

**EA02025**

**TEXAS INSTRUMENTS, INC.'S**

**09/10/03 LETTER TO ODI**

**REQUEST 9**

**BOX 12**

**PART A – 0**

**PART B**

**Pechonis, John**

---

**From:** McGuirk, Andy  
**Sent:** Monday, January 16, 1999 11:33 AM  
**To:** Pechonis, John  
**Subject:** FW: Lincoln Town Car Brake Switch

AUTOMOTIVE SEATBELTS AND CONTROLS QA MANAGER  
24 TORRENT ST N/S 23-05  
ATTLBORO, MA 02703  
TEL : (508) 236-3088  
FAX : (508) 236-3745  
PAGE: (508) 407-3700 EDN 804-2944

**From:** Sharpe, Robert  
**Sent:** Monday, January 18, 1999 9:09 AM  
**To:** Douglas, Charles; Baumann, Russ  
**Cc:** Rowland, Thomas; Baker, Gary; Dague, Bryan; McGuirk, Andy; Dodd, Bob  
**Subject:** Lincoln Town Car Brake Switch

(Ford) Fred Porter contacted me late last Friday (1/15) and had the following requests;

- 1) A copy of a TI 8D from a previous brake switch (thermal) issue on an Econoline application.
- 2) A copy of the TI report from the analysis performed at our technical labs (w/Ford) on 1/7/99.
- 3) Material Specification #s for all components of the brake switch.
- 4) Status of any TI internal testing to recreate a thermal event within the switch.

5) Ford has received several additional switches from Lincolns which experienced a thermal event. Fred has invited TI to participate in their analysis at Ford labs. This testing needs to start ASAP but Ford will wait for our response.

\*\* I informed Fred that above items 1) and 3) were submitted to Norm LaPointe on 1/7/99. He asked if we could provide additional copies to his attention.

In a follow up conversation with Fred, the following items were discussed;

- There is a total of 48 Lincoln Town Car's documented/related to this thermal issue. Fred stated that they are now searching their entire field warranty data base and have found similar issues on a few Crown Vic/Grande Marques applications. In addition, it appears that the Town Car incidents may not be isolated to the South. This search (on all Ford applications) is still in process.

- Ford legal completed a "sweep" on 1/8/99, collecting all internal Ford documents relating to this issue. A class action suit has been filed against Ford.

- Fred has not issued any internal summary report. As of today, Fred stated that he has not seen any evidence that would point to something "other than the brake switch" as the origin of the thermal issue. However, Fred stated that he has not personally reviewed all of the investigations his team is performing. He added that Bill Bramzick (sp ?), who is the Ford rep responsible for replying to NHTSA inquiry, has been investigating actual field incidents and noted that several vehicles' power distribution boxes (located near the brake switch) also appeared damaged from a thermal event. Fred is also wondering if possible overflow of brake fluid (onto the wire harness) could contribute to brake fluid entering into our switch thru the connector.

- NHTSA is investigating this issue independently. Based on their findings, NHTSA could demand a Ford response (recall ?) within 8 days of their response. Fred said NHTSA response could happen "anytime".

- Ford has pulled 12 switches from vehicles in Florida with mileage's ranging between 50K - 100K. These switches, which have not experienced any thermal degradation, will be analyzed with switches from thermal events, at Ford. See item 5) from the above requests from Fred Porter.

TI-NHTSA 016161

Charlie, please review this note with the team and inform me of timing in regards to the above 5 requests from Fred. I feel that it would be to our benefit to have a qualified TI representative at Ford during their upcoming analysis of brake switches from both thermal and non thermal events. Again, Ford would like to begin this analysis ASAP (next couple of days) but is waiting for our reply before beginning. Ford is on Holiday today in recognition of Martin Luther King.

wt:sgok

**Rob Sharpe**

TI  
Fax (416) 309-3739  
Tel (416) 309-3734  
rsharpe@ti.com

**Baumann, Russ**

**From:** Douglas, Charles

**Sent:** Monday, January 04, 1998 11:18 AM

**To:** Degus, Bryan; Gildea, Robert; Hopkins, Al; Frjia, Stephen

**Cc:** Baker, Gary; Baumann, Russ; Beringhauss, Steven; McGuirk, Andrew; Pechonia, John; Sharpe, Robert

**Subject:** Ford 77PS Town Car Visit

Team,

A quick msg on this subject. There is some question as to whether this visit will take place on Wednesday or Thursday. Rob is currently working to nail this down. Weather in Detroit may be keeping Ford personnel out today or resulting in them getting into the office late today.

Relative to framework for an agenda, we are going to keep it fairly simple. Before actually conducting the tear down analysis, we should present a process overview and take them up to the assembly line. Also, we should have both P and D lines available.

Bryan,

Any information we can pull together from the MY92 Econoline excursion will also be of use.

The meeting is going to be housed in 12-1B.

More information will be forthcoming hopefully by late afternoon.

Regards,

**Charlie**

**Charlie Douglas**  
**(508) 218-3657 (P)**  
**(508) 218-1898 (F)**  
**c-douglas2@ti.com**

**TI-NHTSA 016163**

**Douglas, Charlie**

5725# 36.642

**From:** Debus, Bryan  
**Sent:** Monday, January 04, 1999 4:15 PM  
**To:** Douglas, Charlie  
**Subject:** RE: Florida Information

Charlie,

This is what we have so far:

Melt temp of the plastic Noryl GTX 830 was not available. However, we know that they mold this material in the 540 - 580 F range.

Kapton does not melt nor burn. Technically it "Chars". We have not been able determine what temperature kapton chars at, but we know it is significantly above 800 F.

We are working on the melting temperature for the gasket. I'll pass that along to you a bit later.

Regards,  
Bry

**From:** Douglas, Charlie  
**Sent:** Monday, January 04, 1999 8:10 AM  
**To:** Debus, Bryan  
**CC:** Hopkins, Al; Sharpe, Robert; Saumann, Russ  
**Subject:** FW: Florida Information

Bryan,

Please forward answers to the questions that Fred is asking to my attention as soon as possible.

Thanks,

Charlie

**Charlie Douglas**  
**(808) 235-3887 (F)**  
**(808) 238-1888 (F)**  
**c-douglas@ti.com**

**From:** K. Potter [mailto:kpeter@voyager.net]  
**Sent:** Monday, January 04, 1999 12:18 AM  
**To:** c-douglas@ti.com  
**CC:** Fred Potter  
**Subject:** Florida Information

<<File: PIC00002.jpg.jpg>><<File: PIC00003.jpg.jpg>><<File: PIC00004.jpg.jpg>><<File: PIC00005.jpg.jpg>>  
Charlie,

Attached are four pictures that I took of the vehicle in Florida.

There was no plastic left on the part and the corner tor and seal were also gone. According to the analysis, the wires in the wire harness showed no signs of shorting.

Page 1

TI-NHTSA 016164

Questions that arise:

- 1) What is the melting point of kapton, the seal and the plastic used in the switch?
- 2) At what temperature will those three start to burn?

**Douglas, Charles**

---

**From:** Douglas, Charles  
**Sent:** Monday, January 04, 1999 5:23 PM  
**To:** 'Porter, Fred (Ford)'  
**Subject:** FW: Florida Information

Fred,

I was not able to get answers to all of your questions and will pass along what we know right now.

- While the exact melt temperature of the Noryl GTX 830 was not available, we do know that this material is molded in the 540 F - 580 F range.
- Kapton does not melt nor burn. Technically it "char". While we have not been able to determine the exact char temperature of the Kapton, we do know that it is well above 800 F.
- Our team is working on the information on the gasket --> we need to get this from our supplier.

I have a meeting with Bryan Dague and Al Hopkins first thing in the morning and will raise these questions again with them (Al is only returning from vacation on Tuesday). My concern is that we may be reliant on our suppliers for some of the information that you are requesting. What I will try to understand from Al and Bryan is if we have the capability to run tests to determine these temperatures ourselves (if this is the best way to generate the information).

Regards,

Charlie

**Charlie Douglas**  
**(808) 238-3587 (P)**  
**(808) 238-1588 (F)**  
**c-douglas2@ti.com**

**From:** K. Porter(BMTP:porter@vevegar.aet)  
**Sent:** Monday, January 04, 1999 12:18 AM  
**To:** c-douglas2@ti.com  
**Cc:** Fred Porter  
**Subject:** Florida Information



PORTER, Fred



PORTER, Fred



PORTER, Fred



PORTER, Fred

Charlie,

Attached are four pictures that I took of the vehicle in Florida.

There was no plastic left on the part and the connector and seal were also gone. According to the analysis, the wires in the wire harness showed no signs of shorting.

Questions that arose:

- 1) What is the melting point of kapton, the seal and the plastic used in the switch?
- 2) At what temperature will those three start to burn?





**Baker, Gary**

---

**From:** Douglas, Charles  
**Sent:** Tuesday, January 06, 1999 5:02 PM  
**To:** Dague, Bryan; Hopkins, AL; Proia, Stephen  
**Co:** Baumann, Russ; Baker, Gary; McGuirk, Andrew; Beringhouse, Steven  
**Subject:** FW: Ford 77PS Town Car Visit

fyi.

**Charlie**

Charlie Douglas  
(508) 234-3667 (P)  
(508) 234-1566 (F)  
c-douglas2@ti.com

---

**From:** Sharpe, Robert  
**Sent:** Tuesday, January 05, 1999 3:50 PM  
**To:** Douglas, Charles  
**Subject:** RE: Ford 77PS Town Car Visit

Hi Charlie,

Norman LaPointe (Ford AVT-Design Analyst) will be on NW Flight 1440, departing Detroit Metro @ 7:00AM on Thursday, 1/7/99. I informed him that you would meet him at the gate as he is departing the plane. In case you need it, his home phone# is (248) 928-8898. I also gave him your home phone# as (401) 274-3588. Norm is scheduled to return to Detroit from Providence on 1/7/99 (NW1441, 7:25pm departure). Casual attire (no tie) was confirmed.

Conversations with Fred Porter confirmed that he will not be participating in the 1/7/99 visit. Fred did state that John McInerney is planning on attending the 1/7/99 visit. John will be flying in Wednesday evening and will be staying at a Holiday Inn in "Marlborough" (?), Mass.. Fred has given your phone# to John who will be calling you for directions.

Norm is hoping to have test results from Ford Central Labs with him. These test results are from small samples removed from the actual device (to be hand carried by Norm) and would include;

- detection of brake fluid traces
- SEM results from 1) white residue (fire extinguisher ?)  
2) green residue (corrosion ?)  
3) switch contacts

In addition, Fred asked that we keep Mike Thomas (Hilti) informed of our findings as Hilti is somewhat involved as the Tier1 supplier. Fred has spoken directly with Mike and stated that TI has been very supportive/cooperative in helping Ford with this investigation. Mike's # is (248) 543-8520.

