

EA02025

TEXAS INSTRUMENTS, INC.'S

9/10/03 ATTACHMENT TO ODI

BOX 4, PARTS A - N

PART G

REPORT OF PARTIAL ISE TESTING
 FORD PASSENGER CAR
 ELECTRONIC SPEED CONTROL
 DEACTIVATION PRESSURE SWITCH
 98/92/62

TEXAS INSTRUMENTS INCORPORATED
 CONTROL PRODUCTS DIVISION
 PRECISION CONTROLS DEPARTMENT
 34 FOREST STREET
 ATTLEBORO, MA 02703

TI-NHTSA 005805

TEST LOT NO.	TEST	DEVICE
TESTED BY		
APPROVED BY <i>[Signature]</i>	TEXAS INSTRUMENTS  MATERIALS & CONTROLS GROUP ATTLEBORO, MA 02703	DOC.
DATE 92-04-11		PAGE

TABLE OF CONTENTS

1.0	GENERAL	3
2.0	OBJECTIVE	3
3.0	TEST PROCEDURES AND RESULTS	3
3.1	CALIBRATION	4
3.2	VOLTAGE DROP	4
3.3	IMPULSE	5
3.4	TERMINAL STRENGTH	6
4.0	APPENDICES	
4.1	Memoandum	7
4.2	Data # 242	11
4.3	Data # 241	13

TI-NHTSA 005906

TEST LOT NO.	TEST	DEVICE
TESTED BY	TEXAS  INSTRUMENTS	DOC.
APPROVED BY		MATERIALS & CONTROLS GROUP
DATE 82-04-14		ATTLEBORO, MA 01763
		PAGE 2

1.0 GENERAL

1.1 Customer: Ford Motor Company, Passenger Car Brake Systems Engineering

1.2 TI Part Number: 77PSL3-1

1.3 Customer Part Number: F2AC-9F924-AA

1.4 Specifications: Ford Engineering Specification number (delta) ES-F2VC-9F924-AA

1.5 Date of Completion : 920413

1.6 Quantity of Units Tested: 36

1.7 Disposition of Tested Units:

1.7.1 All devices are retained under quarantine.

1.8 TI test number: 241-11-12
242-03-24

1.9 TI Pressure Switch test report number: PS/92/62

2.0 OBJECTIVE

See Memorandum in Appendix 4.1 which explains the scope, extent, and intention of this partial ISR. A full battery of ES tests is planned in the near future to complete a full ISR submission.

3.0 TEST PROCEDURES AND RESULTS

All switches were tested to Ford Engineering Specification (delta) ES-F2VC-9F924-AA, sections III. E. and J., with initial and final characterizations consisting of III. A. Raw data is included in Appendix 4.2 and 4.3.

TI-NHTSA 005907

TEST LOT NO.	TEST	DEVICE
TESTED BY		
APPROVED BY		DOC.
DATE 89-04-13	TEXAS INSTRUMENTS 	PAGE
	MATERIALS & CONTROL GROUP ATLSSORO, MA 02103	

3.1 CALIBRATION

- 3.1.1 Procedure: Calibration is checked at room temperature using ambient air as the pressure medium. Calibration settings, as specified on the part drawing, are actuation (electrical contacts opening) at 90 - 160 psig, and release (contacts reclosing) at 20 psig minimum. For the purpose of stabilization, actuation values are recorded on the sixth cycle, after subjecting the switch to two (2) pressure cycles to 800 psig minimum and back to zero, followed by three (3) cycles to 1.1 times actuation pressure minimum and back to zero. The change in continuity is measured while conducting 750 +/- 50 milliamps at 13.0 +/- 1.0 volts DC.
- 3.1.2 Equipment: Custom TI designed and built pressure check station, using Heise Model CM96365 pressure gage calibrated on a regular quarterly schedule. Continuity change measured on custom TI designed and built equipment meeting the above electrical parameters.
- 3.1.3 Initial Results: All 36 devices tested were found to be within specification.
- 3.1.4 Final Results: All 36 devices tested were found to be within specification.

3.2 VOLTAGE DROP

- 3.2.1 Equipment: Fluke Model 8020B Digital Multimeter, calibrated quarterly, used in conjunction with the continuity equipment in 3.1.2.
- 3.2.3 Final results: Performed on the Impulse devices only, as a check of degradation of the electrical contacts during the powered portion of the Impulse cycles. All values are significantly below the specification of 200 millivolts maximum.

TI-NHTSA 005908

TEST LOT NO.	TEST	DEVICE
TESTED BY	TEXAS INSTRUMENTS  MATERIALS & CONTROLS GROUP ATTLESBORO, MA 02702	DOC.
APPROVED BY		PAGE
DATE 01-01-11		

3.3 IMPULSE

3.3.1 Devices tested: 242-03-01 thru -24

3.3.2 Procedure: Twenty four devices were run on the Impulse test as specified in the ES, with the exception that no devices were run on the Fluid Resistance test due to time constraints. The cycle rate used was actually 163 cycles per minute, again due to time constraints. All other parameters were as specified in the ES.

3.3.3 Equipment: Thermotron model S-4 Mini-Max environmental chamber capable of -55 C to +200 C, humidity uncontrolled. Custom TI designed and built cycler, utilizing Enerpak integrated hydraulic pressure source, TI315 Programmable Logic Controller, Moog servovalve and controller, Simpson signal generator, and opposing-piston fluid isolators, to produce a hydraulic-fluid flow-type primary with a brake-fluid dead-end-type secondary terminated with a 24-station manifold equipped with internal heaters. Capability to 5 Hz at 0-1450 psig cycle. Custom TI designed and built 24 station Switch Monitor Circuit which automatically stops the cycler in the event of abnormal switch action, defined as continuity change which does not track the signal from the signal generator. Thermocouple readouts calibrated quarterly. 12-station inductive load bank, per the schematic found in the ES (frame 18 of 18; figure 4.) used in the last 25K cycles.

3.3.4 Results: All devices passed.

TI-NHTSA 005909

TEST LOT NO.	TEST	DEVICE
TESTED BY		
APPROVED BY	TEXAS INSTRUMENTS 	DOC.
DATE 01-04-11		ATTLEBORO, MA 01701

3.4 TERMINAL STRENGTH

3.4.1 Devices tested: 241-11-01 thru -12

3.4.2 Equipment: Custom TI designed and built fixtures for gaging terminal movement after force application and for application of impact via a pendulum. This equipment is regularly used on the 579S/77FS assembly lines in testing to TI Quality Assurance Specifications.

3.4.3 Results: All twelve devices passed the acceptance criteria found in the ES.

TI-NHTSA 005910

TEST LOT NO.	TEST	DEVICE
TESTED BY		
APPROVED BY	TEXAS INSTRUMENTS  MATERIALS & CONTROLS GROUP ATTLERBORO, MA 02703	DOC.
DATE 02-06-11		PAGE

Appendix 4.1
Memorandum

TI-NHTSA 005911

TEST LOT NO.	TEST	DEVICE
TESTED BY		
APPROVED BY	TEXAS INSTRUMENTS 	DOC.
DATE 12-04-13		PAGE

M E M O R A N D U M

9 April 1992 - Page 1 of 3

To: Bruce Maeroff Ford Motor Co. Fax: 313-323-1924
CC: Dave Czarn TI Design Eng. Supv.
 Norm Freda TI Field Sales Fax: 313-553-1673
 Elaine Rose TI QRA
Fr: Steve Offiler TI Design Eng.

RE: EN53 PARTIAL ISR / VALIDATION PLAN FOR F2AC-9F924-AA

Bruce, it is my understanding that we'll be pulling together an ISR package for your perusal during your visit to our plant on Monday, 13 April. This package will be essentially based upon similarity to the F2VC-9F924-AB ISR, since only two components will be changing. Those two components are the pressure-sensing disc and the molded plastic base (switch housing). The base will undergo a First Article Inspection (FAI) which is a detailed study of all print dimensions, and material certifications from the manufacturer will be included. Below you will find detail of the ES tests which will/will not be completed for the Partial ISR (from ES F2VC-9F924-AA):

III. A. Calibration, B. Voltage Drop, C. Current Leak, D. Proof.

Only the Calibration test will be performed on the 24 devices undergoing the Impulse test (E.) below.

III. E. Impulse.

A complete 500,000 cycle Impulse test will be performed per the ES, with the exception that no devices will undergo the Fluid Resistance Test (M.) beforehand. The Impulse test is an excellent test of the ability of the entire device to withstand mechanical (pressure) cycles combined with electrical loads at elevated temperatures, and is a key test to validate the pressure-sensing disc.

TI-NHTSA 005912

MEMORANDUM

9 April 1992 - Page 2 of 3

III. F. Burst.

Changes to the base and disc should have no effect on burst performance.

III. G. Humidity, M. Fluid Resistance.

The new base material, General Electric Noryl GTX 830, has been tested previously by TI per Ford ES F3AK-19D594-AA along with a host of other engineering plastics. This CCD ES includes Humidity, and Fluid Resistance tests which are similar to the tests called out in ES F2VC-9F924-AA. Noryl was found to pass all tests.

III. H. Salt Spray.

It has been deemed unlikely that changes to the base and disc would have any effect on salt spray performance. Bear in mind that the Fluid Resistance test invoked above included a saturated salt solution, helping to prove that chemical attack will not be an issue; furthermore the environmental sealing system has not been changed in any way providing confidence that salt ingress during salt spray testing will not be an issue either.

III. I. Vibration.

Changes to the base and disc should have no effect on vibration performance.

III. J. Terminal Strength.

The terminal strength test will be performed per the ES, with the exception that no devices will undergo the Fluid Resistance Test (M.) beforehand.

III. K. Vacuum.

Changes to the base and disc should have no effect on vacuum performance.

TI-NHTSA 005913

MEMORANDUM

9 April 1992 - Page 3 of 3

III. 1. Temperature Cycle.

Extensive thermal characterizations have been performed on several materials recently, including the Celanex 4300 PBT material presently used on F2VC-9F924-AB, as well as Ultem, Noryl, and Fortron. While these results are presently undocumented officially, the consistently higher performance of Noryl in terms of dimensional stability relative to Celanex during these tests gives high confidence that changes to the base should have no effect on Thermal Cycle performance.

AS 920409

TI-NHTSA 005914

Appendix 4.2
Data 9 242

TI-NHTSA 005915

TEST LOT NO.	TEST	DEVICE
TESTED BY	TEXAS INSTRUMENTS 	DOC.
APPROVED BY		PAGE
DATE 12-04-77		MATERIALS & CONTROL GROUP ATTLEBORO, MA 02703

PRESSURE SWITCH DATA

Form 21605

TEST NO. 242-03-24

DEVICE 77P5L3-1	DATE REQUESTED 920410	REQUESTED BY S. P. ...	REQUESTED COMPL. DATE
PERFORMED BY Jeffrey D. Domercq	DATE STARTED 920410	DATE COMPLETED 920413	APPROVED BY

PROJECT TITLE: Speed Control

CUSTOMER:

PURPOSE OF TEST: Partial ISA of 77P5L3-1

PROCEDURE: Impulse test, per Ford ES, at 24 production devices.

Device #	Lat Act - Ad		Pos Act - Act	ms drop					
24-03-01	119-102	2	121-109	15.3					
-02	122-119	"	126-110	3.6					
-03	126-101	"	124-102	5.6					
-04	125-114	P	122-110	2.6					
-05	129-116	6	123-117	16.9					
-06	122-102	1	129-102	2.7					
-07	126-116		129-109	6.7					
-08	127-113	7	126-110	22.6					
-09	124-118	5	124-117	6.5					
-10	129-112		122-105	4.7					
-11	128-121	7	128-114	7.5					
-12	122-109	5	129-105	4.2					
-13	128-115		126-105	2.2					
-14	121-117	7	125-107	10.7					
-15	124-109		128-109	3.7					
-16	129-112		122-111	3.8					
-17	128-116		128-111	3.7					
-18	125-110		127-109	4.8					
-19	125-102		125-107	5.6					
-20	128-103		125-107	7.0					
-21	125-113		128-112	6.7					
-22	127-101		122-105	15.1					
-23	122-103		128-101	6.6					
-24	124-101		129-107	6.7					

TI-NHTSA 005916

Appendix 4.3
Data # 241

TI-NHTSA 005917

TEST LOT NO.	TEST	MATERIALS & CONTROL GROUP ATTLEBORO, MA 01705	DEVICE
TESTED BY			DOB.
APPROVED BY	TEXAS INSTRUMENTS 	ATTLEBORO, MA 01705	PAGE
DATE			11

PRESSURE SWITCH DATA

Form 21605

TEST NO. 241-11-13

DEVICE	77 PS	DATE REQUESTED	920409	REQUESTED BY	STW/00 OFF/104	REQUESTED COMPL. DATE
PERFORMED BY	Rich Owens	DATE STARTED	920409	DATE COMPLETED	920410	APPROVED BY

PROJECT TITLE: Speed Control

CUSTOMER:

PURPOSE OF TEST: Part of Noryl base/silent disc validation

PROCEDURE: Production build 77PS with natural Noryl bases and 1st "C" silent discs. Characterize in pressure tester. Run standard terminal strength tests per Ford ES and characterize.

Device #	2A's Act/A.1	P. - act Act/A.1							
241-11-01	174-102	119-103							
-02	177-98	116-98							
-03	174-88	117-90							
-04	174-100	116-101							
-05	174-98	116-97							
-06	131-101	117-88							
-07	173-101	117-103							
-08	170-97	117-96							
-09	172-102	118-107							
-10	174-97	119-111							
-11	179-98	119-100							
-12	181-101	117-100							

INSPECTION TEST SUMMARY
TEXAS INSTRUMENTS
 24 FOREST STREET, ATTLEBORO, MA 01722

PART NO. 77PS **REV.**

PART NAME
 Cruise Control Pressure Switch

QAE NO. 208 **REV.** **SR** **TI ORDER NO./DATE CODE**

CUSTOMER Ford **CUSTOMER P.O. NO.**

CUSTOMER PART NO.
 VARIOUS

APPROVED BY **DATE**

LOT NO.	DATE	BIN NO.	LOT SIZE	SAMPL. SIZE	DWP. AC. NO.	REL. NO.	IMP. NO.	AQL	CHARACTERISTIC	INSPECTION METHOD	Lot Audit Inspections							
											Calibration	Voltage Drop	Impulse Test	Current Leakage	Pinout Test	Burst Test	Terminal Strength	Dimensional
									Calibration, Voltage Drop, Terminal Location, Threads, Workmanship/Coding	Final Inspection	Calibration	Voltage Drop	Impulse Test	Current Leakage	Pinout Test	Burst Test	Terminal Strength	Dimensional
1								100%				4	4	5	4	4	4	4
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		

TI-NHT8A 005919

INSPECTION TEST SUMMARY
TEXAS INSTRUMENTS
 34 FOREST STREET, ATTLEBORO, MA 02703

PART NO. REV.
 77FS

PART NAME
 Cruise Control Pressure Switch

QAS NO. REV. SR TI ORDER NO./DATE CODE
 208

CUSTOMER CUSTOMER P.O. NO.
 Ford

CUSTOMER PART NO.
 Various

APPROVED BY DATE
Michael K. Walter 4/13/92

LOT NO.	DATE	MR. NO.	LOT SIZE	SAMPLE SIZE	DEF.		REJ. NO.	YSP. NO.
					AC.	RE.		
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								

TI-NHTSA 005920

INSPECTION METHOD	FINAL INSPECTION				LOT AUDIT INSPECTION								
	Calibration	Voltage Drop	Terminal Location	Threads	Workmanship/Coding	Calibration	Voltage Drop	Impulse Test	Current Leakage	Proof Test	Burst Test	Terminal Strength	Dimensional
A.P.I. Connector Co/McGo Gages Visual	5/	5/	5/	5/	5/	4	5	4	4	4	4	4	4

**DRAWINGS AVAILABLE UPON
REQUEST**

QUIET SWITCH - PRELIMINARY STUDIES

TI CONFIDENTIAL
TI STRICTLY PRIVATE

I) Plastic connector stability

Purpose: To determine the acceptable pin lengths for quiet switch production given that the quiet disc has a smaller pin window. Also to evaluate the effects of a connector material change to increase the pin window so the device could be manufactured cost effectively.

