MSG PCQA PCQA PCQA MFPC MFPC PCME PRK1 PCME SH2 ZARN KA2 RCS2 AETL MAPA

Memorandum

May 2, 1991

TO:	Ted Brediken	MFPC	Donna Moynihan	PCQA
	Dick Gariepy	MFPC	Elaine Rose	PCQA
	Stan Homol	SH2	Matt Sellers	PCME
	Paul Kotch	PRK1	Rusty Struble	RCS2
CC:	Dave Czarn	ZARN	Andy McGurik	PCQA
	Bill Sweet	PCME	George O'lear	AETL
FM:	Jim Watt	PCQA		

SJ: P.N. 27373-3 Elco Hexports Salt-Spray Test Results
On Recent Discrepant Plating Condition

The 96 hour salt spray testing has been completed on (24) 27373-3 hexports built into pressure switches.

Specifications GM 4290 and GM4252 (plating) indicate that post salt-spray results have " no base metal corrosion ". These GM specifications are referenced in GM print no. 10029288 current issue.

Though the 24 test units showed evidence of base metal corrosion, the existing crimp ring corrosion condition far exceeds the base metal corrosion evident on the hexports tested. Therefore, the level of discrepant plating on the hexports tested were accepted at this time. The long range hexport resolution would be to avoid Elco's current undesirable process of rerolling the threads. I believe the thread lead-in change is being pursued to eliminate the thread rerolling need.

Actual test samples, post and pre salt-spray testing, as well as photographs will be in the QRA office, MS 12-27, for future reference, if needed.

Please let me know if anyone has any questions on the test results.

Regards,

Jim ext. 1719 msg: PCQA

SAMPLE ORDER

ORDER NO:

REQUEST DATE:

CREDIT ACCOUNT:

COST CENTER:

PRODUCT CODE: 45

CUSTOMER: FORD MOTOR COMPANY

CUSTOMER P.O. NO: 47-X-U54023

TI PART NO: ~~TPS61~~ TPS61 2-1

CUSTOMER PART NO: F2VC-9F924-AB

QUANTITY: 15

PRICE: $8.00 EA

DELIVERY PROMISED: 5/03/91

SPECIAL INSTRUCTIONS:

BILL TO:
FORD MOTOR COMPANY
P.O. BOX 1704
DEARBORN, MI 48121

SHIP TO:
FORD MOTOR COMPANY
1800 BAILEY AVE
DEARBORN, MI 48124
ATT'N: DEBBIE NEWMAN

PRODUCTION SAMPLES

XX ENGINEERING DEVELOPMENT SAMPLES

CC: ENGINEERING: STEVE OFFILER

PRODUCTION CONTROL: MARIE CROSSLAND

SALES ENGINEER: JOE SCHUCK

HIGHLIGHTS
Stephen B. Offiler
Week Ending 91-05-03

cc: Dennis M. Fyfe/Gr.

FORD MY'92 ELECTRONIC SPEED CONTROL DEACTIVATE PR

CUSTOMER ISSUES: Joe Schuck has had meetings recently with the new Light Truck players, John Pelkey and Neru Modi. Some concerns were raised over the changes to the J512 spec; Joe responded by putting them in contact with Bruce Pease, and I have sent a copy of the tolerance relaxation report. Joe continues his efforts to win over Modi, who at present is still not a TI ally. He has been asking specific questions related to disc characteristics, which Joe is handling carefully so as not to aggravate him, yet not disclose too much of our proprietary information. I have sent Joe hand-sketches of a map-disc curve and an incipient curve which were purposely not overly accurate in detail, and furthermore marked them with the TI Proprietary Information stamp. The quiet devices we sent George Randall, using lab-developed incipient discs, have been a huge success; both Pass Car and Light Truck are planning on requiring this type of switch action for 77PS production. I have sent Joe a rough idea of the revalidation efforts required for a disc change, as called out in the ES. Thirty-six devices must undergo calibration, proof, vibration, thermal cycle, impulse, burst, and vacuum; this would take roughly two weeks to complete.

PRODUCTION ISSUES: As reported last week, surface cracking of the known burst has been an issue. Work has been ongoing to understand the magnitude of the problem, using dye penetrant to assess the extent of the cracks. Cracked devices have been impact tested, using the production test fixture also used for in process inspections per the ES, then examined with dye. The worst cracks seen to date extend through roughly 20% of the material thickness. We plan to thermal cycle some devices to get a better handle on the long-term effects; time constraints and equipment are delaying this activity. Presently, parts are individually inspected, and the cracks considered minor are being allowed to ship.

Issues related to on-line in-process inspection have begun to surface. Most significant is the failure of one device (out of four) during burst testing. While this device actually passed the requirement of the ES, which is holding 7000 psi for 30 sec. without leakage, upon release of pressure the cup crimp was found to have loosened. We reacted immediately by running three lots of six devices each on our own burst test as follows: hand-line parts with steel crimp rings, hand-line parts with aluminum crimp rings, and AMI parts with steel crimp rings were held at 7000 psi as in the ES, then pressure was released, then the parts were pressurized all the way to failure. The failure results were analyzed with Weibull techniques. Please note that none of the 18 failed after the 7000 psi portion of the test; the one failed device that caused this effort appears to be a fluke. We found the weakest to be the hand-line parts with aluminum crimp rings, which have a 7325 psi burst using Ford's requirement of 72% reliability at 90% confidence; next are the hand-line parts with steel crimp ring at 7985 psi; finally, the AMI parts could not be included here because they were so good that we could not get them to fail at the limits of our equipment, 9400 psi. Other than this burst issue, we have found that some inspection equipment needs modification. The gage on the burst equipment only goes to 5K; a 10K gage is needed. The pressure device itself is good for 10K. The manual check station also needs modification. It's programmed pre-cycles do not fall low enough to allow release of the Pass-Car device, and its ramp rate is too fast to catch actuation.

DESIGN ISSUES: The second-pass 77PS contact test has been completed successfully. Jeff found a malfunctioning load which was apparently responsible for the poor results of the first-pass test. Of the twelve devices, the six that were pinned normally looked excellent, while

the six planned to give very low contact gap still looked very good. No evidence of erosion, no perforation of the silver plate, and no significant millivolt drop change was observed.

Ted Ballard has delivered a total of six lots of low-differential discs, with various levels of differential ranging from 5.3 down to 1.4 psi. We have characterized the first, 5.3 psi lot, and found minimal snap sound on the finished sensor. However, the downside is a loss of throw, from about .012" useful range on a standard sensor to about .008" on these quiet devices. Ted reports that pre-heat-treat, these discs have quite a bit of differential hence they can be heard easily and there is no particular manufacturability issue. He conjectures that this will be true down to a differential of about 2.5 - 3.0; hence, the next lot we will characterize will be the 2.7 psi diff. lot.

We are looking into a unique process to crimp the aluminum crimp rings. Called Magneform, it is based on non-contact magnetic principles. The company, Maxwell Laboratories, has literature which shows automotive driveshafts and shock absorbers, ammunition, etc. being assembled. It does not require that the crimp ring be a magnetic material; it must be an electrical conductor. I have spoken with an applications engineer, and plan to send sketches and parts to them for trial runs. They report that they provide this initial service for free, and it should take roughly 2-3 weeks to get results.

HIGHLIGHTS

Stephen B. Offiler

Week Ending 91-05-03

91-05-03

FORD MY'92 ELECTRONIC SPEED CONTROL DEACTIVATE PS

CUSTOMER ISSUES: Joe Schuck has had meetings recently with the new Light Truck players, John Pelkey and Neru Modi. Some concerns were raised over the changes to the J512 spec; Joe responded by putting them in contact with Bruce Pease, and I have sent a copy of the tolerance relaxation report. Joe continues his efforts to win over Modi, who at present is still not a TI ally. He has been asking specific questions related to disc characteristics, which Joe is handling carefully so as not to aggravate him, yet not disclose too much of our proprietary information. I have sent Joe hand-sketches of a snap-disc curve and an incipient curve which were purposely not overly accurate in detail, and furthermore marked them with the TI Proprietary Information stamp. The quiet devices we sent George Randall using his developed incipient discs, have been a huge success; both Pass Car and Light Truck are planning on requiring this type of switch action for 77PS production. I have sent Joe a rough idea of the revalidation efforts required for a disc change, as called out in the ES. Thirty-six devices must undergo calibration, proof, vibration, thermal cycle, impulse, burst, and vacuum; this would take roughly two weeks to complete.

PRODUCTION ISSUES: As reported last week, surface cracking of the brown bases has been an issue. Work has been ongoing to understand the magnitude of the problem, using dye penetrant to assess the extent of the cracks. Cracked devices have been impact tested, using the production test fixture also used for in process inspections per the ES, then examined with dye. The worst cracks seen to date extend through roughly 20% of the material thickness. We plan to thermal cycle some devices to get a better handle on the long-term effects; time constraints and equipment are delaying this activity. Presently, parts are individually inspected, and the cracks considered minor are being allowed to ship.

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-MSG M#= 190072 FR=DAH2 TO=PCQA SENT=05/03/91 10:12 AM
R#=029 ST=C DIV=0050 CC=00149 BY=DAH2 AT=05/03/91 10:12 AM

Memorandum

May 2, 1991

TO:	Ted Brediken	MFPC	LDonna Moynihan	PCQA
	Dick Gariepy	MFPC	Elaine Rose	PCQA
	Stan Homol	SE2	Matt Sellers	PCME
	Paul Kotch	PRK1	Rusty Struble	RCS2
CC:	Dave Csarn	ZARW	Andy McGurik	PCQA
	Bill Sweat	PCME	George O'lear	ABTL
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Regards,

Jim ext. 1719 msg: PCQA

-N3G N#= 199089 FR=CERN TO=PCQA SENT=05/07/91 08:54 AM
R#=116 ST=C DIV=0050 CC=00101 BY=CERN AT=05/07/91 08:54 AM

CC: DANNA FYI/RV

MAY 07, 1991

RUSTY STRUBLE	RCS2	CC:	TOM CHARBONEAU	TC
MIKE DeMATTIA	PCQA		JOHN KOURTESIS	MDES
CHARLIE DOUGLAS	CPPC		STEVE MAJOR	WELS
DICK GARIEPY	MFPC		ANDY McGUIRK	PCQA
PAUL KOTCH	PRR1		ED O'NEILL	EJON
JOE LABARE	JMLS		JOE SCHUCK	WELS
STEVE OFFILER	SBO1		GARY SNYDER	CPPC
MATT SELLERS	PCME		MARTHA SULLIVAN	CPPC
~~BILL SWEET~~	PCME		RAY TOURANGEAU	PCME
TIM WATT	PCQA		TED BALLARD	AVNE
TED BREDIKEN	MFPC		STAN BONOL	SE2
			CLAIRE BALTHASAR	MFPC
			BILL CONDON	MFPC
			STEVE MCCOOEY	MDES

FR: DAVE CZARN ZARN LT/PC

SJ: FORD CRUISE CONTROL PRESSURE SWITCH START-UP MEETING: 05/03/91 MEETING MINUTES

MEETING

THE NEXT MEETING IS SCHEDULED FOR:

DATE: 05/09 (THURSDAY)
TIME: 10:00 - 11:30 PM
PLACE: MARKETING CONFERENCE ROOM

PLEASE CALL ME IF YOU ARE NOT ABLE TO ATTEND

* = ITEMS THAT ARE NEW OR HAVE BEEN REVISED OR COMPLETED SINCE PREVIOUS MEETING

57 L/T	WHO	WHEN	
Hexport:			
. L/T PILOT RUN	SELLERS/	01/24	ORIG.
(PUSHOUT DUE TO HEXPORT AVAILABILITY)	GARIEPY	05/10	REV.
RECEIVE RE-ROLLED HEXPORTS	KOTCH	05/02	ORIG.
		05/09	REV.
* VANISHING OIL TO ELCO	KOTCH	05/02	ORIG.
		05/02	COMP.
* ELCO'S INPUTS ON WHY THE SECOND	KOTCH	05/09	ORIG.
SHIPMENT OF HEXPORTS WERE IMPROVED AND		05/02	COMP.
HOW THIS GETS CARRIED OVER TO FUTURE LOTS			
REV. ELCO'S CONTROL PLAN; THREAD GAGING	SELLERS	05/09	
DISCUSS DOGPOINT DIA. W/HENDERSHOT	SELLERS	05/09	
* UPDATE HEXPORT SHIPPING SCHEDULE	KOTCH	ONGOING	
. COPY OF FORD'S INSTALLATION TORQUE	SCHUCK	05/09	
SPEC (ES20000-B100); SEND TO TIA			
* ADVISE ON POULSEN'S HEXPORT QUOTES	KOTCH	05/02	ORIG.
		05/02	COMP.
* PLAN FOR EVALUATING POULSEN	KOTCH	05/16	

ISR issues:

. RELEASE PRINT FROM L/T	SCHUCK	05/09	
. SUBMIT ISR FOLLOW-UP TO FORD SQE	WATT	04/04	ORIG.
(NEED RELEASE PRINT)		05/10	REV.
* GAGE CONCEPT FOR TERMINAL POS'N.	SELLERS	04/06	
. DELIVER 238 PRODUCTION SWITCHES	SELLERS/	04/01	ORIG.
'PARTS NOT NEEDED BY FORD UNTIL MID-MAY)	BALTHASAR	05/17	REV.
. UPDATE TEAM ON AUDIBLE NOISE ISSUE	SCHUCK	ONGOING	
* INCIPIENT SNAP DISC SPEC AND INFO.	OFFILER	04/18	ORIG.
TO DISC DEPT.		04/25	REV.
		04/25	COMP.
57 P/C L5-3 F2VC			
* LETTER TO FORD TO CLOSE ON TERM. POS'N	DENATTIA	04/25	ORIG.
ISSUE FOR ALL 57's		04/30	REV.
		05/03	COMP.
* F/U WITH PEASE/FAN RE: P/C SREA'S	SCHUCK	05/09	
* ISR SUPPLEMENT FOR SWITCHES W/ [redacted]	WATT	04/10	ORIG.
OFFSET POLARITY KEY BASES		05/16	REV.
(FOBBOUT DUE TO SREA DELAY)			
. MODIFY 57PS FMEA FOR PITTS	OFFILER	05/09	
* 238 SWITCHES TO PITTS	SELLERS	04/22	ORIG.
		04/29	REV.
		04/29	COMP.
* UPDATE QAS 296 AS REQ'D	WATT	05/23	
. SHIP 21K L5-3'S	GARIEPY/ STUDLE	06/01	
77PS			
. DESIGN UPDATE	OFFILER	ONGOING	
. MFG/NPCE UPDATE	SELLERS	ONGOING	
REPORT ON TOXICO P.S. RESPONSIBILITY	DOUGLAS	ONGOING	
PROD. LINE SET-UP (RTE CARDS, ETC)	BALTHASAR	ONGOING	
. UPDATE SPC FILES/RUN CAPABILITY STUDIES	BALTHASAR	ONGOING	
* ESTABLISH OVERALL SCHEDULE OF	OFFILER	05/02	ORIG.
DESIGN ENG. ACTIONS		05/09	REV.
* 77PS PARTS LISTS	OFFILER	06/06	
. COMPLETE DESIGN FMEA	OFFILER	04/18	ORIG.
		05/30	REV.
. COMPLETE PROCESS FMEA	SELLERS	07/01	
* REPEAT IMPULSE TEST AT 2 HZ TO	OFFILER	04/25	ORIG.
STUDY CONTACT WEAR		05/02	REV.
		05/02	COMP.
. T&L CONTACT ANALYSES: SLOW VS.	OFFILER	DELETED	
FAST CYCLE RATE			
. DETERMINE ACCEPTABLE CALIBRATION WINDOW	OFFILER/	03/14	ORIG.
BY DIMENSIONAL ANALYSIS	SELLERS	05/09	REV.
. VERIFICATION RUN FOR CALIBRATION WINDOW	OFFILER/	03/28	ORIG.
	SELLERS	05/16	REV.
. F/D CHARACTERISATION OF SPRING ARMS	OFFILER	04/18	ORIG.
		05/09	REV.
. GAGING TECHNIQUE FOR IN-PROCESS F/D	SELLERS	04/25	ORIG.
CHARACTERISATION OF SPRING ARMS		05/23	REV.
* STAKE PROD'N PARTS ON PROD'N STAKER	SELLERS	05/02	ORIG.
AND MEASURE TERMINAL POSITION		05/16	REV.
. 57 TO 77 CONVERSION: PHASE 1 TESTING	BONDL	05/30	ORIG.
(FOBBOUT DUE TO COMPONENT AVAILABILITY)		06/06	REV.
IDENTIFY INSPECTION REQMTS. FOR SOP	WATT	06/01	
. 77PS QAS (PRELIMINARY)	WATT	07/01	
. 77PS CHARACTERISTICS SHEETS	WATT	07/15	
. GAGE R&R STUDIES	WATT	07/15	

. 77PS QAS (FINAL)	MATT	08/01	
. SET UP SPC FILES/RUN CAPABILITY STUDIES	BALTHAZAR	08/01	
TOP'S:			
. BASE	SELLERS/ OFFILER	02/28 05/09	ORIG. REV.
Production Components:			
. UPDATE CUP PRINT	OFFILER	03/28 05/09	ORIG. REV.
* RESOLVE OPEN ISSUES ON TERMINALS	SELLERS/ OFFILER	04/04 05/09	ORIG. REV.
* CLOSE W/BASSLER RE: BEND RADII ON TERMINALS	OFFILER	DELETED	
* RESOLVE OPEN ISSUES ON BASE	SELLERS	04/11 05/09	ORIG. REV.
. UPDATE TERMINAL PRINTS/BASE PRINT	OFFILER	05/09	
Manufacturing Equipment:			
. FINAL ASM MACHINE DEBUG COMPLETION	SELLERS/ KOURTESIS	06/03	
. BASE ASM MACHINE BUILD COMPLETION	SELLERS/ KOURTESIS	05/31	
. PRESSURE TESTER BUILD COMPLETION	SELLERS/ KOURTESIS	06/20 06/06	ORIG. REV.

DISCUSSION

57 L/T AND P/C

. JO WILL RE-ROLL THE THREADS ON THE 9K PC. REJECTED LOT THIS WEEK; VANISHING OIL WILL BE EVALUATED, WITH THE PURPOSE OF ELIMINATING THE DEGREASING OPERATION WHICH LEACHES OUT SOME OF THE YELLOW COLORANT IN THE CHROMATE FINISH.

.

POULSEN WILL VISIT THURSDAY 05/09 TO DISCUSS HEXPORT MANUFACTURING. POULSEN HAS PROVIDED A QUOTE FOR THE JS12 HEXPORT WHICH IS COMPETITIVE TO ELCO; PURCHASING IS NOW EVALUATING THEIR POTENTIAL AS A VIABLE HEXPORT SUPPLIER.

.

