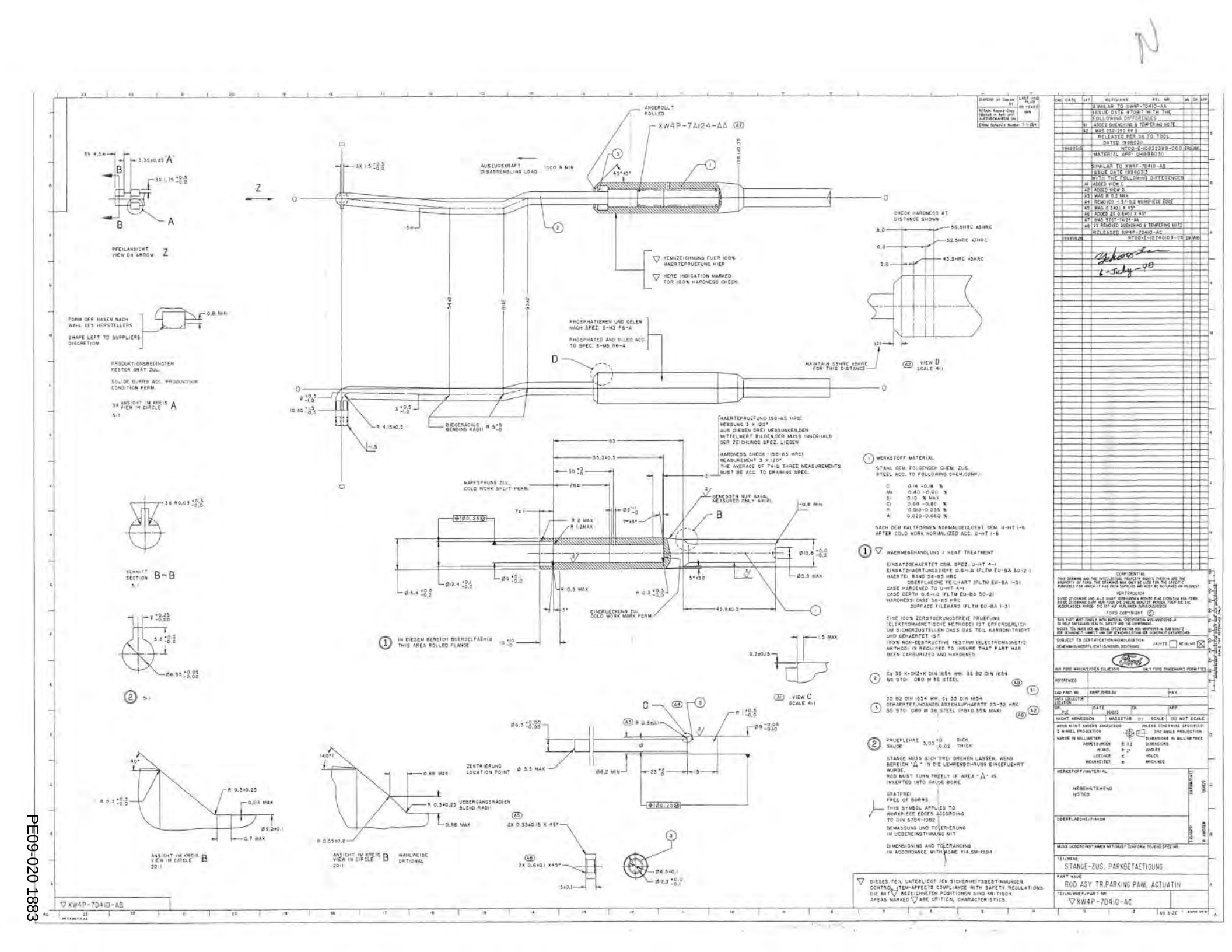
NT00-E-11082970-000 20010801

MFG APPROVAL
JLUDWIG7 DTROJAN

REFERENCE		CPSC: 870102	
PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-AT TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.			
DRAFTED IN ACCORDANCE WITH FAO ENGINEERING DRAFTING STANDARD CURRENT AT INITIAL RELEASE.		3RD ANGLE PROJ DIMENSIONS IN MILLIMETERS	
CAD TYPE I-IDEAS	CAD LOC. METAPH	CAD FILE DRW XW4P-7A441-B. 2#	DTM I5 MASTER
OPER. NO. -----	UNIT -----	DRAWING ▽XW4P-7A441-BC	
DESIGN -----	DETAIL TSCHAFFE	TITLE PWL-TRANS PRK BRK	SHT 1 OF 1
CHECKED	SAFETY -----		RH/LH
SCALE 2:1	DATE 19980227	DIVISION N615	
		PLANT -----	

DRW SIZE A1/0

PE09-020 1882



1 WERKSTOFF MATERIAL

STAHL GEM. FOLGENDER CHEM. ZUS.
STEEL ACC. TO FOLLOWING CHEM.COMP.:

C	0,14 -0,18 %
Mn	0,40 -0,60 %
Si	0,10 % MAX
Cr	0,60 -0,80 %
P	0,010-0,035 %
A	0,020-0,060 %

NACH DEM KALTFORMEN NORMALGEGLUEHT GEM. U-HT 1-6
AFTER COLD WORK NORMALIZED ACC. U-HT 1-6

1 ▽ WAERMEBEHANDLUNG / HEAT TREATMENT

EINSATZGEHAERTET GEM. SPEZ. U-HT 4-1
EINSATZHAERTUNGSTIEFE 0,6-1,0 (FLTM EU-BA 50-2)
HAERTE: RAND 58-65 HRC
OBERFLAECHE FEILHART (FLTM EU-BA 1-3)
CASE HARDENED TO U-HT 4-1
CASE DEPTH 0,6-1,0 (FLTM EU-BA 50-2)
HARDNESS: CASE 58-65 HRC
SURFACE FILEHARD (FLTM EU-BA 1-3)

EINE 100% ZERSTOERUNGSFREIE PRUEFUNG (ELEKTROMAGNETISCHE METHODE) IST ERFORDERLICH UM SICHERZUSTELLEN DASS DAS TEIL KARBONITRIERT UND GEHAERTET IST.
100% NON-DESTRUCTIVE TESTING (ELECTROMAGNETIC METHOD) IS REQUIRED TO INSURE THAT PART HAS BEEN CARBURIZED AND HARDENED.

2 Ck 35 K+SK2+K DIN 1654 WN. 35 B2 DIN 1654 BS 970- 080 M 36 STEEL AB S1

3 35 B2 DIN 1654 WN. Ck 35 DIN 1654 GEHAERTETUNDANGELASSENAUFHAERTE 23-32 HRC BS 970- 080 M 36 STEEL (PB+0,35% MAX) AB A2

2 PRUEFLEHRE GAUGE 3,05 +0 -0,02 DICK THICK

STANGE MUSS SICH FREI DREHEN LASSEN, WENN BEREICH "A" IN DIE LEHRENBOHRUNG EINGEFUEHRT WURDE.
ROD MUST TURN FREELY IF AREA "A" IS INSERTED INTO GAUGE BORE.

GRATFREI
FREE OF BURRS

THIS SYMBOL APPLIES TO WORKPIECE EDGES ACCORDING TO DIN 6784-1982

BEMASSUNG UND TOLERIERUNG IN UEBEREINSTIMMUNG MIT

DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M-1994

▽ DIESES TEIL UNTERLIEGT DEN SICHERHEITSBESTIMMUNGEN.
CONTROL ITEM-AFFECTS COMPLIANCE WITH SAFETY REGULATIONS.
DIE MIT ▽ BEZEICHNETEN POSITIONEN SIND KRITISCH.
AREAS MARKED ▽ ARE CRITICAL CHARACTERISTICS.

CAD	DATE	LET	REVISIONS	REL. NR.	DR	CK	APP.
			SIMILAR TO XW4P-7D410-AA				
			ISSUE DATE 970317 WITH THE				
			FOLLOWING DIFFERENCES				
		S1	ADDED QUENCHING & TEMPERING NOTE				
		S2	WAS 230-280 HV 5				
			RELEASED PER ON TO TOOL				
			DATED 990803)				
990803	US		NTOO-E-10832289-000 (990803)				
			MATERIAL APP. CHANGED S1)				
			SIMILAR TO XW4P-7D410-AB				
			ISSUE DATE 990803				
			WITH THE FOLLOWING DIFFERENCES				
		A1	ADDED VIEW C				
		A2	ADDED VIEW D				
		A3	WAS R 0,2 MAX				
		A4	REMOVED -1,5/-0,3 WORKPIECE EDGE				
		A5	WAS 0,3X0,3 X 45°				
		A6	ADDED 2X 0,6±0,1 X 45°				
		A7	WAS 97ST-7A24-AA				
		A8	2X REMOVED QUENCHING & TEMPERING NOTE				
			RELEASED XW4P-7D410-AC				
990826	IN		NTOO-E-10740109-(IB)	SB WHO			

6-July-99

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VERTRAULICH

DIESE ZEICHNUNG UND ALLE DARIN VERKOERPERTEN RECHTE SIND EIGENTUM VON FORD. DIESE ZEICHNUNG DARF NUR FUER DIE ZWECKE BENUTZT WERDEN, FUER DIE SIE VOM HERSTELLER ZUR VERFUEGUNG GESTELLT WURDE. AUF VERLANGEN SIND SIE AN FORD ZURUECKZUGEBEN.

FORD COPYRIGHT ©

THIS PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P1999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.

DIESES TEIL MUSS DER MATERIAL SPEZIFIKATION WSS-M99P1999-A1 ZUM SCHUTZ DER GESUNDHEIT, SICHERHEIT UND DER UMWELTBEDINGUNGEN ENTSPRECHEN.

SUBJECT TO CERTIFICATION/HOMOLOGATION

GENEHMIGUNGSPFLICHTIG/HOMOLOGIERUNG JA/YES ☐ NEIN/NO ☒

NUR FORD WARENZEICHEN ZULAESSIG — ONLY FORD TRADEMARKS PERMITTED

REFERENCES		
CAD PART NO.	XW4P-7D410-AB	REV.
DATA COLLECTOR LOCATION		
DR. PSE	DATE 990825	CK. APP.

RIGHT ARMRESTR. | MASSSTAB 2:1 | SCALE | DO NOT SCALE

WENN NICHT ANDERS ANGEGEBEN
1. WINKEL PROJEKTION

UNLESS OTHERWISE SPECIFIED:
3RD ANGLE PROJECTION

MASSE IN MILLIMETER
ABMESSUNGEN
WINKEL
LOECHER
BEARBEITET

DIMENSIONS IN MILLIMETRES
± 0,1 DIMENSIONS
± 2° ANGLES
± HOLES
± MACHINED

WERKSTOFF/MATERIAL

NEBENSTEHEND
NOTED

ERSTMUSTER
SERIE

OBERFLAECHE/FINISH

MUSS GEMAESS FORD SPEZ. WSS-M99P1999-A1 ENTSPRECHEN
MUST CONFORM TO FORD SPEC WSS-M99P1999-A1

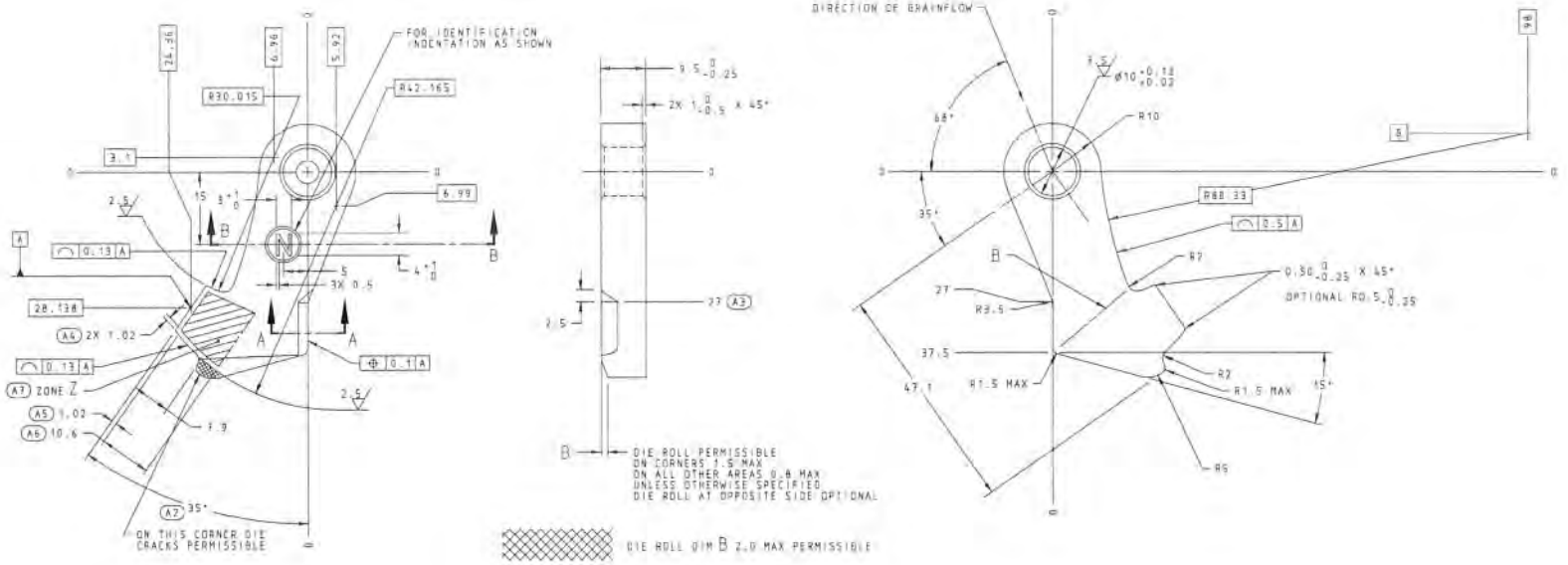
TEILNAME
STANGE-ZUS. PARKBETAETIGUNG

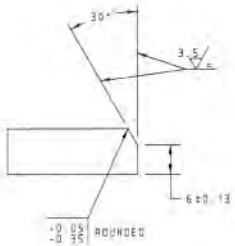
PART NAME
ROD ASY TR,PARKING PAWL ACTUATIN

TEILNUMMER/PART NR
▽XW4P-7D410-AC

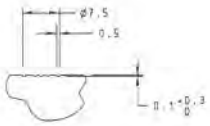
▽XW4P-7D410-AB

PE09-020 18883





SECTION A
SCALE 4:1



SECTION B
SCALE 4:1

MATERIAL:
21 Ni Cr Mo2 DIN 17210 MH BAND
MC QUAID-EHN 5-8

(A9) ▽HEAT TREATMENT:
CARBURIZE AND HARDEN PER FORD MFG STD WHT4-1
SURFACE HARDNESS 58 HRC MIN
EFFECTIVE CASE DEPTH 0.6-0.9 (FLTM EUBA 50-2)
MEASURE EFFECTIVE CASE TO 50 HRC
CORE HARDNESS: 360-520 HV 5 (MEASURED IN CROSS SECTION OF LINE B)
TEMPER AT LEAST ONE HOUR AT 149°C (300°F) MIN

100% SURFACE HARDNESS CHECK TO BE CONDUCTED WITHIN ZONE Z TO 58 HRC MIN

(A1) VOLUME OF CAD MODEL = (8.503 cm³)

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ±0.25
ANGLES ±1°

▽CORE HARDNESS AND CASE DEPTH:
VALUES OF CORE HARDNESS ARE BASED ON A CAPABILITY STUDY OF ONE MAT BATCH (x±3s). PRODUCTION PARTS HAVE TO BE IN ACCORDANCE WITH SPEC PARTS MADE FROM EACH MAT BATCH HAVE TO BE SUBJECTED TO A NEW CAPABILITY STUDY. CHECK 5 PARTS FROM EACH STOVE BATCH. CHECK FROM EACH NEW MAT BATCH FROM 3 STOVE BATCH EACH 20 PARTS.
IF THE SPECIFIED CORE HARDNESS (360-520 HV 5) NOT BE ATTAINED, A NEW VALIDATION IS REQUIRED.
THIS REQUIREMENT IS VALID AS LONG AS ALL DIFFERENT POSSIBLE MAT BATCH ARE CHECKED WITHIN THE RELEASED MAT SPECIFICATION.

(A8) REMOVE ALL BURRS AND SHARP EDGES.

CHANGES AFFECTING DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION REQUIRE PRIOR APPROVAL FROM FORD MOTOR COMPANY PRODUCT ENGINEERING. REFER TO QS-9000.

(A10) FOR ENGINEERING APPROVED SOURCE, SEE THE WERS ENGINEERING NOTICE.

FOR CURRENT RELEASE STATUS, SEE THE WERS ENGINEERING NOTICE.

DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M-1994.

▽CONTROL ITEM-THE▽ALSO IDENTIFIES CRITICAL CHARACTERISTICS DESIGNATED BY THE CROSS FUNCTIONAL TEAMS DEVELOPING THE PRODUCT. THESE, AND ADDITIONAL CRITICAL CHARACTERISTICS IDENTIFIED BY PROCESS REVIEWS, MUST APPEAR ON THE CONTROL PLANS ACCORDING TO QS-9000. THESE CONTROL PLANS REQUIRE PRODUCT ENGINEERING APPROVAL.

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	
RELEASED				
FT00-E-10197594-000		19920425		
TR	SH	R		

REDRAWN AFTER RELEASE DATED 19920425 WITH THE FOLLOWING REVISIONS:

A1 ADDED VOLUME
A2 TO A6 ADDED DIMENSIONS
A7 ADDED ZONE Z
A8 REMOVED NOTE
A9 REVISED NOTE
A10 ADDED STANDARD NOTES

NT00-E-11757587-000 20060125

MDOSH	KAHMED	KAHMED	DG20060118

REFERENCE CPSC 070102

PART MUST COMPLY WITH RESTRICTED SUBSTANCE MANAGEMENT STANDARD WSS-M99P9999-A1 TO SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS VERSION 15.0

3RD ANGLE PROJ. DIMENSIONS ARE IN MILLIMETERS

CAD TYPE	CAD LOC.	CAD FILE	DTM IS MASTER
I-IDEAS	TCE	92GT-7A441-B ;7	
OPER. NO.	UNIT	DRAWING	
-----	-----	▽92GT-7A441-BB	
DESIGN	DETAIL	TITLE	SHT 1
-----	TR	PWL-TRANS PRK BRK	OF 1
CHECKED	SAFETY		
KAHMED	-----		
SCALE	DATE	DIVISION N&S	
2:1	19920425	PLANT -----	

FORD MOTOR COMPANY

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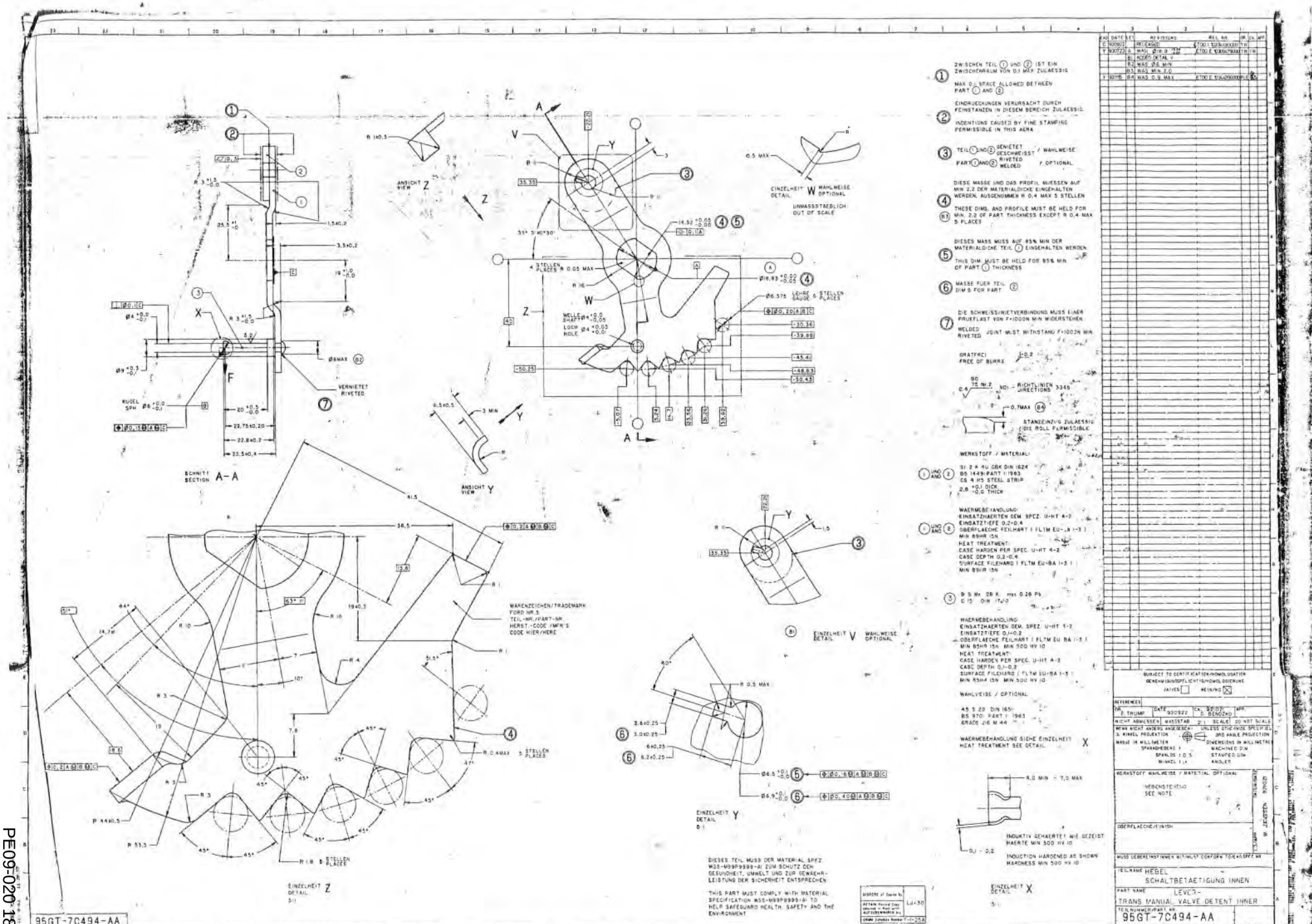
PE09-020 1884