Procedure: Devices were assembled at various contact preloads (pin lengths) using both celenax and noryl connectors. If the material changes dimensional with temperature it can result in an increased or decreased actuation pressure. The actuation and release pressures were measured at low and high temps.

Results: The results for Celenax are shown in Figure 1. Noryl results are shown in Fig 2. The Noryl provided stable actuation and release pressure over a greater pin range. This matches other test results showing greater dimensional stability with noryl. During the test the parts were exposed to temps from -40 to +150, one cycle and there was no visual impact on the material.

II) Plastic connector stability

Purpose: Understand the ability of Noryl material to survive the typical underhood automotive environment.

Procedure: Connectors were fully qualified in Noryl material for an underhood Automotive Pressure Transducer (APT). This includes thermal cycling, chemical resistance, dimensional stability, impulse testing, impact strength, etc.

Results: The Noryl is fully qualified as a connector to 135C. Long term storage has been acceptable at 150C.

III) Quiet Disc development

Purpose: A lower differential disc was needed to reduce the sound generated when the disc snapped.

Procedure: Various discs were developed. The differential was measured by building the disc into a sensor assembly and then measuring the disc deflection vs pressure with an lvdtd (linear variable differential transformer).

Results: Figure 3 shows both a noisy production disc and a quiet disc. Note that the differential has been reduce from 100psi to approx 30psi. Correspondingly the available pin window has been reduce from 14.5 mils to 10 mils.

IV) Switch sound evaluation

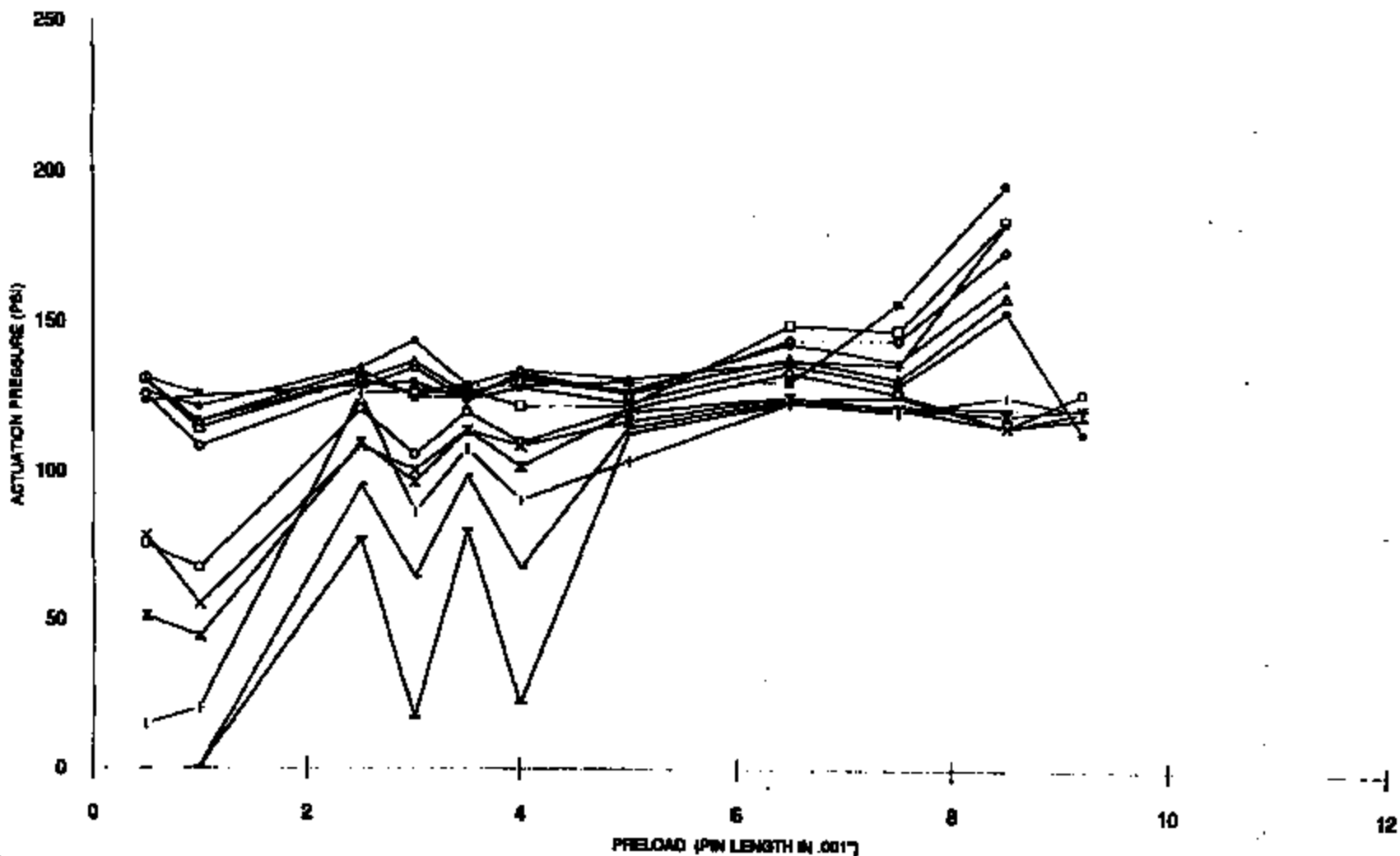
TI-NHTSA 006922

Purpose: To quantify the sound level from different switch configurations and to identify the source of the sound.

Procedure: Switches were mounted on an air calibration stand. An accelerometer was attached to the top of the switch using beeswax. The accelerometer axes was along the long axis of the switch. A microphone was mounted on a T fitting to the switch pressure port. The accelerometer and microphone signal were feed into a spectrum analyzer.

Results: The result for a production 'noisy' switch is shown in Figure 4 & 5. Figure 4 shows the frequency decay, while figure 5 shows the frequency spectrum or resonant frequency. Figure 6 shows a quiet disc. The quiet disc clearly produces less acceleration and less noise. The same evaluation held true on a hydraulic system.

Pressure shift vs pin length at various temps: CCM300R

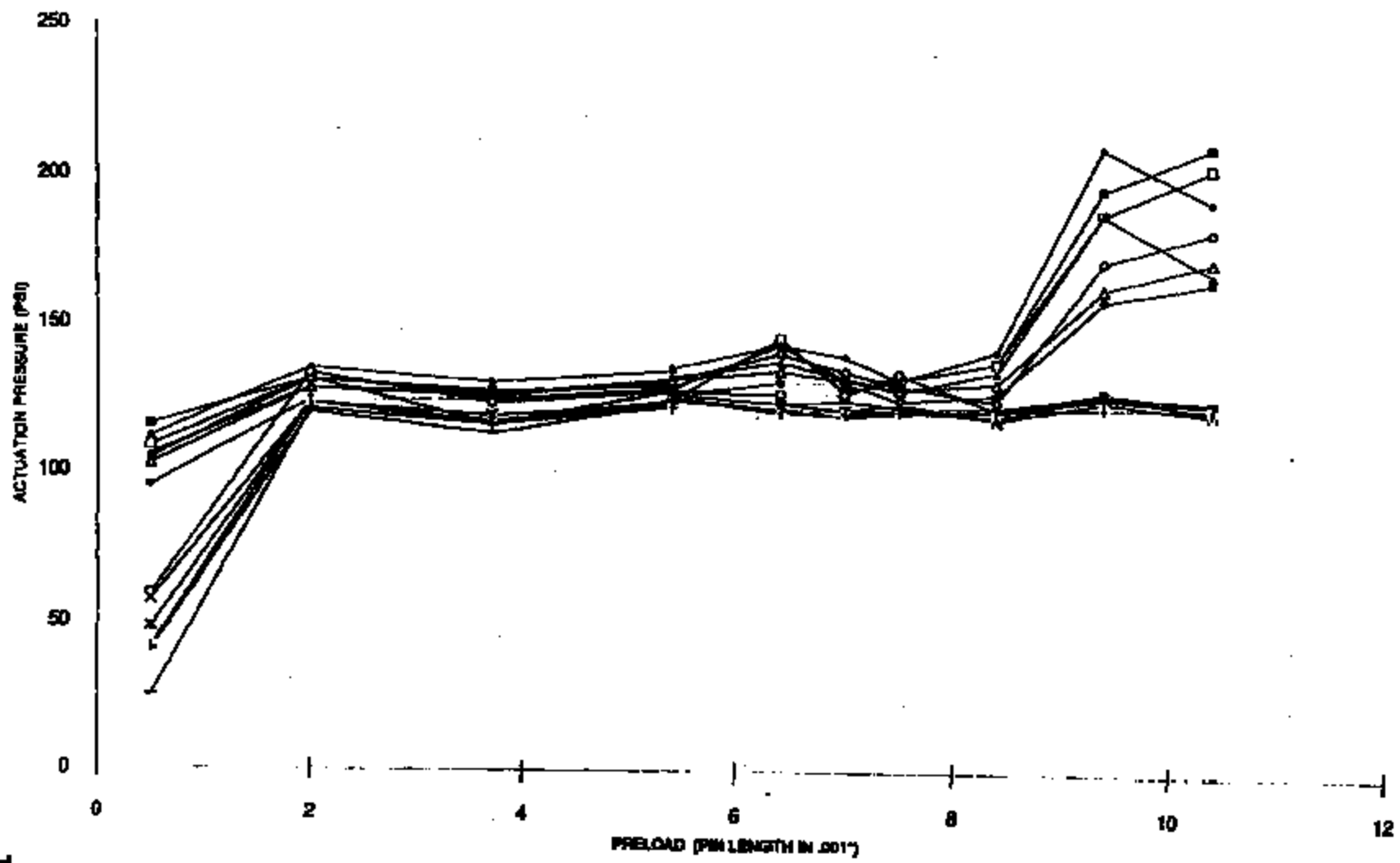


TI-NHTSA 005924

TEMP (DEG C)

FIG 1

Pressure shift vs pin length at various temps: HSTL



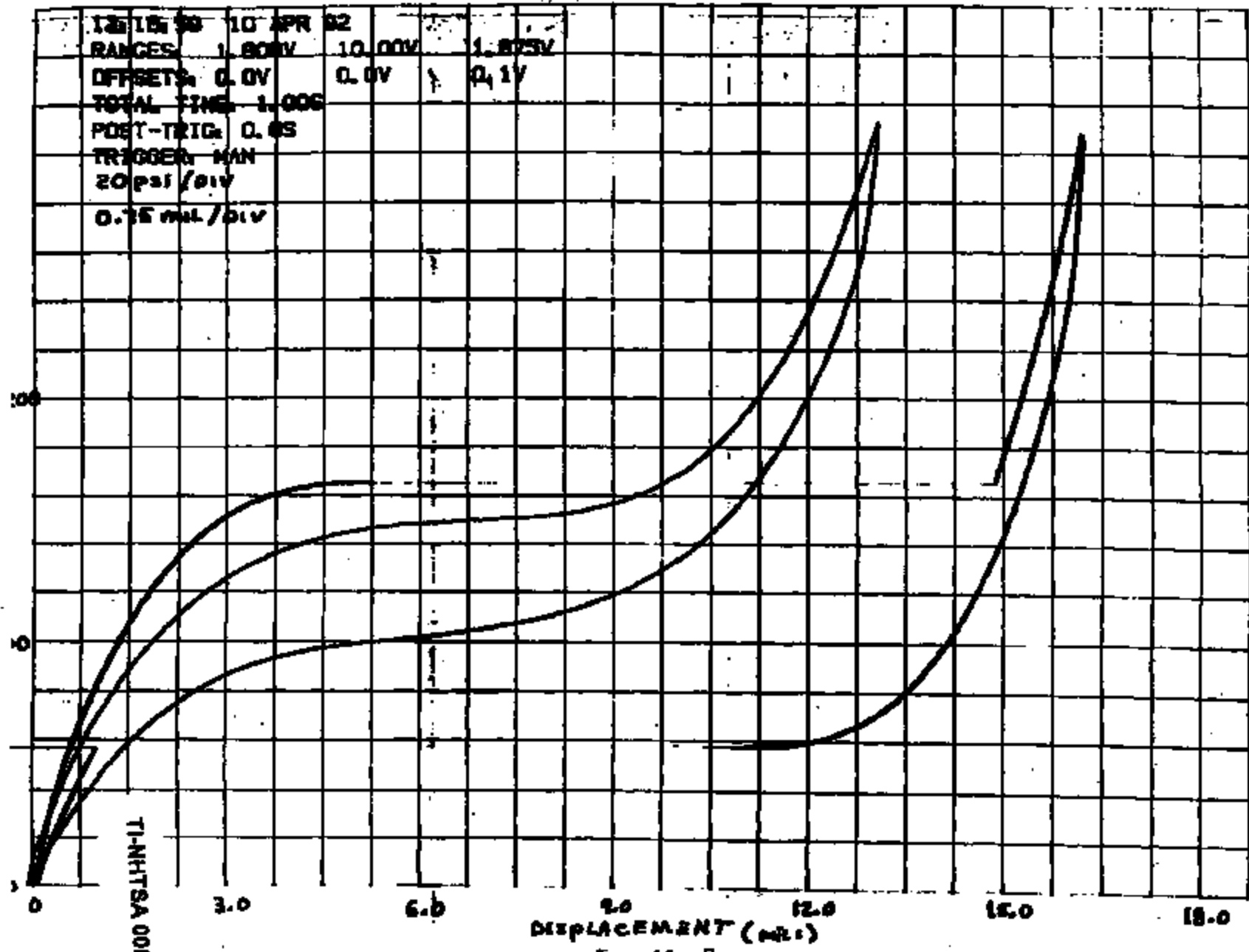
40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120
 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120

