

EA02-025

FORD 10/27/03

APPENDIX N

BOOK 16 OF 61

PART 3 OF 4

**TEXAS
INSTRUMENTS**

February 5, 1999

TO: Name: Mr. Fred Porter
Ford**FROM:** Stephen Proia**Phone Number:** 313-845-3722

508-236-1383

FAX Number: 313-390-4145

508-236-3586

SJ: 77PS - Cruise Control Pressure Switch**# of pages:** 15 (including this page)

Fred,

Please feel free to contact me with any questions. In this fax you will find:

1. Process flow diagrams for the 77PS switch
2. Equipment illustration

Have a nice weekend.

Sincerely,

Stephen B. Proia
Hydraulic Pressure Switch
Mfg Engineering Supervisor

TEXAS INSTRUMENTS INCORPORATED • PO BOX 2964 • 34 FOREST STREET • ATTLEBORO, MA 01703

FEB 05 1999 08:12

3718 1663

PAGE 01

PROCESS FLOW DIAGRAM

PROCESS: OVERVIEW

MODEL YEAR(S)/VEHICLE(S): 77/STPS

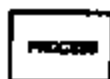
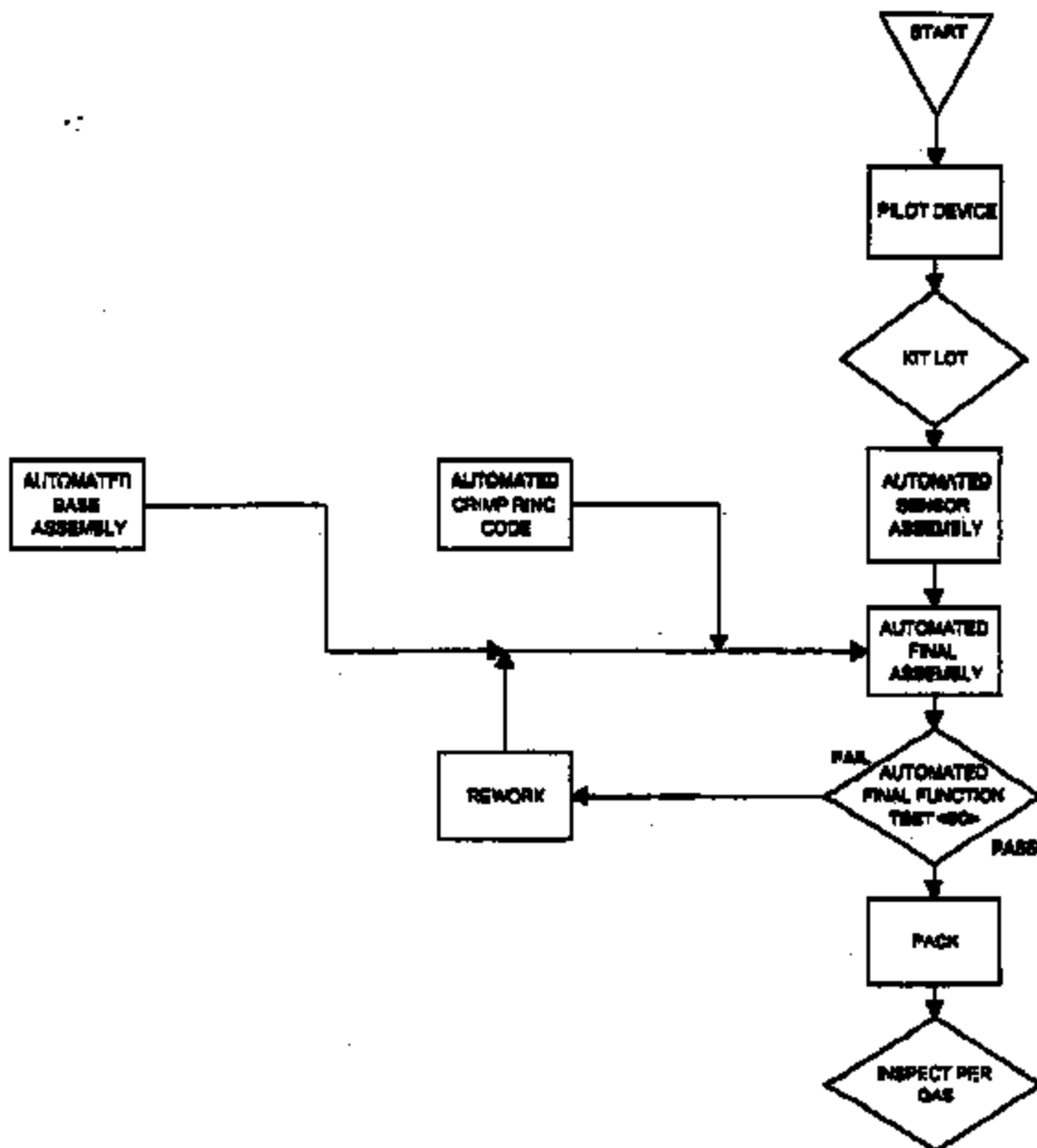
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PF DATE(ORIG.): 8/12/90

PF REVISION: A

DOCUMENT #612362

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CHARACTERISTIC
CLASSIFICATION

PROCESS FLOW DIAGRAM

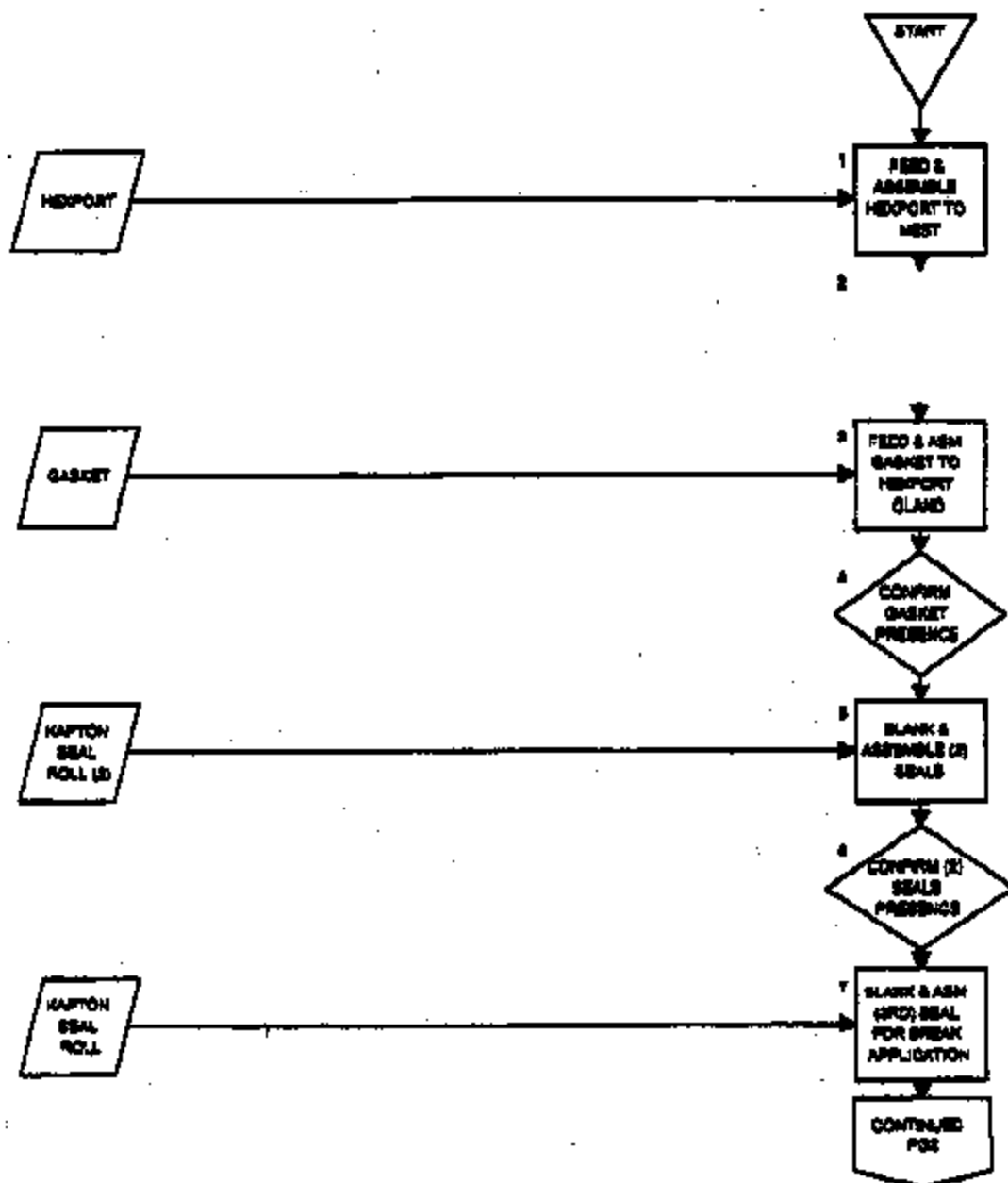
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 MODEL YEAR(S)/VEHICLE(S): 2000/7700/7900/90

PREPARED BY: ANN RGA
 PT DATE/REV: 4/18/98
 PP NUMBER: A
 DOCUMENT 381208

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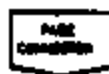


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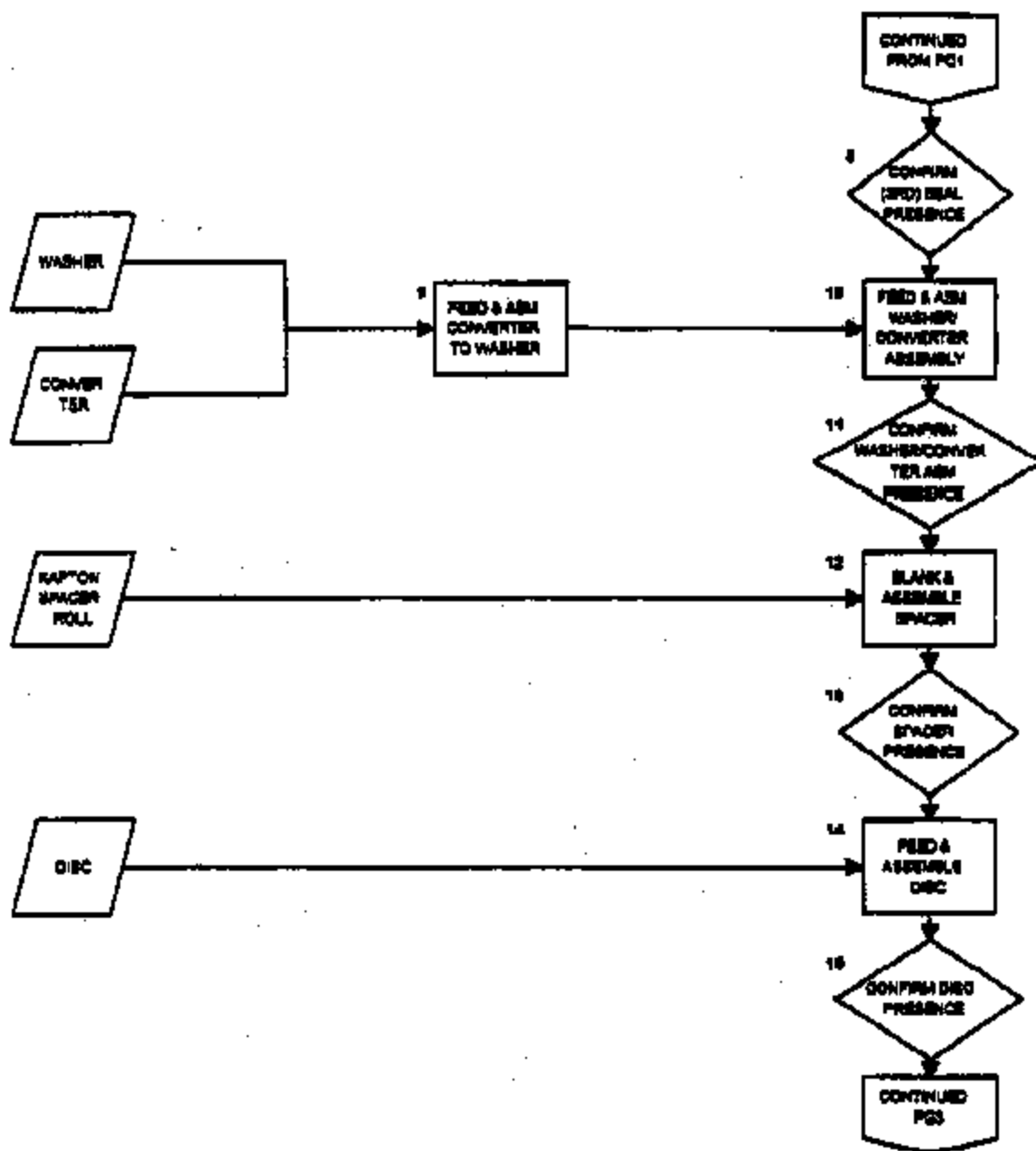
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MODEL YEAR(S)/VOLUME(S): 62/17784/78

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PROCESS FLOW DIAGRAM

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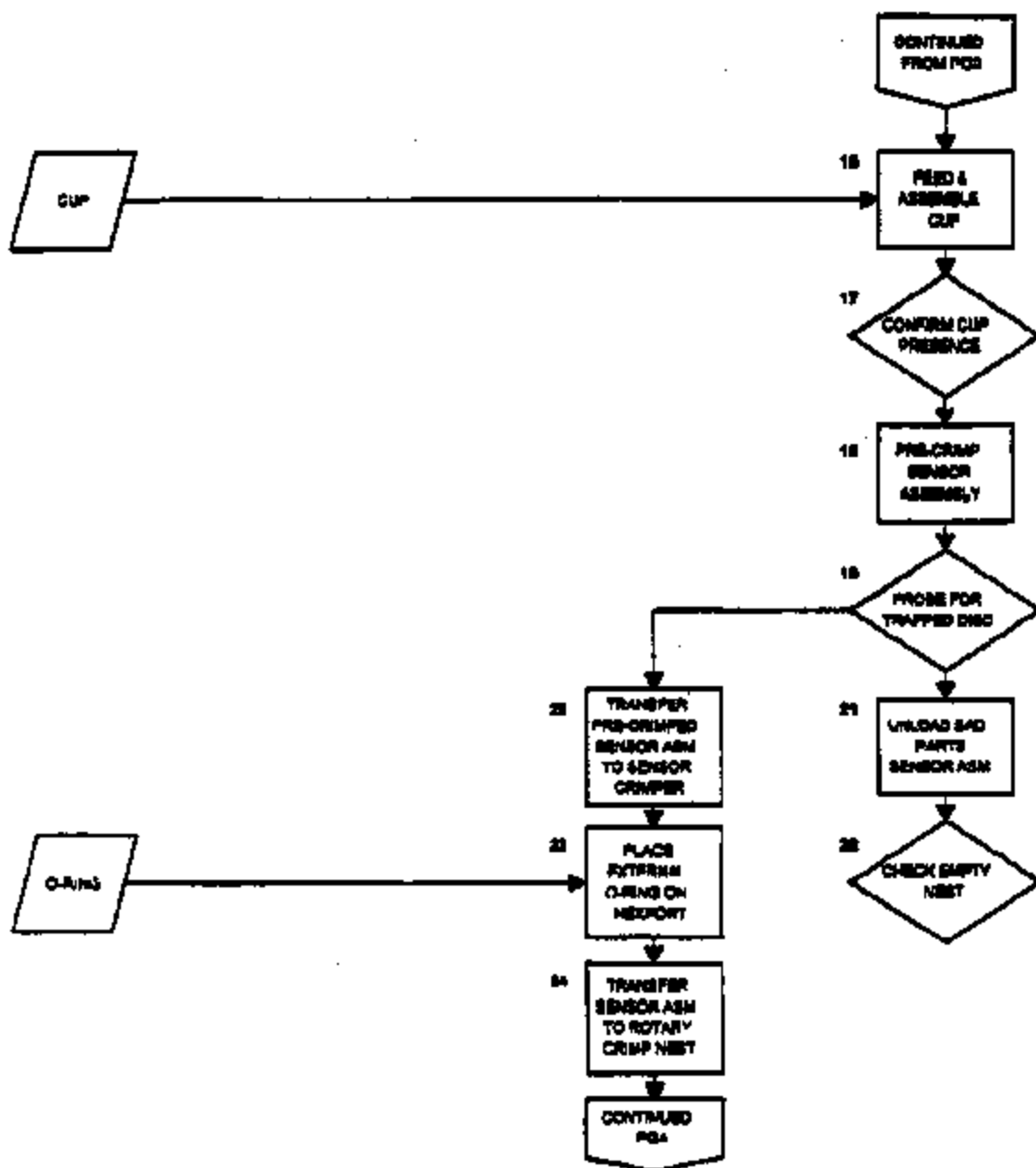
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PREPARED BY: ANN PEA
 PP DATE(ORIG.): 012885
 PP REVISION: A
 DOCUMENT 4913383

LEGEND:



820
 SPECIAL
 CHARACTERISTIC
 CLASSIFICATION



PROCESS FLOW DIAGRAM

PROCESS: AUTOMATED SENSOR ASSEMBLY

MODEL YEAR(S)/VEHICLE(S): 82/71/72/82/71/72

PREPARED BY: ANN REA

PF DATE/ONLY: 8/12/98

PF REVISION: A

DOCUMENT 9812389

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PROCESS



RAW MTL



INSPECT

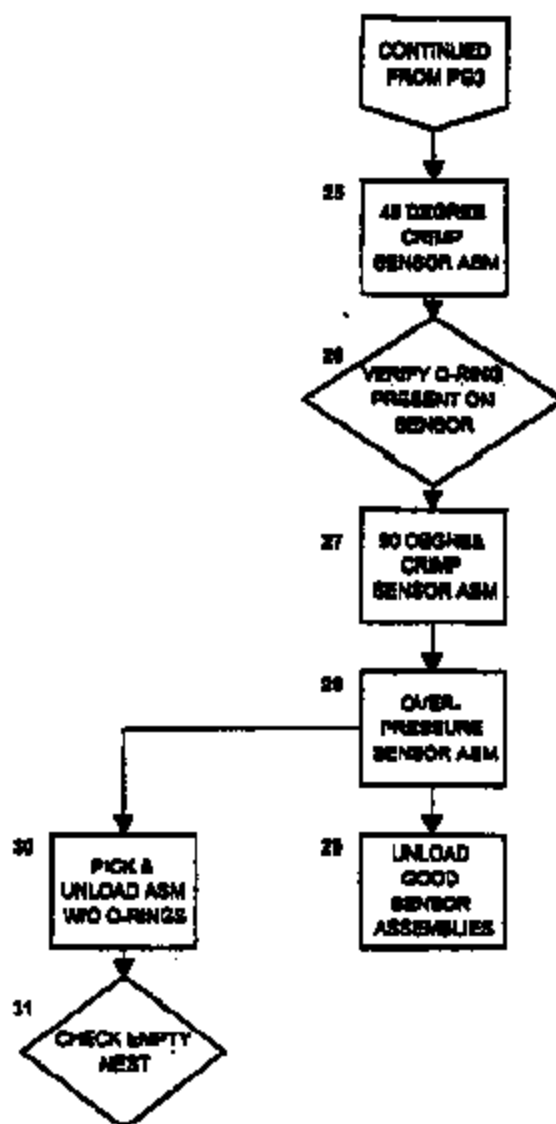


PAIL CONNECTION



START

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CHARACTERISTIC
CLASSIFICATION



PROCESS FLOW DIAGRAM

PROCESS: AUTOMATED BASE ASSEMBLY

MODEL YEAR/TYPE/COLOUR: 7767P5

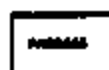
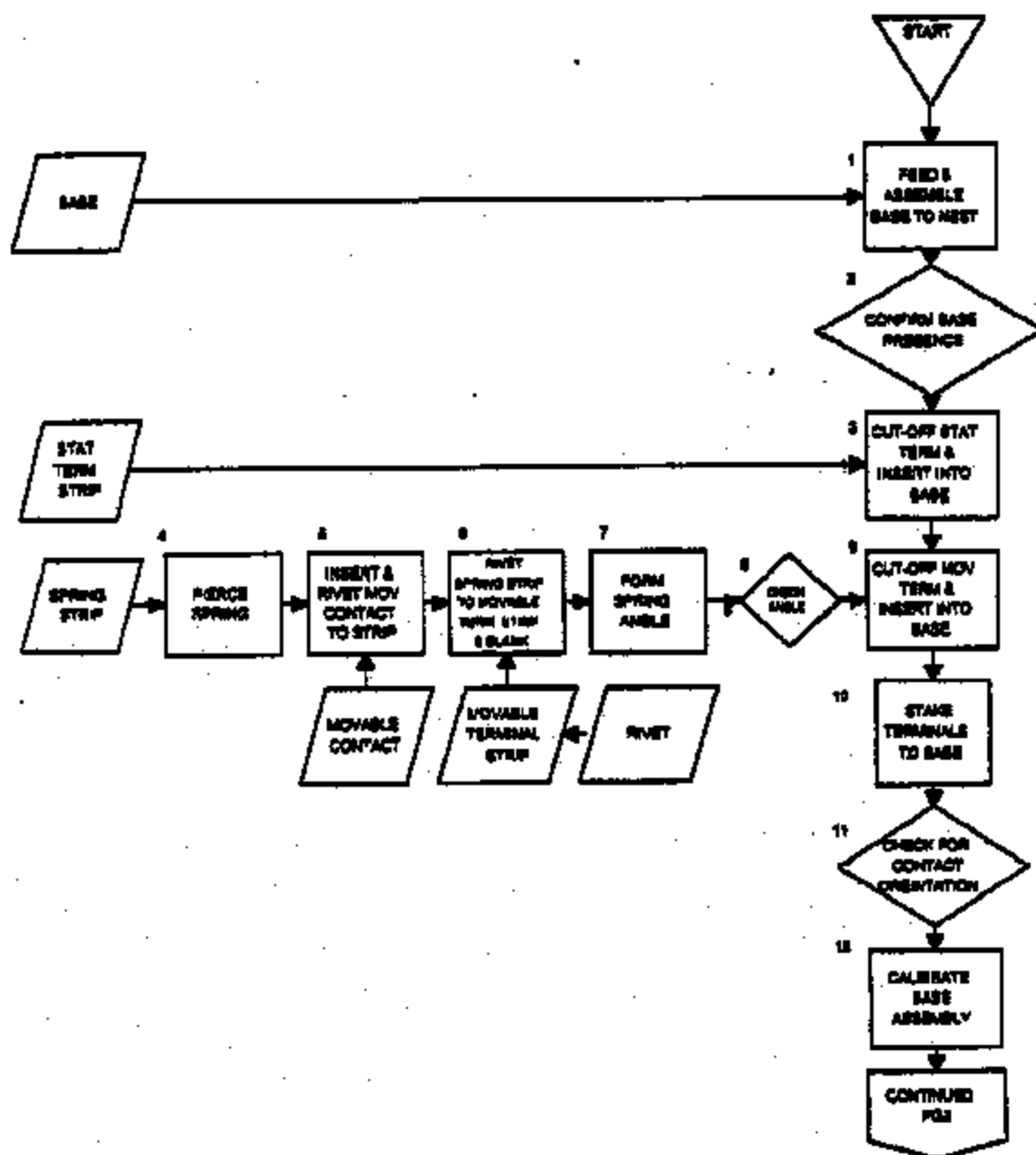
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PP DATES/REV: 5/12/98

PP REVISION: C

DOCUMENT # 012877

LEGEND:

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PROCESS FLOW DIAGRAM

PROCESS: AUTOMATED BASE ASSEMBLY

MODEL YEAR(S)/VEHICLE(S): 77/87PS

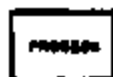
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PF DATE(ORIG.): 8/12/88