238 P/C SWITCHES WERE SHIPPED LAST WEEK. THE BASE CRACKING ISSUE HAS SUBSIDED, DURING THE VARIOUS ITERATIONS MADE AT THE CRIMPING STATION. MATT HAS RECEIVED TUMBLED CUPS FROM VALENTINE; PURPOSE IS TO DETERMINE IF THE SLIVER PROBLEM CAN BE IMPROVED BY MODIFYING THE EDGE CONDITION OF THE RING.

77PS

.

MATT AND STEVE MCCOOEY HIGHLIGHTED SEVERAL ITEMS OF CONCERN AFTER THEIR 4/25 VISIT TO EASTERN AUTOMATION; SOME RELATED TO ACTUAL EQUIPMENT DESIGN, OTHERS RELATED TO SCHEDULE. WHEN JOHN K. FOLLOWED UP WITH EASTERN'S OWNER LAST WEEK, HE WAS TOLD THAT MORE THAN HALF OF THE ITEMS WERE CORRECTED SINCE THE MEETING. WE'VE ALSO BEEN TOLD THAT WE SHOULD RECEIVE SOME INITIAL (COMPLETED) RING ARM ASSEMBLIES BY THE END OF THIS WEEK. JOHN K. HAS ASKED FOR A PROGRAM UPDATE TWICE A WEEK FROM EASTERN; AND HAS RE-ITERATED THE NEED TO HAVE THE MACHINE DELIVERED TO TI NO LATER THAN 05/24.

THE TERMINAL TOOLS ARE NOT APPROVED, BUT WILL PRODUCE PARTS THAT ARE USABLE FOR EQUIPMENT PROVE-OUT AND PV TESTING. THE LATEST CORRECTION MADE BY BASSLER ADDRESSED THE ANGLE AT THE TIP OF THE TERMINALS; HOWEVER, OTHER DIMENSIONS WERE AFFECTED BY THE CHANGE.

A SECOND ITERATION IMPULSE TEST WITH PRODUCTION INTENT SWITCHES WAS COMPLETED, WITH VERY GOOD RESULTS. THE CONTACTS DID NOT SHOW SIGNS OF EXCESSIVE WEAR.

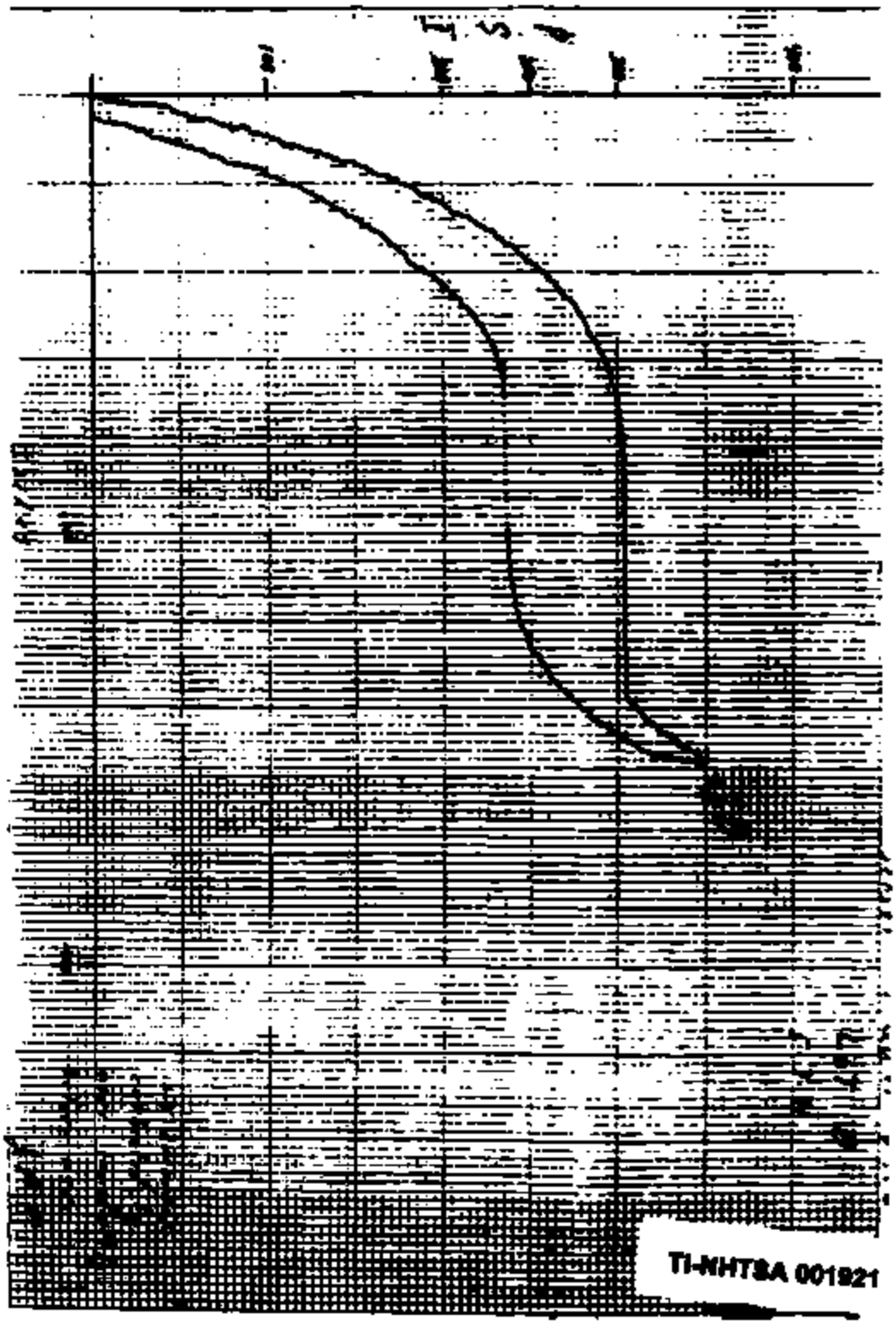
MILESTONES	PLANNED	ACTUAL
57 L/T ISIR	11/21/90	11/21/90
57 L/T JOB 1	09/03/91	
57 P/C ISIR	01/15/91	01/15/91
57 P/C JOB 1	06/03/91	
77PS ISIR	08/01/91	
77PS SOP (TI)	09/01/91	

PRODUCTION PLAN BY MONTH (THOUSANDS) - WITHOUT OVERAGE

	P/C 57PSL5-3	L/T 57PSL5-2	P/C 77PSL2-1	L/T 77PSL2-3
APR	0	0	0	0
MAY	22	2	0	0
JUN	*10 (tentative)	0	0	0
JUL	10 "	2.3	0	0
AUG	10 "	2.3	2	0
SEP	10 "	*2.6	2	0
OCT	0	9.5	**9	2
NOV	0	6.5	25	2
DEC	0	0	25	**9.5

* = JOB1 FOR 57PS VERSIONS
** = TENTATIVE JOB1 FOR 77PS VERSIONS

REGARDS,
DAVE CEARS \22-FORD



PRESSURE SWITCH DATA Form 21605 TEST NO. 146-17-03

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMPL. DATE
7715	5/27/97	[illegible]	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
[illegible]	10/97		

AQUECT TITLE: [illegible]

CUSTOMER:

PURPOSE OF TEST: To take the first step [illegible] called [illegible] determining [illegible] the line

PROCEDURE: Build a [illegible] in the middle of [illegible] at reference point and [illegible] the inflator pull. Determine the pin height with the modified [illegible]

[illegible]	[illegible]								
[illegible]	[illegible]								
[illegible]	[illegible]								
[illegible]	[illegible]								

MSO PCQA PCQA PCQA PCME SBO1 ZARN PCQA PCQA ELB

Memorandum

May 9, 1991

TO:	Rick Dessers	PCQA	Donna Moynihan	PCQA
	Ed Smith	PCQA	Elaine Rose	PCQA
	Steve Offiler	SBO1	Matt Sellers	PCME
	Jeff Didomenico	ELB		
CC:	Dave Czarn	ZARN	Andy McGuirk	PCQA
PM:	Jim Watt	PCQA		

SJ: 57PS Line Equipment Testing For Ford L/T & P/C

A meeting was held to review line equipment testing for the 57PS series for Ford L/T & P/C switches and to review the most recent update revisions to QAS 296. The following actions need to be accomplished :

Action	Who	When
1. Proof/burst tester needs to have the pump repaired. Also need to have a 1000 psi gage and line pressure valve installed for isolation. Place work order with facilities.	Jim W.	5/10/91
2. Manual pressure tester needs to be modified to correctly assess actuation/release pressure after 3 cycles. May need software modification. Determine if current equipment is TI made/installed and get proposal.	Jim W.	5/10/91
3. If above tester is TI made/installed, request mechanization design feasibility.	Matt S.	TBD
4. Review current fixture that may need to be upgraded to avoid interference with switch tab orientation.	Donna/Elaine	5/10/91
5. Review current vaccuum system that removes fluid after testing for improvements.	Jim W.	5/10/91

Regards,

Jim ext. 1719 msg: PCQA

-MSG No= 230489 FR=DAE2 TO=COFT SENT=05/08/91 07:55 AM
ST=C DIV=0030 CC=00149 RT=DAE2 AT=05/08/91 07:55 AM

Memorandum

May 8, 1991

TO:	Rick Demers	PCQA	Donna Moynihan	PCQA
	Ed Smith	PCQA	Elaine Rose	PCQA
	Steve Offiler	EEO1	Matt Sellers	PCME
	Jeff Didomenico	ELE		
CC:	Dave Cearn	EAEW	Andy McGuirk	PCQA
FM:	Jim Watt	PCQA		

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3. If above tester is TI made/installed, request mechanization design feasibility to incorporate software modification.	Matt S.	5/10/91
4. Review current fixture that may need to be upgraded to avoid interference with switch tab orientation on base. (Review showed no problems with tab orientation on base).	Donna/ Elaine	Completed
5. Review current vacuum system that removes fluid after testing for potential improvements.	Jim W.	5/10/91

Regards,

Jim ext. 1719 mag: PCQA

-MSG M#= 230489 FR=DAH2 TO=PCQA SENT=05/08/91 07:55 AM
R#=143 ST=C DIV=0050 CC=00149 BY=DAH2 AT=05/08/91 07:55 AM

Memorandum

May 8, 1991

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	Ed Smith	PCQA	Elaine Rose	PCQA
	Steve Offiler	SBOI	Matt Sellers	PCME
	Jeff Didomenico	ELB		
CC:	Dave Czarn	ZARN	Andy McQuirk	PCQA
FM:	Jim Watt	PCQA		

SJ: 57P8 Line Equipment Testing For Ford L/T & P/C

A meeting was held to review line equipment testing for the 57P8 series for Ford L/T & P/C switches and to review the most recent update revisions to QAS 296. The following actions need to be accomplished:

Action	Who	When
1. Proof/burst tester needs to have the pump repaired. Also need to have a 1000 psi gage and line pressure valve installed for isolation. Place work order with facilities.	Jim W.	5/10/91
2. Manual pressure tester needs to be modified to correctly assess actuation/release pressure after 3 cycles. May need software modification. Determine if current equipment is TI made/installed and get proposal.	Jim W.	5/10/91
3. If above tester is TI made/installed, request mechanization design feasibility to incorporate software modification.	Matt S.	5/10/91
4. Review current fixture that may need to be upgraded to avoid interference with switch tab orientation on base. (Review showed no problems with tab orientation on base).	Donna/ Elaine	~~Completed~~
5. Review current vaccuum system that removes fluid after testing for potential improvements.	Jim W.	5/10/91

Jim, this is not complete. Rick + I misunderstood the another
We need to cut into the fixture for the locating tab to fit.
Jerry

Regards,

Jim ext. 1719 msg: PCQA

HIGHLIGHTS

Stephen B. Offner

Week Ending 92-05-08

87PS VALIDATION ISSUES:

During validation of 87PSL2-2, L8-1, and L11-3, we have discovered an issue with wear of the movable contact. This is mechanical wear not related to electrical erosion. The effect is to increase the base calibration by 3.5 mils (on average, for L2-2, others not analyzed yet). This causes a shift towards creep-actuation after impulse cycling. We are presently working at "A" priority level to correct the issue. Parallel efforts include:

- Rebuild and test of switches which are purposely pinned towards creep release
- Use of the 50418-5 (high current 55/56/58/61PS contact), which should be a drop-in replacement
- Use of a contact similar to 50418-5, but with much less silver, which should provide a more robust mechanical interface with the stationary contact
- Look into a harder version of the present contact, i.e. harder copper or possible use of brass base material instead

We will have all of the above items underway by mid-next week; with results by Mon. 5/18.

OTHER VALIDATION ISSUES

We will be delivering Fluid Resistance parts to the Chem Lab on Monday 5/11 for 77PSL5-2 and L3-1 combined validation. This represents a two-week slip from the original schedule: pushing completion from 7/2 to 7/16.

Problems which surfaced during the final characterizations of 57PSF3-3 and 57PSL11-3 need to be dealt with, which is preventing completion of these ISR packages originally due 4/15.

PRODUCTION ISSUES

We are analyzing samples from the 40% fallout that is occurring on 77PSL3-1. Dale has noted the "bad" devices make noise, and correlate poorly between production and lab readings; whereas "good" devices are just the opposite. It is hoped that Jeff and I will be able to shed light on these observations and help reduce the unacceptably high fallout.

MISCELLANEOUS

The team is working diligently to produce updated D and P FMEA's for the 87PS. Twice-weekly meetings are progressing.

Jeff is working on an extensive test for Dale to characterize the hydraulic disturbance equated to noise versus disc and device differential. This uses many different test lots of devices. The highest priority item, due 5/13, is an R&R between production snap devices and quiet devices. The rest of the testing will lead to a noise test in the ES, as well as control plans, etc.

TYPE CONTACT TEST TEST 141-15-12 AUG 5/9/91

VICE #	CONTACT GAP	PIN CHANGE		ACT	REL	inf drop			ACT	REL	inf drop	PIN CHANGE
141-15-01	LOW	0.091		136 / 73	11.1	2			136 / 77	19.2		0.091
141-15-02	LOW	0.092	A	143 / 75	16.0	4			141 / 79	17.3		0.092
141-15-03	LOW	0.093	S	137 / 74	12.8	E	C		143 / 33	19.2		0.093
141-15-04	LOW	0.092	S	142 / 79	13.5		T		140 / 00	25.4		0.092
141-15-05	LOW	0.091	E	140 / 72	15.1	P	C		142 / 79	14.2		0.091
141-15-06	LOW	0.093	N	142 / 74	10.6	O	L		142 / 78	10.2		0.093
			N	/		O	R		/			
141-15-07	HIGH	0.096	L	145 / 84	13.4	E	S		141 / 86	14.1		0.096
141-15-08	HIGH	0.096	T	127 / 73	13.2	R			135 / 77	15.8		0.096
141-15-09	HIGH	0.093		143 / 73	15.3	S			144 / 79	14.7		0.095
141-15-10	HIGH	0.093		146 / 76	11.5	R			144 / 78	14.1		0.093
141-15-11	HIGH	0.095		143 / 72	16.4				142 / 76	20.5		0.095
141-15-12	HIGH	0.095		138 / 77	10.4				143 / 79	19.8		0.095

HIGHLIGHTS

Stephen B. Offiler

Week Ending 91-05-10

FORD MY'92 ELECTRONIC SPEED CONTROL DEACTIVATE PS

CUSTOMER ISSUES: We learned this week that Ford is sourcing their Light Truck master cylinder business for MY93 and beyond with Tokico. At this point, Tokico requires an external-hex device with a max. diameter slightly smaller than the 77PS. They seem to be unyielding on their envelope requirements. Apparently Hystar has a device under development which meets these envelope size requirements, although rumor has it that the Hystar device cannot meet the 7000 psi burst, is snap-action (rather than our "quiet" device which was warmly received at Ford), and at present uses a Chrysler connector, and an O-ring seal versus the J512 we helped develop. Furthermore, their price is somewhere in the upper-$2 range versus our $2.21. Logic would seem to indicate that technically and financially we have significant advantages, but apparently certain persons within Light Truck Brake Engineering enjoy playing manipulation games with suppliers and logic is out the window. We will be receiving a Tokico master cylinder today, which will give us a much better feel for the envelope size issues. Prints received to date are not to scale and basically unclear.

Jim Wan, Matt Sellers, and I have completed a markup to the present 57PS DFMEA which makes it specific to 57PSL5-2 and -3. Essentially, we updated part numbers, changed references from hydraulic oil to brake fluid, and deleted O-ring information and replaced it with J512 information.

PRODUCTION ISSUES: Hexport thread rejections began to surface on the production line. We discovered the "reject" threads were okay on Receiving Inspection's gage. Although our on-line gage is in-calibration per the sticker, we discovered the gage is no good. This gage will reject parts if one side is used but accept them (just like the R.I. gage) if the other side is used. Since the thread condition of these parts leaves them on the hairy edge of acceptability, very slight gage differences will equate to "accept" versus "reject". Matt and I have made the decision to use the hexports and ignore the questionable gage.

The problem with the thread condition is rapidly becoming very familiar. The first thread or so is deformed, and the general consensus is that it happens during plating at Elco. This will indeed become a chronic problem. Unless a very gentle plating operation can be developed, the obvious correct solution is to use a harder thread which will better resist deformations. We have contacted Elco and spoke with Bob Hendershot about material changes and subsequent heat-treatment. The 10B21 previously suggested by Elco is a hardenable material, and they are well equipped to perform heat-treating operations. We plan to ask Elco for quotes.

We have been planning to thermally cycle several cracked base 57's in order to convince ourselves that the cracks are a surface phenomenon and do not propagate through the material thickness. Our new programmable chamber was recently vacated, and after calibration of its thermocouples we will run some cracked devices over the weekend. I plan to use -40 to +121 C with sufficient soaks to ensure each extreme is attained.

A meeting was held by QC to discuss equipment modifications for on-line inspections. A new, higher-pressure gage is required for the burst tester, as well as a valve to isolate the test device from the pressure source. This valve has always been a requirement of the ES and

QAS, generally ignored until now. Also discussed were modifications to the software of the manual calibration check station; improvements to the evacuating equipment used to empty test devices of hydraulic fluid; and in-process requirements for the Vacuum test. The vacuum test equipment was recently surplused because 1) the test was ignored and 2) the requirements are only once every six months anyway. We now plan to support the vacuum test using lab equipment.

We have been supporting the on-line burst test requirements using lab equipment, until the above is resolved and the correct gage is in place on the line. However, it was discovered that our gage has never been calibrated because we do not have 10,000 psi capability on-site. We immediately air-shipped the gage to Esco in Chelmsford, MA for calibration. They will calibrate today and air-ship back for receipt on Monday, which will allow production to continue.

DESIGN ISSUES: We have received samples of Eastern Automation's second iteration springs. I will analyze these soon, to allow Mechanization to respond to EA. Visually the bumps look much better this time. We hope to be able to get a few hundred springs from EA for upcoming evaluations; best would be ideal but flat would be acceptable.

