EA02-025

TEXAS INSTRUMENTS, INC.'S

9/10/03 ATTACHMENT TO ODI

REQUEST #3

BOX 5

PARTS A - P

PART O

p1

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME
****
* WEIBULL SLOPE : 6.00
* CHARACTERISTIC LIFE : 1133.00

NO.	TIME	RELIABILITY(%)	
1	500	99.2641	③ RED CUP, HL CRIMP

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME
****
* WEIBULL SLOPE : 7.00
* CHARACTERISTIC LIFE : 760.00

NO.	TIME	RELIABILITY(%)	
1	500	94.8053	⑥ MS CUP, AMI CRIMP

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME
****
* WEIBULL SLOPE : 5.70
* CHARACTERISTIC LIFE : 446.00

NO.	TIME	RELIABILITY(%)	
1	500	14.6854	⑦ RED CUP, AMI CRIMP I

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME
****
* WEIBULL SLOPE : 8.70
* CHARACTERISTIC LIFE : 1371.00

NO.	TIME	RELIABILITY(%)	
1	500	97.6343	④ MS CUP, HL CRIMP (VAL)

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME
****
* WEIBULL SLOPE : 6.90
* CHARACTERISTIC LIFE : 1206.00

NO.	TIME	RELIABILITY(%)	
1	500	99.7729	② RED CUP, AMI CRIMP II

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME
****
* WEIBULL SLOPE : ~~3.00~~ 3.50
* CHARACTERISTIC LIFE : ~~1589.00~~ 1469

NO.	TIME	RELIABILITY(%)	
1	500	~~96.7849~~ 97.73	⑤ RED CUP, AMI CRIMP NO BACRIMP

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME
****
* WEIBULL SLOPE : 9.30
* CHARACTERISTIC LIFE : 1005.00

NO.	TIME	RELIABILITY(%)	
1	500	99.8487	① RED CUP, HL CRIMP W/ AMI PRECRIMP

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME
****
* WEIBULL SLOPE : 6.90
* CHARACTERISTIC LIFE : 1208.00

NO.	TIME	RELIABILITY(%)
1	500	99.7729

(NO CHG)
HEAD CUP, MAN CRIMP II

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME
****
* WEIBULL SLOPE : 3.50
* CHARACTERISTIC LIFE : 1469.00

NO.	TIME	RELIABILITY(%)
1	500	97.7258

HEAD CUP, MAN CRIMP W/O FA
(RECORDED PG 1)

CRUISE CONTROL VALVE

INITIAL PROGRAM GOALS

DEVICE PRICE - $1.75 - $1.90
TOOLING - $700 - - $950 -

ORIGINAL PROGRAM GOALS

- USE OF CURRENT PRODUCT IN BASE ASSEMBLY WITH METRI-PACK CONNECTOR
- ADJUSTABLE TO 2 PSI RANGE, TAMPER PROOF
- NORMALLY CLOSED LOGIC
- NO CREEP REQUIREMENT
- NO THREAD CAPTOR CRIMP ON HEADSET
- PROOF PRESSURE 2X PSI
- BURST PRESSURE 5X PSI
- NORMALLY CLOSED LOGIC
- NO PIN GUARDING NECESSARY

CRUISE CONTROL PRESSURE SWITCH

CHANGES/IMPACT OF CHANGES TO PROOF REQUIREMENT

CHANGE	% TOOLING IMPACT	APPROXIMATE % DEVICE IMPACT
PROOF PRESSURE REQUIREMENT MOVED FROM 2K TO 3K PSI		
BURST PRESSURE REQUIREMENT MOVED FROM 5K TO 7K PSI		
• ADDITIONAL PIECE OF TOOLING ADDED TO HANDLE BURST REQUIREMENT	$ 30 K	$ .02
• DISC SEAT HOLD THICKER TO HANDLE BURST REQUIREMENT		$ .06
• DIAPHRAGM HOLD THICKER TO HANDLE BURST REQUIREMENT		$ .06
~~TEMPS END [illegible] OVERALL AGGREGATE ON [illegible] MATERIAL ESTIMATES~~		~~$ .06~~
TOTAL IMPACT -	$ 70	$ .46
OR		
TOTAL IMPACT	$ 370	$ .16

TI-NHTSA 8074

CRUISE CONTROL INJECTOR SWITCH

CHANGES/IMPACT OF CHANGES TO PRODUCTION REQUIREMENTS

CHANGE	X APPROXIMATE % TOOLING COST	% DEVICE COST
USE OF GAGE MISSING WITH METRIC PIN CONNECTOR FOR ELECTRICAL TOOL		
• CUT TO GAGE WITH FULL RADIUS TEST PIN	$50 K	$ .30
OR		
• CUT TO GAGE WITH FLAT TO LEAD TO FULL RADIUS	$250 K	—
• ELIMINATE CONVERTER		($.06)
• CHANGING FROM .065" TO .050" WALL THICKNESS	$10 K	.08
TOLERANCE DEFINED AS +/- 50 PSI	$100 K	
• 2% SURGE REQUIRED (ALSO TIE TO CHANGE GAGE PRESSURE)		

[illegible]

[illegible]

[illegible]

- DEVICE PRICE $2.31 - $2.36
- TOOLING - $370K - $400K

[illegible]

- DEVICE PRICE - $1.91 - $2.06
- TOOLING - $107K - $120K

Original FAI (complete)
on p/c to T.I. print:
scaled down to K-H
print

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

P2VC-9P924-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	19.55	19.56	19.57	19.57	
2	16.56 - 16.76	16.59/16.68	16.62/16.64	16.62/16.63	16.58/16.59	16.54/16.56	16.59/16.79	
3	13.00 - 13.21	12.974	13.081	13.035	13.043	13.078	12.946	
4	11.40 - 11.90	11.788	11.808	11.778	11.778	11.786	11.785	
5	2.84 - 3.05	2.93	2.92	2.92	2.92	2.93	2.93	
	3.1 A	1.869/0.241	1.920/0.020	1.936/0.038	1.868/0.031	1.885/0.115	1.887/0.011	
6	11.50 - 11.92	11.69/11.71	11.67/11.71	11.72/11.66	11.60/11.63	11.63/11.67	11.65/11.65	
7	1.36 - 1.45	1.252	1.250	1.280	1.290	1.290	1.265	
8	1.36 - 1.55	1.402	1.397	1.400	1.389	1.397	1.397	
9	1.85 - 2.06	2.004	1.974	1.994	1.958	1.954	1.956	
10	13.48 - 13.85	13.772	13.693	13.800	13.686	13.666	13.856	
11	312DEG +/- 20	[redacted] 34MIN	290DEG 53MIN	31DEG	290DEG 04MIN	289DEG 03MIN	308DEG 08MIN	
12	2.79 - 3.19 2	[redacted] 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	0.506/0.841	0.480/0.809	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	0.085/0.114	0.048/0.081	0.038/0.813	0.137/0.165	
15	2 19.05 MAX	18.64 18.56	18.57 18.66	18.54 18.56	18.50 18.77	18.63 18.71	18.61 18.67	

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
[redacted] • TELEX [redacted] TWX 710-348-[redacted] • CABLE TEXINS

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
16	57.15 MAX	55.68	55.70	55.71	55.70	55.69	55.68	
17	12.39 - 13.11	12.74/12.86	12.72/12.84	12.77/12.76	12.76/12.77	12.75/12.81	12.73/12.80	
18	11.65 - 12.17	11.66/11.79	11.85/11.64	11.73/11.79	11.86/11.84	11.75/11.86	11.73/11.88	
19	14.23 MAX	13.66	13.65	13.67	13.65	13.69	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	9.12 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	1.92 - 2.04	2.040	1.732	1.783	1.727	1.781	1.796	
23	7.82-8.03	7.98/7.50	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	
244	24DEG+-220 4X	29DEG SAMIN	30DEG SAMIN	MEASURED	ON A CROSS	SECTIONED	PART	
		30DEG SYMIN	30DEG AMIN					
25	1.80+1.21R 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	7.25-7.75	[redacted]	7.92	7.85	7.84	7.88	7.88	
28A	NO FLASH OR	[redacted]	OK	FLASH	OK	OK	FLASH	
	BURRS ALLOWED							
	ON SURFACE							
27	3.79-3.41	3.145	3.098	3.160	3.150	3.119	3.107	
28	0.68-1.30	1.115	1.168	1.179	1.148	1.161	1.153	

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
28A	STAMP DATE CODE & PARTS	INVERTED IN CODING	DELTA OPERATION.	OMITTED.	HAS SINCE	BEEN	INCLUDED	
29	0.25MIN X 40 +/- KNURL CHAMFER	N/A THREADS	HAVE BEEN	ADDED				
30	5/8-24UNF-2A	OK	OK	OK	OK	OK	OK	
31	1.10-1.40	1.316	MEASURED	ON A CROSS	SECTIONED	PART		
32	↗ 0.16 Ø	0.051	0.048	0.048	0.009	0.030	0.056	
33	1.5 ⌀	OK	MEASURED	ON A CROSS	SECTIONED	PART		
34	41DEG - 43DEG	41DEG 21MIN	MEASURED	ON A CROSS	SECTIONED	PART		
35	40-5/8DEG CHAMF	N/A THREADS	HAVE BEEN	ADDED				
36	32.61 MAX	31.64 31.62	31.46 31.48	31.45 31.46	31.51 31.47	31.46 31.48	31.55 31.52	
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	Ø 3.30-3.60	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	[redacted] 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	[redacted] 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 +/- 2DEG 2X	72DEG 30MIN 72DEG 30MIN	72DEG 11MIN 72DEG 14MIN	72DEG 12MIN 72DEG 20MIN	72DEG 24MIN 72DEG 37MIN	71DEG 56MIN 72DEG 1MIN	72DEG 10MIN 72DEG 36MIN	

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	1.42-1.68 2X	1.62-1.62	1.63-1.63	1.59-1.63	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	0.56-0.57	0.57-0.59	
		0.57-0.59	0.59-0.55	0.56-0.57	0.59-0.56	0.56-0.55	0.55-0.56	
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	2.18-2.21	2.19-2.22	2.30-2.19	2.20-2.16	2.14-2.15	2.23-2.16	#1 OUT OF SPEC
46	250EG+/-2 2X	240EG 36MIN	240EG 41MIN	239EG 14MIN	239EG 35MIN	239EG 19MIN	239EG 34MIN	
		239EG 06MIN	239EG 45MIN	240EG 31MIN	239EG 53MIN	239EG 55MIN	240EG 24MIN	
47	HOUSING BROWN	BROWN	BROWN	BROWN	BROWN	BROWN	BROWN	
48	45DEG+/-1 4X	44DEG 56MIN	44DEG 47MIN	46DEG 04MIN	45DEG 06MIN	45DEG 57MIN	43DEG	
		45DEG 49MIN	45DEG 15MIN	43DEG 10MIN	45DEG 04MIN	44DEG 11MIN	44DEG 09MIN	
		44DEG 49MIN	45DEG 46MIN	46DEG 46MIN	45DEG 16MIN	44DEG 17MIN	44DEG 13MIN	
		45DEG 12MIN	45DEG 13MIN	45DEG 39MIN	44DEG 43MIN	45DEG 54MIN	44DEG 54MIN	
49	0.86-1.17 4X	0.96-0.98	0.98-1.03	0.97-1.02	0.96-1.02	0.96-1.03	0.99-1.06	
		0.96-0.93	0.96-0.97	0.96-1.00	0.99-1.00	0.97-0.97	0.95-0.96	
50	0.35-0.66 4X	0.58-0.54	0.45-0.44	0.44-0.48	0.46-0.50	0.45-0.54	0.51-0.49	
		0.48-0.51	0.49-0.52	0.54-0.53	0.53-0.52	0.53-0.54	0.51-0.44	

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
[illegible] • TELEX [illegible] TWX 710-[illegible] • CABLE TEXINS

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
#1	2.65-2.80 2X	2.725	2.710	2.703	2.713	2.710	2.736	
	1.2 m A B C	2.399	2.499	2.578	2.492	2.457	2.515	
	0	0.072	0.034	0.113	0.017	0.008	0.050	
	2.65-2.80 2X	2.695	2.703	2.715	2.703	2.695	2.711	
	1.2 m A B C	2.499	2.522	2.380	2.377	2.427	2.445	
	0	0.034	0.057	0.085	0.098	0.035	0.022	
#2	15-17DEG 2X	17DEG 03MIN	MEASURED	ON A CROSS	SECTIONED	PART		
		19DEG 45MIN	MEASURED	ON A CROSS	SECTIONED	PART		OUT OF SPEC +45MIN
#3	1.45-1.57	0.795	MEASURED	ON A CROSS	SECTIONED	PART		
#4	1.10-0.31	0.262	MEASURED	ON A CROSS	SECTIONED	PART		
#5	1.51-1.65	0.632	MEASURED	ON A CROSS	SECTIONED	PART		

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
508-699-3800 • TELEX 95-7709 TWX 710-348-0699 • CABLE TEXINS

GAGE STUDY FOR REPEATABILITY AND REPRODUCIBILITY (LONG METHOD

-Oct-85

DIAL INDICATOR

GAGE # 16070

TAPS

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

DATA SUMMARY

OPERATOR	AVERAGE	RANGE
1	0.470705	0.00019
2	0.470625	0.00063
3	NA	NA
4	NA	NA
5	NA	NA
6	NA	NA
7	NA	NA
8	NA	NA
9	NA	NA
10	NA	NA
AVERAGE	0.470665	0.00041

MIN XBAR	0.470625
MAX XBAR	0.470705
XBARDIFF	0.00008

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

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

(ER STUDY TITLES IN CELLS A8.A9.A10. MIN/MAX SPEC IN B12. B13
DIAL INDICATOR
GAGE # 16070

MIN SPEC 0.459
MAX SPEC 0.479
TOLERANCE 0.02

DATA FOR OPERATOR 1

PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	0.4693	0.4694				0.46935	0.0001
2	0.4697	0.4696				0.46965	0.0001
3	0.471	0.4715				0.47125	0.0005
4	0.4718	0.4718				0.4718	0
5	0.472	0.472				0.472	0
6	0.4715	0.4716				0.47155	0.0001
7	0.4707	0.471				0.47085	0.0003
8	0.4694	0.4693				0.46935	0.0001
9	0.4718	0.4713				0.47155	0.0005
10	0.4696	0.4698				0.4697	0.0002
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

GRND AVG=0.470705 AVG RNGS 0.00019
UCL FOR INDIVIDUAL RANGES 0.001339

TA FOR OPERATOR 2

PART	TRIAL 1	2	3	4	5	AVG	RANGE
1	0.4695	0.4696				0.46955	0.0001
2	0.4693	0.4698				0.46955	0.0005
3	0.4716	0.4709				0.47135	0.0009
4	0.4719	0.4706				0.47125	0.0013
5	0.4715	0.4718				0.47165	0.0003
6	0.4715	0.4717				0.4716	0.0002
7	0.471	0.4715				0.47125	0.0005
8	0.4705	0.4716				0.47105	0.0011
9	0.4694	0.4702				0.4699	0.0008
10	0.4689	0.4695				0.4692	0.0006
11						NA	0
12						NA	0
13						NA	0
14						NA	0
15						NA	0
16						NA	0
17						NA	0
18						NA	0
19						NA	0
20						NA	0
21						NA	0
22						NA	0
23						NA	0
24						NA	0
25						NA	0

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

Ford Initial Sample Report – Dimensional

No. 112389

Page ____ of ____

TO BE COMPLETED BY SUPPLIER

SUPPLIER	LOCATION	CODE	PART NUMBER
Texas Instruments	Attleboro, Ma.	T099K	F2AC-9F924-AA

BUYER	CODE	FORD CONSUMER DIV.	NO. OF SAMPLES	PRODUCT SAFETY CRITICAL CHARACTERISTIC CONTROL ITEM (▽)
				YES ☐ NO ☒

REASON FOR SAMPLES

NEW PART ☐ CHANGED PART ☐ NEW LOCATION ☐ NEW TOOLS ☐ MULTIPLE CAVITY DIES ☐

PART NAME: NEXT GENERATION SPEED CONTROL Deactivation Safety Switch

SUP. DATE	ENGR. YEAR AND MODEL LINE

☐ PRODUCTION PROCESS | ADVANCED DESIGN NO.

SAMPLE MADE ON PRODUCTION SET-UP AND TOOLS	ADDITIONAL HAND OR TOOL WORK PERFORMED	WE HEREBY CERTIFY THE INSPECTION RESULTS ON THIS FORM ARE CORRECT AND THAT OUR SUPPLY MEETS FORD MOTOR COMPANY REQUIREMENTS
YES ☐ NO ☐	YES ☐ NO ☐	

SAMPLE MADE TO SUP. DATED	DATE INSPECTED	SIGNATURE OF RESPONSIBLE OFFICIAL	TITLE	DATE

CHARACTERISTIC DESIGNATION OR SPECIFICATION	CLASS ▽		SUPPLIER INSPECTION RESULTS	CONSUMER VERIFICATION OF INSPECTION RESULTS	PROCESS CAPABILITY STUDY REQUIRED	PROCESS CAPABILITY STUDY COMPLETED
Partial			FAI Results	Recorded on		
				T.I. Format		

TO BE COMPLETED BY CONSUMER

DISPOSITION	SERIAL NO.	APPROVED	REJECTED	NOT INSP'D.	INSPECTION AND TESTING INSTRUCTIONS APPROVED	SPECIAL GAGES APPROVED	
DIMENSIONAL INP DATED	XXXX				YES ☐ NO ☐	YES ☐ NO ☐	NOT REQ'D ☐
MATERIAL TEST SPEC DATED					INITIAL SAMPLE APPROVAL MUST BE COMPLETED BY APPROVAL OF FIRST PRODUCTION SHIPMENT YES ☐ NO ☐	CONTROL PLAN APPROVED YES ☐ NO ☐	NOT REQ'D ☐
					APPROVED BY STYLING YES ☐ NO ☐ NOT REQ'D ☐	APPROVED BY YES ☐ NO ☐	NOT REQ'D ☐
					DIVISION	AUTHORIZED SIGNATURE	DATE

Ford Form 292a

*DESIGNATED CHARACTERISTIC CLASS
▽ – CONTROL ITEM

COPY 1

TI-NHTSA 8086

INITIAL SAMPLE WARRANT

No. 112389

PART INFORMATION

Part Name NEXT Generation Speed Control Deactivation Safety Switch Part Number F2AC-9F924-AB

Control Item ☐ Yes ☐ No Engineering Change Level _____ Date _____

Engineering Change Authorization Bruce Mossoff Date _____

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

Reason for Initial Sample:

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

SUPPLIER INFORMATION (Manufacturing Location)

Supplier Name Texas Instruments Street Address 34 Forest ST.

City Attleboro State MA Postal Code 02703 Country USA

Supplier Mfg. Location Code – DUNS 7077K/7325814 Customer Assigned _____

CUSTOMER INFORMATION

Customer Name Ford Motor Co NAAO Buyer Fred Hemkestat Buyer Code 165

Purchase Order Number _____ Sample Acceptance Level _____

Application NEXT Generation Speed Control Deactivation Safety Switch

RESULTS

The results for dimensional measurements ☐, material tests ☐, and functional (EE) 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 (EE) Test Results Partial
- ☐ Product Engineering Approval
- ☒ Control Plan
- ☒ Process Capability Results
- ☒ Process Flow Diagram
- ☒ Gage (Measurement) Studies

Supporting data for all requirements are available upon request.

COMMENTS:

Partial ES42 to expedite use of "Quiet" switch; Full Submiss. to be complete by 4/22/96. Bruce Mossoff writes TI on 4/13, Wi: to review proper in status.