TEMP (DEG C)

16 2

TI-NHTSA 005925

12:15:50 10 APR 82
 RANGES 1.00V 10.00V 1.00V
 OFFSETS 0.0V 0.0V 0.1V
 TOTAL TIME 1.006
 POST-TRIG 0.05
 TRIGGER MAN
 20 psi/div
 0.15 mL/div



TI-NHTSA 005926



Briel & Kjaer

Type 2034

Page No.
60

Sign.:

Meas.
Object:

02 A CRYSTAL
ATR

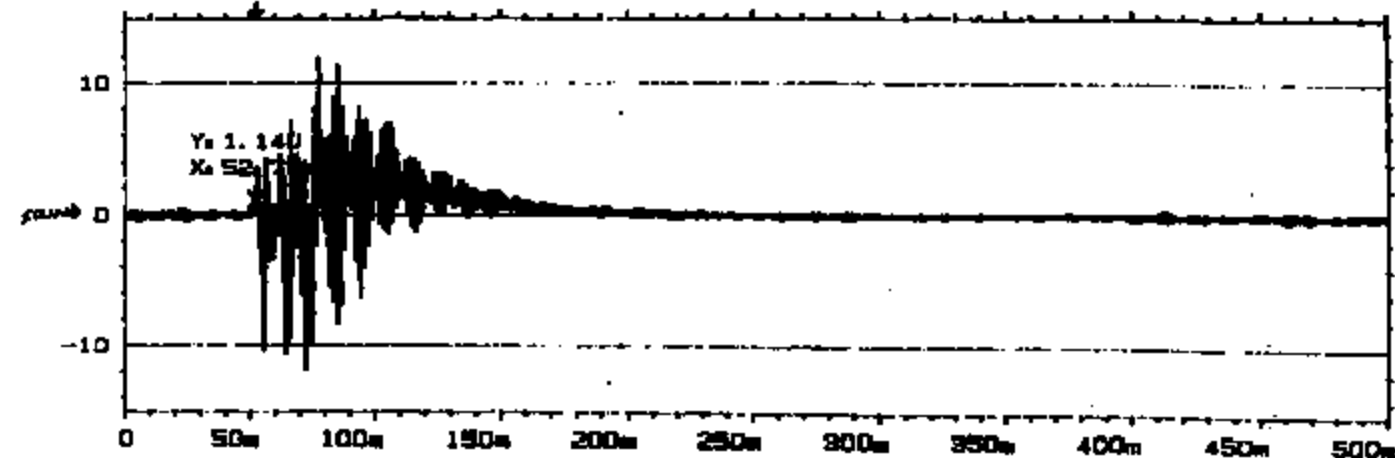
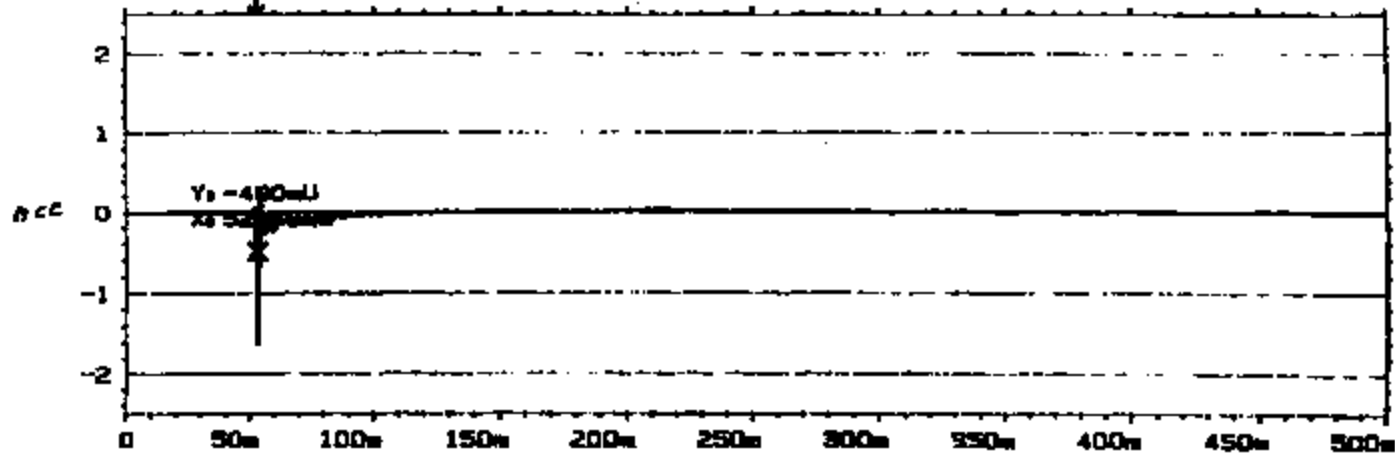
Comments:

3/13/92 BPS
10mV/g

TI-NHTSA 005927

W1 TIME CH. A REAL
Y: 2.50U
X: 0.00ms + 500ms
SETUP W1 OVERLOAD

MAIN Y: -490mU
X: 52.73ms



W1 TIME CH. B REAL INPUT
Y: 15.0U
X: 0.00ms + 500ms
SETUP W1 OVERLOAD

MAIN Y: 1.14U
X: 52.73ms

FIG 4



Brüel & Kjær

Type 2034

Page No.
39

Sign.:

Meas.
Object:

02 ACTUATOR
SLOW RAMP
ACT = 134 ps²
REF = 5B
MIR

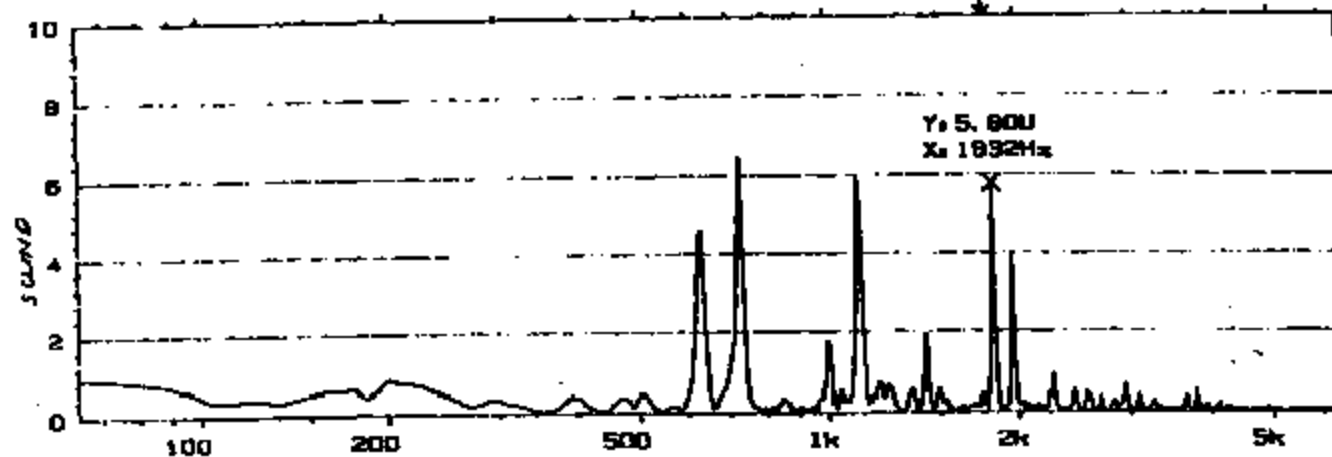
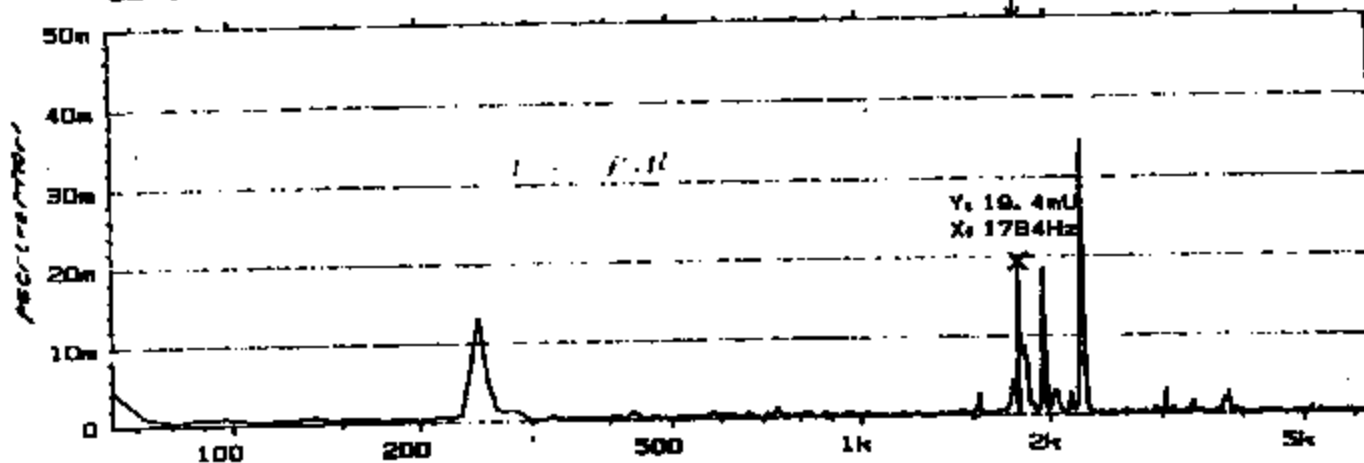
Comments:

A = MICRO 'ACQ'
B = ACCELEROMETER
LENBURD

W1 INST SPEC CH. B MAG
Y: 50.0mU RMS LIN
X: 64Hz TO 6.4kHz LOG
SETUP W1

INPUT

MAIN Y: 19.4mU
X: 1784Hz



W1 INST SPEC CH. A MAG
Y: 10.0U RMS LIN
X: 64Hz TO 6.4kHz LOG
SETUP W1

MAIN Y: 189mU
X: 1784Hz

TI-NHTSA 005928

FIG 5



Brüel & Kjær

Type 2034

Page No. 45

Sign.:

Meas. Object:

Q2. QUIET STATION
PERFORMANCE
SOUND RANGES
AIR

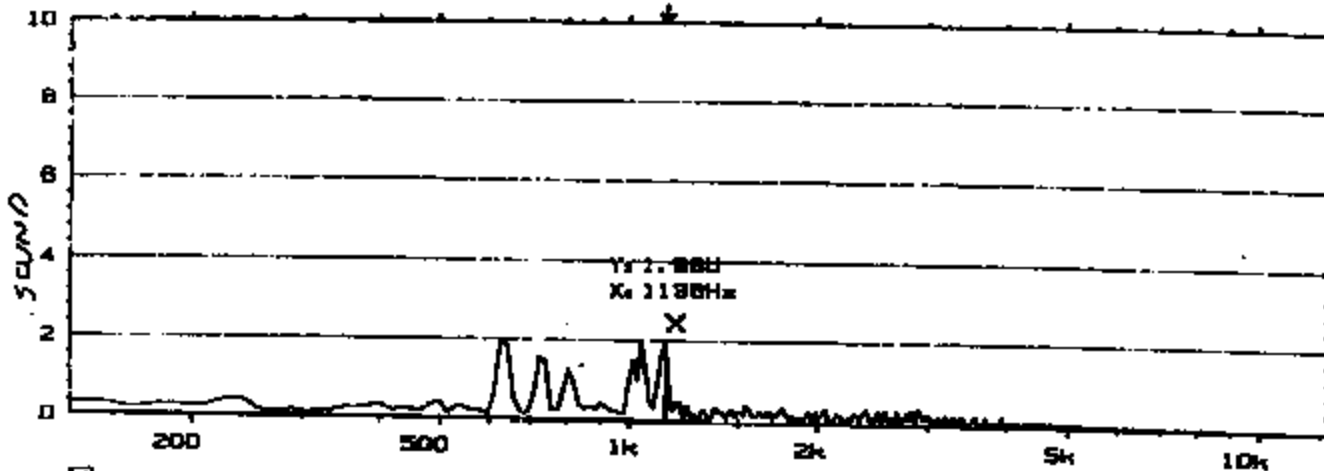
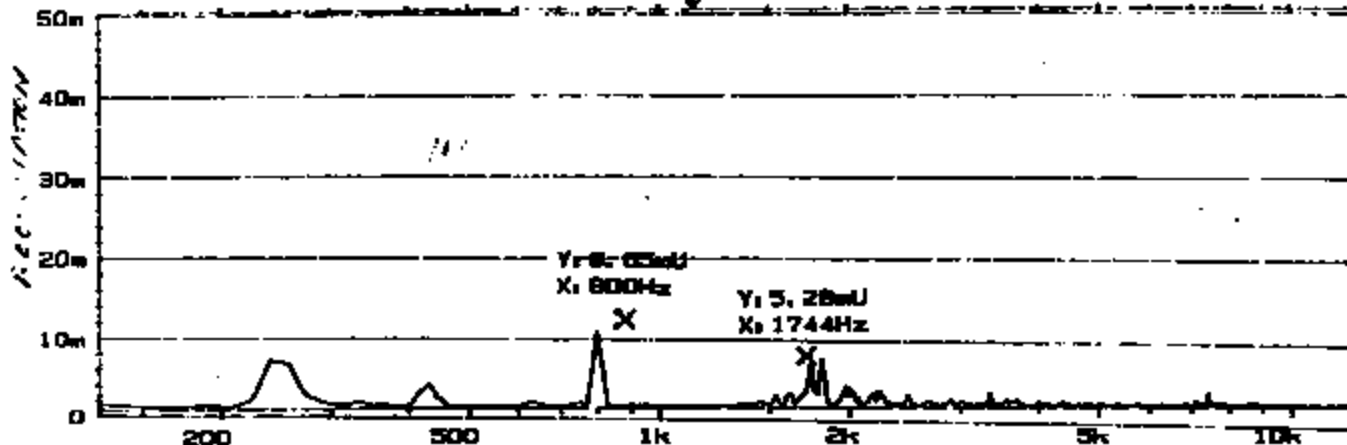
TRUCK DISC?