Matt and I have drafted up some plans for evaluation of the production 77 switch assembly. We expect Bassler to deliver both terminals by Monday, along with bases from molding. With EA springs (or model shop springs as a fallback) we will be evaluation terminal dimensions per envelope print; spring force, angle, and deflection; strip cutoff stations (?) on the AMI; AMI terminal stalking and pushout; AMI calibration; and finally spring life testing if all goes well with the above.

Jeff continues evaluations of the Disc Dept "quiet" low-differential discs. We discovered the 2.7 diff. lot produces silent sensors, with the tradeoff being a somewhat reduced pin window. We are also developing a technique to test a sensor's characteristic curve, with spring-load present, without using X-Y equipment. This technique is similar to a pin-window experiment, where many different pins are used and calibration points are plotted versus pin length. Results of the technique look promising, when judged against an actual X-Y curve (without spring load).

I have sent 57 sensors and switches to Maxwell Laboratories, Inc. for prototyping of their non-contact crimping process called Magneform. Final assembly prints and partially-crimped devices were included as well to demonstrate our current technique. I labelled everything with the TI Proprietary Information stamp; nondisclosures seemed to be extreme and non-expedient.

SAMPLE ORDER

ORDER NO: CD91-19

REQUEST DATE: 05/03/91

CREDIT ACCOUNT: 5902

COST CENTER: 101

PRODUCT CODE: 060

CUSTOMER: DANA (WEATHERHEAD DIVISION)

CUSTOMER P.O. NO: AN96281-05

TI PART NO: 57PSL5-35P

CUSTOMER PART NO: N/A

QUANTITY: 24

PRICE: $40.00 EA

DELIVERY PROMISED: 5/10/91 OR SOONER

SPECIAL INSTRUCTIONS: 12 PARTS HIGH END
12 PARTS LOW END

BILL TO:
DANA CORPORATION
WEATHERHEAD DIVISION
203 WEATHERHEAD STREET
ANGOLA, IN 46703

SHIP TO:
SAME
ATT'N: MIKE ROGERS

PRODUCTION SAMPLES

XX ENGINEERING DEVELOPMENT SAMPLES

CC: ENGINEERING: STEVE OFFILER

PRODUCTION CONTROL: MARIE CROSSLAND

SALES ENGINEER: JOE SCHUCK

SAMPLE ORDER

ORDER NO: C091-22

REQUEST DATE: 04/22/91

CREDIT ACCOUNT: 5902

COST CENTER: 101

PRODUCT CODE: 060

CUSTOMER: KELSEY-HAYES COMPANY

CUSTOMER P.O. NO: A1E0521535

TI PART NO: 57P5L5-3

CUSTOMER PART NO: F2VC 9F924 (AA)

QUANTITY: 21 EE

PRICE: $40.00 EACH

DELIVERY PROMISED: 5/10/91 OR SOONER

SPECIAL INSTRUCTIONS: 7 PARTS MADE TO EACH OF 3 DIFFERENT K-N SPECS.

BILL TO:
KELSEY-HAYES COMPANY
38481 HURON RIVER DRIVE
P.O. BOX 98
ROMULUS, MI 48174

SHIP TO:
KELSEY-HAYES COMPANY
ROMULUS PLANT
38481 HURON RIVER DRIVE
ROMULUS, MI 48174
ATT'N: JIM COSSINS

XX PRODUCTION SAMPLES

ENGINEERING DEVELOPMENT SAMPLES

CC: ENGINEERING: STEVE OFFILER

PRODUCTION CONTROL: MARIE CROSSLAND

SALES ENGINEER: JOE SCHUCK

TEXAS INSTRUMENTS

COPY: 3 EPF

May 16, 1991

Mr. James Cousins
Kelsey Hayes Group
38481 Huron River Drive
Romulus, MI 48174

Dear Jim,

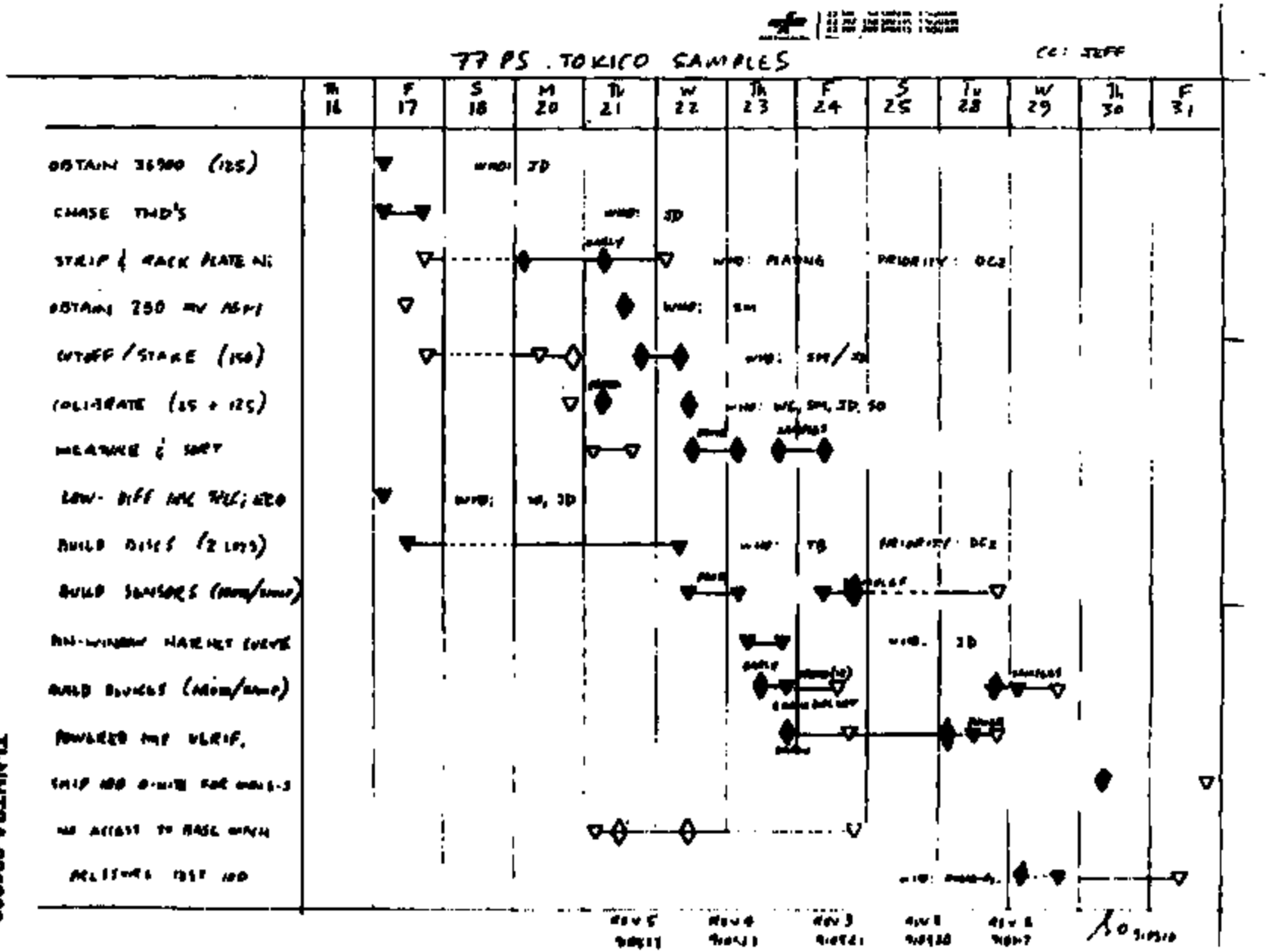
Enclosed you will find the custom samples with tolerances as specified (per Bruce Peace's 21 Dec 1990 letter). As you requested, the parts have been serialized, and the actual measurements of the 3 specific dimensions are included here:

I.D. No.	Dim A	Dim B	Dim C
K 1 1	9.670	1.059	5.822
K 1 2	9.660	1.065	5.830
K 1 3	9.659	1.026	5.799
K 1 4	9.660	1.034	5.974
K 1 5	9.665	1.039	5.869
K 1 6	9.662	1.067	5.842
K 1 7	9.649	1.059	5.964
K 2 1	9.660	1.384	5.906
K 2 2	9.670	1.374	5.878
K 2 3	9.657	1.379	5.860
K 2 4	9.682	1.400	5.883
K 2 5	9.680	1.359	5.880
K 2 6	9.670	1.384	5.946
K 2 7	9.675	1.336	5.872
K 3 1	9.390	1.360	5.563
K 3 2	9.385	1.341	5.555
K 3 3	9.398	1.379	5.519
K 3 4	9.385	1.354	5.499
K 3 5	9.398	1.394	5.540
K 3 6	9.403	1.374	5.547
K 3 7	9.401	1.389	5.608

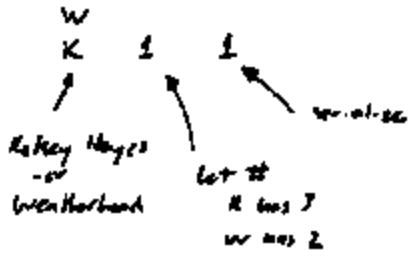
Regards,

Stephen B. Offiler
Design Engineer
Precision Controls

SBO:dh



2) STAMP HEXPORTS ON FLATS w/ I.D. AS FOLLOWS:



4) ON KH PARTS, MEASURE DIMS A, B, C (SEE ATTACHED)

I CAN HELP w/ A & B; I'VE STARTED TO DEVELOP A TECHNIQUE w/ DIAL CALIPER. FOR C, WE'VE GOT TO USE TOOL GAGE IN REC. INSP (6.11). I'LL SET THIS UP.

5) BUILD 3 LOTS OF SAMPLES FOR KH PER CDP1-12 AND 2 LOTS FOR WEATH. PER CDP1-14. KEEP ALL SEPARATE, OF COURSE.

6) FROM STEP 2, I'LL PREPARE THE DIMENSIONS FOR INCLUSION W/ SAMPLES.

HIGHLIGHTS

Stephen B. Offiler

Week Ending 91-05-17

FORD MY'92 ELECTRONIC SPEED CONTROL DEACTIVATE PS

TOKICO: We must supply Tokico a quantity of 100 samples of the Light Truck 77PS, using nickel-plated hexports and quiet sensors, shipping Friday 91-05-31. This extremely high priority need hit quite suddenly, resulting from successful meetings in Dearborn this week to resolve the Tokico/Light Truck/Hi-Sint issue. An aggressive, "if-all-goes-well" schedule has been created that shows we can just barely meet this need, with good cooperation and very high priority from Plating, Disc Dept, and Mechanization.

To build 77PS switches, we plan to use the prototype submission of Eastern Assemblies movable terminal assemblies (due Monday), removed from strip using the AMI cutoff station, and staked either on the AMI or on proto tooling on the 57 line. Stationary terminals, same story. These bases will need to be calibrated, on the AMI, regardless of the level of completeness of the cal. station. We are assuming the same minor problems will be encountered again, requiring us to individually measure and sort bases and pin accordingly. Next, we'll need to perform a powered impulse test to validate the EA spring arms.

To build sensors, we plan to chase threads on a quantity of rejected 36900's, then strip and replate with nickel. For discs, we will submit an EEO to Ted Ballard to build a quantity of low-differential discs similar to the evaluation lots he's already built.

For final assembly, the trick will be to determine pin lengths, since without sound a lab pin window using a creep check to find limits will not work. The plan is to use the technique we've developed where a ratchet curve is graphically constructed by running a range of pin sizes with a single sensor and switch, and manually plotting act and rel based on continuity.

The final hurdle will be pressure testing the samples before shipment. 77PS devices do not fit the production pressure tester, hence a manual check is required. It would be very helpful to obtain one of Dick Gariepy's people to perform this work.

TIER-1 SAMPLES: We're working to complete the hydraulic validation samples for Weatherhead and Kelsey-Hayes. The model shop has delivered hexports custom-machined to the various required dimensions. As requested by the customer, these dimensions have been individually measured and the results will be included with the samples. These should ship today.

HEXPORT THREADS, ETC: We shipped 30 devices to Pittsburgh for their inspection of the thread condition, since we know the Elco hexports are marginal. Upon receipt, I was contacted by Pitts' QC engineer, George Comiskey. I explained the situation with the lead-in thread condition, and George committed to evaluate immediately. He did, and the conclusion was that these parts fit poorly in Pitts' proportioning valve as-is, and fit quite well after thread chasing. They are requiring us to correct the thread condition. Our plan is to expedite the 9K parts Elco has already re-rolled, and to ship back for re-rolling whatever we have in stock (approx. 20K) staggered in two separate lots so we don't leave ourselves dry.

We are looking into long-term corrective actions for the threads. I contend that the only correct solution is to prevent the thread damage, either by using a more gentle plating process or a harder thread. We are evaluating the hardness distribution across the thread area to better

understand the baseline; next we'll ask Elco to quote hexports built to some hardness specification TBD. A related issue is the outer edge of the dog point, which is damaged in a fashion similar to the thread. We are looking into a small chamfer or radius to break this edge. Unfortunately, SAE J512 does not explicitly state that breaking sharp edges is allowable in a general sense; therefore, we will probably need to obtain Ford's permission to make this slight change.

CRACKED BASES: We have completed a test where bases cracked during final crimp were Impact tested, then thermal cycled from -40 to +121C 20 times. The parts have been dye penetrated, and while final cross-sectioning still needs to be completed, the good news is that no evidence of dye can be found inside the switch cavity, i.e. no cracks propagated all the way through. On a related topic, it has been discovered that actual dimensions in the environmental seal area of the sensor differ between 27288 and 27713, which could affect seal compression, and the cracking issue. Print stackups have been blamed. A quick paper analysis shows the internal dimensions in this area (no external dim's on either print) are almost identical; 27288 shows .100-.107 directly, while 27713 shows a stackup which results in .102-.107. Differences may come from the tooling geometry, which on 27713 has been iterated to give fairly sharp corner radii per the print, which may also affect things like material stretch and ultimately the unspecified external dimensions. Application of external dimensions to the prints has been discussed; however, this would require further tooling modifications to meet, and could affect other dim's negatively.

QUIET DISCS: We have characterized a total of three lots of quiet discs: 3.3 diff, 2.7, and 4.1. Jeff reports that the 4.1 lot, built into sensors, has a very subtle sound with significant amplification. Ted proposes that we spec. differential at 3 psi +/- 1.

MISC: Maxwell Laboratories Inc. has received the package of 57PS sensors, switches, and aluminum crimp rings, and has taken an initial look at it. They report that their process would be much better suited to crimping over the sensor, whereas now we crimp over the base. I've instructed them to try both methods for the sake of information. Otherwise, they are very positive about the suitability of their process to our design. They don't think there will be any problems with the internal components being affected by the magnetic pulse.

ELCO INDUSTRIES, INC.
PRECISION FORMING DIVISION
1111 Samuelson Road • P.O. Box 7008
Rockford, Illinois 61125-7008
Phone 815/397-6161 • Fax 815/397-6155 Ext. 746

CERTIFICATION

May 18, 1991

TEXAS INSTRUMENTS INC
ACCTS PAYABLE DEPT
P.O. BOX 666
ATTLEBORO, MA 02703

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

MATERIAL CERTIFICATION, FINAL INSPECTION AND SAMPLES SENT

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

Purchase Order No.	500016567
Register No.	76625
Part No.	35900-1
Description	3/8-24 X .81
Quality Control No.	A9341-S
Quantity	8.735

35-00-1

CERTIFICATION

Authorized Signature
Quality Coordinator

The times call for quality. Elco quality.

TI-NHTSA 001937

12-14-50

COMPANY LIMITED

P.O.# 03462

Type & Grade SC-3896 AISI10L18 SAE

Specification

10410

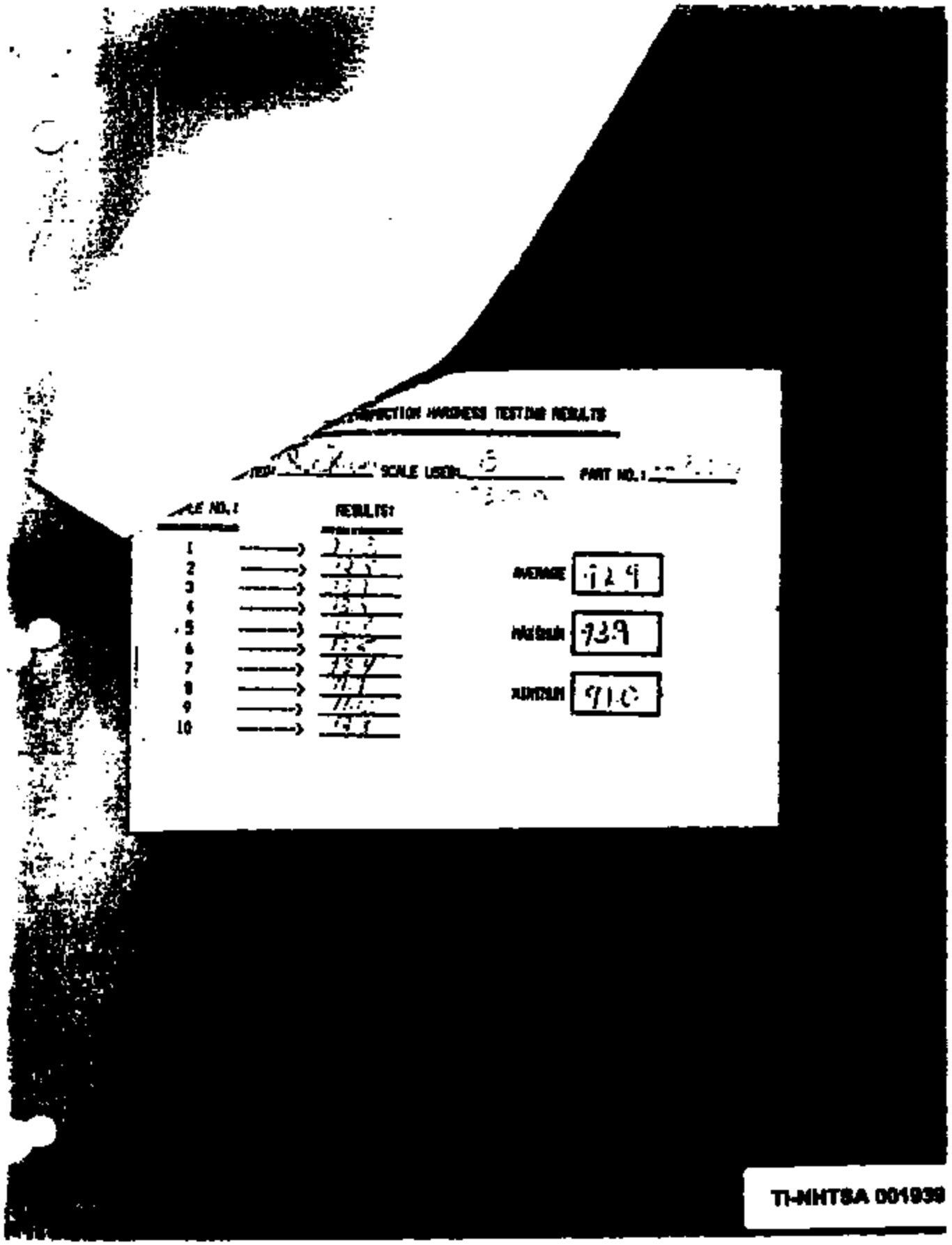
	Heat No.	Coil No.	C % × 100	Mn % × 100	P % × 1000	S % × 1000	Cr % × 100	Ni % × 100	Cu % × 100	Sol. Al % × 100	N % × 1,000
Chemical Composition Of Steel	C78314	0001 – 0018	10	41	8	5	21	1	1	3	FS SN 22