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 _____ Date _____

Print Name _____ Title _____ Phone No. _____

APPROVAL (when required by customer procedure) ☐ Approved ☐ Rejected

Signature _____ Date _____

Supply 2020

TI-NHTSA 0057

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

ENVELOPE DIMENSIONS TO BASE ONLY

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
1	11.40 - 11.90	11.806	11.817	[illegible]	11.794
2	12.80 - 13.21	13.049	13.043	13.072	13.094
3	16.56 - 16.76	16.638	16.652	16.671	16.673
		16.661	----	16.680	16.668
4	19.45 - 19.81	19.752	19.754	19.787	19.799
5	2.80 - 3.05	2.930	2.93	2.944	2.951
	0.1 B A	1.897 0.003	1.923 0.023	1.945 0.045	1.885 0.015
6	31DEG +/- 2DEG	29DEG 29MIN	29DEG 38MIN	29DEG 58MIN	29DEG 34MIN
7	1.85 - 2.06	1.927	1.966	1.969	1.978
8	1.24 - 1.55	1.365	1.387	1.423	1.400
9	1.24 - 1.45	1.269	1.268	1.275	1.308
10	11.80 - 11.92	11.768	11.768	11.753	11.777
		11.729	11.740	11.789	11.747
11	13.43 - 13.85	13.010	13.769	13.786	13.647
12	0.25 - 0.75	0.490 0.475	0.519 0.523	0.573 0.635	0.618 0.598
13	2.79 - 3.10	2.900	2.909	2.912	2.908
	2 PL	2.903	2.915	2.918	2.911

TI-NHTSA 8088

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
[illegible]

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
14	0.05 - 0.26	0.151	0.153	0.104	0.076
	2 PL	0.113	0.142	0.163	0.147
15	19.05 MAX	18.667	18.709	18.671	18.704
		18.701	18.748	18.565	18.757
16	12.59 - 13.11	12.800	12.829	12.802	12.819
		12.829	12.800	12.842	12.824
17	0.68 - 1.30	1.085	1.105	1.122	1.175
18	2.79 - 3.41	3.076	3.0612	3.152	3.109
19	7.23 - 7.75	7.579	7.501	7.514	7.545
20	6.60 - 6.81	6.701	6.673	6.715	6.677
21	29DEG +/- 2DEG	MEASURED	29DEG 24MIN	ON CROSS	SECTIONED
	4 x	PART	30DEG 06MIN	----	----
		----	29DEG 54MIN	----	----
		----	29DEG 47MIN	----	----
22	NO FLASH/BURRS	SLIGHT	FLASH ON	EDGES	@ 10X
23	1.80-2.21 2X	1.651	1.651	1.651	1.651
		1.651	1.779	1.651	1.651

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
23	8.30-8.72 2X	8.535	8.553	8.484	8.578
		8.726	8.512	8.520	8.519
24	2.15-2.42 2X	2.162	2.171	2.282	2.271
		2.212	2.296	2.237	----
25	25DEG +/- 2DEG	24DEG 25MIN	24DEG 56MIN	24DEG 47MIN	24DEG 06MIN
	2 X	24DEG 10MIN	24DEG 14MIN	24DEG 06MIN	24DEG 43MIN
26	45DEG +/- 2DEG	46DEG 10MIN	42DEG 44MIN	43DEG 44MIN	45DEG 03MIN
	4PL	44DEG 35MIN	43DEG 47MIN	44DEG 47MIN	45DEG 01MIN
		45DEG 22MIN	44DEG 47MIN	45DEG 49MIN	46DEG 11MIN
		44DEG 08MIN	45DEG 37MIN	46DEG 38MIN	43DEG 50MIN
27	(71.50EG) 2X	72DEG --	71DEG 31MIN	71DEG 20MIN	72DEG 01MIN
		71DEG 07MIN	72DEG --	72DEG 10MIN	71DEG 12MIN
28	1.48-1.63 2X	1.538	1.536	1.582	1.603
		1.539	1.512	1.602	1.596
29	0.45-0.65 4X	0.546 0.547	0.570 0.590	0.596 0.580	0.561 0.556
		0.592 0.614	0.561 0.578	0.576 0.603	0.558 0.575
30	0.35-0.55 4X	0.501 0.471	0.467 0.502	0.459 0.570	0.477 0.449
		0.378 0.417	0.420 0.444	0.357 0.382	0.398 0.398
		0.499 0.506	0.494 0.539	0.436 0.492	0.486 0.518
		0.382 0.395	0.450 0.486	0.384 0.393	0.372 0.409

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	[illegible] SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
31	0.86 - 1.17	1.023	1.012	1.026	1.021
	4 X	0.985	0.998	0.988	1.041
		1.023	0.992	1.026	1.014
		0.976	0.978	0.991	0.984
32	TERM.HOUSING	BLACK ONLY	AVAILABLE	TO QUALIFY	MOLD
	NATURAL:				

TI-NHTSA 8091

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

ENVELOPE DIMENSIONS TO BASE ONLY

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
1	11.40 - 11.90	11.806	11.817	[redacted]	11.794
2	12.80 - 13.21	13.043	13.043	[redacted]	13.094
3	16.56 - 16.76	16.638	16.652	16.671	16.673
		16.661	----	16.680	16.668
4	19.45 - 19.81	19.752	19.754	19.787	19.799
5	2.80 - 3.05	2.930	2.93	2.944	2.951
	0.1 @ A	1.897 0.003	1.923 0.023	1.945 0.045	1.885 0.015
6	31DEG +/- 2DEG	29DEG 29MIN	29DEG 38MIN	29DEG 58MIN	29DEG 34MIN
7	1.85 - 2.06	1.927	1.966	1.969	1.978
8	1.24 - 1.55	1.365	1.387	1.423	1.400
9	1.24 - 1.45	1.269	1.268	1.275	1.308
10	11.60 - 11.92	11.768	11.768	11.753	11.777
		11.729	11.740	11.789	11.747
11	13.48 - 13.85	13.010	13.769	13.786	13.647
12	0.25 - 0.75	0.490 0.475	0.519 0.523	0.573 0.635	0.618 0.593
13	2.79 - 3.10	2.900	2.909	2.912	2.908
	> PL	2.903	2.915	2.913	2.911

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
14	0.05 - 0.26	0.151	0.153	[illegible]	0.076
	2 PL	0.113	0.142	[illegible]	0.147
15	19.05 MAX	18.667	18.709	[illegible]	18.704
		18.701	18.748	18.545	18.757
16	12.59 - 13.11	12.800	12.829	12.802	12.819
		12.829	12.800	12.842	12.824
17	0.68 - 1.30	1.085	1.105	1.122	1.175
18	2.79 - 3.41	3.076	3.0612	3.152	3.109
19	7.23 - 7.75	7.579	7.501	7.514	7.545
20	6.60 - 6.81	6.701	6.673	6.715	6.677
21	29DEG +/- 2DEG	MEASURED	29DEG 24MIN	ON CROSS	SECTIONED
	4 X	PART	30DEG 06MIN	----	----
		----	29DEG 58MIN	----	----
		----	29DEG 47MIN	----	----
22	NO FLASH/BURRS	SLIGHT	FLASH ON	EDGES	@ 10X
22A	1.80-2.21R 2X	1.651	1.651	1.651	1.651
		1.651	1.778	1.651	1.651

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
23	8.30-8.72 2X	8.535	8.553	8.494	8.578
		8.726	8.512	[illegible]	8.519
24	2.15-2.42 2X	2.162	2.171	[illegible]	2.271
		2.212	2.236	[illegible]	
25	25DEG +/- 2DEG	24DEG 25MIN	24DEG 56MIN	24DEG 47MIN	24DEG 06MIN
	2 X	24DEG 10MIN	24DEG 14MIN	24DEG 06MIN	24DEG 43MIN
26	45DEG +/- 2DEG	46DEG 10MIN	42DEG 44MIN	43DEG 44MIN	45DEG 03MIN
	4PL	44DEG 35MIN	43DEG 47MIN	44DEG 47MIN	45DEG 01MIN
		45DEG 22MIN	44DEG 47MIN	45DEG 49MIN	46DEG 11MIN
		44DEG 08MIN	45DEG 37MIN	46DEG 38MIN	43DEG 50MIN
27	(71.5DEG) 2X	72DEG --	71DEG 31MIN	71DEG 20MIN	72DEG 01MIN
		71DEG 07MIN	72DEG --	72DEG 10MIN	71DEG 12MIN
28	1.42-1.63 2X	1.538	1.538	1.582	1.603
		1.539	1.612	1.602	1.596
29	0.35-0.66 4X	0.546 0.547	0.570 0.590	0.598 0.580	0.581 0.556
		0.592 0.614	0.561 0.574	0.576 0.603	0.559 0.575
30	0.35-0.66 4X	0.501 0.471	0.467 0.502	0.459 0.520	0.477 0.443
		0.378 0.417	0.329 0.344	0.357 0.382	0.338 0.398
		0.499 0.506	0.494 0.539	0.436 0.482	0.486 0.516
		0.382 0.395	0.450 0.464	0.384 0.393	0.373 0.409

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
31	0.96 - 1.17	1.023	1.012	1.026	1.021
	A X	0.985	0.998	0.988	1.041
		1.023	0.992	1.028	1.014
		0.976	0.978	0.991	0.984
32	TERM.HOUSING	BLACK ONLY	AVAILABLE	TO QUALIFY	MOLD
	BROWN:				

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

ENVELOPE DIMENSIONS TO BASE ONLY

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
1	11.40 - 11.90	11.806	11.817	11.817	11.794
2	12.80 - 13.21	13.043	13.043	13.072	13.094
3	16.56 - 16.76	16.638	16.652	16.671	16.673
		16.661	----	16.680	16.668
4	19.45 - 19.81	19.752	19.754	19.787	19.799
5	2.80 - 3.05	2.930	2.93	2.944	2.951
	0.1 @ A	1.897 0.003	1.923 0.023	1.945 0.045	1.885 0.015
6	31DEG +/- 2DEG	29DEG 29MIN	29DEG 38MIN	29DEG 58MIN	29DEG 34MIN
7	1.85 - 2.06	1.927	1.966	1.969	1.978
8	1.24 - 1.55	1.365	1.387	1.423	1.400
9	1.24 - 1.45	1.269	1.268	1.275	1.308
10	11.60 - 11.92	11.768	11.766	11.753	11.777
		11.729	11.740	11.749	11.747
11	13.43 - 13.85	13.010	13.769	13.786	13.647
12	0.25 - 0.75	0.490 0.475	0.519 0.523	0.573 0.635	0.619 0.599
13	2.75 - 3.10	2.900	2.909	2.912	2.903
	2 PL	2.903	2.915	2.913	2.911

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
14	0.05 - 0.26	0.151	0.153	0.124	0.076
	2 PL	0.113	0.142	[illegible]	0.147
15	19.05 MAX	18.667	18.709	18.671	18.704
		18.701	18.748	18.565	18.737
16	12.59 - 13.11	12.800	12.929	12.902	12.819
		12.829	12.900	12.842	12.824
17	0.68 - 1.30	1.085	1.105	1.122	1.175
18	2.79 - 3.41	3.076	3.0612	3.152	3.109
19	7.23 - 7.75	7.579	7.501	7.514	7.545
20	6.60 - 6.81	6.701	6.673	6.715	6.677
21	29DEG +/- 2DEG	MEASURED	29DEG 24MIN	ON CROSS	SECTIONED
	4 X	PART	30DEG 06MIN	----	----
		----	29DEG 58MIN	----	----
		----	29DEG 47MIN	----	----
22	NO FLASH/BURRS	SLIGHT	FLASH ON	EDGES	@ LOX
23A	1.80-2.21R 2X	1.651	1.651	1.651	1.651
		1.651	1.779	1.651	1.651

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
23	8.30-8.72 2X	8.535	8.553	8.484	8.578
		8.726	8.512	8.570	8.519
24	2.15-2.42 2X	2.162	2.171	2.282	2.271
		2.212	2.236	2.237	----
25	25DEG +/- 2DEG	24DEG 25MIN	24DEG 56MIN	24DEG 47MIN	24DEG 06MIN
	2 X	24DEG 10MIN	24DEG 14MIN	24DEG 06MIN	24DEG 43MIN
26	45DEG +/- 2DEG	46DEG 10MIN	42DEG 44MIN	43DEG 44MIN	45DEG 03MIN
	4PL	44DEG 35MIN	43DEG 47MIN	44DEG 47MIN	45DEG 01MIN
		45DEG 22MIN	44DEG 47MIN	45DEG 49MIN	46DEG 11MIN
		44DEG 08MIN	45DEG 37MIN	46DEG 38MIN	43DEG 50MIN
27	(71.5DEG) 2X	72DEG --	71DEG 31MIN	71DEG 20MIN	72DEG 01MIN
		71DEG 07MIN	72DEG --	72DEG 10MIN	71DEG 12MIN
28	1.42-1.63 2X	1.538	1.538	1.582	1.603
		1.539	1.612	1.602	1.596
29	0.35-0.xx 4X	0.546 0.547	0.570 0.550	0.593 0.580	0.53x 0.556
		0.592 0.614	0.5e1 0.574	0.576 0.605	0.558 0.575
30	0.38-0.xx 4X	0.50x 0.471	0.407 0.502	0.459 0.520	0.477 0.443
		0.378 0.417	0.3x0 0.344	0.357 0.362	0.338 0.349
		0.493 0.506	0.494 0.5x9	0.43x 0.421	0.486 0.518
		0.382 0.395	0.450 0.484	0.364 0.343	0.373 0.409

DIMENSIONAL ANALYSIS ON PART NUMBER

F2AC-9F924-AA

	BLUEPRINT SPEC	CAVITY # A ACTUAL	CAVITY # B ACTUAL	CAVITY # C ACTUAL	CAVITY # D ACTUAL
31	0.86 - 1.17	1.023	1.012	1.026	1.021
	4 X	0.985	0.998	0.988	1.041
		1.023	0.992	1.026	1.014
		0.976	0.978	0.991	0.984
32	TERM.HOUSING	BLACK ONLY	AVAILABLE	TO QUALIFY	MOLD
	BROWN				

P/C L21

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4B ACTUAL	CAVITY # 5B ACTUAL	CAVITY # 6B ACTUAL	COMMENTS
1	19.45 - 19.81	19.55	19.61	19.59	19.56	19.[illegible]	[illegible]	
2	16.56 - 16.76	16.59/16.58	16.62/16.64	16.62/16.63	16.58/16.59	16.56/16.56	16.59/16.59	
3	13.50 - 13.21	12.974	13.051	13.035	13.043	13.078	12.946	
4	11.40 - 11.90	11.798	11.808	11.775	11.773	11.758	11.785	
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	1.933/0.035	1.869/0.031	1.885/0.015	1.887/0.013	
6	11.60 - 11.92	11.69/11.71	11.67/11.71	11.72/11.69	11.60/11.69	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	1.978	1.996	1.984	1.994	1.986	
10	13.43 - 13.65	13.772	13.693	13.600	13.686	13.686	13.556	
11	31DEG +/- 2DEG	30DEG 34MIN	29DEG 53MIN	31DEG	29DEG 04MIN	29DEG 03MIN	30DEG 08MIN	
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	0.480/0.300	0.442/0.672	0.498/0.671	0.490/0.744	0.460/0.757	OUT OF SPEC.
14	0.05 - 0.26 2X	0.051/0.069	0.074/0.127	0.140/0.076	0.127/0.135	0.158/0.163	0.071/0.036	
		0.140/0.147	0.092/0.089	0.096/0.114	0.048/0.081	0.036/0.013	0.137/0.165	
15	0 19.05 MAX	18.64 18.56	18.57 18.66	18.54 18.66	18.60 18.77	18.63 19.71	18.61 18.67	

TI-NHTSA 8100

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 # 6A ACTUAL	COMMENTS
16	57.15 MAX	55.65	55.70	55.71	55.70	55.69	[illegible]	
17	12.59 - 13.11	12.74/12.86	12.72/12.84	12.77/12.76	12.76/12.77	12.76/12.81	[illegible]	
18	11.65 - 12.17	11.68/11.79	11.85/11.64	11.73/11.79	11.88/11.84	11.80/11.86	11.78/11.88	
19	14.28 MAX	13.66	13.65	13.67	13.65	13.65	13.66	
20	9.39 - 9.66	9.59/9.62	9.61/9.66	9.57/9.64	9.60/9.62	9.58/9.74	9.55/9.67	OUT OF SPEC.
21	8.12 MIN	8.98/9.29	9.13/9.56	9.12/9.10	8.98/9.56	9.14/9.22	9.11/9.14	
22	1.52 - 2.04	2.040	1.732	1.783	1.727	1.781	1.796	
23	Ø 7.82-8.03	7.94/7.50	7.98	7.97/7.99	7.97	7.98	7.96	
24	6.60 - 6.81	6.640	6.698	6.693	6.647	6.665	6.642	
24A	29DEG+/-2DEG 43	29DEG 54MIN	29DEG 24MIN	MEASURED	ON A CROSS	SECTIONED	PART	
		30DEG 57MIN	28DEG 46MIN					
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	3.79-3.41	3.145	3.095	3.160	3.150	3.119	3.107	
28	1.09-1.30	1.115	1.163	1.179	1.148	1.161	1.153	

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
28A	STAMP DATE	INVERTED	DELTA	OMITTED.	HAS SINCE	BEEN	INCLUDED	
	CODE & PARTS	IN CODING	OPERATION.					
29	0.25MIN x 40 -	N/A THREADS	HAVE BEEN	ADDED				
	500EG CHAMFER							
30	3/8-24UNF-2A	OK	OK	OK	OK	OK	OK	
31	1.36-1.40	1.316	MEASURED	ON A CROSS	SECTIONED	PART		
32	0.16 D	0.051	0.048	0.048	0.000	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	40-50EG CHAMF	N/A THREADS	HAVE BEEN	ADDED				
36	32.5 MAX	31.44 31.42	31.46 31.48	31.45 31.46	31.50 31.47	31.46 31.48	31.50 31.50	
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	3.30-3.60	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 7.36	7.35 7.32	7.33 7.33	7.31 7.37	7.32 7.30	7.37 7.37	
40	5.58-5.25	5.61 5.60	5.72-5.66	5.64-5.66	5.67-5.70	5.60-5.66	5.61-5.63	
41	71.5EG +/-	72DEG 30MIN	72DEG 11MIN	72DEG 12MIN	72DEG 26MIN	71DEG 56MIN	72DEG 10MIN	
	2DEG I	72DEG 30MIN	72DEG 14MIN	72DEG 50MIN	72DEG 37MIN	72DEG 11MIN	72DEG 36MIN	

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
42	1.42-1.61	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	[illegible]	
			0.57-0.59	0.59-0.55	0.58-0.57	0.59-0.56	0.56-[illegible]	[illegible]	
44	8.30-8.72	2X	8.43-8.46	8.51-8.44	8.81-8.44	8.42-8.42	8.39-[illegible]	[illegible]	
45	2.15-2.42	2X	2.13-2.21	2.19-2.22	2.30-2.15	2.20-2.16	2.16-2.18	2.29-2.15	#1 OUT OF SPEC
46	250EG+/-2	2X	240EG 36MIN	240EG 41MIN	238EG 14MIN	238EG 35MIN	238EG 09MIN	238EG 34MIN	
			238EG 04MIN	238EG 45MIN	240EG 38MIN	238EG 58MIN	238EG 59MIN	240EG 24MIN	
47	HOUSING	BROWN	BROWN	BROWN	BROWN	BROWN	BROWN	BROWN	
48	450EG+/-2	4X	446EG 36MIN	446EG 47MIN	446EG 09MIN	448EG 08MIN	450EG 37MIN	430EG	
			450EG 44MIN	450EG 15MIN	438EG 20MIN	450EG 04MIN	440EG 11MIN	446EG 09MIN	
			444EG 42MIN	450EG 44MIN	446EG 44MIN	450EG 16MIN	444EG 07MIN	448EG 01MIN	
			450EG 12MIN	450EG 23MIN	450EG 39MIN	444EG 48MIN	450EG 34MIN	444EG 34MIN	
49	0.86-1.17	4X	0.96-0.95	0.99-1.03	0.97-1.02	0.98-1.02	0.99-1.03	0.99-1.03	
			0.95-0.96	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	0.54-0.56	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	

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB

	BLUEPRINT SPEC	CAVITY # 1D ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
51	2.59-2.80 2X	2.725	2.710	2.709	2.713	2.710	2.733	
	0.2 @ A C	2.393	2.499	2.578	2.482	[illegible]	[illegible]	
	D	0.072	0.034	0.113	0.017	[illegible]	[illegible]	
	2.59-2.80 2X	2.695	2.703	2.715	2.703	[illegible]	[illegible]	
	0.2 @ A C	2.499	2.522	2.380	2.377	2.427	2.443	
	D	0.034	0.057	0.065	0.088	0.039	0.022	
52	13-19DEG 2X	17DEG 23MIN	MEASURED	ON A CROSS	SECTIONED	PART		
		19DEG 45MIN	MEASURED	ON A CROSS	SECTIONED	PART		OUT OF SPEC +45MIN
53	0.64-0.87	0.785	MEASURED	ON A CROSS	SECTIONED	PART		
54	0.10-0.31	0.262	MEASURED	ON A CROSS	SECTIONED	PART		
55	0.58-0.68	0.632	MEASURED	ON A CROSS	SECTIONED	PART		

#27639

R

TOLLWAY STEEL CORPORATION
25th Ave. & Main St.
Melrose Park, IL 60160
Phone (708) 681-8190

Customer [redacted]

ANALYSIS REPORT

ITEM #	ORDER #	PART #	SIZE	GRADE	TEMPER
1.	033652	CROSNAD 1375C	.0985 x 1.375 x cl	C1050	ANNLD
2.			QUALITY CONTROL		
3.			APR 30 1992		

ITEM #	ID#	C	Mn	P	S	Si	Ni	Cr	Al
1.	664332	.51	.69	.013	.002	.27			
2.									
3.									

ITEM #	ROCKWELL	TENSILE	YIELD	ELONGATION	OTHER
1.	RB 78				
2.					
3.					