Comments:

TI-NHTSA 005929

W1 INST SPEC CH. B MAG
Y: 50.0mU RMS LIN
X: 128Hz TO 12.8kHz LOG
SETUP W1

MAIN Y: 88.5mU
X: 1136Hz



W1 INST SPEC CH. A MAG
Y: 10.0U RMS LIN
X: 128Hz TO 12.8kHz LOG
SETUP W1 OVERLOAD

INPUT

MAIN Y: 1.88U
X: 1136Hz

FIG 6

TEXAS INSTRUMENTS



April 14, 1992

Bruce J. Maeroff
Supervisor
Passenger Car Brake Systems
Engineering Department
Body and Chassis Engineering
Car Product Development
2000 Rotunda Drive
Building #5 - Chassis Engineering
Dearborn, MI 48121

Dear Bruce,

With your visit to Texas Instruments, Inc. (Precision Controls Department); on 4-13-92 and 4-14-92; we have reviewed the joint response of both Ford and Texas Instruments to the switch noise issue for the Next Generation Speed Control Safety Switch for the EN53 application. We have jointly reviewed this partial ISW submission for the purpose of releasing Texas Instrument's first pass at a quiet version of this Next Generation Speed Control Safety Switch.

Additionally, as a result of your visit the following W-cubed has been agreed to:

- Jointly reviewed and approved ES test plan for combined testing of F2AC and F3DC switches.....4/13/92.....Maeroff
Offiler
DeMattia
- Begin ES testing for final 7/2/92 ISW submission.....4/13/92.....Offiler
- 20 switches (F3DC9F924AA) B. Maeroff.....4/14/92.....Offiler
- 1 box of F2AC9F924AA switches to B.Maeroff.....4/14/92.....Douglas
- 5 F3DC9F924AA switches with 500K impulse cycles to B. Maeroff for receipt by 4/21/92.....Offiler
- 5 F3DC9F924AA switches with 500K impulse cycles hand carried to Atlanta.....4/21/92.....Offiler
- Participation in the DNS 2PP build in Atlanta.....4/21/92.....Offiler

- Proposal for "Test Buck" construction.....4/24/92.....Sogge
- Forward additional information on thermal testing done to date on Noryl base material.....4/24/92.....Offiler
Freda
- Coordinate final ISW submission for 7/2/92.....Watt

Our plan is to submit the complete ISW package on or before 7/2/92. this is an aggressive schedule designed to meet Ford's 7/18/92 JOB 1 release date.

If you have any further questions, please call me at 508-699-3090

Sincerely

Materials and Controls Group
Control Products Division

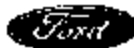
Michael De Mattia
Senior Quality Engineer
Precision Controls Department

FI: Charlie Douglas
Dale Sogge
Dave Czarn
Steve Offiler
Bill Sweet
Matt Sellers
Jim Watt

Ford: Bruce Maeroff

WARRANTS

TI-NHT8A 005932



INITIAL SAMPLE WARRANT

No. 112389

PART INFORMATION

Next Generation Speed Control
Part Name Deactivation Safety Switch Part Number F2AC-9F924-AA

Control Item Yes No Engineering Change Level _____ Date _____

Engineering Change Authorization Bruce Masroff Date _____

Shown on Drawing No. F2AC-9F924-AA Part Weight .062

Reason for Initial Sample:

- Initial Submission
- Engineering Change(s)
- Tooling Transfer
- Other - Please Specify _____
- Change in Optional Construction or Material
- Additional, Replacement, or Refurbished Tooling
- Correction of Discrepancy (Resubmission No. _____)
- Process Change
- Change in Subcontractor or Source
- Parts Produced at Additional Location

SUPPLIER INFORMATION (Manufacturing Location)

Supplier Name Texas Instruments Street Address 34 Forest St.

City Attleboro State MA Postal Code 02703 Country USA

Supplier Mfg. Location Code - DUNS T097K/7325814 Customer Assigned _____

CUSTOMER INFORMATION

Customer Name Ford Motor Co. NA&D Buyer Fred Sandershot Buyer Code 165

Purchase Order Number _____ Sample Acceptance Level _____

Application Next Generation Speed Control Deactivation Safety Switch

RESULTS

The results for dimensional measurements , material tests , and functional (ES) tests meet all drawing and specific requirements Yes No *Partial*

Submission Checklist

- Checked Print
- Auxiliary Drawings/Sketches
- Correct Number of Samples
- Dimensional Results
- Material Test Results
- Certifications
- Functional (ES) Test Results *Partial*
- Product Engineering Approval
- Control Plan
- Process Capability Results
- Process Flow Diagram
- Gage (Measurement) Studies

Supporting data for all requirements are available upon request.

COMMENTS:

Partial ISW to expedite use of "Quiet" Switch, full submission to be complete by 6/22/92. Bruce Masroff visited TI on 4/13, 4/14 to review program status.

DECLARATION

I affirm that the samples represented by this warrant are representative of our parts and have been made to the applicable custom drawings and specifications from specified materials, on regular production tooling with no operations other than the regular production process.

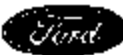
Authorized Signature Michael DeMattia Date 4-13-92

Print Name Michael DeMattia Title SQA ENGINEER Phone No. (508) 699-305

APPROVAL (when required by customer procedure) Approved Rejected

Signature _____ Date _____

Part No. 292c



Initial Sample Report - Dimensional

No. 112389

TO BE COMPLETED BY SUPPLIER

Page of

SUPPLIER	LOCATION	CODE	PART NUMBER
Texas Instruments Incorporated	Attleboro, MA	T097K	F2AC-8F824-AA
BUYER	CODE	FORD CONSUMER DIV.	NO. OF SAMPLES
REASON FOR SAMPLES		PART NAME	
NEW PART <input type="checkbox"/> CHANGED PART <input type="checkbox"/> NEW LOCATION <input type="checkbox"/> NEW TOOL <input type="checkbox"/> MULTIPLE CAVITY DES <input type="checkbox"/>		Next Generation Speed Control Demagnetization Safety Switch	
SAMPLE MADE ON PRODUCTION SET-UP AND TOOLS YES <input type="checkbox"/> NO <input type="checkbox"/>		DISPOSITION PENDING	
ADDITIONAL HAND ON TOOL ROOM WORK PERFORMED YES <input type="checkbox"/> NO <input type="checkbox"/>		MODEL YEAR AND PRODUCT LINE 92.5 EN53	
SAMPLE MADE TO B/P DATED		AUTHORIZING DEVIATION NO.	
WE HEREBY CERTIFY THE INSPECTION RESULTS BELOW ARE CORRECT AND THAT OUR SAMPLE MEETS FORD MOTOR COMPANY SPECIFICATIONS.			
DATE INSPECTED		SIGNATURE OF RESPONSIBLE OFFICIAL	TITLE
		Michael J. Maloney	Senior QA Eng
			4/15/92

CHARACTERISTIC DIMENSION OR SPECIFICATION	CLASS	SUPPLIER INSPECTION RESULTS	CONSUMER VERIFICATION OF INSPECTION RESULTS	PROCESS CAPABILITY STUDY	
				REQUIRED	COMPLETED
Partial		FAI Results recorded on FI Format			

TO BE COMPLETED BY CONSUMER

DISPOSITION	SERIAL NO.	APPROVED	RE/NOTED	NOT REQD.	INSPECTION AND TESTING INSTRUCTIONS APPROVED	YES <input type="checkbox"/>	NO <input type="checkbox"/>	SPECIAL CASES APPROVED	YES <input type="checkbox"/>	NOT REQD.	<input type="checkbox"/>
DIMENSIONAL R/P DATED	XXXX				INITIAL SAMPLE APPROVAL MUST BE SHIPPED BY APPROVAL OF FIRST PRODUCTION SHIPMENT	YES <input type="checkbox"/>	NO <input type="checkbox"/>	CONTROL PLAN APPROVED	YES <input type="checkbox"/>	NOT REQD.	<input type="checkbox"/>
MATERIAL TEST 378a FORM					APPROVED BY STYLE	YES <input type="checkbox"/>	NOT REQD.	APPROVED BY FORD ENGINEERING	YES <input type="checkbox"/>	NOT REQD.	<input type="checkbox"/>
IS TEST 848 FORM					DIVISION			AUTHORIZED SIGNATURE			DATE

Prod Qual 0000

*DESIGNATED CHARACTERISTIC CLASS

TJ-NHTSA 005934

PART INFORMATION

Part Name NEXT GENERATION SPEED CONTROL Part Number F2VC-9F924-AB
Control Item Yes No Engineering Change Level G Date 4-11-91
Engineering Change Authorization BRUCE PRASE Date _____
Shown on Drawing No. F2VC-9F924-AB Part Weight 062 kg

Reason for Initial Sample:
 Initial Submission Change in Optional Construction or Material Process Change
 Engineering Change(s) Additional, Replacement, or Rebuilt Tooling Change in Subcontractor or Source
 Tooling Transfer Correction of Discrepancy (Resubmission No. _____) Parts Produced at Additional Location
 Other - Please Specify SEE BELOW

SUPPLIER INFORMATION (Manufacturing Location)

Supplier Name TEXAS INSTRUMENTS Street Address 34 FOREST STREET
City ATTLEBORO State MA Postal Code 02703 Country USA
Supplier Mfg. Location Code - DUNS TQ97K Customer Assigned FORD MOTOR CO - EED

CUSTOMER INFORMATION

Customer Name FORD MOTOR CO - EED Buyer FRED HENDERSHOT Buyer Code 165
Purchase Order Number _____ Sample Acceptance Level Z
Application NEXT GENERATION SPEED CONTROL

RESULTS

The results for dimensional measurements , material tests , and functional (SB) tests meet all drawing and specification requirements Yes No

Submittals Checklist

Checked Print Material Test Results Control Plan
 Auxiliary Drawings/Sketches Certifications Process Capability Results
 Correct Number of Samples Functional (SB) Test Results Process Flow Diagram
 Dimensional Results Product Engineering Approval Gage (Measurement) Studies

COMMENTS:

ISR SUPPLEMENT WITH ADDITIONAL TESTING TO CLOSE OUT ALERT NO. A10166195;
ALSO, CORRECTED BASE MOLD DIMENSIONS. PART PREVIOUSLY APPROVED ON
ISN # 112384, DATED 9/17/91

DECLARATION

I affirm that the samples represented by this warrant are representative of our parts and have been made to the applicable customer drawings and specifications from specified materials, on regular production tooling with no operations other than the regular production process.

Authorized Signature Jim Watt Date 12/20/91
Print Name JIM WATT Title QA ENGINEER Phone No. 508-699-1719

APPROVAL (when required by customer procedure) Approved Rejected
Signature [Signature] Date 1/11/92
Part No. 2070 VEHICLE OPERATIONAL SQA

TEXAS INSTRUMENTS



DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

ENVELOPE DIMENSIONS TO BASE ONLY

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL				
1	11.40 - 11.90	11.806	11.817	11.817	11.794				
2	16.56 - 16.76	16.638	16.652	16.671	16.673				
		16.661	---	16.680	16.668				
3	19.45 - 19.8	19.752	19.754	19.787	19.799				
4	2.84 - 3.05	2.930	2.93	2.944	2.951				
5	1.85 - 2.06	1.927	1.966	1.969	1.978				
6	1.24 - 1.55	1.365	1.387	1.423	1.400				
7	1.24 - 1.45	1.269	1.268	1.275	1.308				
8	11.60 - 11.92	11.768	11.768	11.753	11.777				
		11.729	11.740	11.789	11.747				
9	0.25 - 0.75	0.490	0.475	0.519	0.523	0.573	0.635	0.618	0.593
10	2.79 - 3.10	2.900		2.909		2.912		2.908	
	2 PL	2.903		2.915		2.913		2.911	
11	19.05 MAX	18.667		18.709		18.671		18.704	
		18.701		18.748		18.565		18.757	
12	12.59 - 13.11	12.800		12.829		12.802		12.819	
		12.829		12.800		12.842		12.824	

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TI-NHTSA 005936

TEXAS INSTRUMENTS



DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
13	0.68 - 1.30	1.085	1.105	1.122	1.175
14	2.79 - 3.41	3.076	3.061	3.152	3.109
15	6.80 - 6.81	6.701	6.673	6.715	6.677
16	NO FLASH/BURRS	SLIGHT	FLASH ON	EDGES	@ 10X
17	8.30-8.72 2X	8.535	8.553	8.484	8.578
		8.726	8.512	8.570	8.519
18	25DEG +/- 4DEG	24DEG 25MIN	24DEG 56MIN	24DEG 47MIN	24DEG 06MIN
		24DEG 10MIN	24DEG 14MIN	24DEG 06MIN	24DEG 43MIN
19	(71.5DEG) 2X	72DEG --	71DEG 31MIN	71DEG 20MIN	72DEG 01MIN
		71DEG 07MIN	72DEG --	72DEG 10MIN	71DEG 12MIN
20	TERM. HOUSING NATURAL	BLACK ONLY	AVAILABLE	TO QUALIFY	MOLD

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505-899-3820 • TELEX 22-7702 TWX 715-545-0588 • CABLE TEXINS

TI-NHTSA 005937



TI-NHTSA 005939

**DRAWINGS AVAILABLE UPON
REQUEST**

TEXAS INSTRUMENTS



DIMENSIONAL ANALYSIS OF PART NUMBER

F200-9F724-0A

ENVELOPE DIMENSIONS TO BASE ONLY

	BLUEPRINT	CAVITY # A	CAVITY # B	CAVITY # C	CAVITY # D
	SPEC.	ACTUAL	ACTUAL	ACTUAL	ACTUAL
1	11.40 - 11.90	11.806	11.817	11.817	11.794
2	12.80 - 13.21	13.043	13.043	13.072	13.094
3	16.55 - 16.76	16.638	16.652	16.671	16.673
		16.661	---	16.680	16.668
4	19.45 - 19.81	19.752	19.754	19.787	19.799
5	2.30 - 2.05	2.930	2.93	2.944	2.951
	0.3 ± A	1.897 0.003	1.923 0.023	1.945 0.043	1.985 0.015
6	31DEG ± 2DEG	29DEG 29MIN	29DEG 38MIN	29DEG 58MIN	29DEG 36MIN
7	1.35 - 2.06	1.927	1.966	1.969	1.978
8	1.24 - 1.55	1.365	1.387	1.423	1.400
9	1.25 - 1.45	1.269	1.268	1.275	1.308
10	11.50 - 11.92	11.768	11.768	11.753	11.777
		11.729	11.740	11.789	11.747
11	13.43 - 13.80	13.010	13.769	13.786	13.647
12	0.25 - 0.75	0.490 0.475	0.519 0.523	0.573 0.635	0.618 0.590
13	2.79 - 3.10	2.900	2.909	2.912	2.903
	2 PL	2.903	2.915	2.913	2.911

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 AND FOR SALE & SERVICE OF YOUR TAYLOR MADE PRODUCTS - CALL & TOLL FREE