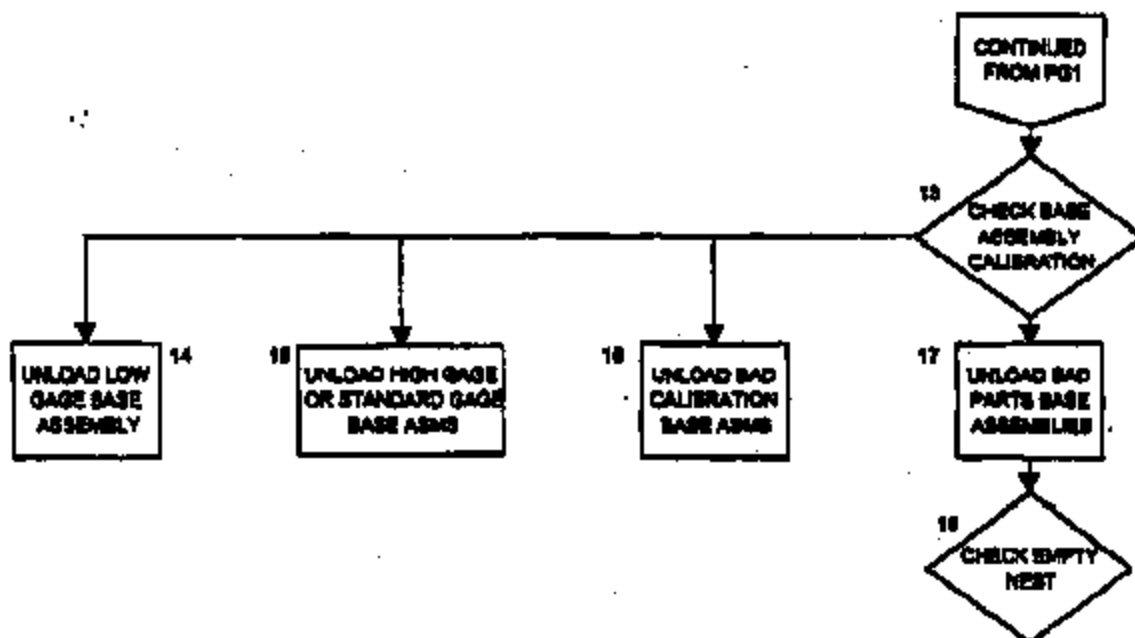
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DOCUMENT # 512377

LEGEND:



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SPECIAL
CHARACTERISTIC
CLASSIFICATION



PROCESS FLOW DIAGRAM

PROCESS: AUTOMATED FINAL ASSEMBLY

MODEL YEAR/EVIDENCE CODE: 87773796

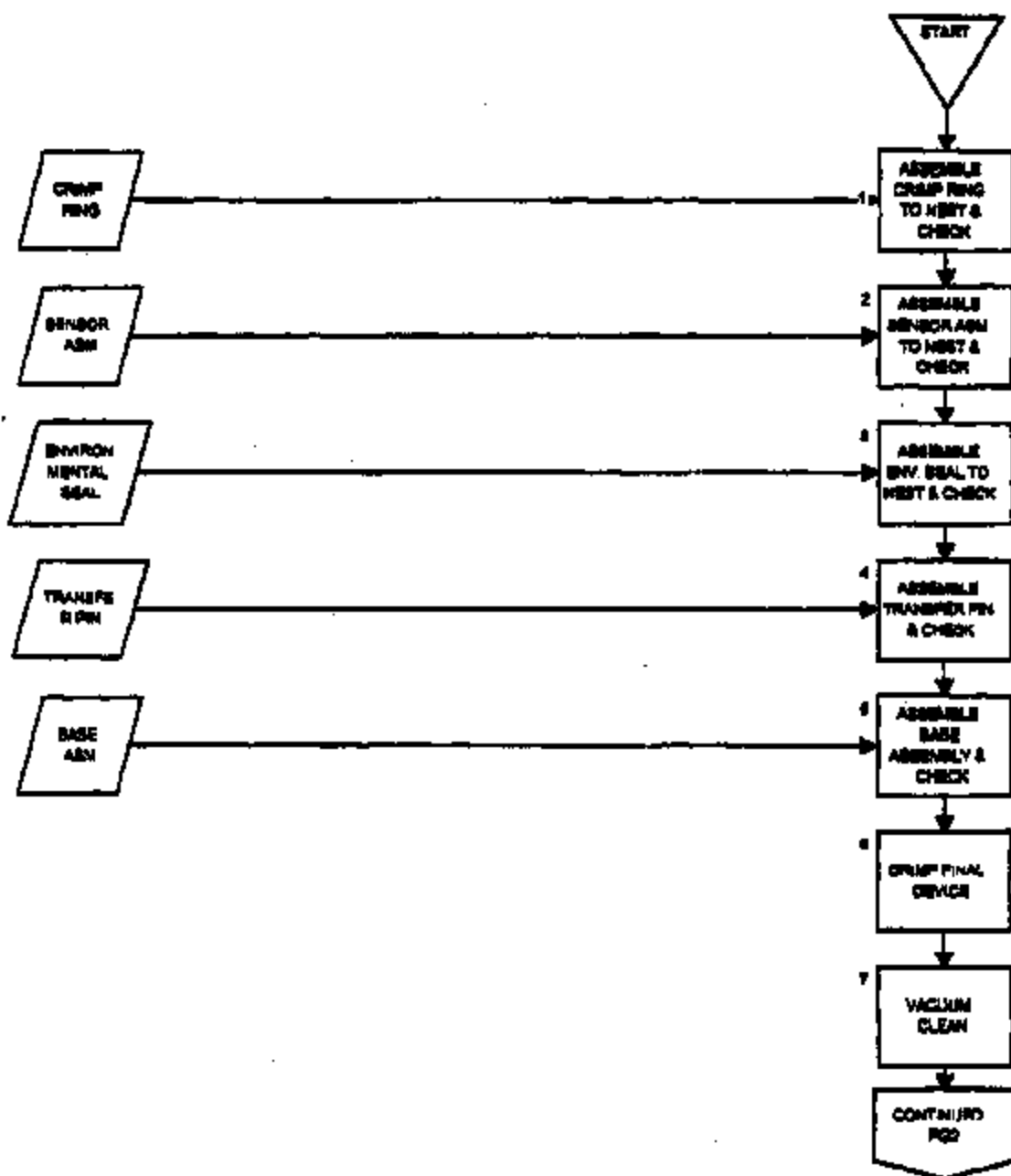
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PF DATE (ORIG.): 01/28/98

PF REVISION: A

DOCUMENT # 612876

LEGEND:

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CHARACTERISTIC
CLASSIFICATION

PROCESS FLOW DIAGRAM

PROCESS: AUTOMATED FINAL ASSEMBLY

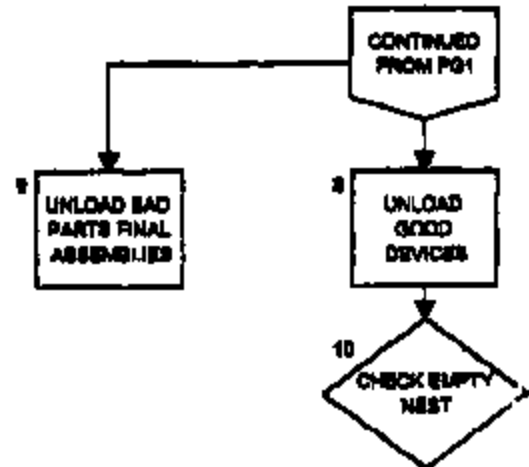
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PREPARED BY: ANN RBA
PF DATE/ORG.: 8/12/98
PF REVISION: A
DOCUMENT # 612378



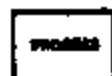
PROCESS FLOW DIAGRAM

PROCESS: AUTOMATED CRIMP RING CODE

MODEL YEARS/VEHICLES: ALL HYDRAULIC PS

PREPARED BY: ANH TBA
 PP DATE(ORIG.): 6/12/88
 PP REVISION: A
 DOCUMENT 8512256

LEGEND:



PROCESS



RAW MATL.



INSPECT

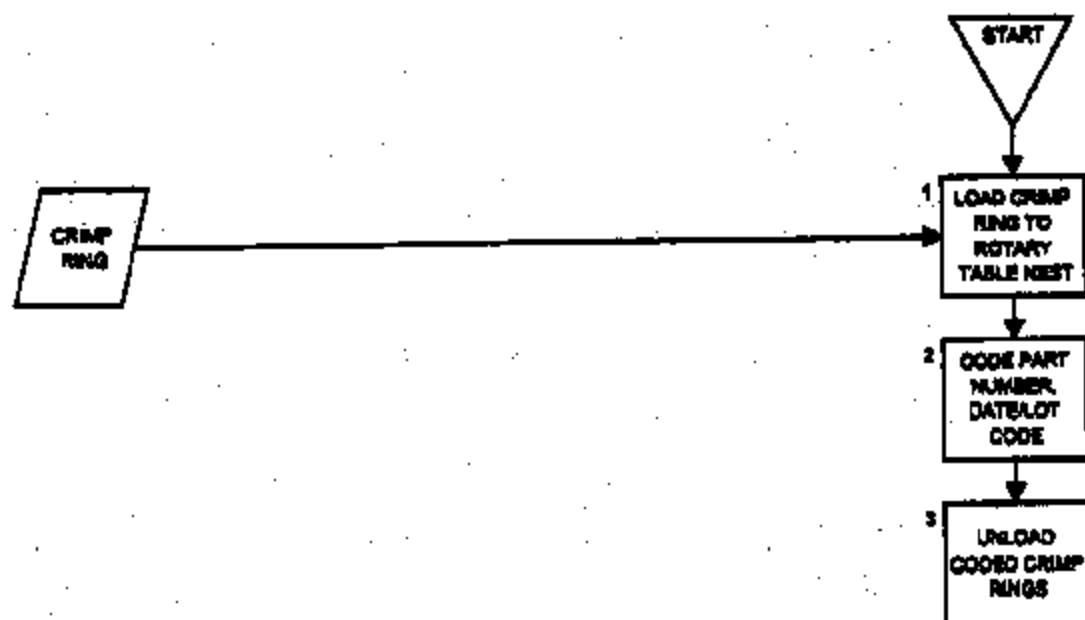


PALLET CONNECTION



START

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 CHARACTERISTIC
 CLASSIFICATION



PROCESS FLOW DIAGRAM

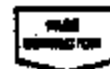
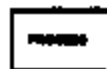
PROCESS: AUTOMATED FINAL FUNCTION TEST

MODEL YEAR(S)/VEHICLE(S): ALL HYDRAULIC PS

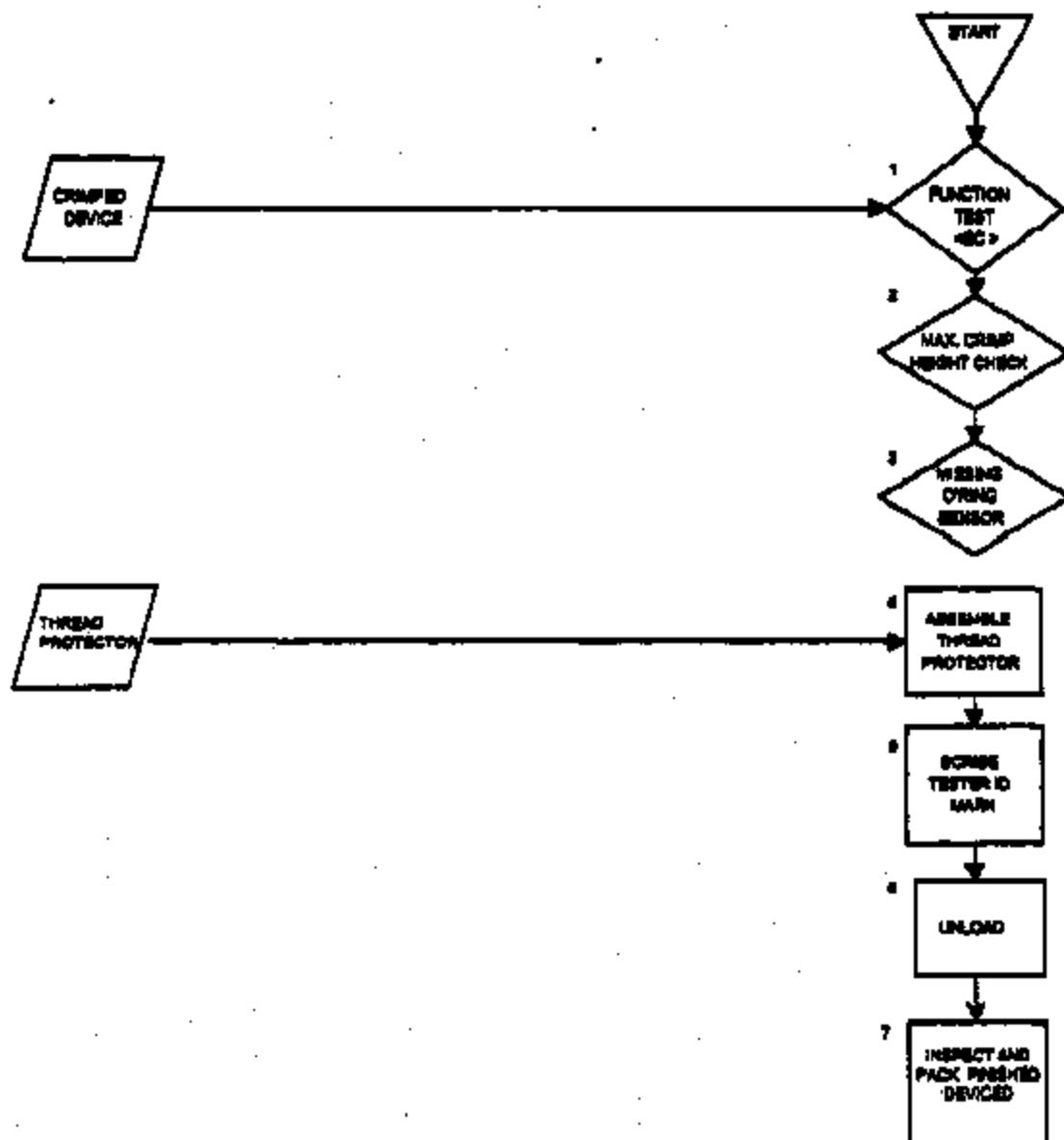
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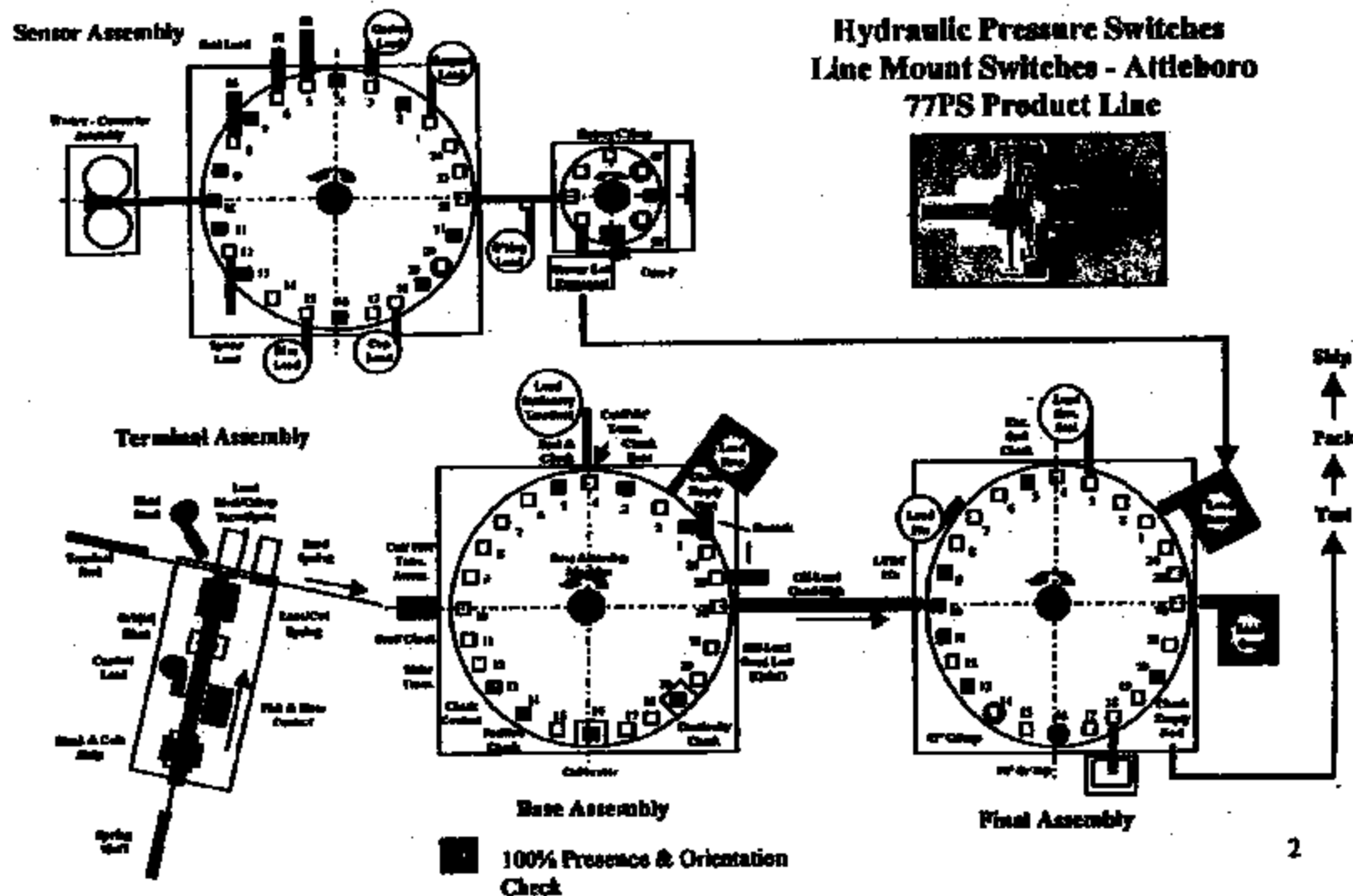


Automotive Sensors & Controls
Ford Visit - January 7, 1998

Hydraulic Pressure Switches

Line Mount Switches - Attleboro

77PS Product Line



FAILURE MODE, EFFECTS ANALYSIS
(DESIGN FMEA)

Document Number 503786
Revision Level G
Revision Date 4-Nov-88

Page 1

System
Subsystem
X Component Proposed Switch

Design Responsibility Proposed Switch Group

Original (Initial) Date 20-Dec-88

Model Year(s)/Vehicle(s) Version

Key Date 1988

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item / Function	Potential Failure Mode	Potential Effect(s) of Failure	S	C	Potential Cause(s) Mechanism(s) of Failure	O	Current Design Controls	D	R	Recommended Action(s)	Responsibility & Target Completion Date	Action Results	S	O	D	R
BASE (PS) (48513) Provides a system of slots which guide, locate, and physically support terminals.	Fails to properly locate terminals.	Terminals out of position.	3	1	Incorrect dimensions and/or tolerances specified between slots and terminals. Inadequate mating design concept.	1	Comparison with dimensions of similar STPS product.	1	2							
	Fails to properly guide the terminals difficult insertion.	Device will not assemble properly; yield lost to scrap.	5	1	Incorrect dimensions and/or tolerances specified between slots and terminals. Insufficient lead-in.	1	Review with assembly equipment designers to determine correct clearances and lead-in.	1	6							
	Fails to properly support the terminals.	Terminals move relative to each other or the base (such as under physical or thermal loadings).	5	1	Incorrect material specified. Excessively large dimensions specified on terminal slots.	1	Comparison with design of similar STPS product.	1	5							
Provides features to enhance the effectiveness of terminal seating.	Terminal seating is inefficient.	Loose terminals. Self-healing in switch endpoints.	3	1	Incomplete understanding of design of seating features.	1	Comparison with design of similar STPS product. Seating configurations.	1	5							
Provides a dielectric medium for the electrical elements.	Current leakage between terminals or terminal-to-housing.	Improper switching action.	5	1	Low insulation resistance. Incorrect material specified.	1	Comparison with design of similar STPS product. Material evaluation.	1	5							

3713 1678

**TRIAL
FAILURE MODE EFFECTS ANALYSIS
(DEVELOP FMEA)**

Document Number 593798
Revision Level C
Revision Date 4-Nov-98

Page 2

System _____
Subsystem _____
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Original (Initial) Date 20-Dec-93

Model Year(s)/Vehicle(s)/Version _____

Key Date 1993

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C o n s e q u e n c e s	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Control Design Controls	D e t e r m i n e d	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Results				
												Action Taken	S e v e r i t y	O c c u r r e n c e	D e t e r m i n e d	R. P. N.
BASE (PS) (40515) Provides physical isolation of the switch components.	Fails to physically isolate: ingress of water from external environment.	High current leakage. High initial drop. Erratic or inoperative switch action.	5		Incorrect material specified. Poor molded part design i.e. wall sections too thin, etc.	1	Comparison with design of similar OVPB product. Design review with molder. Mold flow analysis.	1	5							
Provides a reference surface which locates the electrical elements relative to the pressure sensor.	Fails to properly locate the switch elements relative to the pressure sensor.	Shift in setpoints. Erratic or inoperative switch.	5		Warping of the reference surface. Intrusion of other design elements into the plane of the reference surface. Excessive clearance specified between trailing features.	1	Specification of flatness on print. Flatten this surface to prevent intrusion of other elements. Tolerances cleanup analysis.	1	5							
Provides a flange to compress the internal environmental seal.	Improper compression of internal environmental seal.	Inadequate compression may lead to ingress of water. Excessive compression may prevent switch from sealing correctly to sensor assembly.	7		Incorrect seal gland design. Warping.	1	Review of standard gland design practice. Comparison to similar products. Flatness specified on print.	1	7							

3713 1577

FAILURE MODE EFFECTS ANALYSIS
(FMEA)

Document Number: 503788
Revision Level: C
Revision Date: 4-Nov-85

Page 3

System: _____
Subsystem: _____
Component: Pressure Switch

Design Responsibility: Pressure Switch Group

Original (Inlet) Date: 20-Dec-82

Model Year(s)/Vehicle(s)/Variant: _____

Key Date: 1983

Prepared By: C. Wynn

Core Team: Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item / Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e	C a u s e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	C u r r e n t D e s i g n C o n t r o l s	D e t e r m i n e d	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Results	S e v e r e	O c c u r r e n c e	D e t e r m i n e d	R. P. N.
BASE (PS) (40513) Provides interference tube to locate and temporarily hold the beam in relation to the crimp ring prior to crimp.	Fails to properly locate/hold prior to crimp.	Too large may cause difficulty in assembly, beam cracking, or prevent switch from seating to sensor. Too small provides no effect; possibly affecting subsequent assembly operations.	5		Design of interference tube is insufficient.	1	Calculation and experimentation to determine limits of size. Tolerance stackup analysis.	1	2							
Provides a large surface for the crimp ring.	Fails to provide adequate geometry for crimp ring.	Beam loose or insufficient torque sustained. Beam cracked.	7		Incorrect design of flange for crimp ring.	1	Comparison with design of similar 57PS product.	1	7							
Provides lock tabs, keys, and features which mate to electrical connector.	Mating electrical connector doesn't fit properly.	Connector difficult to install. Connector falls off.	8		Connector geometry improperly specified.	1	Review of dimensions relative to mating connector prints.	1	8							
Provides compression to environmental seal in connector.	Mating connector seal is not properly compressed.	Ingress of water into switch cavity. Connector difficult to install and/or falls off.	7		Connector geometry and/or surface condition/finish is improperly specified. Incorrect material specified.	1	Review of dimensions relative to mating connector prints. Material evaluation.	1	7							

3713 1678

FAILURE MODE EFFECTS ANALYSIS
(FMEA)

Document Number 503789
Revision Level 0
Revision Date 20-May-92
Original (Initial) Date 20-Dec-89

Page 1

System _____
Subsystem _____
X Component Propulsion Switch

Design Responsibility Propulsion Switch Group

Model Year(s)/Vehicle(s) Various

Key Date 1989

Prepared By C. Winger

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v	C i r c	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e c t i o n	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Remarks				
												Action Taken	S e v	O c c u r r e n c e	D e t e c t i o n	R. P. N.
STATIONARY TERMINAL (28908 & 38720)	Provides a brass blade for interconnection.	Poor interconnection. Device appears open- circuit when mating connector installed.	7		Contamination of brass blade. Material specified too thin.	1	Review design and dimensions of mating connector to ensure proper interference and wiping action.	1	7							
	Blade geometry improper.	Difficult to install mating connector.	5		Lead-in chamfers on terminal are insufficiently specified. Material specified too thick.	1	Review design and dimensions of mating connector. Comparison with design of similar 57PS product.	1	5							
Provides a silver inlay surface for electrical contact	Fails to provide adequate electrical contact.	Device appears open- circuited. Intermittent continuity. High contact drop.	7		Incorrect contact material specified. Contamination. Silver layer specified too thin.	1	Review of TI specification and general contact design info. Eliminate paths for ingress of contamination.	1	7							
	Excessive loss of contact height dimension (mechanical loads).	Shift in set points over life.	7		Silver layer specified too thick.	1	Review of TI specification and general contact design info. Life Testing.	1	7							
	Erosion of contacts due to electrical loads.	Shift in setpoints over life. Intermittent or no continuity.	7		Incorrect material specified for particular electrical loading.	1	Review of TI specification and general contact design info. Review and testing with actual electrical loads.	1	7							

3713 1679

71AL
FAILURE MODE EFFECTS ANALYSIS
(DEVELOP FMEA)

Document Number 883789
Revision Level 0
Revision Date 28-May-98
Original (Initial) Date 30-Dec-93

Page 2

System _____
Subsystem _____
X Component Pressure Switch

Design Responsibility/Programmer Bojich Group

Model Year(s)/Vehicle(s)/Variant _____

Key Date 1993

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	C o n t r o l s	D e t e r m i n e	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Taken	S e v e r e	C o n s e q u e n c e	D e t e r m i n e	R. P. N.
STATIONARY TERMINAL (PRESS & STOPS) Provides features for device calibration.	Poor calibration	Mfg. yield loss SNF in solenoids over life.	5		Design is excessively stiff. Design has excessive spring back. Material hardness is incorrectly specified. Initial position requires excess deformation to calibrate. Design has inadequate strength to maintain calibration over life.	1	1	4	Mechanical (analog FEA) analysis Force deflection springback testing Testing with actual production calibration equipment.						
Provides features to ensure adequate staking into base.	Terminal is inadequately staked into base.	Loose terminals. Shift/rotation in switch assembly.	7		Incomplete understanding of design of staking features.	1	1	7	Comparison of design with similar 5VPS product. Staking measurements.						
Provides features which mate with slide in base for location of terminal.	Fails to properly locate terminal.	Terminal out of position.	3		Incorrect dimensions and/or tolerances specified between slide and terminals. Inadequate staking design concept.	3	1	9	Comparison of design with similar 5VPS product.						
Provides electrical path from silver inlay contact to mating connector.	Fails to provide adequate conductivity.	High resistance shown as high millivolt drop.	5		Incorrect material specified. Inadequate cross-section area.	1	1	5	Calculations of resistance Testing						

8713 1680

FAILURE MODE EFFECTS ANALYSIS
(FMEA)

Document Number 593780
Revision Level C
Revision Date 4-Nov-88

Page 1

System
Subsystem
X Component Passive Switch

Design Responsibility Program Switch Group

Original (Initial) Date 25-May-88

Model Year(s)/Vehicle(s)/Version

Key Date 1988

Prepared By C. W. Winger

Core Team Design Engineering, Manufacturing Engineering, Manufacturing Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e c t i o n	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Taken	S e v e r e	O c c u r r e n c e	D e t e c t i o n	R. P. N.
MOVABLE TERMINAL (30887)																
Provides a base plate for interconnection.	Poor interconnection.	Device appears spec- ifically welding connector installed	7		Material specified too thin.	1	Review design and dimensions of welding connector to ensure proper interference and welding action.	1	7							
	Blade geometry improper.	Difficult to install welding connector.	5		Lead-in chamfers on terminal are insufficiently specified. Material specified too thick.	1	Review design and dimensions of welding connector. Comparison with design of similar STPS product.	1	5							
Provides a welding point for the spring via rivet.	Failure to align proper spring/rivet installation.	Distraction in switch setpoints (nose rivet). Inoperative device (rivet hole not completely) Mfg. yield loss.	7		Rivet hole size is specified incorrectly. Rivet hole position is specified incorrectly. Support surface for spring is incorrectly specified. Choice of fastener style incorrect.	1	Comparison with design of similar products. Check with recommendations of that manufacturer. Testing.	1	7							
Provides features to ensure adequate seating into base.	Terminal is inadequately seated into base.	Loose terminal. Distraction in switch setpoints.	7		Incomplete understanding of design of seating features.	1	Comparison of design with similar STPS product. Seating evaluations.	1	7							

3713 1881

**YTM
FAILURE MODE
EFFECTS ANALYSIS
(FMEA)**

Document Number 903760
Revision Level 0
Revision Date 4-Nov-88

Page 2

System _____
Subsystem _____
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Original (initial) Date 28-Dec-88

Model Year(s)/Vehicle(s) Variant _____

Key Date 1988

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C o n s e q u e n c e s	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	C u r r e n t D e s i g n C o n t r o l s	D e t e c t i o n	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Progress				R. P. N.
												W o r k i n p r o g r e s s	C o m p l e t e	D e l a y	F. i n c o m p l e t e	
MONABLE TERMINAL (30087) Provides footcandle switch tests with slide in base for location of terminal.	Fails to properly locate terminal.	Testwelds out of position.	3		Incorrect dimension and/or tolerances specified between side and terminals. Inadequate slaking design concept.	3	Comparison of design with similar SPPS product.	1	9							
	Fails to provide adequate conductivity.	High resistance shown on high altitude drop.	5		Incorrect material specified. Inadequate cross-section area.	1	Calculation of resistance Testing	1	5							

3718 1682

FAILURE MODE
(D. FMEA)

VITAL
EFFECTS ANALYSIS

Document Number 583786
Revision Level C
Revision Date 4-Nov-88

Page 1

System
Subsystem
X Component Position Switch

Design Responsibility Pressure Switch Group

Original (Initial) Date 30-Dec-89

Model Year(s)/Vehicle(s)/Variants

Key Date 1989

Prepared By C. Warner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e r i n i n g	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Planned	S e v e r i t y	O c c u r r e n c e	D e t e r i n i n g	R. P. N.	
SPRING (30000) Provides contact force.	Low contact force.	High millivolt drop across contacts.	5		Incorrect geometry specified. Incorrect material specified.	3	Beam deflection equations. Force/deflection testing.	1	15								
	High contact force.	Shift in setpoints. Disc cracking over life.	7		Incorrect geometry specified. Incorrect material specified.	3	Beam deflection equations. Force/deflection testing.	1	21								
Provides electrical path from movable contact to movable terminal.	Fails to provide adequate conductivity.	High resistance shown as high millivolt drop.	8		Incorrect material specified. Inadequate cross-section area.	1	Calculations of resistance using $R = \rho L / A$ Testing	1	5								
Provides feature to interface with transfer pin.	Fails to interface correctly with transfer pin.	Spring failure over life. Shift in setpoints over life. Sticking transfer pin causes intermittent operation.	7		Inadequate height of feature specified. Inadequate shape of feature specified. Improper position of feature specified.	1	Comparison of design with similar product. Dimension and tolerance stackup analysis. Actual measurement. Testing	1	7								
Provides feature for attachment to movable contact.	Fails to provide adequate mounting for movable contact.	Intermittent or erratic operation. Open circuit.	8		Pin disposition incorrectly specified. Flatness inadequate.	1	First rule recommendations. Comparison of design with similar product. Testing	1	8								
Locates movable contact.	Fails to adequately locate movable contact relative to stationary contact.	High millivolt drop over life. Excessive contact arcing over life.	7		Spring geometry incorrectly specified.	1	Dimension and tolerance stackup analysis. Testing	1	7								

3713 1083

FAILURE MODE
(D. A FMEA)

ITAL
EFFECTS ANALYSIS

Document Number 503782
Revision Level C
Revision Date 4-May-88

Page 2

System
Subsystem
X Component Pneumatic Switch

Design Responsibility Pneumatic Switch Group

Original (initial) Date 25-Jun-83

Model Year(s)/Vehicle(s) Various

Key Date 1983

Prepared By C. Winger

Core Team Design Engineering, Manufacturing Engineering, Manufacturing Quality

Item	Potential Failure Mode	Potential Effect(s) of Failure	S	C	Potential Cause(s) Mechanisms of Failure	D	Current Design Controls	D	FL	Recommended Action(s)	Responsibility & Target Completion Date	Action Results	S	C	D	FL
Function			v	a		r		r	P.			Taken	v	a	r	P.
SPRING (primary)	Provides tension for attachment to movable bearing.	Excess or intermittent operation. Shift in setpoints. Open or short circuit	6		Rivet hole size or position incorrectly specified. Fastener inadequate. Choice of fastener style incorrect.	1	Rivet only. recommendations. Comparison of design with similar product. Testing.	1	6							
Allows disc overtravel	Fails to allow disc overtravel	Shift in setpoints Disc cracking Device inoperative at assembly. Poor calibration.	5		Incorrect geometry specified. Incorrect material specified.	3	Beam deflection equations. Force/deflection testing.	1	16							
Provides force to open contacts.	Inadequate force to open contacts	Insufficient resistance to mechanical vibration. Short circuit.	6		Incorrect geometry specified. Incorrect material specified.	1	Beam deflection equations. Force/deflection testing.	1	6							
	Excessive force to open contacts.	Shift in setpoints. Disc cracking. Device inoperative at assembly. Poor calibration.	7		Incorrect geometry specified. Incorrect material specified.	2	Beam deflection equations. Force/deflection testing.	1	21							

3713 1684

FAILURE MODE EFFECTS ANALYSIS
(Discrete FMEA)

Document Number 508794
Revision Level C
Revision Date 4-Nov-88

Page 1

System
Subsystem
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Original (Initial) Date 20-Dec-88

Model Year(s)/Vehicle(s)/Variants

Key Date 1983

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e r m i n e	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Results	S e v e r e	O c c u r r e n c e	D e t e r m i n e	R. P. N.
GASKET (74338) Provide fluid seal between header and diaphragm.	Fails to provide adequate fluid seal.	Seals fluid leakage.	9		Insufficient compression specified. Very excessive compression specified, leading to displacement from gland. Incorrect ID and/or OD leading to displacement from gland. Incorrect cross-section shape specified. Incorrect material specified, fluid incompatibility. Incorrect design of sealing mechanism.	1	Review of general and design specification. Manufacturer's recommendations. Burst, impact, and thermal cycle tests. Comparison with design of similar products.	1	9							

3713 1685

VTAL
FAILURE MODE EFFECTS ANALYSIS
(D. J. N. P. M. E. A.)

Document Number 503785
Revision Level C
Revision Date 4-Nov-85

Page 1

System
Subsystem
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Original (Initial) Date 29-Dec-85

Model Year(s)/Vehicle(s) Various

Key Date 1983

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e c t i o n	R. P. M.	Recommended Action(s)	Responsibility & Target Completion Date	Active Needs Actions Taken	S e v e r i t y	O c c u r r e n c e	D e t e c t i o n	R. P. M.
CUP (27713 OR 27720) Provides crimpable area which holds pressure sensor together.	Fails to provide a suitable geometry for crimp.	Leakage Low burst	6		Crimp wall thickness incorrectly specified. Crimp wall height incorrectly specified. Incorrect material specified.	1	Burst and impulse testing. Comparison of design with similar product.	1	8							
Locates support, diaphragm, and washer.	Fails to correctly locate support, diaphragm, or washer.	Difficult assembly	5		LD. specified incorrectly.	1	Tolerance stackup analysis.	1	5							
Provides support and location for disc.	Fails to support and locate the disc/coverslip correctly.	SHR in sealpoints. Erratic operation. Stick open at assembly. Reduced disc life.	7		Incorrect disc envelope specified. Deep true-profile incorrectly specified. Poor surface condition of bump, no control specified.	1	Tolerance stackup analysis. Impulse testing.	1	7							
Provides guide for transfer pin.	Fails to guide transfer pin correctly.	Erratic operation. Device stuck short- circuit.	7		Pin guide geometry is incorrectly specified.	1	Tolerance stackup analysis.	1	7							
Provides portion of environmental seal gland.	Fails to allow a proper environmental seal.	Ingress of water. Switch does not seal correctly to cup.	7		Surface condition required for good seal not understood or not correctly specified. Geometry incorrectly specified.	1	Environmentally testing. Switch cavity pressurization testing. Review of standard gland design rules.	1	7							

3713 1886

FAILURE MOD. EFFECTS ANALYSIS
(DESIGN FMEA)

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Revision Level C
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Page 2

System
Subsystem
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Model Year(s)/Vehicle(s)/Version

Key Date 1985

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e c t a b i l i t y	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Planned	S e v e r e	O c c u r r e n c e	D e t e c t a b i l i t y	R. P. N.
CUP 62773 CH 67288 Provides rotation to interface with transmission assembly.	Fails to properly rotate relative to switch.	Shift in setpoints. Erratic or inoperative switch.	5		Incorrect geometry of mating surface specified.	1	Tolerance stackup analysis. Close-tolerance mating device for inspection of interface.	1	5							
(Post-assembly crimp) provides geometry for final assembly with cable plug.	Fails to allow proper final assembly with cable plug.	Erratic operation. Ingress of moisture. Cracked case.	2		Post-crimp geometry is not controlled per design intent. Cup diameter incorrectly specified.	1	Tolerance stackup analysis. Close tolerance testing.	1	7							

3713 1687

7241
FAILURE MOD. EFFECTS ANALYSIS
(EDISON/FMEA)

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Revision Level D
Revision Date 4-Nov-95

aps 1

System
Subsystem
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Original (Initial) Date 20-Dec-93

Model Year(s)/Vehicle(s) Various

Key Date 1993

Prepared By G. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	C u r r e n t D e s i g n C o n d i t i o n s	O a i l P. N.	R e c o m m e n d e d A c t i o n (s)	Responsibility & Target Completion Date	Action Taken	S e v e r e	O c c u r r e n c e	D e t e r m i n e	R. P. N.
DIAPHRAGM (OR SEAL) (BRT) (74178) Forms flexible element of fluid containment cavity.	Failure to contain fluid	Fluid leakage.	0		Gradual rupture over life due to improper design of supporting elements. Gradual rupture over life due to excessive flexure/displacement. Gradual rupture over life due to stress concentrations caused by unfavorable stress distribution. Chemical attack due to increased material specified. Incorrect thickness (or # of layers) of diaphragm material. Incorrect location/charging of diaphragm.	1	Burst, leakage, and thermal cyclic tests. Minimal mfg. recommendation. Comparison of design with similar products.	1	2						
Transfer pressure from fluid to pressure- sensing elements.	Change in area of pressure transfer over life. Excessive change of pressure transfer area versus pressure.	Shift in setpoints over life. Excessively high pressures needed to adequately form pressure transfer area; false signs on setpoints due to unpredictability of lower pressures.	3 0		Diaphragm too stiff. Incorrect material specified. Diaphragm too stiff. Incorrect material specified.	1 1	1. In testing of characteristics at intermediate points. Force and pressure versus deflection testing to calculate effective areas.	1 1	5 4						

3718 1685

ITAL
FAILURE MODE EFFECTS ANALYSIS
(DECISION FMEA)

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Revision Date 4-Nov-88

Page 1

System
Subsystem
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Original (Initial) Date 30-Dec-88

Model Year(s)/Vehicle(s)/Version

Key Date 1989

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	D e s i g n C o n t r o l s	D e t e c t i o n	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Taken	S e v e r e	O c c u r r e n c e	D e t e c t i o n	R. P. N.
WASHER (P) (27028) Provides a portion of the support surface for displacement.	Fails to correctly support the displacement.	Reduced displacement life results in leakage.	5		Corrosion of displacement support surface not specified incorrectly. Corrosion of edges of support surface specified incorrectly. Clearance between washer I.D. and converter housing is specified too small.	Stress, fatigue, and Thermal Cycle tests. Comparison of design with similar products.	1	5							
Provides support for compression of gasket.	Fails to allow proper gasket compression.	Leakage.	5		Washer thickness is incorrectly specified or unspecified. Washer thickness is specified too small. Washer material and/or heat-treat is incorrectly specified.	Stress, fatigue, and Thermal Cycle tests. Comparison of design with similar products.	1	5							
Locates and guides converter with respect to cup.	Converter is not properly located relative to cup.	Still is acceptable. Errors inferior.	5		Incorrectly specified button guide I.D. Incorrectly specified washer O.D.	Comparison of design with similar products. Tolerance stackup analysis.	1	5							
	Converter travel is restricted by washer.	Disc control release; device is stuck open- circuit.	7		Washer thickness is incorrectly specified or unspecified. Washer thickness is specified too small. Washer material and/or heat-treat is incorrectly specified. I.D. of button guide is too small.	Stress, fatigue, and Thermal Cycle tests. Comparison of design with similar products. Tolerance stackup analysis.	1	7							

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FAILURE MOD TIAL
EFFECTS ANALYSIS
(Continued) (FMEA)

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Revision Date 4-Nov-88
Original (Initial) Date 20-Dec-83

Page 2

System
Subsystem
X Component Page 2 of 3

Design Responsibility Program Switch Group

Model Year(s)/Vehicle(s)/Version

Key Date 1983

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v	C i n c u r	Potential Cause(s) Mechanism(s) of Failure	O c c u r r	Control Design Controls	D i s c r i m i n i s t r i c t i o n s	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Required					
												Actions Taken	S e v	O c c u r	D i s c r i m i n i s t r i c t i o n s	R. P. N.	
WASHER (P8) (27838) Interface with cup feature and provide a portion of component stack for creep.	Fails to interface correctly with cup.	Difficult assembly (washer O.D. too large) Poor washer/washer location relative to cup (washer O.D. too small).	7		Washer O.D. specified incorrectly.	1	Comparison of design with similar products. Tolerance stackup analysis.	1	7								
	Fails to allow proper creep.	Reduced burst capability leads to leakage. Reduced fatigue resistance leads to leakage.	8		Thickness incorrectly specified. O.D. incorrectly specified Edge condition incorrectly or unspecified.	1	Tolerance stackup analysis. Burst, Impact, and Thermal Cycle tests.	1	8								

3719 1880

FMEA
FAILURE MODE EFFECTS ANALYSIS
(2nd Ed. MSRA)

Document Number 383728
Revision Level E
Revision Date 13-May-88
Original (Initial) Date 28-Dec-83

System
Subsystem
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Model Year(s)/Vehicle(s)/Variant

Key Date 1993

Prepared By DI Ha

Core Team Design Engineers, Manufacturing Engineers, Manufacturing Quality

Item / Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v	C i n s	Potential Cause(s) Mechanism(s) or Failure	O c c u r r	Current Design Controls	D e t e c t	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Results				
												Action Taken	S e v	O c c u r	D e t e c t	R. P. N.
CONVERTER (PS) (27-408) Transfers pressure from field (via diaphragm) to a force on pressure sensing disc.	Fails to correctly transfer fluid pressure to force on disc.	Shift is complete	5		Button O.D. incorrectly specified relative to washer I.D. Converter major O.D. incorrectly specified relative to cap I.D. Converter thickness incorrectly specified. Incorrect material specified.	1	Tolerance stackup analysis. Force/deflection analysis to determine strength and resistance to plastic deformation. Distal, impact, and Thermal cycle tests.	1	5							
Provides alignment and support to disc.	Fails to properly align and support disc.	Loose tolerances allow misalignment which may cause shift in valveplate or orifice operation. Disc out-of-plane relative to converter may cause valve operation or inoperative device, stuck open-circuit.	5		Button O.D. incorrectly specified relative to washer I.D. Converter major O.D. incorrectly specified relative to cap I.D. Disc support bump incorrectly specified. Disc retaining wall incorrectly specified.	1	Tolerance stackup analysis. Comparison of design with similar product.	1	5							

3713 1691

FAILURE MODE EFFECTS ANALYSIS
(Continued) (FMEA)

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Revision Level E
Revision Date 13 May 88

Page 2

System
Subsystem
X Component Pressure Switch
Model Year(s)/Vehicle(s)/Version

Design Responsibility Pressure Switch Group

Original (initial) Date 20 Dec 88

Key Date 1988

Prepared By D. H.

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Ref. Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e n e s s	C o n s e q u e n c e s	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e s	Current Design Context	D e s i g n e n g i n e e r i n g	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Taken	S e v e r e n e s s	O c c u r r e n c e s	D e t e r i n i n g	R. P. N.
CONVERTER [P8] (27400)	Provides a portion of the support surface for diaphragm.	Fails to properly support diaphragm.	Reduced diaphragm life results in leakage.	5	Contours of surface in contact with diaphragm are specified incorrectly. Condition of edges in contact with diaphragm are specified incorrectly. Clearance between converter bump and washer I.D. are specified too wide.	1	Burst, impact, and Thermal cycle tests. Comparison of design with similar product.	1	5							
Function disc support during over pressure (overhaul).	Fails to properly support disc during over pressure.	Disc deformation results in shift in setpoints. Reduced disc travel if disc motion is restricted prematurely. Reduced disc life.	5		Features which control disc motion during over pressure are incorrectly specified.	3	Pre and post-proof characterization Pressure deflection measurements of disc motion.	1	10							
Valve in converter prevents pressure buildup from exceeding setpoints.	Does not vent properly.	Shift in setpoints over time. Reduced disc amp.	5		Vent hole incorrectly specified.	1	Comparison of design with similar product. Temperature characterization.	1	5							

3713 1082

FAILURE MODE EFFECTS ANALYSIS
(OR - FMEA)

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Revision Level C
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Original (Initial) Date 28-Dec-83

Page 1

System
Subsystem
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Model Year(s)/Vehicle(s)/Version

Key Date 1988

Prepared By C. Wynn

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v	C o n s	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	C u r r e n t D e s i g n C o n t r o l s	D e t e c t i o n	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Results				
												Action Taken	S e v	O c c u r r e n c e	D e t e c t i o n	R. P. N.
SPACER (73858) Reduce friction between disc and converter	Fails to effectively reduce friction.	Shift in setpoints over life. Reduced disc life.	5		Incorrect material specified. Incorrect dimensions specified.	1	Impulse and Thermal Cycle tests. Pre- and Post-life characterizations. Tolerance stackup analysis.	1	5							
Allow venting of chamber formed by disc and converter.	Fails to allow venting.	Shift in setpoints over time. Reduced disc action	5		Vent hole incorrectly specified.	1	Comparison of design with similar product. Temperature characterization.	1	5							

3713-1689

**FAILURE MODE
EFFECTS ANALYSIS**
(FORM FMEA)

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Page 1

System _____
Subsystem _____
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Model Year(s)/Vehicle(s)/Version _____

Key Date 1988

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing Quality

Item / Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e c t i o n	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Planned	S e v e r e	O c c u r r e n c e	D e t e c t i o n	R. P. N.
DISC (pneum)																
Controls actuation and release sub-points of switch relative to applied force.	Fails to actuate and/or release at the proper points at assembly.	sig. yield loss.	5		Disc material improperly specified. Dimension and tolerance improperly specified.	1	Characterization experiments. Comparison of design with similar product.	1	5							
Key component in defining usable service life of device.	Disc actuation and/or release sub-points change excessively over life.	Shift in device sub-points over life.	5		Disc material improperly specified. Disc heat-treat improperly specified. Material thickness improperly specified. Excessive force applied by spring.	1	Impulse testing. Pre- and post-characterizations.	1	5							
	Service life shorter than customer requirements.	Drastic shift in sub-points over life. Device inoperative - open circuit.	7		Disc material improperly specified. Disc heat-treat improperly specified. Material thickness improperly specified. Excessive force applied by spring.	1	Impulse testing. Pre- and post-characterizations.	1	7							

3713 1884

FAILURE MODE EFFECTS ANALYSIS
(DEMON FMEA)

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Page 1

System
Subsystem
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Original (Initial) Date 25-Dec-83

Model Year(s)/Vehicle(s)/Version

Key Date 1985

Prepared By C. Winger

Core Team Design Engineering, Manufacturing Engineering, Manufacturing Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e c t i o n	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Taken	S e v e r i t y	O c c u r r e n c e	D e t e c t i o n	R. P. N.
CFRMP F003 (74787) Hold together base assembly and sensor assembly.	Falls to hold base to sensor assembly.	Enable switch operation. Cracked base. Shift in airpoints. Low base torque on flange.	5	1	Incorrect geometry of drivable area specified. Incorrect geometry of torque radii. Incorrect material specified.	3	Impulse, thermal cycles, base torque, and laser/thermal impact tests.	1	15							
Provide a surface for part identification/label code.	ID characters fading.	Improperly identified parts of assembly plant.	2	1	Geometry/finish not properly specified. Wrong material specified.	1	Coding tests. Environmental tests.	1	2							
Impart environmental protection and protection to device.	Inability to withstand environment.	Corrosion causes material corrosion, loss of mechanical properties, switch eventually fails off circuit. Welding cracking.	7	1	Wrong material specified.	1	Environmental tests.	1	2							
Prevent lubrication to crimp die via lubrication.	Inadequate lubrication.	Metal shrapnel or external device interference.	5	1	Incorrect or insufficient specification.	1	Crimping tests.	1	5							

3713 1695

TIAL
FAILURE MODE EFFECTS ANALYSIS
(DETAILED FMEA)

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Page 1

System _____
Subsystem _____
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Model Year(s)/Vehicle(s)/Usage _____

Key Date 1983

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C o n s e q u e n c e s	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	O c c u r r e n c e	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Status				
												Action Taken	S e v e r i t y	O c c u r r e n c e	D u r a t i o n	R. P. N.
TRANSFER PIN (74078)	Transfer disc motion to movable electrical contact.	Contacts stuck open.	7		(Diameter incorrectly specified.	1	Tolerance stacking between pin and pin guide in cup.	1	2							
		Contacts stuck closed			Chips/fragments cause pin to lodge.		Check with supplier for material properties regarding chips.									
		Erratic operation.														
Insulate electrical components from switch housing.	Falls in insulate.	Continuity between movable terminal and housing to ground.	5		Wrong material specified.	1	Check with supplier for material properties. Check with customer for electrical logic of movable terminal.	1	5							

3713 1686

FAILURE MODE
EFFECTS ANALYSIS
(DESIGN FMEA)

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Page 1

System _____
Subsystem _____
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Model Year(s)/Vehicle(s) Variant _____

Key Date 1988

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r e	C i r c u l a r	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Control	D e t e r m i n e	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Results				
												Action Taken	B e n e f i t	O b s e r v e d	D e t e r m i n e	R. P. N.
ENVIRONMENTAL L. SEAL (74247) Prevents ingress of water to switch cavity. Provides motion to aid in preventing hose rotation.	Contaminants enter switch cavity.	High current leakage High voltage drop Erratic or inoperative switch operation.	7		Gasket thickness is specified (on assy). Limits on porosity not specified. Incorrect material.	1	Review of standard practice for gasket design. Review with gasket manufacturer. Comparison of design with similar product.	1	7							
	Does not rotate too easily.	Positives as inadequate by assembly plant and/or service personnel.	5		Gasket thickness improperly specified.	1	Review of standard practice for gasket design. Torque-to-rotate testing. Comparison of design with similar product.	1	5							

3713 1097

FAILURE MODE, EFFECTS ANALYSIS
(DESIGN FMEA)

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Page 1

System
Subsystem
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Model Year(s)/Vehicle(s) Volvo

Key Date 1988

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C o n s e q u e n c e s	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e c t i o n	R e p a r a b i l i t y	Recommended Action(s)	Responsibility & Target Completion Date	Action Items Taken	S e v e r i t y	O c c u r r e n c e	D e t e c t i o n	R e p a r a b i l i t y	
WIREAD CAP (74000) Protects support threads from damage during shipping and install. Prevents dust from entering the fluid cavity.	Incorrect length.	Does not protect threads sufficiently.	5		Length incorrectly specified.	1	Dimensional checking study.	1	4								
	Loose Cap.	Allows dust to enter fluid cavity	4		Incorrect diameter specified.	1	Dimensional analysis.	1	4								

3713 1898

**FAILURE MODE
EFFECTS ANALYSIS**
(FMEA)

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Page 1

System _____
Subsystem _____
X Component Pressure Switch

Design Responsibility Pressure Switch Group

Model Year(s)/Vehicle(s) Variant _____

Key Date 1988

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C o n s e q u e n c e	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e c t i o n	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Plan(s)					
												Action Taken	S e v e r i t y	O c c u r r e n c e	D e t e c t i o n	R. P. N.	
EXPORT (30000)																	
Provides a hydraulic sealing surface per SAE J1912.	Fails to seal.	Leakage of brake fluid.	9	FF	Incorrect surface finish specification. Incorrect material specification. Incorrectly specified geometry. Excessive pressure.	1		1	2								
Provides external thread for installation into sealing port.	Fails to properly install in sealing port.	Damages threads in sealing port during installation. Does not allow installation.	7	FF	Threads specified improperly. Threads not gauged per ANSI spec's. Flaring buildup.	3		3	22								
	Apparently installs, but fails to properly seal and seal.	Brake fluid leakage.	9	FF	Threads specified improperly. Threads not gauge per ANSI spec's. Flaring buildup.	1		3	29								
Provides hex feature for 1/2" or wrench.	Incorrect hex size.	Damage to hex flats during wrenching. 1/2" wrench does not fit.	5		Hex feature improperly specified per established SAE/ANSI spec's.	1		1	5								
Provides fluid passage to pressure-sensing element.	Fluid passage is too small.	Electrical signal from switch is delayed vs. pressure signal especially at very low temp. Subject to blockage by foreign matter.	7	FF	Inadequate size of fluid passage specified. Inadequate review of Ford standard practices.	1		1	7								
	Fluid passage is too large.	Hampering thin wall section causes buckling: during installation during end-of-line service operations	7	FF	Fluid passage specified excessively large.	1		1	7								

3713 1099

FAILURE MODE
EFFECTS ANALYSIS
(FMEA)

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Revision Date 30-Oct-88

Page 2

System
Subsystem
X Component Frame Split

Design Responsibility Frame Split (Sgt)

Original (Initial) Date 30-Dec-88

Model Year(s)/Vehicle(s)/Version

Key Date 1988

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item	Function	Potential Failure Mode	Potential Effect(s) of Failure	S	C	Potential Cause(s) Mechanism(s) of Failure	O	Current Design Controls	O	R	Recommended Action(s)	Responsibility & Target Completion Date	Action Possible	S	C	P	R
EXPORT (Sgt)																	
	Provides gland for internal gland.	Fails to seal internal gland properly.	Leakage of brake fluid.	9		Gland dimensions improperly specified. Surface finish improperly specified. Gland geometry improperly designed.	1	Cross-check with recommendations of gasket supplier. Comprehensive testing.	1	9							
	Provides flange which interfaces with other components to form pressure-seal structure.	Flange fails to mate properly with other components of pressure seal. Die, too large results in assembly difficulty. Distortion too small results in lost component alignment. Flange too thick results in poor crimp. Flange too thin results in reduced burst capacity. Improper edge chamfer results in stress concentration which initiates crack.		9		Improper or incomplete specification of dimensions and tolerances.	1	Experiments and analysis to determine proper thickness for required strength. Tolerance stack-up analysis. Pilot order.	1	9							
		Material too soft or weak.	Inadequate burst capacity. Damage/leakage during installation or subsequent service. Threads prone to damage, leads to assembly difficulty.	9		Improper material selected.	1	Comprehensive evaluation of physical properties.	1	9							
		Material cracks.	Loss of seal due to leakage.	9		Improper material selection.	1	Review of material properties.	1	9							
		Material degrades in presence of working fluids.	Leakage.	9		Improper material selection.	1	Cross-check with similar products.	1	9							
		Inadequate environmental protection.	Long-term attack causes weakening of key areas which leads to leakage or breakage.	9		Improper or insufficient plating specification.	1	Comprehensive environmental testing.	2	27							

5713 1700

TIAL
FAILURE MODE EFFECTS ANALYSIS
(DETAILED FMEA)

Document Number 92006
Revision Level C
Revision Date 28-Oct-92

apn 2

System _____
Subsystem _____
X Component Passage Switch

Design Responsibility Passage Switch Group

Original (Initial) Date 28-Dec-92

Model Year(s)/Vehicle(s)/Version _____

Key Date 1992

Prepared By C. Wagner

Core Team Design Engineering, Manufacturing Engineering, Manufacturing, Quality

Item Function	Potential Failure Mode	Potential Effects of Failure	S e v e r i t y	C o n s e q u e n c e s	Potential Cause(s) Mechanism(s) of Failure	O c c u r r e n c e	Current Design Controls	D e t e r m i n e d	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Priority				
												Action Taken	S e v e r i t y	O c c u r r e n c e	D e t e r m i n e d	R. P. N.
REPORT (38200) Provides large which interfaces with other components to have positive- negative direction.		Cosmetic problems.	0			1	Preview of plating operation.	3	27							

at Number 808872
 is date 18247 JP
 Prepared by J. Amadori, Versa

Part Component: Borehole Contact
 Part No./Revision: 387-06/01, 80-410-1/0
 Process/Flow: CPM
 Design/Revision:

Design Responsibility: A. Jones / J. Pyle
 Process/Quality Responsibility: R. Meyer / J. Wall
 Supplier:
 Model Year/Release:

Item	Part Name	Part Number	Part Description	Item	Part Name	Part Number	Part Description	Item	Part Name	Part Number	Part Description
1	Provide electrical switching		Fails to provide	7	Correct material specified	1	Failure of TI geometry and general	1	7		
2	switches with efficiency testing		adequate electrical		See 716		contact design info				
3			contact								
4			Automated continuity								
5			High without drop								
6											
7											
8											
9											
10											
11											
12											
13											
14	Provide electrical path from hardware		Fails to provide	7	Incorrect material specified	1	Failure with correct manufacturing	1	7		
15	to contact area		adequate conductivity				Experimental verification				
16											
17											
18											
19	Provide means of mechanical		Inadequately effective	7	Incorrect geometry specified	1	Manufacturer recommendation	1	7		
20	adjustment to contact area		to contact area								
21											
22											
23											
24											
25											
26	Provide rigidity to maintain contact		Collaboration with	5	Incorrect geometry specified	1	Manufacturer recommendation	1	5		
27	any adjustments during calibration										
28	over time										
29											
30											
31	Provide a feature to concentrate		Inadequately force	7	Incorrect geometry specified	1	Manufacturer recommendation	1	7		
32	contact forces to a particular area		concentration								
33											
34											
35											
36	Provide features to allow loading		Fails to allow loading	5	Incorrect geometry specified	7	Manufacturing validation	1	20		
37	information		information								
38											
39											
40											
41											
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System
Subsystem
☒ Component Pressure Switch

**POTENTIAL
FAILURE MODE EFFECTS ANALYSIS
(FMEA)**

Design Responsibility Pressure Switch Group

Document Number 608770
Revision Level B
Revision Date 5-May-88

Original (Initial) Date 20-Dec-88

Model Year(s)/Vehicle(s)/Version

Key Date 1988

Prepared By D. He

Core Team Design Engineers, Manufacturing Engineers, Manufacturing Quality

Item Function	Potential Failure Mode	Potential Effect(s) of Failure	S e v e r i t y	C o n s e q u e n c e s	Potential Cause(s) Mechanism(s) of Failure	D e t e c t i o n	C u r r e n t D e s i g n C o n t r o l s	D e t e c t i o n	R. P. N.	Recommended Action(s)	Responsibility & Target Completion Date	Action Results				
												Action Taken	S e v e r i t y	O c c u r r e n c e	D e l a y	R. P. N.
FUEL (Fuel tank) Fastens spring to movable terminal.	Fails to adequately fasten spring to movable terminal.	Spring rotates about axis of rivet. Spring falls off movable terminal.	6	1	Improper rivet diameter for given hole sizes. Improper rivet length for given material thickness. Improper head size. Improper tabular feature. Improper material.	1	First manufacturer recommendations. Comparison with similar products. Testing to determine torque to rotate spring.	1	6							
	Provides a force between movable terminal and spring which causes terminal contact for current flow.	Inadequate force between spring and movable terminal. High resistance or no continuity of interface of spring and movable terminal.	8	1	Improper rivet diameter for given hole sizes. Improper rivet length for given material thickness. Improper head size. Improper tabular feature. Improper material.	1	First manufacturer recommendations. Comparison with similar products. Testing to determine torque to rotate spring.	1	6							



3713 1704

	Brake Pressure Switch Usage								
VL / MY	92	93	94	95	96	97	98	99	
town									
crown vic									
grand marquis									
econo									
club wagon									
f-series									
bronco									
explor									
ranger									
exped									
navi									
sho									
mark VIII									
windstar									

3713 1705

Steve, below is a memo from Charlie Douglas to Fred Foster that was an early answer to the various brake p/s part number question.....I have now added plastic type as a difference between switches as well as made position tab more prominent as it might be a confounder in the connector seal theoryAndy McGuirk
3/18/99

Fred,

I believe that your list includes some service part numbers, older rev levels, as well as pre-production or prototype part numbers. Overall, including Ford Australia, there are eight different production parts. Differences from part to part are fairly minor and include: actuation calibration, release pressure, hexport style, position tab to locate connector, color (and possibly plastic material) of connector base, thread style, and snap noise associated with the pressure disc. The following matrix, helps summarize this information:

<u>Part Number</u>	<u>Actuation</u>	<u>Release Base/pos tab</u>	<u>Hexport</u>	<u>Thread</u>	<u>S or Q</u>
F2VC 9F924 AB 90-160 (1)	20 min	Brown / pos 2	J512	3/8-24M	Soap
F6LC 9F924 AA 200-300 (2)	40 min	Black / pos 1	J512	3/8-24M	Soap
F2AC 9F924 AA 90-200 (3)	20 min	Natural / pos 2	J512	3/8-24M	Quiet
F58A 9F924 AA 90-160 (4)	20 min	Gray / pos 1	J512	3/8-24M	Quiet
F3TA 9F924 CA 200-300 (5)	40 min	Red / pos 1	J512	3/8-24M	Snap
94DA 9F924 AA 90-160 (6)	20 min	Natural / pos 2	o-ring	M10x1.0M	Quiet
F3DC 9F924 AA 90-160 (7)	20 min	Natural / pos 2	Smibber	3/8-24M	Quiet
94JA 9F924 AB 90-160 (8)	20 min	Gray / pos 1	o-ring	3/8-24M	Quiet

Vehicle - Part Number Correlation

- (1) Crown Vic, Grand Marquis, Mark, Town Car
- (2) Econoline, Club Wagon
- (3) Crown Vic, Grand Marquis, Mark, Town Car
- (4) Winstar
- (5) Bronco, F-Series, Ranger, Explorer, Navigator, Expedition, Econoline, Club Wagon
- (6) Falcon
- (7) SHO Taurus
- (8) Capri

T1 P/N Correlation to Above

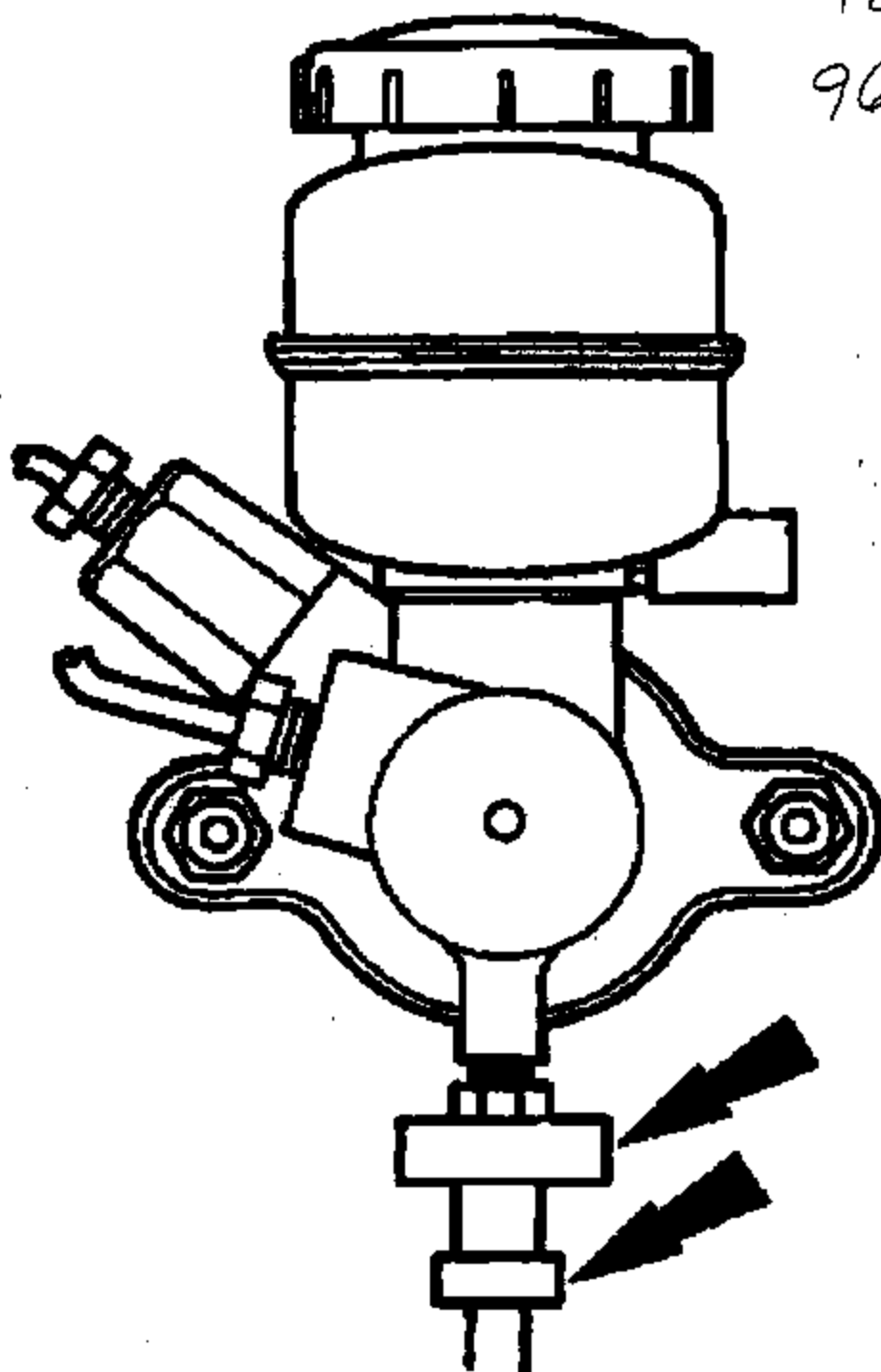
- (1) 77PSL2-1
- (2) 77PSL2-3
- (3) 77PSL3-1
- (4) 77PSL3-2
- (5) 77PSL3-3
- (6) 77PSL4-1
- (7) 77PSL3-2
- (8) 77PSL6-1

[illegible]

Step 2

98 ECONOL

96 WINSTAIR

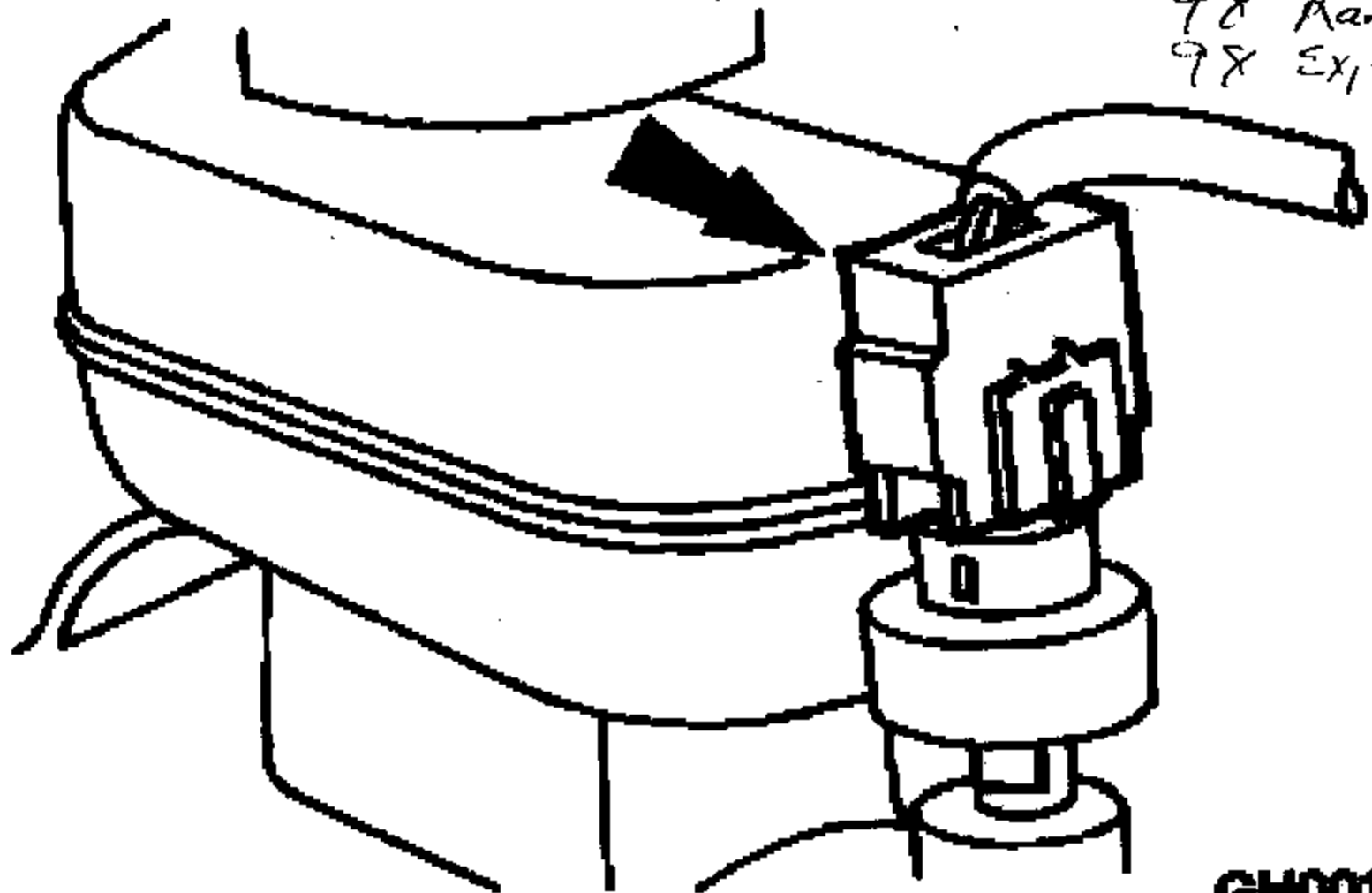


DL0010-A

3713 1708

78 F10/250

98 Ranger
98 Explorer



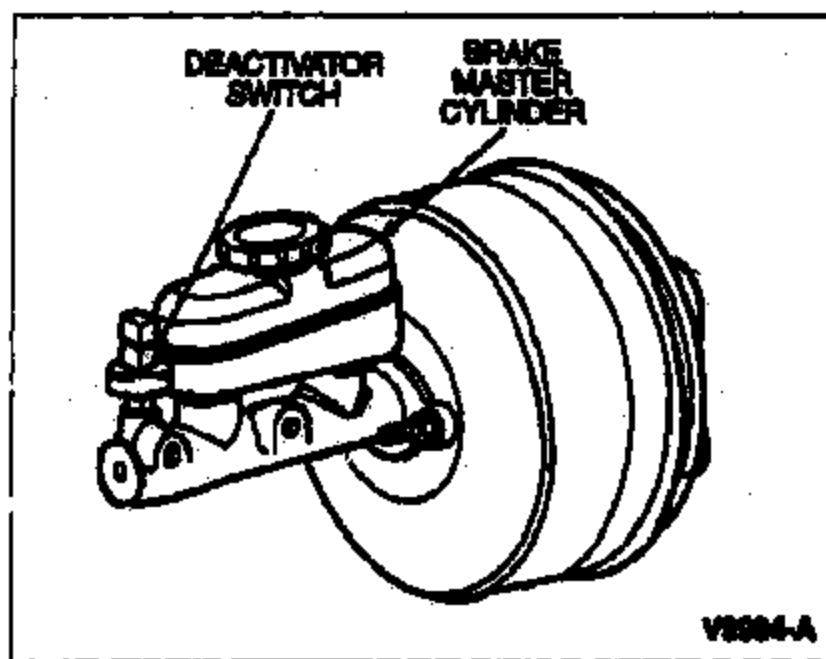
GH0012-A

Removal

1. Disconnect deactivator switch connector. Deactivator switch is located on brake master cylinder (2140).
2. Unscrew switch and remove.

Installation

For installation, follow removal procedures in reverse order. Tighten switch to 15-20 N-m (12-14 lb-ft) and bleed brake lines as described in «Section 06-06».

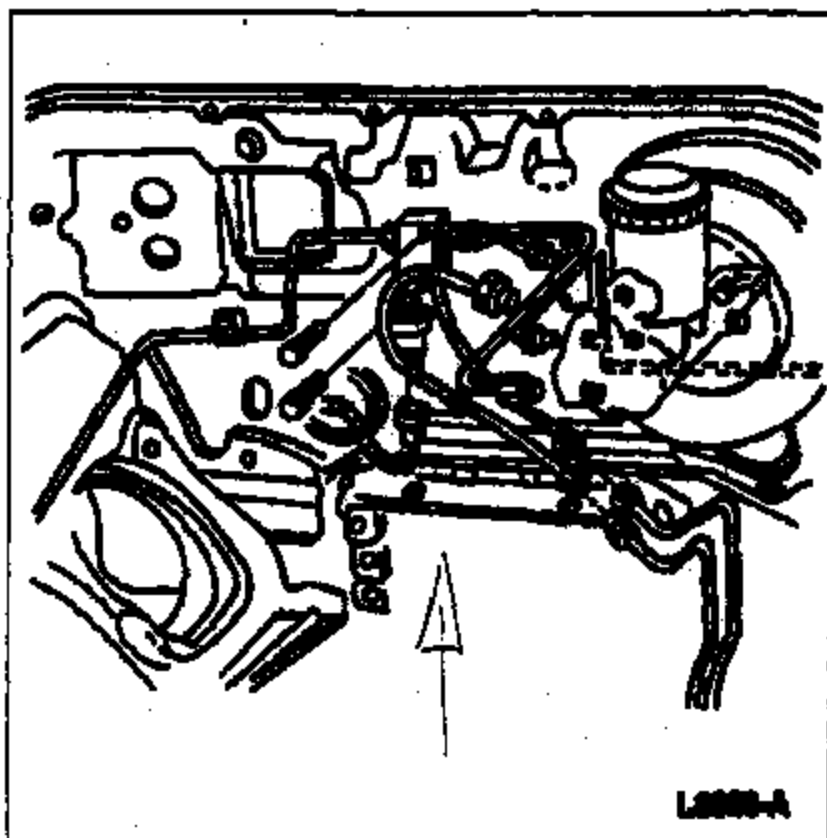


91, 96, 95 Ragi
Explorer

94 Econo
F Series
Bronco

97 Expedition

Speed Control Deactivator Switch Assy

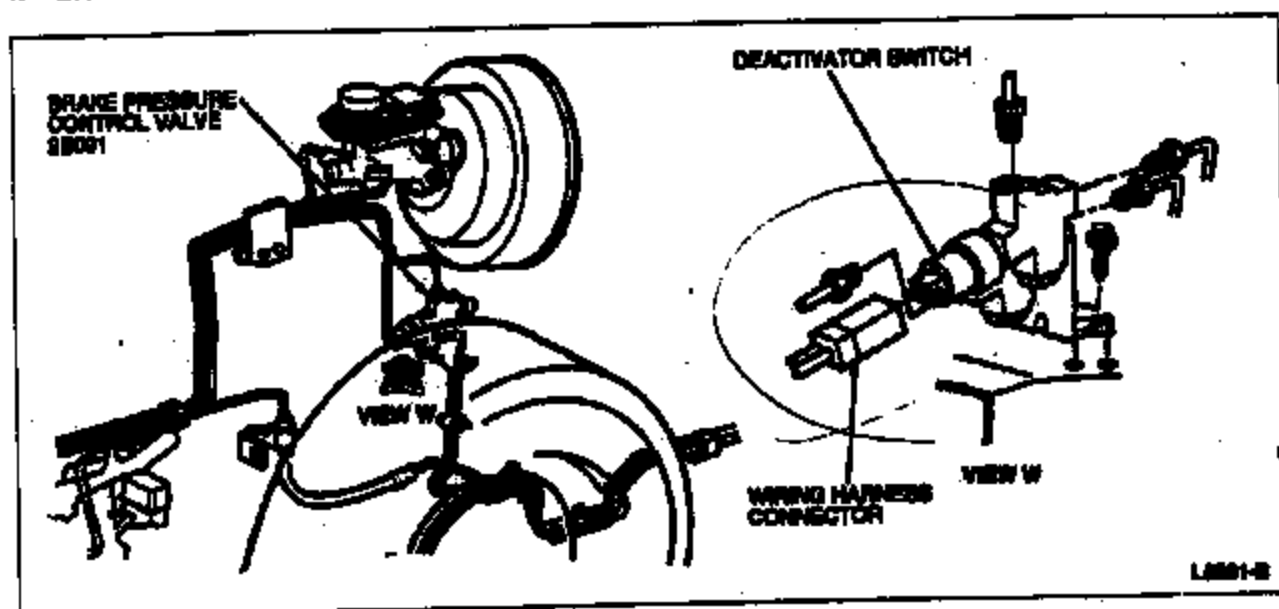


Installation

1. Screw deactivator switch into brake master cylinder tube tee. Tighten switch to 8-11 N-m (71-97 lb-in).
2. Attach electrical connector.

2. Attach electrical connector.
3. Install brake master cylinder reservoir. Refer to «Section 06-05».
4. Bleed brake lines as outlined in «Section 06-00».

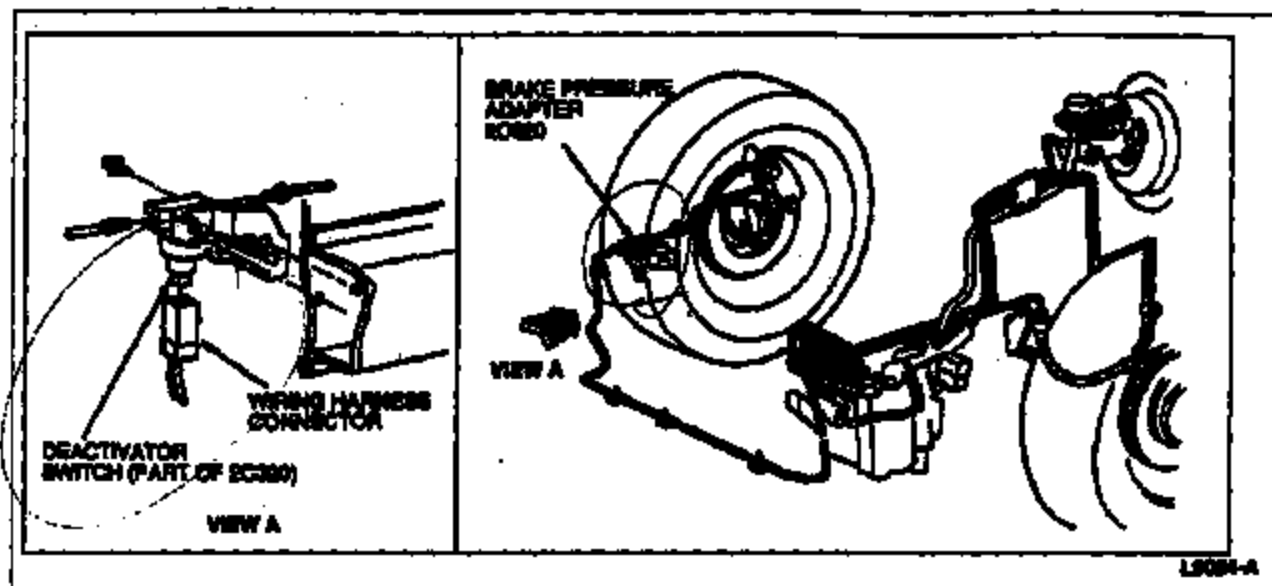
Mk 8
93 1/2 94

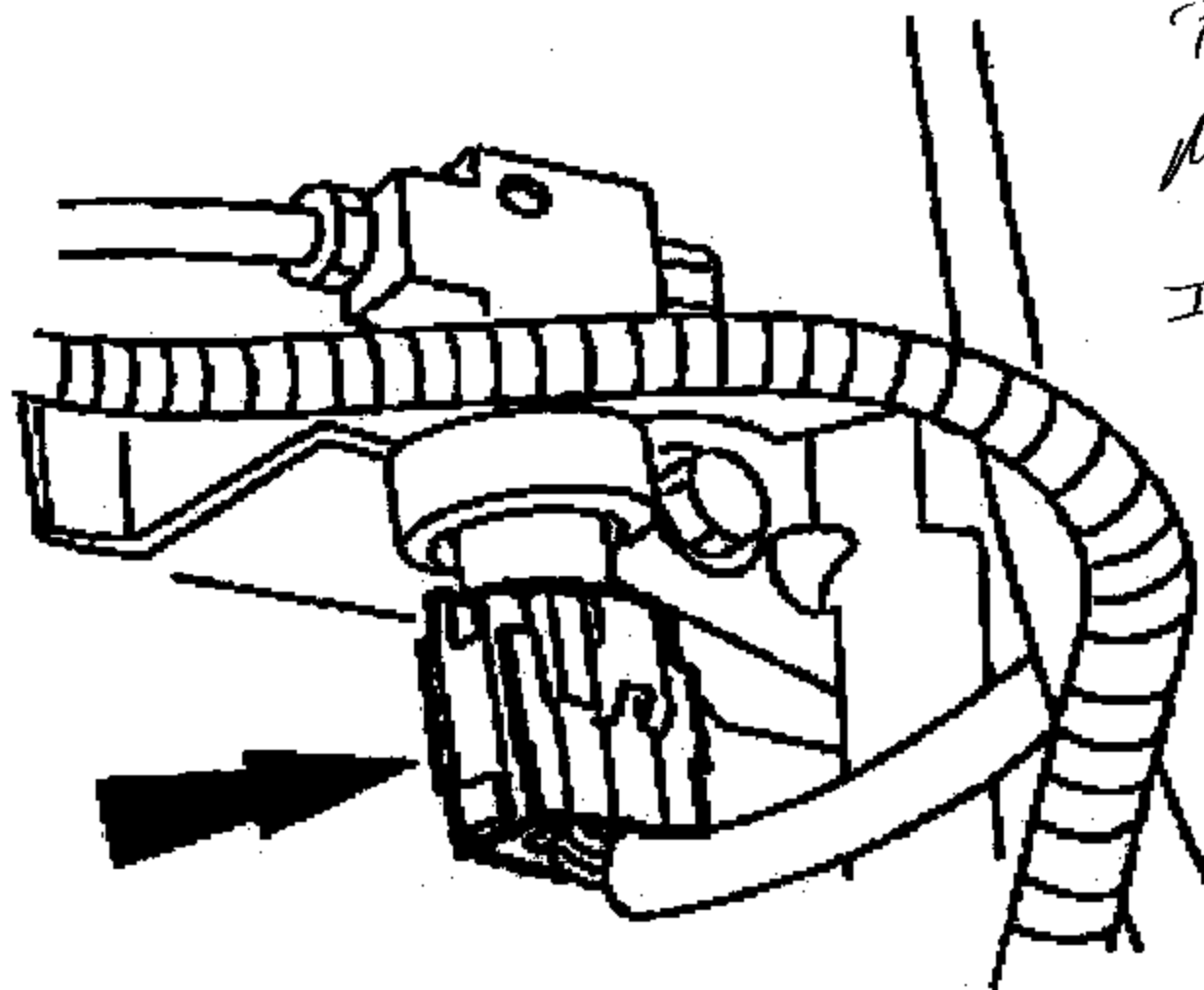


4. Bleed brake lines as outlined in «Section 06-00».

95 Mk VII

Deactivator Switch





78
MARK

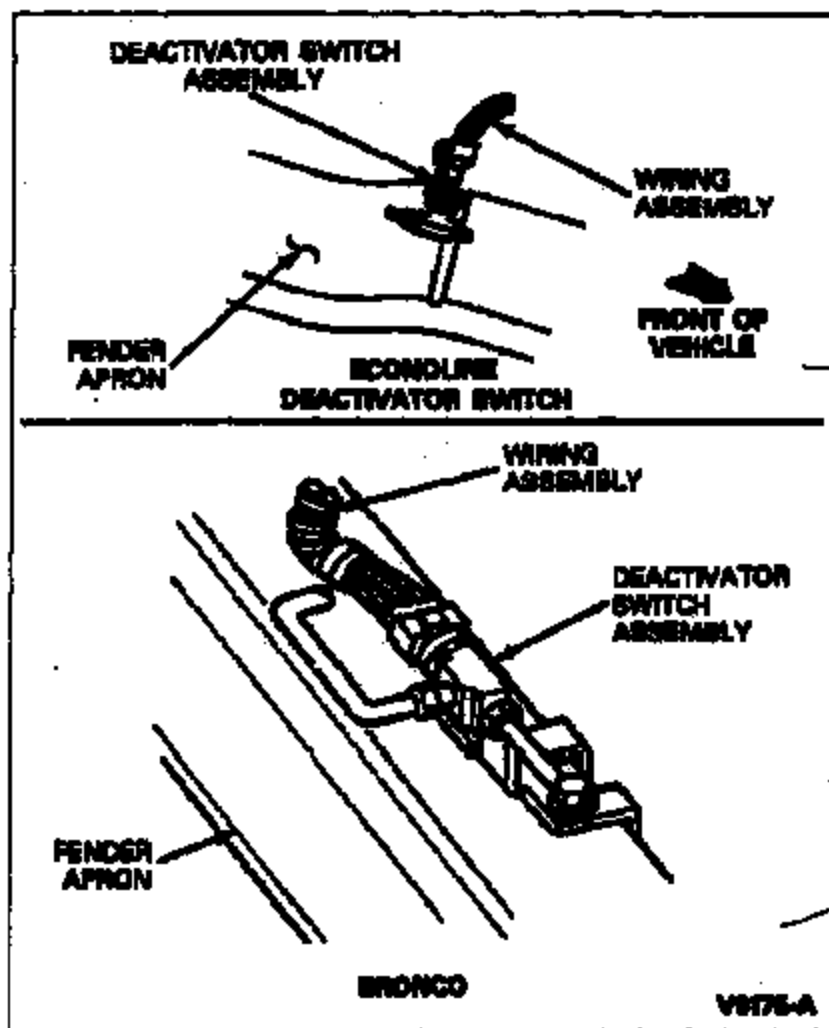
INSIDE
RF
SPLASH
FIELD

AL0194-A

3718 1714

For installation, follow removal procedures in reverse order. Tighten switch to 15-20 N-m (12-14 ft-lb) and bleed brake lines as described in «Section 06-00».

Deactivator Switch



93
CONDOR

1.10.00
F-1000

Steve, below is a memo from Charlie Douglas to Fred Porter that was an early answer to the various brake p/s part number question....I have now added plastic type as a difference between switches as well as made position tab more prominent as it might be a confounder in the connector seal theory.....Andy McQuirk
3/18/99

Fred,

I believe that your list includes some service part numbers, older rev levels, as well as pre-production or prototype part numbers. Overall, including Ford Australia, there are eight different production parts. Differences from part to part are fairly minor and include: actuation calibration, release pressure, hexport style, position tab to locate connector, color (and possibly plastic material) of connector base, thread style, and snap noise associated with the pressure disc. The following matrix, helps summarize this information:

Part Number	Actuation	Release	Base/pos tab	Hexwart	Thread	Spr.O
F2VC 9F924 AB 90-160 (1)	20 min	Brown / pos 2	J512	3/8-24M	Snap	
F6LC 9F924 AA 200-300 (2)	40 min	Black / pos 1	J512	3/8-24M	Snap	
F2AC 9F924 AA 90-200 (3)	20 min	Natural / pos 2	J512	3/8-24M	Quiet	
F58A 9F924 AA 90-160 (4)	20 min	Gray / pos 1	J512	3/8-24M	Quiet	
F3TA 9F924 CA 200-300 (5)	40 min	Red / pos 1	J512	3/8-24M	Snap	
94DA 9F924 AA 90-160 (6)	20 min	Natural / pos 2	o-ring	M10x1.0M	Quiet	
F3DC 9F924 AA 90-160 (7)	20 min	Natural / pos 2	Seubber	3/8-24M	Quiet	
94JA 9F924 AB 90-160 (8)	20 min	Gray / pos 1	o-ring	3/8-24M	Quiet	

Vehicle - Part Number Correlation

- (1) Crown Vic, Grand Marquis, Mark, Town Car
- (2) Econoline, Club Wagon
- (3) Crown Vic, Grand Marquis, Mark, Town Car
- (4) Winstar
- (5) Bronco, F-Series, Ranger, Explorer, Navigator, Expedition, Econoline, Club Wagon
- (6) Falcon
- (7) SHO Taurus
- (8) Capri

TLF/N Correlation to Above

- (1) 77PSL2-1
- (2) 77PSL3-3
- (3) 77PSL3-1
- (4) 77PSL3-2
- (5) 77PSL3-3
- (6) 77PSL4-1
- (7) 77PSL5-2
- (8) 77PSL6-1

Vehicle	MY	Part Number	Price
Bronco	94	F3TA 9F924 CA	200-300
Capri	94	94JA 9F924 AB	90-160
Club Wagon		F6LC 9F924 AA	200-300
Club Wagon		F3TA 9F924 CA	200-300
Crown Victoria	92, 93	F2VC 9F924 AB	90-160
Crown Victoria	95?	F2AC 9F924 AA	90-200
Econoline	92, 93		
Econoline	94	F3TA 9F924 CA	200-300
Econoline		F6LC 9F924 AA	200-300
Expedition		F3TA 9F924 CA	200-300
Explorer	95, 96, 97	F3TA 9F924 CA	200-300
F-Series	94, 97	F3TA 9F924 CA	200-300
Falcon		94DA 9F924 AA	90-160
Grand Marquis	92, 93	F2VC 9F924 AB	90-160
Grand Marquis	95?	F2AC 9F924 AA	90-200
Mark VII	93, 94	F2VC 9F924 AB	90-160
Mark VII	95, 96	F2AC 9F924 AA	90-200
Navigator		F3TA 9F924 CA	200-300
Ranger	95, 96, 97	F3TA 9F924 CA	200-300
SHO Taurus		F3DC 9F924 AA	90-160
Town Car	92, 93	F2VC 9F924 AB	90-160
Town Car	95?	F2AC 9F924 AA	90-200
Winstar		F58A 9F924 AA	90-160

Service PIN:

FRONT WHEEL 3/31/99
SJR

Service Numbers

- a) F2VY - 9F924 - A
- b) F2AZ - - A
- c) F3DZ - - A
- d) F58Z - - A

- e) F3TZ 9F924 B
- f) not found
- g) F6LZ 9F924 AA
- h) not found

9F824 Hydraulic Applications

Vehicle	MY	Part Number	Pressure		Color	Key	Port	Threads		Material	Location	Orientation	Component
			Engage	Release									
Bronco	94	F3TA 9F824 CA	200-300	40	Red	pos 1	J512	3/8-24M	Snap	Polyphenylene Oxide			
Capri	94	94JA 9F824 AB	80-160	20	Grey	pos 1	o-ring	3/8-24M	Quiet		322	180, 0	Prop Valve
Club Wagon		F6LC 9F824 AA	200-300	40	Black	pos 1	J512	3/8-24M	Snap				
Club Wagon		F3TA 9F824 CA	200-300	40	Red	pos 1	J512	3/8-24M	Snap	Polyphenylene Oxide	321	0, 0	Master Cylinder
Crown Victoria	92, 93	F2VC 9F824 AB	80-160	20	Brown	pos 2	J512	3/8-24M	Snap	Celanex 4300	311	45, 0	Prop Valve
Crown Victoria	957	F2AC 9F824 AA	80-200	20	Natural	pos 2	J512	3/8-24M	Quiet		311	45, 0	Prop Valve
Econoline	92, 93								Snap		211	0, 0	Brake Line
Econoline	94	F3TA 9F824 CA	200-300	40	Red	pos 1	J512	3/8-24M	Snap	Polyphenylene Oxide	321	0, 0	Master Cylinder
Econoline		F6LC 9F824 AA	200-300	40	Black	pos 1	J512	3/8-24M	Snap				
Expedition		F3TA 9F824 CA	200-300	40	Red	pos 1	J512	3/8-24M	Snap	Polyphenylene Oxide			
Explorer	95, 96, 97	F3TA 9F824 CA	200-300	40	Red	pos 1	J512	3/8-24M	Snap	Polyphenylene Oxide	321	0, 0	Master Cylinder
F-Series	94, 97	F3TA 9F824 CA	200-300	40	Red	pos 1	J512	3/8-24M	Snap	Polyphenylene Oxide	321	0, 0	Master Cylinder
Falcon		94DA 9F824 AA	80-160	20	Natural	pos 2	o-ring	M10x1.0M	Quiet				
Grand Marquis	92, 93	F2VC 9F824 AB	80-160	20	Brown	pos 2	J512	3/8-24M	Snap	Celanex 4300	311	45, 0	Prop Valve
Grand Marquis	957	F2AC 9F824 AA	80-200	20	Natural	pos 2	J512	3/8-24M	Quiet		311	45, 0	Prop Valve
Mark VII	93, 94	F2VC 9F824 AB	80-160	20	Brown	pos 2	J512	3/8-24M	Snap	Celanex 4300	311	100, 0	Prop Valve
Mark VII	95, 98	F2AC 9F824 AA	80-200	20	Natural	pos 2	J512	3/8-24M	Quiet		113	180, 0	Prop Valve
Navigator		F3TA 9F824 CA	200-300	40	Red	pos 1	J512	3/8-24M	Snap	Polyphenylene Oxide			
Ranger	95, 96, 97	F3TA 9F824 CA	200-300	40	Red	pos 1	J512	3/8-24M	Snap	Polyphenylene Oxide	321	0, 0	Master Cylinder
SHO Taurus		F3DC 9F824 AA	80-160	20	Natural	pos 2	Snubber	3/8-24M	Quiet				
Town Car	92, 93	F2VC 9F824 AB	80-160	20	Brown	pos 2	J512	3/8-24M	Snap	Celanex 4300	311	45, 0	Prop Valve
Town Car	957	F2AC 9F824 AA	80-200	20	Natural	pos 2	J512	3/8-24M	Quiet		311	45, 0	Prop Valve
Windsor		F6BA 9F824 AA	80-160	20	Grey	pos 1	J512	3/8-24M	Quiet				

3713 1719

1. ENGINEERING APPROVAL OF SAMPLES FROM EACH SUPPLIER IS REQUIRED PRIOR TO AUTHORIZATION OF PART PRODUCTION.
2. AFTER INITIAL RELEASE, NO CHANGE MAY BE MADE IN MATERIALS, PROCESS OR DESIGN WITHOUT PRIOR ENGINEERING APPROVAL.
3. THIS PRODUCT IS DRAFTED IN ACCORDANCE WITH AMS Y1434-1988.
4. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
5. MUST CONFORM TO ENGINEERING SPECIFICATIONS ES-E73C-2B091-AA.
6. PACKAGE IN CLOSED POLYETHYLENE BAGS.

NE

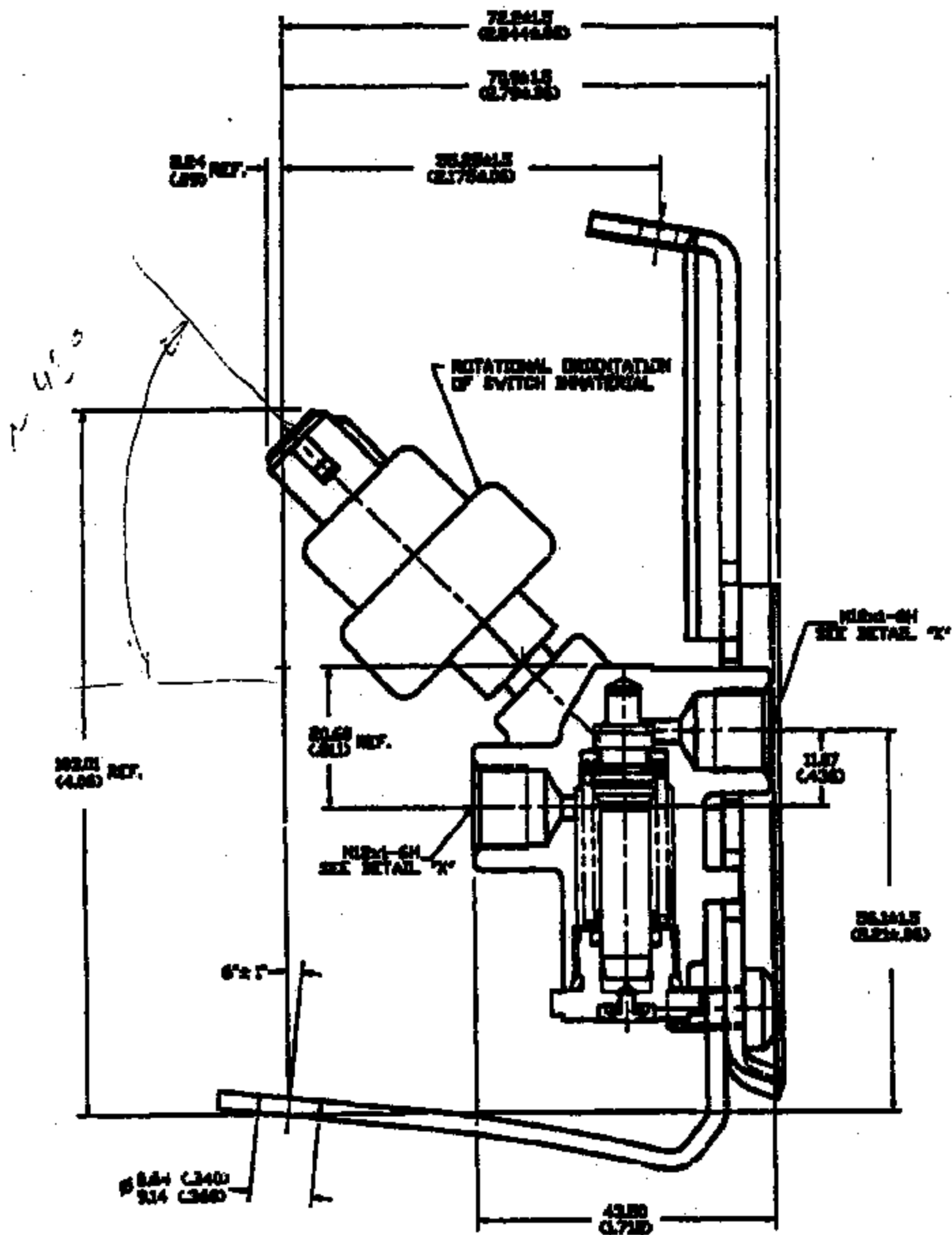
▽ CONTROL ITEM - THE ▽ SYMBOL ALSO IDENTIFIES PRODUCT ENGINEERING DESIGNATED CRITICAL CHARACTERISTICS. THESE, AND ADDITIONAL CRITICAL CHARACTERISTICS IDENTIFIED BY PROCESS REVIEWS, MUST APPEAR ON THE Q-101 CONTROL PLAN WHICH REQUIRES PRODUCT ENGINEERING APPROVAL.

PART MUST COMPLY WITH SPECIFICATION WSS-MSP8888-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.

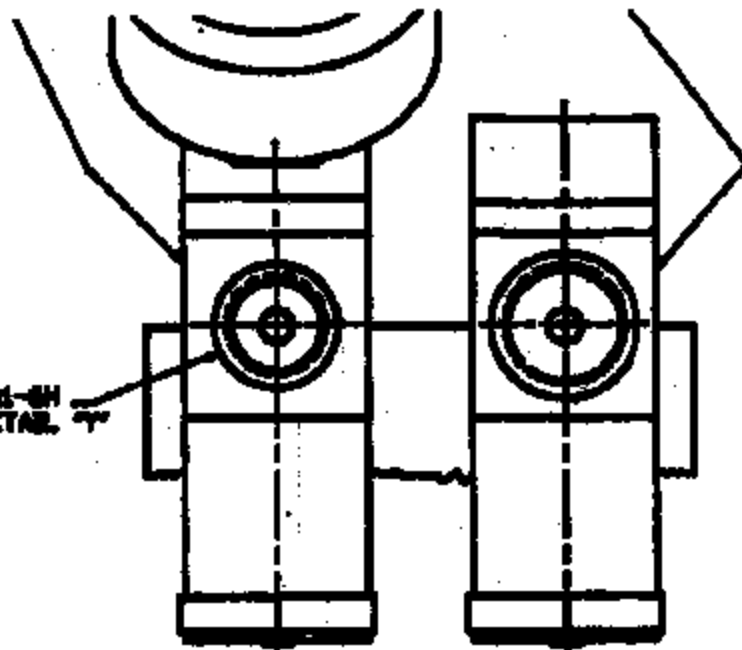
MANUFACTURER TO ESTABLISH PRODUCT ENGINEERING APPROVED CONTROL PLAN.

ENGINEERING APPROVAL OF A MINIMUM OF SIX SAMPLES FROM EACH SUPPLIER IS REQUIRED PRIOR TO FIRST SHIPMENT OF PARTS FOR INITIAL RELEASE AND ALL SUBSEQUENT CHANGE REQUESTS.

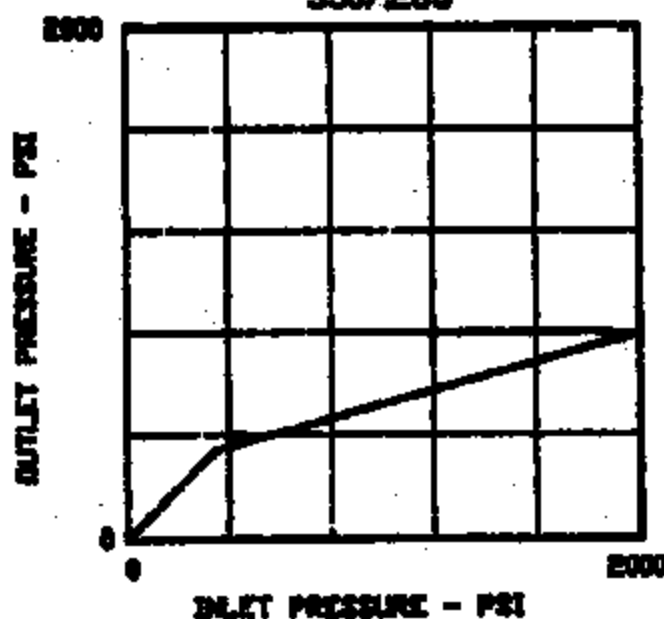
RELEASED				
72-03		NC00E10129983000		90
MATL	DATE	REVISIONS/REL. NO.	CK	APP
	PART MUST COMPLY WITH SPECIFICATION WSS-MSP8888-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT			
	NAME VALVE ASY-BRAKE PRESSURE CONTROL			
	NO. ▽ F3VC-2B091-BA			



MOORE-CH
TEC DETAIL "Y"



**REFERENCE THEORETICAL VALVE PERFORMANCE
350/263**



▽ VALVE PERFORMANCE REQUIREMENTS

WITH HYDRAULIC INLET PRESSURE INCREASING, OUTLET PRESSURE MUST BE 350 TO 450 PSI WHEN THE INLET PRESSURE IS 500 PSI, AND OUTLET PRESSURE MUST BE 750 TO 900 PSI WHEN INLET PRESSURE IS 2000 PSI.

ENG PART: F2VC 9F924 AB
 Eng Name: SW ASY-SPD CONT DEACT
 Part: F2VY- 9F924-A
 In-Out

ORIGIN: WERS REGION: _ USC STAT: _
 PT: _ PTO: _ VL: _
 Replaces: Y Is Replcd: N USC IND: _

t	VL	Yr	Yr	Feature Descriptions	Feature Descriptions
C	DA	94	95	TAURUS	
C	FS	92	94	CROWN VIC LESS ANTI-SPIN TRACTION BRAKES	4 SPD AUTO TRANS NAAO AODE SPEED CONTROL
C	FB	92	94	CROWN VIC ANTI-SPIN TRACT BRAKES W/O IVD	4 SPD AUTO TRANS NAAO AODE SPEED CONTROL
C	FP	92	94	GRAND MARQ (EN53/EN114) LESS ANTI-SPIN TRACTION BRAKES	4 SPD AUTO TRANS NAAO AODE SPEED CONTROL
C	FP	92	94	GRAND MARQ (EN53/EN114) ANTI-SPIN TRACT BRAKES W/O IVD	4 SPD AUTO TRANS NAAO AODE SPEED CONTROL
C	LA	93	93	MARK	
C	LB	94	95	MARK VIII (FN10)	
C	VB	94		TOWN CAR (FN16/FN116)	LINO CONVERSION PACKAGE
C	VB	93	93	TOWN CAR (FN16/FN116)	LINO CONVERSION PACKAGE
F1=Help F4=Priv F5=Next F8=URFA F10=EXEA					F11=EPEA F13=RPLD F14=RPLG
RECORD FOUND					REL6796

STEVE REIMERS
 04145

3713 1725

ENCAPATA

Display Usage Translations

03/17/99 08:32:11

ENG PART: F2VC 9F924 AB ORIGIN: WERS REGION: _ URG STAT: _
 Eng Name: SW ASY-SPD CONT DEACT PT: _ PTO: _ VL: _
 Svc Part: F2VY- 9F924-A Replaces: Y Is Replod: N URG IND: _
 P In Out
 t Vl Yr Yr Feature Descriptions Feature Descriptions
 C VC 88 LINCOLN TOWN CAR LINO CONVERSION PACKAGE
 C VC 98 88 LINCOLN TOWN CAR LINO CONVERSION PACKAGE
 LENS SPECIAL EQUIPMENT PACKAGE

ENCAPATA

Display Usage Translations

03/17/99 08:33:06

ENG PART: F2VC 9F924 AB ORIGIN: WERS REGION: _ URG STAT: _
 Eng Name: SW ASY-SPD CONT DEACT PT: _ PTO: _ VL: _
 Svc Part: F2VY- 9F924-A Replaces: Y Is Replod: N URG IND: _
 P In Out
 t Vl Yr Yr Feature Descriptions Feature Descriptions
 C VE 83 83 TOWN CAR (FV36/FV116) LINO CONVERSION PACKAGE
 4 WEL ANTI-LOCK BRAKES
 C VE 87 87 TOWN CAR (FV36/FV116) LINO CONVERSION PACKAGE
 LENS SPECIAL EQUIPMENT PACKAGE
 C VE 83 TOWN CAR (FV36/FV116) 4 SPD AUTO TRANS MAKO ACDE
 LENS SPECIAL PURPOSE VEHICLE
 C VE 83 83 TOWN CAR (FV36/FV116) 4 SPD AUTO TRANS MAKO ACDE
 LENS SPECIAL PURPOSE VEHICLE 4 WEL ANTI-LOCK BRAKES
 C VE 82 TOWN CAR (FV36/FV116) 4 SPD AUTO TRANS MAKO ACDE
 LINO CONVERSION PACKAGE
 C VE 83 TOWN CAR (FV36/FV116) 4 SPD AUTO TRANS MAKO ACDE
 LINO CONVERSION PACKAGE 4 WEL ANTI-LOCK BRAKES
 C VC 88 LINCOLN TOWN CAR LINO CONVERSION PACKAGE
 P1-Help P4-Prv P5-Quit P9-URPA F10-EXHA F11-EXHA F13-EXLD F14-SVLC
 RECORD FOUND

3713 1726

SERVICE PART: F2VY- 9F924-A **SN** A9Y-895 **COST** BNACT
ENGINEERING PART: F2VC 9F924 AB
SUPPLIER LOC:
Vendor Part:
Motorcraft Part:
Comparable Part:
Replaced Part: F2VY- 9F924-B
Replacing Part:
Buyer: 1C1 SHARON L. BAYNER
Dmd Analyst: LAD DANIELLE ROY
Pred Analyst: 406 BRIAN PEKARSCIK
Price Analyst: 191 SHEILA WEITMAN
Color Name:
Prod Obs: Svc Disp: Unit Issue: 1
Obs Not: Mach Ob Cd: Trfc Cd: 428
Obs Eff: Procure Cd: 2 Hvy Trk App: 2
Eff In: 01/14/91 Rise Hld: N Fab/Hold: N
Eff Out: 07/31/00 Final Rise: N Wgt UOM: LB
Ship Mlt: 238 Spec Pgm: N Dir Ship:
Comdty: 060605 Volume Grp: D Hvy Trk Cd:
F1=Help F2=GIMA F4=PrvPart F5=NxtPart F6=PIGA F9=DEBA F10=HIIA F11=ARFA
RECORD FOUND

ORIGIN: WERS
FINIS: 3424326
For Buy:
Prime Suplr: A9H2E
Packager Cd: AF30E
Mat Content:
Haras Cd: 8536.50.9063
NRA Phone: 734-266-9895
NDA Phone: 734-266-9893
NPA Phone: 734-52-35410
Profs ID: SWEITHMA
Pallet Qty: 8400
Overpack Qty: 20
Max Ord Qty: 0
Min Run Qty: 0
Min Ship Qty: 0
Package Wgt: 0.00
Standard Cst: 2.52
Dealer Net: 6.81

3713 1727

SEMPARFA

Display Usage Translations

03/17/99 08:33:11

ENG PART: F2VC 97924 AB ORIGIN: WERS REGION: _ USG STAT: _
 ing Name: SW ASY-SPD CONT DRACH PT: PTO: VL: _
 Part: F2VY- 97924-A Replaces: Y Is Replod: N USG IND: _
 In Out
 t V1 Yr Yr Feature Descriptions Feature Descriptions
 C VC 98 LINCOLN TOWN CAR LIMO CONVERSION PACKAGE
 C VC 98 00 LINCOLN TOWN CAR LIMO CONVERSION PACKAGE
 LESS SPECIAL EQUIPMENT PACKAGE

F1-Help F4-Prv F5-Nxt F9-UFPA F10-EXHA F11-EPHA F13-SPLO F14-APLC
 RECORD FOUND REL6796

3713 1728

* Note printed by SRKIMERS on 22 Feb 1999 at 12:30:07 *

From: LQHE3 --DREN006
To: KEUBINTA--DREN006
cc: LQHE3 --DREN006

Date and time 02/22/99 11:35:14
SRKIMERS--DREN007

*** Reply to note of 02/22/99 08:23
FROM: Larry Gee
Subject: 92/93 Town Car Options?

USART(UTC -05:00)

For 1992, the coding handbook first states that ABS is optional. This is followed by a statement:

Per marketing decision, ABS anti-lock brakes (less traction control) is standard on all Lincolns except the Limousine Package.

From this one would guess that ABS is standard and Traction Control is optional for 1992.

For 1993, the manual is incomplete. The page containing this information is missing. By 1994, however, ABS with traction control is listed as optional for all Lincoln Town Cars. ABS without traction control is not listed.

Regards,
Larry Gee

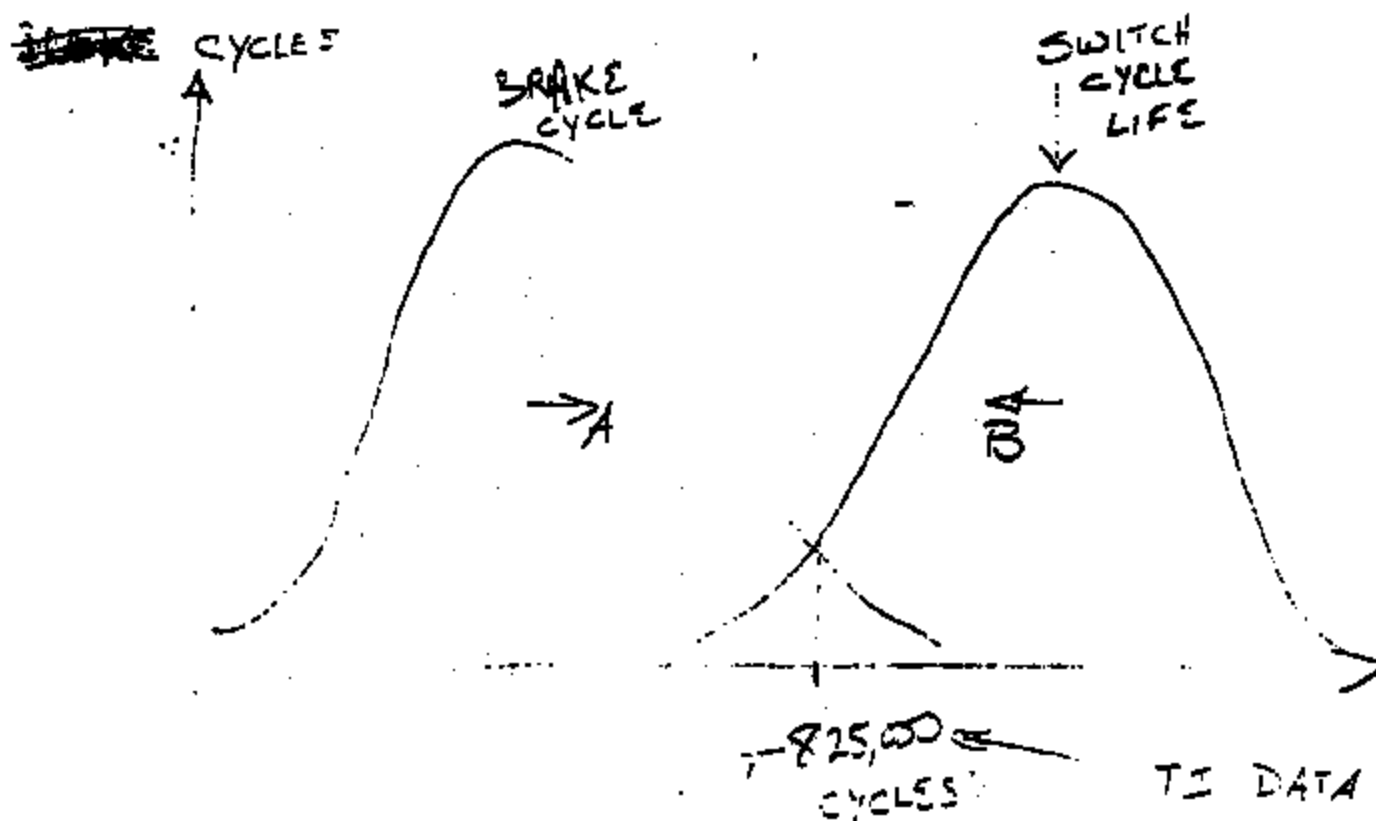
3713 1729

Telecon

2/16/99

FROM: Norm LaPointe

Re: GTO Correlation Data for Brake Application
VS 99% Reliability of Switch.

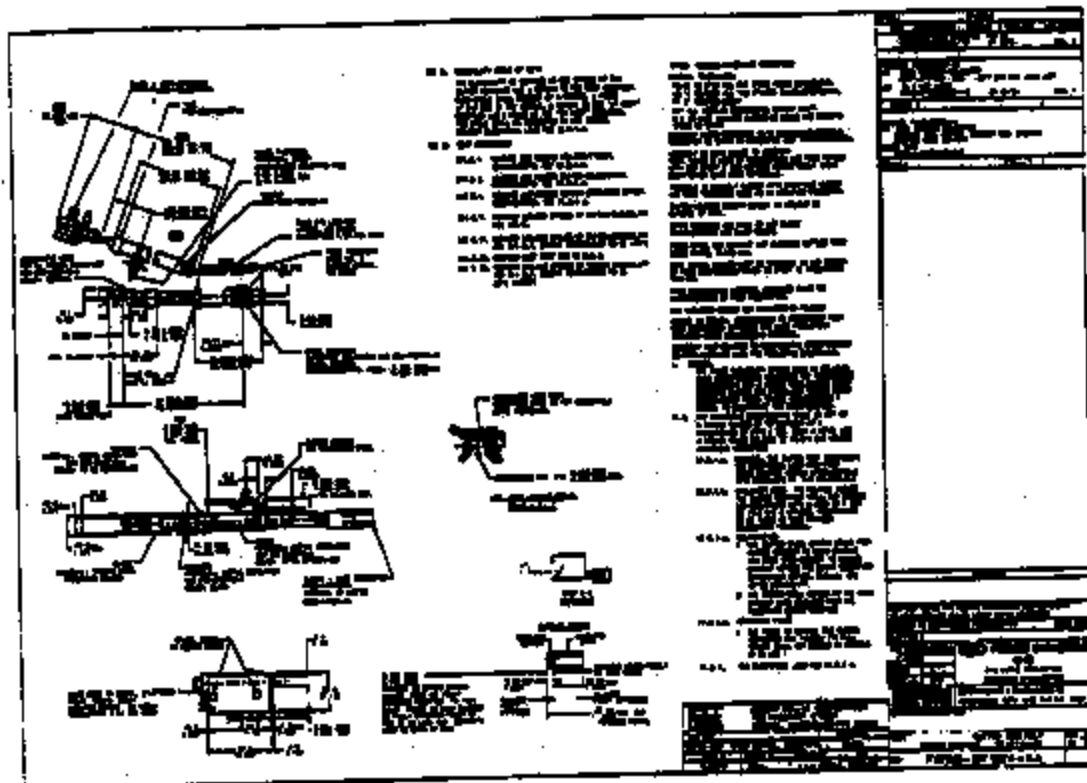


95 Percent

Driver 16 miles per mile

x Mowpr = Car miles

A new Essay for B if A
to right because of ABS
on.



FF65B-9F924-AA

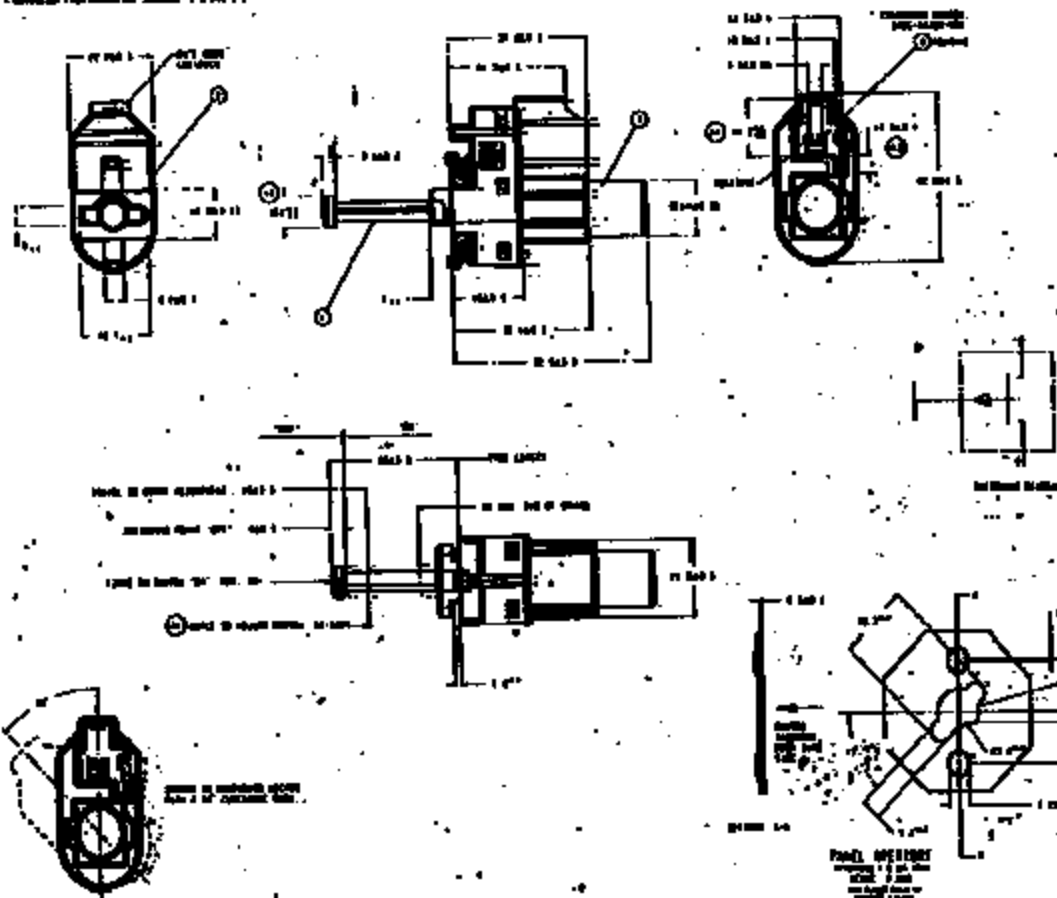
F62B-9F924-AB

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MUJ.

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FORM NO. 10-64		REV. 1-64	
UNITED STATES DEPARTMENT OF THE ARMY HEADQUARTERS, ARMY WASHINGTON, D. C. 20315			
NAME (Last, first, middle initial)		GRADE OR RATE	
JOHN L. JONES JR. Captain 100th Airborne Division Fort Bragg, N. C.		O-5 100th Airborne Division Fort Bragg, N. C.	
NAME OF COMMAND OR ACTIVITY		DATE	
100th Airborne Division		10-1-64	
1. SUBJECT: <u>RECORD OF SERVICE</u> 2. REASON FOR REPORT: <u>RECORD OF SERVICE</u> 3. REPORT MADE AT: <u>Fort Bragg, N. C.</u> 4. REPORT MADE BY: <u>John L. Jones Jr.</u> 5. REPORT MADE ON: <u>John L. Jones Jr.</u> 6. REPORT MADE FOR: <u>John L. Jones Jr.</u> 7. REPORT MADE BY: <u>John L. Jones Jr.</u> 8. REPORT MADE ON: <u>John L. Jones Jr.</u> 9. REPORT MADE FOR: <u>John L. Jones Jr.</u> 10. REPORT MADE BY: <u>John L. Jones Jr.</u> 11. REPORT MADE ON: <u>John L. Jones Jr.</u> 12. REPORT MADE FOR: <u>John L. Jones Jr.</u> 13. REPORT MADE BY: <u>John L. Jones Jr.</u> 14. REPORT MADE ON: <u>John L. Jones Jr.</u> 15. REPORT MADE FOR: <u>John L. Jones Jr.</u> 16. REPORT MADE BY: <u>John L. Jones Jr.</u> 17. REPORT MADE ON: <u>John L. Jones Jr.</u> 18. REPORT MADE FOR: <u>John L. Jones Jr.</u> 19. REPORT MADE BY: <u>John L. Jones Jr.</u> 20. REPORT MADE ON: <u>John L. Jones Jr.</u> 21. REPORT MADE FOR: <u>John L. Jones Jr.</u> 22. REPORT MADE BY: <u>John L. Jones Jr.</u> 23. REPORT MADE ON: <u>John L. Jones Jr.</u> 24. REPORT MADE FOR: <u>John L. Jones Jr.</u> 25. REPORT MADE BY: <u>John L. Jones Jr.</u> 26. REPORT MADE ON: <u>John L. Jones Jr.</u> 27. REPORT MADE FOR: <u>John L. Jones Jr.</u> 28. REPORT MADE BY: <u>John L. Jones Jr.</u> 29. REPORT MADE ON: <u>John L. Jones Jr.</u> 30. REPORT MADE FOR: <u>John L. Jones Jr.</u> 31. REPORT MADE BY: <u>John L. Jones Jr.</u> 32. REPORT MADE ON: <u>John L. Jones Jr.</u> 33. REPORT MADE FOR: <u>John L. Jones Jr.</u> 34. REPORT MADE BY: <u>John L. Jones Jr.</u> 35. REPORT MADE ON: <u>John L. Jones Jr.</u> 36. REPORT MADE FOR: <u>John L. Jones Jr.</u> 37. REPORT MADE BY: <u>John L. Jones Jr.</u> 38. REPORT MADE ON: <u>John L. Jones Jr.</u> 39. REPORT MADE FOR: <u>John L. Jones Jr.</u> 40. REPORT MADE BY: <u>John L. Jones Jr.</u> 41. REPORT MADE ON: <u>John L. Jones Jr.</u> 42. REPORT MADE FOR: <u>John L. Jones Jr.</u> 43. REPORT MADE BY: <u>John L. Jones Jr.</u> 44. REPORT MADE ON: <u>John L. Jones Jr.</u> 45. REPORT MADE FOR: <u>John L. Jones Jr.</u> 46. REPORT MADE BY: <u>John L. Jones Jr.</u> 47. REPORT MADE ON: <u>John L. Jones Jr.</u> 48. REPORT MADE FOR: <u>John L. Jones Jr.</u> 49. REPORT MADE BY: <u>John L. Jones Jr.</u> 50. REPORT MADE ON: <u>John L. Jones Jr.</u> 51. REPORT MADE FOR: <u>John L. Jones Jr.</u> 52. REPORT MADE BY: <u>John L. Jones Jr.</u> 53. REPORT MADE ON: <u>John L. Jones Jr.</u> 54. REPORT MADE FOR: <u>John L. Jones Jr.</u> 55. REPORT MADE BY: <u>John L. Jones Jr.</u> 56. REPORT MADE ON: <u>John L. Jones Jr.</u> 57. REPORT MADE FOR: <u>John L. Jones Jr.</u> 58. REPORT MADE BY: <u>John L. Jones Jr.</u> 59. REPORT MADE ON: <u>John L. Jones Jr.</u> 60. REPORT MADE FOR: <u>John L. Jones Jr.</u> 61. REPORT MADE BY: <u>John L. Jones Jr.</u> 62. REPORT MADE ON: <u>John L. Jones Jr.</u> 63. REPORT MADE FOR: <u>John L. Jones Jr.</u> 64. REPORT MADE BY: <u>John L. Jones Jr.</u> 65. REPORT MADE ON: <u>John L. Jones Jr.</u> 66. REPORT MADE FOR: <u>John L. Jones Jr.</u> 67. REPORT MADE BY: <u>John L. Jones Jr.</u> 68. REPORT MADE ON: <u>John L. Jones Jr.</u> 69. REPORT MADE FOR: <u>John L. Jones Jr.</u> 70. REPORT MADE BY: <u>John L. Jones Jr.</u> 71. REPORT MADE ON: <u>John L. Jones Jr.</u> 72. REPORT MADE FOR: <u>John L. Jones Jr.</u> 73. REPORT MADE BY: <u>John L. Jones Jr.</u> 74. REPORT MADE ON: <u>John L. Jones Jr.</u> 75. REPORT MADE FOR: <u>John L. Jones Jr.</u> 76. REPORT MADE BY: <u>John L. Jones Jr.</u> 77. REPORT MADE ON: <u>John L. Jones Jr.</u> 78. REPORT MADE FOR: <u>John L. Jones Jr.</u> 79. REPORT MADE BY: <u>John L. Jones Jr.</u> 80. REPORT MADE ON: <u>John L. Jones Jr.</u> 81. REPORT MADE FOR: <u>John L. Jones Jr.</u> 82. REPORT MADE BY: <u>John L. Jones Jr.</u> 83. REPORT MADE ON: <u>John L. Jones Jr.</u> 84. REPORT MADE FOR: <u>John L. Jones Jr.</u> 85. REPORT MADE BY: <u>John L. Jones Jr.</u> 86. REPORT MADE ON: <u>John L. Jones Jr.</u> 87. REPORT MADE FOR: <u>John L. Jones Jr.</u> 88. REPORT MADE BY: <u>John L. Jones Jr.</u> 89. REPORT MADE ON: <u>John L. Jones Jr.</u> 90. REPORT MADE FOR: <u>John L. Jones Jr.</u> 91. REPORT MADE BY: <u>John L. Jones Jr.</u> 92. REPORT MADE ON: <u>John L. Jones Jr.</u> 93. REPORT MADE FOR: <u>John L. Jones Jr.</u> 94. REPORT MADE BY: <u>John L. Jones Jr.</u> 95. REPORT MADE ON: <u>John L. Jones Jr.</u> 96. REPORT MADE FOR: <u>John L. Jones Jr.</u> 97. REPORT MADE BY: <u>John L. Jones Jr.</u> 98. REPORT MADE ON: <u>John L. Jones Jr.</u> 99. REPORT MADE FOR: <u>John L. Jones Jr.</u> 100. REPORT MADE BY: <u>John L. Jones Jr.</u>			

FILE - 9F924 - A#

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104 *Journal of Interpersonal Violence* 29(1)[illegible]

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File only, subject to review
Section 7.1.1

Figure 1

• 2-4 years

Editorial Board:

[illegible]

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Source: U.S. Census Bureau, *U.S. Census of Population, 1990*, Table 1-1. *U.S. Census of Population, 1990*, Washington, D.C., 1992.

1993: 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921

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DATE 08-19-2010 BY 60322 UCBAW/SJS/KSP

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 03-10-2001 BY 60322 UCBAW

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DATE: 11-11-77, 11:00 AM.

DATE RECORDED AND INDEXED, SEPTEMBER TWENTY IN
OFFICE OF THE CLERK OF THE DISTRICT COURT,
AT WASHINGTON, D.C.

2008-09-14 14:00:00

5. **CONCLUSION**

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

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11. The following information is for informational purposes only and is not intended to be used for any other purpose.

RESEARCH The authors of this study, which was published in the *Journal of Interpersonal Violence*, found that the most common reasons for leaving a violent relationship were fear, lack of resources, and the desire to protect themselves and their children. The researchers also found that the most common reasons for staying in a violent relationship were love, hope, and the desire to protect themselves and their children.

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1. THE UNITED STATES OF AMERICA DO HEREBY DECLARE TO THE PEOPLES OF THE UNITED Kingdom OF Great Britain and Ireland the following Articles of Agreement and Declaration of Principle which shall govern the peace and friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace and Friendship between the two Nations above named and their respective Subjects in all times hereafter to come and in all places where they shall be found and in all things which shall concern the Peace

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1. The following is a list of the names of the persons who have been appointed to the various positions in the organization of the American Society of International Law, for the year 1910-1911:

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DATE **BY**

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Mini-FAX Transmitted Date 2/4/99 Page 1

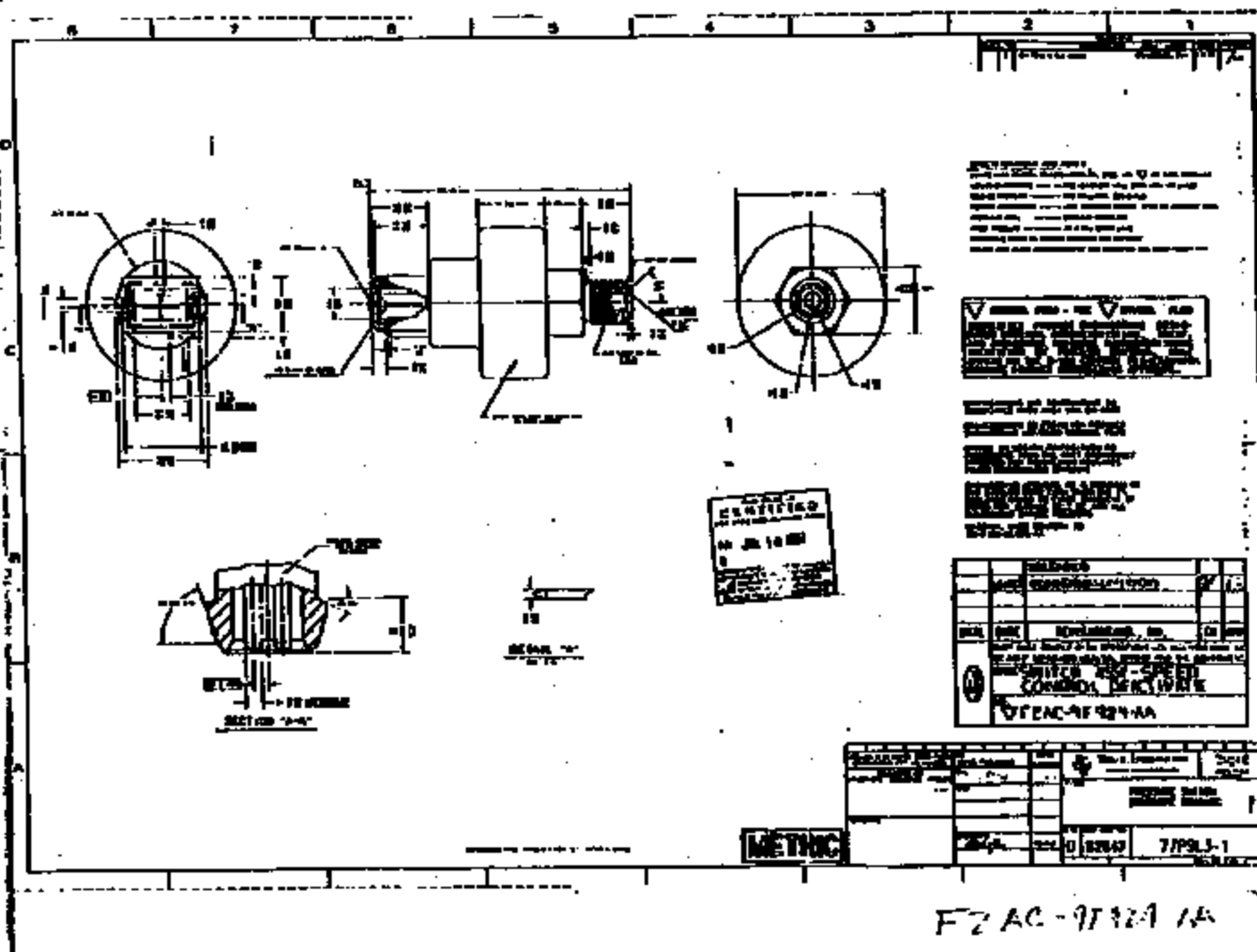
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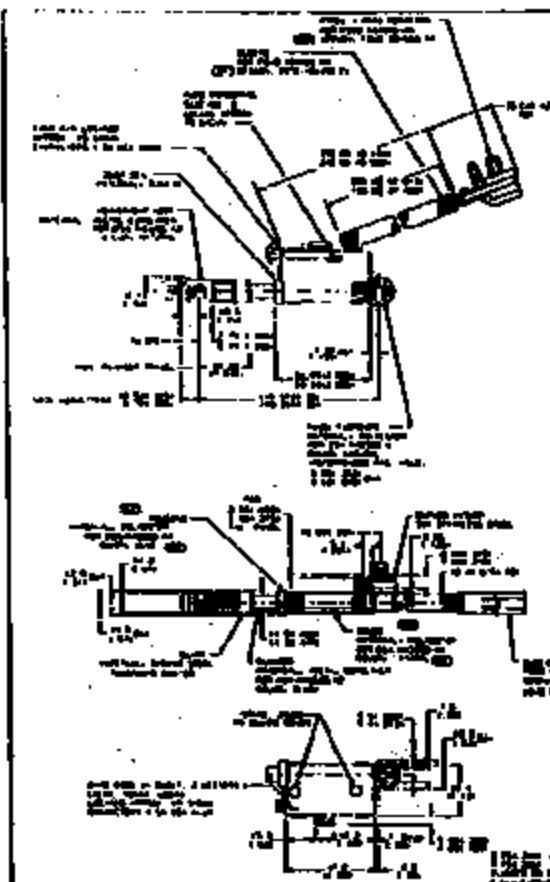
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1. Assembly of the pump is as follows:
- 1.1. Assemble the pump body and the pump head.
 - 1.2. Assemble the pump head and the pump shaft.
 - 1.3. Assemble the pump shaft and the pump impeller.
 - 1.4. Assemble the pump impeller and the pump housing.
 - 1.5. Assemble the pump housing and the pump base.
 - 1.6. Assemble the pump base and the pump frame.
 - 1.7. Assemble the pump frame and the pump motor.
 - 1.8. Assemble the pump motor and the pump system.



2. The pump is assembled as follows:

- 2.1. Assemble the pump body and the pump head.
- 2.2. Assemble the pump head and the pump shaft.
- 2.3. Assemble the pump shaft and the pump impeller.
- 2.4. Assemble the pump impeller and the pump housing.
- 2.5. Assemble the pump housing and the pump base.
- 2.6. Assemble the pump base and the pump frame.
- 2.7. Assemble the pump frame and the pump motor.
- 2.8. Assemble the pump motor and the pump system.

3. The pump is assembled as follows:

- 3.1. Assemble the pump body and the pump head.
- 3.2. Assemble the pump head and the pump shaft.
- 3.3. Assemble the pump shaft and the pump impeller.
- 3.4. Assemble the pump impeller and the pump housing.
- 3.5. Assemble the pump housing and the pump base.
- 3.6. Assemble the pump base and the pump frame.
- 3.7. Assemble the pump frame and the pump motor.
- 3.8. Assemble the pump motor and the pump system.

4. The pump is assembled as follows:

- 4.1. Assemble the pump body and the pump head.
- 4.2. Assemble the pump head and the pump shaft.
- 4.3. Assemble the pump shaft and the pump impeller.
- 4.4. Assemble the pump impeller and the pump housing.
- 4.5. Assemble the pump housing and the pump base.
- 4.6. Assemble the pump base and the pump frame.
- 4.7. Assemble the pump frame and the pump motor.
- 4.8. Assemble the pump motor and the pump system.

5. The pump is assembled as follows:

- 5.1. Assemble the pump body and the pump head.
- 5.2. Assemble the pump head and the pump shaft.
- 5.3. Assemble the pump shaft and the pump impeller.
- 5.4. Assemble the pump impeller and the pump housing.
- 5.5. Assemble the pump housing and the pump base.
- 5.6. Assemble the pump base and the pump frame.
- 5.7. Assemble the pump frame and the pump motor.
- 5.8. Assemble the pump motor and the pump system.

6. The pump is assembled as follows:

- 6.1. Assemble the pump body and the pump head.
- 6.2. Assemble the pump head and the pump shaft.
- 6.3. Assemble the pump shaft and the pump impeller.
- 6.4. Assemble the pump impeller and the pump housing.
- 6.5. Assemble the pump housing and the pump base.
- 6.6. Assemble the pump base and the pump frame.
- 6.7. Assemble the pump frame and the pump motor.
- 6.8. Assemble the pump motor and the pump system.

GENERAL INFORMATION		SPECIFICATIONS	
ITEM	DESCRIPTION	UNIT	VALUE
1	Model		
2	Capacity	liters/min	
3	Pressure	bar	
4	Power	kw	
5	Speed	rpm	
6	Weight	kg	
7	Dimensions	mm	
8	Material		
9	Finish		
10	Notes		

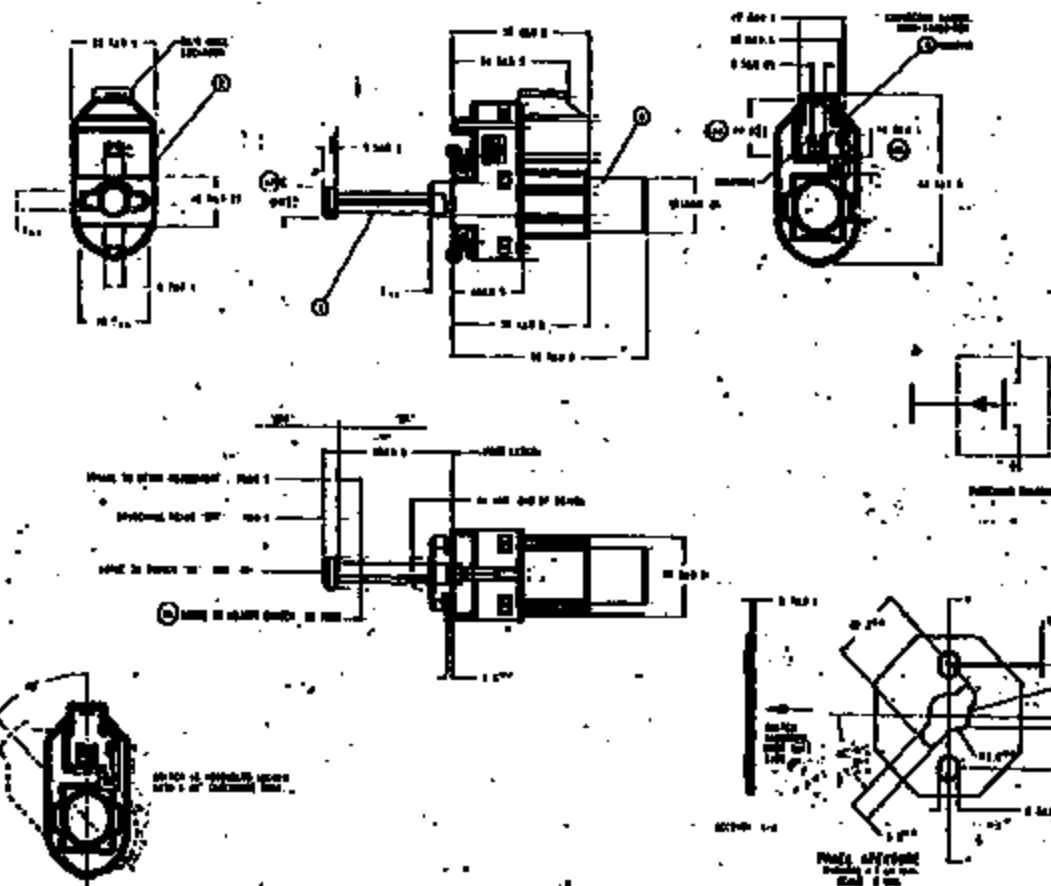
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NOTES

1. Installation and Working Space/Requirements: 2. See Note 1.
2. Working Space: 3. See Note 1.
3. Working Space: 4. See Note 1.
4. Working Space: 5. See Note 1.
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99. Working Space: 100. See Note 1.

Part	Description	Quantity	Notes
1	Motor	1	See Note 1
2	Gear	1	See Note 1
3	Shaft	1	See Note 1
4	Bracket	1	See Note 1



REVISIONS	
NO.	DESCRIPTION
1	Initial Design
2	Revised Design
3	Final Design
APPROVED	
DESIGNED BY	DATE
CHECKED BY	DATE
PART NAME	
PART NUMBER	
QUANTITY	
MATERIAL	
FINISH	
TOLERANCES	
ASSEMBLY INSTRUCTIONS	
DRAWN BY	
DATE	
FOLD-5724-A	

FOLD-5724-A

X-13391-924-66

XR03 9F924 AA

THIS COMPONENT IS THE SAME AS XFIT-9F924-AB.
EXCEPT NOTE 6 REPLACED BY:-
'COMPONENT' TO COMPLY WITH ES-XFIT-9F924-AA
EXCEPT ELECTRICAL DURABILITY LOAD IS 10mA (RESISTIVE)
HOUSING COLOUR TO BE ADVISED

DRAWING OF OFFICE OF		LATE AND		L.TRS		REVISIONS	
PETHA BROWN 8075 8714		DATE		REVISION		CHECKER	
Other Approved Drawing 1-4-84		DATE		REVISION		CHECKER	

PRODUCTION RELEASE
WERS RETEX 425-E-0003464-000
WERS H.HUGHES S.PENDERS C.PACAKS M.WEATH

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REFERENCE

THIS DRAWING COMPLY WITH ORIGINAL SPECIFICATION AND MODIFICATIONS TO ONLY EXTENDED NEED TO SAFETY AND THE ENVIRONMENT

CAD FILE XR03.9F924.AA

CAD TYPE	2-D		CAD PRINT  1/4" SCALE PROJECTION UNLESS OTHERWISE SPECIFIED
UC UNIT	MM		
SCALE	N.T.S.		
REPT NO	FILE		

FOR INFORMATION & TELEPHONING IN
REFERENCE ONLY SEE 104 20-0004
NO SCALE APPLICATION

SWITCH ASY SPEED CONTROL DEACTIVATE

XR03 9F924 AA

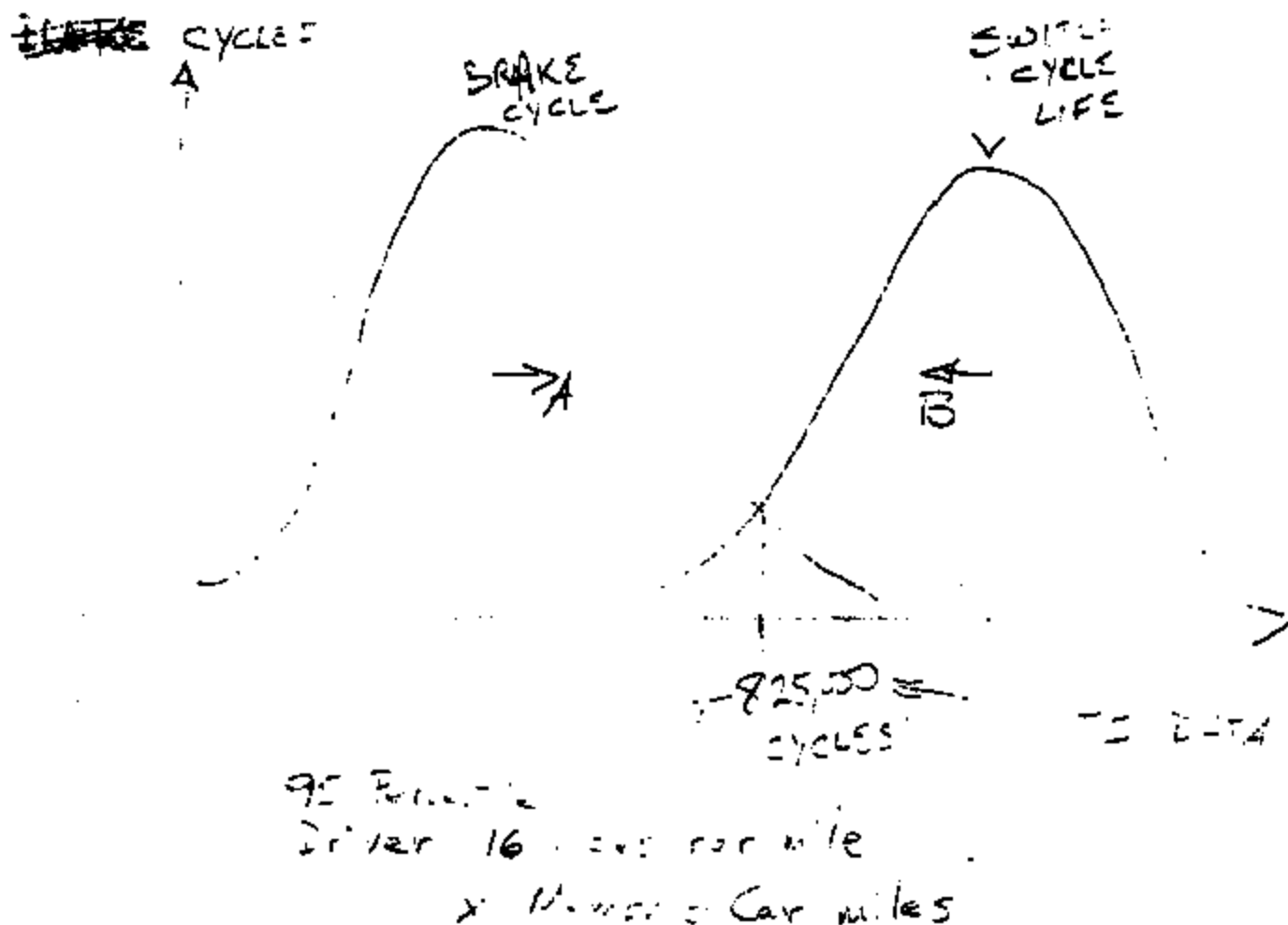
XR03-9F924

3713 1740

Telecon
FROM: Norm LaPointe

2/16/99

Re: GTO Correlation Data for Brake Application
vs 99% Reliability of Switch



Need new Energy for B if A
moves to right because of ABS
modulation.

* Note printed by SREINERS on 22 Feb 1999 at 12:30:07 *

From: LGEE3 --DRBN006 Date and time 02/22/99 11:35:14
To: KSUBINTA--DRBN006
cc: LGEE3 --DRBN006 SREINERS--DRBN007

*** Reply to note of 02/22/99 08:23
FROM: Larry Gee USAET(UTC -08:00)
Subject: 92/93 Town Car Options?

For 1992, the coding handbook first states that ABS is optional. This is followed by a statement:

Per marketing decision, ABS anti-lock brakes (less traction control) is standard on all Lincoln except the Limosine Package.

From this one would guess that ABS is standard and Traction Control is optional for 1992.

For 1993, the manual is incomplete. The page containing this information is missing. By 1994, however, ABS with traction control is listed as optional for all Lincoln Town Cars. ABS without traction control is not listed.

Regards,
Larry Gee



3713 1751

RVT - EESSE WORKPLAN FOR 92-93MY TOWN CAR UNDERHOOD FIRES

	Champion	Target Complete Date
Read, assess, and categorize CQIS verbatims:		
(A). Town Car, CV/GM.	RVT-Elect	A - 3/8/99
(B). Econoline and F-Series.	RVT-Elect	S - 3/12/99
(2). Identify underhood hot at all times wiring circuits and electrical components.	RVT-Elect	S - 3/9/99
(A). Draw possible conclusions relative to CQIS verbatims.	RVT-Elect	S - 3/10/99
(3). Review previous repair info on 47 Town Cars identified with underhood fires:	RVT-Elect	A - 3/5/99
(A). Draw possible conclusions relative CQIS verbatims.	RVT-Elect	S - 3/9/99
(4). Correlate 47 Town Cars against orderable options - traction assist and trailer tow.		
(A). First 31 out of 47 Town Cars.	FCSD	A - 3/1/99
(B). Last 16 out of 47 Town Cars.	FCSD	S - 3/10/99
(C). Draw possible conclusions relative to CQIS verbatims.	RVT-Elect	S - 3/11/99
(5). Perform field inspections of the 47 Town Cars:		
(A). Perform phone survey using questionnaire by RVT-EESSE and Design Analysis.	LVC-Safety	S - 3/15/99
(B). Litigation Prevention Team follows up with selected field reviews of vehicles.	LVC-Safety	S - 4/5/99
(6). Brake Pressure Switch:		
(A). Determine root cause.	RVT-Chassis	
(B). Brainstorm and identify possible resolution proposals.	RVT-Chassis	S - 3/10/99
* Recommend resolution proposal along with supporting rationale.	RVT-Chassis	S - 3/22/99
(C). Identify required DVP&R testing: CAE and/or Bench and/or In-Vehicle, etc.	RVT-Chassis	
* Complete DVP&R testing.	RVT-Chassis	
(D). Determine manufacturing feasibility with affected suppliers.	RVT-Chassis	S - 3/17/99
* Obtain supplier cost/timing/tools to support resolution proposal.	RVT-Chassis	
(E). Determine Assy Feas for proposal - review installation procedure with FCSD.	RVT-Chassis	S - 3/17/99
(F). Complete 14D white paper.	RVT-Chassis	

Work Plan- Brake Pressure Switch

Root Cause Investigation-

Identify the combustibles?

AVT EESE Materials Engineering

Identify the contaminants in returned parts?

Central Lab analysis

Identify source of contaminants?

Central Lab analysis

Identify causes of brake fluid leakage?

Central Lab and Texas Instrument

Identify heat source(s) start event?

AVT EESE Chassis Electronics

Create Event in Lab

AVT EESE Chassis Electronics

Collect Field Samples

LVC - Safety

Root Cause Investigation Tasks

What are the combustibles?

AVT EESE Materials Engineering

Are the switch materials compatible with brake fluid? _____

by 2/18/99

Are the switch materials compatible with brake fluid in an electric field? _____

by 2/18/99

Are the switch materials compatible with brake fluid and contaminants? _____

by 2/18/99

Are the switch materials compatible with contaminated brake fluid in an electric field? _____

by 2/18/99

Flash points for all materials? _____

by completed

TI provided to Norm LaPointe

Get Dow assistance _____

by 2/16/99

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

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

By 2/22/99

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

Texas Instruments by complete

Color of plastic base identifies calibration. Also, plastic material change from Cellanex 4300 to Noryl GTX430 in MY 1993 when P/N changed from F2VC to F2AC

What are the material call-outs for 1992 and 1993?

Texas Instruments by 2/15/99

Brake Pressure Switch

P3VC-SP224-AB

Material List for MY 92/93

Component Name	Material	Comment
Gasket	Elastomer Ethylene Propylene	JBL Compound # E-7104-70
Diaphragm	Kapton, Polyimide	Dupont 800 PN131L, 3 Diaphragms per switch
Base	PBT, Plastic	Grade Celanex 4300
Crimp Ring	Aluminum	Grade # 5052
Spacer	Kapton, Polyimide	Dupont #200H, Friction Reducer on Disc
Rivet	Brass	CDA 280
Transfer Pin	Ceramic	Steele, L-3 Grade
Environmental Seal	Silicone	JBL Compound # 87519
Converter	Cold Rolled Steel	Grade # 1008
Washer	Cold Rolled Steel, Zinc Plated	Grade # 1050
Cup	Cold Rolled Steel	Grade 1010
Spring Arm	Beryllium Copper	Grade # C17200
Movable Contact	Silver Plated Copper	Oxygen Free Cu, Fine Silver
Stationary Terminal	Brass + Silver Inlay	CDA 280
Movable Terminal	Brass	CDA 280
Disc	Stainless Steel	Grade 302
Hexport	Cold Rolled Steel, Zinc Plated	C10L10
Thread Cap	LDPE, Plastic	

What are the contaminants in returned parts?

Central Lab analysis

Results of Memphis part analysis by 2/18/99

Results of testing with corrosion simulation?

AVT EESE Chassis Electronics by complete

Black corrosion recreated in lab on virgin parts. Given to Lab for analysis

TI analysis results of the Memphis parts (crease marks in diaphragm, etc) ?

Texas Instruments by complete

TI gave to Norm LaPointe on 2/10/99. Crease mark caused by degradation of Kapton. TI chemical analysis matches Ford analysis.

What is source of contaminants?

Central Lab analysis by 2/18/99

What causes brake fluid leakage?

By 2/24/99

Central Lab and Texas Instrument

What does TI DFEMA say about this failure mode?

Texas Instruments

by 2/16/99

Complete

TI identifies potential for leaks. Copy to Norm Lapointe.

What are TI in-process test failures?

Texas Instruments by completed

TI provided IP and Weibull test reports to Fred Porter and Norm Lapointe. First leaker observed at 994,000 cycles. Test suspended at 1.6 million cycles. Leaker was by Kapton diaphragm.

Provide TI end-of-life lab test parts to Norm Lapointe.

TI

by 2/18/99

Does the event occur only on vehicles with ABS?

LVC-Safety

by 2/18/99

Characterize the real vehicle brake pressure seen at the switch.

AVT Chassis Brakes by

Characterize the real vehicle brake pressure during ABS and TC events seen at the switch.

AVT Chassis Brakes by

DOE work plan for TI activities.

TI

by 2/16/99

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

TI and Central Lab

by 2/29/99

What heat source(s) start event?

AVT EESE Chassis Electronics

Analysis of harness pig-tails

AVT EESE OPD by 2/18/99

Use thermocouple to record switch temperature during and after driving.

AVT EESE OPD by 2/18/99

Recreates Event in Lab

AVT EESE Chassis Electronics

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

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

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

If current is stopped does combustion stop?

Collect Field Samples

LVC - Safety

Collect Brake Pressure switches and speed control servos with harnesses attached.

By 2/22/99

Miscellaneous

Can the switch act as a fuse?

Team

by complete

No.

Could a fuse (e.g. 2 amp) be added in series between the stop lamp fuse and the brake pressure switch? Failure parameters would have to be known.

What are descriptions from AWS and CQIS?

LVC-Safety

by 2/18/99

What are we seeing in returned Speed control modules (FRACAS)?

Visteon Speed Control

by 2/17/99

Provide color photos of Econoline?

Texas Instruments

by complete

There are no color photos.

Containment / Corrective Action Tasks

Competitive Vehicles

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

AVT EESE Competitive Analysis by 2/24/99

What does Speed control FMEA say about Brake Switch ?

Visteon Speed Control by completed

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

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

When was non-Pressure actuated switch introduced?

AVT EESE Chassis Electronics by completed

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

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

Visteon Speed Control by completed

Circuit is low side driven.

How does speed control use this switch?

Visteon Speed Control by completed

- 1. Brake Pressure Switch provides electrical power to the speed control servo clutch circuit. The clutch circuit needs to be energized for the servo motor to pull the cable.*
- 2. Switch provides a redundant method of sensing brake application independent of the primary system deactivation mode; this is a SDS (SC-0005) requirement.*

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

Do all Ford applications use switch between fuse and load?

YES Visteon Speed Control by complete

Do all Ford applications have switch connected to HOT-ALL-TIMES?

AVT EESE OPD by 2/18/99

Can Brake Pressure Switch function be removed from power feed circuit and placed in ground return circuit?

Visteon Speed Control by completed

1. *Would require redesign of the speed control electronics.*
2. *Additional isolated ground circuit is required.*
3. *From FMEA position switching the ground circuit is not as good as switching the B+ feed.*
 - *With a ground return circuit; short to ground (fault) it would override the deactivation switch.*
 - *With the current power feed circuit; short to ground make the speed control system inoperative. A short to power is required to override the deactivation switch; much lower potential to occur.*

Why is this switch connected to HOT-ALL-TIMES?

Visteon Speed Control by completed
Because the SDS requires it to be connected to the same fuse as the stop lamp.

What is SDS requirement number?

Visteon Speed Control by **completed**
SDS (SC-0068) states: The stop lamp switch and redundant deactivator switch must be on the same fused circuit.

Is it feasible to disconnect the switch as immediate containment?

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

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

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

Elimination of this feature requires the concurrence of the OGC.

Other recommendations for immediate containment?

All by **on-going**
Add fuse between the stop lamp fuse and the brake pressure switch?

Recommendations for increased Life of switch.

TI by **3/5/99**
TI suggested looking at an Automotive ceramic diaphragm pressure transducer (not a switch) that is used for ABS.



3713 1762



1. Connector Seal

Improvement *Improved*

2. Power continuously available

3. Switch orientation

4. Current limit / fuse

5. Hexport isolation

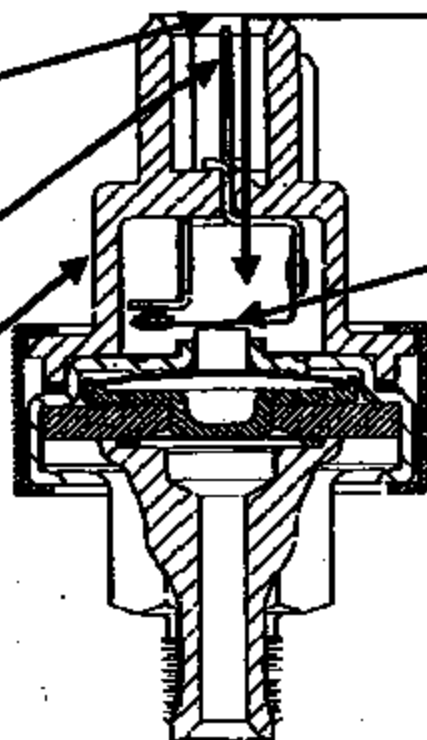
6. Higher temperature plastic

Brake Pressure Switch Potential Thermal Event Theory - 2/24/99

4. Down stream short to ground causes high current to pass through the switch

2. 12V Battery source to drive corrosion and provide energy

5. Plastic connector melts. Once it opens, oxygen enters the switch cavity. If any arcing is present a fire can start, burning the plastic.



1. Water enters the switch cavity

3. Contact arm corrosion increases resistance (heater wire).



3713 1765

STA Mtg

BPS

5/21/99

John Rantis - Andy, FRED, Steve,

Team meeting - Prevent action & development plans

- Recall parts examine plan

XRAY
TEST TO FAILURE
REGIONAL TRAINING

- Invite John Rantis
jrentis

JUNE 17-18 TRIP TO ATTLEBORO

- LINE VIST

John / ME

- UNDERSTAND 92 PROCESS

JOE K?

- " 99 PROCESS

TAMM?

Norm LePointe?

5/19/99

Rob SHARPE (TI), FRED, GREG, ANDY McGuirk, Steve
* via phone. Dorringham

o TI Record retrieval not fruitful yet.

- IP TEST HISTORY WAS FOUND.

- NO SPC DATA OF THAT PERIOD. (998 Confident)

o CRIMP DIE From manual process to auto-mated,
IS WHAT CHANGED TO GET PROCESS TO PASS PARTS.
o CRIMP DIE REPLACEMENT FREQUENCY.

o PM's for polishing dies exist.

o When were Dies replaced? (over time).

o IS OPERATING PRESSURE TRIP/RESET
VALUE A BETTER/WORSE PARAMETER?? FORD o IS THERE A MIN/MAX PRESSURE ~~TO RANGE~~
TC & ECON THAT MAKES THE SWITCHES
CYCLE MORE OR LESS?

TI o When did you ship service parts

- 100,000 Shipped for Recall (to Ford).

1111

ROOT CAUSE PROGRESS -

- Planning analysis of Returned Parts
- STA review of TI

OTHER VEHICLE LINES EFFECTED

- WARRANTY CLAIMS REVIEW
R/100 DATA BEING GATHERED

TENTATIVE AGENDA FOR ATTLEBORO VISIT

- FINDINGS OF 91, 2, 3 PROCESS
SFC CHART
C/O.
THRU-PUT
- TODAY'S SPC
OR
- HOW DO WE CREATE LEAKS BY
TWEAKING THE PROCESS

- K.W. CORONA TREATED TO ^{IMPROVE} ADHERENCE) When
TEFLON ONE-SIDE ONLY

Electrode $3/8 \rightarrow 1/2$ WIDE
Burn-out
SPOT CHECKED

Cold Peel Test samples

5 yrs not seen delay return from customer

ASIDE
Z KAPTON Inspection?

RADIATION, OXIDATION

Permeation 0.4 -m/

H-F

Separate

PFA Teflon Hi Melt better flex endurance -
190° Cents ⁶⁰⁰⁰ ~~5000~~ 3 MIL KAPTON

1/cu - Failure Modes /

Joe - MACHINE/C
TEST F
FOR Hi-Lite

BP Team Mtg

4/21/99

- 200mA Cu/Sn Deposit
- Old BP SW may have Deposits.
- Relay Kit to wire the ground connection to the moveable terminal (this is the one located furthest from the keying tab).
- Key of f = No corrosion^{driver} with Ign OFF
- Brake Fluid continuation test continues at 72 (± 15 days lapse with no thermal action and no excess current.)

BP TEAM Mtg

4/14/99

Fuse for Econo Line 15 AMP?

ECONO-LINE SWITCHES "NO LEAKERS", ANDY (TI).

- ① Proposed Relay 200 mA, 48 hours, no ignition
Salt H₂O injection
- ② Impending burn → 200 mA 18 hours no ignition
As is the lab simulation process with salt water &
unlimited (15 amp?) TI to switch to impending burn then
limited current to 200 mA and NO IGNITION occurred
Resistance wire wrapped around base
to simulate maximum power dissipation no ignition
- ④ Vertical Orientation also burned in TI experiment

H-Lite 1 Supplier of prop. value 923, 7
1 mil by 8/1/99 if starting today at TI.
9F924 for recall

Will have BP switch in
TownCar, Econo, F-Series to compare?

BP Team Mtg

4/7/99

MARTY REESE, BILL ABRAMCZYK, ANDY McGUIRK,
FRED PORTER, JOE KAFATI, TOM MASTERS,
PETER JOH, NORM LAPOINT, 5 Rainers

- Bill Read Report from Myrtle Beach, SC
-- home destroyed.
- Joe - selecting Waterproof relay

UTA

- Need UTA to explain work plan timing
why 8 weeks turn-around?
- Validate Pilot Relay fix
 - Splash, Vibration:
 - Does Speed control still work.
- Need DV work plan developed.
- Will the BP Switch be replaced as part of result?

- Are we going to take interim action of
disconnecting Brake Pressure Switch?
This disables Speed Control.

A - For Monday Meeting should have
FMEA Des & Process, Timing for Kits, Timing for
Validation

- ECONOLINE 8D similarities & uniqueness

TI Testing Vertical (Pius-up) Ignition

- ? - DOES SYMPTOM MOVE ACROSS PLATFORMS
BLOW FUSE, STUCK-IN-PARK, CRUISE IN OP,

① TI needs to look at capacity to provide kits

BP Switch Mtg Notes 3/31/99

Pilot Relay - Is feasible on Town Car,
need to check CV/GM.
Joe K

Re-locate - must use ABS DPDT or
find ~~elect~~ switch to fit where
vacuum switch went on TC.
May require removal of IP.

Isolation from Prop-valve - still looking at
(+ ~~in-line~~ + Drip Loop)

Containment Material - still looking at

* Buy CV/GM

A. Test leaves ability to light Brake Fluid.

FOAB-148192-AK

- Short to Ground that provides pull-in voltage to Pilot Relay will override the switch contacts opening.
- Preference polarity for "Pilot Relay" is to put spring arm & Movable terminal on the ground connection. ~~the~~ The Stationary terminal provides the minimum area for

BP Team Notes

3/31/99

* Callanex 3316 ^{5% NaCl} FI experiment caused connector ignition

* 0 ~~for~~ 2 ignitions of switch base

* Noryl ~ 67X930 Lt Brown Ignited like 4300
Scan TI

T.I. suggested Plastic Base Testing.
Flame ignition, Hot Wire Ignition, Self Extinguishing

? Plastic change for "Pilot Relay"

Note: 3316 Experimental Base has the tabs in wrong place.

P. 1 AMP FUSE blows at what time with NaCl test
TA NaCl in Base Connector interface cavity

T.N. 100k BF + 5% NaCl + H₂O @ TI ✓

T.N. WEIBULL DATA FOR QUIET SWITCH.

T.I. Test NaCl @ 200WA & 2 AMP
LEADED — BT

— I

~~7.3. correct fault @ 1 amp (max) = ALCL T-1~~

- Process PFMEA for installation of Pilot Relay
FCSD
- Pilot Relay FMEA

Brake Pressure Switch Team Mtg 3/31/99

Steve Reimers	RVT/EESE	SRIMERS	X03286
Fred Porter	RVT/EESE	FPORTER	X53722
Fred Kohl	VISION	FKOHL	21001
Greg Stevens	RVT MAT'L	GSTEVENS	56686
Joe Kafati	EESE	JKAFATI	05889
Noem LaPointe	DESIGN ANAL	NLAPOINT	42686
Andy McQuinn	PI Q RA	4-mcquinn@ti.com	5082363086

* Note printed by SRINIKERS on 24 Mar 1999 at 14:03:55 *

From: SLAROUCH--FORDMAIL Date and time 03/24/99 13:20:55
To: SLAPOINT--FORDMAIL LaPointe, Norman SLAROUCH--FORDMAIL LaRoucha, Steve
PORTER --FORDMAIL Porter, Fred SRINIKERS--FORDMAIL Reimers, Steve
GSTEVENI--FORDMAIL Stevens, Gregory

From: LaRoucha, Steve (S.)
Subject: Switches from EAA

I have received two switches with filled out questionnaires from EAA. One is from a 92 Town Car (Davenport, FL), and the other is from a Town Car with no model year listed (Insurance Auto Auction in Aurora, IL). One vehicle caught fire while it was left idling (IL vehicle), the other caught fire "15-20 minutes after it was parked. Owner couldn't get it out of park previous evening. Police changed fuse for her. Both switches badly burned. Probably won't be able to tell much from them. A 15A fuse was included with one of the switches. No other parts or brake fluid received with switches. Will not be able to make today's meeting.

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

Team meeting notes

*93 CV NON/ABS w/SPEED CONTROL
WANT AIR SUSPENSION*

Bring Back 92 Town

*Jon Watson — Contain fire to switch
with Jacket/Shell*

*70/900 Report Leads from ANS ABRAMCZYK
Fseries PN96 - 2 Melted Connectors. Noryl?*

OVER