

EA02025

TEXAS INSTRUMENTS, INC.'S

09/10/03 LETTER TO ODI

REQUEST 9

BOX 12

PART A – O

PART G

Epstein, Sally

From: Steve Reimers [sreimers@ford.com]
Sent: Wednesday, February 17, 1999 8:41 AM
To: nisapoint@ford.com; Rahman, Aziz
Subject: RE: (U)

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 />
*** Forwarding note from SLAROUCH--FORDMAIL 02/17/99 08:18 ***
To: SREIMERS--FORDMAIL Reimers, Steve (S)

From: LaRouche, Steve (S.)
Subject: RE: (U)

Steve: The switch in question is switch F. The copper-beryllium arm of the movable contact separated from the brass base. Now that we have had a chance to look at it in closer detail, it appears that the arm separated due to a loss of material thickness from corrosion. We have also found evidence of stress corrosion cracking in the stationary contact. We did not see any evidence of heat or arc damage in this switch. It looked like the arm separated, fell away, and stuck to the wall of the switch cavity.

Steve LaRouche (SLAROUCH)
Metallurgy Section, Central Laboratory, Room N410
(313) 845-4876 (313) 322-1614 FAX

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

From: Steve Reimers [mailto:sreimers@gw.ford.com]
Sent: Tuesday, February 16, 1999 6:13 PM
To: jname@gw.ford.com; nisapoint@gw.ford.com; ruevi@gw.ford.com;
slarouch@mail.ford.com; Aziz Rahman, Texas
Subject: (U)

Can you help me get smart regarding the "LOOSE METAL PART" mentioned above?

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 />
*** Forwarding note from SCOLE1 --DRBN005 02/16/99 18:04 ***
To: SREIMERS--DRBN007
cc: DGOEL --DRBN005

From: Sam L. Cole USAET(UTC -05:00)
Subject: (U)
THE PREVIOUS CONCERN OF THE "LOOSE METAL PART" WAS MENTIONED IN THE LAST MEETING WITH JACK. HE WILL WANT A FOLLOW UP ON THIS AT THIS FRIDAY'S MEETING. PLEASE GET UP TO SPEED ON THE HISTORY OF THIS CONCERN. IF IT TURNS OUT THAT THIS MAY BE A CAUSE, THEN WE WILL NEED TO KNOW WHEN THE ISSUE WAS IN THE FIELD, WHEN IT WAS FIXED AND HOW MANY ARE OUT THERE TO BE CONCERNED ABOUT. THANKS.

Thank You,
Sam
Ext. 21959
BLDG. 2, 22J31 - MD# 1220 - SCOLE1@FORD.COM
*** Forwarding note from SREIMERS--DRBN007 02/16/99 16:52 ***
To: SCOLE1 --DRBN005 DGOEL --DRBN005

TI-NHTSA 018484

FROM: Steve Reimers
Subject: (U)
I have the part to show and a take-apart version too. I am not familiar with the previous problem but a loose metal part in the switch cavity is definitely a potential cause of this concern.

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 3011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 :>
*** Forwarding note from DE7AWAYR--DRBN007 02/16/99 13:41 ***
Subject: AWAY Facility/VM messages
This note was generated by the AWAY Facility/VM 5799-FLP (c) IBM Corp.
DO NOT REPLY TO THIS NOTE

AWA1101 This mail item is being routed to you from SCOLE1 at DRBN005 on behalf of FPORTER at DRBN007.

To: FPORTER --DRBN007
cc: TMASTERS--DRBN005 TDONOVAN--DRBN005
DGOEL --DRBN005

From: Sam L. Cole
Subject: (U)
I UNDERSTAND THAT THERE WILL BE A FOLLOW UP MEETING WITH JACK PASKUS THIS FRIDAY ON THE TOWN CAR INVESTIGATION. I MET WITH JACK TODAY FOR A 1 ON 1, AND HE REQUESTED SOME SPECIFIC INFO. AT FRIDAYS MEETING, PLEASE BRING A SAMPLE SWITCH TO SHOW JACK.

ALSO, HE IS INTERESTED IN KNOWING OUR PROGRESS AND INVESTIGATING IF THE PREVIOUS PROBLEM WITH THE INTERNAL COMPONENTS BREAKING LOOSE IS A POTENTIAL CAUSE OF THIS CONCERN. PLEASE BE PREPARED TO DISCUSS THIS ON FRIDAY. THANKS.

Thank You,
Sam
Ext. 21959
BLDG. 2, 22J31 - MD# 1220 - SCOLE1@FORD.COM

Epstein, Sally

From: McGuirk, Andy [a-mcguirk@small.mc.tl.com]
Sent: Wednesday, February 17, 1999 8:30 AM
To: Pechonis, John; Watt, Jim
Cc: Bartosh, Bob
Subject: FW: 77PS Loose Metal Part?

is this contact arm rivet related ? any history here?

a

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

From: Rahman, Aziz
Sent: Tuesday, February 16, 1999 8:56 PM
To: Baringhouse, Stevan; Dague, Bryan; Baumann, Russ; McGuirk, Andy;
Baker, Gary; Sharpe, Robert; Douglas, Charles
Subject: 77PS Loose Metal Part?
Importance: High

Please review attached messages. Jack Paskus is Luxury VC Chief Engineer. Do any of you know what the previous history with a "Loose Metal Part" is all about? Could he be talking about the spring arm potentially separating due to corrosion, mechanical fatigue thermal effects etc and causing shorts? Please advise on effects of an assumed loose metal part in the switch cavity.

Do we know which switch terminal is hot and which is grounded through the module? Is the stationary terminal hot or the movable?

Thanks
Aziz.

From: Steve Reimers [SMTP:sreimers@ford.com]
Sent: Tuesday, February 16, 1999 6:13 PM
To: jneme@ford.com; nlapoint@ford.com; rnevi@ford.com;
slarouch@ford.com; Aziz Rahman, Texas
Subject: (U)

Can you help me get smart regarding the "LOOSE METAL PART" mentioned above?

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
*** Forwarding note from SCOLE1 --DRBN005 02/16/99 18:04 ***
To: SREIMERS--DRBN007
cc: DGOEL --DRBN005

From: Sam L. Cole USAET(UTC -05:00)
Subject: (U)
THE PREVIOUS CONCERN OF THE "LOOSE METAL PART" WAS MENTIONED IN THE LAST MEETING WITH JACK. HE WILL WANT A FOLLOW UP ON THIS AT THIS FRIDAY'S MEETING. PLEASE GET UP TO SPEED ON THE HISTORY OF THIS CONCERN. IF IT TURNS OUT THAT THIS MAY BE A CAUSE, THEN WE WILL NEED TO KNOW WHEN THE ISSUE WAS IN THE FIELD, WHEN IT WAS FIXED AND HOW MANY ARE OUT THERE TO

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Thank You,

Sam

Ext. 21959

BLDG. 2, 22J31 - MD# 1220 - SCOLE1@FORD.COM

*** Forwarding note from SREIMERS--DRBN007 02/16/99 16:52 ***

To: SCOLE1 --DRBN005

DGOEL --DRBN005

FROM: Steve Reimers

USAET(UTC -05:00)

Subject: (U)

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he previous problem but a loose metal part in the switch cavity is definitely a

potential cause of this concern.

Steve Reimers

building 5 3C043

AVT Chassis E/E System Applications

mail drop 5011

39-03286 SREIMERS sreimers@ford.com

fax 39-03286

/>

*** Forwarding note from DB7AWAYR--DRBN007 02/16/99 13:41 ***

Subject: AWAY Facility/VM messages

This note was generated by the AWAY Facility/VM 5799-FLP (c)IBM Corp.

DO NOT REPLY TO THIS NOTE

AWAII01 This mail item is being routed to you from SCOLE1 at DRBN005 on behalf of FPORTER at DRBN007.

To: FPORTER --DRBN007

cc: TMASTERS--DRBN005

DGOEL --DRBN005

TDCNOVAN--DRBN005

From: Sam L. Cole

USAET(UTC -05:00)

Subject: (U)

I UNDERSTAND THAT THERE WILL BE A FOLLOW UP MEETING WITH JACK PASKUS THIS FRIDAY ON THE TOWN CAR INVESTIGATION. I MET WITH JACK TODAY FOR A 1 ON 1, AND HE REQUESTED SOME SPECIFIC INFO. AT FRIDAYS MEETING, PLEASE BRING A SAMPLE SWITCH TO SHOW JACK.

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Thank You,

Sam

Ext. 21959

BLDG. 2, 22J31 - MD# 1220 - SCOLE1@FORD.COM

Epstein, Sally

From: Douglas, Charles [c-douglas2@email.mci.com]
Sent: Wednesday, February 17, 1999 10:10 AM
To: Beringhouse, Steven; Dague, Bryan; Baumann, Russ; McGuirk, Andy; Baker, Gary; Sharpe, Robert; Rahman, Aziz
Subject: RE: 77PS Loose Metal Part?

Aziz,

The only issue I am aware of is tied to the Econoline (mating connector issue from CY92) for which we have provided new copies of the 8D for the Ford team. I think you will recall since you were also involved directly with the 77PS back in this timeframe that x-rays showed the terminal arm had completely corroded and in some cases was nothing more than powder and in other cases there was a loose metal part within the switch cavity. However, the only vehicle issue this caused was a cruise control inop code.

Beyond the Econoline, there is a gap in my history on CCP8 as I was not directly involved with this program between CY94 - CY97 so it is possible there is another issue I am not aware of. I would suggest that we have Andy follow up with his organization to see if there are any 8D's generated during this timeframe that may be tied to a loose metal part.

Regards,

Charlie

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

From: Rahman, Aziz
Sent: Tuesday, February 16, 1999 3:55 PM
To: Beringhouse, Steven; Dague, Bryan; Baumann, Russ; McGuirk, Andy; Baker, Gary; Sharpe, Robert; Douglas, Charles
Subject: 77PS Loose Metal Part?
Importance: High

Please review attached messages. Jack Paskus is Luxury VC Chief Engineer. Do any of you know what the previous history with a "Loose Metal Part" is all about? Could he be talking about the spring arm potentially separating due to corrosion, mechanical fatigue thermal effects etc and causing shorts? Please advise on effects of an assumed loose metal part in the switch cavity.

Do we know which switch terminal is hot and which is grounded through the module? Is the stationary terminal hot or the movable?

Thanks
Aziz.

From: Steve Reimers[SMTF:sreimers@ford.com]
Sent: Tuesday, February 16, 1999 6:13 PM
To: jneme@ford.com; ulapoint@ford.com; rnevi@ford.com; slarouch@ford.com; Aziz Rahman, Texas
Subject: (U)

Can you help me get smart regarding the "LOOSE METAL PART" mentioned above?

Steve Reimers building 5 3C045
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 >
*** Forwarding note from SCOLE1 --DREW005 02/16/99 18:04 ***

TI-NHTSA 016488

To: SREIMERS--DRN007
cc: DGOEL --DRN005

From: Sam L. Cole USAET(UTC -05:00)
Subject: (U)
THE PREVIOUS CONCERN OF THE "LOOSE METAL PART" WAS MENTIONED IN THE LAST MEETING WITH JACK. HE WILL WANT A FOLLOW UP ON THIS AT THIS FRIDAY'S MEETING. PLEASE GET UP TO SPEED ON THE HISTORY OF THIS CONCERN. IF IT TURNS OUT THAT THIS MAY BE A CAUSE, THEN WE WILL NEED TO KNOW WHEN THE ISSUE WAS IN THE FIELD, WHEN IT WAS FIXED AND HOW MANY ARE OUT THERE TO BE CONCERNED ABOUT. THANKS.

Thank You,
Sam
Ext. 21939
BLDG. 2, 22J31 - MD# 1220 - SCOLE1@FORD.COM
*** Forwarding note from SREIMERS--DRN007 02/16/99 16:52 ***
To: SCOLE1 --DRN005 DGOEL --DRN005

FROM: Steve Reimers USAET(UTC -05:00)
Subject: (U)
I have the part to show and a take-apart version too. I am not familiar with the previous problem but a loose metal part in the switch cavity is definitely a potential cause of this concern.