TI-NHTSA 005942

TEXAS INSTRUMENTS



DIMENSIONAL ANALYSIS ON PART NUMBER

FRAC-9F924-AA

	ACCEPTED SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
14	0.05 - 0.26	0.151	0.153	0.124	0.076
	1 PL	0.115	0.142	0.163	0.147
15	12.05 MAX	18.667	18.709	18.671	18.704
		18.701	18.748	18.563	18.737
16	12.89 - 13.11	12.900	12.829	12.902	12.819
		12.829	12.800	12.842	12.827
17	0.88 - 1.30	1.085	1.105	1.122	1.179
18	2.34 - 3.41	3.076	3.0612	3.153	3.109
19	7.23 - 7.75	7.599	7.501	7.514	7.543
20	6.46 - 6.81	6.701	6.673	6.715	6.677
21	29DEG ±2- 2DEG	MEASURED	29DEG 24MIN	ON CROSS	SECTIONED
	A	PART	30DEG 06MIN	----	----
		----	29DEG 36MIN	----	----
		----	29DEG 47MIN	----	----
22	NO FLASH/BURRS	SLIGHT	FLASH ON	EDGES	@ 10X

TEXAS INSTRUMENTS



DIMENSIONAL ANALYSIS ON PART NUMBERS

F200-99924-00

	EUSPRTN	SPEC	CAVITY # A		CAVITY # B		CAVITY # C		CAVITY # D	
			ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL		
23	18.50-18.77	2X	8.535	8.533	8.484	8.573				
			8.726	8.512	8.570	8.519				
24	2.15-2.42	2X	2.162	2.171	2.282	2.271				
			2.212	2.236	2.237					
25	20DEG +/-	20DEG	24DEG 25MIN	24DEG 56MIN	24DEG 47MIN	24DEG 06MIN				
	2.4		24DEG 10MIN	24DEG 14MIN	24DEG 06MIN	24DEG 45MIN				
26	45DEG +/-	20DEG	46DEG 10MIN	42DEG 44MIN	43DEG 64MIN	45DEG 03MIN				
	42%		44DEG 35MIN	43DEG 47MIN	44DEG 47MIN	45DEG 01MIN				
			45DEG 22MIN	44DEG 47MIN	43DEG 49MIN	46DEG 10MIN				
			44DEG 08MIN	45DEG 37MIN	46DEG 38MIN	43DEG 50MIN				
27	71.50DEG	2X	72DEG --	71DEG 31MIN	71DEG 20MIN	72DEG 01MIN				
			71DEG 07MIN	72DEG --	72DEG 10MIN	71DEG 13MIN				
28	1.52-1.63	2X	1.538	1.535	1.592	1.603				
			1.539	1.612	1.602	1.596				
29	0.55-0.66	4X	0.546	0.547	0.570	0.590	0.598	0.580	0.581	0.556
			0.592	0.614	0.561	0.574	0.576	0.603	0.589	0.575
30	0.35-0.46	4X	0.301	0.471	0.467	0.502	0.459	0.520	0.477	0.443
			0.378	0.417	0.320	0.344	0.357	0.382	0.388	0.399
			0.493	0.506	0.494	0.539	0.436	0.482	0.466	0.518
			0.382	0.395	0.450	0.484	0.384	0.393	0.373	0.409

TEXAS INSTRUMENTS INCORPORATED - 54 FOREST STREET - ATTLEBORO, MA 02603

FOR THE YEAR ENDING DECEMBER 31, 1974

TI-NHTSA 005944

PIPE/PIST DATA

TI-NHTSA 005948

577

PROCESS POTENTIAL AND QUALITY INDEXES SUMMARY DATA SHEET

PART #: F27C-9F924-AB SUPPLIER CONTACT: Jim Herr
 SUPPLIER: Texas Instruments CONTACT PHONE: 1-508-699-1719
 CODE: 1027K PART DESCRIPTION: Next Generation
 ADDRESS: 34 Forest St. Speed Control
Att: Labore, MA 02703 SOA CODE: (Mark Schiller)
 VEHICLE BUILD: EP VP FB OTHER VEHICLE PROGRAM: Pass Car

CHARACTERISTIC TYPE

∇ = FORD CRITICAL CHARACTERISTICS S.C. = FORD OR SUPPLIER SIGNIFICANT CHARACTERISTICS

NUMBER OF CRITICAL AND SIGNIFICANT CHARACTERISTICS:

Item	Description	Type	Cp	Cpk
1:	<u>Actuation Pressure</u>	<u>SC</u>	<u>**</u>	<u>**</u>
2:	<u>Release Pressure</u>	<u>SC</u>	<u>**</u>	<u>**</u>
3:	<u>3/8-24UNF-2A Thread</u>	<u>SC</u>	<u>A*</u>	<u>A*</u>
4:				
5:				
6:				
7:				
8:				
9:				
10:				
11:				
12:				
13:				
14:				
15:				

PIST = $\frac{1265}{1265} \times 100 = 100 \%$

PIPC_{Cp} = $\frac{N/A}{N/A} \times 100 = \text{---} \%$ PIPC_{Cpk} = $\frac{N/A}{N/A} \times 100 = \text{---} \%$

COMMENTS:

** Calibration check is done 100 percent, parts tested 300; defective 0 percent of defect U.

A* threads are checked on a Co/Boss gage.

PREPARED BY:

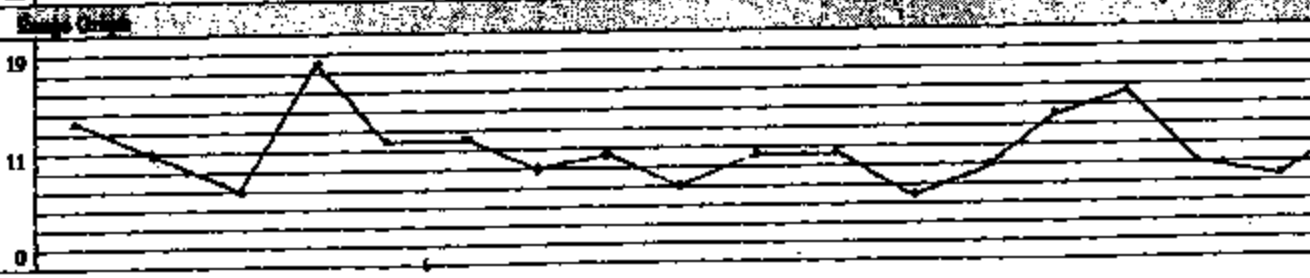
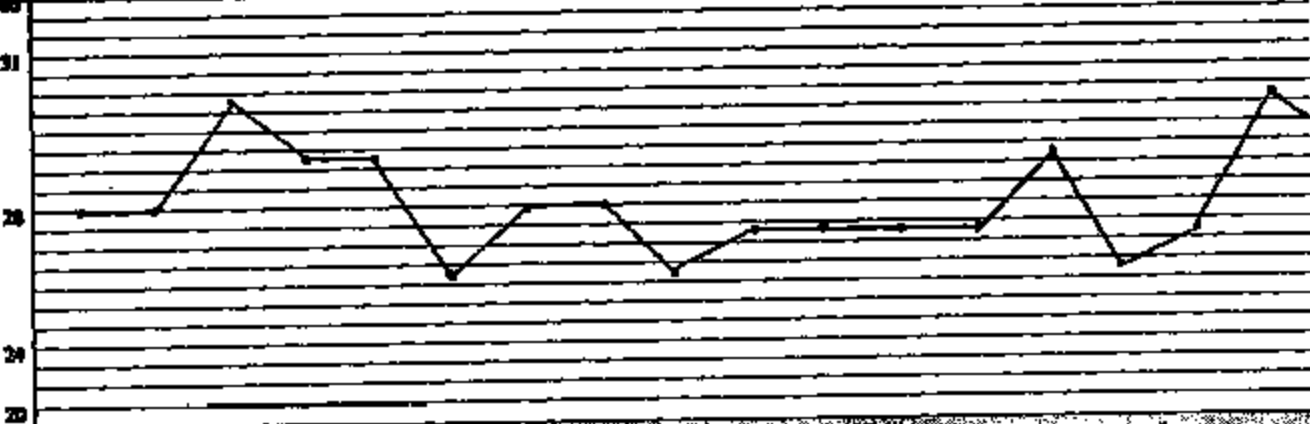
Elaine Ross

DATE: 12/20/91

CONTROL CHART WORKSHEET

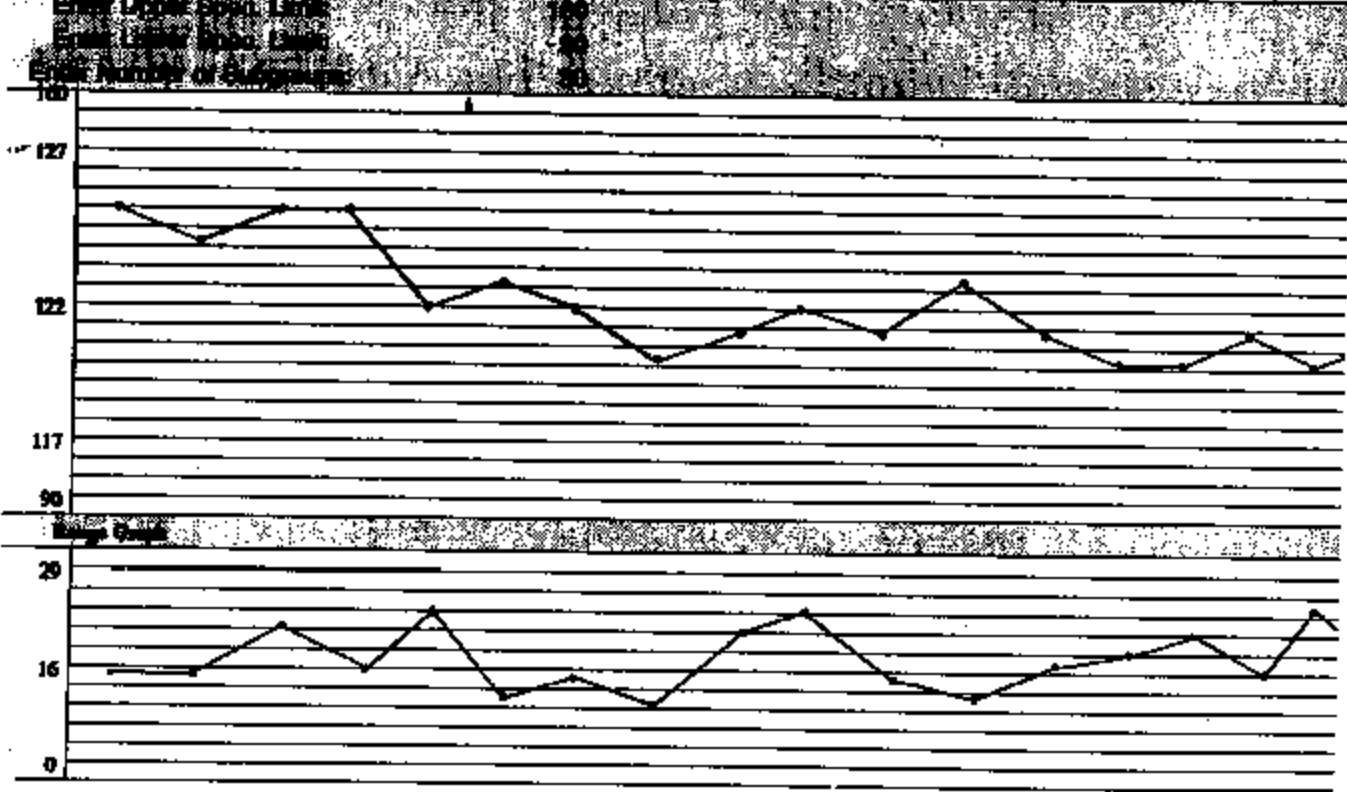
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	38	29	31	30	35	29	34	29	25	25	31	25	27	25	29	23	26	29	26	22	27	27
	34	34	29	27	31	25	26	33	27	25	25	24	29	27	25	29	33	36	30	24	32	
	31	24	33	30	23	26	36	31	29	25	25	30	31	26	28	25	27	31	24	27	28	
	25	23	26	39	36	21	34	27	25	29	27	28	29	24	25	32	32	23	21	25		
	21	32	34	27	34	39	29	26	25	22	27	28	26	25	35	32	34	28	25	25		
	35	25	27	29	34	24	25	28	28	28	23	24	28	35	29	29	30	28	27	7		
	28	30	28	21	23	22	24	25	30	26	27	28	26	37	24	29	30	32	27			
	26	29	34	30	23	27	31	28	25	28	32	26	32	28	24	24	30	26	3			
	30	25	28	29	28	29	33	31	27	32	26	28	29	33	20	28	27	27				
	22	28	29	24	27	29	25	23	28	28	22	28	28	26	27	25	28	32				
Sum	283	280	299	287	291	264	277	290	262	289	265	270	272	286	289	274	295					
avg	26	26	30	29	29	26	28	28	26	27	27	27	27	28	26	27	30					
Range	13	11	7	18	12	12	9	10	7	10	10	6	9	13	15	10	8					

Upper Control Limit: 31
 Lower Control Limit: 23
 Center Line: 27



TI-NHTSA 005946

P	TTPS											CONTROL CHART WORKSHEET										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
116	120	130	127	139	129	123	123	129	112	122	117	128	123	123	117	124	118	126	127	126	121	127
118	118	120	128	124	125	123	121	124	129	120	127	125	125	115	121	120	122	131	127	113	117	121
130	126	121	120	125	117	124	115	118	120	127	120	115	121	122	124	112	127	122	131	123	123	125
123	129	112	128	115	126	116	121	131	124	118	124	123	121	126	114	119	121	123	123	123	125	125
125	117	125	128	116	122	120	129	113	117	116	122	115	122	113	114	115	119	119	109	125	125	125
132	123	132	116	116	123	126	129	123	118	130	128	129	107	115	119	115	116	117	125	125	125	125
126	127	133	132	119	125	119	122	128	136	117	124	122	125	134	123	113	127	116	125	125	125	125
123	126	129	121	118	119	123	117	110	115	120	129	112	118	121	124	118	127	114	125	125	125	125
131	125	122	123	120	119	117	121	123	120	117	118	122	113	116	130	197	123	125	125	125	125	125
130	132	124	129	125	124	129	113	114	125	124	124	123	120	112	122	122	114	125	125	125	125	125
Sum	1232	1241	1247	1233	1239	1228	1219	1200	1213	1216	1210	1233	1213	1195	1193	1208	1196	1207	1207	1207	1207	1207
Avg	125	124	125	125	122	123	122	126	121	122	121	123	121	120	120	121	120	120	120	120	120	120
Range	15	15	22	16	24	11	14	10	21	24	14	11	17	19	21	16	25	25	25	25	25	25