	Nominal Diameter		Tolerance of Diameter		Tensile Strength		Decarburization	
	in	mm	in	mm	1,000 psi	Kg/mm²	Dm-T	Dm-A
Physical Properties	0.565	14.351	+ 0.0040	+ 0.1016	66.9 MAX	46.5 MAX		MAX

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

Test Results

Sample No.	Diameter mm	Tensile Strength Kg/mm²	Tensile Strength 1,000psi	Sample No.	Diameter mm	Tensile Strength Kg/mm²	Tensile Strength 1,000psi
0001	14.36	33.7	47.9				
0002	14.38	33.7	47.8				
0003	14.37	32.7	46.5				
0004	14.41	32.7	47.9				
0005	14.36	32.3	45.9				
0006	14.36	32.9	46.8				
0007	14.37	33.3	47.4				
0008	14.37	33.6	48.1				
0009	14.38	33.1	47.1				
0010	14.36	34.7	49.4				
0011	14.38	33.1	47.1				
0012	14.36	32.7	46.5				
0013	14.38	34.3	48.8				
0014	14.38	33.8	48.1				
0015	14.37	34.2	48.6				
0016	14.36	35.5	50.5				
0017	14.36	35.5	50.5				
0018	14.36	34.2	48.8				
		**********					



INSPECTION HARDNESS TESTING RESULTS

TEST [illegible] SCALE USED C PART NO.: [illegible]

SCALE NO.:		RESULTS:
1	→	[illegible]
2	→	[illegible]
3	→	[illegible]
4	→	[illegible]
5	→	[illegible]
6	→	[illegible]
7	→	[illegible]
8	→	[illegible]
9	→	[illegible]
10	→	[illegible]

AVERAGE 92.9

MINIMUM 92.9

MAXIMUM 91.0

TECHNICAL SERVICE LABS

TEST NO 109407

[illegible]	127
[illegible]	146
[illegible]	060
REQUESTOR	Sandy
MAIL STATION	11-11
EXTENSION	3021
MBS ID	AT&C
DATE SUBMITTED	5/23/91
DATE REQUIRED	5/24/91
NO. OF SAMPLES	3
DESCRIPTION	

STATE YOUR PROBLEM
SAMPLE DESCRIPTION

INFORMATION DESIRED:
Please measure and list 1775
pressure 41°-42° psi
[illegible]
Thank you.
Sandy

REPORT OF RESULTS:

(1) 41.5 - 41

(2) 42 - 41

(3) 41. 41

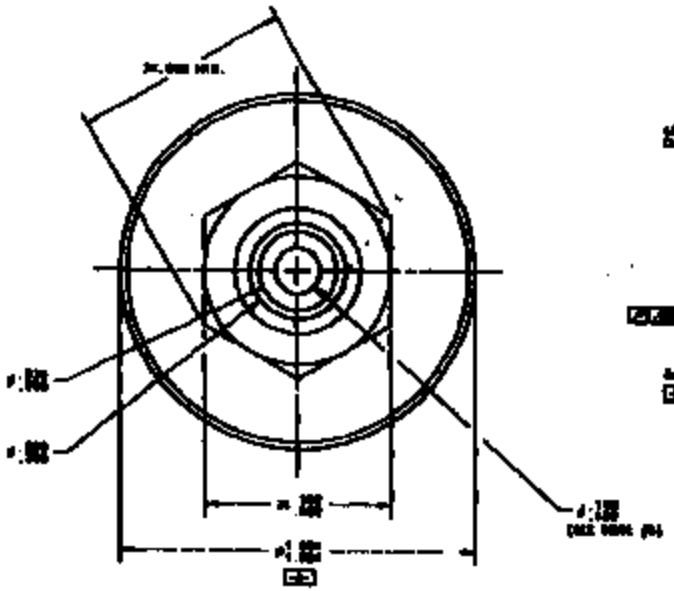
DATE RECEIVED 5/24/91 DATE OUT 5/25/91

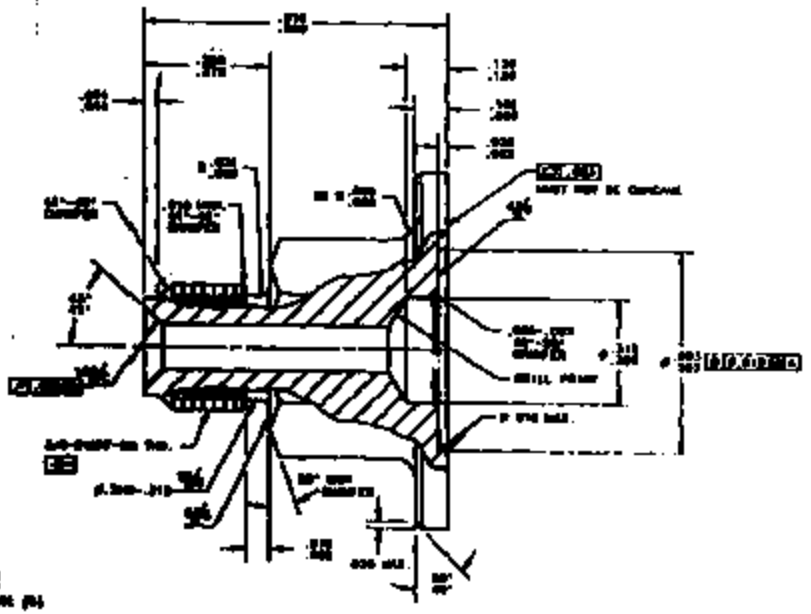
TECHNICIAN			
HOURS WORKED			
PROCEDURE USED			

*PCC I.D.

MC=325	TM=431	JOCY=126	FACIL=514
PC=127	WIRE=432	CLKE=122	FACIL=521
VERS=188	EPD=621	CAN=654	FACIL=531
AFCC=483	PEP=622	AD DEV=286	STAFF=655
IMD=430	CSD=635	EMCD=877	

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





NOTES:
1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]

C	82647	56000		

TI-NHTSA 001941

ELCO CORPORATION, INC.
PRECISION FORGING DIVISION
1111 Springfield Road • P.O. Box 7000
Phone 815/937-6101 • Fax 815/937-6100 Ext. 7-6

CERTIFICATION

May 16, 1991

TEXAS INSTRUMENTS INC
ACCTS PAYABLE DEPT
P.O. BOX 666
ATTLEBORO, MA 02703

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MATERIAL CERTIFICATION, FINAL INSPECTION AND SAMPLES SENT

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Purchase Order No.	500018587
Register No.	78825
Part No.	38900-1
Description	3/8-24 X .81
Quality Control No.	A9341-8
Quantity	8.735

38900-1

CERTIFICATION

Authorized Signature
Quality Coordinator

The times call for quality. Elco quality.

TI-NHTSA 001942

12-14-50

[redacted] COMPANY LIMITED

P/O# 03462

Type & Grade SC:3896 AISI10L10 SAF

Specification

40410#

	Heat No.	Coil No.	C % × 100	Mn % × 100	Si % × 100	P % × 1000	S % × 1000	Cr % × 100	Ni % × 100	Cu % × 100	Mo % × 100	Pb % × 100
Chemical Composition Of Steel	C78314	0001 – 0018	10	41	6	5	21	1	1	3		PB .21 00 22

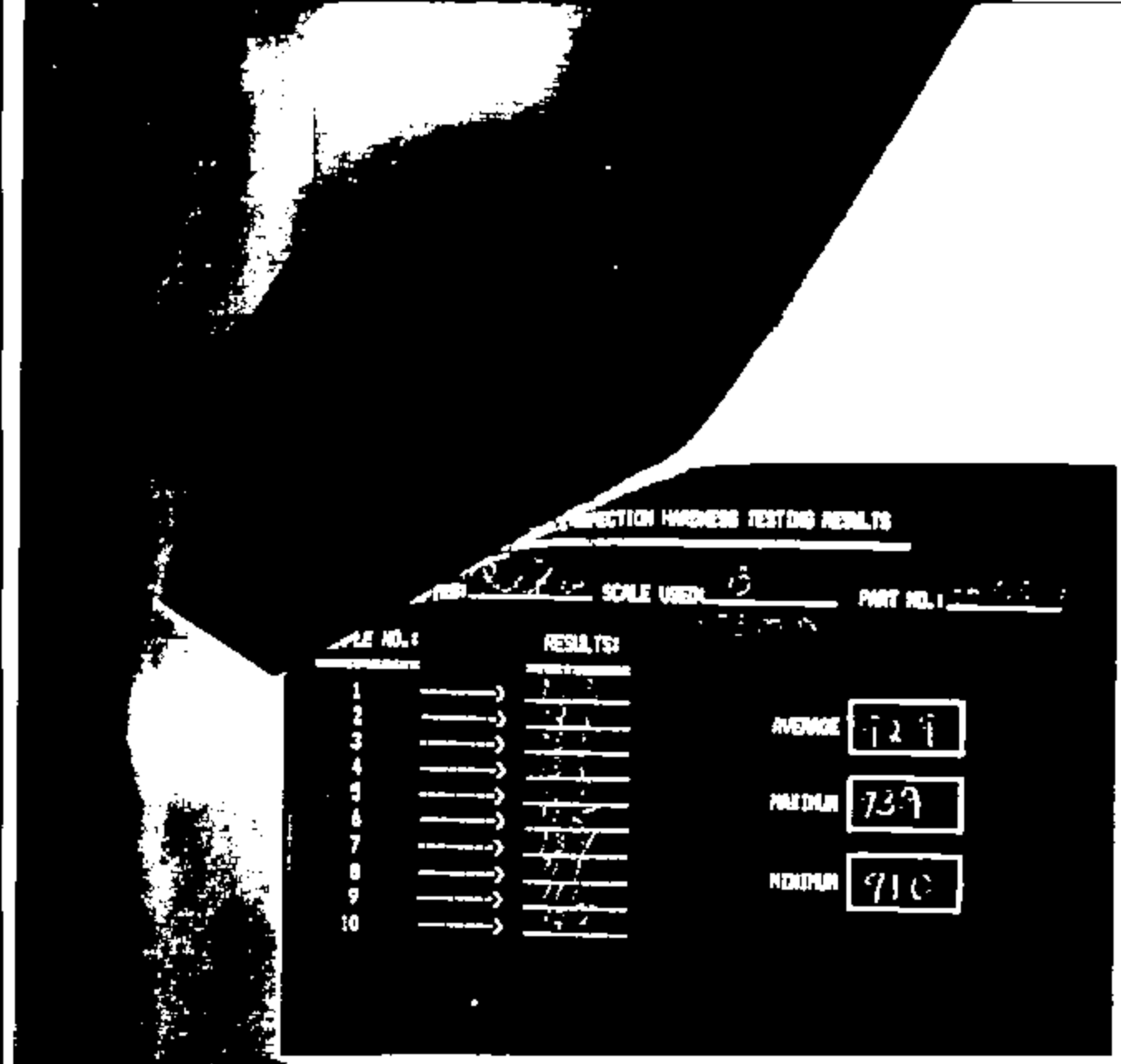
	Nominal Diameter		Tolerance of Diameter		Tensile Strength		Reduction
	in	mm	in	mm	1,000 psi	kg/mm²	%
Physical Properties	0.565	14.351	± 0.0040	± 0.1016	58.9 MAX	48.5 MAX	MIN

	Coil Weight	
Packing	ABT. 2.272LBS (ABT. 1.033KGS)	
	WRAPPED WITH POLYPROPYLENE SHEET.	

2. Test Results

Sample No.	Diameter mm	Tensile Strength kg/mm²	Tensile Strength 1,000psi	Sample No.	Diameter mm	Tensile Strength kg/mm²	Tensile Strength 1,000psi
0001	14.36	33.7	47.9				
0002	14.36	33.7	47.9				
0003	14.37	32.7	46.5				
0004	14.41	33.7	47.9				
0005	14.36	32.3	45.9				
0006	14.36	32.9	46.8				
0007	14.37	33.3	47.4				
0008	14.37	33.8	48.1				
0009	14.36	33.1	47.1				
0010	14.36	34.7	49.4				
0011	14.36	33.1	47.1				
0012	14.36	32.7	46.5				
0013	14.35	34.3	48.8				
0014	14.35	33.8	48.1				
0015	14.37	34.2	48.8				
0016	14.36	35.5	50.5				
0017	14.36	35.5	50.5				
0018	14.36	34.2	48.8				

TI-NHTSA 001943



INDENTATION HARDNESS TESTING RESULTS

SCALE USED: B

SAMPLE NO.:	RESULTS:
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

AVERAGE: 121

MAXIMUM: 139

MINIMUM: 110

TECHNICAL SERVICE LABS

TEST NO 10940

[redacted]	127
[redacted]	146
[redacted]	060
[redacted]	Sandy
MAIL STATION	11-11
EXTENSION	3021
MAIL ID	AT&C
DATE SUBMITTED	5/23/91
DATE REQUIRED	5/24/91
NO. OF SAMPLES	3
COMPOSITION	

GIVE YOUR PERSONAL SAMPLE DESCRIPTION

INFORMATION DESIRED:

Please section and 1775
measure 41°-42° per
attached drawing

Thank yo
Ca

36700-1

REPORT OF RESULTS:

(1) 41.5 - 41

(2) 42 - 41

(3) 41 - 41

DATE RECEIVED 5/24/91

DATE OUT 5/24/91

TECHNICIAN			
HOURS WORKED			
PROCEDURE USED			

*PCC I.D.

MC=325	TM=431	JOCY=128	FACIL=514
PC=127	WIRE=432	CLKE=122	FACIL=521
VERS=188	EPD=621	CAN=964	FACIL=531
AFCC=483	PEP=622	AD DEV=288	STAFF=865
IMD=430	CSD=635	EMCD=877	

TI-NHTSA 001945

DISTRIBUTION: White and Yellow - Lab Pink - Requestor

DRAWINGS AVAILABLE UPON REQUEST

DIEMASTERS

CERTIFICATE OF CONFORMANCE

SHIP TO: TEXAS INSTRUMENTS

FROM
Diemasters Manufacturing, Inc.
787 Industrial Drive
Elmhurst, Illinois 60126

DATE SHIPPED: 6-18-91 PURCHASE ORDER #: Blanket

SHIPPING OR INVOICE NUMBER: 6618-1

MATERIAL TRACE NUMBER (P.O. # HEAT, LOT, OR ROUTE SHEET NUMBER): 6S-7196

QUANTITY SHIPPED: 75,790

PART NUMBER: 27639-1 REVISION: C

PART DESCRIPTION: WASHER

OPERATION PERFORMED: MANUFACTURING

SPECIFICATION: 27639-1 REVISION: C

THE MATERIAL DESCRIBED ABOVE WAS PROCESSED, INSPECTED AND FOUND TO CONFORM TO THE DRAWING(S) AND SPECIFICATION(S) LISTED.

QUALITY CONTROL — DATE: 08-14-91

ENCLOSURES:
- ☒ CERTIFICATE OF RAW MATERIAL — TRACEABLE LOT# 79
- ☐ INDEPENDENT LABORATORY TEST REPORT OF RAW MATERIAL
- ☐ INSPECTION REPORT(S)
- ☒ SUB ~~PLATING~~ HEAT-TREAT SUPPLIER'S CERTIFICATION(S) OF CONFORMANCE
- ☐ FORM _____ NON-CONFORMANCE RELEASED BY: _____
- ☐ REWORK EXPLANATION

RIVERDALE PLATING & HEAT TREATING, INC.
680 West 134th Street Riverdale, Illinois 60627-1184

TELEPHONES
(708) 849 2050
(312) 568 2400

GT MASTERS MANUFACTURING, INC.
747 INDUSTRIAL DR
ELMHURST IL 60126-1525

27039-1

JUN - 3 1991

THIS IS TO CERTIFY THAT THE PARTS, FURNISHED AGAINST THE LISTED PURCHASE ORDER, WERE PROCESSED IN ACCORDANCE TO SPECIFICATION.

133431	108657	AUSTEMPER TO R/C 40-55	74,515	1,559	5/29/91
133431	108657	ZINC .0002 - .0006	74,515	1,559	5/29/91

Subscribed and sworn to before me

THIS 29 DAY OF MAY , 1991

Lloyd B. Bratten
Notary Public

"OFFICIAL SEAL"
Lloyd B. Bratten
Notary Public, State of Illinois
My Commission Expires 10/1/94

RIVERDALE PLATING & HEATING TREATING, INC.

Alfred K. Nelson
Vice President

TI-NHTSA 001949

...that material meets ordered specification

Size
1 3/8 X 098
PO Number
021540
Mill Number
62276

Bobby Diemastus
TEXAS INSTR.
27639-1

QUALITY CONTROL
APR 30 1991
IL BALLO

Heat						AISI			Rockwell		
657196						C-1050			B 74/78		
%C	%Mn	%P	%S	%Si	%Cu	%Cr	%Mo	%Ni	%Cb	%V	%Cb
52	78	015	008	23							

Tensile Strength (psi)	.2% Yield Strength (psi)	% Elongation in 2"

Surface	Inclusion Rating	Grain Size

Decarburization	Microstructure

Cold Bend

Parallel to the rolling direction over a	Radius Bend
Perpendicular to the rolling direction over a	Radius Bend

Hardenability	Miscellaneous

I certify that the above data is correct

By Debbi Date 3/26/91

Title Quality Mgr

Notary Public, State of New York, County of Oneida

My commission expires 3/31/92

ROME STRIP STEEL
530 Henry St.
Rome, NY 13440
315-336-5500
FAX 315-336-5510

DRAWINGS AVAILABLE UPON REQUEST

VALENTINE TOOL & STAMPING, INC.

[illegible] WEST MAIN ST. NORTON, MASS. 02766
(508) 285-[illegible]

MATERIAL CERTIFICATION

DATE : TUESDAY JULY 2, 91

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 5050287[illegible]5 SUPPLIER INVOICE NO.: [illegible]

PART DESCRIPTION : 27268-1 CUP REV.K

SUPPLIER PJO NO. : 18241

QUANTITY SHIPPED : 8,650

SHIPMENT DATE : 07/02/91

WE CERTIFY THAT THE MATERIAL USED
TO PRODUCE THE PRODUCT IN [illegible]
SHIPPED ON MAY 1
[illegible]
CONFORMS TO T.I. DRAWINGS AND
T.I. PURCHASE ORDER REQUIREMENTS.