CERTIFIED BY: Thomas E Bulwan
THOMAS BULWAN

TEXAS INSP
27639-1

alc

TI-NHTSA 8105

F2VC-9F924-AB

MATERIAL ANALYSIS

PARTS LIST

	PART NAME	PART #	CERTIFIED
1	BASE	46515-2	YES
2	STA.TERM.	34999-1	YES
3	MOVE.CONTACT	74406-1	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	74247-4	YES
19	THREAD CAP	74179-2	YES

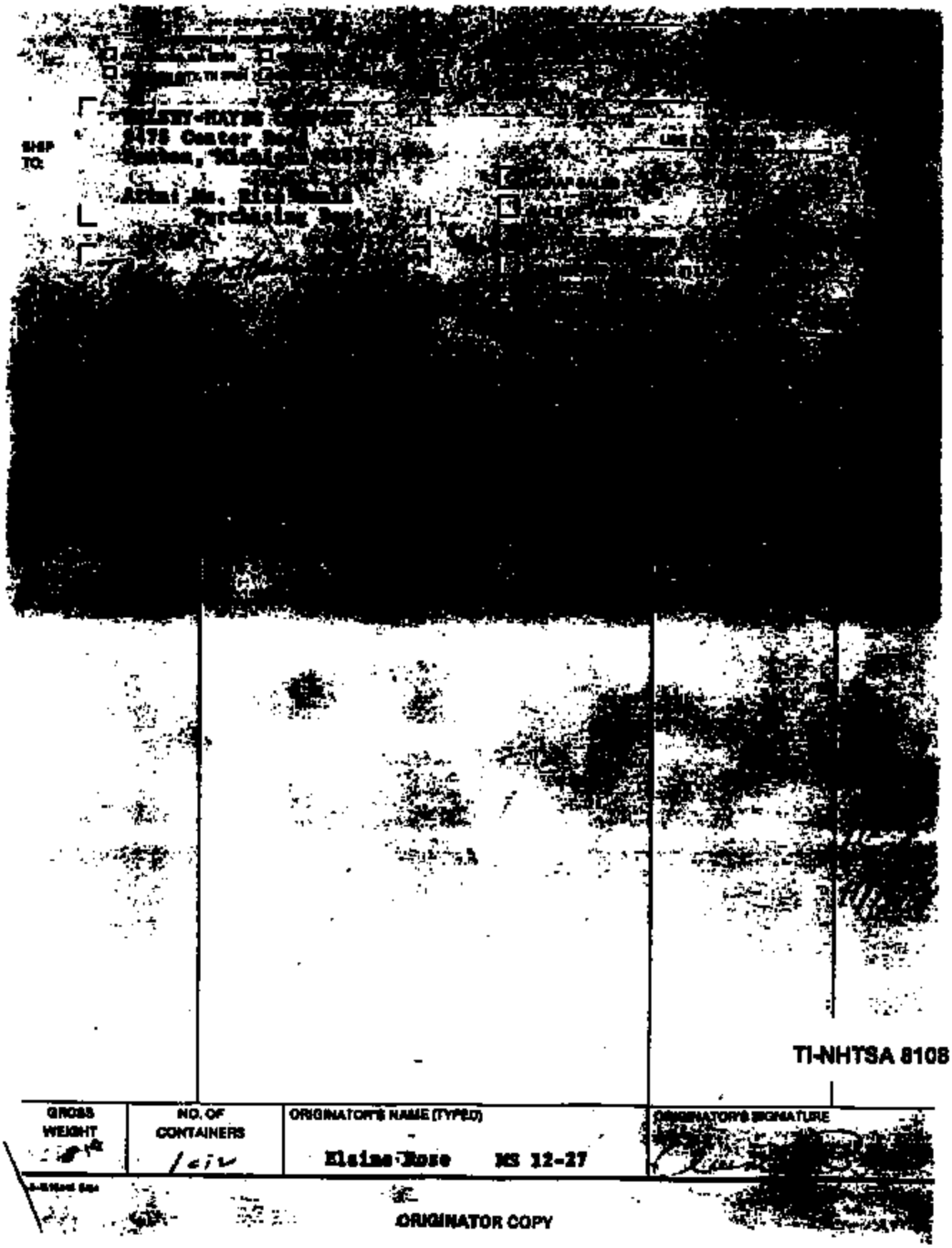
FINAL INSPECTION 77PSL3-1

DATE:

CUSTOMER P/N F2AC-9F924-AA

DISC LOT	MAT.I.D.	DISC LOT	MAT.I.D.
REEL #	CUP LOT #	REEL #	CUP LOT #
LOT #	CONV.LOT	LOT #	CONV. LOT
WASHER LOT	QTY.	WASHER LOT	QTY.

TEST	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
1A ACTUATION																		
RELEASE																		
2 INTERNAL																		
3 DIMENSION	---	---	---	---	---					---	---	---	---	---				
4B VOLT DROP	---	---	---	---	---					---	---	---	---	---				
5C CUR.LEAK	---	---	---	---	---					---	---	---	---	---				
6D PROOF	---	---	---	---	---					---	---	---	---	---				
7 IMPULSE						---	---	---	---						---	---	---	---
8A ACTUATION																		
RELEASE																		
9B VOLT-DROP						---	---	---	---						---	---	---	---
0C CUR.LEAK						---	---	---	---						---	---	---	---
1D PROOF						---	---	---	---						---	---	---	---
2 OUTERM. STR	---	---	---	---	---					---	---	---	---	---				
3A ACTUATION	---	---	---	---	---					---	---	---	---	---				
RELEASE	---	---	---	---	---					---	---	---	---	---				
4B VOLT DROP	---	---	---	---	---					---	---	---	---	---				
5C CUR.LEAK	---	---	---	---	---					---	---	---	---	---				
6D PROOF	---	---	---	---	---					---	---	---	---	---				
7 BURST	---	---	---	---	---					---	---	---	---	---				



TI-NHTSA 8108

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

ORIGINATOR COPY

TEXAS INSTRUMENTS

FAI
K-H P/C Data

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB

	BLUEPRINT SPEC	CAVITY # 1D ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4B ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	COMMENTS
1	19.45 - 19.91	19.55	19.61	19.56	19.56	19.57	19.57	
2	16.56 - 16.76	16.59/16.58	16.62/16.64	16.62/16.60	16.58/16.59	16.54/16.56	16.59/16.59	12.
3	11.80 - 13.21	12.974	13.051	13.035	13.043	13.075	12.946	
4	11.40 - 11.96	11.789	11.808	11.779	11.778	11.785	11.795	
5	2.94 - 3.05	2.99	2.92	2.92	2.92	2.93	2.93	16.
	0.1 R	1.858/0.041	1.920/0.020	1.933/0.033	1.869/0.031	1.865/0.015	1.897/0.013	
6	11.69 - 11.92	11.69/11.71	11.67/11.71	11.72/11.68	11.60/11.63	11.65/11.67	11.65/11.65	24.
7	1.24 - 1.45	1.252	1.250	1.290	1.280	1.290	1.245	
8	1.24 - 1.58	1.402	1.397	1.400	1.389	1.297	1.397	
9	1.85 - 2.06	2.004	1.974	1.956	1.964	1.964	1.986	
10	13.43 - 13.85	13.772	13.693	13.800	13.686	13.656	13.556	24.
11	31DEG +/- 2DEG	30DEG 34MIN	29DEG 53MIN	31DEG	29DEG 04MIN	29DEG 09MIN	30DEG 08MIN	
12	2.79 - 3.10 2X	2.96/2.89	2.96/2.90	2.96/2.90	2.90/2.90	2.89/2.89	2.90/2.94	12.
13	0.25 - 0.75	0.508/0.641	0.488/0.809	0.442/0.6791	0.498/0.671	0.490/0.744	0.640/0.757	OUT OF SPEC. 12.
14	0.05 - 0.26 2X	0.051/0.069	0.074/0.127	0.140/0.076	0.127/0.135	0.153/0.143	0.0711/0.0361	
		0.140/0.147	0.092/0.089	0.086/0.114	0.048/0.081	0.038/0.813	0.137/0.165	
15	D 19.05 MAX	18.64 18.56	18.87 18.56	18.94 18.66	18.69 18.77	18.63 18.71	18.61 18.67	36.

TI-NHTSA 6109

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 # 6A ACTUAL	COMMENTS
16	57.18 MAX	55.68	55.70	55.71	55.70	55.69	55.68	
17	12.09 - 12.11	12.74/12.84	12.72/12.86	12.77/12.76	12.76/12.77	12.75/12.81	12.73/12.80	
18	11.65 - 12.17	11.68/11.79	11.65/11.64	11.73/11.79	11.68/11.84	11.78/11.86	11.73/11.88	36.
19	14.23 MAX	13.66	13.65	13.67	13.65	13.65	13.66	
20	9.39 - 9.46	9.39/9.49	9.41/9.44	9.57/9.64	9.49/9.62	9.58/9.74	9.55/9.67	OUT OF SPEC. 18 - 2.
21	8.12 MIN	8.98/9.29	9.18/9.54	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	1.783	1.727	1.761	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	6.649	6.698	6.693	6.647	6.665	6.642	
24A	29DEG+/-2DG 4	29DEG 54MIN	30DEG 24MIN	MEASURED	ON A CHORD	SECTIONED	PART	
		30DEG 57MIN	28DEG 46MIN					34
25	1.86-2.21R 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	7.25-7.75	7.74	7.52	7.53	7.54	7.55	7.53	
26A	NO FLASH OR	OK	OK	FLASH	OK	OK	FLASH	44 - 2
	BURR ALLOWED							
	ON SURFACE							
27	2.79-3.41	3.146	3.098	3.160	3.130	3.119	3.107	
28	0.60-1.30	1.118	1.168	1.179	1.148	1.141	1.133	12

TI-NHTSA 8110

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

P2VC-9P924-AB

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4B ACTUAL	CAVITY # 5B ACTUAL	CAVITY # 6B ACTUAL	COMMENTS
42	1.62-1.82 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	1.64-0.65	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	0.58-0.57	0.59-0.56	0.56-0.58	0.55-0.56	
44	0.30-0.72 2X	0.43-0.46	0.51-0.44	0.41-0.44	0.42-0.42	0.59-0.43	0.42-0.56	
45	2.15-2.42 2X	2.13-2.21	2.18-2.22	2.30-2.15	2.20-2.16	2.16-2.18	2.23-2.16	61 OUT OF SPEC 30 - 1
46	25DEG+/-2 2X	24DEG 36MIN	24DEG 41MIN	23DEG 14MIN	23DEG 39MIN	23DEG 09MIN	23DEG 34MIN	
		23DEG 06MIN	23DEG 49MIN	24DEG 31MIN	23DEG 53MIN	23DEG 56MIN	24DEG 24MIN	
47	HOUSING	BROWN	BROWN	BROWN	BROWN	BROWN	BROWN	18
48	45DEG+/-2 4X	44DEG 36MIN	44DEG 47MIN	44DEG 04MIN	45DEG 08MIN	45DEG 37MIN	43DEG	
		45DEG 44MIN	45DEG 15MIN	43DEG 20MIN	45DEG 04MIN	44DEG 11MIN	44DEG 08MIN	
		44DEG 43MIN	45DEG 46MIN	46DEG 46MIN	45DEG 16MIN	44DEG 07MIN	44DEG 01MIN	
		45DEG 12MIN	45DEG 23MIN	45DEG 39MIN	44DEG 46MIN	45DEG 39MIN	44DEG 54MIN	24
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	24
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	0.50-0.50	0.52-0.52	0.50-0.54	0.51-0.44	24

TI-NHTSA 8111

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-4F924-AB

	BLUEPRINT SPEC	CAVITY # 10 ACTUAL	CAVITY # 20 ACTUAL	CAVITY # 30 ACTUAL	CAVITY # 40 ACTUAL	CAVITY # 50 ACTUAL	CAVITY # 60 ACTUAL	COMMENTS
51	2.59-2.69 ZX	2.725	2.710	2.705	2.715	2.710	2.738	
	0.2 m A C	2.393	2.499	2.576	2.492	2.457	2.515	
	D	0.072	0.036	0.113	0.017	0.008	0.050	
	2.59-2.69 ZX	2.695	2.703	2.715	2.703	2.695	2.710	
	0.2 m A C	2.499	2.522	2.580	2.377	2.427	2.448	
	D	0.036	0.057	0.095	0.298	0.038	0.022	
52	13-17DEG ZX	17DEG 23MIN	MEASURED	ON A CROSS	SECTIONED	PART		
		17DEG 48MIN	MEASURED	ON A CROSS	SECTIONED	PART		OUT OF SPEC +48MIN
53	0.46-0.67	0.785	MEASURED	ON A CROSS	SECTIONED	PART		
54	0.16-0.31	0.262	MEASURED	ON A CROSS	SECTIONED	PART		
55	0.59-0.69	0.632	MEASURED	ON A CROSS	SECTIONED	PART		

TI-NHTSA 8112

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
508-699-5000 • TELEX 95-1703 TWX 710-349-0000 • CABLE TEXINS

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

P2VC-9F24-AB

	SPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4C ACTUAL	CAVITY # 5C ACTUAL	CAVITY # 6C ACTUAL	COMMENTS
51	(2.57-2.60 2X	2.725	2.710	2.701	2.713	2.710	2.736	
	7.2 @ A C	2.399	2.444	2.376	2.432	2.457	2.515	
	D	0.072	0.034	0.113	0.017	0.006	0.056	
	(2.57-2.60 2X	2.695	2.700	2.715	2.706	2.699	2.717	
	C @ A C	2.499	2.532	2.389	2.377	2.427	2.445	
	D	0.014	0.057	0.099	0.159	0.035	0.021	
52	(3.4) FOR 2X	TITLES COMIN	MEASURE	IN A CROSS	SECTIONAL	PART		
		(FOR 45MIN	MEASURED	IN A CROSS	SECTIONAL	PART		OUT OF SPEC -45MIN
53	1.11-1.17	0.799	MEASURED	IN A CROSS	SECTIONAL	PART		
54	1.11-0.21	0.202	MEASURE	IN A CROSS	SECTIONAL	PART		
55	1.61-1.63	0.632	MEASURED	IN A CROSS	SECTIONAL	PART		

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
508-699-2800 • TELEX 95-7708 TWX 710-348-0696 • CABLE TEXINS

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB/12590701

	BLUEPRINT SPEC	CAVITY # 1D ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6B ACTUAL	COMMENTS
1	2.84 - 3.05	2.93	2.92	2.92	2.92	2.93	2.92	
	⌖ 0.1 Ⓜ A	0.041	0.020	0.033	0.031	0.015	0.013	
	1.90	1.889	1.920	1.933	1.869	1.885	1.887	
2	22.38 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	58.70	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	1.792	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	
		7.50		7.99				
7	0.25X30-40 DEG	CHAMFER	N/A -	THREADS	HAVE BEEN	ADDED		
8	3/8-24UNF-2A	OK	Ok	OK	Ok	OK	OK	
	T=D. ⌖ D ⌖							
9	1.40 - 1.10	1.316	MEASURED	ON A CROSS	SECTIONED	PART		

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
508-699-2800 • TELEX 95-7709 TWX 710-348-0699 • CABLE TEXINS

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB/12598TDI

	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	2.98	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 1.90	1.859	1.928	1.933	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	55.78	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. OK
5	2.04-1.52 ref	2.040	1.732	1.783	1.721	1.781	1.796	
6	8.03-7.82ref	7.94	7.94	7.97	7.97	7.98	7.96	
	1	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	
	IND. -D-							
9	1.40 - 1.10	1.316	MEASURED	ON A CROSS	SECTIONED	PART		

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	55.70	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	2.04-1.92 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	
		7.58		7.99				
7	0.25X50-4D DEG	CHAMFER	N/A -	THREADS	HAVE BEEN	ADDED		
8	3/8-24UNF-2A	OK	OK	OK	OK	OK	OK	
	THD. -D-							
9	1.48 - 1.10	1.316	MEASURED	ON A CROSS	SECTIONED	PART		

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
508-699-2800 • TELEX 92-7708 TWX 710-348-0698 • CABLE TEXINS

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2YC-9F924-AB/1259870

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY #4B ACTUAL	CAVITY # 5B ACTUAL	CAVITY # 6B ACTUAL	COMMENTS
10	↗ 0.16 Ø	0.051	0.048	0.048	0.008	0.038	0.056	
11	2.5√ c	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	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	7.31	7.30	7.37	
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	

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
508-699-2800 • TELEX 97-7705 TWX 710-346-0588 • CABLE TERINS

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
10	Ø 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	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 7.31-7.23	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 5.85-5.58	5.61	5.72	5.64	5.67	5.60	5.61	
		5.68	5.66	5.66	5.70	5.66	5.63	

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
• TELEX 95-7000 TWX 710-348-0466 • CABLE TEXINS

Alt. R102 File: 77PSLKH

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				12-16-9
REPAIRED TOOL.						
REVIEW		THE DIMENSIONS INDICATED BELOW REPRESENT TEXAS INSTRUMENTS' FINDINGS REGARDING THE ACTUAL VALUES FOR ALL CHARACTERIC 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.				
OTHER						

		(CIRCLE ALL OUT OF TOLERANCE DIMENSIONS)					DISPOSITION		
TI #	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	0.030	0.038	0.031	0.015	0.015	
		1.90	1.859	1.920	1.933	1.869	1.885	1.887	
15	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	
16	3	55.15 MAX	55.65	55.70	55.71	55.70	55.69	55.66	
	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
22	5	2.04-1.52 REF.	2.040	1.732	1.783	1.787	1.781	1.796	
23	6	Ø 2.02-7.82 REF.	7.94	7.94	7.97	7.97	7.98	7.96	
			7.50		7.99				
29	7	0.25 X 50°-48° CHAMFER	N/A - THREADS HAVE BEEN ADDED						
30	8	3/8-24UNF-2A THD ⊠	OK	OK	OK	OK	OK	OK	
31	9	1.40 - 1.10	1.316	MEASURED ON A CROSS SECTIONED PART					
32	10	⌖ 0.16 D	0.051	0.048	0.048	0.008	0.030	0.056	
33	11	~~45°~~ C	OK	MEASURED ON A CROSS SECTIONED PART					
34	12	43° - 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	3.43	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 5.55 - 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.:

TI-NHTSA 8119

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F926-AB/1259070/1

	BLUEPRINT SPEC	CAVITY # 1B ACTUAL	CAVITY # 2C ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4D ACTUAL	CAVITY # 5D ACTUAL	CAVITY # 6D ACTUAL	[redacted]
1	2.84 - 3.05	2.93	2.92	2.92	2.93	2.93	2.93	
	Ø 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	22.98 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	9.69	9.58	9.55	
		9.63	9.66	9.64	9.62	9.74	9.67	OUT OF SPEC.
5	1.04-1.52 ref	2.040	1.732	1.783	1.727	1.781	1.796	
6	Ø 5.03-7.82ref	7.94	7.94	7.97	7.97	7.98	7.96	
		7.50		7.99				
7	0.25x50-60 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		

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	CAVITY # ACTUAL
10	0.16 D	0.051	0.048	0.048	0.009	0.030	0.056	
11	2.5 C	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	O 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	O 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	O 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	

Notes

- Rivet mod's. ⇒ if rivet feeding proves to be a problem
  - [illegible] feed 9
  - [illegible] ⇒ [illegible]
    (strengthening)
  - longer shank (!)

77PSL/57PSL line loads 8/92

	J	F	M	20th	10th	1st
77PS L2-1	28.4	30.4	33.4	77.8	74.9	73.8
L2-3	8.0	9.1	9.1	25.1	23.4	[illegible]
57L's				288.3	255.3	243.4
TOTAL	36.4	39.5	39.5	391.2	436.6	442.4
	115.9					

Summary

- W/ Dan Perfilio input, we couldn't conclude that riveting was really a problem in recent past.
- John K will assign mech. technician to the line starting 1/2; assignment is to document problems, fix what he can, report to John & Steve each day

Summary

- Ramp up from 2.1/mo to 5k/mo. for 1st 2 wks of January; ramps up to 7-10k/mo. [illegible] days & on Thru month

target is ≥ 7.5k/mo for 3Q & 4Q12 projected volumes

- agreed to continue to procure welded arm. John / Steve will put together a rough timing schedule for implementation

- Matt will determine if we need to add arm tumbling requirement to revised print. Rivets are vibratorily tumbled by Milford, but not called out on print, so it's not checked when we receive parts. One lot of units was received recently w/out proper sequencing & maybe (?) without arm — and they did not feel well.