TI-NHTSA 006949

4271



TI-NHTSA 005990

M GAGE STUDY FOR REPEATABILITY AND REPRODUCIBILITY (LONG METHOD)
 -Feb-92
 7793 PRESSURE TESTER
 ACTUATION

NUMBER OF OPERATORS	3	MIN SPEC	90
NUMBER OF PARTS	4	MAX SPEC	160
NUMBER OF TRIALS	2	TOLERANCE	70

DATA SUMMARY

OPERATOR	AVERAGE	RANGE
1	104.325	0.25
2	103.7	0.35
3	104.15	0.5
4	NA	NA
5	NA	NA
6	NA	NA
7	NA	NA
8	NA	NA
9	NA	NA
10	NA	NA

AVERAGE	104.0583	0.366666

^N XBAR	103.7
.X XBAR	104.325
XBARDIFF	0.625

	MEASUREMENT UNIT ANALYSIS	%TOLERANCE

REPEATABILITY:	1.674054	2.39%
REPRODUCIBILITY:	1.577854	2.25%
RPT & REPR (R&R):	2.300452	3.29%

NOTE: ALL CALCULATIONS BASED ON 5.15 SIGMA (99%)

PER STUDY TITLES IN CELLS A8,A9,A10. MIN/MAX SPEC IN B12, B13
 7/PS PRESSURE TESTER
 ACTUATION

MIN SPEC 90
 MAX SPEC 160
 TOLERANCE 70

DATA FOR OPERATOR 1

PART	TRIAL					AVG	RANGE
	1	2	3	4	5		
1	107.3	106.8				107.05	0.5
2	106.7	106.8				106.75	0.1
3	102.9	102.5				102.7	0.4
4	100.8	100.8				100.8	0
5						NA	0
6						NA	0
7						NA	0
8						NA	0
9						NA	0
10						NA	0
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

GRND AVG: 104.325 AVG RANGE: 0.25
 UCL FOR INDIVIDUAL RANGES 1.1979

ATA FOR OPERATOR 2

PART	TRIAL					AVG	RANGE
	1	2	3	4	5		
1	105.6	105.5				105.55	0.1
2	106.3	106.3				106.3	0
3	103.1	102.1				102.6	1
4	100.5	100.2				100.35	0.3
5						NA	0
6						NA	0
7						NA	0
8						NA	0
9						NA	0
10						NA	0
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

GRND AVG: 103.7 AVG RANGE: 0.35
 UCL FOR INDIVIDUAL RANGES 1.1979

TA FOR OPERATOR 3

PART	TRIAL					AVG	RANGE
	1	2	3	4	5		
1	104.4	104.4				104.4	0
2	109.4	107.6				109	0.8
3	103	101.8				102.4	1.2
4	101.8	101.8				101.8	0
5						NA	0
6						NA	0
7						NA	0
8						NA	0
9						NA	0
10						NA	0
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

GRND AVG: 104.15 AVG RANGE: 0.5
 UCL FOR INDIVIDUAL RANGES: 1.1979

GAGE STUDY FOR REPEATABILITY AND REPRODUCIBILITY (LONG METHOD)
 -Feb-92
 77PS PRESSURE TESTER
 RELEASE

NUMBER OF OPERATORS	3	MIN SPEC	20
NUMBER OF PARTS	4	MAX SPEC	120
NUMBER OF TRIALS	2	TOLERANCE	100

DATA SUMMARY

OPERATOR	AVERAGE	RANGE
1	46.075	0.5
2	45.2625	0.775
3	45.925	0.15
4	NA	NA
5	NA	NA
6	NA	NA
7	NA	NA
8	NA	NA
9	NA	NA
10	NA	NA

AVERAGE	45.72083	0.475

N XBAR	45.2625
.X XBAR	46.075
XBAR DIFF	0.8125

	MEASUREMENT UNIT	%TOLERANCE
	ANALYSIS	
	-----	-----
REPEATABILITY:	2.168661	2.17%
REPRODUCIBILITY:	2.052217	2.05%
RPT & REPR (R&R):	2.985747	2.99%

NOTE: ALL CALCULATIONS BASED ON 5.15 SIGMA (99%)

PER STUDY TITLES IN CELLS A9,A9,A10. MIN/MAX SPEC IN B12. B13
 77PS PRESSURE TESTER
 RELEASE

MIN SPEC 20
 MAX SPEC 120
 TOLERANCE 100

DATA FOR OPERATOR 1

PART	TRIAL					AVG	RANGE
	1	2	3	4	5		
1	44.1	43.8				43.95	0.3
2	50.5	50.1				50.3	0.4
3	48.7	48.4				48.55	0.3
4	42	41				41.5	1
5						NA	0
6						NA	0
7						NA	0
8						NA	0
9						NA	0
10						NA	0
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

GRND AVG: 46.075 AVG RNGE: 0.3
 UCL FOR INDIVIDUAL RANGES 1.551825

DATA FOR OPERATOR 2

PART	TRIAL					AVG	RANGE
	1	2	3	4	5		
1	43.7	43.2				43.45	0.5
2	49.4	47.6				48.5	1.8
3	48.8	48.2				48.5	0.6
4	40.7	40.5				40.6	0.2
5						NA	0
6						NA	0
7						NA	0
8						NA	0
9						NA	0
10						NA	0
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

GRND AVG: 45.2625 AVG RANGE: 0.775
 UCL FOR INDIVIDUAL RANGES 1.531825

TA FOR OPERATOR 3

RWY	TRIAL					AVG	RANGE
	1	2	3	4	5		
1	42.4	42.5				42.55	0.1
2	50.7	50.4				50.55	0.3
3	48.8	48.7				48.75	0.1
4	41.5	41.4				41.45	0.1
5						NA	0
6						NA	0
7						NA	0
8						NA	0
9						NA	0
10						NA	0
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

GRND AVG: 45.825 AVG RANGE: 0.15
 LCL FOR INDIVIDUAL RANGES 1.551825

GAGE STUDY FOR REPEATABILITY AND REPRODUCIBILITY (LONG METHOD)

DIAL INDICATOR

GAGE # 15070

TIPS

NUMBER OF OPERATORS	2	MTN SPEC	0.459
NUMBER OF PARTS	10	MAX SPEC	0.479
NUMBER OF TRIALS	2	TOLERANCE	0.02

DATA SUMMARY

OPERATOR	AVERAGE	RANGE
1	0.470705	0.00019
2	0.470625	0.00069
3	NA	NA
4	NA	NA
5	NA	NA
6	NA	NA
7	NA	NA
8	NA	NA
9	NA	NA
10	NA	NA

AVERAGE	0.470665	0.00041
---------	----------	---------

N XBAR	0.470625
MAX XBAR	0.470705
XBAR DIFF	0.00008

	MEASUREMENT UNIT ANALYSIS	%TOLERANCE
REPEATABILITY:	0.001871	9.36%
REPRODUCIBILITY:	0	0.00%
RPT & REPR (R&R):	0.001871	9.36%

NOTE: ALL CALCULATIONS BASED ON 5.15 SIGMA (99%)

PER STUDY TITLES IN CELLS A8, A9, A10. MIN/MAX SPEC IN B12. B13
 DIAL INDICATOR
 PAGE # 16070

MIN SPEC 0.459
 MAX SPEC 0.479
 TOLERANCE 0.02

DATA FOR OPERATOR 1

PART	TRIAL					AVG	RANGE
	1	2	3	4	5		
1	0.4693	0.4694				0.46935	0.0001
2	0.4697	0.4696				0.46965	0.0001
3	0.471	0.4715				0.47125	0.0005
4	0.4718	0.4718				0.4718	0
5	0.472	0.472				0.472	0
6	0.4715	0.4716				0.47155	0.0001
7	0.4707	0.471				0.47085	0.0003
8	0.4694	0.4693				0.46935	0.0001
9	0.4718	0.4713				0.47155	0.0005
10	0.4696	0.4693				0.4697	0.0002
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

GRND AVG: 0.470705 AVG RANGE: 0.00019
 UCL FOR INDIVIDUAL RANGES 0.001339

DATA FOR OPERATOR 2

PART	1	2	TRIAL 3	4	5	AVG	RANGE
1	0.4695	0.4696				0.46955	0.0001
2	0.4693	0.4699				0.46935	0.0005
3	0.4718	0.4709				0.47135	0.0009
4	0.4719	0.4706				0.47125	0.0013
5	0.4715	0.4718				0.47165	0.0003
6	0.4715	0.4717				0.4716	0.0002
7	0.471	0.4715				0.47125	0.0005
8	0.4703	0.4716				0.47105	0.0011
9	0.4694	0.4702				0.4699	0.0008
10	0.4689	0.4695				0.4692	0.0006
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

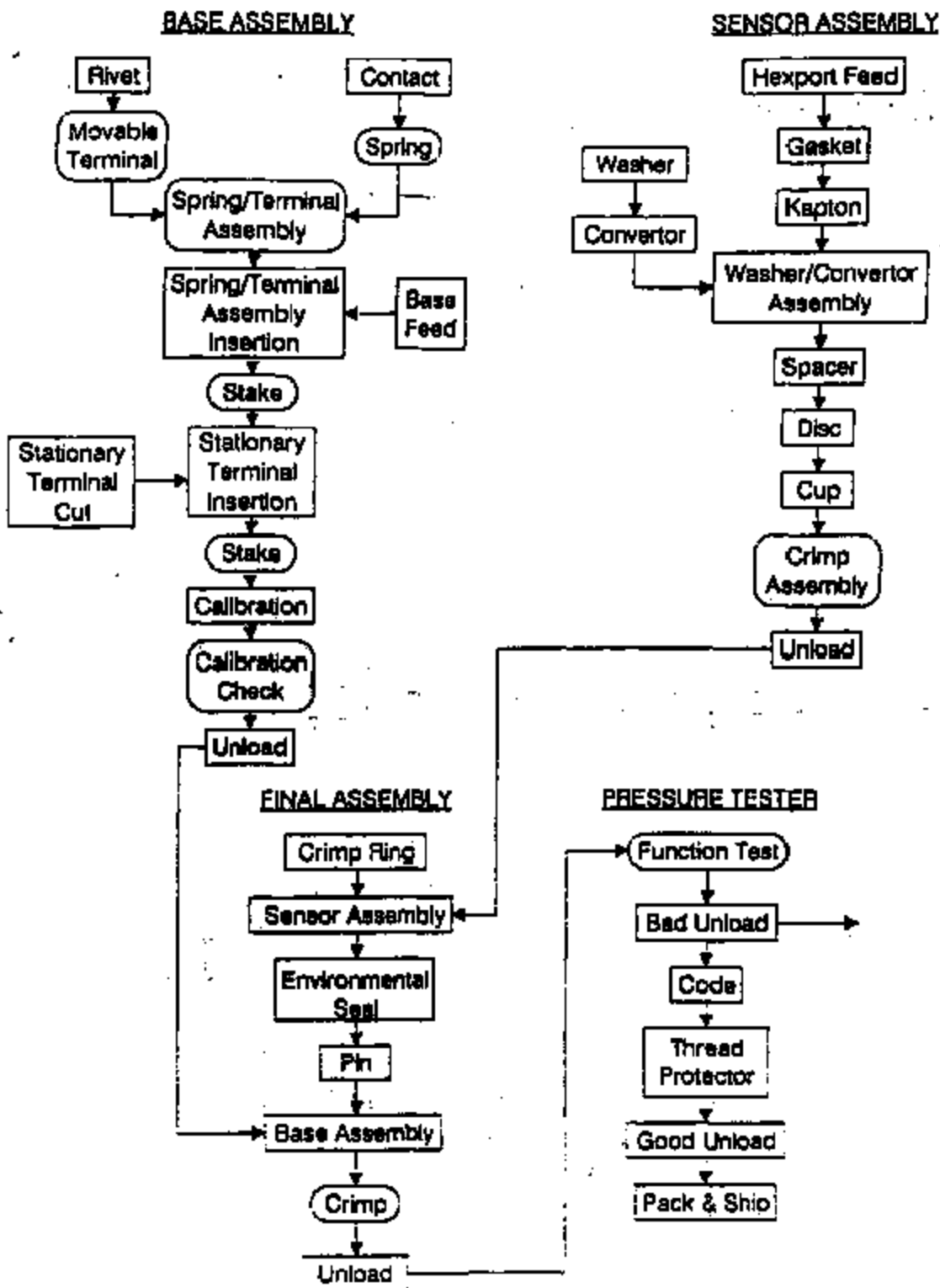
GRND AVG: 0.470625 AVG RNGE: 0.00063
 UCL FOR INDIVIDUAL RANGES 0.001339

Process Flow &
Critical Path

TI-NHTSA 005863

FORD NEXT GENERATION SPEED CONTROL

PROCESS FLOW CHART 77PSL2-1/2-3



**FORD NEXT GENERATION SPEED CONTROL (77PS)
MANUFACTURING CONTROL PLAN
77PSL QUIET SWITCH**

PROCESS STEP DESCRIPTION	PRODUCT CHARACTERISTICS	EVALUATION METHOD	CONTROL METHOD	FREQUENCY OF TEST	REACTION PLAN
BASE ASSEMBLY (AMI AUTOMATION)	TERMINAL HEIGHT	DIAL INDICATOR	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	TERMINAL PUSHOUT	FORCE GAGE/ DIAL INDICATOR	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	TERMINAL SEPERATION/ ALIGNMENT	PLUG GAGE	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	SPRING ANGLE	COMPARATOR	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	SPRING CONTACT WIDTH	CALIPERS	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	SPRING TORQUE	FORCE GAGE	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	SPRING BUMP HEIGHT	CALIPERS	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	RIVET HEIGHT	DIAL INDICATOR	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	CALIBRATION DEFORMATION	CUSTOM CONTINUITY SYSTEM	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	VISUAL QUALITY	VISUAL	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
SENSOR ASSEMBLY	CRIMP DIAMETER	CALIPERS	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	CRIMP HEIGHT	CALIPERS	X/ R	5pc/ Hr.	SOFT SINCE LAST CHECK
	VISUAL QUALITY	VISUAL	P	5pc/ Hr.	SOFT SINCE LAST CHECK