SIGNED Jeanne Laflamme QC
(Supplier Representative)

Jeanne Laflamme Quality Control Manager

VALENTINE TOOL & STAMPING, INC.

111 WEST MAIN ST. NORTON, MASS. 02766
(508) 285-6911 226-0345

CERTIFICATE OF CONFORMANCE

DATE : TUESDAY JULY 2, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505028715 SUPPLIER INVOICE NO.: 7687

PART DESCRIPTION : 27288-1 CUP REV.K

SUPPLIER PJO NO. : 18241

QUANTITY SHIPPED : 8,850

SHIPMENT DATE : 07/02/91

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

SIGNED Jeanne Laflamme
Jeanne Laflamme
Quality Control Manager

ROME STRIP STEEL COMPANY, INC.

530 HENRY ST. BOX 190
ROME, NEW YORK 13440

DATE	INVOICE NO
04/30/91	04594

0 1 0 0 0 0 0 0

8050216

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

ATTN: JEANNE LAFLAMME, Q.C. MGR.

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

QUANTITY (LBS)	NO CLS	NO SKIDS OR COILS		SHIPPED BY	MI NO	C	RR	T	S	SI	NI	CN	NO
16,966	036	06	COIL	J AUSTIN	R22433	04	30	009	017	01 AL	02 WH	02 CN	01 CA

CTS REQUIREMENTS OF:
ST ORDER NO 13428

COLOR CODE

[redacted]02MM X 50.80MM		MILL NO 62460	PREPAID COLLECT PREPAID	STRAPPING	PAPER WRAP	RAILS	CRATES	BOX
		COILS OR CUT		SKIDS	SKID SIZE	PKG WT	WASHERS	CORES
.04000 X 2.0000	B 50 MAX	COIL	440 LBS	3000 ALUMINUM	SPACERS	STRAPS	BOARDS	CAPS
TOLERANCE	LOAD	LENGTH SPEC			3/4"			
001 -001 +005 -005	N03 SLIT	220 PIN 16 36		BURR	CAMBER	FLATNESS	OIL	T-PCS
025 -025MM +127 -127MM	CLASS ALUM KILD	JOB NO C-1006						

[redacted]

TEST REPORT

I 7,896 KGI 16,966

Certificate of Compliance

TEST:
[redacted]
Notary Public, Oneida County
My commission expires 3/1/92

DATE 5/1/91

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

ROME STRIP STEEL CO., INC.

TI-MHTBA 0018630

DRAWINGS AVAILABLE UPON REQUEST

VALENTINE TOOL & STAMPING, INC.

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

MATERIAL CERTIFICATION

DATE : FRIDAY JUNE 14, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505063392 SUPPLIER INVOICE NO.: 19580

PART DESCRIPTION : 27713-1 CUP REV.A

SUPPLIER FJO NO. : 18671

QUANTITY SHIPPED : 1,085

SHIPMENT DATE : 06/14/91

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

SIGNED _____
(Supplier Representative)

Jeanne Leflamme Quality Control Manager

VALENTINE TOOL & STAMPING, INC.

171 WEST [illegible] ST. NORTON, MASS. 02766
(508) 285-6511 226-0868

CERTIFICATE OF CONFORMANCE

DATE : FRIDAY JUNE 14, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

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

PART DESCRIPTION : 27719-1 CUP REV.A

SUPPLIER FJO NO. : 18571

QUANTITY SHIPPED : 1,085

SHIPMENT DATE : 06/14/91

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

SIGNED [signature]
Jeanne LaFlamme
Quality Control Manager

ROME STRIP STEEL COMPANY, INC.
530 HENRY ST. BOX 189
ROME, NEW YORK 13440

SALES CODE
502010

0 1 0 0 0 0 0 0

DATE: 02/26/91 | INVOICE NO: 02740

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

ATTN: JEANNE LAFLAMME - Q.C. MGR.

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

QTY (LBS)	NO. CLS.	NO. BARS OR ROLLS	[redacted]	SHIPPED BY
16,154	040	06	COIL	R S S

HT NO	C	MN	P	S	SI	NI	CR	MO
466709	07	34	012	000	01			

AL VN CB CA

REQUIREMENTS OF:
ORDER NO 13428

COLOR CODE

[redacted]02FM X 50.80MM — BILL NO 6245a — PREPAID COLLECT PREPAID

SHAPING	PAPER WRAP	BOLTS	STRAPS	BOX

SKIDS	SKID SIZE	PKG BY	WASHERS	CORES
3000				

.04000 X 2.0000	TEMPER 4 HR MAX	CONS OR COIL COIL	440 LBS

EDGE	LENGTH SPEC	BUNDLES	SPACERS	STRAPPED	BOARDS	CAP
NUS SLIT	220 MIN 16 36		3/4"			

EDGE	CAMBER	FLATNESS	OIL	T-PLS

101 -001 +005 -005

125 -025MM +127 -127MM

CLASS: ALUM KELD | ORD NO: C-1006

[redacted]

TEST REPORT

Certificate of Compliance

TEST: [redacted]

[redacted] Notary Public, Oneida County
My commission expires 7/1/92

DATE 2/27/91

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

ROME STRIP STEEL CO., INC.

THANTRA 00987

DRAWINGS AVAILABLE UPON REQUEST

K. F. BASSLER COMPANY, INC.
PRECISION TOOLING & METAL STAMPINGS
45 John Willem St. • Attleboro, MA 02703 • (508) 222-1051 • Fax (508) 226-1605
EST 1946

MATERIAL CERTIFICATION

CUSTOMER: Texas Instruments, Inc. - Attleboro

CUSTOMER ORDER NO.: 5050970?8

CUSTOMER PART NO.: 27406-1

REVISION: F

QUANTITY THIS SHIPMENT: 21,000

LOT NO. THIS SHIPMENT: 143

SHIPMENT DATE: 6·25·91

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

TELEX
FAX
PHONE
DATA

ROME STRIP STEEL COMPANY, INC.

530 HENRY ST. BOX 189
ROME, NEW YORK 13440

COMPLIANCE

DATE	INVOICE NO
02/28/91	02786

SALES CODE
08022016

0 1 0 0 0 0 0 0

INVOICE TO: K. F. BASSLER CO., INC.
P. O. BOX 995
ATTLEBORO, MA 02703

SHIP TO: K. F. BASSLER CO., INC.
13TH-JOHN WILLIAM STS
ATTLEBORO, MA

QUANTITY (LBS)	NO CLS	NO YRDS OR DOZS	SHIPMENT COMPLETE	SHIPPED BY	HT NO	C	MN	P	S	SI	CU	CB NO
19,036	135	13	PART	PAUL N	466708	07	36	014	008	01		

SHEET REQUIREMENTS OF:
CUST ORDER NO 14474

[redacted] 7MM X 25.40MM

.84600 X 1.0000 8 90 MAX

MIN NO 58100
CODE OR CUT COIL

PREPAID COLLECT PREPAID

200 LBS 1600

21 HI MAX

+00050-00050+009 -009 ND3 SLIT 200 PIN 16 34

+013 -013MM +127 -127MM

500/096

[redacted]

1 8,907 KGS 19,636

TEST REPORT

Certificate of Compliance

ATTEST: [redacted]
Notary Public, Oneida County
My commission expires

DATE 3/6/91

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

ROME STRIP STEEL CO., INC.

TI-MMTSA 00

DRAWINGS AVAILABLE UPON REQUEST

VALENTINE TOOL & STAMPING, INC.

[redacted]

CERTIFICATE OF CONFORMANCE

DATE : TUESDAY APRIL 30, 91

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 8C8C82715 SUPP DEV ENGINEERING 91 9

PART DESCRIPTION : 7675-01 CRIMP RING REV.B

SUPPLIER P.O NO. : 18573

QUANTITY SHIPPED : 20,449

SHIPMENT DATE : 04/30/91

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

SIGNED Jeanne LaFlamme

Jeanne LaFlamme
Quality Control Manager

UNITED ALUMINUM CORPORATION

100 UNITED DRIVE • NORTH HAVEN, CONNECTICUT 06473 • (203) 239-5801

UNITED ALUMINUM

9281

VALENTINE TOOL & STAMPING, INC.
171 WEST MAIN STREET
NORTON, MA 02766-0469

ATTN: DICK WHITNEY

DATE 4/18/91
P.O. # 13876
SHIPPED 4/19/91
UA ORDER # 161499

THIS IS TO CERTIFY THAT THE MATERIAL LISTED BELOW CONFORMS WITH THE CHEMICAL COMPOSITION LIMITS OF QQA-250/8F AND THE FOLLOWING ARE THE LIMITS:

AA 5052

CHEMICAL COMPOSITION

	MIN	MAX
SILICON		0.25
IRON		0.40
COPPER		0.1
MANGANESE		0.1
MAGNESIUM	2.2	2.8
CHROMIUM	0.15	0.35
ZINC		0.1
TITANIUM		
OTHER ELEMENTS (EACH)		05
OTHER ELEMENTS (TOTAL)		15
ALUMINUM	REMAINDER	

MECHANICAL PROPERTIES

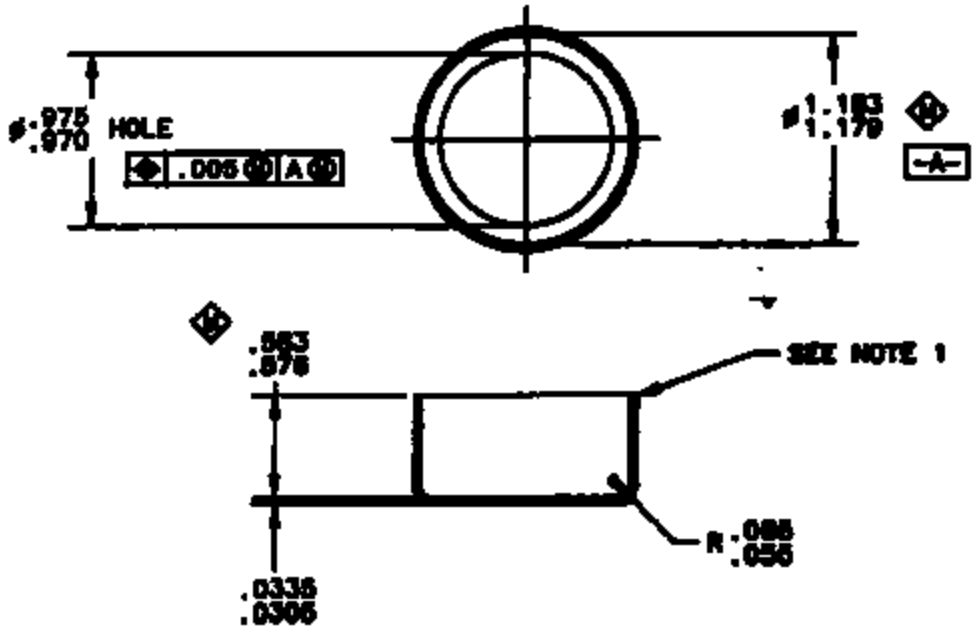
TENSILE STRENGTH	28.3 KSI
ELONGATION IN 2"	20%

.032 2.312 5052-0

UNITED ALUMINUM CORPORATION

TITLE	REV	
CRIMP RING	E	74797

74797



NOTES:
1. PINCH OFF RADIUS ALLOWED.
2. .002 MAX. BURR ALLOWED.
3. PARTS TO BE SHIPPED, ISSUED, AND STORED IN SEALED PLASTIC BAGS.
4. MATERIAL CERTIFICATION REQUIRED WITH EACH SHIPMENT.

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

SUPERSEDES DWG. 74797 REV. A DATED 11-2-90

TI-NHTSA 001964

PART NO.	MATERIAL	FINISH
74797-1	ALUMINUM 5052	

REVISIONS															

BY	CK	ENGR
DAVID FERRIER 11-6-90	1-30-91	

TEXAS INSTRUMENTS
ATTLEBORO, MASSACHUSETTS 02703

KENDALL
CENTRAL PRODUCTS DIVISION

SIZE	DWG. NO.
A	74797

COPY INPUT NO.

Paratech, Inc.

MINIATURE TECHNICAL CERAMICS

15840 Minnesota Avenue • P.O. Box 718 • Paramount, California 90723
Telephone (213) 633-2048 • Fax (213) 633-0907

MATERIAL CERTIFICATION

DATE: 4-22-91

TEXAS INSTRUMENTS, INC.

ORDER NO.: 505049981

PART NO : 74078-146 REV. NO.: F

QUANTITY THIS SHIPMENT: 75,000

SHIPMENT DATE: 4-22-91

PART DESCRIPTION: PIN

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

PRODUCTION MANAGER

VALENTINE TOOL & STAMPING, INC.

[illegible] WEST MAIN ST. [illegible] (508) 285-6911

MATERIAL CERTIFICATION

DATE : TUESDAY APRIL 30, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : [illegible]

PART DESCRIPTION : [illegible]

SUPPLIER P.O. NO. : [illegible]

QUANTITY SHIPPED : 20,449

SHIPMENT DATE : 04/30/91

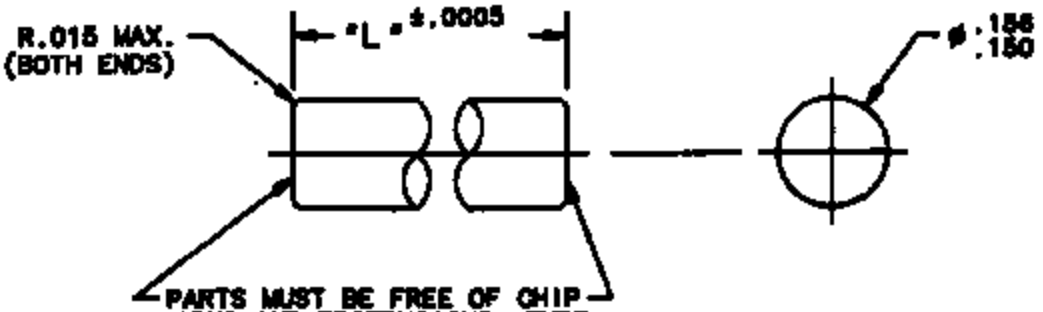
WE CERTIFY THAT THE MATERIAL USED
TO PRODUCE THE PRODUCT IN THIS
SHIPMENT, NAMELY
5052 AL
CONFORMS TO T.I. DRAWINGS AND
T.I. PURCHASE ORDER REQUIREMENTS.

SIGNED [signature] (Authorized Representative)

Joanne Lattanne Quality Control Manager

TITLE: TRANSFER PIN | REV G | 74078

74078



"L" LENGTH IS DETERMINED BY THE SUFFIX OF THE PART NUMBER IN THOUSANDTHS OF AN INCH. I.E.;

PART NO.	"L"
74078-156	.156
74078-210	.210

VENDOR WILL BE PREPARED TO FURNISH PINS .130 - .250 LONG.

NOTES:

1. FINISHED PARTS TO BE SHIPPED, ISSUED AND STORED IN SEALED PLASTIC BAGS. SEALED PLASTIC BAGS TO CONTAIN 20,000 PINS(OR LESS FOR PARTIAL BAGS). BAGS MUST BE CLEARLY LABELED WITH THE PART NO. AND THE QUANTITY OF PARTS IDENTIFIED ON THE OUTSIDE OF EACH BAG.
2. MATERIAL CERTIFICATION REQUIRED WITH EACH SHIPMENT.

MATERIAL: L-3 GRADE STEATITE (DC-188B) OR
L-3 GRADE STEATITE (DC-144E)

CURE PER SPEC.—— 50502-2

SHRINKAGE SPEC.—— 50501-1

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

TI-NHTSA 001967

THIS DWG. SUPERSEDES 74078 REV. "E" DATED 6-4-86

DRAWN											013	01	M27P37-3P35
BY TOM DAIL 10-17-88		TEXAS INSTRUMENTS ATTLEBORO, MASSACHUSETTS 02703									SIZE A		74078
CHK.													
ENG. Steve Vinson 5-20-91													
MANUFACTURE													CODE IDENT NO. 62647

-MSG M#= 125056 FR=VAGS TO=PCQA SENT=05/21/91 07:49 AM
R#=168 ST=C DIV=0050 CC=00194 BY=VAGS AT=05/21/91 07:49 AM

TO: CHERYL BETTINGER CDBQ

PAUL KOTCH PRK1
BILL SWEET PCME
STAN RONOD SH2
JIM WATT PCQA
CHUCK STANFA ATPA

cc: Engineering
FYI / print

FR: MATT SELLERS PCME

SJ: EEKPORT P/N 27290-2 REJECTION

CHERYL,

RECEIVED YOUR MEMO CONCERNING THE DISPOSITION OF REJECTION # 6668. THE ATTACHED SAMPLES WERE DEEMED ACCEPTABLE VISUALLY AND WERE DESIGNATED AS ACCEPTABLE VISUAL STANDARDS. WE HAVE HAD OTHER RECENT PREVIOUS REJECTIONS FOR THE SAME TYPE OF DEFECT THAT WERE DEEMED UN-ACCEPTABLE BY THE MRB; IT IS AN ACCEPTABLE CONDITION ONLY TO AN EXTENT. FOR THIS REASON IT WILL BE DIFFICULT TO APPLY SOME TYPE OF DESCRIPTION TO THE PRINT ALLOWING THIS CONDITION TO EXIST. I UNDERSTAND THAT THE SAMPLES ATTACHED TO THE REJECTION HAVE BEEN WIPED CLEAN DUE TO HANDLING. I BELIEVE THAT IT WAS A 100% CONDITION IN THE SHIPMENT SO COULD WE GRAB SOME MORE SAMPLES FROM THE LOT AND HAVE THE MRB COME OVER TO APPROVE THEM AS STANDARDS. WE COULD THEN HAVE PHOTOS TAKEN IMMEDIATELY.

PLEASE CALL . . .

