EA02-025

TEXAS INSTRUMENTS, INC.'S

9/10/03

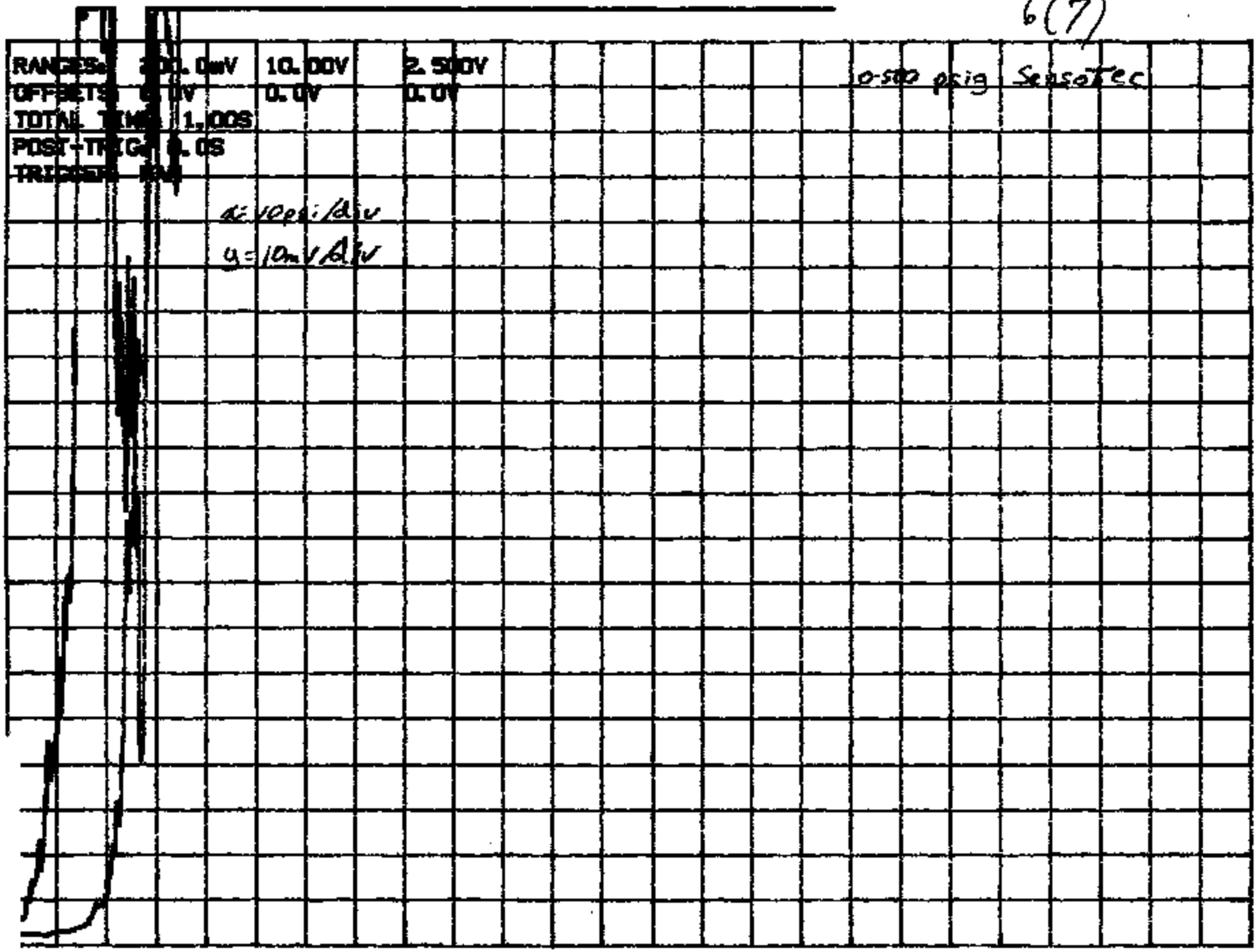
REQUEST NO. 7

BOX 9

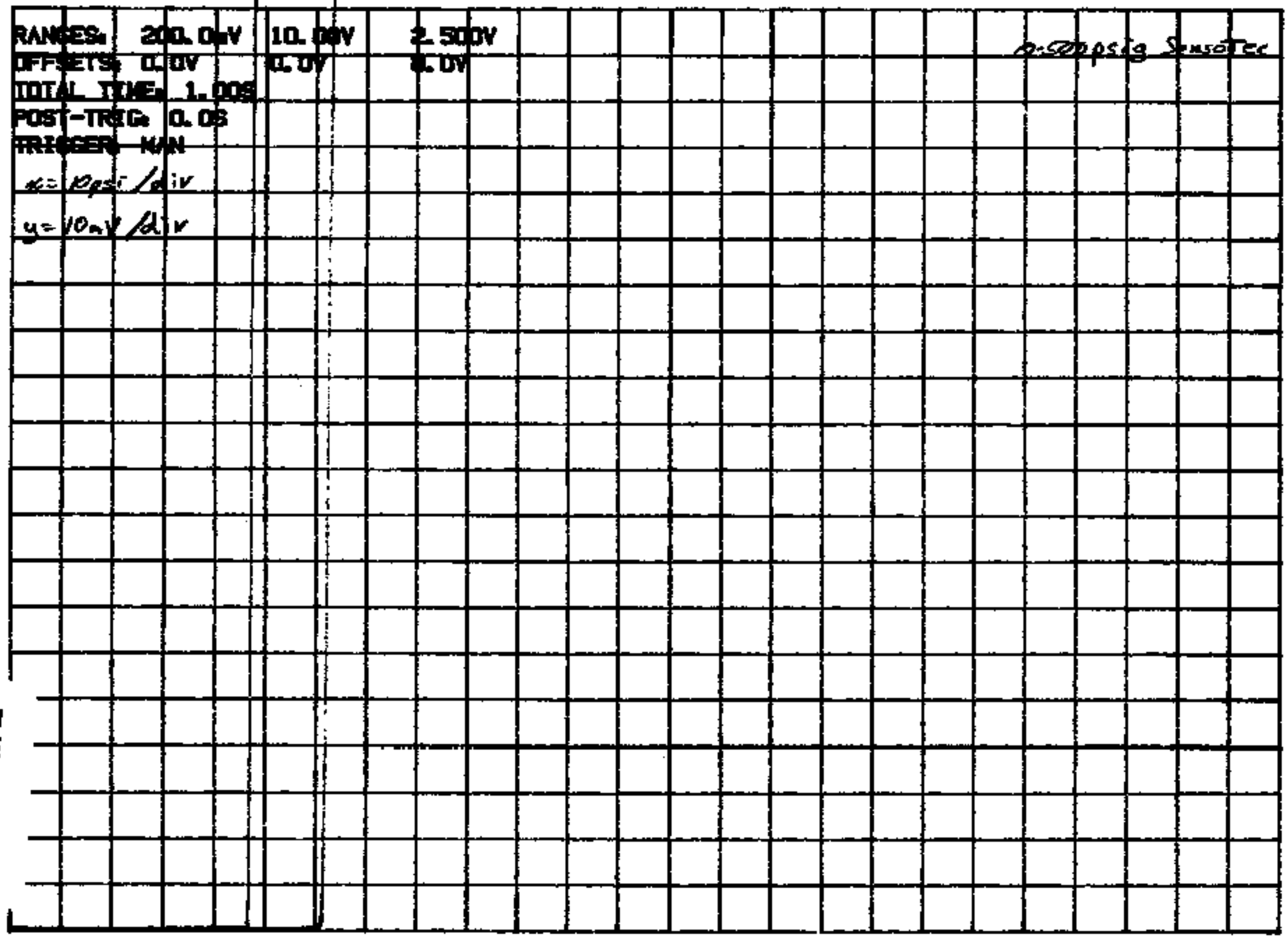
PART A – R

PART L

6(7)



5(4)



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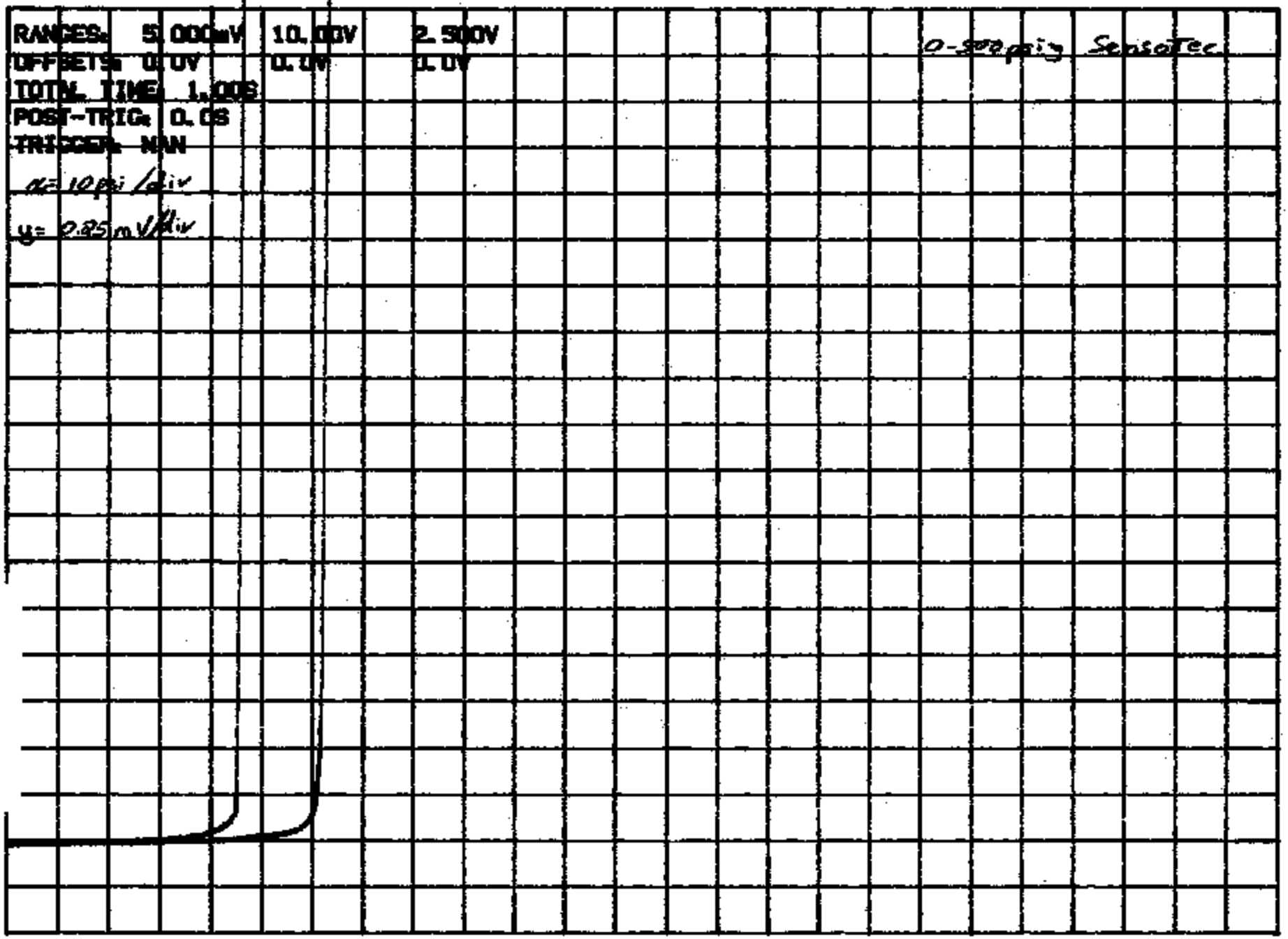
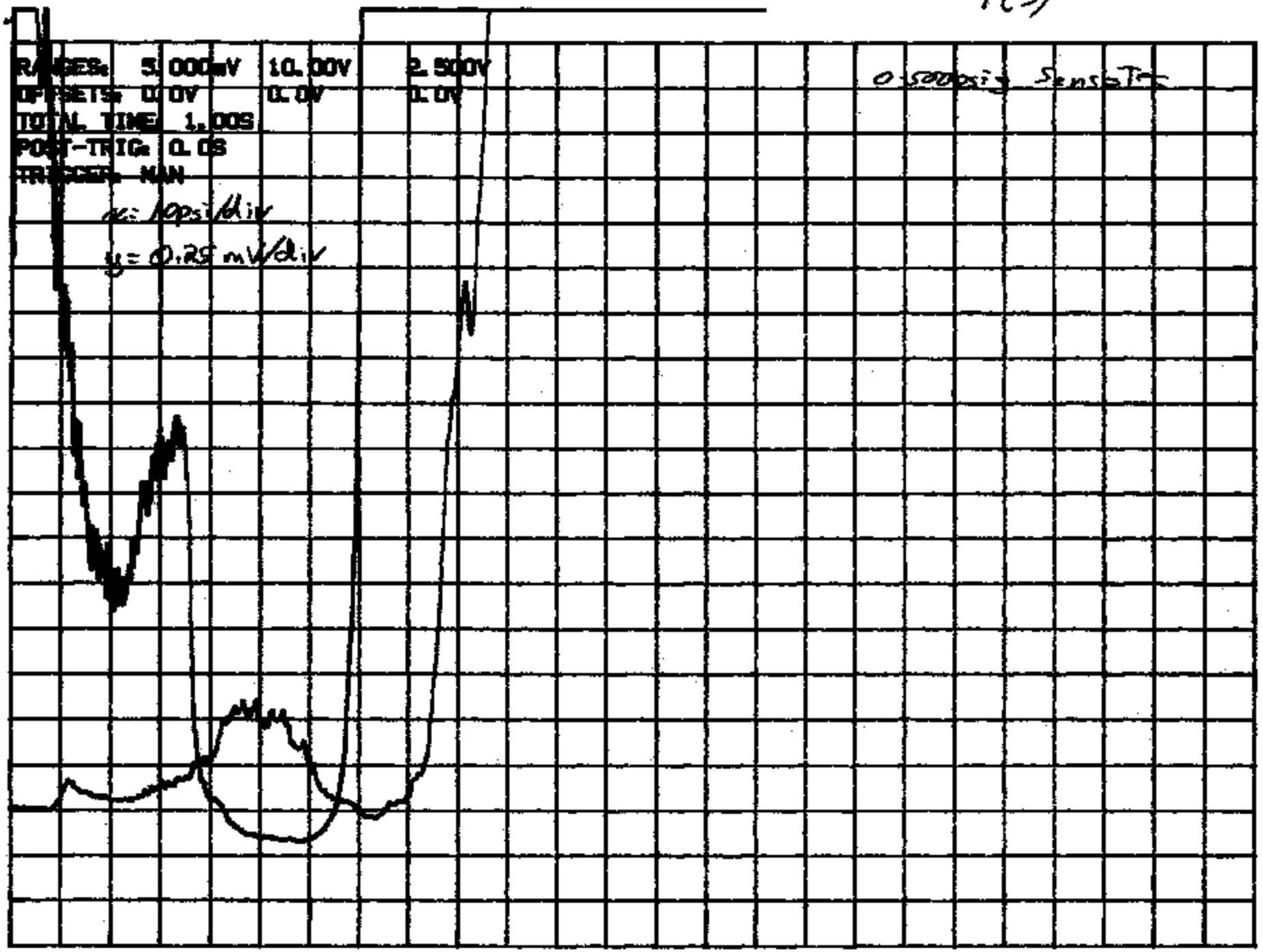
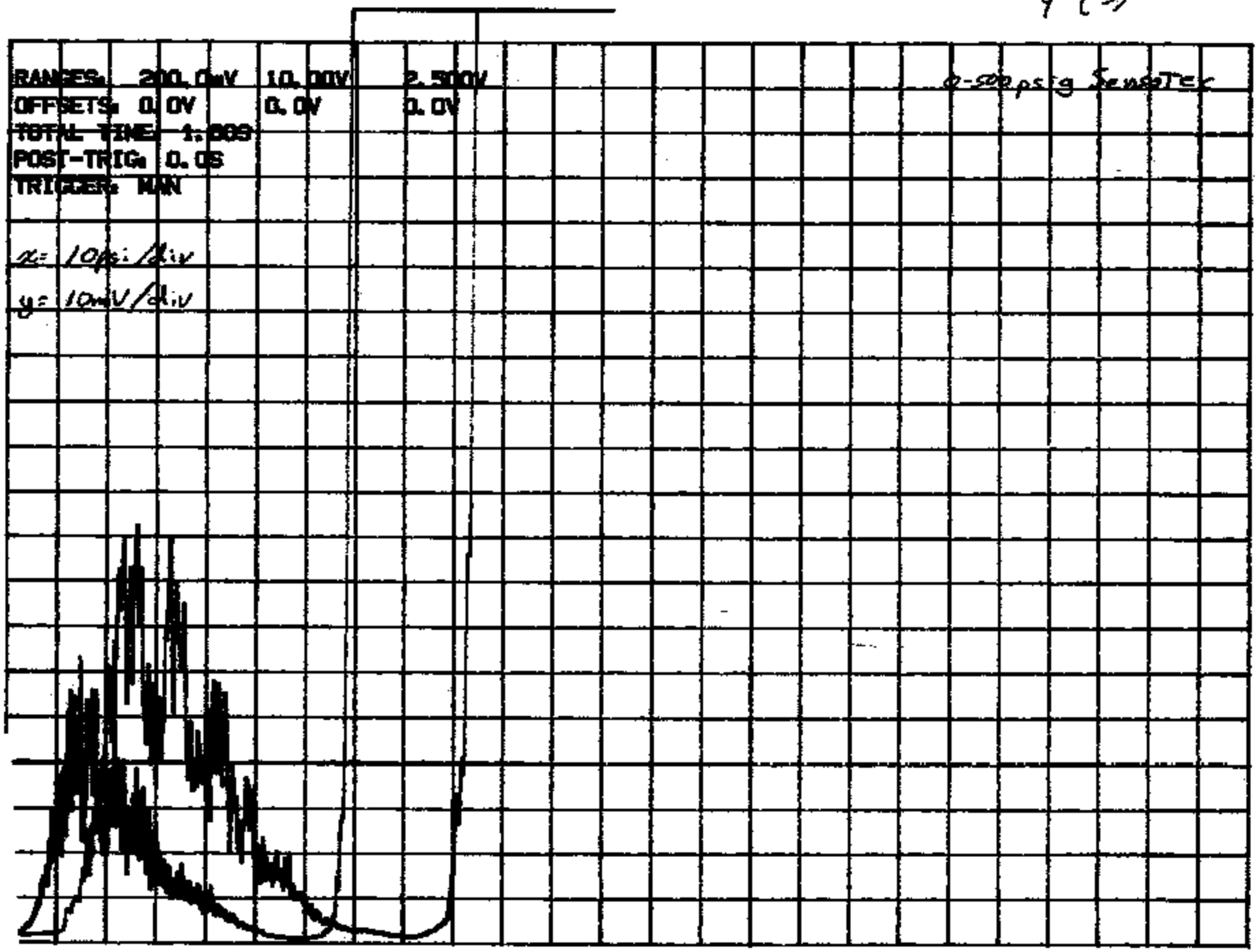


4(5)

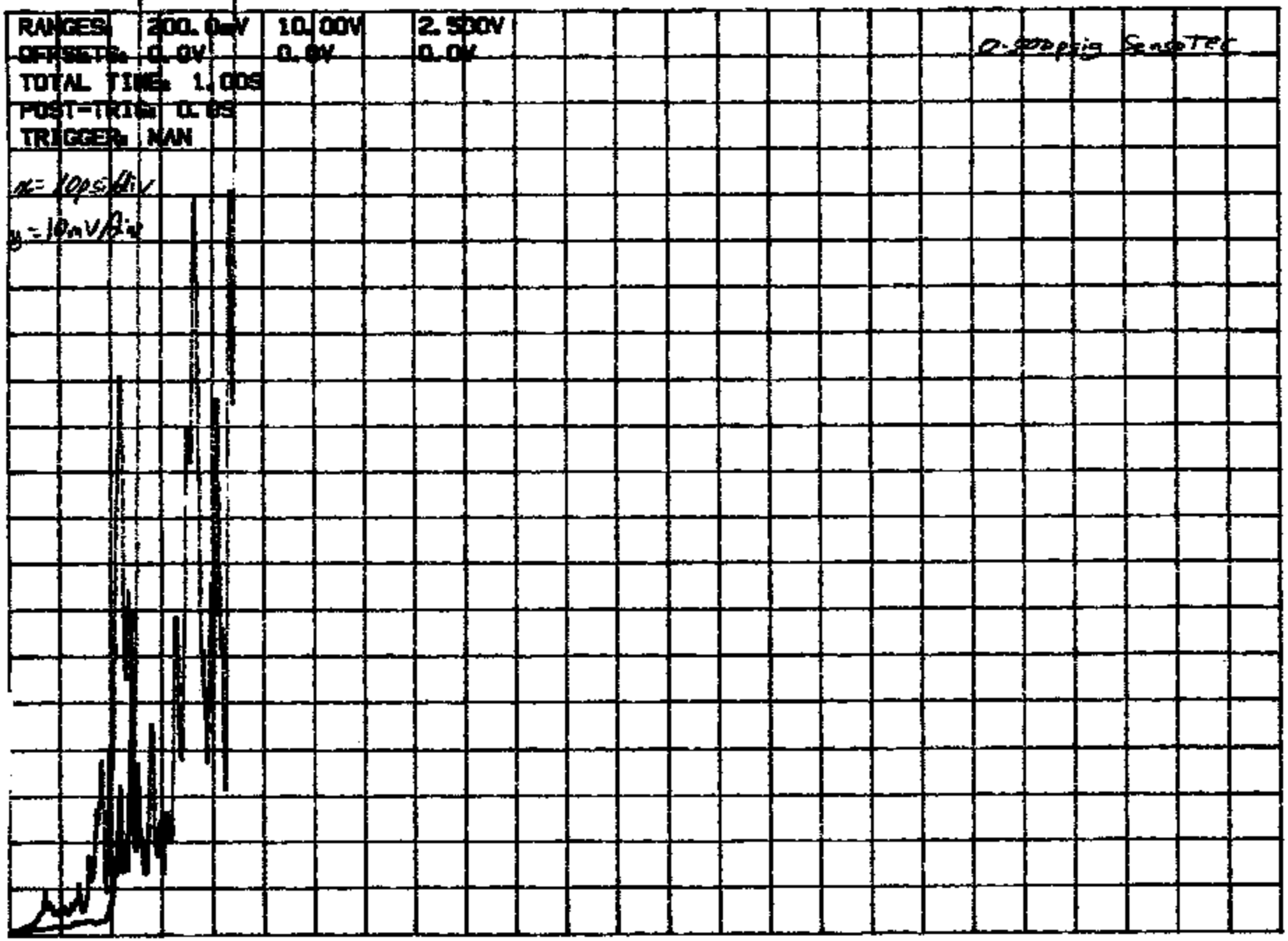


TI-NHTSA 01478

4 (3)



5(6)



6(2)

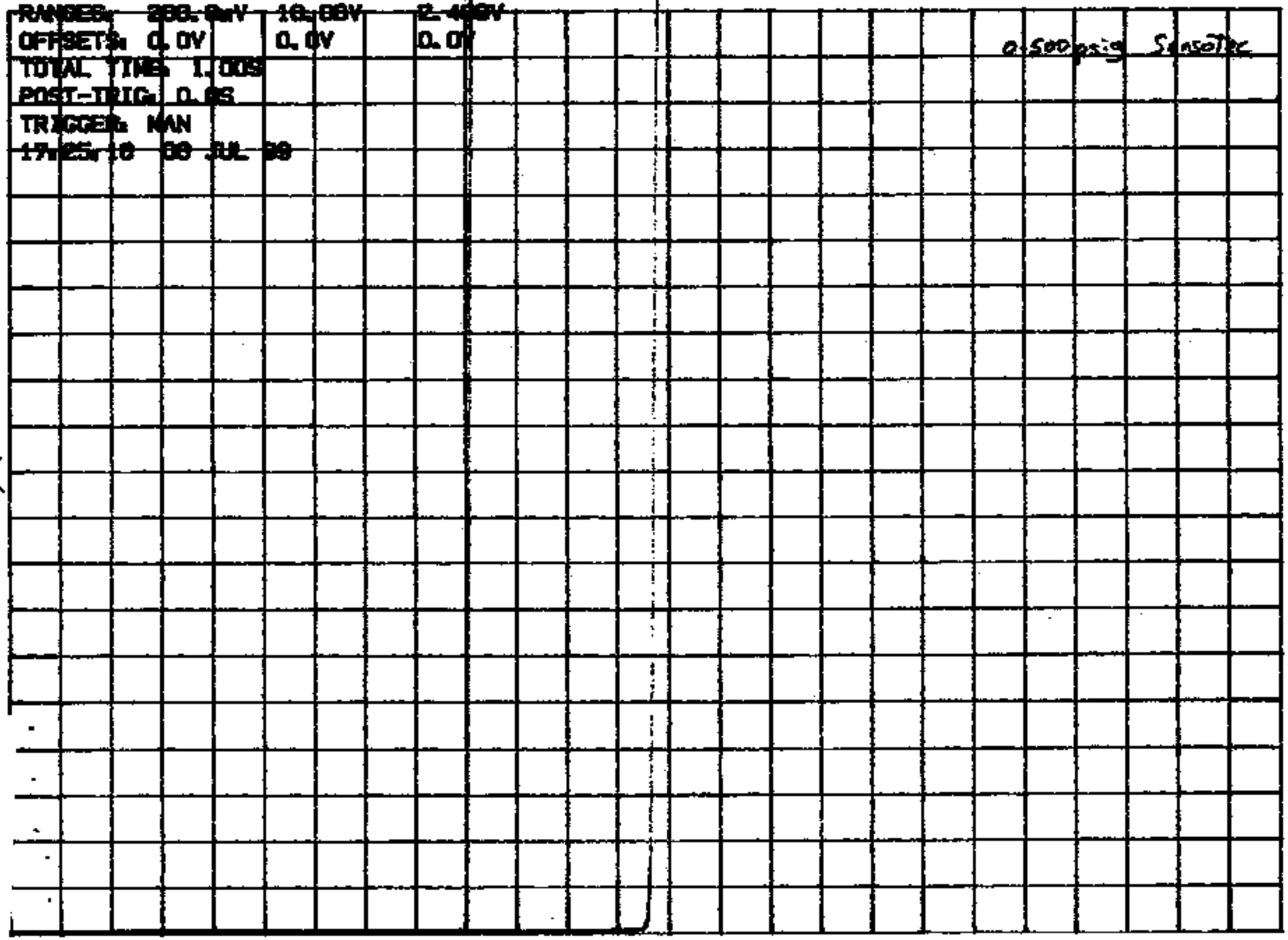
RANGES: 200.0mV 10.00V 2.500V
OFFSETS: 0.0V 0.0V 0.0V
TOTAL TIME: 1.00S
POST-TRIG: 0.0S
TRIGGER: NNN

x = 10psi/div

y = 10mV/div

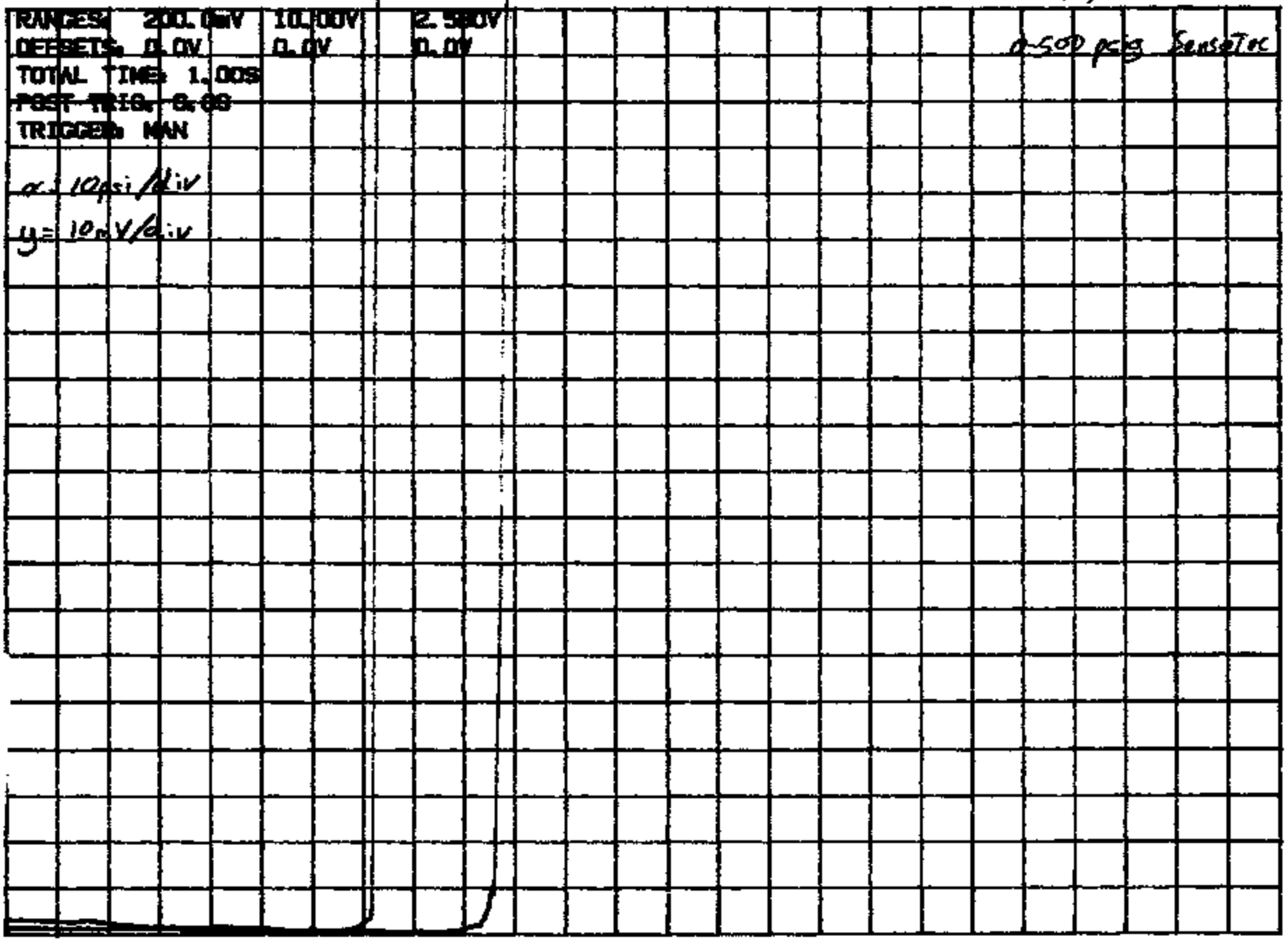
a-sharp psi's Sensotec

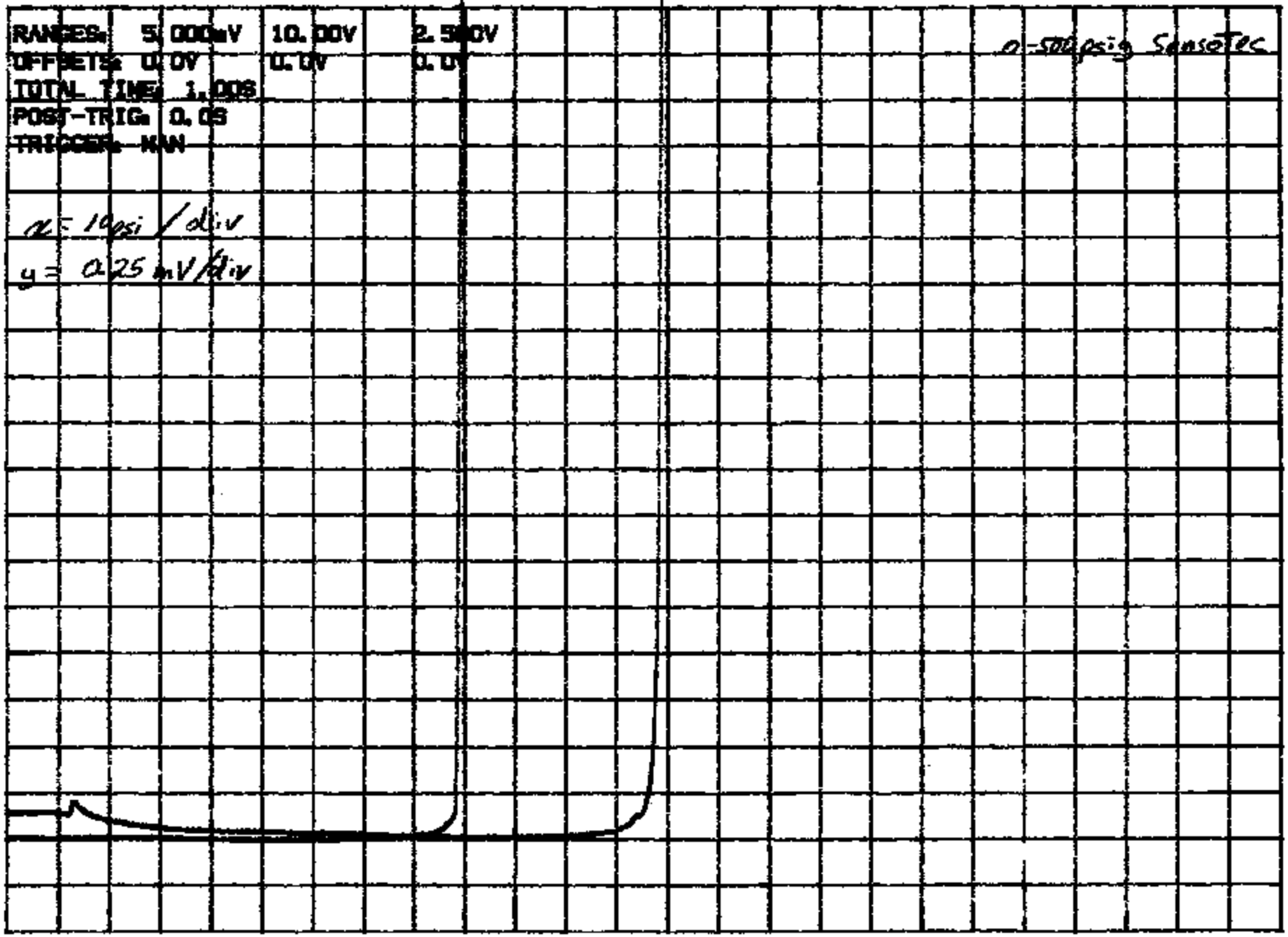
3 (8)



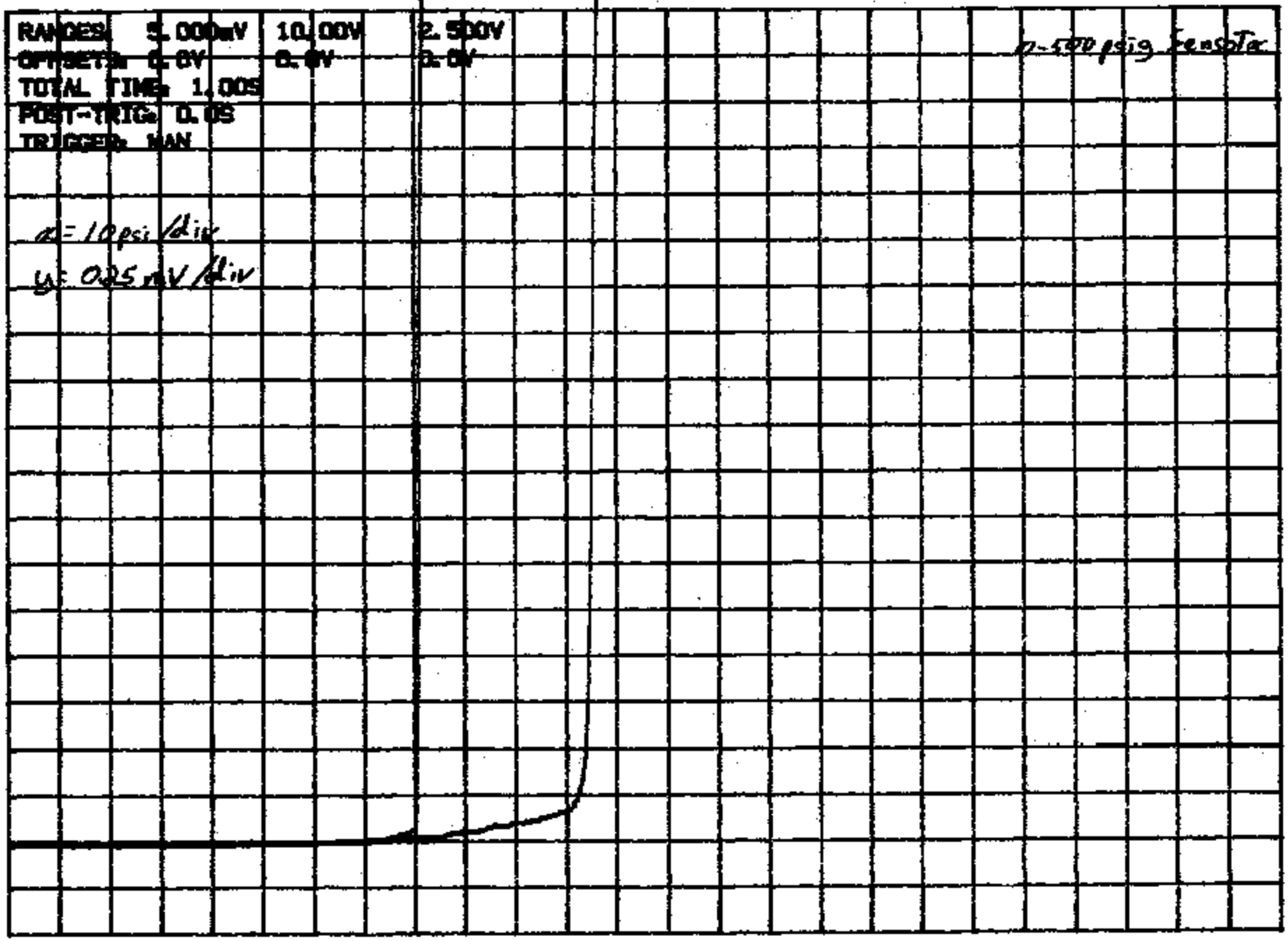
TI-NHTBA 014979

4(5)





3 (14)



RANGES: 250.0mV 10.00V 2.500V
OFFSETS: 0.0V 0.0V 0.0V
TOTAL TIME: 1.00S
POST-TRIG: 0.0S
TRIGGER: MAN
17:28:24 08 JUL 99

0-500 psig Sensor

x=10ms/div

y=10mV/div

DRAWINGS AVAILABLE UPON REQUEST

Attorney Client Privileged Communication
77PSL3-1 Life Test Report
"Bubbled" Diaphragms
Bryan Degen 8/17/99

Purpose:
The purpose of this test is to determine if there is a significant difference in diaphragm life when "bubbled" Diaphragms are exposed to pressure cycles.

Procedure:
1) 3 groups of switches (77PSL3-1) that were previously used to generate weibull plots were obtained. These 3 groups contained a total of 25 switches. Of these 25 switches 9 had been cycled to produce leaks for the weibull analysis.
2) The previous weibull tests were suspended at 1,307,000 cycles.
3) The 25 switches were opened to obtain a clear view of the diaphragm.
4) The opened switches were sorted into 2 groups; those with a visually detectable bubbled diaphragm and those with no sign of a bubbled diaphragm.

Results:
The sort produced 11 switches with bubbled diaphragms, and 14 without bubbled diaphragms. Moreover 4 out of the 11 and 5 out of the 14 had leaked during the previous cycle test.

Since there were less than 6 leakers in each group a weibull plot was not possible. Therefore, the average number of cycles each group was calculated and used to compare the two groups.

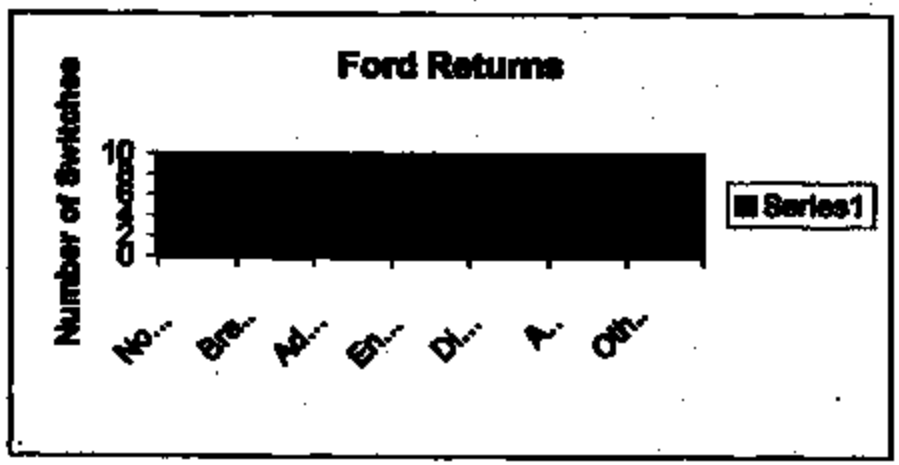
As can be seen from the data, the group with bubbles had an average of 1.27 million cycles, and the group without bubbles in the kapton diaphragm had an average of 1.25 million cycles.

	Bubbles in Kapton Diaphragm			No Bubbles in Kapton Diaphragm	
	1197000	leaked		1078547	leaked
	1197000	leaked		1078547	leaked
	1197000	leaked		1178000	leaked
	1212886	leaked		1200000	leaked
	1307000			1212000	leaked
	1307000			1307000	
	1307000			1307000	
	1307000			1307000	
	1307000			1307000	
	1307000			1307000	
	1307000			1307000	
				1307000	
Average:	1269446			1307000	
Std	77782			1307000	
			Average:	1260916	
			Std	165874	

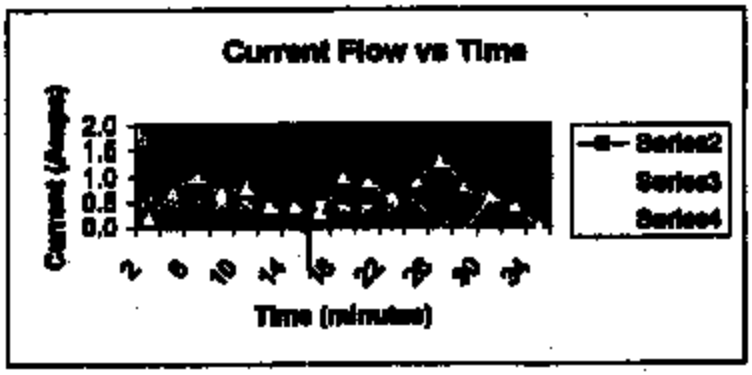
Conclusion:
Based on the above results, there does not seem to be any significant difference in cycle life between switches built with bubbled diaphragms and switches built without bubbled diaphragms.

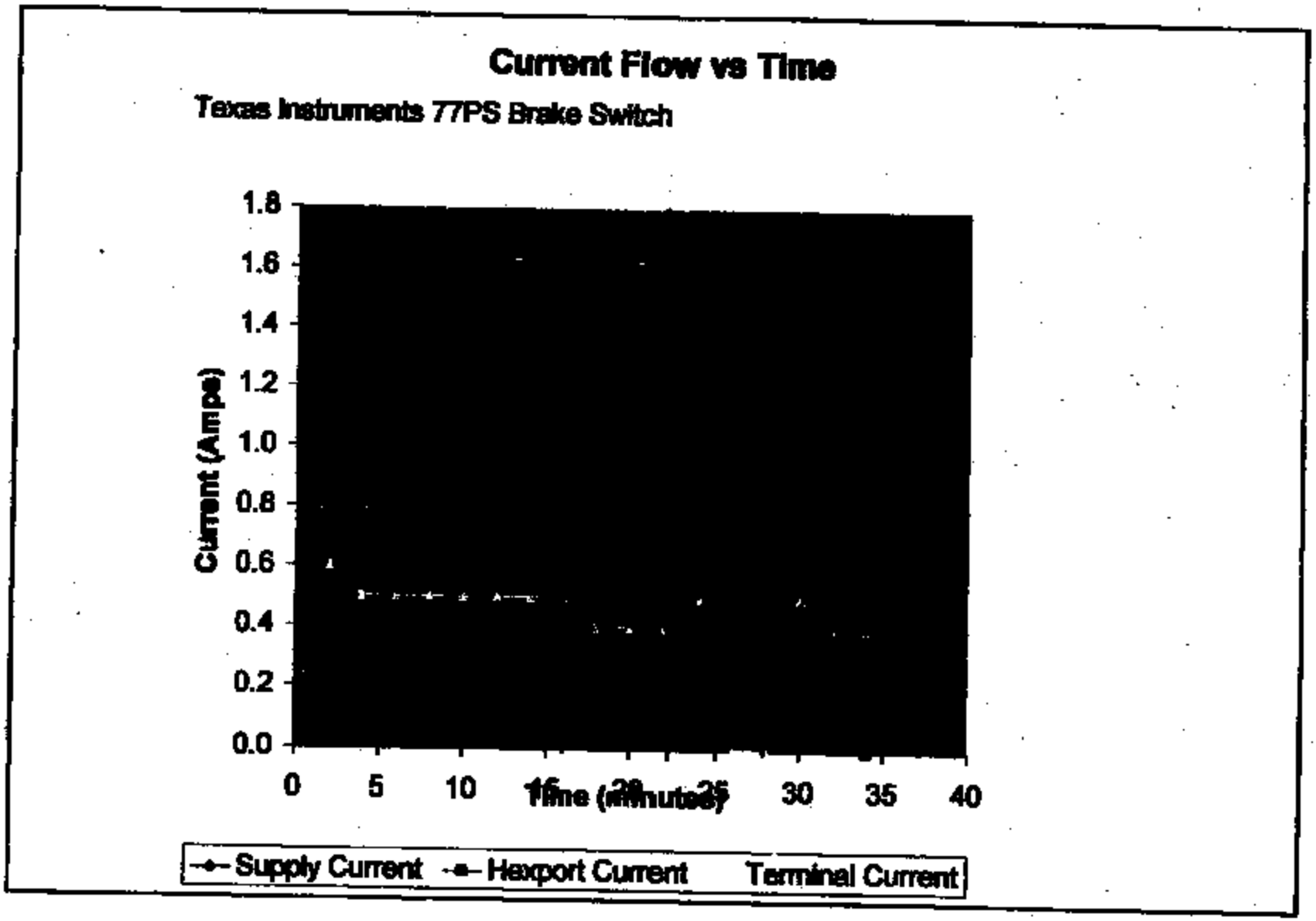
End of document.

No Description	9
Brake Fluid Leak	6
Administrative Parts Return	4
Engagement Troubles	2
Disengagement Troubles	2
ABS Warning Light	1
Other Electrical Accessory Trouble	1



time	Supply Cur	Hexport Ct	Terminal C	Check
2	0.6	0.2	0.6	0.0
4	1.2	0.7	0.6	0.0
6	1.4	1.0	0.5	-0.1
8	1.2	0.7	0.5	0.0
10	1.3	0.8	0.5	0.0
12	0.9	0.4	0.5	0.0
14	0.9	0.4	0.5	0.0
16	0.7	0.3	0.5	-0.1
18	1.6	1.0	0.4	0.2
20	1.4	0.9	0.4	0.1
22	1.0	0.6	0.4	0.0
24	1.3	0.9	0.5	-0.1
26	1.4	1.3	0.0	0.1
28	0.7	0.8	0.0	-0.1
30	1.1	0.6	0.5	0.0
32	0.9	0.4	0.4	0.1
34	0.4	0.0	0.4	0.0
36				
38				
40				





TI Switch ID #	RO #	TI Date Code	VIN #	Car Build Date
709-9	32364	2128		
709-8	32377	2126		
709-6	32407	2120		
709-4	32332	2029		
709-3	32400	2038		
709-7	32319	9140		
E	32087	2052		
F	31907	2052		
D	32114	2052		
612-17	56871	2104		
612-21	56845	2038		
612-28	56896	2052		
612-20	56872	2059		
612-16	56855	2008		
612-19	56874	1252		
612-24	56876	1331		
612-26	56858	2008		
612-22	56859	2056		
612-9	56445	2013		
612-6	57099	1347		
612-5	56850	2017		
612-4	56846	2056		

LAST REVISED [illegible] by [illegible] & LM
Misc changes
TI INTERNAL DATA

PRESSURE SWITCH CROSS-REFERENCE LIST
TO BE USED FOR REFERENCE ONLY

Activation / Release
* = 100C calibration
** = 125C calibration

	TI P/N	CUSTOMER PART NO.	CUSTOMER	funct	Activation (psig)	Release (psig)	base color/ flag/contact	port fitting/hexcap details: type/fitting	thread	hex	finish	disc
1	77PSL2-1	F2VC-9F924-AB	Ford PIC	brake	90-160	20 min	brown/pos 2	J512/[illegible]-1	3/8-24 M	9/16	Zn/yellow	snap
2	77PSL2-3	F8LC-9F924-AA	Hillis Ind.	brake	200-300	40 min	black/pearl	J512/[illegible]-1	3/8-24 M	9/16	Zn/yellow	snap
3	77PSL3-1	F2AC-9F924-AA	PIC - EN53	brake	90-280	20 min	nat'l Nipco 2	J512/[illegible]-1	3/8-24 M	9/16	Zn/yellow	quiet
4	77PSL3-2	F8SA-9F924-AA	Ford WN[illegible]	brake	90-160	20 min	gray Nipco 1	J512/[illegible]-1	3/8-24 M	9/16	Zn/yellow	quiet
5	77PSL3-3	F3TA-9F924-CA	L/T - F-series	brake	200-300	40 min	red Nipco 1	J512/[illegible]-1	3/8-24 M	9/16	Zn/yellow	snap
6	77PSL4-1	94DA-9F924-AA	Austr - Falcon	brake	90-160	20 min	nat'l Nipco 2	o-ring/37027-1	M10x1.0 M	14mm	Zn/clear	quiet
7	77PSL5-2	F5DC-9F924-AA	Taurus SHO	brake	90-160	20 min	nat'l Nipco 2	male/38807-1	3/8-24 M	9/16	Zn/clear	quiet
8	77PSL6-1	94JA-9F924-AB	Austr - Capri	brake	90-160	20 min	dk gry Nipco 1	o-ring/38017-1	3/8-24 M	9/16	Zn/yellow	quiet

TI-NHTSA 014394

Used on :	Base Material
Crown Vic, Grand Marquis, Mark, Town Car	Celanex 4300
Econoline, Club Wagon	Celanex 4300
Crown Vic, Grand Marquis, Mark, Town Car	GE Noryl GTX 830
Windstar	GE Noryl GTX 830
Bronco, F-Series, Ranger, Explorer, Navigator, Expedition, Econoline, Club Wagon	GE Noryl GTX 830
Falcon	GE Noryl GTX 830
SHO Taurus	GE Noryl GTX 830
Capri	GE Noryl GTX 830

TI-NHTSA 014396

Morris, Irene

From: Beringhause, Steven
Sent: Thursday, September 02, 1999 7:36 AM
To: Baumann, Russ
Subject: FW: Field Campaign Analysis Report

From: Beringhause, Steven
Sent: Wednesday, September 01, 1999 6:31 PM
To: 'Steve Reimer'
Subject: Field Campaign Analysis Report

Steve,
Here is the summary document you requested. We were able to complete the analysis on all forty parts. Why don't you call me in the morning so we can discuss this in more detail.

[redacted]

Regards,
Steve 505-236-3375

12) Teardrops were seen on roughly 60% of the switches. No correlation between level of wear and teardrops.

Figure 1. Ceramic pin with wear marks seen on top and around the sides.

Figure 2. Wear marks can be seen as a flat spot on the bump and curved discoloration on the arm.

Figure 3. Delamination of the Teflon from the Kapton can be seen as a circular bubble.

Epstein, Sally

From: Dague, Bryan
Sent: Monday, August 30, 1999 3:39 PM
To: Beringhause, Steven
Subject: 77PS FA summary

Steve,

Here is the latest summary sheet:

<<77PS SUMMARY– Sorted 8-30-99>>

I hope this sent OK.

Regards,
Bry

[illegible]

Corrective Action Notice

0010429

Auditor: Reenie Machado
Supervisor: Mary Milkey
Mfg. Eng.: Bob Gildea
QA Engineer: Jim Watt

PC: 88
CC: 294
BO: 840
OP: 700

Audit Date: 4/20/99
Spec Code/Number: B 11
Severity: 2
Checklist: Yes
Dev#:

Product Line: HYDRAULIC PRESSURE SWITCH

Operation: 502577 PILOT-MAKER

Specification: Process Specification/Prin Requirement: Ele.4.09 The process spec describes the operation/process steps.

Condition Found: The Quality Dept is no longer responsible for the product in this cost center. Mfg. personnel are now responsible for their own quality and final inspection of the product. Through out the document QC is referenced.. The document needs to be updated to reflect the change. This does not conform to Ele. 4.09, Process Control and Ele. 4.05 Document and Data Control. Copies attached and hi-lighted.
ALL HI-LIGHTED AREAS MUST BE COMPLETED

Cause:

Corrective Action: update document to reflect change in responsibilities.

A Target Date: Completed 4/20/99 9/30/99

C.A. By: Sign: Claire Belanger
Date: 9/28/99

Forward to for Signature & Date:

Supervisor: Mary Milkey Date: 9/29/99

Mfg. Eng.: Bob Gildea Date: 9/29/99

QA Eng: _____ Date: _____

Return To: Auditing MS 12-33 By: 5/4/99

Verification: 10/27/99 Follow up
Correction Made, Current Rev. A B
at the operation, includes Changes
Renee

RECEIVED
SEP 7 1999

http://podsdg12.mo.ti.com/docs/PS/502577.revAA.HT

* = CHANGES

PROCESS SPECIFICATION

OPERATION TITLE: PILOT MAKER

DEV: 77/87PS
PC: 088
CC: 294
SO: 840
OP: 700
STD: 15700
LR: 5700

HR/K: 100.00
PC/HR: 10

PART #	DESCRIPTION	# REQ'd	SOURCE
77PS/87PS	PRESSURE SWITCH	1	294

TOOLS AND/OR EQUIPMENT:

FINAL ASSEMBLY MATRIX CHARTS
ACTUATION MEAN CENTERING CHART
SAMPLE ACCEPTANCE CHARTS
CALIBRATION SET POINTS CHART
SENSOR LOT CODE CHART
AMI SENSOR ASSY CRIMPER EQ #121681
FINAL ASSY MACHINE CRIMPER EQ #121980
FINAL FUNCTION TESTER #3 EQ #121983
FINAL FUNCTION TESTERS #2 EQ # 140380
VACUUM LIFTER EQ #122293
MATTHEWS MODEL 2610 CODER EQ #121429
SPC FIXT.DWG#150421 (SENSOR CRIMP HGT)
SPC FIXT.DWG#145875 (DEVICE CRIMP HGT)
PILOT PROGRAM SCHEDULE
FINGER COTS
SMOCK, HAIRNETS
FUNCTION TESTER MATRIX
PILOT COMMUNICATION BOOK
KANBAN DISC CALIBRATION STATUS LOG
PILOT LOG BOOK AND ROUTE SHEETS
STACK-UP DATA BASE LOGS
DISC MATRIX CALIBRATION DATA
77PS CRIMP DIES
WOOD OR FOAM BUILDING PLATFORM

SAFETY REQUIREMENTS - CERTIFICATION OF HAZARD ASSESSMENT:

1. SAFETY GLASSES WITH SIDE SHIELDS (WHEN RUNNING PRESSURE TESTER).
2. SAFETY SHOES MUST BE WORN WHEN KITTING COMPONENTS FOR PILOTS OR LOTS.
3. VACUUM LIFTER MUST BE USED WHEN LIFTING BOXES OF COMPONENTS IN WAREHOUSE

QUALITY REQUIREMENTS: SEE ATTACHED

1. ALL PILOT SWITCHES MUST MEET REQUIREMENTS PER ASSOCIATED T.I. ENVELOPE DRAWING.
2. PRODUCT CLEANLINESS MUST BE MAINTAINED. PILOT MAKER MUST WEAR HAIRNET AND SMOCK AS REQUIRED. FINGER COTS MUST BE WORN WHEN HANDLING BASE ASSEMBLIES ONLY.
3. GOOD ASSEMBLIES MAY NOT PROCEED TO THE NEXT OPERATION UNTIL SPC REQUIREMENT LISTED BELOW FOR EACH TYPE ARE MET:

FREQUENCY OF CHECK:

QR1,2. EACH SWITCH.
QR3. AS REQUIRED PER SPC SPECS.

SPC FILE/CA: SEE SPC SUMMARY VISAIDS: N/A PM: SEE PM SUMMARY

SHIFT, NAME OR BADGE AND DATE

SHIFT	OPERATOR	TRAINER	DATE	SHIFT	OPERATOR	TRAINER	DATE

http://podnfg12.nw.ti.com/docs/PS/502577.nwAA.HTM

DEV: 77/87PS
CC: 294
SO: 840
OP: 700
LK: 5700

PILOT MAKER

QUALITY FAILURE DISPOSITION:

QR1. SALVAGE/SCRAP AS REQUIRED.
QR2. WEAR SMOCK AND HAIRNET.
QR3. HOLD FOR ENGINEERING EVALUATION

PREVENTIVE MAINTENANCE SUMMARY:

CODE #	EQUIPMENT #	DESCRIPTION
D22293-W.PM	122293	WAREHOUSE VACUUM LIFTER
121681-W.PM	121681	AMI SENSOR ASSEMBLY
D21980-W.PM	121980	FINAL ASSEMBLY AMI MACHINE(FAM)-DAILY
121980-W.PM	121980	FINAL ASSEMBLY AMI MACHINE(FAM)-WEEKLY
121980-M.PM	121980	FINAL ASSEMBLY AMI MACHINE(FAM)-MONTHLY
121981-M.PM	121981	BASE AMI MACHINE-MONTHLY
D21981-W.PM	121981	BASE AMI MACHINE-DAILY
121981-W.PM	121981	BASE AMI MACHINE-WEEKLY
D21983-W.PM	121983	FINAL FUNCTION TESTER #3
540380-W.PM	140390	FINAL FUNCTION TESTER #2
D21429-W.PM	121429	MATTHEWS MODEL 2610 CODER

SPC FILE/CA SUMMARY:

SPC FILE	CORRECTIVE ACTION FILE	DESCRIPTION
77TORQUE	77TORQUE.CA1,2,3)	BASE SENSOR TORQUE AFTER CRIMP.
77CRHT	77CRHT.CA1,2,3)	DEVICE CRIMP HEIGHT AFTER CRIMPING.
77SENHTA	77SENHTA.CA1,2,3	77/87PS SENSOR CRIMP HEIGHT
77SHTPC	77SHTPC.CA1,2,3	77PS SENSOR CRIMP HEIGHT-GOLD CUP

OPERATION DESCRIPTION - (SNAP SWITCHES):

NOTE: THIS PROCEDURE IS TO BE USED FOR THE FOLLOWING DEVICE TYPES ONLY:
87PS-ALL
77PSL2-1
77PSL2-3
ALL OTHER DEVICES NOT LISTED ABOVE MUST BE PILOTED USING THE QUIET SWITCH PROCEDURES.

1. DETERMINE THE TARGET DISC ACTUATION CALIBRATION AS FOLLOWS:

   A. DETERMINE THE AVERAGE ACTUATION AMPLIFICATION FOR THE STACK-UP COMBINATION BEING PILOTED. IF THE STACK-UP IS NEW, TRY TO CHANGE TO A USED ONE - OR - SELECT THE MOST RECENTLY USED COMBINATION DATA.

   B. WITH THE AVERAGE AMPLIFICATION DATA SELECT THE TARGET DISC ACTUATION CALIBRATION USING THE DISC SELECTION CHART.

   C. FROM THE DISC INVENTORY SELECT A DISC LOT CLOSEST TO THE TARGET CALIBRATION DETERMINED IN (1B).

   D. REVIEW THE DISC INVENTORY AND DETERMINE IF THE CURRENT DISC DEPARTMENT ORDER PRESSURE IS CORRECT. CONTACT SUPERVISOR/COACH IF PRESSURE IS OUTSIDE OF KANBAN.

2. WHEN A DISC LOT HAS BEEN SELECTED FOR QUALIFICATION PROCEED WITH THE BUILD PROCESS. SELECT 24 DISCS AND 24 SAMPLES FROM EACH LOT CONTROLLED COMPONENT, (WASHER, CONVERTER, AND CUP). ASSEMBLE SENSOR ASSEMBLIES USING APPROVED MANUAL BUILD PROCEDURES. CRIMPED SENSOR ASSEMBLIES MUST PASS SPC REQUIREMENTS. REFER TO SECTION #1 FOR DETAILS.

3. ALL BOXES OF HEX PORTS, CONVERTERS, WASHERS, ETC.... MUST BE RESEALED AFTER PARTS HAVE BEEN REMOVED. INITIAL AND DATE THE OUTSIDE OF THE BOX AND INDICATE THE NUMBER OF PARTS REMOVED.

4. WHEN THE PILOT SENSORS ARE COMPLETE, THE PILOT MAKER MUST FINAL ASSEMBLE USING STANDARD PRODUCTION FINAL ASSEMBLY PROCEDURES. USE THE CALIBRATION SET-POINTS CHART TO DETERMINE PROPER BASE AND PIN SIZE TO USE FOR FINAL BUILD OF THE PILOT.

5. FINAL ASSEMBLE THE PILOT LOT USING STANDARD BUILD PROCEDURES. CRIMPED DEVICES FULLY USING THE FINAL ASSEMBLY MACHINE CRIMP STATIONS. CRIMP FINAL ASSEMBLIES MUST PASS SPC REQUIREMENTS. REFER TO SECTION #2 FOR CODE MAKE-UP.

6. THE PILOT SAMPLE MUST BE FINAL TESTED ON THE APPROPRIATE TESTER PER THE FUNCTION TESTER MATRIX. THE TESTER MUST BE FULLY OPERATIONAL DURING USE. UNDER NO CIRCUMSTANCES CAN ANY PORTION OF THE TESTER OR UNLOAD SYSTEM BE DISABLED OR BYPASSED DURING OPERATION. ALL PILOT SWITCHES MUST BE UNLOADED ONTO THE UNLOAD CONVEYOR AND SUCCESSFULLY PASS THE O-RING PRESENT/ABSENT CHECK AND CRIMP HEIGHT CHECK. ANY FAILURE IS CAUSE FOR REJECTION OF THE PILOT SWITCHES FOR ENGINEERING REVIEW. AFTER TESTING ALL PILOT SAMPLES, PRINT OUT A LOT SUMMARY FOR USE IN DETERMINING LOT APPROVAL. ENTER THE PILOT RESULTS ONTO THE STACK-UP DATABASE LOG FOR FUTURE REFERENCE.

7. FINISHED PILOT PIECES MUST BE PLACED, HEXPORT UP, IN A FOAM HOLDER AND VISUALLY INSPECTED FOR HEXPORT CORRECTNESS AND O-RING PRESENCE, IF REQUIRED.

8. USE THE PILOT SAMPLE ACCEPTANCE CHART TO DETERMINE IF THE LOT IS ACCEPTABLE FOR PRODUCTION RELEASE. TAKE THE FOLLOWING ACTION(S) BASED ON WHICH ZONE THE SAMPLE IS IN:

ZONE	ACTION(S)
TARGET	- APPROVE THIS SAMPLE IF ALL OTHER REQUIREMENTS ARE MET PER THE ACCEPTANCE CHART. - APPROVE UP TO (3) ADDITIONAL DISC LOTS (BONUS LOTS) FOR USE WITH THE SAME STACK-UP ONLY IF THE ADDITIONAL LOTS HAVE DISC ACTUATION MEANS WITHIN +/-.5 PSI OF THIS SAMPLE LOT. EACH ADDITIONAL DISC LOT MUST PASS REQUIRED ACCEPTANCE CHART CRITERIA. ADDITIONAL DISC LOT ACTUATION AND RELEASE SIGMAS MUST BE LESS THAN PILOTED DISC SIGMAS. NO "RED X" DISCS LOTS MAY BE USED AS BONUS LOTS.
GO (OUTSIDE TARGET)	- APPROVE THIS SAMPLE ONLY IF ALL OTHER REQUIREMENTS ARE MET PER THE ACCEPTANCE CHART. - USE THE ACTUATION MEAN CENTERING PROCEDURE TO SELECT NEW DISC CALIBRATION TO TRY FOR THE NEXT SAMPLE. (SEE SAMPLE ACCEPTANCE CHART)
STOP	- REJECT THIS SAMPLE. - USE THE ACTUATION MEAN CENTERING PROCEDURE TO SELECT NEW DISC CALIBRATION TO TRY FOR THE NEXT SAMPLE. (SEE SAMPLE ACCEPTANCE CHART)

ONCE ACCEPTED, THE LOT MUST BE LOGGED INTO THE PILOT LOG BOOK. Q.C. ACCEPTANCE MAY BE REQUIRED PRIOR TO RELEASE. IF Q.C. ACCEPTANCE IS REQUIRED, LOT

MAY NOT BE RELEASED TO BE KITTED AND BUILT UNTIL Q.C. TESTING IS COMPLETE AND LOT PASSES. IF LOT FAILS Q.C. TESTING, IT IS REJECTED AND MAY NOT BE USED UNTIL DISPOSITIONED BY ENGINEERING. REFER TO SECTION #3 FOR Q.C. SAMPLE SUBMISSION PLAN.

9. ALL BOXES OF "RED X" DISCS LOTS MUST BE SUBMITTED TO Q.C. FOR ACCEPTANCE. NO SENSORS MAY BE ASSEMBLED UNTIL IMPULSE TESTING IS COMPLETE AND ALL SENSOR ASSEMBLIES HAVE PASSED.

10. ONLY HEXPORTS FROM SEALED BOXES MAY BE KITTED.

11. ALL PILOT SWITCHES MUST BE RETESTED WITH THE ASSOCIATED PRODUCTION LOT WHENEVER POSSIBLE. IF NOT POSSIBLE, THE PILOT SWITCHES MUST AT A MINIMUM BE RETESTED WITH A PRODUCTION LOT OF THE SAME DEVICE TYPE PRIOR TO PACKING.

OPERATION DESCRIPTION - (QUIET SWITCHES):

NOTE: THIS PROCEDURE IS TO BE USED FOR THE FOLLOWING DEVICES:
- 77PSL3-1
- 77PSL3-2
- 77PSL3-3
- 77PSL5-2
- 77PSL6-1
- 77PSL4-1

1. DETERMINE THE TARGET DISC ACTUATION CALIBRATION AS FOLLOWS:

   A. DETERMINE THE AVERAGE ACTUATION AMPLIFICATION FOR THE STACK-UP COMBINATION BEING PILOTED. IF THE STACK-UP IS NEW, TRY TO CHANGE TO A USED ONE - OR -- SELECT THE MOST RECENTLY USED COMBINATION DATA.

   B. WITH THE AVERAGE AMPLIFICATION DATA SELECT THE TARGET DISC ACTUATION CALIBRATION USING THE DISC SELECTION CHART.

   C. FROM THE DISC INVENTORY SELECT A DISC LOT CLOSEST TO THE TARGET CALIBRATION DETERMINED IN (1B.).

   D. REVIEW THE DISC INVENTORY AND DETERMINE IF THE CURRENT DISC DEPARTMENT ORDER PRESSURE IS CORRECT. CONTACT SUPERVISOR/COACH IF PRESSURE IS OUTSIDE OF KANBAN.

2. WHEN A DISC LOT HAS BEEN SELECTED FOR QUALIFICATION PROCEED WITH THE BUILD PROCESS. SELECT 24 DISCS AND 24 SAMPLES FROM EACH LOT CONTROLLED COMPONENT, (WASHER, CONVERTER, AND CUP). ASSEMBLE SENSOR ASSEMBLIES USING APPROVED MANUAL BUILD PROCEDURES. REFER TO SECTION #1 FOR DETAILS. SENSOR ASSEMBLIES MUST BE CRIMPED USING STANDARD PRODUCTION PROCEDURES.

3. ALL BOXES OF HEX PORTS, CONVERTERS, WASHERS, ETC... MUST BE RESEALED AFTER PARTS HAVE BEEN REMOVED. INITIAL AND DATE THE OUTSIDE OF THE BOX AND INDICATE THE NUMBER OF PARTS REMOVED.

4. WHEN THE PILOT SENSOR ASSEMBLIES ARE COMPLETE THE PILOT MAKER MUST DETERMINE THE SENSOR CODE. REFER TO SECTION #4 FOR DETAILED INSTRUCTIONS. THE PILOT MAKER MUST USE THIS CODE, AND THE PRODUCTION VALID FINAL ASSEMBLY MATRIX CHART, TO DETERMINE THE PROPER BASE AND PIN SIZE TO USE FOR FINAL BUILD OF THE PILOT.

5. FINAL ASSEMBLE THE 24 PIECE PILOT AS FOLLOWS:

   A. BUILD EACH PILOT DEVICE COMPLETELY, EXCEPT FOR THE BASE, IN A WOOD OR FOAM PLATFORM.

   B. SELECT 24 CALIBRATED BASE ASSEMBLIES FROM THE PILOT SAMPLE BOXES WHICH HAVE SIGNED AND DATED BASE ASSEMBLY SLIPS ENCLOSED. MEASURE 3 OF THE ASSEMBLIES ON THE SPC GAGE. EACH MUST MEASURE WITHIN TOLERANCE ANNOTATED ON THE BOX.

C. PROGRAM F.A.M. LIMITS TO THE VALUES SPECIFIED FOR THE SENSOR CODED/PIN COMBINATION YOU ARE USING. REFER TO THE F.A.M. OPERATORS CHART.

D. LOAD DISABLE THE CRIMP RING LOADER. ENABLE THE SENSE PIN, LOAD AND SENSE BASE, CRIMPERS, AND UNLOAD STATIONS. LEAVE OTHER STATIONS DISABLED.

E. FILL BASE LOAD TRACK WITH SPC CERTIFIED BASE ASSEMBLIES. LOAD PILOT DEVICES, LESS THE BASE ASSEMBLY, THREE AT A TIME JUST BEFORE THE SENSE PIN STATION. CYCLE THE F.A.M. UNTIL ALL ARE CRIMPED AND UNLOADED. VERIFY ASSEMBLIES TO CRIMP HEIGHT SPC REQUIREMENTS BY PERFORMING THE CRIMP HEIGHT SPC PROCESS. SAMPLES MUST PASS SPC.
ANY PIN HEIGHT FAILURES MUST BE SEPARATED AND HELD FOR ENGINEERING.

6. THE PILOT SAMPLE MUST BE FINAL TESTED ON THE APPROPRIATE TESTER PER THE FUNCTION TESTER MATRIX. THE TESTER MUST BE FULLY OPERATIONAL DURING USE. UNDER NO CIRCUMSTANCES CAN ANY PORTION OF THE TESTER OR UNLOAD SYSTEM BE DISABLED OR BYPASSED DURING OPERATION. ALL PILOT SWITCHES MUST BE UNLOADED ONTO THE UNLOAD CONVEYOR AND SUCCESSFULLY PASS THE O-RING PRESENT/ABSENT CHECK AND CRIMP HEIGHT CHECK. ANY FAILURE IS CAUSE FOR REJECTION OF THE PILOT SWITCHES FOR ENGINEERING REVIEW.

7. FINISHED PILOT PIECES MUST BE PLACED, NEXPORT UP, IN A FOAM HOLDER AND VISUALLY INSPECTED FOR NEXPORT CORRECTNESS AND O-RING PRESENCE, IF REQUIRED.

8. USE THE PILOT SAMPLE ACCEPTANCE CHART TO DETERMINE IF THE LOT IS ACCEPTABLE FOR PRODUCTION RELEASE. TAKE THE FOLLOWING ACTION(S) BASED ON WHICH ZONE THE SAMPLE IS IN:

ZONE	ACTION(S)
TARGET	- APPROVE THIS SAMPLE IF ALL OTHER REQUIREMENTS ARE MET PER THE ACCEPTANCE CHART. - APPROVE UP TO (5) ADDITIONAL DISC LOTS (BONUS LOTS) FOR USE WITH THE SAME STACK-UP ONLY IF THE ADDITIONAL LOTS HAVE DISC ACTUATION MEANS WITHIN +/- .5 PSI OF THE SAMPLE LOT. EACH ADDITIONAL DISC LOT MUST PASS REQUIRED ACCEPTANCE CHART CRITERIA. ADDITIONAL DISC LOT ACTUATION AND RELEASE SIGMAS MUST BE LESS THAN PILOTED DISC SIGMAS. NO "RED X" DISCS LOTS MAY BE USED AS BONUS LOTS.
GO (OUTSIDE TARGET)	- APPROVAL THIS SAMPLE ONLY IF ALL OTHER REQUIREMENTS ARE MET PER THE ACCEPTANCE CHART. - USE THE ACTUATION MEAN CENTERING PROCEDURE TO SELECT NEW DISC CALIBRATION TO TRY FOR THE NEXT SAMPLE. (SEE SAMPLE ACCEPTANCE CHART)
STOP	- REJECT THIS SAMPLE. - USE THE ACTUATION MEAN CENTERING PROCEDURE TO SELECT NEW DISC CALIBRATION TO TRY FOR THE NEXT SAMPLE. (SEE SAMPLE ACCEPTANCE CHART)

ONCE ACCEPTED, THE LOT MUST BE LOGGED INTO THE PILOT LOG BOOK. Q.C. ACCEPTANCE MAY BE REQUIRED PRIOR TO RELEASE. IF Q.C. ACCEPTANCE IS REQUIRED, LOT MAY NOT BE RELEASED TO BE KITTED AND BUILT UNTIL Q.C. TESTING IS COMPLETE AND LOT PASSES. IF LOT FAILS Q.C. TESTING, IT IS REJECTED AND MAY NOT BE USED UNTIL DISPOSITIONED BY ENGINEERING. REFER TO SECTION #3 FOR Q.C. SAMPLE SUBMISSION PLAN.

9. ALL BOXES OF "RED X" DISCS MUST BE SUBMITTED TO Q.C. FOR ACCEPTANCE. NO SENSORS MAY BE ASSEMBLED UNTIL IMPULSE TESTING IS COMPLETE AND ALL SENSOR ASSEMBLIES HAVE PASSED.

10. WHEN THE PRODUCTION SENSOR LOT IS RECEIVED FROM THE SENSOR ASSEMBLY PROCESS THE PILOT MAKER MUST DETERMINE THE SENSOR CODE OF THE PRODUCTION LOT. REFER TO SECTION #4 FOR DETAILED INSTRUCTIONS. THE PILOT MAKER MUST USE THIS CODE, AND THE PRODUCTION VALID FINAL ASSEMBLY MATRIX CHART, TO DETERMINE THE PROPER BASE AND PIN SIZE TO USE FOR PRODUCTION FINAL BUILD. THE COMMUNICATION CHART MUST BE COMPLETED FOR EACH LOT PRIOR TO RELEASE TO PRODUCTION.

11. ONLY HEXPORTS FROM SEALED BOXES MAY BE KITTED.

12. ALL PILOT SWITCHES MUST BE RETESTED WITH THE ASSOCIATED PRODUCTION LOT WHENEVER POSSIBLE. IF NOT POSSIBLE, THE PILOT SWITCHES MUST AT A MINIMUM BE RETESTED WITH A PRODUCTION LOT OF THE SAME DEVICE TYPE PRIOR TO PACKING.

SECTION #1 - MANUAL SENSOR BUILD PROCEDURE:

THE PILOT MAKER MUST VISUALLY INSPECT COMPONENTS AND SUB-ASSEMBLIES 100% FOR VISUAL DEFECTS. REFER TO VISUAL AIDS. HAIRNETS AND SMOCKS MUST BE WORN DURING THE BUILD PROCESS. SENSORS MAY BE CRIMPED ON EITHER AMI2 OR THE MANUAL SENSOR CRIMPER.

1. ASSEMBLE O-RING TO HEXPORT GLAND IF REQUIRED PER PARTS LIST. O-RING MUST SEAT FULLY AGAINST HEX SHOULDER.

2. PLACE HEXPORT, THREADS DOWN, INTO WOOD BUILD PLATFORM. ASSEMBLE GASKET INTO GLAND. VERIFY GASKET IS FULLY SEATED.

3. ASSEMBLE SEALS CONCENTRIC WITH ASSEMBLY. SPLAY SEALS SO THAT ALL CORNERS ARE VISIBLE. USE CAUTION NOT TO DISPLACE GASKET DURING ASSEMBLY. ENSURE PROPER NUMBER OF SEALS ARE USED PER PARTS LIST.

4. PLACE CHAMFER SIDE OF WASHER FACING DOWN AGAINST SEALS. WASHER MUST BE CONCENTRIC WITH HEXPORT.

5. INSTALL SPACER INTO CONVERTER. SPACER MUST FULLY SEAT INTO CONVERTER.

6. PLACE DISC, CROWN FACING UP, ONTO CONVERTER SEAT OVER THE SPACER.

7. PLACE THE CONVERTER ASSEMBLY, CONVERTER BUTTON DOWN AND DISC FACING UP, INTO WASHER HOLE.

8. CAREFULLY PLACE CUP OVER ASSEMBLY USING CARE NOT TO DISPLACE ANY COMPONENTS. CUP MUST FULLY SEAT OVER HEXPORT.

9. SEQUENTIALLY LOAD SENSOR ASSEMBLIES INTO CRIMP TABLE NEST USING CARE NOT TO DISPLACE ANY COMPONENTS. VERIFY SENSOR ASSEMBLIES TO CRIMP HEIGHT SPC REQUIREMENTS BY PERFORMING THE CRIMP HEIGHT SPC PROCESS FOR THE DEVICE TYPE BEING BUILT. SAMPLES MUST PASS SPC.

SECTION #2 - CODE MAKE-UP:

FOR ALL 77P8 AND 87P8 DEVICES TYPES:

SAMPLE XX-XXX 4256A

EX: XX-XX = CUSTOMER PART #
4XXXX = LAST DIGIT OF CURRENT YEAR
X256X = DAY OF THE YEAR
XXXXA = SEQUENTIAL LOT IDENTIFICATION (A,B,C,ETC)

SECTION #3 - Q.C. SAMPLE SUBMISSION PLAN:

THE FOLLOWING Q.C. SUBMISSION SCHEDULE IS TO BE FOLLOWED FOR ALL 77PS AND 87PS PRODUCTION LOTS.

SUBMISSION TYPE	SUBMISSION FREQUENCY	
	77PS	87PS
IP2 FUNCTIONAL TESTING. (NO IMPULSE) (SEE NOTE BELOW FOR SAMPLE AND BONUS LOTS)	4 DEVICES FROM EACH DISC LOT ** SEE BELOW	4 DEVICES FROM FIRST PILOT LOT OF EACH WEEK
IP2 DURABILITY TESTING (IMPULSE)	5 DEVICES FROM FIRST PILOT LOT OF EACH WEEK OR IF CHANGING TO A NEW LOT # OF WASHERS, CONVERTERS OR CUPS.	5 DEVICES FROM FIRST PILOT LOT OF EACH DEVICE OF EACH WEEK OR IF CHANGING TO A NEW LOT # OF WASHERS, CONVERTERS OR CUPS.

** IF DISC LOT EXCEEDS 4,000, 4 MORE DEVICES FROM EACH SUCCESSIVE 4,000 DISCS MUST BE TESTED.

BASE ASSEMBLIES MUST BE FROM BAM NEW WORK - NOT SAFETY STOCK.

MEASURE ALL BASES AND PINS USED FOR Q.C. SAMPLES TO ENSURE THEY ARE CORRECT PRIOR TO ASSEMBLY.

NOTE: SAMPLE LOT IS THE INITIAL ACCEPTED PILOT. THIS MUST BE SUBMITTED TO Q.C. AND PASS ALL TESTING BEFORE LOT CAN BE KITTED AND BUILT FOR PRODUCTION. BONUS LOT SAMPLES MUST BE SUBMITTED TO Q.C. AFTER FUNCTION TEST AND BEFORE PACKING. NO LOTS MAY BE SEALED OR SHIPPED UNTIL Q.C. TESTING IS COMPLETE AND ALL SAMPLES PASS.

SECTION #4 - SENSOR LOT CODE DETERMINATION (QUIET SWITCHES)

THE FOLLOWING PROCEDURE MUST BE USED FOR THE FOLLOWING DEVICES ONLY:

-77PSL3-1 -77PSL4-1
-77PSL3-2 -77PSL5-2
-77PSL3-3 -77PSL6-1

THIS PROCEDURE IS TO BE USED TO DETERMINE A SENSOR CODE FOR THE FOLLOWING SITUATIONS:

PILOT LOT READY FOR PIN AND BASE SELECTION.
PRODUCTION SENSOR LOT READY FOR FINAL ASSEMBLY SET-UP.

PROCEDURE FOR PILOT LOT:

1. FULLY ASSEMBLE AND CRIMP THE PILOT SENSORS USING MANUAL BUILD PROCEDURES IN THIS SPECIFICATION.
2. USING THE PILOT MAKER SENSOR DEPTH GAGE MEASURE AND RECORD THE DEPTH DIMENSION ON ALL 24 SENSORS.
3. ADD ALL 24 DEPTH DIMENSIONS TOGETHER AND FIND THE AVERAGE BY DIVIDING THE TOTAL BY 24.
4. VERIFY THAT THE DIFFERENCE BETWEEN THE HIGHEST AND LOWEST SENSOR DEPTH DIMENSION IS NOT MORE THAN .003". IF THE DIFFERENCE IS GREATER THAN .003" PLACE LOT ON HOLD AND NOTIFY ENGINEERING.
5. DETERMINE THE LOT SENSOR CODE USING THE CORRECT FINAL ASSEMBLY MATRIX CHART.
6. RETURN TO PILOT OPERATION DESCRIPTION FOR QUIET SWITCHES.

PROCEDURE FOR PRODUCTION LOT:

1. SAMPLE 24 PRODUCTION SENSORS FROM EACH SENSORS LOT. A FEW SENSORS FROM EACH TOTE WILL ENSURE A THOROUGH SAMPLING.

2. USING THE PILOT MAKER SENSOR DEPTH GAGE MEASURE AND RECORD THE DEPTH DIMENSION ON ALL 24 SENSORS.

3. ADD ALL 24 DEPTH DIMENSIONS TOGETHER AND FIND THE AVERAGE BY DIVIDING THE TOTAL BY 24.

4. VERIFY THAT THE DIFFERENCE BETWEEN THE HIGHEST AND LOWEST SENSOR DEPTH DIMENSION IS NOT MORE THAN .003". IF THE DIFFERENCE IS GREATER THAN .003" PLACE LOT ON HOLD AND NOTIFY ENGINEERING.

5. DETERMINE THE LOT SENSOR CODE USING THE CORRECT FINAL ASSEMBLY MATRIX CHART.

6. RETURN TO PILOT OPERATION DESCRIPTION FOR QUIET SWITCHES.

Title: Pilot Disc Lot		Link Number: 3840
Product Code: 088	Device Type: 77/87PS	Doc #: 502577
Shop Order: 840	Operation Number: 700	Hrs/K: 100
Cost Center: 294	Standard Number: 5700	Pcs/Hr: 10
Copies: 1	Date: 08/31/99	Revision: AB

Part Number Information	Component/Subassembly Description	Number Required
See Parts List	77PS Final Assembly	1
See Parts List	87PS Final Assembly	1

1.0 SAFETY PERSONAL PROTECTIVE EQUIPMENT REQUIRED

1. Safety glasses with side shields (when Function Testing devices).
2. Safety shoes must be worn when kitting components for pilots or lots.
3. Vacuum Lifter must be used when lifting boxes of components in warehouse.
4. Hearing Protection.

2.0 TOOLS AND/OR EQUIPMENT

Function Tester #2, Eq. # 140380	Calibration Setpoints Chart	Wood/ Foam Building Platform
Function Tester #3, Eq. # 121983	KanBan Disc Calibration Status Log	Route Cards, Labels
Enerpak Rc104 Press/2k psi Gage	Disc matrix Calibration Data	Finger Cots
Matthews Coder Model 2610 Eq. # 121681	Stackup Data Base Logs	Visual Aids
AMI Sensor Assy Crimper Eq. #121681	Lot Control Documents	Yellow salvage totes
Warehouse Vacuum Lifter Eq. # 122293	Actuation Mean Centering Chart	Red scrap tote
SPC Fixture DWG # 145575 Device Crimp Height (57PS only)	Sample Acceptance Charts	Operator Helmet and Smock
SPC Fixture DWG # 150421 Sensor Crimp Height	Final Assembly Matrix Charts	Pilot Computer Software

TEST WORKSHEET

P/N:		77PB12-1			DATE:	12/9/99		
A. CALIBRATION SPEC			POST TEST					
	ACT	95-160	A.B.M.P.					
	REL	20 MIN	A.B.M.P.		LAB TEST # 625-16-44			
B. MILLIVOLT DROP	< 200		A.B.M.P.					
C. CURRENT LEAKAGE			A.B.M.P.					
D. PROOF		3000psi	A.B.M.P.					
PRE TESTS:					IP-3 TEST		POST TESTS:	
DEVICE #	PROOF	ACT	REL	MVD	CUR.LK	VIBRATION		A,B,C,D
1	OK	137.8	51.2	0.06	OK	#1-6		
2	OK	151.3	48.8	0.06	OK			
3	OK	138.4	60	0.06	OK			
4	OK	131.2	60	0.06	OK			
5	OK	126.8	61.1	0.06	OK			
6	OK	136.3	59.4	0.06	OK			
7	OK	131.8	59.4	0.06	OK	VACUUM		A,B,C,D
8	OK	136.8	66.4	0.11	OK	#7-12		
9	OK	131.4	64.4	0.1	OK			
10	OK	120.2	65.2	0.06	OK			
11	OK	128.6	60.4	0.06	OK			
12	OK	120.2	61.2	0.06	OK			
13	OK	128.8	60.8	0.06	OK	TEMP.CYCLE		A,B,C,D
14	OK	132.2	63.3	0.07	OK	#13-18		
15	OK	131.3	66.4	0.06	OK			
16	OK	121.2	59.7	0.06	OK			
17	OK	134.4	66.4	0.06	OK			
18	OK	131.8	66.4	0.07	OK			
19	OK	127.3	63.4	0.06	OK	FLUID RES.	E,G,H,J	
20	OK	123.7	66.8	0.07	OK	#19-24	IMPULSE	A,B,C,D
21	OK	138.2	66.8	0.06	OK		#19-30	
22	OK	133	66.4	0.06	OK			
*23A	OK	130.8	66.4	0.06	OK			
24	OK	130.7	66.6	0.06	OK			
25	OK	134.4	66.6	0.06	OK			
26	OK	128.6	66.8	0.07	OK	*23A & 30A	REPLACEMENT PCS.	
27	OK	130.2	66.4	0.06	OK	DUE TO TEST SET-UP ERROR		
28	OK	128.6	66.4	0.06	OK			
29	OK	128.8	67.1	0.07	OK			
*30A	OK	132.8	70.4	0.06	OK			
31	OK	128.1	64	0.06	OK		TERM.STR	A,B,C,D
32	OK	123.3	66.8	0.06	OK		#31-42	
33	OK	127.5	64.3	0.06	OK			
34	OK	127.8	66.8	0.06	OK			
35	OK	125.5	60.4	0.06	OK			
36	OK	130.9	46.8	0.06	OK			
37	OK	123.1	67.7	0.06	OK			
38	OK	130.2	66.1	0.07	OK			

Prepared by ELAINE ROSE X:1907 9/16/99

TEST WORKSHEET

P/N:				DATE:					
A. CALIBRATION SPEC			POST TEST						
ACT			A.B.M.P.						
REL			A.B.M.P.						
B. MILLIVOLT DROP			A.B.M.P.						
C. CURRENT LEAKAGE			A.B.M.P.						
D. PROOF			A.B.M.P.						
PRE TESTS:						B-S TEST		POST TESTS:	
DEVICE #	PROOF	ACT	REL	MVD	CURLK				
39	OK	128	87.6	0.05	OK				
40	OK	127.9	84.1	0.09	OK				
41	OK	128.9	91.2	0.09	OK				
42	OK	132.8	88.1	0.08	OK				
43	OK	134.6	83.4	0.08	OK		HUMIDITY		A.B.C.D
44	OK	127.4	89.6	0.06	OK		845-48		
45	OK	132.2	80.1	0.07	OK				
46	OK	126.1	80.1	0.17	OK				
47	OK	126.8	80.4	0.09	OK				
48	OK	136.4	84.4	0.08	OK				
49	OK	124.5	85.3	0.05	OK		SALT SPRAY		A.B.C.D
50	OK	131.8	81.5	0.08	OK		949-54		
51	OK	136.1	87.1	0.07	OK				
52	OK	136.5	81.8	0.09	OK				
53	OK	131.8	86.4	0.08	OK				
54	OK	131.1	86.8	0.08	OK				

CIRCUITS THAT REMAIN ENERGIZED AT ALL TIMES - 1998-02 LINCOLN TOWN CAR
ON THE LEFT HAND SIDE OF THE ENGINE COMPARTMENT

CKT #	CIRCUIT NAME / DESCRIPTION	CKT COLOR	WIRE HARNESS
30	[illegible]	[illegible]	[illegible]
40	[illegible]	[illegible]	[illegible]
43	[illegible]	[illegible]	[illegible]
57	[illegible]	[illegible]	[illegible]
64	[illegible]	[illegible]	[illegible]
197	[illegible]	[illegible]	[illegible]

3713 4238

POST TESTS

P/N:		77PSL2-1				DATE:	1/14/97		
A. CALIBRATION SPEC				POST TEST					
	ACT	90-150		A,B,M,P.					
	REL	20 MIN		A,B,M,P.		LAB TEST #	882-16-94		
B. MILLIVOLT DROP		< 200		A,B,M,P.					
C. CURRENT LEAKAGE				A,B,M,P.					
D. PROOF		3000psi		A,B,M,P.					
POST TESTS:						IP-3 TEST		POST TESTS:	
DEVICE #	PROOF	ACT	REL	MVD	ICUR LK	VIBRATION		A,B,C,D	
1	OK	134	68.8	0.18	OK	#1-6			
2	OK	121.4	68.9	0.32	OK				
3	OK	134.7	69.9	0.21	OK				
4	OK	131.8	78.4	0.21	OK				
5	OK	129.4	60.4	0.22	OK				
6	OK	131.3	61.3	0.28	OK				
7	OK	133.8	68.4	0.29	OK	VACUUM		A,B,C,D	
8	OK	134.4	68.7	0.21	OK	#7-12			
9	OK	128.8	60	0.39	OK				
10	OK	122.4	68.3	0.23	OK				
11	OK	127.8	69.8	0.27	OK				
12	OK	124.7	62.8	0.19	OK				
13	OK	113.8	67.8	0.18	OK	TEMP CYCLE		A,B,C,D	
14	OK	123.4	69.7	0.28	OK	#13-18			
15	OK	128.4	54.4	0.41	OK				
16	OK	116.8	60.6	0.19	OK				
17	OK	121.9	61.9	0.31	OK				
18	OK	116.6	63.2	0.28	OK				
19	OK	120.1	68.4	0.27	OK	FLUID RES.	E,G,H,I	S/N. 7/30 ONLY	
20	OK	114.4	64.8	0.24	OK	#19-24	IMPULSE		A,B,C,D
21	OK	114.8	61.2	0.38	OK		#19-30		
22	OK	117.1	63.1	0.83	OK				
23	OK	114.4	68.1	1.18	OK				
24	OK	117.4	68.4	0.88	OK				
25	OK	115.3	68.8	4.71	OK				
26	OK	114.8	64.4	0.5	OK				
27	OK	112.8	67.8	0.38	OK				
28	OK	110.8	68.8	0.31	OK				
29	OK	112.8	68.4	0.34	OK				
30	OK	123.8	72.8	0.32	OK				
31	OK	130.8	66.8	0.31	OK		TERM STR		A,B,C,D
32	OK	124.8	68.8	0.24	OK		#31-42		
33	OK	128.8	60.2	0.22	OK				
34	OK	131.8	63.4	0.32	OK				
35	OK	128.1	66.8	0.27	OK				
36	OK	121.6	64.8	0.88	OK				
37	OK	124.4	68.8	0.28	OK				
38	OK	137	65.8	0.37	OK				

POST TESTS

For:					DATE:				
A. CALIBRATION SPEC			POST TEST						
	ACT		A.B.M.P.						
	REL		A.B.M.P.						
B. MILLIVOLT DROP			A.B.M.P.						
C. CURRENT LEAKAGE			A.B.M.P.						
D. PROOF			A.B.M.P.						
POST TESTS:						**P-T TEST**		**POST TESTS:**	
DEVICE #	PROOF	ACT	REL	MVD	CURR.LK				
39	OK	139.3	81.4	0.19	OK				
40	OK	138.4	70.1	0.22	OK				
41	OK	139.8	66.8	0.26	OK				
42	OK	136.9	67.4	0.19	OK				
43	OK	141.4	70.3	0.6	OK		HUMIDITY		A.B.C.D
44	OK	141.1	83.3	0.51	OK		#43-48		
45	OK	140.2	68.3	0.27	OK				
46	OK	139.4	68.6	0.32	OK				
47	OK	138.8	69.9	0.28	OK				
48	OK	134.4	68.7	0.23	OK				
49	OK	133.7	68.7	0.19	OK		SALT SPRAY		A.B.C.D
50	OK	133.4	68.1	0.19	OK		#49-54		
51	OK	141.8	48.6	0.51	OK				
52	OK	141.2	84.6	0.36	OK				
53	OK	130.4	80.4	0.33	OK				
54	OK	144.3	68.4	0.22	OK				

Return Analysis on 77PSL2-1
10/8/99

Background:
25 switches were reported to have failed during the change-out procedure currently being conducted by Ford Dealers. These returns were all built in 1999 and supplied to Ford as part of the *Brake Repair Kit* (XW7Z-9G652-AA).

Objective:
Find any functional deficiencies with the 25 switches returned.

Visual Inspection:
Upon receipt of the 25 switches, TI did a visual inspection. Twenty-three of the switches appeared to be in like new condition. However, 2 of the switches showed obvious signs of abuse. These 2 switches appeared to have been installed or removed with pliers by applying torque to the crimp ring and base; not the hex flats. The results of this inspection are summarized below:

Indications of proper installation	17
No signs of installation	4
Improper installation techniques used	2
Damaged threads	1

Only 2 switches were returned with caps and still had brake fluid retained in the pressure cavity of the switches. We were able to obtain 2 small samples of this fluid.

It should be noted that the switches were returned with yellow tags containing information about why the switch was replaced. The tags listed the following reasons for returns:

No Description	9
Brake Fluid Leak	6
Administrative Parts Return	4
Engagement Troubles	2
Disengagement Troubles	2
ABS Warning Light	1
Other Electrical Accessory Trouble	1

Calibration and Electrical Testing:
All 25 switches were checked for actuation and release as defined by the specification. All were within specified limits.

In addition to the normal electrical parameters defined in the product specification, TI also measured current leakage from the terminal to the housport. This test was done by applying a current limited 14 Vdc power supply to the terminals of the switch. While a voltage is applied to terminal and the housport is held at ground, the current flow into the switch is measured. All switches measured 0.0 mA.

During the calibration check the switch is pressurized to 200psi with air. All switches sealed properly during this test.

Dissection:
Since no issues were discovered, it was determined that only a sub set would be dissected and internally inspected. Removing the crimp ring and the base would allow internal inspection and direct leak check of the sensor. Six switches were selected for dissection (2 from the brake Fluid Leak group, 1 from Administrative Parts, 1 from Disengagement Troubles, 1 from other Electrical Accessory Troubles, and 1 from Brake ABS Warning Light Troubles).

The internal inspections confirmed no fluid leakage into the connector cavity, no contamination, and good electrical contacts. Further leak testing of the sensor using refrigerant and a leak detector confirmed no leakage. It is possible that leaks fluid leakage may occur on the vehicle due to insufficient installation torque, contaminated threads, contaminated sealing surface, or damaged components.

Summary:

- All switches were within specification.
- No current path to ground was detected.
- No leaks were discovered.
- 2 switches were mis-handled during the install/removal cycle.

End of Document.

Impact of these modifications. Meanwhile, attention has shifted away from the switch as the root cause of the thermal event.

Dague, Bryan

From: Dague, Bryan
Sent: Thursday, November 11, 1999 3:25 PM
To: Beringhause, Steven
Subject: DOE follow-up summary

77PS Life Cycle DOE
Follow Up Test Summary
10/28/99

Purpose:
The objective of this series of tests was to determine why the 77PS2-1 switches used in the "77PS Life Cycle DOE Test to Leakage" did not perform as expected. Cycle expectations for this switch in the specified conditions should easily exceed 500K cycles.

Procedure:
As mentioned in the previous report, converter height was believed to be the cause of the early life cycle failures. Tests were run is which converter heights were varied and the life was measured. Converter heights were varied beyond the dimensions called out on the component prints.

Results/Conclusion:
Upon completion of these tests, it was clear that the converter height was not a significant factor in the cycle life obtained. Three different cyclers were used during this test. As a result, switch life was seen to vary with the cycler used, and not the switch group being tested.

Upon reviewing of the data, Cycler # 4 was instrumented with high-speed transducers, thermal couples, and set-up procedures were reviewed. Cycler #4 was the cycler used in the original DOE. This investigation revealed there are several differences and problem areas with this cycler. These discoveries include an inability to bleed the air from the system, difficulty obtaining a true zero pressure on the low side of the cycle, water content of the brake fluid contained in the system, and different oven temperatures being used during the test.

Corrective Actions:
Cycler #4 is now being redesigned, over hauled, brake fluid changed, and components cleaned. In addition, the set-up procedures are being reviewed to determine the best method of setting pressures and temperatures.

Upon completion of these improvements, a confirmation test run will be conducted to verify the cycler was the root cause of the early failures.

End of document.

77P8 Vacuum Dependency Matrix

TI Part Number	# sorted	fell out	% fell out	disc type	sum PTE	sum holelst
77P8L3-1	1100	0	0.00	snap	27713-1	.090 - .092
77P8L3-3	no inventory			snap		
77P8L3-1			#DIV/0!	quiet	27713-1	.090 - .092
77P8L3-2	14000	18	0.13	quiet	27713-1	.090 - .092
77P8L3-3	1000	0	0.00	quiet	27713-1	.085 - .088
77P8L3-4	no inventory			quiet		
77P8L4-1			#DIV/0!	quiet	27713-2	.088 - .096
77P8L5-2	no inventory			quiet	27713-2	.088 - .096
77P8L5-1	no inventory			quiet	27713-2	.088 - .096

77RS
Documents 129

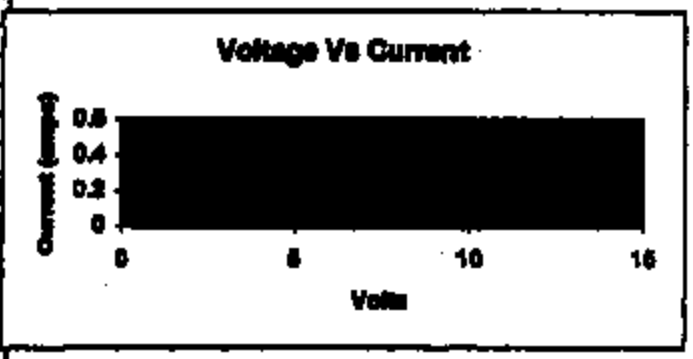
11:19 AM12/10/99

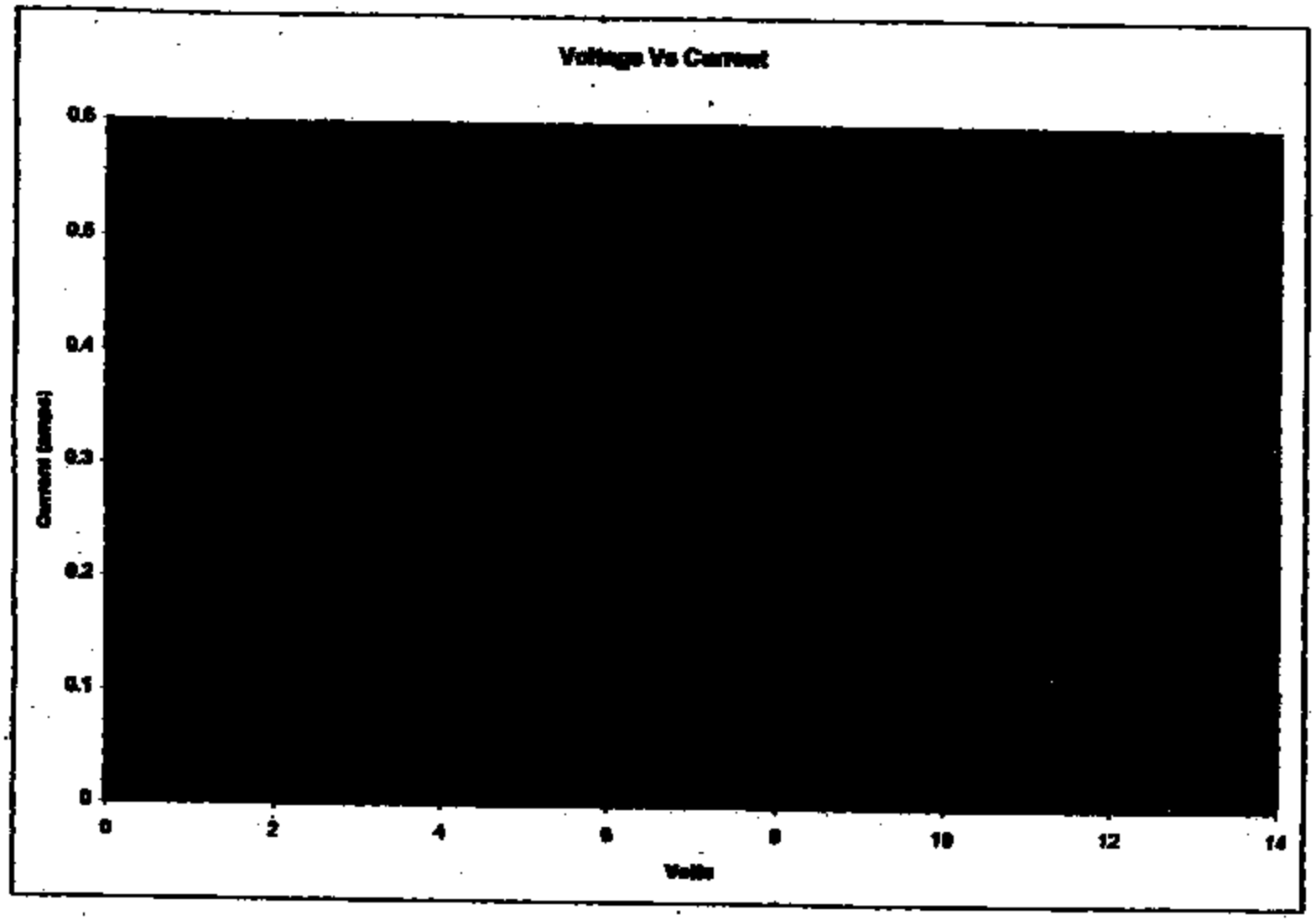
Voltage -vs- Current with monitored temperature

Vdc

Vdc	I (amps)	Temp deg F
13	0.524	79.2
12	0.488	80.3
11	0.452	81.3
10	0.381	81.8
9	0.342	82.0
8	0.308	82
7	0.269	82.3
6	0.231	82.6
5	0.194	82.7
4	0.157	82.9
3	0.119	83
2	0.081	83.1
1	0.043	83.2
-1	0.044	83.3
-2	0.085	83.1
-3	0.124	83.0
-4	0.164	83.4
-5	0.205	83.7
-6	0.242	83.4
-7	0.278	83.6
-8	0.316	83.2
-9	0.361	83.3
-10	0.397	87.2
-11	0.419	86.3
-12	0.462	85.7
-13	0.484	86.6

misc. note: closes at 7.0 Vdc, and opens @0.2Vdc.




Voltage Vs Current
Current (amps)
0.6
0.5
0.4
0.3
0.2
0.1
0
0
2
4
6
8
10
12
14
Volts

Voltage -vs- Current at 130 deg. C

Vdc

Vdc	I (amps)
15	0.413
12	0.371
11	0.357
10	0.338
9	0.274
8	0.349
7	0.212
6	0.182
5	0.163
4	0.122
3	0.085
2	0.062
1	0.033
0.007	0.008
1	0.032
2	0.062
3	0.082
4	0.122
5	0.152
6	0.181
7	0.209
8	0.236
9	0.263
10	0.292
11	0.32
12	0.347
13	0.371

77P6 Vacuum Dependency Matrix

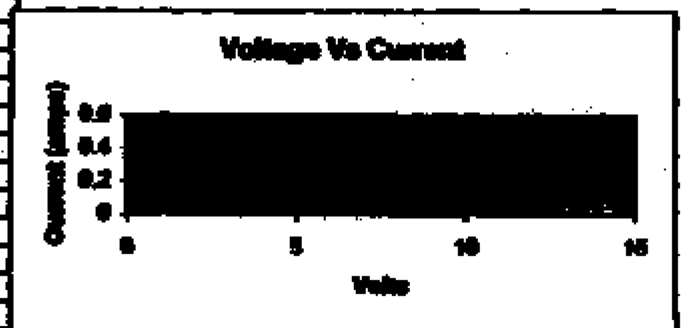
TI Part Number	$ earned	$ left out	% $ left out	disc type	cust PTN	cust height
77P6L3-1	1190	0	0.00	snap	27713-1	.060 - .062
77P6L24	no inventory			snap		
77P6L3-1			#DIV/0!	quiet	27713-1	.060 - .062
77P6L3-2	14280	18	0.13	quiet	27713-1	.060 - .062
77P6L3-3	1000	0	0.00	quiet	27268-1	.063 - .065
77P6L3-4	no inventory			quiet		
77P6L6-1			#DIV/0!	quiet	27713-3	.060 - .062
77P6L6-2	no inventory			quiet	27713-3	.060 - .062
77P6L6-1	no inventory			quiet	27713-3	.060 - .062

Voltage -vs- Current with monitored temperature

Vdc

Vdc	I (amps)	Temp deg F
13	0.534	79.2
12	0.469	80.3
11	0.432	81.2
10	0.391	81.9
9	0.342	82.8
8	0.305	83
7	0.268	83.2
6	0.251	82.8
5	0.194	82.7
4	0.157	82.9
3	0.120	83
2	0.081	83.1
1	0.042	82.8
1	0.044	82.8
2	0.083	82.1
3	0.124	82.9
4	0.166	82.4
5	0.209	82.7
6	0.242	83.4
7	0.279	83.5
8	0.316	83.2
9	0.354	83.5
10	0.387	87.2
11	0.419	88.5
12	0.452	89.7
13	0.484	89.5

...ation, note: closes at 7.0 Vdc, and opens @8.2Vdc.



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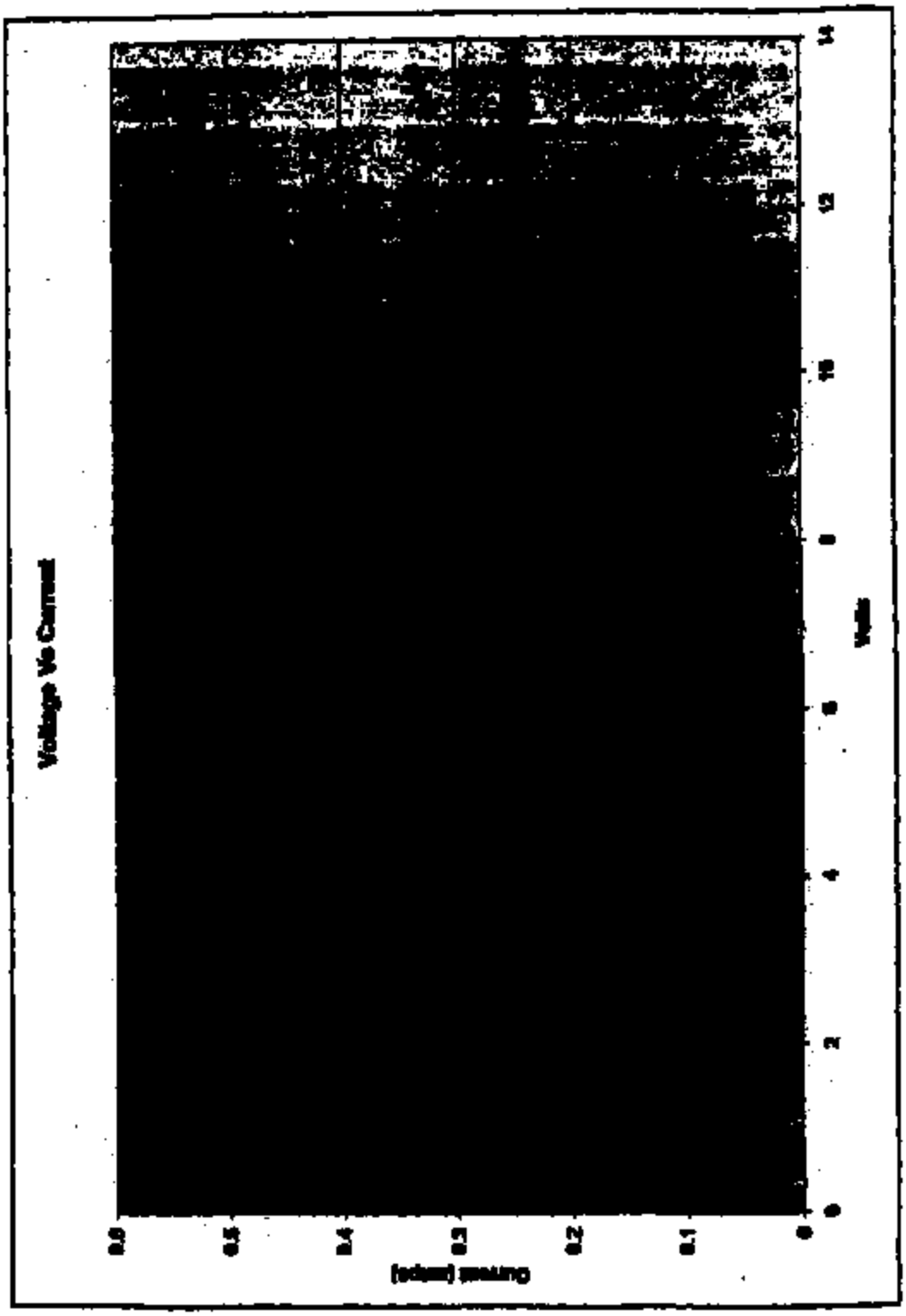
Voltage Vs Current
Volts
(Ohms) resistor

Voltage -vs- Current at 150 deg. C

Vds

Vds	I (amps)
13	0.419
12	0.371
11	0.337
10	0.308
9	0.274
8	0.245
7	0.217
6	0.189
5	0.162
4	0.133
3	0.105
2	0.076
1	0.048
0.927	0.037
	0.03
	0.02
	0.01
	0.01
	0.04
	0.07
	0.10
	0.13
	0.16
	0.19
	0.22
	0.25
	0.28
	0.31
	0.34
11	0.37
12	0.397
13	0.971

[redacted]

[redacted]	[redacted]	[redacted]	[redacted]
11	closed	12.00	11.80
12	closed	closed *	closed
13	closed	11.00	9.80
14	closed	8.80	7.80
15	closed	closed *	closed
16	closed	7.80	6.80
Average:		8.65	8.75
STD		2.31	2.02
MAX		12.00	11.80

Procedure:
1) Subject outlet to 60psig.
2) Check vent at atmos pressure
3) Subject to vacuum.
4) Record vacuum pressure at vent loss.
5) Decrease vacuum and record pressure at vent.
6) Measure vent at atmos pressure.

* max vacuum of 30.0 inches achieved.

[redacted]	[redacted]	[redacted]	[redacted]
LF1	closed	16.00	15.00
LF2	closed	13.00	10.80
LF3	closed	12.80	11.80
LF4	closed	14.80	13.80
LF5	closed	12.00	8.80
LF6	closed	13.00	11.80
LF7	closed	22.00	20.00
LF8	closed	closed*	closed
LF9	closed	11.00	8.00
LF10	closed	9.00	8.00
LF11	closed	14.00	OPEN
LF12	closed	26.00	21.00
LF13	closed	14.00	10.00
LF14	closed	20.00	14.00
LF15	closed	27.00	26.00
LF16	closed	20.00	18.00
Average:		16.67	14.04
STD		6.15	6.39
MAX:		26.00	26.00

[illegible] Cross-Ref List on [illegible] by [illegible]

77PG [illegible]

TO BE USED FOR REFERENCE ONLY

[illegible] DATA

[illegible] P/N	CUSTOMER PART NO.	CUSTOMER	Actuating [illegible]	[illegible]	[illegible] Replacement	port fitting/bump details	[illegible]	[illegible]	[illegible]	[illegible]
1 77PGL2-1	F2AC-[illegible]	Ford FIC	[illegible]	25 min	[illegible] 2	[illegible]-1	30-34 M	[illegible]	Zn/yellow	[illegible]
2 77PGL2-3	F4LC-[illegible]-AA	[illegible]	[illegible]	40 min	[illegible]	[illegible]-1	30-34 M	[illegible]	Zn/yellow	[illegible]
3 77PGL3-1	F2AC-[illegible]-AA	FIC - [illegible]	[illegible]	20 min	[illegible] 2	[illegible]-1	30-34 M	[illegible]	Zn/yellow	split
4 77PGL3-2	[illegible]-AA	[illegible]	[illegible]	20 min	[illegible] 1	[illegible]-1	30-34 M	[illegible]	Zn/yellow	split
5 77PGL3-3	[illegible]-DA	UT - [illegible]	[illegible]	40 min	[illegible] 1	[illegible]-1	30-34 M	[illegible]	Zn/yellow	[illegible]
6 77PGL4-1	[illegible]-AA	[illegible]	[illegible]	20 min	[illegible] 2	[illegible]-4	[illegible] M	14mm	[illegible]	split
7 77PGL5-2	[illegible]-AA	[illegible]	[illegible]	20 min	[illegible] 2	[illegible]-4	30-34 M	[illegible]	[illegible]	split
8 77PGL6-1	[illegible]	[illegible]	[illegible]	20 min	[illegible] 1	[illegible]-4	30-34 M	[illegible]	Zn/yellow	split

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12/16/[illegible]:07 AM

Used on :	Base Material	Specification
Crown Vic, Grand Marquis, Mark, Town Car	Celanex [illegible]	[illegible]-AA
Excursion, Club Wagon	Celanex [illegible]	[illegible]-AA
Crown Vic, Grand Marquis, Mark, Town Car	GE Noryl GTX [illegible]	[illegible]-AA
Windstar	GE Noryl GTX [illegible]	[illegible]-AA
Bronco, F-Series, Ranger, Explorer, Navigator, Expedition, Econoline, Club Wagon	GE Noryl GTX [illegible]	[illegible]-AA
Taurus	GE Noryl GTX [illegible]	[illegible]-AA
SHO Taurus	GE Noryl GTX [illegible]	[illegible]-AA
Capri	GE Noryl GTX [illegible]	[illegible]-AA

Customer Returns

Switch ID	Atmosphere	Vacuum open (in of water)	Atmosphere
11	closed	12.00	11.50
12	closed	closed *	closed
13	closed	11.00	9.50
14	closed	8.00	7.50
15	closed	closed *	closed
16	closed	7.50	6.50
Average:		9.50	8.75
STD		2.21	2.22
MAX		12.00	11.50

Procedure:
1) Subject switch to 60psig.
2) Check cont at atmos pressure
3) Subject to vacuum.
4) Record vacuum pressure at cont loss.
5) Decrease vacuum and record pressure at cont.
6) Measure cont at atmos pressure.

* max vacuum of 28.9 inches achieved.

Line Failout

Switch ID	Atmosphere	Vacuum open (in of water)	Atmosphere
LF1	closed	16.00	15.00
LF2	closed	12.00	10.50
LF3	closed	12.50	11.50
LF4	closed	14.50	13.50
LF5	closed	12.00	9.50
LF6	closed	13.00	11.50
LF7	closed	22.00	20.00
LF8	closed	closed*	closed
LF9	closed	11.00	8.00
LF10	closed	9.00	8.00
LF11	closed	14.00	OPEN
LF12	closed	25.00	21.00
LF13	closed	14.00	10.00
LF14	closed	28.00	14.00
LF15	closed	27.00	25.00
LF16	closed	20.00	19.00
Average:		16.67	14.04
STD		6.15	5.29
MAX:		28.00	25.00

Shower Test Visual results

D1 (vertical) wet on exterior of switch on securely mating connector area.
there is a ring of wet on seal in mating connector.
2 black spots are on terminal
no evidence of corrosion or fluid ingress.

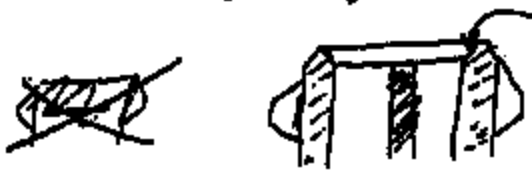
2 black spots near top, part way down
black spots appear to be arcing.

D2. vertical, sealed connector

no orientation tab on this side

connector: ring of moisture on sponge seal. moisture on outside of ring left by switch.

switch: terminals ~~dry~~ a bit of blue on terminal blade cavity dry; except were noted



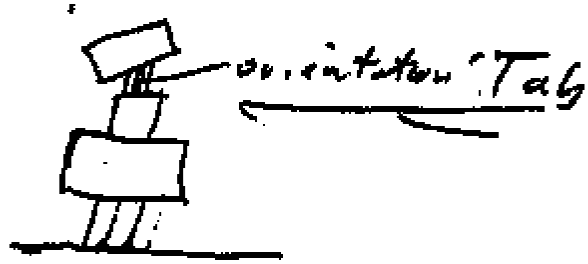
C1 not cocked, vertical

connector: Typical ring of moisture

switch: inside of ~~on~~ blade cavity dry. terminals clean dry. remainder appears from mating connector. ~~some exposure~~ to arc on

C1 continue . some debris appears to be held to the terminal blades by a drop of water (clear liquid)

C2



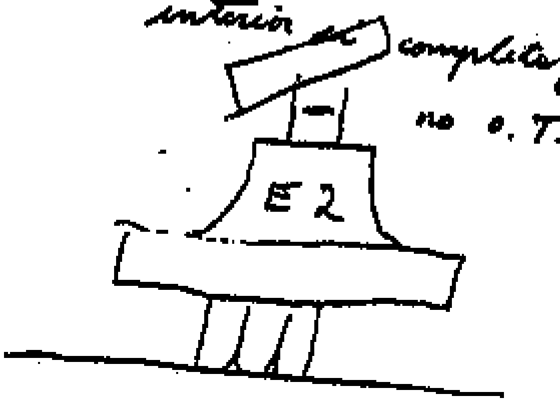
~~intrusion of fl~~

blade cavity soaked w/ water.
blades wet
plastic wet

mating connector wet at seal interface

E2 soaked vertical

interior ~~is~~ completely soaked



switch & terminals are completely soaked

F2 not soaked vertical

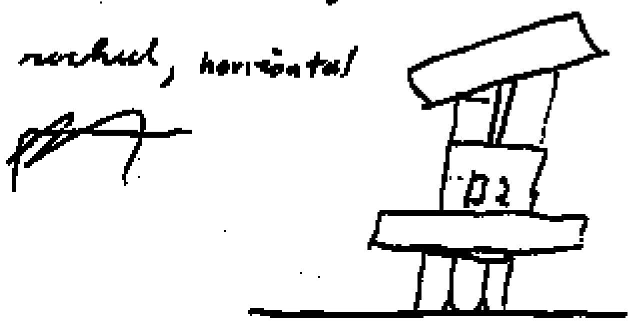
mating connector wet. switch wet.

basically, the cavity was soaked. corrosion evident

E1 & F1 vertical not rocked.

Both looked dry no microscope exam done. The locking tab on E2 broke during removal.

B2 rocked, horizontal



top view

water on outside ~~surf~~ locking tab surface on top of interior wall, opposite side water is present. This is deeper, water seemingly pool!

at terminal tips, ~~now~~ on the top surface, many spots are visible as well as corrosion.

B1 ~~not~~ rocked, horizontal

switch & connector appear dry, microscopic ~~---~~ ~~--~~ evaluation revealed that some corrosion is on the terminal

a colored ~~thread~~ bottom too. thread is at the terminal

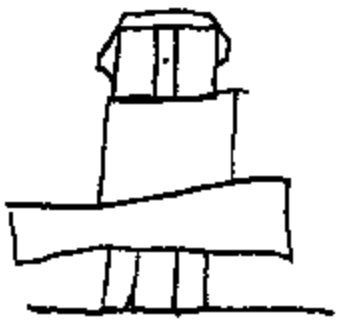
A1 ~~not~~ rocked. horizontal

wet. horizontal face between connector & switch The switch is dry & no evidence of

A1 continued

corrosion on terminal / blade
connector in obvious wet compression ring

A2 water has to get inside connector



one residual corrosion is present on this terminal near the tip

— PHOTOS OF APPLICATION... MODIFY & [illegible] SIMULATE

(ANNY) (WHAT) WHAT PART USED WHERE? FAILURES?
TIER 1

DOG BONES (WHAT) — CELERITY 430/33V6 / NOISY IGNITION TESTS [illegible]
• ΔS, • [illegible], • [illegible] THEN, [illegible] NOT BURN

— CYCLE PROFILE OF TESLA FOR WETBULL
• [illegible] COMPARED TO VEHICLE DATA...
• RATE OF [illegible]

— SOME CONTRIBUTORS.... UTA? ....ΔT, ΔP

0 → 300 [illegible] .34
0 → 410 [illegible] .74

[illegible] — TEST CONDITIONS FROM TESLA ← [illegible] / [illegible]
[illegible]

★ — A. HOPKINS ANALYSIS OF [illegible] TEST

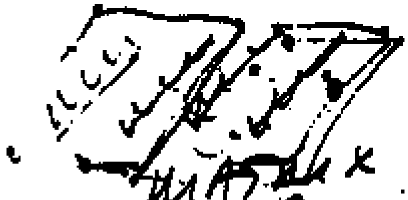
— AOE UPDATE ← WETBULL [illegible] QUIET / WETBULL OF NOISY

→

— COPY OF WARRANTY DATA
— COPY OF [illegible] MATRIX
—

BRIAN — BRAKE FLUID & SALT TESTING (43CC)

2008 [illegible]



✓ TEST PROFILES UPDATE - ARIZ

✓ RESOLVE OOZ PLANS - STEVE
- DISPOSITION - 4-H2O
- NEW OUT
- H2O

- PLASTIC PRODUCTS UPDATE - STEVE
✓ - HIGHER TEMP - RAN BRYAN
✓ - FIND SPECS

- SALT VS OTHER IONS - STEVE / AL
- SALT - WHAT IS ALKYLIC
- BRAKE FLUID INHIBITORS - ? DAVID
- GIVE VS OLD FLUID - 92 EXPLAIN

- PRESENTATION WEEDS - ANDY
- COIL ISSUE (IV)
- LAYMENS EXPLAIN.

- TEST / IGNITION PRODUCTS
- VIDEO TAPE ✓ - STEVE
- FLEW THINGS ✓

~~- 93 PLS -~~

- SYS FAILED... WHY PARTNERS?
- ALT UNK - MC ARM →
- SWITCH - GOLD PLATE

TI-NHTSA 014437

Date

CROWN Height | 10/3/44

77MS 2-1 : -27, -28
" 3-1 : -35, -41
4-1 : -35, -41
} 36656

Measurements

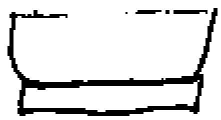
77MS Discs

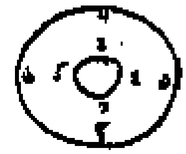
		CROWN
36656 - 27	1	.0297
	2	.0295
	3	.0300
	4	.0299
	5	.0299
-28	1	.0311
	2	.0309
	3	.0307
	4	.0311
	5	.0311
-35	1	.0276
	2	.0277
	3	.0273
	4	.0275
	5	.0274
-41	1	.0294
	2	.0290
	3	.0291
	4	.0291
	5	.0291

Sample Cup

	77PSL2-1	Pot 1	09/03/99

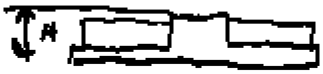
Measured (3) unused units
placed on spacer
→ zeroed on converter

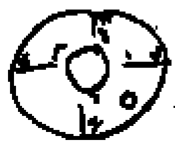




	1	2	3	4	5	6	7	8
S1	-.0030	-.0029	-.0012	-.0030	-.0031	-.0060	-.0037	-.0045
S2								
S3								

77PSL2-1





Slight pressure applied by a wobble on cup

Sample	H	1	2	3	4	5	6	7	8
S1	.1955	.1948	(.1947)	.1957	.1964	.1950	.1957	.1945	.1950
	.1884	.1946	.1960	.1942	.1962	.1950	.1954	.1952	.1862
	.1883	.1949	(.1964)	.1954	.1962	.1959	.1959	.1945	.1851
S2	.1890	.1953	.1949	.1854	.1953	.1952	.1956	.1962	.1865
	.1890	.1856	.1847	.1851	.1959	.1957	.1955	.1962	.1862
	.1890	.1853	.1956	.1858	.1968	.1956	.1961	.1857	.1862
S3	.1890	.1857	.1960	.1862	(.1979)	.1959	.1967	.1959	.1967
	.1890	.1862	.1965	.1962	.1977	.1958	.1963	.1960	.1864
	.1899	.1959	.1964	.1958	(.1967)	.1959	.1964	.1963	.1972

better control of wobble ↓

77PSL4-1

Sample	H	1	2	3	4	5	6	7	8
S1	.1957	.1938	.1953	.1935	.1938	.1936	.1939	.1941	.1947
	.1956	.1941	.1952	.1937	.1945	.1836	.1939	.1935	.1940
	.1956	.1936	.1947	.1942	.1949	.1937	.1940	.1939	.1941
		Avg .1939	.1950	.1939	.1944	.1936	[illegible]	[illegible]	[illegible]
S2	.1955	.1940	.1942	.1936	.1942	.1939	.1942	.1941	.1945
	.1954	.1941	.1950	.1940	.1949	.1943	.1949	.1938	.1944
	.1954	.1938	.1949	.1934	.1939	.1934	.1938	.1932	.1936
S3	.1950	.1929	.1932	.1929	.1927	.1931	.1939	.1935	.1920
	.1950	.1929	.1934	.1925	.1924	.1927	.1932	.1930	
	.1950	.1927	.1930	.1926	.1922	.1928	.1932	.1930	

77PS Vacuum Dependency Matrix

TI Part Number	# sorted	fell out	% fell out	disc type	sus PT#	sus height
77PSL2-1	1190	0	0.00	snap	27713-1	.090 - .092
77PSL2-3	no inventory			snap		
77PSL3-1			#DIV/0!	quiet	27713-1	.090 - .092
77PSL3-2	14000	18	0.13	quiet	27713-1	.090 - .092
77PSL3-3	1000	0	0.00	quiet	27266-1	.083 - .088
77PSL3-4	no inventory			quiet		
77PSL4-1			#DIV/0!	quiet	27713-2	.086 - .088
77PSL8-2	no inventory			quiet	27713-2	.086 - .088
77PSL8-1	no inventory			quiet	27713-2	.086 - .088

10:22 AM12/10/99

77PSL2-1 Return Analysis Sheet (Revised for Ford RTNs)

Revised 10/00

Device ID: ________ Date: ______ Ford Part # ________

Operator's Name: ________ Sw Date Code: ______ Technician ________

Vin #: ____________________

1 Visual Inspection
General condition of Switch: Good Bad
Signs of leakage into connector? No Yes
Mating connector seal? Foam Silicone
compression? Yes No
Wire Harness returned? Yes No
Wire insulation compression?

2 Extract fluid from pressure port.
Actuation psi
Release psi
Creep time mSecs
Leak during cal check? Yes No

3 Current draw :
Terminal to Terminal? Ohms
Terminal to Hexport? mA 14 Vdc supply Current limited to 10 amps.

4 STOP for engineering review.

4 Open Crimp Ring

5 Visual Inspection
Connector Leak? No Yes
Component wear? None Light Medium Heavy
EP leak? No Yes
Environment seal condition? Good Bad
If seal bad, Why?
Corrosion? Yes No
Pictures

6 Leak Test Sensor Asm. Pass Fail

7 Open Cup Crimp.

8 Diaphragm Inspection

	Nearest Fluid			Middle			Nearest Connector		
	Fluid	#1	Connector	Fluid	#2	Connector	Fluid	#3	Connector
	Teflon	Kapton	Teflon	Teflon	Kapton	Teflon	Teflon	Kapton	Teflon
Teflon stretch									
Teflon cracks									
Teflon delamination									
Kapton cracks									
Stretch pattern									
Wear marks/discoloration									

9 Gasket Inspection
Present Yes No
Nicks/missing material Yes No
Gasket thickness ______ inches
______ inches
______ inches

10 Package and Store

77PSI-2-1 Return Analysis Sheet

Device ID: _____ Date: _____ Ford Part # _____

Operator's Name: _____ Svr Date Code: _____ Technician _____

1 Visual Inspection

General condition of Switch:	Good		Bad
Signs of leakage into connector?	No		Yes
Mating connector seal?	Foam	Silicone	
compression?	Yes	No	
Wire Harness returned?	Yes	No	
Wire Insulation compression?			

2 Current data:

Terminal to Terminal?	Ohms	
Terminal to Housing?	mA	14 Vdc supply Current limited to 10 amps.

3 Open Oring Ring

4 Visual Inspection

Connector Leak?	No		Yes		
Component wear?	None		Light	Medium	Heavy
EP leak?	No		Yes		
Environment seal condition?	Good		Bad		
If seal bad, Why?					
Corrosion?	Yes		No		
Fixture					

5 Leak Test Sensor Asm. Pass Fail

6 Open Cup Crimp.

7 Diaphragm Inspection

	Nearest Field			Middle			Nearest Converter		
	Field	#1	Converter	Field	#2	Converter	Field	#3	Converter
	Yellow	Kaptan	Yellow	Yellow	Kaptan	Yellow	Yellow	Kaptan	Yellow
Yellow splash									
Yellow crystal									
Yellow discoloration									
Kaptan crystal									
Kaptan splash									
Water contamination									

8 Gasket Inspection

Present	Yes	No
Nibbled/missing material	Yes	No
Gasket thickness	_____ inches	
	_____ inches	
	_____ inches	

9 Package and Store

10 Analysis Summary: NTF Issue Discovered

TABLE USED FOR REFERENCE ONLY

1 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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