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
*** Forwarding note from DB7AMAYR--DRN007 02/16/99 13:41 ***
Subject: AMAY Facility/VN messages
This note was generated by the AMAY Facility/VN 5789-FLP (c)IBM Corp.
DO NOT REPLY TO THIS NOTE

AWA1101 This mail item is being routed to you from SCOLE1 at DRN005 on behalf of FPORTER at DRN007.

To: FPORTER --DRN007
cc: TMASTERS--DRN005 TDONOVAN--DRN005
DGOEL --DRN005

From: Sam L. Cole USAET(UTC -05:00)
Subject: (U)
I UNDERSTAND THAT THERE WILL BE A FOLLOW UP MEETING WITH JACK PASKUS THIS FRIDAY ON THE TOWN CAR INVESTIGATION. I MET WITH JACK TODAY FOR A 1 ON 1, AND HE REQUESTED SOME SPECIFIC INFO. AT FRIDAY'S MEETING, PLEASE BRING A SAMPLE SWITCH TO SHOW JACK.

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Thank You,
Sam
Ext. 21939
BLDG. 2, 22J31 - MD# 1220 - SCOLE1@FORD.COM

Erwin, Edly

From: Rahman, Aziz (arhman@mail.mot.com)
Sent: Wednesday, February 17, 1999 8:21 AM
To: Birmingham, Steven; Cagun, Bryan; McClure, Andy; Baumert, Russ; Sharpe, Robert
Subject: FW: Switch 7

Steve, I think it will be a good idea to respond quickly with what may have caused the spring arm to corrode. I believe that salt water intrusion will caused more accelerated corrosion than brake fluid.

From: Steve Reimers [SMTP:sreimers@ford.com]
Sent: Wednesday, February 17, 1999 9:41 AM
To: nlapoint@ford.com; Aziz Rahman, Texas
Subject: RE: (U)

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
*** Forwarding note from SLAROUCH--FORDMAIL 02/17/99 08:18 ***
To: SREIMERS--FORDMAIL Reimers, Steve (S.)

From: LaRouche, Steve (S.)
Subject: RE: (U)

Steve: The switch in question is switch F. The copper-beryllium arm of the moveable contact separated from the brass base. Now that we have had a chance to look at it in closer detail, it appears that the arm separated due to a loss of material thickness from corrosion. We have also found evidence of stress corrosion cracking in the stationary contact. We did not see any evidence of heat or arc damage in this switch. It looked like the arm separated, fell away, and stuck to the wall of the switch cavity.

Steve LaRouche (SLAROUCH)
Metallurgy Section, Central Laboratory, Room N410
(313) 845-4876 (313) 322-1614 FAX

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

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Sent: Tuesday, February 16, 1999 8:13 PM
To: jname@gw.ford.com; nlapoint@gw.ford.com; rnevi@gw.ford.com;
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Subject: (U)

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Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
*** Forwarding note from SCOLEL --DREN005 02/16/99 18:04 ***
To: SREIMERS--DREN007
cc: DGOEL --DREN005

From: Sam L. Cole USAET(UTC -05:00)
Subject: (U)
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Thank You,

Sam

Ext. 21959

BLDG. 2, 22J31 - MD# 1220 - SCOLE1@FORD.COM

*** Forwarding note from SREIMERS--DRBN007 02/16/99 16:52 ***

To: SCOLE1 --DRBN005 DGOEL --DRBN003

FROM: Steve Reimers

USAET(UTC -05:00)

Subject: U

I have the part to show and a take-apart version too. I am not familiar with the

previous problem but a loose metal part in the switch cavity is definitely a potential cause of this concern.

Steve Reimers

building 6 3C043

AVT Chassis E/E System Applications

mail drop 5011

39-03286 SREIMERS sreimers@ford.com

fax 39-03286

*** Forwarding note from DS7AWAYR--DRBN007 02/16/99 13:41 ***

Subject: AWAY Facility/VM messages

This note was generated by the AWAY Facility/VM 5799-FLP (c) IBM Corp.

DO NOT REPLY TO THIS NOTE

AWA1101 This mail item is being routed to you from SCOLE1 at DRBN005 on behalf of FPORTER at DRBN007.

To: FPORTER --DRBN007

cc: TMASTERS--DRBN005

TDONOVAN--DRBN005

DGOEL --DRBN005

From: Sam L. Cole

USAET(UTC -05:00)

Subject: (U)

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Thank You,

Sam

Ext. 21959

BLDG. 2, 22J31 - MD# 1220 - SCOLE1@FORD.COM

Watt, Jim

From: McGuirk, Andy
Sent: Wednesday, February 17, 1999 9:29 AM
To: Pechonis, John; Watt, Jim
Cc: Bertosh, Bob
Subject: FW: 77PS Loose Metal Part?

Is this contact arm rivet related ? any history here?

B

AUTOMOTIVE SENSORS AND CONTROLS (RA HANDEK)
34 FOREST ST N/S 23-03
ATLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
PAGE: (800) 467-3700 FAX 604-2044

From: Rahman, Aziz
Sent: Tuesday, February 16, 1999 8:56 PM
To: Beringhaus, Steven; Dague, Bryan; Baumann, Russ; McGuirk, Andy; Baker, Gary; Sharpe, Robert; Douglas, Charles
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Do we know which switch terminal is hot and which is grounded through the module? Is the stationary terminal hot or the movable?

Thanks
Aziz.

From: Steve Reimers[SMTP:sreimers@ford.com]
Sent: Tuesday, February 16, 1999 8:15 PM
To: jname@ford.com; nispoint@ford.com; mev@ford.com; alarouch@ford.com; Aziz Rahman, Texas
Subject: (U)

Can you help me get smart regarding the "LOOSE METAL PART" mentioned above?

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
*** Forwarding note from SCOLE1 --DRBN005 02/16/99 18:04 ***
To: SREIMERS--DRBN007
cc: DGOEL --DRBN005

From: Sam L. Cole USAET(UTC -05:00)
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To: SCOLE1 --DRBN005 DGOEL --DRBN005

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Subject: (U)

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39-03286 SREIMERS sreimers@ford.com fax 39-03286 />
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DO NOT REPLY TO THIS NOTE

AWA110I This mail item is being routed to you from SCOLE1 at DRBN005 on behalf of FPORTER at DRBN007.

To: FPORTER --DRBN007
cc: TMASTERS--DRBN005 TDONOVAN--DRBN005
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Epstein, Sally

From: Deque, Bryan [bdeque@small.mc.N.com]
Sent: Wednesday, February 17, 1999 9:55 AM
To: Beringhaus, Steven; McGuirk, Andy; Baumann, Russ; Sharpe, Robert; Rahman, Aziz
Subject: RE: Switch 7

Aziz,

I have not been able to close with JF yet, but I believe the only time we had an arm problem in the field was with the econo van circa 1992. You are very familiar with that issue.

I think somebody got this issue confused.

Regards,
Bry

From: Rahman, Aziz
Sent: Wednesday, February 17, 1999 10:21 AM
To: Beringhaus, Steven; Deque, Bryan; McGuirk, Andy; Baumann, Russ; Sharpe, Robert
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Subject: RE: (U)

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Steve LaRouche (SLAROUCH)
Metallurgy Section, Central Laboratory, Room N410
(313) 845-4876 (313) 822-1614 FAX

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Subject: (U)

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cc: DGOEL --DRBN005

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To: SCOLE1 --DRBN005 DGOEL --DRBN005

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Subject: (U)
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39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
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DO NOT REPLY TO THIS NOTE

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To: FPORTER --DRBN007
cc: TMASTERS--DRBN005 TDONOVAN--DRBN005
DGOEL --DRBN005

From: Sam L. Cole USAET(UTC -05:00)
Subject: (U)
I UNDERSTAND THAT THERE WILL BE A FOLLOW UP MEETING WITH JACK PASKUS THIS FRIDAY ON THE TOWN CAR INVESTIGATION. I MET WITH JACK TODAY FOR A 1 ON 1, AND HE REQUESTED SOME SPECIFIC INFO. AT FRIDAY'S MEETING, PLEASE BRING A SAMPLE SWITCH TO SHOW JACK.

ALSO, HE IS INTERESTED IN KNOWING OUR PROGRESS AND INVESTIGATING IF THE PREVIOUS PROBLEM WITH THE INTERNAL COMPONENTS BREAKING LOOSE IS A POTENTIAL CAUSE OF THIS CONCERN. PLEASE BE PREPARED TO DISCUSS THIS ON FRIDAY. THANKS.

Thank You,

Sam
Ext. 21959
BLDG. 2, 22J31 - MDW 1270 - SCOLEISFORD.COM

Epstein, Sally

From: McGuirk, Andy [a-mcguirk@gmail.com]
Sent: Wednesday, February 17, 1999 9:56 AM
To: Watt, Jim; Pechonk, John
Subject: FW: Switch 7

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
14 FOREST ST W/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
PAGE: (800) 487-3700 PIN 604-2044

From: Dague, Bryan
Sent: Wednesday, February 17, 1999 10:54 AM
To: Beringhouse, Steven; McGuirk, Andy; Baumann, Russ; Sharpe, Robert;
Rahman, Aziz
Subject: RE: Switch 7

Aziz,

I have not been able to close with JP yet, but I believe the only time we had an arm problem in the field was with the econo van circa 1992. You are very familiar with that issue.

I think somebody got this issue confused.

Regards,
Bry

From: Rahman, Aziz
Sent: Wednesday, February 17, 1999 10:21 AM
To: Beringhouse, Steven; Dague, Bryan; McGuirk, Andy; Baumann, Russ; Sharpe, Robert
Subject: FW: Switch 7

Steve, I think it will be a good idea to respond quickly with what may have caused the spring arm to corrode. I believe that salt water intrusion will caused more accelerated corrosion than brake fluid.

From: Steve Reimers[SMTP: sreimers@ford.com]
Sent: Wednesday, February 17, 1999 9:41 AM
To: alupoint@ford.com; Aziz Rahman, Texas
Subject: RE: (U)

Steve Reimers building 3 3C043
AVT Chassis E/E System Applications mail drop 5011
39-09296 SREIMERS sreimers@ford.com fax 39-01206 ;>
*** Forwarding note from SLAROUCE--FORMAIL 02/17/99 08:18 ***
To: SREIMERS--FORMAIL Reimers, Steve (S)

From: LaRouche, Steve (S.)
Subject: RE: (U)

Steve: The switch in question is switch F. The copper-beryllium arm of the

movable contact separated from the brass base. Now that we have had
a chance to look at it in closer detail, it appears that the arm
separated due to a loss of material thickness from corrosion. We have also found
evidence of stress corrosion cracking in the stationary contact. We did not
see any evidence of heat or arc damage in this switch. It looked like the
arm separated, fell away, and stuck to the wall of the switch cavity.

Steve LaRouche (SLAROUCH)
Metallurgy Section, Central Laboratory, Room H410
(313) 845-4876 (313) 322-1614 FAX

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

From: Steve Reimers [mailto:sreimers@w.ford.com]
Sent: Tuesday, February 18, 1999 6:13 PM
To: jsm@w.ford.com; nlapoint@w.ford.com; rnevi@w.ford.com;
slarouch@mail.ford.com; Aziz Rahman, Texas
Subject: (U)

Can you help me get smart regarding the "LOOSE METAL PART" mentioned
above?

Steve Reimers building 3 SC043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
*** Forwarding note from SCOLE1 --DREW005 02/18/99 18:04 ***
To: SREIMERS--DREW007
cc: DGOEL --DREW005

From: Sam L. Cole
Subject: (U) USAET (UTC -05:00)

Erstein, Sally

From: Beringhaus, Steven [sberinghaus@smat.mcl.com]
Sent: Wednesday, February 17, 1999 10:08 AM
To: Dague, Bryan; McGuirk, Andy; Baumann, Russ; Sharpe, Robert; Rahman, Aziz
Subject: RE: Switch 7

Attorney client Privileged Information

Aziz,

I spoke with Al Hopkins and he and I both agree that brake fluid alone will not cause the corrosion of the contact arm. Water and contaminants in the water that drive conductivity will be needed to drive the corrosion. Although it is possible that the "dirty" water could come in to the switch with the brake fluid, it is more likely that the corrosion was caused by water and contaminants through the connector.