REGARDS...MATT
X1245

-MSG #= 126535 FR=CSRN TO=PCQA SENT=05/21/91 08:24 AM
#=170 ST=C DIV=0050 CC=00101 BY=CSRN AT=05/21/91 08:24 AM

TO:	RUSTY STEUBLE	RCS2	CC:	TOM CHARBONEAU	TC
	MIKE DeMATTIA	PCQA		JOHN KOURTESIS	MDES
	CHARLIE DOUGLAS	CPPC		STEVE MAJOR	WELS
	DICK GARIEPY	MFPC		ANDY McGUIRK	PCQA
	PAUL KOTCH	PRR1		ED O'NEILL	EJON
	JOE LASARE	JNLS		JOE SCHUCK	WELS
	STEVE OFFILER	SJO1		GARY SNYDER	CPPC
	MATT SELLERS	PCNE		MARTHA SULLIVAN	CPPC
	BILL SWEET	PCNE		RAY TOURANGEAU	PCNE
	JIM WATT	PCQA		TED BALLARD	AVNE
	TED BREDIKEN	MFPC		STAN BOHOL	SR2
				CLAIRE BALTHASAR	MFPC
				BILL CONDON	MFPC
				STEVE MCCOOEY	MDES
				TERRY RODRIGUES	MFPC
FR:	DAVE CSARN	SAHN			

SJ: FORD CRUISE CONTROL PRESSURE SWITCH START-UP MEETING:
05/09/91 MEETING MINUTES

MEETING

THE NEXT MEETING IS SCHEDULED FOR:

DATE: 05/24 (FRIDAY) *** PLEASE NOTE CHANGE ***
TIME: 1:30 - 3:00 PM
PLACE: PURCHASING CONFERENCE ROOM

PLEASE CALL ME IF YOU ARE NOT ABLE TO ATTEND

* = ITEMS THAT ARE NEW OR HAVE BEEN REVISED OR COMPLETED SINCE PREVIOUS MEETING

57 L/T	WHO	WHEN	
Hexport:			
* L/T PILOT RUN	SELLERS/	01/24	ORIG.
(PUSHOUT DUE TO HEXPORT AVAILABILITY)	GARIEPY	05/23	REV.
* RECEIVE RE-ROLLED HEXPORTS	KOTCH	05/02	ORIG.
		05/09	REV.
		05/16	COMP.
* REV. ELCO'S CONTROL PLAN; THREAD GAGING	SELLERS	05/09	ORIG.
		05/09	COMP.
* DISCUSS DOGPOINT DIA. W/HENDERSHOT	SELLERS	05/09	ORIG.
		05/09	COMP.
* UPDATE HEXPORT SHIPPING SCHEDULE	KOTCH	ONGOING	
* COPY OF FORD'S INSTALLATION TORQUE SPEC (ES20000-S100); SEND TO TIA	SCHUCK	05/09	ORIG.
		05/30	REV.
* PLAN FOR EVALUATING POULSEN	KOTCH	05/16	ORIG.
		05/23	REV.
ISR issues:			
* CONNECTOR INSTALLATION FORCE STUDY	OFFILER	06/06	
* GAGE CONCEPT FOR TERMINAL DOE'S	SELLERS	06/06	
* RELEASE PRINT FROM L/T	SCHUCK	05/09	ORIG.
(SEE DISCUSSION)		06/20	REV.
SUBMIT ISR FOLLOW-UP TO FORD SQA	WATT	04/04	ORIG.
(NEED RELEASE PRINT)		06/27	REV.
* DELIVER 238 PRODUCTION SWITCHES	SELLERS/	04/01	ORIG.
	BALTHASAR	05/23	REV.

57 P/C

* F/U WITH PEASE/FAN RE: P/C SREA'S	SCHUCK	05/09	ORIG.
		05/16	COMP.
SR SUPPLEMENT FOR SWITCHES W/BROWN OFFSET POLARITY KEY BASES (PUSHOUT DUE TO SREA DELAY)	WATT	04/10	ORIG.
		05/30	REV.
* MODIFY 57PS PMEA FOR PITTS	OFFILER	05/09	ORIG.
		05/09	COMP.
* UPDATE 57PS DFMEA PER STEVE'S INPUTS	WATT	06/06	
. UPDATE QAS 286 AS REQ'D	WATT	05/23	
. SHIP 21X L5-3's	GARIEPY/ STRUBLE	06/03	
* PLAN FOR MAKING L/T AND P/C ENV. SEAL COMPRESSION CONSISTENT	OFFILER/ SELLERS	06/06	
* ADD MATING CONNECTOR FIT-UP CHECK TO INSP. REQMTS. - 5 PCS/HR.	WATT	05/30	
* DISPOSITION NEXPORTS W/REROLLED THDS.	SELLERS	05/23	

77PS

. DESIGN UPDATE	OFFILER	ONGOING	
. MFG/MECH UPDATE	SELLERS	ONGOING	
. PROD. LINE SET-UP (RTE CARDS, ETC)	BALTHASAR	ONGOING	
. UPDATE SPC FILES/RUN CAPABILITY STUDIES	BALTHASAR	ONGOING	
* ESTABLISH OVERALL SCHEDULE OF DESIGN ENG. ACTIONS	OFFILER	05/02	ORIG.
		05/23	REV.
. 77PS PARTS LISTS	OFFILER	06/06	
. COMPLETE DESIGN FMEA	OFFILER	04/18	ORIG.
		05/30	REV.
. COMPLETE PROCESS FMEA	SELLERS	07/01	
* DETERMINE ACCEPTABLE CALIBRATION WINDOW BY DIMENSIONAL ANALYSIS	OFFILER/ SELLERS	03/14	ORIG.
		05/23	REV.
* VERIFICATION RUN FOR CALIBRATION WINDOW Final Definition	OFFILER/ SELLERS	03/28	ORIG.
		05/30	REV.
* F/D CHARACTERIZATION OF SPRING ARMS	OFFILER	04/18	ORIG.
		05/23	REV.
. GAGING TECHNIQUE FOR IN-PROCESS F/D CHARACTERIZATION OF SPRING ARMS	SELLERS	04/25	ORIG.
		05/23	REV.
* STAKE PROD'N PARTS ON PROD'N STAKER AND MEASURE TERMINAL POSITION	SELLERS	05/02	ORIG.
		05/23	REV.
. 57 TO 77 CONVERSION: PHASE 1 TESTING (PUSHOUT DUE TO COMPONENT AVAILABILITY)	HONOL	05/30	ORIG.
		06/06	REV.
* COST ESTIMATE FOR LOW DIFF. SWITCH	SELLERS	06/06	
. IDENTIFY INSPECTION REQMTS. FOR SOP	WATT	06/01	
* IDENTIFY AUTOMATION SPECIALIST	GARIEPY	06/06	
. 77PS QAS (PRELIMINARY)	WATT	07/01	
. 77PS CHARACTERISTICS SHEETS	WATT	07/15	
. GAGE R&R STUDIES	WATT	07/15	
. 77PS QAS (FINAL)	WATT	08/01	
. SET UP SPC FILES/RUN CAPABILITY STUDIES	BALTHASAR	08/01	

IDR's:
* BASE

	SELLERS/ OFFILER	02/28	ORIG.
		05/23	REV.

Production Components:

* UPDATE CUP PRINT	OFFILER	03/28	ORIG.
		05/23	REV.
RESOLVE OPEN ISSUES ON TERMINALS	SELLERS/ OFFILER	04/04	ORIG.
		05/09	REV.
		05/16	COMP.
* RESOLVE OPEN ISSUES ON BASE	SELLERS	04/11	ORIG.
		05/23	REV.

. UPDATE TERMINAL PRINTS/BASE PRINT	OFFILER	05/09 05/30	ORIG. REV.
Manufacturing Equipment:			
. FINAL ASM MACHINE DEBUG COMPLETION	SELLERS/ KOURTESIS	06/03	
BASE ASM MACHINE BUILD COMPLETION	SELLERS/ KOURTESIS	05/31	
. PRESSURE TESTER BUILD COMPLETION	SELLERS/ KOURTESIS	06/20 06/06	ORIG. REV.
* PROVIDE DATES FOR EFFECTIVITY RUNS	SELLERS/ MCCOOEY	05/30	
Tokico:			
. REPORT ON TOKICO P.S. RESPONSIBILITY	DOUGLAS	ONGOING	
* DEL. 100 SAMPLES TO TOKICO USA	OFFILER	06/03	

See Steve Dan re web

DISCUSSION

57 L/T AND P/C

THE CREEP LIMITS FOR THE L/T AND P/C SWITCHES WILL REMAIN AT 20 ms SO A PIN WINDOW CAN BE DETERMINED.

77PS

JOHN PELKEY OF FORD'S L/T BRAKE ENGINEERING HAS TAKEN OVER SWITCH RESPONSIBILITY FROM GEORGE RANDALL. HE IS DELAYING THE RELEASE DRAWING FOR THE +/- .25mm TERMINAL POSITION UNTIL WE CONDUCT AN INSERTION FORCE TEST.

Need to run force test

FD L/T IS MANDATING A "QUIET" SWITCH FOR THE 77PS SWITCH (WON'T BE REQUIRED FOR THE L/T 57PS). A TECHNIQUE WILL NEED TO BEDEVELOPED TO DETERMINE PIN WINDOW FOR THESE SWITCHES; WHICH WILL BE REQUIRED BY THE L/T (AND MAYBE P/C) 77PS.

WE WILL BE SUPPLYING 100 SWITCHES TO TOKICO FOR THEIR DVP&R TESTING IN JUNE. TOKICO IS TARGETED TO SUPPLY A MASTER CYLINDER/PRESSURE SWITCH ASSEMBLY TO L/T FOR MY93.

MILESTONES	PLANNED	ACTUAL
57 L/T ISIR	11/21/90	11/21/90
57 L/T JOB 1	09/03/91	
57 P/C ISIR	01/15/91	01/15/91
57 P/C JOB 1	06/03/91	
77PS ISIR	08/01/91	
77PS SOP (TI)	09/01/91	

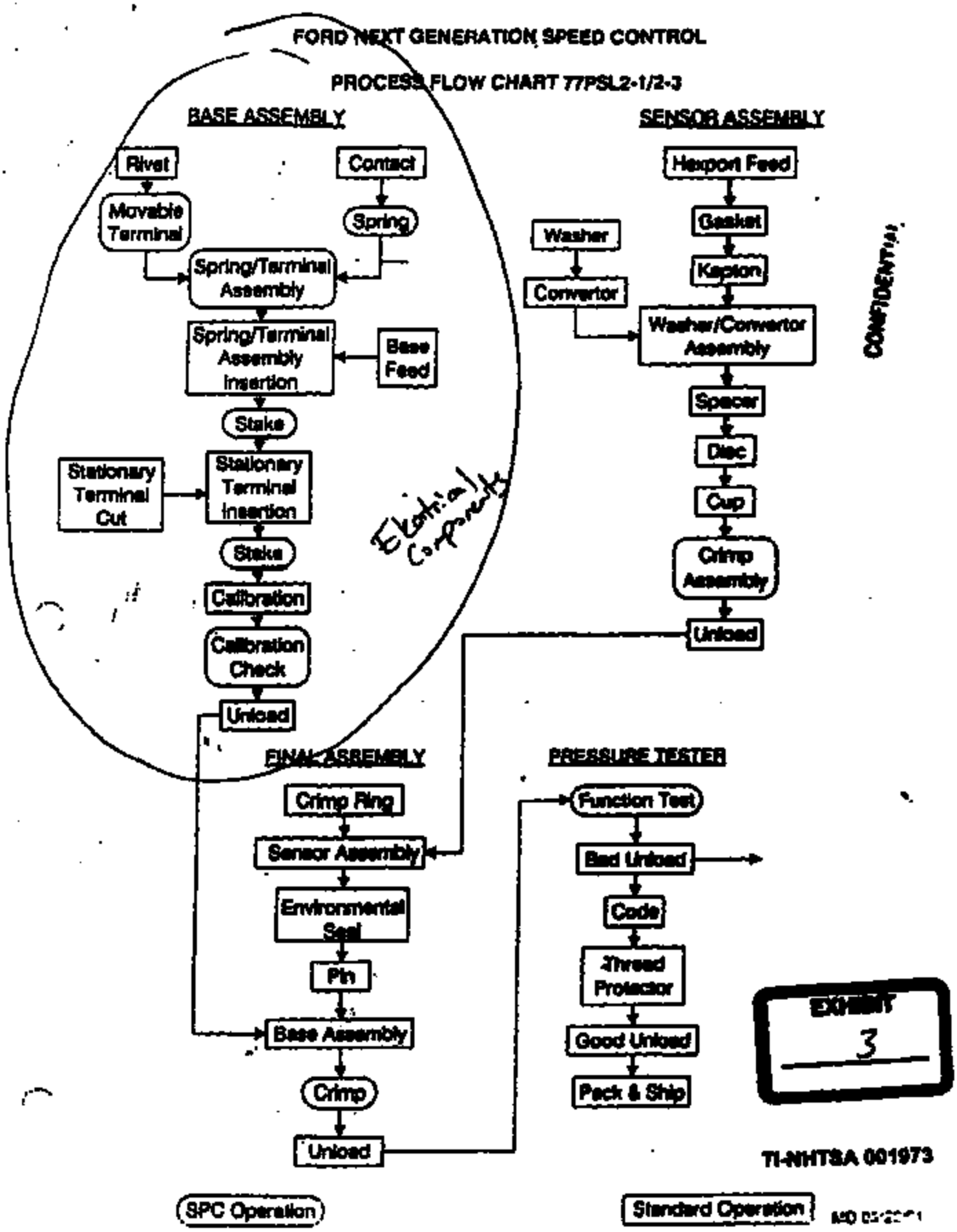
PRODUCTION PLAN BY MONTH (THOUSANDS) - WITHOUT OVERAGE

	P/C 57PSL5-3		L/T 57PSL5-2	P/C 77PSL2-1	L/T 77PSL2-3
APR	0		0	0	0
MAY	22		2	0	0
JUN	*10	(tentative)	0	0	0
JL	10	"	2.3	0	0
AU	10	"	2.3	2	0
SEP	10	"	*2.6	2	0
OCT	0		9.5	**9	2
NOV	0		8.5	25	2

DEC 0 0 25 **9.5

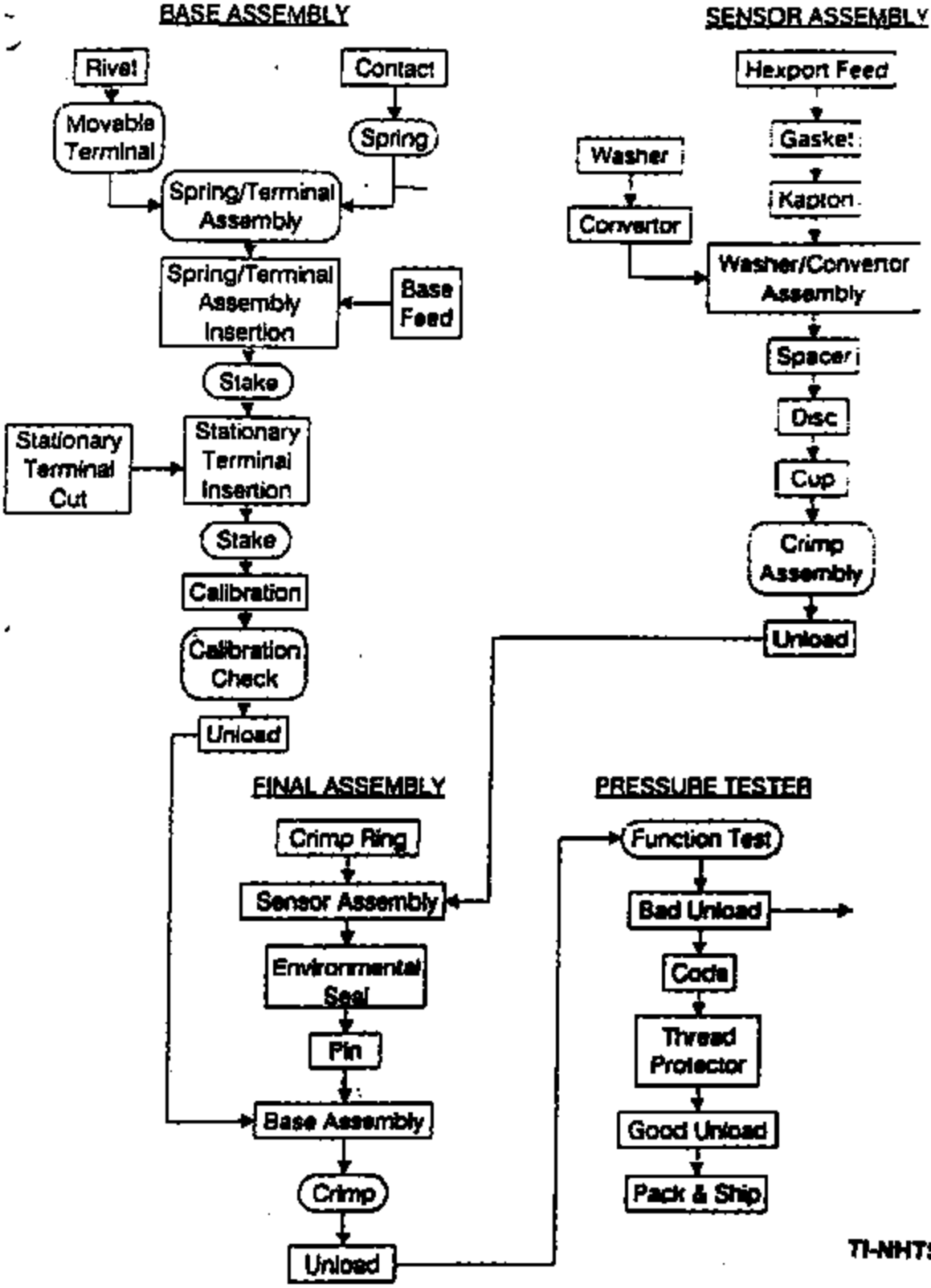
* = JOBI FOR 57PS VERSIONS
** = TENTATIVE JOBI FOR 77PS VERSIONS

REGARDS,
E CEARN \23-FORD


FORD NEXT GENERATION SPEED CONTROL
PROCESS FLOW CHART 77PSL2-1/2-3
BASE ASSEMBLY
Rivet
Movable Terminal
Contact
Spring
Spring/Terminal Assembly
Spring/Terminal Assembly Insertion
Base Feed
Stake
Stationary Terminal Cut
Stationary Terminal Insertion
Stake
Calibration
Calibration Check
Unload
Electrical Components
SENSOR ASSEMBLY
Hexport Feed
Gasket
Kapton
Washer
Convertor
Washer/Convertor Assembly
Spacer
Disc
Cup
Crimp Assembly
Unload
CONFIDENTIAL
FINAL ASSEMBLY
Crimp Ring
Sensor Assembly
Environmental Seal
Pin
Base Assembly
Crimp
Unload
PRESSURE TESTER
Function Test
Bad Unload
Code
Thread Protector
Good Unload
Pack & Ship
EXHIBIT 3
TI-NHTSA 001973
SPC Operation
Standard Operation

FORD NEXT GENERATION SPEED CONTROL

PROCESS FLOW CHART 77PSL2-1/2-3



TI-NHTSA 001974

-MSG Mew 21:705 FR=SEQ1 TO=ZARN SENT=[illegible]
Subject: CCPS Diversity Calibration Afternoon 21 [illegible]

CC: Wayne Jackson JWSJ
Dave Czarn DJCZ
John Fulcomer MFCS
Mike McCann MFCS
Matt Seliger MFMC

CC: Jeff Differding SLB

FR: Steve Offiler SEQ1

SUB: Notes on CCPS AMI Calibration, 21-MAY-22

Our target calibration value is 92 mils. Pre-trials on a few devices showed an offset was present, similar to previous trials. The difference between the calibrator reported measurement and the actual measurement was roughly 3 mils, so the calibrator value was set to 89 to compensate. We manually gaged 22 calibrated switch assemblies, measuring from the base reference surface to the spring bump at continuity change as usual. The statistics showed an average of 91.0 mils, with an N-1 sigma of 1.6 mils.