1. ZWISCHEN TEIL (1) UND (2) IST EIN ZWISCHENRAUM VON 0,1 MAX ZULAESSIG
   MAX 0,1 SPACE ALLOWED BETWEEN PART (1) AND (2)
2. EINDRUECKUNGEN VERURSACHT DURCH FEINSTANZEN IN DIESEM BEREICH ZULAESSIG
   INDENTIONS CAUSED BY FINE STAMPING PERMISSIBLE IN THIS AERA
3. TEIL (1) UND (2) GENIETET / GESCHWEISST / WAHLWEISE
   PART (1) AND (2) RIVETED / WELDED / OPTIONAL
4. DIESE MASSE UND DAS PROFIL MUESSEN AUF MIN 2,2 DER MATERIALDICKE EINGEHALTEN WERDEN, AUSGENOMMEN R 0,4 MAX 5 STELLEN
   THESE DIMS. AND PROFILE MUST BE HELD FOR MIN. 2,2 OF PART THICKNESS EXCEPT R 0,4 MAX 5 PLACES
5. DIESES MASS MUSS AUF 85% MIN DER MATERIALDICKE TEIL (1) EINGEHALTEN WERDEN
   THIS DIM MUST BE HELD FOR 85% MIN OF PART (1) THICKNESS
6. MASSE FUER TEIL (2)
   DIM'S FOR PART (2)
7. DIE SCHWEISS/NIETVERBINDUNG MUSS EINER PRUEFLAST VON F=1000N MIN WIDERSTEHEN
   WELDED / RIVETED JOINT MUST WITHSTAND F=1000N MIN

GRATFREI / FREE OF BURRS 1-0,2

80 75 Nr.2 0,4 VDI - RICHTLINIEN / DIRECTIONS 3345

0,7 MAX (84) STANZEINZUG ZULAESSIG / DIS ROLL PERMISSIBLE

WERKSTOFF / MATERIAL:
(1) UND (2) St 2 4 KU GBK DIN 1624
BS 1449: PART 1: 1983
CS 4 HS STEEL STRIP
2,0 +0,1 DICK -0,0 THICK

(1) UND (2) WAERMEBEHANDLUNG:
EINSATZHAERTEN GEM. SPEZ. U-HT 4-2
EINSATZTIEFE 0,2-0,4
OBERFLAECHE FEILHART (FLTM EU-BA 1-3)
MIN 89HR 15N
HEAT TREATMENT:
CASE HARDEN PER SPEC. U-HT 4-2
CASE DEPTH 0,2-0,4
SURFACE FILEHARD (FLTM EU-BA 1-3)
MIN 89HR 15N

(3) B 3 Mn 28 K, max 0,28 Pb
C 15 DIN 17210

(8) WAERMEBEHANDLUNG:
EINSATZHAERTEN GEM. SPEZ. U-HT 1-2
EINSATZTIEFE 0,1-0,2
OBERFLAECHE FEILHART (FLTM EU BA 1-3)
MIN 85HR 15N MIN 500 HV 10
HEAT TREATMENT:
CASE HARDEN PER SPEC. U-HT 4-2
CASE DEPTH 0,1-0,2
SURFACE FILEHARD (FLTM EU-BA 1-3)
MIN 85HR 15N MIN 500 HV 10

WAHLWEISE / OPTIONAL
45 S 20 DIN 1651
BS 970: PART 1: 1983
GRADE 216 M 44

WAERMEBEHANDLUNG SIEHE EINZELHEIT X
HEAT TREATMENT SEE DETAIL X

REV	DATE	REVISIONS	REL NR	DR	CK	APP
C	920907	RELEASED	ETOO E 95AA9000BTH			
Y	930722	A WAS Ø14,9 +0,2 -0,0 NEW Ø14,9 +0,1 -0,0	ETOO E 95AA9000BTH			
		B1 ADDED DETAIL Y				
		B2 WAS Ø6 MIN				
		B3 WAS MIN 2,0				
Y	931116	B4 WAS 0,9 MAX	ETOO E 95AA9000BTH			

SUBJECT TO CERTIFICATION/KONTROLLSTATION
GENEHMIGUNGSPFLICHT/KONTROLLSTELLE
JA/YES ☐ NEIN/NO ☒

REFERENCES

DR	DATE	CK	APP
F. TRUMP	920922	D. BENZKO	

NICHT BEMASSEN / MASSSTAB 2:1 / SCALE: DO NOT SCALE
WENN NICHT ANDERS ANGEGEBEN / UNLESS OTHERWISE SPECIFIED
3. WINKEL PROJEKTION / 3RD ANGLE PROJECTION
MASSE IN MILLIMETER / DIMENSIONS IN MILLIMETRE
SPANABHEBEND / MACHINED DIN
SPANLOS / STAMPED DIN
WINKEL / ANGLES

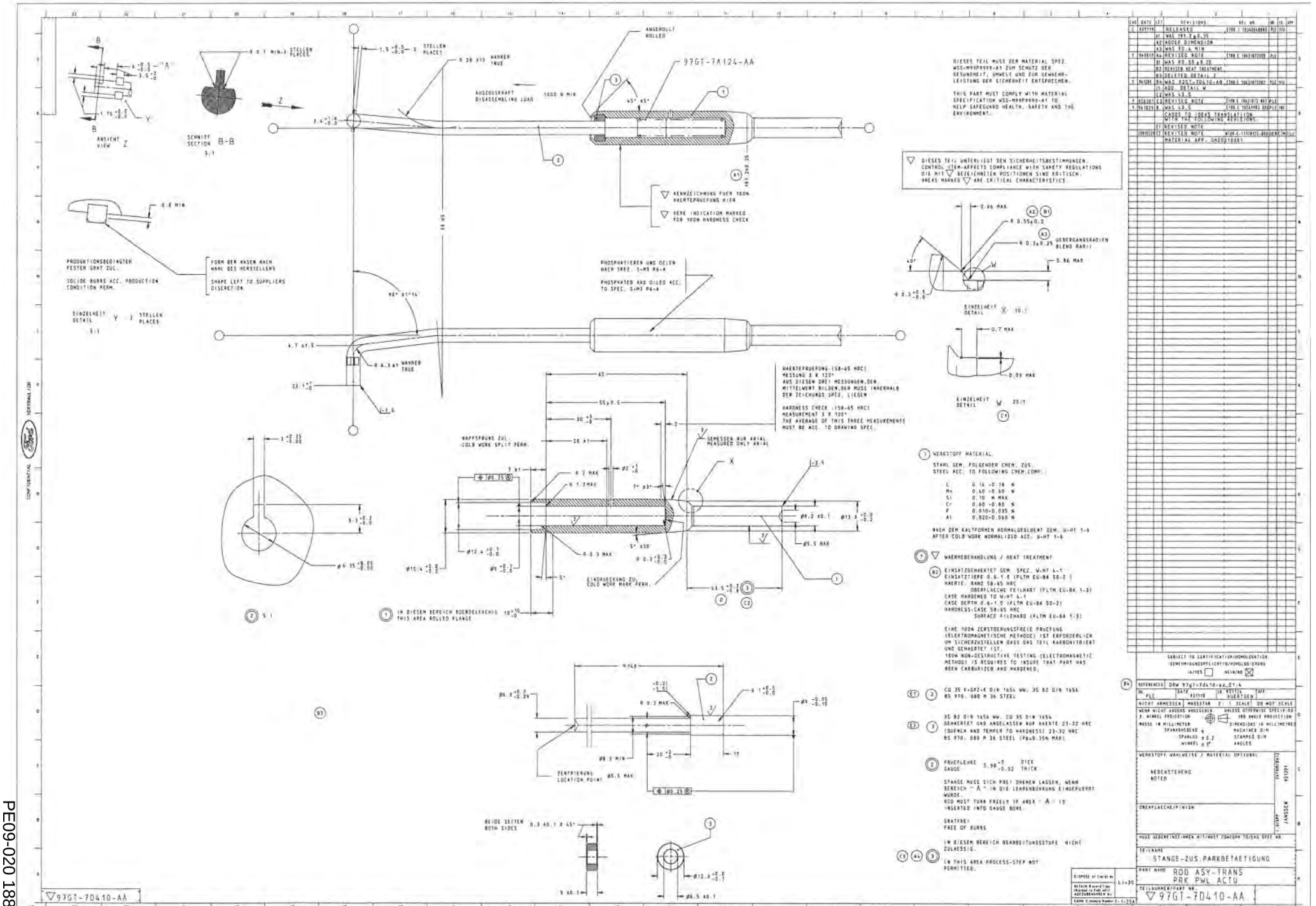
WERKSTOFF WAHLWEISE / MATERIAL OPTIONAL
SIEHE NOTE / SEE NOTE
OBERFLAECHE / FINISH
MUSS UEBEREINSTIMMEN MIT MUSTER CONFORM TO EXAMPLE

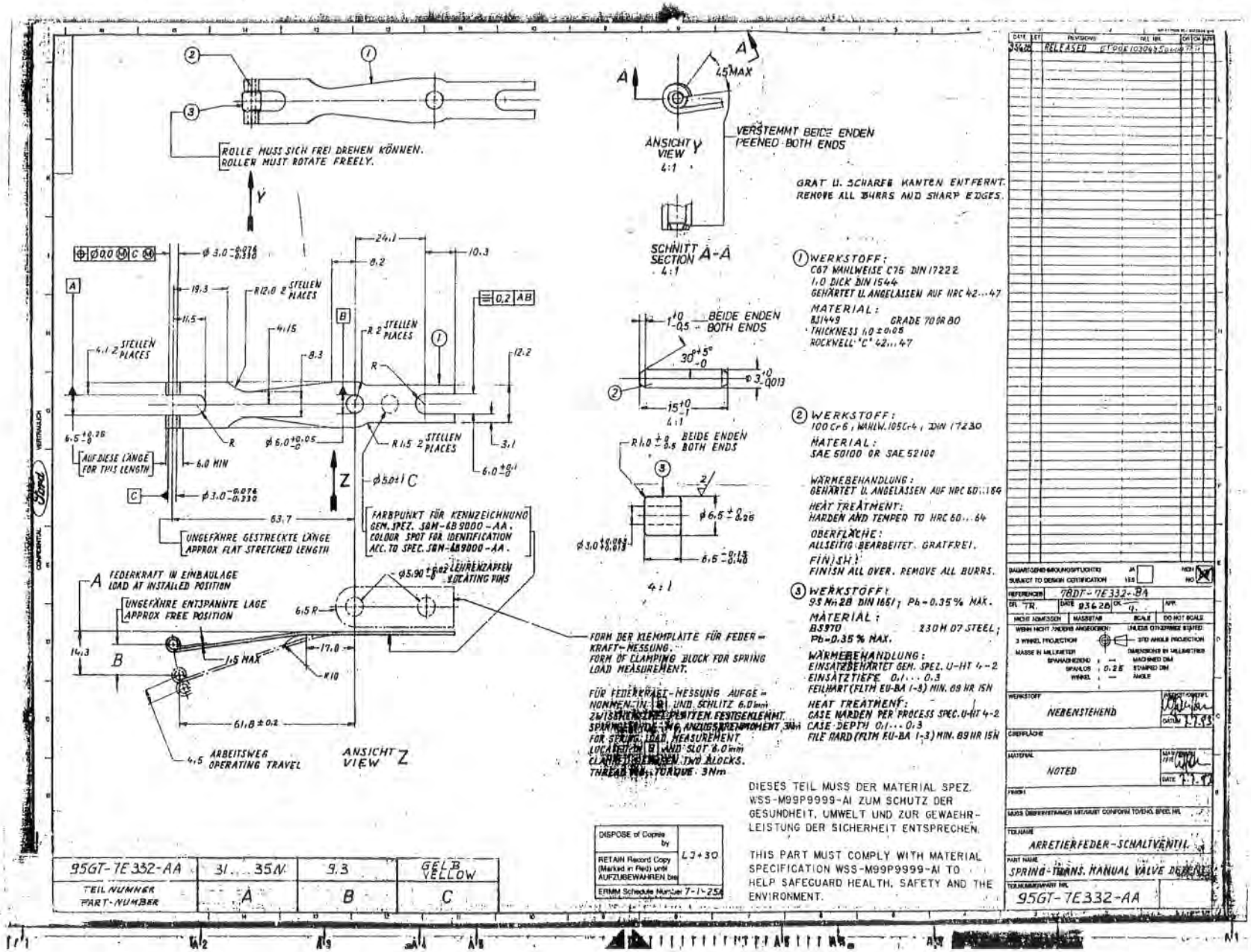
TEILNAME HEBEL
SCHALTBETAETIGUNG INNEN
PART NAME LEVER -
TRANS MANUAL VALVE DETENT INNER
TEILNUMMER/PART NO.
95GT-7C494-AA

95GT-7C494-AA

ORIGINAL

PE09-020 1885


97GT-7A124-AA
ANSICHT Z
VIEW Z
SCHNITT B-B
SECTION B-B
5:1
EINZELHEIT Y 3 STELLEN PLACES
DETAIL Y 5:1
EINZELHEIT X 10:1
DETAIL X
EINZELHEIT W 20:1
DETAIL W
ANGEROLLT
ROLLED
AUSZUGSKRAFT 1000 N MIN
DISASSEMBLING LOAD
PRODUKTIONSBEDINGTER FESTER GRAT ZUL.
SOLIDE BURRS ACC. PRODUCTION CONDITION PERM.
FORM DER NASEN NACH WAHL DES HERSTELLERS
SHAPE LEFT TO SUPPLIERS DISCRETION
PHOSPHATIEREN UND OELEN NACH SPEZ. S-NT R6-A
PHOSPHATED AND OILED ACC. TO SPEC. S-NT R6-A
KERBZEICHNUNG FUER 100% HAERTEPRUEFUNG HIER
HERE INDICATION MARKED FOR 100% HARDNESS CHECK
HAERTEPRUEFUNG (58-65 HRC)
MESSUNG 3 X 120°
AUS DIESEN DREI MESSUNGEN DEN MITTELWERT BILDEN, DER MUSS INNERHALB DER ZEICHNUNGS SPEZ. LIEGEN
HARDNESS CHECK (58-65 HRC)
MEASUREMENT 3 X 120°
THE AVERAGE OF THIS THREE MEASUREMENTS MUST BE ACC. TO DRAWING SPEC.
KAPPSPRUNG ZUL. COLD WORK SPLIT PERM.
GEMESSEN NUR AXIAL MEASURED ONLY AXIAL
EINPRAEGUNG ZUL. COLD WORK MARK PERM.
IN DIESEM BEREICH BOERDELFREIHEIG
THIS AREA ROLLED FLANGE
BEIDE SEITEN BOTH SIDES
PENTRIERUNG LOCATION POINT
DIESES TEIL MUSS DER MATERIAL SPEZ. WSS-M99P9999-A1 ZUM SCHUTZ DER GESUNDHEIT, UMWELT UND ZUR GEWAEHRLEISTUNG DER SICHERHEIT ENTSPRECHEN.
THIS PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.
DIESES TEIL UNTERLIEGT DEN SICHERHEITSBESTIMMUNGEN. CONTROL ITEM-AFFECTS COMPLIANCE WITH SAFETY REGULATIONS
DIE MIT ▽ BEZEICHNETEN POSITIONEN SIND KRITISCH. AREAS MARKED ▽ ARE CRITICAL CHARACTERISTICS
WERKSTOFF MATERIAL
STAHL GEM. FOLGENDER CHEM. ZUS. STEEL ACC. TO FOLLOWING CHEM.COMP.:
C 0.16 -0.26 %
Mn 0.60 -0.80 %
Si 0.10 % MAX
Cr 0.60 -0.80 %
P 0.010-0.035 %
Al 0.020-0.060 %
NACH DEM KALTFORMEN NORMALGEGLUEHT GEM. W-NT 1-6
AFTER COLD WORK NORMALIZED ACC. W-NT 1-6
▽ WAERMEBEHANDLUNG / HEAT TREATMENT
EINSATZGEHAERTET GEM. SPEZ. W-NT 4-1
EINSATZTIEFE 0.6-1.0 (FLTH EU-BA 50-2)
HAERTE: RAND 58-65 HRC
OBERFLAECHE FEILHART (FLTH EU-BA 1-3)
CASE HARDENED TO W-NT 4-1
CASE DEPTH 0.6-1.0 (FLTH EU-BA 50-2)
HARDNESS: CASE 58-65 HRC
SURFACE FILEHARD (FLTH EU-BA 1-3)
EINE 100% ZERSTOERUNGSFREIE PRUEFUNG (ELEKTROMAGNETISCHE METHODE) IST ERFORDERLICH UM SICHERZUSTELLEN DASS DAS TEIL KARBONITRIERT UND GEHAERTET IST.
100% NON-DESTRUCTIVE TESTING (ELECTROMAGNETIC METHOD) IS REQUIRED TO INSURE THAT PART HAS BEEN CARBURIZED AND HARDENED.
CQ 35 K+QT2-K DIN 1654 WW. 35 B2 DIN 1654
BS 970, 080 M 36 STEEL
35 B2 DIN 1654 WW. CQ 35 DIN 1654
GEHAERTET UND ANGELASSEN AUF HAERTE 29-32 HRC
(QUENCH AND TEMPER TO HARDNESS) 29-32 HRC
BS 970, 080 M 36 STEEL (P≤0.35% MAX)
PRUEFLEHRE GAUGE 5.98 +0 -0.02 DICK THICK
STANGE MUSS SICH FREI DREHEN LASSEN, WENN BEREICH "A" IN DIE LEHRENBOHRUNG EINGEFUEHRT WURDE.
ROD MUST TURN FREELY IF AREA "A" IS INSERTED INTO GAUGE BORE.
GRATFREI
FREE OF BURRS
IN DIESEM BEREICH BEARBEITUNGSSTUFE NICHT ZULAESSIG.
IN THIS AREA PROCESS-STEP NOT PERMITTED.
SUBJECT TO CERTIFICATION/HOMOLOGATION
GENEHMIGUNGSPFLICHTIG/HOMOLOG-ERUNG
JA/YES ☐ NEIN/NO ☒
REFERENCES DRW 97GT-7A410-AA_ET:4
BEARB. PLC DATUM 030198 GEPR. 97GT-A HUERTGEN FREIG.
NICHT ANMESSEN MASSSTAB 2 : 1 SCALE: DO NOT SCALE
WENN NICHT ANDERS ANGEGEBEN UNLESS OTHERWISE SPECIFIED
3. WINKEL PROJEKTION 180 ANGLE PROJECTION
MASSE IN MILLIMETER DIMENSIONS IN MILLIMETRE
SPANABHEBEND ± MACHINED DIM
SPANLOS ± 0.2 STAMPED DIM
WINKEL ± 1° ANGLES
WERKSTOFF WAHLWEISE / MATERIAL OPTIONAL
NEBENSTEHEND
NOTED
OBERFLAECHE/FINISH
MASS UEBEREINSTIMMEN MIT/MUST CONFORM TO/ENG. SPEC NR.
TEILNAME
STANGE-ZUS.PARKBETAETIGUNG
PART NAME ROD ASY-TRANS PRK PWL ACTU
TEILNUMMER/PART NR.
▽97GT-7D410-AA
97GT-7D410-AA
CONFIDENTIAL VERTRAULICH
PE09-020 1886



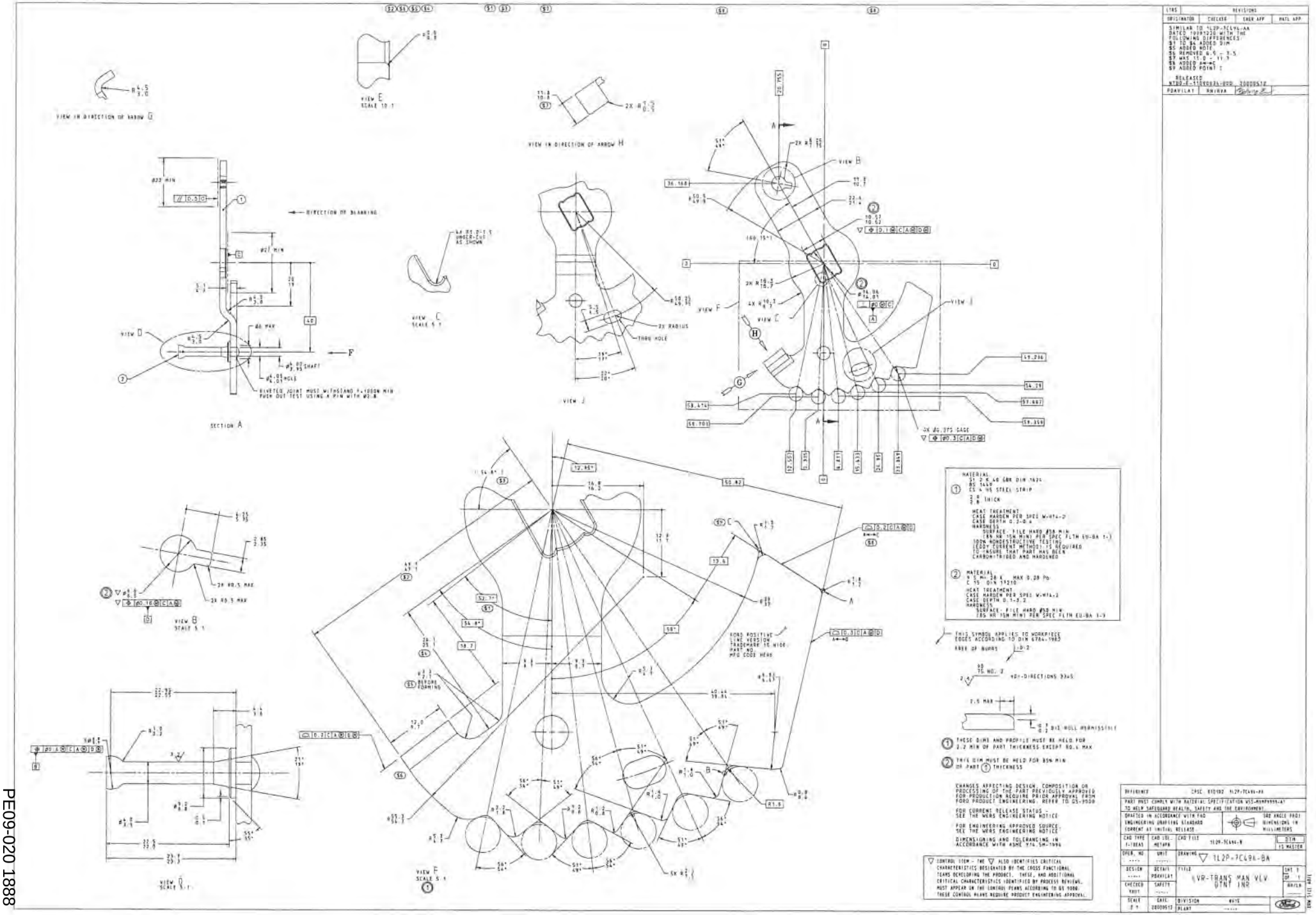
1 WERKSTOFF:
C67 WAHLWEISE C75 DIN 17222
1.0 DICK DIN 1544
GEHÄRTET U. ANGELASSEN AUF HRC 42...47
MATERIAL:
BS1449 GRADE 709 A 80
THICKNESS 1.0 ±0.05
ROCKWELL 'C' 42...47

2 WERKSTOFF:
100 Cr 6, WAHLW. 105 Cr 4, DIN 17230
MATERIAL:
SAE 50100 OR SAE 52100
WÄRMEBEHANDLUNG:
GEHÄRTET U. ANGELASSEN AUF HRC 60...64
HEAT TREATMENT:
HARDEN AND TEMPER TO HRC 60...64
OBERFLÄCHE:
ALLSEITIG BEARBEITET. GRATFREI.
FINISH:
FINISH ALL OVER. REMOVE ALL BURRS.

