EA02025

TEXAS INSTRUMENTS, INC.'S

09/10/03 LETTER TO ODI

REQUEST 9

BOX 12

PART A – O

PART K

Epstein, Sally

From: LaRouche, Steve (S.) [slarouch@ford.com]
Sent: Tuesday, March 30, 1999 2:54 PM
To: Rahman, Aziz; LaPointe, Norman; LaRouche, Steve; Porter, Fred; Reimers, Steve; Stevens, Gregory
Subject: Latest Versions of Switch Log and Testing Checklist


<<chklist.xls>> <<SwitchLog.xls>>

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

TI-NHTSA 016837

C = COMPLETE
NA = NOT APPLICABLE
TBP = TO BE PERFORMED

Brake Switch Testing Checklist

INF = INFINITY (OPEN)
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			Memphis	A	B	C	D	E	F	1
			PY622977	PY665224	NY745119	NY703705	VX145373	NX758774	NY760055	NX762858
Field Info	1	Log Field info into Switch log #	C	C	C	C	C	C	C	C
		Condition	FIRE	FIRE	FIRE	FIRE	BF LEAK	NO FIRE/LEAK	BF LEAK	NO FIRE/LEAK
	2	Photograph Switch	C	C	C	C	C	C	C	NP
	3	Record any unusual external visual observations	C	C	C	C	C	C	C	C
	4	Check for Connector engagement	C	NA	NA	NA	NA	NA	NA	NA
		X-ray if appropriate	C	NA	NA	NA	NA	NA	NA	NA
Switch + Connector Assembly	5	Wire 1(LO-B) to Wire 2(ORANGE) Resistance	NA	NA	NA	NA	NA	NA	NA	NA
	6	Wire 1(LO-B) to Hexport Resistance	NA	NA	NA	NA	NA	NA	NA	NA
	7	Wire 2(ORANGE) to Hexport Resistance	NA	NA	NA	NA	NA	NA	NA	NA
	8	Separate Harness from Switch	C	NA	NA	C	NA	NA	NA	NA
Connector Only	9	Verify Connector Seal	C	NA	NA	C	NA	NA	NA	NA
	10	Wire 1(LO-B) to Wire 2(ORANGE) resistance	NA	NA	NA	NA	NA	NA	NA	NA
[redacted]										
	12	Check for full engagement of connector	NA	NA	NA	NA	NA	NA	NA	NA
	13	Check cavity condition	C	NA	NA	NA	NA	NA	NA	NA
	14	Check wire gray seals	C	NA	NA	NA	NA	NA	NA	NA
	15	Cut wire insulation to check for corrosion	C	NA	NA	NA	NA	NA	NA	NA
Switch External Unpressurized	16	Assemble Switch to Calibration Stand	NA	NA	NA	NA	NA	NA	NA	C
	17	Spring Terminal to Stationary Terminal Resistance	NA	NA	NA	NA	0.4	0.2	NP	0.3
	18	Spring Terminal to Hexport Resistance	NA	NA	NA	NA	4.8M	INF	2M	INF
	19	Stationary Terminal to Hexport resistance	NA	NA	NA	NA	NP	NP	NP	INF
	20	Base to Hexport Resistance	NA	NA	NA	NA	1.1	6.6M	NP	3.3M
[redacted]										
Switch External Pressurized	24	Switch Opening Pressure	NA	NA	NA	NA	NA	NA	NA	122
	25	Switch Closing Pressure	NA	NA	NA	NA	NA	NA	NA	59
	26	Proof Test for Leakage	NA	NA	NA	NA	NA	NA	NA	NO LEAK
	27	Repeat Steps 17 through 20 at 180 psig	NA	NA	NA	NA	NA	NA	NA	C
	17	Spring Terminal to Stationary Terminal Resistance	NA	NA	NA	NA	NA	NA	NA	INF
	18	Spring Terminal to Hexport Resistance	NA	NA	NA	NA	NA	NA	NA	INF
	19	Stationary Terminal to Hexport resistance	NA	NA	NA	NA	NA	NA	NA	INF
	20	Base to Hexport Resistance	NA	NA	NA	NA	NA	NA	NA	INF
Switch	28	Remove aluminum crimp ring	C	C	NP	C	C	C	C	NP
	29	Examine revealed surfaces. Photograph	C	C	NP	C	C	C	C	NP
	30	Remove cup	C	C	NP	C	C	C	C	NP
	31	Examine revealed surfaces. Photograph	C	C	NP	C	C	C	C	NP
Technique	31	SEM/EDAX & TM base, contacts, terminals	C	C	NP	C	C	C	C	NP
	32	SEM/EDAX & TM cup, hexport, gasket, walls, etc	C	C	C	C	C	C	C	NP
	33	Metallographic analysis of contacts	C	NA	NP	C	C	C	C	NP
		Look for evidence of corrosion or arcing	C	NA	NP	C	C	C	C	NP

TI-NHTSA 018838

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			3	4	5	6	7	8	9	10
			PY724043	PY628170	PY832529	PY729611	NX726439	PX160223	PX837765	PY689375
Field Info	1	Log Field Info into Switch Logs	C	C	C	C	C	C	C	C
		Condition	NO FIRE/LEAK	NO FIRE/LEAK	NO FIRE/LEAK	NO FIRE/LEAK	NO FIRE/LEAK	NO FIRE/LEAK	NO FIRE/LEAK	NO FIRE/LEAK
	2	Photograph Switch	NP	NP	NP	NP	NP	NP	NP	NP
	3	Record any unusual external visual observations	C	C	C	C	C	C	C	C
	4	Check for Connector Engagement	NA	NA	NA	NA	NA	NA	NA	NA
		X-ray if Appropriate	NA	NA	NA	NA	NA	NA	NA	NA
Switch + Connector Assembly	5	Wire 1(LGR) to Wire 2(ORANGE) Resistance	NA	NA	NA	NA	NA	NA	NA	NA
	6	Wire 1(LGR) to Hosiet Resistance	NA	NA	NA	NA	NA	NA	NA	NA
	7	Wire 2(ORANGE) to Hosiet Resistance	NA	NA	NA	NA	NA	NA	NA	NA
	8	Separate Harness from Switch	NA	NA	NA	NA	NA	NA	NA	NA
Connector Only	9	Visely Connector Seal	NA	NA	NA	NA	NA	NA	NA	NA
	10	Wire 1(LGR) to Wire 2(ORANGE) resistance	NA	NA	NA	NA	NA	NA	NA	NA
	12	Check for full engagement of connector	NA	NA	NA	NA	NA	NA	NA	NA
	13	Check wire insulation	NA	NA	NA	NA	NA	NA	NA	NA
	14	Check wire poly sheath	NA	NA	NA	NA	NA	NA	NA	NA
	15	Cut wire insulation to check for corrosion	NA	NA	NA	NA	NA	NA	NA	NA
Switch External Unpressurized	16	Assemble Switch to Calibration Stand	C	C	NA	NA	C	C	C	C
	17	Spring Terminal to Retaining Terminal Resistance	0.2	0.3	NA	NA	0.2	0.2	0.2	2.2
	18	Spring Terminal to Hosiet Resistance	INF	INF	NA	NA	INF	INF	INF	INF
	19	Retaining Terminal to Hosiet resistance	INF	INF	NA	NA	INF	INF	INF	INF
	20	Case to Hosiet Resistance	11.4	1.8M	NA	NA	7.8M	16.5	7.5M	1.4M
Switch External Pressurized	24	Switch Opening Pressure	134	160	NA	NA	147	132	140	137
	25	Switch Closing Pressure	59	86	NA	NA	70	60	112	68
	26	Proof Test for Leakage	NO LEAK	NO LEAK	NA	NA	NO LEAK	NO LEAK	NO LEAK	NO LEAK
	27	Repeat Steps 17 through 20 at 160 psig	C	C	NA	NA	C	C	C	C
	17	Spring Terminal to Retaining Terminal Resistance	INF	INF	NA	NA	INF	INF	INF	INF
	18	Spring Terminal to Hosiet Resistance	INF	INF	NA	NA	INF	INF	INF	INF
	19	Retaining Terminal to Hosiet resistance	INF	INF	NA	NA	INF	INF	INF	INF
	20	Case to Hosiet Resistance	INF	INF	NA	NA	INF	INF	INF	INF
Switch	28	Retaining aluminum crimping	NP	NP	C	C	NP	NP	NP	NP
	29	Examine abraded surfaces. Photograph	NP	NP	C	C	NP	NP	NP	NP
	30	Remove cup	NP	NP	C	C	NP	NP	NP	NP
	31	Examine abraded surfaces. Photograph	NP	NP	C	C	NP	NP	NP	NP
Technique	31	SEM-EDX of ER base material, terminals	NP	NP	NP	NP	NP	NP	NP	NP
	32	SEM-EDX of ER cup, hosiet, washer, balls, etc	NP	NP	NP	NP	NP	NP	NP	NP
	33	Metallographic analysis of corrosion	NP	NP	NP	NP	NP	NP	NP	NP

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7/28/99

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		Check for evidence of corrosion or arcing	NP	NP	NP	NP	NP	NP	NP	NP
			11	12	13	14	15	16	17	18
			PY728088	PX685270	NY740208	PX623672	PY695374	BY639884	PY650225	PY688795
Field Info	1	Log Field Info into Switch Log xls	C	C	C	C	C	C	C	C
		Continuity	NO FIRE/LEAK	[redacted]						
	2	Photograph Switch	NP							
	3	Record any unusual external visual observations	C							
	4	Check for Connector engagement	NA							
		Re-seat if appropriate	NA							
Switch + Connector Assembly	5	Wire 1(LG/Blk)to Wire 2(ORANGE) Resistance	NA							
	6	Wire 1(LG/R) to Hosport Resistance	NA							
	7	Wire 2(ORANGE) to Hosport Resistance	NA							
	8	Separate Harness from Switch	NA							
Connector Only	9	Visely Connector Slot	NA							
	10	Wire 1(LG/R) to Wire 2(ORANGE) resistance	NA							
	12	Check for full engagement of Switch/Stem	NA							
	13	Check vane position	NA							
	14	Check vane play/ slack	NA							
	15	Cut vane insulation to check for corrosion	NA							
Switch External Unpressurized	16	Assemble Switch to Calibration Stand	C							
	17	Moving Terminal to Stationary Terminal Resistance	0.2							
	18	Spring Terminal to Hosport Resistance	INF							
	19	Stationary Terminal to Hosport resistance	INF							
	20	Base to Hosport Resistance	INF							
Switch External Pressurized	24	Switch Opening Pressure	139							
	25	Switch Closing Pressure	71							
	26	Proof Test for Leakage	NO LEAK							
	27	Repeat Steps 17 through 20 or 100 psig	C							
	17	Moving Terminal to Stationary Terminal Resistance	INF							
	18	Moving Terminal to Hosport Resistance	INF							
	19	Stationary Terminal to Hosport resistance	INF							
	20	Base to Hosport Resistance	INF							
Switch	28	Remove aluminum crimp ring	NP							
	29	Examine modified surfaces- Photograph	NP							
	30	Measure cup	NP							
	31	Examine remaining surfaces- Photograph	NP							
Techniques	31	SEM EDX of lift cup contacts- Elements	NP							
	32	SEM EDX of lift cup hosport- wetted areas, etc	NP							

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			18	20	21	22	23	1	2	3
			PY774255	PY754575	PX643515	??	PX629934	PY638990	PX163620	RX841595
Field Info	1	Log Field Info into Switch Legds						C	C	C
		Condition						NO FIRE/LEAK	NO FIRE/LEAK	NO FIRE/LEAK
	2	Photograph Switch						C	C	C
	3	Record any unusual external visual observations						C	C	C
	4	Check for Connector engagement						C	C	C
		Log if it appropriate						NA	C	NA
Switch + Connector Assembly	5	Wire 1(LG/R)to Wire 2(ORANGE) Resistance						0.3	0.4	0.2
	6	Wire 1(LG/R) to Hospot Resistance						INF	INF	INF
	7	Wire 2(ORANGE) to Hospot Resistance						INF	INF	INF
	8	Duplicate Hotstage Ryan Switch						C	C	C
Connector Only	9	Verify Connector Seal						C	C	C
	10	Wire 1(LG/R) to Wire 2(ORANGE) resistance						INF	INF	INF
	12	Check for full engagement of connector						C	C	C
	13	Check wire insulation						C	C	C
	14	Check wire grey resin						C	C	C
	15	Cut wire insulation to check for corrosion						TBP	TBP	TBP
Switch External Unpressurized	16	Assemble Switch to Calibration Shell						C	C	C
	17	Spring Terminal to Stationary Terminal Resistance						0.3	0.1	0.2
	18	Spring Terminal to Hospot Resistance						INF	INF	INF
	19	Stationary Terminal to Hospot resistance						INF	INF	INF
	20	Base to Hospot Resistance						5.5	INF	17.7K
Switch External Pressurized	24	Switch Opening Pressure						158	127	126
	25	Switch Closing Pressure						88	62	64
	26	Proof Test for Leakage						NO LEAK	NO LEAK	NO LEAK
	27	Repeat Steps 17 through 20 at 180 psig						C	C	C
Switch	17	Spring Terminal to Stationary Terminal Resistance						INF	0.1	INF
	18	Spring Terminal to Hospot Resistance						INF	INF	INF
	19	Stationary Terminal to Hospot resistance						INF	INF	INF
	20	Base to Hospot Resistance						INF	INF	INF
	28	Remove aluminum casing ring						NP	C	NP
	29	Examine revealed surfaces - Photograph						NP	C	NP
	30	Remove cap						NP	C	NP
	31	Examine exposed surfaces - Photograph						NP	C	NP
Techniques	31	SEM EDX of TIR base, contacts, terminals						NP	C	NP

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	32	SEM EDX FTIR cup fungus smoke tests, etc	[redacted]					NP	C	NP
	33	Metallographic analysis of contacts						NP	NP	NP
		Lost tin resistance at corrosion or arcing						NP	C	NP

			4 PX1653312	5 PY6103B4	6 NY724388	7 PY750172	8 NY733191	9 PY758158	10 PX15T140	11 NY757408
Field Info	1	Log Field Info into Switch Log sht	C	C	C	C	C	C	C	C
		Condition	NO FIRE/LEAK	NO FIRE/LEAK	FIRE	NO FIRE/LEAK	FIRE	NO FIRE/LEAK	NO FIRE/LEAK	NO FIRE/LEAK
	2	Photograph Switch	C	C	C	C	C	C	C	C
	3	Record any unusual external visual observations	C	C	C	C	C	C	C	C
	4	Check for Connector engagement	C	C	NA	C	NA	C	NA	C
		X-ray if if applicable	C	NA	NA	NA	NA	C	NA	NA
Switch + Connector Assembly	5	Wire 1(LGR)to Wire 2(ORANGE) Resistance	NP	0.2	NA	INF	NA	2	0.4	NP
	6	Wire 1(LGR) to Hospot Resistance	NP	INF	NA	INF	NA	6 0M	INF	NP
	7	Wire 2(ORANGE) to Hospot Resistance	NP	INF	NA	INF	NA	6 1M	INF	NP
	8	Separate Harness from Switch	C	C	NA	C	NA	C	C	C
Connector Only	9	Study Connector Seal	C	C	NA	C	NA	C	C	C
	10	Wire 1(LGR) to Wire 2(ORANGE) resistance	NP		NA	INF	NA	INF	INF	NP
	12	Check for full engagement of connector	C	C	NA	C	NA	C	C	C
	13	Check wire insulation	C	C	NA	C	NA	C	C	C
	14	Check wire gray scale	C	C	NA	C	NA	C	C	C
	15	Cut wire insulation to check for corrosion	TBP	TBP	NA	TBP	NA	TBP	TBP	TBP
Switch External Unpressurized	16	Assemble Switch to Calibration Stand	C	C	NA	C	NA	C	C	C
	17	Spring Terminal to Stationary Terminal Resistance	0.1	0.2	NA	0.3	NA	1.5	0.4	0.1
	18	Spring Terminal to Hospot Resistance	INF	INF	NA	INF	NA	6.3M	INF	INF
	19	Stationary Terminal to Hospot resistance	INF	INF	NA	INF	NA	6.4M	INF	INF
	20	Base to Hospot Resistance	INF	760K	NA	463K	NA	0.4	6.8	INF
Switch External Pressurized	24	Switch Opening Pressure	133	151	NA	136	NA	164	136	135
	26	Switch Closing Pressure	83	82	NA	85	NA	86	108	74
	28	Final Test for Leakage	NO LEAK	NO LEAK	NA	NO LEAK	NA	NO LEAK	NO LEAK	NO LEAK
	27	Repeat Steps 17 through 20 at 150 psig	C	C	NA	C	NA	C	C	C
	17	Spring Terminal to Stationary Terminal Resistance	INF	INF	NA	INF	NA	0.1	INF	INF
	18	Spring Terminal to Hospot Resistance	INF	INF	NA	INF	NA	~970K	INF	INF
	19	Stationary Terminal to Hospot resistance	INF	INF	NA	INF	NA	~970K	INF	INF
	20	Base to Hospot Resistance	INF	INF	NA	INF	NA	INF	INF	INF
Switch	29	Remove aluminum crimp ring	NP	NP	NP	NP	NP	C	NP	NP
	29	Examine exposed surfaces. Photograph	NP	NP	NP	NP	NP	C	NP	NP
	30	Remove cap	NP	NP	NP	NP	NP	C	NP	NP
	31	Examine revealed surfaces. Photograph	NP	NP	NP	NP	NP	C	NP	NP

TI-NHTSA 019842

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Techniques	31	SEM-EDX (FTIR byte, contacts, armature	NP	NP	NP	NP	NP	C	NP	NP	
	32	SEM-EDX (FTIR cup, magnet, washer base, etc	NP	NP	NP	NP	NP	C	NP	NP	
	33	Metallographic analysis of corrosion	NP	NP	NP	NP	NP	NP	NP	NP	
		Look for evidence of corrosion or arcing	NP	NP	NP	NP	NP	C	NP	NP	

			12 PY7426S6	13 PY7433413	OASIS NY734410	OASIS PY6055626	EAA PY614995	EAA NY735847	EAA NY706341	
Field Info	1	Log Field Info into Switch Log xls	C	C	C	C	C	C	C	
		Comments	NO FIRE/LEAK	NO FIRE/LEAK	BF LEAK	BF LEAK	FIRE	FIRE	FIRE	
	2	Photograph Switch	C	C	C	C	C	C	NA	
	3	Record any visual/aural external visual observations	C	C	C	C	C	C	NA	
	4	Check for Connector engagement	C	C	NA	NA	NA	NA	NA	
		X-ray if appropriate	C	NA	NA	NA	NA	NA	NA	
Switch + Connector Assembly	5	Wire 1(LGR)to Wire 2(ORANGE) Resistance	0.3	0.3	NA	NA	NA	NA	NA	
	6	Wire 1(LGR) to Hexport Resistance	20.2M	INF	NA	NA	NA	NA	NA	
	7	Wire 2(ORANGE) to Hexport Resistance	21.5M	INF	NA	NA	NA	NA	NA	
	8	Depress Harness type Switch	C	C	NA	NA	NA	NA	NA	
Connector Only	9	Verify Connector Seal	C	C	NA	NA	NA	NA	NA	
	10	Wire 1(LGR) to Wire 2(ORANGE) resistance	INF	INF	NA	NA	NA	NA	NA	
	12	Check for full engagement of connector	C	C	NA	NA	NA	NA	NA	
	13	Check wire insulation	C	C	NA	NA	NA	NA	NA	
	14	Check wire gray ends	C	C	NA	NA	NA	NA	NA	
	15	Cut wire insulation to check for corrosion	TBP	TBP	NA	NA	NA	NA	NA	
Switch External Unpressurized	16	Assemble Switch to Calibration Stand	C	C	C	C	NA	NA	NA	
	17	Spring Terminal to Stationary Terminal Resistance	0.2	0.2	>700K	>130K	NA	NA	NA	
	18	Spring Terminal to Hexport Resistance	34M	INF	>250K	>17K	NA	NA	NA	
	19	Stationary Terminal to Hexport resistance	39M	INF	>350K	>120K	NA	NA	NA	
	20	Base to Hexport Resistance	63.4K	7.5M	INF	INF	NA	NA	NA	
Switch External Pressurized	24	Switch Opening Pressure	146	150	152	NO SOUND	NA	NA	NA	
	25	Switch Closing Pressure	61	70	92	NO SOUND	NA	NA	NA	
	26	Proof Test for Leakage	NO LEAK	NO LEAK	NO LEAK	NO LEAK	NA	NA	NA	
	27	Repeat Steps 17 through 20 at 150 psig	C	C	C	C	NA	NA	NA	
	17	Spring Terminal to Stationary Terminal Resistance	0.1	INF	>1.0M	170K	NA	NA	NA	
	18	Spring Terminal to Hexport Resistance	INF	INF	>600K	>140K	NA	NA	NA	
	19	Stationary Terminal to Hexport resistance	INF	INF	>400K	>15K	NA	NA	NA	
	20	Base to Hexport Resistance	INF	INF	INF	INF	NA	NA	NA	
Switch	28	Remove aluminum crimp ring	SCI LAB	NP	C	C	TBP	TBP	NA	
	29	Examine mated surfaces Photograph	SCI LAB	NP	C	C	TBP	TBP	NA	
	30	Remove cup	SCI LAB	NP	C	C	TBP	TBP	NA	

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	31	[illegible] surface. Photograph	SCI LAB	NP	C	C	TBP	TBP	NA	
Techniques	31	SEM EDX IFTIR base, contacts, terminals	SCI LAB	NP	TBP	TBP	TBP	TBP	NA	
	32	SEM-EDX IFTIR cap, flanged, washer seals, etc	SCI LAB	NP	TBP	TBP	TBP	TBP	NA	
	33	Metallographic analysis of contacts	SCI LAB	NP	TBP	TBP	TBP	TBP	NA	
		Look for evidence of corrosion or arcing	SCI LAB	NP	TBP	TBP	TBP	TBP	NA	
Field Info	1	Log Field Into into Switch Log sh								
	2	Photograph Switch								
	3	Record any unusual external visual observations								
	4	Check the Connector engagement								
		X-ray if Appropriate								
Switch + Connector Assembly	5	Wire 1(LG/BK) Wire 2(ORANGE) resistance								
	6	Wire 1(LG/BK) to Hooper Resistance								
	7	Wire 2(ORANGE) to Hooper Resistance								
	8	Separate Housing from Switch								
Connector Only	9	Verify Connector Seal								
	10	Wire 1(LG/BK) to Wire 2(ORANGE) resistance								
	12	Check rod seal for full engagement of connector								
	13	Check cap condition								
	14	Check cap grey seals								
	15	Cut wire insulation to check for corrosion								
Switch External Unpressurized	16	Assemble Switch to Calculation Sheet								
	17	Spring Terminal to Stationary Terminal Resistance								
	18	Spring Terminal to Hooper Resistance								
	19	Stationary Terminal to Hooper resistance								
	20	Base to Hooper Resistance								
Switch External Pressurized	24	Switch Opening Pressure								
	25	Switch Closing Pressure								
	26	Proof Test for Leakage								
	27	Repeat Steps 17 through 20 at 100 psig								
	17	Spring Terminal to Stationary Terminal Resistance								
	18	Spring Terminal to Hooper Resistance								
	19	Stationary Terminal to Hooper resistance								
	20	Base to Hooper Resistance								
Switch	28	Measure diameter crimp ring								
	29	Examine formation surfaces. Photograph								
	30	Remove cap								

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	31	Examine insulated surfaces. Photograph									
Technisquest	31	SEM EDX IFTIR base, contacts, terminals									
	32	SEM EDX IFTIR cup, hanger, washer seals, etc									
	33	Metallographic analysis of contacts									
		Look for evidence of corrosion or arcing									

TL-NHTSA 018846

DRAWINGS AVAILABLE UPON REQUEST

Epstein, Sally

From: McGuirk, Andy (a-mcguirk@email.mc.ti.com)
Sent: Thursday, April 01, 1999 2:28 PM
To: 'Frederick J. Porter'
Subject: FW: ANDY.xls

FRED, THIS IS THE CORRECTED MATRIX AND MAY NEED DIALOGUE.....CALL ME OR CHARLIE

A

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

From: Pawlowski, Robin
Sent: Thursday, April 01, 1999 2:04 PM
To: McGuirk, Andy; Douglas, Charles
Subject: ANDY.xls

<<ANDY.xls>>
I have added more locations to the Ford 779SL3-3

[illegible]

Customer	SHIP TO LOC.	Part Number	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DANA CORP.														
[illegible]		77PBL2-1 / F2VC 9F924 AB	31.40	67.11	43.38	0	0	0	0	0	0	0	0	0
		[illegible] / F2VC 9F924 AA	0	0	0	0	22.84	0	74.73	[illegible]	0	0	0	0
		[illegible] 9F924 AA	0	0	0	0	0	0	0	0	0	0	0	0
ITT CORP														
[illegible]		77PBL2-1 / F2VC 9F924 AB	8.85	0	0	0	0	0	0	0	0	0	0	0
		[illegible] 9F924 AA	0	0	0	0	0	0	0	0	0	4.28	[illegible]	[illegible]
[illegible]		[illegible] 9F924 AA	1.42	[illegible]	3.33	[illegible]	2.38	0.71	0	0	0.47	0.714	0	0.952
1994		[illegible] 9F924 AA	1.42	0.714	1.9	1.42	1.42	0	0.71	0.71	0.714	0.476	0.476	1.19
[illegible]		[illegible] 9F924 AA	0.238	0.952	0.952	1.19	0	0	0	0	0	0	0	0
[illegible]														
[illegible]		77PBL2-1 / F2VC 9F924 AB	40.93	43.51	8.47	[illegible]	32.38	3.33	35.22	[illegible]	21.42	[illegible]	44.74	18.58
		[illegible] 9F924 AA	0	0	0	0	0	0	0	2.38	0	0	0	0
[illegible]		[illegible] / F2VC 9F924 AB	14.47	18.33	[illegible]	23.81	14.81	22.61	30.7	30.48	23.58	[illegible]	24.75	28.7
		[illegible] / F2VC 9F924 AA	0	0	0	0	0	0	0	0	[illegible]	0	0	5.33
[illegible]		[illegible] / F2VC 9F924 AB	[illegible]	[illegible]	10.71	25.7	[illegible]	[illegible]	[illegible]	3.8	1.19	8.09	0	0
		[illegible] / F2VC 9F924 AA	0	0	0	0	6.71	19.32	40.23	27.8	33.79	34.03	[illegible]	10.51
		[illegible] 9F924 CA	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]		[illegible] / F2VC 9F924 AA	27.84	[illegible]	38.32	26.84	15.7	11.18	18.47	7.14	14.04	9.04	[illegible]	5.95
		[illegible] 9F924 CA	0.476	0	0	0	0	2.14	2.85	0.714	0.714	1.19	0.714	4.04
		[illegible] / F2VC 9F924 AB	0	0	0.238	0.714	0.476	0	0	0	0	0	0	0
[illegible]		[illegible] / F2VC 9F924 AA	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0
		[illegible] 9F924 CA	0	0	0	1.42	0	0	0	0	0	0	0	0
		[illegible] / F2VC 9F924 AB												
FORD MOTOR														
[illegible]	[illegible]	[illegible] / F2VC 9F924 AB	0	0	0	0	0	0	0	0	0.47	0	0	0
	Laredo, Texas	[illegible] / F3TA 9F924 CA	19.81	[illegible]	31.41	19.5	20.05	15.7	19.0	[illegible]	18.18	8.52	17.73	15.23
	[illegible] [illegible]													
	Canada(Oakville) Kansas City													
	[illegible] [illegible]													
	[illegible]	[illegible] / F3TA 9F924 CA	0	0	0	0	0	2.44	3.33	40.3	60.11	71.97	40.92	44.29
	[illegible]	[illegible] 9F924 AA	0	0	0	0	0	0	0	0	0	0	0.47	0
[illegible]	[illegible]	[illegible] / F2VC 9F924 AB	0	0	0	0	0	0	0	0	0	0.238	0	0
	Laredo, Texas	[illegible] / F3TA 9F924 CA	1.97	0	0	0	0	0	0	0	0	0	0	0
	[illegible]	[illegible] 9F924 AA	0	0	0	0	0	0	0	0	0.71	[illegible]	0.476	0.714
	[illegible] [illegible]													
	Canada(Oakville) Kansas City													
	[illegible] [illegible]													
	[illegible]	[illegible] / F3TA 9F924 CA	35.28	41.65	30.75	44.58	56.34	[illegible]	25.08	32.43	0.47	0.714	0.833	0.952
	[illegible]	[illegible] 9F924 AA	0	0.71	0	0	0	0	0	0	0	0	0	0
[illegible]	[illegible]	[illegible] / F2VC 9F924 AB	0.238	0	0	0	0	0	0	0.71	0	0	0	0

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	[illegible]	77PGL3-3 / F3TA 6F024 CA	0	0	0	0	0	0	0	0	0	0	0	0
	[illegible]	77PGL3-2 / F5BA 6F024 AA	1.42	[illegible]	11.42	17.[illegible]	[illegible]	[illegible]	[illegible]	20.4	24.27	30.7	[illegible]	[illegible]
	[illegible]	77PGL3-3 / F3TA 6F024 CA	3.8	0.611	1.16	1.19	1.9	1.42	0.71	[illegible]	[illegible]	0	0	0
	[illegible]	77PGL5-2 / F3TE 6F024 AA												
[illegible]	[illegible]	77PGL3-2 / F5BA 6F024 AA	[illegible]	19.61	[illegible]	21.19	[illegible]	22.37	14.76	20.7	22.57	25.49	11.[illegible]	[illegible]
[illegible]	[illegible]	77PGL3-2 / F5BA 6F024 AA	14.[illegible]	19.[illegible]	21.[illegible]	20.41	21.[illegible]	19.41	14.62	27.37	[illegible]	[illegible]	14.51	15.47
	[illegible]	77PGL2-1 / F2VC 6F024 AB	0	0	0	0	0.238	0	0	0	0	0.476	0	0
	[illegible]	77PGL3-3 / F3TA 6F024 CA	0	0	0	0	0	0	0	0	0	1.2	0	0
1987	[illegible]	77PGL3-2 / F5BA 6F024 AA	21.18	21.42	27.6	24.03	22.04	27.37	4.76	20.41	25.04	24.27	24.75	17.37
	[illegible]	77PGL2-1 / F2VC 6F024 AB	0	0	0	0	0.714	0	0	0	0	0	0.714	0
	[illegible]	77PGL3-3 / F3TA 6F024 CA	0	0	0	0.48	0	0	0.48	1.2	0	[illegible]	[illegible]	0.239
[illegible]	[illegible]	77PGL3-2 / F5BA 6F024 AA	14.75	29.75	26.[illegible]	22.[illegible]	29.5[illegible]	21.[illegible]	1.19	11.9	10.47	22.[illegible]	30.[illegible]	[illegible]
	[illegible]	77PGL2-1 / F2VC 6F024 AB	0	0.952	0	0	0	0	0	0.476	0	[illegible]	0	0
	[illegible]	77PGL3-3 / F3TA 6F024 CA	2.4	0.48	0.72	1.9	0.72	1.02	[illegible]	1.02	2.14	2.[illegible]	2.[illegible]	1.2
	[illegible]	77PGL4-1 / [illegible] AA	0	0	11.9	0.238	34.28	0	0	3.65	[illegible]	0	3.33	0.238
KELSEY-HAYES CO. [illegible]		77PGL2-1 / F2VC 6F024 AB	4.[illegible]	4.[illegible]	6.23	2.8	2.8	3.07	4.[illegible]	0	0	0	0	0
ALLIED SIGNAL 1983		77PGL3-3 / F3TA 6F024 CA	0	0	0.238	0	0	0.238	0	0	0	0	0.238	
1984		77PGL3-3 / F3TA 6F024 CA	[illegible]	0.238	0	0.476	0.8	0	0.952	0.85	0	2.87	20.38	33.[illegible]
		77PGL3-1 / F2AC 6F024 AA	0	0	0	0.08	0.08	0	0	0.05	0	0	0	4.8
[illegible]		77PGL3-1 / F2AC 6F024 AA	2.8	0	0	0	0.952	18.7	16.67	0	0.54	15.47	17.13	18.[illegible]
		77PGL3-3 / F3TA 6F024 CA	[illegible]	70.13	23.76	73.[illegible]	[illegible]	[illegible]	[illegible]	43.[illegible]	[illegible]	[illegible]	[illegible]	49.32
[illegible]		77PGL3-1 / F2AC 6F024 AA	16.[illegible]	22.84	21.42	17.13	[illegible]	18.[illegible]	12.85	[illegible]	17.13	14.28	7.42	
		77PGL3-3 / F3TA 6F024 CA	[illegible]	[illegible]	[illegible]	[illegible]	47.04	[illegible]	30.34	[illegible]	[illegible]	67.2	6.72	
TOMCO [illegible]		77PGL3-3 / F3TA 6F024 CA	0	0	0	1.5	0	2	30	20	[illegible]	[illegible]	50	40.[illegible]
[illegible]		77PGL3-3 / F3TA 6F024 CA	20.[illegible]	28.6	72.[illegible]	72.72	[illegible]	26.[illegible]	[illegible]	78	[illegible]	18.[illegible]	[illegible]	[illegible]
[illegible]		77PGL3-3 / F3TA 6F024 CA	74.[illegible]	[illegible]	70	[illegible]	[illegible]	64.[illegible]	[illegible]	70.2	[illegible]	[illegible]	[illegible]	47.52
[illegible]		77PGL3-3 / F3TA 6F024 CA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		77PGL3-2 / F5BA 6F024 AA												0.02
1987		77PGL3-3 / F3TA 6F024 CA	72	87.[illegible]	105.[illegible]	73.2	[illegible]	[illegible]	47.12	107	90	[illegible]	[illegible]	[illegible]
		77PGL3-2 / F5BA 6F024 AA												
[illegible]		77PGL3-3 / F3TA 6F024 CA	[illegible]	111.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	72.[illegible]	65.0[illegible]	[illegible]	44.4
		77PGL3-2 / F5BA 6F024 AA												
HAYES-DANA [illegible]		77PGL3-1 / F2AC 6F024 AA	0	0	0	0	0	0	0	0	0	20.[illegible]		

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1995	77P[illegible]3-1/F2AC 6F024 AA	0	0	0	0	0	[illegible]	0	5.9	15.23	4.69	14.00	[illegible]
1996	77P[illegible]3-1/F2AC 6F024 AA	[illegible]	[illegible]	[illegible]	[illegible]	4.6	4.6	0	0	0	0	0	0
SPECIFIC GRAVURE 1996	77P[illegible]3-2/F8[illegible]A 6F024 AA	0	0	0	0	0	0.238	0	0	0.714	0	0	0
1997	77P[illegible]3-2/F8[illegible]A 6F024 AA	0	0	0.238	0	0	0	0.238	0	0.238	0	0.476	0.238
1998	77P[illegible]3-2/F8[illegible]A 6F024 AA	0	0	0	0	0	0	0	0	0.238	0.238	0	0
[illegible] INDUSTRIES 1996	77P[illegible]3-1/F2AC 6F024 AA	0	0	0	[illegible]	14.5	[illegible]	14.2	12.81	5.23	18.32	2.8	6.4
	77P[illegible]3-3/F3TA 6F024 CA					3.5		1.42	3.3	3.3		7.86	
1997	77P[illegible]3-3/F3TA 6F024 CA	[illegible]	0	2.1	2.8	0	0	2.8	3.3	0	1.18	0	0
	77P[illegible]3-1/F2AC 6F024 AA	0	[illegible]	[illegible]	18.4	5.7	5.7	[illegible]	14.75	7.37	0	0	
	77P[illegible]3-1/F2AC 6F024 AB	0	0	0	0	0	0	0	0	0	0	0	1.19
1998	77P[illegible]3-3/F3TA 6F024 CA	0	1.18	2.14	[illegible]	0	0	0	0	0	0	0	0
	77P[illegible]3-1/F2AC 6F024 AA												
	77P[illegible]3-1/F2AC 6F024 AB	0	0	0	0	0	0	0	0	0	0	0.238	
BOSCH BRAKING 1996	77P[illegible]3-1/F2AC 6F024 AA	0	0	0	0	0	0	0	0	0	0	21.42	22.84
	77P[illegible]3-3/F3TA 6F024 CA	0	0	0	0	0	0	0	0	0	0	[illegible]	57.1
1997	77P[illegible]3-1/F2AC 6F024 AA	15.7	10.0	14.5	18.58	15.7	21.4	8.58	4.28	4.28	0	0	0
	77P[illegible]3-3/F3TA 6F024 CA	[illegible]	[illegible]	57.12	53.78	30.4	[illegible]	23.52	[illegible]	30.4	67.1	[illegible]	30.4
1998	77P[illegible]3-1/F2AC 6F024 AA												
	77P[illegible]3-3/F3TA 6F024 CA	[illegible]	30.4	57.12	[illegible]	47	47.8	47	50.4	[illegible]	[illegible]	53.7	[illegible]

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TI-NHTSA 016861

Epstein, Sally

From: Steve Reimers [sreimers@ford.com]
Sent: Thursday, April 01, 1999 3:34 PM
To: McGuirk, Andy; Porter, F.J.
Subject: Materials Recommendations for Flammability issue

fyi

Steve Reimers — building 5 3E008
RVT Chassis E/E System Applications — mail drop 5011
39-03286 SREIMERS sreimers@ford.com — fax 39-04145 ;>
*** Forwarding note from PAPC5HBU--EXTERNAL 04/01/99 16:09 ***
To: GSTEVEN1--FORD@MTP SREIMERS--FORDMAIL
cc: O2K07WNT--EXTERNAL Michael J Bauhof

From: Paul J Kane
Subject: Marterials Recommendations for Flammability issue

From: "Paul J Kane"<Paul.J.Kane@USA.dupont.com>
cc: "Michael J Bauhof"<Michael.J.Bauhof@USA.dupont.com>

Greg, I recommend the Zenite 6140L (used at Ford in a wiper motor to solve similiar concern where high amperage going through when motor was in stall torque condition). The DuPont Zenite LCP is a liquid crystal polymer that is V-0 (flame retardant) down to .031 inch thickness and has a melt point of 635F. The Celanex PBT grades have a melt point of 431F and the Meryl GTX 830 which is just a nylon alloy has a melt point of 497 F.

My experience is that in these situations, going to higher melt point is the only hope for solving it from a polymer standpoint.

The other material I recommended is Zytel HTN FR52G30BL which has a melt point of 590 F and is flame retardant. This would be lower cost resin.

I have fax'd data sheet to you and we can rush samples to TI for molding if you want, Paul Kane.....248-583-8107

TI-NHTSA 016852

Epstein, Sally

From: Warner, Pam [pwarner@email.mc.ti.com]
Sent: Wednesday, April 07, 1999 8:48 AM
To: 'fporter@ford.com'
Cc: McGuirk, Andy
Subject: fordti.xls

Fred,
Please give Andy McGuirk a copy of this spreadsheet when you see him today.
Thank you.

<<fordti.xls>>

77PS-Molded Base

Entry No.	Rev No.	DATE of ECN	[illegible]	VALUE IMPROVEMENT	Design Engr	FORD P/N	TI P/N	[illegible]	Material
1	A	First Issue [illegible]-Nov-90	Angle	Replaced EX 3423-[illegible] dated [illegible] Celanex 4300	[illegible]	F2VC-[illegible]-AB F8LC-[illegible]-AA	77PSL-2-1 77PSL2-3	2 ([illegible] #2) 1 (black, #1)	Celanex 4300 Celanex 4300
2	B	[illegible]-Jan-91	Angle	Celanex 4300 CN [illegible] Cosmetically print views	[illegible]	F2VC-[illegible]-AB F8LC-[illegible]-AA	77PSL2-1 77PSL2-3	2([illegible] #2) 1 (black #1)	Celanex 4300 Celanex 4300
3	C	[illegible]-May-92	Angle	Added (-3) GE Noryl GTX 830 CRN [illegible]	[illegible]	F[illegible]-AA [illegible]-AA F[illegible]-AA	77PSL[illegible]-1 77PSL[illegible]-1 77PSL[illegible]-2	3 ([illegible]) 3 ([illegible]) 3 ([illegible])	GE Noryl GTX 830 GE Noryl GTX 830 GE Noryl GTX 830
4	D	21-May-92	Angle	Added (-4 through -8) CRN [illegible] (-4, -7) GE Noryl GTX 830 (-5, -6, -8, -9) Celanex 4300	[illegible]	F[illegible]-AA F2VC-[illegible]-AB F[illegible]-AA F[illegible]-CA F[illegible]-AA F[illegible]-AA [illegible]-AA	77PSL2-1 77PSL2-1 77PSL[illegible] 77PSL[illegible] [illegible] [illegible] [illegible]11-2	3 ([illegible]) 2 ([illegible]) 3 ([illegible]) 7 ([illegible]) [illegible] [illegible] [illegible]	GE Noryl GTX 830 Celanex 4300 GE Noryl GTX 830 GE Noryl GTX 830 Celanex 4300 Celanex 4300 GE Noryl GTX 830
5	E	[illegible]-Jul-92	Angle	Added -10 (GE Noryl GTX 830) CRN [illegible]	[illegible]	F[illegible]-AA	77PSL2-2	10 ([illegible])	GE Noryl GTX 830
6	F	[illegible]-Dec-93	Angle	Clarified dimensions CRN [illegible]	[illegible]				
7	G	[illegible]-May-[illegible]	[illegible]	[illegible] CCC [illegible] CRN [illegible]	[illegible]				
8	H	[illegible]-May-[illegible]	[illegible]	[illegible] 4 [illegible] CRN [illegible]	[illegible]				
9	J	13-Jan-97	CAD	[illegible] [illegible] CAD [illegible] CRN [illegible]	[illegible]				
10	K	[illegible]-Dec-97	CAD	Change [illegible] [illegible] degree [illegible], CRN [illegible]	[illegible]				
11	L	[illegible]-Feb-[illegible]	CAD	Change [illegible] [illegible] CRN [illegible]	[illegible]				
12	M	1-[illegible]	CAD	Added -11 [illegible] GE Noryl GTX 830 CRN [illegible]	[illegible]	[illegible]-AA	[illegible]2-8	11 ([illegible])	GE Noryl GTX 830
13	N	[illegible]-May-[illegible]	CAD	Added 12 [illegible] Celanex 4300 ECN [illegible]	[illegible]	[illegible]	[illegible]2-6	12 ([illegible])	Celanex 4300

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TI-NHTSA 016654

Epstein, Sally

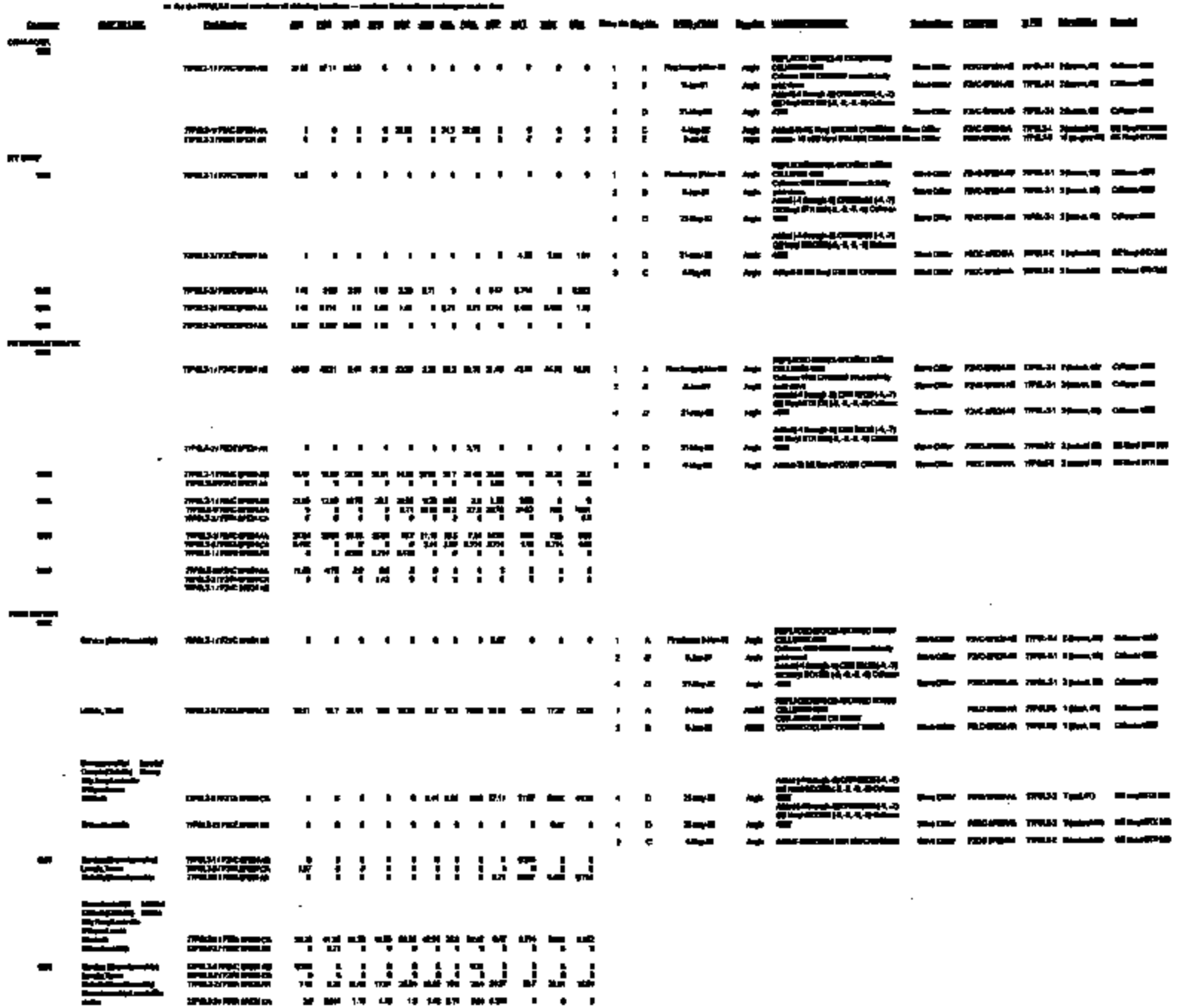
From: Pawlowski, Robin [rpawlowski@smallmail.com]
Sent: Wednesday, April 07, 1999 1:44 PM
To: 'FPORTER@FORD.COM'
Cc: Douglas, Charles; McGuirk, Andy
Subject: ANDY.xls

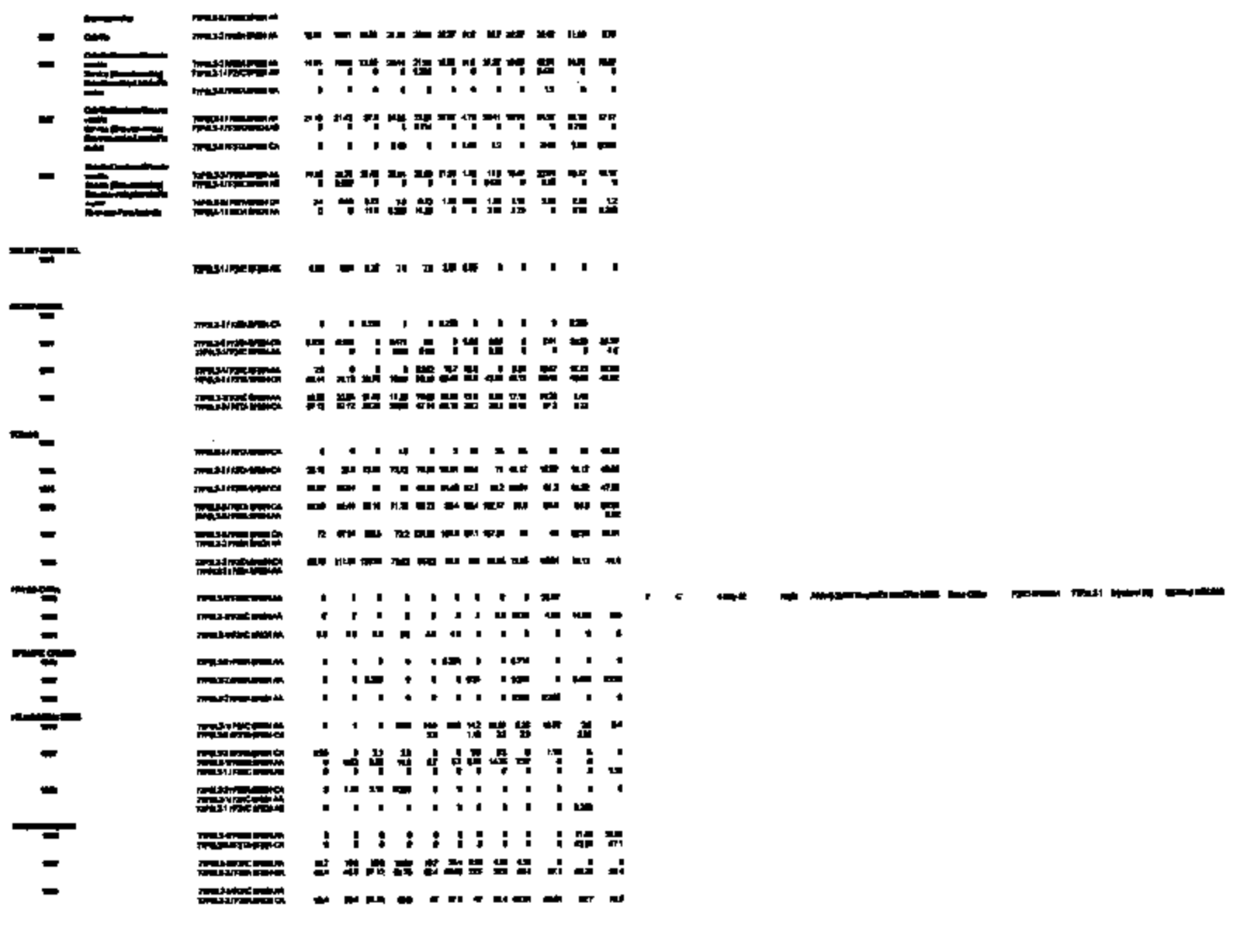

ANDY.xls

<<ANDY.xls>>

TI-NHTSA 016855

TI-NHTSA 016856





8	H	[illegible]	[illegible]	[illegible]	[illegible]					
9	J	[illegible]	[illegible]	[illegible]	[illegible]					
10	K	[illegible]	[illegible]	[illegible]	[illegible]					
11	L	[illegible]	[illegible]	[illegible]	[illegible]					
12	M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TI-NHTSA 018858

77PS-Molded Base

Entry No.	Rev No.	ATE of ECN	Dwg Sys	VALUE IMP Design Engr	FORD P/N	TI P/N	P/N 46515-x Material
1	A	First issue 9-Nov-90	Aegis	Replaced EXSteve Offiler dated 09/26/90 Cellanex 4300	F2VC-9F92477PSL-2-1 F6LC-9F92477PSL2-3	2 (brown, #2 Cellanex 4300 1 (black, #1) Cellanex 4300	
2	B	8-Jan-91	Aegis	Cellanex 430Steve Offiler CN 155897 Correct/clarify print views	F2VC-9F92477PSL2-1 F6LC-9F92477PSL2-3	2(brown,#2) Cellanex 4300 1 (black #1) Cellanex 4300	
3	C	4-May-92	Aegis	Added (-3) Steve Offiler GE Noryl GTX 830 CRM 06966	F2AC-9F92477PSL3-1 94DA-9F92477PSL4-1 F3DC-9F92477PSL5-2	3 (natural #2GE Noryl GTX 830 3 (natural #2GE Noryl GTX 830 3 (natural #2GE Noryl GTX 830	
4	D	21-May-92	Aegis	Added (-4 thSteve Offiler CRM 09128 (-4, -7) GE Noryl GTX 83 (-5,-6,-8,-9) Cellanex 430	F2AC-9F92477PSL3-1 F2VC-9F92477PSL2-1 F3DC-9F92477PSL5-2 F3TA-9F92477PSL3-3 F37A-3N82467PSL2-2 F37A-3N82467PSL2-3 94BP-3N82467PSL11-2	3 (natural #2GE Noryl GTX 830 2 (brown #2) Cellanex 4300 3 (natural #2GE Noryl GTX 830 7 (red, #1) GE Noryl GTX 830 6 (gray #1) Cellanex 4300 6 (gray #1) Cellanex 4300 8 (green #1) GE Noryl GTX 830	
5	E	9-Jul-92	Aegis	Added -10 Steve Offiler (GE Noryl GTX 830) CRM 09991	F68A-9F92477PSL3-2	10 (dk gray #GE Noryl GTX 830	
6	F	29-Dec-93	Aegis	Clarified dim ziz Rahman CRM 16819			
7	G	1-May-96	Cadras	Dim added C hris Wagner CRM 28757			
8	H	20-May-96	Cadras	Note 4 hris Wagner Regrind was 50% CRM 28057			
9	J	13-Jan-97	CAD	Adjust 3 note Di Ha Added note CAD dwg CRM 32804			
10	K	18-Dec-97	CAD	Change dim Di Ha Remove 45-55 degree chamfer, CRM 38295			
11	L	23-Feb-98	CAD	Change .055 Di Ha chamfer to .030/.020 CRM 39157			
12	M	1-Apr-98	CAD	Added -11 M Di Ha GE Noryl GTX 830 CRM 39965	XW43-3N8287PSL2-5	11 (brown #1GE Noryl GTX 830	
13	N	6-May-98	CAD	Added 12 Ma Di Ha Cellanex 4300 ECN M40538	A50520 87PSL2-5	12 (white #1 Cellanex 4300	

Fax'd 9:55

April 7, 1999

TEXAS INSTRUMENTS

FACSIMILE TRANSMITTAL

TO: **Name:** **Fred Porter**

Location: **Ford**

Phone Number: **(313) 845-3723**

FAX Number: **(313) 390-4145**

FROM: **Sean P. Mulligan**
Mechanical Design
Precision Controls

TEXAS INSTRUMENTS MS 12-29

Phone Number: **(508) 236-2535**

FAX Number: **(508) 236-3586**

Total number of pages (including header page): 2

COMMENTS: Fred,

Please find an updated schematic of the proposed test circuit included on page (2) of this fax. This schematic includes Ford relay P/N F0AB-14B192-AA. Please phone me after you review the schematic.

Thank you,

Sean Mulligan

Faxed 11:15

April 6, 1999

TEXAS INSTRUMENTS

FACSIMILE TRANSMITTAL

TO: **Name:** **Fred Porter**

Location: **Ford**

Phone Number: **(313) 845-3722**

FAX Number: **(313) 390-4145**

FROM: **Sean P. Mulligan**
Mechanical Design
Precision Controls

TEXAS INSTRUMENTS MS 12-29

Phone Number: **(508) 236-2535**

FAX Number: **(508) 236-3586**

Total number of pages (including header page): 2

COMMENTS: Fred,

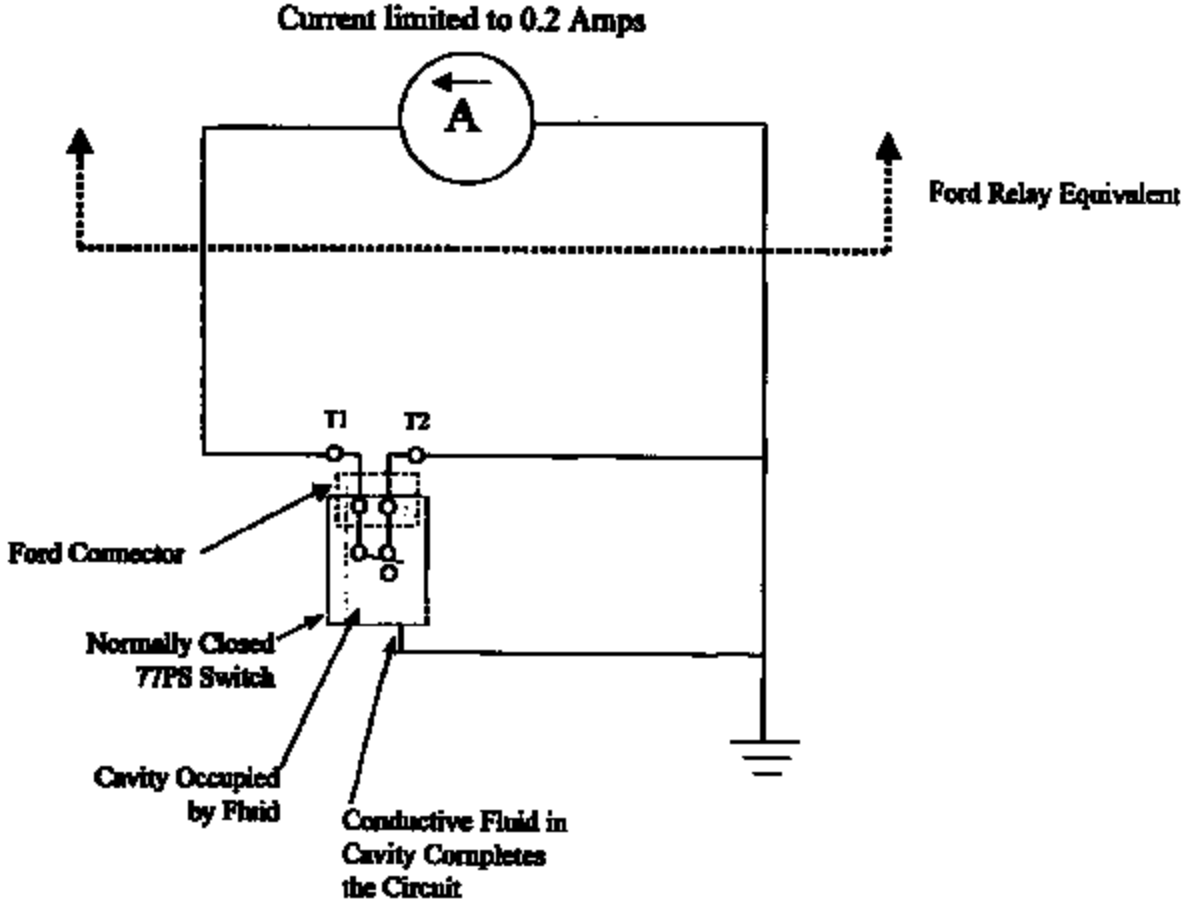
Please find included with this cover sheet, a drawing of the proposed test circuit for use with a relay. The current supply will be limited to 0.2 Amps. Per our phone conversation, I will contact you at 2:30 (your time) to discuss the proposed test circuit.

Thank you,

Sean P Mulligan

Sean P. Mulligan

TI Test Circuit



TI-NHTSA 016862

Faxed 10:00

April 7, 1999

TEXAS INSTRUMENTS

FACSIMILE TRANSMITTAL

TO: **Name:** **Fred Porter**

Location: **Ford**

Phone Number: **(313) 845-3722**

FAX Number: **(313) 390-4145**

FROM: **Sean P. Mulligan**
Mechanical Design
Precision Controls

TEXAS INSTRUMENTS MS 12-29

Phone Number: **(508) 236-2535**

FAX Number: **(508) 236-3586**

Total number of pages (including header page): 3

COMMENTS: Fred,

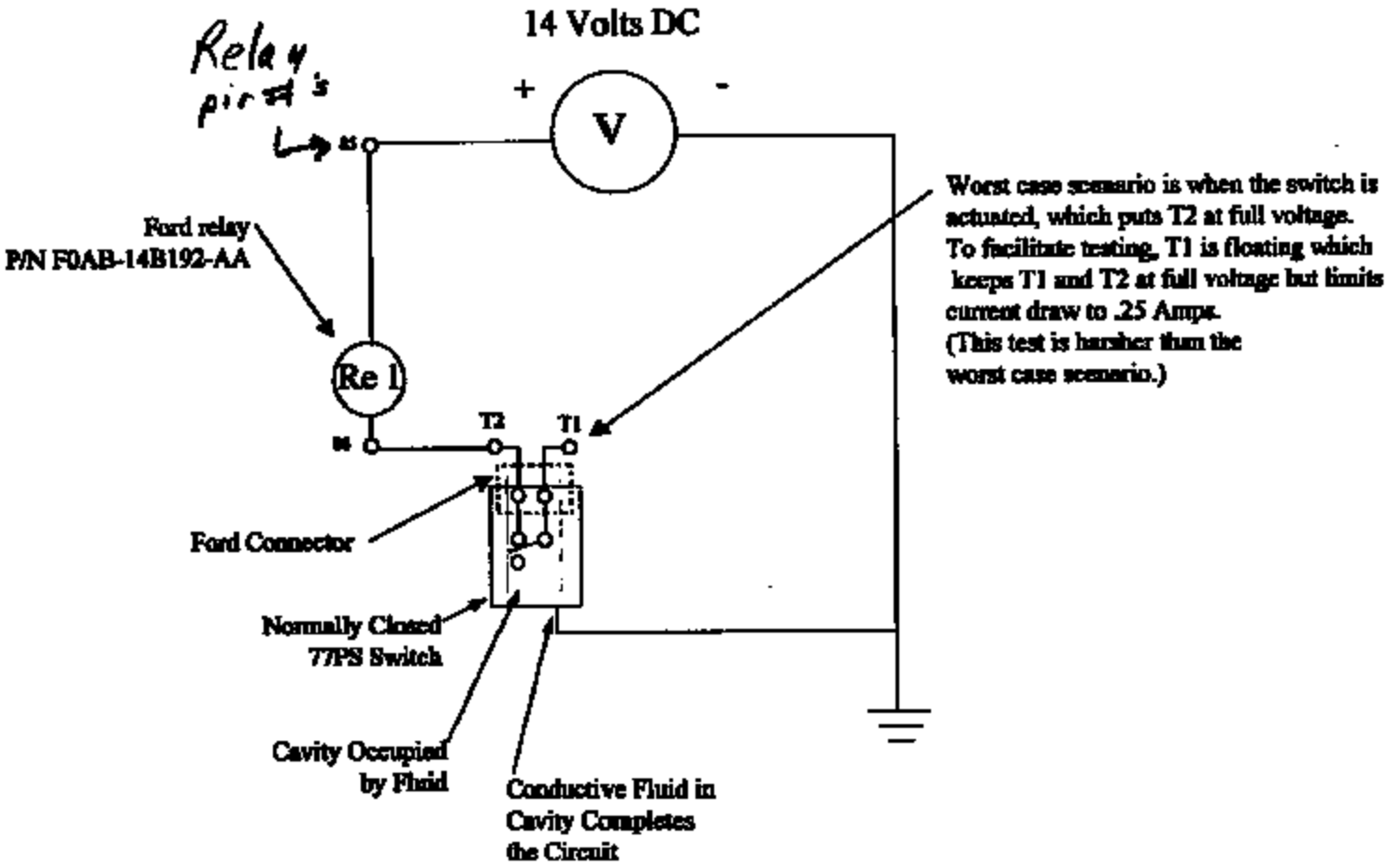
Please find an updated schematic of the proposed test circuit included on page (2) of this fax. This schematic includes Ford relay P/N F0AB-14B192-AA. Please phone me after you review the schematic. Page (3) shows how this relay may be used in Ford application.

Thank you,

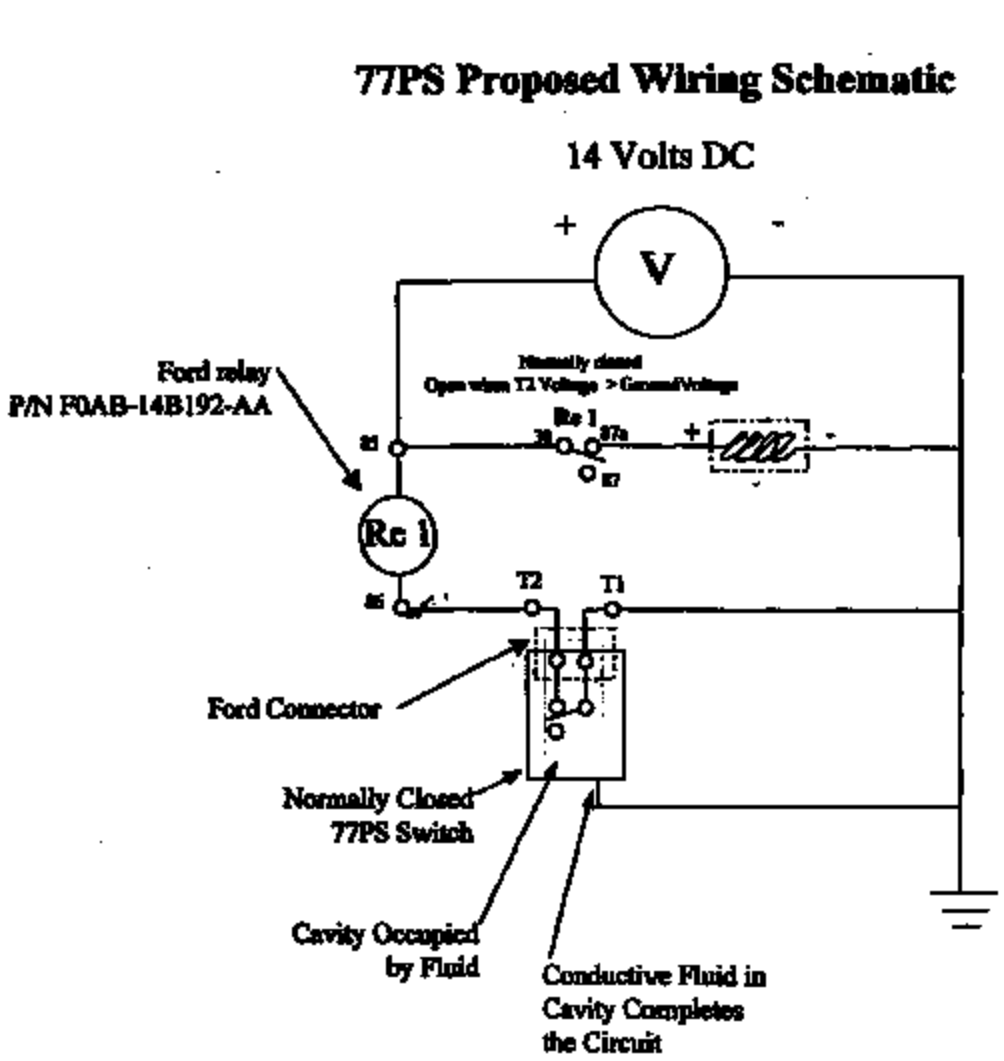
Sean Mulligan

TEXAS INSTRUMENTS INCORPORATED * PO BOX 2964 * 34 FOREST STREET * ATTLEBORO, MA 02703

TI Test Setup



77PS Proposed Wiring Schematic



(3)

TI-NHTSA 016865

Epstein, Sally

From: Roy, Norman [nroy@email.mc.ti.com]
Sent: Thursday, April 08, 1999 8:09 AM
To: McGuirk, Andy
Subject: FW: Materials Recommendations for Flammability Issue

Andy,

Attached is the reply from Ticona regarding material pedigree with additional info regarding effect of colorants. The current runnerless system in the 46515 mold uses heat pipe technology that is not recommended for LCP materials. We are also getting an answer on its compatability with the Zytel material.

Regards,

Norm

From: Dunn, Kevin
Sent: Tuesday, April 06, 1999 9:52 AM
To: Roy, Norman
Subject: FW: Materials Recommendations for Flammability issue

---

From: kprice@ticona.com[SMTP:kprice@ticona.com]
Sent: Tuesday, April 06, 1999 9:45 AM
To: kdunn@email.mc.ti.com
Cc: rfyurachek@ticona.com
Subject: RE: Materials Recommendations for Flammability issue

Mr. Dunn,

The samples sent to you labeled as Celanex 3316 were in fact Celanex 3316. A non-technical test, such as exposing a sample to a simple kitchen match under non-controlled conditions, will yield misleading results. The UL-94 flammability tests are very specific in nature. Items which must be carefully controlled include sample orientation (vertical or horizontal), sample size and thickness, burner size and regulator, type of gas used to supply burner, flame height, temperature and relative humidity. The time that the flame is applied and the relative orientation of the flame to the specimen are also carefully controlled.

I can send you a copy of the procedure, but in order to perform the test properly, you must have the right equipment. If you want a copy, please provide your fax number.

The tensile bar probably behaved better because it was thicker. Colorants can have an effect on the flammability. We have pre-colored materials which have been rated in the UL-94 test. For example, Celanex 3316 natural is rated V-0 down to 0.38 mm thickness, while all other colors are rated V-0 down to 0.75 mm thickness. The natural material is more robust in its flame retardancy.

Celanex 3316 has been successfully used in hot runner systems.

Ken Price

TI-NHTSA 016866

-----Original Message-----
From: Yurachek, Robert, TP/US
Sent: Tuesday, April 06, 1999 12:55 AM
To: Price, Kenneth, TP/US
Subject: FW: Materials Recommendations for Flammability issue
Importance: High

Ken:

Please contact Kevin and respond to his request. Thanks and please copy me.

Bob

-----Original Message-----
From: Dunn, Kevin [mailto:kdunn@email.mc.ti.com]
Sent: Monday, April 05, 1999 2:52 PM
To: rfyurachek@ticona.com
Subject: FW: Materials Recommendations for Flammability issue

Hi Bob, Would you please verify that the test bars were 3316 material. Also
please check for alternatives.

As you can see, things are getting more attention at the customer.

Kevin

From: Roy, Norman
Sent: Monday, April 05, 1999 9:00 AM
To: Dunn, Kevin
Subject: FW: Materials Recommendations for Flammability issue

Kevin,

Would you please follow-up with Ticona to insure the sample of Celanex 3316
was indeed that. Also would adding colorant reduce the V-0 flammability
rating of the sample Ticona submitted. Feedback from our customer is that
the 3316 was no better than the 4300 material when subjected to a
non-technical type of flammability test, i.e., "the kitchen match test".
However, it was reported that the tensile bars behaved better.

The customer is now getting input to move to a higher melt temperature
material such as an LCP that would, in addition to a V-0 rating, provide the
flammability resistance they need. Another material being suggested is
Dupont Zytel HTN FR52G30BL which is lower cost. Does Ticona have any
recommendations keeping in mind that the mold is equipped with a Kona hot
runner system?

Please get a response from Ticona on these questions ASAP.

Regards,

Norm

TI-NHTSA 016867

From: McGuirk, Andy
Sent: Thursday, April 01, 1999 5:44 PM
To: Porter, F.J.; 'Steve Reimers'
Cc: Roy, Norman; Dague, Bryan
Subject: RE: Materials Recommendations for Flammability issue

Steve, got your voice mail and did act upon it.

norm roy is our in-house plastic molding coordinator and has initiated considerations of various plastics. our first concern was 'knit line' integrity of the LCP which might create a mechanical weakness issue. alternates were being reviewed.

also, norm was going to review our celenex 3316 pedigree to assure it was what it should have been as it 'acted' too similar to 4300.

TI-NHTSA 016868

Epstein, Sally

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Thursday, April 08, 1999 10:37 AM
To: 'Frederick J. Porter'
Subject: Materials Recommendations for Flammability issue

Importance: High

PER MY TELECON

SEVERAL POINTS.....

THE 3316 SAMPLES WERE 3316.

THE 'SIMPLE TEST' WE HAVE USED WITH A KITCHEN MATCH IS NOT 'SANCTIONED' AS A TEST..(but seems to be a pretty good indicator)

COLORANTS ARE KNOWN TO AFFECT FLAMMABILITY

STEVE REIMERS HAD OFFERED TO OBTAIN SOME Dupont Zytel HTN FR52G30BL
.....CAN WE GET SOME ASAP TO SAMPLE IN OUR MOLD ?

SHOULD I GET IT HERE?

A
AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Roy, Norman
Sent: Thursday, April 08, 1999 9:09 AM
To: McGuirk, Andy
Subject: FW: Materials Recommendations for Flammability issue

Andy,

Attached is the reply from Ticona regarding material pedigree with additional info regarding effect of colorants. The current runnerless system in the 46515 mold uses heat pipe technology that is not recommended for LCP materials. We are also getting an answer on its compatability with the Zytel material.

Regards,

TI-NHTSA 016869

Norm

From: Dunn, Kevin
Sent: Tuesday, April 06, 1999 9:52 AM
To: Roy, Norman
Subject: FW: Materials Recommendations for Flammability issue

---

From: kprice@ticona.com[SMTP:kprice@ticona.com]
Sent: Tuesday, April 06, 1999 9:45 AM
To: kdunn@email.mc.ti.com
Cc: rfyurachek@ticona.com
Subject: RE: Materials Recommendations for Flammability issue

Mr. Dunn,

The samples sent to you labeled as Celanex 3316 were in fact Celanex 3316. A non-technical test, such as exposing a sample to a simple kitchen match under non-controlled conditions, will yield misleading results. The UL-94 flammability tests are very specific in nature. Items which must be carefully controlled include sample orientation (vertical or horizontal), sample size and thickness, burner size and regulator, type of gas used to supply burner, flame height, temperature and relative humidity. The time that the flame is applied and the relative orientation of the flame to the specimen are also carefully controlled.

I can send you a copy of the procedure, but in order to perform the test properly, you must have the right equipment. If you want a copy, please provide your fax number.

The tensile bar probably behaved better because it was thicker. Colorants can have an effect on the flammability. We have pre-colored materials which have been rated in the UL-94 test. For example, Celanex 3316 natural is rated V-0 down to 0.38 mm thickness, while all other colors are rated V-0 down to 0.75 mm thickness. The natural material is more robust in its flame retardancy.

Celanex 3316 has been successfully used in hot runner systems.

Ken Price

> -----Original Message-----
> From: Yurachek, Robert, TP/US
> Sent: Tuesday, April 06, 1999 12:55 AM
> To: Price, Kenneth, TP/US
> Subject: FW: Materials Recommendations for Flammability issue
> Importance: High
>
> Ken:
>
> Please contact Kevin and respond to his request. Thanks and please copy me.
>
> Bob
>
> -----Original Message-----
> From: Dunn, Kevin [mailto:kdunn@email.mc.ti.com]
> Sent: Monday, April 05, 1999 2:52 PM
> To: rfyurachek@ticona.com

TI-NHTSA 016870

Subject: FW: Materials Recommendations for Flammability issue

Hi Bob, Would you please verify that the test bars were 3316 material. Also
please check for alternatives.

As you can see, things are getting more attention at the customer.

Kevin

From: Roy, Norman
Sent: Monday, April 05, 1999 9:00 AM
To: Dunn, Kevin
Subject: FW: Materials Recommendations for Flammability issue

Kevin,

Would you please follow-up with Ticona to insure the sample of Celanex 3316
was indeed that. Also would adding colorant reduce the V-0 flammability
rating of the sample Ticona submitted. Feedback from our customer is that
the 3316 was no better than the 4300 material when subjected to a
non-technical type of flammability test, i.e., "the Kitchen match test".
However, it was reported that the tensile bars behaved better.

The customer is now getting input to move to a higher melt temperature
material such as an LCP that would, in addition to a V-0 rating, provide the
flammability resistance they need. Another material being suggested is
Dupont Zytel HTN FR52G30BL which is lower cost. Does Ticona have any
recommendations keeping in mind that the mold is equipped with a Kona hot
runner system?

Please get a response from Ticona on these questions ASAP.

Regards,

Norm

From: McGuirk, Andy
Sent: Thursday, April 01, 1999 5:44 PM
To: Porter, F.J.; 'Steve Reimers'
Cc: Roy, Norman; Daque, Bryan
Subject: RE: Materials Recommendations for Flammability issue

Steve, got your voice mail and did act upon it.

norm roy is our in-house plastic molding coordinator and has initiated
considerations of various plastics. our first concern was 'knit line'
integrity of the LCP which might create a mechanical weakness issue.

TI-NHTSA 01687

alternates were being reviewed.

also, norm was going to review our celanex 3316 pedigree to assure it was what it should have been as it 'acted' too similar to 4300.

TI-NHTSA 016872

Epstein, Sally

From: McGuirk, Andy [a-mcguirk@email.mc.il.com]
Sent: Thursday, April 08, 1999 12:32 PM
To: 'Frederick J. Porter'
Subject: SUPPLY CHAIN MANAGEMENT

FRED, I BELIEVE WE WILL SEE THAT ALL PRESSURE SWITCHES FOR THE TOWN CAR PLATFORM TRAVELED THROUGH HILITE INDUSTRIES (PITTS/MAPCO/SURFACES & HILITE) IN TEXAS FOR ASSEMBLY INTO THE PROP VALVE. HAVE YOU HAD DIALOGUE WITH THEM ABOUT PROCESS AND TEST PROTOCOL AND SPECIFICS ABOUT CLEANING OF THE PROP VALVE AND RINSE REGARDING FLUIDS AND RESIDUES ? IS THERE A CHANCE THAT SOME OF THOSE FLUIDS DRIP OUT OF A PROP VALVE AND INTO ELECTRIC SWITCH WHEN THEY ARE MOUNTING/PACKING THE VALVE ?? THERE JUST MIGHT BE A DISTINCTION SOMEWHERE IN THERE THAT HELPS FOCUS.

MEDHAT HABASHI IS THE QUALITY MANAGER THERE AT CARROLLTON, TX AT (972) 242-3432.

MEDHAT AND I HAVE WORKED SEVERAL PRODUCT ISSUES OVER THE YEARS AND WE KNOW EACH OTHER.

A
AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

Epstein, Sally

From: Steve Reimers (sreimers@ford.com)
Sent: Thursday, April 08, 1999 12:51 PM
To: Porter, F.J.; McGuirk, Andy
Subject: Materials Recommendations for Flammability issue

I have asked Paul Kane at Dupont to send a sample of Zytel to TI, Garry Torino
....

Steve Reimers building S 3E008
RVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-04145 />
*** Forwarding note from FPORTER --DRBN007 04/08/99 12:47 ***
To: SREIMERS--DRBN007

FROM: F. J. Porter USAET(UTC -04:00)
Subject: Materials Recommendations for Flammability issue

Please get the material that Andy asked for.

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 PIR4394A--EXTERNAL 04/08/99 11:48 ***
To: FPORTER --FORDMAIL 'Frederick J. Port

From: McGuirk, Andy
Subject: Materials Recommendations for Flammability issue

From: "McGuirk, Andy"<a-mcguirk@email.mc.ti.com>

PER MY TELECON

SEVERAL POINTS.....

THE 3316 SAMPLES WERE 3316.

THE 'SIMPLE TEST' WE HAVE USED WITH A KITCHEN MATCH IS NOT 'SANCTIONED' AS A TEST..(but seems to be a pretty good indicator)

COLORANTS ARE KNOWN TO AFFECT FLAMMABILITY

STEVE REIMERS HAD OFFERED TO OBTAIN SOME Dupont Zytel NTN FR52G30SL
.....CAN WE GET SOME ASAP TO SAMPLE IN OUR MOLD ?

SHOULD I GET IT HERE?

TI-NHTSA 016874

A
AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Roy, Norman
Sent: Thursday, April 08, 1999 9:09 AM
To: McGuirk, Andy
Subject: FW: Materials Recommendations for Flammability issue

Andy,

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Regards,

Norm

From: Dunn, Kevin
Sent: Tuesday, April 06, 1999 9:52 AM
To: Roy, Norman
Subject: FW: Materials Recommendations for Flammability issue

---

From: kprice@ticona.com[SMTP:kprice@ticona.com]
Sent: Tuesday, April 06, 1999 9:45 AM
To: kdunn@email.mc.ti.com
Cc: rfyurachek@ticona.com
Subject: RE: Materials Recommendations for Flammability Issue

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TI-NHTSA 016875

retardancy.

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Ken Price

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From: Yurachek, Robert, TP/US
Sent: Tuesday, April 06, 1999 12:55 AM
To: Price, Kenneth, TP/US
Subject: FW: Materials Recommendations for Flammability issue
Importance: High

Ken:

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Bob

-----Original Message-----
From: Dunn, Kevin [mailto:kdunn@email.mc.ti.com]
Sent: Monday, April 05, 1999 2:52 PM
To: rfyurachek@ticona.com
Subject: FW: Materials Recommendations for Flammability issue

Hi Bob, Would you please verify that the test bars were 3316 material. Also
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Kevin

From: Roy, Norman
Sent: Monday, April 05, 1999 9:00 AM
To: Dunn, Kevin
Subject: FW: Materials Recommendations for Flammability issue

Kevin,

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material such as an LCP that would, in addition to a V-0 rating, provide the
flammability resistance they need. Another material being suggested is
Dupont Zytel HTN FR52G30BL which is lower cost. Does Ticona have any
recommendations keeping in mind that the mold is equipped with a Kona hot
runner system?

TI-NHTSA 016876

Please get a response from Ticona on these questions ASAP.

Regards,

Norm

From: McGuirk, Andy
Sent: Thursday, April 01, 1999 5:44 PM
To: Porter, F.J.; 'Steve Reimers'
Cc: Roy, Norman; Dague, Bryan
Subject: RE: Materials Recommendations for Flammability issue

Steve, got your voice mail and did act upon it.

norm roy is our in-house plastic molding coordinator and has initiated considerations of various plastics. our first concern was 'knit line' integrity of the LCP which might create a mechanical weakness issue. alternates were being reviewed.

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TI-NHTSA 016877

Epstein, Sally

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Friday, April 09, 1999 1:28 PM
To: Roy, Norman
Cc: Pechonis, John; Beringhause, Steven
Subject: FW: Zytel Sample to TI

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Paul J Kane[SMTP:Paul.J.Kane@USA.dupont.com]
Sent: Friday, April 09, 1999 12:34 PM
To: Steve Reimers
Cc: A-mcguirk@ti.com; swalters@ti.com
Subject: Re: Zytel Sample to TI

The V-0(flame retardant) high temperature Zytel HTN FR52G30BL NC010 (natural color) will arrive at TI on Monday April 12. I talked with Andy McGuirk and Steve Walters (molding responsibility) about this product and have fax'd the processing guidelines to Steve. This product will have a 160F higher melt point over the Celanex 4300 and a 100F higher melt point over the Noryl GTX 830 (a nylon alloy). It will also have much better flow and dimensional stability over the Noryl GTX 830. Paul 248-583-8107

TI-NHTSA 016878

Epstein, Sally

From: Hopkins, AL [ahopkins@email.mo.ti.com]
Sent: Tuesday, April 13, 1999 3:16 PM
To: McGuirk, Andy
Subject: Fax to Ford

Andy, here is the cover sheet that I was going to fax to Ford with the data. How does it look?

<<Ford Letter.doc>>

Al

TI-NHTSA 016879

[Click here and type address]

[redacted]simile transmittal

To:	Rock Carter	Fax:	313-621-0646
From:	Al Hopkins (Texas Instruments	Date:	07/12/99
Re:	SEM-EDS Data Collected at TI	Pages:	This Cover Sheet & 41 Pages of Data
CC:	[Click here and type name]		

☐ Urgent x For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Rock, this data was accumulated while Ford Engineering was present. They took copies of this data and all the actual parts of the sample. They had, however, left the small amounts of debris for our Chem Lab to perform FTIR analysis to check if there was brake fluid present. In fact, the FTIR analysis showed that this was the case.

As you know, we subsequently were requested to send this small amount of debris (wrapped in aluminum foil) back to Ford. I would think that it would be much more useful to examine the actual vehicle itself.

In any case, this is the key to the data. I am going to try to E-mail you the photos electronically tomorrow. If you have any questions, feel free to call me at [redacted].

Sample	Pages	Photos	Spectra
Top Surf of Cup After Degreasing	1-14	01-05	001-009
Terminal Cavity after Disassembly	15-28	06-15	010-013
"A" -Black Flake from Trough	29-31	20	020-021
"B" - Material Scraped from Cup Assembly	32-37	21	022-026
"C" - Green Material on Cup	38-41	22	027-029

Regards,

Al

Hopkins, AL

From: Hopkins, AL
Sent: Wednesday, April 14, 1999 9:48 AM
To: 'FORD- Rock Carter'
Subject: Electronic Image Versions of Photos that had been Faxed on 4/13/99

Rock,

This is the text of the FAX that I sent you yesterday. The Fax was acting up yesterday so I had to send it in three separate pieces. You should have pages 1-41.

Rock, this data was accumulated while Ford Engineering was present. They took copies of this data and all the actual parts of the sample. They had, however, left the small amounts of debris for our Chem Lab to perform FTAR analysis to check if there was brake fluid present. In fact, the FTAR analysis showed that this was the case.

As you know, we subsequently were requested to send this small amount of debris (wrapped in aluminum foil) back to Ford. I would think that it would be much more useful to examine the actual switch itself.

In any case, this is the key to the data. I am going to try to E-mail you the photos electronically tomorrow. If you have any questions, feel free to call me at 508-236-3040.

Sample	Pages	Photos	Spectra
Top Surf of Cup After Degreasing	1-14	01-05	001-009
Terminal Cavity after Disassembly	15-28	06-15	010-013
"A" -Black Flake from Trough	29-31	20	020-021
"B" - Material Scraped from Cup Assembly	32-37	21	022-026
"C" - Green Material on Cup	38-41	22	027-029

The following images are Windows PCX bit maps. They don't have any annotation on them but you can probably read that off of the faxed copy. The last two digits on the file names are the photo numbers.

If you have any questions, feel free to call. There aren't many spectra from the Terminal Cavity After Disassembly

because I couldn't avoid shadowing without additional disassembly that Ford Engineering didn't want to do at the time.

Regards,

Al

Epstein, Sally

From:	McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent:	Thursday, April 15, 1999 7:54 AM
To:	'Frederick J. Porter'
Subject:	FW: Electronic Image Versions of Photos that had been Faxed on 4/ 13/99

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
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TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 504-2044

From: Hopkins, AL
Sent: Thursday, April 15, 1999 8:46 AM
To: McGuirk, Andy
Subject: FW: Electronic Image Versions of Photos that had been Faxed on 4/13/99

Here is Rock's response

From: Roscoe Carter[SMTP:rcarter@ford.com]
Sent: Thursday, April 15, 1999 8:37 AM
To: 'Hopkins, AL'
Subject: RE: Electronic Image Versions of Photos that had been Faxed on 4/13/99

Al - Thanks for the pictures and the cooperation is great. The electronic pictures are much better than the faxed ones. Thanks again ROC FORD Research

---

From: Hopkins, AL[SMTP:ahopkins@email.mc.ti.com]
Sent: Wednesday, April 14, 1999 9:49 AM
To: FORD- Rock Carter
Subject: Electronic Image Versions of Photos that had been Faxed on 4/13/99

<<File: dague_150709_01.pcx>><<File: dague_150709_02.pcx>><<File: dague_150709_03.pcx>><<File: dague_150709_04.pcx>><<File: dague_150709_05.pcx>><<File: dague_150709_06.pcx>><<File: dague_150709_07.pcx>><<File: dague_150709_08.pcx>><<File: dague_150709_09.pcx>><<File: dague_150709_10.pcx>><<File: dague_150709_11.pcx>><<File: dague_150709_12.pcx>><<File: dague_150709_13.pcx>><<File: dague_150709_14.pcx>><<File: dague_150709_15.pcx>><<File: dague_150709_20.pcx>><<File: dague_150709_21.pcx>><<File: dague_150709_22.pcx>>Rock,

This is the text of the FAX that I sent you yesterday. The fax was acting up yesterday so I had to send it in three separate pieces. You should have pages 1-41.

Rock, this data was accumulated while Ford Engineering was present. They took copies of this data and all the actual parts of the samplm. They had, however, left the small amounts of debris for our Chem Lab to perform FT/IR analysis to check if there was brake fluid present. In fact, the FT/IR

analysis showed that this was the case.

As you know, we subsequently were requested to send this small amount of debris (wrapped in aluminum foil) back to Ford. I would think that it would be much more useful to examine the actual switch itself.

In any case, this is the key to the data. I am going to try to E-mail you the photos electronically tomorrow. If you have any questions, feel free to call me at 508-236-3040.

<<...>>

The following images are Windows PCX bit maps. They don't have any annotation on them but you can probably read that off of the faxed copy. The last two digits on the file names are the photo numbers.

<<dague_150709_01.pcx>> <<dague_150709_02.pcx>> <<dague_150709_03.pcx>>
<<dague_150709_04.pcx>> <<dague_150709_05.pcx>> <<dague_150709_06.pcx>>
<<dague_150709_07.pcx>> <<dague_150709_08.pcx>> <<dague_150709_09.pcx>>
<<dague_150709_10.pcx>> <<dague_150709_11.pcx>> <<dague_150709_12.pcx>>
<<dague_150709_13.pcx>> <<dague_150709_14.pcx>> <<dague_150709_15.pcx>>
<<dague_150709_20.pcx>> <<dague_150709_21.pcx>> <<dague_150709_22.pcx>>

If you have any questions, feel free to call. There aren't many spectra from the Terminal Cavity After Disassembly because I couldn't avoid shadowing without additional disassembly that Ford Engineering didn't want to do at the time.

Regards,

Al

TI-NHTSA 016884

Epstein, Sally

From: Hopkins, AL [ahopkins@email.mc.ti.com]
Sent: Thursday, April 15, 1999 7:47 AM
To: McGuirk, Andy
Subject: FW: Electronic Image Versions of Photos that had been Faxed on 4/ 13/99

Here is Rock's response

From: Roscoe Carter[SMTP:rcarter6ford.com]
Sent: Thursday, April 15, 1999 8:37 AM
To: 'Hopkins, AL'
Subject: RE: Electronic Image Versions of Photos that had been Faxed on 4/13/99

Al - Thanks for the pictures and the cooperation is great. The electronic pictures are much better than the faxed ones. Thanks again ROC FORD Research

---

From: Hopkins, AL[SMTP:ahopkins@email.mc.ti.com]
Sent: Wednesday, April 14, 1999 9:49 AM
To: FORD- Rock Carter
Subject: Electronic Image Versions of Photos that had been Faxed on 4/13/99

<<File: dague_150709_01.pcx>><<File: dague_150709_02.pcx>><<File: dague_150709_03.pcx>><<File: dague_150709_04.pcx>><<File: dague_150709_05.pcx>><<File: dague_150709_06.pcx>><<File: dague_150709_07.pcx>><<File: dague_150709_08.pcx>><<File: dague_150709_09.pcx>><<File: dague_150709_10.pcx>><<File: dague_150709_11.pcx>><<File: dague_150709_12.pcx>><<File: dague_150709_13.pcx>><<File: dague_150709_14.pcx>><<File: dague_150709_15.pcx>><<File: dague_150709_20.pcx>><<File: dague_150709_21.pcx>><<File: dague_150709_22.pcx>>Rock,

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As you know, we subsequently were requested to send this small amount of debris (wrapped in aluminum foil) back to Ford. I would think that it would be much more useful to examine the actual switch itself.

In any case, this is the key to the data. I am going to try to E-mail you the photos electronically tomorrow. If you have any questions, feel free to call me at 508-236-3040.

<<...>>

The following images are Windows PCX bit maps. They don't have any

TI-NHTSA 016885

annotation on them but you can probably read that off of the faxed copy. The last two digits on the file names are the photo numbers.

<<dague_150709_01.pcx>> <<dague_150709_02.pcx>> <<dague_150709_03.pcx>>
<<dague_150709_04.pcx>> <<dague_150709_05.pcx>> <<dague_150709_06.pcx>>
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<<dague_150709_20.pcx>> <<dague_150709_21.pcx>> <<dague_150709_22.pcx>>

If you have any questions, feel free to call. There aren't many spectra from the Terminal Cavity After Disassembly because I couldn't avoid shadowing without additional disassembly that Ford Engineering didn't want to do at the time.

Regards,

Al

TI-NHTSA 016886

Epstein, Sally

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Thursday, April 15, 1999 7:56 AM
To: 'Frederick J. Porter'
Subject: FW: ANDY.xls

FRED, THIS SHOULD BE A VERY CLEAR HISTORY OF THE '92-'97 P/S SHIP-TO HISTORY.....INCLUDING TYPE AND COLOR OF PLASTIC USED.

A

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 804-2044

<<ANDY.xls>>

DRAWINGS AVAILABLE UPON REQUEST

Currey, Pat

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Friday, April 16, 1999 3:43 PM
To: 'Frederick J. Porter'
Subject: Launch/PPAP/SREA dates- Changes via SREA- Alerts

77PS SREA-ALERT UPDATE.XLS

PER OUR TELECON, THIS WAS AN 'OLD' PEB INVESTIGATION INTO CHANGES OF RECORD IN THE 91-94 TIMEFRAME.

WE SAW NOTHING IN HERE OF 'SIGNIFICANCE' AS WE REVIEWED THE CHANGES OVER

A
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PAGE: (800) 467-3700 PIN 604-2044

<<77PS SREA-ALERT UPDATE.XLS>>

TI-NHTSA 018891

77PS-SREA-ALERT UPDATE

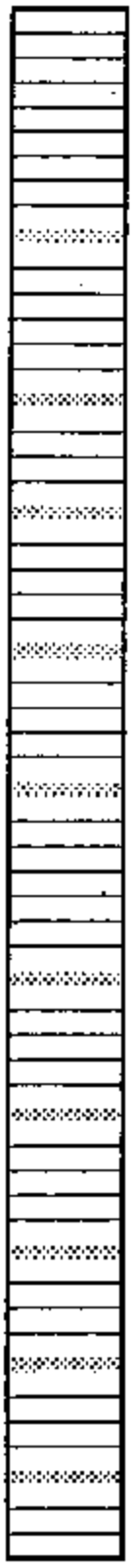
Entry No.	SREA/ALERT No.	DATE SUBMITTED	VALUE IMPROVEMENT	FORD P.N.	TI-P. N.
1	409666	27-Feb-95	Use of alternate pressure	F2AC-9F924-AA	77PSL3-1
			barier for capacity improvement.	F2VC-9F924-AB	77PSL2-1
			Scribe mark indicating "test	F3DC-9F924-AA	77PSL5-2
			pass" to be on crimp ring	F58A-9F924-AA	77PSL3-2
			rather than on the plastic	F3TA-9F924-CA	77PSL3-3
			connector base.		
2	409668	27-Feb-95	Use of 10L07 steel from cold headed	F2AC-9F924-AA	77PSL3-1
			supplier in lieu of 10L10 steel due to	F2VC-9F924-AB	77PSL2-1
			temporary material supply interruption.	F3DC-9F924-AA	77PSL5-2
			10L07 steel made with same	F58A-9F924-AA	77PSL3-2
			process.	F3TA-9F924-CA	77PSL3-3
3	409937	8-Sep-94	Change p.n. from	94DA-9F924AB	77PSL4-1
			p.n. 94DA-9F924AA to		
			p.n. 94DA-9F924AB		
4	409911	17-Mar-94	Use of color pigments in plastic	F3TA-9F924-CA	77PSL3-3
			base containing alternate		
			material in lieu of heavy metal		
			per governmental regulations		
5	282442	22-Jan-93	Use of part submission of	F3TA-9F924-CA	77PSL3-3
			prior level "BA". Converting		
			from snap to quiet disc switch.		
			Change is to internal disc only.		
6	147693	2-Dec-92	Reduce internal cup dimension	F2VC-9F924-AB	77PSL2-1
			by .004" from .091" to .087" nominal.	F2AC-9F924-AA	77PSL3-1
			Address potential open circuit	F3DC-9F924-AA	77PSL5-2
			condition under vacuum, based		
			to disc envelope under stack-		
			up conditions		
7	147675	21-Nov-91	Change thread gaging specification	F3TA-9F924-CA	77PSL3-3
			from 2A go to 3A go ring gage.		
			Use of ANSI B1.1 Industry Standard for		
			plated thread allowance.		
8	147671	6-Nov-91	Use blue colored environmental	F2VC-9F924-AB	77PSL2-1
			seal in lieu of reddish color with black		
			stripe to help differentiate seal;		
			to reduce potential assembly errors.		
9	149555	3-Apr-91	Change terminal position	F2TA-9C888-AA	57PSL5-2
			dimension from 0.60+/- 0.20mm		
			to 0.60+/-0.25mm		
10	147866	3-Apr-91	Change terminal position	F3TA-9F924-CA	77PSL3-3
			dimension from 0.60+/- 0.20mm		
			to 0.60+/-0.25mm		
11	Alert No. A10166193	11-Oct-91	Use of manually loaded sensor crimp	F2VC-9F924-AB	77PSL2-1
			machine vs auto in-line loaded crimper.		
			Manual crimp passes SS tests.		

TI-NHTSA 016892

\ps on klixon\quality\J. Watt

Updated 7/12/99

77PS-SREA-ALERT UPDATE



TI-NHTSA 016993

\ps on ktlxcn\quality\J. Watt

Updated 7/12/99

Spotain, Sally

From: Hall, Alison [a-hall1@ansat.mc.ti.com]
Sent: Wednesday, April 21, 1999 12:44 PM
To: Sharpe, Robert
Subject: info [redacted] Barb Foster - Ford Service

Importance: High

Barb mentioned Ford Service requested 20k parts over the next 90 days of 77ESL2-1 for a recall. Just a heads up in case you have not heard.

Regards

Alison
Alison H. Hall
Texas Instruments
Phone: 248-305-9709
Fax: 248-305-5734

TI-NHTSA 016894

Carrey, Pat

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Sunday, April 25, 1999 11:55 AM
To: Mulligan, Sean
Subject: FW: Switch Log and Eval. Procedure


AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Rahman, Aziz
Sent: Thursday, February 18, 1999 1:45 PM
To: 'Fred Porter (Ford)'; 'Norm LaPointe (Ford)'; 'Steve LaRouche (Ford)'; 'Steve Reimers (Ford)'
Cc: Beringhause, Steven; Dague, Bryan; Baumann, Russ; McGuirk, Andy; Sharpe, Robert
Subject: Switch Log and Eval. Procedure

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

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

I suggest that the switch analysis priority be as follows:

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

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

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

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

Please comment.

Thanks
Aziz

TI-NHTSA 016896

DRAWINGS AVAILABLE UPON REQUEST

Currey, Pat

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Sunday, April 25, 1999 11:55 AM
To: Mulligan, Sean
Subject: FW: Switch Evaluation Plan.xls

Brake Pressure Switch Evaluati...

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TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Rahman, Aziz
Sent: Thursday, February 18, 1999 10:21 AM
To: 'Fred Porter (Ford)'; 'Norm LaPointe (Ford)'; 'Steve LaRouche (Ford)'; 'Steve Reimers (Ford)'
Cc: Beringhause, Steven; Dague, Bryan; Baumann, Russ; Sharpe, Robert; McGuirk, Andy
Subject: Switch Evaluation Plan.xls

<<Brake Pressure Switch Evaluation Plan.xls>>

Revised to include Switch dissection procedures.

Regards
Aziz.

TI-NHTSA 016900

Currey, Pat

From: McGuirk, Andy [a-mcguirk@email.mo.ti.com]
Sent: Friday, April 23, 1999 2:56 PM
To: Dague, Bryan; Mulligan, Sean
Cc: Beringhause, Steven
Subject: FW: Printable Ford Findings

Ford Findings.doc

I ASKED AL TO USE THIS AS A FRAME FOR HIS FEEDBACK REPORTS

A

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3060
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Hopkins, AL
Sent: Friday, April 23, 1999 1:11 PM
To: McGuirk, Andy
Subject: Printable Ford Findings

This prints out on a single sheet of paper. I had to remove VINS and Date Codes

<<Ford Findings.doc>>

Regards,

Al

TI-NHTSA 016901

Sample	Condition	Hexport, Washer, Connector, and Spacer	Seals	Cup	Base/Switch Cavity/Terminals
Reddick (Memphis, 1993 Town Car)	Partially burned.	Black residue containing glycol based material (probably brake fluid) and a metal oxide. Indicates presence of brake fluid on fluid and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. All three Kapton seals are buckled and exhibit brittle cracks which most likely formed leak path. Damage appears to have initiated in seal closest to washer. Damaged Kapton darkened and embrittled by unknown mechanism.	Green Deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product. Glycol based material (probably brake fluid) also detected in this area.	Base separated below crimp ring. Transfer pin and movable contact missing. Stationary contact exhibits loss of material due to corrosion, evidence of electrification, stress corrosion cracking. Base of movable contact melted back into bulkhead between switch and terminal cavities. Appears to have occurred in later stages of event. Surfaces of terminals covered with black and green deposits which appear to be sulfur compounds of the terminal materials.
A (1993 Town Car, Houston)	Burned	Elements from contact material detected at fitting end of hexport. Indicate possible flow of fluid back through seals.	Gasket and environmental seal missing. Charred fragments Kapton seals remain.	Deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product.	Base, stationary contact, movable contact, and terminals missing.
B (1992 Town Car, Houston)	Burned	Elements from contact material detected at fitting end of hexport. Indicate possible flow of fluid back through seals.	Not permitted to disassemble switch.	Deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product.	Transfer pin and movable contact missing. Stationary contact exhibits crack in similar location as that in Reddick sample.
C (1992 Town Car, Houston)	Burned	Elements from contact material detected at fitting end of hexport. Indicate possible flow of fluid back through seals. Black deposit in cavity currently being analyzed (possibly charred gasket).	Gasket appears chewed. Environmental seal missing. Damage to Kapton seals currently being evaluated.	Deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product.	Base, stationary contact, movable contact, and terminals missing.
D (1997 Crown Victoria)	Apparent leakage.	Black residue containing glycol based material (probably brake fluid) and a metal oxide. Indicates presence of brake fluid on fluid and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. Kapton seals exhibit damage similar to that found in Reddick sample. All three exhibit brittle cracks which most likely formed a leak path.	Dark green deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product. Liquid in interior and on face of cup is glycol based (probably brake fluid).	Switch cavity and terminal cavity contain glycol based material (probably brake fluid). Contacts appear intact. Dark green deposits on movable and stationary contacts contain elements from brass contact material. Terminals appear clean (no apparent deposits or corrosion).
E (911 from survey)	No leaks or other apparent problems.	Black residue containing glycol based material (probably brake fluid) and a metal oxide. Indicates presence of brake fluid on fluid and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. Kapton seals exhibit deformation and buckling similar to that found in Reddick sample. Cracking on surfaces suggest incipient damage is occurring.	Face of cup appears clean and dry.	Switch cavity and terminal cavity appear clean and dry. No apparent deposits or corrosion.
F FT-001289	Apparent leakage	Black residue containing glycol based material (probably brake fluid) and a metal oxide. Indicates presence of brake fluid on fluid and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. Kapton seals exhibit damage similar to that found in Reddick sample. All three exhibit brittle cracks which most likely formed a leak path.	Dark green deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product. Liquid in interior and on face of cup is glycol based (probably brake fluid).	Switch cavity and terminal cavity contain glycol based material (probably brake fluid). Stationary contact is intact, but does show stress corrosion cracking in progress in bridge area (same location as in Reddick switch). Movable contact appears to have separated as a result of loss of material (~50% of thickness) due to corrosion. No evidence of heating or arc damage. Dark green deposits on movable and stationary contacts contain elements from brass contact material, as well as sulfur. Terminals exhibit green deposits (currently being analyzed). Deposits extend in from both sides of bulkhead between switch and terminal cavities, but do not meet.

Central Laboratory

TI-NHTSA 018802

Currey, Pat

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Monday, April 26, 1999 6:05 AM
To: Warner, Pam
Subject: FW: Printable Ford Findings

Ford Findings.doc

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Hopkins, AL
Sent: Friday, April 23, 1999 1:11 PM
To: McGuirk, Andy
Subject: Printable Ford Findings

This prints out on a single sheet of paper. I had to remove VINS and Date Codes

<<Ford Findings.doc>>

Regards,

Al

TI-NHTSA 016903

Sample	Condition	Hexpod, Washer, Converter, and Spacer	Seals	Cap	Base/Switch Cavity/Terminals
Reddick (Memphis, 1993 Town Car)	Partially burned.	Black residue containing glycol based material (probably brake fluid) and a metal oxalate. Indicates presence of brake fluid on field and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. All three Kapton seals are buckled and exhibit brittle cracks which most likely formed leak path. Damage appears to have initiated in seal closest to washer. Damaged Kapton deformed and embrittled by unknown mechanism.	Green Deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product. Glycol based material (probably brake fluid) also detected in this area.	Base separated below crimp ring. Transfer pin and movable contact missing. Stationary contact exhibits loss of material due to corrosion, evidence of delamination, stress corrosion cracking. Base of movable contact melted back into bulkhead between switch and terminal cavities. Appears to have occurred in later stages of event. Surfaces of terminals covered with black and green deposits which appear to be sulfur compounds of the terminal materials.
A (1993 Town Car, Houston)	Burned	Elements from contact material detected at fitting end of hexport. Indicate possible flow of fluid back through seals.	Gasket and environmental seal missing. Charred fragments Kapton seals remain.	Deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product.	Base, stationary contact, movable contact, and terminals missing.
B (1992 Town Car, Houston)	Burned	Elements from contact material detected at fitting end of hexport. Indicate possible flow of fluid back through seals.	Not permitted to disassemble switch.	Deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product.	Transfer pin and movable contact missing. Stationary contact exhibits crack in similar location as that in Reddick sample.
C (1992 Town Car, Houston)	Burned	Elements from contact material detected at fitting end of hexport. Indicate possible flow of fluid back through seals. Black deposit in cavity currently being analyzed (possibly charred gasket).	Gasket appears charred. Environmental seal missing. Damage to Kapton seals currently being evaluated.	Deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product.	Base, stationary contact, movable contact, and terminals missing.
D (1997 Crown Victoria)	Apparent leakage.	Black residue containing glycol based material (probably brake fluid) and a metal oxalate. Indicates presence of brake fluid on field and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. Kapton seals exhibit damage similar to that found in Reddick sample. All three exhibit brittle cracks which most likely formed a leak path.	Dark green deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product. Liquid in interior and on face of cup is glycol based (probably brake fluid).	Switch cavity and terminal cavity contain glycol based material (probably brake fluid). Contacts appear intact. Dark green deposits on movable and stationary contacts contain elements from brass contact material. Terminals appear clean (no apparent deposits or corrosion).
E (911 from survey)	No leaks or other apparent problems	Black residue containing glycol based material (probably brake fluid) and a metal oxalate. Indicates presence of brake fluid on field and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. Kapton seals exhibit deformation and buckling similar to that found in Reddick sample. Crazing on surfaces suggest incipient damage is occurring.	Face of cup appears clean and dry.	Switch cavity and terminal cavity appear clean and dry. No apparent deposits or corrosion.
F	Apparent leakage	Black residue containing glycol based material (probably brake fluid) and a metal oxalate. Indicates presence of brake fluid on field and switch sides of seals.	Environmental seal and gasket intact and appear to have had good sealing. Kapton seals exhibit damage similar to that found in Reddick sample. All three exhibit brittle cracks which most likely formed a leak path.	Dark green deposits on face of cup contain elements from brass contacts indicating transfer of contact material to cup probably as oxide, sulfide, or corrosion product. Liquid in interior and on face of cup is glycol based (probably brake fluid).	Switch cavity and terminal cavity contain glycol based material (probably brake fluid). Stationary contact is intact, but does show stress corrosion cracking in progress in bridge area (same location as in Reddick switch). Movable contact appears to have separated as a result of loss of material (~80% of thickness) due to corrosion. No evidence of heating or arc damage. Dark green deposits on movable and stationary contacts contain elements from brass contact material, as well as sulfur. Terminals exhibit green deposits (currently being analyzed). Deposits extend in from both sides of bulkhead between switch and terminal cavities, but do not meet.

Central Laboratory

TI-NHTSA 016904

Currey, Pat

From: Steve Reimers [sreimers@ford.com]
Sent: Thursday, April 29, 1999 9:36 AM
To: McGuirk, Andy
Subject: Date Code

What is the date code for service parts F2VY-9F924-A built before Dec. 1992?

Steve Reimers building 5 3E008
RVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-04145 ;>

Curvey, Pat

From: Steve Reimers [sreimers@ford.com]
Sent: Thursday, April 29, 1999 9:31 AM
To: slarouch@ford.com
Cc: Porter, F.J.; McGuirk, Andy; Sharpe, Robert
Subject: RE: Brake Switch

I have asked Andy to Fed Ex a 48 inch strip of Kapton and 10 sensors to Rob Sharpe (local TI rep) for you to use in comparitive tests with some of the field return samples. Please also include in this test the samples from TI that were removed every 200K cyles from the Impulse testing. Please let me know when these tests could be completed.

Steve Reimers building 5 3E008
RVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-04145 ;>
*** Forwarding note from SLAROUCH--FORDMA1 04/29/99 08:51 ***
To: SREIMERS--FORDMAIL Reimers, Steve (S.
cc: FPORTER --FORDMAIL Porter, Fred (F.J. SLAROUCH--FORDMA1 LaRouche, Steve (S

From: LaRouche, Steve (S.)
Subject: RE: Brake Switch

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Steve LaRouche (SLAROUCH)
Metallurgy Section, Central Laboratory, Room M410
(313) 845-4876 (313) 322-1614 FAX

-----Original Message-----
From: Steve Reimers [mailto:sreimers@gw.ford.com]
Sent: Wednesday, April 28, 1999 6:59 PM
To: slarouch@mail.ford.com
Subject: Brake Switch

Steve, thanks for the updates. Can I get the updated findings Thursday?

Steve Reimers building 5 3E008
RVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-04145 ;>
*** Forwarding note from SLAROUCH--FORDMA1 04/23/99 16:28 ***
To: SREIMERS--FORDMAIL Reimers, Steve (S.

From: LaRouche, Steve (S.)

TI-NHTSA 016906

Subject: Brake Switch

Steve: Here are the updated switch log and checklist. I am working on expanded results spreadsheet, incorporating observations on the connectors and wires. I hope to have that completed by Tuesday next week. In addition to the results already reported on the findings spreadsheet you already have,

<<chklist.xls>> <<SwitchLog.xls>>

Steve LaRouche (SLAROUCH)
Metallurgy Section, Central Laboratory, Room N410
(313) 845-4976 (313) 322-1614 FAX

Attachments sent separately:

Data Type	File Name
BINARY	CHKLIST.XLS_PC
BINARY	SWITCHLO.XLS_PC

TI-NHTSA 016907

Carrey, Pat

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Friday, April 30, 1999 9:02 AM
To: Beringhause, Steven; Baumann, Russ
Cc: Andres, Amy
Subject: FW: Brake Switch

fyi.

we are complying with the requests.....

here's what they are doing....

steve, we ought to have the tsl folks look too. how about it ?

a

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 804-2044

From: Steve Reimers[SMTP:sreimers@ford.com]
Sent: Thursday, April 29, 1999 10:30 AM
To: slarouch@ford.com
Cc: Porter, F.J.; A.McGuirk, a-mcgui; ROb Sharpe,Texas I
Subject: RE: Brake Switch

I have asked Andy to fed Ex a 48 inch strip of Kapton and 10 sensors to Rob Sharpe (local TI rep) for you to use in comparitive tests with some of the field return samples. Please also include in this test the samples from TI that were removed every 200K cyles from the Impulse testing. Please let me know when these tests could be completed.

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*** Forwarding note from SLAROUCH--FORDNA1 04/29/99 08:51 ***
To: SREIMERS--FORDMAIL Reimers, Steve (S.
cc: FPORTER --FORDMAIL Porter, Fred (F.J. SLAROUCH--FORDNA1 LaRouche, Steve (S

From: LaRouche, Steve (S.)
Subject: RE: Brake Switch

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(313) 845-4876 (313) 322-1614 FAX

Attachments sent separately:

Data Type	File Name
BINARY	CHKLIST.XLS_PC
BINARY	SWITCHLO.XLS_PC

TI-NHTSA 016909

Currey, Pat

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Friday, April 30, 1999 9:02 AM
To: Beringhause, Steven; Baumann, Russ
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From: LaRouche, Steve (S.)
Subject: RE: Brake Switch

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Attachments sent separately:

Data Type	File Name
BINARY	CHKLIST.XLS_PC
BINARY	SWITCHLO.XLS_PC

TI-NHTSA 016911

Currey, Pat

From:	Andres, Amy [aandres@email.mc.ti.com]
Sent:	Friday, April 30, 1999 9:11 AM
To:	Griffin, Hank
Cc:	Beringhause, Steven; McGuirk, Andy
Subject:	FW: Brake Switch

Hank, I am forwarding this message for your information. For background on the issue please discuss with Al. He has been extensively involved in the analysis to date.

Please provide the team the DSC analysis requested, and line up our outside supplier of DMA for the upcoming requests.
Best regards,
Amy Andres
aandres@email.mc.ti.com
x3616
pg 0662

From: McGuirk, Andy
Sent: Friday, April 30, 1999 10:02 AM
To: Beringhause, Steven; Baumann, Russ
Cc: Andres, Amy
Subject: FW: Brake Switch

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To: SREIMERS--FORDMAIL Reimers, Steve (S.
cc: FPORTER --FORDMAIL Porter, Fred (F.J. SLAROUCH--FORDMAI LaRouche, Steve (S

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Subject: RE: Brake Switch

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(313) 845-4876 (313) 322-1614 FAX

Attachments sent separately:

Data Type	File Name
BINARY	CHKLIST.XLS_PC
BINARY	SWITCHLO.XLS_PC

TI-NHTSA 016914

Currey, Pat

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Sunday, April 25, 1999 11:55 AM
To: Mulligan, Sean
Subject: FW: Switch Log and Eval. Procedure


SwitchLog


EVALPROC

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
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TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Rahman, Aziz
Sent: Thursday, February 18, 1999 1:45 PM
To: 'Fred Porter (Ford)'; 'Norm LaPointe (Ford)'; 'Steve LaRouche (Ford)'; 'Steve Reimers (Ford)'
Cc: Beringhause, Steven; Daque, Bryan; Baumann, Russ; McGuirk, Andy; Sharpe, Robert
Subject: Switch Log and Eval. Procedure

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

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

I suggest that the switch analysis priority be as follows:

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

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

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

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

Please comment.

Thanks
Aziz

TI-NHTSA 016915

TI-NHTSA 016916

Currey, Pat

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Sunday, April 25, 1999 11:55 AM
To: Mulligan, Sean
Subject: FW: Switch Evaluation Plan.xls

Brake Pressure Switch Evaluati..

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Rahman, Aziz
Sent: Thursday, February 18, 1999 10:21 AM
To: 'Fred Porter (Ford)'; 'Norm LaPointe (Ford)'; 'Steve LaRouche (Ford)'; 'Steve Reimers (Ford)'
Cc: Beringhause, Steven; Dague, Bryan; Baumann, Russ; Sharpe, Robert; McGuirk, Andy
Subject: Switch Evaluation Plan.xls

<<Brake Pressure Switch Evaluation Plan.xls>>

Revised to include Switch dissection procedures.

Regards
Aziz.

TI-NHTSA 016917

Brake Pressure Switch   Plan Update? 3/1/2000
Evaluation Plan for Field Returns

Car #		Date of update	
Mileage		Mfr Date Code	
Date Pulled			

Category	Step #	Action	Initials/Date	Comments
Field Info	1	Log Field Info into Switch Log/file		
	2	Photograph Switch		
	3	Record any unusual external visual observations		
	4	Check for Connector engagement		If not correct contact X-Ray to determine [illegible] (cable tie and [illegible])
Switch + Connector Assembly	5	Wire 1 to Wire 2 Resistance		
	6	Wire 1 to Hexport Resistance		
	7	Wire 2 to Hexport Resistance		
	8	Separate Harness from Switch		
Connector Only	9	Verify Connector Seal		Visual check of Red Seal, Dirt lines, Intersection mark. Intersection mark must be 360 degrees.
	10	Wire 1 to wire 2 resistance		
	11	Current Leakage Wire 1 to Wire 2		
	12	Check for full engagement of connector		Visual check of dirt lines on mated switch base
	13	Check wire insulation		
	14	Check wire gray seals		
	15	Cut wire insulation to check for corrosion		Cut insulation longitudinally to check for wicking along wires. If signs of corrosion, identify color, save samples for chem lab.
Switch External Unpressurized	16	Assemble switch in Calibration Stand		
	17	Terminal 1 to Terminal 2 Resistance		
	18	Terminal 1 to Hexport Resistance		
	19	Terminal 2 to Hexport resistance		
	20	Base to Hexport Resistance		
	21	Current Leakage Terminal 1 to Hexport		
	22	Current Leakage Terminal 2 to Hexport		
	23	Voltage drop at 100 mA		
Switch External Pressurized	24	Switch Opening Pressure		Do not perform on parts from underhood fires, as may disturb diaphragm/disc condition
	25	Switch Closing Pressure		Do not perform on parts from underhood fires, as may disturb diaphragm/disc condition
	26	Proof Test for Leakage		Do not perform on parts from underhood fires, as may disturb diaphragm/disc condition
	27	Repeat Steps 17 through 23 at 100 psig		
Switch Internal		Procedure to remove aluminum crimp ring Use aluminum foil (or plastic if Tenit present) to mask the analysis surfaces. 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 jewelers saw or Dremel cutoff wheel Cut crimp ring at 180 degree orientation Unfold crimp ring Optically examine the exposed surfaces. Take optical photographs (Digital camera with macro lens plus Ireland microphotography) and document observations where appropriate. Examine the following areas: Inside surface of crimp ring. Seal area and outer side of base Top of cup		
Analytical Techniques SEM/EDXA		Assess Need for Analytical Techniques 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. Reposition the top surface and remove the cup Optically document all revealed surfaces starting with cup. Meanwhile, start SEM-EDX analysis on top side of cup. . Particularly look for evidence of corrosion or arcing Particularly focus in on the edges of the ceramic pin guide and on the [illegible] 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 take 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 cup.		
Data Entry		Log All data from this sheet into Switch Log Photographs, Elemental maps etc must be retained and referenced by Switch #		

TI-NHTSA 016918

Currey, Pat

From: Steve Reimers [sreimers@ford.com]
Sent: Thursday, April 29, 1999 9:36 AM
To: McGuirk, Andy
Subject: Date Code

What is the date code for service parts F2VY-9F924-A built before Dec. 1992?

Steve Reimers building 5 3E008
RVT Chassis E/E System Applications mail drop 5011
39-03286 SREIMERS sreimers@ford.com fax 39-04145 ;>

TI-NHTSA 016919

Currey, Pat

From: McGuirk, Andy [a-mcguirk@email.mc.ti.com]
Sent: Friday, April 30, 1999 2:25 PM
To: 'Frederick J. Porter'
Subject: FW: Items for Ford

AUTOMOTIVE SENSORS AND CONTROLS QRA MANAGER
34 FOREST ST M/S 23-05
ATTLEBORO, MA 02703
TEL : (508) 236-3080
FAX : (508) 236-3745
MOBILE: (508) 208-6119
PAGE: (800) 467-3700 PIN 604-2044

From: Mulligan, Sean
Sent: Friday, April 30, 1999 3:14 PM
To: Beringhause, Steven; McGuirk, Andy; Dagua, Bryan; Sharpe, Robert
Subject: Items for Ford

The following items were sent to Ford for analysis via Robert Sharpe:

(10) 77FS switches.
(1) 48 inch roll of Kapton from production.

The items will be delivered Monday morning.

All the best,

Sean P. Mulligan

Phone (508) 236-2535
Fax (508) 236-3586

TI-NHTSA 016920

Ford Thermal Event

- Ford has announced a recall campaign for 1992-1993 Town Car, Crown Victoria and Grand Marquis (279K)
- TI position/conclusion letter sent to Fred Porter on 25 May
  - 1992 switches met Ford specification (data to support)
  - removal of constant power recommended
  - agreement to bring diagnostic journey to conclusion
- Porter supported our conclusion of meeting spec.
- Hosted Ford (1 person) for one day for site visit; Beringhause/McGuirk felt it was favorable to TI
- Delivered 225KU replacement pressure switches as requested by Ford to support recall.
- Ford/TI now named by 3 plaintiffs (2 lawsuits) in conjunction with vehicle fires
  - Ford legal's position is TI made a crimping change in February of 92 resulting in a systems performance change causing thermal events
- We are not clear of Ford's position of TI liability

TR/alw Ford Thermal Event.ppt

Ford Thermo

A. R. O'Neill
Director
Vehicle Service and Programs
Ford Customer Service Division

Ford Motor Company
P.O. Box 1904
Dearborn, MI 48121-1904

May, 1999

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

Ford Motor Company has decided that a defect which relates to motor vehicle safety exists in certain 1992 and 1993 Crown Victoria, Grand Marquis, and Lincoln Town Cars with Speed Control.

Safety Defect: Some Speed Control Deactivation Switches on the affected vehicles may develop a resistive short in the electrical circuit that may potentially result in an underhood fire. A fire is possible both when the vehicle is running and when the vehicle engine is off. Also, the short may disable the speed control system or cause the brake light fuse to open.

Repairs: Repair parts may not be available until mid-June, 1999. If your dealer is not able to obtain the parts needed for this recall, an Interim Repair can be performed at no charge to you. However a second visit to your dealer will be required at a later date to have the permanent repair performed. We regret this inconvenience, but your safety is our primary concern.

Interim Repair: If parts are not available, the Interim Repair should be performed immediately. This repair involves disconnecting the electrical connector from the Speed Control Deactivation Switch and protecting the connector end from contamination. The Speed Control system will be inoperative until the Permanent Repair is performed; normal vehicle operation without Speed Control is not affected.

Permanent Repair: Parts for this repair are expected to become available the middle of June, 1999. This repair will involve the replacement of the Speed Control Deactivation Switch with a new switch. In addition, the switch hard-shell connector will be replaced to eliminate the possibility of undetected heat damage to the connector.

How Long Will It Take?

The time needed for either of the repairs is less than one-half day. However, due to service scheduling issues, your dealer may need your vehicle for a longer period of time. Please call your dealer for a service date.

Call your dealer without delay. Ask for a service date and whether parts are in stock for Safety Recall 99315.

If your dealer does not have the parts in stock, they can be ordered before scheduling your service date. If available, parts would be expected to arrive within a week after ordering. If parts are not available, your dealer can perform the Interim Repair free of charge. When parts are available, your dealer will perform the Permanent Repair free of charge.

When you bring your vehicle in, show the dealer this letter. If you misplace this letter, your dealer will still do the work, free of charge.

Refunds:

If you paid to have this service done before the date of this letter, Ford is offering a full refund. For the refund, please give your paid original receipt to your Ford or Lincoln Mercury dealer. To avoid delays, do not send receipts to Ford Motor Company.

Changed Address Or Sold The Vehicle?

Please fill out the enclosed prepaid postcard and mail it to us if you have changed your address or sold the vehicle.

If the dealer doesn't make the repair promptly and without charge, you may contact the Ford Customer Assistance Center, P.O. Box 6248, Dearborn, Michigan 48121. You also may send a complaint to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 or call the toll-free Auto Safety Hotline 1-800-424-9393 (Washington, D.C. area residents may call 366-0123).

We regret the inconvenience this service may cause you, but we want you to have the work done for your safety and satisfaction with your Ford or Lincoln built vehicle.

Sincerely,

A. R. O'Neill
Director
Vehicle Service and Programs

Safety Recall
99315

NEAL RESSLER, V.P. R.V.T.

CARRIE WILLSON, DIRECTOR, E/E SYSTEMS

To: MS
For: Andy

Ford

Ford Motor Company

Tim F. Donovan
Manager
E/E Systems-Ongoing Prod. Dev.
E/E Systems Engineering

Building 5, Mail Drop 8017
20000 Rotunda Drive, Rm. 1A043
Dearborn, MI 48121-2053 USA

Tel: 313 [illegible]
Fax: 313 317-8158
TDONOVAN

usinc79n@bmmail.com

tdonovan@ford.com

DEEPAK GOEL
MANAGER
EMC, POWER SUPPLY, RESPONSE, CHASSIS

Ford

Ford Motor Company

John S. Rentlo
Engineer
Supplier Technical Assistance
Ford Automotive Operations

Quality, Manufacturing & Purchasing
17101 Rotunda Drive, MD610
Dearborn, MI 48121 USA

Tel: 313 337-8827
Fax: 313 390-3449
JRENTIS

jrentis@ford.com

STA

Ford

Ford Motor Company

Thomas E. Masters
Supervisor Large/Lux Car & Truck
Systems & Wiring OPD
AVT EESE - OPD

20000 Rotunda Drive MD 5017
Rm. 2A024, Bldg. 45
Dearborn, MI 48121-2053 USA

Tel: 734 390-8687
Fax: 313 317-8158

Ford

Ford Motor Company

Frederick J. Porter
Supervisor
Security, Safety & Chassis Appl.
E/E Systems Engineering
Advanced Vehicle Technology

20000 Rotunda Drive
Bldg. 5, 3E004, Mail Drop 8007
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TI-NHTSA 016924

Service Recall Bulletin

May, 1999

TO: All Ford and Lincoln Mercury Dealers

SUBJECT: Safety Recall 99S15: Certain 1992 and 1993 Crown Victoria, Grand Marquis, and Lincoln Town Cars with Speed Control - Speed Control Deactivation Switch

AFFECTED VEHICLES

Certain 1992 and 1993 Crown Victoria and Grand Marquis with Speed Control built at the St. Thomas assembly plant from February 5, 1992 through November 30, 1992. Also, certain 1992 and 1993 Town Cars built at the Wixom Assembly plant from November 4, 1991 through November 30, 1992.

REASON FOR RECALL

Some Speed Control Deactivation Switches on the affected vehicles may develop a resistive short in the electrical circuit that may potentially result in an underhood fire. A fire is possible both when the vehicle is running and when the vehicle engine is off. Also, the short may disable the speed control system or cause a fuse to open.

SERVICE ACTION

Repair parts will not be available until mid-June, 1999. Until parts are available, the interim repair described in Attachment III should be used. When parts are available the permanent repair must be completed to close this recall.

Interim Repair: This repair should be performed immediately to eliminate the possibility of a fire. This interim repair involves disconnecting the electrical connector from the Speed Control Deactivation Switch, taping the connector end to protect it from contamination and securing the connector with a tie-strap. The speed control system will be inoperative until the permanent repair is performed.

Permanent Repair: The parts for this repair are expected to become available the middle of June, 1999. This repair will involve the replacement of the Speed Control Deactivation Switch with a new switch. In addition, the switch hard-shell connector will be replaced to eliminate the possibility of undetected heat damage to the connector.

Safety Recall 99S18
Certain 1992 and 1993 Crown Victoria, Grand Marquis, and Lincoln Town Cars
with Speed Control - Speed Control Deactivation Switch

OASIS

You must use OASIS to determine if a vehicle is eligible for this recall.

Please note that the Interim Repair will not remove the VIN from OASIS

PLEASE NOTE

Correct all vehicles in stock before delivery. Federal law requires dealers to complete any outstanding safety recall service before a new vehicle is delivered to the buyer or lessee. Violation of this requirement by a dealer could result in a civil penalty of up to $1,100 per vehicle.

PROMPTLY CORRECT

Promptly correct affected vehicles on the enclosed list and other eligible vehicles which are brought to your dealership.

DEALER-OWNER CONTACT

Immediately contact any affected owner whose name is not on the list. Give the owner a copy of the Owner Letter and schedule a service date.

REGIONAL CONTACT

Advise regional office if an owner:

- cannot be contacted.
- does not make a service date.

CLAIMS PREPARATION AND SUBMISSION

- Enter claims using DWE.
- Refer to ACES II Manual for claims preparation and submission information.
- After performing the Permanent Repair, the replaced parts must be returned to the Warranty Parts Return Center for inspection (See Attachment II page 2). PCS 700 tags will be sent as soon as the claim for the Permanent Repair is submitted.

OWNER REFUNDS

Ford Motor will only refund for owner-paid repairs made before the date of the Owner Letter (or after the date of the Owner Letter if an emergency repair was made away from the servicing dealer.) Refer to ACES II Manual for Refund information.

Safety Recall 99S15
Certain 1992 and 1993 Crown Victoria, Grand Marquis, and Lincoln Town Cars with Speed Control - Speed Control Deactivation Switch

LABOR ALLOWANCES

Interim Repair

Description	Labor Operation	Labor Time
Remove, Tape and Secure the Speed Control Deactivation Switch *	99S15E*	0.3 Hour
Administrative Allowance	Misc. Expense Code "ADMIN"	0.1 Hour

* Labor Operation 99S15E will NOT close the Recall.

Permanent Repair

Description	Labor Operation	Labor Time
Replace Speed Control Deactivation Switch and Hard-shell Connector	99S15B	0.5 Hour
Administrative Allowance	Misc. Expense Code "ADMIN"	0.1 Hour

PARTS REQUIREMENTS

Parts Ordering Information

Parts will not be direct shipped for this recall. Order your parts requirement through normal order processing channels as noted below:

Stock Orders	Effective immediately	Normal order process
Interim Orders	Effective immediately	Normal order process
Emergency Orders	after July 1, 1999	Normal order process
Emergency Orders	before July 1, 1999	Call 1-800-325-6621

Part Number	Description	Quantity
XW7Z-9C662-AA	Speed Control Deactivation Switch Kit	1

Safety Recall 99S16
Certain 1992 and 1993 Crown Victoria, Grand Marquis, and Lincoln Town Cars with Speed Control - Speed Control Deactivation Switch

DEALER PRICE

For latest prices, check or call your:

- Order Processing Center
- DOES II
- Updated Price Book

EXCESS STOCK RETURN

Excess stock returned for credit must have been purchased from Ford Customer Service Division in accordance with Policy Procedure Bulletin 4000.

DISPOSITION OF REMOVED PARTS

Parts Return Requested (after completion of Permanent Repair):

We are requesting that the removed parts be returned to Ford Motor Company:

- Speed Control Deactivation Switch
- Switch Hardshell Connector

Packaging and Shipping:

- Speed Control Deactivation Switch
  - Do not drain the brake fluid from inside the Speed Control Deactivation Switch.
  - Use the plastic cap from the new switch to trap and seal as much oil inside the switch as possible.
- Switch Hardshell Connector
  - Connect the hardshell connector to the Speed Control Deactivation Switch.
  - Attach the FCS 700 tag to the part
  - Place the part in a plastic bag and secure with twist-tie.
- Shipping Instructions
  - Follow direction on FCS 700 tag
  - See Section 3 of the ACES II manual for more details

INTERIM REPAIR

DISABLE SPEED CONTROL DEACTIVATION SWITCH

SERVICE PROCEDURE

1. Disconnect the electrical connector from the speed control deactivation switch. See Figure 1.

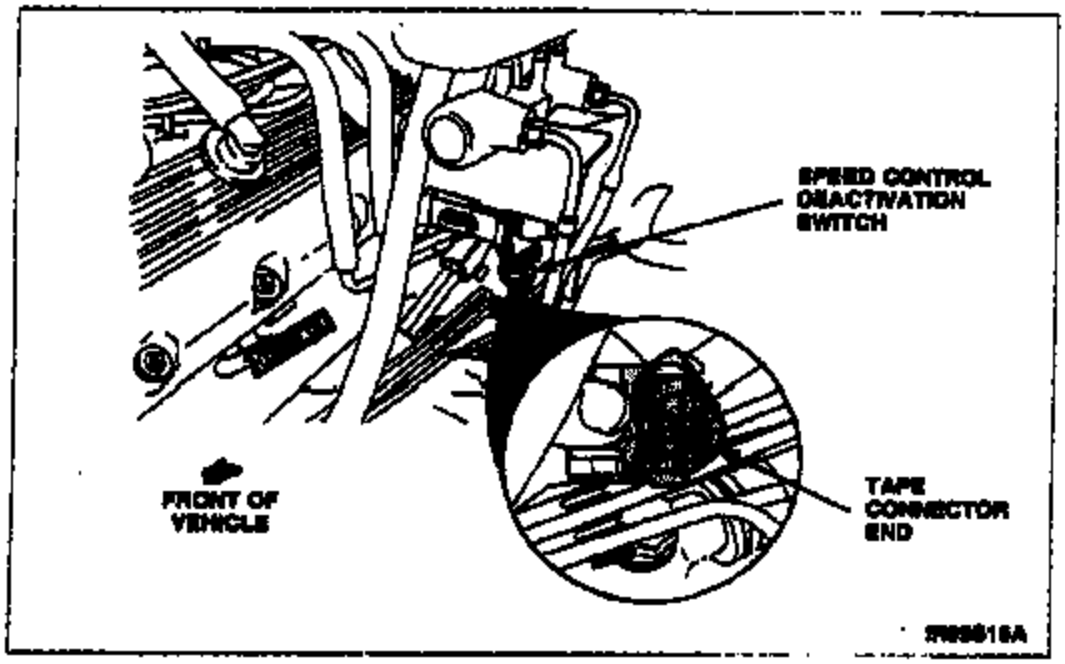

FIGURE 1

2. Tape the end of the connector to prevent contamination from entering the end of the connector.
3. Tie strap the connector to the wiring harness located on the left splash shield.

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PERMANENT REPAIR

SPEED CONTROL DEACTIVATION SWITCH AND CONNECTOR REPLACEMENT

AFFECTED VEHICLES: CERTAIN 1992 AND 1993 CROWN VICTORIA, GRAND MARQUIS AND TOWN CAR WITH SPEED CONTROL

OVERVIEW

This repair involves replacement of the speed control deactivation switch and the hard shell of the switch electrical connector. The connector terminals will be removed from the old connector hard shell and inserted into the *new* connector hard shell.

PROCEDURE

1. Install a memory saver and disconnect the negative battery terminal.
2. Disconnect the electrical connector from the speed control deactivation switch. See Figure 2.

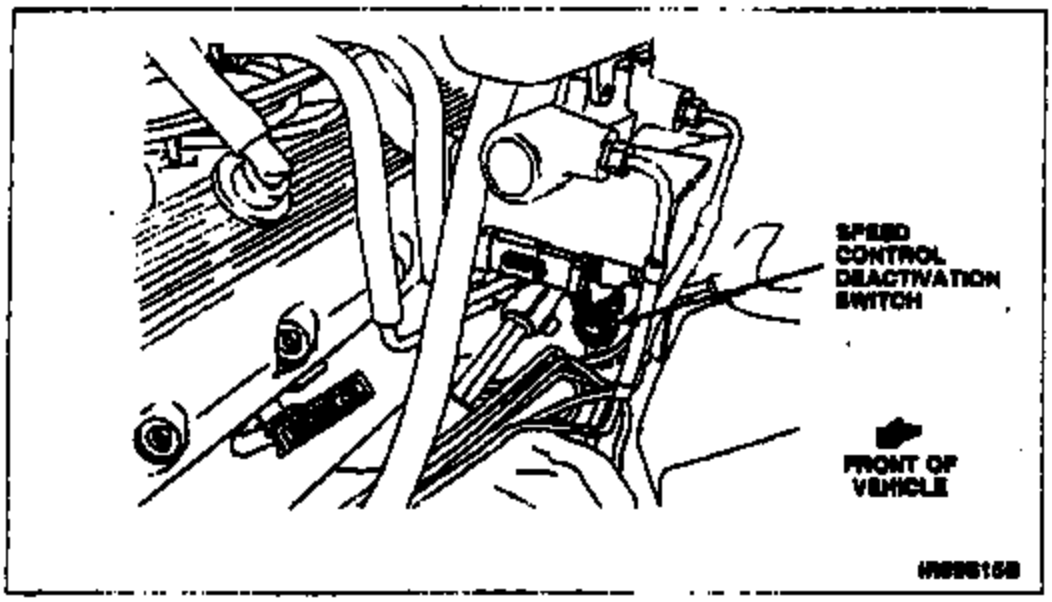

FIGURE 2

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3. Remove the locking wedge from the end of the connector. Then, disengage the locking tabs and remove the wire terminals from the connector. See Figure 3.

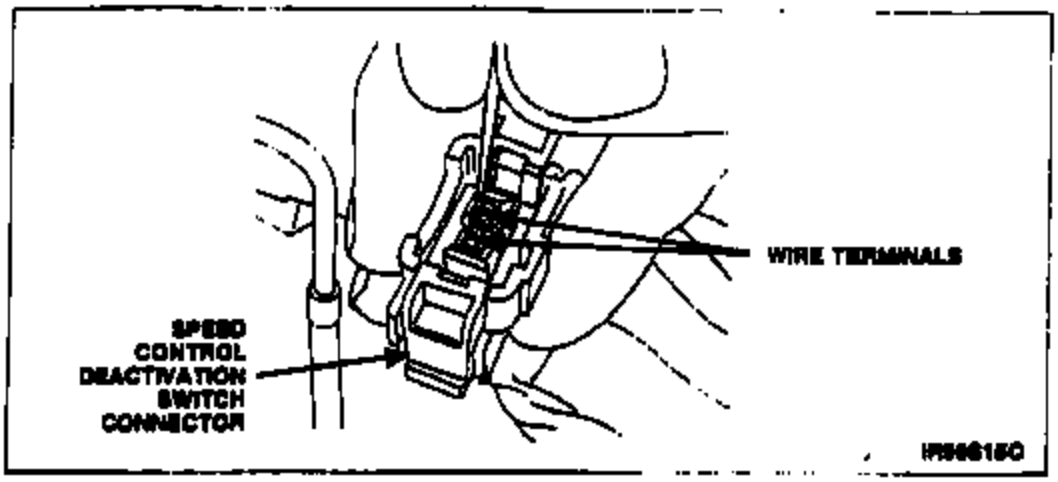

FIGURE 3

4. Obtain the *new* connector from the kit. Insert both wire terminal ends through the connector seal and into the connector hard shell. (The wire terminal ends may be installed into either of the connector cavities).
5. Check the connector to make sure the locking tabs have engaged both terminal ends. Also, make sure the seal is fully seated in the back of the connector. Then, install the red locking wedge to secure the terminals in the connector.
6. Obtain the speed control deactivation switch from the parts kit.
7. Remove the old speed control deactivation switch.
8. Fill the *new* speed control deactivation switch with High Performance DOT 3 Brake Fluid and install the speed control deactivation switch. Tighten the switch to 18 Nm (13 lb-ft).
9. Attach the electrical connector to the speed control deactivation switch.
10. Connect the battery negative cable and remove the memory saver.
11. Raise the vehicle on a hoist.
12. Connect a clear drain tube to the RH rear bleeder screw and the other end in a container partially filled with the recommended brake fluid.
13. Have an assistant pump the brake pedal and then hold firm pressure on the brake pedal.
14. Loosen the RH rear bleeder screw until a stream of brake fluid comes out. While the assistant maintains pressure on the brake pedal, tighten the bleeder screw.
    - Repeat until clear, bubble-free fluid comes out.
    - Refill the brake master cylinder reservoir as necessary.
15. Repeat Steps 12-14 for the LH rear bleeder screw.
16. Lower the vehicle.

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