- log book @ Easton equipment → will be added immediately

Pass Car Quiet Devices; Vacuum Sensitivity

① Run new pilot LS-2 with -2 cup - 32 pc
- M·S - characterize sensor variability : 32 pc
- A·R - hatchet curves : 12 pc
- M·S - pre/post vac measurement: 32 pc

② Run 1000 pc production LS-2 with -2 cup
- M·S - characterize sensor variability - 25 pc
- A·R - hatchet curves : 12 pc
- M·S - pre/post vac measurement : 25 pc
- M·S - monitor 100% vac check for fallout

③ Run 50 pc model shop cups LS-2
- A·R - characterize sensor variability : 50 pc
- A·R - hatchet curves : 12 pc
- A·R - pre/post vac measurement : 25 pc
- A·R - build devices + check for vacuum sensitivity

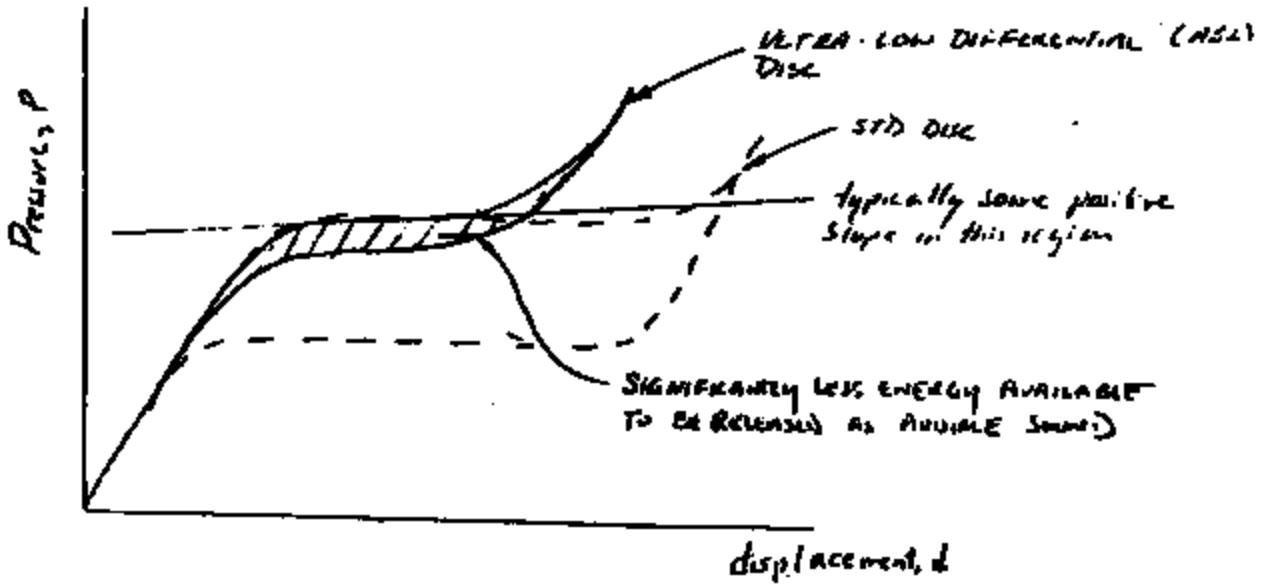
④ Disc Development
- goal is to obtain more data from the silent dive (Thriller disc?)
- A·R - set up meeting with Ted B.

Eric 2-10

QUIET SWITCH

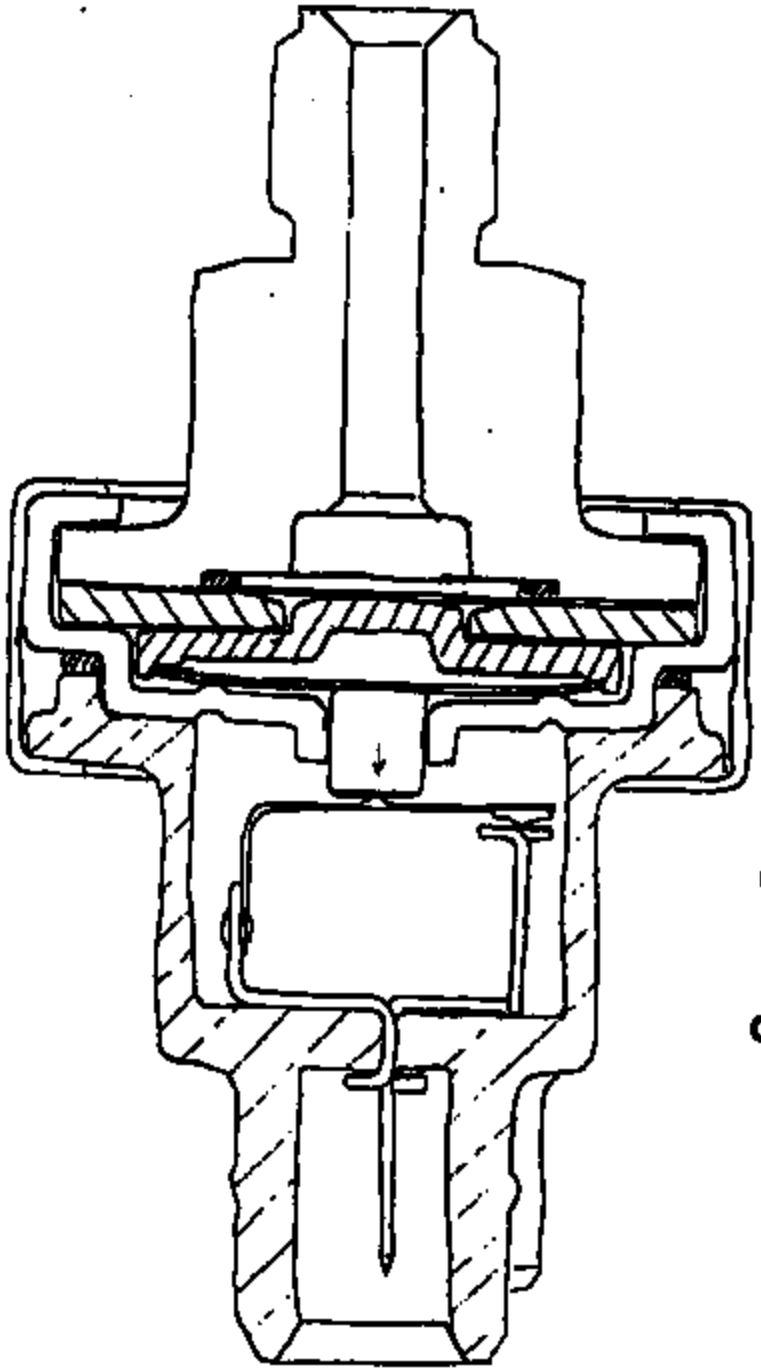
DISC TECHNOLOGY

THROUGH PROPRIETARY DISC TECHNOLOGY, THE HYSTERESIS OR DIFFERENTIAL IS REDUCED TO A MINIMAL VALUE, MAKING THE DISC INAUDIBLE TO OUR STANDARD DISC AND DISC MEASUREMENT EQUIPMENT.



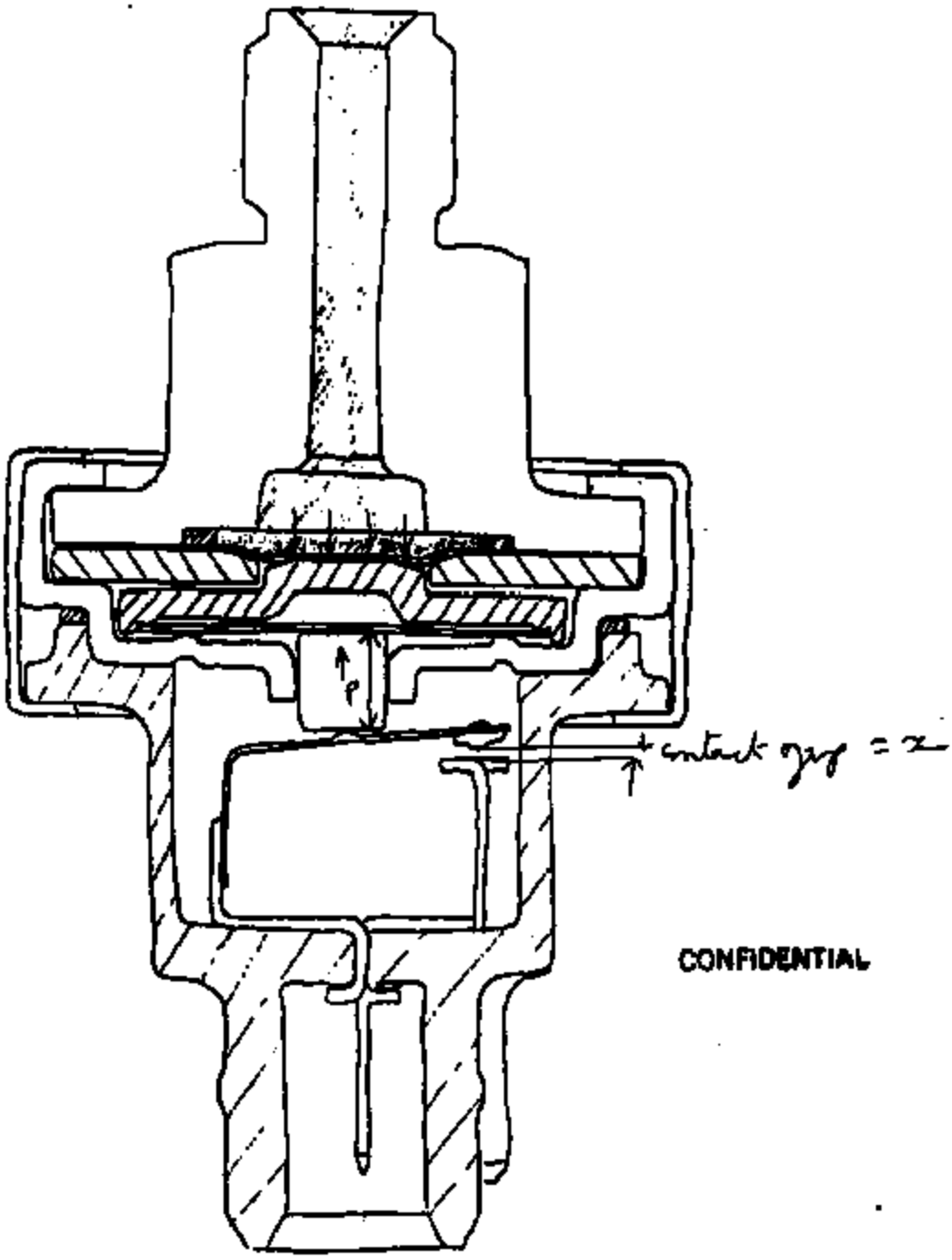
(A2/2)

