PRESSURE SWITCH DATA Form 21605 TEST NO. 175-03-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
TPS	10/30/91	Steve Officer	

PERFORMED BY	DATE STARTED	DATE COMPLETED	APPROVED BY
Jeffrey D. DeProfio	11/19/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Attempt to control the cleaning and wetting of the Kapton.

PROCEDURE: Used

- All use Ø cut washers for quick results
- All crimped on AMP
- Counter @ Ø

Initial

Device #	Keypart	Kapton	Act/Rel					Failure	Suspend
175-03-01	Standard	Square	115/69						
-02			142/61						
-03			128/68	154.6	54.6				
-04			138/59	9.3	1.7				
-05			136/60						
-06			137/57						
175-03-07	standard	Round	159/88						
-08			159/87						
-09			146/84	156.0	85.3				
-10			168/90	9.1	1.8				
-11			151/89						
-12			166/84						
175-03-13	.003" step	Round	149/87						
-14			159/93						
-15			159/86	152.0	82.2				
-16			146/84	5.9	4.7				
-17			149/78						
-18			164/75						
175-03-19	.005" step	Round	151/85						
-20			156/83	148.8	86.0				
-21			149/75	4.7	9.2				
-22			158/78						
-23			142/73						
-24			147/76						

Device #	Airgap	Kapton	act/rel					Failure	[illegible]
179-03-25	.012" Dap	[illegible]	149/91						
-27	↓	↓	157/85						
-27	↓	↓	154/87	153.8	87.3				
-28	↓	↓	155/89	3.3	2.9				
-29	↓	↓	157/80						
-38	↓	↓	151/93						

TI-NHTSA 003391

PRESSURE SWITCH DATA Form 21605 **TEST NO.** 179-03-30

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
77 PS	10/30/91	Steve Officer	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey D. DeDonico	11/19/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Attempt to control the clamping and wetting of the Kapton.

PROCEDURE: over

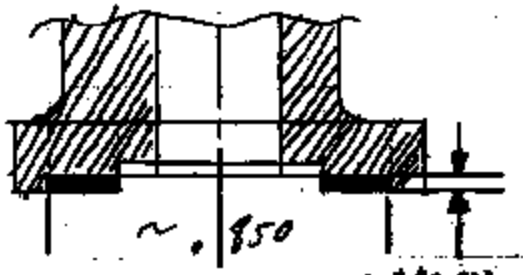
- all use 0 cut washers for quick results
- all crimped on AMP
- Separate @ 0
  COUNTER RESET TO 0 @ 970K
  COUNTER RESET TO 0 @ 1700K TOTAL CYCLES
  " " " " 2002K " "
  Initial 454K Counter reset @ 2545K

Device #	Report	Kapton	Act/Rel	Act/Rel				Failure	Suspended
179-03-01	Standard	Square	136/60					1429K	
-02			142/61					970K	
-03			124/58					1113K	
-04			122/59					1866K	
-05			136/60					1056K	
-06			137/57					1121K	
179-03-07	Standard	Round	159/88					2601K	
-08			154/87					2316K	
-09			160/89					2591K	
-10			148/85					1933K	
-11			151/84	137/72				3347K	
-12			155/84					2245K	
179-03-13	.003" Step	Round	142/87					1672K	
-14			139/83	140/73				2096K	
-15			157/86					2577K	
-16			146/84					1866K	
-17			171/94					2015K	
-18			154/75					1493K	
179-03-19	.005" Step	Round	151/85					2541K	
-20			150/83					4594K	
-21			149/75					2291	
-22			158/78					3661K	
-23			142/83	137/75				2267K	
-24			149/76					2544K	

(OVER)

Modified Kapton Clamps Round Kapton

* Modify Hexports



NTS

Qty: 10 each

* Build into devices w/ full round Kapton.
  Include control lots w/ round and square Kapton.

* Cut leads off 2 of each to examine Kapton wetting. This information will be used in determining which, if not all, groups will be impulsed.

* Impulse to failure

JAD 11/20/91

ROUND KAPTON TEST TEST 178-03-30 JAD 1/2/92

DEVICE #	HEXPORT	KAPTON	INITIAL ACT /REL	454K CYC. ACT /REL	CYC. TO FAILURE
178-03-01	STANDARD	SQUARE	136 / 60		1424K
178-03-02	STANDARD	SQUARE	145 / 61		970K
178-03-03	STANDARD	SQUARE	134 / 62		1113K
178-03-04	STANDARD	SQUARE	133 / 59		1866K
178-03-05	STANDARD	SQUARE	136 / 60		1056K
178-03-06	STANDARD	SQUARE	137 / 57		1131K
178-03-07	STANDARD	ROUND	154 / 88		2601K
178-03-08	STANDARD	ROUND	154 / 87		2316K
178-03-09	STANDARD	ROUND	160 / 84		2591K
178-03-10	STANDARD	ROUND	162 / 85		1933K
178-03-11	STANDARD	ROUND	151 / 84	137 / 72	2247K
178-03-12	STANDARD	ROUND	155 / 84		2245K
178-03-13	.003" STEP	ROUND	149 / 87		1672K
178-03-14	.003" STEP	ROUND	159 / 83	140 / 73	2096K
178-03-15	.003" STEP	ROUND	157 / 86		2577K
178-03-16	.003" STEP	ROUND	146 / 84		1866K
178-03-17	.003" STEP	ROUND	147 / 78		2015K
178-03-18	.003" STEP	ROUND	154 / 75		2083K
178-03-19	.005" STEP	ROUND	151 / 85		254K
178-03-20	.005" STEP	ROUND	150 / 83		454K
178-03-21	.005" STEP	ROUND	147 / 75		2631K
178-03-22	.005" STEP	ROUND	156 / 78		2661K
178-03-23	.005" STEP	ROUND	142 / 83	137 / 75	2267K
178-03-24	.005" STEP	ROUND	147 / 76		2544K
178-03-25	.007" STEP	ROUND	149 / 81		294K
178-03-26	.007" STEP	ROUND	157 / 85	139 / 75	2441K
178-03-27	.007" STEP	ROUND	154 / 83		105K
178-03-28	.007" STEP	ROUND	155 / 88		1693K
178-03-29	.007" STEP	ROUND	157 / 80		2222K
178-03-30	.007" STEP	ROUND	151 / 83		2225K

PRESSURE SWITCH DATA Form 21605 **TEST NO.** 179-15-28

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
7715	11/20/91	Steve Offiler	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey DiBenedetto	11/21/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Asymmetric Crimp Study

PROCEDURE:

Device #		Next	Air Leak Test
179-15-01		1	Yes
-02	Pressure	2	
-03	Actuation	3	
-04	Paper	4	
-05		5	
-06		6	
-07		7	
-08		8	
-09		9	
-10		10	
-11		11	
-12		12	
-13		13	
-14		14	
-15		15	
-16		16	
179-15-17		17	Yes
-18	Tear down	18	
-19	relative	19	
-20	to	20	
-21	variation	21	
-22	in crimp	22	
-23	test	23	
-24		24	
179-15-25	Possible	25	No
-26	Tear down	26	
-27	Formation	27	
-28	Inspection	28	

TI-NHTSA 003396

(OVER)

ASYMMETRIC CRIMP STUDY

PURPOSE: To attempt to correlate teardrop formation with asymmetry in the crimp procedure, which possibly arises from deflections of the table / "C" frame, and possibly manifests itself as measurable differences in sensor height and/or diameter around the circumference.

SCOPE: Four areas of information will be explored: presence of teardrop, height and diameter of crimp, and pressure sensitive paper readings, all correlated with position; and crimp without air-blast to examine the Kapton before it is wetted.

PROCEDURE:

- Place an indelible mark on the outer circumference of 28 Pass Car cups, which will be used to align the uncrimped sensor assemblies in the crimper dial (mark pointing towards center of dial).

- Cut 16 sets of pressure-sensitive paper by tracing a washer with an X-acto knive. Place small marks on the outer surface for alignment with hexports and cups.

- Place alignment marks on the outer edge of 16 hexports, and kit sensors with pressure paper between Kapton and washer. Align marks on hexport, paper, and cup.

- Kit another 12 sensors normally, with the marked cups.

- Crimp all 16 pressure paper parts on AMI. Record which nest was used for each (the nests are numbered on the dial 1 thru 8 with a marker). We will use these to look for nest-to-nest variations.

- Crimp 8 of the 12 normal sensors, recording which nest was used.

- Disable air blast and crimp the 4 remaining sensors (or, remove them from dial before the air blast station). Nest info not important.

- Decrimp the pressure paper parts. Examine the pressure paper for evidence of asymmetric crimp relative to the mark, as well as for nest-specific variations.

ASYMMETRIC CRIMP STUDY

- Lathe cut the hexports on the other 12 devices.

- Look for teardrop on the 8 air-blast parts and location relative to the mark. Also, look for nest-related correlations between these and the pressure paper results. If no teardrops show up, we'll need to rebuild this portion of the test.

- On 8 air-blast parts, place small marks around the outer circumference at 45 degree intervals beginning with original cup mark. Measure the crimp height at each of these points with a dial indicator, and take four diameter readings across 1-5, 2-6, 3-7, and 4-8.

- Examine the parts with no air blast to get an idea of the shape/condition of the Kapton before it ever sees any pressure. Look for any evidence of the beginnings of teardrop, as a function of the precrimp or crimp processes.

Nest 1

179-15-01 179-15-09

Nest 2

179-15-07 179-15-12

Nest 3

179-15-10 179-15-11

Nest 4

179-15-01 179-15-12

Nest 5

179-15-05 179-15-13

Nest 6

179-15-01 179-15-14

Nest 7

179-15-03 179-15-15

Nest 8

179-15-05 179-15-16

Center of Pad

Test 179-15-08

Asymmetric Crisp Study

TI-NHTSA 003398

PRESSURE SWITCH DATA Form 21605 TEST NO. 175-03-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
77 PS	10/30/91	Steve Officer	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey D. Dierdorf	11/1/91		

PROJECT TITLE: Ford AX '91 Electronic Speed Control Duty cycle PS

CUSTOMER:

PURPOSE OF TEST: Attempt to control the cleaning and wetting of the Kapton.

PROCEDURE: over

- all use of cut washers for quick results
- all crimped on AMP
- counter @ 0.

COUNTER RESET TO 0 @ 970K
COUNTER RESET TO 0 @ 1700K TOTAL CYCLES
" " 2122K " "

Total 454K Counter reset @ 2545K

Device #	Harness	Kapton	Act/Rel	Act/Rel				Failure	Sig. Change
175-03-01	Standard	Space	136/60					1424K	
-02			145/61					970K	
-03			134/68				5.3	1113K	
-04			133/59				1348	1866K	
05			136/60				99.67%	1056K	
-06			137/57					1131K	
179-03-07	standard	Round	154/88					2601K	
-08			154/87					2314K	
-09			146/84				102	2591K	
-10			148/85				2428	1933K	
-11			151/84	137/76			99.[illegible]%	2247K	
-12			155/84				(0.586K)	2245K	
175-03-13	.063" Slot	Round	149/87					1672K	
-14			159/83	140/73			8.9	2096K	
-15			150/86				2170	2572K	
-16			146/84				[illegible]	1866K	
-17			140/78				[illegible]	2015K	
-18			154/75				99.9982%	2091K	
176-03-19	.063" Slot	Round	151/85					254K	
-20			150/83				12.8	454K	
-21			149/75				2144	≈2725	2817K
-23			158/78				99.99999	2661K	
-21			142/83	137/75			(0.661)	2267K	
-39			147/76					2548K	

Device #	[illegible]	[illegible]	unit [illegible]					Failure	[illegible]
175-01-25	[illegible]	[illegible]	149/191					294K	
-31	↓	↓	150/85	179/75				2441K	
-32			154/87				6.4	105K	
-35			155/89				2286	1693K	
-29			157/80					2222K	
-38			151/97				99.994%	2225K	

AVERALL FOR 19 DEVICES FROM ALL AND KAPTON GROUPS →

9.2
2350
99.9999 %

Ford Motor Company
17000 Oakwood Blvd.
P.O. Box 1586-D-2015
Dearborn, Michigan 48121

October 31, 1991

Attn: Mr. Mark Scholler

Subj: Initial ISR Submission NOSC Deactivation Switch
Ford Part Number F3TA-9F924-AA Light Truck Series
1.85 - 2.06 Dimensional Discrepancy
PIST/PIPC Data For F2VC-9F924-AB

Ref: My September 25, 1991 Letter

Dear Mark,

My initial September 25, 1991 letter noted a discrepancy on the 1.85 - 2.06 dimension due to an error in transferring that dimension from the envelope drawing to the component drawing.

Enclosed, please find our subsequent measurements for the 1.85 - 2.06 dimension and some sample bases from each of the four corrected base mold cavities. We have also included the PIST/PIPC data for the F2VC-9F924-AB switch.

Please let me know if you have any questions or if I may be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Andy McGuirk, MS 12-27
Joe Schuck, TI Farmington Hills, Michigan

encl: 1.85 - 2.06 Measurements
Sample bases
PIST/PIPC Data

(Rev 0, 10/31/91)

Ford Part Number NGSC Deactivation Switch

Base Measurements (Dimension Specification 1.85 - 2.06)

Part Number F2VC-9F924-AB

Cavity	Sample #1	Sample #2
A	1.92	1.94
B	1.99	1.98
C	2.00	1.98
D	1.99	1.97

Part Number F3TA-9F924-AA

Cavity	Sample #1	Sample #2
A	1.92	1.95
B	1.99	1.97
C	2.00	1.98
D	1.97	1.97

(Rev 0, J. Watt, 10/31/91)

cc= Elaine R.
fyi / comments
Thx,
Jim W

Ford Motor Company
17000 Oakwood Blvd.
P.O. Box 1586-D-2015
Dearborn, Michigan 48121

October 31, 1991

Attn: Mr. Mark Scheller

Subj: Initial ISR Submission NGSC Deactivation Switch
Ford Part Number F3TA-9F924-AA Light Truck Series
1.85 - 2.06 Dimensional Discrepancy
PIST/PIPC Data For F2VC-9F924-AB

Ref: My September 25, 1991 Letter

Dear Mark,

My initial September 25, 1991 letter noted a discrepancy on the 1.85 - 2.06 dimension due to an error in transferring that dimension from the envelope drawing to the component drawing.

Enclosed, please find our subsequent measurements for the 1.85 - 2.06 dimension and some sample bases from each of the four corrected base mold cavities. We have also included the PIST/PIPC data for the F2VC-9F924-AB switch.

Please let me know if you have any questions or if I may be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
[redacted] McGuirk, MS 12-27
[redacted]huck, TI Farmington Hills, Michigan

encl: 1.85 - 2.06 Measurements
Sample bases
PIST/PIPC Data

(Rev 0, 10/31/91)

PRESSURE SWITCH DATA Form 21605 TEST NO. 175-15-12

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
Colt	10/19/91	Steve Officer	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey Dilmenico	11/19/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Reactivate PS

CUSTOMER:

PURPOSE OF TEST: Next Page

PROCEDURE: Pass - Cal. Sensors hand built and crimped on hand line

TORQUE TESTING

Sensor #	Harness	Buss				10.10		10.21	
175-15-01	10.21	7900				4.37		53	
-02		8100				38		51	
-03		7900				41		47	
-04		8100				42		56	
-05		8000				41		48	
-06		8100				41		57	
						42		43	
175-15-07	20.90	7600				39		54	
-08		7800				47		56	
-09		7800				46		51	
-10		7800							
-11		7700							
-12		7600							

PRESSURE SWITCH DATA Form 21605 **TEST NO.** 172-15-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
77PSL 2-1	11/1/91	Steve Offiley	

PERFORMED BY	DATE STARTED	DATE COMPLETED	APPROVED BY
Jeffrey DiDomenico	11/1/91		

PROJECT TITLE: Ford MY'92 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Rerun of validation testing which failed the first time.

PROCEDURE: Impulse and Fluid Res./Impulse test per Ford ES. Parts crimped on head-line.

118/ 48 / 51 Lower pressure = higher wetted area?

Device #	Build date	Act/Rel	Hr Drop	Current Leakage A	B	C	Proof		
172-15-01	9/11/62	113/42	5.9	1.37 mA	1.50 mA	1.66 mA	Pass		
-02		116/41	6.0	1.85	1.46	1.67			
-03		119/41	6.4	1.93	1.44	1.69			
-04		119/45	4.6	1.91	1.46	1.67			
-05		115/43	4.7	1.83	1.47	1.70			
-06		120/49	4.2	1.92	1.57	1.71			
-07		124/42	5.4	1.85	1.51	1.70			
-08		113/44	3.1	1.92	1.47	1.72			
-09		125/41	5.6	1.912	1.45	1.71			
-10		120/47	5.7	1.91	1.48	1.70			
-11		111/50	4.3	1.91	1.48	1.71			
-12		124/47	3.5	1.91	1.47	1.71			
172-15-13	9/8/62								
-14									
-15									
-16									
-17									
-18									
-19									
-20									
-21									
-22									
-23									
-24									

PRESSURE SWITCH DATA Form 21605 TEST NO. 172-15-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
77 PSL 2-4	11/1/91	Steve Offield	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey DiBenedetto	11/2/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Deactivate #5

CUSTOMER:

PURPOSE OF TEST: Rerun of Validation testing which failed the first time

PROCEDURE: Impulse and Fluid Res./Impulse test per Ford ES parts crimped on hand-tool

Device #	Build date	Act/Rel	Mr Drop	A	B	C	Proof	
172-15-01	9/11/92	113/42	5.9	1.97 mA	1.50 mA	1.66 mA	Pass	
02		116/41	6.0	1.95	1.96	1.62		
03		118/41	6.7	1.92	1.94	1.68		
04		119/45	4.6	1.91	1.96	1.69		
05		115/43	4.7	1.83	1.97	1.72		Fluid Res.
06		110/39	6.2	1.92	1.61	1.71		
07		124/42	5.9	1.95	1.51	1.70		and Impulse
08		113/44	3.1	1.93	1.97	1.73		
09		125/41	5.6	1.90	1.45	1.71		
10		120/42	5.7	1.91	1.99	1.76		
11		113/50	4.3	1.91	1.98	1.71		
12		114/47	3.5	1.91	1.92	1.71		
172-15-13	9/10/92	108/42	2.7	1.58	1.34	1.74	Pass	
14		114/42	4.5	1.61	1.37	1.77		
15		125/45	2.7	1.78	1.43	1.71		
16		111/42	4.4	1.58	1.38	1.88		
17		119/51	2.7	1.58	1.76	1.86		
18		124/49	3.1	1.67	1.91	1.85		
19		118/53	2.7	1.60	1.37	1.93		Impulse
20		120/47	3.2	1.67	1.38	1.86		
21		108/47	3.6	1.68	1.70	1.85		
22		124/42	2.2	1.63	1.41	1.79		
23		119/45	4.1	1.93	1.42	1.84		
24		119/43	3.9	1.74	1.45	1.79		

(OVER)

TI-NHTSA 003407

PRESSURE SWITCH DATA Form 21605 **TEST NO.** 173-15-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
7785L2-1	11/1/91	Steve officer	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey D'Onofrio	11/2/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Begin of Validation testing which failed the first time

PROCEDURE: Impulse test and Fluid Res/Impulse test per Ford ES. All parts crimped on ATE.

Device #	Build Date	Act/Rel	Hysteresis	Contact Leakage A	B	C	Proof		
173-15-01	9/10/92	121/57	3.9	1.98	1.50	1.72	Pass		
-02		124/57	6.3	1.93	1.49	1.72			
-03		125/52	5.3	1.84	1.52	1.78			
-04		122/57	4.3	1.96	1.54	1.79			
-05		129/56	3.6	1.86	1.52	1.77			
-06		120/49	4.1	1.93	1.50	1.74		Fluid Res.	
-07		124/59	4.4	1.93	1.52	1.75			
-08		125/59	4.1	1.72	1.49	1.74		and Impulse	
-09		129/52	4.3	1.84	1.50	1.75			
-10		123/57	5.0	1.96	1.51	1.75			
-11		121/54	4.8	1.88	1.52	1.78			
-12		119/53	6.2	1.92	1.50	1.79			
173-15-13	9/11/92	121/55	3.3	1.70	1.76	1.79	Pass		
-14		122/57	2.9	1.70	1.44	1.76			
-15		119/61	9.3	1.60	1.36	1.81			
-16		125/61	4.0	1.75	1.46	1.84			
-17		122/55	7.1	1.70	1.41	1.69			
-18		115/50	3.9	1.44	1.34	1.83			
-19		128/57	9.3	1.67	1.42	1.82		Impulse	
-20		122/62	2.9	1.67	1.46	1.82			
-21		118/53	3.9	1.59	1.38	1.79			
-22		118/51	4.2	1.74	1.47	1.75			
-23		119/60	5.9	1.57	1.34	1.82			
-24		119/52	8.8	1.53	1.33	1.90			

TI-NHTSA 003409

[OVER]

PRESSURE SWITCH DATA Form 21605 TEST NO. 172-11-14

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
77 PSL 2-9	11/1/91	Steve Offinger	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey DiBernardo	11/6/91		

PROJECT TITLE: Ford MT'92 Electronic Speed Control Development ES

CUSTOMER:

PURPOSE OF TEST: Retest of Validation testing which failed the first time

PROCEDURE: Leakage and Fluid Res/Impulse test per Ford ES Parts Crimped on hand-tool

Device #	Date Tested	Act/Rel	No Prod	A	B	C	Proof
172-11-01	9/10/92	123/43	5.9	1.97-A	1.50-A	1.66-A	Pass
-02		116/41	6.0	1.85	1.46	1.67	
-03		118/41	6.4	1.92	1.44	1.69	
-04		118/45	4.6	1.81	1.46	1.69	
-05		115/43	4.7	1.82	1.47	1.72	
-06		120/44	4.2	1.91	1.51	1.71	
-07		124/42	5.9	1.95	1.51	1.70	
-08		113/44	2.1	1.97	1.47	1.72	
-09		125/41	5.6	1.90	1.45	1.71	
-10		120/42	5.7	1.91	1.49	1.74	
-11		113/50	4.3	1.91	1.48	1.71	
-12		124/47	3.3	1.91	1.47	1.71	
172-11-13	9/10/92	119/42	2.7	1.58	1.39	1.74	Pass
-14		116/42	4.5	1.61	1.37	1.77	
-15		125/45	2.7	1.78	1.43	1.71	
-16		111/42	4.4	1.58	1.38	1.88	
-17		118/51	2.3	1.58	1.36	1.86	
-18		124/48	3.1	1.69	1.41	1.85	
-19		119/53	2.3	1.60	1.37	1.93	
-20		120/47	3.2	1.67	1.39	1.96	
-21		120/47	3.6	1.81	1.40	1.95	
-22		124/42	3.3	1.63	1.41	1.79	
-23		119/45	4.1	1.75	1.42	1.89	
-24		119/42	3.4	1.74	1.43	1.79	
		118.2 44.1 45.6 3.1					
		2.0 1.7					

TI-NHTSA 003411

PRESSURE SWITCH DATA Form 21605 **TEST NO.** 123-15-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
77852-1	11/1/91	Steve Officer	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey DiGeorgio	11/2/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Perform of Validation testing which failed the first time

PROCEDURE: Impulse test and Fluid Res/Engine test per Ford ES. All parts crimped on AMP.

122.8 58.1
2.7 1.3 HIGHER PRESSURE = SMALLER WETTED AREA ?

Device #	Build Date	Act/Rel	Avdrop	Current at Leakage A	B	C	Proof
123-15-01	9(10C)	121/57	2.9	1.90	1.50	1.72	Base
-02		124/52	6.3	1.92	1.49	1.72	
-03		125/52	5.3	1.84	1.52	1.78	
-04		123/57	4.3	1.86	1.54	1.79	
-05		129/56	3.6	1.88	1.52	1.77	
-06		120/48	4.1	1.93	1.50	1.74	
-07		122/59	4.4	1.93	1.51	1.75	
-08		125/59	4.1	1.72	1.48	1.74	
-09		124/52	4.3	1.84	1.50	1.75	
-10		123/57	5.0	1.96	1.51	1.75	
-11		121/54	4.9	1.88	1.52	1.93	
-12		119/53	6.2	1.92	1.50	1.79	
123-15-13	9(11C)						
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							

(OVER)

TI-NHTSA 003412

PRESSURE SWITCH DATA Form 21605 **TEST NO.** 173-15-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
7785L2-1	11/1/91	Steve Officer	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey DiDonnico	11/2/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Rerun of Validation testing which failed the first time

PROCEDURE: Impulse test and Fluid Res/Impulse test per Ford ES. All parts cleaned to ATI.

Device #	Build Date	Act/Rel	Nudge	Current Leakage A	B	C	Perf		
173-15-01	9/11/92	121/57	7.9	1.90	1.50	1.72	Pass		
-02		114/53	6.3	1.92	1.49	1.72			
-03		115/53	5.3	1.84	1.52	1.71			
-04		122/57	4.3	1.86	1.54	1.79			
-05		118/56	3.6	1.86	1.52	1.77			
-06		120/49	4.1	1.83	1.50	1.74		Fluid	Res
-07		124/59	4.4	1.93	1.52	1.75			
-08		125/59	4.1	1.72	1.48	1.74		and I	mpulse
-09		124/52	4.3	1.84	1.50	1.75			
-10		123/57	5.0	1.96	1.51	1.75			
-11		[redacted]/54	4.8	1.88	1.52	1.73			
-12		[redacted]/53	6.2	1.90	1.50	1.72			
173-15-13	9/11/92	121/55	3.3	1.78	1.46	1.79	Pass		
-14		122/57	2.9	1.70	1.44	1.76			
-15		119/51	9.3	1.60	1.36	1.81			
-16		125/61	4.0	1.75	1.46	1.84			
-17		122/55	7.1	1.78	1.41	1.69			
-18		116/50	2.7	1.44	1.34	1.83			
-19		123/57	4.5	1.67	1.42	1.82		Impulse	
-20		123/62	2.9	1.67	1.40	1.82			
-21		113/55	3.9	1.59	1.38	1.79			
-22		119/51	4.0	1.74	1.49	1.75			
-23		119/60	3.9	1.57	1.34	1.82			
-24		119/52	5.8	1.53	1.33	1.80			
		121.0/56.3							
		4.1 / 4.1							

(OVER)

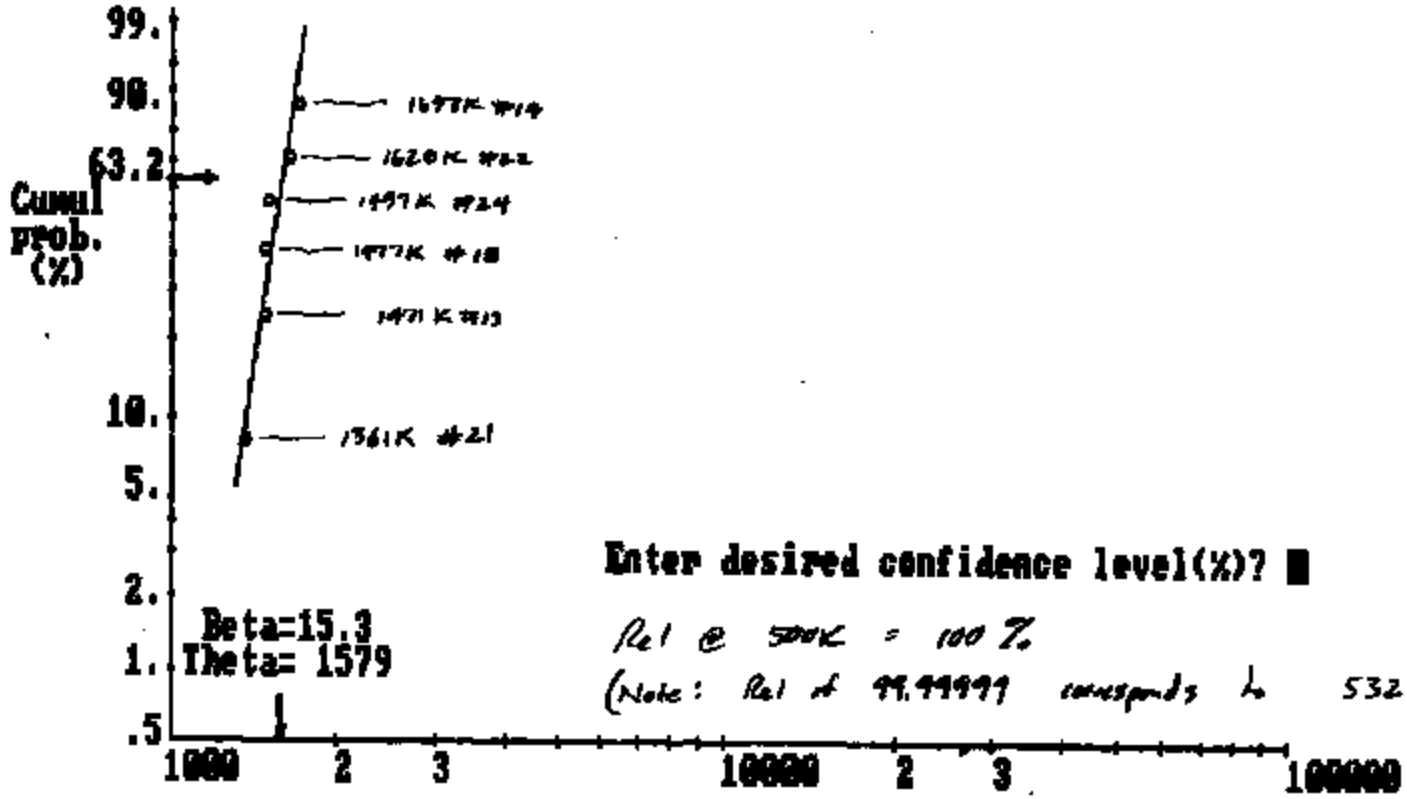
Final Clay

	Proof	Act/Ref	mu Dep	Current Leakage A	B	C
173-15-01						
-02						
-03						
-04						
-05						
-06						
-07						
-08						
-09						
-10						
-11						
-12						
173-15-13	Pass	112/57	2.0	1.60	1.37	1.75
-14	↓	112/60	98.2	1.69	1.42	1.84
-15	↓	114/58	1.5	1.61	1.37	1.90
-16	↓	111/54	93.6	1.45	1.25	1.86
-17	↓	115/55	97.9	1.56	1.35	1.71
-18	↓	105/57	2.3	1.55	1.39	1.89
-19	↓	117/59	93.6	1.49	1.28	1.77
-20	↓	115/61	1.9	1.58	1.36	1.79
-21	↓	112/58	21.4	1.73	1.47	1.78
-22	↓	110/55	47.2	1.58	1.30	1.75
-23	↓	111/56	40.2	1.75	1.48	1.70
-24	↓	110/55	35.1	1.61	1.39	1.69
		113/57.1				
		3.1/2.2				

TEST #173 BLD 911102

6/0 FAIL - 2 SUSP. FOR ANALYSIS #20 & 23 @ 1361K

AMI CRIMP W/ IHL TOOLS



Rel @ 500K = 100 %

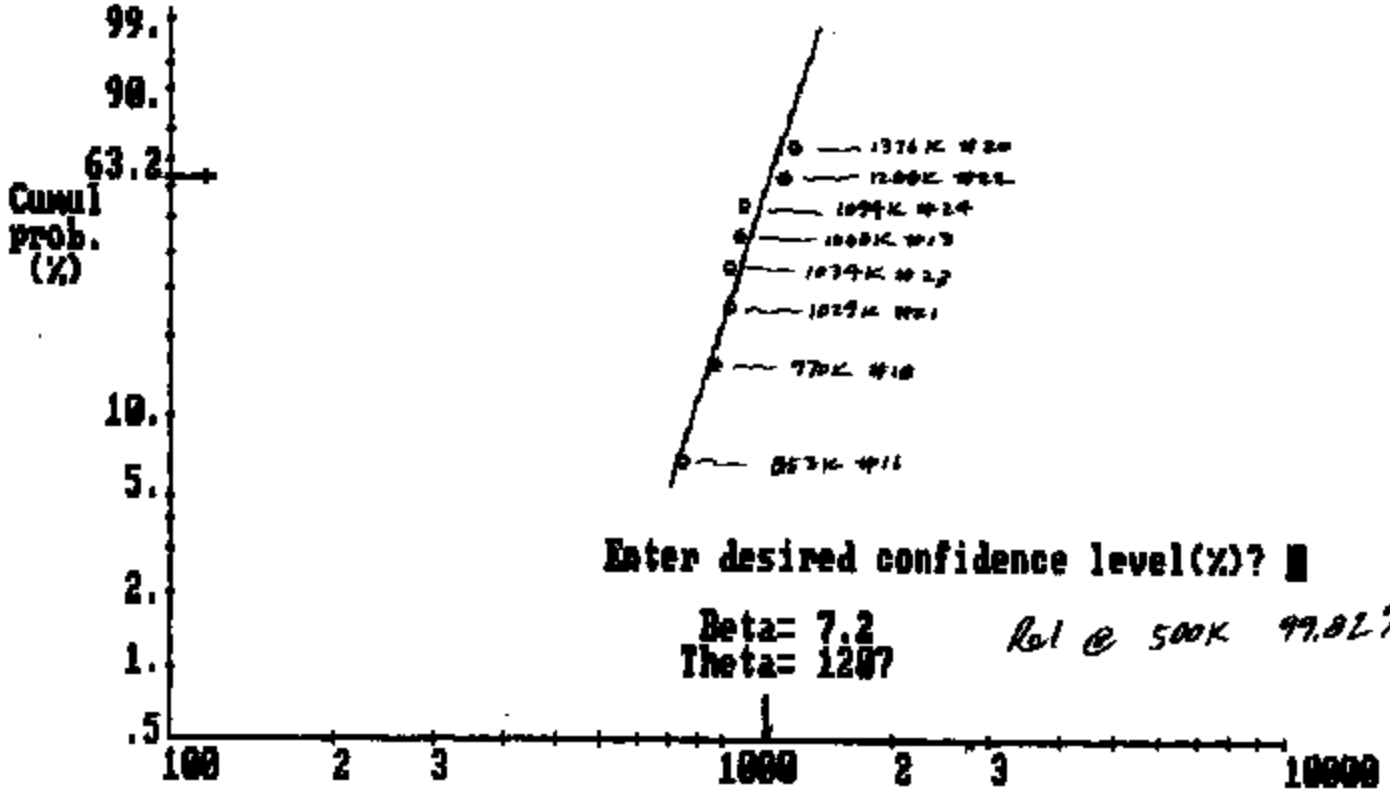
(Note: Rel of 99.99999 corresponds to 532 K cycles)

TI-NHTSA 003415

TEST # 172 ALD 9/11/02

8/10 FAIL - 2 SUSP FOR ANALYSIS #14 & #19 @ 1384 K

HAND-LINE CRIMP



TI-NHTSA 003418

PRESSURE SWITCH DATA Form 21605 TEST NO. 172-03-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
CCPS	11/4/91	Steve Offley	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey O'Bonsaint	11/11/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Brake PS

CUSTOMER:

PURPOSE OF TEST: Cycle to failure validation Intake parts from tests 172-15-24 and 173-15-24

PROCEDURE: Intake per Ford ES antil leak specs

172-15-13 thru -24 : Counter + 525K
173-15-13 thru -18 : counter + 900K

Remaining Parts from 173-15-24: Counter +1971

Device #	Crimp	Lot #		Failure			Suspended
172-15-13	Hand-line	91102		~~1065~~			
-14				—			1546 K
-15			opened - not cycled	~~953K~~			
-16							
-17			opened - not cycled				
-18				~~1160K~~			
-19				—			1361 K
-20				~~1326K~~			
-21				~~1033K~~			
-22				~~1498K~~			
-23				~~1038K~~			
-24				~~1694K~~			
173-15-13	AMP	91091		~~1477K~~			
-14				~~1692K~~			
-15			opened - not cycled				
-16			opened - not cycled				
-17			opened - not cycled				
-18				1732K			
-19			opened - not cycled				1361 K
-20				—			
-21				~~1971K~~			
-22				~~1028K~~			1361 K
-23				—			
-24				~~1477K~~			

(OVER)

HIGHLIGHTS

Steve Offiler
W/E 91-11-01

DIAPHRAGM WIPE:

Results of washer test (using 0 wt Zn plate; 2 wt Zn plate; and 0 wt Ni plate) all crimped on Amp "normal" position:

	LOT	β	θ	
a)	0 wt Ni	2.4	1630	(first fail @ 603K)
b)	2 wt Zn	2.4	1472	(first fail @ 607K)
c)	0 wt Zn	3.3	960	(first fail @ 436K)

Mixed failure modes were apparent from the Weibull graphs;... the first failures seemed to be on a different curve than the latter ones. The above β and θ therefore actually represent averages of the mixed modes combined.

Results of crimp tool swap:

	LOT	β	θ	
a)	Hand-held tools on Amp	10.4	709	— CUT OPEN
b)	Hand-held tools on HL	5.3	670	
c)	Amp tools on Amp	6.6	668	
d)	Amp tools on HL	7.9	540	

Contrary to washer test, mixed modes did not appear to be a factor. It seems that the hand-held tools produce a higher θ, while the Amp produces a higher β. All above used 0 wt washers tested in results of washer test. However, LOT C of washer test should be identical to LOT C of crimp tool swap.

Based on a combination of the views, it would appear that hand-held tools on the Amp dies with 2-wt washers will produce our best shot at good devices. Of course, we still have no concrete idea why.

Jeff DiDomenico has developed a very good hypothesis which explains teardrop formation. He suggests that the washer & header loading is quite possibly asymmetric, leading to greater clamp in some areas and less in others. Those areas clamped less would allow the Kapton to pull out, producing the "point" of the teardrop. We're experimenting with this hypothesis using stepped reliefs in the header combined w/ full-round Kapton.

Using the relatively new technique of cutting away the bezel to observe the top Kapton layer while the device is still fully crimped, we have opened up the worst and best devices from the three weather lots. This was done to attempt to understand the apparent differences in failure mode. Evidence of teardrop shape was fairly subtle, but nonetheless the three low-life parts had a fairly narrow area of perforation, apparently at the peak of the teardrop (but this is questionable, since the teardrop could be a result of the perforation rather than the cause.) In contrast, the high-life parts showed the top layer to be failing uniformly all the way around.

It is unfortunate that we are at our drop-dead point to build ISIR parts, because all indications seem to be pointing to the teardrop as the fundamental problem, and we are only just beginning to understand the cause and remedy to this phenomenon. With Joe Schueck's departure, it might be wise for Marianito to place a call to Orrin Penn to update him on our status and request an extension to our 90-day deadline.

PRESSURE SWITCH DATA Form 21605 **TEST NO.** E-15-6

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
EX3445-16, 20	11/01/91	D CZARN	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
P. Puggise / R. [illegible]	11/05/91		

PROJECT TITLE: TEMP - PRESSURE AGE CYCLING

CUSTOMER:

PURPOSE OF TEST:

PROCEDURE:
① OBTAIN VESSEL VOLUME = 1223.0 CM³
② R134a CHARGE = 75.0 gm
③ OIL = 4.35 gm
④ WEIGH VESSEL
⑤ ADD OIL
⑥ ADD R134a

42 CYCLES OF:
(3) HOURS (MIN) @ -29°C
(1) HOUR (MIN) RAMP UP TO 125°C
(3) HOURS MIN @ 125°C
(1) HOUR (MIN) RAMP DOWN TO -29°C

ID #	VESSEL #	(A) INIT WT	(B) WT + OIL	(C) WT + R134a	(D) WT [illegible]	% CHANGE C-D/C	(E) WT [illegible]	% CHANGE C-E/C	(F) WT [illegible]	% CHANGE C-F/C
PS-209	R1	426.118	431.160	505.024	504.526	0.110	503.888	0.237	503.553	0.501
PST 213	R3	428.982	433.384	508.347	507.860	0.096	507.257	0.214	505.899	0.482
PST 216	R2	428.262	432.282	507.700	441.515	13.024	REMOVED FROM TEST			—
N-1	9	400.927	405.287	480.329	480.300	0.001	480.230	0.015	480.240	0.017
N-2	15	406.308	408.645	483.550	483.531	0.004	483.499	0.013	483.466	0.017
N-3	16	401.260	405.604	480.477	480.449	0.006	480.194	0.059	479.534	0.196

WEIGHT A: VESSEL, SW HOUSING, DECLATOR, ADAPTER (FOR PS - ONLY)
WEIGHT B: WEIGHT A PLUS ~ 4.350 OIL
WEIGHT C: WEIGHT B PLUS R134a CHARGE

TI-NHTSA 003420

11-5-91 VESSEL # R2 HAD TO BE RECHARGED BEFORE TEST DUE TO POSSIBLE LEAK BETWEEN ADAPTER AND VESSEL - [illegible] [illegible].