3 WERKSTOFF:
9 S Mn 28 DIN 1651; Pb = 0.35% MAX.
MATERIAL:
BS 970 230 M 07 STEEL; Pb = 0.35% MAX.
WÄRMEBEHANDLUNG:
EINSATZGEHÄRTET GEM. SPEZ. U-HT 4-2
EINSATZTIEFE 0.1...0.3
FEILHART (FLTH EU-BA 1-8) MIN. 69 HR 15N
HEAT TREATMENT:
CASE HARDEN PER PROCESS SPEC. U-HT 4-2
CASE DEPTH 0.1...0.3
FILE HARD (FLTH EU-BA 1-3) MIN. 69 HR 15N

PE09-020 1887

S/W



LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	

SIMILAR TO 1L2P-7C496-AA
DATED 19991230 WITH THE
FOLLOWING DIFFERENCES:
$7 TO $6 ADDED DIM
$6 ADDED NOTE
$5 REMOVED 4.6 ± 1.5
$7 WAS 11.0 ± 11.5
$4 ADDED A⊕=C
$9 ADDED POINT I

RELEASED
NTDD-E-11E0283-EDD 20000517

PDAVILAY	MAHAYA	

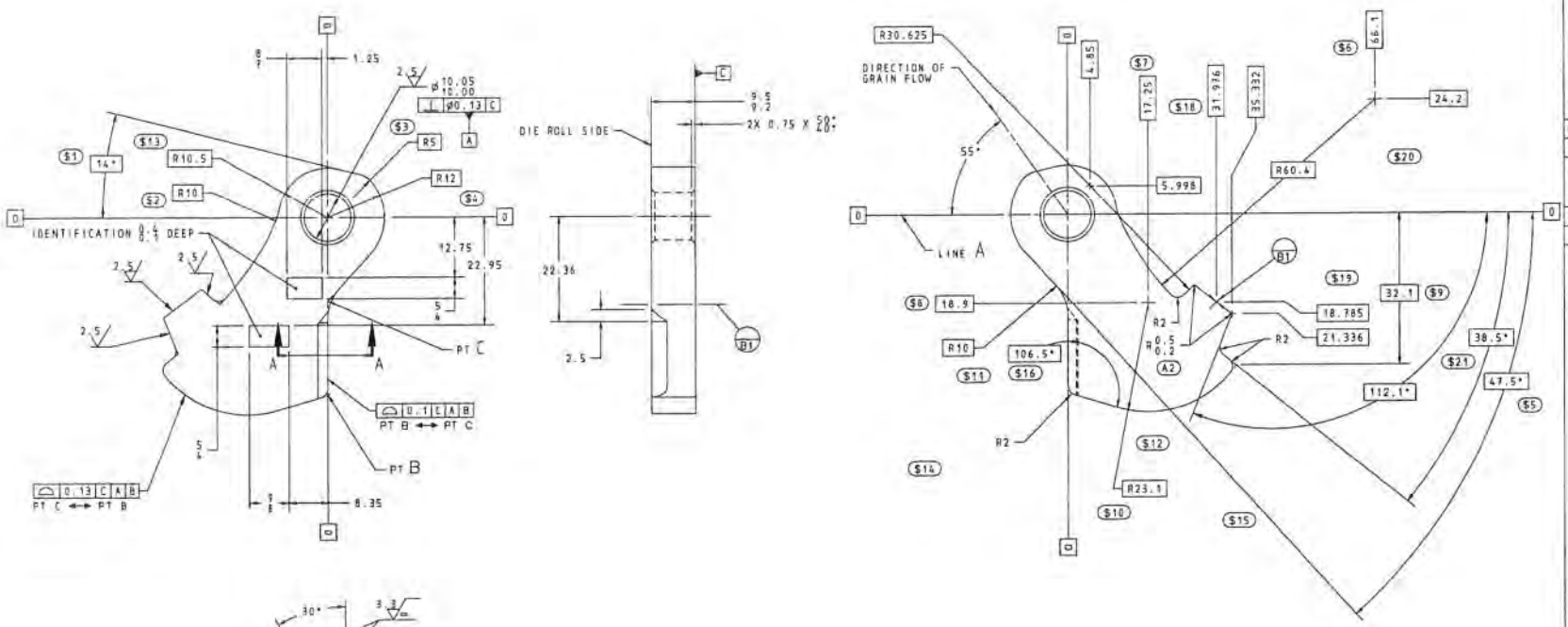
REFERENCE	CPSC 810102 1L2P-7C496-AA	
PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M4P6999-A1		
TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT		
DRAFTED IN ACCORDANCE WITH FAO ENGINEERING DRAFTING STANDARD CURRENT AT INITIAL RELEASE.		ISO KNEE PROJ DIMENSIONS IN MILLIMETERS

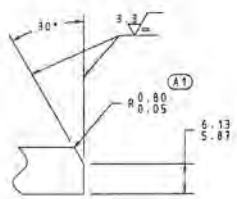
CAD TYPE F-TERAS	CAD LEV. METAPH	CAD FILE 1L2P-7C496-B	DTH IS MASTER
DRLR. NO -----	UNIT -----	DRAWING ▽ 1L2P-7C496-BA	
DESIGN -----	DETAIL PDAVILAY	TITLE LVR-TRANS MAN VLV DTNT INR	SHT 1 OF 1
CHECKED KNOX	SAFETY -----		REVLTR -----
SCALE 2 : 1	DATE 20000512	DIVISION 4015 PLANT -----	

PE09-020 1888

S/W

PE09-020 1889





SECTION

LTRS	REVISIONS		
ORIGINATOR	CHECKER	ENGR APP	MATL A

SIMILAR TO 1L2P-7A441-AB
ISSUE DATE 20009 25 WITH
THE FOLLOWING DIFFERENCES:

$1 THRU $10 ADDED DIM
$11 WAS R20
$12 REMOVED NOTCH AND RELATED DIMS
$13 WAS R10
$14 REMOVED 38.78
$15 REMOVED 38.53
$16 WAS 82.9°
$17 REMOVED NOTE
$18 REMOVED 27.081
$19 REMOVED 15.065
$20 REMOVED 0.5 C A B
$21 WAS 38.5°

RELEASED
NTOO-E-11177823-000 20001220

MFG APPROVAL:

TSCHAFFE	RNIRVA	YXU1	GH20000105

A1 WAS R0.05-0.35
A2 WAS R0.25-0.50

NTOO-E 11189353-000 20010126

MFG APPROVAL:

TSCHAFFE	WBURDIS	MFYIE	

▽ MATERIAL:
SAE J1268 8620-H

▽ HEAT TREATMENT:
CASE HARDENED ACC TO W-HT4-1
CASE DEPTH 0.6-0.9
HARDNESS:
SURFACE: FILEHARD (SAE J864) NO. 58 FILE MIN
CASE HARDNESS: 58 HRC MIN
CORE: 360-520 HV 10 (MEASURED IN CROSS SECTION OF LINE A)

▽ 100% NONDESTRUCTIVE TESTING (EDDY CURRENT METHOD) IS REQUIRED TO INSURE THAT PART HAS BEEN CARBURIZED AND HARDENED

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ±0.25
ANGLES ±1°

$17

REMOVE ALL BURRS AND SHARP EDGES

CHANGES AFFECTING DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION REQUIRE PRIOR APPROVAL FROM FORD PRODUCT ENGINEERING. REFER TO QS-9000

FOR ENGINEERING APPROVED SOURCE, SEE THE WERS ENGINEERING NOTICE

FOR CURRENT RELEASE STATUS - SEE THE WERS ENGINEERING NOTICE

DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M-1994

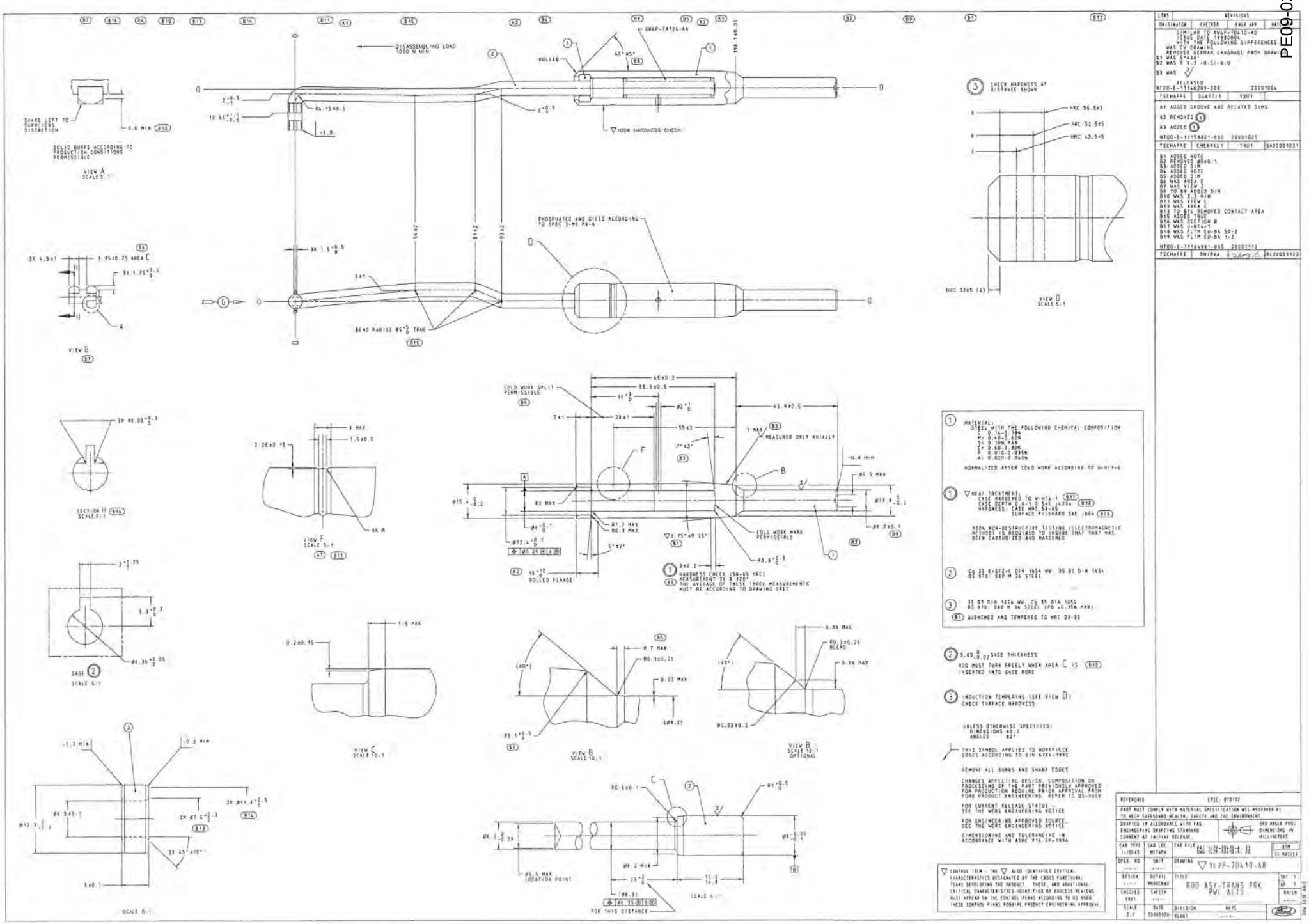
▽ CONTROL ITEM - THE ▽ ALSO IDENTIFIES CRITICAL CHARACTERISTICS DESIGNATED BY THE CROSS FUNCTIONAL TEAMS DEVELOPING THE PRODUCT. THESE, AND ADDITIONAL CRITICAL CHARACTERISTICS IDENTIFIED BY PROCESS REVIEWS, MUST APPEAR ON THE CONTROL PLANS ACCORDING TO QS 9000. THESE CONTROL PLANS REQUIRE PRODUCT ENGINEERING APPROVAL.

REFERENCE	CPSC: 070102		
PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.			
DRAFTED IN ACCORDANCE WITH FAO ENGINEERING DRAFTING STANDARD CURRENT AT INITIAL RELEASE.		3RD ANGLE PROJ DIMENSIONS IN MILLIMETERS	
CAD TYPE I-IDEAS	CAD LOC. METAPH	CAD FILE PRT 1L2P-7A441-A; 20 DRW 1L2P-7A441-A; 25	DTM IS MASTER
OPER. NO. -----	UNIT -----	DRAWING ▽ 1L2P-7A441-AC	
DESIGN ----	DETAIL TSCHAFFE	TITLE PWL-TRANS PRK BRK	SHT 1 OF 1
CHECKED YXU1	SAFETY -----		RH/LH -----
SCALE 2:1	DATE 20001220	DIVISION N615 PLANT -----	

DRW SIZE A1/D

s/w

PE09-020 1890



1. MATERIAL:
STEEL WITH THE FOLLOWING CHEMICAL COMPOSITION
C 0.14-0.18%
Mn 0.40-0.60%
Si 0.10% MAX
Cr 0.60-0.80%
P 0.010-0.035%
Al 0.020-0.060%
NORMALIZED AFTER COLD WORK ACCORDING TO W-HTX-6

1. ▽HEAT TREATMENT:
CASE HARDENED TO W-HTX-1 (B17)
CASE DEPTH 0.6-1.0 U SAE J423a (B18)
HARDNESS: CASE HRC 58-63
SURFACE PER HARD SAE J864 (B16)
100% NON-DESTRUCTIVE TESTING (ELECTROMAGNETIC METHOD) IS REQUIRED TO INSURE THAT PART HAS BEEN CARBURIZED AND HARDENED

2. CG 35.6+GEE+6 DIN 1654 WW: CS 35 DIN 1654 BS 970: EN 9 36 STEEL

3. 35 B2 DIN 1654 WW: CS 35 DIN 1654 BS 970: EN 9 36 STEEL (PB .0.35% MAX)
(B1) QUENCHED AND TEMPERED TO HRC 29-33

2. 8.05 +0.03 -0 GAGE THICKNESS
ROD MUST TURN FREELY WHEN AREA C IS (B12) INSERTED INTO GAGE BORE

3. (INDUCTION TEMPERING (SEE VIEW D)
CHECK SURFACE HARDNESS

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ±0.2
ANGLES ±2°

THIS SYMBOL APPLIES TO WORKPIECE EDGES ACCORDING TO DIN 6784-1995

REMOVE ALL BURRS AND SHARP EDGES

CHANGES AFFECTING DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION REQUIRE PRIOR APPROVAL FROM FORD PRODUCT ENGINEERING. REFER TO QS-9000

FOR CURRENT RELEASE STATUS - SEE THE WERS ENGINEERING NOTICE

FOR ENGINEERING APPROVED SOURCES - SEE THE WERS ENGINEERING NOTICE

DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M-1994

▽ CONTROL ITEM - THE ▽ ALSO IDENTIFIES CRITICAL CHARACTERISTICS DESIGNATED BY THE CROSS FUNCTIONAL TEAMS DEVELOPING THE PRODUCT. THESE, AND ADDITIONAL CRITICAL CHARACTERISTICS IDENTIFIED BY PROCESS REVIEWS, MUST APPEAR ON THE FONTROL PLANS ACCORDING TO QS 9000. THESE CONTROL PLANS REQUIRE PRODUCT ENGINEERING APPROVAL.

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MFG APP	DATE

SIMILAR TO XWLP-7D130-AB
ISSUE DATE 19980804
WITH THE FOLLOWING DIFFERENCES:
WAS CV DRAWING
REMOVED GERMAN LANGUAGE FROM DRAWING
S1 WAS 6°±30'
S2 WAS R 0.3 +0.5/-0.0
S3 WAS
RELEASED
W700-E-11146289-000 20001004
TSCHAFFE | SGATTIS | YKU1

A1 ADDED GROOVE AND RELATED DIMS
A2 REMOVED (1)
A3 ADDED (1)
W700-E-11158801-000 20001025
TSCHAFFE | CMERRILL | YKU1 | $A20001031

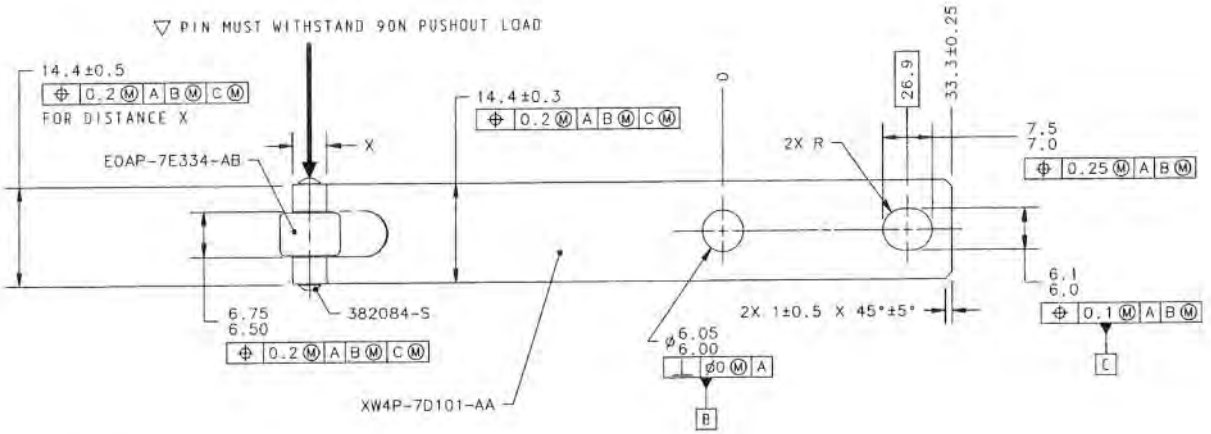
B1 ADDED NOTE
B2 REMOVED Ø8±0.1
B3 ADDED DIM
B4 ADDED NOTE
B5 ADDED DIM
B6 WAS AREA E
B7 WAS VIEW
B8 TO B9 ADDED DIM
B10 WAS 0.3 MIN
B11 WAS VIEW I
B12 WAS AREA I
B13 TO B14 REMOVED CONTACT AREA
B15 ADDED TOLE
B16 WAS SECTION B
B17 WAS U-HTX-1
B18 WAS FLTM EU-BA 58-2
B19 WAS FLTM EU-BA 1-2
W700-E-11164891-000 20001110
TSCHAFFE | RNIRVA | $B20001122

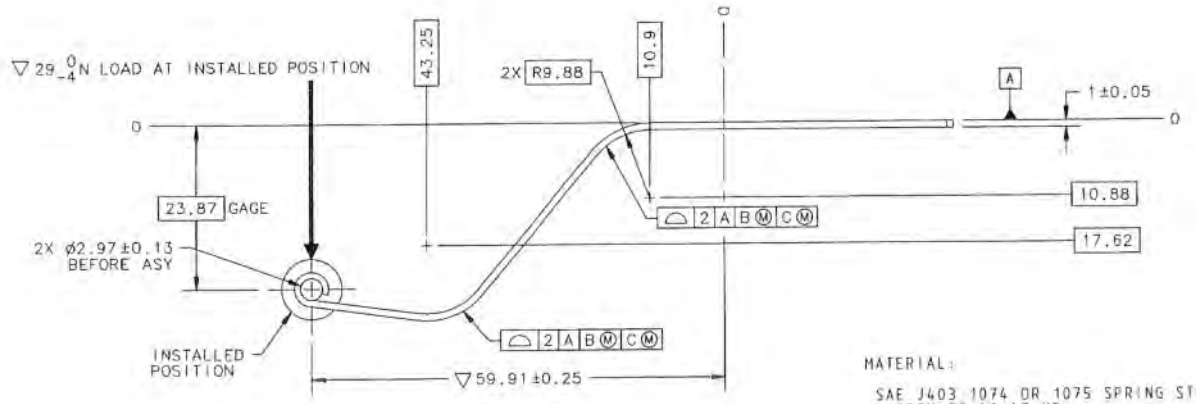
REFERENCE	EPDC: 870102		
PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P6999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.			
DRAFTED IN ACCORDANCE WITH FAS ENGINEERING DRAFTING STANDARD CURRENT AT INITIAL RELEASE		3RD ANGLE PROJ	DIMENSIONS IN MILLIMETERS
CAD TYPE I-DEAS	CAD LOC. METAPH	CAD FILE	ATM TO MASTER
DESIGN	DETAIL	TITLE	ROD ASY-TRANS PRK PWI AUTO	SHT 1 OF 1	SIZE D
CHECKED	SAFETY				
SCALE 2:1	DATE 20000930	DIVISION PLANT			

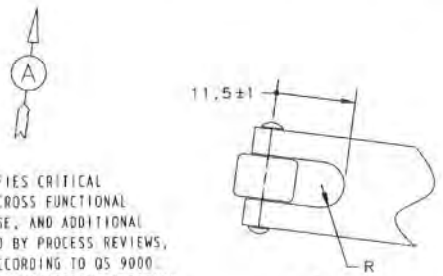
Ford

S/W

PE09-020 1891







▽ CONTROL ITEM - THE ▽ ALSO IDENTIFIES CRITICAL CHARACTERISTICS DESIGNATED BY THE CROSS FUNCTIONAL TEAMS DEVELOPING THE PRODUCT. THESE, AND ADDITIONAL CRITICAL CHARACTERISTICS IDENTIFIED BY PROCESS REVIEWS, MUST APPEAR ON THE CONTROL PLANS ACCORDING TO QS 9000. THESE CONTROL PLANS REQUIRE PRODUCT ENGINEERING APPROVAL.