Un-Pressurized
Contacts Closed



CONF...
CONFIDENTIAL
CONFIDENTIAL

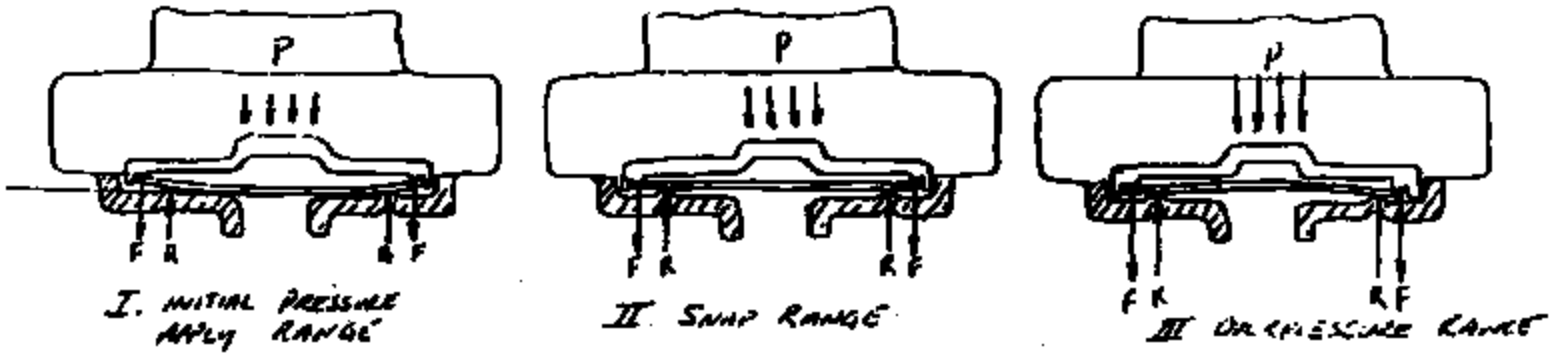
PRESSURIZED
CONTACTS OPEN



CONFIDENTIAL

SENSOR ASSEMBLY

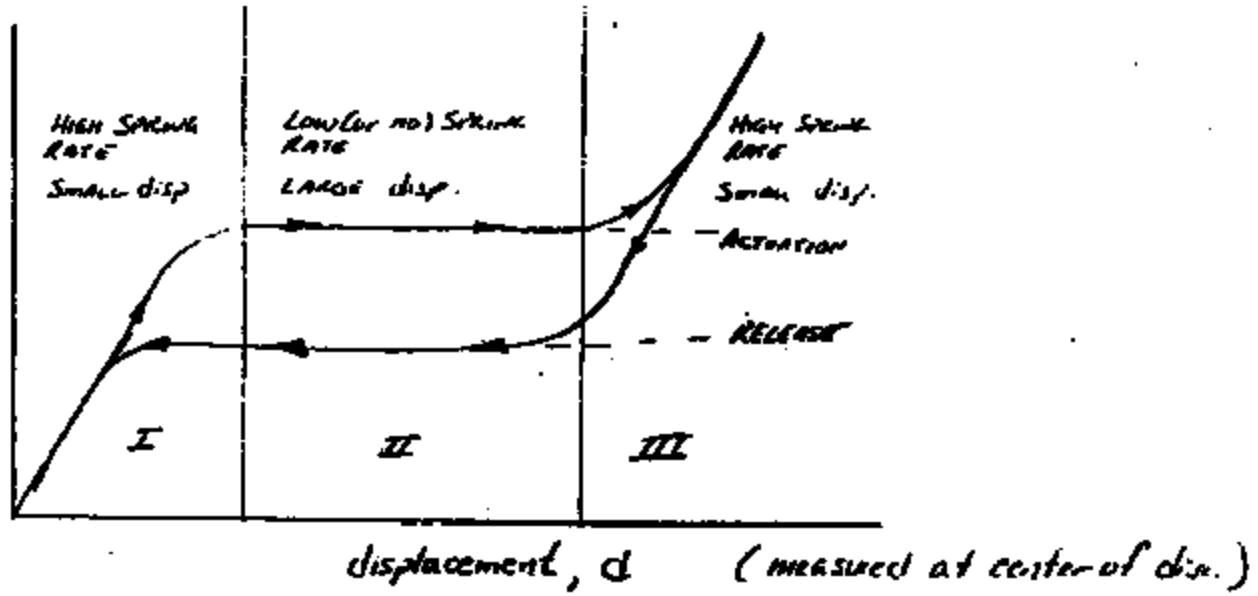
PRESSURE VS. DISPLACEMENT

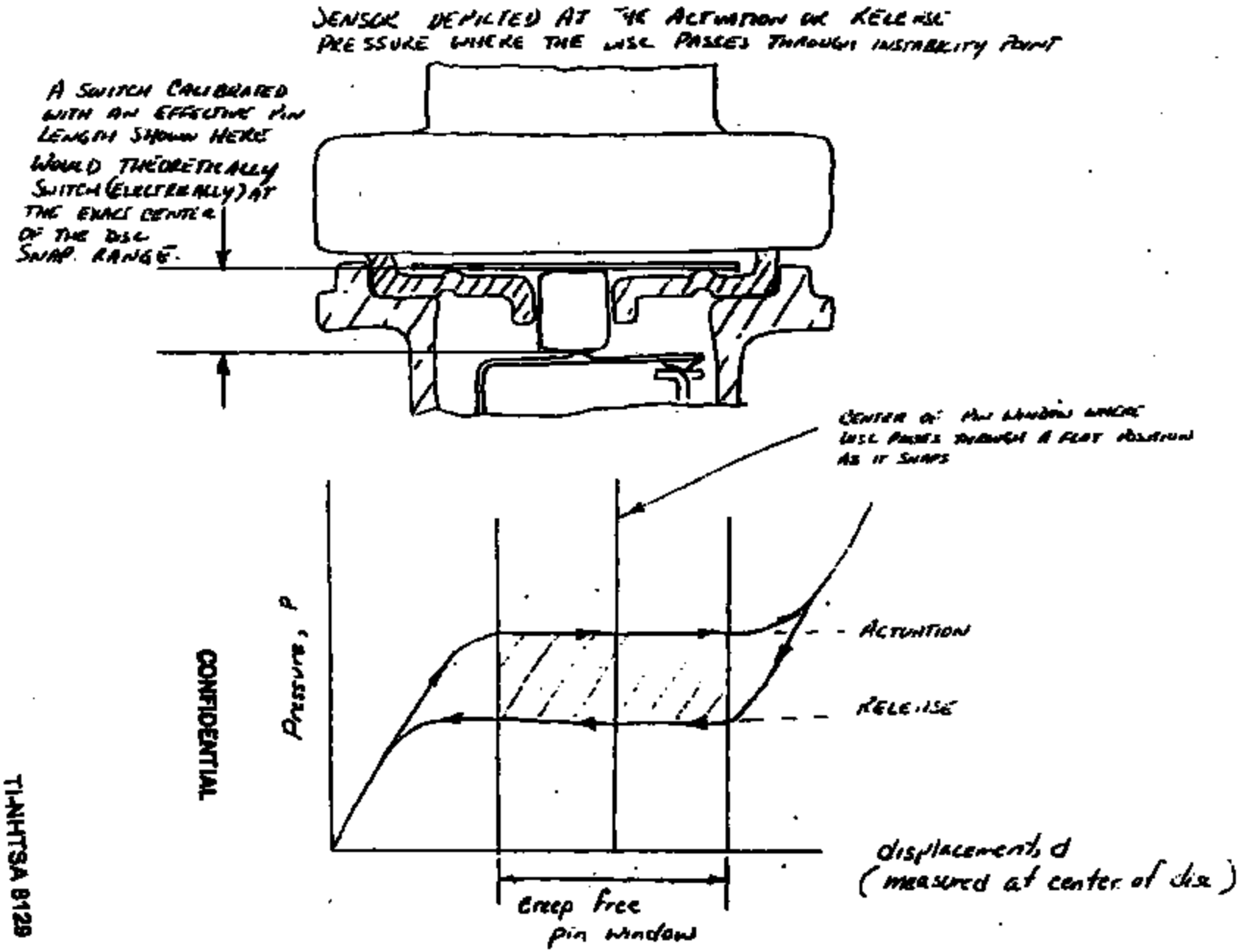


I. INITIAL PRESSURE APPLY RANGE

II SNAP RANGE

III OVERPRESSURE RANGE





CONFIDENTIAL

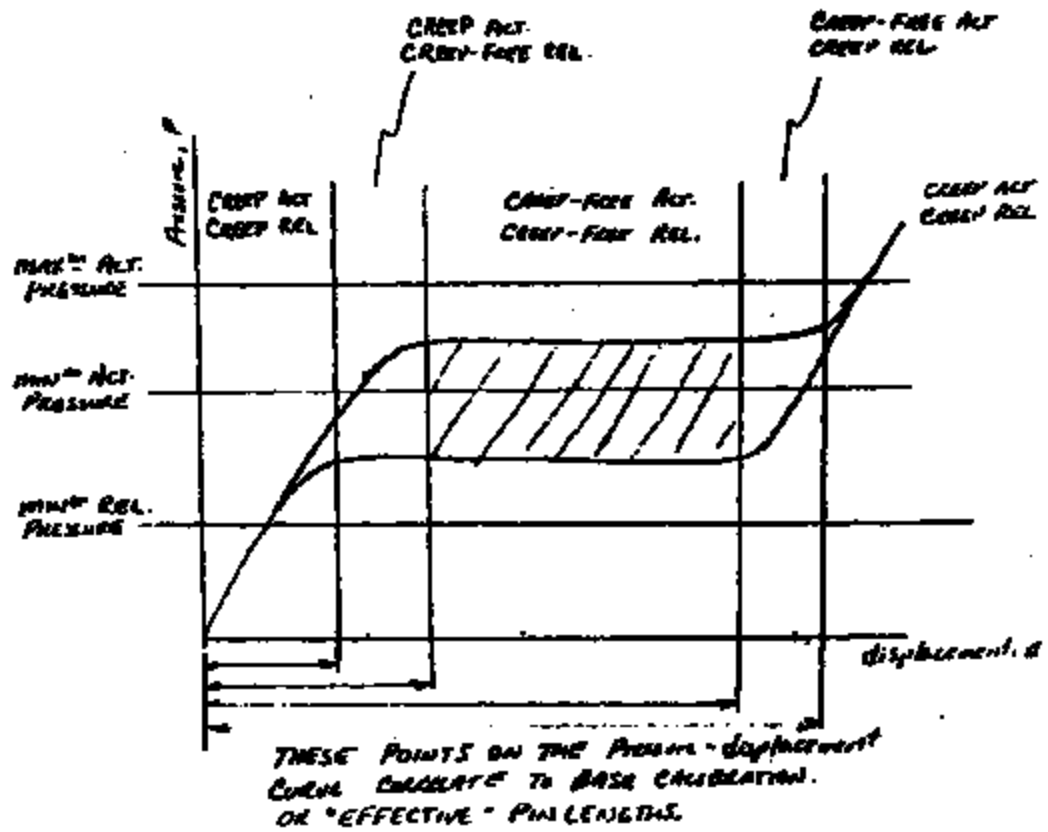
TI-NHTSA 8129

STANDARD (MULTI-QUIET) SWITCH

REGIONS WITHIN THE P-d CURVE ARE CORRELATED TO BASE CALIBRATION USING A "TIME WINDOW" EVALUATION

. THIS SWITCH IS COMPARED TO CHANGE IN CONTINUITY ON A TIME BASIS

ACTUATION AND RELEASE "CREEP TIME" CORRELATE TO SPECIFIC REGIONS OF THE P-d CURVE

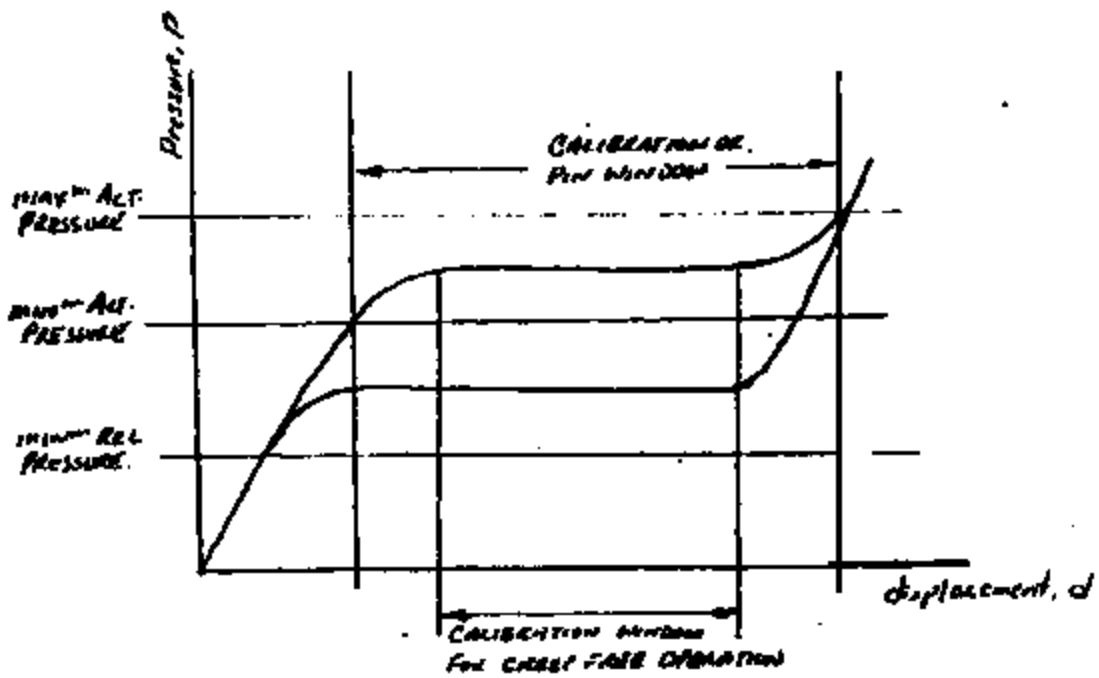


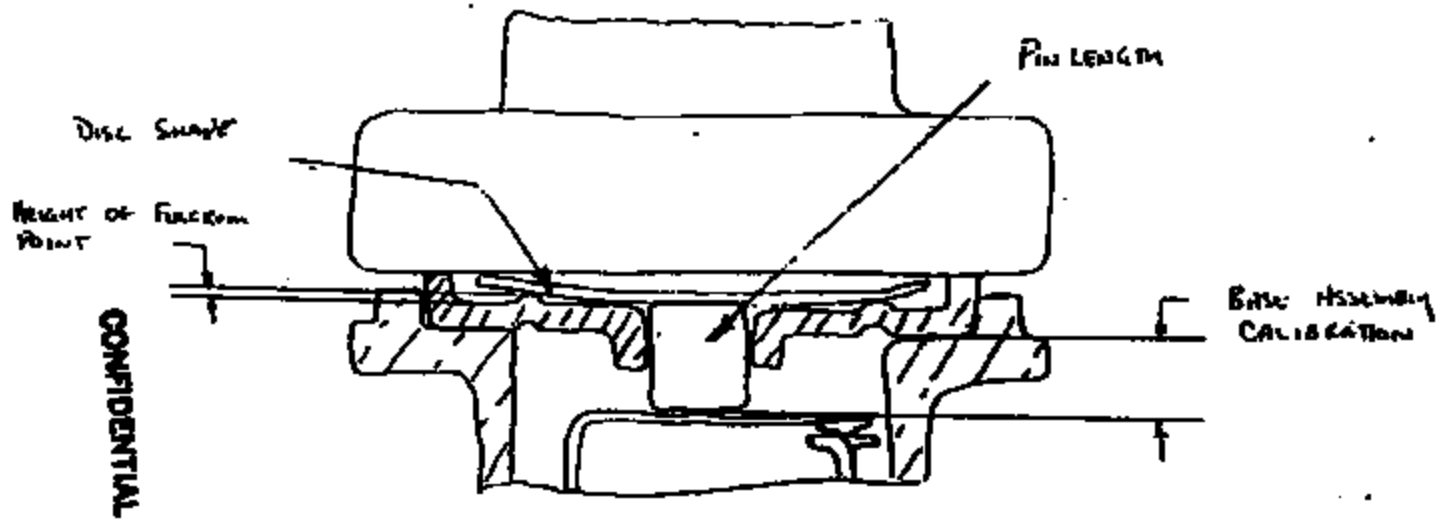
CONFIDENTIAL

TI-NHTSA 8130

A PREMISE WITH THE NGSC SYSTEM HAS BEEN THAT CREEP FREE OPERATION CONSTRAINTS AREN'T NECESSARY DUE TO THE WAY THE SWITCH OPERATES IN THE SYSTEM.

A WIDER CALIBRATION WINDOW RESULTS ; MAKING THE BUILD PROCESS MORE ROBUST TO ASSEMBLY TOLERANCES





CONTRIBUTORS TO ASSEMBLY TOLERANCES INCLUDE:

Component PIN LENGTH VARIATIONS –

BASE ASM. CALIBRATION – EACH IS CALIBRATED TO A PRESET INJECT VALUE, BUT VARIABILITY EXISTS

DISC SHAPE – CAN VARY FROM CUP TO CUP, USUALLY [illegible] INSIGNIFICANT

HEIGHT OF FULCRUM POINT IN CUP – TYPICALLY SEE LITTLE VARIABILITY WITHIN A CUP, BUT CUP-TO-CUP VARIABILITY EXISTS.

Assembly SENSOR CRIMPING OPERATION – CAN AFFECT THE DIMENSION FROM THE CUP REFERENCE SURFACE TO THE CENTER OF THE PIN

FINAL CRIMPING ORIENTATION – CAN AFFECT THE "EFFECTIVE PIN LENGTH" (SENSOR-TO-CASE CRIMP)

ADDITIONALLY, THE CENTERING OF THE ACTUATION & RELEASE PRESSURES ARE DEPENDANT UPON DISC CALIBRATION AND PRESSURE-TO-FORCE AMPLIFICATION RATIO.

Quiet Switch

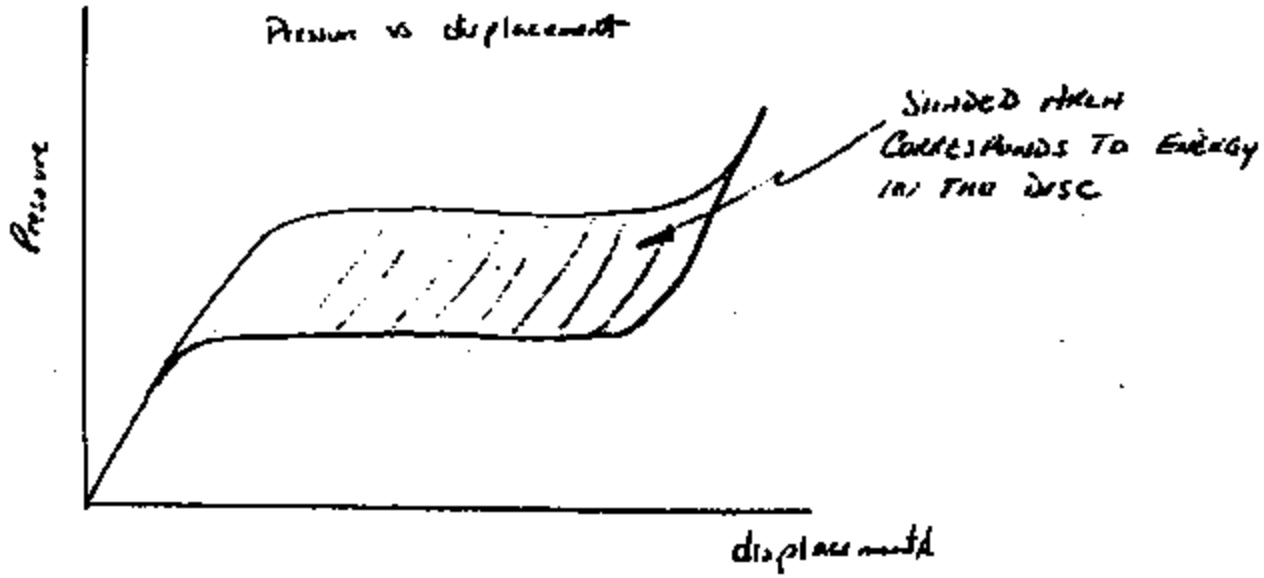
Disc Technology

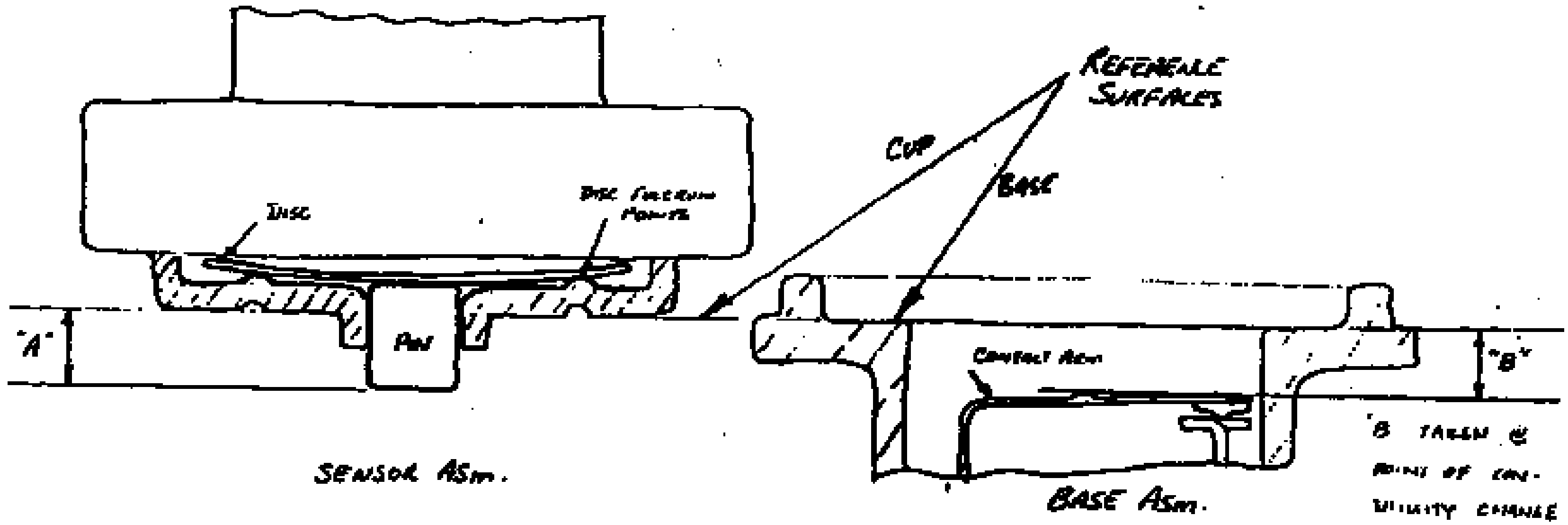
Discs used in Standard (non-quiet) switches have a built in hysteresis which provides a relatively large difference in switch actuation and release pressure.

The hysteresis - or differential - also provides for a relatively large vibration or pressure range.

The area under the P-d curve is indicative of the energy released as audible noise during the snap.

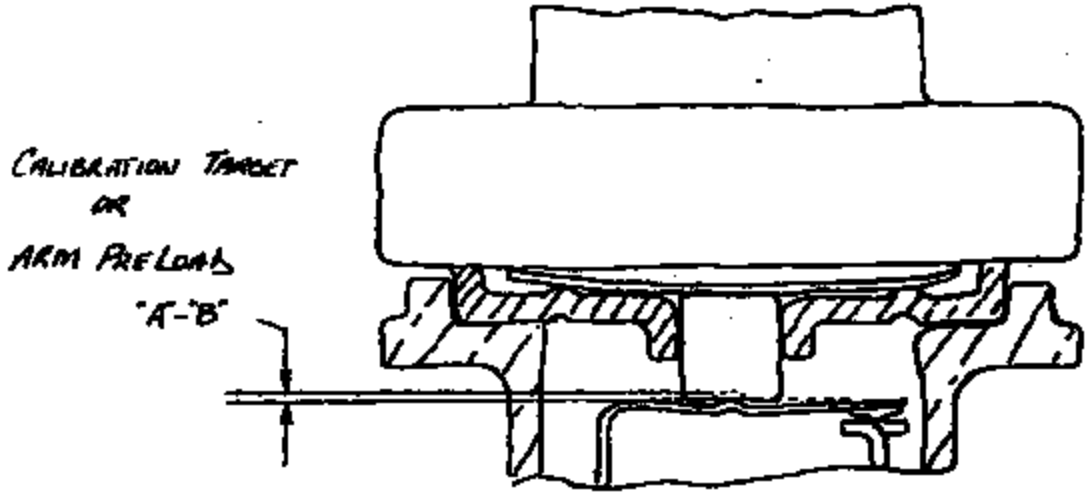
Standards Disc

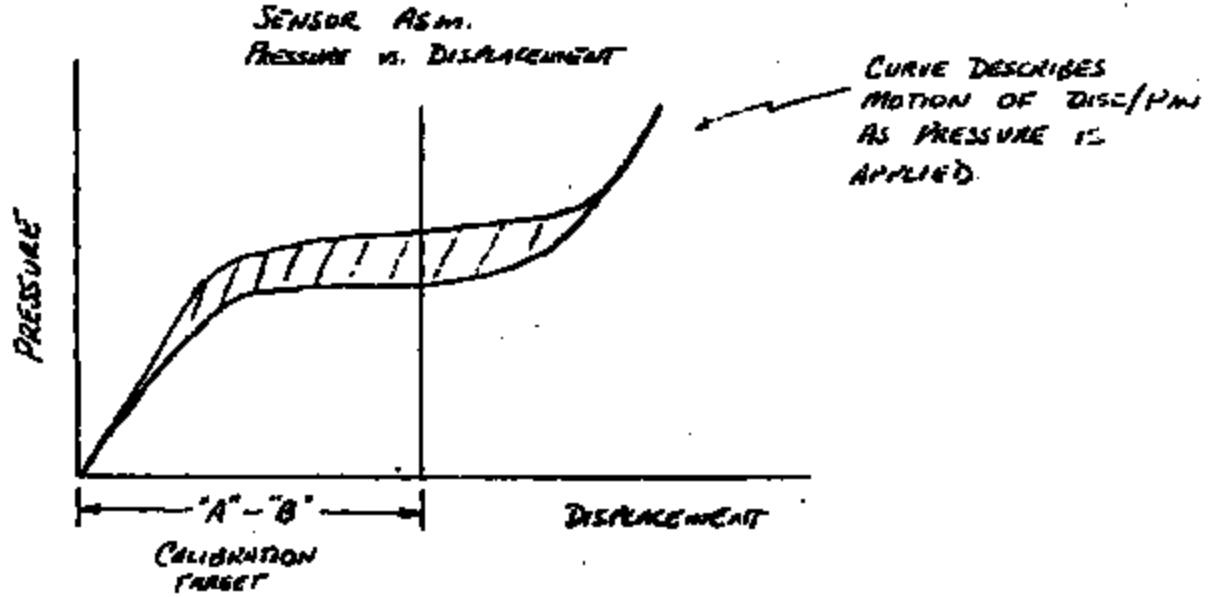




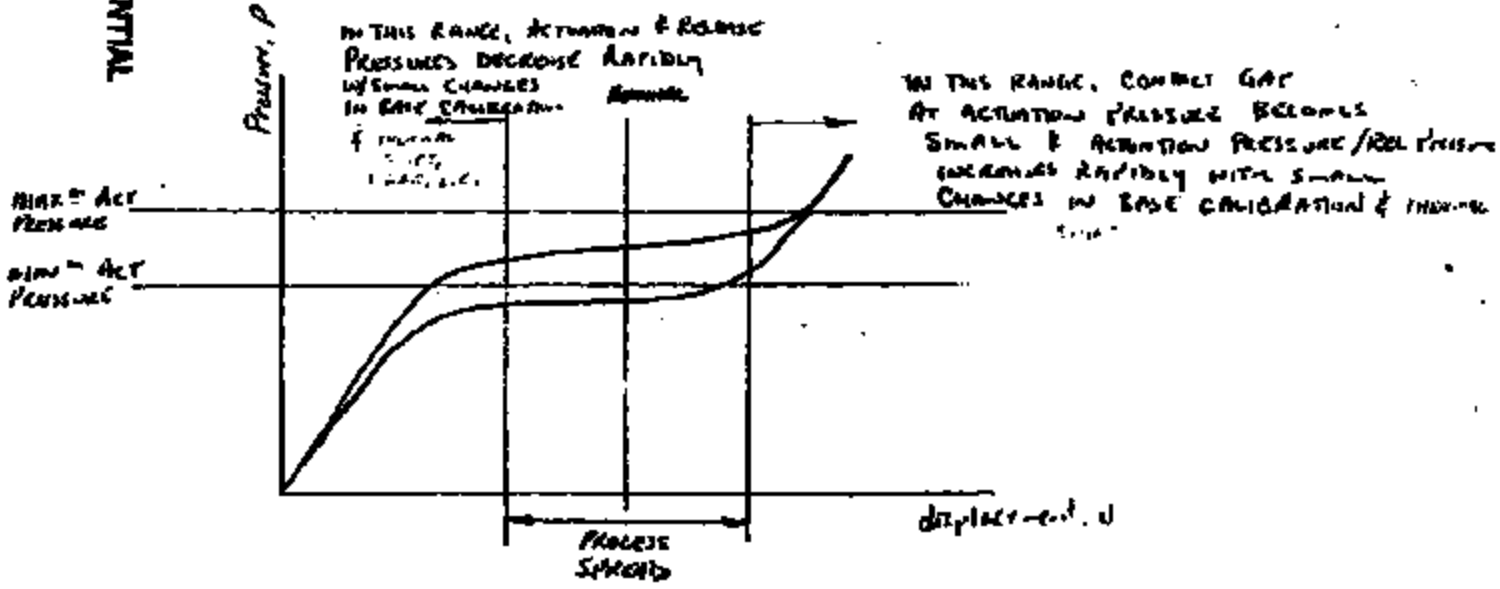
CONFIDENTIAL

TI-NHTSA 8134





Qk r Switch



Qu Switch

WITH WHAT WE KNOW OF THE QUICK SWITCH TODAY, THERE ARE SEVERAL KEY AREAS TO ITS SUCCESS:

(1) PRODUCING THE DISC ITSELF, WHICH IS NO LONGER AVAILABLE

(2) PRODUCING SWITCHES WITH THE REDUCED CALIBRATION WINDOW.

(3) DETERMINING WHAT THE CALIBRATION WINDOW IS, BECAUSE THE STD. PROCEDURE - WHICH RELIES ON "HEARING" A DISC SNAP - NO LONGER APPLIES

(4) MINIMIZING ASSEMBLY TOLERANCES TO MAXIMIZE THE NUMBER OF SWITCHES PRODUCED WITHIN THE CALIBRATION WINDOW.