Regards,
Steve

From: Rahman, Aziz
Sent: Wednesday, February 17, 1999 10:21 AM
To: Beringhaus, Steven; Dague, Bryan; McGuirk, Andy; Baumann, Russ; Sharpe, Robert
Subject: FW: Switch 7

Steve, I think it will be a good idea to respond quickly with what may have caused the spring arm to corrode. I believe that salt water intrusion will caused more accelerated corrosion than brake fluid.

From: Steve Reimers [SMTP:sreimers@ford.com]
Sent: Wednesday, February 17, 1999 9:41 AM
To: nlapoint@ford.com; Aziz Rahman, Texas
Subject: RE: (U)

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 3011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
*** Forwarding note from SLAROUCH--FORDMAIL 02/17/99 08:18 ***
To: SREIMERS--FORDMAIL Reimers, Steve (S).

From: LaRouche, Steve (S.)
Subject: RE: (U)

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Steve LaRouche (SLAROUCH)
Metallurgy Section, Central Laboratory, Room N410
(313) 845-4876 (313) 322-1614 FAX

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

From: Steve Reimers [mailto:sreimers@gw.ford.com]
Sent: Tuesday, February 16, 1999 6:13 PM
To: jneme@gw.ford.com; nlapoint@gw.ford.com; znevi@gw.ford.com;
slarouch@mail.ford.com; Aziz Rahman, Texas

TI-NHTSA 016499

Subject: (U)

Can you help me get smart regarding the "LOOSE METAL PART" mentioned above?

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 />
*** Forwarding note from SCOLE1 --DRBN005 02/16/99 18:04 ***
To: SREIMERS--DRBN007
cc: DGOEL --DRBN005

From: Sam L. Cole USAET(UTC -05:00)
Subject: (U)
THE PREVIOUS CONCERN OF THE "LOOSE METAL PART" WAS MENTIONED IN THE LAST MEETING WITH JACK. HE WILL WANT A FOLLOW UP ON THIS AT THIS FRIDAY'S MEETING. PLEASE GET UP TO SPEED ON THE HISTORY OF THIS CONCERN. IF IT TURNS OUT THAT THIS MAY BE A CAUSE, THEN WE WILL NEED TO KNOW WHEN THE ISSUE WAS IN THE FIELD, WHEN IT WAS FIXED AND HOW MANY ARE OUT THERE TO BE CONCERNED ABOUT. THANKS.

Thank You,
Sam
Ext. 21959
BLDG. 2, 22J31 - MD# 1220 - SCOLE1@FORD.COM
*** Forwarding note from SREIMERS--DRBN007 02/16/99 16:52 ***
To: SCOLE1 --DRBN005 DGOEL --DRBN005

FROM: Steve Reimers USAET(UTC -05:00)
Subject: (U)
I have the part to show and a take-apart version too. I am not familiar with the previous problem but a loose metal part in the switch cavity is definitely a potential cause of this concern.

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 />
*** Forwarding note from DB7AMAYR--DRBN007 02/16/99 13:41 ***
Subject: AMAY Facility/VM messages
This note was generated by the AMAY Facility/VM 5799-FLF (c) IBM Corp.
DO NOT REPLY TO THIS NOTE

AM1101 This mail item is being routed to you from SCOLE1 at DRBN005 on behalf of FPORTER at DRBN007.

To: FPORTER --DRBN007
cc: THASTERS--DRBN005 TDCNOVAN--DRBN005
DGOEL --DRBN005

From: Sam L. Cole USAET(UTC -05:00)
Subject: (U)
I UNDERSTAND THAT THERE WILL BE A FOLLOW UP MEETING WITH JACK PASKUS THIS FRIDAY ON THE TOWN CAR INVESTIGATION. I MET WITH JACK TODAY FOR A 1 ON 1, AND HE REQUESTED SOME SPECIFIC INFO. AT FRIDAYS MEETING, PLEASE BRING A SAMPLE SWITCH TO SHOW JACK.

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Thank You,
Sam

ENC. 21959.
SLIP. 2, 22531 - NEW 1221 - SC0213FORD.COM

Baumann, Russ

From: DeGus, Bryan
Sent: Wednesday, February 17, 1999 10:55 AM
To: Beringhaus, Steven; McGuirk, Andy; Baumann, Russ; Sharpe, Robert; Rahman, Aziz
Subject: RE: Switch 7

Aziz,

I have not been able to close with JP yet, but I believe the only time we had an arm problem in the field was with the econo van circa 1992. You are very familiar with that issue.

I think somebody got this issue confused.

Regards,
Bry

From: Rahman, Aziz
Sent: Wednesday, February 17, 1999 10:21 AM
To: Beringhaus, Steven; DeGus, Bryan; McGuirk, Andy; Baumann, Russ; Sharpe, Robert
Subject: FW: Switch 7

Steve, I think it will be a good idea to respond quickly with what may have caused the spring arm to corrode. I believe that salt water intrusion will caused more accelerated corrosion than brake fluid.

From: Steve Reimers[SMTP:areimers@ford.com]
Sent: Wednesday, February 17, 1999 8:41 AM
To: nicopolis@ford.com; Aziz Rahman, Texas
Subject: RE: (U)

Steve Reimers building 5 JCO41
AVT Chassis E/E System Applications mail drop 5011
39-01286 SREIMERS sreimers@ford.com fax 39-03286 >>
*** Forwarding note from SLAROUCH--FORDMAIL 02/17/99 08:18 ***
To: SREIMERS--FORDMAIL Reimers, Steve (S).

From: LaRouche, Steve (S.)
Subject: RE: (U)

Steve: The switch in question is switch F. The copper-beryllium arm of the movable contact separated from the brass base. Now that we have had a chance to look at it in closer detail, it appears that the arm separated due to a loss of material thickness from corrosion. We have also found evidence of stress corrosion cracking in the stationary contact. We did not see any evidence of heat or arc damage in this switch. It looked like the arm separated, fell away, and stuck to the wall of the switch cavity.

Steve LaRouche (SLAROUCH)

Metallurgy Section, Central Laboratory, Room N410
(313) 845-4876 (313) 322-1614 FAX

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

From: Steve Reimers (mailto:sreimers@gw.ford.com)
Sent: Tuesday, February 16, 1999 6:13 PM
To: jnms@gw.ford.com; alapoint@gw.ford.com; rnavid@gw.ford.com;
slarouch@mail.ford.com; Aziz Rahman, Texas
Subject: (U)

Can you help me get smart regarding the "LOOSE METAL PART" mentioned above?

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
*** Forwarding note from SCOLEL --DRBN005 02/16/99 18:04 ***
To: SREIMERS--DRBN007
cc: DGOEL --DRBN005

From: Sam L. Cole USAET(UTC -05:00)
Subject: (U)
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Thank You,
Sam
Ext. 21959
BLDG. 2, 22J31 - MD# 1220 - SCOLEL@FORD.COM
*** Forwarding note from SREIMERS--DRBN007 02/16/99 16:52 ***
To: SCOLEL --DRBN005 DGOEL --DRBN005

FROM: Steve Reimers USAET(UTC -05:00)
Subject: (U)
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potential cause of this concern.

Steve Reimers building 5 3C043
AVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-03286 ;>
*** Forwarding note from DE7AWAYR--DRBN007 02/16/99 13:41 ***
Subject: AWAY Facility/VM messages

TI-NHTSA 016503

This note was generated by the AWAY Facility/VM 5799-FLP (c)IBM Corp.

DO NOT REPLY TO THIS NOTE

AWA1101 This mail item is being routed to you from SCOLE1 at DRBN005 on behalf of FPORTER at DRBN007.

To: FPORTER --DRBN007
cc: TMASTERS--DRBN005
DGOEL --DRBN005

TDOVOVAN--DRBN005

From: Sam L. Cole
Subject: (U)

USAET(UTC -05:00)

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ON
FRIDAY. THANKS.

Thank You,

Sam

Ext. 21959

BLDG. 2, 22731 - MOP 1220_- SCOLE1@FORD.COM

TI-NHTSA 016504

Morris, Irene

From: McGuirk, Andy
Sent: Wednesday, February 17, 1999 11:36 AM
To: Baumann, Russ; Watt, Jim; Pechónis, John; Hopkins, AL; Beringhaus, Steven
Subject: FW: Switch 7

attorney client privileged communication

steve, should we connect up with al hopkins and have a discussion

2

AUTOMOTIVE SESSIONS AND CONTROL ORA RANGER
14 FOREST ST W/S 21-85
ATTLEBORO, MA 01701
TEL : (508) 238-3548
FAX : (508) 238-3748
PAGE: (800) 457-1700 227 694-2044

From: Rahman, Aziz
Sent: Wednesday, February 17, 1999 10:21 AM
To: Beringhaus, Steven; Oagus, Bryan; McGuirk, Andy; Baumann, Russ; Sharpe, Robert
Subject: FW: Switch 7

Steve, I think it will be a good idea to respond quickly with what may have caused the spring arm to corrode. I believe that salt water intrusion will caused more accelerated corrosion than brake fluid.

From: Steve Reimers[mailto:reimers@ford.com]
Sent: Wednesday, February 17, 1999 9:41 AM
To: nisapint@ford.com; Aziz Rahman, Texas
Subject: RE: (U)

Steve Reimers building 5 3C043
AVT Chassis E/K System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 19-03286 >
*** Forwarding note from SLAROUCH--FORDMAIL 02/17/99 08:18 ***
To: SREIMERS--FORDMAIL Reimers, Steve (S.)

From: LaRouche, Steve (S.)
Subject: RE: (U)

Steve: The switch in question is switch F. The copper-beryllium arm of the movable contact separated from the brass base. Now that we have had a chance to look at it in closer detail, it appears that the arm separated due to a loss of material thickness from corrosion. We have also found evidence of stress corrosion cracking in the stationary contact. We did not see any evidence of heat or arc damage in this switch. It looked like the arm separated, fell away, and stuck to the wall of the switch cavity.

Steve LaRouche (SLAROUCH)
Metallurgy Section, Central Laboratory, Room M410
(313) 445-4876 (313) 322-1614 FAX

Page 1

TI-NHTSA 016505

Epstein, Sally

From: LaRouche, Steve (S.) [slarouch@ford.com]
Sent: Wednesday, February 17, 1999 10:55 AM
To: Rahman, Aziz



Findings.doc

Aziz: Here is a copy of the spread sheet summarizing our findings to date.
Sorry I didn't get it to you sooner, but I wanted Norm to review it first.

<<Findings.doc>>

Steve LaRouche (SLAROUCH)
Metallurgy Section, Central Laboratory, Room N410
(313) 845-4876 (313) 322-1614 FAX

TI-NHTSA 016508

**DRAWINGS AVAILABLE UPON
REQUEST**

2/17/99

Team Review @ Ford

Switch Test Log. Rows. (1-11)

Brake Fluid Flash point 312°F (spark) = 150°C
auto ignition 606°F

Any '92, '93 vehicles checked for actual pressure levels @ switch?
(Planning to evaluate - Ford)

Several master cylinder (considerable) failures on '92, '93 caused
brake heat/fires. Justify looking @ '92-'93' vehicle evaluation

* Do not assume 15 Amp fuse protection as fail safe (Test #5).
This test will be increased with power.
Joe Nemi → look at "spark" input

May want to look for any "transient" load dump (similar to
capacitive discharge)

Need to determine if this is a "durability" event vs a "single"
event (Tom Masters collecting all data). June - last year initial
reports

Brake/speed control system changed in '96

Any '92-'95 Town Car, Crown Vic, Grand Marq will be looked at (from fire
incident)
Pressure trace (if not from Texas) ask John Joyce

Told NHTSA today that we will (Ford) take field action within 2 months

Common to see reliability issues begin in specific region (hot,
cold, salt area).