MATERIAL:

SAE J403 1074 OR 1075 SPRING STEEL
HARDEN TO 42-47 HRc

CHANGES AFFECTING DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION REQUIRE PRIOR APPROVAL FROM FORD PRODUCT ENGINEERING. REFER TO QS-9000

FOR CURRENT RELEASE STATUS - SEE THE WERS ENGINEERING NOTICE

FOR ENGINEERING APPROVED SOURCE, SEE THE WERS ENGINEERING NOTICE

DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M-1994

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	
RELEASED				CAD: Y
NT00-E-10740109-038		970924		METALLIC
MFG APPROVAL		DHELTON 971007		NON-MET
MEIZLER	WBURDIS	JGOODEN		CORROSION

REDRAWN AFTER REV $ DATED 970924 WITH FOLLOWING REVISION WAS CV DRAWING

A1 ADDED XW4P-7D101-AA WAS S/O SELF REVISED & REDRAWN

NT00-E-10816413-000		980126		CAD: Y METALLIC
MFG APPROVAL				NON-MET
MBROCKWA	DLASECKI			CORROSION

REFERENCE	PL-XW4P-070102-95329		
PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.			
DRAFTED IN ACCORDANCE WITH FAO ENGINEERING DRAFTING STANDARD CURRENT AT INITIAL RELEASE.		3RD ANGLE PROJ DIMENSIONS IN MILLIMETERS	
CAD TYPE S-SDRC	CAD LOC. TDM	CAD FILE XW4P-7E332-A	MICROFILM IS MASTER
OPER. NO. -----	UNIT -----	DRAWING ▽XW4P-7E332-AA	
DESIGN -----	DETAIL MEISLER	TITLE SPG ASY-TRANS MAN VLV DTNT	SHT 1 OF 1 RH/LH
CHECKED	SAFETY -----		
SPG XW4P-7D101-AA	SCALE 2:1	DATE 970917	DIVISION N615 PLANT -----

A1

DRW SIZE A2/C

Vehicle Line	Engine	2001	2002	2003	2004	2005	2006	2007	2008
Ranger	2.5L I4	4R44E							
	2.3L I4	5R44E	5R44E	5R44E	5R44E	5R44E	5R44E	5R44E	
	3.0L V6	5R44E	5R44E	5R44E	5R44E	5R44E	5R44E	5R44E	
	4.0L V6	5R55E	5R55E	5R55E	5R55E	5R55E	5R55E	5R55E	
Explorer Sport Trac	4.0L V6	5R55E	5R55E	5R55E	5R55E	5R55E	5R55E	5R55S	5R55S
	4.6L V8							6R60	6R60
Explorer Sport (2-Door)	4.0L V6	5R55E	5R55E	5R55E					
Explorer/Mountaineer (4-Dr)	4.0L V6	5R55E	5R55W 5R55S	5R55S	5R55S	5R55S	5R55S	5R55S	5R55S
	5.0L V8	4R75W							
	4.6L V8		5R55W 5R55S	5R55S	5R55S	5R55S	6R60	6R61	6R62
Aviator	4.6L V8					5R55S			

Explorer 4-door changed from 5R55W to 5R55S sometime during 2002MY

Owner Relations
Ford Parts and Service Division

3000 Schaefer Road
P. O. Box 1805
Dearborn, Michigan 48121

April, 1981

Dear Owner:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

On June 9, 1980, the National Highway Traffic Safety Administration (NHTSA) made an initial determination that a defect which relates to motor vehicle safety exists in 1970-1979 and certain 1980 Ford vehicles equipped with FMX, C-3, C-4, C-6 or JATCO automatic transmissions. According to NHTSA's initial determination, the park gear may not be securely engaged after the operator has attempted to shift the gear selector lever to "P" (Park) and the transmission may shift to reverse by itself without warning, allowing the vehicle to move when it is unattended. NHTSA also initially determined that such uncontrolled vehicle movement may result and has resulted in injury to or death of the occupants of the vehicle or to persons outside the vehicle.

Ford wishes to warn owners and drivers of these vehicles of the serious hazard which may result if the vehicle is not securely engaged in park and is left unattended without shutting off the engine and fully applying the brake, and to remind them of the precautions set out in their owners manuals. In order to resolve this matter, Ford has produced the enclosed self-sticking label to serve as a day-to-day reminder to you and to alert others who may drive your vehicle. Ford strongly urges you to place the label in a conspicuous location in your vehicle, such as the dashboard or the sun-visor, and to observe the following safety precautions:

- Never leave a vehicle unattended without first turning off the engine and securing the parking brake fully.
- When shifting to park, be sure that you have rotated the gear-shift lever as far as it will go in a counterclockwise direction by first pulling the lever toward the steering wheel and then rotating it to the left as far as it will go. If you are not sure the transmission is in park, give the gear selector a firmer push toward the park position while pulling it toward you.
- Always check whether the vehicle is in the "P" (Park) position after you have shifted it. To determine if the gearshift lever is fully engaged in the park position, you should not be able to rotate it toward reverse unless you first pull it toward you.
- For vehicles equipped with floor-mounted gearshift selector levers, when shifting into the "P" (Park) position, move the lever all the way forward while fully depressing the release button. To determine if the gearshift lever is in the "P" (Park) position, you should not be able to move it toward reverse unless you first depress the release button.
- The gearshift linkage holds the transmission in the park position. Always keep the vehicle's gearshift linkage in proper maintenance and adjustment.

The enclosed form contains our current record of the vehicle you own. If you no longer own this vehicle, please fill out the appropriate portion on the enclosed prepaid postcard and mail it to us so that we may correct our records.

Should you have any questions relating to this matter, including proper maintenance and operation of the park selector system, please contact a Ford or Lincoln-Mercury dealer; or write Owner Relations, Ford Parts and Service Division, P.O. Box 1805, Dearborn, Michigan, 48121; or call 1-800-521-4134 (except Alaska and Hawaii-in Michigan call 1-800-482-0234). Questions regarding this matter may also be directed to the Administrator, National Highway Traffic Safety Administration, Washington, D.C. 20590.

Sincerely,

Owner Relations
Ford Parts and Service Division

OWNER REMINDER LABEL — SUGGESTED TYPICAL APPLICATION LOCATIONS

This label should be placed in your automatic transmission equipped car or light truck in a conspicuous location where it can be read and will serve as a day-to-day reminder of the safety precautions to be used in parking your vehicle. Suggested locations include:

- Driver's Sun Visor
- Driver's Door Inside Upper Surface Just Below Window.
- Steering Wheel
- Dashboard

Typical steering wheel and dashboard applications are shown on the reverse side.

REMINDER LABEL (See reverse side for application instructions)

IMPORTANT SAFETY PRECAUTION

Before leaving the driver's seat, you should always:

1. **Make sure the gear selector lever is engaged in Park.**
2. **Set the parking brake fully.**
3. **Shut off the ignition.**

- Unexpected and possibly sudden vehicle movement may occur if these precautions are not taken.
- Refer to your owner's manual for other important safety information.

NOTE: Additional labels are available free at Ford and Lincoln-Mercury dealerships.

AUTOMATIC TRANSMISSION REMINDER PROGRAM RETURN POSTCARD

Detach Here Before Mailing

Please complete and return this postcard ONLY if you no longer own this vehicle and can tell us the address of the new owner. If you don't know the name and address of the current owner, please **DO NOT** return this postcard.

NOTE: We encourage you to place the enclosed reminder label in your present automatic transmission vehicle. Additional labels are available free at any Ford or Lincoln-Mercury Dealer should you wish to place them in other vehicles.

(OUR CURRENT RECORD OF VEHICLE YOU OWN)

8Y82A800323

Dear Sirs,

I no longer own this vehicle, it has been sold/transferred to (Exclude New or Used Car Dealers.):

Name _____

Street _____

City _____ State _____ Zip _____

ALTERNATE SHIFT CONTROL PROPOSALS

AUTOMATIC TRANSMISSION SHIFT CONTROL SYSTEMS

OBJECTIVE

- Improve the perception of the driver that he has correctly engaged the desired transmission position by placing the shift lever in the proper steering column detent.

ALTERNATIVE

1. Mechanical changes in steering column controls, transmission linkage and internal transmission components to revise shift system tactile feel.

2. Column-mounted PRND21 displays, optionally with colored lights associated with different positions (similar to Mr. [redacted] proposal).

3. External, visible shift lever detent plate (similar to Mercedes floor shift control).

4. Warning lights or buzzers to indicate shift errors.

Each of these alternatives is discussed in detail in the following sections.

HUMAN FACTORS CONSIDERATIONS

- Drivers do not look at the PRND21 display or the shift lever when shifting into "Park" over half of the time. These "non-visual" shifts are most likely to result in operator error. Most drivers release the shift lever prior to it reaching the bottom of the "Park" detent.

- Designs which make the shift motion positive, precise and crisp are most likely to reduce operator error in selecting gear positions. Higher lifts of the shift lever (closer to the steering wheel) as the lever moves toward the "Park" detent are desirable as are solid stops at the ends of shift lever travel.

- Revised visual and tactile cues will not [illegible] and will not guarantee proper operator action.

CONCLUSIONS AND ACTIONS

The most effective methods of improving the driver's ability to engage the Park position require the strengthening of the subtle, sometimes subconscious tactile and visual cues that drivers use to position the shift lever. Warning devices are less effective because they can be ignored by the operator and can be unreliable, particularly in signalling a very infrequent event.

To enhance tactile feel, the column/linkage/transmission changes described in (1) abo[illegible] are being released for the 1980 model year for passenger cars and light trucks.

PCPEO is continuing the external, visible detent plate concept (Alternate 3) and additional tactile cues for applications on future models. Effectiveness, engineering feasibility, reliability, cost and timing are being resolved. A recommendation for Corporate actions on transmission controls for future models will be completed by 8/1/79.

PCPEO
3/23/79
4/2/79 Rev.

NHTSA
80-12-29-R
05-0005-C0
C8-02

PLAINTIFF'S EXHIBIT 8
PE09-020 1895

ADDENDUM TO ORIGINAL REPORT FROM
Dr. M. J. WARRICK AND J. M. CHRISTENSEN DATED OCTOBER 2, 1978
(NOTE: This was typed from the handwritten addendum that was provided)

We have continued our interest in the "transmission jump" problem. We have made limited further observation, have further discussed the matter and are now able to state and justify our opinion in a more succinct and straight-forward manner.

1. People sometimes leave their cars parked with the engine running. This fact is self-evident. It is also well known that people sometimes leave their keys in the car. We believe, but have not verified, that the key/ignition switch is sometimes left in a position that does not interlock the transmission lever. A cue, that the switch is "off" is that the engine has stopped, but the ignition switch may not yet be in the interlock position. If the ignition key/switch is not in the off/lock position, engine running or not, the shift lever may not be in the secure park position.

2. People sometimes leave their car without securely applying the parking brake. Even when they may apply it they do not apply it securely; or it may not hold. This is common experience and also is self-evident.

3. In some cars the shift lever can be jarred from an intermediate, between secure Park and R, position into R. This fact was verified in our formal report and by others. Further observations confirm the observation. We would add only that in some cars this is easier than in others - but we have observed nothing that would suggest Ford products are any more, or likely to be any more, susceptible than those of other manufacturers. Our limited personal experiences might even suggest otherwise.

4. People sometimes park leaving the shift lever short of the secure Park position. To verify this we asked drivers variations of the following question. "Have you ever parked, started to leave the car, only to find that you hadn't pushed the shift lever up far enough to release the key?" Literally, nine-out-ten answered to the affirmative. This question does not cover all possibilities nor does it get at "how frequently?" Nevertheless, the preponderance of affirmative responses would tentatively appear adequately to support our contention that people "intending" to, and "presuming" they had, sometimes fail to position the shift lever in the secure P position.

Simultaneous occurrence of conditions 1-4 create a hazardous condition that could result in an accident very likely, we believe, to be ascribed to "the transmission jumping from park to reverse."

We have observed nothing that would indicate Ford products or the C-6 and FMX transmission systems are any more prone to condition 3 than any other products or transmissions. (We admit, of course, that our observations are quite limited. We have, furthermore, no basis for commenting on the possibility of manufacturing, structural, adjustment or other defects, flaws, etc.)

We have observed nothing that would suggest that Ford-product drivers are any more or less prone to conditions 1, 2, and 4 than other drivers. Although we would suspect not, we have not pursued, nor do we have the capability of pursuing, that possibility; nor do we think it necessary.

We believe that it would, through design, be possible to reduce the likelihood of condition 3, either by preventing the shift from accidently dropping into R from the intermediate position, by effectively eliminating the ambiguity of an intermediate position, between R and P, or by providing a warning.

However, we suggest that a straightforward and immediate and at least partial solution to the safety problem would be an educational safety/publicity program/campaign stressing to driver's of <u>all</u> makes of cars the hazards of 1, 2 and 4.

Original signed by:

Melvin J. Warrick, Ph.D
Julien M. Christensen, Ph.d

FORD 005507
Wiles Case

NHTSA 78-12-17

C8-02
01-0052-02

Butler, Wooten & Fryhofer, LLP

Trial Lawyers

2719 Buford Highway
Atlanta, Georgia 30324
(404) 321-1700
Wats 1-800-242-2962
Fax (404) 321-1713

Columbus, Georgia
(706) 322-1990
Wats 1-800-233-4086
Fax (706) 323-2962
www.butlerwooten.com

James E. Butler, Jr., P.C.*
Joel O. Wooten, Jr.
George W. Fryhofer III **
Matthew E. Cook
Leigh Martin May
Kate S. Cook
Alan J. Hamilton
Brandon L. Peak
* admitted in Ala. & Ga.
**admitted in Ga., Mass., & Tx.

Columbus Office:
P.O. Box 2766
Columbus, GA 31902

Reply To:

Atlanta

July 3, 2007

VIA FACSIMILE (404) 527-4198 and U.S. MAIL

Jill Kuhn, Esq.
McKenna Long & Aldridge, LLP
303 Peachtree Street, NE
Suite 5300
Atlanta, GA 30308

Re: 2004 Ford Explorer
VIN # 1FMZU62KX4UB55825

Dear Ms. Kuhn:

I write to follow up on our conversation of July 3, 2007, in which we discussed a representative of Ford attending an inspection of the above-referenced vehicle on either July 11 or July 13, 2007. Please let me know if Ford will be able to attend the inspection on either of those dates. At the inspection, our representative would like to remove the pan from the transmission. This test will be non-destructive.

Pursuant to your request, I am enclosing with this letter a copy of the wreck report which provides additional information about the incident we are investigating. Thank you for your time and consideration. Please let me know if you need additional information or if I can be of further assistance.

Very truly yours,

BUTLER, WOOTEN & FRYHOFER, LLP

Brandon L. Peak

BLP/bt
Enclosure

Remarks

DR#1 EXITED V#1 AFTER PARKING IN A PARKING SPACE.
V#1 ROLLED BACK AND PINNED DR#1 UNDER THE VEHICLE.
DR#1 COMPLAINED OF BACK PAINS AND WAS FLOWN BY AIR AMBULANCE TO GRADY MEMORIAL HOSPITAL.
NO CITATIONS WERE ISSUED.

Witnesses:

Name | Address | Phone

Diagram

Not To Scale

SR 155

THIS FORM TO BE USED FOR PRIVATE PROPERTY ONLY

Case Number 05-11-06603 Date 11/01/2005 Time Officer Notified 18:10

County HENRY City MCDONOUGH Time Officer Arrived 18:12

Location of Accident 100 POSTMASTER DR

Driver # 1 JESSICA RUTH MUNDY Sex F Race WHITE D.O.B. 07/29/1982

Driver's License # 050185881 State GA Class C Expiration 07/29/2005

Vehicle Owner, Address and Phone # JESSICA RUTH MUNDY 1850 MIDCOURT WAY MCDONOUGH, GA 30252 (770)898-4348

Vehicle # 1 Make FORD Model EXPLORER Year 2004 Tag # ATL 5349 Year 2006 State GA

Insurance Company and Policy # UNKNOWN UNKNOWN

Damage to Vehicle: NONE

****

Driver # 2 _____ Sex _____ Race _____ D.O.B. _____

Driver's License # _____ State _____ Class _____ Expiration Date _____

Vehicle Owner, Address and Phone # _____

Vehicle # 2 Make _____ Model _____ Year _____ Tag # _____ Year _____ State _____

Insurance Company and Policy # _____

Damage to Vehicle: _____

Other Property Damage _____

Injuries:

Name _____ Age _____ Sex _____ Vehicle # _____

Name _____ Age _____ Sex _____ Vehicle # _____

Name _____ Age _____ Sex _____ Vehicle # _____

Name _____ Age _____ Sex _____ Vehicle # _____

Vehicle # 1 Towed by _____ Vehicle # 2 Towed by _____

Officer OFFICER R L GARDNER Badge # 2119 Agency MCDONOUGH POLICE DEPARTMENT

Supervisor _____

DPS MICRO FILM NUMBER
(DO NOT WRITE IN THIS SPACE) _____

MAIL TO: Accident Reporting, P. O. Box 1456 Atlanta, Georgia 30371

DPS - 523B (1/88)

Jessica Ruth Mundy

2004 Explorer 4x2

Para - (park/reverse) parking lot

door knock down

@25 y/o

SOL runs in 11/07

7/13 but may want to

Butler/Wooten

~~Strawn Norton~~ is claims rep

Julie

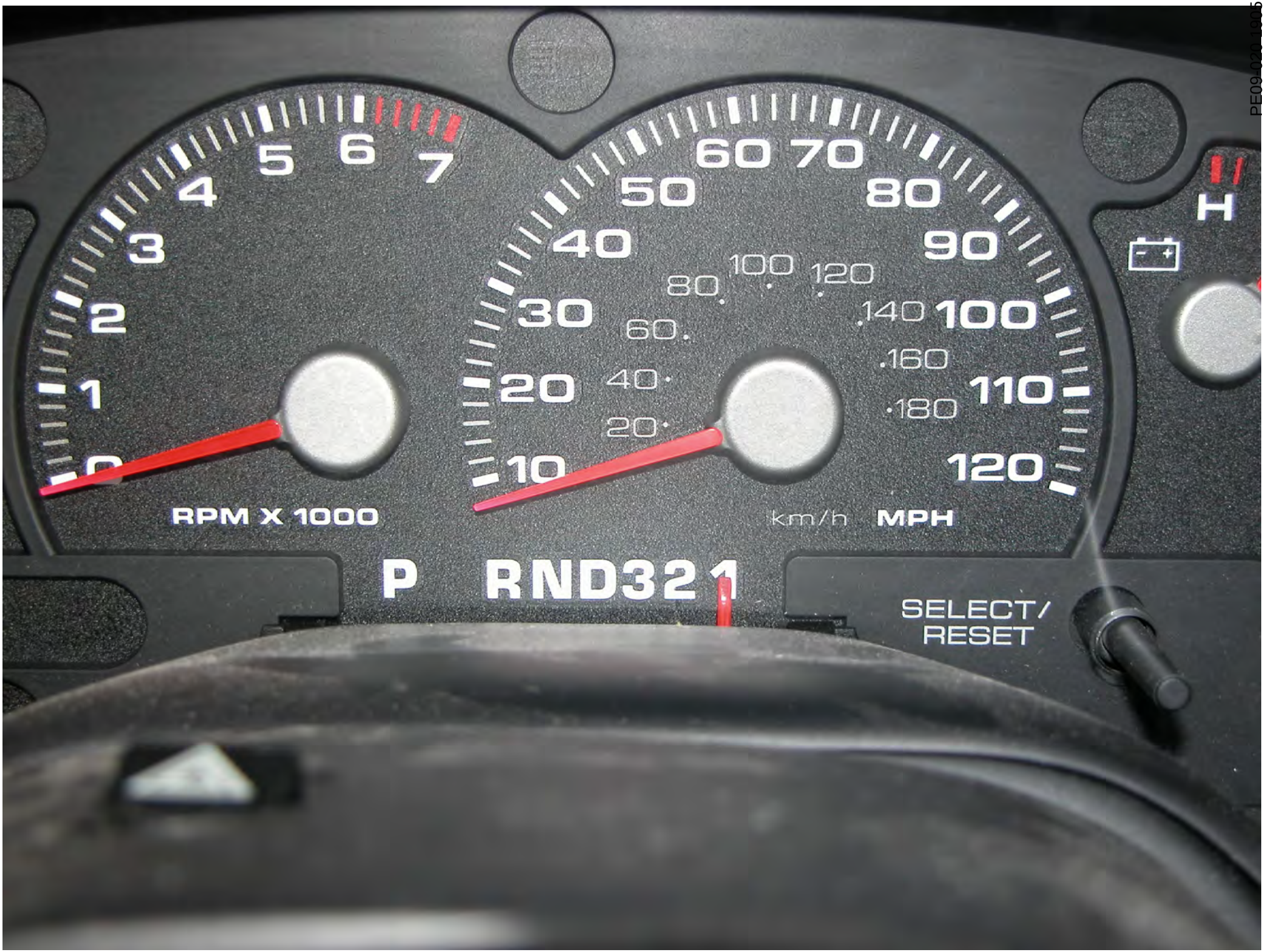
Mark Taylor inspect

Jill Kuhn

PE09-020 1902

ATL 5349
JAN
HENRY
2006

PE09-020-1904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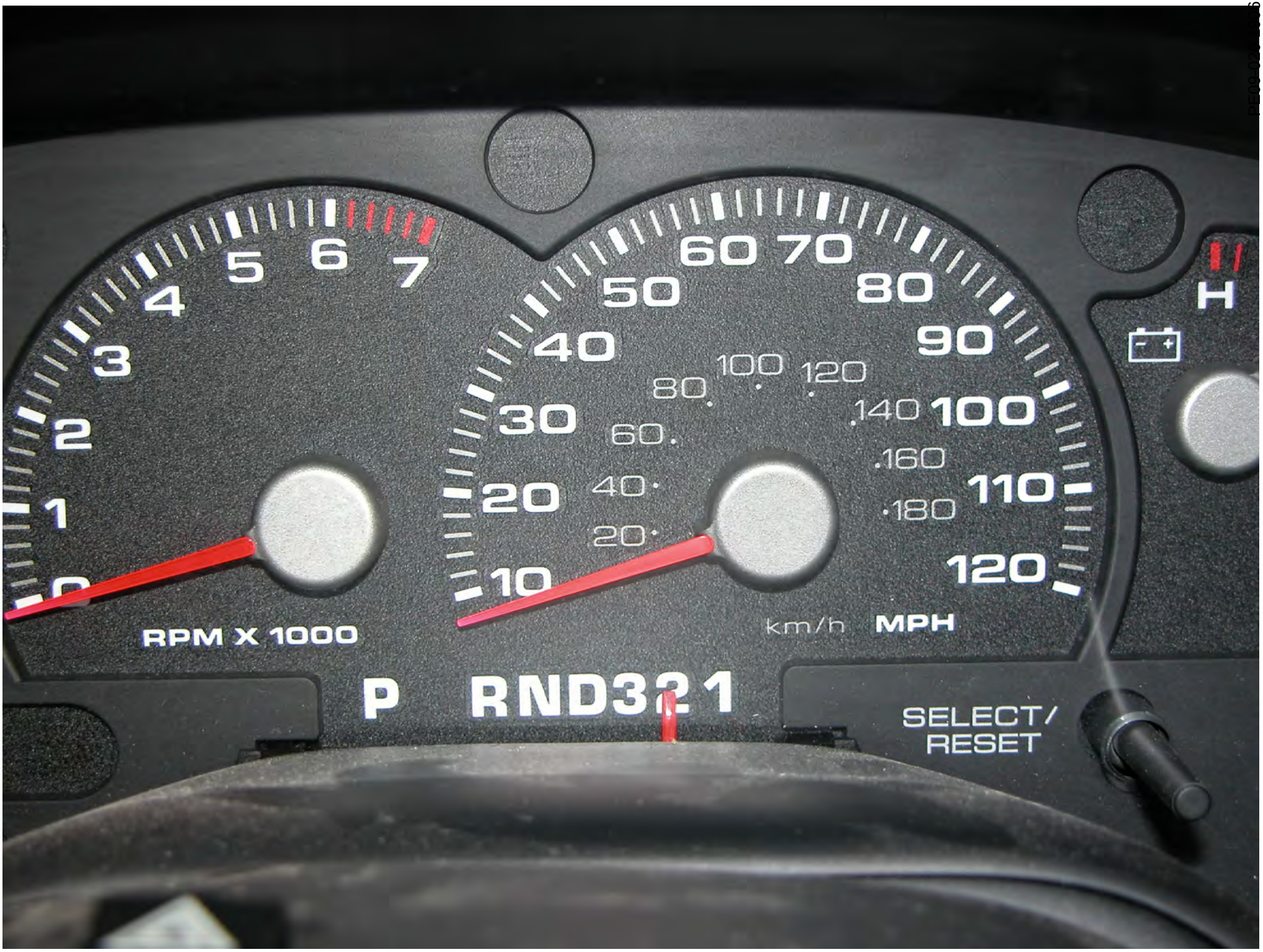
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PE09-020 1914