For comparison, the first calibration iteration (Feb 21), on the benchtop, had a sigma of 0.6 mils. Gaging errors were approximated at this time to be 0.1 mils, giving a 0.5 mil sigma for the process. Removing the same gage errors for the present iteration gives a sigma of 1.5 mils, or 3 times worse than the previous iteration. Work is ongoing to understand the sigma actually required, given the size of the pinning window.

Further work is also required to understand the delta between the machine's measurement and the actual measurement. During the first iteration the offset was found to be 2.3 mils, and during this iteration the offset was 2.9 mils. One hypothesis to explain the offset involves the point of application of force. Gaging applies force to the bump only, while calibration applies force to both the contact area and the bump. It is probable that the shape of the deflected spring is different for each case. Closely matching the force at the bump during calibration to the gaging force may help.

Occasionally, the calibrator would simply crush the stationary terminal instead of performing the normal procedure. Steve M. noted that assemblies with abnormally high (large angle) spring arms seemed to result in crushing. We hypothesized that the force applied to hold the spring closed against the stationary terminal was insufficient, "fooling" the calibrator because the spring did not follow the stationary terminal downward during calibration. Adding weight to the tool which holds the spring closed seemed to rectify the problem.

Measurements on calibrated switches with normal spring arms show the largest force to close the contacts, measured at the bump, is about 120 grams. This translates to about 60 grams at the movable contact. We may choose to place a fairly large force at this point, ca. 200+plus grams, to ensure that the contacts are positively closed; conversely, we may choose to set this force to about 80 grams, such that any further with abnormally high spring arms will purposely be destroyed by the calibrator. This would be

TECHNICAL SERVICE LABS

9407

TSR# 105107

		STATE YOUR PROBLEM / SAMPLE DESCRIPTION	INFORMATION DESIRED
	127		
	146		
	060		
REQUESTOR	Sandy		
MAIL STATION	1141		
EXTENSION	3091		
MSG ID	AT&C		
DATE SUBMITTED	5/23/91		
DATE REQUIRED	5/24/91		
NO. OF SAMPLES	3		
DISPOSITION			

REPORT OF RESULTS:

(1) 41 - 41

(2) 42 - 41

(3) 41. 41

DATE RECEIVED 5/24/91 DATE OUT

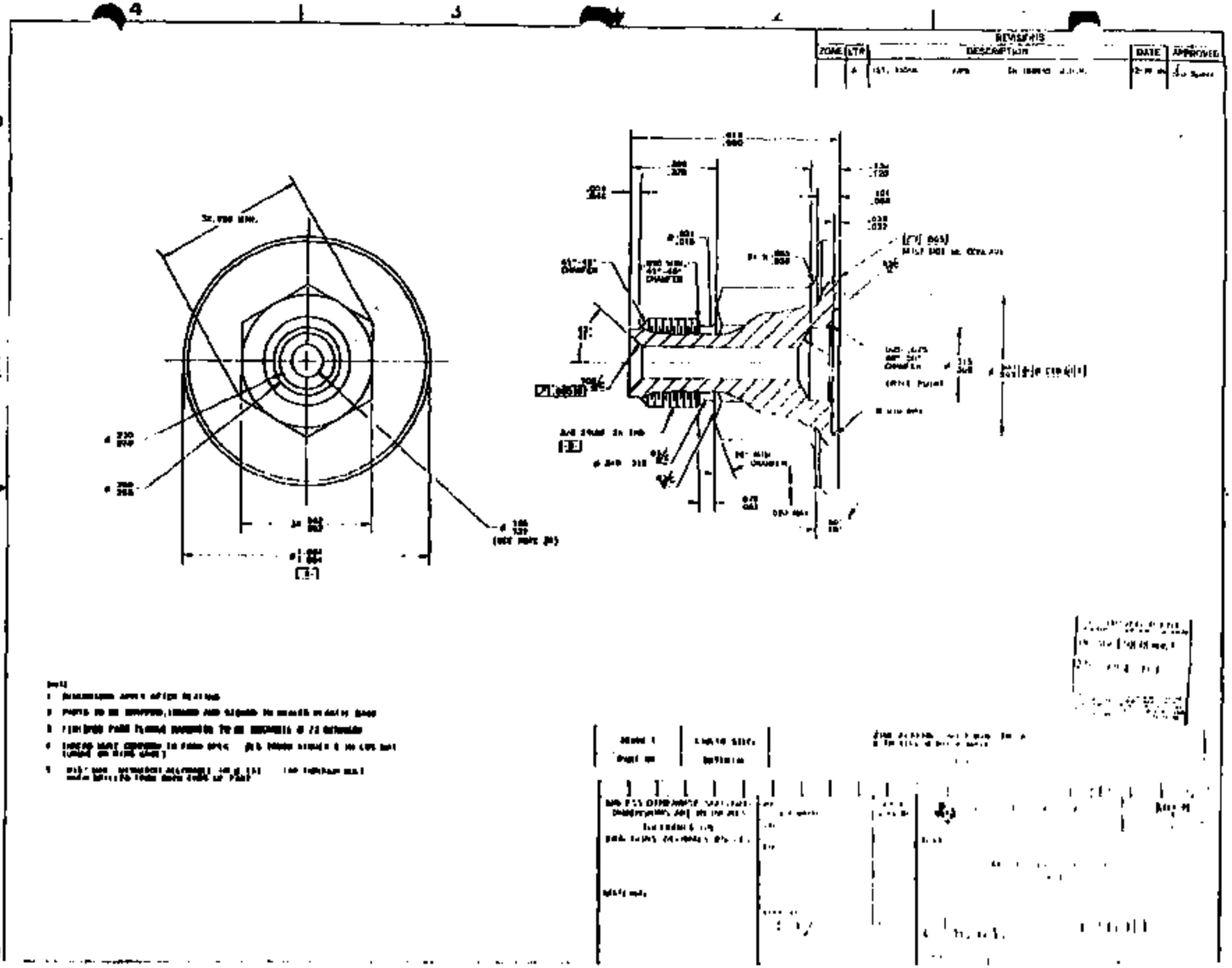
TECHNICIAN			
HOURS WORKED			
PROCEDURE USED			

*PCC I.D.

MC=325	TM=431	JOCY=126	FACIL=514
PC=127	WRE=432	CLKE=122	FACIL=521
VERS=168	EPD=621	CAN=654	FACIL=537
AFCC=483	PEP=622	AC DEV=286	STAFF=555
IMD=430	CSD=535	EMCD=677	

DISTRIBUTION: WHITE - TECHNICAL LAB PINK - REQUESTOR

TI-NHTSA 001977



REVISIONS

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

HIGHLIGHTS

Stephen B. Offiler

Week Ending 91-05-24

FORD MY'92 ELECTRONIC SPEED CONTROL DEACTIVATE PS

TOKICO SAMPLES: We are making very good progress on the aggressive sample build schedule. Movable terminal assemblies from Eastern Automation, expected last Friday on the original schedule, did not arrive until this past Tuesday. This required some schedule reshuffling. We were able to get a quantity of 36900 hexports (with damaged threads) chased, stripped, and replated with Nickel. Plating turned these parts around in one day. Ted Ballard turned around the low-differential Light Truck discs very quickly also. We have built a small quantity of sensors with these discs and finished manual-plot hatchet curves to determine appropriate pin lengths. The EA movable terminal assemblies, and the stationary terminals, were removed from strip using the AMI cutoff stations. Brown bases (large quantities on-hand) and black bases (very limited supply, which will be exhausted by Tokico samples) were built up with these terminals, using staking tools on the 57PS line; the AMI stakers are not ready yet. We have been using the brown bases for calibrator evaluations and prototype work, saving the black bases for samples. All switch assemblies have been calibrated on the AMI. At this point, 12 prototypes are undergoing a standard Impulse test to validate the life of the EA spring arms and the new discs. In parallel, we are preparing switches and sensors for the Tokico samples. Upon successful completion of the Impulse test next Tuesday, we will go ahead with final assembly. Pressure testing of the 100 customer samples will be done in the lab, with the help of an individual supplied by Dick Garlepy. We are on track to ship samples by next Friday, 05/31.

77PS SPRINGS: Analysis of the geometry of the Eastern Automation springs was completed. MSG# 200985 has complete details. It was discovered that all geometry looks good except the bend, which is slightly out of place. John Kourtesis has spoken with EA about moving the bend. They report that the tools are out being hardened, but the change we are requesting is not a problem, even on hard tools. Tools will be back to EA on Tuesday (05/28), and they will make the change and reassemble by approx. Friday (05/31). We should see parts from this modification by approx. Mon (06/03) and complete evaluation and tool approval by approx. Wed. (06/05).

77PS CALIBRATION: The next calibration iteration on the AMI was completed, driven by the need for Tokico samples. MSG# 211705 has complete details. At this point, the operation is not representative of the production issue, because the bases are not yet being lifted out of the seats. This means cal. forces are applied to the AMI dial, which deflects noticably. Jeff's manual gaging method shows a sigma (gage errors approximated and removed) of 1.5 mils, which is about 3 times worse than the original iteration, with the calibrator set up stand-alone on the benchtop. Work is ongoing to understand and calculate the sigma that is actually required given the size of the pin window.

-MSG M#= 245032 FR=CZRN TO=PCQA SENT=05/24/91 02:55 PM
R#=113 ST=C DIV=0050 CC=00101 BY=CZRN AT=05/24/91 02:55 PM

TO:	RUSTY STRUBLE	RCS2	CC:	TOM CHARBONEAU	TC
	MIKE DeMATTIA	PCQA		JOHN KOURTESIS	MDES
	CHARLIE DOUGLAS	CPPC		STEVE MAJOR	WHLI
	DICK GARIEPY	MFPC		ANDY McGUIRK	PCQA
	PAUL ROTCH	PRK1		ED O'NEILL	EJON
	JOE LAZARZ	JHL0		JOE SCHUCK	WHLZ
	STEVE OFFILER	SBO1		GARY SNYDER	CPPC
	MATT SELLERS	PCNE		MARTHA SULLIVAN	CPPC
	BILL SWEET	PCNE		RAY TOURANGEAU	PCNE
	JIM WATT	PCQA		TED BALLARD	AVNE
	TED BREDIKEN	MFPC		STAN HONOL	SH2
				CLAIRE BALTHAZAR	MFPC
				BILL CONGDON	MFPC
				STEVE MCCOOEY	MDES
				TERRY RODRIGUEZ	MFPC

FR: DAVE CZARN ZARN

SJ: FORD CRUISE CONTROL PRESSURE SWITCH START-UP MEETING:
05/09/91 MEETING MINUTES

MEETING

THE NEXT MEETING IS SCHEDULED FOR:

DATE: 05/30 (THURSDAY)
TIME: 10:00 - 11:30 AM
PLACE: MARKETING CONFERENCE ROOM

PLEASE CALL ME IF YOU ARE NOT ABLE TO ATTEND

* = ITEMS THAT ARE NEW OR HAVE BEEN REVISED OR COMPLETED SINCE PREVIOUS MEETING

57 L/T	WHO	WHEN	
Hexport:			
* L/T PILOT RUN [illegible]	SELLERS/	01/24	ORIG.
(PUSHOUT DUE TO HEXPORT AVAILABILITY)	GARIEPY	06/06	REV.
. UPDATE HEXPORT SHIPPING SCHEDULE	ROTCH	ONGOING	
. COPY OF FORD'S INSTALLATION TORQUE	SCHUCK	05/09	ORIG.
SPEC (ES20000-S100); SEND TO TIA		05/30	REV.
* PLAN FOR EVALUATING POULSEN	ROTCH	05/16	ORIG.
		05/30	REV.
* PLAN FOR HEXPORT COST REDUCTION W/ELCO	ROTCH	06/06	
ISR issues:			
. CONNECTOR INSTALLATION FORCE STUDY	OFFILER	06/06	
. GAGE CONCEPT FOR TERMINAL POS'N.	SELLERS	06/06	
. RELEASE PRINT FROM L/T	SCHUCK	05/09	ORIG.
(SEE DISCUSSION)		06/20	REV.
SUBMIT ISR FOLLOW-UP TO FORD SQA	WATT	04/04	ORIG.
(NEED RELEASE PRINT)		06/27	REV.
* DELIVER 52 PRODUCTION SWITCHES	SELLERS/	04/01	ORIG.
	BALTHAZAR	05/23	REV.
		05/23	COMP.

[illegible] Calibration

57 P/C

. ISR SUPPLEMENT FOR SWITCHES W/BROWN OFFSET POLARITY KEY BASES (PUSHOUT DUE TO SREA DELAY)	WATT	04/1. 05/30	ORIG. REV.
* UPDATE 57PS DFMEA PER STEVE'S INPUTS	WATT	06/06 05/23	ORIG. COMP.
* UPDATE QAS 296 AS REQ'D	WATT	05/23 05/23	ORIG. COMP.
* SHIP 21K LS-3'S (DELIV. DATE PUSHOUT BY FORD)	GARIEPY/ STRUBLE	06/03 07/01	ORIG. REV.
. PLAN FOR MAKING L/T AND P/C ENV. SEAL COMPRESSION CONSISTENT	OFFILER/ SELLERS	06/06	
. ADD MATING CONNECTOR FIT-UP CHECK TO INSP. REQMTS. - 5 PCS/HR	WATT	05/30	
* DISPOSITION HEXPORTS W/REROLLED THDS.	SELLERS	05/23 05/23	ORIG. COMP.

77PS

. DESIGN UPDATE	OFFILER	ONGOING	
. MFG/MECH UPDATE	SELLERS	ONGOING	
. PROD. LINE SET-UP (RTE CARDS, ETC)	BALTHAZAR	ONGOING	
. UPDATE SPC FILES/RUN CAPABILITY STUDIES	BALTHAZAR	ONGOING	
* ESTABLISH OVERALL SCHEDULE OF DESIGN ENG. ACTIONS	OFFILER	05/02 05/30	ORIG. REV.
. 77PS PARTS LISTS	OFFILER	06/06	
. COMPLETE DESIGN FMEA	OFFILER	04/18 05/30	ORIG. REV.
COMPLETE PROCESS FMEA	SELLERS	07/01	
DETERMINE ACCEPTABLE CALIBRATION WINDOW BY DIMENSIONAL ANALYSIS	OFFILER/ SELLERS	03/14 05/30	ORIG. REV.
* VERIFICATION RUN FOR CALIBRATION WINDOW	OFFILER/ SELLERS	03/28 05/30	ORIG. REV.
* F/D CHARACTERISATION OF SPRING ARMS	OFFILER	04/18 06/06	ORIG. REV.
* GAGING TECHNIQUE FOR IN-PROCESS F/D CHARACTERIZATION OF SPRING ARMS	SELLERS	04/25 05/30	ORIG. REV.
* STAKE PROD'N PARTS ON PROD'N STAKER AND MEASURE TERMINAL POSITION	SELLERS	05/02 06/06	ORIG. REV.
* COMMUNICATE ANY REQ'D TERMINAL CHANGES TO BASSLER	SELLERS	06/13	
. 57 TO 77 CONVERSION: PHASE 1 TESTING (PUSHOUT DUE TO COMPONENT AVAILABILITY)	BONOL	05/30 06/06	ORIG. REV.
. COST ESTIMATE FOR LOW DIFF. SWITCH	SELLERS	06/06	
. IDENTIFY INSPECTION REQMTS. FOR SOP	WATT	06/01	
. IDENTIFY AUTOMATION SPECIALIST	GARIEPY	06/06	
. 77PS QAS (PRELIMINARY)	WATT	07/01	
. 77PS CHARACTERISTICS SHEETS	WATT	07/15	
. GAGE R&R STUDIES	WATT	07/15	
. 77PS QAS (FINAL)	WATT	08/01	
. SET UP SPC FILES/RUN CAPABILITY STUDIES	BALTHAZAR	08/01	
* 57 STYLE SWITCHES TO JOHN K. FOR EVAL. ON FINAL ASM MACHINE	SELLERS	05/30	
* CAN 57 SWITCHES BE BUILT ON F.A.M. ?	ROUSTEGIS	06/06	

Production Components:

* UPDATE CUP PRINT	OFFILER	03/28 05/30	ORIG. REV.
* RESOLVE OPEN ISSUES ON BASE	SELLERS	04/11	ORIG.

		05/30	REV.
. UPDATE TERMINAL PRINTS/BASE PRINT	OFFILER	05/09	ORIG.
		05/30	REV.
Manufacturing Equipment:			
FINAL ASM MACHINE DEBUG COMPLETION	SELLERS/ KOURTESIS	06/03	
. BASE ASM MACHINE BUILD COMPLETION	SELLERS/ KOURTESIS	05/31	
. PRESSURE TESTER BUILD COMPLETION	SELLERS/	06/20	ORIG.
	KOURTESIS	06/06	REV.
* PROVIDE DATES FOR EFFECTIVITY RUNS	SELLERS/ MCCOOEY	05/30	
Tokico:			
. REPORT ON TOKICO P.S. RESPONSIBILITY	DOUGLAS	ONGOING	
* DEL. 100 SAMPLES TO TOKICO USA	OFFILER	06/03	

DISCUSSION

57 L/T AND P/C

.

-1600 P/C SWITCHES WERE BUILT THIS WEEK, WITH WAXED CRIMP RINGS AND HEXPORTS THAT REQ'D THREAD CHASING. 2000 SETS OF COMPONENTS STARTED, AND THERE WERE YIELD LOSSES FOR VARIOUS REASONS. THE BUILD ALSO HIGHLIGHTED A PROBLEM WITH FEEDING THE LOWER CROWN HEIGHT P/C DISC, AND OTHER ANI-RELATED ISSUES. MATT AND DAVE PERIPOLI WILL MONITOR THE NEXT BUILD.

'95 HEXPORTS - WITH THREADS THAT WERE RE-ROLLED USING VANISHING OIL - ARE AT RECEIVING INSPECTION. PAUL K. WILL PROVIDE AN UPDATE OF ELCO'S DELIVERY SCHEDULE FOR THE NEXT MEETING.

.

PITTS HAS DETERMINED THAT PARTS WHICH HAVE THE MARGINAL THREAD ROLL-OVER ARE NOT ACCEPTABLE. THEY ARE REQUESTING A FORMAL RESPONSE FOR A CORRECTIVE ACTION. JIM IS WORKING ON THE RESPONSE, IN WHICH WE NEED TO STRESS THAT NO CRITERIA HAS BEEN ESTABLISHED BY FORD OR PITTS WITH REGARD TO INITIAL INSTALLATION TORQUE.

.