Tom Basil → ⁱⁿ Marty Reese 7-7142 mreese@ford.com
(switch)

Friday mtg. (have profile - pressure from '92, containment, Dow interface)
possibilities

5
AUTOMOTIVE SENSORS AND CONTROLS QA NUMBER
34 FOREST ST N/A 23-25
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOB: (800) 467-3700 PCM 601-2046

From: Rahman, Aziz
Sent: Wednesday, February 17, 1999 6:16 PM
To: Beringhaus, Steven; Degus, Bryan; McQuirk, Andy; Baumann, Russ; Sharpe, Robert
Subject: 2/17 Update

Main event 2PM core team meeting. Highlights:

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

Two tests conducted today at AVT labs:

- Passed about 64 Amps at about 1V, through switch terminals, no fluid. Temp in connector area increased to about 182 F before system went open circuit. Dissection revealed spring arm deformed and twisted away from stationary. Will have pictures tomorrow.
- Passed about 50 Amps at about 1V through switch terminals, with switch based filled with approx 50% Brake Fluid, 50% salt water. Temp in connector area increased to about 270 F and stayed there. No smoke or ignition. Dissection revealed spring arm deformed. Pictures tomorrow.
- Will set up calibration station in Central Lab tomorrow.
- Will be returning to MA Friday 3pm flight. Later flights not available because of vacation week. Per Steve B.'s input, will plan to return next week.

Regards
Aziz

Evaluation Process Brake Pressure Switch / Harness

Category	Step #	Action	Notes/Comments
Field Job	1	Log Field into into Switch Log file	
	2	Photograph Switch	
	3	Record any unusual external visual observations	
	4	Check for Connector engagement	If not correct contact N/ing in determine why between Case 20 and rail road
Switch + Connector Assembly	5	Wire 1(L/GRN) Wire to Resistor	
	6	Wire 1(L/GRN) to Magnet Resistor	
	7	Wire 2(BL/BLK) to Magnet Resistor	
	8	Separate Harness from Switch	
Connector Only	9	Verify Connector Seal	Visual check of Seal Ring, Air Lines, Lubrication mark. Installation seal must be 280 degrees.
	10	Wire 1(L/GRN) to Wire 2(BL/BLK) resistor	
	11	Current Leakage Wire 1(L/GRN) to Wire 2(BL/BLK)	
	12	Check for full engagement of connector	Visual check of air lines on rail side only base
	13	Check wire insulation	
	14	Check wire gray seals	
	15	Get wire insulation to check for corrosion	Get low voltage high resistance to check for wiring along wires. If signs of corrosion, identify type, wear pattern for repair L.R.
Switch Internal Upper/Lower	16	Assemble Switch in Collector Board	
	17	Spring Tension in Stationary Tension Resistor	Stationary Tension is correct in the outside connector being job.
	18	Spring Tension in Magnet Resistor	
	19	Stationary Tension in Magnet Resistor	
	20	Wire to Magnet Resistor	
	21	Current Leakage Spring Tension in Magnet	
	22	Current Leakage Stationary Tension in Magnet	
	23	Voltage drop at 750 mA	
Switch External Permanant	24	Switch Opening Process	
	25	Switch Closing Process	Do not position on pins from unaltered line, do not disturb displacement condition
	26	Final Test for Leakage	Do not position on pins from unaltered line, do not disturb displacement condition
	27	Repeat Steps 27 through 30 at 750 mA	Do not position on pins from unaltered line, do not disturb displacement condition
Switch Internal		Preparation to remove stainless epoxy ring Use stainless ball for punch: If Punch preferred to avoid the acrylic surface. Also obtain a preparation of ball to better view of an indication during cutting of crisp ring. Place a piece of tape over the area to be cut. Cut epoxy ring using stainless steel or brass coated wheel Cut corners of ring at 90 degree separation Inspect epoxy ring Optically examine revealed surfaces. Take optical photographs (Digital camera with macro lens plus infrared photography) and downward observations where appropriate. Inside surface of crisp ring. Seal area and underside of base Top of cup	
Analytical Techniques SEM/EDS/EDX		Always Read for Analytical Techniques Send SEM/EDS (Scanning Electron Microscopy with Energy Dispersive Analysis of X-rays) analysis on the inside of the ring and on various portions of the plastic base. Repeat on the top surface and remove the cup Optically document all revealed surfaces starting with cup. Meanwhile, send SEM/EDS analysis on top side of cup. Particularly look for evidence of deposition or drying Particularly focus in on the edges of the cup and on the internal ring that line up with interior wall of the switch body Particularly look for evidence of corrosion or arcing Decide if an attempt to take off any of the overlapping debris to try to examine the underlying metal surface. Prepared to perform SEM/EDS analysis on other component surfaces revealed by removal of cup	
Case Entry		Log all data from this sheet into Switch Log Photographs, Electrical maps etc must be reviewed and returned by Switch #	

TI-NHTSA 016813

Data Log Brake Pressure Switch

Log Updated 2/18/08

Br #	Br Date Code	Vehicle	VIN	Event	Mileage	Trans-Hogart Reference	Leaker?	Knipon #1	Knipon #2	Knipon #3	Present Status
Memphis	2000	Town Car	PY62307	Br. Flw				crack	crack	crack	Analysis Complete
A	2201	Town Car	PY600204	Underhood Flw				no info	no info	no info	Analysis Complete
B	2114	Town Car	NY740110	Underhood Flw							Br. not available
C	2000	Town Car	NY700705	Underhood Flw							Analysis In Progress
D		Crown Vic Police Car	YK140078	Crobs Insp		4,186,040-945	yes	crack	crack	crack	Analysis Complete
E	2137	Town Car	NY700774	Reference		OPEN	no	leak, no crack	yes, no crack	warn, no crack	Analysis Complete
F	2120	Town Car	NY700665	Crobs Insp		4,862,034	yes	crack	crack	crack	Analysis Complete
1	2000	Town Car	NY700606	Reference	7904	OPEN					
3	3005	Town Car	PY734043	Reference	7327	OPEN					
4	2000	Town Car	PY60070	Reference	8007	OPEN					
5	2004	Town Car	py60200	Reference	0000						
6	2000	Town Car	py72011	Reference	0700						Analysis In Progress
7	2000	Town Car	NY720430	Reference	0002	OPEN					Analysis In Progress
8	2000	Town Car	PX140020	Reference	0014	OPEN					
9	2000	Town Car	PX007700	Reference	77	OPEN					
10	2001	Town Car	PY60070	Reference	0204	OPEN					
11	2000	Town Car	PY72000	Reference	0200	OPEN					
12	2000	Town Car	PX000270	Reference	0000	OPEN					
13	2000	Town Car	NY70000	Reference	0002	OPEN					
14	2071	Town Car	PX00070	Reference	0410	OPEN					
15	2004	Town Car	PY60074	Reference	77	OPEN					
16	??	Town Car	NY60004	Reference	0700	OPEN					
17	??	Town Car	PY60020	Reference	7214	OPEN					
18	??	Town Car	PY60000	Reference		OPEN					
19	??	Town Car	PY77400	Reference	0700	OPEN					
20	??	Town Car	PY70400	Reference	0001	OPEN					
21	??	Town Car	PY60000	Reference	0001	OPEN					
22	2074	??	??	Reference	77						
23	??	Town Car	PY60004	Reference	0002	OPEN					

From TX slip of 2/16 to 2/12, John McNamee Group

1	2000	Town Car	PY60000	Reference							
2	2000	Crown Vic Police Car	PX10000	Reference	10000						
3	2000	Grand Memphis	0104100	Reference	77						
4	2000	Crown Vic	PX10012	Reference	4002						
5	2000	Town Car	PY60004	Reference	7310						
6	??	Town Car	NY72400	Underhood Flw	77						
7	2001	Town Car	PY70072	Reference	77						
8	2000	Town Car	NY70001	Underhood Flw	10000						
9	2000	Town Car	PY70010	Reference	77						
10	2072	Crown Vic	PX10140	Reference	7204						
11	2100	Town Car	NY70400	Reference	77						
12	2000	Town Car	PY70000	Reference	77						
13	2000	Town Car	PY74000	Reference	10000						

TL-NHTSA 018514

Show Refers: 313 20 03208,
mailto:refers@ford.com,
file:RefersLog.xls

page 1 of 1
printed 2/18/08 1:00 PM
uncontrolled document

revised 2/18/08

McGuirk, Andy

To: Sullivan, Martha; Rowland, Thomas; Baumann, Russ; Baker, Gary
Cc: Beringhouse, Steven; Pechonis, John; Rahman, Aziz; Bartosh, Bob; Sharpe, Robert; Douglas, Charles; Hopkins, Al
subject: Ford overview.... 2/18 telecon Update

attorney client privileged communication

BELOW ARE OBSERVATIONS FROM MY TELECON WITH STEVE REIMERS OF FORD AND AZIZ RAHMAN FROM 2/18

REVIEWED FORD'S ANALYSIS SPREADSHEET AND SWITCH BACKLOG:

SUGGESTED PRIORITY OF SWITCHES FOR ANALYSIS PER OUR INTERNAL MEETING.... DISCOVERED SEVERAL OF THE '7' DATE CODES ARE IN SOME FORM OF DISASSEMBLY (NOT CORRODED CRIMP RINGS) AND FORM WILL BE UPDATED TO SHOW STATE.....AGREED THAT PRIORITY SHOULD BE HIGH MILE TOWNCARS FOLLOWED BY HIGH MILE CROWN-VIC/GRAND MARQ WITH SOME LOW MILE BASELINES. ALSO AGREED TO REVIEW 'CORROSION' UNITS FIRST IF EXTERNAL CORROSION WAS VISIBLE.

REVIEWED 'SCIENCE FAIR' EXPERIMENTS RESULTS:

FORD REQUESTED UPDATE TO TEST LOG FIRST THING FRIDAY FOR TI TESTS NUMBER 1,2,8,7,8,10 TO INCLUDE FINAL OBSERVATIONS WITH DETAIL LIKE 'WAS THERE INTERNAL BLACK CORROSION' AFTER CYCLE TESTS AT TEMP ETC. THIS WILL BE USED TO SHOW EXECS THAT WE ARE MOVING FORWARD.

ALSO, FORD REQUESTED WE ADD TESTS 12,13,14 TO BE "E6" TYPE (107 DEG C AMBIENT, 135 DEG C FLUID, PRESSURE CYCLING) INDUCTIVE TESTS OF SWITCHES WITH 'HIGH' CURRENT (AS MUCH AS WE CAN GET THRU THE INDUCTORS WITHOUT SATURATION) WITH 12 'CLEAN AND EMPTY', 13 'CLEAN BRAKE FLUID FILLED', AND 14 'CONTAMINATED BRAKE FLUID FILLED'. SEEMS LIKE THEY ARE TELLING US THAT THERE IS A 'SNEAK' CIRCUIT IN HERE SOMEPLACE THAT CAN AFFECT SWITCH ELECTRICALLY.

UNDERSTAND FORD'S DATA ABOUT ABS (C/O TEVES) AND PROP VALVE PRESSURE TRACES

CONTINUED TO PUSH FOR THIS.... I THINK OUR PRIVATE PLAN TO GO UNDERSTAND PRESSURE IN DIFFERENT FORD SYSTEM LOCATIONS (MASTER CYLINDER UPSTREAM OF ABS AND TRACTION

DATA FROM DOW C/O FORD ABOUT BRAKE FLUID AS IT RELATES TO FIRES

DOW VISITING FORD MONDAY AND SHOULD HAVE DATA TO FORD WEDS NEXT WEEK

KAPTON (FROM FORD)

FORD THINKS WE HAVE COMMITTED TO CONTACTING DUPONT HERE.....HAVE WE ?

UNDERSTAND BRAKE SWITCH AND KAPTON WEAROUT WITH ANOTHER FORD PLATFORM:

FORD STAYS FOCUSED ON THE TOWNCAR AND CROWN-VIC/GRAND-MARQ PLATFORM...NO PLANS

DISCUSSED THE POTENTIAL BRAKE PEDAL POSITION 'SOLUTION' :

FORD UNDERSTOOD THAT THIS SOLUTION WAS A TEMPORARY CONTAINMENT AND AKNOWLEDGED IT WOULD BE POWERED AT ALL TIMES AND THAT IF EVENTS ARE NOT UNDERSTOOD A SOLUTION WAS NOT CLEAR.

8

AUTOMOTIVE SENSORS AND CONTROLS O&A WAGER
34 FOREST ST. R/S 22-08
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3748
RAGE: (800) 457-3700 #28 604-2044

From: McQuirk, Andy
Sent: Thursday, February 18, 1999 9:52 AM
To: Sullivan, Martha; Rowland, Thomas; Baumann, Russ; Baker, Gary
Cc: Beringhouse, Steven; Pechonis, John; Rahman, Aziz; Bartosh, Bob
Subject: Ford overview.... 2/18 'status' Update

attorney client privileged communication

Ford has been switch 'wear out' in several samples where brake fluid is believed to have leaked into the switch cavity (total of 7 switches 'analyzed' to 'complete scientific conclusions' from 1 P/S thermal event, 3 underhood thermal events, 2 cruise Inops and 1 reference). there are 24 switches awaiting analysis at Ford, and in fact a faster paced analysis scheme is under review at Ford in order to work thru this backlog.