(5) MAXIMIZING THE STABILITY OF THE CALIBRATION IN SERVICE; I.E. CHANGING TO A MORE STABLE BASE MATERIAL

(6) PROVING THROUGH TESTING THAT:

a. SWITCHES ARE, IN FACT, INAUDIBLE IN THE VEHICLE

b. THE CHECKS IN PLACE IN PRESENT MANUFACTURING PROCESS ARE SUCCESSFUL IN PRODUCING SWITCHES THAT MEET ALL OTHER PERFORMANCE REQUIREMENTS

CONFIDENTIAL

TI-NHTSA 8137

PART#	DEVICE	MEAN		MEAN TOL		MEAN RANGE		SIGMA MAX.		MEAN DIFF.		MATERIAL	BLANKING STI
		ACT (volts)	REL (volts)	ACT (volts)	REL (volts)	ACT (volts)	REL (volts)	ACT (volts)	REL (volts)	MIN (volts)	MAX (volts)	PART #	PART #
[illegible]	77PSL2-1	AS REQUIRED	AS REQUIRED	+/- 1.0	+/- 1.5	23 - 28	11 - 16	1.0	1.0	N/A	N/A	75525-2	74371-2
[illegible]	77PSL2-2	AS REQUIRED	AS REQUIRED	+/- 1.0	+/- 1.5	23 - 28	11 - 17	1.0	1.0	N/A	N/A	75525-2	74371-2
[illegible]	77PSL2-3	AS REQUIRED	AS REQUIRED	+/- 1.0	+/- 1.5	19 - 26		1.0	1.0	N/A	2.0	75525-2	74371-2
[illegible]	77PSL2-1/2/3	AS REQUIRED	AS REQUIRED	+/- 1.0	+/- 1.5	22 - 27		1.0	1.0	N/A	2.0	75525-2	74371-2
[illegible]	77PSL2-3	AS REQUIRED	AS REQUIRED	+/- 1.0	+/- 1.5	98-99	68-72	1.0	1.0	2.0	N/A	75525-8	74371-
53	9X17-1	98	70	+/-1.0	+/-1.5								

TRUCKS 2-3

83-	95
84-	96
85-	95.5
86-	96
87-	95.5
88-	95
89-	96
90-	95
91-	95.5
92-	95.5
83-	95
84-	95.5
85-	96
86	96
87-	95
88-	95.5
89-	96
90-	95
91-	95.5
92-	95.5
$\bar{x}$	95.5
σ_{n-1}	.397

PASCAR

96
96
96
96.5
96.5
96
96.5
96
96
96
96.5
96.5
96
96
96.5
96.5
96
96.5
96.5
96
$\bar{x}$ 96.2
σ_{n-1} .265

MEAS w/ .143 PIN

K. F. BASSLER COMPANY, INC.
PRECISION TOOLING & METAL STAMPINGS
45 John William St. • Attleboro, MA 02703 • (508) 222-1061 • Fax: (508) 226-1605
EST. 1946

MATERIAL CERTIFICATION

CUSTOMER: Texas Instruments, Inc. -- Attleboro

CUSTOMER ORDER NO.: 505118095

CUSTOMER PART NO.: 27406-1

REVISION: "F"

QUANTITY THIS SHIPMENT: 28,750

LOT NO. THIS SHIPMENT: 182

SHIPMENT DATE: 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
Inside Sales Specialist

PMA PRECISION METAL-FORMING ASSOCIATION

INTRODUCTION

The second generation of thermoplastic polyesters, polybutylene terephthalate, or PBT, was developed by Hoechst Celanese and introduced under the trademark Celanex in 1970.

Celanex® thermoplastic polyester resins are highly crystalline and exhibit a unique combination of properties including high strength, rigidity and toughness, low creep even at elevated temperatures, minimal moisture absorption, exceptional dimensional stability, resistance to a wide range of chemical attack, excellent electrical properties and outstanding processing characteristics.

Available in a wide range of formulations, including unreinforced, glass and mineral reinforced, polymer blends, and impact modified, as well as flame retarded to meet the requirements of Underwriters' Laboratories Bulletin UL 94V-0, Celanex resins have demonstrated a versatility of performance at economical overall finished part cost, leading to their use in an unusually wide range of applications.

The series listed below, are designed to provide the design engineer and end user a spectrum of performance to enable a formulation choice to be made that closely tailors both cost and performance to specific application needs, in the economic replacement of metals, thermosets and competitive thermoplastics.

For further detailed information on these resins and other specialty grades, please contact your local sales representatives or call the Engineering Plastics Division Technical Information Center — 201-535-4393.

CELANEX COMPOSITIONS:

1000 Unreinforced Series

- Chemical Resistance
- Wear Resistance and Lubricity
- Easy Flow

The Celanex 1000 series offers a unique combination of chemical and wear resistance, low coefficient of friction, minimal moisture absorption, excellent colorability, and surface gloss. These properties combined with outstanding processing characteristics make the Celanex 1000 series ideal for such diverse applications as typewriter and terminal keytops, cable liners, switches, paint brush bristles, stator insulation, and motor end caps.

There are three unreinforced grades available in the Celanex 1000 series: Celanex 1000, noted for its easy flow; Celanex 1002, a tougher version of 1000; and Celanex 1013, a flame retarded version of 1002 recognized by UL as 94V-0 down to 0.028 inch minimum thickness.

3000 General Purpose Series

- High Strength and Rigidity
- Excellent Electrical Properties
- High Temperature Performance

The Celanex 3000 general purpose series consists of glass reinforced injection moldable grades that offer an unusual combination of excellent mechanical, electrical and thermal properties, together with outstanding processability. In high energy auto ignition systems, the unique properties of the Celanex 3000 series enabled it to replace performance thermosets, providing greatly improved dielectric strength and arc resistance, in both wet and dry environments at temperatures as high as 300°F. The high performance characteristics of the Celanex 3000 series have made it ideal for use in automotive distributor caps, coil bobbins, coil cases, rotors and other ignition components, and in a seemingly endless array of electrical, telecommunications, appliance, and industrial applications.

The 3000 general purpose series is available in three levels of glass reinforcement (15%, 30%, and 40%) to offer the end user the maximum in design flexibility in terms of rigidity and ductility.

3000 Flame Retarded Series

- High Strength and Rigidity
- Excellent Electrical Properties
- High Temperature Performance
- UL 94V-0

Like its general purpose counterpart, the Celanex 3000 flame retarded series consists of glass reinforced injection moldable grades that maintain excellent mechanical and electrical properties throughout a wide range of aggressive end-use environments, while exhibiting superior thermal stability and exceptional processing characteristics. The excellent electrical profile, dimensional stability, and chemical resistance of the 3000 flame retarded series make it an outstanding candidate for a multitude of connector applications; DIP sockets and switches; motor components, terminal boards, stator insulation, brush holders, and motor control devices; relays and protectors; all types of switches; bobbins for use in solenoids and transformers; and relay cases and covers.

The 3000 flame retarded series is available in from 12% to 30% glass reinforcement levels offering the maximum design flexibility and all grades are recognized by UL as 94V-0 in all recommended colors. Of particular note, Celanex 3211 and 3311 meet UL's requirements for the Sole Support of current carrying components and Celanex 3310 and 3311 have electrical temperature index ratings of 140°C. All other grades in this series have UL electrical temperature index ratings of 130°C.

4000 Higher Impact Series

- Toughness
- Flexibility and Ductility
- Surface Appearance and Colorability

Through the use of impact modifiers and higher molecular weight polymers, the new Celanex 4000 series offers glass reinforced grades that combine excellent mechanical strength with improved impact performance and ductility. The 4000 series is an ideal candidate for a wide array of applications including large and small industrial pump housings and impellers; gears, bearings and other load bearing components; mechanical winches; chain saw housings; power tool components, and generally any Celanex 3300 type application where greater impact strength and toughness is required.

The Celanex 4000 series consists of two 30% glass reinforced grades: 4330 which offers the greatest impact strength in the Celanex product line; and 4300 which provides impact strength intermediate between Celanex 3300 and 4330. Both grades offer outstanding colorability with Celanex 4330 providing exceptional surface gloss as well.

CYLINDER TEMPERATURE SETTINGS

Glass reinforced resins derive their strength from glass fiber orientation and glass length. Orientation is determined by the direction of melt flow. Fiber length is determined by the length of the resin pellet less whatever damage is sustained during processing. Obviously, it is important to keep the fiber lengths as long as possible. It has been determined that breakage of fibers can be minimized in a screw machine by keeping the rear zone of the cylinder as hot or hotter than the front zone. For this reason, it is recommended that a flat or reverse profile be used on the cylinder temperature settings when running Celanex glass-reinforced resins. Keep in mind, however, that the recommended melt temperatures should be maintained, and residence time should be held to a minimum.

MOLD TEMPERATURE

Mold temperatures for molding Celanex resins are generally in the 100°F to 250°F range, with a temperature of 170°F most frequently yielding the best overall results. Unlike most other glass reinforced resins, Celanex yields a smooth glossy finish even when molded in a relatively cold mold. Higher mold temperatures are used to obtain the ultimate in surface gloss and uniformity. Low mold temperatures are sometimes employed to help prevent sink or warpage.

INJECTION AND HOLDING PRESSURE

Because of its ease of flow, Celanex polyester resin requires only moderate injection pressures (typically in the range of 50 to 75% of machine maximum).

Holding pressures are typically in the range of 50 to 50% of the injection pressures. Since Celanex resin crystallizes rapidly holding pressures (and holding time) are dependent on part thickness. Very thin walled parts may require only moderate holding pressure while thick-section parts may require high holding pressure and long holding times.

INJECTION SPEED

Fast fill speed is desirable because Celanex solidifies very rapidly once it enters the mold cavity. In very special cases, reduced fill speed can sometimes help cure warpage problems induced by orientation of the glass fibers in the material.

CYCLE TIME

Because Celanex solidifies rapidly, cycle times can be extremely short. Plunger forward time need only be long enough to deliver the molten charge to the mold and to hold the material under pressure until the gate freezes. The die closed time must only be long enough to permit the material to set hard enough so that the ejector pins will not distort the part when it is ejected from the mold. Overall cycle time is, consequently, a function of part size and wall thickness. Cycles for Celanex moldings vary, generally, from as little as 5 seconds for small thin-walled parts, to 40 or 45 seconds for large thick-walled parts. Cycle times over 45 seconds are encountered only in rare instances, where molds must be opened or closed slowly due to special coring, or where inserts must be loaded into the mold.

BACK PRESSURE AND SCREW SPEED

Little back pressure and minimum screw speed should be used in molding glass fiber reinforced Celanex in a screw machine. High back pressures and high screw speeds tend to reduce the length of the glass fibers in the material, causing a reduction in physical properties. Back pressure need only be high enough to compact the molten material in front of the screw as the screw rotates and retracts; the screw speed need only be high enough to retract the screw before the mold opens. Screw speeds used are generally in the 25 to 50 rpm range. A normal back pressure level should be under 50 psi.

CUSHION

When molding Celanex resins a cushion of 1/16-1/8 inch is recommended.

EXTERNAL LUBRICANTS

Celanex resins are generally supplied containing an internal release agent. With proper mold design and processing condition, problems are seldom encountered in filling cavities or part release during ejection with Celanex. If the maximum draft possible is employed and a wide variety of molding conditions cannot solve filling or ejection problems, then additional external lubricant may be employed.

Acrawax C, at 0.2-0.3% level, should be the only lubricant used with Celanex.

Stearates, such as aluminum or zinc, should not be utilized, as they tend to degrade the polymer, causing extreme losses in physical properties.

REGRIND

Celanex resin has excellent thermal stability during molding, and as such, regrind can be used. Regrind should be free of contamination, combined with virgin resin and dried along with the virgin resin before molding. It is recommended that regrind be combined in the ratio of no more than 25% regrind to 75% virgin. Table XVIII indicates the effect of regrind on properties.

As indicated in Table XVIII a slight decrease in tensile and impact properties is observed with the addition of 25% regrind. This decrease is due mainly to breakage of the glass fibers during molding, grinding, etc. For this reason, the level of regrind should not exceed 25% unless further reduction in strength can be tolerated.

TABLE XVIII

EFFECT OF REGRIND ON PROPERTIES OF CELANEX 2300 NATURAL

	Virgin	25% Regrind 75% Virgin
Tensile Strength, psi	19,500	18,500
Notched Izod, ft.-lb./in.	1.7	1.4
Tensile Impact, (ft.-lb./in.)^2	47	42
Heat Deflection Temp. °F @ 264 psi	403	403

TYPE	GRADE*	DESCRIPTION
Unreinforced	1300A	Unmodified PBT, Super Flow
	1400A	Unmodified PBT, High Flow
	1800A	Unmodified PBT, Extrusion Grade
	1700A	Unmodified PBT, Ultrahigh Molecular Weight
	1602Z	Unfilled PBT, Lubricated
	2000	Unfilled PBT, High Flow
	2000K	Unfilled PBT, Key Cap Grade
	2002	Unfilled PBT, Medium Flow
	2003	Unfilled PBT, Good Flow
	2003K	Unfilled PBT, Key Cap Grade
	2012	Unfilled Flame Retarded Base Resin
Glass Reinforced/General Purpose	1432Z	15% Fiberglass Filled, General Purpose
	1442Z	30% Fiberglass Filled, General Purpose
	3100	7.5% Fiberglass Filled, General Purpose
	3200	15% Fiberglass Filled, General Purpose
	3300	30% Fiberglass Filled, General Purpose
	3400	40% Fiberglass Filled, General Purpose
Glass Reinforced/Flame Retarded	3112	13% Fiberglass Filled, Flame Retarded
	3210	15% Fiberglass Filled, Flame Retarded
	3211	15% Fiberglass Filled, Flame Retarded Copolymer
	3310	30% Fiberglass Filled, Flame Retarded
	3311	30% Fiberglass Filled, Flame Retarded Copolymer
High Impact	1612Z	7.5% Fiberglass Filled, Improved Impact
	1632Z	15% Fiberglass Filled, Improved Impact
	1662Z	30% Fiberglass Filled, Improved Impact
	4300	30% Fiberglass Filled, Improved Impact
	4330	30% Fiberglass Filled, High Impact
Improved Surface Finish	5200	15% Fiberglass Filled, Improved Surface
	5300	30% Fiberglass Filled, Improved Surface
	7632Z	15% Fiberglass Filled, Improved Surface
	7662Z	30% Fiberglass Filled, Improved Surface
Low Warp/General Purpose	J8000	40% Glass/Mineral, Low Warpage and Improved Impact
	LW6443R	40% Glass/Mineral, Excellent Warp Resistance
	6400	40% Glass/Mineral, Warp Resistant Improved Surface
Low Warp/Flame Retarded	7700	30% Glass/Mineral, Flame Retarded and Low Warpage

*All standard Celanex grades are packaged with the suffix "–2" to indicate that an internal lubricant system has been added to facilitate mold release and maximize productivity. Developmental or special products including unlubricated grades are also available. Please contact your nearest sales office for price and availability.
Please refer to CX-4 Bulletin for complete property information.

SYMBOLS

To help identify the most significant material properties for particular end-use applications of Celanex® thermoplastic polyester, the symbols shown below are used throughout this issue.

Electrical properties: arc track resistance and high dielectric strength.

High heat resistance.

Weather resistance.

Chemical resistance.

Typical Properties of Celanex® Thermoplastic Polyester*

PROPERTY	ASTM TEST METHOD	UNITS	3300	1600Z	4300	4510	5700	5300	7300Z	7
Specific Gravity	D792	—	1.64	1.32	1.52	1.53	1.41	1.54	1.42	1
Water Absorption, 24 hr. Immersion	D570	%	0.07	0.08	0.01	0.10	0.08	0.05	0.08	0
Mold Shrinkage Flow Direction	—	mil/in	5	2	5	5	5	5	4	
Mechanical (73°F)										
Tensile Strength at Break	D638	psi	19,000	18,000	18,000	14,000	13,000	19,000	13,000	15
Tensile Modulus	D638	psi	1,400,000	—	1,300,000	1,200,000	—	—	—	—
Elongation at Break	D638	%	3	4	3	3	2	2	4	
Flexural Strength	D790	psi	28,000	26,000	27,000	22,000	22,000	28,000	22,000	20
Flexural Modulus	D790	psi	1,200,000	1,000,000	1,200,000	1,000,000	600,000	1,300,000	750,000	1,20
Compressive Strength	D695	psi	16,000	—	20,000	—	—	—	—	—
Compressive Modulus	D695	psi	700,000	—	900,000	—	—	—	—	—
Shear Strength	D732	psi	8,100	—	8,300	8,400	—	8,200	—	—
Izod Impact Strength: Notched	D256	ft.lb./in.	1.7	2.0	1.9	3.0	1.8	1.5	1.1	1
Un-notched	D256	ft.lb./in.	4.5	—	9.0	12.0	—	8.4	—	—
Tensile Impact Strength	D1822	ft.lb./in.²	47	—	84	65	—	45	—	—
Taber Abrasion	D1044	mg/1000 cycles	40	—	28	42	—	17	—	—
Rockwell Hardness	D785	M-scale	80	80	91	85	—	93	88	9
Coefficient of Friction Against Metal: Dynamic	D1894	—	0.12	—	—	0.19	—	0.13	—	—
Static	D1894	—	0.26	—	—	0.19	—	—	—	—
Thermal										
Heat Deflection Temperature: @ 66 psi	D648	°F	442	432	432	424	—	430	417	42
@ 264 psi	D648	°F	403	—	399	376	—	403	—	—
Coef. of Linear Thermal Expansion	D696	in./in./°F x10⁻⁵	1.4	—	0.9	0.6	—	0.6	—	—
Deformation Under Load @ 122°F, 24 hrs. 2000 psi	D621	%	0.6	—	0.2	1.2	—	—	—	—
4000 psi	D621	%	1.3	—	0.5	4.3	—	—	—	—
Electrical										
Volume Resistivity	D257	ohm-cm	>10¹⁵	>10¹⁵	>10¹⁵	>10¹⁴	>10¹⁵	>10¹⁴	>10¹⁵	>1
Dielectric Strength Short Term .125" Thickness 50% RH, 73°F	D149	V/mil	380	530	550	500	480	530	450	52
20% RH, 73°F	D149	V/mil	540	—	570	520	—	510	—	—
6 weeks water immersion	D149	V/mil	530	—	570	480	—	530	—	—
50% RH, 122°F	D149	V/mil	505	—	550	510	—	510	—	—
50% RH, 250°F	D149	V/mil	360	—	540	500	—	500	—	—
Dielectric Constant 100 Hz	D150	—	3.7	3.7	3.6	4.3	3.7	3.6	3.5	3
Dissipation Factor 100 Hz	D150	—	.002	.008	.008	.004	.002	.002	.002	.0
Flammability										
Underwriters Laboratories Ratings (UL94) @ 1/16"	—	—	HB	HB	HB	HB	HB	HB	HB	H
(UL94) @	—	min. thk. in.	—	—	—	—	—	—	—	—

*All data measured on natural colored products except J638 — values for colored products are generally lower.
†Tensile strength at yield

TI-NHTSA 8144

****
NEXT MEETING:
****

DATE: TUESDAY 3/17
TIME: 3:30
PLACE: CAFETERIA CUBE

ISSUE: Devices calibrated to the "short pin" (actually high calibration base) side of the pin window exhibit loss of continuity at elevated temperature. Problem is believed to be primarily related to thermal expansion/warpage of the base reducing the effective pin length.

DISCUSSION:

Steve reviewed the engineering spec and determined that the only other area of potential concern (besides vibration) is the humidity test, where the base material could change dimensionally when exposed to moisture. Although we don't believe moisture absorption is a concern with the PBT, we will review it with the Celanese rep Wednesday.

About 1% of switches tested 3/13 exceed current 150ms release spec; about the same level of failures in the "continuity" category perhaps due to actuation >10% above the maximum specified. Bill Sweet to re-test at higher pressure. 3/16 switch w/ 7% low in release comp

---

Base calibration check funneled by .5 mils on low end; from +/-2 mils to +2/-1.5 mils. Fallout can be sent back through the machine. Matt will report on results.

SHORT TERM ACTIONS

---

* = NEW ITEM OR COMPLETED ITEM
P = PRIORITY ITEM

OFFSET FOR ALL SWITCHES = .056"
CREEP SPEC = 25 ms MAX'M ACTUATION
150 ms MAX'M RELEASE

P	PROVIDE "SHORT PIN" MATRIX TO S.O. (need 52 to 54 mil offsets)	SELLERS (comp.)
P	HIGH TEMP EVAL'N W/ "SHORT PIN" MATRIX (REPEAT TEMP CYCLE 5 TIMES)	OFFILER
P	REVIEW SPEC	OFFILER comp.
P	REVIEW DFMEA	OFFILER
P	VIBRATION TEST W/52 MIL OFFSET	OFFILER
P	SAMPLE P/C BASE IN ULTEM (BROWN/ULTEM 2200 OR 2300 IF POSSIBLE)	SELLERS/ WALTERS (Natural - ease of both Nyl)
.	COLLECT YIELD DATA PER ABOVE LIMITS FOR REVIEW AT DAILY MEETINGS (include why reject)	SWEET
*	REPORT ON 9.A.M. YIELDS W/TIGHTENED CHECK STATION WINDOW	SELLERS
*	EXPEDITE P-TESTER MODS TO ALLOW DIFFERENT ACT'N AND REL CREEP LIMITS	KOURT. comp.
*	PREPARE TEMP. TEST STATION FOR USE BY 3/16 (operator training needed)	SWEET comp.