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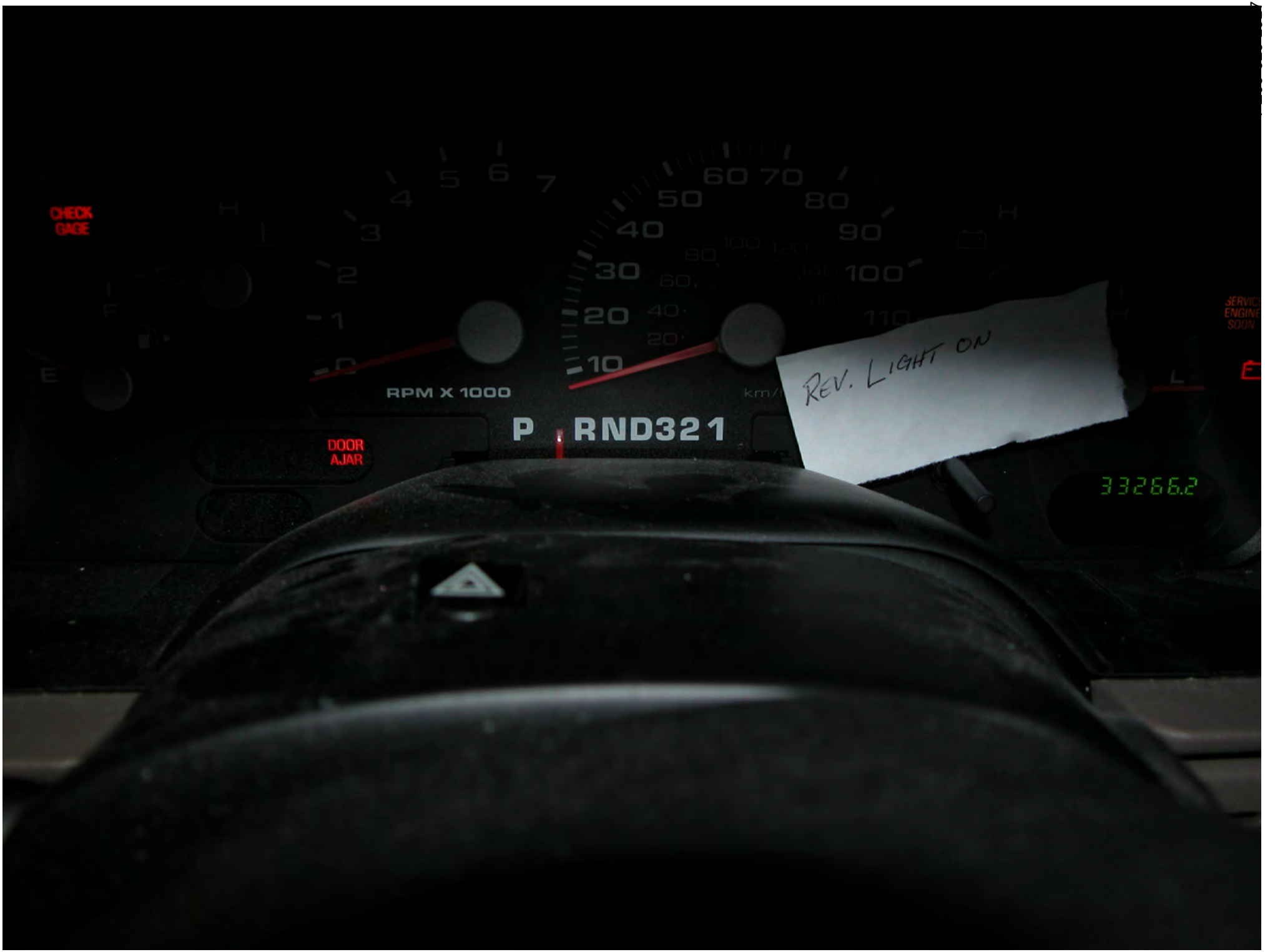
REV. LIGHT ON
SERVICE ENGINE SOON
33266.2

CHECK
GAGE
DOOR
AJAR
33266.2
Rev. Light On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DOOR AJAR
REV. LIGHT ON
33266.2

RPM X 1000
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PE09-020 1919

PE09-020 1920

PE09-020 1921

PE09-020 1922

PE09-020 1923

PE09-020 1924

PE09-020 1925

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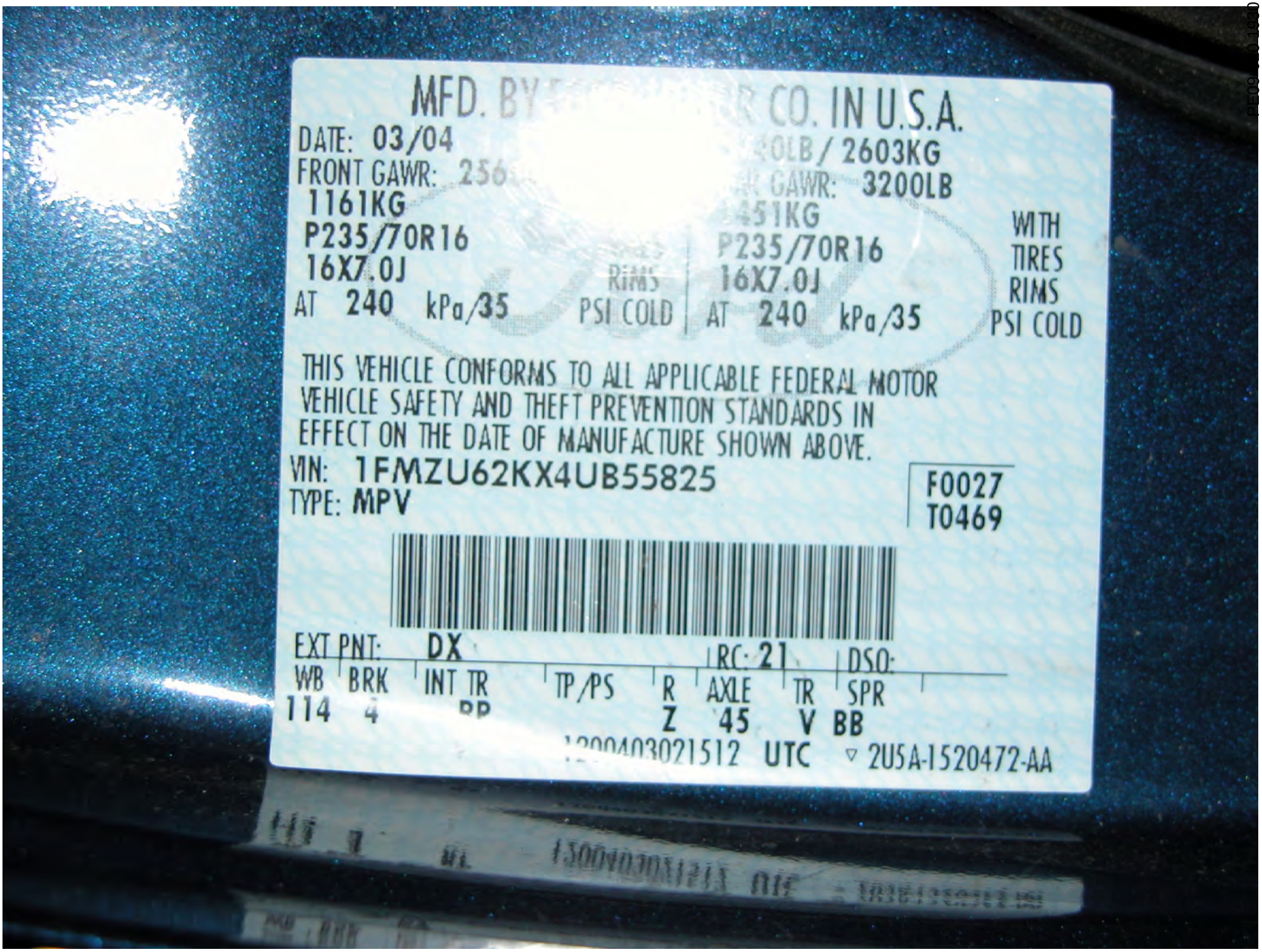
MFD. BY
CO. IN U.S.A.
DATE: 03/04
FRONT GAWR: 256
1161KG
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AT 240 kPa/35 PSI COLD
RIMS
2603KG
GAWR: 3200LB
451KG
P235/70R16
16X7.0J
AT 240 kPa/35 PSI COLD
WITH TIRES RIMS
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
VIN: 1FMZU62KX4UB55825
TYPE: MPV
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T0469
EXT PNT: DX
RC: 21
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WB 114
BRK 4
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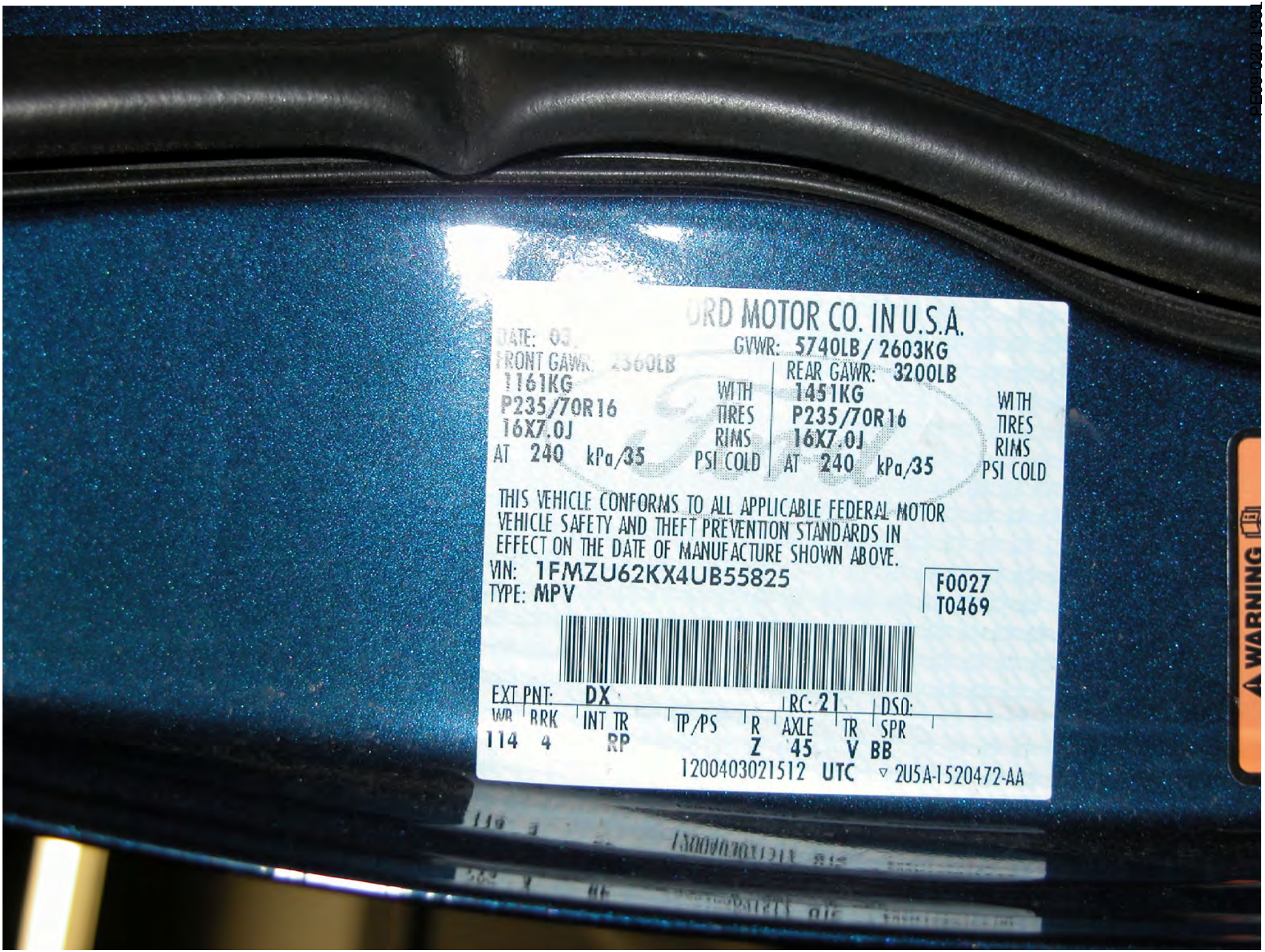
RD MOTOR CO. IN U.S.A.
DATE: 03
GVWR: 5740LB / 2603KG
FRONT GAWR: 2560LB
1161KG
WITH
TIRES
RIMS
P235/70R16
16X7.0J
AT 240 kPa/35 PSI COLD
REAR GAWR: 3200LB
1451KG
WITH
TIRES
RIMS
P235/70R16
16X7.0J
AT 240 kPa/35 PSI COLD
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
VIN: 1FMZU62KX4UB55825
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EXT PNT: DX
RC: 21
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2U5A-1520472-AA
WARNING

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PE09-020 1936

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PE09-020 1945

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PE09-020 1950

PE09-020-1951

PE09-020 1952

PE09-020-1053

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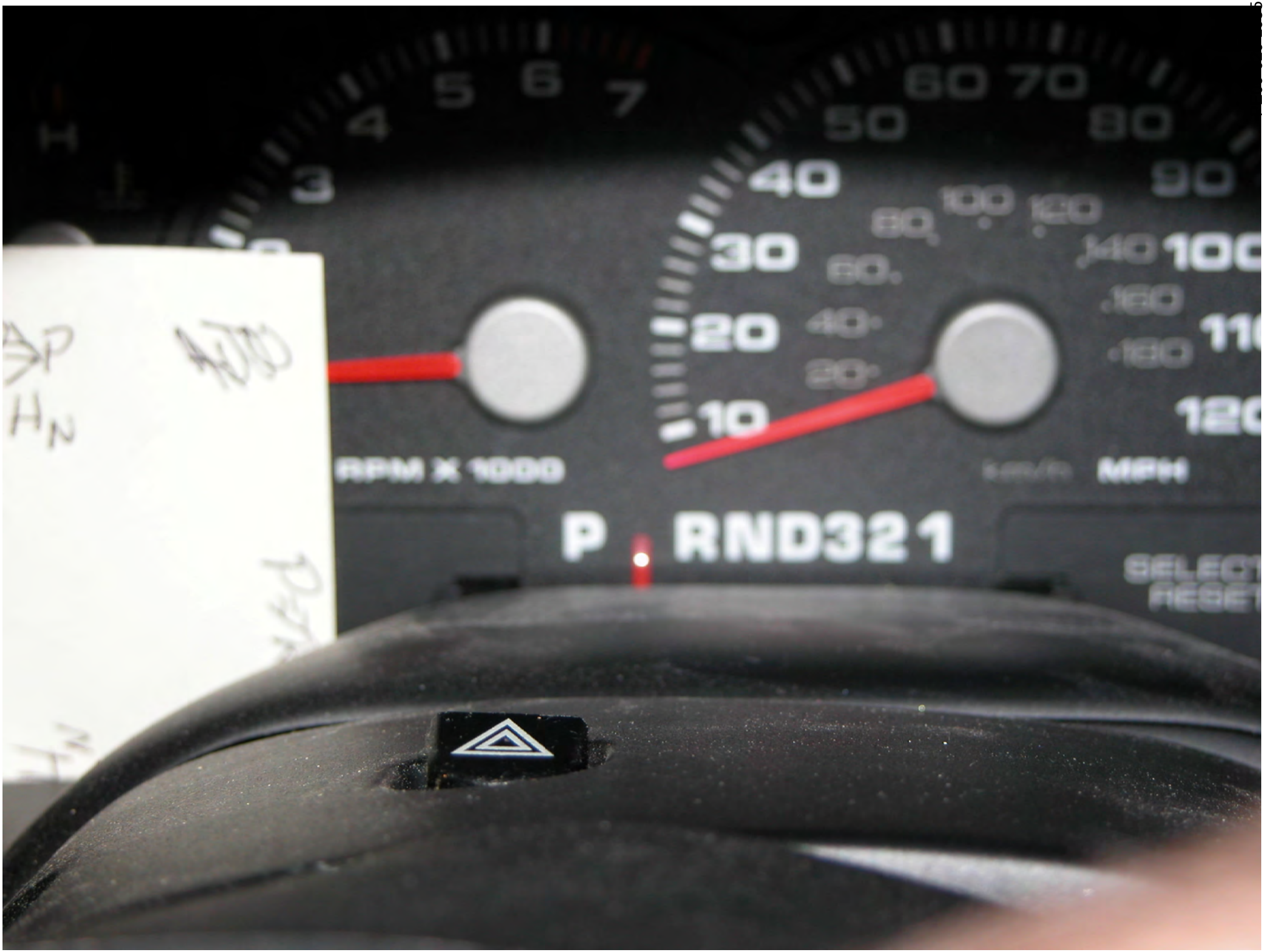
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PE09-020 1958

PE09-020 1959

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PE09-020 1961

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PE09-020 1966

PE09-020 1967

PE09-020 1968

PE09-020 1969

PE09-020 1970

PE09-020 1971

PE09-020 1972

PE09-020 1973

PE09-020 1974

DONOHUE BROWN
MATHEWSON & SMYTH LLC
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Telephone (312) 422-0900 • Fax (312) 422-0909 • www.dbmslaw.com

Writer's Direct Line (312) 422-0977
kim.radek@dbmslaw.com

August 19, 2008

VIA FACSIMILE (920) 893-1461
Mr. Dean Dallman, Service Manager
Mike Burkart Ford
3110 County Rd PP
Plymouth, WI 53073

Re: Noe v Ford Motor Company, et al.
Court No.: 08 L 000388
Our File: 080145

Dear Mr. Dallman:

As we discussed our firm represents Ford Motor Company in the above referenced matter pending in the Circuit Court of Cook County here in Chicago. On Friday, August 29, 2008 at 10:00 a.m., Mark Taylor, a Ford Design Analysis Engineer, will be performing an inspection of the subject vehicle in this matter, a 2003 Ford Explorer, VIN 1FMDU84W03UB94766, currently owned by John Cinealis. This is to confirm that Mr. Cinealis will be brining his Explorer to Mike Burkart Ford for this inspection to take place in one of your bays. Attorney John Krivicich from our office will also be in attendance and an attorney for Mr. Noe may also attend.

Thank you for your assistance in this matter and please do not hesitate to contact me if you should have any questions.