(Steve, do we recommend this approach?...lets respond ASAP)

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17 potential other causes

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

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

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39 events with engine off

8 events with engine on..... or said a different way, Ford might say engine on/off has little effect.....

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

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

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

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

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

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

8

8

AUTOMOTIVE SENSORS AND CONTROLS QA MANAGER
34 FOREST ST N/S 23-05
ATTLEBORO, MA 02103
TEL : (508) 236-3080
FAX : (508) 236-3743
PAGE: (800) 487-3100 PIN 804-2044

From: Rahman, Aziz

Sent: Wednesday, February 17, 1999 6:16 PM

To: Beringhouse, Steven; Dague, Bryan; McGuirk, Andy; Baumann, Russ; Sharpe, Robert

Subject: 2/17 Update

Main event: 2PM core team meeting. Highlights:

- Manager Len Brown agitated that Dow has not shown up yet. Will probably get them on board tomorrow or Friday.
- Exec. meeting at 4pm Friday. TI not invited. Will present test plan (copy with Steve B.).
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- Increasing speculation that pure heat is not sufficient to ignite. Need spark.
- Will present brake pedal position sensor to execs as possible containment.

Two tests conducted today at AVT labs:

- Passed about 54 Amps at about 1V, through switch terminals, no fluid. Temp in connector area increased to about 182 F before system went open circuit. Dissection revealed spring arm deformed and twisted away from stationary. Will have pictures tomorrow.

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

-Will set up calibration station in Central Lab tomorrow.

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

Regards
Aziz.

Epstein, Sally

From: Palmer, Aziz [mailto:azpalmer@coroll.com]
Sent: Friday, February 19, 1999 7:58 AM
To: Modrak, Andy; Beringhaus, Steven; DeGus, Bryan; Eschmann, Ross; Harpe, Robert; Baker, Gary; Douglas, Charles
Subject: FW: (U)Pressure Tests

GOOD INFO.

From: Steve Reimers [mailto:stevr@reimers@ford.com]
Sent: Friday, February 19, 1999 8:13 AM
To: Aziz Rahman, Tom
Subject: (U)Pressure Tests

fyi... I gave him a copy of your test plan and asked what pressure range and frequency we should instrument for.

Steve Reimers Building 8 JCS43
AVT Chassis E/E System Applications Mail drop 9011
39-01286 ERINCERS stevrea@ford.com fax 39-03386 ;>
*** Forwarding note from JJOYCE --DANN007 02/18/99 15:40 ***
To: ERINCERS--DANN007
cc: FFOSTER --DANN007

FROM: John Joyce **DATE/TIME:** 02/18/99 15:40
Subject: (U)Pressure Tests

Steve,

I got your note and will be on vacation tomorrow through Wednesday. Here's the info.

The more I think about this, the more I think TC activation may be the mechanism.

I am not sure of the order of the things estimated and that can influence the low frequency magnitude of the signals. But the short answer is to instrument for 0-250 Bar and sample at 1 kHz or more.

Since I'm not sure of where the pressure switch is hydraulically connected I'll give you pressure at nodes and states I do know. The worst case for the switch would be to be connected between the NCU and the prop valve, which is where I think it is.

This is the low frequency component of the signal, I'll talk about the high-frequency component further down.

NC - NCU NOOD
Maximum Pressure - -175 Bar
Achieved by getting maximum vacuum (high revving engine and suddenly close throttle) then stomping on the pedal as hard as you can. I don't remember this number very well it might be as low as -130 or as high as 220. It also depends on your leg strength. This type of pressure is VERY RARE at this node. For this car, the driver will typically apply <30 bar and very rarely exceed 50 bar.

UCD - MDV VALVE NOOD

1 Bar = 100 kPa = 14.50 psi

Ford ES-F24C-9F724-AA Impulse Test 5x10⁵ ~ 0-1450 psi / 100 Bar / 10⁴ kPa

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Standing Still - Same as MC pressure - see above.

ABS Maximum - ~110 Bar

This is achieved by loading to GVW and performing an ABS stop. you may find that you are pedal effort limited, not limited by ABS control. It's pretty rare to get this high of pressure in this mode.

TC Maximum - ~100 Bar

This is a good candidate. On this vehicle because the HCU had to pump through the prop valve to do the brakes-only traction control, the pressures coming out of the HCU get very high. The pressure relief valve on the pump VERY OFTEN dictated the peak pressure which could be developed - not the control - put another way, because the pressure at the rear brake had to restrain the entire powertrain (no engine intervention) and push through a prop valve, it was often possible to drive through the TC - the engine could overpower the brakes, even though very high pressures were being generated at the HCU. The noise during TC activation in these applications was very dependent upon the pressure relief valve opening point. So the pressure relief valve value got changed a few times over the years as performance was sacrificed for NVH. Also the tolerance on the pressure relief valves was fairly large - a total of 40 bar, at that time I believe. The pressure relief valve pressure might be anywhere from 80 to 100 bar depending on part-to-part variation and the design generation that was agreed upon.

You can achieve this easiest by getting the rear wheels off the ground and putting the car in drive. Get into the throttle hard, but not so hard that you drive out of first gear or faster than ~15 mph. If you maintain this for a while, the thermal model to protect the rear linings will disable the Traction Control. You will then need to wait for them to cool, before the function will be reenable. You can dramatically accelerate the cooling time by cruising (without braking) at about 40 mph.

Typical drivers can regularly get high pressures in this mode.

PROP VALVE - SEAR BRAKE MODE

ABS Maximum Pressure ~70 Bar

Load to GVW and perform an ABS stop at maximum pedal effort.

TC Maximum Pressure ~100 Bar

This pressure level is strongly dependent upon the pressure relief valve level - see above.

Standing Still

Same as ABS Maximum Pressure

High Frequency Content

The high frequency content has two parts. If you are not in ABS or Traction Control there is practically no high frequency content - the pressure is modulated at <10 Hz. This is basically limited by booster response time and hydraulic damping in the ABS orifices.

High Frequency Content Due To Control

During ABS/TC events the pressure is changed in quick steps. Typically it will increase by ~10 Bar in a few milliseconds, and this type of change occurs about every 100ms. The pressure will decrease by about 20 Bar every 300 ms. There can be quite a bit of variation in these numbers, but these are pretty typical. (Actually the numbers I assigned were for ABS, swap "increase" and "decrease" for TC activation.)

High Frequency Content Due to Shock Waves

This is a secondary effect from the control. Generally it is worst right at the outlet of the HCU. It is damped and dissipated the further you

2

get from the HCU. The shock wave is generated from the cyclical pulsing of the pump as well as the sudden changes in pressure when a solenoid valve is crapped open or shut.

The amplitude of this can be really big - I haven't looked at it in this generation unit for a few years, but I think it's about 60 Bar peak-peak right at the HCU. It will fall off as you move further away from the HCU.

The frequency is pretty high and I think some components are above the 1 kHz level, but you can get a very good idea of the disturbances by sampling at ~1kHz.

Regards,

John Joyce $5 \times 10^2 / 10^3 = 500 \text{ sec} = 8.3 \text{ min}$

TI-NHTSA 016520

Epstein, Sally

From: McGuirk, Andy [a-mcguirk@email.mc.tl.com]
Sent: Thursday, February 18, 1999 12:22 PM
To: Sullivan, Martha; Rowland, Thomas; Baumann, Russ; Baker, Gary
Cc: Beringhouse, Steven; Pechonis, John; Rahman, Aziz; Bartosh, Bob
Subject: Ford overview.... 2/18 plans Update

attorney client privileged communication

I have an appointment to talk to Steve Reimers who is acting for Fred Porter at 1:45 thursday today.

I want to lead us thru discussions:

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

Leak?, priority ?

OUR UPDATED CAUSE AND EFFECT DIAGRAM (BRYAN),

ABS?

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

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

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

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

WELL AS KAPTON (C/O AZIZ FROM FORD). no results

UNDERSTAND BRAKE SWITCH AND KAPTON WEAROUT WITH ANOTHER FORD PLATFORM...STEVE DID WE

TI-NHTSA 016521

COLLECT ANY SAMPLES FROM SIMILAR AGE VEHICLES? no results

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

a

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

From: McGuirk, Andy
Sent: Thursday, February 18, 1999 9:52 AM
To: Sullivan, Martha; Rowland, Thomas; BAUMANN, Russ; Baker, Gary
Cc: Beringhause, Steven; Pachenis, John; Rahman, Aziz; Bartosh, Bob
Subject: Ford overview.... 2/18 'status' Update

attorney client privileged communication

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

TI-NHTSA 016522

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

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5 pressure switch causes.....or said a different way, Ford might say that 2/3 is the number one known cause

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

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

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

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

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

4

AUTOMOTIVE SENSORS AND CONTROLS JRA MANGER
14 FOREST ST M/S 23-05
ATTLESCRO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
PAGE: (800) 467-3750 PIN 604-2044

From: Rahman, Aziz
Sent: Wednesday, February 17, 1999 5:16 PM
To: Beringhouse, Steven; Dague, Bryan; McGuirk, Andy; Baumann, Russ; Sharpe,
Robert
Subject: 2/17 Update

Main event: 2PM core team meeting. Highlights:

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- Exec. meeting at 4pm Friday. TI not invited. Will present test plan copy with Steve B.).
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Two tests conducted today at AVT Labs:

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

-Will set up calibration station in Central Lab tomorrow.

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Regards
Aziz.

TI-NHTSA 016524

Epstein, Sally

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

attorney client privileged communication

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

From: Rahman, Aziz
Sent: Wednesday, February 17, 1999 6:16 PM
To: Baxinghouse, Stevan; Dague, Bryan; McGuirk, Andy; Baumann, Russ; Sharpe, Robert
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Regards
Aziz.

**DRAWINGS AVAILABLE UPON
REQUEST**

Data Log Brake Pressure Switch

Log Updated 3/18/2009

Seq #	Seq Data Code	Vehicle	VIN	Event	Mileage	Trans-Header Resistance	Leakoff	Kapton #1	Kapton #2	Kapton #3	Prepact Status
Memphis	2008	Town Car	FY02027	Br. Fire				crack	crack	crack	Analysis Complete
A	2281	Town Car	FY06024	Underhood Fire			no leak	no info	no info		Analysis Complete
B	2114	Town Car	NY748118	Underhood Fire							Analysis Complete
C	2983	Town Car	NY703786	Underhood Fire							Br. not available
D		Crown Vc. Police Car	VK145373	Crack trap		4.8MEGADHMS	yes	crack	crack	crack	Analysis In Progress
E	2137	Town Car	ND798774	Reference		OPEN	no	tear, no crack	work, no crack	tear, no crack	Analysis Complete
F	2138	Town Car	NY748085	Crack trap		4MEGADHMS	yes	crack	crack	crack	Analysis Complete
1	2983	Town Car	6K762828	Reference	79184	OPEN					Analysis Complete
2	3048	Town Car	FY724848	Reference	71337	OPEN					
3	2048	Town Car	PV628170	Reference	38087	OPEN					
4	2024	Town Car	JK023228	Reference	82348						
5	3025	Town Car	JK728211	Reference	47328						Analysis In Progress
6	3028	Town Car	6K728438	Reference	88822	OPEN					Analysis In Progress
7	3028	Town Car	PX188223	Reference	65814	OPEN					
8	3028	Town Car	FY637785	Reference	77	OPEN					
9	2881	Town Car	FY688275	Reference	82284	OPEN					
10	3028	Town Car	FY728888	Reference	84385	OPEN					
11	3223	Town Car	FY888278	Reference	88888	OPEN					
12	2088	Town Car	NY748288	Reference	82337	OPEN					
13	2071	Town Car	FY823272	Reference	84145	OPEN					
14	3081	Town Car	FY888274	Reference	77	OPEN					
15	77	Town Car	NY688884	Reference	87188	OPEN					
16	77	Town Car	FY888226	Reference	72114	OPEN					
17	2888	Town Car	FY888276	Reference		OPEN					
18	77	Town Car	FY774286	Reference	87648	OPEN					
19	77	Town Car	FY754375	Reference	43821	OPEN					
20	77	Town Car	FY848816	Reference	43881	OPEN					
21	2874	77	77	Reference	77						
22	77	Town Car	FY828884	Reference	86302	OPEN					

From TX Map of 2/18 to 2/12, John McKinney Group

1	2026	Town Car	FY628888	Reference							
2	2883	Crown Vc. Police Car	PX183228	Reference	18888						
3	3226	Crown Vc	JK841888	Reference	77						
4	2825	Crown Vc	PX183212	Reference	48842						
5	2983	Town Car	FY818284	Reference	73118						
6	77	Town Car	NY728288	Underhood Fire	77						
7	2881	Town Car	FY788172	Reference	77						
8	2846	Town Car	NY738181	Underhood Fire	108810						
9	2888	Town Car	FY788188	Reference	77						
10	2272	Crown Vc	PX151148	Reference	72814						
11	2145	Town Car	NY787888	Reference	77						
12	3085	Town Car	FY742868	Reference	77						
13	3088	Town Car	FY7423413	Reference	108048						

TI-NHTSA 016633

Steve Roberts, 313 38 83288,
sroberts@fwi.com,
the SwitchLog.xls

page 1 of 1
printed 3/18/09 1:30 PM
uncontrolled document

revised 2/18/09

Data Log Brake Pressure Switch

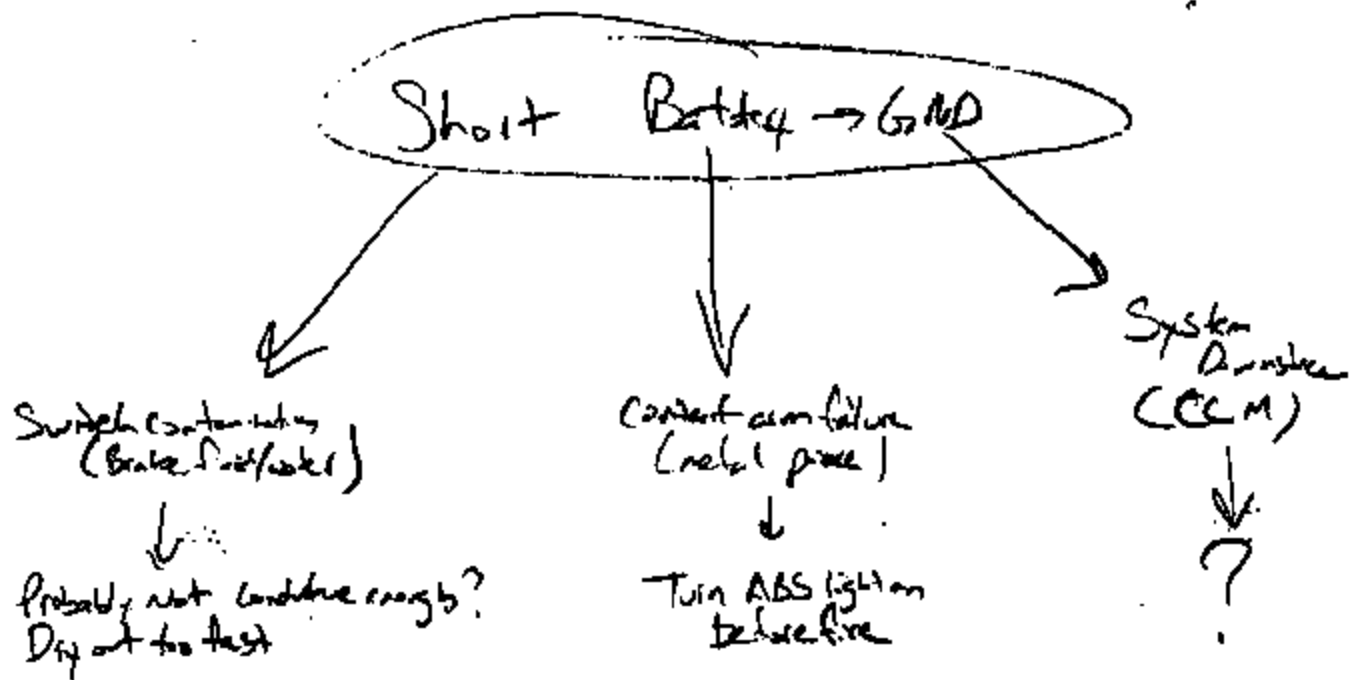
VIN	Event	Mileage	Turn-Header Resistance	Leaker?	Kapton #1	Kapton #2	Kapton #3	Present Status
PY622877	Sw. Fire				crack	crack	crack	Analysis Complete
PY665224	Underhood Fire				no info	no info	no info	Analysis Complete
NY746119	Underhood Fire							Sw. not available
NY703705	Underhood Fire							Analysis In Progress
VX146378	Cruise Inop	4.6MEGACHM	yes	crack	crack	crack		Analysis Complete
NX758774	Reference	OPEN	no	worn, no crack	worn, no crack	worn, no crack		Analysis Complete
NY780055	Cruise Inop	4MEGACHM	yes	crack	crack	crack		Analysis Complete
NX762858	Reference	78164	OPEN					
PY724043	Reference	71337	OPEN					
PY828170	Reference	88087	OPEN					
cy632329	Reference	98348						Analysis In Progress
cy728611	Reference	47325						Analysis In Progress
NX728438	Reference	88822	OPEN					
PX160223	Reference	88614	OPEN					
PX837788	Reference	??	OPEN					
PY668376	Reference	62224	OPEN					
PY726088	Reference	91388	OPEN					
PX666270	Reference	88689	OPEN					
NY740208	Reference	53237	OPEN					
PX823872	Reference	84146	OPEN					
PY885374	Reference	??	OPEN					
BY838884	Reference	97189	OPEN					
PY666226	Reference	72114	OPEN					
PY888785	Reference		OPEN					
PY774256	Reference	67549	OPEN					
PY754676	Reference	42621	OPEN					
PX843515	Reference	43531	OPEN					
??	Reference	??						
PX829934	Reference	86302	OPEN					
PY636990	Reference							
PX163820	Reference	100000						
RX641585	Reference	??						
PX163312	Reference	40842						
PY610384	Reference	73116						

TI-NHTSA 016634

**Data Log
Brake Pressure Switch**

NY724388	Underhood Fire	??
PY750172	Reference	??
NY733191	Underhood Fire	108810
PY758158	Reference	??
PX151140	Reference	72814
NY757408	Reference	??
PY742858	Reference	??
PY7433413	Reference	105048

TI-NHTSA 018636



TI-NHTSA 016837

	Prefix/ Date Code	Condition	Heoport, Washer, Converter, and Spacer	Seals	Cup
177	F2VC/2058	Partially burned.	Black residue containing glycol based material (probably brake fluid) and a metal oxalate. Indicates presence of brake fluid on fluid and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. All three Kapton seals are buckled and exhibit brittle cracks which most likely formed leak path. Damage appears to have initiated in seal closest to washer. Damaged Kapton darkened and embrittled by unknown mechanism.	Green element transfer as oxid Glycol also de
124	7777/2281	Burned	Elements from contact material detected at fitting end of heoport. Indicates possible flow of fluid back through seals.	Gasket and environmental seal missing. Charred fragments Kapton seals remain.	Depos from br contact sulfide.
118	F2VC/2114	Burned	Elements from contact material detected at fitting end of heoport. Indicates possible flow of fluid back through seals.	Not permitted to disassemble switch.	Depos from br contact sulfide.
105	F2VC/2003	Burned	Elements from contact material detected at fitting end of heoport. Indicates possible flow of fluid back through seals. Black deposit in cavity currently being analyzed (possibly charred gasket).	Gasket appears charred. Environmental seal missing. Damage to Kapton seals currently being evaluated.	Depos from br contact sulfide.
73	F2ACJ7777	Apparent leakage.	Black residue containing glycol based material (probably brake fluid) and a metal oxalate. Indicates presence of brake fluid on fluid and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. Kapton seals exhibit damage similar to that found in Reddick sample. All three exhibit brittle cracks which most likely formed a leak path.	Dark g element transfer as oxid Liquid based
	F2AC/2137	No leaks or other apparent problems.	Black residue containing glycol based material (probably brake fluid) and a metal oxalate. Indicates presence of brake fluid on fluid and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. Kapton seals exhibit deformation and buckling similar to that found in Reddick sample. Grazing on surfaces suggest incipient damage is occurring.	Face o
155	F2VC/2128	Apparent leakage	Black residue containing glycol based material (probably brake fluid) and a metal oxalate. Indicates presence of brake fluid	Environmental seal and gasket intact and appear to have had good sealing. Kapton seals exhibit damage similar to that found in Reddick sample. All	Dark g element transfer as oxid

Data Log Brake Pressure Switch

A-155

Log Updated 2/18/2009

Seq #	Seq Date Code	Vehicle	VIN	Event	Mileage	Team/Inspector	Leak?*	Knipon #1	Knipon #2	Knipon #3	Passport Status
Memphis	2086	Town Car	PY8220/7	Se Fire				crack	crack	crack	Analysis Complete
A	2261	Town Car	PY8862/4	Underhood Fire			no leak	no leak	no leak		Analysis Complete
B	2114	Town Car	NY748119	Underhood Fire							Se not available
C	2025	Town Car	NY793705	Underhood Fire							Analysis in Progress
D		Crown Vic Police Car	VE146573	Cross leak		4 BMEGAONMS	yes	crack	crack	crack	Analysis Complete
E	2127	Town Car	MM7987/4	Reference		OPEN	no	warm, no crack	warm, no crack	warm, no crack	Analysis Complete
F	2126	Town Car	NY788968	Cross leak		4BMEGAONMS	yes	crack	crack	crack	Analysis Complete
1	2028	Town Car	MM762469	Reference	79184	OPEN					
3	2013	Town Car	PY724843	Reference	71327	OPEN					
4	2048	Town Car	PY828178	Reference	88287	OPEN					
5	2084	Town Car	py838786	Reference	88948						Analysis in Progress
6	2026	Town Car	py728111	Reference	47285						Analysis in Progress
7	2028	Town Car	MC728428	Reference	88822	OPEN					
8	2028	Town Car	PX188273	Reference	88814	OPEN					
9	2284	Town Car	PY837788	Reference	??	OPEN					
10	2281	Town Car	PY888975	Reference	82224	OPEN					
11	2028	Town Car	PY728888	Reference	81288	OPEN					
12	2233	Town Car	PY888970	Reference	88888	OPEN					
13	2088	Town Car	NY748208	Reference	83237	OPEN					
14	2071	Town Car	PY823672	Reference	84148	OPEN					
15	2081	Town Car	PY888374	Reference	??	OPEN					
16	??	Town Car	2Y828884	Reference	87188	OPEN					
17	??	Town Car	PY888228	Reference	72114	OPEN					
18	2088	Town Car	PY888788	Reference		OPEN					
19	??	Town Car	PY774288	Reference	87848	OPEN					
20	??	Town Car	PY754375	Reference	48821	OPEN					
21	??	Town Car	PY843816	Reference	83534	OPEN					
22	2074	??	??	Reference	??						
23	??	Town Car	PY888834	Reference	88888	OPEN					

From TL log of 2/18 to 2/12, John McKinney Group

1	2088	Town Car	PY838888	Reference							
2	2073	Crown Vic Police Car	PY182888	Reference	18888						
3	2088	Grand Marquis	28881888	Reference	??						
4	2088	Crown Vic	88888148	Reference	88888						
5	2088	Town Car	PY888884	Reference	73116						
6	??	Town Car	NY728888	Underhood Fire	??						
7	2081	Town Car	PY798172	Reference	??						
8	2088	Town Car	NY723181	Underhood Fire	108810						
9	2028	Town Car	PY728188	Reference	??						
10	2223	Crown Vic	PX131148	Reference	72414						
11	2113	Town Car	NY767488	Reference	??						
12	2085	Town Car	PY742866	Reference	??						
13	2088	Town Car	PY7433413	Reference	10888						

*... 'UNDERHOOD FIRE' Δ'S
CIT VS GML vs IC.*

... 370 JTV TL 9/2 →

TL-NHTSA 016538

Ford Actions

* OZD BF INTERVIEW WITH
WATSON — Get BF Samples

* WRITE FINE DETAIL OF HOW
TO PERFORM THE TEST

A&C PARTS...

92 TC — SENSE ELEMENTS RIGHT / PLACE
— WHATS DOES IT MEAN
— ABS ACTIVITY..... SOME ACTIVITY
NOT APPEAR TO GET TO 2000

FILES 1/15

XXXXX?

XXXXXX

XXXXXXXXXXXX

A

B

C

D

E

F

G

H

CY 92

TOWN CAN

BY

MONTH
MFG

X

MILES

68 K MILES

**DRAWINGS AVAILABLE UPON
REQUEST**

Step #	Message Box Field	Points of Update for Data Code
Category	Step #	Action
Field Info	1	Log Field into into Switch Log #1
	2	Photograph Switch
	3	Remove any residual oil/water about circumference
	4	Check for Corrosion engagement
Switch	5	Use 100X Magnifying Glass (MAG) to Inspect Switch
Connector	6	Wipe 100X MAG to Inspect Switch
Assembly	7	Wipe 100X MAG to Inspect Switch
Component	8	Remove Magnet from Switch
Only	9	Verify Connector Seal
	10	Use 100X MAG to Inspect Switch
	11	Check Leakage Mile 100X MAG to Inspect Switch
	12	Check for full engagement of connector
	13	Check wire insulation
	14	Check wire gage marks
	15	Cut wire insulation to check for corrosion
Switch	16	Remove Switch to Collector Stand
Connector	17	Spring Tension to Holloway Yarnish/Resistor
Impedance	18	Spring Tension to Magnet Resistor
	19	Resistor Tension to Magnet Resistor
	20	Wipe to Inspect Resistor
	21	Check Leakage Spring Tension to Magnet
	22	Check Leakage Resistor Tension to Magnet
	23	Wipe top of 100X MAG
Switch	24	Switch Opening Procedure
Connector	25	Switch Closing Procedure
Resistor	26	Final Test for Leakage
	27	Repeat Steps 17 through 25 at 100 gms
Switch		Procedure to remove connector using ring
Impedance		Use alcohol (or plastic if Ford preferred) to wash the sample surface.
		Use double paper towels to further reduce chance of contamination during washing of sample ring.
		Place a plastic tape over the area to be cut.
		Cut wire ring using hand-cut wire or bypass cutter about
		End remove ring at 90 degree orientation
		Mount using ring
		Optically examine exposed surfaces. Take optical photographs (Digital camera with zoom lens plus related accessories) and document observations where appropriate.
		Detail markings of sample ring
		Final size and materials of wire
		Top of cap
		Remove Switch for Analytical Techniques
		Use SEM-EDX (Secondary Electron Microscopy with Energy Dispersive Analysis of X-ray) analysis on the inside of the ring and on various surfaces of the plastic base
		Document the top surface and remove the cap
		Optically document all electrical contacts using ring cap
		Mountable, step SEM-EDX samples on top side of cap. Particularly look for evidence of corrosion or wiring
		Particularly focus on the edges of the connector pin leads where the connector ring that takes up with resistor side of the switch body
		Particularly look for evidence of corrosion or wiring
		Detail if not already by to take all any of the underlying data to try to measure the underlying contact surface
		Prepared to perform SEM-EDX analysis on other appropriate surfaces revealed by removal of cap
Final Entry		Log All data from this sheet into Switch Log
		Photographs, Expanded maps etc must be retained and referenced by Switch #

Evoked Process
 Brake Pressure Switch / Harness

Step #	Message Box Field	Points of Update for Data Code
Category	Step #	Action
Field Info	1	Log Field into into Switch Log #1
	2	Photograph Switch
	3	Remove any residual oil/water about circumference
	4	Check for Corrosion engagement
Switch	5	Use 100X Magnifying Glass (MAG) to Inspect Switch
Connector	6	Wipe 100X MAG to Inspect Switch
Assembly	7	Wipe 100X MAG to Inspect Switch
Component	8	Remove Magnet from Switch
Only	9	Verify Connector Seal
	10	Use 100X MAG to Inspect Switch
	11	Check Leakage Mile 100X MAG to Inspect Switch
	12	Check for full engagement of connector
	13	Check wire insulation
	14	Check wire gage marks
	15	Cut wire insulation to check for corrosion
Switch	16	Remove Switch to Collector Stand
Connector	17	Spring Tension to Holloway Yarnish/Resistor
Impedance	18	Spring Tension to Magnet Resistor
	19	Resistor Tension to Magnet Resistor
	20	Wipe to Inspect Resistor
	21	Check Leakage Spring Tension to Magnet
	22	Check Leakage Resistor Tension to Magnet
	23	Wipe top of 100X MAG
Switch	24	Switch Opening Procedure
Connector	25	Switch Closing Procedure
Resistor	26	Final Test for Leakage
	27	Repeat Steps 17 through 25 at 100 gms
Switch		Procedure to remove connector using ring
Impedance		Use alcohol (or plastic if Ford preferred) to wash the sample surface.
		Use double paper towels to further reduce chance of contamination during washing of sample ring.
		Place a plastic tape over the area to be cut.
		Cut wire ring using hand-cut wire or bypass cutter about
		End remove ring at 90 degree orientation
		Mount using ring
		Optically examine exposed surfaces. Take optical photographs (Digital camera with zoom lens plus related accessories) and document observations where appropriate.
		Detail markings of sample ring
		Final size and materials of wire
		Top of cap
		Remove Switch for Analytical Techniques
		Use SEM-EDX (Secondary Electron Microscopy with Energy Dispersive Analysis of X-ray) analysis on the inside of the ring and on various surfaces of the plastic base
		Document the top surface and remove the cap
		Optically document all electrical contacts using ring cap
		Mountable, step SEM-EDX samples on top side of cap. Particularly look for evidence of corrosion or wiring
		Particularly focus on the edges of the connector pin leads where the connector ring that takes up with resistor side of the switch body
		Particularly look for evidence of corrosion or wiring
		Detail if not already by to take all any of the underlying data to try to measure the underlying contact surface
		Prepared to perform SEM-EDX analysis on other appropriate surfaces revealed by removal of cap
Final Entry		Log All data from this sheet into Switch Log
		Photographs, Expanded maps etc must be retained and referenced by Switch #

Critical
 → Wires for SART

→ use this extra photos on FI TEST samples in C/APP/APP/20

TI-NHTSA 018048

FAA Order 8000.108, 20000104 by G. Dugan

TYPE: 2000
TO BE USED FOR REFERENCE ONLY

TYPE	PART NO.	DESCRIPTION	Amount		Unit	Part Description	Part Number	QTY	Unit	Part Description	Part Number	QTY	Unit	Part Description	Part Number	QTY	Unit	
			Original	Revised														
1 TYPE 2-1	FAAC-0700-00	FAAC-0700-00	20-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00
2 TYPE 2-2	FAAC-0700-00	FAAC-0700-00	20-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00
3 TYPE 2-3	FAAC-0700-00	FAAC-0700-00	20-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00
4 TYPE 2-4	FAAC-0700-00	FAAC-0700-00	20-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00
5 TYPE 2-5	FAAC-0700-00	FAAC-0700-00	20-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00
6 TYPE 2-6	FAAC-0700-00	FAAC-0700-00	20-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00
7 TYPE 2-7	FAAC-0700-00	FAAC-0700-00	20-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00
8 TYPE 2-8	FAAC-0700-00	FAAC-0700-00	20-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00	20-00	1	FAAC-0700-00

*Callahan
v.
No. 1.*

TI-NHTSA 016847

Epstein, Sally

From: Rahman, Aziz [arhman@email.mc.ti.com]
Sent: Thursday, February 18, 1999 8:22 AM
To: 'Fred Porter (Ford)'; 'Norm LaPointe (Ford)'; 'Steve LaRouche (Ford)'; 'Steve Reimers (Ford)'
Cc: Berghause, Steven; Dague, Bryan; Baumann, Russ; Sharpe, Robert; McGuirk, Andy
Subject: Switch Evaluation Plan.xls



Brake Pressure Switch
English

<<Brake Pressure Switch Evaluation Plan.xls>>

Revised to include Switch dissection procedures.

Regards
Aziz.

TI-NHTSA 018548

E: Steve, Sally

From: Rehman, Aziz [azihman@gmail.com]
Sent: Thursday, February 18, 2009 8:22 AM
To: 'Fred Porter (Ford)'; Norm LaPointe (Ford); Steve LeRouche (Ford); Steve Raimers (Ford);
Cc: Berghaus, Steven; Deque, Bryan; Saumann, Russ; Sharpe, Robert; McGurt, Andy
Subject: Switch Evaluation Plans



Brake Pressure Switch
Revised

<<Brake Pressure Switch Evaluation Plan.xls>>

Revised to include Switch dissection procedures.

Regards
Aziz.

TI-NHTSA 016550

**DRAWINGS AVAILABLE UPON
REQUEST**

Epstein, Sally

From: Norman Lapointe [nlapointe@ford.com]
Sent: Thursday, February 18, 1999 9:13 AM
To: Rahman, Aziz
Subject: Switch Evaluation Plan.xls

*** Reply to note of 02/18/99 09:27
Aziz, Can you obtain the print for the disc p/n 36656-21 it is not in the
batch of prints I initially received. Thanks in advance.....
Regards,
Norman LaPointe
PHONE 59-42666 FAX 313-337-8256

Epstein, Sally

From: Norman Lapointe [nlapoint@ford.com]
Sent: Thursday, February 18, 1999 9:13 AM
To: Rahman, Aziz
Subject: Switch Evaluation Plan.xls

*** Reply to note of 02/18/99 09:27
Aziz, Can you obtain the print for the disc p/n 36656-21 it is not in the
batch of prints I initially received. Thanks in advance.....
Regards,
Norman LaPointe
PHONE 59-42686 FAX 313-337-8256

REDACTED

Graveline, Dora

From: Rahman, Aziz
Sent: Thursday, February 18, 1999 9:21 AM
To: 'Fred Porter (Ford)'; 'Norm LaPointe (Ford)'; 'Steve LaRouche (Ford)'; 'Steve Reimers (Ford)'
Cc: Beringhaus, Steven; Dague, Bryan; Baumann, Russ; Sharpe, Robert; McGuirk, Andy
Subject: Switch Evaluation Plan.xls



Insta Pressure Switch
Evaluation Plan.xls

Revised to include Switch dissection procedures.

Regards
Aziz

Gravfine, Dora

From: Rahman, Aziz
Sent: Thursday, February 18, 1999 9:21 AM
To: 'Fred Porter (Ford)'; 'Norm LaPointe (Ford)'; 'Steve LaRouche (Ford)'; 'Steve Raimers (Ford)'
Co: Beringhaus, Steven; Dagus, Bryan; Baumann, Russ; Sharpe, Robert; McGuirk, Andy
Subject: Switch Evaluation Plan.xls



Inake Pressure Switch
Evaluation Plan.xls

Revised to include Switch dissection procedures.

Regards
Aziz.

Brake Pressure Switch Plan Updated 2/18/99
 Evaluation Plan for Field Returns

Sw #		Date of update
Mileage		Sw Data Code
Sw P/N		

Category	Step #	Action	Notes/Data
Field Info	1	Log Field Info into Switch Log.xls	
	2	Photograph Switch	
	3	Record any unusual external visual observations	
	4	Check for Connector engagement	
Switch + Connector Assembly	5	Wire 1 to Wire 2 Resistance	
	6	Wire 1 to Hexport Resistance	
	7	Wire 2 to Hexport Resistance	
Connector Only	8	Separate Harness from Switch	
	9	Verify Connector Seal	
	10	Wire 1 to Wire 2 resistance	
	11	Current Leakage Wire 1 to Wire 2	
	12	Check for full engagement of connector	
	13	Check wire insulation	
	14	Check wire gray seals	
15	Cut wire insulation to check for corrosion		
Switch External Unpressurized	16	Assemble Switch to Calibration Stand	
	17	Terminal 1 to Terminal 2 Resistance	
	18	Terminal 1 to Hexport Resistance	
	19	Terminal 2 to Hexport resistance	
	20	Base to Hexport Resistance	
	21	Current Leakage Terminal 1 to Hexport	
	22	Current Leakage Terminal 2 to Hexport	
	23	Voltage drop at 750 mA	
	24	Switch Opening Pressure	
Switch External Pressurized	25	Switch Closing Pressure	
	26	Proof Test for Leakage	
	27	Repeat Steps 17 through 23 at 180 psig	
Switch Internal		Procedure to remove aluminum crimp ring Use aluminum foil (or plastic if Ford prefers) to mask the analysis surface. Also create a paper/tape shield to further reduce chance of contamination during Place a piece of tape over the area to be cut. Cut crimp ring using jewelers saw or Dremel cutoff wheel Cut corners of ring at 180 degree orientation Unfold crimp ring	

Optically examine revealed surfaces. Take optical photographs (Digital camera inside surface of crimp ring.

Seal area and underside of base

Top of cup

Analytical
Techniques
SEM/EDX/IR

Assess Need for Analytical Techniques

Start SEM-EDX (Scanning Electron Microscope with Energy Dispersive Analysis)

Reprotect the top surface and remove the cup

Optically document all revealed surfaces starting with cup.

Meanwhile, start SEM-EDX analysis on top side of cup. . Particularly look for ev

Particularly focus in on the edges of the ceramic pin guide and on the indented

Particularly look for evidence of corrosion or arcing

Decide if we should try to flake off any of the overlying debris to try to examine

Proceed to perform SEM-EDX analysis on other component surfaces revealed |

Data Entry

Log All data from this sheet into Switch Log

Photographs, Elemental maps etc must be retained and

referenced by Switch #

[Redacted]

[Redacted]

Comments

[Redacted]

If not correct conduct X-Ray to determine fit-up between
base lip and red seal

[Redacted]

[Redacted]

[Redacted]

Visual check of Red Seal, Dirt lines, Indentation mark.
Indentation mark must be 360 degree.

Visual check of dirt lines on mated switch base

Cut insulation longitudinally to check for wicking along wires.
If signs of corrosion, identify color, save samples for chem I.d.

[Redacted]

[Redacted]

Do not perform on parts from underhood fire, as may disturb diaphragm/other condition
Do not perform on parts from underhood fire, as may disturb diaphragm/other condition
Do not perform on parts from underhood fire, as may disturb diaphragm/other condition

[Redacted]

g cutting of crimp ring.

with macro lens plus instant microphotography) and document observations where appropriate. Examine

and X-rays) analysis on the inside of the ring and on various surfaces of the plastic base.

Identify any corrosion or arcing
ring that lines up with interior wall of the switch cavity

the underlying metal surface,
by removal of cup.

[REDACTED]

Epstein, Sally

From: Rahman, Aziz [arshman@email.mc.ti.com]
Sent: Thursday, February 18, 1999 11:45 AM
To: 'Fred Porter (Ford)'; 'Norm LaPointe (Ford)'; 'Steve LaRouche (Ford)'; 'Steve Reimers (Ford)'
Cc: Beringhaus, Steven; Dague, Bryan; Baumann, Russ; McGuirk, Andy; Sharpe, Robert
Subject: Switch Log and Eval. Procedure



SWITCHLOG



EVALPROC

Updated as of 2/18/99. There were some switches from the

initial 24 switch survey that were opened up at AVT and the tag and switch parts were not kept together. I have noted this in the log.

Since the tag numbers for every incoming shipment start from 1, I suggest we use VIN numbers to track the database. This will uniquely identify the switch.

I suggest that the switch analysis priority be as follows:

- Switches from underhood fires, which have not been severely damaged
- Switches from Town Cars, starting by highest mileage and descending
- Switches from CV and GM, starting by highest mileage and descending
- Severely damaged switches from underhood fires
- Disassembled switches, with suspect paperwork trail

<<SwitchLog>>

Evaluation Procedure updated as of 2/18/99. Note identification of harness wires by color.

<<EVALPROC>>

I think we are closing in on finalizing the log format and the evaluation procedures. I believe that these are good enough for us to start using them for data entry.

In order to reduce confusion, I will plan on updating the log once a week. Please delete the earlier versions, so that you have only one latest copy.

Please comment.

Thanks
Aziz

TI-NHTSA 016581

Epstein, Sally

From: Douglas, Charles [c-douglas2@email.mc.ti.com]
Sent: Friday, February 05, 1999 10:52 AM
To: Baker, Gary; Dague, Bryan; Rahman, Aziz; Rowland, Thomas; McGuirk, Andy
Cc: Pechonis, John
Subject: FW: Town Car Brake Pressure Switch

lyl.

Charlie

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

From: Sharpe, Robert
Sent: Friday, February 05, 1999 11:45 AM
To: Douglas, Charles
Cc: Beringhaus, Steven; Sullivan, Martha; Baumann, Russ; Dodd, Bob
Subject: Town Car Brake Pressure Switch

Yesterday afternoon, I was requested to attend a meeting at Ford in regards to the Lincoln Town Car Fire issue.

Attendee's

Fred Portak, Steve Reimers - Chassis Electronic Systems
Tom Masters - Large/Lux Vehicle Systems & Wiring
Steve LaRouche - Ford Central Labs
Norm LaPointe - AVT Design Analysis
Rob English - Core Electrical
Paul Stokes - Speed (cruise) Control
John McInerney - Large/Lux Vehicle Safety Group
Jow Nemi (sp?) - Large/Lux Vehicle Safety Group

Summary

This issue is one of Ford's top priorities and is gaining Executive Level exposure. Ford does not have a root cause to reply to NHTSA's inquiry. Strong perception that the fires have originated at the pressure switch, based on (1) NHTSA's internal investigation, (2) reports from insurance investigators, (3) incident at Memphis where vehicle fire started in front of mechanic and mechanic noted that only the switch was "burning" (switch was replaced and vehicle returned to owner - same switch that was analyzed in TI-A). Ford stated that the pressure switch should be considered as "guilty" until proven innocent. To this point, TI has been viewed as "cooperative" but not "proactive" (Ford is looking for our help as they consider TI the experts in regards to switch issues).

Ford is concerned that in absence of a "root cause" response to NHTSA, NHTSA will pick the brake switch and demand that all Town Cars with Cruise Control be grounded (recalled). Without a root cause, containment action is unclear. Possible containment includes (1) disengage cruise/speed control option (high impact to customer) or (2) rewire the brake switch to an ignition feed. It was confirmed by the cruise control group that there is no necessity to have the brake switch "hot" (12v) at all times. Both options are under discussion.

Although there is high attention on the brake switch, John McInerney stated that other components must be investigated as well. His comments were based on:

- Data Base search of all MY92/93 Lincoln Town Car fires shows approx. 132 incidents

Data Base search of all MY92/93 Town Car fires with brake switch identified shows approx 32 incidents

- NHTSA has requested Ford to investigate/respond to the following components:
 - Brake Pressure Switch
 - 42 way connector (beneath the brake fluid fill reservoir)
 - EEC (Controller) wire harness
 - Relay Pack contains 3 relays (AC Cut off, EEC, fuel pump) and the EEC diode

Ford is now investigating to verify if other fires, similar in nature, have occurred on other vehicle lines that use this switch. Focus is on the MY92/93 Crown Vic and Grand Marq as they have identical systems.

Ford has requested an "on site" TI representative familiar with this specific brake switch application.

Questions for TI

- What are the flash points for all components/material used in the switch?
 - Are the material specs submitted to Ford the same as the material specs used on the MY92/93 applications?
 - Does our DFMEA or PFMEA identify any potential "fire" occurrences?
 - How do we control our terminal positioning in production? Any chance for the terminals to "short"?
 - Has our IP testing showed any failures or concerns (confirm IP testing results)?
 - Are there any material differences between the different colored bases?
 - Where are the answers/feedback to the "many" questions asked during the analysis at TI Tech Lab's?
- (stated many questions were asked, primary was in regards to the cause of the crease mark found on the kapton)
- What testing/investigating is TI doing internally. Are we trying to simulate any conditions that verify a fire potential?
 - Do we sell the brake switch outside of Ford applications? If so, is it wired "hot" at all times?
 - Ford would like "color" pictures from the Econoline failure analysis report (connector issue).

Actions

- (TI) Respond to above questions by early next week
- (TI) Respond to Ford request of providing on-site engineer, preferably on 2/5/99
- (Ford) Develop a Work Plan to support a I4D and a Tech Review
- (Ford) Retrieve additional field samples from the South. All components identified by NHTSA will be collected.
- 12 additional switches from Houston (hi mileage, no fire) were given to Fred Porter
- (Ford) Support meeting with UTA on 2/12/99 to discuss wiring/connector issues
- (Ford) Monitor testing of brake switches (8 Bldg5) injected with brake fluid and a 24v supply across terminals (ongoing)

Please contact me if you have questions regarding the information above.

Best Regards,

Rob Sharpe
Texas Instruments
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Baumann, Russ

From: Rahman, Aziz
Sent: Thursday, February 18, 1999 12:45 PM
To: 'Fred Porter (Ford)'; 'Norm LaPointe (Ford)'; 'Steve LaRouche (Ford)'; 'Steve Reimers (Ford)'
Cc: Beringhaus, Steven; Dague, Bryan; Baumann, Russ; McGuirk, Andy; Sharpe, Robert
Subject: Switch Log and Eval. Procedure

Updated as of 2/18/99. There were some switches from the initial 24 switch survey that were opened up at AVT and the tag and switch parts were not kept together. I have noted this in the log.

Since the tag numbers for every incoming shipment start from 1, I suggest we use VIN numbers to track the database. This will uniquely identify the switch.

I suggest that the switch analysis priority be as follows:

- Switches from underhood fires, which have not been severely damaged
- Switches from Town Cars, starting by highest mileage and descending
- Switches from CV and GM, starting by highest mileage and descending
- Severely damaged switches from underhood fires
- Disassembled switches, with suspect paperwork trail


SwitchLog.xls

Evaluation Procedure updated as of 2/18/99. Note identification of harness wires by color.


EVALPROC.xls

I think we are closing in on finalizing the log format and the evaluation procedures. I believe that these are good enough for us to start using them for data entry.

In order to reduce confusion, I will plan on updating the log once a week. Please delete the earlier versions, so that you have only one latest copy.

Please comment.

Thanks
Aziz

TI-NHTSA 016564

Epstein, Sally

From: sreimers@ford.com
Sent: Thursday, February 18, 1999 4:34 PM
To: Rahman, Aziz
Subject: File TST_MTRX.XLS_PC



TST_MTRX.XLS

Brake Pressure Switch Test Log
Updated 2/18/98

Category	Test	Location	Test Parameters	Results Update
Lab Simulation of Potential Location of Switch	1	TI	Various Levels of Brake Fluid, Water, Contaminant 10Vdc to one terminal, support grounded	100+ hours into test, no significant leak
	2	TI	Various Levels of Brake Fluid, Water, Contaminant 1 Amp through switch terminals	No significant change with time
	3	AVT	Brake Fluid in Switch, 24 VDC to one terminal Support Grounded	100+ hours into test
	4	AVT	Brake Fluid in Switch, 24 VDC to one terminal Support Grounded, Ambient at 100 C	No significant temperature rise with time
	5	AVT	Brake Fluid in Switch, 18 Amps Through switch terminals	Temperature rise of 20 C above room temp
	6	TI	Built heater element into Switch Heat till failure	Cells T reached steady state at 100 C Expected up to 2/19
Life Cycle Reliability of Pressure Switch	7	TI	0-1400 psig pressure pulses at 150C ambient per 48	Parts at 500k cycles, no leaks WHT continues to failure
	8	TI	0-1400 psig pressure pulses at 100C ambient	Parts withdrawn every 200k cycles, characterized for wear
Diaphragm Wear Field vs Lab Corrosion	9	Central Labs	Various Field returns from dealer lots, just opened	Parts in Central Labs, being processed
Design Of Experiments Evaluating Factors Effecting Diaphragm Wear	10	TI	Various Levels of Brake Fluid, Water Under 48 conditions, to failure	Test being structured. Expected Phase One to begin 2/18
On-Vehicle Characterization of Pressure & Temperature Profile in Your Car	11	AVT	Monitor Pressure and Temperature at Switch Location for ABS and non-ABS braking events.	Logistics being worked out.