SEYMOUR SPECIALTY WIRE COMPANY

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

(203) 888-8778

ANALYSIS REPORT

Customer: Milford Rivet & Machine Co.
Address: P.O. Box 4016
City: Elyria, OH 44035

Date: December 22, 1986
Customer P.O.: 37309
Seymour #: S-54738-1

Material: CDA 260 Wire
Size: .060" Rd.
Specification: W.S. 56/63,000 PSI GR #1/2 Heavy Soap Coat
Conforms to UNS# C26000

Date Shipped: 12-15-87
Weight: 993 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	
2 NO TEST	
GRAIN SIZE AVERAGE	
RESISTIVITY ohms/cm	
CONDUCTIVITY	

TI-NHTSA 8146

Seymour Connecticut

III. TEST PROCEDURES AND REQUIREMENTS (cont'd)

G. Humidity

1. Test Requirements

a. Mount the switch in the test port in a humidity chamber. Currently released mating electrical connector must be installed before start of test.

b. Subject the switch to ten (10) continuous humidity cycles as follows:

(1) Raise temperature to 65 +10/-2 °C over 2.5 hours; at 90-98% relative humidity.

(2) Hold 3 hours at 65 +10/-2 °C at 90-98% relative humidity.

(3) Lower temperature to 25 +10/-2 °C over 2.5 hours at 80-98% relative humidity.

2. Acceptance Requirements

a. Within 15 minutes after completion of the tenth humidity cycle check the switch to sections A, B, C, D, using the procedure established in each section.

b. Nonconformance is defined as any switch not meeting the criteria in sections A, B, C, or D.

H. Salt Spray

1. Test Requirements

a. Mount the switch in the test port in a salt spray chamber. The currently released mating electrical connector and wiring must be installed prior to start of test.

b. Expose the switch assembly to 72 hours of salt spray per ASTM B-117.

2. Acceptance Requirements

a. After exposure, check the switch to sections A, B, C, D, using the procedure established in each section.

b. Nonconformance is defined as any switch not meeting the criteria in sections A, B, C, or D. Samples used for this test must be destroyed after all testing is completed.

Ford PKG. P/C
PV Test
PIST/PIPE

ES Tests: *1660
Repeat Imp. 12
" FL. Resist. 36
" Imp. 12
720

Ford
FAI: 60
90
65 + 2
125 + 1
135 + 2
+ Point
"Base Dim."

K-N FAI: 520-15 Qty 4

TEXAS INSTRUMENTS

Ford P/C
FAI DATA

DIMENSIONAL ANALYSIS ON PART NUMBER

F2VC-9F924-AB

NOTE: MARKED PRINT DENOTES CAVITY # 1A

	BLUEPRINT SPEC	CAVITY # 2A ACTUAL	CAVITY # 3C ACTUAL	CAVITY # 4C ACTUAL	CAVITY # 5B ACTUAL	CAVITY # 6C ACTUAL	COMMENTS
1	11.82 - 11.66	11.68	11.69	11.69	11.70	11.69	
	.45 - .34	.42	.39	.33	.26	.37	
3	19.81 - 19.47	19.62	19.64	19.64	19.66	19.66	
4	16.76 - 16.56	16.62	16.64	16.64	16.64	16.65	
5	3.35 - 3.04	3.31	3.27	3.31	3.31	3.31	
		.79	.79	.79	.81	.79	
		2.85	2.84	2.84	2.84	2.85	
8	8.23 - 8.02	8.16	8.16	8.15	8.15	8.14	
9	21.29 - 21.04	OK	OK	OK	OK	OK	
10	3.39 - 3.29	2.695	2.685	2.669	2.705	2.685	TOOL TO BE CORRECTED

(60)

THE PASS CAR (F2VC-9F924-AB)AND LIGHT TRUCK (F3TA-9F924-AA)SWITCHES ARE PRODUCED OFF OF THE SAME PRODUCTION TOOLING.

THE (F3TA-9F924-AA) FULL DIMENSIONAL ANALYSIS FOLLOWS. DIMENSIONS # 1-10 LISTED ABOVE PERTAIN TO THE POLARITY KEY FEATURE WHICH IS DIFFERENT ON THE(F2VC-9F924-AB) SWITCH.

correct demi # 1 marked on print

60
90 out of spec.
65
125
135

586

+ P/C = 12
+ L/T = 99
= 111

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

P/N-99924-AA

NOTE: MARKED POINT DENOTES CAVITY # 01

BLUEPRINT SPEC	CAVITY # 01 ACTUAL	CAVITY # 02 ACTUAL	CAVITY # 04 ACTUAL	CAVITY # 05 ACTUAL	CAVITY # 06 ACTUAL	COMMENTS
1	13.692	13.629	13.602	13.719	13.646	
2	90DEG +/- 2DEG	90DEG 56MIN	92DEG 01MIN	90DEG 49MIN	92DEG 10MIN	92DEG 27MIN
3	2.669	2.669	2.667	2.699	2.692	TOOL TO BE CORRECTED
4	18.697	18.662	18.691	18.677	18.636	
5	.127	.207	.195	.245	.157	.228 .176 .169 .161
6	.583 .510	.515 .455	.614 .247	.242 .583	1.429 .896	
7	2.900 2.896	2.894 2.894	2.894 2.900	2.901 2.891	2.867 2.894	
8	19.60	19.58	19.61	19.57	19.61	
9	16.566	16.608	16.585	16.585	16.625	
10	13.040	13.036	13.025	12.978	12.958	
11	11.770	11.810	11.788	11.790	11.777	
12	2.935	2.917	2.923	2.920	2.928	
	0.1 A	.004	.013	.019	.004	.032
13	1.387	1.294	1.292	1.328	1.326	
14	11.742	11.672	11.745	11.688	11.737	

(90)

TI-NHTSA 6150

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON "MY" NUMBER

F37A-9F924-AA

	BLUEPRINT SPEC	CAVITY # A2 ACTUAL	CAVITY # C3 ACTUAL	CAVITY # C4 ACTUAL	CAVITY # D5 ACTUAL	CAVITY # D6 ACTUAL	COMMENTS
15	1.24 - 1.25	1.249	1.334	1.337	1.334	1.333	
16	6.66 - 6.81	6.679	6.675	6.680	6.685	6.687	
17	NO FLAG/BARB	OK	OK	OK	OK	OK	
18	7.22 - 7.75	7.549	7.644	7.639	7.654	7.628	
	2.74 - 2.8	3.10	3.10	3.10	3.07	3.07	
20	0.87 - 1.30	1.154	1.094	1.102	1.110	1.104	
21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
22	0.25[illegible] 4(+5)	UNABLE TO MEASURE		BECAUSE	THREADS ARE	ALREADY IN	
	DEG DAMPER						
23	3/8-24UNF-2A	OK	OK	OK	OK	OK	
24	1.10 - 1.40	1.220	1.213	1.220	1.224	1.220	
25	12.5 C	.20	.20	.20	.20	.20	
26	0.16 B	.009	.006	.008	.022	.025	
27	41000 - 43000	MEASURED ON NONDR SECTIONED PIECE					
28	44000 - 50000	MEASURED ON NONDR SECTIONED PIECE					
29	7.82 - 8.03	7.90 7.91	7.90 7.89	7.89 7.93	7.89 7.88	7.86 7.90	
30	1.80 - 2.04	1.784	1.857	1.881	1.907	1.887	

65 +a

TEXAS INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F3TA-9F924-AA

#	BLUEPRINT SPEC	CAVITY # 42 ACTUAL	CAVITY # 43 ACTUAL	CAVITY # 44 ACTUAL	CAVITY # 45 ACTUAL	CAVITY # 46 ACTUAL	COMMENTS
31	9.26 - 9.66	9.55	9.52	9.50	9.50	9.58	
32	8.11 +.04	8.22	8.14	8.15	8.22	8.14	
33	14.21 REF	13.64	13.62	13.58	13.67	13.68	
34	57.15 REF	55.60	55.60	55.55	55.56	55.52	
35	12.75-13.11	12.85	12.86	12.82	12.86	12.89	
36	11.85-12.17	11.76 11.84	11.89 11.91	11.89 11.94	11.89 11.89	11.91 11.94	
37	1.81-2.19 CPL	1.82	2.02	1.82	1.91	1.80	MEAS.SIDE W/O AE\
38	(SEE) - - (SEE) (4pl)	MEASURED ON SEPARATE PAGE - CROSS SECTIONED					
39	31.5 REF	31.62 31.66	32.07 31.72	31.67 31.72	31.58 31.65	31.64 31.79	
40	14.02-14.58	14.221	14.221	14.225	14.222	14.221	
41	3.30 - 3.60	3.420 3.413	3.441 3.429	3.435 3.430	3.434 3.428	3.436 3.421	
42	7.23 - 7.37	7.299 7.281	7.308 7.282	7.294 7.284	7.303 7.286	7.309 7.408	
43	5.58 - 5.80	5.604 5.588	5.641 5.642	5.594 5.563	5.618 5.591	5.612 5.588	
44	71.3059+/-.2059	72059 28MIN	72059 30MIN	72065 30MIN	72059 34MIN	72059 29MIN	
	(2 PL)	72088 24MIN	72065 36MIN	71059 33MIN	72065 43MIN	71088 44MIN	
45	1.42-1.61 3PL	1.595 1.572	1.610 1.581	1.581 1.544	1.595 1.590	1.609 1.588	
46	0.35 - 0.46	.571 .557	.595 .575	.550 .573	.562 .556	.588 .582	
	(4 PL)	.582 .568	.588 .583	.562 .564	.565 .569	.576 .571	

105

+1

TI-NHTSA 8152

TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
508-699-3805 • TELEX 94-7709 TWX 710-348-0552 • CABLE TEXINS

INSTRUMENTS

DIMENSIONAL ANALYSIS ON PART NUMBER

F2TA-9F924-AA

	BLUEPRINT SPEC	CAVITY # A2 ACTUAL	CAVITY # B3 ACTUAL	CAVITY # D4 ACTUAL	CAVITY # E5 ACTUAL	CAVITY # D6 ACTUAL	COMMENTS
47	2.59 - 2.80	L 2.681	L 2.705	L 2.687	L 2.697	L 2.709	
	(2 PL)	R 2.702	R 2.696	R 2.705	R 2.721	R 2.694	
	0.1 B A C	L.021 R.017	L.009 R.075	L.076 R.061	L.061 R.030	L.011 R.154	
	2.468	2.444 2.450	2.465 2.390	2.389 2.384	2.384 2.495	2.476 2.311	
48	0.35 - 0.64	.463 .458	.559 .530	.571 .492	.508 .483	.476 .504	
	(4 PL)	.484 .532	.474 .525	.449 .514	.511 .509	.491 .509	
49	0.86 - 1.17	.987 .993	.939 .962	.968 .989	.990 .953	.987 .935	
	(4 PL)	.943 .951	.954 .959	.975 .923	.935 .934	.960 .974	
50	45DEG +/- 2DEG	44DEG 49MIN	43DEG 50MIN	45DEG 39MIN	45DEG 26MIN	43DEG 58MIN	
	(6 PL)	44DEG 47MIN	44DEG 45MIN	44DEG 40MIN	44DEG 39MIN	45DEG 5AMIN	
		45DEG 13MIN	44DEG 37MIN	44DEG 11MIN	45DEG 12MIN	45DEG 54MIN	
		45DEG 04MIN	45DEG 20MIN	44DEG 44MIN	44DEG 23MIN	44DEG 20MIN	
51	8.30-8.72 3PL	8.342 8.459	8.352 8.423	8.364 8.499	8.365 8.429	8.305 8.392	
52	2.15-2.42 3PL	2.180 2.220	2.198 2.153	2.169 2.219	2.164 2.170	2.149 2.194	
53	23DEG +/- 2DEG	24DEG 22MIN	24DEG 10MIN	24DEG 47MIN	24DEG 17MIN	22DEG 37MIN	
	(2 PL)	22DEG 38MIN	23DEG 41MIN	22DEG 50MIN	23DEG 04MIN	23DEG 59MIN	
54	COLOR BLACK	OK	OK	OK	OK	OK	
55	13-19DEG 3PL	ON CHART	SECTIONED	PART ON	PRINT		
%	0.46 - 0.87	ON CHART	SECTIONED	PART ON	PRINT		
57	0.10 - 0.31	.252 .278	.287 .251	.276 .260	.287 .260	.280 .257	
58	0.58 - 0.68	.625 .646	.646 .621	.648 .622	.656 .622	.64- .626	

TI-NHTSA 8153

135 42

PIST

72 x 4 = 288

36

36

36

66 x 4 = 264

660 - ES Tests

Original FAI (complete)
on P/C to TI pit:
scaled down to K-M
pit

Test plan for special guest Disc

1. Disc curves: 24 discs each type
2. Sensor curves: 24 sensors e.t
3. Device build: non preload, 24 devices e.t
4. Impulse test:
5. Vacuum sensitivity
6.

1. [illegible] (Fuel Supply - AB)

* 12/13/91 - Successful fail of P/ test (Engine 2)

* Mat Select - Spec change [illegible] T/S transit shell. Direction from Haiti due to AVH

* ES date does transmittal: 12/16/91 [illegible]

2. Engine:

* Package - Add fifth Power Group # PM on Trans

* Pump, Power Fuel, ES Gas Tank, Thermostat, Fuel Lines, Air Valve, Access Window, Nut, Position Gluten Tank of Rear

3. Tank & Hose on [illegible]

* Tank [illegible]

4. Use to Gabriel for [illegible]

5. Gas [illegible] - [illegible] Spl.

1. TIRE + ROAD ISSUE

- TRANSITION FROM 615 → MICHELIN WHICH INCLUDED CHANGING A LOAD TO X-REP BOXES THAT WERE MOVED TO DSC (DATA SOURCES CENTER)
  - CALLED 316 (9.50R 5/12), FAILED IN TEXAS & REJECTED A COMPLETE INVESTIGATION PER GL 119.
    - CLIFF (10TH GRADE)
    - LOOKING FOR 'A IMPULSE DATA
- COORDINATORS FOR TRANSITION:
  - RUSSELL CHARLES
  - NORA NUNEZ (1716)
  - LOU MAYNOR - ARRANGED RECORD RETENTION EARLY 90'S
  - CELESTE ARNOLD (LO)
  - BOB DEMERS #0691
  - DIANE 823-1135
- TYPICAL LIFE (RETENTION PERIOD) HAS BEEN 2 YEARS
  - OFFICIALLY ISO GUIDELINE IN MID-90'S 1½ TO CLOSE FROM HOLDING TIME AND EARLY TYPE OF COMPLAINT
- RUNS RECALL = 250,000 VEHICLES @ $100/VEHICLE LOOKING FOR A SHARED LIABILITY

2. AIRBAG SWITCHES
   - CAUTION TEST
   - INITIAL ACTIVATION (CALIBRATION)
   - CALIBRATION OVER TEMP
   - IMPULSE TO FAILURE
   - REJECT SAMPLES

3. SIR - O-RING LOAD Q
   - INVENTORY ~ 15%

4. TIRE OTP ESTIMATE

5. LEAK TEST:
   - ANYTHING UNDER 95% THAT ANOTHER LOOK ON TIRES

3-4 MOS

I. PASS-CAR, 57PS MY 92 MRD 6/01

ACT 125PSI ± 35 → NEW CUP
REL 20 MIN

OFFSET POLARITY KEY → 46912 MOLD MOD

COLOR - GRAY

ALUMINUM C/R.

HEXPART - SAE J512 INVERTED FLARE

3-4 MOS

II. LITE TRUCK 57PS MY 91.75 MRD 4/91

ACT 2501 50 → STD 57 SENSOR
REL 90 MIN

CTR POLARITY, BLACK

ALUMINUM - C/R

HEX - J512

III. PASS CAR 77PS PERM. MOD DESIGN

NEW SWITCH ASS'Y (ANDY McKENNA)

SENSOR SAME AS I. ABOVE

→ FULLY AUTOMATED ASM'T.
POLARITY KEY, COLOR, AS I ABOVE

IV. LITE TRIC 77PS PERM. MOD. DESIGN

AUTOMATED SW ASS'Y III ABOVE
SAME COLOR, POLARITY KEY AS II ABOVE

SENSOR STD 57PS

CCPS QUALITY ASSURANCE START-UP REQUIREMENTS

ACTION	DATE REQUIRED
REVIEW & UPDATE 57PS QAS/CHARACTERISTIC SHEETS	2/28
DESIGN FMEA	
START	????
COMPLETE	4/16
PROCESS FMEA	
START	????
COMPLETE	7/1
DEVELOP 77PS QAS (PRELIMINARY)	7/1
DEVELOP 77PS CHARACTERISTIC SHEETS	7/15
COMPLETE GAGE R&R STUDIES FOR ALL 77PS GAGES	7/15
ESTABLISH 77PS MANUFACTURING CONTROL PLAN	7/15
FINALIZE 77PS QAS	8/1
SUBMIT 77PS ISIR	8/1
ESTABLISH 77PS START-UP INSPECTION REQUIREMENTS	8/15
SET-UP 77PS SPC FILES	8/15

77PSL2-1 Pre-Launch Control Plan

- Pilot 24 pieces
  - Normal piloting procedures
  - Impulse (5) devices
  - Function Test (4) devices

- Build Sensors
  - Increase SPC on the Kapton stations from once every 4 hours to once every hour

- Build Final Devices

- 100% Function Test
  - Actuation
  - Release
  - Creep
  - Millivolt Drop

- Leak test full devices
  - First lot 100% - 2000 pcs
  - 10 pieces from each subsequent tote of 200 pcs – 100 pcs / lot
  - Total tested for first 50,000 pcs = 4,400 pcs

- 200% visual inspection for correct base and bexport
  - Done at Pressure Test and Packing

- Inspect 10 pcs from each box at packing with mating connector

- Inspect 10 pcs. from each box at packing with 3/8"-24 go/no-go ring gauge and torque wrench set at 4.5 in-lbs.

Ford Cpk/Cp : (77PS + 57PS)

Team decision was not to use APT SPC files because data is based on master.

In reviewing print outs from production run data, it ends up being sorted product, which is also not acceptable.

Suggestion to start separate SPC files, using a 5 (?) pc prod. sample, is the next idea.

Please consider this.

Thx -
Elaine

__ Quotation Level __ Initial Production Level

HILITE INDUSTRIES INC.

HILITE MANUFACTURING FEASIBILITY SIGN-OFF

SUPPLIER TEXAS INSTRUMENTS INC.
CUSTOMER [redacted]
PART NUMBER & REVISION 82VC-9P924-AB
CUSTOMER PART NUMBER & REVISION 77PSL8-1

DEFINITION:
Manufacturing Feasibility is the mutual agreement between product engineering, manufacturing, the supplier, and assembly activities that a proposed design can be manufactured, assembled, packaged and shipped at an acceptable level. A feasible design must permit meeting production volumes and schedules, consistent with the ability to meet engineering requirements and program quality, reliability, investment cost, unit cost and timing objectives.

FEASIBILITY CONSIDERATIONS:
The following list, not intended to be inclusive, identifies major questions which should be considered in performing a feasibility evaluation. The data provided in this request should be used as a basis for analyzing your ability to meet all the specified requirements. Negative answers to the questions must be supported by comments identifying your concerns and/or proposed changes to enable you to meet the specified requirements. Comments, as appropriate, may also be requested on other pertinent considerations not mentioned below. If you require additional space for comments, use an attachment to the form.

YES	NO	CONSIDERATIONS
✓		Can the part be manufactured as specified on the attached drawings? . Compatibility of specifications to accepted manufacturing standards. . Containability of tolerance stack-up. . Special equipment requirements. . Adequacy of part definition to enable feasibility evaluations.
✓		Can you meet the Engineering Specification (ES) as written? . Containability of all ES requirements.
✓		Can you meet the quality control requirements of Q-101? . Establishment of process capability at required volume levels. . Maintenance of required quality system controls.
✓		Can you meet all specified requirements at the projected volume levels? . Adequacy of capacity.
✓		Does the design allow use of conventional efficient material handling equipment techniques? . Attainability of shipping densities.
✓		Can the part be manufactured without incurring any unusual costs (capital equipment, tooling or piece costs)? . Product improvement proposals. . Cost reduction alternatives.
✓		Can you maintain production capacity on the related part until incorporation of new/revised design (for current suppliers only)?

FEASIBILITY ASSESSMENT:

__ Feasible – Part can be produced as specified with no revisions.
__ Changes Required – Design revision required to produce part within the specified requirements.
✓ Changes Recommended – Feasible but can be improved or less costly if proposed revision is incorporated. Note change revision reverse side.

1671 S. Broadway Carrollton, TX 75006 P.O. Box 614649 Dallas, TX 75261-4649

Impulse Testing PC086

* Impulse Test is to monitor:
  - Disc Cracking issue
  - spring breakage issue
  - Post functional / performance

* Recommendations

- Q.C. Submissions

(1.0) 1 devices per lot for functional test per
ES-F2VC-9F924-AA (or 9F924 ES spec.) 77PS
F37A-3N824-AA 3N824 ES spec 77PS

actually higher freq than 3N824 ES.