Very truly yours,

Kim Radek

Kim A. Radek
Paralegal

KAR/kar/91
cc: Mark Taylor (via e-mail)

Vehicle Inspection Notes

Name: NOE

Number: 54942

DAE/Rep: M.K. TAYLOR

Inspection Date: 10/10/08

Inspection Location: Plymouth WI

VIN: 1FMDU84W03UB94766

DOOR BUILD DATE: 03/03

Vehicle Make: FORD

Vehicle Model: EXPLORER

Vehicle Color: BLUE

Mileage 98223

License Plate: 5H13-684

GENERAL ALLEGATIONS	HARD TO GO IN PARK ?
VEHICLE EXTERIOR OBSERVATIONS	
VEHICLE INTERIOR OBSERVATIONS	
UNDERHOOD OBSERVATIONS	
UNDERBODY FRONT/REAR OBSERVATIONS	
TRUNK/PICKUP BED OBSERVATIONS	
OTHER OBSERVATIONS	REPLACED STEERING COLUMN PER COURT ORDER

Vehicle Inspection Notes

Name: NOÉ

Number: 549142

DAE/Rep: M.K. TAYLOR

Inspection Date: 8/29/08

Inspection Location: PLYMOUTH, WI

VIN: 1FMDU84W03UB[illegible]766

DOOR BUILD DATE: 03/03

Vehicle Make: FORD

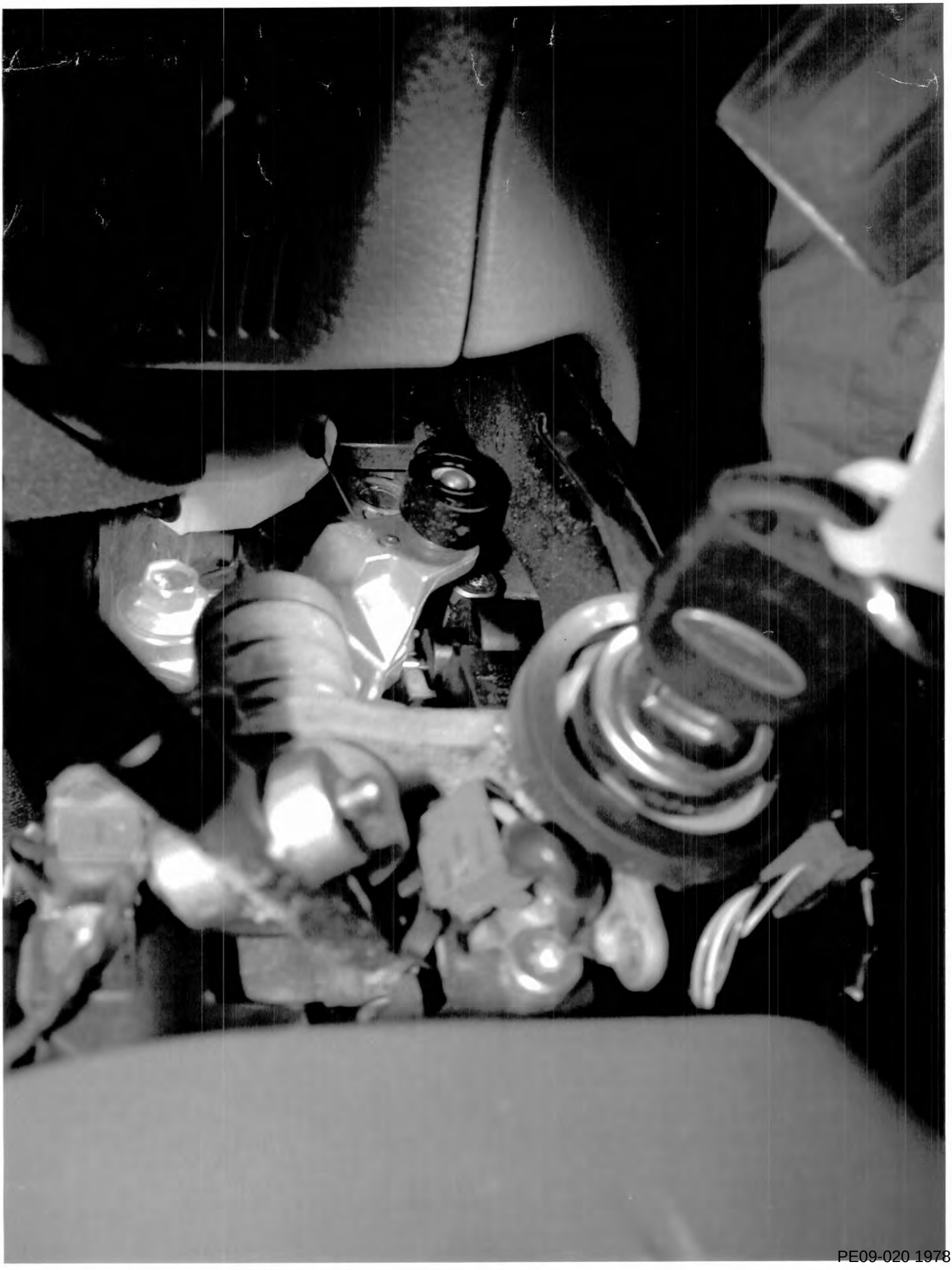
Vehicle Model: EXPLORER

Vehicle Color: BLUE

Mileage 94579

License Plate: SHB-6847 (WI)

GENERAL ALLEGATIONS	P-R
VEHICLE EXTERIOR OBSERVATIONS	
VEHICLE INTERIOR OBSERVATIONS	
UNDERHOOD OBSERVATIONS	
UNDERBODY FRONT/REAR OBSERVATIONS	
TRUNK/PICKUP BED OBSERVATIONS	
OTHER OBSERVATIONS	



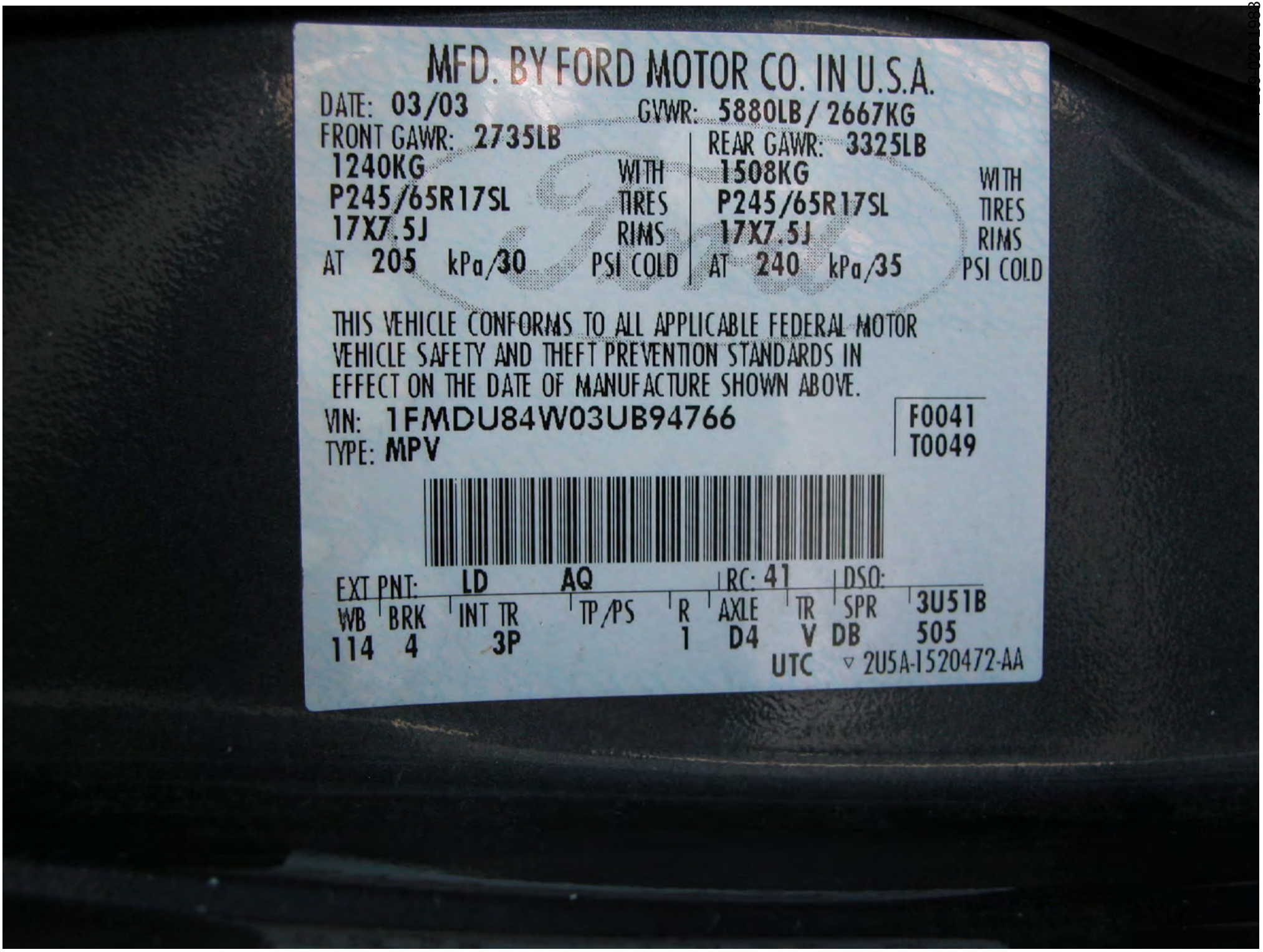
PE09-020 1978

PE09-020 1979

PE09-020 1980

PE09-020 1981

PE09-020 1982



MFD. BY FORD MOTOR CO. IN U.S.A.

DATE: 03/03 GVWR: 5880LB / 2667KG

FRONT GAWR: 2735LB
1240KG
P245/65R17SL
17X7.5J
AT 205 kPa/30 PSI COLD
WITH TIRES RIMS

REAR GAWR: 3325LB
1508KG
P245/65R17SL
17X7.5J
AT 240 kPa/35 PSI COLD
WITH TIRES RIMS

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 1FMDU84W03UB94766

TYPE: MPV

F0041
T0049

EXT PNT: LD AQ RC: 41 DSO:

WB	BRK	INT TR	TP/PS	R	AXLE	TR	SPR	3U51B
114	4	3P		1	D4	V	DB	505

UTC ▽ 2U5A-1520472-AA

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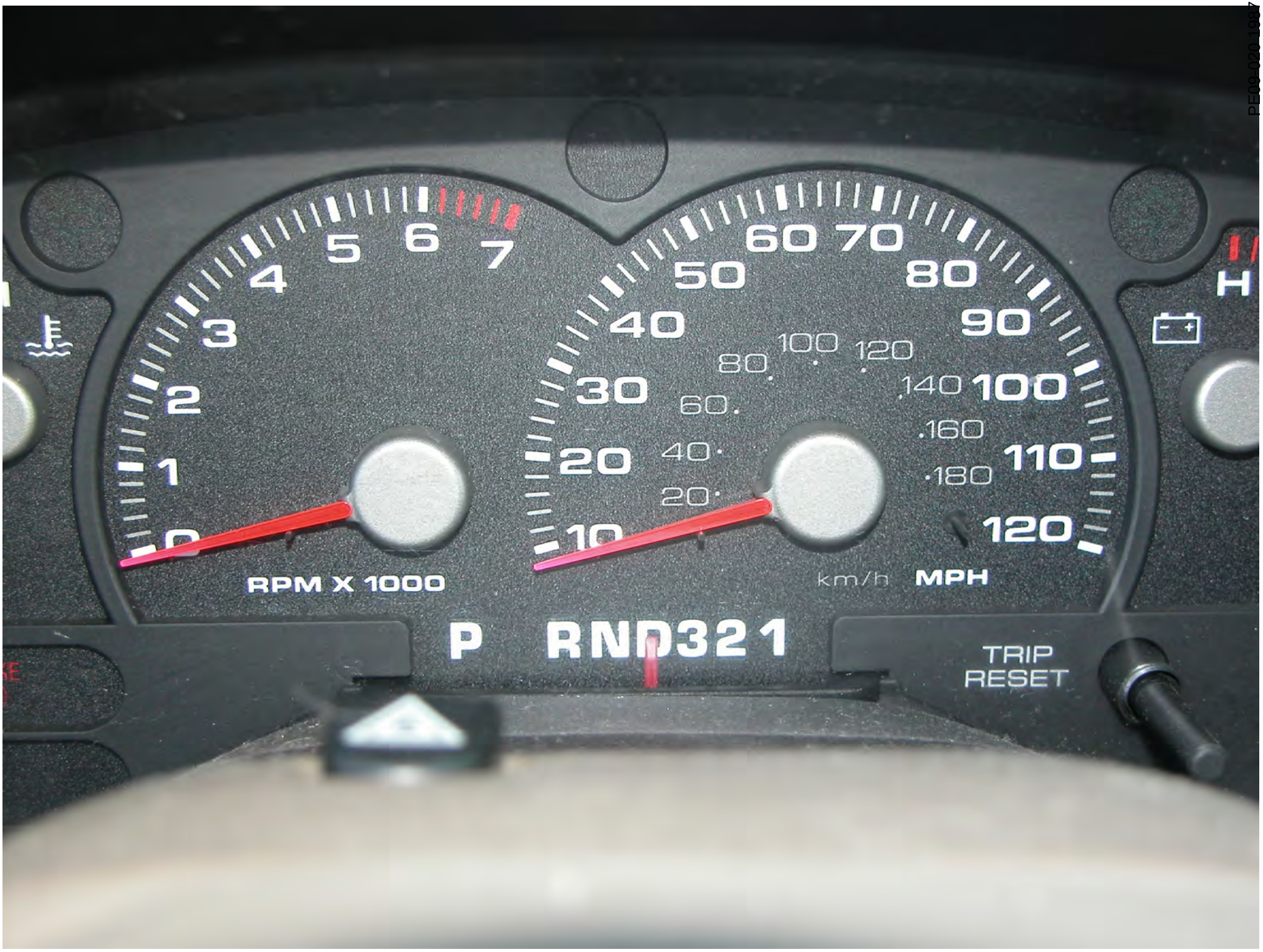
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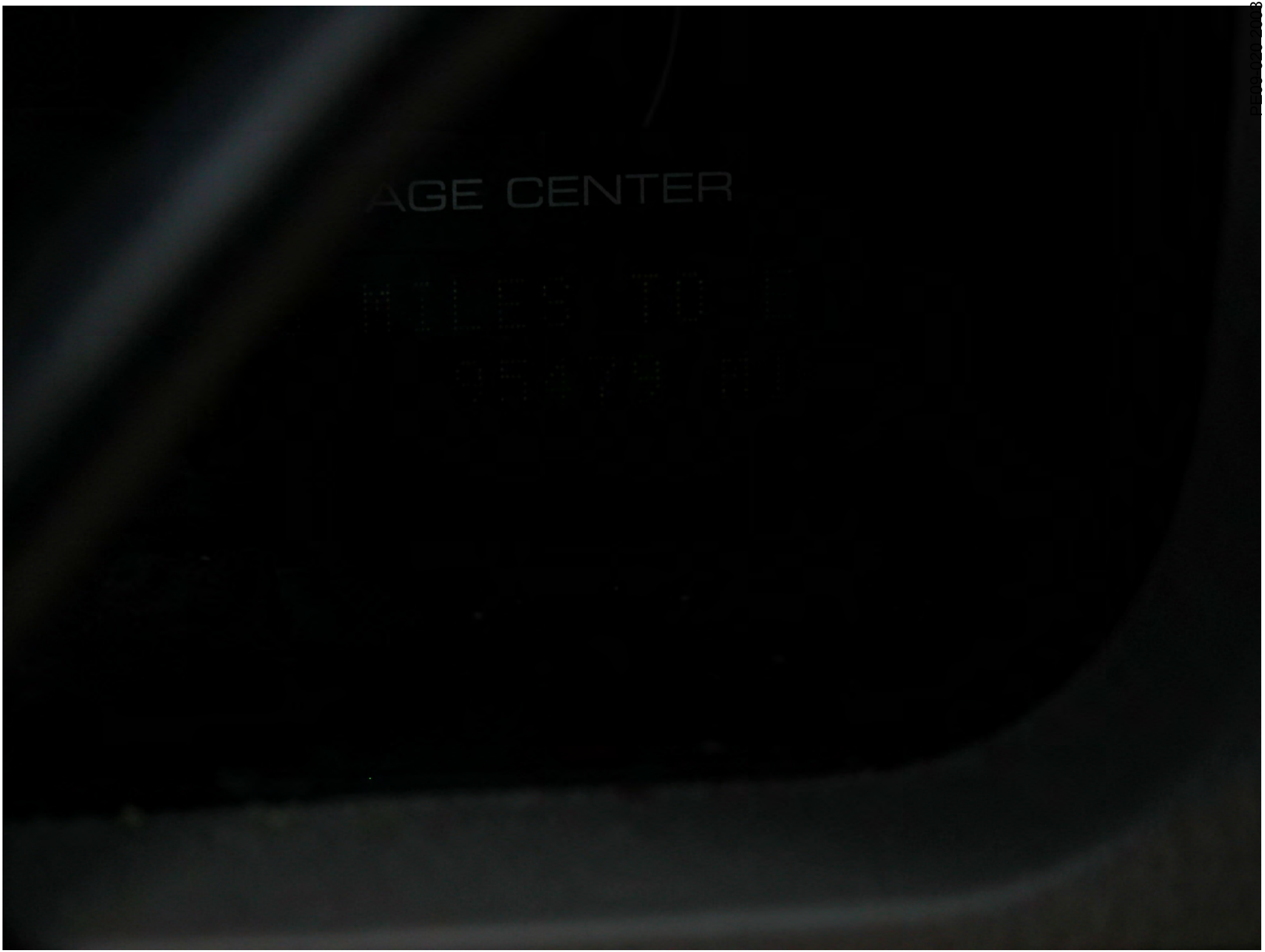

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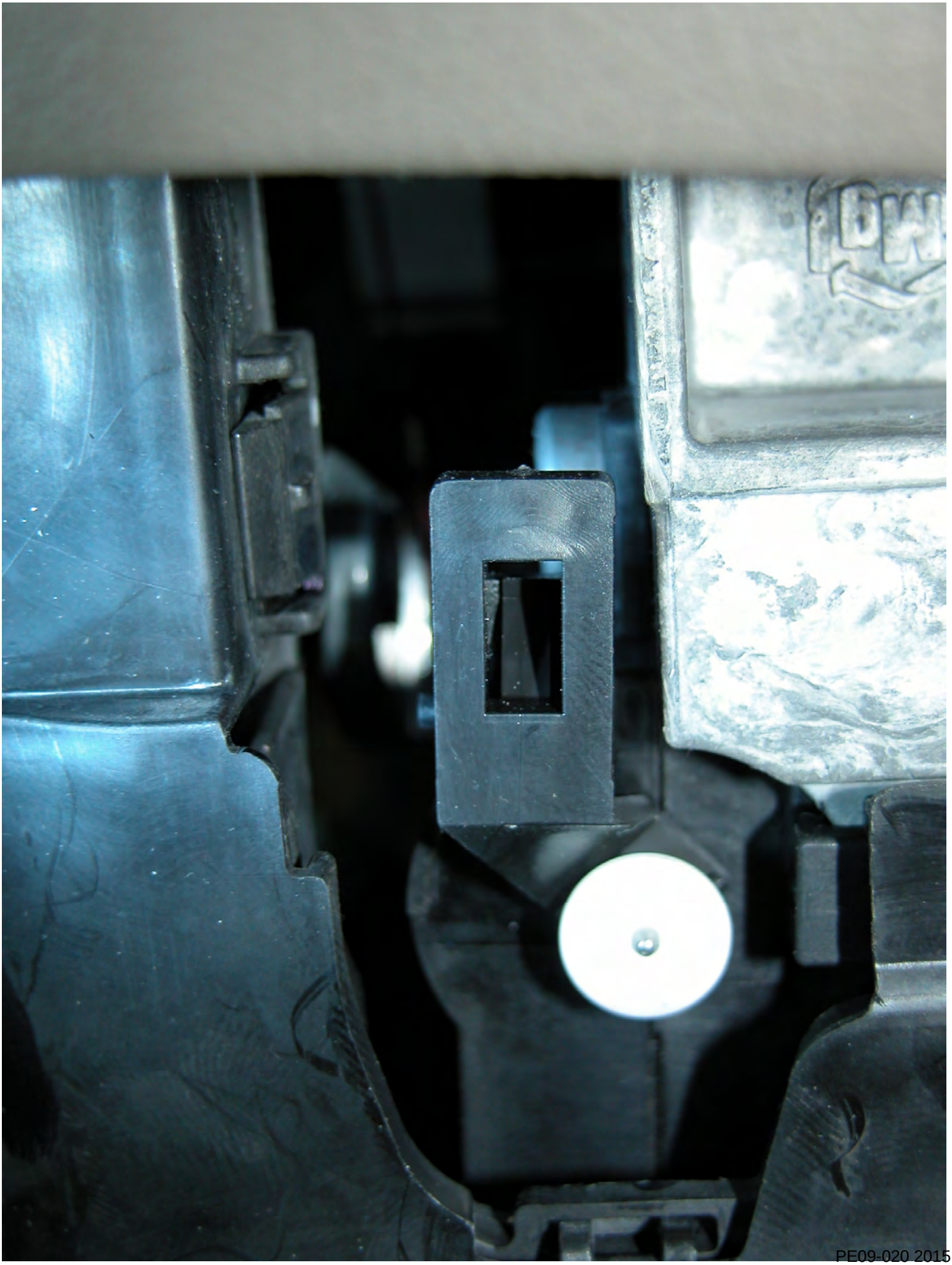

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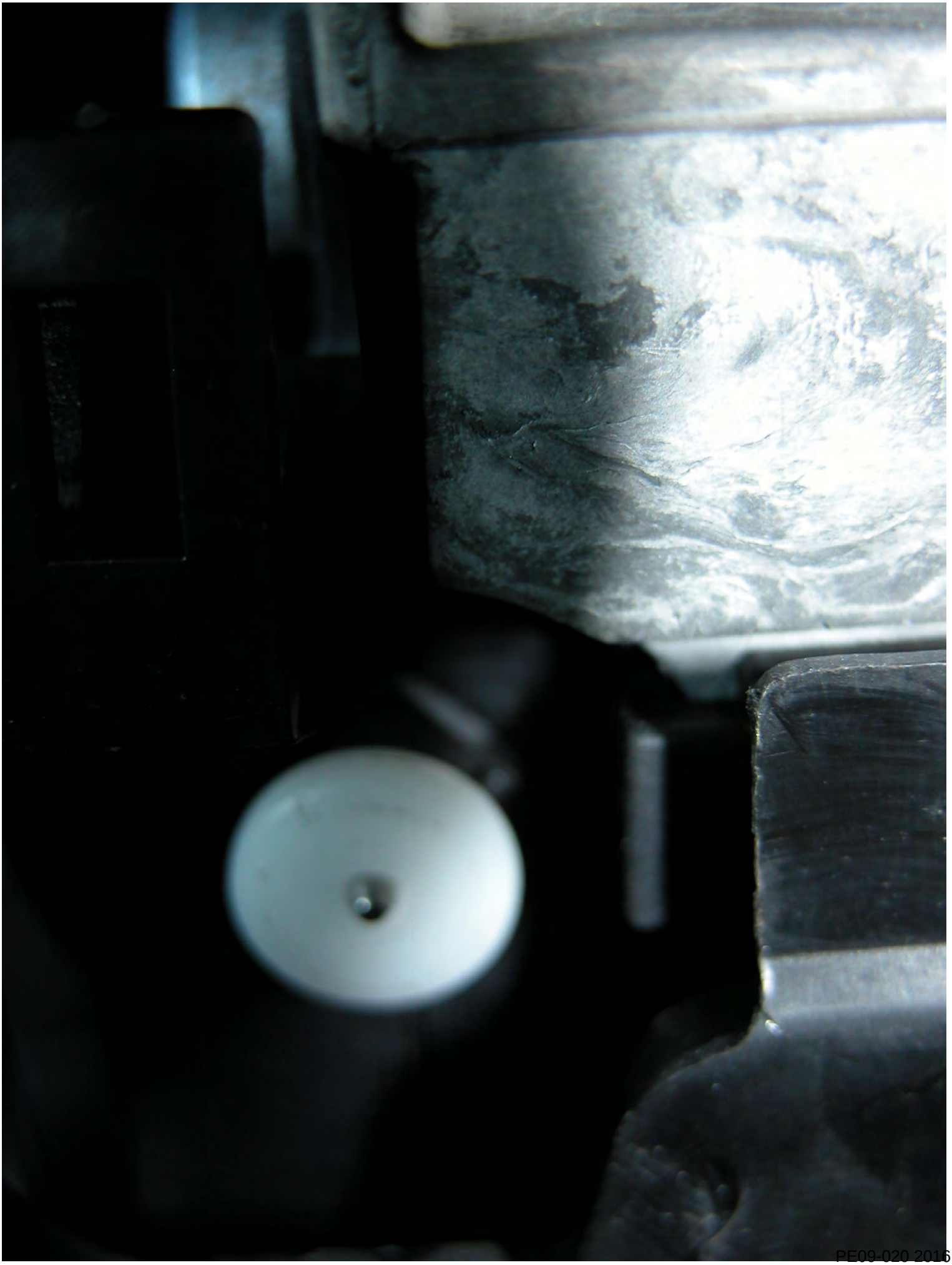

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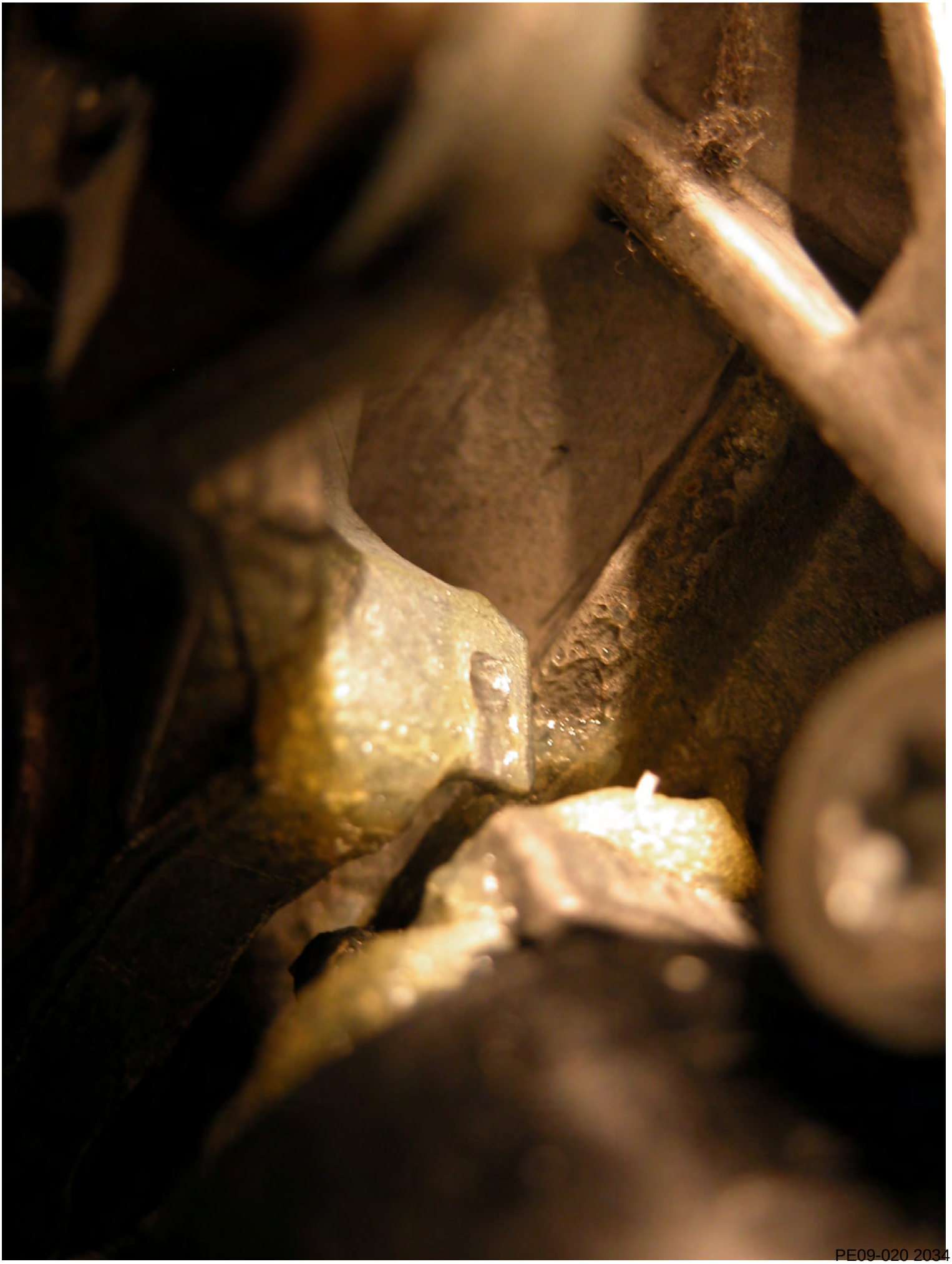

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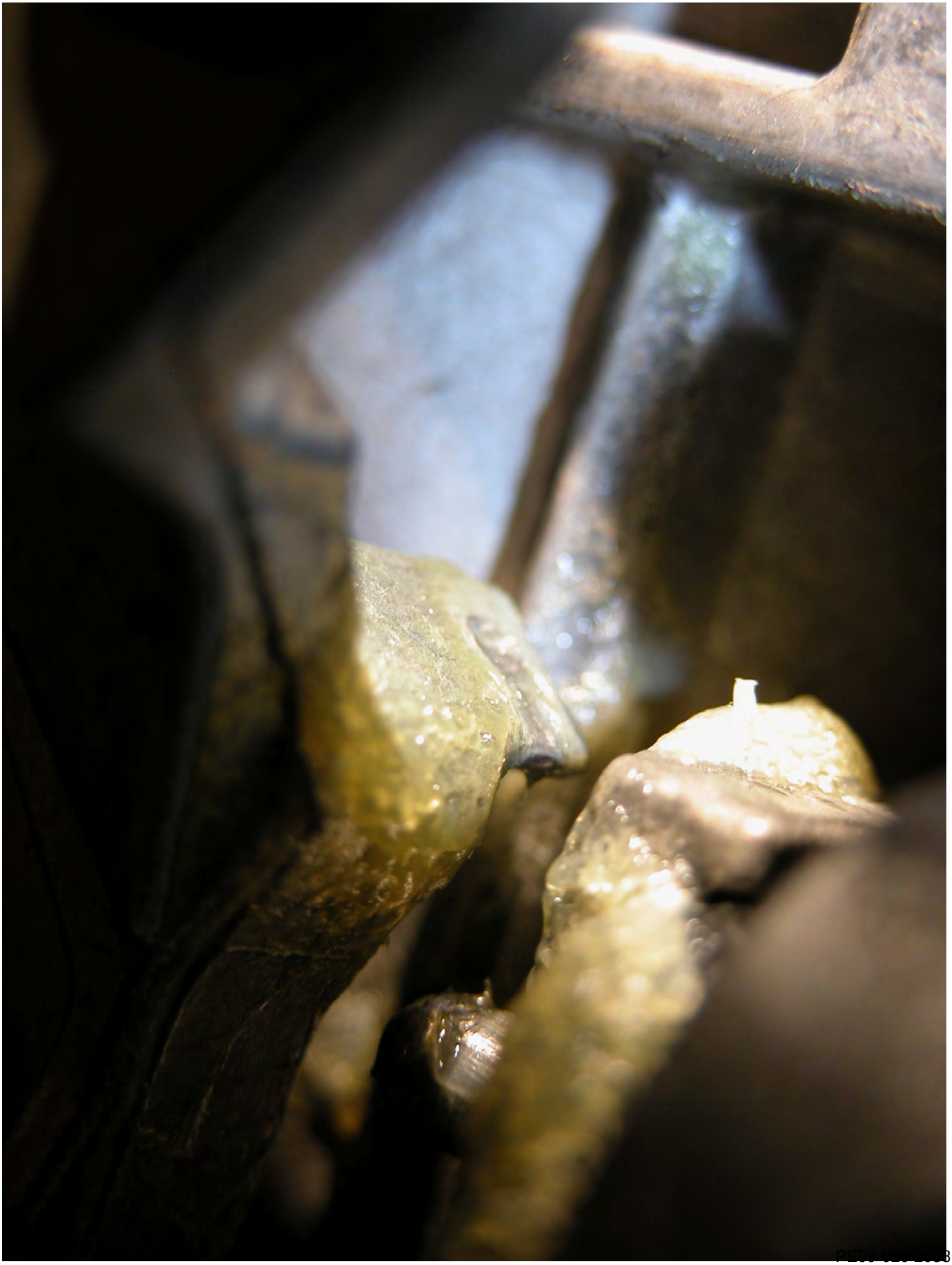

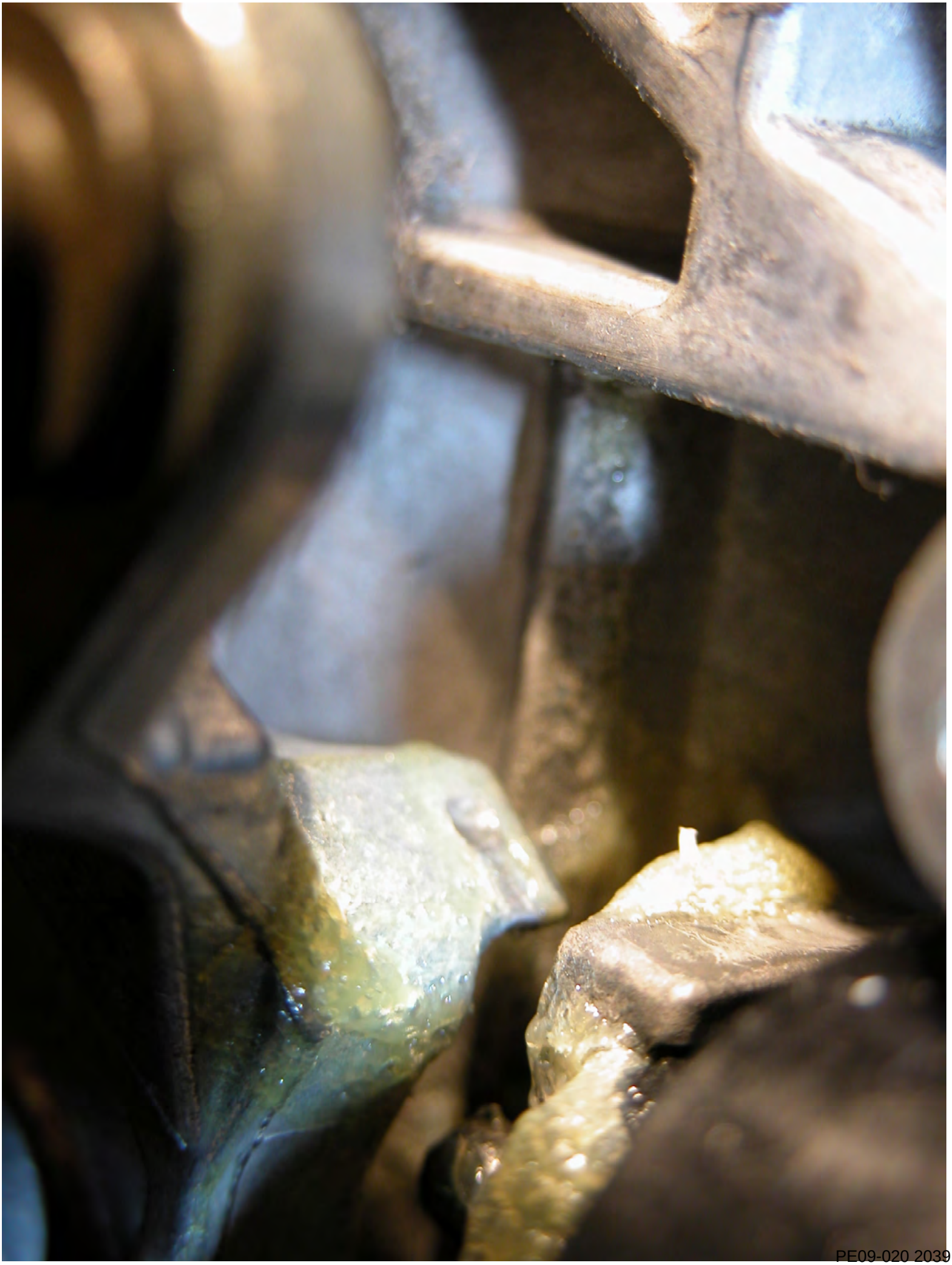

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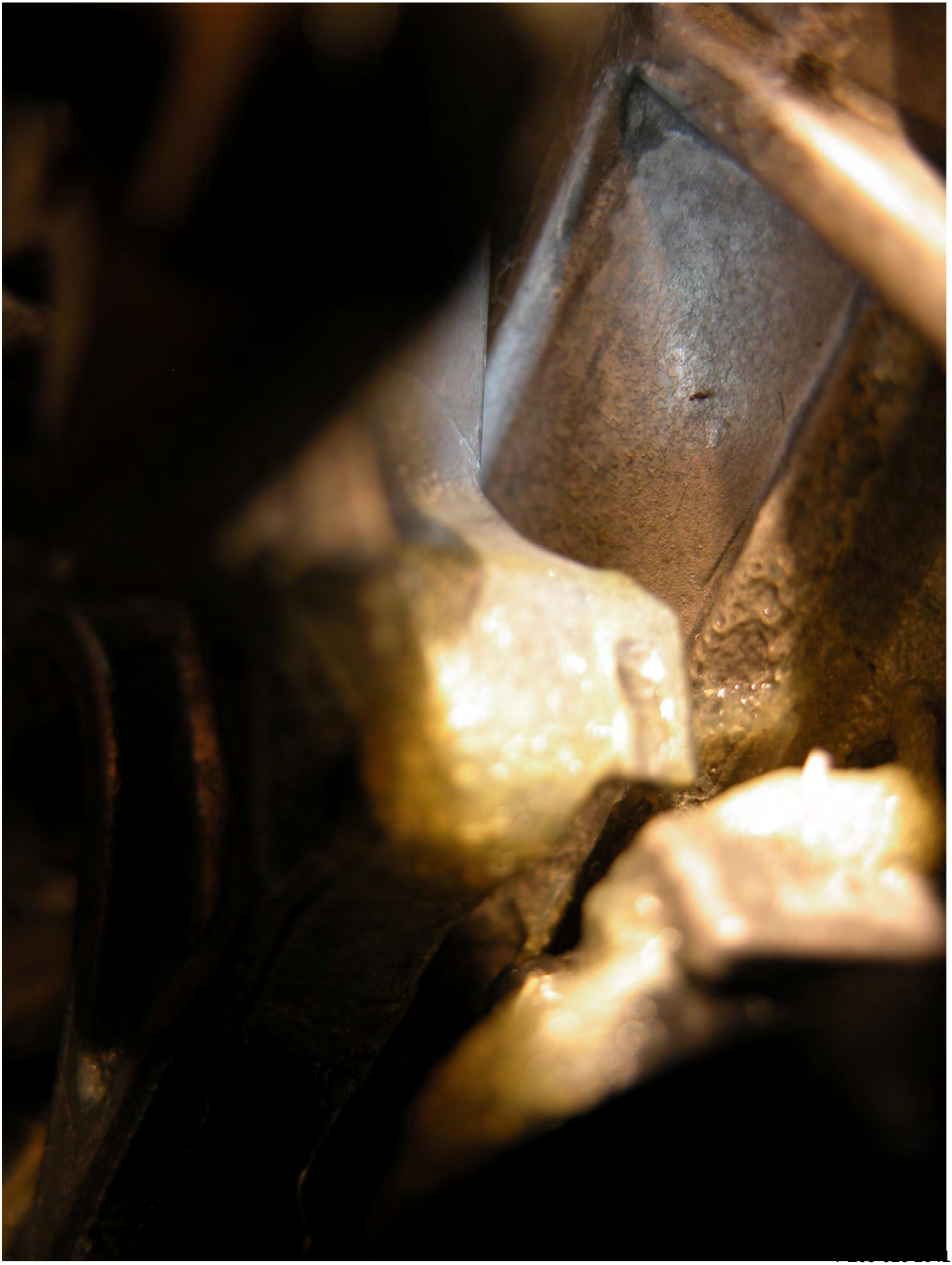

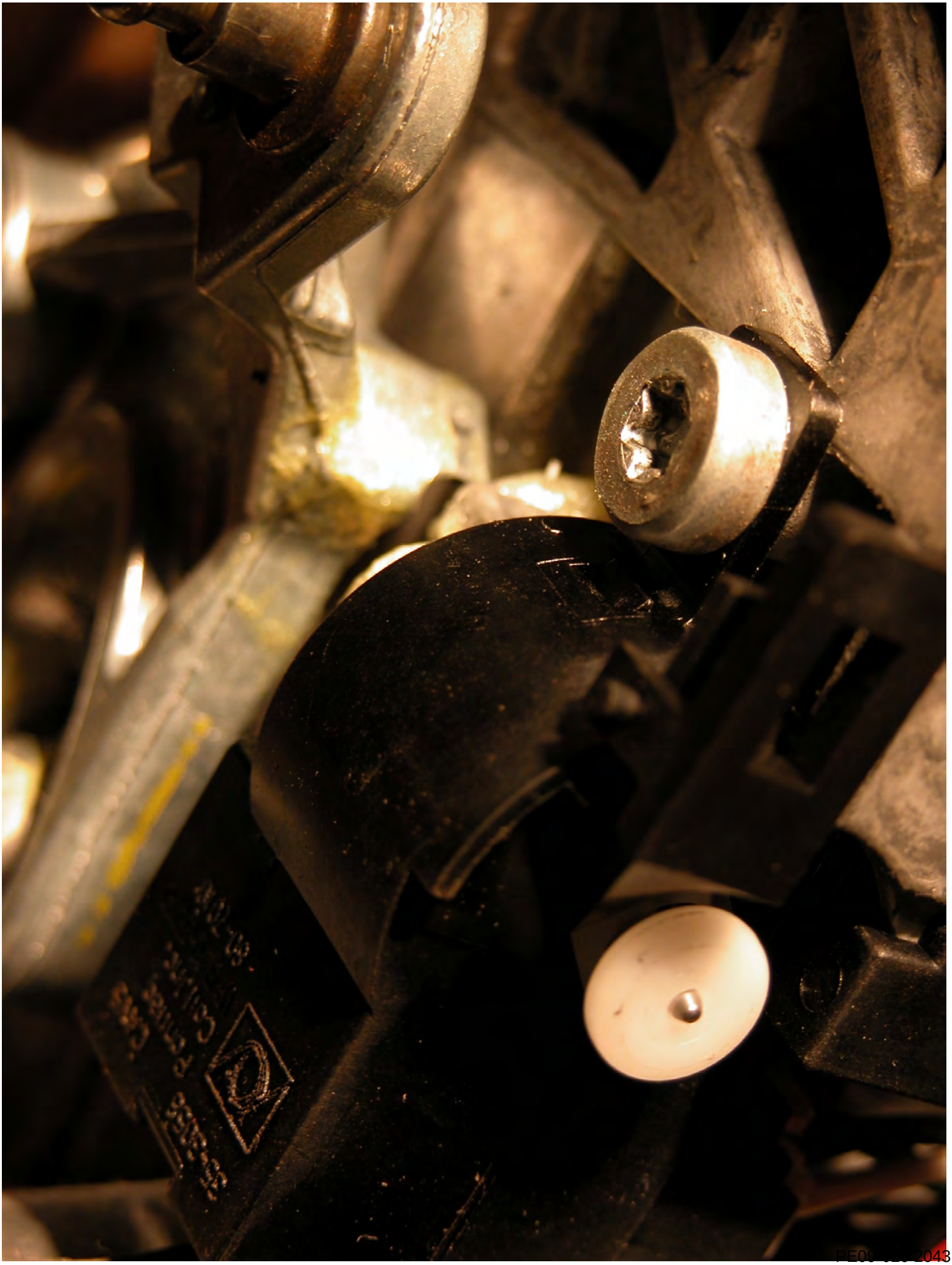

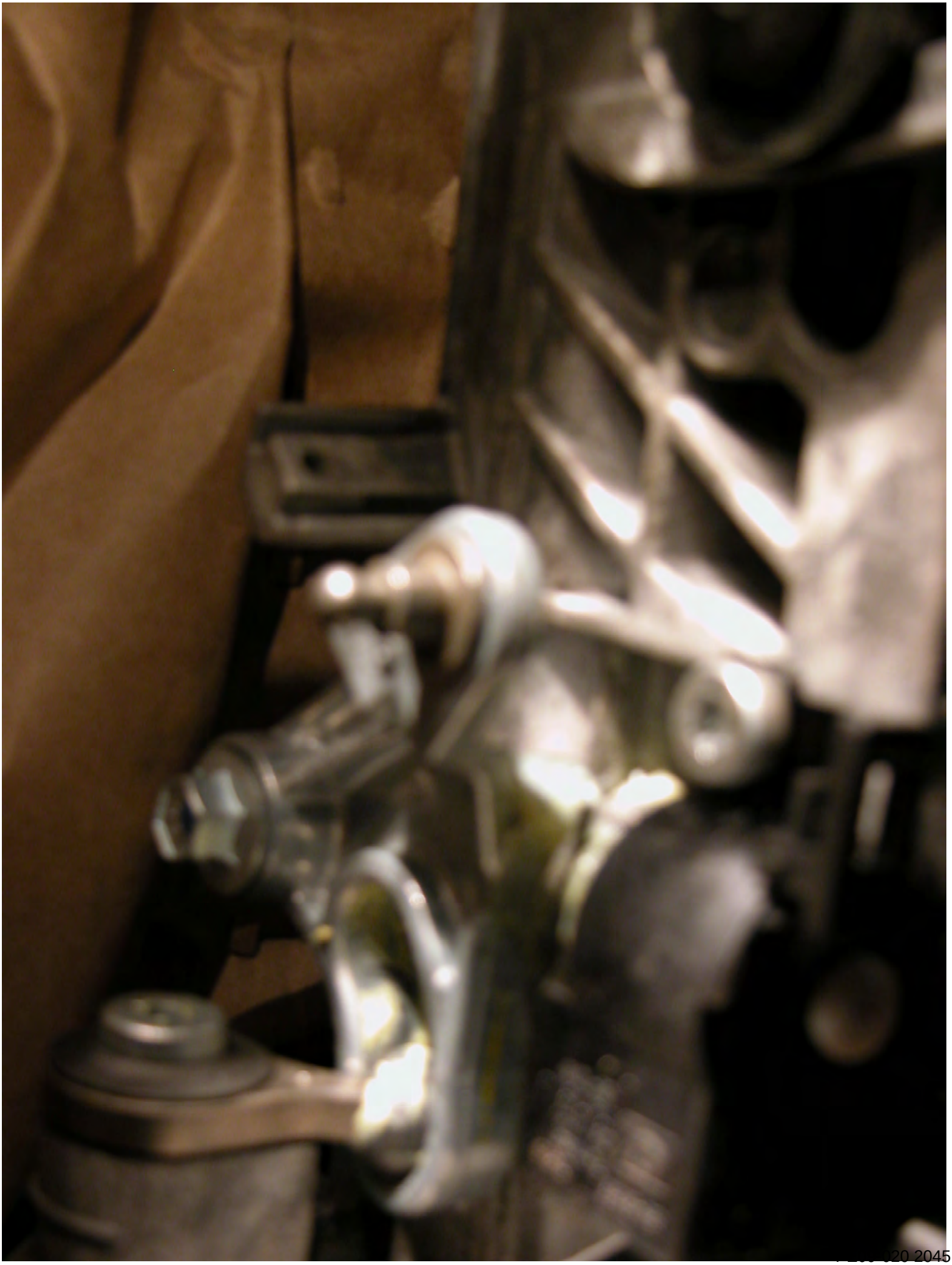

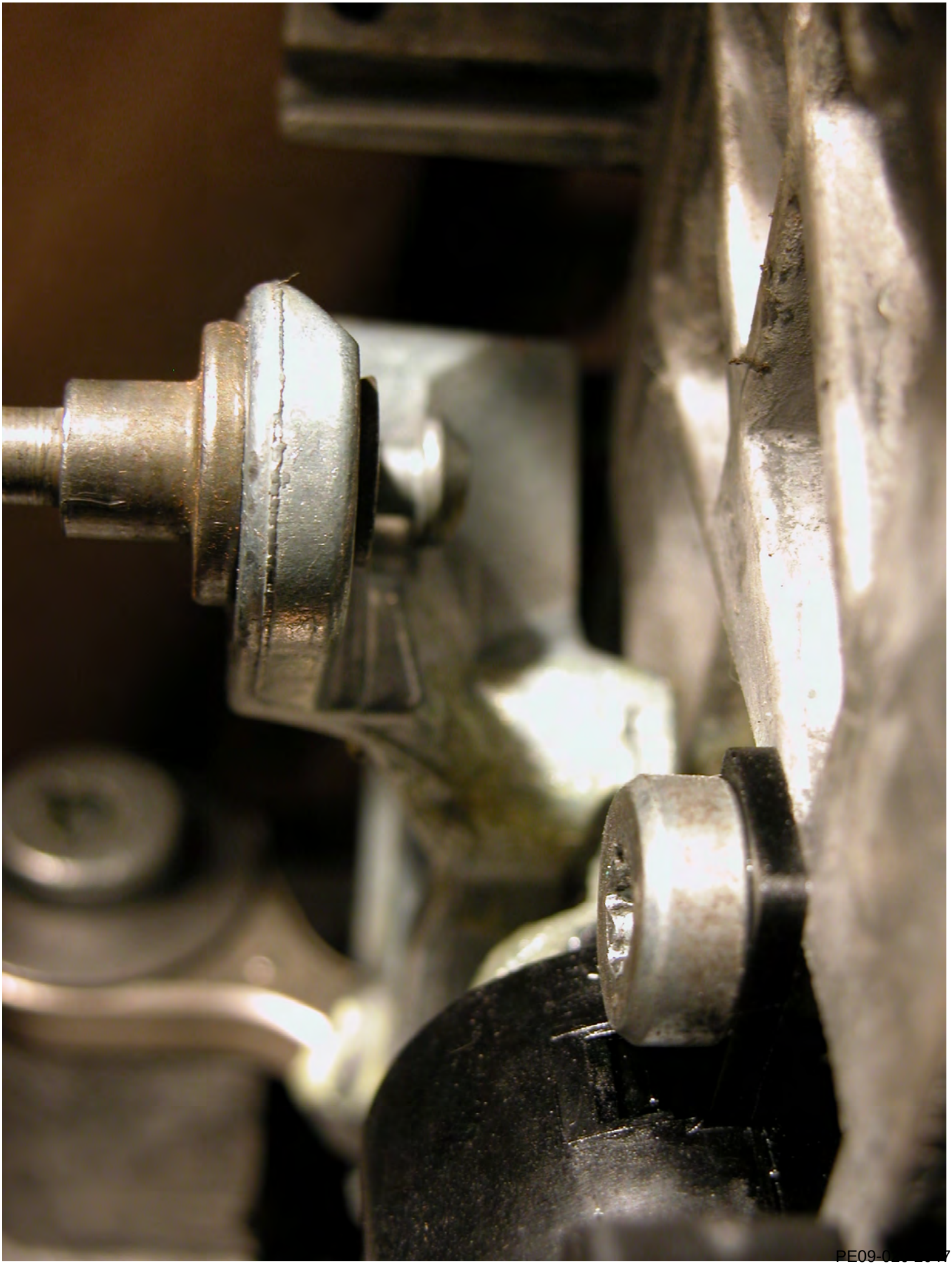

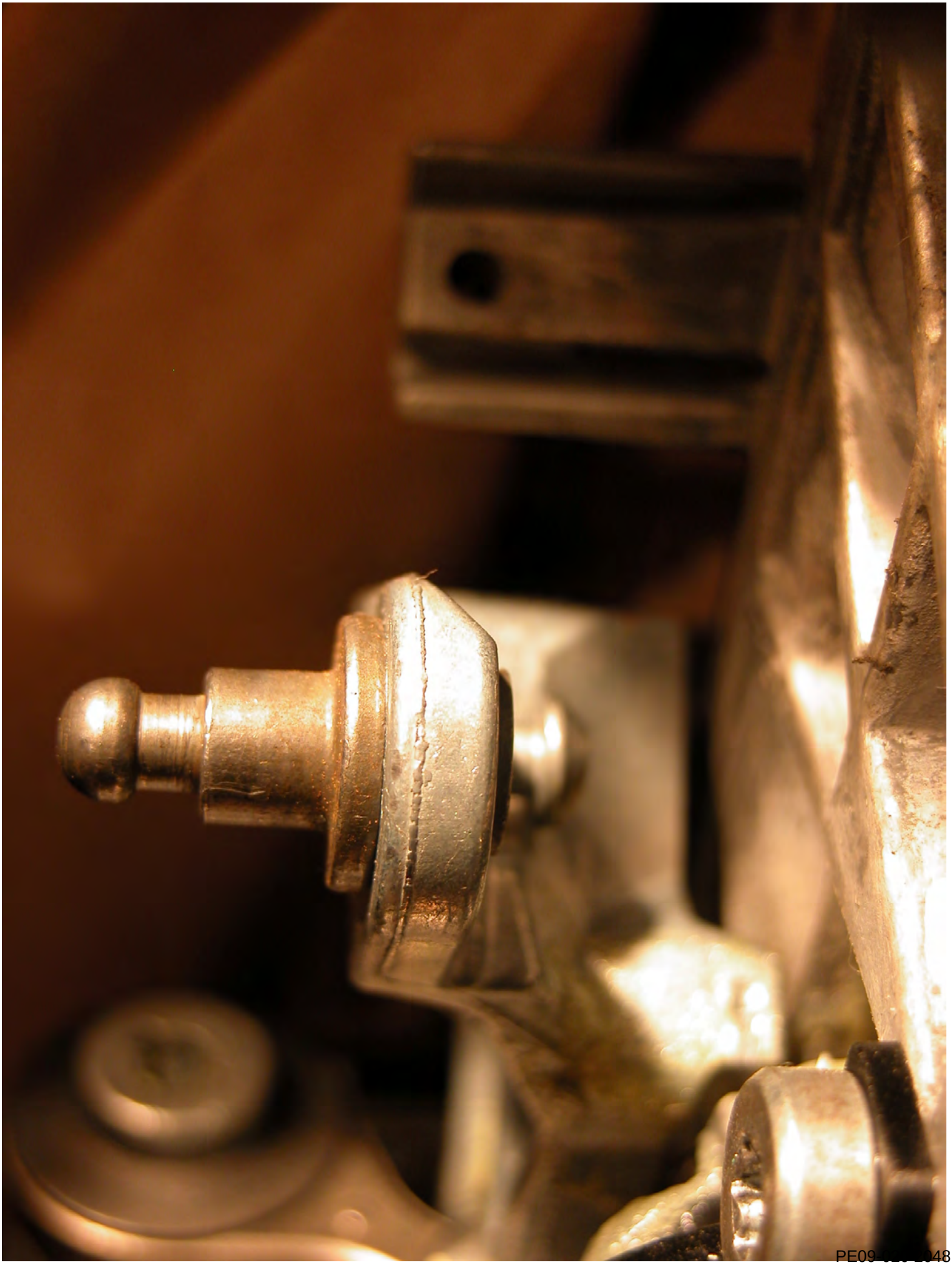
PE09

The Office of Design Analysis

One American Road
Mezzanine Level
Dearborn, MI 48126
313 594-0563

May 6, 2009

Bradley J. McGiboney
Huie, Fernambucq, & Stewart LLP
Three Protective Center
2801 Highway 280 South, Suite 280
Birmingham, Alabama 35223

Meredith Chadwick Ray v. Ford Motor Company 2002 Mercury Mountaineer, VIN 4M2ZU66W02UJ37911

Facts in Brief:
As you requested, I reviewed the above referenced matter involving a claim of unintended vehicle movement. In this regard, I have reviewed the following for this matter:

- The subject 2002 Mercury Mountaineer, VIN 4M2ZU66W02UJ37911
- The service history of the vehicle.
- Technical service bulletins
- Process and quality sheets for the 2002 Mountaineer
- Detailed drawings of the shift system components
- Engineering specification for the 2002 Mountaineer
- Owner guide for the 2002 Mountaineer
- Service manual for the 2002 Mountaineer
- FMVSS 101,102, 114 & 135 for the 2002 Mercury Mountaineer/Ford Explorer
- The depositions of Meredith Ray, Phillip Ray, and Kenneth George
- The expert report authored by Wayne McCracken, Camille Peres, and Kathryn Willard and their respective deposition testimony
- Depositions of Mohammed Azeem, Alan Johnston, Tim Snider, Alan Porter, and Sharon Welch
- Plaintiffs' Rule 26 expert disclosures
- Ford's responses to plaintiff's interrogatories and requests for production
- Plaintiff's complaint
- Plaintiff's interrogatory responses
- Accident Report and
- My previous deposition testimony, dated September 14, 2007

I understand the allegation to be that Meredith Ray exited the vehicle to make an insurance payment. The vehicle was left running, with two children inside, Grace Ray and Lauren Chadwick. Miss Chadwick moved from a car seat in the second row seat to the driver's seat, moved the shift selector lever, allowing the vehicle to move forward. Meredith Ray was in front of the vehicle and was trapped between the vehicle and a building.

Qualifications:

I hold a BSME from the University of Missouri, 1986. I am a graduate of Northern Michigan University Trade School with a certificate in Automatic Transmission Theory and Repair, 1977. I have been an employee of Ford Motor Company since 1988. I have designed, developed, and tested shift systems and steering column components that are at issue in this litigation. I have worked in the Design Analysis Department of Ford Motor Company for 17-years, and have worked as a Design Analysis Engineer for the past 14-Years, assisting Ford's Office of General Counsel in matters of litigation.

Background:

The shift system of the 2002 Mercury Mountaineer is comprised of a series of components that convert rotational motion to transverse motion to engage the parking mechanism in the automatic transmission. The shift system is controlled by the operator of the vehicle.

The subject vehicle is equipped with shift system interlock (so that the key cannot be removed from the ignition unless the transmission is in the park latch position) and the vehicle cannot be started with the key in any selector lever position, except park latch and neutral. This protects the vehicle from being moved without the key by locking the steering column and the shift selector lever. Starting a vehicle in the neutral position allows a moving vehicle to potentially restart after a stall without bringing the vehicle to a complete stop, versus, bringing a vehicle to a complete stop, placing the shift selector lever in the park position, and then restarting the vehicle.

The vehicle also has brake shift interlock, so the transmission shift selector lever cannot be moved from the park latch position with the vehicle running unless the brake pedal is depressed. The brake shift interlock protects the operator from unintended powered vehicle movement.

This vehicle was not subject to any safety recalls involving the shift system, the key interlock, the steering column, or transmission park mechanism.

Plant Installation Process:

- The transmissions are built at a transmission assembly plant and shipped to the vehicle assembly plant. Each transmission is individually tested for function, including park engagement and manual lever position sensor prior to leaving the transmission plant. This ensures proper park function and start function in the appropriate gear selection.

- The steering column is built at a steering column plant and shipped to the vehicle assembly plant in the overdrive position (D). The steering column on the Mountaineer is assembled into the instrument panel at the assembly plant.
- The connection is made between the column and the transmission, using a shift cable and the transmission is adjusted. This adjustment is done with the transmission in the overdrive position and the steering column in the overdrive position, using a 3-pound weight to bias the entire shift system towards 1st gear.
- The completed vehicle is tested prior to leaving Ford's control at the assembly plant for park engagement, shift lever position start function, and key function.

Inspection:
The inspection of the vehicle took place at Weil Wrecker in Birmingham, Alabama on March 14, 2008. The inspection included, but was not limited to the following:

- PRNDL: the PRNDL was checked for proper installation and function. The PRNDL was correctly installed, adjusted, and functioned correctly.
- Shift System: the shift system, including the shift lever, all steering column related shift system components, the shift cable, transmission bracket, and outer manual lever were all present and installed correctly.
- Shift System Adjustment: the shift system adjustment was checked and found to meet specifications.
- Neutral Start Switch: the neutral start switch was checked for function and proper installation. The neutral start switch functioned properly, only allowing the vehicle to start in the neutral and the park latch position.
- Ignition Cylinder: the key ignition cylinder was checked and functioned appropriately in the 4-positions.
- Shift System Interlock: the vehicle was inspected for proper key interlock. The key could not be removed from the vehicle unless the shift lever was fully in the park latch position.
- Vehicle: the vehicle was tested for park engagement in both directions. The vehicle would not move in park.
- Brake Shift Interlock: the brake shift interlock was tested and worked properly.
- Parking Brake: The foot pedal operated parking brake was checked and the vehicle would not move with the parking brake set in either direction. The foot pedal parking brake had a pull-handle release that was also inspected for proper installation and function; the pull-handle release for the parking brake was installed correctly and functions appropriately.
- Parking Brake Light: the parking brake malfunction indicator lamp (MIL) illuminated when the parking brake pedal was depressed
- The brake shift interlock solenoid was removed and the swing arm was inspected for any wear, none was recorded at that time.

My personal inspection of the vehicle showed the vehicle will not move if any or all of the following conditions are present.

1. The shift selector lever is in the park latch position
2. The parking brake is set fully
3. The key is out of the vehicle

Conclusion:

Based upon my education, training, experience and review of all of the evidence, I have the following opinions to a reasonable degree of engineering certainty:

1. The component parts of the automatic transmission, shift control system, and key interlock system of the subject 2002 Mercury Mountaineer were appropriately manufactured and met the general state of the art in the industry,
2. The 2002 Mercury Mountaineer met all applicable Federal Motor Vehicle Safety Standards,
3. The subject vehicle was reasonably safe for its intended use and was not defective,
4. The vehicle will not move when the vehicle's transmission is in park,
5. The vehicle will not move if the parking brake is set,
6. The injury could have been avoided had Meredith Chadwick Ray taken any or all of the following preventative measures, all of which are outlined in the owners guide or intuitive to the operator;
    - Place the gear selector lever full in the park latch position
    - Set the parking brake fully
    - Removed the key from the vehicle
    - Not left children unattended in a running automobile

I anticipate that I may use the following exhibits as a summary or to support of my opinions herein:

- Diagrams and drawings of the 2002 Mercury Mountaineer steering column, automatic transmission and shift system.
- Photographs/videotape of the subject vehicle
- Applicable engineering drawings
- Engineering standards and specifications
- Process and quality specification sheets
- 49 CFR 571 §§ 101, 102, 114, 135
- SAE J915
- A mock-up and/or exemplar components of the 2002 Mercury Mountaineer steering column, automatic transmission, and shift control system.

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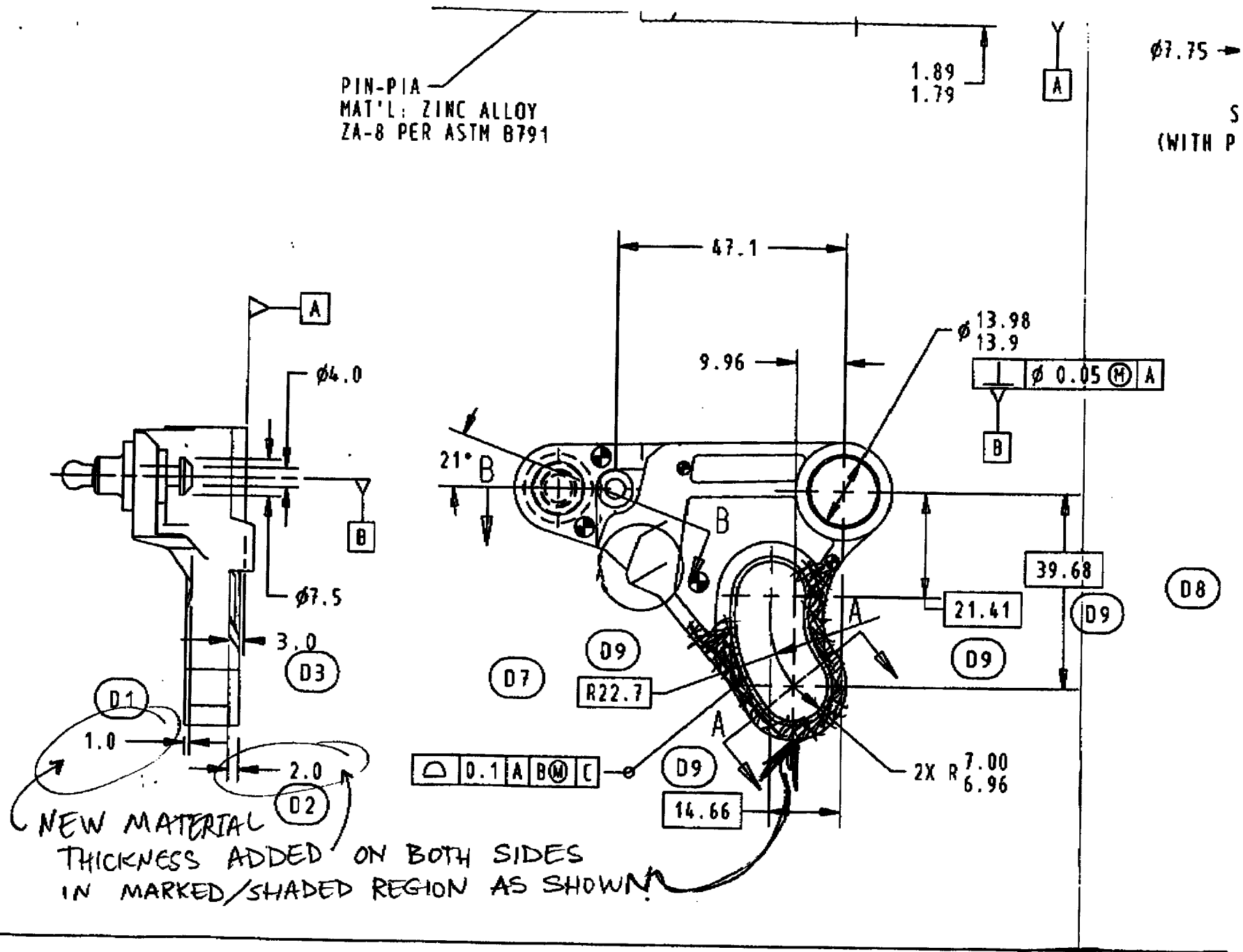
I am not being compensated specifically for the time involved in my research and testimony in this case, however, as a Design Analysis Engineer at the Ford Motor Company; I do receive an annual salary as a Ford employee.

Deleted: If necessary, I may supplement this report, as I understand that discovery is ongoing, expert depositions have not been taken, and my investigation into this case continues.¶

Respectfully Submitted,

Mark K. Taylor
Design Analysis Engineer



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MATERIAL:
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SEE 3D CAD FILE 1L2C-7302-B
ALL GRAPHIC MEASURED DATA IS BASIC

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UNLESS OTHERWISE SPECIFIED:
ALL DIM ±0.1
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UNTOLERANCED DIM ±0.1
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FILLET RADII R 2

CHANGES AFFECTING DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION REQUIRE PRIOR APPROVAL FROM VISTEON PRODUCT ENGINEERING, REFER TO QS-9000

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PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-A1
TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.

DRAFTED IN ACCORDANCE WITH VISTEON ENGINEERING CAD STANDARDS CURRENT AT INITIAL RELEASE.

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