ID #	Vehicle #	(A) WT @ [illegible]	(B) % Change C-7/C	(C) WT @ [illegible]	(D) % Change C-10	(E) WT @ [illegible]	(F) % Change C-11C
PST 209	A1	501.980	0.615	501.064	0.796	498.424	1.299
PST 215	A1	505.320	0.598	504.399	0.777	501.072	1.286
PST 248	A4	—	—	—	—	—	—
N-1	9	480.181	0.029	480.112	0.043	480.100	0.046
N-2	15	483.489	0.029	483.312	0.045	483.306	0.050
N-3	16	479.191	0.268	478.718	0.342	477.948	0.526

TI-NHTSA 003421

PRESSURE SWITCH DATA Form 21605 TEST NO. 173-15-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
7785L3-1	11/1/91	Steve Officer	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey DiDonnico	11/12/91		

PROJECT TITLE: Ford 01Y '91 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Perform of Validation testing which failed the first time

PROCEDURE: Impulse test and Fluidics/Impulse test per Ford ES. All Parts crimped to AMP

133.8 55.1 HIGHER PRESSURE = SMALLER WETTED AREA?
3.7 7.3

Device #	Build Date	Act/All	Nudrop	Current Leakage A	B	C	Proof		
173-15-01	9/11/92	121/57	7.9	1.98	1.50	1.72	Pass		
-02		124/52	6.3	1.92	1.47	1.72			
-03		115/52	5.3	1.84	1.52	1.79			
-04		122/57	4.3	1.86	1.84	1.79			
-05		129/56	3.6	1.86	1.52	1.77			
-06		120/48	4.1	1.83	1.50	1.74			
-07		121/59	4.4	1.93	1.52	1.78			
-08		125/59	4.1	1.72	1.48	1.74			
-09		124/52	4.3	1.84	1.50	1.75			
-10		123/57	5.0	1.86	1.51	1.75			
-11		121/54	4.8	1.88	1.52	1.73			
-12		119/53	6.2	1.82	1.50	1.73			
173-15-13	9/11/92								
-14									
-15									
-16									
-17									
-18									
-19									
-20									
-21									
-22									
-23									
-24									

PRESSURE SWITCH DATA Form 21605 **TEST NO.** 173-15-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
7785L)-1	11/1/91	Steve Officer	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey D. Decarlo	11/2/91		

PROJECT TITLE: Ford 91Y '91 Electronic Speed Control Description PS

CUSTOMER:

PURPOSE OF TEST: Review of Validation testing which failed the first time

PROCEDURE: Jaguar test and Fluidyne/Engelke test for Ford ES. All parts changed to AMI.

Device #	Build Date	Act/Rel	Hysteresis	Current Leakage A	B	C	Part Type
		132-B 8.7 / 8.9					
173-15-01	91102	121/57	2.9	1.98	1.50	1.72	Base
-02		114/57	6.3	1.92	1.43	1.72	
-03		125/52	5.3	1.84	1.52	1.78	
-04		122/57	4.3	1.96	1.84	1.79	
-05		129/56	3.6	1.96	1.52	1.77	
-06		120/53	4.1	1.91	1.50	1.74	
-07		121/59	4.4	1.93	1.52	1.76	
-08		125/59	4.1	1.77	1.98	1.94	
-09		129/52	4.3	1.84	1.60	1.75	
-10		123/57	5.0	1.96	1.51	1.75	
-11		121/54	4.9	1.88	1.52	1.83	
-12		119/53	4.0	1.82	1.50	1.79	
173-15-13	91102	131/56	3.7	1.78	1.76	1.79	Case
-14		122/57	2.4	1.70	1.44	1.76	
-15		119/61	9.3	1.60	1.36	1.81	
-16		125/61	4.0	1.75	1.46	1.84	
-17		127/55	7.1	1.78	1.41	1.69	
-18		115/50	3.7	1.44	1.34	1.83	
-19		128/57	7.5	1.67	1.42	1.80	
-20		123/62	2.9	1.67	1.40	1.82	
-21		118/55	3.9	1.59	1.38	1.79	
-22		119/51	4.8	1.74	1.43	1.75	
-23		119/60	5.7	1.57	1.29	1.82	
-24		119/52	8.8	1.33	1.33	1.80	
		124.0 56.3					
		9.1 9.1					

PRESSURE SWITCH DATA Form 21605 TEST NO. 175-15-04

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
7785L2-1	11/1/91	Steve office	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey DiDomenico	11/1/91		

PROJECT TITLE: Ford MY '91 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Repeat of Validation testing which failed the first time

PROCEDURE: Impulse test and Fluid Res/Impulse test per Ford ES. All parts crimped to AMP.

Device #	Build Date	Act/Rel	Hysteresis	A	B	C	Part		
175-15-01	31102	121/57	7.9	1.98	1.50	1.72	Fuse		
-02		114/57	6.9	1.92	1.49	1.72			
-03		115/58	5.8	1.84	1.52	1.79			
-04		122/57	7.5	1.96	1.54	1.79			
-05		119/56	3.6	1.96	1.52	1.77			
-06		120/49	4.1	1.93	1.50	1.74		Fluid	Res
-07		121/59	4.4	1.93	1.52	1.75			
-08		125/59	4.1	1.92	1.48	1.74		and Impulse	
-09		120/52	4.3	1.94	1.50	1.75			
-10		123/57	5.0	1.96	1.51	1.75			
-11		121/54	4.8	1.93	1.52	1.73			
-12		119/52	6.2	1.92	1.50	1.73			
175-15-13	9/1/92	121/55	3.3	1.78	1.41	1.79	Fuse		
-14		122/57	2.4	1.20	1.44	1.76			
-15		118/61	9.3	1.60	1.36	1.81			
-16		125/61	9.0	1.75	1.46	1.84			
-17		122/55	7.1	1.70	1.41	1.69			
-18		116/50	5.7	1.44	1.34	1.83			
-19		119/57	7.5	1.63	1.42	1.80		Impulse	
-20		122/62	2.9	1.67	1.40	1.68			
-21		123/55	3.7	1.63	1.38	1.79			
-22		119/51	4.2	1.74	1.43	1.75			
-23		119/60	5.7	1.57	1.29	1.68			
-24		119/52	8.8	1.53	1.33	1.70			
		121.0/56.3							
		91/4.1							

TI-NHTSA 003424

(over)

Final Clar

	Proof	A: 1/R1	mv Dep	A	B	C				
22-15-01										
-02										
-03										
-04										
-05										
-06										
-07										
-08										
-09										
-10										
-11										
-12										
3-45 -13	Acc	112/57	20	1.60	1.37	1.75				
-14		112/60	39.2	1.69	1.42	1.94				
-15		110/58	4.5	1.61	1.37	1.80				
-16		111/54	93.6	1.45	1.25	1.86				
-17		115/56	97.9	1.56	1.35	1.71				
-18		116/57	2.3	1.55	1.38	1.99				
-19		113/59	92.6	1.77	1.28	1.77				
-20		115/61	1.8	1.58	1.36	1.79				
-21		112/58	21.9	1.77	1.47	1.78				
-22		80/55	47.2	1.54	1.36	1.75				
-23		111/56	4.0.0	1.75	1.48	1.70				
-24		110/55	35.1	1.61	1.39	1.69				
		112/57.1								
		21/1.2								

PRESSURE SWITCH DATA Form 21605 TEST NO. 173-15-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
7785L2-1	11/4/91	Steve office	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffery DiAngelo	11/11/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Quantity PS

CUSTOMER:

PURPOSE OF TEST: Begin of Validation testing which failed the first time

PROCEDURE: Impulse test and Fluid Res/Impulse test per Ford ES. All tests viewed on AMI

Device #	Date	Act/Rel	Rating	A	B	C	Pass?		
173-15-01	9/11/92	121/57	3.8	1.80	1.50	1.72	Pass		
-02		114/57	4.3	1.92	1.47	1.72			
-03		123/58	5.3	1.89	1.52	1.78			
-04		122/57	3.5	1.86	1.58	1.79			
-05		119/58	3.6	1.86	1.52	1.77			
-06		120/59	4.1	1.82	1.50	1.74		Pin'd Res.	
-07		122/59	4.4	1.93	1.52	1.75			
-08		118/58	4.1	1.72	1.48	1.79		and Impulse	
-09		120/58	4.3	1.84	1.50	1.75			
-10		123/57	5.0	1.86	1.51	1.75			
-11		121/58	4.8	1.88	1.52	1.78			
-12	▼	119/53	6.2	1.92	1.50	1.78	▼		
173-15-13	9/11/92	121/58	3.7	1.78	1.76	1.79	Pass		
-14		123/57	3.4	1.70	1.49	1.76			
-15		118/61	9.3	1.60	1.36	1.81			
-16		125/61	9.0	1.75	1.46	1.84			
-17		122/55	7.1	1.78	1.41	1.69			
-18		118/50	3.7	1.94	1.34	1.83			
-19		128/57	7.5	1.87	1.42	1.82		Impulse	
-20		121/58	3.9	1.87	1.36	1.58			
-21		123/55	3.9	1.89	1.38	1.79			
-22		118/51	4.0	1.79	1.49	1.75			
-23		117/60	3.9	1.87	1.39	1.82			
-24	▼	119/52	5.8	1.83	1.33	1.80	▼		

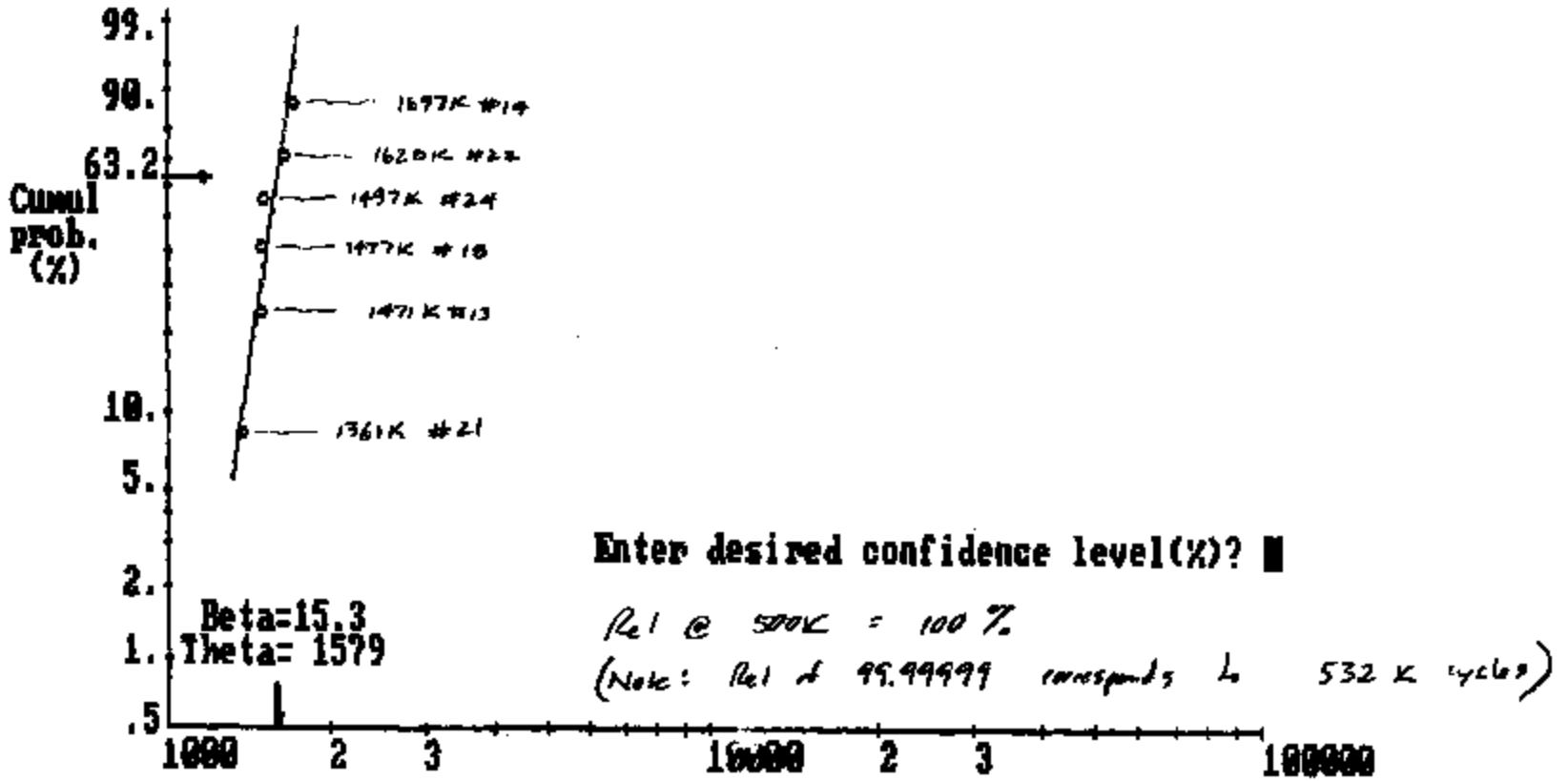
Final Clar

	Proof	Acc/Rej	mv Dup	Carr A	Carr B	Carr C				
1330-12-01	Pass	111/60	6.3	3.04*FR	1.53	1.69				
-02		112/58	2.3	1.55	1.28	1.56				
-03		113/57	2.0	1.97	1.91	2.69				
-04		110/58	1.8	1.60	1.37	1.67				
-05		107/60	5.9	1.71	1.42	1.61				
-06		108/55	3.0	1.75	1.45	1.61				
-07		114/62	21.5	1.66	1.38	1.65				
-08		106/57	2.9	1.53	1.32	1.69				
-09		102/57	4.2	1.58	1.37	1.61				
-10		103/51	34.2	1.98	1.55	1.71				
-11		104/51	4.5	1.66	1.34	1.62				
-12	"	110/52	2.6	1.64	1.35	1.79				
1345-13	Pass	112/57	2.0	1.60	1.37	1.75				
-14		112/60	29.2	1.69	1.42	1.84				
-15		108/58	1.5	1.61	1.27	1.90				
-16		111/54	93.6	1.45	1.25	1.86				
-17		115/55	97.9	1.56	1.35	1.71				
-18		106/57	2.3	1.65	1.34	1.99				
-19		114/59	93.6	1.79	1.28	1.77				
-20		115/61	1.9	1.58	1.36	1.79				
-21		113/59	21.9	1.77	1.42	1.78				
-22		106/55	47.2	1.58	1.36	1.75				
-23		111/56	40.2	1.75	1.45	1.70				
-24	"	108/55	35.1	1.61	1.39	1.69				

TEST #173 BLD 911102

6/8 FAIL - 2 SUSP. FOR ANALYSIS #20 & 23 @ 1361K

AMI CRIMP W/ HL TOOLS



Rel @ 500K = 100 %

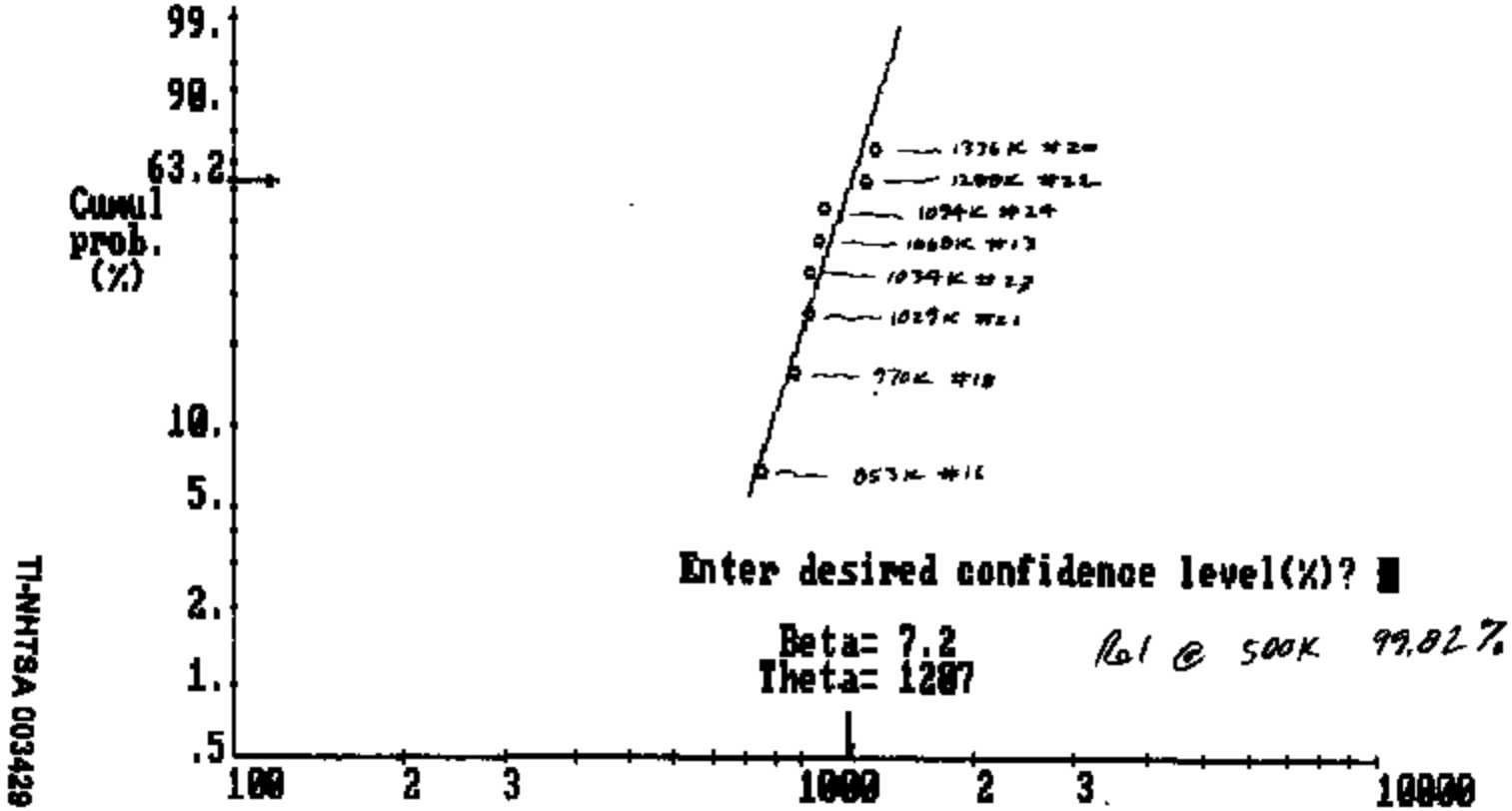
(Note: Rel @ 99.99999 corresponds to 532 K cycles)

TI-NHTSA 003428

TEST # 172 BLD 9/1102

8/10 FAIL - 2 SUSP FOR ANALYSIS #14 & #19 @ 1386 K

HAND-LINE CRIMP



Gave Bruce a # IV [illegible]

11/4/91 - 16. 32 F [illegible]

[illegible]

Give mute time chart to Bruce

→ switch tools in Pro I / hand ckirg?

HAND-LINE VS. AMI CRIMP (VAL PARTS)

	ACT	σ	REL	σ
HANDLINE	118.2	4.5	44.3	3.1
AMI	122.8	2.7	55.1	3.3

THESE PARTS ARE IDENTICAL EXCEPT FOR CRIMP. TO FIND OUT IF THE KAPTON WETTED AREA IS DIFFERENT:

- TAKE 2 SENSORS FROM EACH LOT
- CHARACTERIZE VERY CAREFULLY (THIS ASSUMES THE DEVICES HERE FOLLOW THE TRENDS ABOVE)
- HAVE PETE S. DO F/A ON DEVICES BY REACHING THRU HEXPART TO UNIVERSITER SUTTON
- AREA CAN BE CALCULATED FROM FORCE AND PRESSURE. DIFFERENCES, IF ANY, MAY PROVIDE A CLUE TO DIAPHRAGM LIFE PROBLEMS (?)

[redacted]

SO 911106

PRESSURE SWITCH DATA Form 21605 TEST NO. 177-15-04

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
7715	11/6/91	Steve Officer	

PERFORMED BY	DATE STARTED	DATE COMPLETED	APPROVED BY
Jeffrey Albanese	11/19/91		

PROJECT TITLE: Ford NV '93 Electronic Speed Control Deactivate PS

CUSTOMER:

PURPOSE OF TEST: Next Page

PROCEDURE: Next Page

Device #	From Test	Ground on	Build Date	Act/Rel					
177-15-01	177	H-L	9/10/91	177/47					
-02	177	H-L	9/10/91	133/39					
177-15-03	177	Amt	9/5/91	120/60					
-04	177	Amt	9/6/91	177/61					

(OVER)

HAND-LINE VS. AMI CRIMP (VAL PARTS)

	ACT	σ	REL	σ
HANDLINE	118.2	4.5	44.3	3.1
AMI	132.8	2.7	55.1	3.3

THESE PARTS ARE IDENTICAL EXCEPT FOR CRIMP. TO FIND OUT IF THE KAPTON WETTED AREA IS DIFFERENT:

- TAKE 2 SENSORS FROM EACH LOT
- CHARACTERIZE VERY CAREFULLY (THIS ASSUMES THE DEVICES HERE FOLLOW THE TRENDS ABOVE)
- HAVE PETE S. DO F/A ON DEVICES BY REACHING THRU HEXPORT TO CONVERTER BUTTON
- AREA CAN BE CALCULATED FROM FORCE AND PRESSURE. DIFFERENCES, IF ANY, MAY PROVIDE A CLUE TO DIAPHRAGM LIFE PROBLEMS (?)

SO
911106

77PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
11-2/11-1	77PSL2-3	4 pm PM	5:00 AM	11-07-91 (Thurs)
11-3	77PSL2-3	6:05 AM		11-8-91
11-4	77PS L2-2	11:00 AM		11-12-91
11-7/11-6	77P.S-	3'30. PM	4:30 AM	11-19-91 11-20 91
11-5	77PSL2-3	5:05 AM		11-21 91
11-8/11-11	77PSL2-1	6:45 P.M.	8:10 AM	11-25-91 11-26-91
11-9/11-10	77PS L2-1	11:45 AM	10:30PM	11-26-91 11-26-91

77PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
12-1/12-2	77PS-L2-1	6:00 AM	9:30 PM	12/5/91
12-3/12-4	77PS L2-1	9:30 P.M	11:00 AM	12-5-91 ⇔ 12/6/91
12-6/12-8	77PS L2-1	8:10 A.M	7:55 AM	12/7/91 ⇔ 12/9/91 12-9-91
12-5	77PS L2-1	8:00 AM		
12-10/12-11	77PS L2-1	6:00 PM	9:30 AM	⇔ 12-11-91 12-11-91 12-11-91
12-7/12-9	77PS L2-1	8:00 AM		
12-12/12-13	77PS L2-1	5:30 PM	6:50 AM	12-12-91 12-13-91 12-13-91
12-14/12-15	77PS L2-1	8:30 AM		⇔ 12-13-91
12-16/12-17	77PS L2-1	10:05 PM		
12-18/12-19	77PS L2-1	1:00 AM	1:10 PM	12-16-91 12-18-91
12-23	57PS-F3-5	4:50 PM		

77PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
1-1/1-7	77PSX2-1	10:15 PM	11:45 AM	1-1-92 1-2-92
1-1/1-2	77PSL2-1	4:30 PM	5:30 AM	1-2-92 1-3-92
1-5/1-6	77PSX2-1	10:20 PM	11:45 AM	1-5-92 1-6-92
1-3	77PSL2-1	2:30 PM	3:30 AM	1-6-92 1-7-92
1-7/1-8	77PSX2-1	11:17 PM	12:45 PM	1-7-92 1-8-92
1-9/1-10	77PSL2-1	12:50 PM	2:00 AM	1-8-92 1-9-92
11-20/11-21	77PS F33	6:00 PM	7:25 AM	1-9-92 1-10-92
1-11/1-12	77PSL2-1	10:30 A.M.	12:05 AM	1-14-92 1-15-92
1-15/1-16	77PSL2-1	11:10 AM	1:45 PM	1-15-92 1-16-92
1-17/1-18	77PSL2-1	2:00 PM	3:50 AM	1-15-92 1-20-92
1-14	77PSL2-1	11:50 A.M.	1:45 AM	1-29-92

97PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
1-22	L2-1	4'45 PM	1:15	1-20-92 1-31-92
1-23	L2-1	〃	〃	1-31-92
1-21	L2-1	4:00 PM	6:30 AM	2-1-92
1-24/1-25	L2-1	9:25 AM	10'45	2-4-92
1-26/1-27	L2-1	11:00 PM	12:20 PM	2-4-92 2-5-92
1-28/1-29	L2-1	1:15 PM		2-5-92
2-4/2-3	L2-1	12:00 PM	1:00 AM	2-10-92 2-11-92
2-5/2-6	L2-1	1:45 AM		2-11-92
2-9/2-10	L2-1	8:00 AM	6:00 PM	2-12-92
2-8/2-7	L2-1	9:30		2-13-92
2-12/2-11	L2-1	6:15 PM	7:00 AM	2-13-92 2-14-92

77PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
2-13 / 2-14	77PS	8:00 AM	9:30 PM	2-14-92
2-6 / 2-15	L2.2	10:00 PM		2.14.92
2-1 / 2-16	X2-3 / X2-1	4:25 AM		2-17-92
2-5 / 2-19	L2.3 / L2-1	6:45 PM	8:00 AM	2.17-92 2-18-92
2-3 / 2-4	L2-3	8:10 AM		2-18-92
2-6	X2-3	12:07 PM		2-21-92
			11:45 AM 1:15 AM	2-22-92 2-24-92
2-20 / 2-21	L2-1	3:30 PM		2.22.92
1-20	X2-3	1:20 AM		2-24-92
/ 2-27	77PS	2:40 PM	9:50 AM	2-25-92
2-24 / 2-25	77PS X2	3:00		
2-28 / 2-29	77PS L2-1	11:45 AM	11:00	2-27-92 2-28-92

TI-NHTSA 003438

77PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
5-26 / 5-27	L3-1	3:30 PM	5:05 AM	5-27-92 5-28-92
3-24 / 3-25	L2-3	9:00 AM	11:00 PM	6-02-92 6-2-92
3-26 / 5-30	L2-3 / L3-1	11:00 PM	12:05 PM	6-03-92 6-3-92
5-31	L3-1	4:45 PM		06-04-92 6-5-92
6-2 & 6-3	L2-3	11:30 AM	12:30 AM	06-05-92 6-6-92
6-4	L2-3	11:30 AM	12:30 AM approx. 9:00 PM	06-09-92
5-29 / 5-32	L3-1	7:50 AM		06-16-92 6-17-92
6-6	L3-3	2:00 PM	approx. 3:00 AM	06-18-92 06-19-92
6-8 / 6-9	L3-3	6:15 PM	8:05 AM	6-22-92 6-23-92
6-10 / 6-9	L3-3	9:00 PM	10:00 AM	6-23-92
6-11 / 6-12	L3-3	9:00 AM		

TL-NHTSA 003438

#7 PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
6-13 & 6-14	L3-3	9:20 AM	10:10 PM	6-29-92
6-15	L3-3	6:23 PM	11:10 AM	6-29-92 6-30-92
6-16	+ 5 PCS L3-3 END. SAMPLE	3:25 PM		6-30-92
		5:25 PM		6-30-92
7-3 / 7-2	L2-3	2:00 PM	approx 3:00 PM	7-08-92
7-4	L2-3	4:45 AM		7-9-92 7-9-92
100 / 102	L3-1	9:45 AM		7-23-92
101 / 102	L2-3	10:30 PM 9:50 PM	11:55 PM	7-24-92 7-24-92
103 & 104	L3-1	12:40 PM		7-27-92
105 / 101	L3-1 L3-1	9:10 AM		7-28-92
109 / 111		9:00 AM		

TI-NHTSA 003440

77PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
112 / 113	L3-1	8:15 AM		7-29-92
114	L3-1	10:22 PM	1:50 PM	7-29-92 7-30-92
115 / 116	L3-1	2:00 PM	5:50 AM	8-04-92 8-5-92
117 / 118	L2-3 / L3-3	6:30 PM	8:00 AM	8-5-92 8-06-92 8-6-92
119 / 120	L3-1	5:45 PM	7:30 AM	8-07-92
121 / 122	L3-3 / L2-3	3:45 PM	5:00 AM	8-10-92 8-11-92
123 / 124	L2-3 /	5:20 PM	9:00 AM	8-11-92 8-12-92
126 / 130	L3-3 / L3-1	5:30 PM	7:00 AM	8-12-92
129	L3-1	7:00 AM		8-13-92
128 / 133	L3-3 / L3-1	2:25 PM		8-19-92
134	L3-1	5:00 AM		8-20-92

77PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
249	L2-3	7:15 PM	8:40 AM	10-26-92 ↔ 10-27-92
250A/251A	L3-3	3:30 PM	5:15 AM	10-27-92
253/254	L2-1	2:30 PM	3:45 AM	10-28-92
252/255	L2-1	3:50 AM		10-29-92
256/257	L3-3	8:00 PM	9:30 AM	10-29-92 ↔ 10-30-92
258/259	L3-3	9:45 AM		10-30-92
260	L2-3	10:00 PM	11:10 AM	11-3-92 ↔ 11-03-92
262/261	L2-1	2:30 PM	3:45	
263	L5-2	5:10 AM	[redacted]	11-4-92
265/264	L3-3	2:00 PM	8:05 AM	11-5-92 ↔ 11-5-92
267/268	L3-3	7:00 PM	8:10 AM	11-05-92 ↔ 11-06-92

77PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
293	X3-3	10:00 PM	11:10 AM	11-27-92 11-28-92
297/295	L3-3	6:45 PM	8:25 AM	11-30-92 12-1-92
300	L3-3	9:00 PM	1:15 PM	12-2-92 12-01-92
303/302	L3-3 / L2-3	3:30 PM	4:45 PM	12-03-92 12-02-92
296AA	L5-2	4:50 AM		12-03-92
305/306	L3-3	6:15 PM	7:40 AM	12-04-92 12-03-92
307	L2-1	8:00 AM	9:30 PM	12-04-92
308-309	L2-3	10:00 PM	10:55 AM	12-04-92 12-05-92
310	L2-1	10:55 PM	approx. 12:30 AM	12-08-92 12-9-92
312/311	7775 L3-3	10:15 AM	11:35 AM	12-10-92 12-11-92
317/318	L3-3 / L2-1	2:35 PM		12-11-92

TI-HHTBA 003448

77PS

IMPULSE TEST LOG SHEET

DISC LOT	DEVICE	START	STOP	DATE
325/319	X3-3 / X2-1	10:15 PM	11:40 AM	12-15-92 → 12-16-92
321/322	L2-1	11:50 AM	approx 1:00 PM	12-16-92 12-17-92
323/331	X2-1 / X2-3	1:20 PM	2:50 PM	12-17-92
320/324	L2-1	3:00 PM	approx 4:15 PM	12-17-92
326A/329A	L3-3	5:15 PM	7:00 PM	12-18-92
332/333	L3-3	7:30 PM	3:50 AM → 12-19-92	12-19-92
334/335	L2-3 / L2-1	11:00 AM	approx 12:30 PM	12-20-92
336/337	X2-1	10:15 PM	11:45 AM → 12-21-92	12-21-92
296AA	L5-2	6:00 PM	7:30 AM → 12-22-92	12-22-92
330	L3-3	11:40 AM	11:30 AM	1-3-93
338A/339A	X3-3	10:15 PM	11:30 AM	1-4-93

HIGHLIGHTS

Stephen B. Offiler

Week Ending 91-11-08

FORD MY'92 ELECTRONIC SPEED CONTROL, DEACTIVATE PS

PASS-CAR REVALIDATION:

Two lots of parts were constructed to undergo the combined Fluid Resistance and Impulse testing, which was compromised in the original validation attempt. One lot uses the desired production technique (AMI) whereas the other uses the technique we were forced into as a fallback during the original validation (57PS Hand Line). Based on results of failure testing over the last several weeks, the best-performing crimp dies and washers were used. Half of each lot was precharacterized and delivered to the Chem Lab on time to begin the Fluid Resistance test on schedule Tuesday. The other half, which undergo only Impulse, started cycling on Wednesday. These will complete their 475K mechanical cycles early Saturday, and Jeff will come in to set up and run the 25K powered cycles. Post-characterizations will be done early next week, then all parts will be run to failure in order for the sake of information. An interesting observation was made regarding act/rel pressures. Parts crimped on the hand-line were lower on average than the AMI parts, by about 3 psi on act and 11 psi on release. We plan to take a closer look at this phenomenon to see if it provides any clues to the diaphragm life issue.

KAPTON DIAPHRAGM LIFE:

We're continuing to work on the teardrop shape in the Kapton surface as a contributor to early life failures. We've seen the perforation in the diaphragm to generally coincide with the apex of the teardrop if present; if absent the diaphragm wear is well distributed around the perimeter. We're looking into the possible mechanisms that promote teardrop formation, including pre-crimp, gasket friction, and asymmetric clamping. We're also looking into whether teardrop formation is an issue with Light Truck parts.

CUSTOMER ISSUES, SAMPLES:

For the Ford of Australia samples, the M10 x 1.0 hexports were completed by an outside house, plated in B11, and have been built into devices. We planned to test these on the production tester, but apparently it would not seal properly. We're making an adapter so we can manually test these on our Life Test check station. They will ship today, on-time per the revised schedule. They were originally promised for 91-09-17 until confusion over thread spec's arose.

Charlie Douglas met with Bruce Pease earlier this week to discuss the Kapton life / revalidation issue. Charlie reports that the meeting went well, and Bruce is convinced we're making good progress on the solution to this problem. It looks like an extension to the 90-day alert is possible, if required. On another subject, Charlie hand-delivered the SREA for the change to blue-colored environmental seals for PC devices.

MECHANIZATION:

John Kourtesis and crew are presently working on eliminating the rivet from the Eastern Automation movable-terminal assembly machine. The two options being considered are ultrasonic welding and resistance welding. I'm working on a quick sketch of the terminal/spring redesign for presentation at a meeting John will hold early next week. Of course, this change will require revalidation. I propose that we use our P & DFMEA's to drive the justification for this change, possibly rethinking the PRN's associated with the rivet and riveting process relative to a welding process.

-MSG M#= 72120 FR=SBO1 TO=CPPC SENT=11/08/91 10:44 AM
R#=106 ST=C DIV=0050 CC=00101 BY=SBO1 AT=11/08/91 10:44 AM

TO:	Tom Burke	MFPC	Steve Major	WHLZ
	Jeff DiDomenico	ELB	Matt Sellers	PCME
	Charlie Douglas	CPPC	Rusty Struble	RCS2
	Paul Kotch	PRK1	Jim Watt	PCQA
CC:	Tom Charboneau	(delivered separately)		
	Dave Czarn			
FR:	Steve Offiler	SBO1		

SJ: Weekly Highlights

FORD MY'92 ELECTRONIC SPEED CONTROL DEACTIVATE PS

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Two lots of parts were constructed to undergo the combined Fluid Resistance and Impulse testing, which was compromised in the original validation attempt. One lot uses the desired production technique (AMI) whereas the other uses the technique we were forced into as a fallback during the original validation (57PS Hand Line). Based on results of failure testing over the last several weeks, the best-performing crimp dies and washers were used. Half of each lot was precharacterized and delivered to the Chem Lab on time to begin the Fluid Resistance test on schedule Tuesday. The other half, which undergo only Impulse, started cycling on Wednesday. These will complete their 475K mechanical cycles early Saturday, and Jeff will come in to set up and run the 25K powered cycles. Post-characterizations will be done early next week, then all parts will be run to failure in order for the sake of information. An interesting observation was made regarding act/rel pressures. Parts crimped on the hand-line were lower on average than the AMI parts, by about 3 psi on act and 11 psi on release. We plan to take a closer look at this phenomenon to see if it provides any clues to the diaphragm life issue.

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CUSTOMER ISSUES, SAMPLES:
For the Ford of Australia samples, the M10 x 1.0 hexports were completed by an outside house, plated in B11, and have been built into devices. We planned to test these on the production tester, but apparently it would not seal properly. We're making an adapter so we can manually test these on our Life Test check station. They will ship today, on-time per the revised schedule. They were originally promised for 91-09-17 until confusion over thread spec's arose.

Charlie Douglas met with Bruce Pease earlier this week to discuss

the Kapton life / revalidation issue. Charlie reports that the meeting went well, and Bruce is convinced we're making good progress on the solution to this problem. It looks like an extension to the 90-day alert is possible, if required. On another subject, Charlie hand-delivered the SREA for the change to blue-colored environmental seals for PC devices.

MECHANIZATION:
John Kourtesis and crew are presently working on eliminating the rivet from the Eastern Automation movable-terminal assembly machine. The two options being considered are ultrasonic welding and resistance welding. I'm working on a quick sketch of the terminal/spring redesign for presentation at a meeting John will hold early next week. Of course, this change will require revalidation. I propose that we use our P & DFMEA's to drive the justification for this change, possibly rethinking the PRN's associated with the rivet and riveting process relative to a welding process.

Regards,
Steve O.

DIAPHRAGM LIFE: WASHER LOTS TEST 169-03-24 JAD 11/08/91

DEVICE #	WASHER	BUILD DATE	CYC. TO FAILURE	SUSPENDED
169-03-01	0 CUT	911017	1320K	
169-03-02	NICKLE		1166K	
169-03-03	PLATE		603K	
169-03-04			1673K	
169-03-05				1670K
169-03-06			1548K	
169-03-07	2 CUT	911017	1166K	
169-03-08	ZINK		603K	
169-03-09	PLATE			1870K
169-03-10			902K	
169-03-11			1632K	
169-03-12			1404K	
169-03-13	0 CUT	911017	771K	
169-03-14	ZINK		426K	
169-03-15	PLATE		888K	
169-03-16			1166K	
169-03-17			1212K	
169-03-18			662K	

PRESSURE SWITCH DATA Form 21605 TEST NO. 176-05-24

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
CCPS	11/4/97	Steve Offley	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey DiBenedetto	11/11/97		

PROJECT TITLE: Ford MY '99 Electronic Speed Control Reactivate PS

CUSTOMER:

PURPOSE OF TEST: Cycle to failure validation Impulse parts from tests 172-14-24 and 172-15-24

PROCEDURE: Impulse per Ford ES until leak occurs

172-15-13 thru -24 : Counter + 525K
173-15-13 thru -24 : counter + 700K

Remaining Parts from 173-15-24: Counter +1971

Piece #	Crimp	Build date		Failure			Succeeded	
172-15-13	Hard-line	9/11/97		1069				
-14				—			1396 K	
-15			Opened - not cycled					
-16				955K				
-17			Opened - not cycled					
-18				970K				
-19				—			1382 K	
-20				1326K				
-21				1029K				
-22				1390K				
-23				1039K				
-24				1694K				
173-15-13	Amp	9/19/97		1971K				
-14				1697K				
-15			Opened - not cycled					
-16			Opened - not cycled					
-17			Opened - not cycled					
-18				1977K				
-19			Opened - not cycled					
-20				—			1361 K	
-21				1391K				
-22				1628K				
-23				—			1361 K	
-24				1977K				

PRESSURE SWITCH DATA Form 21605 **TEST NO.** 173-03-01

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
CCPS	11/4/91	Steve Offiley	

PERFORMED BY	DATE STARTED	DATE COMPLETED	APPROVED BY
Jeffrey DiDomenico	11/11/91		

PROJECT TITLE: Ford MY '93 Electronic Speed Control Acceleration PS

CUSTOMER:

PURPOSE OF TEST: Cycle to failure validation impulse parts from tests 173-15-24 and 173-15-24

PROCEDURE: Impulse per Ford ES until leak occurs

173-15-13 thru -24 : Counter = 525K
173-15-13 thru -18 : counter + 904K

Remaining Parts from 173-15-24 : Counter + 1971

Device #	Crimp	Build date		Failure			Suspended		
173-15-13	Hard-line	91401		[illegible]					
-14				—			1386 K		
-15			opened - not cycled						
-16				[illegible]					
-17			opened - not cycled						
-18				[illegible]					
-19				—			1382 K		
-20				[illegible]					
-21				[illegible]					
-22				[illegible]					
-23				[illegible]					
-24				[illegible]					
173-15-13	AMT	91401		[illegible]					
14				1637K?					
15			opened - not cycled						
16			opened - not cycled						
17			opened - not cycled						
18				1433K					
19			opened - not cycled						
20				—			1361 K		
21				[illegible]					
22				1428K?					
23				—			1361 K		
24				1444K?					

TI-NHTSA 003460

PRESSURE SWITCH DATA Form 21605 TEST NO. 175-15-12

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
CCPS	10/10/91	Steve Office	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
Jeffrey DiBenedetto	11/11/91		

PROJECT TITLE: Ford MY '92 Electronic Speed Control Deactivate 05

CUSTOMER:

PURPOSE OF TEST: Next Page

PROCEDURE: Pass - Coil Sensors hand built and crimped on hand line

TORQUE TESTING

Sensor #	Hexpart	Burst				10L10		10D21
175-15-01	10D21	7900				< 37		52
-02		8100				38		51
-03		7900				41		47
-04		8100				42		56
-05		8000				41		48
-06		8000				41		57
						42		45
175-15-07	26900	7600				39		54
-08		7600				47		56
-09		7900				41		51
-10		7600						
-11		7700						
-12		7600						

TI-NHTSA 003451

(OVER)

10B21 HEXPORT EVALUATION

PURPOSE: To make an initial determination of the relative suitability of 10B21 steel as a replacement for the current hexport material, 10L10.

SCOPE: Two basic tests of mechanical strength will be used to get a rough comparison of the two materials: a burst test, and a torque test. For the burst test, sensors will be built using 10B21 hexports and standard 36900's as a control, using either standard or rebump cups, either AMI or handline crimp (just be consistent). For the torque test, bare hexports may be used.

PROCEDURE:

(BURST)
Build 6 sensors with 10B21 hexports, and 6 sensors with 36900 hexports.

Burst all using the normal procedure.

Create a Weibull plot for each test lot.

(TORQUE)
Obtain a peak-hold torque wrench capable of roughly 50 ft-lb or better.

Place a 3/8-24 nut in a vise.

Thread in a hexport fully, and tighten to failure with the torque wrench. Record results, including failure mode, which is likely to be fracture at the O-ring gland, but may involve stripped threads in some situations. Of course, replace the nut if it becomes damaged.

Perform this test on about 10 of each. Present raw data to me for consideration whether Weibull plots or something else might be appropriate or even necessary.

SBO 911112 filename: hexeval.001

SBO 911112

J2I BEXPORT EVALUATION TEST# 175-15-12 JAN 11/15/91

BURST TEST				TORQUE TEST	
DEVICE #	BEXPORT	BURST		10L10	10B21
175-15-01	10B21	7900		37	53
175-15-02	10B21	8100		36	51
175-15-03	10B21	7800		41	47
175-15-04	10B21	8100		42	56
175-15-05	10B21	8000		41	48
175-15-06	10B21	8000		41	57
				42	45
175-15-07	10L10	7600		39	54
175-15-08	10L10	7600		47	56
175-15-09	10L10	7800		41	51
175-15-10	10L10	7600			
175-15-11	10L10	7700			
175-15-12	10L10	7600			

cc: JEFF D.

HEXPORT MATERIAL EVALUATION
10L10 VS. 10B21

In order to determine if 10B21 steel is a suitable replacement/substitute for the present production 10L10 steel hexport material, three different types of tests were run. One involved cross-sectioning one hexport of each material and performing Diamond Pyramid Hardness readings in various areas, specifically at the roots and crests of the threads. The second test involved affixing the threaded portion in a vise and applying a measured torque to the hex until failure occured. The third involved a burst test of actual pressure switches built with hexports of each material.

The results of the DPH test, using a 200-gram indenter, showed the average reading in the threaded area to be 244 for the 10B21 vs. 194 for the 10L10. A higher reading means greater hardness.

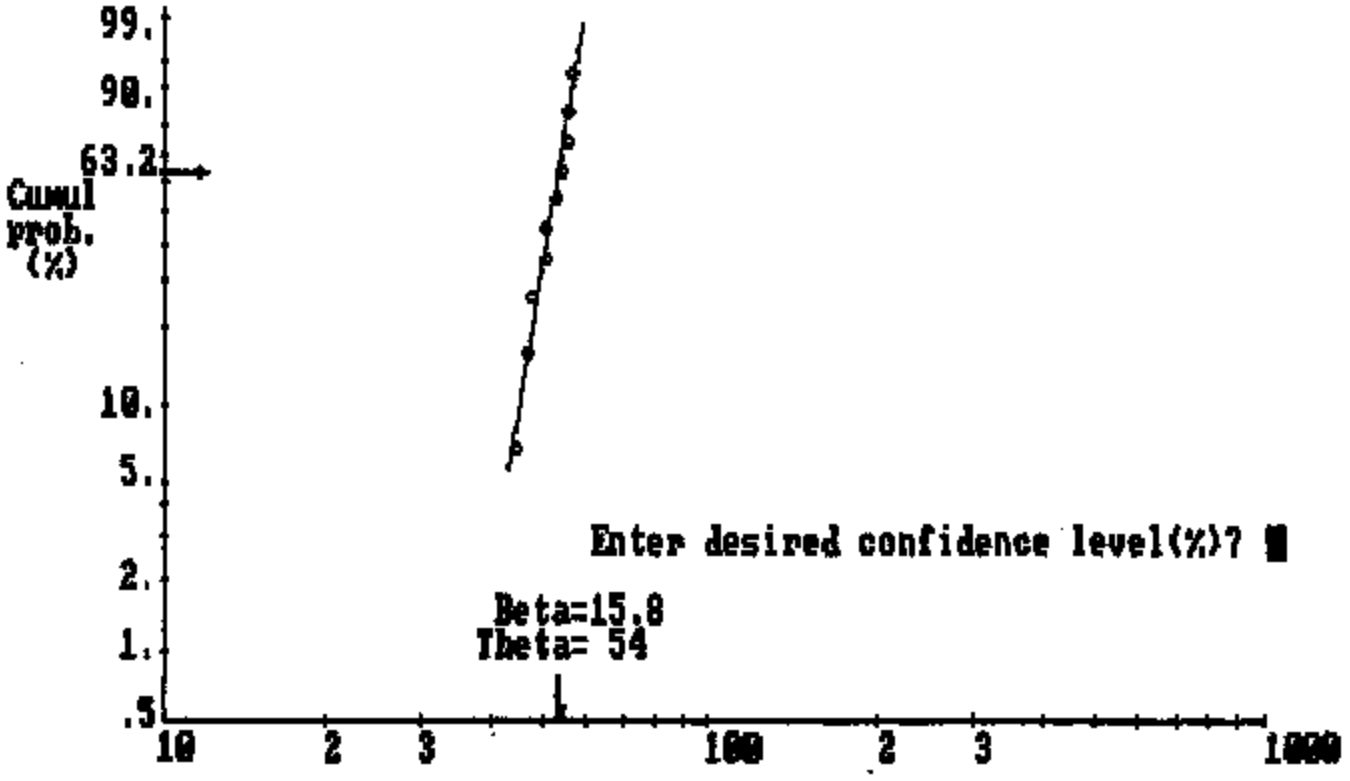
The torque test was run on ten hexports of each material. During this test, shear failure occured at the thread undercut (similar geometry to the O-ring gland on hexports so intended) in all cases. 3/8-24 nuts were affixed to the male hexport thread with Loctite and held firmly in a vice to ensure that hexport failure would occur. (Preliminary testing showed the female thread would strip otherwise.) Torque was increased in 1 ft-lb increments with a limit-release type torque wrench, and the sequence of test parts was randomized to remove any potential effects of calibration drift. The average torque to reach shear failure was 51.8 ft-lb for 10B21 vs. 41.3 ft-lb for 10L10.

The burst test was run on 12 pressure switches total, using 6 hexports of each material. The procedure involves slowly increasing hydraulic pressure while observing a gage, and recording the peak value attained at the point of yield. This is signalled by a suddend drop in test pressure of several hundred psi, and is due to plastic deformation of some internal component(s) which results in a larger fluid volume, hence the pressure drop. The hexport is generally involved in the failure mode, showing some deformation in the flange area. Results show the average burst strength of devices built with 10B21 hexports was 7983 psi vs. 7650 for 10L10.

As can be seen above, in each of the three functional tests the 10B21 was shown to be superior. The magnitude of the improvement in physical properties is not extremely large, but significant nonetheless. The 10B21 material has higher carbon content, and contains boron to improve heat-treatability. Even without a heat-treat, this material will cold-work to a greater hardness than the 10L10 which accounts for the observed differences. There is no reason to expect any difference whatsoever in other properties, such as the level of corrosion protection offered by zinc and chromate plating.

Stephen B. Offiler, Design Engineer
Texas Instruments Inc.

Torque to failure of 70821 Hexports



TI-NHTSA 003456

TEXAS INSTRUMENTS
INCORPORATED
MATERIALS AND CONTROLS GROUP
☐ ATTLEBORO, MA 02703 ☐ VERSAILLES, KY 40383
☐ JOHNSON CITY, TN 37601 ☐ CENTRAL LAKE, MI 49622

Shipping Order

DATE: / / S.O. # 214070

REF. # _____ DATE SHIPPED / /

SHIPPED VIA: _____

SHIP TO:
KELSEY-HAYES COMPANY
9475 Center Road
Fenton, Michigan 48430

Attn: Ms. Rita Gunia
Purchasing Dept.

CHARGE TO:
Texas Instruments Inc

USE (CHECK ONE)

☐ SCRAP SALES
☐ SALE OF ASSETS
☐ OUTSIDE PROCESSING
☐ TRANSFERS BETWEEN TI LOCATIONS
☐ EXPENSE MATERIAL
☒ OTHER, EXPLAIN: Samples

DIV/ACCT. # 050 CC: 149

QUANTITY	DESCRIPTION/PART #/PC	UNIT PRICE	TOTAL
	One complete package One partial package 6 Samples	N/C	

GROSS WEIGHT	NO. OF CONTAINERS	ORIGINATOR'S NAME (TYPED)	ORIGINATOR'S SIGNATURE
		Elaine Rose MS 12-27	Elaine Rose

5-015148 5/84

#5, #15, #23
Add char.

#32, #33, #37,
#38, #39, #40, #51

Jim - I'll address it on a follow up
Is your ... to ... PEST ... well on the F3-3?

E -

F2VC-9F924-AB

MATERIAL ANALYSIS

PARTS LIST

	PART NAME	PART #	CERTIFIED
1	BASE	46515-2	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	J512 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	74247-2	YES
19	THREAD CAP	74179-2	YES

K-H
PKG 11-15-91

11-15-91

Lisa -

77 P/C out of spec issues that need to be addressed.

Carla

Office Copy

TEXAS INSTRUMENTS

ISIR SUBMISSION

TO KELSEY HAYES
FOR PART NUMBER F2VC-9F924-AB
NEXT GENERATION SPEED CONTROL

NOVEMBER 15, 1991

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
508-699-3800 • TELEX 210901 • CABLE TEXINS

Prod. or Doc#
TI 20275-20587

1-9-92

Resubmitted to K-H:

① FAC Data Rewritten to K-H Print & marked print

② Copy of Ford PEST/PEX PPQE summary Data Sheet with significant characteristics Identified

③ DFMEA & PFMEA

④ New Cert for -4 envio. seal

Fax to send this separate

1-9-92

K-H PKG 57F3-3

INCLUDED:

(1) PIPC

(2) R+R

(3) Material Anal.

?may have
used PIPC
from L/T
??

11-15-91

cc: Elaine R.

TEXAS INSTRUMENTS

Kelsey-Hayes Company
101 Oak Street
Milford, Michigan 48381

January 20, 1992

Attn: Mr. Clay Bailey
Manufacturing Engineer

Subj: Part Number E7BC-3N924-AA Pressure Switch 5-7F3-5
Part Number F3TA-9F924-AA Pressure Switch 7-49-3

Ref: Your 01/20/92 Telephone Call

Dear Clay,

The purpose of this letter is to substantiate our discussion concerning the above referenced pressure switches. The switches are to be assembled with the threaded metal hexport onto the application. Installation torque is to be applied only to the metal hexport part of the switch.

There is to be no torque applied to the plastic connector part of the switch. Any torque applied to the plastic connector may cause abnormal operation, damage, or destruction of the switch function.

Please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Thomas Dan, Kelsey-Hayes Supplier Quality, Fenton, Mi.
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

c = Elaine R.

TEXAS INSTRUMENTS

December 19, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
Supplier Manufacturing Change Request (SMCR)

Ref: Your 12/17/91 Telephone Call

Dear Tom,

Enclosed, please find the SMCR describing the proposed change for the Kelsey-Hayes print number 12590701. We believe that the errors were inadvertantly created from the recent ECN No, 25136 .

After reviewing the SMCR, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

encl: SCMR, ECN no. 25136

KELSEY-HAYES SUPPLIER MANUFACTURING CHANGE REQUEST

PART NAME: Pressure Switch	REQUEST NUMBER:	BUYER: Rita Gunia	DATE: 12/18/
PART NUMBER: 12590701	PRODUCT LINE:	P.O.C.N. NUMBER:	E/P LEVEL: A
SUPPLIER: Texas Instruments Inc	K-H USING PLANT: Milford	SUPPORTING DATA ATTACHED? ☒YES ☐NO	

REASON FOR CHANGE/PURPOSE: 1.) Update and correct Kelsey-Hayes drawing to reflect correct Ford part number and Ford ES specification number.

2.) Kelsey-Hayes ECN No. 25136 (9/5/91) created error. ECN No. 25136 copy is attached.

ORIGINATOR: Jim Watt TITLE: QRA Engr. CONCURRENCE: Charlie Douglas TITLE: Prod. Specia

DESCRIPTION: Kelsey-Hayes drawing no. 12590701-A should be changed to reflect:

1.) Ford Motor Co. Part No. ▽ F2VC-9F924-AB

2.) Ford Motor Co. Specification No. ▽ ES-F2VC-9F924-AA

PLAN FOR VERIFICATION & TESTING: Validation of these changes made with Ford Motor Co.

DISPOSITION - BY KELSEY-HAYES

APPROVE	REJECT	DISTRIBUTION	INSTRUCTIONS, QUALIFICATIONS AND/OR REASON FOR REJECTION:
		K-H PURCHASING	
		PLANT MANUFACTURING ENGINEERING	
		PLANT QUALITY CONTROL	
		K-H PRODUCT ENGINEERING	
		K-H SALES	
		PROCUREMENT or DIVISIONAL QUALITY ASSURANCE	ISIR LEVEL REQUIRED- ☐NONE ☐1 ☐2 ☐3

TI-NHTSA 003465

10/30/91 PQA_S-1.F

KELSEY-HAYES **ENGINEERING CHANGE NOTICE**

PROD.AREA:	SUBJECT:	PROGRAM:	MODEL YEAR:	CUSTOMER(S):	ECN NO.: 25136
VALVES	FN-10 PRESSURE SWITCH	DUAL PROP	93	FORD	PAGE 1 OF 1

NATURE OF CHANGE: REVISE THE T.I. PRESSURE SWITCH - NEW AUTOMATED VERSION IS AVAILABLE.

NOTE: THIS IS A CHANGE TO CUSTOMER DRAWING.

REASON: CUSTOMER REQUEST: [X] PLANT REQUEST: [ ] VENDOR/PURCHASING REQUEST: [ ]
T.I. NOW HAS THEIR AUTOMATED ASSY GOING.
- NEED TO UPDATE PRINTS SO ISIR WILL REFLECT PRODUCTION LEVEL SWITCH.
ES TEST WILL BE PERFORMED ON ENTIRE VALVE FOR ISIR TO FORD.

EPA NO.: 48011-8 4 /	CLASSIFICATION:
REF.DOCUMENTS:	REGULAR X
CUST.CHG.:	RECORD
K-H DEV./MCR:	MANDATORY
K-H EST.:	EXPEDITED
K-H NTR:	VEHICLE APPLICATION:
ATTACHMENTS:	PASSENGER X
DISTRIBUTION CODE:	TRUCK
	TRAILER
	SERVICE

IS TEST REQUIRED: YES [X] NO [ ] CONCURRENT [ ] TEST DURATION, DAYS: 30 INITIATED BY: J.COSSINS 8-2 DATE: 9-5-91

APPROVED BY:

PRODUCT ENGINEERING		DATE			DATE			DATE
RESP ENGINEER	J.H. COSSINS	8-2-91	Q A	T.PRYOR/LV	8-20-91	ESTIMATING	K.R.HAWKINS	8-20-91
MATERIALS	RR		SALES	D.CLINE/CD	8-8-91	PURCHASING	R.IVES	8-13-91
MANAGER	C.A.WILLI	8-2-91	CUST AUTHORIZATION	YES [ ] N R [ ]		MANUFACTURING	R.BELLAR	8-20-91
CHIEF ENGINEER	C.BONDING	8-2-91	COST RECOVERABLE?	YES [ ] NO [ ]		ENGINEERING SERV.	GAM	

(SEE ENGINEERING MANUAL SECTION 2.811)
AFFECTED DESIGN DATA BANK: REVIEWED? YES REVISED? NO
SERVICE MANUAL REVIEWED? NO SERVICE MANUAL REVISED? NO
FMEA REVIEWED? YES FMEA REVISED? NO

DELETE	REPLACE	RELEASE	CHANGE	CHG. LEVEL	PART NAME / REVISION	CO-OR CHG.	PURCH. PART X	STOCK DISPOSITION
			D-12590701	A5	ASSY - PRESSURE SWITCH - REVISE TO T.I. PRINT 77PSL2-1 WAS TO 57PSL5-3. NOTE THE ONLY VISIBLE CHANGE IS THE OVERALL LENGTH ON SWITCH. SO SPECIFIC CHANGES ARE: 1) CHANGE TO "57.15 MAX" WAS ""62.23 MAX" 2) CHANGE TO " ▽F2VC-9P924-AA" WAS "F2VC-9P924-BA" 3) CHANGE T.I. P/N TO "77PSL2-1" WAS "57PSL5-3" 4) REMOVE "FOR FINAL ASSY SEE DWG. 12575501"	1	X	NO STK
			D-12603101	B	ASSY 'S - FN-10 DUAL PROP - REFLECT ABOVE CHANGES ON THESE DRAWINGS AND PARTS LIST	1		NO STK
			D-12603401	B				
			P-12603401	B				
			P-12603401	B				

APPROVED AUG 20 1991

PLANT(S) INVOLVED: MILFORD ECN NO: 25136

ATTACH COST SHEET, TEST & ES INFO RELATING TO DEPARTMENTS CONCERNED

TI-NHTSA 003466

KELSEY-HAYES

SUPPLIER MANUFACTURING CHANGE REQUEST

PART NAME: Pressure Switch	REQUEST NUMBER:	BUYER: Rita Gunia	DATE: 12/18/91
PART NUMBER: 12590701	PRODUCT LINE:	P.O.C.N. NUMBER:	S/P LEVEL: A
SUPPLIER: Texas Instruments	K-H USING PLANT: FARMINGTON	SUPPORTING DATA ATTACHED? ☒YES ☐NO	

REASON FOR CHANGE/PURPOSE: (1) Update and correct Kelsey-Hayes DRAWING TO Reflect CORRECT FORD PART NO. and FORD ES SPECIFICATION NUMBER.

(2) K-H ECN NO 25126 (12/5/91) CORRECTS ERROR.

ORIGINATOR: [illegible] TITLE: QPA ENGR CONCURRENCE: CHARLIE DONGILL TITLE: PRODUCT ENGR.

DESCRIPTION: Kelsey Hayes DRAWING NO. 12590701-A Should Be changed to Reflect:

1) FORD MATCH PART NO. ESZC-9F924-AB

2) FORD MATCH SPEC NO. ESE-52C-9F924-AA

PLAN FOR VERIFICATION & TESTING: VALIDATE THAT CHANGE DOES NOT EFFECT FIT

DISPOSITION - BY KELSEY-HAYES

APPROVE	REJECT	DISTRIBUTION	INSTRUCTIONS, QUALIFICATIONS AND/OR REASON FOR REJECTION:
		K-H PURCHASING	
		PLANT MANUFACTURING ENGINEERING	
		PLANT QUALITY CONTROL	
		K-H PRODUCT ENGINEERING	
		K-H SALES	
		PROCUREMENT or DIVISIONAL QUALITY ASSURANCE	QUALITY LEVEL REQUIRED: ☐None ☐1 ☐2 ☐3

10/30/91 PSA_1-1.PCD

cc: Elaine R.

TEXAS INSTRUMENTS

Kelsey-Hayes Company
101 Oak Street
Milford, Michigan 48381

January 15, 1992

Attn: Mr. John Shorkey
Quality Engineer

Subj: Part Number E7SC-3N824-AA Pressure Switch
Part Number F3TA-9F924-AA Pressure Switch

Ref: Your 01/14/92 Telephone Call

Dear John,

We have confirmed the actuation pressures for Kelsey-Hayes part number numbers as follows:

Part number	Actuation Pressure
E7SC-3N824-AA	350-450 psi
F3TA-9F924-AA	200-300 psi

I have also enclosed a copy of Mr. Thomas Dan's 12/20/91 letter as you requested.

Please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Thomas Dan, Kelsey-Hayes Supplier Quality, Fenton, Mi.
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

TI-NHTSA 003468

cc: Elaine R.

TEXAS INSTRUMENTS

December 13, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12604301 Pressure Switch (E7SC-3N824-4A)
Part Number 12590701 Pressure Switch (F2UC-9F924-AB)
ISIR Submissions

Ref: Your 12/11/91 Telephone Conversation

Dear Tom,

Confirming your agreement that the ISIR submission documents that Texas Instruments uses need not be Kelsey-Hayes specific documents. We currently utilize Ford formatted documents for our ISIR submissions. In the event that Kelsey-Hayes has content specific requirements that are different from our current ISIR submission, we will provide those specific requirements on Kelsey-Hayes' documents.

After reviewing the ISIR submissions, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-39
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

cc= E/Lines?.

TEXAS INSTRUMENTS

December 10, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12604301 Pressure Switch (E7SC-3N824-AA)
Part Number 12590701 Pressure Switch (E2UC-9F924-AB)
ISIR Submissions

Dear Tom,

Just a short note to thank you for your efforts in locating the ISIR submission packages for the two pressure switches that were sent to Kelsey-Hayes on November 20, 1991 and signed for by " P. Ovington " at the Kelsey-Hayes receiving location.

After reviewing the submissions, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McQuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

cc = Elsner.

TEXAS INSTRUMENTS

December 05, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Ms. Mary Cooney
Shipping Department

Subj: Part Number 12604301 Pressure Switch (E7SC-3N924-AA)
Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
ISIR Submissions

Dear Mary,

A package containing pressure switches and test documents was sent via UPS to Ms. Rita Gunia of your purchasing department on November 20, 1991. The package was signed for by " P. Ovington " at the Kelsey-Hayes receiving location.

Could you please let me know if the package was inadvertantly routed to someone other than Ms. Rita Gunia, or if you know of the individual " P. Ovington " ? A copy of the shipping document is attached.

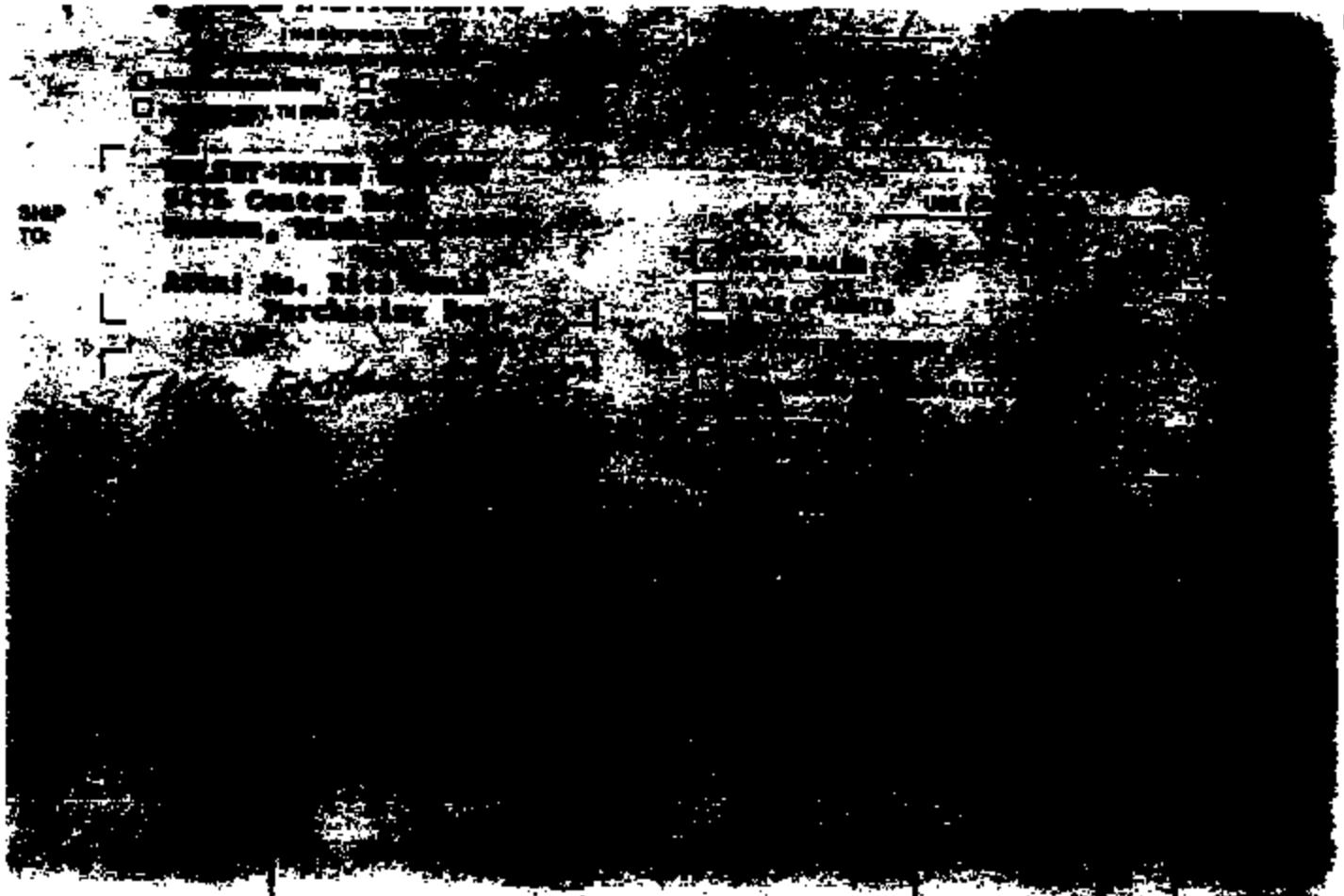
I can be reached at: (508) 699-1719. Thank you in advance for your help.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

encl: UPS Shipping Document # 214070



GROSS WEIGHT	NO. OF CONTAINERS	ORIGINATOR'S NAME (TYPED)	ORIGINATOR'S SIGNATURE
[redacted]	1 of 1	Elaine Rose MS 12-27	[redacted]

ORIGINATOR COPY

	Ci	Cpk
MASA	.22	3.15
MASR	.16	4.14

Ci = Cp — Ci = Cp

1 ÷ .15 = 6.66 — 1 ÷ .24 = 4.16

57PSMASA

$\bar{X}$ & R ✓

Histo's ✓

57PSMASR

$\bar{X}$ & R

Histo's

cc: Elaine L.

TEXAS INSTRUMENTS

March 16, 1992

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
ISIR Approval

Ref: Your 03/09/91 Telephone Call

Dear Tom,

Enclosed, please find the approved ISIR signed by Ford SQA for the Kelsey-Hayes print number 12590701.

After reviewing the ISIR, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
SQRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McQuirk, MS 12-27
Norm Freda, TI Farmington Hills, Michigan

encl: ISIR No. 112384

Ford

INITIAL SAMPLE WARRANT

No. 112384

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 PRINT-PEASE Date

Shown on Drawing No. F2VC-9F924-AB Part Weight 062 LB

Reason for Initial Sample:

- ☐ Initial Submission
- ☐ Engineering Change(s)
- ☐ Tooling Transfer
- ☐ Other – Please Specify SEE BELOW
- ☐ 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 STREET

City ATTLEBORO State MA Postal Code 02703 Country USA

Supplier Mfg. Location Code – DUNS T0S7K 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 (ES) tests ☒ meet all drawing and specification requirements ☒ Yes ☐ No

Submission Checklist

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

Supporting data for all requirements are available upon request.

COMMENTS:

ISR SUPPLEMENT WITH ADDITIONAL TESTING TO CLOSE OUT ALERT NO. A10166193;
ALSO, CORRECTED BASE MOLD DIMENSIONS. PART PREVIOUSLY APPROVED ON
ISW # 112384, DATED 9/20/91

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 (where required by Customer Specification) ☒ Approved ☐ Rejected

Signature Date 1/14/92

Form 292C Vendor Controls SQA

TEXAS INSTRUMENTS

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

January 09, 1992

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
ISIR Addendum

Ref: Your 12/20/91 Letter

Dear Tom,

Enclosed, please find the dimensional layout for the pressure switch, Kelsey-Hayes part number 12590701. Please refer to the SMCR that was submitted on 12/19/91 to correct the 12590701 release drawing.

We have also included copies of the design FMEA, process FMEA, and designated key characteristics list. We believe this completes the ISIR submission requirements for part number 12590701.

After reviewing the ISIR addendum, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

encl: ISIR Addendum For 12590701

TEXAS INSTRUMENTS

cc= Elaine R.
FYI JH

November 15, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Ms. Rita Gunia
Purchasing Department

Subj: Part Number 12604301 Switch (E7SC-3M824-AA) SPEC F3-3
Part Number 12590701 Switch (F2VC-9F924-AB) TP2L2-1
ISIR Submissions

Dear Rita,

Enclosed, please find the ISIR for the 12604301 and 12590701 switches . Both ISIR submissions were accomplished on Ford forms as we are in the process of transferring data to Kelsey-Hayes forms.

The 12590701 submission has several dimensional issues on the layout that are being addressed.

The 12604301 submission needs dimensional layout, control plan, manufacturing flow diagram, PIST, PIPC, and PV testing that are being addressed.

Please let me know if you have any questions or if I may be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Gary Snyder, MS 12-33
Charlie Douglas, MS 12-33
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

encl: ISIR submissions

TEXAS INSTRUMENTS

ISIR SUBMISSION

TO KELSEY HAYES
FOR PART NUMBER F2VC-9F924-AB
NEXT GENERATION SPEED CONTROL

NOVEMBER 15, 1991

TEXAS INSTRUMENTS INCORPORATED • 34 FORBES STREET • ATTLEBORO, MA 02703
508-699-3800 • TELEX 210601 • CABLE TEXINS

A1-1
77PSL2-1
K-H

TEXAS INSTRUMENTS, INC. ISIR SUBMISSION TO KELSEY HAYES FOR PART NUMBER F2VC-9F924-AB (77PSL2-1)

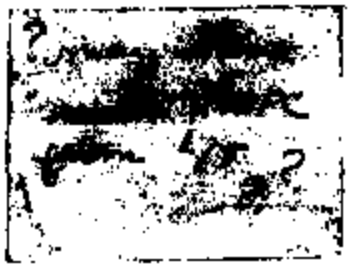
K-H PKG 57F3-3

INCLUDED:

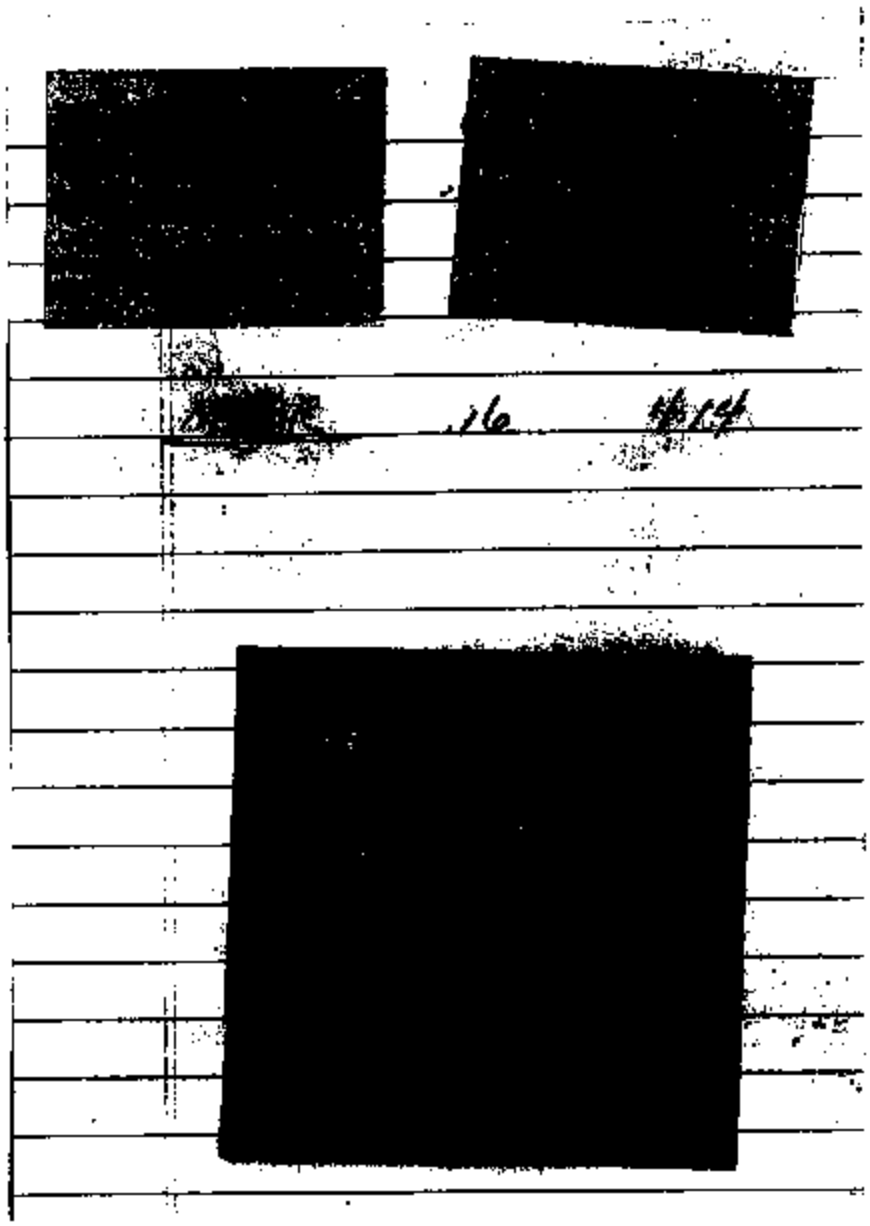
(1) PIPC

(2) R+R

(3) Material Anal.



11-15-91



cc: Elwell,

TEXAS INSTRUMENTS

Kelsey-Hayes Company
101 Oak Street
Milford, Michigan 48381

January 20, 1992

Attn: Mr. Clay Bailey
Manufacturing Engineer

Subj: Part Number E7SC-3N824-AA Pressure Switch 5-7F3-3
Part Number F3TA-9F924-AA Pressure Switch 77.A0-3

Ref: Your 01/20/92 Telephone Call

Dear Clay,

The purpose of this letter is to substantiate our discussion concerning the above referenced pressure switches. The switches are to be assembled with the threaded metal hexport onto the application. Installation torque is to be applied only to the metal hexport part of the switch.

There is to be no torque applied to the plastic connector part of the switch. Any torque applied to the plastic connector may cause abnormal operation, damage, or destruction of the switch function.

Please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Thomas Dan, Kelsey-Hayes Supplier Quality, Fenton, Mi.
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

cc - Blaine R.

TEXAS INSTRUMENTS

December 19, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
Supplier Manufacturing Change Request (SMCR)

Ref: Your 12/17/91 Telephone Call

Dear Tom,

Enclosed, please find the SMCR describing the proposed change for the Kelsey-Hayes print number 12590701. We believe that the errors were inadvertantly created from the recent ECN No. 25136 .

After reviewing the SMCR, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

encl: SCMR, ECN no. 25136

SUPPLIER MANUFACTURING CHANGE REQUEST

PART NAME: Pressure Switch	REQUEST NUMBER:	BUYER: Rita Gunia	DATE: 12/18
PART NUMBER: 12590701	PRODUCT LINE:	P.O.C.N. NUMBER:	E/P LEVEL: A
SUPPLIER: Texas Instruments Inc	K-H USING PLANT: Milford	SUPPORTING DATA ATTACHED?	☒YES ☐NO

REASON FOR CHANGE/PURPOSE: 1.) Update and correct Kelsey-Hayes drawing to reflect correct Ford part number and Ford ES specification number.

2.) Kelsey-Hayes ECN No. 25136 (9/5/91) created error. ECN No. 25136 copy is attached.

ORIGINATOR: Jim Watt TITLE: QRA Engr. CONCURRENCE: Charlie Douglas TITLE: Prod. Specia

DESCRIPTION: Kelsey-Hayes drawing no. 12590701-A should be changed to reflect:

1.) Ford Motor Co. Part No. ▼ F2VC-9F924-AB

2.) Ford Motor Co. Specification No. ▼ ES-F2VC-9F924-AA

PLAN FOR VERIFICATION & TESTING: Validation of these changes made with Ford Motor Co.

DISPOSITION - BY KELSEY-HAYES

APPROVE	REJECT	DISTRIBUTION	INSTRUCTIONS, QUALIFICATIONS AND/OR REASON FOR REJECTION:
		K-H PURCHASING	
		PLANT MANUFACTURING ENGINEERING	
		PLANT QUALITY CONTROL	
		K-H PRODUCT ENGINEERING	
		K-H SALES	
		PROCUREMENT or DIVISIONAL QUALITY ASSURANCE	THIS LEVEL APPROVED: ☐NONE ☐1 ☐2 ☐3

10/30/91 PSW_K-H.PC

KH KELSEY-HAYES **ENGINEERING CHANGE NOTICE**

PROD.AREA:	SUBJECT:	PROGRAM:	MODEL YEAR:	CUSTOMER(S):	ECN NO.: 25136
VALVES	FN-10 PRESSURE SWITCH	DUAL PROP	93	FORD	PAGE 1 OF 1

NATURE OF CHANGE: REVISE THE T.I. PRESSURE SWITCH - NEW AUTOMATED VERSION IS AVAILABLE.

NOTE: THIS IS A CHANGE TO CUSTOMER DRAWING.

REASON: CUSTOMER REQUEST: [X] PLANT REQUEST: [ ] VENDOR/PURCHASING REQUEST: [ ]
T.I. NOW HAS THEIR AUTOMATED ASSY GOING.
- NEED TO UPDATE PRINTS SO ISIR WILL REFLECT PRODUCTION LEVEL SWITCH.
ES TEST WILL BE PERFORMED ON ENTIRE VALVE FOR ISIR TO FORD.

EPA NO.: 48011-B

REF.DOCUMENTS:

CUST.CHG.:

K-H DEV./MCR.:

K-H EST.:

K-H NTR:

ATTACHMENTS:

DISTRIBUTION CODE:

CLASSIFICATION:

REGULAR	X
RECORD	
MANDATORY	
EXPEDITED	

VEHICLE APPLICATION:

PASSENGER	X
TRUCK	
TRAILER	
SERVICE	

ES TEST REQUIRED: YES [X] NO [ ] CONCURRENT [ ] TEST DURATION, DAYS: 30

INITIATED BY: J.COSSINS 8-2 DATE: 9-5-91

APPROVED BY:

PRODUCT ENGINEERING		DATE			DATE			DATE
PROJ ENGINEER	J.M. COSSINS	8-2-91	Q A	T.PRYOR/LV	8-20-91	ESTIMATING	K.R.HAWKINS	8-20-91
MATERIALS	NR		SALES	D.CLINE/CD	8-8-91	PURCHASING	R.IVES	8-13-91
MANAGER	G.A.WELLS	8-2-91	COST AUTHORIZATION	YES [ ] N R [ ]		MANUFACTURING	R.BELLAR	8-20-91
COST ENGINEER	C.DOWDING	8-2-91	COST RECOVERABLE?	YES [ ] NO [ ]		ENGINEERING SERV.	CAM	

(SEE ENGINEERING MANUAL SECTION 2.81)
AFFECTED DESIGN DATA BANK: REVIEWED? YES REVISED? NO

SERVICE MANUAL REVIEWED? NO SERVICE MANUAL REVISED? NO
FMEA REVIEWED? YES FMEA REVISED? NO

DELETE	REPLACE	RELEASE	CHANGE	CHG. LEVEL	PART NAME / REVISION	CO-DR CHG.	PURCH. PART X	STOCK DISPOSITION
			D-12590701	A5	ASSY - PRESSURE SWITCH - REVISE TO T.I. PRINT 77PSL2-1 WAS TO 57PSL5-3. NOTE THE ONLY VISIBLE CHANGE IS THE OVERALL LENGTH ON SWITCH. SO SPECIFIC CHANGES ARE: 1) CHANGE TO "57.15 MAX" WAS ""62.23 MAX" 2) CHANGE TO "▽F2VC-9F924-AA" WAS "F2VC-9F924-BA" 3) CHANGE T.I. P/N TO "77PSL2-1" WAS "57PSL5-3" 4) REMOVE "FOR FINAL ASSY SEE DWG. 12575501"	1	X	NO STK
			D-12603101	B	ASSY 'S - FN-10 DUAL PROP - REFLECT ABOVE CHANGES ON THESE DRAWINGS AND PARTS LIST	1		NO STK
			D-12603401	A				
			D-12603401	B				
			D-12603101	B				

APPROVED

POINTS INVOLVED: AUG 20 1991 MILFORD ECN NO: 25136

COMPLETE ATTACHED COST SHEET. COST/LEAD ETC. INFO. RELATING TO DEPARTMENTS CONCERNED

TI-NHTSA 003485

SUPPLIER MANUFACTURING CHANGE REQUEST

PART NAME: Passive Switch	REQUEST NUMBER:	BUYER: Bob Gunia	DATE: 12/18/91
PART NUMBER: 12590701	PRODUCT LINE:	F.O.C.B. NUMBER:	E/P LEVEL: A
SUPPLIER: Texas Instruments	K-H USING PLANT: [redacted]	SUPPORTING DATA ATTACHED?	YES ☐NO

REASON FOR CHANGE/PURPOSE: (1) Update and correct Kelsey-Hayes DRAWING TO Reflect CORRECT FORD PART NO. and FORD ES Specification Number.
(2) K-H ECN NO 25136 (9/5/91) CREATED ERROR.

ORIGINATOR: Jim Wiest TITLE: DRAFTER CONCURRENCE: CHARLIE DAUGHERTY TITLE: PRODUCT SPECIALIST

DESCRIPTION: Kelsey Hayes Drawing No. 12590701-A should Be changed to Reflect:
1.) FORD MOTOR Part No. ∇F2VC-9F924-AB
2.) FORD MOTOR Spec No. ∇ES-F2VC-9F924-AA

PLAN FOR VERIFICATION & TESTING: VALIDATE These changes with FORD MOTOR CO.

DISPOSITION - BY KELSEY-HAYES

APPROVE	REJECT	DISTRIBUTION	INSTRUCTIONS, QUALIFICATIONS AND/OR REASON FOR REJECTION:
		K-H PURCHASING	
		PLANT MANUFACTURING ENGINEERING	
		PLANT QUALITY CONTROL	
		K-H PRODUCT ENGINEERING	
		K-H SALES	
		PROCUREMENT or DIVISIONAL QUALITY ASSURANCE	TEST LEVEL REQUIRED: ☐none ☐1 ☐2 ☐3

12/20/91 PSA_S-1.PRD

cc = Eleveld

TEXAS INSTRUMENTS

Kelsey-Hayes Company
101 Oak Street
Milford, Michigan 48381

January 15, 1992

Attn: Mr. John Shorkey
Quality Engineer

Subj: Part Number E7SC-3N924-AA Pressure Switch
Part Number F3TA-9F924-AA Pressure Switch

Ref: Your 01/14/92 Telephone Call

Dear John,

We have confirmed the actuation pressures for Kelsey-Hayes part number numbers as follows:

Part number	Actuation Pressure
E7SC-3N924-AA	350-450 psi
F3TA-9F924-AA	200-300 psi

I have also enclosed a copy of Mr. Thomas Dan's 12/20/91 letter as you requested.

Please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-39
Thomas Dan, Kelsey-Hayes Supplier Quality, Fenton, Mi.
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

cc: Elaine K.

TEXAS INSTRUMENTS

December 13, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12604301 Pressure Switch (E7SC-3N824-AA)
Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
ISIR Submissions

Ref: Your 12/11/91 Telephone Conversation

Dear Tom,

Confirming your agreement that the ISIR submission documents that Texas Instruments uses need not be Kelsey-Hayes specific documents. We currently utilize Ford formatted documents for our ISIR submissions. In the event that Kelsey-Hayes has content specific requirements that are different from our current ISIR submission, we will provide those specific requirements on Kelsey-Hayes' documents.

After reviewing the ISIR submissions, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

cc= Glover

TEXAS INSTRUMENTS

December 10, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12604301 Pressure Switch (E78C-3N824-AA)
Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
ISIR Submissions

Dear Tom,

Just a short note to thank you for your efforts in locating the ISIR submission packages for the two pressure switches that were sent to Kelsey-Hayes on November 20, 1991 and signed for by " P. Ovington " at the Kelsey-Hayes receiving location.

After reviewing the submissions, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
DRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

√ cc Elaine R.

TEXAS INSTRUMENTS

December 05, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Ms. Mary Cooney
Shipping Department

Subj: Part Number 12604301 Pressure Switch (E78C-3N824-AA)
Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
ISIR Submissions

Dear Mary,

A package containing pressure switches and test documents was sent via UPS to Ms. Rita Gunia of your purchasing department on November 20, 1991. The package was signed for by " P. Ovington " at the Kelsey-Hayes receiving location.

Could you please let me know if the package was inadvertantly routed to someone other than Ms. Rita Gunia, or if you know of the individual " P. Ovington " ? A copy of the shipping document is attached.

I can be reached at: (508) 699-1719. Thank you in advance for your help.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

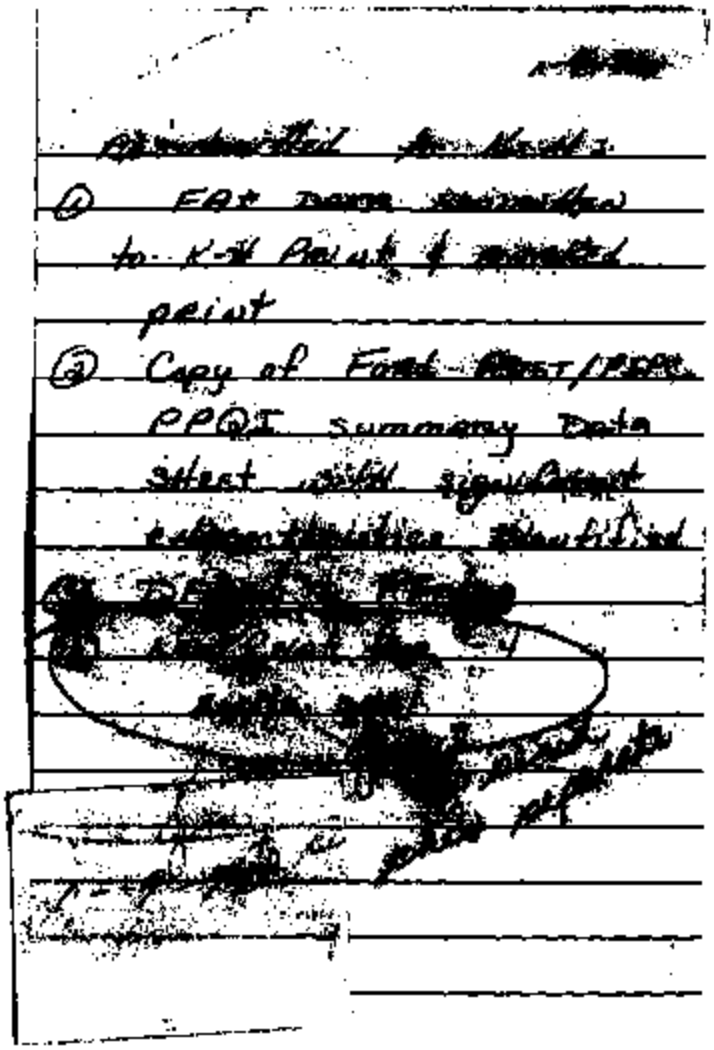
encl: UPS Shipping Document # 214070

TEXAS INSTRUMENTS

SHIP TO:

Attn: Ms. Rita Gould
Purchasing Dept.

GROSS WEIGHT	NO. OF CONTAINERS	ORIGINATOR'S NAME (TYPED)	ORIGINATOR'S SIGNATURE
[illegible]	1 of 1	Elaine Rose MS 12-27	



TI-NHTSA 003492

cc: Elaine L.

TEXAS INSTRUMENTS

March 16, 1992

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
ISIR Approval

Ref: Your 03/09/91 Telephone Call

Dear Tom,

Enclosed, please find the approved ISIR signed by Ford SQA for the Kelsey-Hayes print number 12590701.

After reviewing the ISIR, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
SRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuire, MS 12-27
Norm Freda, TI Farmington Hills, Michigan

encl: ISIR No. 112384

INITIAL SAMPLE WARRANT

No. I12384

PART INFORMATION

Part Name: NEXT GENERATION SPEED CONTROL Part Number: ▽P2VC-9F924-AB

Control Item: ☒ Yes ☐ No Engineering Change Level: G Date: 4-11-91

Engineering Change Authorization: [redacted] Date:

Shown on Drawing No.: P2VC-9F924-AB Part Weight: 062 lb

Reason for Initial Sample:

- ☐ Initial Submission
- ☐ Engineering Change(s)
- ☐ Tooling Transfer
- ☐ Other — Please Specify: SEE BELOW
- ☐ 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 STREET

City: ATTLEBORO State: MA Postal Code: 02703 Country: USA

Supplier Mfg. Location Code — CUNS: T097K Customer Assigned: FORD MOTOR CO - EED

CUSTOMER INFORMATION

Customer Name: FORD MOTOR CO - EED Buyer: FRED HENDERSHOT Buyer Code: 165

Purchase Order Number: [redacted] Sample Acceptance Level: 2

Application: NEXT GENERATION SPEED CONTROL

RESULTS

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

Submission Checklist

- ☐ Checkprint
- ☒ Auxiliary Drawings/Sketches
- ☒ Correct Number of Samples
- ☒ Dimensional Results
- ☐ Material Test Results
- ☒ Certifications
- ☒ Functional (SE) Test Results
- ☐ Product Engineering Approval
- ☐ Control Plan
- ☐ Process Capability Results
- ☐ Process Flow Diagram
- ☐ Gage (Measurement) Studies

Supporting data for all requirements are available upon request.

COMMENTS:

ISR SUPPLEMENT WITH ADDITIONAL TESTING TO CLOSE OUT ALERT NO. A10166193;
ALSO, CORRECTED BASE MOLD DIMENSIONS. PART PREVIOUSLY SUBMITTED ON
ISR #I12384, DATED 9/6/91

DECLARATION

I affirm that the samples represented by this warrant are representative of our parts and have been made to the applicable engineer 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 (place signature in appropriate box): ☒ Approved ☐ Rejected

Signature: [redacted] Date: 1/14/92

FMC 2020 Version effective 5/84

TEXAS INSTRUMENTS

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

January 09, 1992

Attn: Mr. Thomas G. Dan
Supplier Quality Assurance

Subj: Part Number 12590701 Pressure Switch (F2VC-9F924-AB)
ISIR Addendum

Ref: Your 12/20/91 Letter

Dear Tom,

Enclosed, please find the dimensional layout for the pressure switch, Kelsey-Hayes part number 12590701. Please refer to the SMCR that was submitted on 12/19/91 to correct the 12590701 release drawing.

We have also included copies of the design FMEA, process FMEA, and designated key characteristics list. We believe this completes the ISIR submission requirements for part number 12590701.

After reviewing the ISIR addendum, please let me know if you have any questions or if I can be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Charlie Douglas, MS 12-33
Rita Gunia, Kelsey-Hayes Purchasing Dept., Fenton, Mi.
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

encl: ISIR Addendum For 12590701

TEXAS INSTRUMENTS

cc: Elaine R.
FYI/RE

November 15, 1991

Kelsey-Hayes Company
9475 Center Road
Fenton, Michigan 48430

Attn: Ms. Rita Gunia
Purchasing Department

Subj: Part Number 12604301 Switch (E7SC-3N824-AA) STR-F3-3
Part Number 12590701 Switch (F2VC-9F924-AB) TBR12-1
ISIR Submissions

Dear Rita,

Enclosed, please find the ISIR for the 12604301 and 12590701 switches . Both ISIR submissions were accomplished on Ford forms as we are in the process of transferring data to Kelsey-Hayes forms.

The 12590701 submission has several dimensional issues on the layout that are being addressed.

The 12604301 submission needs dimensional layout, control plan, manufacturing flow diagram, PIST, PIPC, and PV testing that are being addressed.

Please let me know if you have any questions or if I may be of any further assistance.

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Gary Snyder, MS 12-39
Charlie Douglas, MS 12-39
Andy McGuirk, MS 12-27
Steve Majors, TI Farmington Hills, Michigan

encl: ISIR submissions

KELSEY-HAYES ENGINEERING CHANGE NOTICE

PROD. AREA:	SUBJECT:	PROGRAM:	MODEL YEAR:	CUSTOMER(S):	EDN NO.: 25136
VALVES	FN-10 PRESSURE SWITCH	DUAL PROP	93	FORD	PAGE 1 OF 1

NATURE OF CHANGE: REVISE THE T.I. PRESSURE SWITCH - NEW AUTOMATED VERSION IS AVAILABLE.

NOTE: THIS IS A CHANGE TO CUSTOMER DRAWING.

REASON: CUSTOMER REQUEST: [X] PLANT REQUEST: [ ] VENDOR/PURCHASING REQUEST: [ ]

T.I. NOW HAS THEIR AUTOMATED ASSY COMPLETE.
- NEED TO UPDATE PRINTS SO ISIR WILL REFLECT PRODUCTION LEVEL SWITCH.
- ES TEST WILL BE PERFORMED ON ENTIRE VALVE FOR ISIR TO FORD.

EPA NO.: 48011-B	CLASSIFICATION:
REF. DOCUMENTS:	REGULAR X
CUST. CHG.:	RECORD
K-H DEV./NCR:	MANDATORY
K-H EST.:	EXPEDITED
K-H NTR:	VEHICLE APPLICATION:
ATTACHMENTS:	PASSENGER X
DISTRIBUTION CODE:	TRUCK
INITIATED BY: J.COSKINS 8-2 DATE: 9-5-91	TRAILER
	SERVICE

ES TEST REQUIRED: YES [X] NO [ ] CONCURRENT [ ] TEST DURATION, DAYS: 30

APPROVED BY: PRODUCT ENGINEERING		DATE		DATE		DATE
RESP ENGINEER	J.M. COSSINS	8-2-91	Q A	T.PRYOR/LV 8-20-91	ESTIMATING	K.H.HAWKINS 8-20-91
MATERIALS	NR		SALES	D.CLINE/CD 8-8-91	PURCHASING	R.IVES 8-13-91
MANAGER	G.A.WILLI	8-2-91	CUST AUTHORIZATION	YES [ ] N R [ ]	MANUFACTURING	R.BELLAR 8-20-91
CHIEF ENGINEER	C.DOWDING	8-2-91	COST RECOVERABLE?	YES [ ] NO [ ]	ENGINEERING SERV.	CAW

(SEE ENGINEERING MANUAL SECTION 2.81)

AFFECTED DESIGN DATA BANK: REVIEWED? YES REVISED? NO

SERVICE MANUAL REVIEWED? NO SERVICE MANUAL REVISED? NO

FMEA REVIEWED? YES FMEA REVISED? NO

DELETE	REPLACE	RELEASE	CHANGE	CHG. LEVEL	PART NAME / REVISION	CO-OP CHG.	PURCH. PART X	STOCK DISPOSITION
			D-12590701	A5	ASST - PRESSURE SWITCH - REVISE TO T.I. PRINT 77PSL-1 WAS TO 57PSL5-3. NOTE THE ONLY VISIBLE CHANGE IS THE OVERALL LENGTH ON SWITCH. SO SPECIFIC CHANGES ARE: 1) CHANGE TO "57.15 MAX" WAS ""62.23 MAX" 2) CHANGE TO "▽F2VC-9F924-AA" WAS "F2VC-9F924-BA" 3) CHANGE T.I. P/N TO "77PSL2-1" WAS "57PSL5-3". 4) REMOVE "FOR FINAL ASSY SEE DWG. 12575501"	1	X	NO STK
			D-12603101	B	ASSY 'S - FN-10 DUAL PROP			
			D-12603101	B	- REFLECT ABOVE CHANGES ON THESE DRAWINGS AND PARTS LIST	1		NO STK
			D-12603401	B				
			P-12603401	B				
			P-12603101	B				

APPROVED

PLANT(S) INVOLVED: AUG 20 1991 MILFORD

COMPLETE ATTACHED COST SHEET. COST/LEAD ETC. INFO. RELATING TO DEPARTMENTS CONCERNED

EDN NO. 25136

TI-NHTSA 003498

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB/12596701

	BLUEPRINT SPEC	CAVITY # 1D ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
1	2.94 - 3.05	2.93	2.92	2.92	2.92	2.93	2.93	
	Ø 0.1 (S) M	0.041	0.020	0.035	0.031	0.015	0.013	
	1.90	1.859	1.920	1.936	1.869	1.885	1.887	
2	22.86 MAX	18.64	18.57	18.54	18.60	18.63	18.61	
		18.56	18.66	18.66	18.77	18.71	18.67	
3	57.15 MAX	55.65	55.70	55.71	55.70	55.69	55.68	
4	9.66 - 9.39	9.59	9.61	9.57	9.49	9.58	9.55	
5	2.04-1.52 ref	2.040	1.732	1.783	1.727	1.781	1.796	
6	Ø 8.03-7.82ref	7.94	7.94	7.97	7.97	7.98	7.96	
		7.90		7.99				
7	10.23X30-40 DEG	CHAMFER	N/A -	THREADS	HAVE BEEN	ADDED		
8	5/8-24UNF-2A	OK	OK	OK	OK	OK	OK	
	THD. -D-							
9	1.40 - 1.10	1.316	MEASURED	ON A CROSS	SECTIONED	PART		

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TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB/12590701

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
1	2.84 - 3.05	2.93	2.92	2.92	2.92	2.93	2.93	
	⌀ 0.1 Ⓜ A	0.041	0.020	0.033	0.031	0.015	0.013	
	1.90	1.859	1.920	1.933	1.869	1.885	1.887	
2	22.88 MAX	18.64	18.57	18.54	18.60	18.63	18.61	
		18.56	18.66	18.66	18.77	18.71	18.67	
3	57.15 MAX	55.65	55.78	55.73	55.70	55.69	55.60	
4	9.66 - 9.39	9.59	9.61	9.57	9.49	9.58	9.55	
		[redacted]						Omitted
5	2.04-1.52 ref	2.040	1.732	1.783	1.727	1.783	1.796	PER J.C.W. 1-9-92
6	⌀ 8.03-7.82ref	7.94	7.94	7.97	7.97	7.98	7.96	
		7.50		7.99				
7	10.25X50-40 DEG	CHAMFER	N/A -	THREADS	HAVE BEEN	ADDED		
8	3/8-24UNF-2A	OK	OK	OK	OK	OK	OK	
	THD. -D-							
9	1.40 - 1.10	1.316	MEASURED	ON A CROSS	SECTIONED	PART		

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TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2YC-9F924-AB/12598701

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
1	2.84 - 3.85	2.93	2.92	2.92	2.92	2.93	2.93	
	⌖ 0.1 Ⓜ A	0.041	0.029	0.033	0.031	0.015	0.013	
	1.90	1.859	1.920	1.933	1.869	1.885	1.887	
2	22.00 MAX	18.64	18.57	18.54	18.68	18.63	18.61	
		18.56	18.66	18.66	18.77	18.71	18.67	
3	57.15 MAX	55.65	55.70	55.71	55.78	55.69	55.68	
4	9.66 - 9.39	9.59	9.61	9.57	9.49	9.58	9.55	
		9.63	9.66	9.64	9.62	9.74	9.67	OUT OF SPEC.
5	2.04-1.52 ref	2.040	1.732	1.783	1.727	1.781	1.796	
6	⌭ 8.03-7.82ref	7.94	7.94	7.97	7.97	7.98	7.96	
		7.58		7.99				
7	0.25X50-40 DEG	CHAMFER	N/A -	THREADS	HAVE BEEN	ADDED		
8	3/8-24UNF-2A	OK	OK	OK	OK	OK	OK	
	THD. -D-							
9	1.40 - 1.10	1.316	MEASURED	ON A CROSS	SECTIONED	PART		

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TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2YC-9F924-AB/12590781

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY #4D ACTUAL	CAVITY # 5B ACTUAL	CAVITY # 6B ACTUAL	COMMENTS
10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
11	2.5√ c	OK -	MEASURED	ON A CROSS	SECTIONED	PART		
12	430EG-410EG	410EG 21MIN	MEASURED	ON A CROSS	SECTIONED	PART		
13	600EG-250EG	N/A -	THREADS	HAVE BEEN	ADDED			
14	Ø 3.60-3.30	3.45	3.45	3.43	3.45	3.44	3.45	
		3.46	3.43	3.42	3.46	3.47	3.45	
15	Ø 7.37-7.23	7.27	7.35	7.33	7.31	7.32	7.37	
		7.28	7.32	7.33	7.37	7.30	7.37	
16	Ø 5.85-5.50	5.61	5.72	5.64	5.67	5.60	5.61	
		5.60	5.60	5.66	5.70	5.66	5.63	

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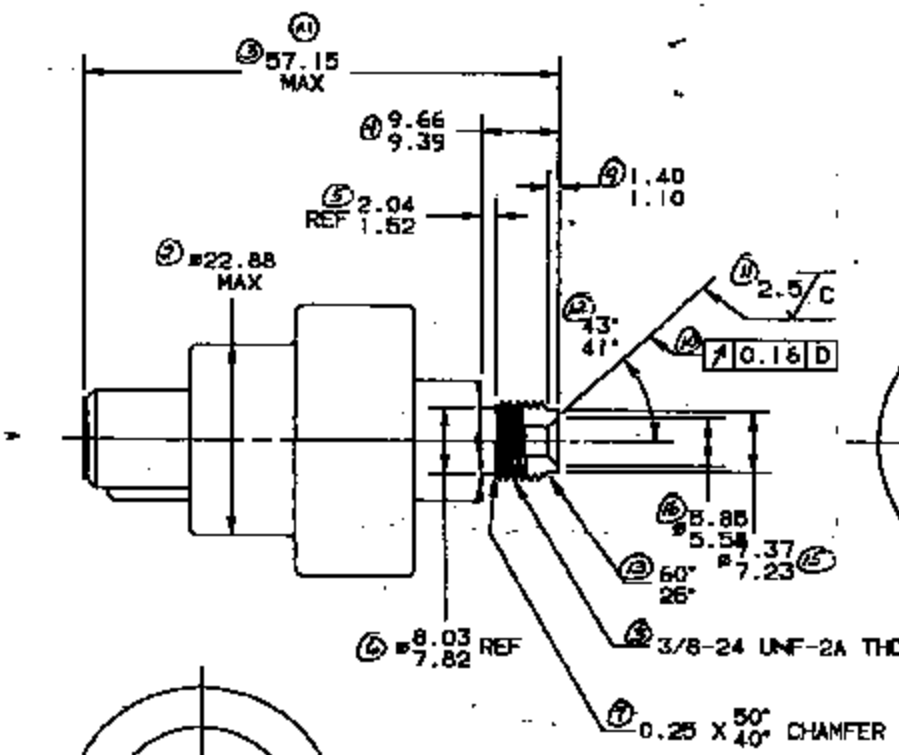

FORD PART NO. ▽F2VC-9F924-AA

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

SPECIFICATION:

DEVICE MUST CONFORM TO FORD MOTOR CO. SPEC NO. ES-F2VC-9F924-A

ACTUATION PRESSURE---- 862 ±241 kPag (125 ±35 psig)

RELEASE PRESSURE------ 138 kPag MIN. (20 psig)

		A5	ADDED CONTROL ITEM BLOCK	9-5-91	CS
		A4	REMOVED "FOR FINAL ASSY REF..."	9-5-91	CS
		A3	WAS SHEET 2	9-5-91	CS
		A2	WAS F2VC-9F924-AA	9-5-91	CS
8438	25134	A1	WAS Ø22.38 MAX DIA	9-5-91	CS
8436	301		RELEASED	1-11-91	
ENG/MFR	ORG/SEC	CHG	REVISION	DATE	DR.

UNLESS OTHERWISE SPECIFIED: PART TOLERANCES — MATERIAL/FINISH

SCALE 2 X SIZE — 3RD ANGLE PROJECTION

METRIC

KYH ELECTRONICS

ASSY-PRESSURE SWITCH

CHK R. HENNESSY	DATE 12-15-90	
CHK D. KERSHAW	DATE 1-3-91	
CUST		
APPROVED BY	DATE	
ENG J. JOHNSON	1-11-91	
MKTG		
PROC J. GALES	1-11-91	
QUALITY R.A. WILLIT	1-11-91	

ENG. RELEASED FOR PRODUCTION BY KYH ELECTRONICS

NO MANUAL CHANGE

SIZE C — CAD NO. DWG.

PART NUMBER

BASE NUMBER 12590701 SUFFIX -A

TI-NHTBA 003504

DRAWINGS AVAILABLE UPON REQUEST

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2YC-9F924-AB/12590701

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5B ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
1	2.84 - 3.05	2.93	2.92	2.92	2.92	2.93	2.93	
	Ⓜ 0.1 Ⓜ A	0.041	0.020	0.033	0.031	0.015	0.013	
	1.98	1.859	1.920	1.933	1.869	1.885	1.867	
2	22.88 MAX	18.64	18.57	18.54	18.60	18.63	18.61	
		18.56	18.66	18.66	18.77	18.71	18.67	
3	57.15 MAX	55.65	55.70	55.71	55.70	55.69	55.68	
4	9.66 - 9.99	9.59	9.64	9.57	9.49	9.58	9.55	
		9.63	9.66	9.64	9.62	9.74	9.67	OUT OF SPEC.
5	2.04-1.52 ref	2.048	1.732	1.783	1.727	1.781	1.796	
6	Ø 8.05-7.82ref	7.94	7.94	7.93	7.97	7.98	7.96	
		7.58		7.99				
7	10.25X50-40 DEG	CHAMFER	N/A -	THREADS	HAVE BEEN	ADDED		
8	3/8-24UNF-2A	OK	OK	OK	OK	OK	OK	
	THD. -B-							
9	1.48 - 1.18	1.316	MEASURED	ON A CROSS	SECTIONED	PART		

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TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB/1259878

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY #4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
11	2.5 ± .1	OK -	MEASURED	ON A CROSS	SECTIONED	PART		
12	43DEG-41DEG	41DEG 21MIN	MEASURED	ON A CROSS	SECTIONED	PART		
13	60DEG-25DEG	N/A -	THREADS	HAVE BEEN	ADDED			
14	3.64-3.30	3.45	3.45	3.43	3.45	3.44	3.45	
		3.46	3.43	3.42	3.46	3.47	3.45	
15	7.37-7.23	7.27	7.35	7.33	7.31	7.32	7.37	
		7.28	7.32	7.33	7.37	7.38	7.37	
16	5.85-5.58	5.61	5.72	5.64	5.67	5.68	5.61	
		5.68	5.68	5.66	5.70	5.66	5.63	

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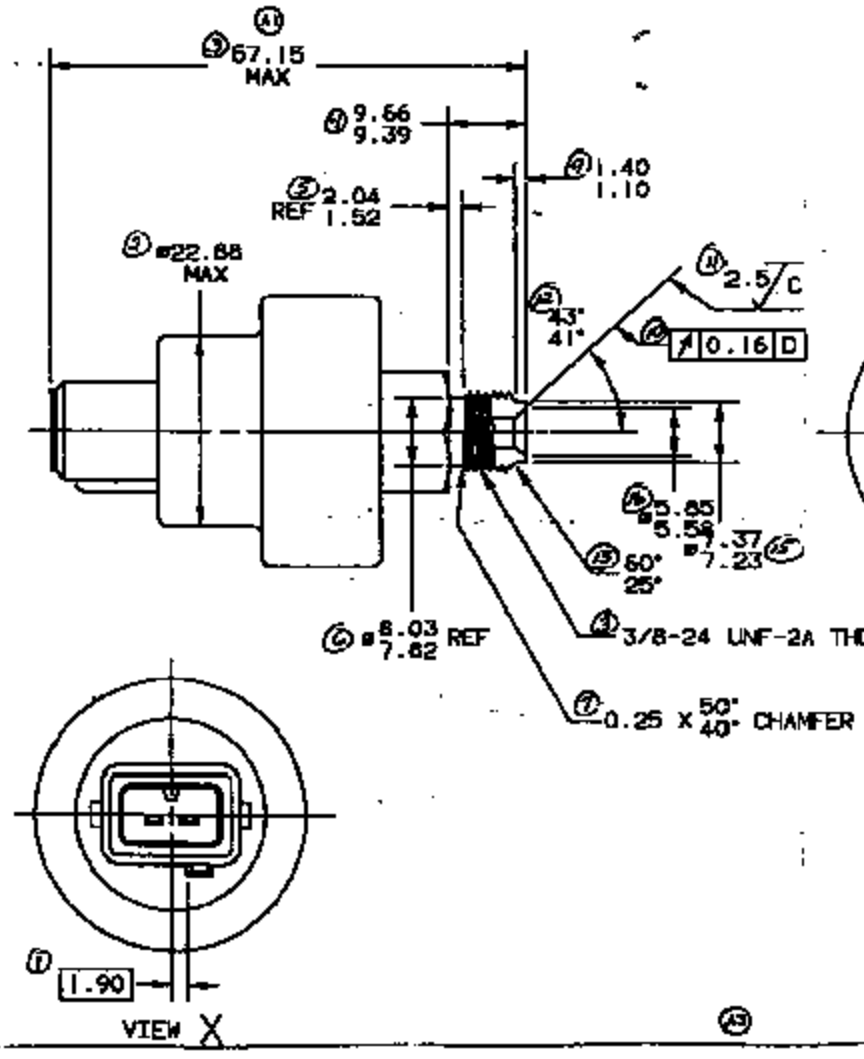

FORD PART NO. ▽F2VC-9F924-AA

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

SPECIFICATION:

DEVICE MUST CONFORM TO FORD MOTOR CO.
SPEC NO. ES-F2VC-9F924-A

ACTUATION PRESSURE---- 862 ±241 kPag (125 ±35 psig).

RELEASE PRESSURE------ 138 kPag MIN. (20 psig)

		A5	ADDED CONTROL ITEM BLOCK	9-6-91	CB	JT
		A4	REVISED "FOR FINAL ... SEE..."	9-5-91	CB	JT
		A3	WAS 87F9LB-3	9-5-91	CB	JT
		A2	WAS F2VC-9F924-AA	9-5-91	CB	JT
8438	98134	A1	WAS 92.33 MAN 03H	9-5-91	CB	JT
8438	201		RELEASED	1-11-91		
EPA/WTR	ENG/DSGN	CHG	REVISION	DATE	DR.	CK.

PART TOLERANCES

MATERIAL/FINISH

SCALE 2 X SIZE

3RD ANGLE PROJECTION

METRIC

KH RELSEHAMES

ASSY-PRESSURE SWITCH

DR R. KENWORTHY	DATE 12-15-90	CAD DRAWING ORIGINAL IS IN ELECTRONIC FORM. NO MANUAL CHANGE	
CK D. NEWMAN	DATE 1-3-91		
CUST			

APPROVED BY	DATE	FINAL STAGE				ENG. REL. DATE
ENG J.CROSSLEY	1-11-91	C				
MAT'L						
MFR J.GALIS	1-11-91	PART NUMBER				
QUAL REP G.A.VELLI	1-11-91	DASH NUMBER	BASE NUMBER	SUFFIX	CHANGE LEVEL	
			5-12590701	-A		

TI-NHTSA 003608

DRAWINGS AVAILABLE UPON REQUEST

KELSEY-HAYES ENGINEERING CHANGE NOTICE

PROD. AREA:	SUBJECT:	PROGRAM:	MODEL YEAR:	CUSTOMER(S):	ECN NO.: 25136
VALVES	FN-10 PRESSURE SWITCH	DUAL PROP	93	FORD	PAGE 1 OF 1

NATURE OF CHANGE: REVISE THE T.I. PRESSURE SWITCH - NEW AUTOMATED VERSION IS AVAILABLE.

NOTE: THIS IS A CHANGE TO CUSTOMER DRAWING.

REASON: CUSTOMER REQUEST: [X] PLANT REQUEST: [ ] VENDOR/PURCHASING REQUEST: [ ]
T.I. NOW HAS THEIR AUTOMATED ASSY CELNC.
- NEED TO UPDATE PRINTS SO ISIR WILL REFLECT PRODUCTION LEVEL SWITCH.
  RR TEST WILL BE PERFORMED ON ENTIRE VALVE FOR ISIR TO FORD.

EPA NO.: 48011-B	CLASSIFICATION:
REF. DOCUMENTS:	REGULAR [X]
CUST. CHG.:	RECORD [ ]
K-H DEV./NCR:	MANDATORY [ ]
K-H EST.:	EXPEDITED [ ]
K-H NTR:	VEHICLE APPLICATION:
ATTACHMENTS:	PASSENGER [X]
DISTRIBUTION CODE:	TRUCK [ ]
	TRAILER [ ]
	SERVICE [ ]

INITIATED BY: J.COSSINS 8-2 DATE: 9-5-91

ES TEST REQUIRED: YES [X] NO [ ] CONCURRENT [ ] TEST DURATION, DAYS: 30

APPROVED BY:

PRODUCT ENGINEERING		DATE		DATE		DATE
NSP ENGINEER	J.M. COSSINS	8-2-91	Q A T.PRYOR/LV	8-20-91	ESTIMATING K.R.HAWKINS	8-20-91
MATERIALS	NR		SALES D.CLINE/CD	8-8-91	PURCHASING R.IVES	8-13-91
MANAGER	G.A.WELLI	8-2-91	CUST AUTHORIZATION YES [ ] N R [ ]		MANUFACTURING R.BELLAR	8-20-91
OGEF ENGINEER	C.DOWDING	8-2-91	COST RECOVERABLE? YES [ ] NO [ ]		ENGINEERING SERV. CAN	

(SEE ENGINEERING MANUAL SECTION 2.81)
AFFECTED DESIGN DATA BANK: REVIEWED? YES REVISED? NO
SERVICE MANUAL REVIEWED? NO SERVICE MANUAL REVISED? NO
FMEA REVIEWED? YES FMEA REVISED? NO

DELETE	REPLACE	RELEASE	CHANGE	CHG. LEVEL	PART NAME / REVISION	CO-OR CHG.	PURCH. PART X	STOCK DISPOSITION
			D-12590701	A5	ASSY - PRESSURE SWITCH - REVISE TO T.I. PRINT 77PSL2-1 WAS TO 57PSL5-3. NOTE THE ONLY VISIBLE CHANGE IS THE OVERALL LENGTH ON SWITCH. SO SPECIFIC CHANGES ARE: 1) CHANGE TO "57.15 MAX" WAS ""62.23 MAX" 2) CHANGE TO " ▽F2VC-9F924-AA" WAS "F2VC-9F924-BA" 3) CHANGE T.I. P/N TO "77PSL2-1" WAS "57PSL5-3" 4) REMOVE "FOR FINAL ASSY SEE DWG 12575501"	1	X	NO STK
			D-12603101	B	ASSY 'S - FN-10 DUAL PROP - REFLECT ABOVE CHANGES ON THESE DRAWINGS AND PARTS LIST	1		NO STK
			D-12603101	B				
			D-12603401	B				
			P-12603401	B				
			P-12603101	B				

APPROVED

PLANT(S) INVOLVED: AUG 2 0 1991 MILFORD

COMPLETE ATTACHED COST SHEET. COST/LEAD ETC. INFO. RELATING TO DEPARTMENTS CONCERNED

ECN NO. 25136

THNHT8A 003510

Al.. B402 — File: 77PSLH

TEXAS INSTRUMENTS

ATTLEBORO, MASSACHUSETTS 02703

PAGE ____ OF ____

SAMPLE REPORT

REASON FOR REPORT		VENDOR		P.O.	PART NO. P/C 77PSL2-1	REV.
NEW PART						
REPLACEMENT TOOL.		REPORT REQ. BY	DATE	INSPECTED BY		DATE
CORRECTED TOOL.		K-H				12-16-91
REPAIRED TOOL.						
REVIEW						
OTHER						

THE DIMENSIONS INDICATED BELOW REPRESENT TEXAS INSTRUMENTS' FINDINGS REGARDING THE ACTUAL VALUES FOR ALL CHARACTERICS MEASURED. IN CASES WHERE ACTUAL VALUES DEVIATE FROM THE SPECIFIED DIMENSIONS, THE DISPOSITION MUST INDICATE THE REQUIRED ACTION FOR EACH NON-CONFORMANCE IN THE APPROPRIATE COLUMN.

		(CIRCLE ALL OUT OF TOLERANCE DIMENSIONS)					DISPOSITION		
INSP. K-H		SPEC:	1B	2C	3C	4D	5D	6D	
5	1	2.84 - 3.05	2.93	2.92	2.92	2.92	2.93	2.93	
		⊕ 0.1 Ⓢ A	0.041	0.020	0.038	0.031	0.015	0.013	
		1.90	1.859	1.920	1.933	1.869	1.885	1.887	
15	2	22.88 max	[illegible]	18.57	18.54	18.60	18.63	18.61	
			18.56	18.66	18.66	18.77	18.71	18.67	
16	3	57.15 max.	55.65	55.70	55.71	55.70	55.69	55.68	
17	4	9.66 - 9.39	9.59	9.61	9.57	9.49	9.58	9.55	
			9.62	9.66	9.64	9.62	*9.74	* 9.67	out of Spec.
22	5	[illegible] ref.	2.040	1.732	1.783	1.727	1.781	1.796	
23	6	Ø 8.02 - 7.82 ref.	7.94	7.94	7.97	7.97	7.98	7.96	
			7.50		7.99				
29	7	0.25 x 50° - 46° chamfer	N/A - Threads Have Been Added						
30	8	3/8 - 24 UNF - 2A THD [illegible]	OK	OK	OK	OK	OK	OK	
31	9	1.40 - 1.10	1.316	measured on a Cross Sectioned Part					
[illegible]	[illegible]	0.16 D	0.051	0.048	0.048	0.008	0.030	0.056	
[illegible]	[illegible]	[illegible]	OK	measured on a Cross Sectioned Part					
34	10	42° - 41°	41°21'	"	"	"	"	"	
35	13	60° - 25°	N/A - Threads Have Been Added						
38	14	Ø 3.60 - 3.30	3.45	3.45	3.43	3.45	3.44	3.45	
			3.46	3.43	3.42	3.46	3.47	3.45	
39	15	Ø 7.37 - 7.23	7.27	7.35	7.33	7.31	7.32	7.37	
			7.28	7.32	7.33	7.37	7.30	7.37	
40	16	Ø 5.85 - 5.58	5.61	5.72	5.64	5.67	5.60	5.61	
			5.68	5.68	5.66	5.70	5.66	5.63	

REMARKS AND/OR INSTRUCTIONS:

DISPOSITION: Tool Approved For Prod. | Resubmission Req'd

MFG. ENG.: | QRA ENG.:

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB/12590701

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5B ACTUAL	CAVITY # 6D ACTUAL	[illegible]
1	2.84 - 3.05	2.93	2.92	2.92	2.92	2.93	2.93	
	D 0.1 m A	0.041	0.020	0.033	0.031	0.015	0.013	
	1.90	1.859	1.920	1.938	1.869	1.885	1.887	
2	22.80 MAX	18.64	18.57	18.54	18.60	18.63	18.61	
		18.56	18.66	18.66	18.77	18.71	18.67	
3	57.15 MAX	55.65	55.70	55.71	55.70	55.69	55.68	
4	9.66 - 9.39	9.59	9.61	9.57	9.49	9.58	9.55	
		9.63	9.66	9.64	9.62	9.74	9.67	OUT OF SPEC.
5	2.04-1.52 ref	2.040	1.732	1.788	1.727	1.781	1.796	
6	10 8.03-7.82ref	7.94	7.94	7.97	7.97	7.98	7.96	
		7.58		7.99				
7	0.25000-40 UNS	DIAMETER	N/A -	THREADS	HAVE BEEN	ADDED		
8	3/8-24UNF-2A	OK	OK	OK	OK	OK	OK	
	THD. H							
9	1.40 - 1.10	1.316	MEASURED	ON A CROSS	SECTIONED	PART		

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB/12590701

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY #4B ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	CAVITY # ACTUAL
10	0.16 D	0.051	0.048	0.048	0.008	0.030	0.056	
11	2.5 c	OK -	MEASURED	ON A CROSS	SECTIONED	PART		
12	430EB-410EB	410EB 21XDN	MEASURED	ON A CROSS	SECTIONED	PART		
13	600EB-590EB	N/A -	THREADS	HAVE BEEN	ADDED			
14	ID 3.60-3.30	3.45	3.45	3.43	3.45	3.44	3.45	
		3.46	3.43	3.42	3.46	3.47	3.45	
15	ID 7.37-7.23	7.27	7.35	7.31	7.31	7.32	7.37	
		7.28	7.32	7.33	7.37	7.30	7.37	
16	ID 5.85-5.58	5.61	5.72	5.64	5.67	5.60	5.61	
		5.60	5.60	5.66	5.70	5.66	5.63	

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4B ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
1	19.45 - 19.81	19.55	19.61	19.58	19.56	19.57	19.57	
2	16.56 - 16.76	16.59/16.58	16.62/16.64	16.62/16.63	16.58/16.59	16.54/16.56	16.59/16.59	
3	11.30 - 13.21	12.974	13.051	13.035	13.043	13.078	12.946	
4	11.40 - 11.90	11.768	11.808	11.775	11.773	11.756	11.755	
5	2.84 - 3.05	2.93	2.92	2.92	2.92	2.93	2.93	
	0.1 A	1.859/0.041	1.920/0.020	1.933/0.033	1.869/0.031	1.885/0.015	1.987/0.013	
6	11.60 - 11.92	11.69/11.71	11.67/11.71	11.72/11.68	11.60/11.63	11.63/11.67	11.65/11.65	
7	1.24 - 1.45	1.252	1.250	1.280	1.280	1.290	1.265	
8	1.24 - 1.55	1.402	1.397	1.400	1.389	1.397	1.397	
9	1.85 - 2.06	2.004	1.974	1.996	1.984	1.994	1.986	
10	13.43 - 13.85	13.772	13.693	13.800	13.686	13.686	13.556	
11	31DEG +/- 2DEG	30DEG 34MIN	29DEG 53MIN	31DEG	29DEG 04MIN	29DEG 03MIN	30DEG 06MIN	
12	2.79 - 3.10 2X	2.90/2.89	2.90/2.90	2.90/2.90	2.90/2.90	2.89/2.89	2.90/2.94	
13	0.25 - 0.75	0.508/0.841	0.480/0.800	0.442/0.6731	0.498/0.671	0.490/0.744	0.460/0.757	OUT OF SPEC.
14	0.05 - 0.26 2X	0.051/0.049	0.074/0.127	0.140/0.076	0.127/0.135	0.153/0.163	0.0711/0.036	
		0.140/0.147	0.092/0.089	0.086/0.114	0.048/0.081	0.038/0.013	0.137/0.165	
15	Ø 19.05 MAX	18.64 18.56	18.57 18.66	18.54 18.66	18.60 18.77	18.63 18.71	18.61 18.67	

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TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4C ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
16	57.15 MAX	55.65	55.70	55.71	55.70	55.69	55.68	
17	12.59 - 13.11	12.74/12.86	12.72/12.84	12.77/12.76	12.76/12.77	12.75/12.91	12.73/12.80	
18	11.65 - 12.17	11.68/11.79	11.85/11.84	11.73/11.79	11.88/11.80	11.78/11.86	11.73/11.88	
19	14.23 MAX	13.66	13.65	13.67	13.65	13.65	13.66	
20	9.39 - 9.66	9.59/9.63	9.61/9.66	9.57/9.64	9.49/9.62	9.58/9.74	9.55/9.67	OUT OF SPEC.
21	8.12 MIN	8.98/9.29	9.13/9.54	9.12/9.18	8.98/9.56	9.14/9.22	9.11/9.14	
22	1.52 - 2.04	2.040	1.732	1.789	1.727	1.781	1.796	
23	Ø 7.82-8.03	7.94/7.50	7.94	7.97/7.99	7.97	7.96	7.96	
24	6.60 - 6.81	6.640	6.698	6.693	6.647	6.665	6.642	
24A	290EB+/-20B 4X	290EB 54MIN 300EB 57MIN	300EB 24MIN 280EB 46MIN	MEASURED	ON A CROSS	SECTIONED	PART	
25	1.80-2.21R 2X	1.84-1.84	1.84-1.84	1.84-1.84	1.84-1.84	1.84-1.84	1.84-1.84	
26	7.23-7.75	7.74	7.52	7.53	7.54	7.55	7.53	
26A	NO FLASH OR BURRS ALLOWED ON SURFACE	OK	OK	FLASH	OK	OK	FLASH	
27	2.79-3.41	3.145	3.099	3.160	3.150	3.139	3.107	
28	0.68-1.30	1.115	1.168	1.179	1.148	1.161	1.153	

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DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-A8

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
28A	STAMP DATE	INVERTED	DELTA	OMITTED.	HAS SINCE	BEEN	INCLUDED	
	CODE & PART#	IN CODING	OPERATION.					
29	0.25MIN X 40 -	N/A THREADS	HAVE BEEN	ADDED				
	50DEG CHAMFER							
30	3/8-24UNF-2A	OK	OK	OK	OK	OK	OK	
31	1.10-1.40	1.316	MEASURED	ON A CROSS	SECTIONED	PART		
32	↗ 0.16 D	0.051	0.048	0.048	0.008	0.030	0.056	
33	2.5 c	OK	MEASURED	ON A CROSS	SECTIONED	PART		
34	41DEG - 43DEG	41DEG 21MIN	MEASURED	ON A CROSS	SECTIONED	PART		
35	40-50DEG CHAMF	N/A THREADS	HAVE BEEN	ADDED				
36	32.51 MAX	31.64 31.62	31.46 31.48	31.45 31.46	31.50 31.47	31.46 31.48	31.58 31.58	
37	14.02-14.53HEX	14.11	14.11	14.11/14.13	14.11/14.13	14.12/14.13	14.11/14.12	
38	Ø3.30-3.60	3.45 - 3.46	3.45 - 3.43	3.43 - 3.42	3.45 - 3.46	3.44 - 3.47	3.45 - 3.45	
39	7.23-7.37	7.27 7.28	7.35 7.32	7.33 7.33	7.31 7.37	7.32 7.30	7.37 7.37	
40	5.58-5.85	5.61 5.68	5.72-5.68	5.64-5.66	5.67-5.70	5.60-5.66	5.61-5.63	
41	71.5DEG +/-	72DEG 30MIN	72DEG 11MIN	72DEG 12MIN	72DEG 28MIN	71DEG 56MIN	72DEG 10MIN	
	2DEG 2X	72DEG 30MIN	72DEG 14MIN	72DEG 50MIN	72DEG 37MIN	72DEG 11MIN	72DEG 36MIN	

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TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
42	1.42-1.63 2X	1.62-1.62	1.63-1.63	1.58-1.63	1.63-1.60	1.60-1.59	1.60-1.57	
43	0.35-0.66 4X	1.66-0.65	0.57-0.59	0.57-0.60	0.58-0.58	0.58-0.57	0.57-0.59	
		0.57-0.59	0.59-0.55	0.59-0.57	0.59-0.56	0.54-0.55	0.55-0.54	
44	8.30-8.72 2X	8.43-8.46	8.51-8.44	8.41-8.44	8.42-8.42	8.59-8.43	8.42-8.56	
45	2.15-2.42 2X	2.19-2.21	2.18-2.22	2.20-2.15	2.20-2.16	2.16-2.18	2.29-2.16	#1 OUT OF SPEC
46	25DEG+/-2 2X	24DEG 36MIN	24DEG 41MIN	23DEG 16MIN	23DEG 39MIN	22DEG 09MIN	23DEG 34MIN	
		23DEG 06MIN	23DEG 45MIN	24DEG 31MIN	23DEG 53MIN	23DEG 58MIN	24DEG 24MIN	
47	HOUSING: BROWN	BROWN	BROWN	BROWN	BROWN	BROWN	BROWN	
48	45DEG+/-2 4X	44DEG 36MIN	46DEG 47MIN	46DEG 09MIN	45DEG 08MIN	46DEG 37MIN	45DEG	
		45DEG 46MIN	45DEG 19MIN	43DEG 20MIN	45DEG 04MIN	44DEG 11MIN	46DEG 05MIN	
		44DEG 43MIN	45DEG 44MIN	46DEG 46MIN	45DEG 16MIN	44DEG 07MIN	44DEG 01MIN	
		45DEG 12MIN	45DEG 23MIN	45DEG 39MIN	44DEG 48MIN	45DEG 34MIN	44DEG 34MIN	
49	0.86-1.17 4X	0.96-0.95	0.98-1.03	0.97-1.02	0.98-1.02	0.99-1.03	0.99-1.03	
		0.95-0.93	0.96-0.97	0.96-1.00	0.93-1.00	0.97-0.97	0.95-0.96	
50	0.35-0.66 4X	0.54-0.54	0.45-0.44	0.46-0.48	0.46-0.50	0.45-0.54	0.51-0.49	
		0.48-0.51	0.49-0.52	0.54-0.53	0.52-0.52	0.50-0.54	0.51-0.44	

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TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB

	BLUEPRINT SPEC	CAVITY # 1D ACTUAL	CAVITY # 2E ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
51	2.59-2.80 2X	2.728	2.710	2.703	2.713	2.710	2.739	
	0.2 m A B C	2.393	2.499	2.578	2.482	2.457	2.515	
	0	0.072	0.034	0.113	0.017	0.008	0.050	
	2.99-2.80 2X	2.695	2.703	2.715	2.703	2.695	2.710	
	0.2 m A B C	2.499	2.522	2.380	2.377	2.427	2.443	
	0	0.004	0.057	0.085	0.068	0.038	0.022	
52	13-19DEG 2X	17DEG 23MIN	MEASURED	ON A CROSS	SECTIONED	PART		
		19DEG 49MIN	MEASURED	ON A CROSS	SECTIONED	PART		OUT OF SPEC +43MIN
53	0.46-0.67	0.785	MEASURED	ON A CROSS	SECTIONED	PART		
54	0.10-0.31	0.262	MEASURED	ON A CROSS	SECTIONED	PART		
55	0.53-0.69	0.632	MEASURED	ON A CROSS	SECTIONED	PART		

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DRAWINGS AVAILABLE UPON REQUEST

PIPC/PIST DATA

PROCESS POTENTIAL AND QUALITY INDEXES SUMMARY DATA SHEET

PART #: F2VC-9F924-AB
SUPPLIER: Texas Instruments
CODE: 70978
ADDRESS: 34 Forest St.
Attleboro, MA 02703
VEHICLE BUILD: EP VP FB OTHER

SUPPLIER CONTACT: Jim Hatt
CONTACT PHONE: 1-508-699-1719
PART DESCRIPTION: Next Generation Speed Control
SQA CODE: (Mark Schuller)
VEHICLE PROGRAM: Probe Cxt

CHARACTERISTIC TYPE

∇ = FORD CRITICAL CHARACTERISTICS

S.C. = FORD OR SUPPLIER SIGNIFICANT CHARACTERISTICS

NUMBER OF CRITICAL AND SIGNIFICANT CHARACTERISTICS:

1:	Actuation Pressure	TYPE:	SC	Cp =	**	Cpk = **
2:	Release Pressure	TYPE:	SC	Cp =	**	Cpk = **
3:	3/8-24UNF-2A Thread	TYPE:	SC	Cp =	A*	Cpk = A*
4:		TYPE:		Cp =		Cpk =
5:		TYPE:		Cp =		Cpk =
6:		TYPE:		Cp =		Cpk =
7:		TYPE:		Cp =		Cpk =
8:		TYPE:		Cp =		Cpk =
9:		TYPE:		Cp =		Cpk =
10:		TYPE:		Cp =		Cpk =
11:		TYPE:		Cp =		Cpk =
12:		TYPE:		Cp =		Cpk =
13:		TYPE:		Cp =		Cpk =
14:		TYPE:		Cp =		Cpk =
15:		TYPE:		Cp =		Cpk =

PIST = 1265/1265 x 100 = 100 %

$PIPC_{Cp}$ = N/A x 100 = ____ % $PIPC_{Cpk}$ = N/A x 100 ____ %

COMMENTS:

** Calibration check is done 100 percent parts tested 300; defective 0 percent or defect 0.

A* threads are checked on a Go/Nogo gage.

PREPARED BY:

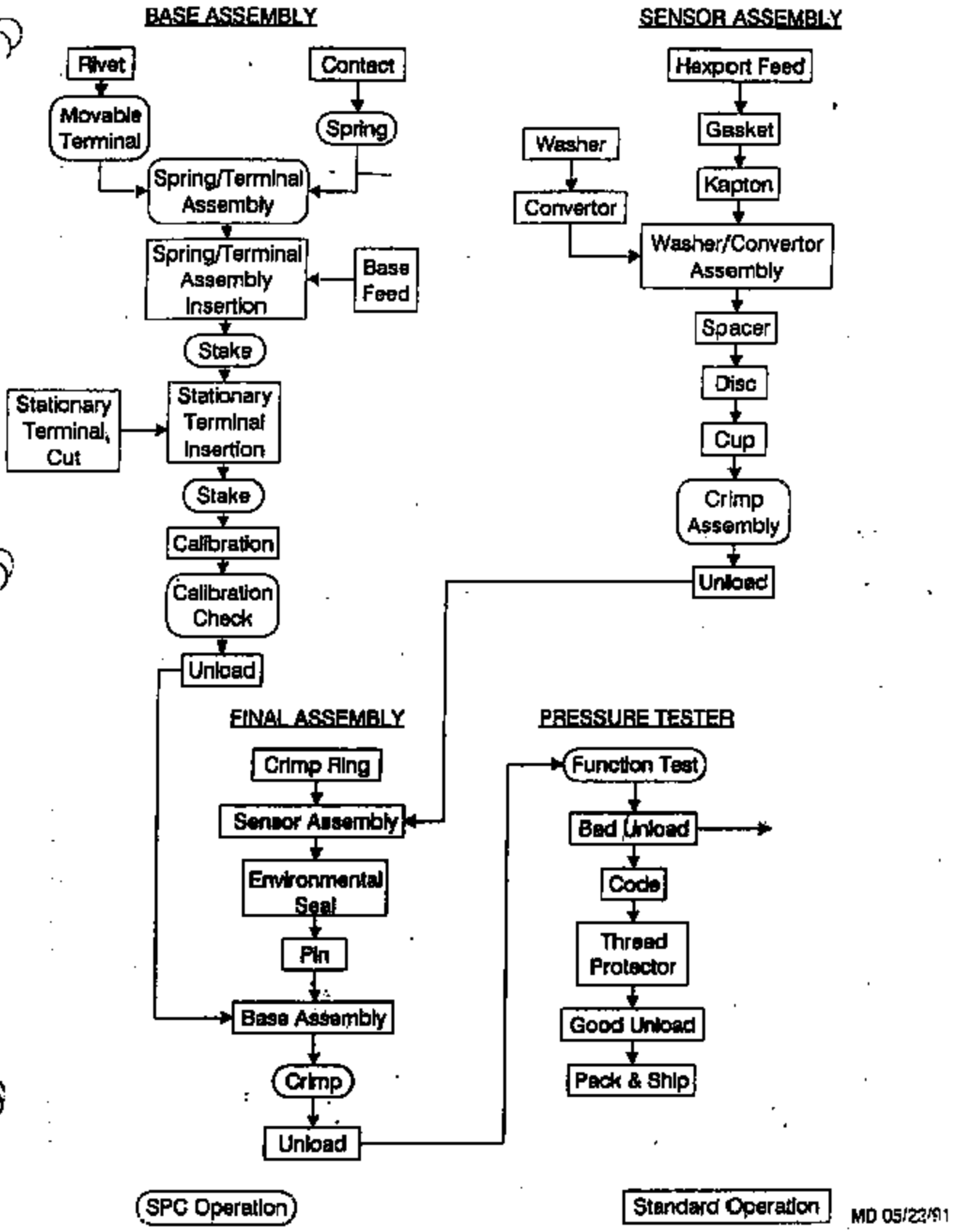
Elaine Rose DATE: 12/20/91

DRAWINGS AVAILABLE UPON REQUEST

PROCESS FLOW
CONTROL CHART

FORD NEXT GENERATION SPEED CONTROL

PROCESS FLOW CHART 77PSL2-1/2-3



MD 05/22/91

TI-NHTSA 003525

FORD NEXT GENERATION SPEED CONTROL (77PS)
MANUFACTURING CONTROL PLAN

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.	SORT SINCE LAST CHECK
	TERMINAL PUSHOUT	FORCE GAGE/ DIAL INDICATOR	X/R	5pc/Hr.	SORT SINCE LAST CHECK
	TERMINAL SEPERATION/ ALIGNMENT	PLUG GAGE	X/R	5pc/Hr.	SORT SINCE LAST CHECK
	SPRING CONTACT WIDTH	CALIPERS	X/R	5pc/Hr.	SORT SINCE LAST CHECK
	SPRING TORQUE	FORCE GAGE	X/R	5pc/Hr.	SORT SINCE LAST CHECK
	SPRING BUMP HEIGHT	DIAL INDICATOR	X/R	5pc/Hr.	SORT SINCE LAST CHECK
	RIVET HEIGHT	DIAL INDICATOR	X/R	5Pc/Hr.	SORT SINCE LAST CHECK
	CALIBRATION DEFORMATION	CUSTOM CONTINUITY SYSTEM	X/R	5pc/Hr.	SORT SINCE LAST CHECK
	VISUAL QUALITY	VISUAL	X/R	5pc/Hr.	SORT SINCE LAST CHECK
SENSOR ASSEMBLY	CRIMP DIAMETER	CALIPERS	X/R	5pc/Hr.	SORT SINCE LAST CHECK
	CRIMP HEIGHT	CALIPERS	X/R	5pc/Hr.	SORT SINCE LAST CHECK
	VISUAL QUALITY	VISUAL	P	5pc/Hr.	SORT SINCE LAST CHECK

TI-NHTRA 003426

24 September 1991 MJS/cnr 050-0134

FORD NEXT GENERATION SPEED CONTROL (77PS)
MANUFACTURING CONTROL PLAN

PROCESS STEP DESCRIPTION	PRODUCT CHARACTERISTICS	EVALUATION METHOD	CONTROL METHOD	FREQUENCY OF TEST	REACTION PLAN
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
FUNCTION TESTER (CUSTOM)	ACTUATION/ RELEASE POINTS	MASTERS	X/ R	EACH SHIFT	TOOL ROOM/ ENGINEERING EVALUATIONS
	ACTUATION/ RELEASE POINTS	RAMP THROUGH PRESSURE RANGE	X/ R	100%	YIELD TRACKING/ SCRAP CONTROL
Q.C. AUDITS	FUNCTION TESTING DURABILITY TESTING ELEVATED TEMP TESTING ENVELOP DIMENSIONAL CHECKS				

GM GAGE STUDY FOR REPEATABILITY AND REPRODUCIBILITY (LONG METHOD
24-Sep-91
77PS PRESSURE TEST
CTUATION

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	114.7875	1.025
2	113.9375	0.775
3	113.025	0.45
4	NA	NA
5	NA	NA
6	NA	NA
7	NA	NA
8	NA	NA
9	NA	NA
10	NA	NA
AVERAGE	113.9166	0.75

MIN XBAR	113.025
MAX XBAR	114.7875
'BARDIFF	1.7625

	MEASUREMENT UNIT ANALYSIS	%TOLERANCE
REPEATABILITY:	3.424202	4.89%
REPRODUCIBILITY:	4.595500	6.57%
RPT & REPR (R&R):	5.730949	8.19%

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

ENTER STUDY TITLES IN CELLS A8,A9,A10, MIN/MAX SPEC IN B12, B13
7PS PRESSURE TEST
ACTUATION

MIN SPEC : 90
MAX SPEC : 160
TOLERANCE : 70

DATA FOR OPERATOR 1

PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	120.8	121.6				121.2	0.8
2	123.8	123.5				123.65	0.3
3	107.9	106.4				107.15	1.5
4	107.9	106.4				107.15	1.5
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: 114.7875 AVG RNGE: 1.025
UCL FOR INDIVIDUAL RANGES 2.45025

DATA FOR OPERATOR 2

PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	120.1	120.9				120.5	0.8
2	122.2	122.9				122.55	0.7
3	107	107.5				107.25	0.5
4	106	104.9				105.45	1.1
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: 113.9375 AVG RNGE: 0.775
UCL FOR INDIVIDUAL RANGES 2.45025

DATA FOR OPERATOR 3

PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	121.9	123				122.45	1.1
2	118.1	117.8				117.95	0.3
3	107	106.8				106.9	0.2
4	104.9	104.7				104.8	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: 113.025 AVG RNGE: 0.45
UCL FOR INDIVIDUAL RANGES 2.45025

GM GAGE STUDY FOR REPEATABILITY AND REPRODUCIBILITY (LONG METHOD
24-Sep-91
47PS PRESSURE TEST
RELEASE

NUMBER OF OPERATORS	3	MIN SPEC	20
NUMBER OF PARTS	4	MAX SPEC	160
NUMBER OF TRIALS	2	TOLERANCE	140

DATA SUMMARY

OPERATOR	AVERAGE	RANGE
1	47.725	0.4
2	46.4875	0.475
3	46.9625	0.425
4	NA	NA
5	NA	NA
6	NA	NA
7	NA	NA
8	NA	NA
9	NA	NA
10	NA	NA
AVERAGE	47.05833	0.433333

MIN XBAR	46.4875
MAX XBAR	47.725
XBARDIFF	1.2375

	MEASUREMENT UNIT ANALYSIS	%TOLERANCE
REPEATABILITY:	1.978427	1.41%
REPRODUCIBILITY:	3.262574	2.33%
RPT & REPR (R&R):	3.815569	2.73%

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

ENTER STUDY TITLES IN CELLS A8,A9,A10, MIN/MAX SPEC IN B12, B13
Y7PB PRESSURE TEST
RELEASE

MIN SPEC 20
MAX SPEC 160
TOLERANCE 140

DATA FOR OPERATOR 1

PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	44.1	43.6				43.85	0.5
2	57.8	57.6				57.7	0.2
3	44	44.2				44.1	0.2
4	45.6	44.9				45.25	0.7
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: 47.725 AVG RNGE: 0.4
UCL FOR INDIVIDUAL RANGES 1.4157

DATA FOR OPERATOR 2

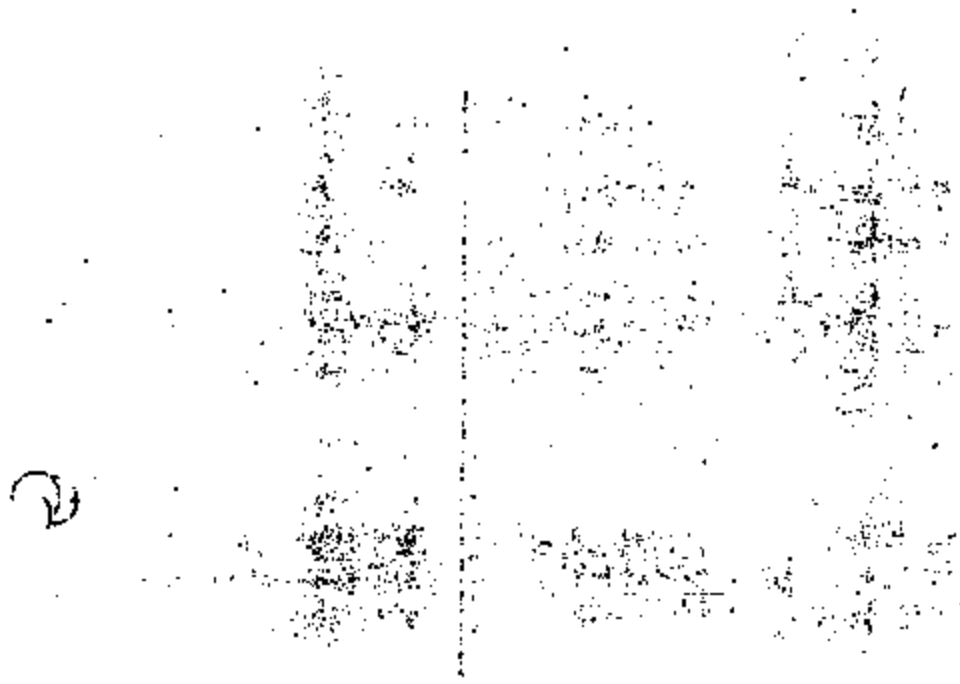
PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	43.4	43.7				43.55	0.3
2	56	54.9				55.45	1.1
3	43.1	42.9				43	0.2
4	44.1	43.8				43.95	0.3
5						NA	0
6						NA	0
7						NA	0
8						NA	0
9						NA	0
10						NA	0
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

GRND AVG: 46.4875 AVG RNGE: 0.475
UCL FOR INDIVIDUAL RANGES 1.4157

DATA FOR OPERATOR 3

PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	43.2	43				43.1	0.2
2	58	57.1				57.55	0.9
3	43.6	43.1				43.35	0.5
4	43.8	43.9				43.85	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: 46.9625 AVG RNGE: 0.425
UCL FOR INDIVIDUAL RANGES 1.4157



GM GAGE STUDY FOR REPEATABILITY AND REPRODUCIBILITY (LONG METHOD
24-Sep-91
7DIAL INDICATOR #14508
MOVEABLE TERMINAL

NUMBER OF OPERATORS	2	MIN SPEC	0.459
NUMBER OF PARTS	10	MAX SPEC	0.479
NUMBER OF TRIALS	2	TOLERANCE	0.2

DATA SUMMARY

OPERATOR	AVERAGE	RANGE
1	0.46925	0.0003
2	0.46925	0.0003
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	0.46925	0.0003

MIN XBAR	0.46925
MAX XBAR	0.46925
XBARDIFF	0

	MEASUREMENT UNIT ANALYSIS	%TOLERANCE
REPEATABILITY:	0.001369	0.68%
REPRODUCIBILITY:	0	0.00%
RPT & REPR (R&R):	0.001369	0.68%

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

Note: Same fixturing / dial indicator used for Stationary Terminal.

ENTER STUDY TITLES IN CELLS A8,A9,A10, MIN/MAX SPEC IN B12, B13
DIAL INDICATOR #14506
MOVEABLE TERMINAL

MIN SPEC	0.459
MAX SPEC	0.479
TOLERANCE	0.2

DATA FOR OPERATOR 1

PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	0.468	0.469				0.4685	0.001
2	0.468	0.468				0.468	0
3	0.469	0.469				0.469	0
4	0.469	0.469				0.469	0
5	0.47	0.47				0.47	0
6	0.469	0.47				0.4695	0.001
7	0.47	0.47				0.47	0
8	0.469	0.469				0.469	0
9	0.47	0.471				0.4705	0.001
10	0.469	0.469				0.469	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: 0.46925 AVG RNGE: 0.0003
UCL FOR INDIVIDUAL RANGES 0.000980

DATA FOR OPERATOR 2

PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	0.469	0.469				0.469	0
2	0.467	0.468				0.4675	0.001
3	0.469	0.469				0.469	0
4	0.469	0.469				0.469	0
5	0.47	0.469				0.4695	0.001
6	0.469	0.469				0.469	0
7	0.47	0.47				0.47	0
8	0.469	0.47				0.4695	0.001
9	0.471	0.471				0.471	0
10	0.469	0.469				0.469	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: 0.46925 AVG RNGE: 0.0003
UCL FOR INDIVIDUAL RANGES 0.000980

M 21781

TEXAS INSTRUMENTS

CERTIFICATION OF COMPLIANCE TEST

CUSTOMER: Kelsey Hayes

CUSTOMER ORDER NO.:	TI ORDER NO.:

CUSTOMER PART NO.:	TI PART NO.:
12590701	77RSL2-1

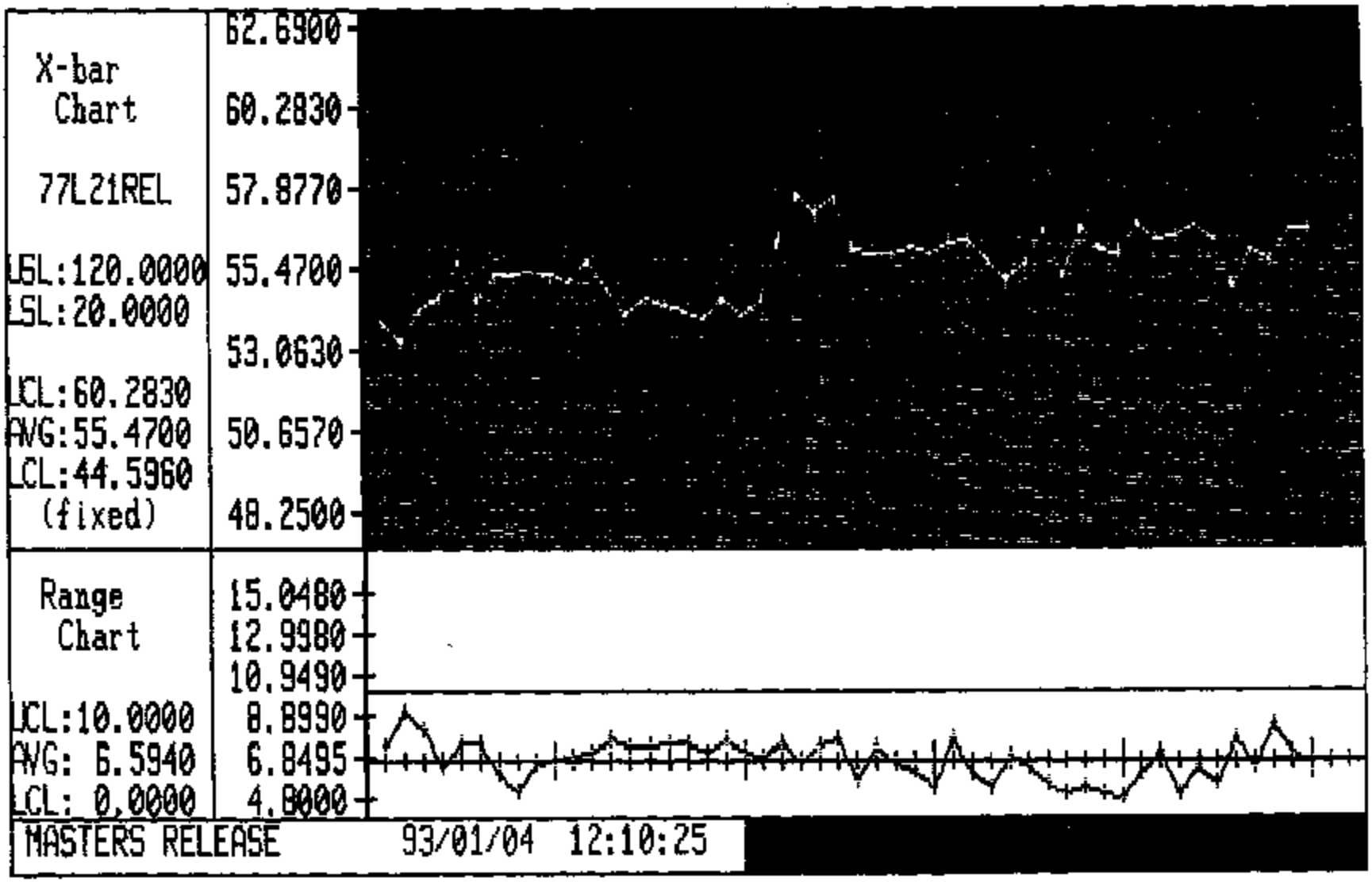
CUSTOMER SPEC: F2VC-9F924-AB TI SR:

QUANTITY: DATE SHIPPED: 01/6/93

IT IS HEREBY CERTIFIED THAT THE GOODS SPECIFIED ABOVE CONFORM TO THE TI ORDER SHOWN ABOVE, AS REVISED BY MUTUALLY AGREED WRITTEN AMENDMENTS, IF ANY. Further, component parts utilized have been scrutinized and do not violate Ford Engineering Materials Specifications WSS-M99P9999-A1/A2/A3 restrictions.

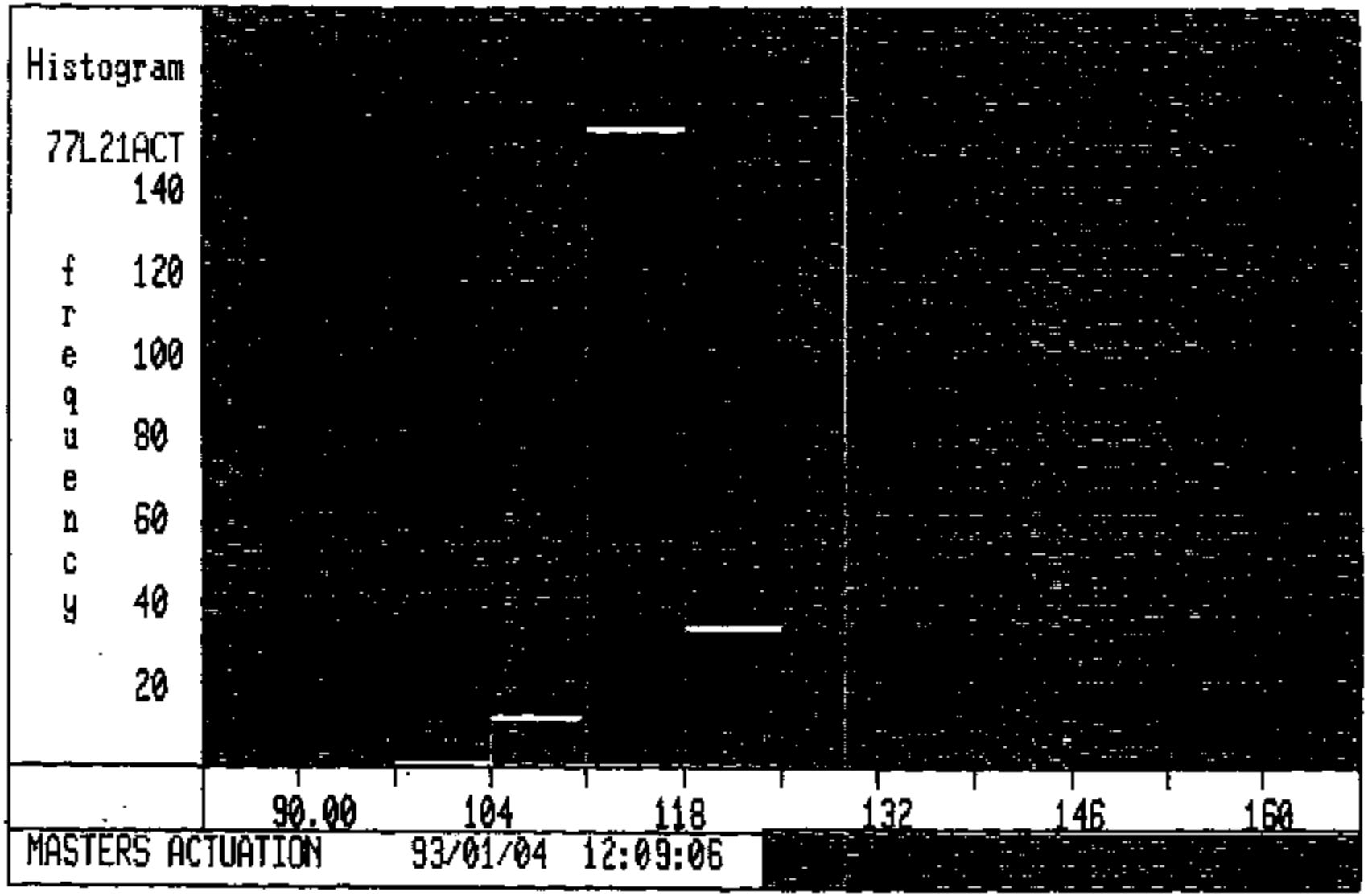
PRECISION CONTROLS QUALITY CONTROL

DATED:

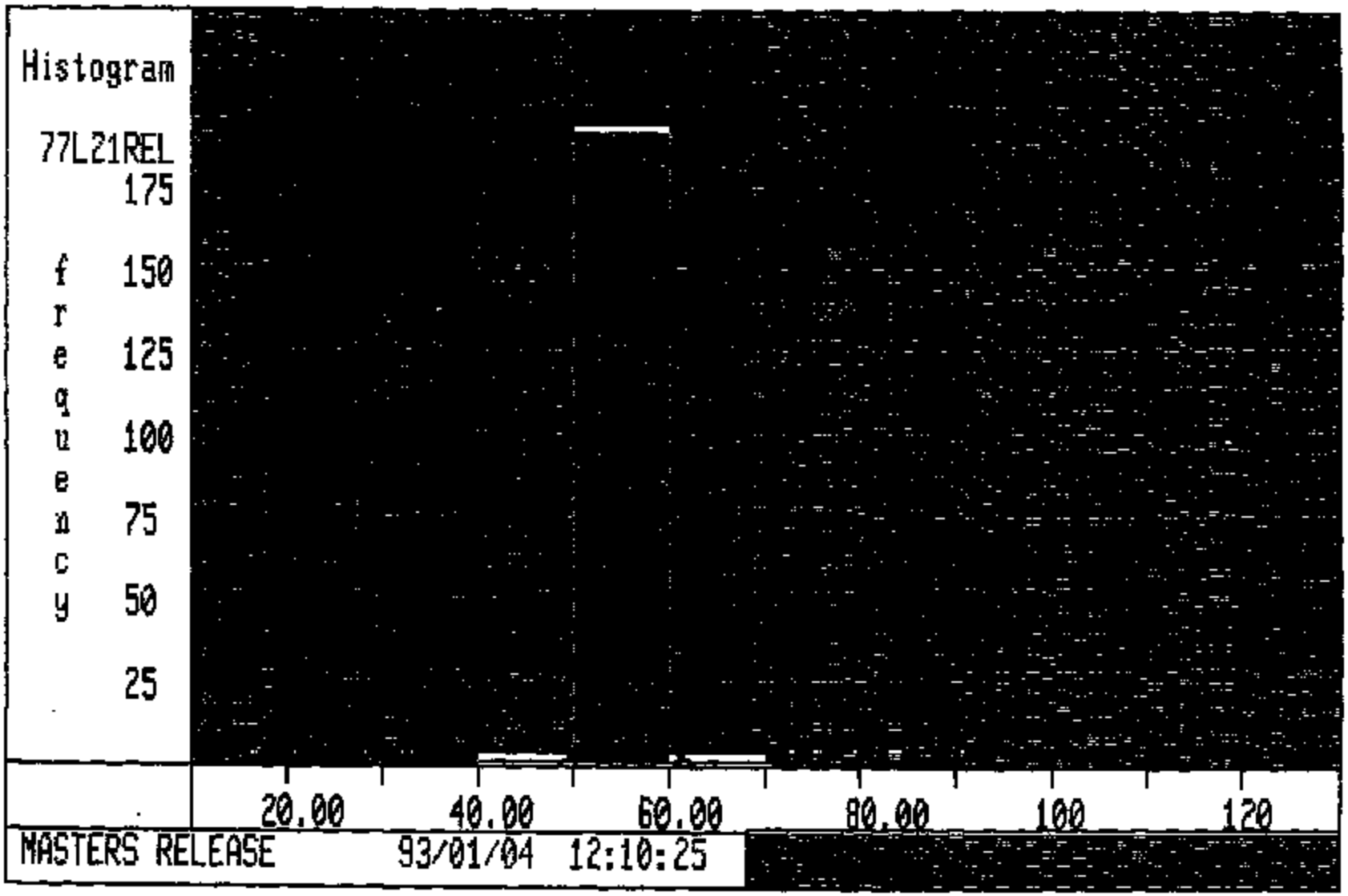


TI-NHT8A 003542

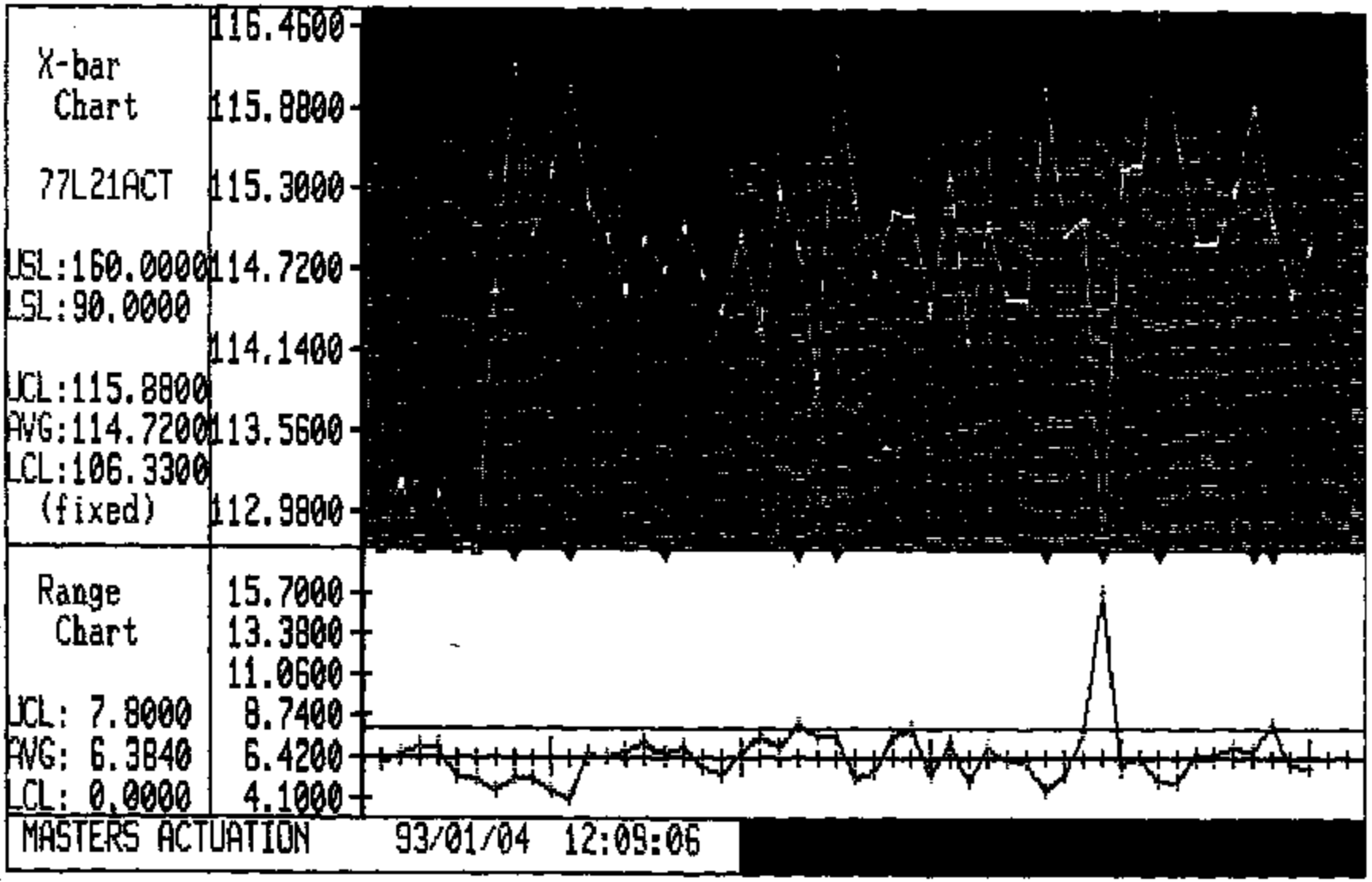
← → f12



TI-NHTSA 003543



TL-NHTBA 003544



1-6-93

7742-1

Base	46516-2	Rev Botella
Ste Term	36888-1	N/A
Screw Cont.	74408-1	✓
Rivet	[illegible]	✓
Insulator	[illegible]	✓
Spring Arm	[illegible]	N/A
Spring Wire	27716-1	✓
Header	36900-1	✓
Gasket	*74353-1	✓
Cup	27713-1	✓ -1 or -2?
Seal	*74176-1	✓
Kapton Strip	*27225-1	✓
Washer	*27639-1	✓
Connector	*27406-1	✓
Spacer	*[illegible]	✓
Kapton	*[illegible]	✓
CR	[illegible]	
TR	[illegible]	✓
ESVID	[illegible]	✓
Thermal	[illegible]	

F2VC-9F924-AB

MATERIAL ANALYSIS

PARTS LIST

	PART NAME	PART #	CERTIFIED
1	BASE	46515-2	YES
2	STA.TERM.	36888-1	YES
3	MOVE.CONTACT	74408-1	YES
4	RIVET	74916-1	YES
5	MOVE.TERM.	36887-1	YES
6	SPRING ARM/MAT'L	36889-1/27716-1	YES
7	J512 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	74079-SEL	YES
18	ENVIO.SEAL	74247-4	YES

Jan. 1993

Hoechst Celanese

46515-2

NOVEMBER 4, 1992

TEXAS INSTRUMENTS INC
ACCTS. PAYABLE DEPT.
PO 666
ATTLEBORO, MA 02730
ATTN: RONALD BOTELITTO

Advanced Materials Group
Hoechst Celanese Corporation
26 Main Street
Chatham, NJ 07928
201 635 2600
Telex 136 348
Fax 201 635 4330

HOECHST CELANESE CELANEX
GRADE 4300 NATURAL HF3022

In reference to your Purchase Order 500059491, our Order No. 907, this is to advise you that the 2205 pounds of CELANEX(R) Thermoplastic Polyester 4300 NATURAL HF3022 lot number LJ21008321 shipped to you on NOVEMBER 3, 1992 is standard product and meets the following requirements:

SPECIFICATION	Ford ESB M4D 354-A2	
LOT RELEASE DATA-Actual Values (Tests performed on all lots)	(Specification Limit)	(Actual Values)
Melt Index, gm./10min.	4-10	8.3
Ash, %	28-32	30.1

CERTIFIABLE VALUES	(Specification Limit)	(Monitored Values)
Tensile Strength, MPa	103 MIN.	134.9
Elongation, %	3 MIN.	4.7
Flexural Strength, MPa	159 MIN.	210
Flexural Modulus, MPa	6,200 MIN.	7940
Notched Izod, J/m	101 MIN.	99

PERIODIC TESTS	(Specification Limit)	(Test Values)
Specific Gravity, g/cc.	1.58 MAX.	1.52
HDT @ (1.8 MPa), °C	193 MIN.	207
Melting point, °C	215-235	225

ADDITIONAL SPECIFICATIONS	

All test data is generated by standard ASTM test methods.

HOECHST CELANESE CORPORATION
ENGINEERING PLASTICS DIVISION

Dr. John K. Morrow
Quality Assurance Officer

Hoechst

August 20, 1991

To: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110823

Sample Description:

P/N 36888-1 Stationary Terminal CDA 260 Brass 1/2 Hard

Results:

	P/N 36888-1	Spec. CDA 260
Cu (wt%)	68.5%	68.5 - 71.5%.
Fe	0.030	0.05 max
Pb	0.010	0.07 max
Zn	balance	balance
Hardness	73 RB	60 - 77 RB

Results confirm the terminal is made of CDA 260 brass, 1/2 hard.

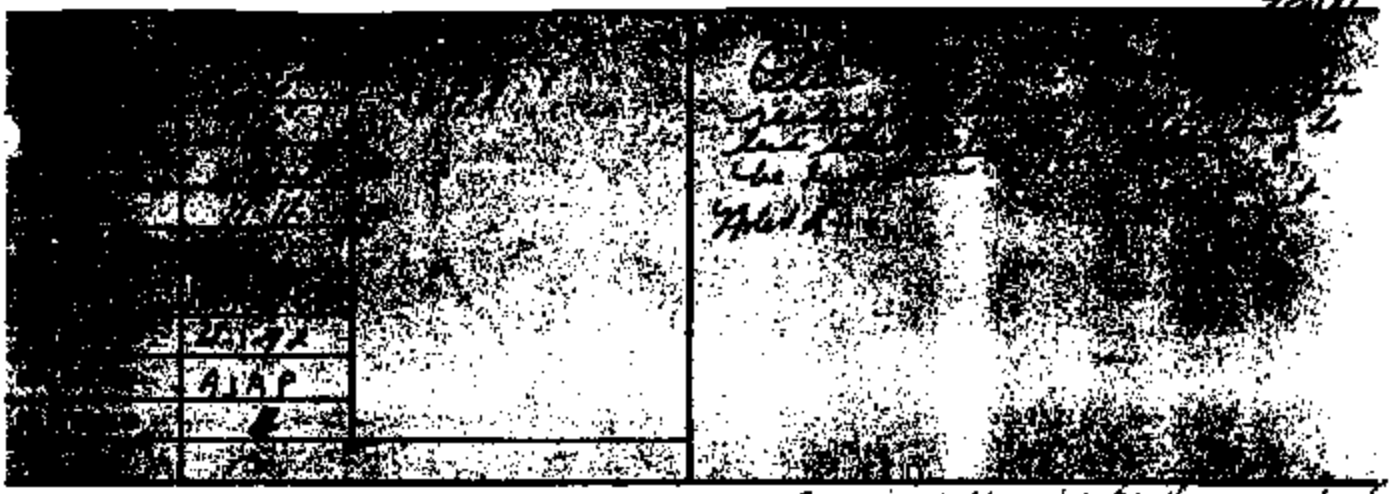
Regards,

Beth X3069

TEST NO. 116927

TECHNICAL SERVICE LABS

TEST NO. 116927



REPORT OF RESULTS:

silver ink pad

					Ave
#1 -	.0012	0013	0011	0012 -	.0012
2 -	0013	0012	0012	0012 -	.0012
3 -	0015	.0011	0012	0011 -	.0012
4 -	.0011	0012	0012	0011	.0012

DATE RECEIVED 12/4/92 DATE OUT 12-7-92 Vus

TECHNICIAN			
HOURS WORKED			
PROCEDURE USED			

*PCC I.D.

MC=325	TM=431	JOCY=128	FACIL=514
PC=127	WIRE=432	CLKE=122	FACIL=521
VERS=168	EPD=621	CAN=954	FACIL=531
AFCC=483	PEP=622	AD DEV=286	STAFF=855
IMD=430	CSD=835	EMCD=877	

DISTRIBUTION: White and Yellow - Lab Pink - Requestor

THE MILFORD GROUP
857 BRIDGEPORT AVE.
MILFORD, CONNECTICUT 06460

TEL\ 203-878-4631 * FAX 203-878-5071, 203-876-1346

TO: TEXAS INSTRUMENTS

CERTIFICATE OF COMPLIANCE

ACME MILFORD CERTIFIES THAT;

P.O. NUMBER: 5000B6023
ACME/MILFORD CONTROL NUMBER: 021874
ACME/MILFORD P/N: 6254-A
QUANTITY: 40221B

WAS PROCESSED TO CONFORM TO THE FOLLOWING

PART NUMBER: 74408-1
PART REVISION: D
MATERIAL: COPPER CDA102
HEAT NUMBER:
TENSILE AFTER LIGHT DRAW:
FINISH: PLAIN

SIGNED: Paul Molinari DATE: 12-30-92

PAUL MOLINARI
TITLE\ VICE PRESIDENT QUALITY ASSURANCE

SWORN TO AND SUBSCRIBED BEFORE ME THIS/_____DAY_____MONTH_____YEAR

NOTARY PUBLIC_____

BIGELOW COMPONENTS CORPORATION
74 DIAMOND ROAD, SPRINGFIELD, NEW JERSEY 07081-3190
AREA CODE 201-467-1200

CERTIFICATE OF CONFORMANCE

Texas Instruments Inc.
Materials & Controls
34 Forest Street
Attleboro, MA. 02703

Your P.O. No. - 5000086112
Your Part No. - 74916-1 Rev. B
Qty. Shipped - 50,000
Date Shipped - 12-08-92

We certify that all items shipped on this order meet the requirements of the T.I. Purchase Order and T.I. Drawing Specifications.

We certify that the parts shipped were made of CDA 260 Brass, as requested on T.I. Drawing.

Very truly yours,

Frank Serafin

K. F. BASSLER COMPANY, INC.
PRECISION TOOLING & METAL STAMPINGS
45 John Wilson St. • Attleboro, MA 02703 • (508) 222-1061 • Fax: (508) 226-1605
EST. 1948

MATERIAL CERTIFICATION

CUSTOMER: TEXAS INSTRUMENTS, INC. ATTLEBORO

CUSTOMER ORDER NO.: 505112589

CUSTOMER PART NO.: 36887-1

REVISION: B

QUANTITY THIS SHIPMENT: 50,000

LOT NO. THIS SHIPMENT: N/A

SHIPMENT DATE: 10.8.92

WE CERTIFY THAT THE MATERIAL USED TO PRODUCE THE PRODUCT IN THIS SHIPMENT, NAMELY, CDA 260, CONFORMS TO TIS DRAWING AND PURCHASE ORDER REQUIREMENTS.

AUTHORIZED SIGNATURE: Kathleen A. Penkala

Kathleen A. Penkala
Inside Sales Specialist

TI-NHTSA 003553

A.J. OSTER CO.

Brass Mill Products • Steel • Powder • Casting Alloys

1982-1

ORIGINATOR HRA

A J OSTER - WARWICK
445 INDUSTRIAL DRIVE
WARWICK, RI 02886

*** CERTIFICATE OF COMPLIANCE ***

AJO ORD#:	CUST ORD#:	QUANTITY:	DATE SHIPPED:
0181203	15404	TOTAL 2608	6-4-92

CUSTOMER NAME:
K. F. BASSLER CO.

CUST PART#:
260-025-112-2

DESCRIPTION:	GAUGE:	TEMPER:	WIDTH:
CDA 260 COIL	.02500	2#	1.1200

#36887

CHEMICAL ANALYSIS

TNO.....	0107936
HEAT#.....	163053
COIL#.....	S 44291 A
CU.....	69.40000
ZN.....	30.56000
PB.....	.00700
FE.....	.01400
SB.....	.00100
BI.....	.00100

PHYSICAL TEST RESULTS

ROCKWELL.....	R30T 63.4-
TENSILE.....	62.4-
YIELD.....	51.7-
ELONGATION.....	27.5

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HERE IN HAS BEEN MADE TO CONFORM TO SPECIFICATION/ OR REQUIREMENTS OF YOUR ORDER.

June 3 1992
DATE

A. Arroyo
LAB SUPERVISOR

ENGINEERED MATERIALS

Spring MAT'L

BRUSH WELLMAN INC. 5 JUST ROAD FAIRFIELD NJ 07006 201-227-2556

CERTIFICATE OF MATERIAL QUALITY

TEXAS INSTRUMENT
34 FOREST STREET
BUILDING 11 DOOR 16
ATTLEBORO MA 02703

OUR ORDER NO: FA6712 CUSTOMER NO: 697852
OUR ITEM NO: 01 SHIPMENT NO: 002
YOUR P.O. NO: 300015587 11/24/92
YOUR SPEC NO:
YOUR PART NO: 27716-1

ALLOY	STRIP	190 C17200	HM TM04	35306	0.005 0.183	+0.0002 +0.002	-0.0002 -0.002	" "	THI WIC COI

SHIPMENT NBR 002 = 100.0 LBS
HEAT NUMBER 35306

***** CHEMICAL COMPOSITION (PERCENT) *****

1.88 BE	.20 CO	.04 NI	.06 FE	.09 SI	.05 AL
(.005 SN	(.01 ZN	.007 CR	(.003 PB		

REMAINDER: CU

***** AS SHIPPED PROPERTIES *****

TENSILE	(KSI)	139.6	- 142.4
YIELD	(KSI)	117.5	- 123.9
ELONGATION	% IN 2"	13.0	- 13.0
HARDNESS-1	DPH	284.0	- 287.0
CONDUCTIVITY % IACS		19.2	
GRAIN SIZE (MM)		.015	- .018

******* PC / LOT OR COIL NUMBER ******

15- B

Paul J. Freund
QUALITY ASSURANCE MANAGER

11/24/92
DATE

[redacted]

11/24/92 14:03:03

TI-NHTSA 003555

CERTIFICATION

December 30, 1992

TEXAS INSTRUMENTS INC
ACCTS PAYABLE DEPT
P.O. BOX 565
ATTLEBORO, MA 02703

This is to certify the parts furnished on your purchase order have been produced in accordance with specifications listed on your purchase order and/or blueprint. This certification and accompanying documents may not be reproduced, except in full, without written approval of Elco Industries, Inc.

INSPECTION SHEET,SAMPLES, AND MILL SHEET ATTACHED

REV.: B

Records covering material used and the tests and inspection conducted are on file, subject to examination. This is an original certification and has not been amended unless stated below.

Purchase Order No.	505106996
Register No.	50347
Part No.	36900-1
Description	3/8-24 X .81
Quality Control No.	A9341-S
Mfg. Lot No.(s)	14265
Quantity	27,310

Authorized Signature
Quality Coordinator

CERTIFICATION

ELCO INDUSTRIES, INC.
PRECISION AUTOMOTIVE DIVISION
1111 Samuelson Road • P.O. Box 7009
Rockford, Illinois 61125-7009
815/397-5151 • Fax 815/398-4899

F-81-2

#36900

O&K COMPANY LIMITED

Type & Grade SC-4345 AISI10L10 SAE

G.O.A 9341-S
S.O # 14055

1. Specification

	Heat No.	Coil No.	C % × 100	Mn % × 100	P % × 1000	S % × 1000	Cu % × 100	Ni % × 100	Cr % × 100	Mo % × 100	B % × 10000
Chemical Composition Of Steel	D08703	0021 ~ 0022	10	42	7	5	21	1	1	2	PB MX100 25

	Nominal Diameter		Tolerance of Diameter		Tensile Strength		Decarburization	
	in	mm	in	mm	1,000 psi	kg/mm²	Dm-T	Dm-F
Physical Properties	0.555	14.351	+ 0.0040	+ 0.1016	55.9 MAX	48.5 MAX		MAX

	Coil Weight	
Packing	ABT. 2,142LBS (ABT. 970KGS)	
	WRAPPED WITH POLYPROPYLENE SHEET.	

2. Test Results

Coil No.	Diameter mm	Tensile Strength Kg/mm²	Tensile Strength 1,000psi	Sample No.	Diameter mm	Tensile Strength Kg/mm²	Tensile Strength 1,000psi
0021	14.43	33.3	47.4				
0022	14.39	33.4	47.5				

T74203I5

TEXAS INSTRUMENTS, INC.
BUILDING 11-16
34 FORBES STREET
ATTLEBORO, MA 02703

PARKER HANNIFIN CORPORATION
JBL DIVISION
WEST CROFT CIRCLE
SPARTANBURG, S.C. 29302
TELEPHONE (803) 573-7332

J.B.L. Division of Parker Seal certifies that the material used to produce the product in this shipment, namely EPDM/E7104. Conforms to TI drawing and TI purchase order requirements.

PART TITLE... GASKET

CUST P/N... 74363-1 REV E DATE SHIPPED P/O... 5000130?9

J.B.L. P/N.. 202158 11-25-92 B/N... 21653

COMPOUND... E7104 QUANTITY... 190,000

Very Truly Yours,
J.B.L. Division

DENNIS T. JOHNSON
Quality Control Manager

DTJ/BS

VALENTINE TOOL & STAMPING, INC.

171 WEST MAIN ST. NORTON, MASS. 02766
(508) 285-6911 226-0048

CERTIFICATE OF CONFORMANCE

DATE : FRIDAY NOVEMBER 6, 1992

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505111697 SUPPLIER INVOICE NO.: 82792

PART DESCRIPTION : 27713-1 CUP REV.B

SUPPLIER FJO NO. : 19053

QUANTITY SHIPPED : 22,000

SHIPMENT DATE : 11/09/92

WE CERTIFY THAT ALL ITEMS SHIPPED ON THIS ORDER MEET THE REQUIREMENTS OF THE PURCHASE ORDER AND APPLICABLE DRAWINGS/SPECIFICATIONS. RESULTS OF REQUIRED MECHANICAL, VISUAL, FUNCTIONAL AND CHEMICAL TESTS ARE ON FILE IN OUR QUALITY ASSURANCE DEPARTMENT.

SIGNED Joanne Laflamme

Joanne Laflamme
Quality Assurance Manager

VALENTINE TOOL & STAMPING, INC.

171 WEST MAIN ST. NORTON, MASS. 02766
(508) 285-6911

MATERIAL CERTIFICATION

DATE : FRIDAY NOVEMBER 6, 1992

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505111897 SUPPLIER INVOICE NO.: 82792

PART DESCRIPTION : 27713-1 CUP REV.B

SUPPLIER FJO NO. : 19053

QUANTITY SHIPPED : 22,000

SHIPMENT DATE : 11/09/92

WE CERTIFY THAT THE MATERIAL USED
TO PRODUCE THE PRODUCT IN THIS
SHIPMENT, NAMELY
[C1006]
CONFORMS TO T.I. DRAWINGS AND
T.I. PURCHASE ORDER REQUIREMENTS.

SIGNED _____
(Supplier Representative)

Joanne Laflamme Quality Assurance Manager

#27713-1

ROME STRIP STEEL COMPANY, INC.

590 HENRY ST. BOX 189
ROME, NEW YORK 13440

COMPLIANCE #1

DATE	INVOICE NO.
09/17/92	20883

0 1 0 0 0 0 0 0

SOLD TO: VALENTINE TOOL & STAMPING, INC.
P.O. BOX 469
NORTON, MA 02766

SHIP TO: VALENTINE TOOL & STAMPING, INC.
171 N MAIN ST
NORTON, RA

ATTN: JEANNE LAFLAMME, QUALITY MGR.

(LBS)	NO. CLS.	NO. ENDS OR COILS	FINISH/DUPLEX	SHIPPED BY	HT. NO.	C	MN	P	S	SI	NI	CR	NO
33,192	072	12	COMP	J AUSTIN	R44829	04	31	012	014	01	01	03	

AL VR CU CB

REQUIREMENTS OF:

ORDER NO. 15112

COLOR CODE

		MILL NO.	PREPAID/COLLECT	STRAPPING	PAPER WRAP	RAILS	CRATES	BOX
.2MM X 50.80MM		74155	PREPAID					
.004000 X 2.0000	TEMPER B 50 MAX	COILS OR CUT COIL	440 LBS	SKIDS 3000	SKID SIZE	PKG. HT	WAFERS	CORES
	EDGE	LENGTH SPEC		RUNNERS	SPACERS	SHROUD	BOXES	CAPS
-001 +005 -005	ND3 SLIT	220 PIW 16 36			3/4"			
				BURR	CAMBER	FLATNESS	OIL	T-PCS

-025MM +127 -127MM [redacted]

TEST REPORT (15,056 KG) 33,192

Certificate of Compliance

Sworn to before me this 17th day of Sept., 1992
Notary Public, Oneida County
My commission expires 5/31/94

I certify that the above figures are a true and correct copy of those contained in the records of this corporation.

ROME STRIP STEEL CO., INC.

TI-NHTSA 003561

DUPONT

CIRCLEVILLE PLANT
P.O. Box 89
Circleville, OH 43113

NO: KC-11
Effective Date: 3/06/92
Expiration Date: 3/06/93

MATERIAL CERTIFICATION

DATE: 12-30-92

CUSTOMER: TEXAS INSTRUMENTS, ATTLEBORO

CUSTOMER ORDER NO. 5000 85037

CUSTOMER PART NO. & REV. Z7225-1 (REV. R)

QUANTITY THIS SHIPMENT 104.00

SHIPMENT DATE 12-30-92

We certify that the material used to produce the product in this shipment, namely 500FN131 Kapton*, 3/4" wide, conforms to TI drawing and TI purchase order requirements on file with the HPF Group of the Dupont Company.

SUPPLIER REPRESENTATIVE
ENGINEER - QUALITY CONTROL - TITLE

:dkh/smart no. 387

Charting a Course for Excellence

DIEMASTERS MANUFACTURING, INC.

CERTIFICATE OF CONFORMANCE

DATE: 12-22-92

CUSTOMER: TEXAS INSTRUMENTS

PURCHASE ORDER NUMBER: 505/20270

PART NUMBER: 27639-1 REV/ECO NUMBER: D

PART DESCRIPTION: WASHER

QUANTITY THIS SHIPMENT: 90,000

SHIPMENT DATE: 12-22-92

TRACEABLE LOT NUMBER: TI. 201

****

WE CERTIFY THAT ALL ITEMS SHIPPED ON THIS ORDER MEET THE REQUIREMENTS OF THE TI PURCHASE ORDER AND TI DRAWINGS/SPECIFICATIONS. RESULTS OF REQUIRED MECHANICAL, VISUAL, FUNCTIONAL, AND CHEMICAL TESTS ARE ON FILE IN OUR QUALITY CONTROL DEPARTMENT.

****

SIGNED: Jim Nguyen
QUALITY ASSURANCE REPRESENTATIVE

TITLE: INSpector

11-13-92 13:04

THOMPSON STEEL COMPANY INC.
9470 KING STREET
FRANKLIN PARK, IL 60131

#27639

SOLD TO DIEMASTERS MFG
767 INDUSTRIAL DRIVE
ELMHURST IL 60126-0000

SHIP TO DIEMASTERS MFG
767 INDUSTRIAL DRIVE
ELMHURST IL 60126-0000

SHIP DATE : 12-08-92

ANALYSIS REPORT

CUSTOMER ORDER NO. BL-4762

THOMPSON ORDER NO. 2680800

GRADE	SIZE	T	F	E	PART NO.	SPEC. NO.
1050X	1.3750 X .0985	A	2	3		

HEAT NO. Y47629

TEXAS INSITE
27639-1

C:	MN	P:	S:	SI
.520	.790	.0080	.0060	.210
AL	**CU**	**NI**	**CR**	**MO**
.033	.020	.020	.030	.010

EE

WEIGHT: 13,101 # COILS: 40
ROCKWELL:
BEND TEST:
OTHER :

NOTE:

8/80

QUALITY CONTROL
DEC 09 1992

CERTIFIED BY

IT IS CERTIFIED THAT THE ABOVE IS A TRUE STATEMENT
THE TEST DATA CONTAINED IN THE RECORDS OF THIS COMP

PHONE: [708] 639-6116
FAX: [708] 639-4651

FPM CONTINUOUS PROCESSING II
320 CARY POINT DRIVE · CARY, ILLINOIS 60013

DIEMASTERS, INC.
767 INDUSTRIAL DRIVE
ELMHURST IL
60126

CERTIFICATION

Shop No. 096061

Order No. 111917

Quantity 148,400

Description 27639-1 WASHER TI-LOT 201

Material 1050

The following is certified:

Process AUSTEMPERED TO 40-60RC

INSPECTION RESULTS: 46-47Rc

QUALITY CONT

DEC 02 1992

FPM CONTINUOUS PROCESSING II

Authorized Signature: [signature] Pur Mgr Date: 12/2/92

PHONE 708-678-0200

AFFIDAVIT

Belmont PLATING WORKS

3410 NORTH RIVER ROAD
FRANKLIN PARK, ILLINOIS

DATE 12/9/92

We hereby certify that the Zinc *plating on the material described below, was so processe*
as to meet U.S. Government Specifications.

Diamasters

767 Industrial Drive Elmhurst, Il. 60126

QUANTITY	PART NO.	ORDER NO.	DESCRIPTION
146,400	27639-1		Zinc .0002/.0006 thk

QUALITY CONTROL

DEC 15 1992

Tatiana Gudkov

DIEMASTERS MANUFACTURING, INC.

CERTIFICATE OF MATERIAL ANALYSIS

DATE: 12-22-92

CUSTOMER: TEXAS INSTRUMENTS

SUPPLIER PURCHASE ORDER: BL-4762

CUSTOMER PURCHASE ORDER: 505120270

PART NUMBER: 27639-1 REV/ECO: D

PART DESCRIPTION: WASHER

QUANTITY THIS SHIPMENT: 90,000 SHIPMENT DATE: 12-22-92

TRACEABLE LOT NUMBER: TI. 201

HEAT NUMBER: Y47629

TYPE OF MATERIAL: CRS 1050

****

WE CERTIFY THAT THE MATERIAL USED TO PRODUCE THE PRODUCT IN THIS SHIPMENT CONFORMS TO THE TI PURCHASE ORDER AND TI DRAWING/SPECIFICATION REQUIREMENTS. RESULTS VERSUS SPECIFICATION ARE AS NOTED BELOW.

****

ELEMENTAL CONSTITUENTS	SPECIFIED RANGE	ACTUAL RANGE
1. C	0.47 – 0.55	.520
2. Mn	0.60 – 0.90	.790
3. $P_{MAX.}$	0.040	.0080
4. $S_{MAX.}$	0.050	.0060
5.		

ROCKWELL HARDNESS: B/80 DPH:

TS. K.S.I.:

SIGNED: John Nguyen
QUALITY ASSURANCE REPRESENTATIVE

TITLE: Inspector

DIEMASTERS MANUFACTURING, INC.

MATERIAL CERTIFICATION

DATE: 12-22-92

CUSTOMER: TEXAS INSTRUMENTS

SUPPLIER PURCHASE ORDER: BL-4762

CUSTOMER PURCHASE ORDER: 505120270

PART NUMBER: 27639-1 REV/ECO: D

PART DESCRIPTION: WASHER

QUANTITY THIS SHIPMENT: 90,000

SHIPMENT DATE: 12-22-92

TRACEABLE LOT NUMBER: TI. 201

HEAT NUMBER: Y47629

TYPE OF MATERIAL: CRS 1C50

• • • • • • • • • •

WE CERTIFY THAT THE MATERIAL USED TO PRODUCE THE PRODUCT IN THIS SHIPMENT. NAMELY (SPECIFIC NAME/NUMBER OF MATERIAL), CONFORMS TO TI DRAWING AND TI PURCHASE ORDER REQUIREMENTS.

• • • • • • • • • •

SIGNED: Jim Nguyen
QUALITY ASSURANCE REPRESENTATIVE

TITLE: INSpector

K. F. BASSLER COMPANY, INC.
PRECISION TOOLING & METAL STAMPINGS
45 John Wiliam St. • Attleboro, MA 02703 • (508) 222-1061 • Fax: (508) 226-1605
EST. 1945

MATERIAL CERTIFICATION

CUSTOMER: Texas Instruments, Inc. -- Attleboro

CUSTOMER ORDER NO.: 506118095

CUSTOMER PART NO.: 27406-1

REVISION: "F"

QUANTITY THIS SHIPMENT: 28,750

LOT NO. THIS SHIPMENT: 182

SHIPMENT DATE: 1 4 93

We certify that the material used to produce the product in this shipment, namely, AK 1008 CRS, conforms to TI's drawing and purchase order requirements

AUTHORIZED SIGNATURE: Kathleen A. Penkala

Kathleen A. Penkala
Eneide Sales Specialist

PMA PRECISION METAL FORMING ASSOCIATION

TI-NHTSA 003569

#27406

TELEX 881214
FAX 315-336-8510
PHONE 315-336-8000
OUTSIDE 223-3138

ROME STRIP STEEL COMPANY, INC.
580 HENRY ST. BOX 189
ROME, NEW YORK 13442-0189

COMPLIANCE # 1

DATE	INVOICE NO.
10/22/92	22122

SALES CODE 08072016

0 1 1 0 0 0 0 0

INVOICE TO: K. F. BASSLER CO., INC.
45 JOHN WILLIAM ST
ATTLEBORO, MA 02703

SHIP TO: K. F. BASSLER CO., INC.
45 JOHN WILLIAM ST
ATTLEBORO, MA

QUANTITY (LBS)	NO. CLS.	NO. SAME OR ENDS	MATERIAL COMPLETE	SHIPPED BY
3,178	021	02	PART	R S S

MT. NO. R44829 C 04 MW 31 P 012 S 014 JH 01 RI 01 CR 03
AL VR CO CA

CUST. ORDER NO. 19463

7MM X 25.40MM

.04600 X 1.0000

TEMPER B45 8 50 MAX

HEA NO. 75638

COILS OR CUT COIL

PREPAID/COLLECT PREPAID

200 LBS 1600

TOLERANCE +00050-00050+005 -005

EDGE NO3 SLIT

LENGTH SPEC 200 PIW 16 34

+013 -013MM +127 -127MM

COLOR CODE

CLASS ALUM KILD

JOB NO. C-1008

STRAPPING	PAPER WRAP	RINGS	CRATES	BOX
SKIDS	SKID SIDE	PER. MT 21 MI MAX	WASHERS	COVERS
RUNNERS	SPACERS	SPROUD	BOARDS	CAPS
EDGE	CARRIER 500/096"	PLATTENS	OIL	T-PCS

[redacted] (1,442 KG) 3,178

TEST REPORT

Certificate of Compliance

ATTEST: 052 06280793 101092
Notary Public, Oneida County
My commission expires 5/31/94

DATE 10/22/92

I certify that the above figures are a true and correct copy of those contained in the records of this corporation.

ROME STRIP STEEL CO., INC.

TI-NHTSA 003570

#27406

TELEX 681314
FAX 315-339-8610
PHONE 315-339-2600
BANK [redacted]

ROME STRIP STEEL COMPANY, INC.

630 HENRY ST. BOX 189
ROME, NEW YORK 13442-0189

COMPLIANCE # 1

SALES CODE
08072016

0 1 1 0 0 0 0 0

DATE	INVOICE NO.
10/22/92	22123

INVOICE TO: K. F. BASSLER CO., INC.
45 JOHN WILLIAM ST
ATTLEBORO, MA 02703

SHIP TO: K. F. BASSLER CO., INC.
45 JOHN WILLIAM ST
ATTLEBORO, MA

QUANTITY (LBS)	NO. CLS.	NO. SKIDS OR BDLS	PARTIAL COMPLETE	SHIPPED BY	MT. NO.	C	XR	P	S	SI	HI	CR	NO
4,636	030	03	COMP	R S S	R44232	04	29	010	007	01	01	02	01

AL YR OR CA

MEETS REQUIREMENTS OF:
CUST. ORDER NO. 15463

COLOR CODE

[redacted].7MM X 25.40MM — TEMPER B 44/45 — MILL NO. 75638 — PREPAID COLLECT PREPAID

.04600 X 1.0000 — 8 50 MAX — COILS OR CUT COIL — 200 LBS

TOLERANCE +00050-00050+005 -005 — CODE NO3 SLIT — STRENGTH SPEC 200 PIW 16 34

+013 -013MM +127 -127MM

CLASS	ALLOY NO.
ALUM KILD	C-1008

STRAPPING	PAPER WRAP	BALE	CRATES	BOX
SKIDS	**SKID SIZE**	**PKG. HT**	**WASTERS**	**CORES**
1600		21 HI MAX		
BUNDLES	**SPACERS**	**SKIDDED**	**BOARDS**	**CAPS**
SKID	**CARRIER**	**FLATNESS**	**OIL**	**T-PCS**
	500/096*			

TEST REPORT

(2,103 KG) 4,636

Certificate of Compliance

ATTEST: Joseph Hoke
052 06286 33 101092
Notary Public, Oneida County
My commission expires 5/31/94

DATE 10/23/92

I certify that the above figures are a true and correct copy of those contained in the records of this corporation.

ROME STRIP STEEL CO., INC.

TI-NHTSA 003571

E. I. DU PONT DE NEMOURS & COMPANY
CIRCLEVILLE, OHIO 43113

NO: KC-13
Effective Date: 4/3/91
Expiration Date: 4/3/92

MATERIAL CERTIFICATION

DATE: 11-19-92

CUSTOMER: TEXAS INSTRUMENTS, ATTLEBORO

CUSTOMER ORDER NO. 5000 85060

CUSTOMER PART NO. & REV. 74224-1 (REV. F)

QUANTITY THIS SHIPMENT 41.30

SHIPMENT DATE 11-19-92

We certify that the material used to produce the product in this shipment, namely 200HN Kapton®, 15/16" wide, conforms to TI drawing and TI purchase order requirements on file with the HPF Group of the Dupont Company.

J Yn
SUPPLIER REPRESENTATIVE
ENGINEER - QUALITY CONTROL - TITLE

idkh/smart no. 389

Insulfab PLASTICS, INC.
PLASTIC FABRICATORS DIVISION
155 NO. MAIN STREET, FRANKLIN, N.H. 03235
603-934-2770

CERTIFICATE OF CONFORMANCE

TO: TEXAS INSTRUMENTS DATE: DEC - 1 1992

ATT: QUALITY CONTROL SUP.

THIS CERTIFIES THAT:

SHIPMENT # 165917

PART # 73955-1 REVISION G

QUANTITY 200,000

MAT'L DESC. KAPTON HN

IS IN CONFORMANCE WITH THE REQUIREMENTS, SPECIFICATIONS, AND DRAWINGS ON YOUR ORDER # 5951085Z-01AP

BY: INSULFAB PLASTICS
FRANKLIN, NH 03235

Fred Wyzny
QUALITY CONTROL MANAGER

VALENTINE TOOL & STAMPING, INC.

171 WEST MAIN ST. NORTON, MASS. 02766
(508) 285-6911 226-0040

CERTIFICATE OF CONFORMANCE

DATE : TUESDAY JANUARY 5, 1993

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505117282 SUPPLIER INVOICE NO.: 83078

PART DESCRIPTION : 74797-1 CRIMP RING REV.B

SUPPLIER FJO NO. : 19120

QUANTITY SHIPPED : 54,400

SHIPMENT DATE : 01/05/93

WE CERTIFY THAT ALL ITEMS SHIPPED ON THIS ORDER MEET THE REQUIREMENTS OF THE PURCHASE ORDER AND APPLICABLE DRAWINGS/SPECIFICATIONS. RESULTS OF REQUIRED MECHANICAL, VISUAL, FUNCTIONAL AND CHEMICAL TESTS ARE ON FILE IN OUR QUALITY ASSURANCE DEPARTMENT.

SIGNED Jeanne LaPlamme
Jeanne LaPlamme
Quality Assurance Manager

[redacted]NITED ALUMINUM CORP[redacted]

VALENTINE TOOL & STAMPING, INC.

171 WEST MAIN ST. NORTON, MASS. 02766
(508) 285-4911

MATERIAL CERTIFICATION

DATE : TUESDAY JANUARY 5, 1993

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505117282 SUPPLIER INVOICE NO.: 83078

PART DESCRIPTION : 74797-1 CRIMP RING REV.B

SUPPLIER FJO NO. : 19120

QUANTITY SHIPPED : 54,400

SHIPMENT DATE : 01/05/93

WE CERTIFY THAT THE MATERIAL USED
TO PRODUCE THE PRODUCT IN THIS
SHIPMENT, NAMELY
[5052 AL]
CONFORMS TO T.I. DRAWINGS AND
T.I. PURCHASE ORDER REQUIREMENTS.

SIGNED Joanne Laflamme
(Supplier Representative)

Joanne Laflamme Quality Assurance Manager

[redacted] P.O. [redacted] HAVEN, CONNECTICUT

CUSTOM ROLLED™ ALUMINUM SHEET

#74797-1

9958

SOLD TO: VA003
ATTN: DICK WHITNEY

VALENTINE TOOL & STAMPING INC.
PO BX 469, 171 W. MAIN
NORTON, MA 02766-0469

DATE October 05, 1992
CUST. PO# 15363
ORDER SPECS 5052-O .03200 x 2.312
UA ORDER# 170260D
SPECIFICATIONS ASTM B209,QQ-A-250/8

CHEMICAL COMPOSITION LIMITS

This is to certify the following chemical composition limits, based on an individual or blanket certification of analysis supplied to United Aluminum by its vendor(s):

	VENDOR CERTIFICATION MIN	MAX
SILICON		0.25
IRON		0.40
COPPER		0.10
MANGANESE		0.10
MAGNESIUM	2.2	2.8
CHROMIUM	0.15	0.35
ZINC		0.10
OTHER ELEMENTS (EACH)		0.05
OTHER ELEMENTS (TOTAL)		0.15
ALUMINUM	REMAINDER	

MECHANICAL PROPERTY RESULTS

his is to certify that the following are the results of the mechanical roperty test(s) performed by United Aluminum, based on a minimum of one mple for the order:

TENSILE STRENGTH (KSI)	29.2
ELONGATION (%)	24

y test results reported above are subject to the limitations of the sting process. All sales are subject to United Aluminum's Terms and nditions contained on the reverse of its Sales Order Acknowledgement.

10/05/1992 13:51:13
SHIP SHIP 2
00124-00002 08496

Paratech, Inc.

MINIATURE TECHNICAL CERAMICS

16945 MINNESOTA AVENUE • P.O. BOX 718 • PARAMOUNT, CALIFORNIA 90723
TELEPHONE (213) 633-2045 • FAX (213) 633-8907

MATERIAL CERTIFICATION

DATE: 11-25-92

TEXAS INSTRUMENTS, INC.

ORDER NO.: 5051289I5

PART NO : 74078-145 REV. NO.: G

QUANTITY THIS SHIPMENT: 75,000

SHIPMENT DATE: 11-25-92

PART DESCRIPTION: PIN

WE CERTIFY THAT THE MATERIAL USED TO PRODUCE THE PRODUCT IN THIS SHIPMENT, NAMELY PIN / STEATITE - L3, CONFORMS TO T.I. DRAWING AND T.I. PURCHASE ORDER REQUIREMENTS.

PRODUCTION MANAGER

15220721

TEXAS INSTRUMENTS, INC.
BUILDING 11-10
34 FOREST STREET
ATTLEBORO, MA 02703

PARKER HANNIFIN CORPORATION
JOK DIVISION
WEST CHOPT CIRCLE
SPARTANBURG, S.C. 29302
TELEPHONE (803) 573-7332

J.O.K. Division of Parker Seal certifies that the material used to produce the product in this shipment, namely SILICONE/ S7424. Conforms to TI drawing and TI purchase order requirements.

PART TITLE... ENVIRONMENTAL SEAL

COST P/N... 74247 4 REV B DATE SHIPPED P/O... 5908230SB

J.O.K. P/N.. 207215 12-11-92 S/N... 18456 & 18457

SILICONE COMPOUND... S7615 QUANTITY... 42,700

Very Truly Yours,
J.O.K. Division

Dennis T. Johnson

DTJ/BS

DENNIS T. JOHNSON
Quality Control Manager

880	2 001	500023698	09/21/92	D56	P	12/11/	004417-

PACKING LIS

CONT: 0

TEXAS INSTRUMENTS
P O BOX 666

BILL TO

ATTLEBORO MA 02703

SHIP TO

TEXAS INSTRUMENTS, INC.
BUILDING 11, DOOR 16
34 FOREST STREET

ATTLEBORO MA 02703

#74247-4

SPEC. INSTR.

Parke

Seal

JBL DIVISION

P. O. BOX 15009
WEST CROFT CIRCLE
SPARTANBURG, S.C. 29302

TELEPHONE (803) 573-7332
TELEFAX (803) 583-4299

DATE SHIPPED	SHIP VIA		WEIGHT	CARTONS	FREIGHT	INT
12-11-92	Ups		25 LB	3		K

ITEM	ORIGINAL QTY.	PARKER PART NUMBER	CUSTOMER P/N - DESCRIPTION		QTY. THIS SHIPMENT	POD *	QUANTITY B/O	PRICE **	DISC.	REQUIRED DATE	DELI-
04	55,000	207218 57519	74247-4	T32 H	42,700	C	42,600	[redacted]		12/11/92 ** NOT BEFORE	12/

3 BX
FLOOR B

WE HEREBY CERTIFY THAT TO THE BEST OF OUR KNOWLEDGE AND BELIEF, THE FINISHED PARTS AND/OR MATERIAL PURSUANT TO PURCHASE ORDERS ISSUED BY YOU AND NUMBERED AS LISTED BELOW CONFORM TO APPLICABLE SPECIFICATIONS OR REQUIREMENTS.

CLAIMS FOR DAMAGES OR SHORTAGES MUST BE MADE WITHIN 30 DAYS.

ITEM	BATCH #	QUANTITY	ITEM	BATCH #	Q
4	17459	27,700			
4	19485	15,000			

* LEGEND
PARTIAL = P
COMPLETE = C
OVERSHIPPED = O

JBL 1001

TI-NHT&A 003579

F2VC-9F924-AB

MATERIAL ANALYSIS

PARTS LIST

	PART NAME	PART #	CERTIFIED
1	BASE	46515-2	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	J512 HEXPORT	36900-1	YES
8	GASKET	74353-1	YES
9	CUP	27713-1	YES
10	SEAL	74176-1	YES
11	KAPTON STRIP	27325-1	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	~~74247-2~~	YES
19	THREAD CAP	~~74179-2~~ 74888-1	YES

submitted -4 CERT. JAN. '92

August 28, 1991

To: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110822

Sample Description:

P/N 46515-2 Thermoplastic Polyester
Celanex 4300

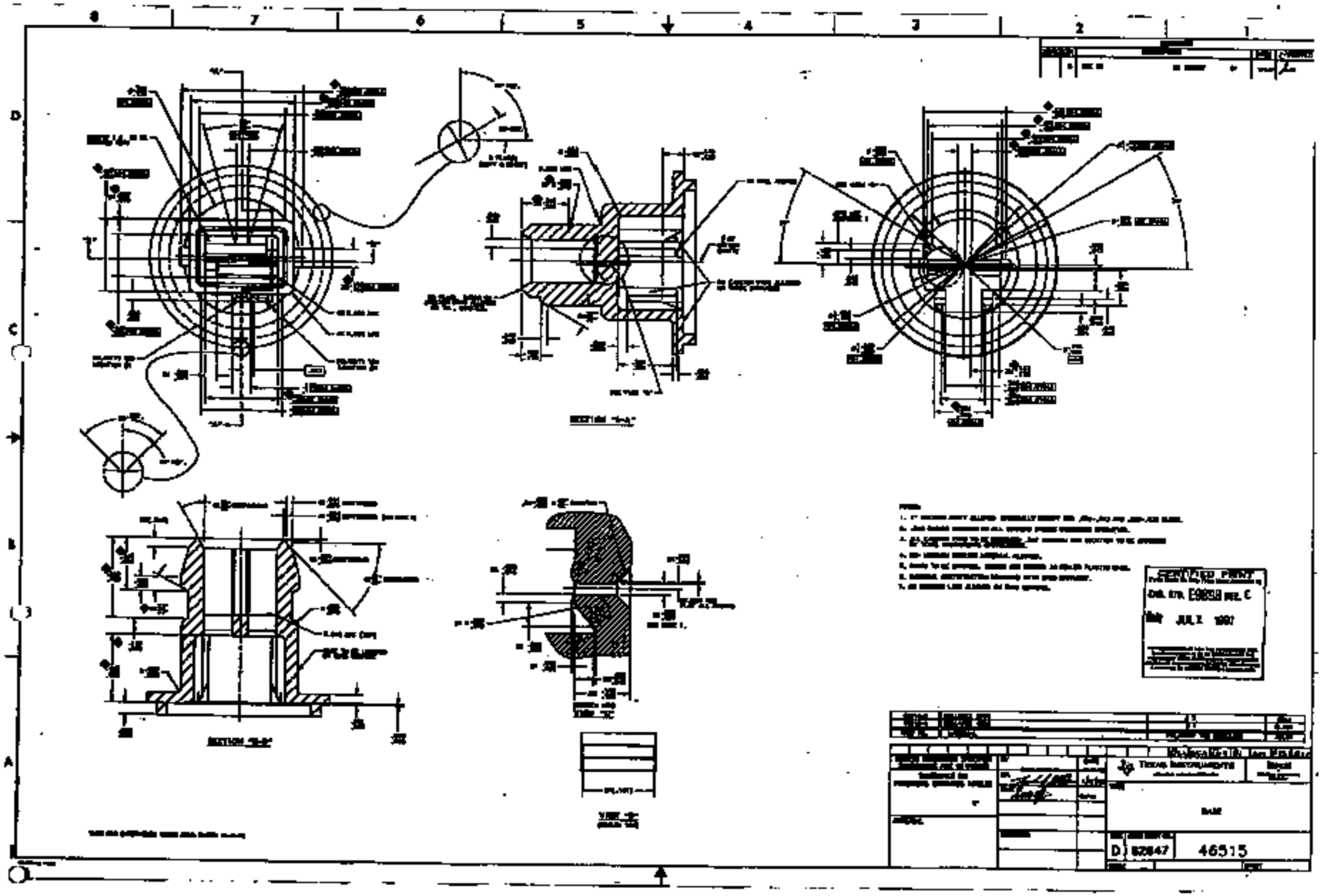
Results:

	P/N 46515-2	Spec.
Glass Fill	32%	30%

TGA results confirm the base contains slightly high glass fill. DSC results confirm the base material to be a thermoplastic polyester with a melting point at 223 -225 deg. C., and a glass transition at 50 - 60 deg. C., consistent with Celanex 4300.

Regards,

Beth X3069



D	62847	46515	

August 20, 1991

TO: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110823

Sample Description:

P/N 36888-1 Stationary Terminal CDA 260 Brass 1/2 Hard

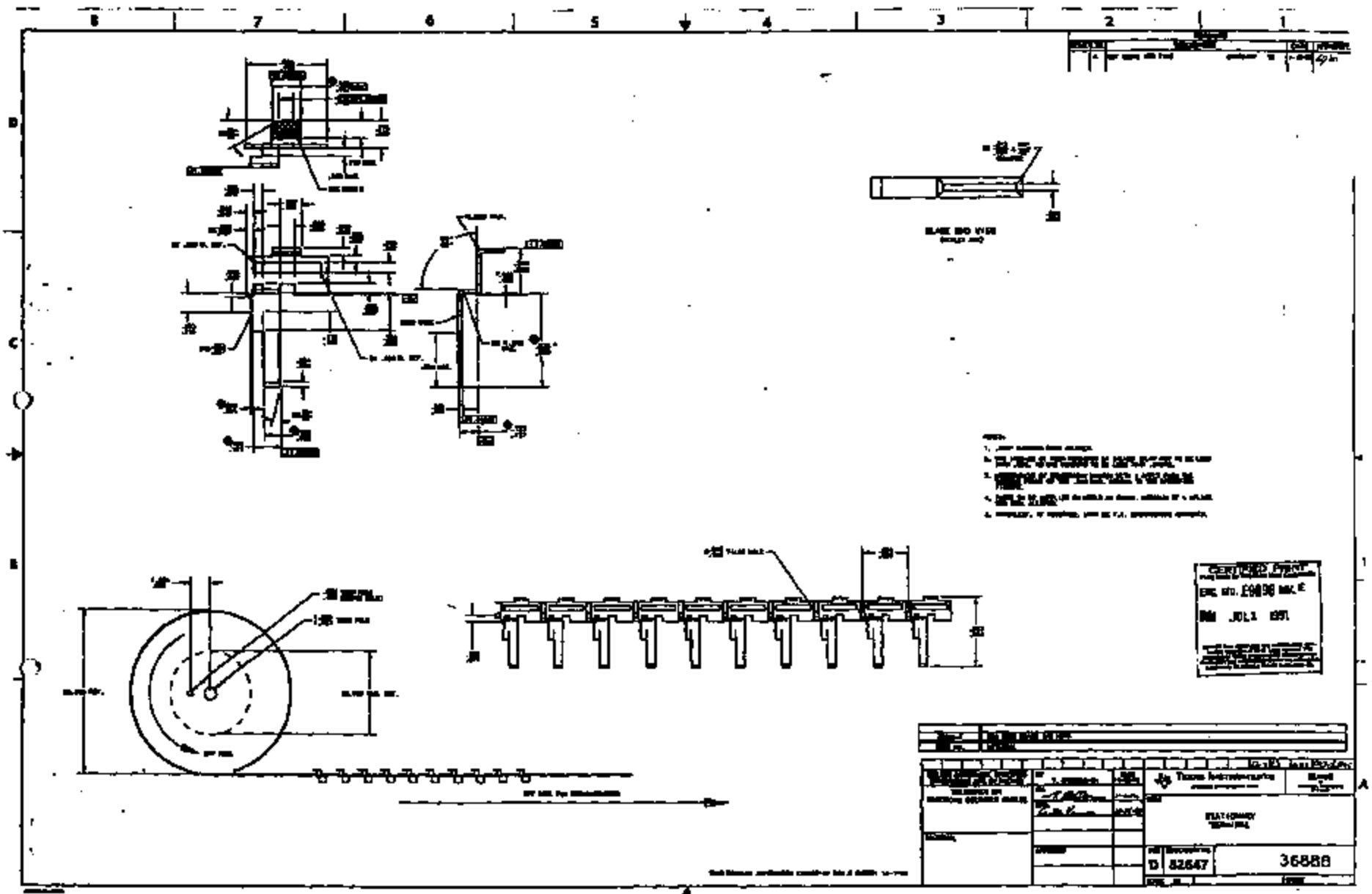
Results:

	P/N 36888-1	Spec. CDA 260
Cu (wt%)	68.5%	68.5 - 71.5%
Fe	0.030	0.05 max
Pb	0.010	0.07 max
Zn	balance	balance
Hardness	73 RB	60 - 77 RB

Results confirm the terminal is made of CDA 260 brass, 1/2 hard.

Regards,

Beth X3069



TI-NHTSA 003584

ACME MILFORD
857 BRIDGEPORT AVE.
MILFORD, CONNECTICUT 06460

TEL.\ 203-878-4631 * FAX 203-878-3071

TO: TEXAS INSTRUMENTS

CERTIFICATE OF COMPLIANCE

ACME MILFORD CERTIFIES THAT;

P.O. NUMBER: 500011076
ACME/MILFORD CONTROL NUMBER: 17642
ACME/MILFORD P/N: 6254-A
QUANTITY: 915425

WAS PROCESSED TO CONFORM TO THE FOLLOWING

PART NUMBER: 74408-1
PART REVISION: D
MATERIAL: COPPER CDA 102
HEAT NUMBER:
TENSILE AFTER LIGHT DRAW:
FINISH: .0011-.0024 SILVER PLATE
(.0007 MIN OVER VENT)

SIGNED: DATE: 09-06-91

JOHN MICHAUD
TITLE\ QUALITY CONTROL MANAGER

SWORN TO AND SUBSCRIBED BEFORE ME THIS/_____DAY_____MONTH_____YEAR

NOTARY PUBLIC_____

RADCLIFF WIRE INC.

FLAT, SQUARE AND SHAPED WIRE
Phosphor Bronze • Brass • Nickel Silver

ORDER NO. 5321

RONZO ROAD • P.O.BOX 603 • BRISTOL, CONNECTICUT 06010
TELEPHONE: 203 / 583-1305 • FAX: 203 / 583-6553

MATERIAL CERTIFIC

SOLD TO
ACME MILFORD
857 BRIDGEPORT AVENUE
MILFORD, CT 06460

SHIP TO

VIA BUNTINGS

YOUR ORDER NO.	DATE ENTERED	DATE WANTED	DATE PROMISED	F.O.B.
347-2	6/28/91	7/29/91		Bristol

QTY/WEIGHT ORDERED	SIZE/TOLERANCE	SHAPE
300 lbs.	.0575 p/m .0005 Dia.	Round

TEMPER	MATERIAL	EDGE	FINISH
	ETP 110 Copper		

SPECS	TENSILE	SPOOL-COIL
	45-55,000 PSI	

SPECIAL CONDITIONS
CERTS/NATL.

SHIPPING RECORD

DATE	QUANTITY	PACKAGING	TEST
7/16/91	323#	1 Barrel	46,000 PSI

HEAT	C	MN	SI	S	P	CR	NI	CU	B	FE	AL
HARDNESS	TI	CB + TA	CO	MO	V	MG	CE	N	ZN	PB	
TENSILE STR. 46,000 PSI	ZA	CB	TA	SN	BE						

*This is to certify that the above wire was proceed from raw material and was found to be incompliance with the specifications of your po#347-2.

RADCLIFF WIRE, INC.

Claire Boucher
AUTHORIZED SIGNATURE
Claire Boucher Quality Control Inspector

TI-NHTSA 003586

AMERICAN ELECTRO PRODUCTS INC.
1356 THOMASTON AVENUE
WATERBURY, CT 06704
(203) 755-7051

Certificate of Compliance

NO. [illegible]

MILFORD RIVET & MACH
[illegible]

MILFORD CT 06460

DATE [illegible]

YOUR ORDER NO. [illegible]
SHIPPED VIA [illegible]

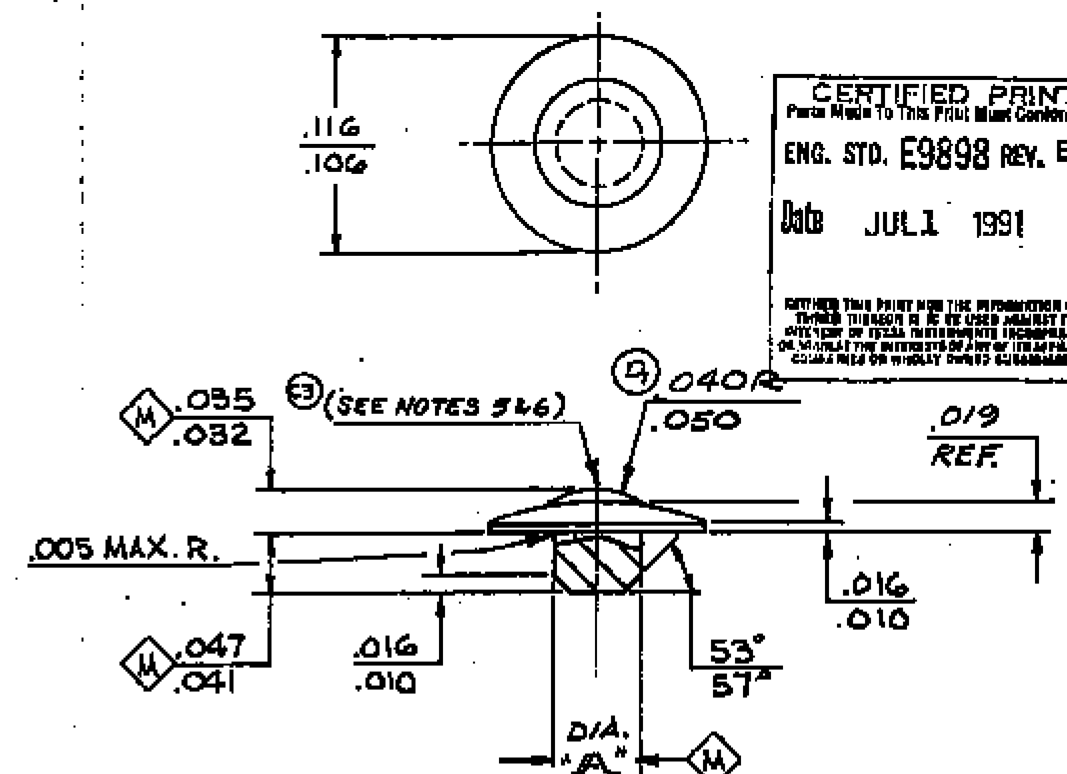
This is to verify that parts and/or your material furnished against your purchase order number shown above, have been manufactured in accordance with requirements and specification as required.

PART NO.	DESCRIPTION	QUANTITY
[illegible]	[illegible]	[illegible]

Tests to substantiate this have been performed in our plant (or have been performed by our suppliers) and are available upon request from us/or our suppliers.

Very truly yours,
AMERICAN ELECTRO PRODUCTS, INC.
Signed by: [illegible]
Q.C. Inspector

MOVABLE CONTACT | REV. D | 74408



CERTIFIED PRINT
Parts Made To This Print Must Conform To
ENG. STD. E9898 REV. E
Date JUL 1 1991

NOTES:

1. PARTS MUST BE STORED IN PLASTIC BAGS THROUGH ALL SHIPPING AND HANDLING PROCESSES.
2. MATERIAL & PLATING THICKNESS CERTIFICATION REQUIRED WITH EACH SHIPMENT.
3. DIMENSIONS APPLY AFTER PLATING.
4. MEASURE PLATING THICKNESS BY MOUNTING & CROSS-SECTIONING PART.
5. PLATING THICKNESS APPLIES AT THE INDICATED LOCATION ONLY.
6. TOOL VENT MARK ON .040-.050 R ALLOWED. DIMENSIONS MAY NOT EXCEED .001 IN HEIGHT AND .003 IN WIDTH. THERE MUST BE NO VOID IN PLATING IN THIS AREA. .032-.035 DIMENSION MAY MEASURE .036 OVER THIS MARK.
7. PLATING THICKNESS OF .0007 MINIMUM ALLOWED ABOVE TOOL VENT MARK ONLY. ADJACENT AREAS MUST MEET "FINISH" REQUIREMENTS.

PART NO.	MATERIAL	FINISH	DIA. "A"
74408-1	COPPER	SILVER PLT. .0011/.0024 THK. (SEE NOTE #5)	.0605-.063

REV: C — SEE CN-CR# 98057; D — SEE DCN CR2511(1) 3-10-88

BY T. Dail 1-6-85
CH. K. Perkins 1-13-86
ENG. Ben Barker 1-13-86

TEXAS INSTRUMENTS INCORPORATED
ATTLEBORO, MASS., U.S.A.
KLIXON CONTROL PRODUCTS DIVISION
DWG. SIZE A | PARTS LIST 74408

TI-NHTSA 003588

ACME MILFORD
857 BRIDGEPORT AVE.
MILFORD, CONNECTICUT 06460

TEL\ 203-878-4631 * FAX 203-878-5071

TO: TEXAS INSTRUMENTS

CERTIFICATE OF COMPLIANCE

ACME MILFORD CERTIFIES THAT:

P.O. NUMBER: 50001502
ACME/MILFORD CONTROL NUMBER: 19095
ACME/MILFORD P/N: 6051-A
QUANTITY: 59,995

WAS PROCESSED TO CONFORM TO THE FOLLOWING

PART NUMBER: 74171-1
PART REVISION: B
MATERIAL: BRASS CDA 260
HEAT NUMBER:
TENSILE AFTER LIGHT DRAW:
FINISH: PLAIN FINISH

SIGNED: John Michaud DATE: 05-30-91

JOHN MICHAUD
TITLE\ QUALITY CONTROL MANAGER

SWORN TO AND SUBSCRIBED BEFORE ME THIS/_____DAY_____MONTH_____YEAR

NOTARY PUBLIC_____

SEYMOUR SPECIALTY WIRE COMPANY

(An Employee Owned Company)
15 Franklin Street
Seymour, Connecticut 06483

(203) 888-6773

ANALYSIS REPORT

Customer: Milford River & Machine Co.
Address: P.O. Box 401E
City: Elyria, OH 44035

Date: December 21, 1987
Customer P.O.: 37309
Seymour #: S-54738-E

Material: OFX 250 Wire
Size: .060" Rd.
Specification: U.S. 56/63,000 PSI GR #1J Heavy Soap Coat
Conforms to UNS# C26000

Date Shipped: 12-18-87
Weight: 985 lbs.

CHEMICAL ANALYSIS

COPPER	70.03
LEAD	*.01
IRON	*.01
ZINC	Bal.
TIN	
SILICON	
MANGANESE	
PHOSPHORUS	
NICKEL	
ALUMINUM	

* Less Than

PHYSICAL ANALYSIS

TENSILE STRENGTH PSI	65,000
YIELD STRENGTH PSI	
ELONGATION, % in.	20%
ROCKWELL	
BEND TEST	
GRAIN SIZE, AVERAGE	
RESISTIVITY ohms/cm	
CONDUCTIVITY	

State of Connecticut
County of New Haven

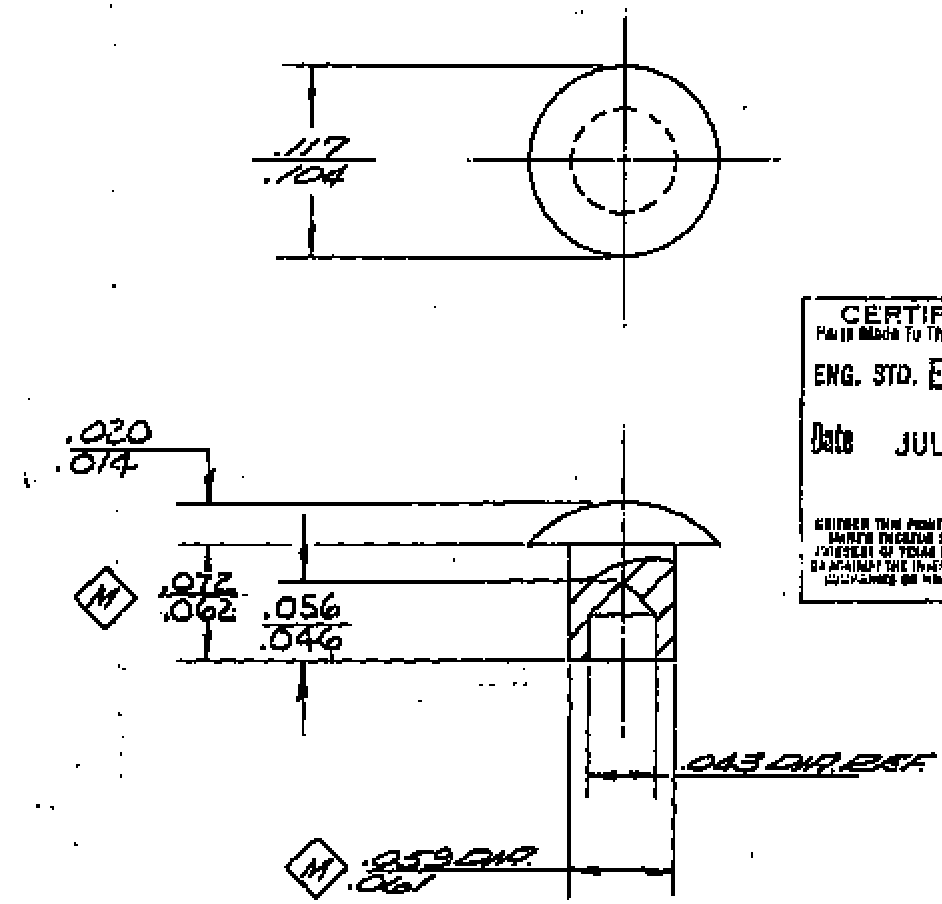
Sworn and subscribed to before me this 21 day of Dec. 19 87

Notary Public

RIVET

REV. B

74171



CERTIFIED PRINT
Parts Made To This Print Must Conform To
ENG. STD. E9898 REV. E
Date JUL 1 1991

NOTE:
1. PARTS MUST BE STORED IN PLASTIC BAGS THRU ALL SHIPPING AND HANDLING PROCESSES

PART NO.	MATERIAL
74171-1	CDA #260 BRASS

REV. B

TVS: 1013-1 / 1014 / 1421-1 / ... / P381 / P378 / V35-1 / P97

BY: [signature] 2-1-84
CH. K. H. Wa[illegible] 2-15-84
ENG. D. [signature] 2/13/84

TEXAS INSTRUMENTS INCORPORATED
ATTLEBORO, MASS., U.S.A.

KLIXON
CONTROL PRODUCTS DIVISION

DWG. SIZE A

DWG. NO. 74171

August 20, 1991

To: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110824

Sample Description:

P/N 36887-1 Moving Terminal CDA 260 Brass
1/2 Hard

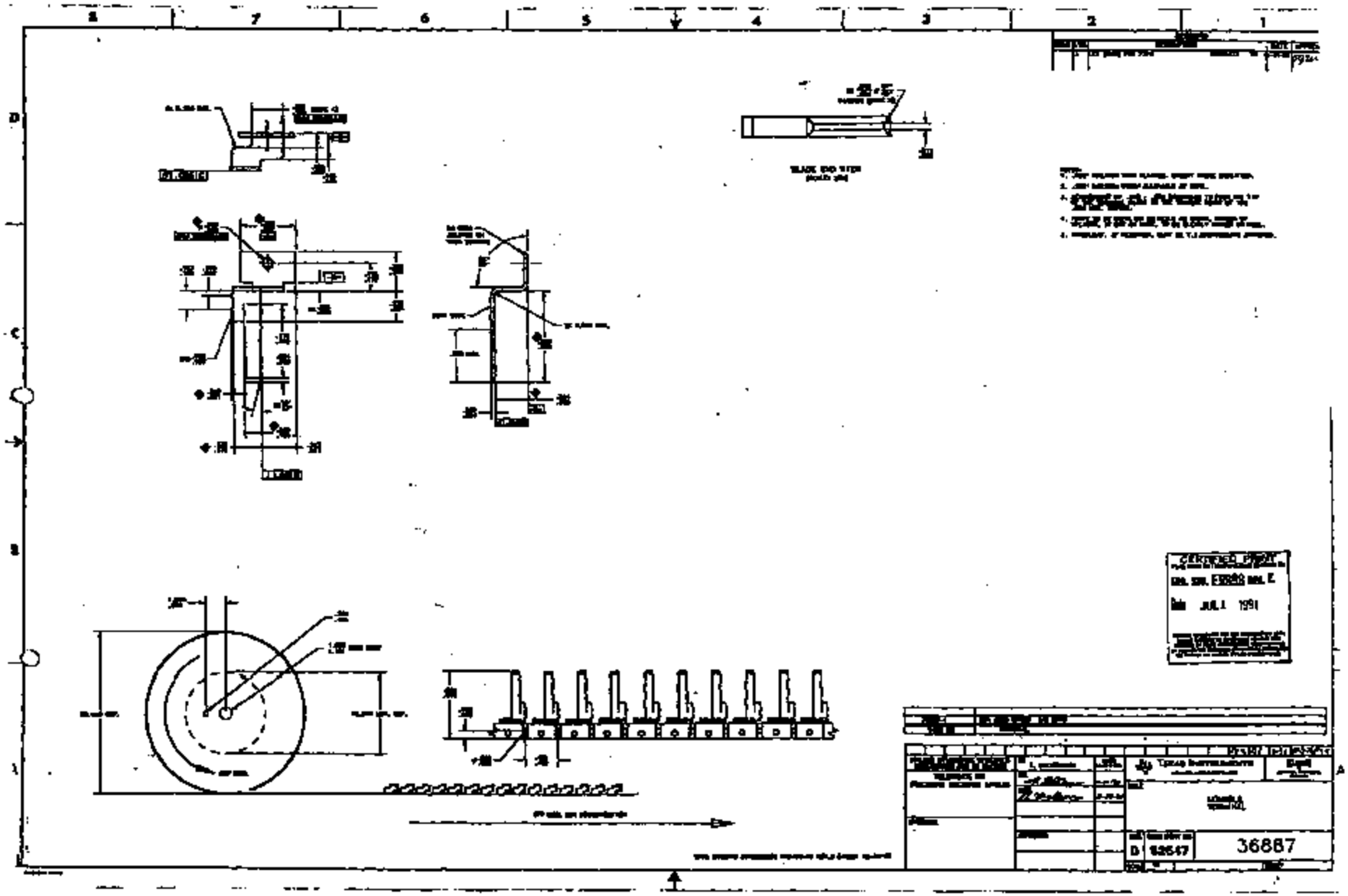
Results:

	P/N 36887-1	Spec. CDA 260
Cu (wt%)	68.7%	68.5 - 71.5%
Fe	0.020	0.05 max
Pb	0.010	0.07 max
Zn	balance	balance
Hardness	80.5 RB	60 - 77 RB

Results confirm the terminal is made of CDA 260 brass, and slightly above 1/2 hard.

Regards,

Beth X3069



36887

TI-NHTSA 003693

August 20, 1991

To: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110825

Sample Description:

P/N 36889-1 Spring C17200 Beryllium Copper

Results:

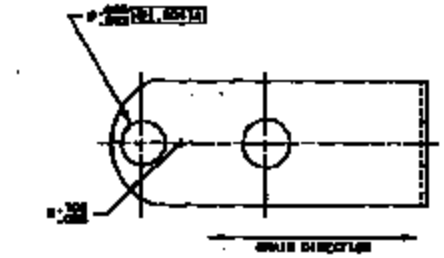
	P/N 36889-1	Spec. C17200
Be (wt%)	1.87%	1.80 - 2.00%
Fe	0.089	
Ni	0.068	[Fe + Ni + Co <0.6%] [Ni + Co >0.2%]
Co	0.220	
Hardness	300 DPH	285 - 343 DPH

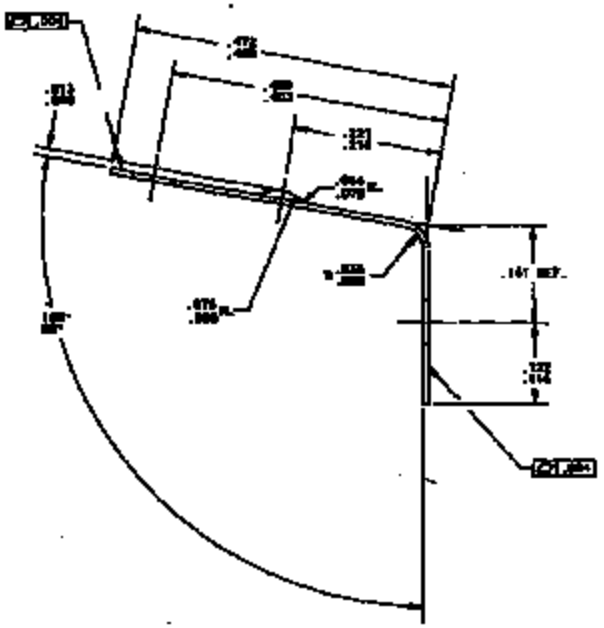
Results confirm the spring is made of C17200 beryllium copper at the specified hardness.

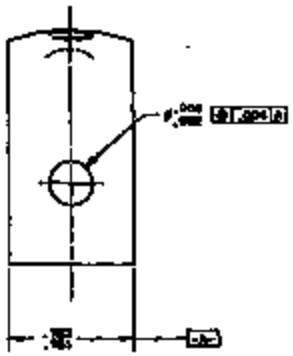
Regards,

Beth X3069

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	[illegible]	[illegible]	[illegible]







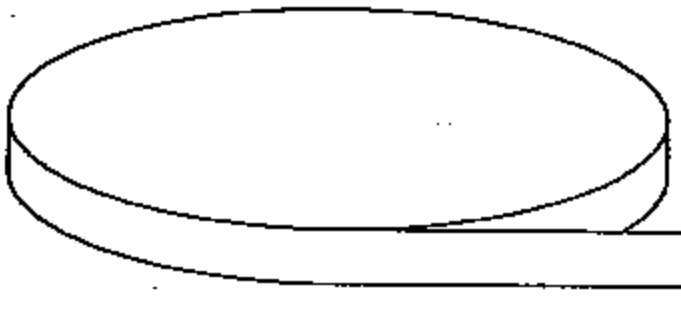
NOTE:
1. [illegible]
2. [illegible]

[illegible]-1	97216
THIRD ANG.	[illegible]

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON FRACTIONS DECIMALS ANGLES MATERIAL	BY T. [illegible] CHK [illegible] ENGR [illegible] APPROVED	DATE [illegible] [illegible] [illegible]	TEXAS INSTRUMENTS TITLE SPRING ARM SIZE C · CODE IDENT NO. 82647 · 36889 SCALE [illegible] · SHEET

TI-NH78A 003595

ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPROVED
	B	1. MOVE 4 EDGE TAB DIM. 2. ADDED NOTES 5, 6, AND 7. CN 185868	1-24-91	OF



NOTES:

1. MATERIAL CERTIFICATION INCLUDING TENSILE STRENGTH AND HARDNESS DATA REQUIRED WITH EACH SHIPMENT.
2. EACH REEL TO BE LABELED WITH T.I. PART NUMBER ON INSIDE OF CORE.
3. MAX. ALLOWABLE BURR .001.
4. ROLLS SLITTED FROM EDGE OF MASTER COIL NOT ACCEPTABLE.
5. MAX. WEIGHT PER REEL IS 20 LBS.
   MIN. WEIGHT PER REEL IS 10 LBS.
6. ROLL TO BE PANCAKE STYLE.
   12" TO 18" ID.
   24" MAX. OD.
   3/4" DRIVE HOLE
7. NO SPLICES ALLOWED.

CERTIFIED PRINT
ENG. STD. E9898 REV. E
DATE JUL 1 1991

PART NO	MATERIAL	TENSILE STRENGTH (KSI)	HARDNESS DPH	THICKNESS (IN)	STRIP WIDTH	PAD PUT UP (ID) (OD)
27716-1	BERYLLIUM COPPER C17200, MILL HARDENED (BRUSH WELLMAN ALLOY 190 HX)	135-150	285-343	.005 ±.0002	.181-.185	TBD

THIS DRAWING SUPERSEDES 27716SH1 REV.A DATED: 11-14-90

	BY	DATE
	T. BREITENBACH	11-14-90
		1-21-91
		SHEET
		SHEET

TEXAS INSTRUMENTS
INCORPORATED

SPRING MATERIAL
STRIP SPECIFICATION

SIZE	DRAWING NO.	REV
B	82647	27716SH1

SCALE | SHEET

TI-NHTSA 003598

ELCO INDUSTRIES, INC.
PRECISION FORMING DIVISION
1111 Samuelson Road • P.O. Box 7008
Rockford, Illinois 61125-7008
Phone 815/987-8181 • Fax 815/987-8188 Ext. 748

CERTIFICATION

May 16, 1991

TEXAS INSTRUMENTS INC
ACCTS PAYABLE DEPT
P.O. BOX 656
ATTLEBORO, MA 02703

This is to certify the parts furnished on your purchase order have been produced in accordance with specifications listed on your purchase order and/or blueprint.

MATERIAL CERTIFICATION, FINAL INSPECTION AND SAMPLES SENT

Records covering material used and the tests and inspection conducted are on file, subject to examination.

Purchase Order No.	500016587
Register No.	76825
Part No.	36900-1
Description	3/8-24 X .81
Quality Control No.	A9341-S
Quantity	8.735

36900-1

CERTIFICATION

Authorized Signature
Quality Coordinator

The times call for quality. Elco quality.

F-81

12-14-50

COMPANY LIMITED

P.O.# 03162

Type & Grade SC-3896 AISI10L10 SAF

Specification 36100-1

4041107

	Heat No.	Coil No.	C % × 100	Mn % × 100	Si % × 100	P % × 1000	S % × 1000	Cu % × 100	Ni % × 100	Cr % × 100	Mo % × 100	B % × 10,000
Chemical Composition Of Steel	C78314	0001 – 0018	10	41	6	5	21	1	1	3		PB XX100 22

	Nominal Diameter		Tolerance of Diameter		Tensile Strength		Decarburization	
	in	mm	in	mm	T,000 psi	kg/mm²	Dm-T	Dm-F
Physical Properties	0.565	14.351	+ 0.0040	+ 0.1016	68.9 MAX	48.5 MAX	MAX	

	Coil Weight	
Packing	ABT. 2,272LBS (ABT. 1,033KGS)	
	WRAPPED WITH POLYPROPYLENE SHEET.	

Test Results

Sample No.	Diameter mm	Tensile Strength kg/mm²	Tensile Strength 1,000psi	Sample No.	Diameter mm	Tensile Strength kg/mm²	Tensile Strength 1,000psi
0001	14.36	33.7	47.9				
0002	14.38	33.7	47.9				
0003	14.37	32.7	46.5				
0004	14.41	33.7	47.9				
0005	14.36	32.3	45.9				
0006	14.36	32.9	46.8				
0007	14.37	33.3	47.4				
0008	14.37	33.8	48.1				
0009	14.36	33.1	47.1				
0010	14.38	34.7	49.4				
0011	14.36	33.1	47.1				
0012	14.38	32.7	46.5				
0013	14.38	34.3	48.8				
0014	14.36	33.8	48.1				
0015	14.37	34.2	48.6				
0016	14.36	35.5	50.5				
0017	14.36	35.5	50.5				
0018	14.36	34.2	48.6				
		********					

...SPECTION HARDNESS TESTING RESULTS

...TED: Rc Kuan SCALE USED: 15 PART NO.: 342007

73 min

...PLE NO.:		RESULTS:
1	------>	[illegible]
2	------>	[illegible]
3	------>	[illegible]
4	------>	[illegible]
5	------>	[illegible]
6	------>	[illegible]
7	------>	[illegible]
8	------>	[illegible]
9	------>	[illegible]
10	------>	[illegible]

AVERAGE: 92.9

MAXIMUM: 93.9

MINIMUM: 91.0

9970 36900-1 5725 [illegible]

9407 TECHNICAL SERVICE LABS

TEST NO. 109407

		STATE YOUR PROBLEM / SAMPLE DESCRIPTION	INFORMATION DESIRED:
[illegible]	127		Please section and 1725 measure 41°-43° per attached drawing.
[illegible]	146		
[illegible]	060		
[illegible]	Sandy		Thank you, Sandy
MAIL STATION	11-11		
EXTENSION	3021		
REQ ID	ATQC		
DATE SUBMITTED	5/23/91		
DATE REQUIRED	5/24/91		
NO. OF SAMPLES	3		
COMPOSITION			36900-1

REPORT OF RESULTS:

(1) 41.5 - 41

(2) 42 - 41

(3) 41 - 41

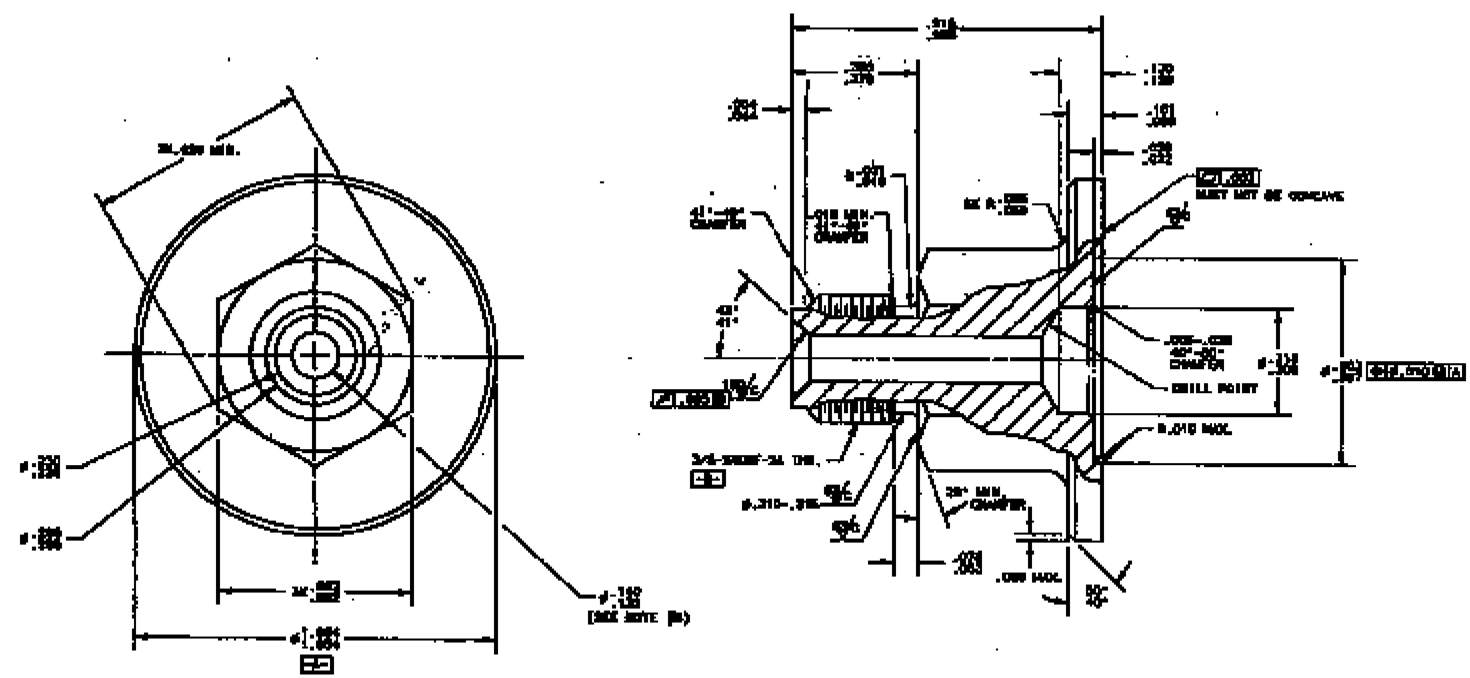
DATE RECEIVED 5/24/91 DATE OUT 5/24/91 3:30 PM

TECHNICIAN			
HOURS WORKED			
PROCEDURE USED			

*PCC I.D.

MC=325	TM=431	JOCY=126	FACIL=514
PC=127	WIRE=432	CLKE=122	FACIL=521
VERS=166	EPD=521	CAN=954	FACIL=531
AFCC=483	PEP=522	AD DEV=286	STAFF=958
IMD=430	CSD=535	EMCD=677	

DISTRIBUTION: White and Yellow - Lab Pink - Requestor



NOTE:

1. DIMENSIONS APPLY AFTER PLATING.
2. PARTS TO BE SHIPPED, [illegible] AND [illegible] IN SEALED PLASTIC BAGS.
3. [illegible] PORT FLANGE HARDNESS TO BE ROCKWELL [illegible]-73 MINIMUM.
4. THREAD MUST CONFORM TO [illegible] SPEC . [illegible]
5. .[illegible] ALLOWABLE [illegible] - .140 THROUGH HOLE WHEN DRILLED FROM BOTH SIDE OF PART.

[illegible]	[illegible] STEEL	ZINC PLATING [illegible] MIN. THICK WITH YELLOW [illegible]
PART NO.	MATERIAL	FINISH

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCE ON FRACTIONS DECIMALS ANGLES

MATERIAL

BY J.D.[illegible] DATE [illegible]

CH.

ENG.

APPROVED

TEXAS INSTRUMENTS

TITLE

MODIFIED SAE J512 HEX PORT

SIZE	CODE IDENT NO.	
C	82647	36900

SCALE SHEET

TI-NHTSA 003601

July 29, 1991

To: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110831

Sample Description:

#110831	P/N	74353-1	Gasket	Ethylene propylene rubber

Results:

Akron Rubber Development Laboratory Inc. has analyzed the above component. The material conforms to specification. See the enclosed report.

Regards,

Beth X3069

AKRON RUBBER DEVELOPMENT LABORATORY, INC.
300 KENMORE BOULEVARD • AKRON, OHIO 44301
Office (216) 434-6664 Telefax (216) 434-6668

July 24, 1991

Ms. Elizabeth Kill
Texas Instruments
34 Forest St.
MS 10-16
Attleboro, MA 02703

SUBJECT: Chemical analysis on sample submitted by the above company.
PO# 500066978

RECEIVED: One sample identified as: #110831 Ethylene Propylene JBL compound E-7104-70.

POLYMER IDENTIFICATION: ASTM D 3677
Pyrolysis method

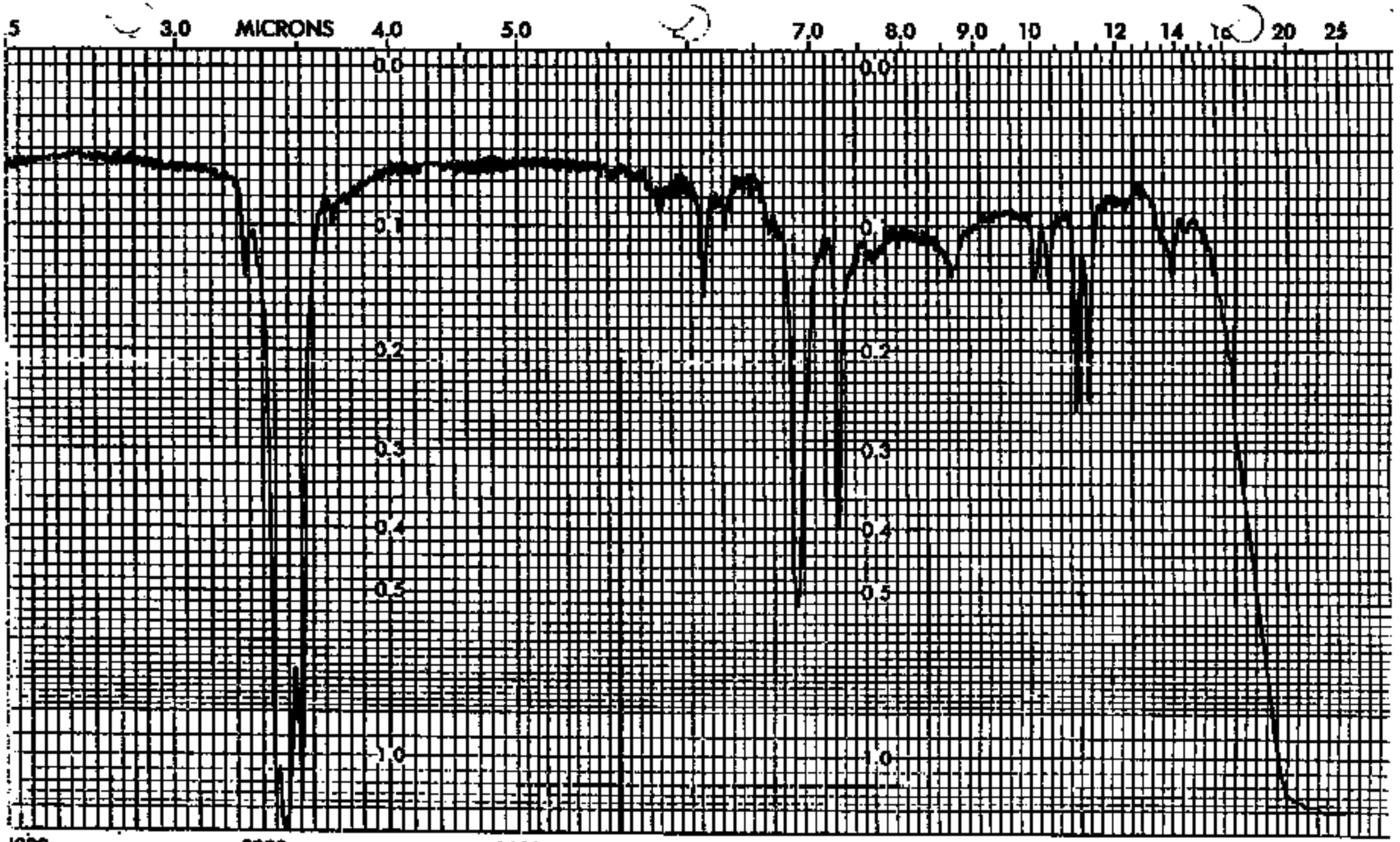
SAMPLE	POLYMER IDENTIFICATION
#110831	Ethylene-Propylene Rubber

Janis Seifert
Senior Chemical Technician
AKRON RUBBER DEVELOPMENT LABORATORY, INC.

Thomas N. Knowles
Vice President, Chemical Services

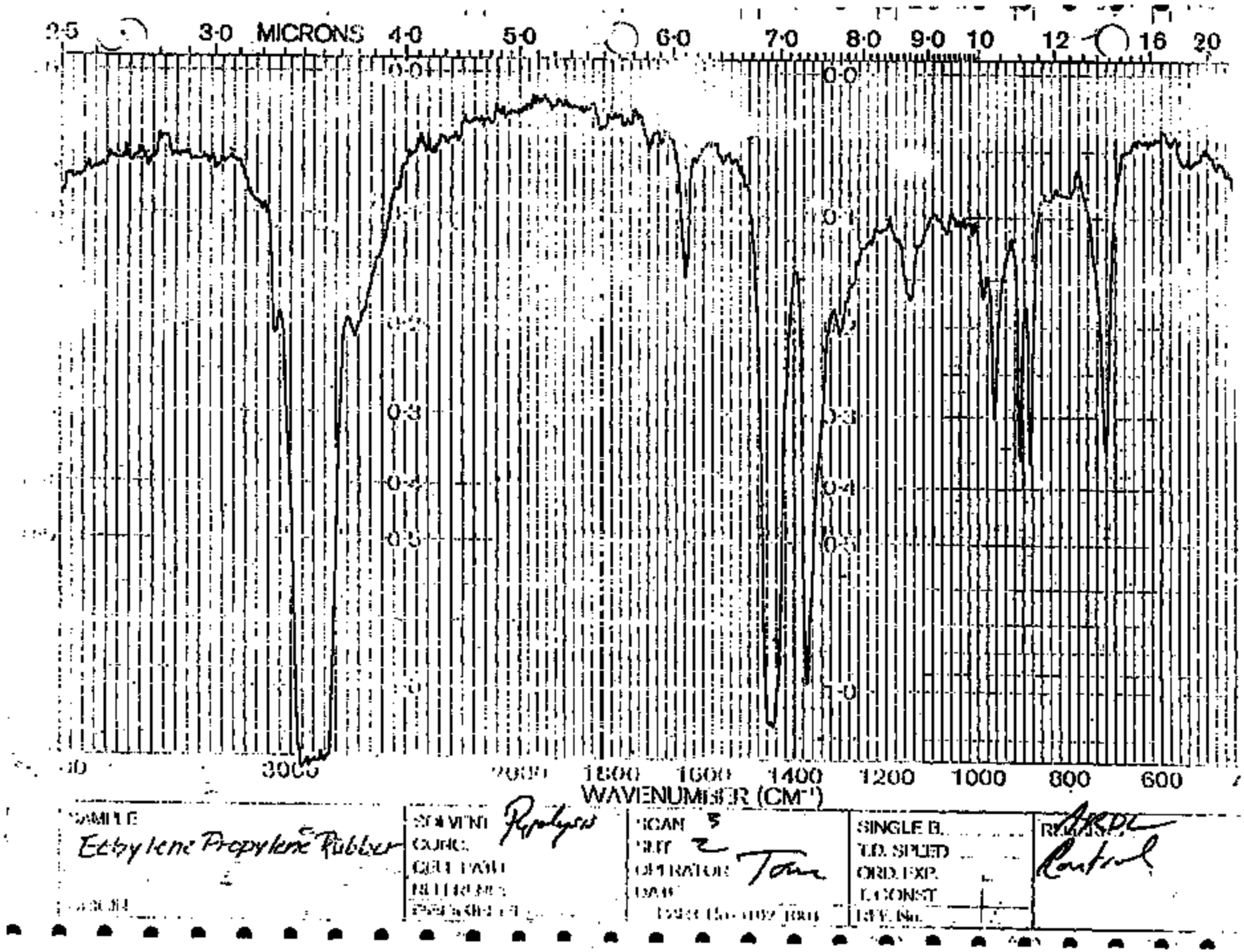
PN# 11726 INV# 31172601

tk



SAMPLE	SOLVENT	SCAN	SINGLE B.	REMARKS.
	CONC.	SLIT	T. D. SPEED.	
	CELL PATH	OPERATOR	ORD. EXP.	
ORIGIN	REFERENCE	DATE	T. CONST.	
		No. PR 5102-1001	REF. No.	

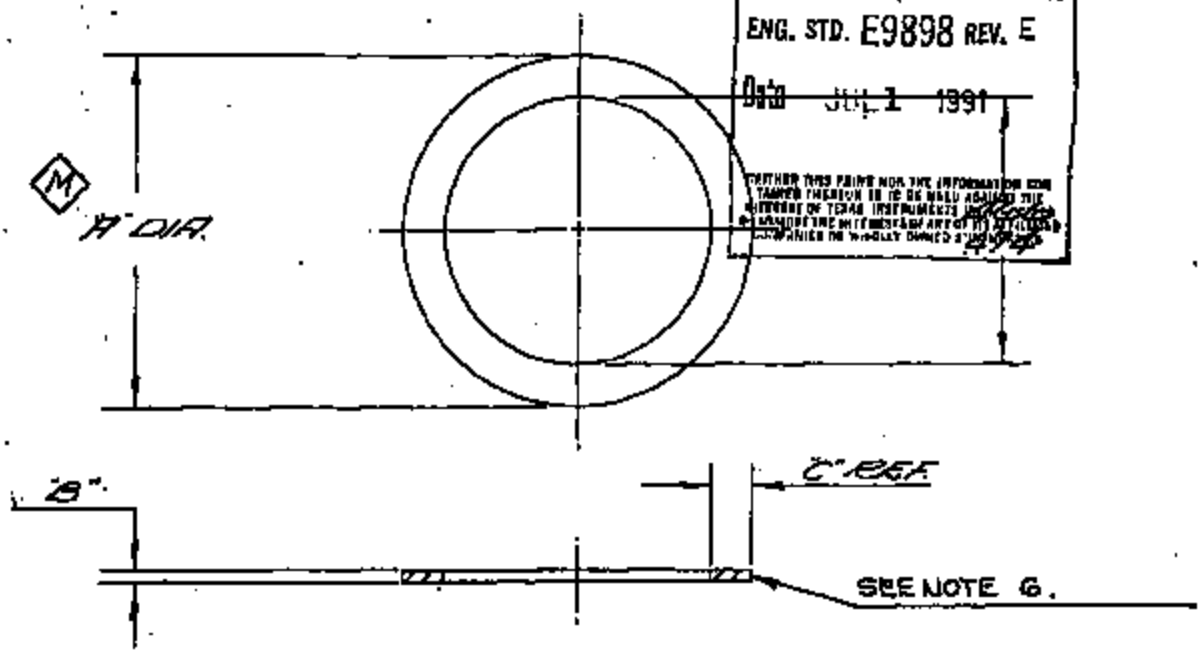
TL-NHTBA 003604



GASKET | G | 14353

74353

CERTIFIED PRINT
Parts Made To This Print Must Conform To
ENG. STD. E9898 REV. E
Date JUL 1 1991



NOTES:
1. PARTS MUST BE PURCHASED FROM T.I. ENGINEERING APPROVED VENDORS, LISTED BELOW.
2. MATERIAL CERTIFICATION REQUIRED WITH EACH SHIPMENT.
3. MATERIAL TO BE COMPATIBLE WITH FREON-12 & REFRIGERANT OIL.
4. PARTS TO BE SHIPPED, ISSUED & STORED IN SEALED PLASTIC BAGS. AND 50,000 PARTS PER BAG MAX.
5. ALL CONTAINERS OF PARTS MUST BE MARKED TO REFLECT ANY MATERIAL LOT, TOOL OR PROCESS CHANGE.
6. DASH 1 (-1) AND DASH 4 (-4) GASKET MUST HAVE FOUR (4) WHITE STRIPING INK MARKS, EQUALLY SPACED AROUND THE CIRCUMFERENCE, AND NOT LESS THAN 1/8 INCH WIDE. NO INK IS ALLOWED ON ANY OTHER SURFACE.

PART NO.	MATERIAL	DUROMETER	COLOR	A ⟨M⟩	B ⟨M⟩	C
74353-4	ETYLENE PROPYLENE JBL COMPOUND E-7104-70 JBL PART NO. G197E	70	BLACK	.670-.662	.030-.036	.063
74353-3	ETHYLENE PROPYLENE JBL COMPOUND E-7054	70	WHITE	.670-.662	.030-.036	.063
74353-2	ETHYLENE PROPYLENE JBL COMPOUND E-7054	70	WHITE	.599-.591	.030-.036	.063
74353-1	ETHYLENE PROPYLENE JBL COMPOUND E-7104-70 JBL PART NO. G197E	70	BLACK	.599-.591	.030-.036	.063

USE: QB-1 | QI-1 | MH-1 | P37-7 | P35-1

BY T. Dail 3-10-86
CH. [illegible] 3-10-86
ENG. [illegible] 3-11-86

TEXAS INSTRUMENTS INCORPORATED
ATTLEBORO, MASS., U.S.A.

KILDON CONTROL PRODUCTS DIVISION

DWG. SIZE A | PARTS LIST 74353

CONF INFRNT. NO. 82647

VALENTINE TOOL & STAMPING, INC.

111 WEST MAIN ST. NORTON, MASS. 02766
(508) 285-6811

MATERIAL CERTIFICATION

DATE : FRIDAY JUNE 14, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505063392 SUPPLIER INVOICE NO.: 79580

PART DESCRIPTION : 27713-1 CUP REV.A

SUPPLIER FJO NO. : 18571

QUANTITY SHIPPED : 1,085

SHIPMENT DATE : 06/14/91

WE CERTIFY THAT THE MATERIAL USED
TO PRODUCE THE PRODUCT IN THIS
SHIPMENT, NAMELY
(C1006)
CONFORMS TO T.I. DRAWINGS AND
T.I. PURCHASE ORDER REQUIREMENTS.

SIGNED _____
(Supplier Representative)

Jeanne Laflamme Quality Control Manager

VALENTINE TOOL & STAMPING, INC.

171 WEST MAIN ST. NORTON, MASS. 02766
(508) 285-6911 226-8040

CERTIFICATE OF CONFORMANCE

DATE : FRIDAY JUNE 14, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505063392 SUPPLIER INVOICE NO.: 79580

PART DESCRIPTION : 27713-1 CUP REV.A

SUPPLIER FJO NO. : 18571

QUANTITY SHIPPED : 1,085

SHIPMENT DATE : 06/14/91

WE CERTIFY THAT ALL ITEMS SHIPPED ON THIS ORDER MEET THE REQUIREMENTS OF THE PURCHASE ORDER AND APPLICABLE DRAWINGS/SPECIFICATIONS. RESULTS OF REQUIRED MECHANICAL, VISUAL, FUNCTIONAL AND CHEMICAL TESTS ARE ON FILE IN OUR QUALITY CONTROL DEPARTMENT.

SIGNED Jeanne Laflamme
Jeanne Laflamme
Quality Control Manager

E 315-336-
S 223-212-

500 HIGHLAND AVENUE
ROME, NEW YORK 13440-

SALES CODE
.502Q1o

0 1 0 0 0 0 0 0

DATE	INVOICE NO
02/26/91	02740

VOICE TO: VALENTINE TOOL & STAMPING, INC.
171 W MAIN ST
NORTON, MA. 02766

SHIP TO: VALENTINE TOOL & STAMPING, INC.
171 W MAIN ST
NORTON, MA

ATTN: JEANNE LAFLAMME, Q.C. MGR.

QTY (LBS)	NO. CTS.	NO. SKIDS OR BDLS	PARTIAL COMPLETE	SHIPPED BY
16,154	040	06	COMP	R S S

HT NO.	C	MN	P	S	SI	NI	CR NO
466709	07	34	012	006	01		

AL VN CB CA

E REQUIREMENTS OF:
ORDER NO. 13428

COLOR CODE

125	02MM X 50.80MM			MILL NO 62456	PREPAID COLLECT PREPAID	STRAPPING	PAPER WRAP	BOLS	CRATES	BOX
	.04000 X	2.0000	TEMPER R 50 MAX	COILS OR CUT COIL	440 LBS	SKIDS 3000	SKID SIZE	PKG. WT	WASHERS	CORES 4
TRANCE			EDGE	LENGTH SPEC		RUBBERS	SPACERS	SKIDOID	BOARDS	CAPS
001	-001	+005 -005	MILL SLIT	220 PIN 16 36			3/4"			
						BBER	CAMBER	FLATNESS	OIL	T-PCS

125 -025MM +127 -127MM

CLASS	ASTM NO.
ALUM KILD	C-1006

TEST REPORT

Certificate of Compliance

TEST: [signature]
[illegible] 07205 33/030291
Notary Public, Oneida County
My commission expires 7/31/92

ATE 2/27/91

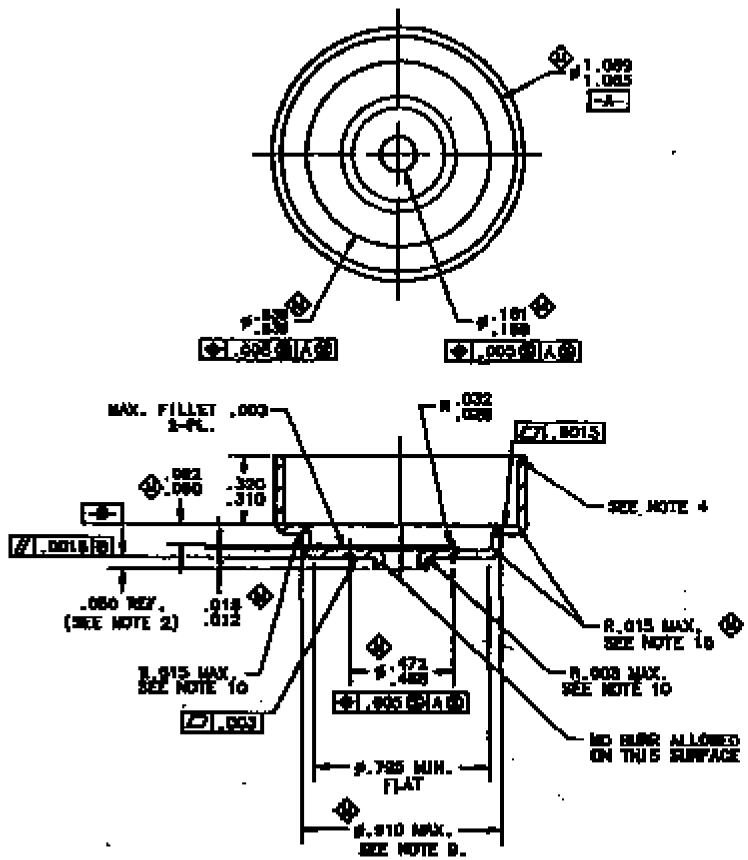
I certify that the above figures are a true and correct copy of those contained in the records of this corporation.

[signature]
ROME STRIP STEEL CO., INC.

TI-NHTBA 003609

920.5

REVISIONS					
ZONE	LTR	9799 DESCRIPTION PROJ. # 3423	DATE	APPROVED
	B	ADDED NOTE 10. ADDED "SEE NOTE 10" IN 3 PL., "MAX. FILLET .003" WAS "R.010 MAX. 2-PL.". "⌖.005 Ⓜ A Ⓜ" WAS "⌖.003 Ⓜ A Ⓜ" IN 2-PL. ALSO "R.015 MAX. SEE NOTE 10" WAS "R.005 MAX. SEE NOTE 10", CR.155645. TJ	3-14-91	SO CK



NOTES:
1. .002 MAX. BURR ALLOWED, EXCEPT WHERE INDICATED.
2. .159-.161 ⌀ MUST BE MAINTAINED THRU .058 MIN..
3. DIMENSIONS APPLY AFTER PLATING.
4. PINCH OFF RADIUS ALLOWED.
5. PARTS TO BE SHIPPED, ISSUED, AND STORED IN SEALED PLASTIC BAGS.
6. ALL CONTAINERS OF PARTS MUST BE DATE CODED, DATE CODE IS TO REFLECT ANY MATERIAL LOT, TOOL OR PROCESS CHANGE.
7. THIS PART IS LOT CONTROLLED. ANY PRESS CHANGE: NEW SET-UP, PUNCH CHANGE, MAJOR TOOL WORK OR MATERIAL LOT CHANGE WILL SIGNIFY START OF A NEW LOT. EACH LOT WILL HAVE IT'S OWN PACKING SLIP WITH LOT IDENTIFICATION. PALLETIZED LOTS REQUIRE ONE SKID FOR EACH LOT.
8. MATERIAL CERTIFICATION REQUIRED WITH EACH SHIPMENT.
9. .038 - .041 THICKNESS DOES NOT APPLY IN THIS AREA DUE TO WALL THINNING DURING FORMING.
10. EFFECTIVE RADIUS. NO MATERIAL MAY PROTRUDE BEYOND THE THEORETICAL BOUNDARY ESTABLISHED BY THE GIVEN RADIUS.

CERTIFIED PRINT
ENG. STD. E9898 REV. E
Date JUL 1 1991

PART NO	MATERIAL	THICKNESS	FINISH
27713-1	⌀1010 OR ⌀1008 C.R.S.	.038-.041	ZINC PLATING W/YELLOW CHROMATE .0002-.0004 THICK

TEXAS INSTRUMENTS

KLIXON

TITLE: CUP

SIZE B | CODE IDENT NO. 82647 | 27713

THIS DWG. SUPERSEDES 27713 REV. "A" DATED 11-3-80

September 25, 1991

To: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: Material Confirmation
TSL Request # 110632

Sample Description:

P/N 74176-1 Seal Teflon and Kapton

Results:

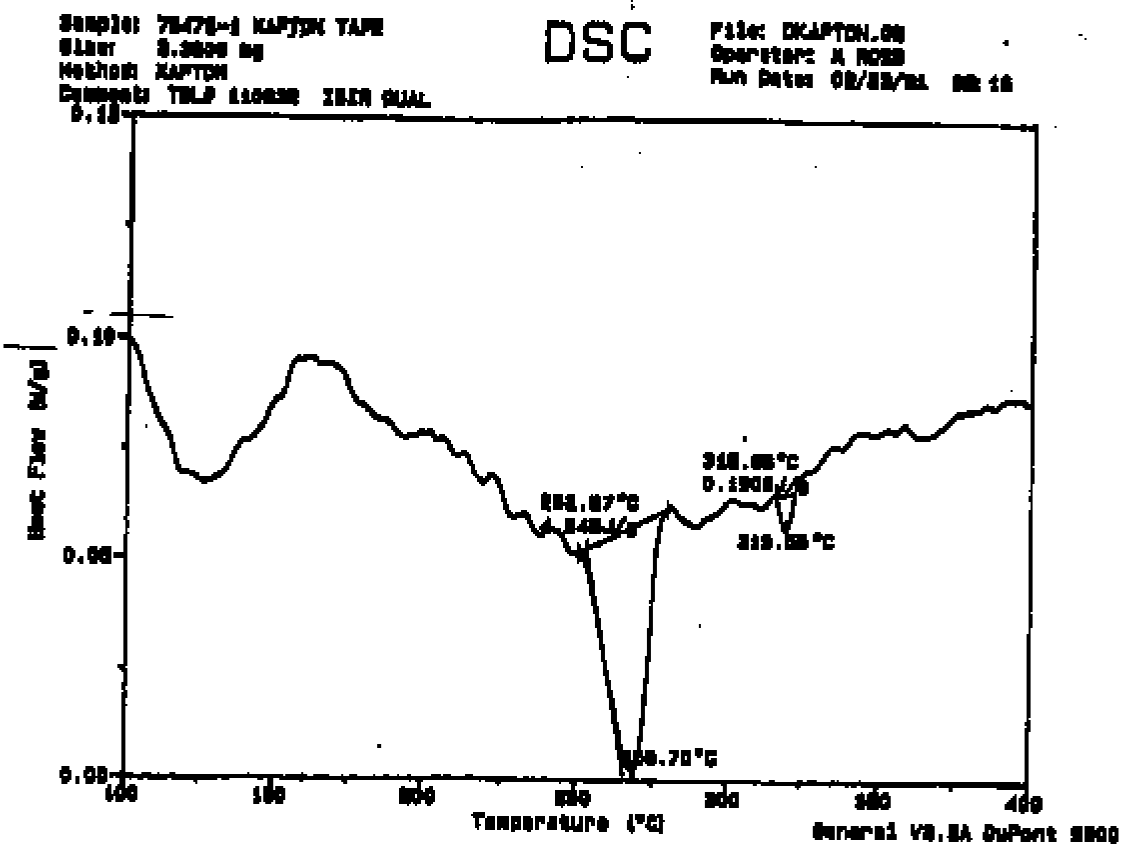
DSC results confirm the presence of Teflon by the characteristic melt point at 316 - 319 degrees C.

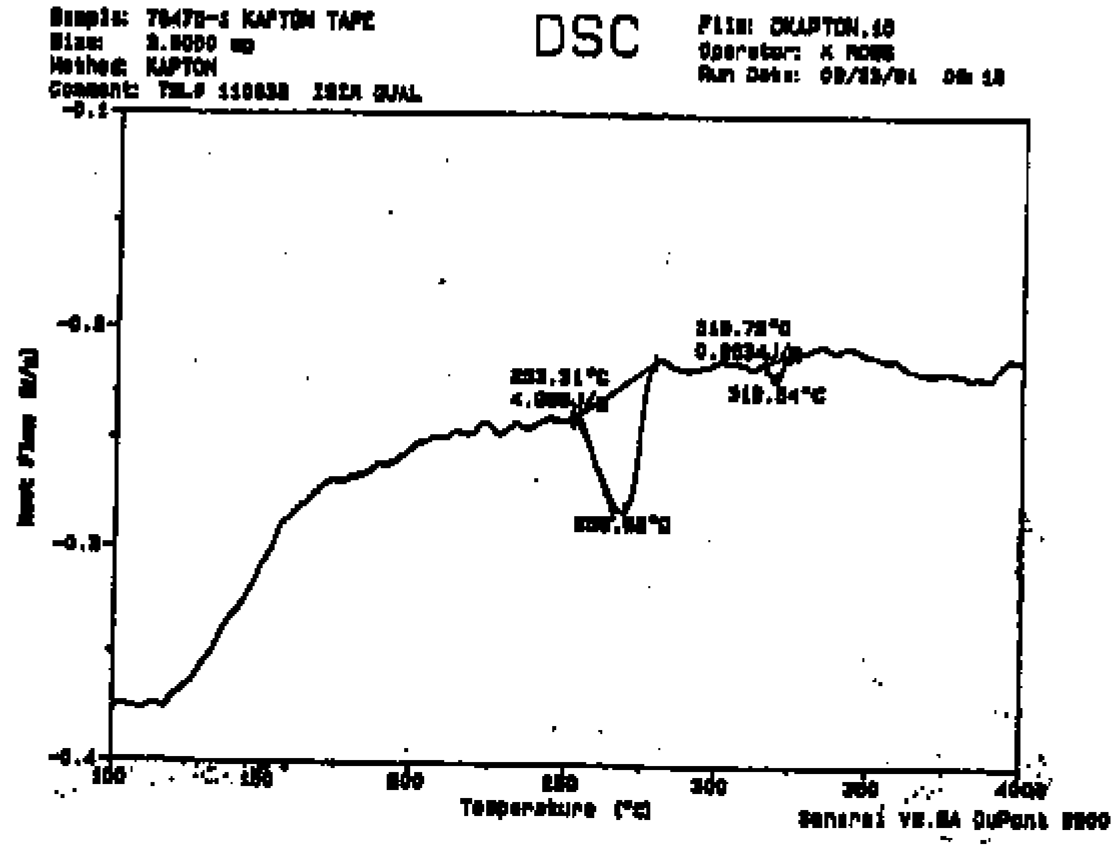
Kapton is confirmed in the seal by the IR scan. It shows the same chacteristic absorbances exhibited by the sample known to be Kapton. See the enclosed scan.

Finally, the Teflon is confirmed to be on the surface of both sides of the seal by EDAX analysis.

Regards,

Beth X3069


Method: KAPTON
DSC
Heat Flow (W/g)
Temperature (°C)


Sample: 78478-1 KAPTON TAPE
Method: KAPTON
DSC
File: DKAPTON.10
Heat Flow (W/g)
Temperature (°C)

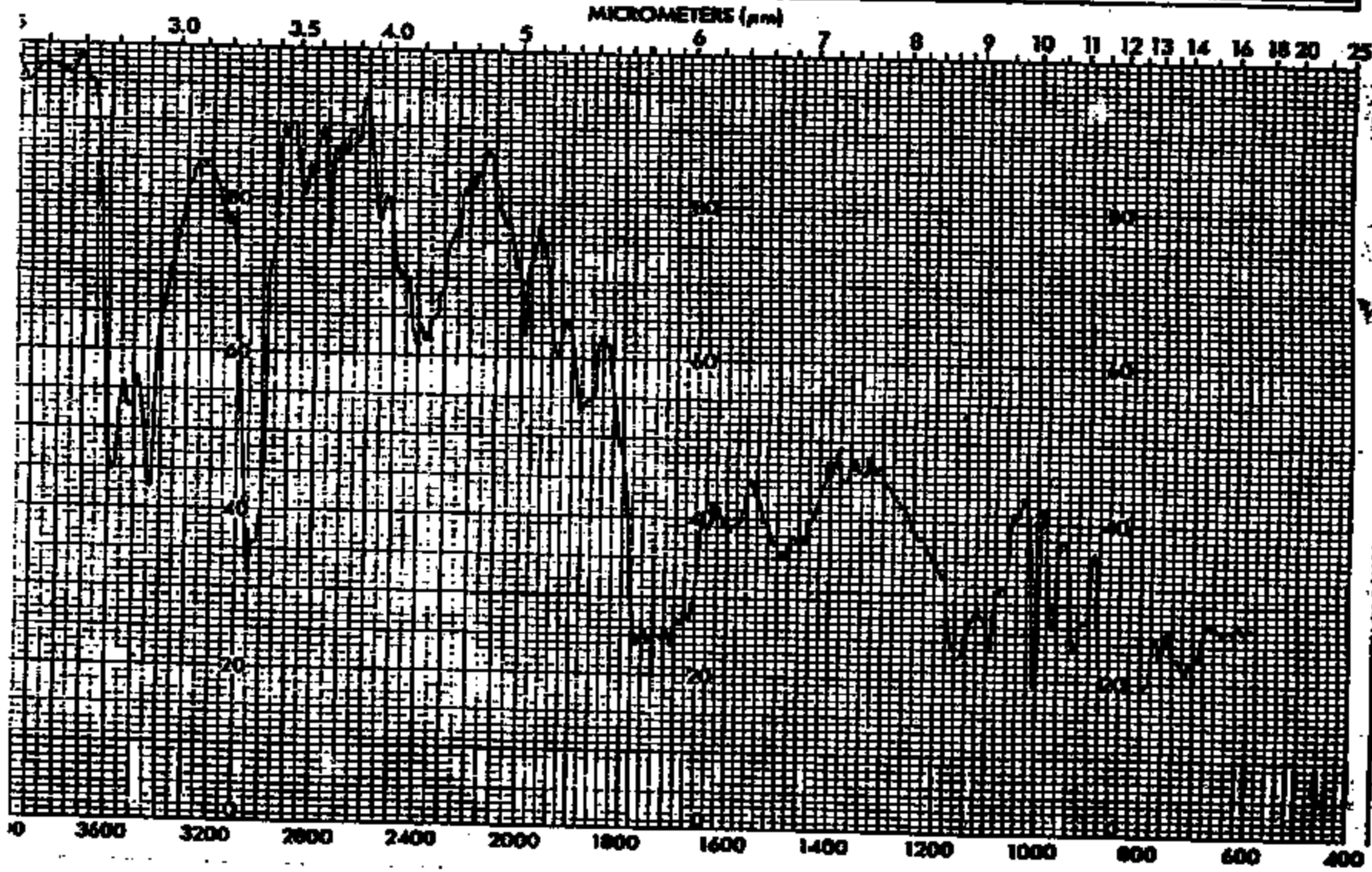
NO. 007-1493

PERKIN-ELMER

CONCENTRATION
THICKNESS
PHASE
REMARKS

SCAN MODE ACCY. ☐ SURVEY ☐
HI ENERGY ☐ CAL. ☐
RESOLUTION ☑
OPERATOR EK DATE 9/23/91

SPECTRUM NO.
SAMPLE 110232
Kapton - Teflon
ORIGIN



SAMPLE

SPECTRUM NO.

TI-NHTSA 003613

NCENTRATION

ICKNESS

ASE

MARKS

SCAN MODE ACCY. ☐ SURVEY ☐

HI ENERGY ☐ CAL ☐

RESOLUTION ☑

OPERATOR JS DATE 3/6/87

SPECTRUM NO.

SAMPLE DUPONT KAPTON 100EN099

ORIGIN

MICROMETERS (μm)

3.0 3.5 4.0 5 6 7 8 9 10 11 12 13 14 16 18 20 25

100 80 60 40 20 0

3600 3400 3200 3000 2800 2600 2400 2200 2000 1800 1600 1400 1200 1000 800 600 400

SAMPLE SPECTRUM NO.

09. 25. 91 10:37 AM

705

TI-NHTSA 003914