Revision: A

11 April 1992 MJG/mjs 060-9134

TI-NHTSA 005965

**FORD NEXT GENERATION SPEED CONTROL (77PS)
MANUFACTURING CONTROL PLAN
77PSL QUIET SWITCH**

<u>PROCESS STEP DESCRIPTION</u>	<u>PRODUCT CHARACTERISTICS</u>	<u>EVALUATION METHOD</u>	<u>CONTROL METHOD</u>	<u>FREQUENCY OF TEST</u>	<u>REACTION PLAN</u>
FINAL ASSEMBLY (AMI AUTOMATION)	CRIMP DIAMETER	CALIPER	X/R	5pc/ Hr.	SORT SINCE LAST CHECK
	CRIMP HEIGHT	CALIPER	X/R	5pc/ Hr.	SORT SINCE LAST CHECK
	BASE TORQUE	TORQUE GAGE	X/R	5pc/ Hr.	SORT SINCE LAST CHECK
	CODE CRIMP RING/ DIAMETER-LEGIBILITY	PLUG-VISUAL	P	5pc/ Hr.	SORT SINCE LAST CHECK
	PIN HEIGHT	DIAL INDICATOR	X/R	5pc/ Hr.	SEPARATE FAILED LOT. PRODUCT TEAM REVIEW.
FUNCTION TESTER (CUSTOM)	ACTUATION/ RELEASE POINTS (Ford Significant Char.)	MASTERS	X/R	EACH SHIFT	TOOL ROOM / ENGINEERING EVALUATIONS
	ACTUATION/ RELEASE POINTS	RAMP THROUGH PRESSURE RANGE	X/R	100%	YIELD TRACKING/ SCRAP CONTROL
PRODUCT AUDITS * (PRODUCTION)	HIGH PINNING	CUSTOM HYPOT SYSTEM	P	100%	SEPARATE FAILED LOT. PRODUCT TEAM REVIEW.
	HIGH TEMP CONTINUITY	OVEN/ CONTINUITY METER	P	10pc/ Lot	SEPARATE FAILED LOT. PRODUCT TEAM REVIEW.
Q.C. AUDITS	OUTLINED IN DETAIL IN TEXAS INSTRUMENTS (QAS 208), FMC				Revision: A

11 April 1992 MJS/mja 050-0134

TI-NHTSA 005866

F2AC-9F924-AA

MATERIAL ANALYSIS

PARTS LIST

	PART NAME	PART #	CERTIFIED
1	BASE	46515-3	YES
2	STA. TERM.	36888-1	YES
3	MOVE. CONTACT	74408-1	YES
4	RIVET	74171-1	YES
5	MOVE. TERM.	36887-1	YES
6	SPRING ARM	36889-1	YES
7	4512 HEXPORT	36900-1	YES
8	GASKET	74353-1	YES
9	CUP	27713-1	YES
10	SEAL	74176-1	YES
11	KAPTON STRIP	27225-1	YES
12	WASHER	27639-1	YES
13	CONVERTER	27406-1	YES
14	KAPTON TAPE	74224-1	YES
15	SPACER	73958-2/-3	YES
16	CRIMP RING	74797-1	YES
17	TRANSFER PIN	74078-SEL	YES
18	ENVIO. SEAL	74247-4	YES

TI-NHTSA 005967



Product Quality Documentation

CERTIFICATE OF COMPLIANCE

Customer Order Number 9LE/SKILLIE	Customer Part Number	GE Requisition Number 1281498/1	Material, Grade and Color N-501	GT2830	111
Lot Number NE2311	Qty. Shipped 100	U.M. LB	Shipped From HSE SERVICE INC	Date Shipped 04/05/78	Shipper's Number 01295195

It is hereby certified that the product indicated above conforms to our standard internal specifications for the designated material. This certification is subject to our standard conditions of sale applying to products sold by the General Electric Company.

Specification _____
 Specification Originator _____
 Specification Comments _____

TEST	REFERENCE	REQUIREMENT	(UNITS)	(RETRY)
LOT DATA:				
HOT TENSILE STRENGTH - 1/4"	ASTM D248	430.0 DBB F MINIMUM	460.0 CEG F	290 LBS C
NOTCHED IZOD IMPACT-1/8"	ASTM D256	1.5 FT-LB/IN MINIMUM	2.0 FT-LB/IN	107.0 J/M
X ELONGATION	ASTM D238	4 % MINIMUM	8 %	
TENSILE YIELD	ASTM D238	20,000 PSI MINIMUM	25,000 PSI	100.5 MPa
FLEXURAL MODULUS	ASTM D790	1,000,000 PSI MINIMUM	1,265,000 PSI	8,715.5 MPa
FLEXURAL STR @ YIELD	ASTM D790	20,000 PSI MINIMUM	37,000 PSI	261.8 MPa
SPECIFIC GRAVITY	ASTM D282	1.21-1.25 G/CC	1.22	1.31 G/CC
MOISTURE CONTENT	WVA FISCHER	0.50 % MAXIMUM	0.09 %	

PRODUCT AUDIT DATA:
 PLANNED LTV, .100" THICK PMS.202 4.00 IN/IN MAXIMUM

DATE OF LAST AUDIT: 06/79
 SELF-EXTINGUISHING HAZARD BURN RATE

ROBERT G. MATTHEWS
 Quality Manager

THOMAS HEERS
 Manufacturing Manager

If you have any questions concerning this, please contact:

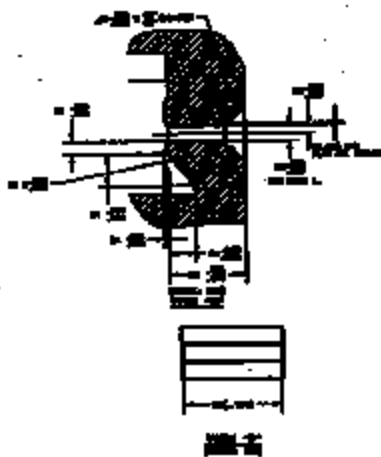
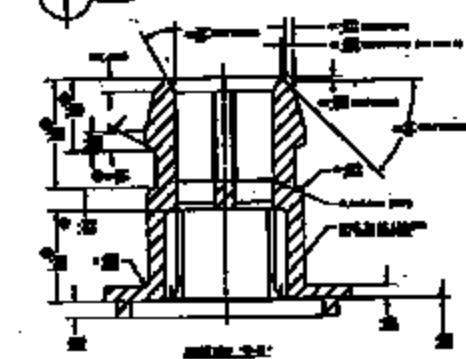
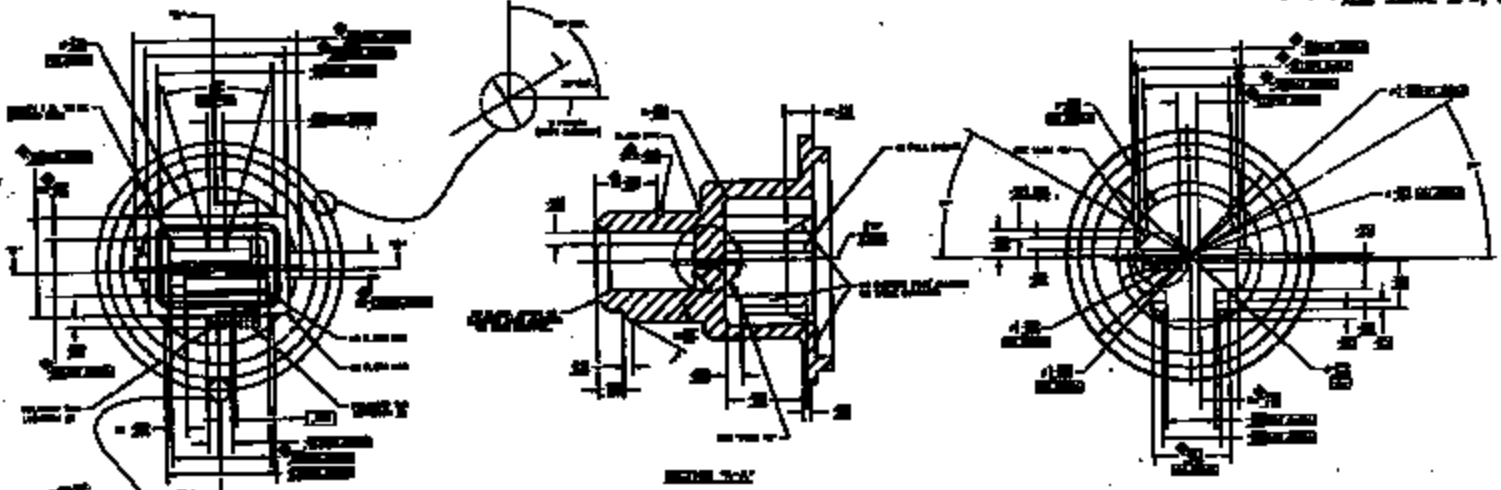
_____ **GARY SHEPHERD** _____
 _____ **1-510-475-3000** _____

TERMS INSTRUCTIONS INC.
 ACCOUNTS PAYABLE DEPT
 PO BOX 685
 ATTLEBORO MA 01735-0685
 Attn: JIM KEANE

TI-NHTSA 005988

8 7 6 5 4 3 2 1

REV.	DESCRIPTION	DATE
1	ISSUED FOR FABRICATION	10/1/52



- 1. ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN INCHES AND FRACTIONS THEREOF.
- 2. ALL DIMENSIONS ARE TO BE TAKEN TO THE CENTER UNLESS OTHERWISE SPECIFIED.
- 3. ALL DIMENSIONS ARE TO BE TAKEN TO THE CENTER UNLESS OTHERWISE SPECIFIED.
- 4. ALL DIMENSIONS ARE TO BE TAKEN TO THE CENTER UNLESS OTHERWISE SPECIFIED.
- 5. ALL DIMENSIONS ARE TO BE TAKEN TO THE CENTER UNLESS OTHERWISE SPECIFIED.
- 6. ALL DIMENSIONS ARE TO BE TAKEN TO THE CENTER UNLESS OTHERWISE SPECIFIED.
- 7. ALL DIMENSIONS ARE TO BE TAKEN TO THE CENTER UNLESS OTHERWISE SPECIFIED.
- 8. ALL DIMENSIONS ARE TO BE TAKEN TO THE CENTER UNLESS OTHERWISE SPECIFIED.

CRITICAL PART
 QTY. 1000
 DES. NO. 03880 Rev. 1
 Mfg. APR 13 1952
 MILITARY AIRCRAFT DIVISION
 WASHINGTON, D. C.

DATE	10/1/52	BY	J. W. B.						
DESIGNED BY	J. W. B.	CHECKED BY	J. W. B.						
APPROVED BY	J. W. B.	DATE	10/1/52						
REVISIONS	<table border="1"> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>DATE</th> </tr> <tr> <td>1</td> <td>ISSUED FOR FABRICATION</td> <td>10/1/52</td> </tr> </table>			NO.	DESCRIPTION	DATE	1	ISSUED FOR FABRICATION	10/1/52
NO.	DESCRIPTION	DATE							
1	ISSUED FOR FABRICATION	10/1/52							
QUANTITY	1000	UNIT PRICE	46515						
TOTAL	46515000								

TI-NHTSA 005939

M E M O R A N D U M

14 April 1992

TO: Bruce Maeroff - Ford Motor Co.

CC: Dave Czarn
Jeff DiDomenico
Norm Freda
Elaine Rose
Jim Watt

FR: Steve Offiler

RE: ES Testing for Full ISR Submission for: F2AC-9F924-AA
F3DC-9F924-AA

The proposed methodology to complete the full ISR submissions for the above referenced part numbers is as follows. A complete battery of ES tests per Ford Engineering Specification (delta) F2VC-9F924-AA will be performed on F2AC. The only difference between this device and F3DC is the fact that F3DC includes a "snubber" which is an .020" nominal diameter orifice in the fluid passage. Therefore, the only tests to be run on F3DC are those which may be somehow impacted by this orifice, specifically the Impulse test and the Thermal Cycle test. Furthermore, as can be seen in the attached Flow Chart (marked-up) the F3DC parts will not be required until 920605, giving sufficient time to obtain production quantities from the supplier.

So 92447

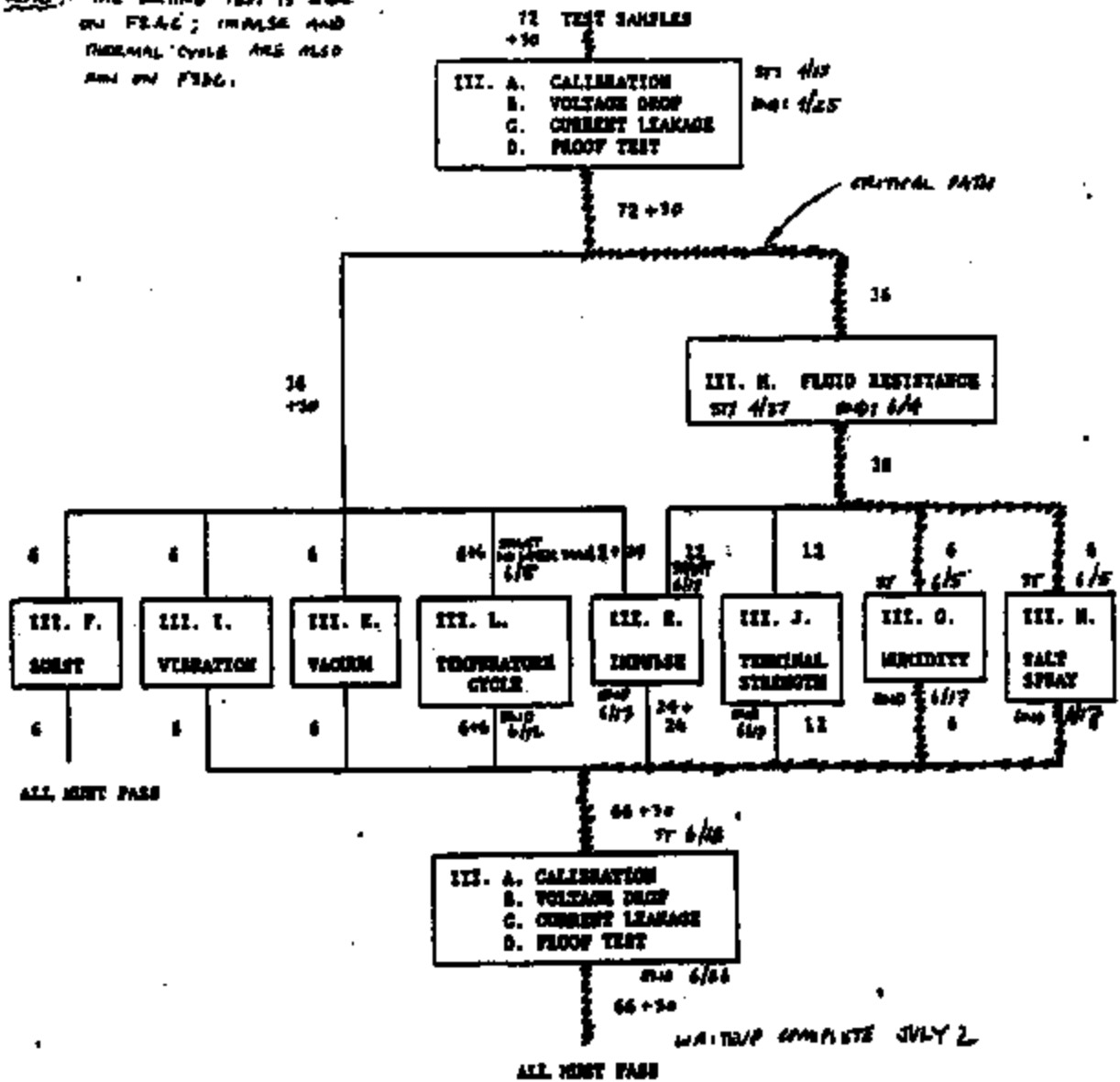
TI-NHTSA 005970

Engineering Specification

MADE-UP BY STEVE WOLLER
NO 92093

**COMBINED FLAC 9924AA & FDC 9924AA
PRODUCTION VALIDATION FLOW CHART**

NOTE: THE ENTIRE TEST IS RUN ON FLAC; IMPULSE AND THERMAL CYCLE ARE ALSO RUN ON FDC.