*Best Regards,*

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

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

From: Douglas, Charles  
Sent: Tuesday, January 03, 1990 1:23 PM  
To: Dague, Bryan; Hopkins, AL; Prois, Stephen  
Cc: Baker, Gary; Baumann, Russ; Beringhouse, Stewart; McGuirk, Andrew; Pechonis, John; Sharpe, Robert  
Subject: RE: Ford 77PB Town Car Visit

Team,

Here is the latest update on the visit. Visit will definitely take place on Thursday. When all is said and done, we only have one visitor from Ford. Fred Porter will not be coming in. Norm LaPointe will definitely be coming in and one additional visitor may also be coming.

Norm will be flying in Thursday morning and leaving on the 7 PM flight. Since Rob cannot make it, I will pick up Norm at the airport. The meeting will start at 9:30 and will be housed in 12-1B.

TI participants should be limited to those directly addressed. Also, at both Norm and Fred Porter's request, no presentations or line tours will take place to start the meeting. Beyond introductions, we will go right into the bar down analysis per the protocol that AT will publish later today.

At this point, unless you hear otherwise, assume casual dress for this visit.

Any questions / issues, please let me know.

Regards,

Charlie

Charlie Douglas  
(800) 234-3867 (P)  
(800) 238-1888 (F)  
c-douglas3@ti.com

From: Douglas, Charles  
Sent: Monday, January 04, 1990 2:16 PM  
To: Dague, Bryan; Glides, Robert; Hopkins, AL; Prois, Stephen; Douglas, Charles  
Cc: Baker, Gary; Baumann, Russ; Beringhouse, Stewart; McGuirk, Andy; Pechonis, John; Sharpe, Robert  
Subject: RE: Ford 77PB Town Car Visit

As an update, three different people at Ford have made three different sets of reservations for coming out here - one flying in Tuesday evening for Wednesday visit, one flying in Wednesday evening for Thursday visit, and one flying in Thursday morning for Thursday visit. The Ford folks are currently working to coordinate their schedules so we may not know until tomorrow morning whether the visit is Wednesday or Thursday though my best guess at this point would be a Thursday visit.

Regards,

Charlie

Charlie Douglas  
(800) 234-3867 (P)  
(800) 238-1888 (F)  
c-douglas2@ti.com

From: Douglas, Charles  
Sent: Monday, January 04, 1990 12:17 PM  
To: Dague, Bryan; Glides, Robert; Hopkins, AL; Prois, Stephen

Cc: Baker, Gary; Baumann, Russ; Beringhaus, Steven; McGuirk, Andy; Pachonis, John; Sharps, Robert  
Subject: Ford 77PS Town Car Visit

Team,

A quick msg on this subject. There is some question as to whether this visit will take place on Wednesday  
Thursday. Rob is currently working to nail this down. Weather in Detroit may be keeping Ford personnel  
today or resulting in them getting into the office late today.

Relative to framework for an agenda, we are going to keep it fairly simple. Before actually conducting the  
tear down analysis, we should present a process overview and take them up to the assembly line. Also, we  
should have both P and D free's available.

Bryan,

Any information we can pull together from the MY92 Econoline excursion will also be of use.

The meeting is going to be housed in 12-1B.

More information will be forthcoming hopefully by late afternoon.

Regards,

Charlie

Charlie Douglas  
(608) 238-3857 (P)  
(608) 238-1888 (F)  
c-douglas2@fi.com

**Dague, Bryan**

---

**From:** Douglas, Charles  
**Sent:** Tuesday, January 05, 1999 4:02 PM  
**To:** Dague, Bryan; Hopkins, AL; Proba, Stephen  
**Cc:** Baumann, Russ; Baker, Gary; McGuirk, Andrew; Beringhouse, Steven  
**Subject:** FW: Ford 77PS Town Car Visit

tyl,

Charlie

**Charlie Douglas**  
(508) 238-3857 (P)  
(508) 238-1598 (F)  
c-douglas2@t.com

---

**From:** Sharpe, Robert  
**Sent:** Tuesday, January 05, 1999 3:59 PM  
**To:** Douglas, Charles  
**Subject:** RE: Ford 77PS Town Car Visit

Hi Charlie,

Norman LaPointe (Ford AVT-Design Analyst) will be on NW Flight 1440, departing Detroit Metro @ 7:00AM on Thursday, 1/7/99. I informed him that you would meet him at the gate as he is departing the plane. In case you need it, his home phone# is (248) 928-9896. I also gave him your home phone# as (401) 274-3588. Norm is scheduled to return to Detroit from Providence on 1/7/99 (NW1441, 7:25pm departure). Casual attire (no ties) was confirmed.

Conversations with Fred Porter confirmed that he will not be participating in the 1/7/99 visit. Fred did state that John McInerney is planning on attending the 1/7/99 visit. John will be flying in Wednesday evening and will be staying at a Holiday Inn in "Marlborough" (?), Mass.. Fred has given your phone# to John who will be calling you for directions.

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2) green residue (corrosion ?)  
3) switch contacts

In addition, Fred asked that we keep Mike Thomas (Hilite) informed of our findings as Hilite is somewhat involved as the Tier1 supplier. Fred has spoken directly with Mike and stated that TI has been very supportive/cooperative in helping Ford with this investigation. Mike's # is (248) 543-6520.

Best Regards,

**Rob Sharpe**

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

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

**From:** Douglas, Charles  
**Sent:** Tuesday, January 06, 1998 1:26 PM  
**To:** Dague, Bryan; Hopkins, AL; Prola, Stephen  
**Cc:** Baker, Gary; Baumann, Russ; Beringhaus, Steven; McGuirk, Andrew; Pechonis, John; Sharpe, Robert  
**Subject:** RE: Ford 77PS Town Car Visit

Team,

Here is the latest update on the visit. Visit will definitely take place on Thursday. When all is said and done, we may only have one visitor from Ford. Fred Porter will not be coming in. Norm LaPointe will definitely be coming in and one additional visitor may also be coming.

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Any questions / issues, please let me know.

Regards,

Charlie

**Charlie Douglas**  
**(508) 238-3857 (P)**  
**(508) 238-1698 (F)**  
**c-douglas2@ti.com**

-----  
**From:** Douglas, Charles  
**Sent:** Monday, January 04, 1998 2:18 PM  
**To:** Dague, Bryan; Gidea, Robert; Hopkins, AL; Prola, Stephen; Douglas, Charles  
**Cc:** Baker, Gary; Baumann, Russ; Beringhaus, Steven; McGuirk, Andy; Pechonis, John; Sharpe, Robert  
**Subject:** RE: Ford 77PS Town Car Visit

As an update, three different people at Ford have made three different sets of reservations for coming out here -- > one flying in Tuesday evening for Wednesday visit, one flying in Wednesday evening for Thursday visit, and one flying in Thursday morning for Thursday visit. The Ford folks are currently working to coordinate their schedules so we may not know until tomorrow morning whether the visit is Wednesday or Thursday though my best guess at this point would be a Thursday visit.

Regards,

Charlie

**Charlie Douglas**  
**(508) 238-3857 (P)**  
**(508) 238-1698 (F)**  
**c-douglas2@ti.com**

1400

From: Douglas, Charles  
Sent: Monday, January 04, 2009 11:21 AM  
To: ~~Charles, Doug; Gilles, Robert; Hopkins, AL; Proia, Stephen~~  
Cc: Baker, Gary; Baumann, Russ; Beringhause, Steven; McGuirk, Andy; Pookonia, John; Sharpe, Robert  
Subject: Ford 77PS Town Car Visit

2211 ST 4 N. 1774 J/25

Team,

A quick msg on this subject. There is some question as to whether this visit will take place on Wednesday or Thursday. Rob is currently working to nail this down. Weather in Detroit may be keeping Ford personnel out today or resulting in them getting into the office late today.

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Regards,

Charlie

Charlie Douglas  
(508) 236-3667 (P)  
(508) 236-1506 (F)  
c-douglas2@tl.com

IN NHTSA 016173

**Douglas, Charles**

**From:** Sharpe, Robert  
**Sent:** Tuesday, January 05, 1999 3:59 PM  
**To:** Douglas, Charles  
**Subject:** RE: Ford 77PS Town Car Visit

Hi Charlie,

5:45 AM A... 201

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- SEM results from 1) white residue (fire extinguisher ?)  
2) green residue (corrosion ?)  
3) switch contacts

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Best Regards,

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

---Original Message---

**From:** Douglas, Charles  
**Sent:** Tuesday, January 05, 1999 1:25 PM  
**To:** Deque, Bryan; Hopkins, AL; Proia, Stephen  
**Cc:** Baker, Gary; Baumann, Russ; Baringhouse, Steven; McG...k, Andrew; Pechonis, John; Sharpe, Robert  
**Subject:** RE: Ford 77PS Town Car Visit

Team,

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Norm will be flying in Thursday morning and leaving on the 7 PM flight. Since Rob cannot make it, I will pick up Norm at the airport. The meeting will start at 9:30 and will be held in 1-1B.

TI participants should be limited to those directly addressed. As requested, at both Norm and Fred Porter's request, no

**Graveline, Dora**

---

**From:** McGuirk, Andy  
**Sent:** Tuesday, January 16, 1999 5:26 PM  
**To:** Sullivan, Martha; Rowland, Thomas; Baumann, Russ  
**Cc:** Baker, Gary; Douglas, Charise; Baringhouse, Steven; Pechonis, John; Hopkins, AL  
**Subject:** Ford Lincoln Town Car "thermal events" updates

attorney - client privileged communication:

The core Pressure Switch team continues to support Ford's requests for support and information in the "thermal event" investigation being exercised on the '92-'93 Town Car (some 225,000 vehicles). AS&C will be providing technical support to Ford on Jan 25th to aid in the analysis of some 12 'non-thermal event' switches Ford removed from vehicles in the south where the most history has been generated as well as some 2 switches from 'thermal event' vehicles. Recall this is the 77PS pressure switch family of products applied to Ford's Cruise Control deactivation circuit in the brake system of many car and truck platforms from MY '92 on.

On Jan 7th, we hosted Ford in an on-site analysis of a "thermal event" switch which was initially reported as having inconclusive analysis results.

additional information has been delivered, including:

- a total of 48 Lincoln Town Car 'thermal events' are now recognized by Ford
- Ford is reviewing the Crown Victoria/Grande Marquis history (similar application and location) finding 'a few' 'similar issues'
- Ford legal completed a 'sweep' of all Ford documents on 1/8/99
- a class action suit has been filed against Ford
- NHTSA is investigating the issue independently... Ford's Fred Porter advises NHTSA's response could happen "anytime"
- Ford has not issued an internal summary report from their 1/7/99 Attleboro analysis of a "thermal event" switch performed jointly with AS&C
- Ford's Fred Porter stated to TT's Rob Sharpe that "he has not seen any evidence that would point to something 'other than the brake switch' as the origin of the thermal issue" as of Jan 15th PM.
- Ford's Fred Porter also has theorized to TT's Rob Sharpe that "overflow of brake fluid (onto the wire harness) could contribute..."
- Ford's Bill Bremzick (sp?) has noted several vehicle's power distribution boxes 'also appeared damaged in the thermal event'

Our team continues to move forward understanding the Ford issue and translating same into high priority local action plans to support the process.

I will keep you updated.

regards,

Andy

AUTOMOTIVE BRONCO AND CONTROL CAR GROUP  
14 FOREST ST N/E 21-54  
ATTLEBORO, MA 01723  
TEL : (603) 238-3888  
FAX : (603) 238-3748  
PAGE: (603) 457-1700 FAX 866-2844



**Beringhaus, Steven**

---

**From:** Douglas, Charles  
**Sent:** Wednesday, February 03, 1999 11:52 AM  
**To:** Baker, Gary; Baumann, Russ; Beringhaus, Steven; McGuirk, Andy; Rowland, Thomas  
**Subject:** FW: (U) Part Number Information

Team,

Attached is msg from Fred Porter referred to in my voice mail.

Tom R.,

For some reason, system would not let me forward voice mail to your box.

Regards,

Charlie

Charlie Douglas  
(808) 238-3687 (P)  
(808) 238-1588 (F)  
c-douglas2@ti.com

---

**From:** Frederick J. Porter[FJTP:fpporter@ford.com]  
**Sent:** Wednesday, February 03, 1999 10:22 AM  
**To:** c-douglas2@ti.com  
**Subject:** (U) Part Number Information

to: c-douglas2@ti.com

For my phone message:

Please identify the difference between these parts including specifications, materials and manufacturing process. Also include the change history on these components.

F2AC-9F924-AA  
F2VC-9F924-AA  
F2VC-9F924-AB  
F2VC-9F924-BA  
F2VC-9F924-BB  
F3DC-9F924-AA  
F3TA-9F924-AA  
F3TA-9F924-BA  
F3TA-9F924-CA  
F58A-9F924-AA  
F58A-9F924-AB  
F58B-9F924-AA  
F58B-9F924-AB  
F5LC-9F924-AA  
F5SB-9F924-AA  
F62B-9F924-AA  
F62B-9F924-AB  
F8AB-9F924-AA  
F8OB-9F924-AA  
XF1T-9F924-AA  
XF1T-9F924-AB  
XF1T-9F924-AC  
XR33-9F924-AA

*Don't know latest part number? why?*

KR83-9F924-AA

I am also interested in any ideas you would have to fuse the switch in circuit.

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

Page 2

TI-NHTSA 016176

**Baumann, Russ**  
**From:** Douglas, Charles  
**Sent:** Wednesday, February 03, 1999 10:52 AM  
**To:** Baker, Gary; Baumann, Russ; Beringhouse, Steven; McGuirk, Andy; Rowland, Thomas  
**Subject:** FW: (U) Part Number Information

Team,

Attached is msg from Fred Porter referred to in my voice mail.

Tom R.,

For some reason, system would not let me forward voice mail to your box.

Regards,

Charlie

Charlie Douglas  
(800) 238-3867 (P)  
(800) 238-1888 (F)  
c-douglas2@ti.com

---

**From:** Frederick J. Porter[SMTF:iporter@ford.com]  
**Sent:** Wednesday, February 03, 1999 10:22 AM  
**To:** c-douglas2@ti.com  
**Subject:** (U) Part Number Information

to: c-douglas2@ti.com

Per my phone message:

Please identify the difference between these parts including specifications, materials and manufacturing process. Also include the change history on these components.

F2AC-9F924-AA  
F2VC-9F924-AA  
F2VC-9F924-AB  
F2VC-9F924-BA  
F2VC-9F924-BB  
F3DC-9F924-AA  
F3TA-9F924-AA  
F3TA-9F924-BA  
F3TA-9F924-CA  
F58A-9F924-AA  
F58A-9F924-AB  
F50B-9F924-AA  
F6DB-9F924-AA  
F6DB-9F924-AB  
F6LC-9F924-AA  
F6EB-9F924-AA  
F6ZB-9F924-AA

TI-NHTSA 018179

FC2B-9F924-AB  
FSAB-9F924-AA  
FSDH-9F924-AA  
XF1T-9F924-AA  
XF1T-9F924-AB  
XF1T-9F924-AC  
XR3J-9F924-AA  
XR8J-9F924-AA

I am also interested in any ideas you would have to fuse the switch in circuit.

Thanks.

Regards,

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

TI-NHTSA 016180

**Baker, Gary**

---

**From:** McGuirk, Andy  
**Sent:** Thursday, February 04, 1999 1:45 PM  
**To:** Sullivan, Martha; Baumann, Russ  
**Cc:** Douglas, Charles; Bernhause, Steven; Baker, Gary  
**Subject:** Ford Lincoln Cruise control

attorney - client privileged communication

We have spent a little time estimating what we think the typical Ford Dealer cruise control pressure switch replacement labor time might be for the platform of discussion.

A check through our contacts at Tesco Mercury dealership indicates the 'computer' says 1.5 hours or \$90 plus switch (service charges \$17.44 for a pressure switch). We thought this was very high given that the switch is so easy to access on the proportional valve in the engine compartment. We are theorizing that the labor is so high because of a need to evacuate and refill the system with brake fluid and possibly bleed the system.

We had brain-stormed a replacement scenario prior to connecting with Tesco of a 'swap out strategy' whereby one would pre-fill the switch 'port' cavity of the switch with fluid to eliminate air and insert into the proportional valve 'loosely' such that one could 'bleed' out the micro-amount of trapped air (via leakage around port threads). If this were the replacement process and it worked then we would be talking about ten minutes which probably charges out at 1/2 hour service cycle.

summary:  
223 k cars in '92 and '93 Town Car platform.... attrition at 95% results in 212 k vehicles on the road

212 k at \$93 each ( 90 labor and 3 cost of switch) results in \$ 19,716 K per the 'computer'

(if the speedy swap is viable, it would be 212 K at \$33 (30 labor and 3 switch) resulting in \$6,996 K)

this dialogue led us (Charlie Douglas and Andy McGuirk) to a number of vehicle specific questions.... the '92 model had 6 (six !) service bulletins published for brakes. (one for ABS 'coming on' during just rough road driving, one for ABS 'staying on' when brake pedal fails to return to normal up position !)  
Did each bulletin result in vehicle brake service and evacuation ? is the fluid in the southern states water contaminated because of humidity ? have the thermal event vehicles been serviced multiple times for brakes ? is there a connection here that creates the environment for a thermal event ? is ABS a common element? We'll need to generate some questions and answers here.

2

ALTERNATIVE DISPUTE RESOLUTION AND CONSUMER OMBUDSMAN  
14 FRONT ST #222 22-08  
ATTLEBORO, MA 01703  
TEL : (508) 236-1080  
FAX : (508) 234-1749  
WWW: (800) 487-3700 FAX 801-2044

**Morris, Irene**

---

**From:** Beringhouse, Steven  
**Sent:** Thursday, February 04, 1999 3:33 PM  
**To:** Baumann, Russ  
**Cc:** Baker, Gary; Rowland, Thomas; Douglas, Charles; Degue, Bryan; Sullivan, Martha; McGuirk, Andy  
**Subject:** RE: Ford Lincoln Cruise control

attorney - client privileged information.

I spoke with Fred Porter this afternoon. He also told me he is concerned that NHTSA will issue a finding. He said another fire occurred yesterday and this whole thing was heating up.

He feels one solution is to disconnect the switch, he believes that the electricity is involved in the ignition. He believes the switch is at the center of the fire. He is currently running an experiment where he has taken a switch, drilled a hole in the housing and filled it with brake fluid. He has applied 24V to the switch for two days and nothing has happened. The switch is only drawing 0.5ms. He is waiting to see if the current draw increases over time. We discussed that maybe the current driver is occurring elsewhere. He stated that the clutch coil limits the current flow and there is a FET to ground.

We discussed the possibility of adding a fuse to the wire harness but he does not know what current threshold to set the fuse at. We discussed the use of a thermal protection device in the connector and he thought that it might be a possible idea but he is unsure how to do it.

They found copper and zinc on the sensor cup for both leakers and the two very burned switches from fires. He feels that corrosion of the contact arm is a common thread in leakers and fires.

Fred believes there will be a recall, he hopes that it can be limited to the F2VC part (town car, continental, etc) and not across the fleet. They are looking at differences in pressure, mounting location etc. as well as warranty reports that may validate this approach.

Fred also requested that TI sends an engineer to Ford for a few weeks to help them with the investigation. The engineer would need to have switch design and process knowledge as well as be a contact to the rest of the TI organization. I told him I would get back to him on this.

Steve

**Epstein, Sally**

**From:** McGuirk, Andy [a-mcguirk@aemil.mc.li.com]  
**Sent:** Thursday, February 04, 1999 4:48 PM  
**To:** Sullivan, Martha; Baumann, Russ; Douglas, Charles  
**Cc:** Beringhaus, Steven; Baker, Gary; Rowland, Thomas; Pechonis, John  
**Subject:** Ford Lincoln Cruise control

ATTORNEY CLIENT PRIVILEGED INFORMATION

LETS ALL AGREE TO A SHORT ACTION LIST OF THE THINGS WE ARE DELIVERING TO FORD TODAY....FRIDAY FEB 5TH

- 1) DIFFERENCES BETWEEN THE FORD P/S ON PORTER LIST (ACTIVE PRODUCTION P/N ONLY)
  - 1A) Identify the difference between these parts specifications  
.....DAGUE/BERINGHAUSE,
  - 1B) Please identify the difference between these parts materials  
.....DAGUE/BERINGHAUSE
  - 1C) Please identify the difference between these parts manufacturing process.....PECHONIS
- 2) CHANGES ON THE FORD P/M ON THE PORTER LIST (ACTIVE PRODUCTION P/N ONLY)
  - 2A) Also include the change history on these components.(SREA HISTORY)..... MCGUIRK
- 3) OVERVIEW OF PROCESS FLOW (requested an assembly process overview).....DOUGLAS

REGARDS

A

, AUTOMOTIVE SENSORS AND CONTROLS QRA MANGER  
34 FOREST ST N/S 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3080  
FAX : (508) 236-3743  
PAGE: (800) 467-3700 PIN 604-2044

-----  
**From:** Douglas, Charles  
**Sent:** Thursday, February 04, 1999 1:56 PM  
**To:** Sullivan, Martha; Baumann, Russ; McGuirk, Andy  
**Cc:** Beringhaus, Steven; Baker, Gary; Rowland, Thomas  
**Subject:** RE: Ford Lincoln Cruise control

attorney - client privileged information.

As additional and new information. Fred Porter just phoned in and this whole situation appears to be escalating. Ford is very concerned that NHTSA is going to issue a final ruling (with or without Ford input) and that the ruling could literally come down within the next few days. I did not attempt to get into specifics as to implications from a NHTSA ruling.

Rob Sharpe has been called in to attend an emergency meeting at Ford at 2:00 pm today. Only questions Rob will be prepared to answer center around capacity on the 77PS assembly line. Meeting was called by Fred Porter's group.

TI-NHTSA 016183

Fred had several technical requests all of which were deferred to Steve. Fred also requested an assembly process overview. If there are any issues with honoring this request, please let me know asap as I have committed to a response of no later than Friday AM.

Regards,

Charlie

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

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER  
34 FOREST ST N/S 23-05  
ATTLEBORO, MA 02703  
TEL : (508) 236-3090  
FAX : (508) 236-3745  
PAGE: (800) 467-3700 PIN 604-2044



**Epstein, Sally**

---

**From:** Beringhouse, Steven [sberinghouse@email.mc.llcom]  
**Sent:** Monday, February 08, 1999 6:20 AM  
**To:** McGuirk, Andy; Baumann, Russ  
**Subject:** Ford Town Car



**Attorney - Client Privileged Information**

I spoke with Fred Porter late Friday and discussed adding a relay into the circuit. He thought it was a good idea. I told him I would fax a schematic Monday (Gary Baker's from the meeting). Here is my proposed cover letter that I would also fax. Please give me any comments etc...

<<FordTCI>>

Steve

Steven Beringhause  
Design Engineering Manager  
Texas Instruments Incorporated  
Attleboro, MA 02703

February 8, 1999

Fred,

As we discussed over the phone Friday, per your request that we look at the possibilities of adding a fuse in line with the pressure switch, we think a more appropriate solution might be to use a relay circuit (schematic attached). Our understanding of the application is that the brake pressure switch is a failsafe component to shut off the cruise control if the standard brake light switch fails and the driver depresses the brake pedal. The brake switch therefore only needs to be powered when the cruise control is on. By placing a normally open relay in the circuit and only closing the relay when the cruise control is activated, the switch will only be powered when it needs to be. This eliminates the energy source from the entire switch circuit for 99% of the time (including when the car is off). We feel this is a better solution than an in line fuse because the relay prevents the high current situation from happening rather than reacting once it does occur. If you have any questions, please give me a call at 508-236-3378.

Regards,  
Steven Beringhause

TI-NHTSA 016186

**Epstein, Sally**

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**From:** McGuirk, Andy [a-mcguirk@email.mc.ti.com]  
**Sent:** Monday, February 08, 1999 7:05 AM  
**To:** Basmann, Russ; Beringhaus, Steven  
**Cc:** Dague, Bryan; Pechonis, John; Rowland, Thomas; Sullivan, Martha; Baker, Gary; Rahman, Aziz; Sharpe, Robert  
**Subject:** Friday 'eve' Fred Porter telecon 2/5/99

attorney - client privileged communication

I was able to speak with Fred Porter Friday afternoon. We brought Rob Sharpe into a conference call and delivered several points:

- Aziz Rahman was coming into the team to join Fred 10AM Tuesday as a TI Design Engineering resource... "great" was the reaction.
- Andy McGuirk was coming into the team as a mechanism to augment our desire and actions for prompt and complete communication... he has my 24 hour nationwide pager and home tel number should he feel a need to elevate any issue through TI he was told to feel free to contact me and allow a 20 minute response. I could feel Fred trying to explain some of the Ford meeting implied feedback about our support and just re-stated our commitment to be fully supportive of the process.
- Rob helped us lead into a discussion that allowed us to re-enforce that this P/S issue was receiving highest priority inside TI and we were committed to resolving issues/questions/analysis around the application... I spoke of executive and leadership level involvement.
- Fred was very difficult to connect with... he stated this was the worst week he could recall... his voice mailbox had become overflowing on Friday. he also stated that our deliverables for Friday could be delivered Monday and again Tuesday during Aziz's first day. I covered some of these on the phone to let him know we had done our homework.
- We arranged to have Steve Beringhaus have a conversation Friday afternoon... but Fred implied he was too tired to focus...

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

TI-NHTSA 016187

Post-Net Fax Note	7871	Date	1/6/88	Page	2
To	Norman LaPointe	From	Bob Stoen		
Co./Dept	Ford AUT	Co.	Texas Instruments		
Phone #	(214) 594-2686	Phone #	(714) 305-5729		
Fax #	(214) 377-8256	Fax #			

**Sharpe, Robert**

---

**From:** Douglas, Charles  
**Sent:** Wednesday, January 06, 1999 8:28 AM  
**To:** Porter, Fred (Ford); Sharpe, Robert  
**Subject:** FW: 99-003: PROPOSED PROTOCOL FOR DISASSEMBLY AND ANALYSIS OF SWITCH FROM 77PS FROM LINCOLN TOWN CAR

Fred.

Attached is the protocol for disassembly and analysis we plan to follow tomorrow. Please feel free to offer your thoughts relative to any additions or modifications your team may desire.

Rob.

Please make sure Norm gets a copy of this at your earliest convenience.

Regards.

Charlie

Charlie Douglas  
(800) 238-3837 (P)  
(800) 238-1886 (F)  
c-douglas2@td.com

---

**From:** Hopkins, AL  
**Sent:** Tuesday, January 06, 1999 7:37 PM  
**To:** Dague, Bryan; Prois, Stephen; Douglas, Charles  
**CC:** Baumann, Russ; Baker, Gary; McGuirk, Andy; Beringhouse, Steven; Andra, Amy; Skozick, Allen; Pavesi, Joe  
**Subject:** 99-003: PROPOSED PROTOCOL FOR DISASSEMBLY AND ANALYSIS OF SWITCH FROM 77PS FROM LINCOLN TOWN CAR

Here's a rough pass, what do you guys think?

**PROPOSED PROTOCOL FOR DISASSEMBLY AND ANALYSIS OF SWITCH FROM  
77PS FROM LINCOLN TOWN CAR**

- Review Ford's Analysis data that they are bringing in.
- Examine threads and determine if it is OK to just chase the threads to get a good seal or should we remove material for analysis.
- Pressure Leak Test the device (15 minute static-hold, air-pressurized test).
- Decide if we should remove any material or try any other analysis before we start disassembling the device.
- Do a practice dump using the below procedure on a deliberately fractured part (to mimic the condition that the returned device will be in) before performing it on the real sample. Bryan, you and I could do this now.
- 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 cutting of crimp ring.
- Place a piece of tape over the area to be cut.
- Cut crimp ring using jeweler's saw or Dremel cutoff wheel in one of the two areas indicated on optical photo.
- Cut corners of ring at 180 degree orientation
- Unfold crimp ring

- Optically examine revealed surfaces. Take optical photographs (Digital camera with macro lens plus instant microphotography) and document observations where appropriate. Examine the following areas
  - Inside surface of crimp ring.
  - Seal area and underside of base
  - Top of cap
- Start SEM-EDX (Scanning Electron Microscope with Energy Dispersive Analysis of X-rays) analysis on the inside of the ring and on various surfaces of the plastic base.
- Reprotect the top surface and remove the cap. Bryan had originally suggested just using an end mill to remove the cap. I wouldn't, however, go all the way through with the end mill. I would leave some material behind as a shield. I would suggest then bending the cap off.
- Optically document all revealed surfaces starting with cap.
- Meanwhile, start SEM-EDX analysis on top side of cap. Particularly focus in on the edges of the ceramic pin guide and on the indented ring that lines up with interior wall of the switch cavity. Particularly look for evidence of corrosion or arcing.
- Decide if we should try to flake off any of the overlaying debris to try to examine the underlying metal surface.
- Proceed to perform SEM-EDX analysis on other component surfaces revealed by removal of cap.
- Non-destructively probe inside of the grommet to determine its resilience which will give us an indication of the temperature that it saw. Another indication might be the depth of the indentations left by the grommet seal rings in the wire.
- Decide if it makes sense to further examine the mating connector or grommet seal.

Regards,

Al



Central Laboratory  
15000 Century Drive  
Dearborn, MI 48120-1207  
FAX (313) 322-1514

Report 9804105  
Preliminary

January 6, 1999

**To:** G. Stevens/N. LaPointe (313) 32-36888 07224 FAX

**From:** S. LaRouche (313) 84-64876

**Subject:** Speed Control Cut-Off Switch  
Part Number: FZVY-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<sup>1</sup>
- Greenish deposit visible on switch side of cup<sup>2</sup>
- 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.

<sup>1</sup> Small scraping from side of contact.

<sup>2</sup> Small scraping from deposit.



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

Report 9804105  
Preliminary

January 6, 1999

To: G. Stevens/N. LaPointe/S. LaRouche (313) 32-36686 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 base were received on January 4, 1999, from S. LaRouche.

Object: Determine if any fluid is present on the switch cup in metallic-exposed area and compare the switch base material to the unused material.

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 suspected. [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 base and metallic interference during the event].

**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.

Contributor: V. Cooper

Concur:

Mary Haga  
Organic Section

By:

Gayle D. Gullen (GGULLEN)  
Product Materials Engineer



TEXAS INSTRUMENTS INC. | MATERIALS & CONTROLS GROUP | SITE

PARTS LIST | PROJECT | PART NUMBER: 77PSL2-1 | REV LTR: L CLS: 650  
 EXPLOSION | NUM: 3423 | DWG PFX: NUM:77PSL2-1 | ECN INC.DT: 98/02/24

TITLE: PRESSURE SWITCH (CUST P/N F2VC-9F924-AB)

LVICNT	QTY/UM	BITM	PART/DRAWING NUMBER	RV	NOMENCLATURE/PARM DATA
01	1	REF	36952-1		FINAL ASSEMBLY
			36952-1	A	
01	2	1	27759-10		BASE ASSEMBLY
			27759SH1	L	
02	3	1	46515-2		BASE (BROWN)
			46515	N	
02	4	1	36888-1		STATIONARY TERMINAL
			36888	D	
02	5	1	36897-2		MOVABLE TERMINAL ASM
			36897SH1	H	
03	6	1	36887-1		MOVABLE TERMINAL
			36887	D	
03	7	1	74916-1		RIVET
			74916	G	
03	8	1	36889-1		SPRING ARM
			36889	B	
04	9	AR	27716-1		SFR MAT'L STR SPEC(.216 LBS/K)
			27716SH1	D	
03	10	1	28744-1		MOVABLE CONTACT
			28744	D	
01	11	1	27293-13		SENSOR ASSEMBLY
			27293SH2	W	
02	12	1	36900-1		MOD SAE J512 HEXPORT
			36900	H	
02	13	1	74353-1		GASKET
			74353	H	
02	14	1	27713-1		CUP
			27713	F	
02	15	3	74176-1		SEAL
			74176	C	
03	16	AR	27225-1		KAPTON STRIP SPEC (.175 LBS/K)
			27225	AB	
02	17	1	27639-1		WASHER
			27639	F	
02	18	1	27406-1		CONVERTER
			27406	F	
02	19	1	73958-2		SPACER
			73958	J	
02	20	OR	73958-3		SPACER
			73958	J	
03	21	AR	74224-1		KAPTON TAPE (.100 LBS/K)
			74224	F	
02	22	1	36656-27		3/4" FORMED DISC
			36656SH1	BM	
02	23	OR	36656-28		3/4" FORMED DISC
			36656SH1	BM	
01	24	1	74797-1		CRIMP RING
			74797	B	
01	25	1	74078-143		TRANSFER PIN
			74078	G	
01	26	1	74247-4		ENVIRONMENTAL SEAL
			74247	L	
01	27	1	74888-1		THREAD CAP
			74888	A	
01	28	AR	27318-1		CARTON ASM.
			27318	D	
02	29	1	74219-1		CARTON

TI-NHTSA 016193

02	30	3	3	74219	D
				74218-1	ROW SEPARATOR
				74218	D
02	31	2	4	27317-1	DEVICE SEPARATOR
				27317	D
02	32	AR	5	13608-4	CLOSURE TAPE
				13608-4	

! NOTES, REV. DATA, DISTRIBUTION, OPERATING CHARACTERISTICS, SPECIAL REQUIREMENTS !

REV DESC: CHG 74408-1 TO 28744-1 | CCM APPROVAL DATE: 98/02/24

DFTG WORK GROUP: PRECISION CONTROLS | ECM ORIGINATOR: DI T HA

NOTES:

- 1 - ACTUATION PRESSURE ----- 90-160 PSIG
- 2 - RELEASE PRESSURE ----- 20 PSIG MIN.
- 3 - DIFFERENTIAL PRESSURE ----- 55 PSI MAX.
- 4 - DEVICE TO BE MARKED PER CODING SPECIFICSTION 75871-3

DETAILED REVISION DESCRIPTION:

99 CR M39209, 28744-1 CONTACT (MOV) WAS 74408-1  
 STOCK DISPOSITION  
 FINISHED DEVICES - USE  
 PARTS & SUB ASMS - USE SUBS, HOLD PARTS

TEXAS INSTRUMENTS INC. : MATERIALS & CONTROLS GROUP : SITE  
 PARTS LIST : PROJECT : PART NUMBER: 77PSL3-1 : REV LTR: H CLS: 650  
 EXPLOSION : NOM: 3423 : DWG PFX: NUM:77PSL3-1 : ECN INC.DT: 98/02/24

TITLE: PRESSURE SWITCH (CUST P/N F2AC-9P924-AA)

LVICNT	QTY/UM	BITM	PART/DRAWING NUMBER	RV	NOMENCLATURE/PARM DATA
01	1	REF	36952-1		FINAL ASSEMBLY
			36952-1	A	
01	2	1	27759-9		BASE ASSEMBLY
			27759SH1	L	
02	3	1	46515-3		BASE (NATURAL)
			46515	N	
02	4	1	36888-1		STATIONARY TERMINAL
			36888	D	
02	5	1	36897-2		MOVABLE TERMINAL ASM
			36897SH1	H	
03	6	1	36887-1		MOVABLE TERMINAL
			36887	D	
03	7	1	74916-1		RIVET
			74916	G	
03	8	1	36889-1		SPRING ARM
			36889	B	
04	9	AR	27716-1		SFR MAT'L STR SPEC(.215 LBS/K)
			27716SH1	D	
03	10	1	28744-1		MOVABLE CONTACT
			28744	D	
01	11	1	27293-25		SENSOR ASSEMBLY
			27293SH3	AD	
02	12	1	36900-1		MOD SAE J512 HEXPORT
			36900	H	
02	13	1	74353-1		GASKET
			74353	H	
02	14	1	27713-1		CUP
			27713	F	
02	15	3	74176-1		SEAL
			74176	C	
03	16	AR	27225-1		KAPTON STRIP SPEC (.175 LBS/K)
			27225	AB	
02	17	1	27639-1		WASHER
			27639	F	
02	18	1	27406-1		CONVERTER
			27406	F	
02	19	1	73958-2		SPACER
			73958	J	
02	20	OR	73958-3		SPACER
			73958	J	
03	21	AR	74224-1		KAPTON TAPE (.100 LBS/K)
			74224	F	
02	22	1	36656-35		3/4" FORMED DISC
			36656SH1	BM	
02	23	OR	36656-41		3/4" FORMED DISC
			36656SH1	BM	
01	24	1	74797-1		CRIMP RING
			74797	B	
01	25	1	74078-SEL		TRANSFER PIN
			74078	G	
01	26	1	74247-4		ENVIRONMENTAL SEAL
			74247	L	
01	27	1	74888-1		THREAD CAP
			74888	A	
01	28	AR	27316-1		CARTON ASM.
			27316	D	
02	29	1	74219-1		CARTON

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07	30	3	3	74219	DI
				74218-1	ROW SEPARATOR
				74218	DI
02	31	2	4	27317-1	DEVICE SEPARATOR
				27317	DI
02	32	AR	5	13608-4	CLOSURE TAPE
				13608-4	

! NOTES, REV. DATA, DISTRIBUTION, OPERATING CHARACTERISTICS, SPECIAL REQUIREMENTS !

REV DESC: CHG 74408-1 TO 28744-1 | CCB APPROVAL DATE: 98/02/24

DFTG WORK GROUP: PRECISION CONTROLS | ECN ORIGINATOR: DI T HA

NOTES:

- 1 - ACTUATION PRESSURE ----- 90 -160 PSIG
- 2 - RELEASE PRESSURE----- 20 PSIG MIN.
- 3 - DEVICE TO BE MARKED PER CODING SPECIFICATION 75871-1

DETAILED REVISION DESCRIPTION:

99 CR M39209, 28744-1 CONTACT (MOV) WAS 74408-1  
 STOCK DISPOSITION  
 FINISHED DEVICES - USE  
 PARTS & SUB ASMS - USE SUBS, HOLD PARTS

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 traces of Si, Al, F - rich material (Muscovite).

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Contributor: P. Nallos

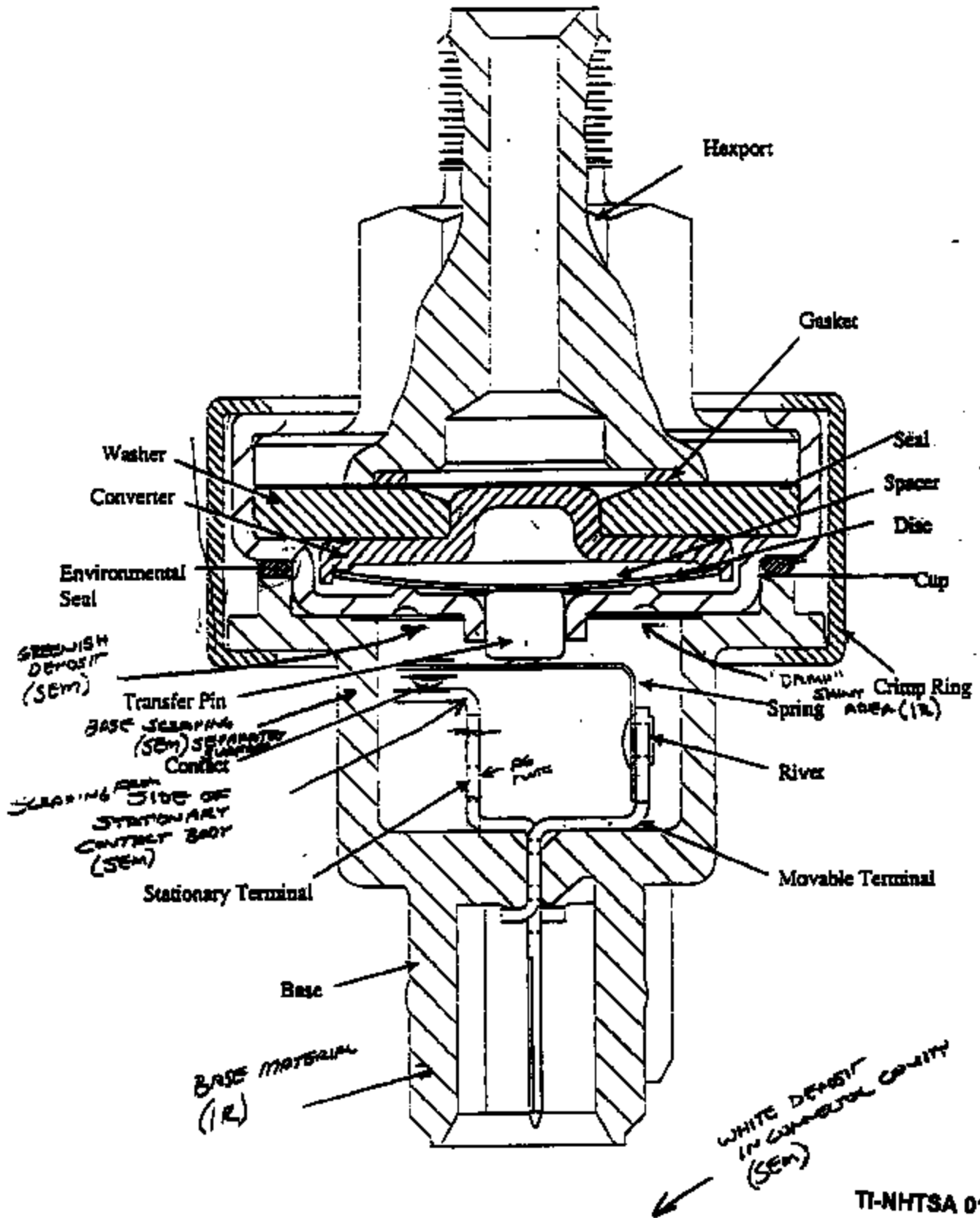
Concur: \_\_\_\_\_  
P. Kloss, Supervisor  
Metallurgy Section

By: \_\_\_\_\_  
Steven LaRouche (SLAROUCH)

Enclosures: Nine EDS spectra  
Data sheet on muscovite

SL/al

### Hydraulic Pressure Switch Cross Section



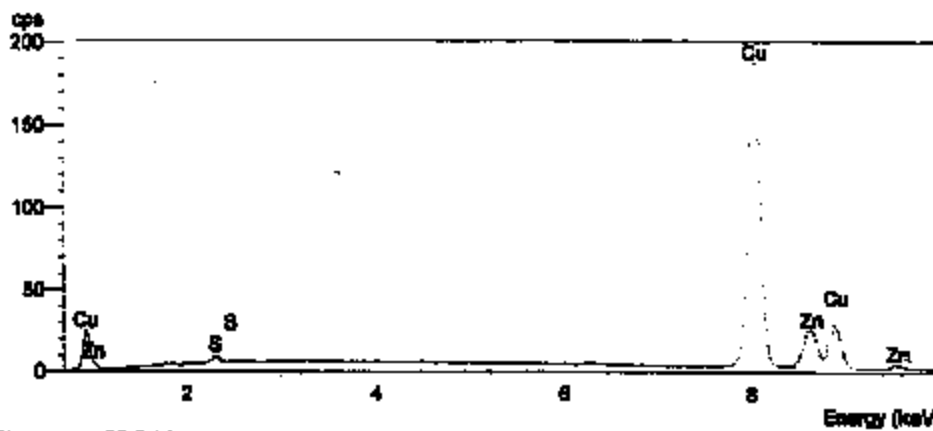


Figure 1: EDS X-ray spectrum of material scraped from the side of the stationary contact body.

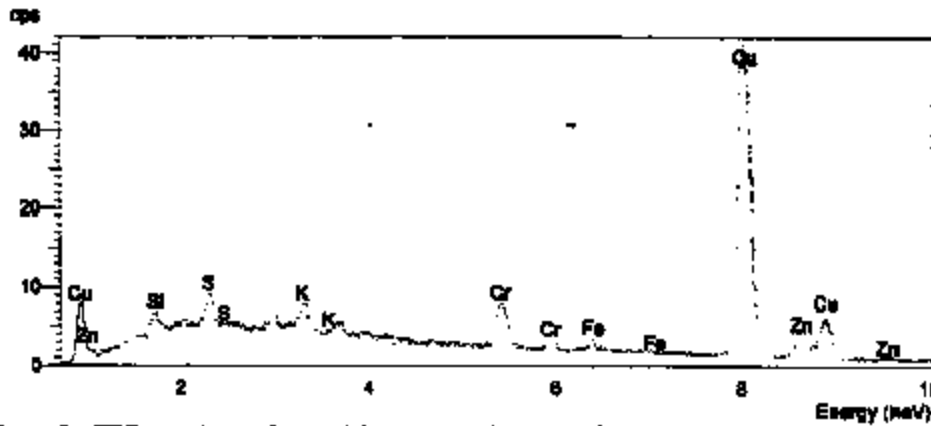


Figure 2: EDS spectrum of greenish compound scraped from the cup region.

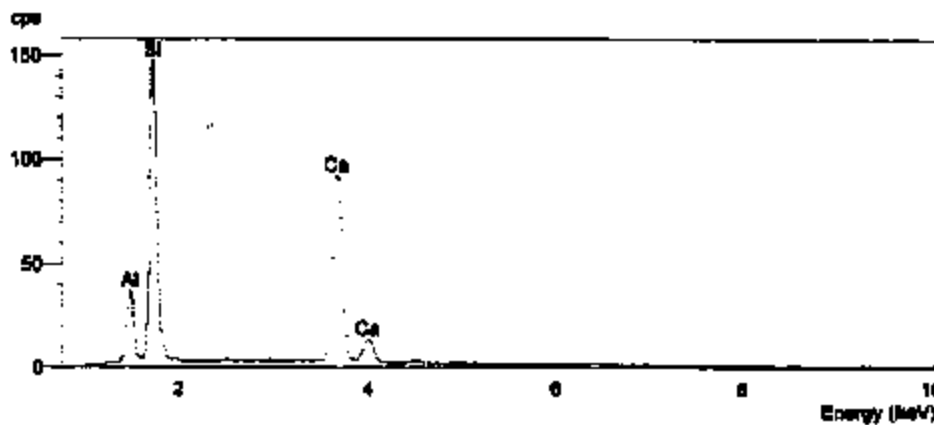


Figure 3: EDS X-ray spectrum of fibrous material scraped from the cup region.

Note: Nominal magnifications given for photomicrographs.

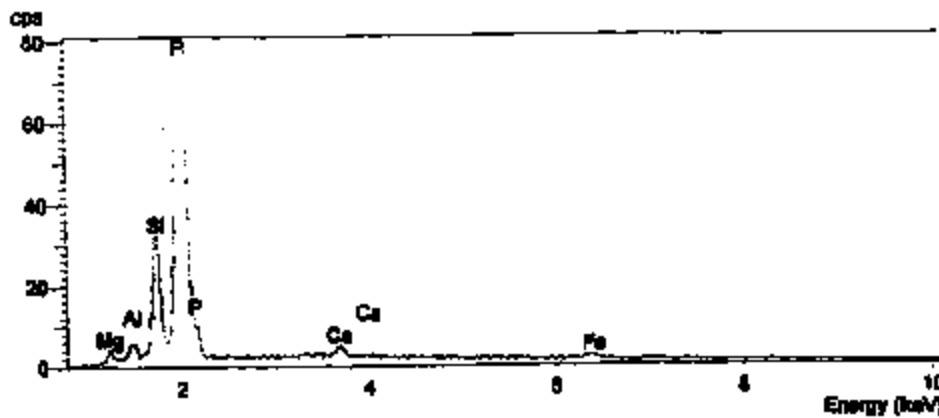


Figure 6: EDS X-ray spectrum of one of three samples of the white powder taken from the connector cavity below the wire seal.

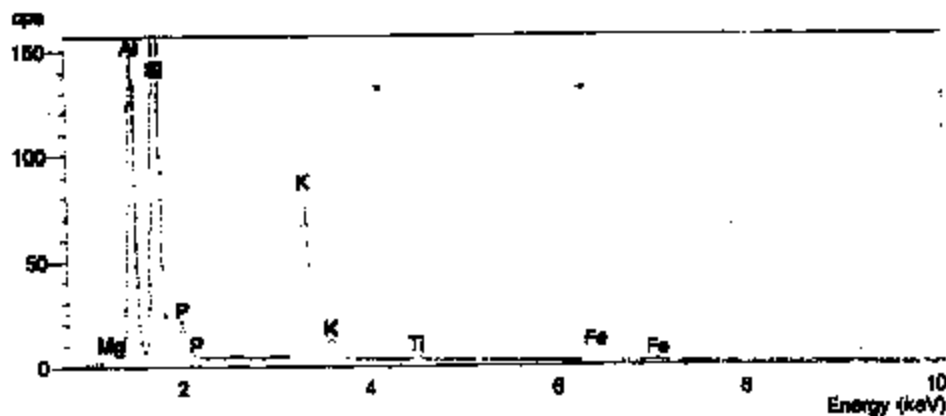


Figure 7: EDS X-ray spectrum of the second of three samples of the white powder.

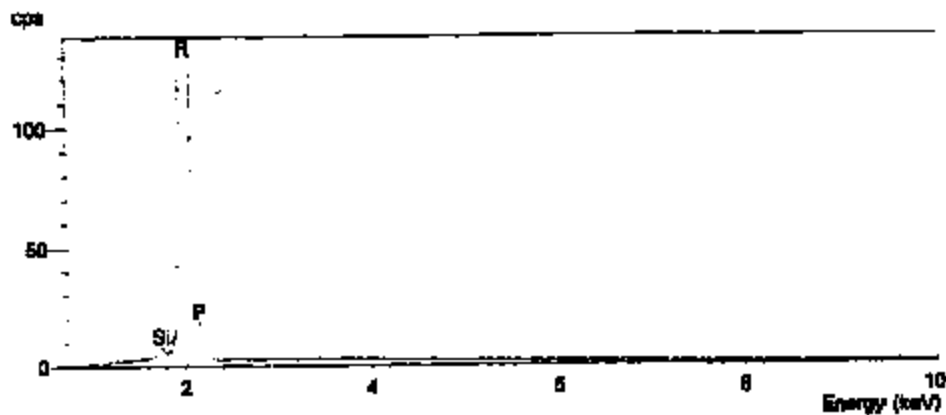


Figure 8: EDS X-ray spectrum of the third of three samples of the white powder.

Note: Nominal magnification given for photomicrographs.



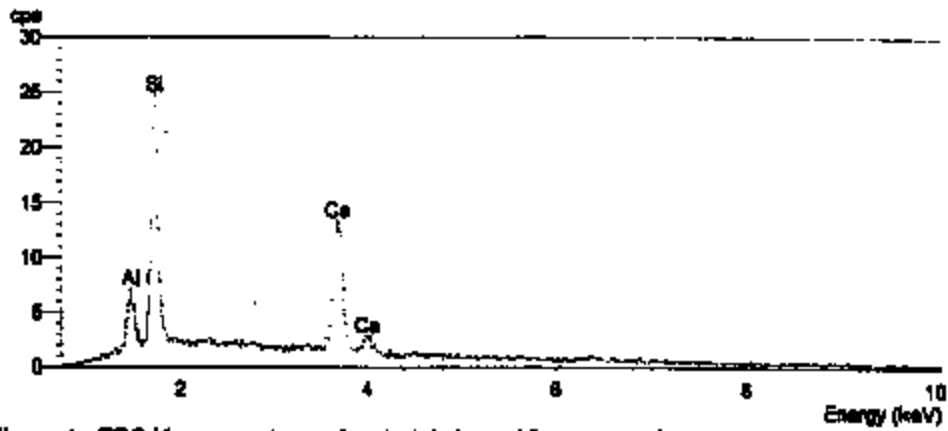


Figure 4: EDS X-ray spectrum of material shaved from a new base.

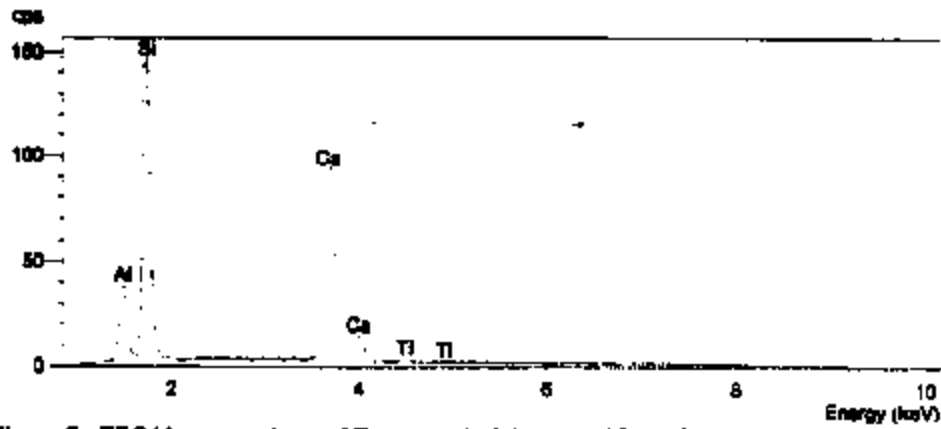
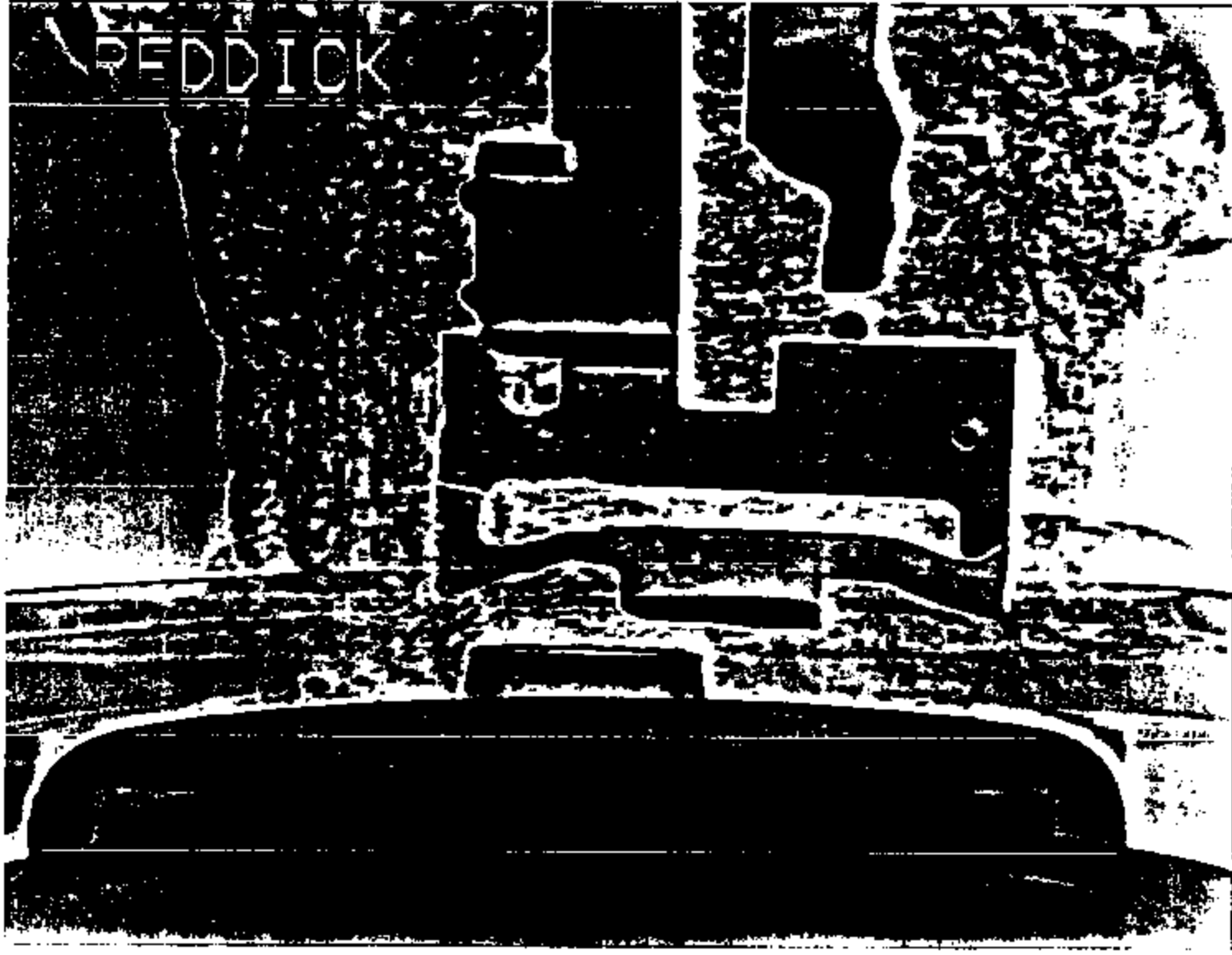


Figure 5: EDS X-ray spectrum of fibrous material scraped from the old base.

Note: Nominal magnifications given for photomicrographs.

TL-NHTSA 016201

**DRAWINGS AVAILABLE UPON  
REQUEST**



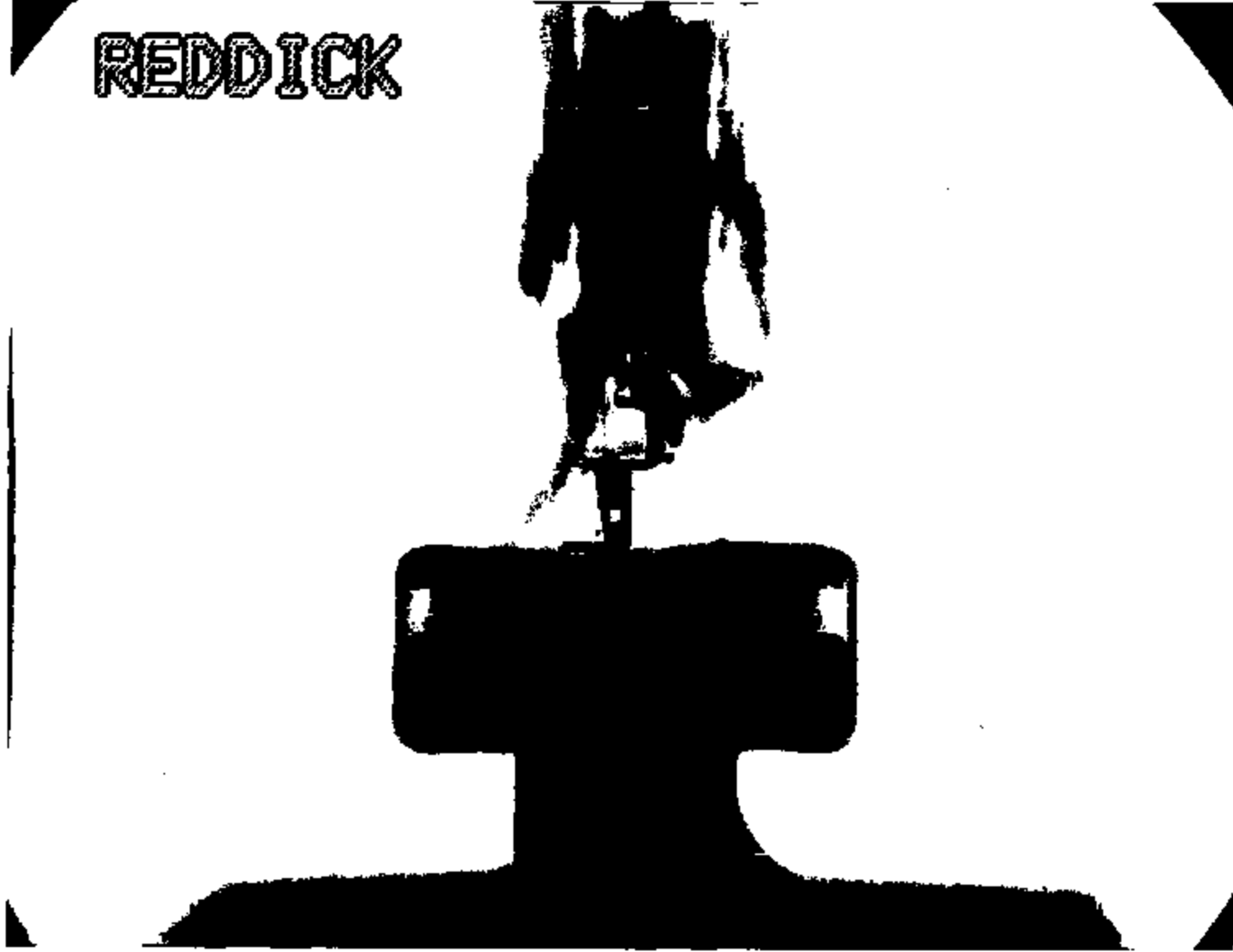
TI-NHTSA 016205

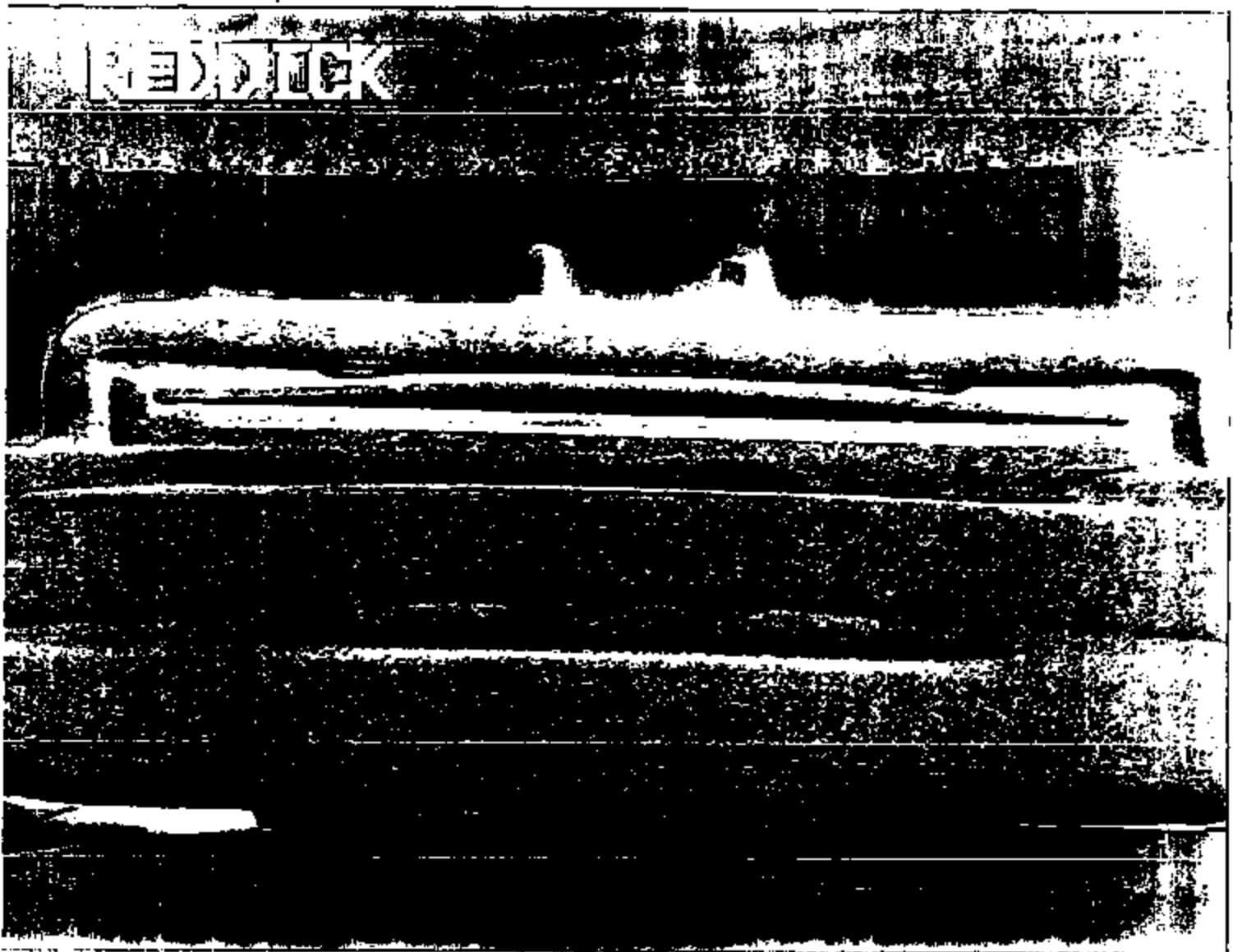


TI-NHTSA 016206

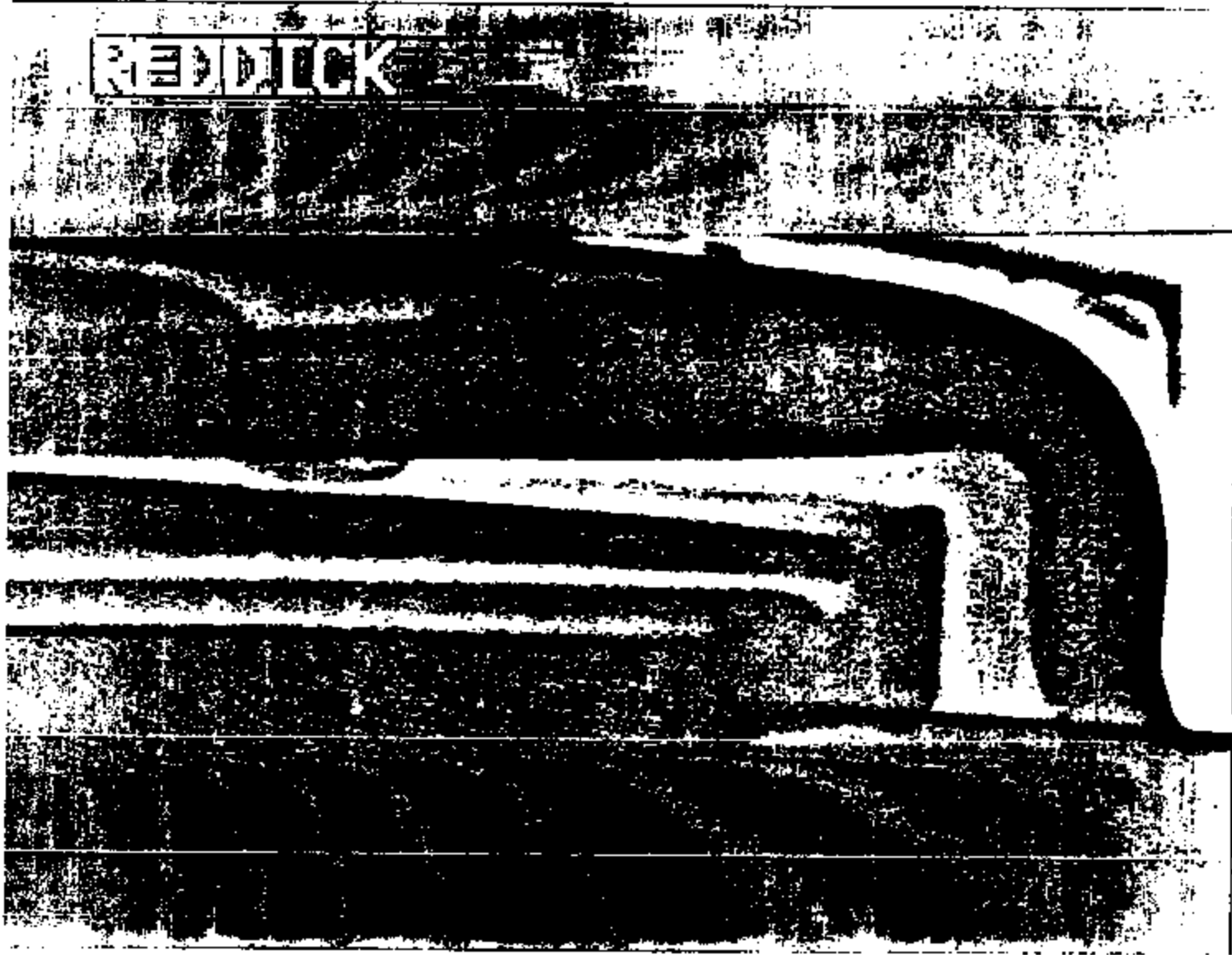
REDDICK

TI-NHTSA 016207





TI-NHTSA 016208



TI-NHTSA 016209

**Baker, Gary**

---

**From:** Douglas, Charles  
**Sent:** Monday, January 11, 1999 8:21 PM  
**To:** Baker, Gary  
**Subject:** FW: Lincoln Town Car "thermal events"

fyi, (I am not sure what precipitated this but you should have probably been cc'd directly)

**Charlie**

**Charlie Douglas**  
(508) 236-3657 (P)  
(508) 236-1688 (F)  
c-douglas2@fi.com

---

**From:** McGuirk, Andy  
**Sent:** Monday, January 11, 1999 3:48 PM  
**To:** Sullivan, Martha; Rowland, Thomas  
**Cc:** Baumann, Russ; Douglas, Charles; Pechoria, John  
**Subject:** Lincoln Town Car "thermal events"

Our core Pressure Switch team is assisting Ford Motor Co. in understanding the cruise control (77P/S family) pressure switch design as part of an investigation into MY '92 & '93 Lincoln Town Car "thermal events". Ford representatives indicated some 20 events have been reported in the MY '92 Town Car.

On January 7th we hosted two Ford representatives and completed a failure analysis of a 77P/S pressure switch reported to be involved in a MY '93 Town Car issue. We are providing complete technical support and the preliminary results regarding pressure switch involvement from this failure analysis are inconclusive.

Charlie Douglas, from our Marketing Leadership, continues to lead the process for TI with excellent support from Russ Baumann supported by Bryan Dague, Al Hopkins, and Steve Proia.

8

AUTOMOTIVE SERVICE AND CONTROLS (ASA) NUMBER  
14 FOREST ST N/S 21-48  
ATTLEBORO, MA 02703  
TEL : (508) 236-1888  
FAX : (508) 236-3745  
PAGE : (508) 467-3788 TDD 604-2644



Form II Fax Note	7871	Date	1/16/98	Page #	1
To	Charlie Douglas	From	Rob Sharpe		
On Behalf	TI - A2614910	Co.			
Phone #	(308) 236-3657	Phone #			
Fax #	(308) 236-1598	Fax #			

January 16, 1998

The cup is partially covered with a greenish residue. Residue appears to be primarily an oxide of the brass contact material with possibly a sulfur compound. This suggests transfer of oxide or corrosion product from the brass contacts to the cup.

The stationary contact exhibits intergranular cracks which indicate stress corrosion cracking (SCC). SCC is caused by combination of a specific corrosive environment and a sustained tensile stress (can be localized). Ammonia, ammonia compounds, sulfur compounds, and moisture are known to cause SCC in brass. The contact material has been reported to be 500 brass, which is highly susceptible to SCC.

The presence of brake fluid on the switch side of the diaphragm has been determined. Black residues in the hex port and on the cup, converter, and disc appear to be compounds which may have formed from a reaction between decomposition products (acids) of the polyester base, the brake fluid, and metals in the switch. This suggests that the brake fluid was present on both sides of the diaphragm during the thermal event.

All three diaphragms exhibit what appears to be mechanical damage. The damage does not match up with any mating parts of the switch. This suggests that damage may have occurred prior to assembly. The diaphragm has become brittle and cracked in the vicinity of the damage. Brake fluid has become entrained between the layers (Teflon and capton) of the diaphragm.

The post of the movable contact melted back into the bulkhead between the switch and terminal cavities of the base. There is also arc damage (localized melting) to one corner of the bridge of the stationary contact. This damage appears fresh (surfaces bright and shiny) which suggests that it may have occurred in the later stages of the thermal event.

The terminals exhibit deposits which appear to be primarily sulfur compounds of the terminal material (tin plated brass). Although these deposits appear visually similar to the deposit found on the cup, they appear to be of different composition.

The white residue found in the connector cavity contains elements found in dry chemical fire extinguishers (Muscovite and phosphorus).

- Service history on 21 NHISA vehicles Steve LaRouche
- Fuse slow blow or fast blow?

Mini-FAX Transmittal		Date	Page
TO	FROM		
TO: ROB SIMAK	FROM: PROTECTA		
TEL: 246 345 5774			
FAX NO.	FAX NO.		

January 15, 1999

The cup is partially covered with a greenish residue. Residue appears to be primarily an oxide of the brass contact material with possibly a sulfur compound. This suggests transfer of oxide or corrosion product from the brass contacts to the cup.

The stationary contact exhibits intergranular cracks which indicate stress corrosion cracking (SCC). SCC is caused by combination of a specific corrosive environment and a sustained tensile stress (can be localized). Ammonia, ammonia compounds, sulfur compounds, and moisture are known to cause SCC in brass. The contact material has been reported to be 360 brass, which is highly susceptible to SCC.

The presence of brake fluid on the switch side of the diaphragm has been determined. Black residues in the base pod and on the cup connector, and also appear to be compounds which may have formed from a reaction between decomposition products (acids) of the polyester base, the brake fluid, and metals in the switch. This suggests that the brake fluid was present on both sides of the diaphragm during the thermal event. *BLACK RESIDUE BRASS FLUID & AN OXIDATE OF METAL*

All three diaphragms exhibit what appears to be mechanical damage. The damage does not match up with any mating parts of the switch. This suggests that damage may have occurred prior to assembly. The diaphragm has become brittle and cracked in the vicinity of the damage. Brake fluid has become entrained between the layers (Teflon and capton) of the diaphragms.

The post of the movable contact melted back into the bulkhead between the switch and terminal cavities of the base. There is also arc damage (localized melting) to one corner of the bridge of the stationary contact. This damage appears fresh (surfaces bright and shiny) which suggests that it may have occurred in the later stages of the thermal event.

The terminals exhibit deposits which appear to be primarily sulfur compounds of the terminal material (tin plated brass). Although these deposits appear visually similar to the deposit found on the cup, they appear to be of different composition.

The white residue found in the connector cavity contains elements found in dry chemical fire extinguishers (Muscovite and phosphorus)

Steve LaRouche

**Beringhause, Steven**

**From:** Sharpe, Robert  
**Sent:** Thursday, January 21, 1999 7:53 AM  
**To:** Beringhause, Steven; Douglas, Charles  
**Cc:** Baumann, Russ; Dodd, Bob  
**Subject:** Lincoln Town Car Testing at Ford 1/25/99

Next weeks testing/analysis of the brake switch will be conducted at Ford's Central Labs in Dearborn. Steve LaRouche will coordinate this testing and can be reached directly at (313) 845-4878. This analysis will begin at 8:30am on Monday, 1/25/99. It appears that Steve's priority will be to examine 4 brake switches returned from Lincoln Town Car's (3 from cars that experienced actual thermal events, 1 removed as a reported "leaker" (no thermal event)). In addition, Ford has 2-3 samples removed from high mile mileage vehicles in Florida that may be examined on Monday if time allows.

Steve B., I will pick you up at the Courtyard Marriott in Dearborn (located on Mercury Drive, between Ford Rd and Michigan Ave, East of the Southfield Frey, ph# 313-271-1400) on Monday morning between 8:00am and 8:15am. If you need to contact me over the weekend, my home phone# is (817) 552-9997. My car phone is (248) 588-8642.

Best Regards,

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