(2.0) 3 devices each quarter for impulse durability test per ES standard.

(3.0) 5 devices per operating day as follows, or upon major/minor workstream changes:
- BASE ASSY's newly mfg. that day.
- 87PSE 9-9 Sensor Assemblies (worst case)
- offset calibration TBD by engineering.
- Devices must pass functional evaluation to 87PSE 9-2 defaults prior to submission.
- Failures to engineering

= Q test
= Rivet
= Push sw

(4.0)

PRESSURE SWITCH DATA Form 21605 **TEST NO.** [illegible]

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
[illegible]	[illegible]	[illegible]	

PERFORMED BY	DATE STARTED	DATE COMPLETED	APPROVED BY
[illegible]	[illegible]		

PROJECT TITLE: [illegible]

CUSTOMER:

PURPOSE OF TEST: [illegible]

PROCEDURE: [illegible]

[illegible]	[illegible]	[illegible]	Initial Act/Rel	MAGNET	Final Act/Rel				
[illegible]	[illegible]		131/106		127/96				
[illegible]			131/107		129/97				
[illegible]			132/102		132/100				
[illegible]			137/103		128/93				
[illegible]			139/99		132/98				
[illegible]	[illegible]	[illegible]	133/98	*	127/99				
			125/89		119/91				
			126/97		111/97				
			123/97		125/100				
			114/85		111/86				
	[illegible]	[illegible]	120/90		117/88				
			120/88		117/90				
			120/87		118/87				
			123/92		124/96				
			117/88		114/86				
[illegible]	[illegible]	[illegible]	253/193		247/192				
			252/191		250/193				
[illegible]			242/187		235/171				
[illegible]			264/199		252/194				
[illegible]			270/194		259/178				

TI-NHTSA 8165

COPS

George R 57 in VA58 (Lunch)

F-series/Econoline Rebound 1/77 (mypg?)
Econoline 57 → Wkly Lunch 77
VAN 88 (Bill)
77

→ Mike Tim L → to assy plant

→ TBD ; may be candidate.

P/C - mtg on prop value 10' from horizontal ⇒ to block the switch
- ABC → mtl switch projection
- Mike - same fitting @ master cylinder mtg

FN-94 } mypg5 — switch was probably to plug a master cyl.
VAN 01 } → Bruce ; for this time period, we should be thinking about a switch (assembly or pedal) with switch, wire harness fitting to pedal
→ hexcap ; shorter connector

L/T JD1 is Sep 03 VN 55

L/T - Lorrain has produced 10 vehicles (1pp's)
- will produce ~ 800 through Aug.

mypg2 (L/T) Econoline is 190K/yr vehicle ; 3/4 gets the switch
with switches → assume would pull.

mypg3 FN-56 (P/C) is about 12K/mo to C491.

→ close w/ Gary Klingler.

- Lee does not know about 20K pcs needed by Hitch Shed.

"T" - fitting is for L/T ; mypg2 ; Tim L ; "T" from switches (both styles) to new plant ; maybe master fitting

77PS

(1)

George Randall
Bruce Rasar

- We received an program [illegible] position improvement. We are currently able to center the Z dimension to ~~within~~ ± 0.0025" ~~of~~ the other terminal is being worked on, and needs to remain a priority. Joe and I got the impression that ~~the~~ Bruce and George would provide further [illegible] dimensions if required after we complete our tooling changes.

- We are continually approved for 57 PK and CT, and cannot ship parts until we get full approval. (The only open issue being terminal position) & get a duration of shipment ~~before~~ Both made it clear that they [illegible] want to ~~change~~ deviate parts on a vehicle level. We need to do everything we can to submit [illegible] The JSR for this - [illegible] parts in 2 weeks.

- We discussed swivel mounting location for future C/T and PK vehicles; our interest was in the Takico (mpg's) which would move the PC to the master cylinder and ~~the~~ make it a Tier 1 Supplier to GT.

Steve at Takico is working on a swivel unit for the C/T. Bruce said it's likely that ~~it~~ some P/C [illegible] will go to a swivel unit installed in the for MY95.

FN-71, VN101

- will not accept parts w/ out jaw chamfer
- Bruce → check the counter bore depth on the parts with the ... we made ... some ...
  → Steve f/u with Bruce

- Discussed term parts w/ wrong ...
  ~~Bruce~~ → keep parts

George wants a test run:
- Check Pressure on a switch

→ What is the new date to start 77 ft c/r.

Disc Life Test

- six test lots:

PC	23.48 / 11.51	.0103 P
PC	21.25 / 11.52	.0102 P
LT	29.96 / 12.75	.0103 P
LT	27.9 / 13.1	.0102 P
PC	23.81 / 10.4	.013 NP
LT	29.04 / 12.42	.013 NP

- Characterize five discs
- hand-build into devices
- Characterize devices (no proof)
- Give to production for testing per their standard procedures and personnel.
- Re characterize devices
- Disect and recharacterize discs

9/8/10

JEFF –

DISC TEST: SIX TEST LOTS

TOTAL, AS FOLLOWS:

PC	LOW END	.0102 P } MATT HAS DISCS
PC	HI END	.0102 P
LT	LOW	.0102 P
LT	HI	.0102 P
PC		.013 NP } JEFF HAS DISCS
LT		.013 NP

SO

Device #	act rel	Mu Dop	Current leak	3000 Hz Leak	act rel				
2SC-[illegible]-10	124 107	2.7	✓	✓	121 111				
-10	129 97	3.9	✓	✓	131 110				
-11	133 115	2.9	✓	✓	130 112				
-12	101 [illegible]	2.3	✓	✓	123 [illegible]				
-22	115 99	6.6	✓	✓	100 97				
-23	137 115	3.8	✓	✓	138 118				
-25	120 106	3.8	✓	✓	130 116				
-36	130 101	3.1	✓	✓	138 100				
-37	125-112	3.6	✓	✓	123-102				
-38	130-114	6.8	✓	✓	127-105				
-39	134-112	6.7	✓	✓	126-108				
-40	131-113	8.0	✓	✓	129-110				
-41	125-111	7.2	✓	✓	122-106				
-42	126-112	5.6	✓	✓	126-107				
-43	127-113	5.7	✓	✓	124-108				
-44	125-111	5.5	✓	✓	122-99				
-45	138-123	7.7	✓	✓	125-115				
-46	133-116	7.0	✓	✓	130-108				
-47	131-117	8.0	✓	✓	129-105				
-48	126-112	4.6	✓	✓	122-105				
-49	127-98	8	✓	✓	116 98				
-50	129-100	5.6	✓	✓	129 100				
-51	126-108	2.6	✓	✓	127 98				
-52	130-105	1.7	✓	✓	130 101				
-53	130-102	2.9	✓	✓	128 102				
-54	126-108	1.1	✓	✓	125 97				
-55	138-117	1.3	✓	✓	135-100				
-56	132-120	1.2	✓	✓	130-115				
-57	134-123	1.2	✓	✓	134-108				
-58	135-121	1.9	✓	✓	131-113				
-59	130-118	2.7	✓	✓	127-114				
-60	140-128	1.7	✓	✓	136-120				
-61	134-117	1.5	✓	✓	134-120				
-62	131-104	2.8	✓	✓	130-114				
-63	137-115	2.6	✓	✓	138-120				
-64	135-109	2.6	✓	✓	128-113				
-65	127-107	2.8	✓	✓	130-104				
-66	129-105	3.1	✓	✓	129-110				

PRESSURE SWITCH DATA Form 21605 TEST NO. _____

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
PERFORMED BY	DATE STARTED	DATE COMPLETED	APPROVED BY

PROJECT TITLE:

CUSTOMER:

PURPOSE OF TEST:

PROCEDURE:

771563-1

Final Characterizations

Device #	act. rel	Mv Dep	Current limit	Zero off reset	act. rel
247.15.01	131 104	38.6	✓	✓	128-100
-02	128 97	29.4	✓	✓	122-105
-03	130 103	30.6	✓	✓	119-108
-04	129 101	33.0	✓	✓	127-104
-05	135 108	35.2	✓	✓	132-110
-06	127 95	32.1	✓	✓	117-99
-07	130 103	45.6	✓	✓	128-105
-08	124 99	17.2	✓	✓	122-103
-09	124 96	34.3	✓	✓	103-105
-10	122 108	26.5	✓	✓	120-101
-11	127 99	25.9	✓	✓	126-105
-12	125 100	41.8	✓	✓	125-105
-13	128 109	4.3	✓	✓	138-115
-14	124 92	2.7	✓	✓	119-95
-15	125 109	2.8	✓	✓	136-115
-16	136 111	2.9	✓	✓	136-120
-17	134 107	2.6	✓	✓	133-116
-18	131 99	2.2	✓	✓	132-105
-19	133 99	2.7	✓	✓	130-115
-20	134 97	3.5	✓	✓	130-111
-21	142 110	4.7	✓	✓	140-122
-22	132 107	5.1	✓	✓	132-110
-23	133 108	3.0	✓	✓	135-116
-24	135 103	2.5	✓	✓	136-114
-25	131 105	2.1	✓	✓	129 110
-26	124 112	5.0	✓	✓	115 109
-27	138 117	3.1	✓	✓	127 114

TI-NHTSA 8172

PST 209	21	501.930	0.615	501.064	0.796	498.524	1.299			
PST 219	21	505.320	0.595	504.399	0.777	501.812	1.286			
PST 248	24	—	—	—	—	—	—			
N-1	9	510.181	0.029	480.112	0.043	480.100	0.046			
N-2	15	483.409	0.029	483.332	0.045	483.306	0.050			
N-3	16	479.141	0.268	478.738	0.362	477.948	0.526			

GENERAL THOUGHTS

I AM NOT HEAVILY CONVINCED THAT THE DISC ITSELF IS THE SOURCE OF THE NOISE. IT SEEMS THAT THERE ARE SEVERAL POSSIBLE SOURCES THAT WE HAVEN'T FINISHED CHECKING OUT YET.

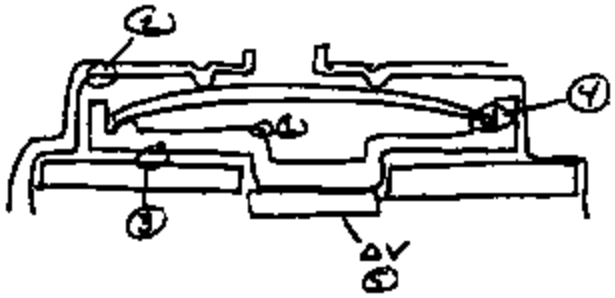
1) IMPACT OF THE DISC TO THE CONVERTER ON ACTUATION. THE IMPACT IS THEN TRANSMITTED THRU THE CONVERTER TO THE FLUID. (THE DISC ISN'T TOUCHING ANYTHING ELSE AT THIS POINT). THERE ARE WEAR MARKS IN THIS AREA SO PARTS MUST HAVE COMPLETED LIFE TEST. ON PAPER THE DISC DOES NOT IMPACT BUT IN REALITY THE DISC OVERTRAVELS BEFORE REACHING THE FINAL RESTING POSITION.

2) CONVERTER IMPACTS THE CUP ON ACTUATION. THE ENERGY IS TRANSMITTED THRU THE CUP TO THE WASHER. THE WASHER VIBRATES AXIALLY SENDING THE SOUND DOWN THE HYDRAULIC FLUID. THERE ARE WEAR MARKS ON LIFE TEST PARTS. UNKNOWN IF FROM TOP OR OVERPRESSURE. PROBABLY BOTH

3) ON RELEASE THE CONVERTER IMPACTS THE WASHER

4) THE DISC TRANSMITS ITS ENERGY TO IT'S EDGES WHEN IT SNAPS, THE ENERGY THEN TRANSMITS THROUGH THE CONVERTER. THIS FITS BEST WITH THE LOW DIFFERENTIAL DISC IMPROVEMENT BECAUSE A LOW DIFFERENTIAL DISC WOULD ALSO HELP 1, 2, 3 BECAUSE OF LOWER CROWN HEIGHT & LOWER KINETIC ENERGY.

5) THE SUDDEN MOVEMENT OF THE CONVERTER CAUSES THE FLUID TO VERY RAPIDLY FLOW INTO THE INCREASED VOLUME. IF THE FLOW RATE IS HIGH ENOUGH IT CAN GENERATE SOUND EVEN IF THE VOLUME IS SMALL. SINCE THE CONVERTER PROBABLY MOVES "DIP" IN SEVERAL MILLISECONDS THIS SEEMS LIKELY. IN THIS CASE THE SNUBBER WOULD HAVE SOME EFFECT BECAUSE OF REDUCED FLOW RATE.



Acoustics

There is two methods that sound can couple to the master cylinder. The first is through the metal to metal coupling from the disc all the way to the master cylinder. The second is through the fluid itself. Your test with the rubber hose would seem to indicate that it is through the fluid & not the metal. This fits with acoustic theory because the resistance of metal to sound is greater than the resistance of fluid. So even if a metal couple exists the sound will tend to travel through the fluid. Acoustic resistance to sound is a complex impedance just like electronic impedance.

steel	=	39×10^6 kg/m²s (MKS RAYL)
motor oil	=	1.45×10^6 RAYLS
rubber	≈	$.06 \times 10^6$
air	=	428×10^0

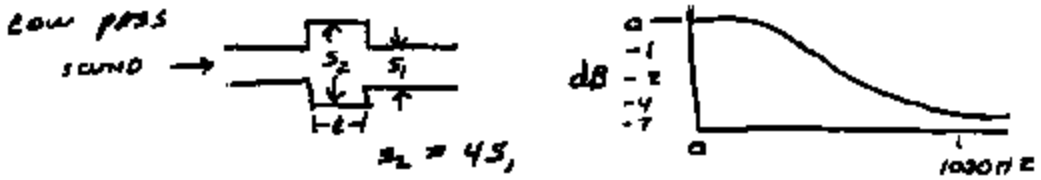
Resistance of steel is 30 times that of oil

impedance $Z = \pm \rho_0 c$ for a plane wave

ρ_0 = equilibrium density
c = wave (sound) velocity

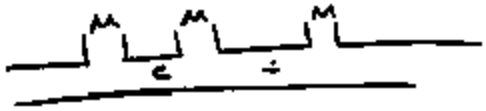
plane (rather than spherical) are commonly produced by a piston vibrating at one end of a fluid filled tube. this make the analysis easier.

if the sound is really traveling through the fluid then it is possible to build a sound filter if we know the frequencies to be filtered. a simple low pass filter can be built by changing the diameter of the pipe



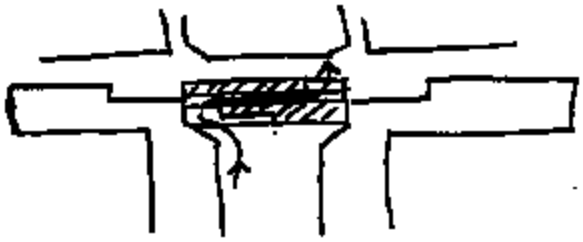
this is the theory behind mufflers & gun silencers

high pass



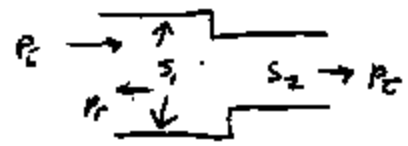
C = acoustic compliance (capacitor)
M = acoustic inertance (inductor)

using these ideas we maybe able to build a simple filter into the part



we have slot of width & length to play with. several plastic parts may use the trick. I built one slot like mine. it had no effect but it may not be tuned to the right frequency. that's why the spectrum analysis could be important. I am sure GM has an acoustic expert who could help us with the filter design.

SNUBBER (ORFICE)



IF WAVELENGTH IS LARGE COMPARED TO DIAMETER OF HOLE THEN THE SOUND POWER TRANSMISSION COEFFICIENT IS

$$\alpha_c = \frac{4 S_1 S_2}{(S_1 + S_2)^2}$$

SOME ADDITIONAL THOUGHTS

YOUR COMMENT ABOUT FEELING THE SOUND IN THE PEDAL IS INTERESTING. DO YOU ACTUALLY FEEL A MOTION. IF SO THEN IT'S PROBABLY DUE TO THE SUDDEN INCREASE IN THE FLUID VOLUME WHICH WOULD POINT TO #5 AS THE PROBLEM.

WE MAYBE ABLE TO SEPERATE MECHANICAL COUPLING FROM FLUID COUPLING BY PUTTING AN ACCELEROMETER ON THE SWITCH OR MASTER CYLINDER AND COMPARING TO THE MICROPHONE PICK UP. IF THERE ARE ALREADY COUPLES TO THE FLUID THERE SHOULD BE VERY LITTLE VIBRATION. IF THE NOISE IMPACTS THE SOME PART THE ACCELEROMETER SHOULD SEE IT. I TRIED DETECTING THE SWEEP ON THE MIC CALIBRATION SOUND WITH A 2Kg ACCELEROMETER MOUNTED ON TOP OF THE CAMRY PEDAL. I DID NOT DETECT ANYTHING. PROBABLY BECAUSE THE ACCELEROMETER ONLY MEASURES TO 1 KHz - WE NEED TO TRY A PIEZOELECTRIC TYPE THAT CAN MEASURE TO 50 OR 100 KHz.

USING RIGID BRAKE LINE BETWEEN ME AND SWITCH YOU MAYBE ABLE TO BUILD AN ACOUSTIC FILTER BY TWISTING IT INTO A COMPLEX SHAPE SUCH AS A Z. THIS IS A HIT OR MISS PROPOSITION.

THE SPECTRUM ANALYZER USED FOR TESTING SHOULD BE ABLE TO MEASURE TO 25KHZ OR BETTER. YOU CAN'T USE A SCOPE. IT'S TO SLOW. HUMANS CAN HEAR FROM 20 TO 15,000 HZ

		LAB				IROD.				DIFF.	
		1 ACT	2 REL	3 DIFF	4	5 ACT	6 REL	7 DIFF	8	8 ACT	REL
L4	2	149	153	36		136.4	118.5	12.9		12.6	9.5
L9	4	151	121	30		140.3	116.7	23.6		10.9	4.3
P5	6	130	105	25		117.4	99.4	18.0		12.6	5.6
P6	8	128	103	25		116.1	96.6	19.5		11.9	6.9

EFFICIENCY LAB - 22.203

THESE ARE TAKEN AT VERY SLOW RAMP RATES, WITH RELEASE TAKEN AFTER ATTAINING A PRESSURE ~2K ACTUATION

CALCULATED AREAS (in^2)

	ACT	REL	
L4	.0629	.0647	LAB - BUILT (DALE)
L9	.0623	.0656	
P5	.0707	.0745	IROD BUILT
P6	.0715	.0739	

TI-NHTSA 8179

P/N E7SC-3N824-AA

ACT Spec. 350-450 psi

REL " 120 min Diff 50 min.

ACT	REL
378	168
431	152
414	162
412	154
401	158
413	132
371	165
388	160
379	157
366	172
422	164
425	154
427	136
365	159
436	146
412	164
414	165
423	131
430	155
410	150

20 →

TEXAS INSTRUMENTS

TO: JOE JORDAN
FR: CHARLIE DOUGLAS

SJ: FORD SPEED CONTROL DEACTIVATION SWITCH

F2VC-9F924-BA IS THE SWITCH WE WILL START PRODUCTION WITH. WITHIN 3-6 MONTHS OF JOB 1, WE WILL CONVERT TO F2VC-9F924-AA. CURRENT PRICING (WHICH WILL PROBABLY CHANGE BY +/- $.10) IS AS FOLLOWS

F2VC-9F924-BA ... $ 3.11
F2VC-9F924-AA ... $ 2.19 } PRODUCTION PRICES

TOOLING IS PAID FOR BY FORD. ISIR FOR THE BA SWITCH WILL OCCUR DECEMBER/JANUARY WHILE FOR THE AA SWITCH IT WILL BE JUNE/JULY. SINCE THE MAJOR DIFFERENCE BETWEEN BA AND AA IS PROCESS (MANUAL VS FULLY AUTOMATED), I WOULD NOT EXPECT PITTC TO HAVE TO PERFORM 2 ISIRS AS TI WILL HAVE TO (HOWEVER, AS I STATED, YOUR QA DEPT. WILL HAVE TO CLOSE WITH FORD ON THIS ISSUE).

JOB 1 FOR TI IS CURRENTLY SCHEDULED FOR LATE MAY EARLY JUNE 1991. IF YOU NEED ANY ADDITIONAL INFORMAT PLEASE LET ME KNOW

REGARDS, CHARLIE

PH # (508) 699-3637
FAX # (508) 699-1548
TEXAS INSTRUMENTS INCORPORATED • 34 FOREST STREET • ATTLEBORO, MA 02703
508-699-4800 • TELEX 214801 • CABLE TEXINS