4	18		788-7270-9792-11
FRAME	OF	REVISED	NUMBER

NO. PD 3947-82 (Previous editions may NOT be used)

TI-NHTSA 005971

MEMORANDUM

9 April 1992 - Page 1 of 3

To: Bruce Maeroff Ford Motor Co. Fax: 313-323-1924
CC: Dave Czarn TI Design Eng. Supv.
Norm Freda TI Field Sales Fax: 313-553-1673
Elaine Rose TI QRA
Fr: Steve Offiler TI Design Eng.

RE: EW53 PARTIAL ISR / VALIDATION PLAN FOR F2AC-9F924-AA

Bruce, it is my understanding that we'll be pulling together an ISR package for your perusal during your visit to our plant on Monday, 13 April. This package will be essentially based upon similarity to the F2VC-9F924-AB ISR, since only two components will be changing. Those two components are the pressure-sensing disc and the molded plastic base (switch housing). The base will undergo a First Article Inspection (FAI) which is a detailed study of all print dimensions, and material certifications from the manufacturer will be included. Below you will find detail of the ES tests which will/will not be completed for the Partial ISR (from ES F2VC-9F924-AA):

III. A. Calibration, B. Voltage Drop, C. Current Leak, D. Proof.

Only the Calibration test will be performed on the 24 devices undergoing the Impulse test (E.) below.

III. E. Impulse.

A complete 500,000 cycle Impulse test will be performed per the ES, with the exception that no devices will undergo the Fluid Resistance Test (M.) beforehand. The Impulse test is an excellent test of the ability of the entire device to withstand mechanical (pressure) cycles combined with electrical loads at elevated temperatures, and is a key test to validate the pressure-sensing disc.

TI-NHTSA 005972

MEMORANDUM

9 April 1992 - Page 2 of 3

III. F. Burst.

Changes to the base and disc should have no effect on burst performance.

III. G. Humidity, M. Fluid Resistance.

The new base material, General Electric Noryl GTX 830, has been tested previously by TI per Ford ES F3AH-19D594-AA along with a host of other engineering plastics. This CCD ES includes Humidity, and Fluid Resistance tests which are similar to the tests called out in ES F2VC-9F924-AA. Noryl was found to pass all tests.

III. H. Salt Spray.

It has been deemed unlikely that changes to the base and disc would have any effect on salt spray performance. Bear in mind that the Fluid Resistance test invoked above included a saturated salt solution, helping to prove that chemical attack will not be an issue; furthermore the environmental sealing system has not been changed in any way providing confidence that salt ingress during salt spray testing will not be an issue either.

III. I. Vibration.

Changes to the base and disc should have no effect on vibration performance.

III. J. Terminal Strength.

The terminal strength test will be performed per the ES, with the exception that no devices will undergo the Fluid Resistance Test (M.) beforehand.

III. K. Vacuum.

Changes to the base and disc should have no effect on vacuum performance.

TI-NHTSA 005973

MEMORANDUM

9 April 1992 - Page 3 of 3

III. L. Temperature Cycle.

Extensive thermal characterizations have been performed on several materials recently, including the Celanex 4300 PBT material presently used on F2VC-9F924-AB, as well as Uitem, Noryl, and Fortron. While these results are presently undocumented officially, the consistently higher performance of Noryl in terms of dimensional stability relative to Celanex during these tests gives high confidence that changes to the base should have no effect on Thermal Cycle performance.

As 920409

FINAL INSPECTION 775819-1

DATE:

CUSTOMER P/N F2AC-9F924-AA

BTSC LOT
 PERL #
 LOT #
 WASHER LOT

MAT. I.D.
 CUP LOT #
 CONV. LOT
 QTY.

BTSC LOT
 REEL #
 LOT #
 WASHER LOT

MAT. I.D.
 CUP LOT #
 CONV. LOT
 QTY.

TEST	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
1) AGITATION																		
2) RELEASE																		
3) WASH																		
4) DIMENSION																		
5) VOLT DROP																		
6) CUR. LEAK																		
7) PROOF																		
8) IMPULSE																		
9) AGITATION																		
10) RELEASE																		
11) VOLT DROP																		
12) CUR. LEAK																		
13) PROOF																		
14) EXTEN. STR																		
15) AGITATION																		
16) RELEASE																		
17) VOLT DROP																		
18) CUR. LEAK																		
19) PROOF																		
20) BURST																		

INSPECTION TEST SUMMARY

TEXAS INSTRUMENTS

34 FOREST STREET, ATTLEBORO, MA 02703

PART NO. **77PS** REV.

PART NAME
Cruise Control Pressure Switch

GAS NO. **208** REV. SR TI ORDER NO./DATE CODE

CUSTOMER **Ford** CUSTOMER P.O. NO.

CUSTOMER PART NO.
VARIOUS

APPROVED BY DATE

LOT NO.	DATE	SUB NO.	LOT SIZE	SAMPLE SIZE	DISP.		REL. NO.	INSP. NO.
					AC.	RE.		
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								

CHARACTERISTIC	INSPECTION METHOD	Final Inspection								Lot Audit Inspection								
		AGL	100%	5	5	5												
Calibration, Voltage Drop	A.P.T.																	
Terminal Location	connector																	
Threads	bu/No. Gages																	
Workmanship / Coding	VISUAL																	
Calibration										9								
Voltage Drop										4								
Impulse Test										5								
Overheat Leakage										4								
Proof Test										4								
Burst Test										4								
Terminal Strength										4								
Dimensional										4								

TI-NHTSA 005976

INSPECTION TEST SUMMARY
TEXAS INSTRUMENTS
 34 FOREST STREET, ATTLEBORO, MA 02703

PART NO. **77PS** REV.

PART NAME
Cruise Control Pressure Switch

GAS NO. **208** REV. SR TI ORDER NO./DATE CODE

CUSTOMER **Ford** CUSTOMER P.O. NO.

CUSTOMER PART NO.
Various

APPROVED BY *Michael Whittle* DATE **4/13/92**

LOT NO.	DATE	SUB NO.	LOT SIZE	SAMPLE SIZE	DISP.		REL. NO.	INSP. NO.
					AC.	RE.		

1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								

CHARACTERISTIC	INSPECTION METHOD		LOT		AUDIT		INSPECTION	
	FINAL	INSPECTION						
Calibration	A.P.T.							
Voltage Drop	Connector							
Terminal Location	Co/NOCo Gages							
Threads	Visual							
Workmanship/Coding								
Calibration			9					
Voltage Drop			4					
Impulse Test			5					
Current Leakage			4					
Proof Test			4					
Burst Test			4					
Terminal Strength			4					
Dimensional			4					

TI-NHTSA 005977

**DRAWINGS AVAILABLE UPON
REQUEST**

TEXAS INSTRUMENTS



DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

ENVELOPE DIMENSIONS TO BASE ONLY

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
1	11.40 - 11.90	11.806	11.817	11.817	11.794
2	12.80 - 13.21	13.043	13.043	13.072	13.094
2	16.56 - 16.76	16.638	16.652	16.671	16.673
		16.661	----	16.680	16.668
3	19.45 - 19.81	19.752	19.754	19.787	19.799
4	2.84 - 3.05	2.930	2.93	2.944	2.951
	⊙ 0.1 ⊙ A	1.897 0.003	1.923 0.023	1.945 0.045	1.865 0.015
6	31005 ±.2 2DEG	29DEG 29MIN	29DEG 38MIN	29DEG 58MIN	29DEG 34MIN
5	1.85 - 2.06	1.927	1.966	1.969	1.978
6	1.24 - 1.55	1.365	1.387	1.423	1.400
7	1.24 - 1.45	1.269	1.268	1.275	1.308
8	11.50 - 11.92	11.768	11.768	11.753	11.777
		11.729	11.740	11.789	11.747
11	13.63 - 13.85	13.010	13.769	13.786	13.647
9	0.25 - 0.75	0.490 0.475	0.519 0.523	0.573 0.635	0.618 0.593
10	2.79 - 3.10	2.900	2.909	2.912	2.908
	2 PL	2.903	2.915	2.919	2.911

TEXAS INSTRUMENTS



DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9#924-RA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
11	0.05 - 0.26	0.151	0.153	0.124	0.076
	2 PL	0.113	0.142	0.163	0.147
17	19.05 MAX	18.667	18.709	18.671	18.704
		18.701	18.748	18.565	18.757
18	12.59 - 13.11	12.800	12.829	12.802	12.819
		12.829	12.800	12.842	12.824
13	0.68 - 1.30	1.085	1.105	1.122	1.175
14	2.79 - 3.41	3.076	3.0612	3.152	3.109
19	7.23 - 7.75	7.579	7.501	7.514	7.545
15	6.60 - 6.81	6.701	6.673	6.715	6.677
21	29DEG +/- 2DEG	MEASURED	29DEG 24MIN	ON CROSS	SECTIONED
	@ X	PART	30DEG 06MIN	----	----
		----	29DEG 58MIN	----	----
		----	29DEG 47MIN	----	----
16	NO FLASH/BURRS	SLIGHT	FLASH ON	EDGES	@ 10X

TEXAS INSTRUMENTS



DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
19	8.30-8.72 2X	8.535	8.553	8.484	8.578
		8.726	8.512	8.570	8.519
24	2.15-2.42 2X	2.162	2.171	2.282	2.271
		2.212	2.236	2.237	---
18	25DEG 17 2DEG	24DEG 25MIN	24DEG 56MIN	24DEG 47MIN	24DEG 06MIN
		24DEG 10MIN	24DEG 14MIN	24DEG 06MIN	24DEG 43MIN
17	45DEG 17 2DEG	46DEG 10MIN	42DEG 44MIN	43DEG 44MIN	45DEG 03MIN
		44DEG 35MIN	43DEG 47MIN	44DEG 47MIN	43DEG 01MIN
		45DEG 22MIN	44DEG 47MIN	45DEG 49MIN	46DEG 11MIN
		44DEG 08MIN	45DEG 37MIN	46DEG 38MIN	43DEG 50MIN
14	(17) (21.56) 2X	72DEG --	71DEG 31MIN	71DEG 20MIN	72DEG 01MIN
		71DEG 07MIN	72DEG --	72DEG 10MIN	71DEG 12MIN
22	1.43-1.73 2X	1.538	1.538	1.582	1.602
		1.539	1.612	1.602	1.591
23	0.55-0.66 4X	0.546 0.547	0.570 0.590	0.598 0.580	0.551 0.556
		0.592 0.614	0.561 0.574	0.576 0.603	0.558 0.573
21	0.45-0.56 4X	0.501 0.471	0.487 0.502	0.459 0.520	0.477 0.443
		0.376 0.417	0.320 0.344	0.357 0.382	0.338 0.396
		0.493 0.506	0.494 0.539	0.436 0.482	0.456 0.518
		0.382 0.395	0.450 0.484	0.384 0.393	0.373 0.409

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
401-833-2666 • TELETYPE: 401-833-2666 • CABLE: TIVINS

TI-NHTSA 005982

SAMPLE REPORT

(77P5L 3-1)

REASON FOR REPORT	VENDOR	P.O.	PART NO.	REV.
NEW PART			77P5L 2-1	G
REPLACEMENT TOOL.	REPORT REQ. BY	DATE	INSPECTED BY	DATE
CORRECTED TOOL.	E. Rose	4/20/82	ELAINE GRAVEL	4/17
REPAIRED TOOL.	THE DIMENSIONS INDICATED BELOW REPRESENT TEXAS INSTRUMENTS' FINDINGS REGARDING ACTUAL VALUES FOR ALL CHARACTERISCS MEASURED. IN CASES WHERE ACTUAL VALUES DEVI FROM THE SPECIFIED DIMENSIONS, THE DISPOSITION MUST INDICATE THE REQUIRED ACTION - EACH NON-CONFORMANCE IN THE APPROPRIATE COLUMN.			
REVIEW				
OTHER <u>DIMENSIONAL ANALYSIS</u>				

	(CIRCLE ALL OUT OF TOLERANCE DIMENSIONS)					Inspect Method	DISPOSITION
		A	B	C	D		
1	11.40-11.90	11.806	11.797	11.817	11.794	TM	
2	12.80-13.21	12.843	12.843	12.872	12.894	TM	
3	16.56-16.76	16.651	16.652	16.660	16.662	MIC	
4	19.45-19.81	19.752	19.754	19.787	19.799	MIC	
5	2.84-3.05	2.930	2.93	2.944	2.951	MIC	
	Ø 0.1 @ A	Ø 0.023	Ø 0.023	Ø 0.025	Ø 0.015	TM	
6	31° ± 2°	29° 49'	29° 38'	29° 58'	29° 34'		
7	1.85-2.06	1.929	1.966	1.969	1.979		
8	1.24-1.55	1.365	1.387	1.423	1.400		
9	1.24-1.45	1.269	1.268	1.275	1.308	✓	
10	11.60-11.92	11.729	11.740	11.787	11.782	MIC	
11	13.43-13.85	13.810	13.769	13.786	13.807	TM	
12	0.25-0.75	0.495	0.579	0.575	0.593		
13	2.79-3.10 2X 1	2.900	2.909	2.912	2.908	✓	
	2	2.907	2.915	2.913	2.911	MIC	
14	0.05-0.26 2X	0.113	0.153	0.124	0.076	TM	
15	Ø 19.05 MAX.	18.701	18.700	18.569	18.707	TM	
16	12.59-13.11	12.809	12.800	12.842	12.824	TOLD	
MA 17	11.65-12.17	N/A	NO TERMINALS				
17	0.62-1.30	1.025	1.125	1.122	1.125	TM	
18	2.79-3.41	3.076	3.061	3.152	3.109		
19	7.23-7.75	7.579	7.501	7.514	7.545		
20	6.60-6.81	6.701	6.673	6.715	6.677		
21	29° ± 2° 4X		29° 24'				
			29° 26'				
			29° 42'				
22	No Flash on burrs N=	Slight	Flash on edges			✓	(2) 10X

REMARKS AND/OR INSTRUCTIONS:
 - Noryl GTX 830 -
 for 77P5L 3-1 (NEW MATERIAL)

DISPOSITION: TOOL APPROVED FOR PROD.	RESUBMISSION REQ'D
MFG. ENG.:	ORA ENG.:
	PURCH. AGENT: