EA02-025

FORD 10/27/03

APPENDIX N

BOOK 37

PART 1 OF 3

NORM LAPOINTE

DATE	PREFIX/DCODE	VEHICLE	VIN	COND
Jun-98	F3TA/8117	F150	[redacted]	Reference
Apr-98	F3TA/8085	E250		Reference
Jan-97	F3TA/8626	F150		Reference
89	F2AC/2211	Crown Vic		Reference
May-93	F3TA/8127	Bronco		Reference
May-96	F3TA/8508	F150		Reference
Nov-96	F3TA/8276B	F150		Reference
Oct-98	F3TA/8276A	Exp		Reference
?	F2AC/8331	Grand Marquis		Reference
97	F2AC/8011	?		Reference
Mar-97	F3TA/7869	F150		Reference
Oct-95	F3TA/8274	Exp		Reference
95	F2VC/2282A	?		Reference
97	F3TA/8024A	Exp		Reference
97	F3TA/8281	Exp		Reference
92	F2VC/8069	Crown Vic		Reference
95	F2AC/8214	Crown Vic		Reference

TITLE Cutter Swirl [illegible]

Project No. [illegible]
Book No. 2697

From Page No.

1/3

K [redacted] [illegible] Dark [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] Clean
Base is white [illegible] [illegible] [illegible]
No [illegible] [illegible]

B [redacted] [illegible] — No [illegible] [illegible]
[illegible] Clean
Base is [illegible]

D [redacted] [illegible] with
[illegible] [illegible] to be [illegible] [illegible].
Could not [illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]
[redacted]

W [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible]
[illegible] base
[illegible] [illegible] clean

C [redacted] — No [illegible] [illegible]
[redacted] [illegible] [illegible] [illegible]
[illegible] — [illegible] [illegible] [illegible] in [illegible]
and
[illegible] Base

[illegible] [illegible] with what appears to be [illegible]
[illegible] — [illegible] [illegible] [illegible] [illegible]
[redacted] [illegible] — [illegible] [illegible] [illegible]
No Allergic [illegible]
Black [illegible] at [illegible]

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

3713 3283

PRODUCED BY FORD

EA02-025-R 9816

Project No. 4401571

Book No. 2697 TITLE Cutoff Switch

From Page No.

3/3

NI [redacted] — NO [illegible] LEAK
[redacted]
[illegible] [illegible] AND CLEAN
[illegible] BASE

L [redacted] Y [illegible] [illegible] WITH [illegible] [illegible]
— [illegible] [illegible] OUT IN [illegible]
[redacted] CLEAN & DRY — NO
[illegible] LEAK
[illegible] [illegible]
[illegible] AND CLEAN
[illegible] [illegible]
[illegible] [illegible] [illegible], BUT NO [illegible]
[illegible] [illegible] — [illegible] [illegible], BUT
[illegible]

NC [redacted] Y [illegible] — [illegible] WITH B.F. → [illegible]
[illegible] [illegible]
[redacted] CLEAN & DRY — NO [illegible]
[illegible] AND CLEAN
[illegible] BASE

XP [redacted] [illegible] DONE WITH B.F. → [illegible] [illegible]
[redacted] & DRY — NO AIR LEAK
[illegible] [illegible] — [illegible] [illegible]
[illegible]

OBD [redacted] SAME AS ABOVE EXCEPT [illegible] [illegible]
CLEAN AND [illegible] BASE

To Page No.

Witnessed & Understood by me.	Date	Invented by	Date
		Recorded by	

3713 3284

PRODUCED BY FORD

ER02-825-R 9817

Project No. 991571
TITLE Cutoff Switch Book No. 2697
From Page No.___ 3/3

L[redacted] Term. cav. clean ? Day — no app. leak
Term. clean
Fitting end clean
Rod base

P[redacted] Extended dome with BF → Probable drainage
[redacted] Clean ? day → no apparent leak

LB[redacted] + day → no app. leak.
Fitting end clean.
Rod base

X[redacted] Ext. connector wet with BF → Probable drainage
[redacted] day → no app leak.
Black residue in fitting end

TX[redacted] Ext dome with brake fluid drainage — some fluid down into terminal cavity; otherwise cavity dry. White residue on terminals.
Fitting end clean.

LA[redacted] Ext wet with BF — appears that some has run in to terminal cavity.
Rest of cavity dry.
Cavity & terminals have white residue.
Black residue in fitting end

To Page No.___

Witnessed & Understood by me, | Date | Invented by | Date
Recorded by

3713 3286
PRODUCED BY FORD

ER82-625-A 9815

BRAKE PRESSURE SWITCH MTG 12-16-98

ROB ENGLISH	AVT-EESE-EES	[redacted]	RENGLIS1
NORM LAPOINTE	AVT - DES. ANAL.		N LAPOINT
Jim Gregoire	AVT EEE OPE		J GREGOIR
FRED PORTER	AVT- EESE		F PORTER
[illegible] ADAMEK	[illegible]		WADAMEZ
[illegible]	[illegible]		[illegible]
[illegible]	[illegible] SAFETY		J [illegible]

RAY NEVI

CENTRAL LAB
[illegible] — X-RAY

KEN GRIBBLE AVT MATLS
CLARK THOMAS

3713 1487

PRODUCED BY FORD

EA02-025-A 9819

BRAKE PRESSURE SWITCH MTG 12-16-98

ROB ENGLISH	AVT-EESE-EES	[redacted]	RENGLIS1
NORM LAPOINTE	AVT-DES. ANAL.		NLAPOINT
Jim Gregoire	AVT EEE OPS		JGREGOIR
FRED PORTER	AVT-EESE		FPORTER
William Adamczyk	[illegible]		WADAMCZ
[illegible]	[illegible]		[illegible]
[illegible] McLELLEY	LVC Safety		JMCLELLEY

3713 1102

PRODUCED BY FORD

EA02-025-A 9828

BRAKE PRESSURE SWITCH MTG 12-16-98

ROB ENGLISH	AVT-EESE-EES	[redacted]	RENGLIS1
NORM LAPOINTE	AVT-DES. ANAL.		N LAPOINT
Jim Gregoire	AVT [illegible] OPS.		JGREGOIR
FRED PORTER	AVT-EESE		F.PORTER
WILLIAM ABRAMCZYK	AO		WABRAMCZ
JOE NEME	LVC		JNEME
JOHN MCINERNEY	LVC-SAFETY		JMCINERN

3713 0985

****
* Note printed by FPORTER on 17 Dec 1998 at 08:48:16 *
****

From: FPORTER --DRBW007 Date and time 12/17/98 08:46:37
To: LBROWN --DRBW005

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

FYI.

Regards,
Fred Porter OV - fporter fporter@ford.com
Chassis E/E Systems Applications (313)845-3722
Bldg S - Mail Drop 5030 - Cubicle 3E004 fax: 390-4145
*** Forwarding note from FPORTER --DRBW007 12/17/98 08:48 ***
To: WABRANCZ--DRBW005 RCLAYTON--DRBW005
BEGEN --DRBW007 RENGLISH--DRBW005
JEVANS8 --DRBW005 JGREGOIR--DRBW005
KGRIBBLE--DRBW005 NLAPOINT--DRBW005
JMCINERN--DRBW005 JNAMA --DRBW005
RMEVI --DRBW005 GSTEVEN1--DRBW005
CTHOMAS5--DRBW005 DGOEL --DRBW005
HWELFER1--DRBW006

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

1992-1993 Town Car F2VC-9F924-A Brake Pressure Switch Investigation

TEAM:

AVT EESE Chassis Electronics:	Fred Porter	x84-53722	fporter
AVT Chassis Engineering:	Joe Evans	x32-23852	jevans8
	Barry Egan	x32-38812	begen
AVT EESE EOS:	Rob English	x33-73225	renglis1
AVT Design Analysis:	Norm LaPointe	x59-42686	nlapoint
AVT SESE OPE:	Jim Gregoire	x31-79963	jgregoir
EaSE Prod. Veh. Safety:	William Abramczyk	x32-23284	wabramcz
	Ray Mevi	x59-47688	rmevi
Large Luxury VC:	Joe Nama	x38-08133	jnama
	Ron Clayton	x32-24029	rclayton
Large Luxury VC Safety:	John McInerney	x32-20276	jmcinern
AVT Materials Engineering:	Ken Gribble	x33-38658	kgribble
	Clark Thomas	x59-41313	cthomas5
	Greg Stevens	x32-36686	gsteven1

INFORMATION:

NHTSA letter: PE98-058

Vehicles identified: 21 initially identified.
20 additional vehicles reported since publication of the investigation.

Warranty: A total of 89 warranty claims are identified in AMS on the F2VY-9F924-A for 1992 and 1993 Town Cars.

Two CQIS reports (WJIAA138 & VDKAA322) mention underhood fire

3713 1631

PRODUCED BY FORD

EA92-825-A 9822

in connection with the brake pressure switch.
MJTAA135 occurred at 81,500 miles.
VDUAA322 occurred at 56,802 miles.

Supplier: The pressure switch was manufactured by Texas Instruments. The switch was purchased in assembly with the brake proportioning valve bought from Surfaces.

Contacts: Surfaces - Mike Thomas (248)543-6520 [HILITE Industries]
TI - Andy McGuirk (508)236-3080.

Function: The brake pressure switch is a redundant switch for turning off the speed control function.

ON-GOING ACTIVITY:

Norm LaPointe and Clark Thomas will meet with engineers from Central Laboratory to x-ray one part on 12/17/1998.

QUESTIONS: (in no particular order)

1) What is the normal current in the brake pressure switch?

2) Was cruise control standard on Town Car in 1992 and 1993?

3) Under what circumstances is brake fluid flammable?

4) What is the repair history for vehicles that have exhibited a problem?

5) What other vehicles use this brake pressure switch? What are their electrical configurations?

6) Is this switch still in use? If not, why not? If so, what design changes have been implemented since 1992/1993?

7) What fault codes are stored if the brake pressure switch fails?

Regards,

Fred Porter OV - fporter fporter@ford.com
Chassis E/E Systems Applications (313)845-3722
Bldg 5 - Mail Drop 5030 - Cubicle 3E004 fax: 390-4145

3713 1532

```
**********************************************************************
*          Note printed by WABRAMCZ on 5 Jan 1999 at 13:07:08        *
**********************************************************************

From: FPORTER --DRBN007                    Date and time    12/17/98 00:48:31
To: WABRAMCZ--DRBN005                    RCLAYTON--DRBN005
    BEGEN    --DRBN007                   KENGLISH--DRBN005
    JEVANS8 --DRBN005                    JGREGOIR--DRBN005
    KGRIBBLE--DRBN005                    NLAPOINT--DRBN005
    JMCINERN--DRBN005                    JNEMZ    --DRBN005
    RNEVI    --DRBN005                   GSTEVEN1--DRBN005
    CTHOMAS5--DRBN005                    DGOEL    --DRBN005
    HWELFER3--DRBN006

FROM: F. J. Porter                              USART(UTC -05:00)
Subject: (U)

1992-1993 Town Car F2VC-9F924-A Brake Pressure Switch Investigation

TEAM:

AVT SESE Chassis Electronics:  Fred Porter        x84-53722  fporter
AVT Chassis Engineering:       Joe Evans          x32-21832  javans8
                               Barry Egan         x32-39512  began
AVT SESE SOS:                  Rob English        x33-73226  renglis1
AVT Design Analysis:           Norm LaPointe      x59-42686  nlapoint
AVT SESE OPE:                  Jim Gregoire       x33-75962  jgregoir
SaSE Prod. Veh. Safety:        William Abramczyk  x32-21284  wabramcz
                               Ray Nevi           x59-47685  rnevi
Large Luxury VC:               Joe Nemz           x39-08133  jnemz
                               Ron Clayton        x32-24025  rclayton
Large Luxury VC Safety:        John McInerney     x32-20276  jmcinern
AVT Materials Engineering:     Ken Gribble        x33-18858  kgribble
                               Clark Thomas       x59-41313  cthomas5
                               Greg Stevens       x32-34686  gstevens

INFORMATION:

NHTSA Letter: PE98-055

Vehicles identified:  21 initially identified.
                      20 additional vehicles reported since publication of the
                      investigation.

Warranty:  A total of 69 warranty claims are identified in AMS on the
           F2VY-9F924-A for 1992 and 1993 Town Cars.

           Two CQIS reports (WJIAA135 & VDUAA322) mention underhood fire
           in connection with the brake pressure switch.
           WJIAA135 occurred at 51,500 miles.
           VDUAA322 occurred at 86,802 miles.

Supplier:  The pressure switch was manufactured by Texas Instruments.  The
           switch was purchased in assembly with the brake proportioning
           valve bought from Surfaces.

Contacts:  Surfaces - Mike Thomas (248)543-6520 (HILITE Industries)
           TI - Andy McQuirk (508)236-1060.

Function:  The brake pressure switch is a redundant switch for turning off the
```

speed control function.

ON-GOING ACTIVITY:

Norm LaPointe and Clark Thomas will meet with engineers from Central Laboratory to x-ray one part on 12/17/1998.

QUESTIONS: (in no particular order)

1) What is the normal current in the brake pressure switch?

2) Was cruise control standard on Town Car in 1992 and 1993?

3) Under what circumstances is brake fluid flammable?

4) What is the repair history for vehicles that have exhibited a problem?

5) What other vehicles use this brake pressure switch? What are their electrical configurations?

6) Is this switch still in use? If not, why not? If so, what design changes have been implemented since 1992/1993?

7) What fault codes are stored if the brake pressure switch fails?

Regards,

Fred Porter CV - fporter fporter@ford.com
Chassis E/E Systems Applications (313)845-3722
Bldg 3 - Mail Drop 3030 - Cubicle 32004 fax: 390-4145

Request for Central Laboratory Service

9804105 | 10-17-98

15800 Century Dr., Dearborn MI 48120-1267 Phone (313) 32-31676 FAX (313) 32-31614

Your Name [redacted]	Telephone 36686	PROFS ID G STEVEN 7	FAX 36686
Supervisor [redacted]	Telephone 42686	PROFS ID NLARNINT	FAX

MD 50 [illegible]

Sample Handling: ✓ Return after test ___ Dispose after test ___ Dispose after 30 days

Part/Model Name	Sample Identification	Part Number	Material Specification	CPSC Code	Supplier
					TEXAS
SPEED CONTROL	BURNED	F2VV-9F924-A	NA		INSTRUMENTS
DEACTIVATION SWITCH	CONNECTOR &				
	PRESSURE ACTUATOR				
	(REDDICK)				

[illegible]

Requester Info. Box: HIGH PRIORITY - POSSIBLE LEGAL

___ No ___ Yes

Do you need to know your CL contact and testing? ___ Yes

Additional Sample Information/Testing Requirements

DETERMINE CAUSE OF BURNED CONNECTOR
- RADIOGRAPH
- PHOTOGRAPH
- PRESSURE TEST DIAGRAM

EVALUATE / UNDERSTAND [illegible] OF NEW SWITCHES

ATTN: S. LARNINT

Sample in Lab

NOTE: ALL COMMUNICATIONS / REPORT ETC. TO BE DUAL: (E.G. NLARNINT

[redacted]

Format (Check all that apply): ✓ FAX preliminary results ___ FAX final report ___ Mail typed report ___ Electronically typed report ___ FAX typed report ___ Mail final report ___ Phone preliminary results

For information about applying or assistance in completing this form please refer to the Central Laboratory WWW page. Laboratory number and date cannot be assigned without receipt of sample. Samples will be disposed of after 30 days unless otherwise indicated above.

CL-Form #CLF07_01

3713 2868

PRODUCED BY FORD

EA02-025-A 9828

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number: 009904105
Date of Request: 12/17/1998 10:50:33 AM
Print Date: 01/04/1999 01:36:52 PM

Request Description: SPEED CONTROL CUT-OFF SWITCH

Requestor Information:
Primary Contact: [redacted] 10008 Phone: (313) 323-8686 PROFS ID: GSTEVEN1 Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10075 Phone: (313) 594-2686 PROFS ID: NLAPOINT Fax: (313) 337-6256

Send Report to: MD 5006/20066, AVT MATERIALS, BLDG. #3
Bill to: Acctg.Location: 5100
Dept: T113
Work Task: XQ304

Sample Information:
Total Number of Containers: 1 Sample Handling: Return after test
Source: Not specified Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUT-OFF SWITCH	1	BURNED CONNECTOR *	F2VY-9F924-A	NA	16.00.00	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation: Requestor Info. Box: Mail typed report
Fax preliminary results
HIGH PRIORITY - POSSIBLE LEGAL

Additional Sample Information/Testing Requirements:
SAMPLE ID: BURNED CONNECTOR & PRESSURE ACTUATOR (REDDICK)

DETERMINE CAUSE
OF BURNED CONNECTOR - RADIOGRAPH, PHOTOGRAPH, PRESSURE TEST DIAPHRAGM.

EVALUATE/UNDERSTAND CIRCUITRY OF NEW SWITCHES.

ATTN: S. LA
ROUCHE - SAMPLE IN LAB

NOTE: ALL COMMUNICATIONS/REPORT, ETC. TO BE DUAL
(I.E. N. LA POINT).

Reporting Directions:
Date customer would like report: 01/13/1999
Date customer must have report: 01/14/1999

Report Format(s):

Log-in Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: Morton, Jacqueline R. Phone: 58-47084

View your test status at: 'HTTP://fod4web.pd7.ford.com/kalis'

Program Name: KALISLab Engr Module
Program Version: Version: 2.0.6

3713 2673

PRODUCED BY FORD

EA92-625-A 9827

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number: 00[illegible]04106
Date of Request: 12/17/1998 10:50:33 AM
Print Date: 01/04/1999 01:35:52 PM

Request Description: SPEED CONTROL CUT-OFF SWITCH

Requester Information:
Primary Contact: [redacted] 10006 Phone: (313) 323-[illegible] PROFS ID: GSTEVEN1 Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10073 Phone: (313) 594-2086 PROFS ID: NLAPOINT Fax: (313) 337-8254

Send Report to: MD 5008/2G085, AVT MATERIALS, BLDG. #5
Bill to: Acctg.Location: 8100
Dept: T113
Work Task: XGG04

Sample Information:
Total Number of Containers: 1 Sample Handling: Return after test
Source: Not specified Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUT-OFF SWITCH	1	BURNED CONNECTOR *	F2VY-9F924-A	NA	10.08.00	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation:Requester Info. Box: Mail typed report
Fax preliminary results
HIGH PRIORITY - POSSIBLE LEGAL

Additional Sample Information/Testing Requirements:
SAMPLE ID: BURNED CONNECTOR & PRESSURE ACTUATOR (REDDICK)

DETERMINE CAUSE
OF BURNED CONNECTOR - RADIOGRAPH, PHOTOGRAPH, PRESSURE TEST
DIAPHRAGM.

EVALUATE/UNDERSTAND CIRCUITRY OF NEW SWITCHES.

ATTN: S. LA
ROUCHE - SAMPLE IN LAB

NOTE: ALL COMMUNICATIONS/REPORT, ETC. TO BE DUAL
(I.E. N. LA POINT).

Reporting Directions:
Date customer would like report: 01/13/1999
Date customer must have report: 01/14/1999

Report Format(s):

Log-in Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: Morton, Jacqueline R. Phone: 59-47084

Program Name: KALS/Lab Engr Module
Program Version: Version: 2.0.5

View your test status at: 'HTTP://bd4web.pd7.ford.com/kals'

3713 2674

PRODUCED BY FORD

ER02-025-R 9828

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number: 009804105
Date of Request: 12/17/1998 10:50:33 AM
Print Date: 01/04/1999 01:38:52 PM

Request Description: SPEED CONTROL CUT-OFF SWITCH

Requestor Information:
Primary Contact: [redacted] 10008 Phone: (313) 323-8685 PROFS ID: GSTEVEN1 Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10075 Phone: (313) 594-2686 PROFS ID: NLAPOINT Fax: (313) 337-8255

Send Report to: MD 5008/2G085, AVT MATERIALS, BLDG. #5
Bill to: Accig.Location: 5100
Dept: T113
Work Task: XGG04

Sample Information:
Total Number of Containers: 1 Sample Handling: Return after test
Source: Not specified Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUT-OFF SWITCH	1	BURNED CONNECTO R *	[redacted]	NA	16.08.00	[redacted] INST RUMEN TS

Investigation Information:
Nature of Investigation Requestor Info. Box: Mail typed report
Fax preliminary results
HIGH PRIORITY - POSSIBLE LEGAL

Additional Sample Information/Testing Requirements:
SAMPLE ID: BURNED CONNECTOR & PRESSURE ACTUATOR (REDOICK)

DETERMINE CAUSE
OF BURNED CONNECTOR - RADIOGRAPH, PHOTOGRAPH, PRESSURE TEST DIAPHRAGM

EVALUATE/UNDERSTAND CIRCUITRY OF NEW SWITCHES.

ATTN: S LA
ROUCHE - SAMPLE IN LAB

NOTE: ALL COMMUNICATIONS/REPORT, ETC TO BE DUAL
(I.E. N LA POINT)

Reporting Directions:
Date customer would like report: 01/13/1999
Date customer must have report: 01/14/1999

Report Format(s):

Log-in Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: Morton, Jacqueline R. Phone: 59-47084

View your test status at: "HTTP://bot4web.pd7.ford.com/kals/

Program Name: KALISLab Engr Module
Program Version: Version: 2.0.5

3713 2630

PRODUCED BY FORD

ER82-625-A 9529

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number: 009604108
Date of Request: 12/17/1998 10:50:33 AM
Print Date: 01/12/1999 08:30:44 AM

Request Description: SPEED CONTROL CUT-OFF SWITCH

Requestor Information:
Primary Contact: [redacted] 10008 Phone: (313) 323-6586 PROFS ID: GSTEVEN1 Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10075 Phone: (313) 594-2809 PROFS ID: NLAPOINT Fax: (313) 337-6236

Send Report to:
Bill to: MD 5006/2G065, AVT MATERIALS, BLDG. 86
Acctg.Location: 5100
Dept: T113
Work Task: XQG04

Sample Information:
Total Number of Containers: 1 Sample Handling: Return after test
Source: Not specified Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUT-OFF SWITCH	1	BURNED CONNECTOR	F2VY-9F924-A	NA	16.00.00	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation/Requestor Info. Box: Mail typed report
Fax preliminary results
HIGH PRIORITY - POSSIBLE LEGAL

Additional Sample Information/Testing Requirements:
SAMPLE ID: BURNED CONNECTOR & PRESSURE ACTUATOR (REDDICK)

DETERMINE CAUSE
OF BURNED CONNECTOR - RADIOGRAPH, PHOTOGRAPH, PRESSURE TEST
DIAPHRAGM.

EVALUATE/UNDERSTAND CIRCUITRY OF NEW SWITCHES.

ATTN: S. LA
ROUCHE - SAMPLE IN LAB

NOTE: ALL COMMUNICATIONS/REPORT, ETC. TO BE DUAL
(I.E. N. LA POINT).

Reporting Directions:
Date customer would like report: 01/13/1999
Date customer must have report: 01/14/1999

Report Format(s):

Log-in Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: Merlon, Jacqueline R. Phone: 59-47084

View your test status at: 'HTTP://tst4web.pd7.ford.com/tsts'

Program Name: KALISLab Engr Module
Program Version: Version: 2.0.6

3713 2879

PRODUCED BY FORD

E982-825-A 9838

```
**********************************************************************
*          Note printed by JEVANS8 on 21 Dec 1998 at 14:57:41        *
**********************************************************************

From: FPORTER --DRBN007                    Date and time    12/18/98 17:04:06
To: MABRAMCZ--DRBN005                   BEGEN   --DRBN007
    RENGLIS1--DRBN005                   JEVANS8 --DRBN005
    DGOEL   --DRBN005                   JGREGOIR--DRBN005
    KGRIBBLE--DRBN005                   NLAPOINT--DRBN005
    SLAROUCH--FORDMA1                   JMCINERN--DRBN005
    JMEME   --DRBN005                   RNEVI   --DRBN005
    GSTEVEN1--DRBN005                   CTHOMAS5--DRBN005
    HMELFER3--DRBN006

FROM: F. J. Porter                              USART(UTC -05:00)
Subject: 9F924 Update (19981218)

1992-1993 Town Car F2VC-9F924-A Brake Pressure Switch Investigation


TEAM:
----------------------------------------------------------------------
AVT EESE Chassis Electronics:   Fred Porter        x84-53722   fporter
AVT Chassis Engineering:        Joe Evans          x32-23832   jevans8
                                Barry Egan         x32-19512   begen
AVT EESE EOS:                   Rob English        x33-73225   renglis1
AVT Design Analysis:            Norm LaPointe      x59-42686   nlapoint
AVT EESE CPE:                   Jim Gregoire       x33-79962   jgregoir
E&SE Prod. Veh. Safety:         William Abramczyk  x32-23284   wabramcz
                                Ray Nevi           x59-47668   rnevi
Large Luxury VC Safety:         John McInerney     x32-20276   jmcinern
                                Joe Meme           x39-08133   jmeme
AVT Materials Engineering:      Greg Stevens       x32-36686   gstevenl
                                Ken Gribble        x32-38688   kgribble
                                Clark Thomas       x59-41313   cthomas5
Central Lab Services:           Steve LaRouche     x84-54876   slarouch


INFORMATION:
----------------------------------------------------------------------
NHTSA Letter: PE98-068

Vehicles identified:  21 initially identified.
                      20 additional vehicles reported since publication of
                      the investigation.

Warranty:  A total of 89 warranty claims are identified in AWS on the
           F2VY-9F924-A for 1992 and 1993 Town Cars.

           Two CQIS reports (MJIAA135 & VDUAA122) mention underhood fire
           in connection with the brake pressure switch.
           MJIAA135 occurred at 51,500 miles.
           VDUAA122 occurred at 56,802 miles.

Supplier:  The pressure switch was manufactured by Texas Instruments.  The
           switch was purchased in assembly with the brake proportioning
           valve bought from Surfaces.

Contacts:  Surfaces - Mike Thomas (248)543-6820  HILITE Industries
           TI - Rob Sharp (248)305-5729
```

3713 0910

TI - Russ Baumann (508)236-3314
TI - Charlie Douglas (508)236-3657

Function: The brake pressure switch is a redundant switch for turning off the speed control function.

X-Rays: Taken by Steve LaRouche, Norm LaPointe & Clark Thomas on 12/17/1998. Original photographs and part are in Steve LaRouche's possession.

ON-GOING ACTIVITY:

2 service parts have been ordered from Fairlane Ford for X-ray and other testing by Central Lab Services.

Meeting with representatives of TI is planned for 12/22/1998 to discuss intended operation of the switch. The meeting will be at the Central Laboratory Conference room off of the lobby.

QUESTIONS: (in no particular order)

1) What is the normal current in the brake pressure switch?

2) Was cruise control standard on Town Car in 1992 and 1993?

3) Under what circumstances is brake fluid flammable?

According to Clark Thomas & Mary Haga, brake fluid is flammable at approximately 300 degrees F.

4) What is the repair history for vehicles that have exhibited a problem? Repair history for the two CQIS vehicles are being gathered by Fred Porter.

5) What other vehicles use this brake pressure switch? What are their electrical configurations?

MODEL YEAR	92	93	94	95	96	97	98
Town Car	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	
Crown Vic	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	
Grand Marquis	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	
Econoline	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Club Wagon	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
F-Series		XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Bronco		XXXX	XXXX	XXXX	XXXX		
Taurus SHO		XXXX	XXXX	----			
Capri			XXXX	XXXX	----		
Windstar			XXXX	XXXX	XXXX	XXXX	XXXX
Falcon				XXXX	XXXX	XXXX	XXXX
Explorer					----	XXXX	XXXX
Ranger					----	XXXX	XXXX
Expedition						XXXX	XXXX
Navigator							XXXX

XXXX = used in model year
---- = may have been used in model year

3713 0911

6) Is this switch still in use? If not, why not? If so, what design changes have been implemented since 1992/1993?

Charlie Douglas of TI is investigating the design changes that may have been implemented on the brake pressure switch beginning in 1992.

7) What fault codes are stored if the brake pressure switch fails?

Regards,

Fred Porter CV - fporter fporter@ford.com
Chassis E/E Systems Applications (313)845-3722
Bldg 5 - Mail Drop 5030 - Cubicle 3E004 fax: 390-4145

****
* Note printed by GSTEVEN1 on 5 Jan 1999 at 08:26:50 *
****

From: FPORTER --DRBN007
To: WABRAMCZ--DRBN005
RENGLI81--DRBN005
DGOEL --DRBN005
KGRIBBLE--DRBN005
SLAROUCH--FORDNA1
JNEMS --DRBN005
GSTEVEN1--DRBN005
HWELPER3--DRBN005

Date and time 12/16/98 17:04:26
BEGEN --DRBN007
JEVANS6 --DRBN005
JGREGOIR--DRBN005
NLAPOINT--DRBN005
JMCINERN--DRBN005
RNEVI --DRBN005
CTHOMAS6--DRBN005

FROM: F. J. Porter USART(UTC -05:00)
Subject: 9F924 Update (19981218)

1992-1993 Town Car F2VC-9F924-A Brake Pressure Switch Investigation

TEAM:

AVT EESE Chassis Electronics:	Fred Porter	x84-51722	fporter
AVT Chassis Engineering:	Joe Evans	x32-21832	jevans6
	Barry Egen	x32-39512	begen
AVT EESE EOS:	Rob English	x21-71225	renglis1
AVT Design Analysis:	Norm LaPointe	x58-42686	nlapoint
AVT EESE OPE:	Jim Gregoire	x13-79962	jgregoir
EESE Prod. Veh. Safety:	William Abramczyk	x32-21284	wabramcz
	Ray Nevi	x59-47688	rnevi
Large Luxury VC Safety:	John McInerney	x32-20278	jmcinern
	Joe Nemo	x39-08133	jnemo
AVT Materials Engineering:	Greg Stevens	x32-34684	gstevens
	Ken Gribble	x32-30658	kgribble
	Clark Thomas	x59-41313	cthomas6
Central Lab Services:	Steve LaRouche	x84-54876	slarouch

INFORMATION:

NHTSA letter: PE98-055

Vehicles identified: 21 initially identified.
20 additional vehicles reported since publication of the investigation.

Warranty: A total of 89 warranty claims are identified in AWS on the F2VY-9F924-A for 1992 and 1993 Town Cars.

Two CQIS reports (WJIAA135 & VDUAAJ22) mention underhood fire in connection with the brake pressure switch.
WJIAA135 occurred at 51,500 miles.
VDUAAJ22 occurred at 56,802 miles.

Supplier: The pressure switch was manufactured by Texas Instruments. The switch was purchased in assembly with the brake proportioning valve bought from Surfaces.

Contacts: Surfaces - Mike Thomas (248)541-6520 HILITE Industries
TI - Rob Sharp (248)305-3729

3713 6079

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2002-025-A 9634

TI - Russ Baumann (508)236-3314
TI - Charlie Douglas (508)236-3657

Function: The brake pressure switch is a redundant switch for turning off th speed control function.

X-Rays: Taken by Steve LaRouche, Norm LaPointe & Clark Thomas on 12/17/1998. Original photographs and part are in Steve LaRouche's possession.

ON-GOING ACTIVITY:

2 service parts have been ordered from Fairlane Ford for X-ray and other testing by Central Lab Services.

Meeting with representatives of TI is planned for 12/22/1998 to discuss intended operation of the switch. The meeting will be at the Central Laboratory Conference room off of the lobby.

QUESTIONS: (in no particular order)

1) What is the normal current in the brake pressure switch?

2) Was cruise control standard on Town Car in 1992 and 1993?

3) Under what circumstances is brake fluid flammable?

According to Clark Thomas & Mary Raga, brake fluid is flammable at approximately 300 degrees F.

4) What is the repair history for vehicles that have exhibited a problem? Repair history for the two CQI8 vehicles are being gathered by Fred Porter.

5) What other vehicles use this brake pressure switch? What are their electrical configurations?

MODEL YEAR	92	93	94	95	96	97	98
Town Car	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	
Crown Vic	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	
Grand Marquis	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	
Roadline	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Club Wagon	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
F-Series		xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Bronco		xxxx	xxxx	xxxx	xxxx		
Taurus SHO		xxxx	xxxx	----			
Capri			xxxx	xxxx	----		
Windstar			xxxx	xxxx	xxxx	xxxx	xxxx
Falcon				xxxx	xxxx	xxxx	xxxx
Explorer					----	xxxx	xxxx
Ranger					----	xxxx	xxxx
Expedition						xxxx	xxxx
Navigator							xxxx

xxxx = used in model year
---- = may have been used in model year

3713 8080

PRODUCED BY FORD

EA82-825-A 9835

6) Is this switch still in use? If not, why not? If so, what design changes have been implemented since 1993/1993?

Charlie Douglas of TI is investigating the design changes that may have been implemented on the brake pressure switch beginning in 1992.

7) What fault codes are stored if the brake pressure switch fails?

Regards,

Fred Porter OV - fporter fporter@ford.com
Chassis E/E Systems Applications (313)845-3722
Bldg 5 - Mail Drop 5010 - Cubicle 3E004 fax: 390-4145

```
**********************************************************************
*          Note printed by JLOTT on 21 Dec 1998 at 14:58:31          *
**********************************************************************

From: DBSANAA1--DRBN005                          Date and time   12/18/98 13:13:1
Subject:  ANAY Facility/VM messages
This note was generated by the ANAY Facility/VM 5799-FLP (c) IBM Corp.
                    DO NOT REPLY TO THIS NOTE

ANA110I This mail item is being routed to you from FPORTER at DRBN007
on behalf of KGRIBBLE at DRBN005.

To: WARRANCE--DRBN005                    BEGEN   --DRBN007  Barry Egen
    KENGLISI--DRBN005                    JEVANS8 --DRBN005
    DGOEL    --DRBN005                   JGREGOIR--DRBN005
    KGRIBBLE--DRBN005                    BLAPOINT--DRBN005
    BLAROUCH--FORDMA1                    JMCINNER--DRBN005
    JHEME    --DRBN005                   KMEVI   --DRBN005
    GSTEVENS--DRBN005                    CTHOMAS5--DRBN005
    HWELFER5--DRBN006

FROM: F. J. Porter                              USANT(UTC -05:00)

Requester:              Frederick J. Porter
Date to be scheduled:   12/22/98
Starting time:          10:00AM   USANT
Ending time:            12:00PM   USANT

Location:   Central Labs - Lobby Conference Room

Subject:    Brake Pressure Switch Analysis

Purpose:    Review brake pressure switch operation with Texas Instrument
            Review available data and determine next steps.

            . . . . . .

Regards,
Fred Porter              OV - fporter       fporter@ford.com
Chassis E/E Systems Applications            (313)948-3722
Bldg 5 - Mail Drop 5030 - Cubicle 13E04     fax: 390-4145
```

-If brake fluid gets into the cavity- the brake fluid itself is fairly inert, but if it has some water or other contaminants, that's when you might get corrosion

-designed to handle 3-5amp load

****

* Note printed by JMCINERN on 18 Dec 1998 at 16:14:05 *

****

From: JNEME --DRBN005 Date and time 12/18/98 13:40:56
To: JMCINERN--DRBN005

FROM: Joseph S. Neme USAET(UTC -05:00)
SUBJECT: Brake Pressure Switch Analysis
Please cover for me... thanks

Joseph S. Neme
LVC- Chassis: SN95 - Wheels/Tires, Steering, Carline
Phone: 39-08133, Fax:39-07281, E-Mail:jneme@ford.com
Location: MD1255/Cube 2M37, Building #2 Textpager:313-795-7003
*** Forwarding note from FPORTER --DRBN007 12/18/98 13:19 ***

To: NABRAMCI--DRBN005	BEGAN --DRBN007 Barry Egan
RENGLIS1--DRBN005	JEVANS4 --DRBN005
DGOEL --DRBN005	JGREGOIR--DRBN005
KGRIBBLE--DRBN005	MLAPOINT--DRBN005
SLAROCCK--FORDNA1	JMCINERN--DRBN005
JNEME --DRBN005	RNEVI --DRBN005
GSTEVEN1--DRBN005	CTHOMAS6--DRBN005
HWELFER3--DRBN006	

FROM: F. J. Porter USAET(UTC -05:00)

Requester: Frederick J. Porter
Date to be scheduled: 12/22/98
Starting time: 10:00AM USAET
Ending time: 12:00PM USAET

Location: Central Labs - Lobby Conference Room

Subject: Brake Pressure Switch Analysis

Purpose: Review brake pressure switch operation with Texas Instrument
Review available data and determine next steps.

* *

Regards,
Fred Porter OV - fporter fporter@ford.com
Chassis B/E Systems Applications (313)845-3722
Bldg 5 - Mail Drop 5010 - Cubicle 3N004 fax: 390-4145

****
* Note printed by WABRAMCZ on 5 Jan 1999 at 13:03:21 *
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From: FPORTER --DRBN007 Date and time 12/18/98 17:04:06
To: WABRAMCZ--DRBN005 BEGEN --DRBN007
RENGLI91--DRBN005 JEVANS8 --DRBN005
DGOEL --DRBN005 JGREGOIR--DRBN005
KGRIBBLE--DRBN005 NLAPOINT--DRBN005
SLAROUCH--FORDNAL JMCINERN--DRBN005
JNEMS --DRBN005 RNEVI --DRBN005
GSTEVEN1--DRBN005 CTHOMAS5--DRBN005
KWELFEL3--DRBN006

FROM: F. J. Porter USART(UTC -05:00)
Subject: 97S24 Update (19981218)

1992-1993 Town Car F2VC-97S24-A Brake Pressure Switch Investigation

TEAM:

AVT ESES Chassis Electronics:	Fred Porter	x84-53722	fporter
AVT Chassis Engineering:	Joe Evans	x32-23832	jevans8
	Barry Segen	x32-39511	begen
AVT ESES SOS:	Rob English	x33-73225	renglis1
AVT Design Analysis:	Norm LaPointe	x59-42606	nlapoint
AVT ESES OPE:	Jim Gregoire	x33-79963	jgregoir
NASE Prod. Veh. Safety:	William Abramowyk	x32-23284	wabramcz
	Ray Nevi	x59-47808	rnavi
Large Luxury VC Safety:	John McInerney	x32-20276	jmcinern
	Joe Nems	x39-08133	jnems
AVT Materials Engineering:	Greg Stevens	x32-36646	gsteven1
	Ken Gribble	x32-38658	kgribble
	Clark Thomas	x59-41311	cthomas5
Central Lab Services:	Steve LaRouche	x84-54876	slarouch

INFORMATION:

NHTSA letter: PE98-055

Vehicles identified: 21 initially identified.
20 additional vehicles reported since publication of the investigation.

Warranty: A total of 89 warranty claims are identified in AMS on the F2VY-97S24-A for 1992 and 1993 Town Cars.

Two CQIS reports (MJIAA115 & VDKRA122) mention underhood fire in connection with the brake pressure switch.
MJIAA115 occurred at 51,500 miles.
VDKRA122 occurred at 56,802 miles.

Supplier: The pressure switch was manufactured by Texas Instruments. The switch was purchased in assembly with the brake proportioning valve bought from Surfaces.

Contacts: Surfaces - Mike Thomas (248)541-6520 (MILITH Industries)
TI - Rob Sharp (248)305-9729

TI - Russ Baumann (508)236-3314
TI - Charlie Douglas (508)236-3657

Function: The brake pressure switch is a redundant switch for turning off the speed control function.

X-Rays: Taken by Steve LaRoucha, Norm LaPointe & Clark Thomas on 12/17/1998. Original photographs and part are in Steve LaRoucha's possession.

ON-GOING ACTIVITY:

2 service parts have been ordered from Fairlane Ford for X-ray and other testing by Central Lab Services.

Meeting with representatives of TI is planned for 12/22/1998 to discuss intended operation of the switch. The meeting will be at the Central Laboratory Conference room off of the lobby.

QUESTIONS: (in no particular order)

1) What is the normal current in the brake pressure switch?

2) Was cruise control standard on Town Car in 1992 and 1993?

3) Under what circumstances is brake fluid flammable?

According to Clark Thomas & Mary Haga, brake fluid is flammable at approximately 300 degrees F.

4) What is the repair history for vehicles that have exhibited a problem? Repair history for the two CQIS vehicles are being gathered by Fred Porter.

5) What other vehicles use this brake pressure switch? What are their electrical configurations?

MODEL YEAR	92	93	94	95	96	97	98
Town Car	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	
Crown Vic	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	
Grand Marquis	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	
Econoline	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Club Wagon	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
F-Series		XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Bronco		XXXX	XXXX	XXXX	XXXX		
Taurus SHO		XXXX	XXXX	----			
Capri			XXXX	XXXX	----		
Windstar			XXXX	XXXX	XXXX	XXXX	XXXX
Falcon				XXXX	XXXX	XXXX	XXXX
Explorer					----	XXXX	XXXX
Ranger					----	XXXX	XXXX
Expedition						XXXX	XXXX
Navigator							XXXX

XXXX = used in model year
---- = may have been used in model year

6) Is this switch still in use? If not, why not? If so, what design changes have been implemented since 1992/1993?

Charlie Douglas of TT is investigating the design changes that may have been implemented on the brake pressure switch beginning in 1993.

7) What fault codes are stored if the brake pressure switch fails?

Regards,

Fred Porter CV - fporter fporter@ford.com
Chassis E/E Systems Applications (313)845-3732
Bldg 5 - Mail Drop 5030 - Cubicle 3E004 fax: 390-4145

BRAKE PRESSURE SWITCH REVIEW 12/22/98

NAME	ORGANIZATION	PHONE
FRED PORTER	FORD ANT EESE	(313)84-53722
JOLA LOTT	ANT HMTLS ENGINEERING	(313)24-83641
ZANDRA DEERING	LVC - SAFETY ENGR.	(313) 97-VIC 3
Jim Gregoire	ANT EESE OPD	(313) 23-29962
STEVE LaROUCHE	FORD CENTRAL LABS	313 845-4876
NORMAN LAPOINTE	ANT-DES. ENG.	313 39/42686

3713 1581

PRODUCED BY FORD

ER82-825-R 9842

BRAKE PRESSURE SWITCH 12/22/98
REVIEW

NAME	ORGANIZATION	PHONE
FRED. PORTER	FORD AVT EESE	(313) 84-S 3722
JOLA LATT	AVT HBTLS ENGINEERING	(313) 24-88641
ZANDRA DEERING	LVC - SAFETY ENGR.	(313) 37-V1663
Jim Gregoire	AVT EESE OPD	(313) 33-79962
STEVE LaROCHE	FORD CENTRAL LABS	313 8454876
NORMAN LAPOINTE	AVT-DES. ANAL.	313 59/42686

ROBERT SHARPE FIELD SALES T.L.
BRYAN DAGUE DES ENG SUP T.I.

3713 6673

PRODUCED BY FORD

EA62-625-A 9643

****
* Note printed by GSTEVEN1 on 5 Jan 1999 at 08:26:22 *
****

From: FPORTER --DRBN007 Date and time 12/23/98 10:33:16
To: MABRAMCZ--DRBN005 ZDEERING--DRBN005
BEGEN --DRBN007 RENGLIS1--DRBN005
JEVANS8 --DRBN009 DGOEL --DRBN005
JGREGOIR--DRBN005 KGRIEHLE--DRBN005
NLAPOINT--DRBN009 SLABOUCH--FORDHA1
JMCINNEN--DRBN009 JNEMH --DRBN005
RNEVI --DRBN005 GSTEVEN1--DRBN005
CTHOMAS5--DRBN009 HWELFER3--DRBN006

FROM: F. J. Porter USAET(UTC -05:00)
Subject: (U) Part Analysis

Dr. Al Hopkins from TI suggests that representatives from Ford travel to Attleboro, MA via Providence, RI the evening of January 5, 1999 for a full day of analysis on January 6, 1999.

Can some find out the type of material used in the extinguisher? This will aid in the analysis.

It would also be helpful to understand the weather conditions at the time of the event. I don't have the date and dealership from this part.

Thanks.

Regards,
Fred Porter OV - fporter fporter@ford.com
Chassis E/E Systems Applications (313)845-3722
Bldg 5 - Mail Drop 5030 - Cubicle-3E004 fax: 390-4145

Central Laboratory
19000 Century Drive
Dearborn, MI 48120-1287
FAX (313) 322-1614

Report 9804106
Preliminary

January 6, 1999

To:	G. Stevens/N. LaPointe	(313) 32-36686	07224 FAX
From:	S. LaRouche	(313) 84-54878	

Subject: Speed Control Cut-Off Switch
Part Number: F2VY-9F24-A
Source: Customer Vehicle

Received: One switch which had been involved in a thermal event, one unused switch, and unused switch components were received on December 17, 1998.

Object: Determine cause of thermal event.

Conclusion: Surface analysis indicates that oxide or corrosion product from the brass contacts may have transferred to the cup component of the switch. Deposits on the cup also appear to contain filler materials from the switch base.

The white deposit in the connector cavity below the wire seal appears to be from a dry chemical fire extinguisher.

Data and Analysis:

Surface Analysis
(Visual Examination, Scanning Electron Microscopy (SEM),
Energy Dispersive X-ray Spectroscopy (EDS))

The as-received condition of the switch is shown in Figure 1. The switch is shown after sampling for EDS in Figure 2 (arrow A in photograph points to area where sample was removed). Energy dispersive X-ray spectroscopy was performed on the following materials:

Oxide-like material on side surface of stationary contact body[1]

Greenish deposit visible on switch side of cup[2]

Material scraped from switch base

Material scraped from new switch base

White material in cavity of connector below wire seal

The spectra from these materials are attached.

The spectra from the material on the side of the stationary contact exhibits elements from the base metal (brass) as well as a trace amount of sulfur. This suggests that the material on the surface of the stationary contact is most likely an oxide of the base metal with possibly a sulfate.

[1] Small scraping from side of contact.

[2] Small scraping from deposit.

Surface Analysis - continued

The spectra from the greenish deposit on the cup exhibits mostly copper and zinc with trace amounts of sulfur, potassium, silicon, chromium, and iron. The presence of copper and zinc indicates that the deposit is primarily an oxide of the brass contact material which has transferred to the cup. The presence of sulfur suggests that some of the material may be a sulfate. The chromium and iron are most likely from the cup. The deposit also contains fibers which have spectra similar to those in the switch housing.

Spectra from the switch bases are similar. Aluminum, silicon, and calcium are most likely from the fillers (fibers, etc.) used in the housing material.

Spectra from the white deposit exhibit elements which would be found in dry chemical fire extinguishers, i.e., high phosphorus content material with plates of Si, Al, F - rich material (Muscovite).

Contributor: P. Nalbe

Concur: _____
P. Klass, Supervisor
Metallurgy Section

By: _____
Steven LaRouche (SLAROUCH)

Enclosures: Eight EDS spectra
Data sheet on muscovite

SL/sl

Central Laboratory
16000 Century Drive
Dearborn, MI 48120-1267
FAX (313) 322-1614

Report 9804105
Preliminary Report

January 15, 1999

To:	G. Stevens/N. LaPointe	(313) 32-36656	07224 FAX
From:	V. Beltran	(313) 59-47304	

Subject: Speed Control Cut Off Switch
- Part Number: F2VY-9F924-A
- Specification: Not Provided
- Supplier: Texas Instruments

Received: 3 switches (1 assembled, 1 assembled new, and one disassembled failed) were received on December 17, 1998.

Object: Determine the extent/cause of the damage Kapton Strips.

Conclusion: Damage appears to have been initiated at the Kapton strip closest to the washer prior to assembly of the switch by pinching and/or impact which tore the teflon and deformed the Kapton material. The damaged Kapton material appears to have been darkened and embrittled by an unknown mechanism.

Data and Analysis:

See Attached Photographs.

By: Vladimir S. Beltran
Vladimir S. Beltran (VBELTRA1)
Laboratory Engineer

Central Laboratory
15000 Century Drive
Dearborn, MI 48120-1267
FAX (313) 322-1614

Report 9804108

January 19, 1999

To: G. Stevens/N. LaPointe/S. LaRouche (313) 32-38656 07224 FAX

From: Gayle D. Gullen (313) 32-27322

Subject: Speed Control Cut-Off Switch
Part Number: F2VY-9F924-A
Source: Customer Vehicle

Received: One opened switch which had undergone a thermal event and one unused switch housing were received on January 4, 1999, from S. LaRouche. The switch was returned on January 11, 1999, after disassembly and preliminary examination by Texas Instruments.

Object: Determine if any fluid is present on the switch base in metallic-exposed area and compare the switch housing material to the unused material. Determine the nature of the black residue in the hexport and converter and determine the type of fluid in the diaphragm squares.

Conclusion/ Discussion: There was spectral evidence of a glycol ether [spectrally similar to Dow HD 50-4 brake fluid] and a metal soap on the metallic-exposed area of the switch cup. The customer base and unused base are spectrally similar and are composed of a polyester material. This is not the 'Noryl' material which was specified. [Noryl is a styrenated PPO (polyphenylene oxide).]

The exact nature and source of the noted metal soap could not be conclusively determined. Metal soaps can be utilized as polymeric compounding and/or mold release agents. Metal soaps are also utilized in greases [this glycol ether material does not match known carrier grease fluids] and may also be formed in the presence of acids and metal salts [both perhaps a reaction of the polymeric housing and metallic interference during the event].

The black residue in the hexport, converter, and washer are similar and are composed of a glycol based material [probably brake fluid] and a metal salt [probably an oxalate salt]. The black residue on the spacer is composed of a metal salt [probably oxalate salt], and a glycol based fluid [probably brake fluid]. The fluid removed from the #2 diaphragm was glycol based [probably brake fluid] and contained a metal salt [probably oxalate salt]. The hexport deposit appears to contain ~10% water, however, this value may be artificially elevated due to reactions with the salts and other compounds in the deposit.

Decomposition of the polyester base causes acid formation, with one of these acids likely being oxalic acid. Reaction with the metals in the system forms oxalate salts. Based on this, it is highly unlikely that the oxalate salts were introduced into the system in this fashion but were likely formed during the thermal decomposition of the housing.

Data and Analysis:

Molecular Characterization
(FTIR, Qualitative, Microscopic)

Arrow B in Figure 2 points to area where analysis was performed). Spectra of the fluid noted on the metallic surface [chloroform micro casts - several areas] are characteristic of a glycol ether [spectrally similar to Dow HD 50-4 brake fluid] with evidence of an ester and metal soap.

Spectra of the new, brown base are characteristic of a polyester on the base of terephthalic acid.

Spectra of the blackened, customer base are similar to the new base and are characteristic of a polyester on the base of terephthalic acid.

Molecular Characterization
(FTIR, Qualitative, Conventional and Microscopic)

Hexport Deposit

Spectra as received are characteristic of a glycol based material [probably brake fluid] and a metal salt [probably an oxalate].

Spectra of the methanol solubles are characteristic of a glycol based material [probably brake fluid] and ester.

Spectra of the insolubles are characteristic of essentially a metal salt [possibly an oxalate].

Converter Deposit

Spectra as received are characteristic of a glycol based material [probably brake fluid] and a metal salt [probably an oxalate].

Spectra of the methanol solubles are characteristic of a glycol based material [probably brake fluid, ester, and other material.

Spectra of the insolubles are characteristic of essentially a metal salt [probably an oxalate].

Spacer Deposit

Spectra of the deposit [as received] are characteristic of a metal salt [probably an oxalate] and a glycol based material [probably brake fluid].

Washer Deposit

Spectra of the deposit [as received] are characteristic of a glycol based material [probably brake fluid] and a metal salt [possibly an oxalate].

Diaphragm #2 Internal Fluid/Deposit

Spectra as removed are characteristic of a glycol based material [probably brake fluid] and a metal salt [possibly an oxalate].

Water Content, % by weight[1] ~10
(ASTM D 1744)

[1] Accuracy of this result is unknown based on the small sample size and possible interferences caused between compounds present in the deposit and the threat.

INFORMATION[2]

Chemical Resistance	Polytetrafluoroethylene [Teflon ®][3]	Polyimide [Ultem ®]	Polyester [Valox ®]
Brake Fluid [100%conc./73°F/ 180 days]	no information listed	no information listed	no observed changes no tensile strength change
Sulfuric Acid	no observed changes -2% tensile change [30%conc/212°F/8hr]	no observed changes -3% tensile change [20% conc/73°F/100 days]	no observed changes -4% tensile change [35%conc/73°F/180 days]
Water Absorption, % [1/8 in thick sample, 24hr]	<0.01	0.24-0.34	0.06-0.08 [30% glass filled]
Environmental Stress Cracking			
Brake Fluid (100% conc/2500 psi stress/72°F)	no information listed	>336 hours - no failure	no information listed

[2] Information obtained from *Modern Plastics Encyclopedia*, October 1984, November 1988: Teflon ® manufactured by DuPont, Ultem ® and Valox ® are manufactured by General Electric. Ultem ® is a polyetherimide material similar to Kapton ® polyimide which is manufactured by DuPont. Ultem ® was substituted for informational purposes only since Kapton ® information was not readily available (water absorption information is for Kapton ®, Ultem ® value is 0.25.)

[3] "Not known to dissolve in any known solvent and not attacked by highly corrosive acids and caustic materials". *Today's Chemist At Work*, January 1989

Contributor: V. Cooper, M Hage

Concur: _____
Mary Hage
Organic Section

By: _____
Gayle D. Gullen (GGULLEN)
Product Materials Engineer

****
* Note printed by FPORTER on 26 JAN 1999 at 17:26:08 *
****

From: FPORTER --DRBW007 Date and time 01/26/99 17:25:48
To: MLAPOINT--DRBW005 SLAROUCH--FORDMAL

USART(UTC -05:00)

FROM: F. J. Porter
Subject: (U) Brake Pressure Switch Material

The following is from TI drawings

Part	Material	Comments
Modified SAE J512 Hexport	C10L10 Steel	Zinc Plating .0001 min thk w/yellow dichromate
Converter	1006 or 1010 C.R. Steel	Zinc Plating .0002-.0004 thk may have rust inhibitor
Washer	1080 CRS	Zinc Plate .0002-.0006 thk Heat treat austemper Rockwell 40-60
Cup	1010 or 1006 C.R.S.	Zinc Plating w/yellow chromate .0002-.0004 thk
Spring	Beryllium copper C172v0	Mill hardened (Brush Wellman alloy 190 HM)
Kapton	Dupont 500 FN1313L	1 mil Teflon FEP 3 mil Kapton Type H 1 mil teflon FEP
Moveable Contact	Copper	Finish: DMC-133 OFHC Silver DMC-10 fine silver
Environmental Seal	Silicon JBL 87819	
Transfer Pin	L-2 Grade Steatite (DC-16E5) or L-3 Grade Steatite (DC-144E)	
Switch Rivet	CDA 260 Brade	
Gasket	Ethylene Prepylene JBL Compound E-7104-70 JBL Part No. 6197E	
Spacer	Dupont Kapton 200E .0017-.0023 thk	
Crimp Ring	Aluminum 5052	
Thread Cap	LDPE	

Regards,
Fred Porter OV - fporter fporter@ford.com
Chassis E/E Systems Applications (313)845-3712
Bldg 5 - Mail Drop 5030 - Cubicle 1E004 fax: 390-4145

3713 1580

All shaded areas must be filled in to process your request

Request for Central Laboratory Service

15000 Century Dr., Dearborn MI 48120-1287 Phone (313) 32-21676 FAX (313) 32-21614

Administrative Use Only	
Laboratory Number	Date
9900226	1-26-97 SL

Your Name (Send report to)	Telephone	PROFS ID	FAX
G. STEVENS	36686	GSTEVEN1	36686
Secondary Contact	**Telephone**	**PROFS ID**	**FAX**
N LaPointe	42686	NLaPointe	

T

Send Report To / Bill To

Room No./Mail Drop/PO Box	Department/Activity	Building	Location Code	Dept. #	Work Task # (For 5100 Loc. Only)
MD 5006	MATERIALS AXT	BLDG #3	5102	7113	XQG44

Samples

Total # of Samples	Sample Handling	TOX/CAS#	Source	Supplier Code
	X Return after test ___ Dispose after test ___ Dispose after 30 days			

Part/Material Name	Sample Identification (Continue below if needed)	Part Number (If any)	Material Specification (If any)	CPSC Code	Supplier
SPEED CONTROL CUTOFF SWITCH	A, B, C, D, U(E), AND F	F2DY 9F924 A	NA		TEXAS INSTRUMENTS

Investigation

Nature of Investigation/Specific Tests Required (Check all that apply)

- ___ Production/Plant problem
- X Failure Analysis
- X Legal
- ___ Specification Compliance
- ___ Perform Tests as in Lab No. ____________
- ___ Photograph (Describe below)
- ___ Use Specification ____________ as a guide
- ___ Other (Describe below)

Requester Info. Box (For requester use)

Stop testing upon failure? ___ No ___ Yes

Does this support CAR testing? (If "Yes", what is the expected outcome?) X No ___ Yes

Do you need to know your CL contact and timing? ___ Yes

Additional Sample Information/Testing Requirements

DISASSEMBLE SWITCHES IN PRESENCE OF PERSONNEL FROM TEXAS INSTRUMENTS

PERFORM ANALYSES TO ASSIST IN DETERMINING CAUSE OF POSSIBLE SWITCH FAILURE AND LEAKAGE

Report

Date you would like report: 2-11-97

Date you must have report: 2-11-97

Format (Check all that apply)

- ___ FAX preliminary results
- ___ FAX typed report
- ___ FAX legal written
- ___ Mail legal written
- X Mail typed report
- ___ Electronically transfer report
- ___ Phone preliminary results

For information about services or assistance in completing this form please refer to the Central Laboratory WEB page. (www.[illegible].ford.com/central/forms.htm)
Laboratory number and date cannot be assigned without receipt of samples.
Samples will be disposed of after 30 days unless otherwise indicated above.

3713 2743

PRODUCED BY FORD

EA02-025-A 8852

Project No. 9900226

Book No. [illegible] TITLE Speed Control Cutoff Switch

From Page No. [illegible] Recd. [illegible]

Rec'd six switches A, B, C, D, 11(E), & F
[illegible annotations]

Switches were disassembled in presence of
Texas Inst. personnel.

A. Switch involved in fire
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

B. Switch involved in fire
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

To Page N

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

3713 2744

PRODUCED BY FORD

E682-025-R 0653

Project No. [illegible]

LE [illegible] Book No. 2609

From Page No. ___ [illegible]/3

C. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

D. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

[illegible]

[illegible]

[illegible]

To Page No. ___

Witnessed & Understood by me.	Date	Invented by	Date
		Recorded by	

Project No. 9900226

72 Book No. 94 TITLE Sterile Corridor Concept Study

From Page No.

U (E)

F

To Page No.

Witnessed & Understood by me. Date Invented by Date

Received by

3713 2746

PRODUCED BY FORD

EA82-825-R 9/85

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number 209900228
Date of Request 01/26/1999 11:19:53 AM
Print Date 01/28/1999 02:13:51 PM

Request Description: SPEED CONTROL CUTOFF SWITCH

Requestor Information:
Primary Contact: STEVENS, GREG - 10008 Phone: (313) 323-6586 PROFS ID: GSTEVEN1 Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10075 Phone: (313) 594-2596 PROFS ID: NLAPOINT Fax: (313) 337-6256

Send Report to: MD 5008/2G065, AVT MATERIALS BLDG #5
Bill to: Acctg.Location: 5100
Dept: T113
Work Task: XQG04

Sample Information:
Total Number of Containers: 6 Sample Handling: Dispose after 30 days
Source: Not specified Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUTOFF SWITCH	6	A,B,C,D,11(E), AND F	F2VY-9F924-A	NA	00 00 00	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation: Requestor Info. Box: Mail typed report

Additional Sample Information/Testing Requirements:
DISASSEMBLE SWITCHES IN PRESENCE OF PERSONNEL FROM TEXAS INSTRUMENTS. PERFORM ANALYSES TO ASSIST IN DETERMINING CAUSE OF POSSIBLE SWITCH FIRE OR LEAKAGE.

Reporting Directions:
Date customer would like report: 02/11/1999
Date customer must have report: 02/11/1999

Report Format(s):

Log-in Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: LaRouche, Steve Phone: 64-54878

View your test status at: 'HTTP://bd4web.pd7.ford.com/tutle'

Program Name: KALISLab Engr Module
Program Version: Version 2.0.6

PLEASE DETERMINE PRESENCE OF BRAKE FLUID IN LOCATIONS SPECIFIED ON ATTACHED SHEET. ALSO IDENTIFY ANY OTHER MATERIALS, ESPECIALLY IN DARKENED AREAS OF INTERIOR COMPONENTS. PLEASE RETURN PARTS AFTER YOU FINISH SAMPLING SO I CAN ROUTE THEM TO OTHER ANALYSTS

THANKS,

S. LaRouche

3713 2780

PRODUCED BY FORD

F982-625-A 9655

990226 Test Locations

Sample	Component	Location
A, C	Hexport	Fitting End
		Cavity
	Cup	Interior
		Switch Side
	Washer, Converter, Disc	Anywhere
D,F	Hexport	Fitting End
		Cavity
	Seal	Dark Areas
	Washer, Converter, Spacer and Disc	Dark Areas
	Cup	Interior
		Switch Side[1]
	Contact	Anywhere[1]
	Base	Connector Cavity
11	Hexport	Fitting End
		Cavity
	Seal	Dark Areas

[1] Sample already collected prior to further disassembly. Placed in Gelman dish or in vial.

990226 Test Locations

Sample	Component	Location
A, C	Hexport	Fitting End
		Cavity
	Cup	Interior
		Switch Side
	Washer, Converter, Disc	Anywhere
D,F	Hexport	Fitting End
		Cavity
	Seal	Dark Areas
	Washer/Converter/Spacer/ and Disc	Dark Areas
	Cup	Interior
		Switch Side[1]
	Contact	Anywhere[1]
	Base	Connector Cavity
11	Hexport	Fitting End ✓
		Cavity ✓
	Seal	Dark Areas

11 - is in service - no problem -
fluid in [illegible] (of hexport) probably
came from [illegible] during handling -
[illegible] in ID of [illegible]

TI's - [illegible] method to determine presence of brake fluid w/o [illegible] - [illegible] fluid only
Hexport cavity - [illegible] behind [illegible]
fitting end - [illegible] in 1st [illegible] of thread [illegible]

Thanks
[illegible]

[1] Sample already collected prior to further disassembly. Placed in Gelman can or in vial

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number [illegible]
Date of Request: 01/29/1999 [illegible] AM
Print Date: 01/29/1999 02:13:51 PM

Request Description: SPEED CONTROL CUTOFF SWITCH

Requester Information:
Primary Contact: STEVENS, GREG - 10006 Phone (313) 323-6886 PROFS ID GSTEVENS Fax (313) [illegible]
Secondary Contact: LA POINTE, NORM - 10075 Phone (313) 594-2586 PROFS ID NLAPOINT Fax (313) [illegible]

Send Report to: MD 5006/2G065, AVT MATERIALS BLDG #5
Bill to:
Acctg.Location: 5100
Dept: T113
Work Task: XOG04

Sample Information:
Total Number of Containers: 6 Sample Handling: Dispose after 30 days
Source: Not specified Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Case	Supplier
SPEED CONTROL CUTOFF SWITCH	6	A,B,C,D,11(E), AND F	F2VY-9F924-A	NA	30 30 02	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation: Requester info. Box: Mail typed report

Additional Sample Information/Testing Requirements:
DISASSEMBLE SWITCHES IN PRESENCE OF PERSONNEL FROM TEXAS INSTRUMENTS. PERFORM ANALYSES TO ASSIST IN DETERMINING CAUSE OF POSSIBLE SWITCH FIRE OR LEAKAGE

Reporting Directions:
Date customer would like report: 02/11/1999
Date customer must have report: 02/11/1999

Report Format(s):

Log-in Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: LaRouche, Steve Phone 34-54875

View your test status at: "HTTP://bdeweb pd7 ford com/kals" Program Name: KALISLab Engr Module
Program Version: Version [illegible]

PLEASE DETERMINE PRESENCE OF BRAKE FLUID IN LOCATIONS SPECIFIED ON ATTACHED SHEET. ALSO IDENTIFY ANY OTHER MATERIALS, ESPECIALLY IN DARKENED AREAS OF INTERIOR COMPONENTS. PLEASE RETURN PARTS AFTER YOU FINISH SAMPLING SO I CAN ROUTE THEM FOR OTHER ANALYSES

THANKS,

S. LaRouche

3713 2783

PRODUCED BY FORD

Project No.
TITLE Book No.

From Page No.

990226 Greg Stevens / [illegible]

[illegible]

990226 Test Locations

Sample	Component	Location
A, C	Hexport	Fitting End
		Cavity
	Cup	Interior
		Switch Side
	Washer, Converter, Disc	Anywhere
D,F	Hexport	Fitting End
		Cavity
	Seal	Dark Areas
	Washer, Converter, Spacer and Disc	Dark Areas
	Cup	Interior
		Switch Side*
	Contact	Anywhere*
	Base	Connector Cavity
11	Hexport	Fitting End
		Cavity
	Seal	Dark Areas

* Sample already collected prior to further disassembly. Placed in German [illegible]

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
[illegible]	2[illegible]/09		

3713 2764

PRODUCED BY FORD

EB02-025-A 9050

[illegible] Tom Dotro
Joe McArney

****
*   Note printed by SREIMERS on 4 Feb 1999 at 13:21:52   *
****

From: SREIMERS--DEARN007   Date and time   02/04/99 11:29:14
To: ✓FPORTER --DEARN007   Frederick J. Porter   DGOHL --DEARN005
LBROWN --DEARN003   ? CSTEVEN7--DEARN005
JWENK --DEARN005   ✓ DKNOSTMA--VISTEON
✓ PSTOKES --VISTEON   ✓ SLAMOUCH--FORDMA1
✓ RENGLIS1--DEARN005   RWALTER --DEARN005 — Later
✓ MLAPOINT--DEARN003   TMASTERS--DEARN005
✓ SREIMERS--DEARN007   Steve Reimers   SCOLE1 --DEARN005
Open — JKAFASI --DEARN004   ✓ Rob Sharpe   TI

FROM: Steve Reimers   USAET(UTC -05:00)

Requester: Steve Reimers
Date to be scheduled: 02/04/99
Starting time: 2:00PM   USAET
Ending time: 3:00PM   USAET

Location: building 5 conf rm 1A839

Subject: Brake Pressure Switch

Purpose: Kick-off meeting for Investigation of Brake Pressure switch
              in response to NHTSA investigation.
              1. Develop work plan
              2. Identify addition team players — — VO
              3. Establish meeting schedule and location.

* *

Steve Reimers   building 5 1C043
AVT Chassis E/E System Applications   mail drop 5011
39-03286 SREIMERS   sreimers@ford.com   fax 39-03286

Introductions
Description '92/'93 TC UNDERHOOD
Problem Statement (TC Focus?)
Work Plan -
Containment Short Term
             Long Term
Root Cause
Recreate Fault
Failure Analysis

3713 1816

BRAKE PRESS -- SW - INVESTIGATION 2/4/99

✓ DAN BUDREWSKI? } ✓ PAUL JEKEO } [illegible]

Speed control

✓ CRACK STRESS - MATERIALS Safety off ✓ [illegible] ✓

SALT IN SOLUTION? ✓ Central lab - STEVE LAROCHE

✓ II - ROB SHARPE (313) 845-5729

SECTIONED SWITCH ✓ [illegible] - CCRG

✓ STU SMITH - BUSCH MORGAN

✓ [illegible] - DESIGN ANALYSIS

✓ TOM MARTIN [illegible]

BRAKE FLUID IN WIRE? ✓ [illegible] FRED

Spark from arc of switch

NHTSA INVESTIGATION CC ✓ D GOEL

✓ H WELFER?

✓ L BROWN

✓ SCOLES

C-R-J

Immediate Actions

Work Plan

✓ C[illegible]VEN?

[illegible]

Central Laboratory
15000 Century Drive
Dearborn, MI 48120-1267
FAX (313) 322-1614

Report 9804105
Preliminary Report

February 6, 1999

To:	G. Stevens/N. LaPointe	(313) 32-36586	39-07224 FAX
From:	V. Beltran	(313) 39-05018	

Subject: Speed Control Cut Off Switch
Part Number: F2VY-9F924-A
Specification: Not Provided
Supplier: Texas Instruments

Received: 3 switches (1 assembled, 1 assembled new, and one disassembled failed) were received on December 17, 1998.

Object: Determine the extent/cause of the damage Kapton Strips.

Conclusion: Damage appears to have been initiated at the Kapton strip closest to the washer prior to assembly of the switch. Pinching and/or impact tore the Teflon and deformed the Kapton material. The damaged Kapton material appears to have been darkened and embrittled by an unknown mechanism.

Data and Analysis:

Reflected Light Microscopy

Figure 1.
Kapton Strip (Teflon Layers Removed) Closest to Washer with Concave Side Down.
7X Magnification

Scanning Electron Microscopy

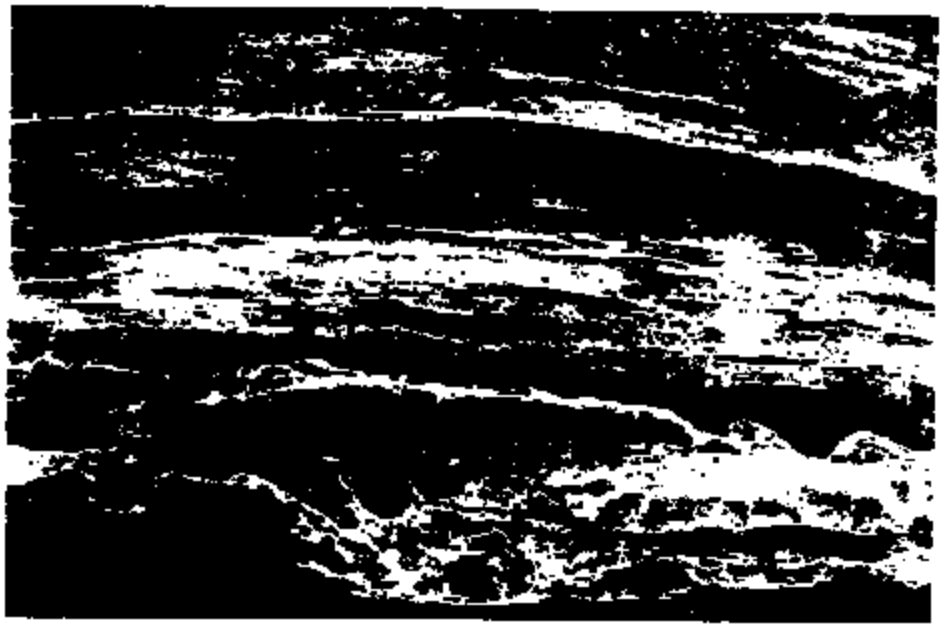

Figure 2.
SEM Photomicrograph of Brittle Fracture on Kapton Strip.
The fracture appears to propagate away from the washer.
The direction of propagation is perpendicular to the plane of the page.
563X Magnification

Scanning Electron Microscopy continued

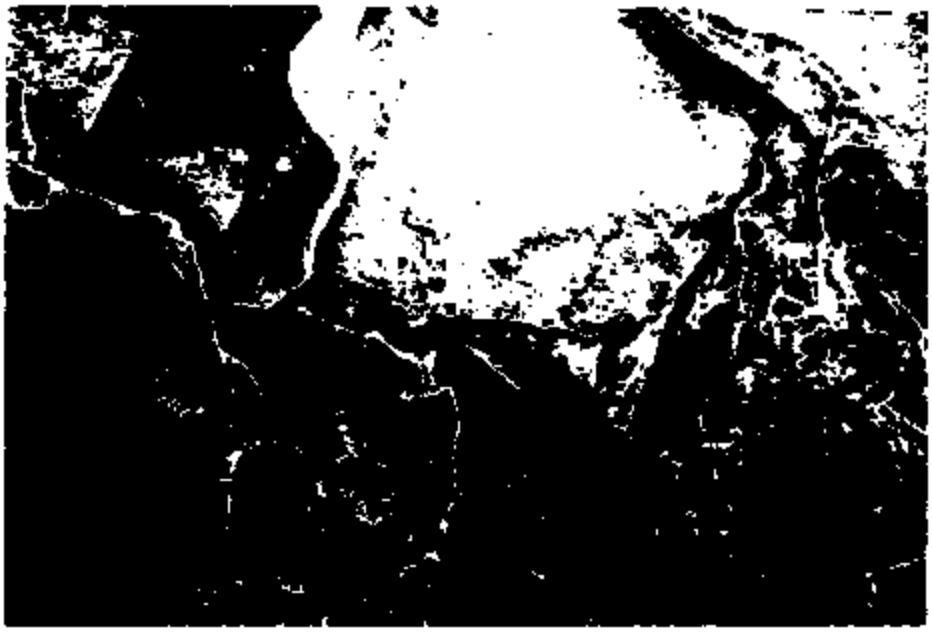

Figure 3.
Scanning Electron Photomicrograph of Brittle Fracture on Kapton Strip.
The direction of fracture propagation is perpendicular to the plane of the page.
2000 Magnification

By: _____
Vladimir S. Beltran (VBELTRA1)
Laboratory Engineer, Polymers Section

****
*   Note printed by [illegible] on 11 Feb 1999 at 07:27:43   *
****

From: FPORTER --DRBN007
To: [illegible]--DRBN007

Date and time 02/09/99 16:27:09

FROM: F. J. Porter UNANT(UTC -05:00)
Subject: CONNECTOR F2AB 14A464 ADA

Regards,
Fred Porter   OV - fporter   fporter@ford.com
Chassis E/E Systems Applications   (313)845-3722
Bldg 5 - Mail Drop 5030 - Cubicle 3B004   fax: 390-4145
*** Forwarding note from NLAPOINT--DRBN005 02/09/99 14:11 ***

To: JKENDE --DRBN005
FGAYNIER--DRBN007
FPORTER --DRBN007
THASTINGS--DRBN005
[illegible]--DRBN005
[illegible] --DRBN004
[illegible] --DRBN004
[illegible]--DRBN005

cc: JKAPATI --DRBN004
CTHOMAS5--DRBN005
CKILGORE--DRBN005
[illegible]--FORDMAIL
NLAPOINT--DRBN005

FROM: Norman LaPointe UNANT(UTC -05:00)
Subject: CONNECTOR F2AB 14A464 ADA

Meeting 2-12-1999 w/UTA, 1:00PM at Central Laboratories, Small Conf. Rm.
Agenda:

1. Obtain drawings for F2AB-14A464-ADA connector & components from UTA.
2. Obtain components for above connector (5 sets).
3. Obtain and discuss FMEA.
4. Discuss sealing details & history of above connector.
5. Obtain the visual characteristics of: water, brake fluid, or other materials that could enter the connector or the wires.
6. Discuss assembly difficulties to seal joint.
7. Hand off 6 press. switch assemblies to UTA.
8. Develop game plan to disassemble and examine the submitted connector from Reddick veh.

FAX copy of above sent to Dan Kulkarni-UTA, Dick Radkey-UTA.

Regards,
Norman LaPointe
PHONE 59-42606 FAX 313-337-8256

3713 1809

PRODUCED BY FORD

ER02-025-A 8686

2/10/99

ONLY FZVC IS FOR ~~AT ISSUE~~

149 92', 93' Fire / Thermal Event / Smoke / overheated.

36 OFF
9 ROUNING } engine State
104 UNKNOWN

5 TO 1 GM Brake Sw
17 OTHER COMPONENTS

FAMES OFF WORK PLAN

- DAMAGE LIMITED TO SWITCH ?
- OASIS Msg ~~NO~~ For Replaced Brake Sw
- WARRANTY Return Parts Have been Logged
- A → E ANALYSIS
  - Thermal Enviroment
  - Orientation
  - Pressure Enviroment 8D on Econoline
  - Reaction to fretal occurrence

Wed 2 PM Weekly

3713 1810

PRODUCED BY FORD

EA82-825-A 9887

2/10/99

NAME	PROES	ORG.
Steve Reimers	SREIMERS	AVT/EESE
Tom Baba	TBABA	LVC-OPD BRAKES
John McInerney	JMCINERN	LVC-Safety
Joseph Nieme	JNIEME	LVC-Safety
Rob Erlich	RERLICH	AVT-EESE-BOS
Norm LaPointe	NLAPOINT	DES ANAL AVT
Steve LaRoche	SLAROCH	CENTRAL LAB
Dan Budzynski	D BUDZYN	
Paul Stokes	PSTOKES	
Stuart Salter	SSALTER	EESE COMPETITIVE ANA.
Fred Porter	FPORTER	AVT: Chassis Electronics
Tim Schrady	TSCHRADY	
Fred Kohl	FKOHL 21801	

3713 1811

PRODUCED BY FORD

EA82-825-A 9868

Central Laboratory
15000 Century Drive
Dearborn, MI 48120-1267
FAX (313) 322-1614

Report 9804105
Preliminary Report

February 10, 1999

To:	G. Stevens/N. LaPointe	(313) 32-36686	39-07224 FAX
From:	V. Sekran	(313) 39-05018	

Subject: Speed Control Cut Off Switch
Part Number: F2VY-9F924-A
Specification: Not Provided
Supplier: Texas Instruments

Received: 3 switches (1 assembled, 1 assembled new, and one disassembled failed) were received on December 17, 1998.

Object: Determine the extent/cause of the damage Kapton Stripe.

Conclusion: Damage to the Kapton strips appears to be the result of pinching and/or buckling of the Kapton material. The damaged Kapton material appears to have been darkened and embrittled by an unknown mechanism and fractured in a brittle mode. Torn Teflon material on all three strips of the switch coinciding with the location of the fractured Kapton material provide a leak path.

Data and Analysis:

Reflected Light Microscopy

Figure 1.
Kapton Strip (Teflon Layers Removed) Closest to Washer with Concave Side Down. 7X Magnification

Scanning Electron Microscopy

Figure 2.
SEM Photomicrograph of Brittle Fracture on Kapton Strip.
The fracture appears to propagate away from the washer.
The direction of propagation is perpendicular to the plane of the page.
263X Magnification

Scanning Electron Microscopy continued

Figure 3.
Scanning Electron Photomicrograph of Brittle Fracture on Kapton Strip.
The direction of fracture propagation is perpendicular to the plane of the page.
2500X Magnification

By: _____
Vladimir S. Beltran (VBELTRA1)
Laboratory Engineer, Polymers Section

Work Plan- Brake Pressure Switch

Root Cause Investigation-

Identify the combustibles?
AVT EESE Materials Engineering

Identify the contaminants in returned parts?
Central Lab analysis

Identify soures of contaminants?
Central Lab analysis

Identify causes of brake fluid leakage?
Central Lab and Texas Instrument

Identify heat source(s) start event?
AVT EESE Chassis Electronics

Create Event in Lab
AVT EESE Chassis Electronics

Collect Field Samples
LVC - Safety

Root Cause Investigation Tasks

What are the combustibles?

AVT EESE Materials Engineering

Are the switch materials compatible with brake fluid?
by 2/18/99

Are the switch materials compatible with brake fluid in an electric field?
by 2/18/99

Are the switch materials compatible with brake fluid and contaminants?
by 2/18/99

Are the switch materials compatible with contaminated brake fluid in an electric field? by 2/18/99

Flash points for all materials? by *completed*

TI provided to Norm LaPointe

Get Dow assistance by 2/16/99

How can a fire start with the switch given the constraints:

Continuous Battery voltage applied between switch electrical components and the hydraulic connection, circuit fused at 15 amps, inductive load current of 0.5 amps switched when speed control is turned off. the switch cavity contains a black material containing at least copper, zinc, sulfur, and brake fluid (probably containing water), vehicle underhood temperatures.

By 2/22/99

What is the difference in the base materials that look different?

Texas Instruments by *complete*

Color of plastic base identifies calibration. Also, plastic material change from Cellanex 4300 to Noryl GTX430 in MY 1995 when P/N changed from F2VC to F2AC

3713 1754

What are the material call-outs for 1992 and 1993?
Texas Instruments by 2/15/99

Brake Pressure Switch
P3VC-9F884-AB
Material List for MY 88/93

Component Name	Material	Comment
Gasket	Elastomer Ethylene Propylene	JBL Compound # E-7104-70
Diaphragm	Kapton, Polyimide	Dupont 900 FN131L, 3 Diaphragms per switch
Base	PBT, Plastic	Ticona Celanex 4800
Crimp Ring	Aluminum	Grade # 5052
Spacer	Kapton, Polyimide	Dupont 450GS, Friction Reducer on Disc
Rivet	Brass	CDA 360
Transfer Pin	Ceramic	Brasilia , L-3 Grade
Environmental Seal	Silicone	JBL Compound # S7519
Converter	Cold Rolled Steel	Grade # 1008
Washer	Cold Rolled Steel, Zinc Plated	Grade # 1080
Cup	Cold Rolled Steel	Grade 1010
Spring Arm	Beryllium Copper	Grade # C17200
Movable Contact	Silver Plated Copper	Oxygen Free Cu, Fine Silver
Stationary Terminal	Brass + Silver Inlay	CDA 360
Movable Terminal	Brass	CDA 360
Disc	Stainless Steel	Grade 302
Hexport	Cold Rolled Steel, Zinc Plated	CNGL10
Thread Cap	LDPE, Plastic	

What are the contaminants in returned parts?
Central Lab analysis
Results of Memphis part analysis by 2/18/99

Results of testing with corrosion simulation?
AVT EESE Chassis Electronics by *complete*

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3713 1756

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Central Lab and Texas Instrument

What does TI DFEMA say about this failure mode?

Texas Instruments by ~~2/16/99~~ Complete

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TI by 2/18/99

Does the event occur only on vehicles with ABS?

LVC-Safety by 2/18/99

Characterize the real vehicle brake pressure seen at the switch.

AVT Chassis Brakes by

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DOE work plan for TI activities.

TI by 2/16/99

Correlate Lab test cycle Kapton wear with field mileage Kapton wear.

TI and Central Lab by 2/29/99

What heat source(s) start event?

AVT EESE Chassis Electronics

Analysis of harness pig-tails

AVT EESE OPD by 2/18/99

Use thermocouple to record switch temperature during and after driving. AVT EESE OPD by 2/18/99

Recreate Event in Lab

AVT EESE Chassis Electronics

What does it take to start an event? by on-going

If a switch is contaminated can it start the event? by on-going

Switch with clean Brake fluid inside is being monitored for increase in leakage current.

If current is stopped does combustion stop?

Collect Field Samples

LVC - Safety

Collect Brake Pressure switches and speed control servos with harnesses attached. By 2/22/99

Miscellaneous

Can the switch act as a fuse?
Team by complete

No.
Could a fuse (e.g. 2 amp) be added in series between the stop lamp fuse and the brake pressure switch? Failure parameters would have to be known.

What are descriptions from AWS and CQIS?
LVC-Safety by 2/18/99

What are we seeing in returned Speed control modules (FRACAS)?
Visteon Speed Control by 2/17/99

Provide color photos of Econoline?
Texas Instruments by *complete*
There are no color photos.

Containment / Corrective Action Tasks

Competitive Vehicles

How is switch packaged?
Is it always Powered (HOT_ALL_TIME) ?
Are the contacts opened when pressure applied?
What is fuse limit?
What is being switched?
Is it a redundant switch?

AVT EESE Competitive Analysis **by** **2/24/99**

What does Speed control FMEA say about Brake Switch ?

Visteon Speed Control **by** *completed*

The Brake Pressure Switch (Deactivation Switch) coupled with the Stop Lamp switch are categorizes as "Automatic Deactivation". The FMEA lists Automatic Deactivation" as current design control for 66 different potential cause/ mechanical failures.

Brake Pressure Switch (Deactivator Switch) is one of the most important safety features.

When was non-Pressure actuated switched introduced?

AVT EESE Chassis Electronics **by** *completed*

95 Continental and T/Bird were first to use it.

Is the Circuit drive hi-side or low-side?

Visteon Speed Control **by** *completed*

Circuit is low side driven.

How does speed control use this switch?

Visteon Speed Control **by** *completed*

1. *Brake Pressure Switch provides electrical power to the speed control servo clutch circuit The clutch circuit needs to be energized for the servo motor to pull the cable.*

2. *Switch provides a redundant method of sensing brake application independent of the primary system deactivation mode: this is a SDS (SC-0003) requirement.*

- *Signal from the stop lamp switch is primary deactivation mode for brake application.*
- *<u>Under "hard" braking condition</u>: Brake Pressure Switch provides redundant brake signal to the speed control logic (similar to stop lamp switch signal) and disconnects power to the clutch circuit; causing the speed control servo pulley to immediately return to the idle position. Note: Under normal braking conditions, only the stop lamp switch signal cancels speed control operation.*

Do all Ford applications use switch between fuse and load?
Visteon Speed Control **by** *complete*

YES

Do all Ford applications have switch connected to HOT-ALL-TIMES?
AVT EESE OPD **by** **2/18/99**

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Visteon Speed Control **by** *completed*

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Why is this switch connected to HOT-ALL-TIMES?
Visteon Speed Control **by** *completed*

Because the SDS requires it to be connected to the same fuse as the stop lamp.

What is SDS requirement number?

Vistoon Speed Control **by** *completed*

SDS (SC-0068) states: The stop lamp switch and redundant deactivator switch must be on the same fused circuit.

Is it feasible to disconnect the switch as immediate containment?

Yes. The customer will not have use of the speed control.

Is it acceptable to Jumper out the switch as immediate containment?

Vistoon Speed Control **by** *completed*

NO... Would eliminate an important safety feature of the speed control system. The Brake Pressure Switch provides the redundant method for sensing brake application independent of the primary system deactivation mode. This is an SDS (SC-0005) requirement.

Elimination of this feature requires the concurrence of the OGC.

Other recommendations for immediate containment?

All **by** **on-going**

Add fuse between the stop lamp fuse and the brake pressure switch?

Recommendations for increased Life of switch.

TI **by** **3/5/99**

TI suggested looking at an Automotive ceramic diaphragm pressure transducer (not a switch) that is used for ABS.

Work Plan- Brake Pressure Switch

Root Cause Investigation-

Identify the combustibles?
AVT EESE Materials Engineering

Identify the contaminants in returned parts?
Central Lab analysis

Identify source of contaminants?
Central Lab analysis

Identify causes of brake fluid leakage?
Central Lab and Texas Instrument

Identify heat source(s) start event?
AVT EESE Chassis Electronics

Create Event in Lab
AVT EESE Chassis Electronics

Collect Field Samples
LVC - Safety

Root Cause Investigation Tasks

What are the combustibles?

AVT EESE Materials Engineering

Are the switch materials compatible with brake fluid?
by 2/18/99

Are the switch materials compatible with brake fluid in an electric field?
by 2/18/99

Are the switch materials compatible with brake fluid and contaminants?
by 2/18/99

Are the switch materials compatible with contaminated brake fluid in an electric field? by 2/18/99

Flash points for all materials? by *completed*

TI provided to Norm LaPointe

Get Dow assistance by 2/16/99

How can a fire start with the switch given the constraints:

Continuous Battery voltage applied between switch electrical components and the hydraulic connection, circuit fused at 15 amps, inductive load current of 0.5 amps switched when speed control is turned off, the switch cavity contains a black material containing at least copper, zinc, sulfur, and brake fluid (probably containing water), vehicle underhood temperatures.

By 2/22/99

What is the difference in the base materials that look different?

Texas Instruments by *complete*

Color of plastic base identifies calibration. Also, plastic material change from Cellanex 4300 to Noryl GTX430 in MY 1995 when P/N changed from F2VC to F2AC

What are the material call-outs for 1992 and 1993?
Texas Instruments by 2/15/99

Brake Pressure Switch
F2VC-9F834-AB
Material List for MY 92/93

Component Name	Material	Comment
Gasket	Elastomer Styrlene Propylene	JBL Compound # E-7104-70
Diaphragm	Kapton, Polyimide	Dupont 500 FN131L, 3 Diaphragms per switch
Base	PBT, Plastic	Grade Celanex 4300
Crimp Ring	Aluminum	Grade # 5052
Spacer	Kapton, Polyimide	Dupont #500FJ Friction Reducer on Disc
Rivet	Brass	CDA 360
Transfer Pin	Ceramic	Steatite , L-3 Grade
Environmental Seal	Silicone	JBL Compound # 87618
Converter	Cold Rolled Steel	Grade # 1008
Washer	Cold Rolled Steel, Zinc Plated	Grade # 1080
Cup	Cold Rolled Steel	Grade 1010
Spring Arm	Beryllium Copper	Grade # C17200
Movable Contact	Silver Plated Copper	Oxygen Free Cu, Fine Silver
Stationary Terminal	Brass + Silver Inlay	CDA 360
Movable Terminal	Brass	CDA 360
Disc	Stainless Steel	Grade 302
Retainer	Cold Rolled Steel, Zinc Plated	C10L10
Thread Cap	LDPE, Plastic	

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