WE LEARNED FROM FRED HENDERSHOT THAT TRANSMISSION PROBLEMS ARE AFFECTING START-UP OF 3 PLATFORMS - INCLUDING FW36 (P/C) AND VH58 (L/T). THEREFORE, WE DON'T ANTICIPATE VOLUME SWITCH RIGHTS. FROM PITTS UNTIL AT LEAST MID-JULY.

77P8

.

THE 100 PC. SWITCH BUILD FOR TOKICO IS ON SCHEDULE; WE'LL SHIP PARTS ON 05/31.

.

EASTERN AUTOMATION SUBMITTED COMPLETED SPRING/TERMINAL ASSEMBLIES ON TUESDAY. THE BEND IN THE ARM WAS IN THE WRONG POSITION, RESULTING IN AN ACUTE ANGLE WITH THE CONTACTS CLOSED. THIS ALSO CONTRIBUTED TO THE BUMP BEING OFF-CENTER. THE PLAN IS TO HAVE E.A. GRIND THE BENDING TOOL; IF FURTHER WORK IS NEEDED TO RE-CENTER THE BUMP, IT WILL BE DONE AFTER WE RECEIVE THE MACHINE.

.

PURCHASING INVITED POULSEN IN FOR A VISIT TODAY REGARDING HEXPORT MANUFACTURING. THE POULSEN REPRESENTATIVES LEFT A GENERALLY

POSITIVE IMPRESSION ON THOSE WHO MET WITH THEM. THEY SEEM TO BE A VIABLE SOURCE FOR HEXPORTS, AND THEY BEAT ELCO'S HIGH VOLUME PRICE FOR THE J512 HEXPORT BY ~$.05/PC; TOOLING IS $30+K.

MILESTONES	PLANNED	ACTUAL
57 L/T ISIR	11/21/90	11/21/90
57 L/T JOB 1	09/03/91	
57 P/C ISIR	01/15/91	01/15/91
57 P/C JOB 1	06/03/91	
77PS ISIR	08/01/91	
77PS SOP (TI)	09/01/91	

PRODUCTION PLAN BY MONTH (THOUSANDS) - WITHOUT OVERAGE

	P/C 57PSLS-3		L/T 57PSLS-2	P/C 77PSL2-1	L/T 77PSL2-1
APR	0		0	0	0
MAY	2	(COMP.)	2	0	0
JUN	*22		0	0	0
JUL	10	(tentative)	2.3	0	0
AUG	10	"	2.3	2	0
SEP	10	"	*2.6	2	0
OCT	0		9.5	**9	2
NOV	0		8.5	25	2
DEC	0		0	25	**9.5

* = JOB1 FOR 57PS VERSIONS
** = TENTATIVE JOB1 FOR 77PS VERSIONS

REGARDS,
DAVE CHARN \24-FORD

RIVERDALE PLATING & HEAT TREATING, INC.
650 West 134th Street Riverdale, Illinois 60827-1184

TELEPHONES
(708) 841-2660
(312) 568-2400

ILLINASTICS MANUFACTURING, INC.
747 INDUSTRIAL DR
ELMHURST IL 60126-1519

27639-1

JUN - 3 1991

THIS IS TO CERTIFY THAT THE PARTS, FURNISHED AGAINST THE LISTED PURCHASE ORDER, WERE PROCESSED IN ACCORDANCE TO SPECIFICATION.

133431	138657	AUSTENITE TO R/C 40-55	74,515	1,559	5/29/91
133431	138657	ZINC .0002 - .0006	74,515	1,559	5/29/91

Subscribed and sworn to before me

THIS 29 DAY OF MAY , 1991

Notary Public

"OFFICIAL SEAL"
Notary Public, State of Illinois
My Commission Expires 12/30/92

RIVERDALE PLATING & HEATING TREATING, INC.

Vice President

THANTEA 001804

ACME MILFORD
857 BRIDGEPORT AVE.
MILFORD, CONNECTICUT [illegible]

TEL. 203 878-4631 • FAX [illegible]

TO: TEXAS INSTRUMENTS

CERTIFICATE OF COMPLIANCE

ACME MILFORD CERTIFIES THAT:

P.O. NUMBER: [illegible]
ACME/MILFORD CONTROL NUMBER: [illegible]
ACME/MILFORD P/N: [illegible]
QUANTITY: 99,995

WAS PROCESSED TO CONFORM TO THE FOLLOWING

PART NUMBER: [illegible]
PART REVISION: A
MATERIAL: BRASS CDA [illegible]
HEAT NUMBER:
TENSILE AFTER FINAL DRAW:
FINISH: PLAIN FINISH

SIGNED: John Michael DATE: [illegible]

JOHN MICHAUD
TITLE QUALITY CONTROL MANAGER

SWORN TO AND SUBSCRIBED BEFORE ME THIS [illegible] DAY OF [illegible]

NOTARY PUBLIC [illegible]

SEYMOUR SPECIALTY WIRE COMPANY

(An Enthoven Owned Company)
18 Franklin Street
Seymour, Connecticut 06483

ANALYSIS REPORT

Customer [illegible] Rivers & Machine Co.
Address P.O. Box 501E
City Ellyria, OH 44035

Date December 27, 1991
Customer P.O. [illegible]
Seymour # S-54725-2

Material CDA 260 Wire
Size .060" Rd.
Specification U.S. 56/63,000 PSI QR ELO Heavy Soap Coat
Conforms to UNS# C26000

Date Shipped 12-27-91
Weight 937 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.	29%
ROCKWELL	
BEND TEST	
GRAIN SIZE, AVERAGE	
RESISTIVITY ohms/cm	
CONDUCTIVITY	

TI-NHTSA 001986

State of Connecticut
County of New Haven

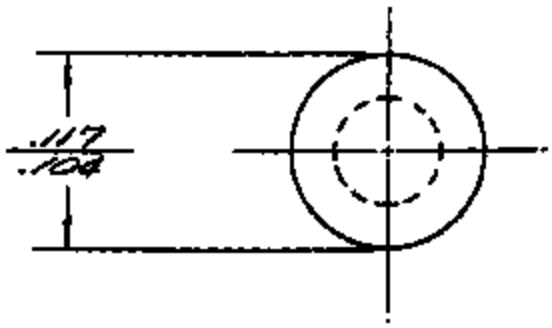
Sworn and subscribed to before me this 31 day of Dec. 19 91

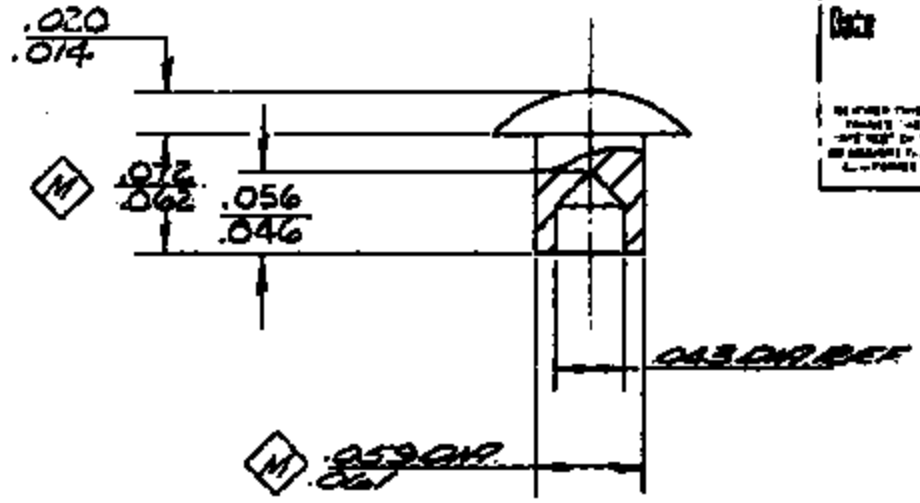
74171

TITLE RIVET

REV B

74171





CERTIFIED PRINT
ENG. STD E9893 REV. E
DATE 1.1.1991

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

TI-NHTSA 001987

74171-1	COMP. PROGRESS	
A REV NO.	MATERIAL	

REVISIONS: 175 [illegible] P3H P3A P3S P3T

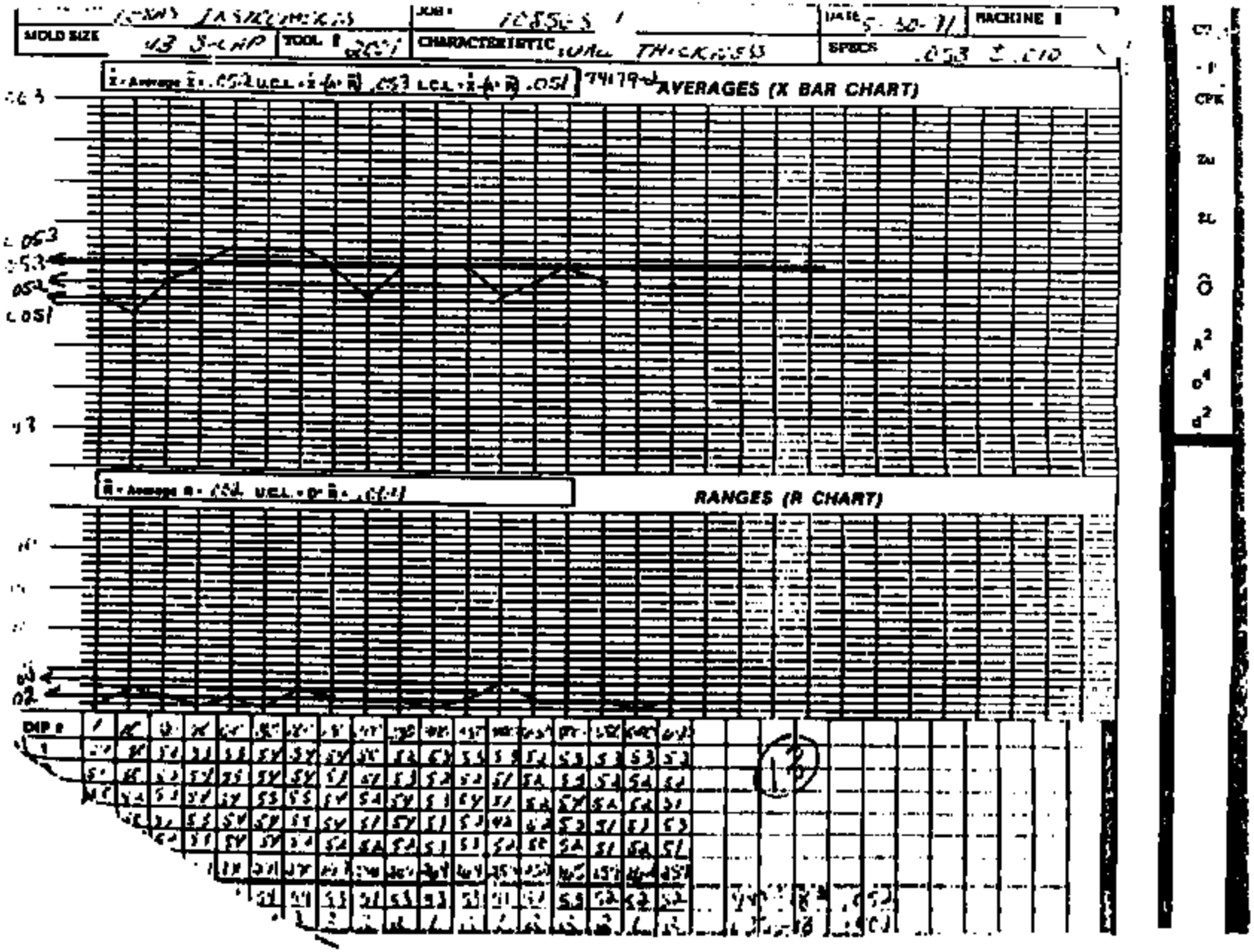
BY 2-1-94
CH. K. H. Wen 2-1-94
ENG. D. [illegible] 2/1/94

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

KIDDON

SIZE A

DWG NO. 74171



QUIET DISC VERIFICATION TEST TEST 146-15-12 JAD 5/30/91

DEVICE #	DISC LOT	ACT	REL	mV DROP	IMPULSE TEST	ACT	REL	mV DROP
146-15-01	26 / 22.5	273	/183	1.2		266	/190	2.2
146-15-02	26 / 22.5	271	/186	2.6		265	/191	2.4
146-15-03	26 / 22.5	265	/186	2.8		256	/191	4.5
146-15-04	26 / 22.5	281	/199	2.4		284	/202	3.8
146-15-05	26 / 22.5	277	/192	1.1		267	/197	19.8
146-15-06	26 / 22.5	270	/192	1.8		265	/192	0.6
146-15-07	26.5 / 23.5	249	/181	2.7		256	/184	6.5
146-15-08	26.5 / 23.5	244	/185	1.4		248	/180	4
146-15-09	26.5 / 23.5	264	/193	2.4		259	/189	3.5
146-15-10	26.5 / 23.5	267	/195	1.7		268	/192	5.4
146-15-11	26.5 / 23.5	271	/191	2.9		268	/190	4.8
146-15-12	26.5 / 23.5	258	/191	2.1		259	/187	3.1

PRESSURE SWITCH DATA Form 21605 TEST NO. 1

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMP. DATE
7795	6/21/94		
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
	7/1/94		

PROJECT TITLE:

CUSTOMER:

PURPOSE OF TEST: 7795 Switch Design Confirmation Test
First Piece

PROCEDURE:

ABORTED

		Group							

kCap

CERTIFICATE OF CONFORMANCE

TO: TEXAS INSTRUMENTS
ATTLEBORO, MASSACHUSETTS

PURCHASE ORDER NUMBER: [illegible]

CUSTOMER PART NUMBER: [illegible]

PART DESCRIPTION: [illegible] 3/8" THICK [illegible]

OUR JOB NUMBER: [illegible]

The supplier hereby certifies that adequate data is on file showing that all components and materials used in the article furnished comply with the physical and chemical properties required by our firm.

[signature] 5-31-91

Roger J. Rinkus
Quality Assurance Manager

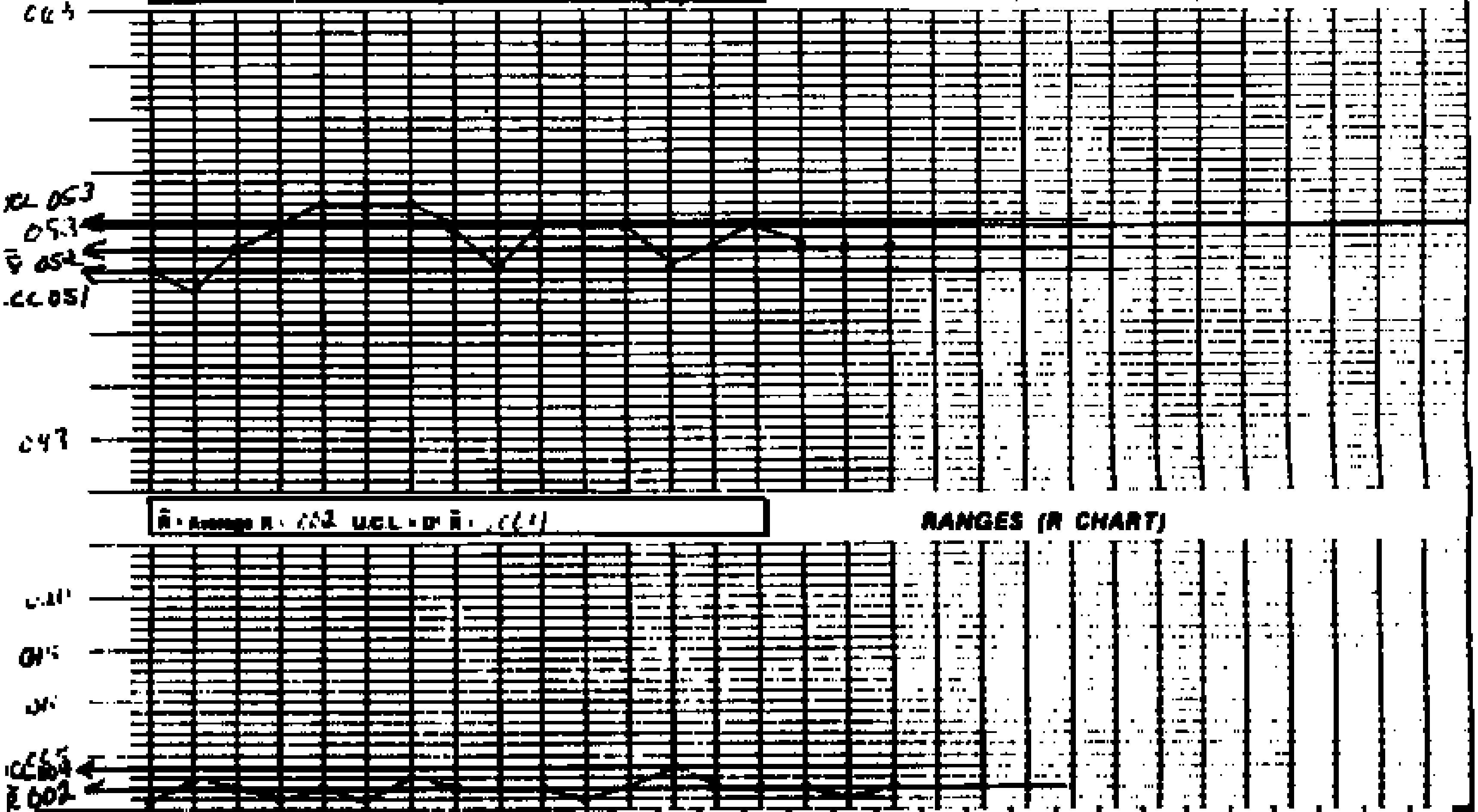
CUSTOMER Texas Instruments	**JOB #** 10858-1	**DATE** [illegible] 11	**MACHINE #** 6
MOLD SIZE .343 S-CAP	**TOOL #** 201	**CHARACTERISTIC** WALL THICKNESS	**SPECS** .053 ± .010

$\bar{\bar{X}}$ = Average $\bar{X}$ = .052 U.C.L. = $\bar{\bar{X}}$ + (A_2 $\bar{R}$) .053 L.C.L. = $\bar{\bar{X}}$ − (A_2 $\bar{R}$) .051

74179-3 **AVERAGES (X BAR CHART)**

$\bar{R}$ = Average R = .002 U.C.L. = D_4 $\bar{R}$ = .004

RANGES (R CHART)



DIP #																		
1	51	51	52	52	53	54	54	54	50	54	53	52	53	54	53	53	53	52
2	51	50	53	54	55	54	54	51	51	53	54	[illegible]	51	[illegible]	52	52	54	52
3	[illegible]	54	53	51	54	55	55	54	54	54	53	54	51	54	54	54	53	51
4	[illegible]	52	53	54	54	53	54	51	57	53	52	54	54	53	51	51	53	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CP

CPK

Zu

ZL

$\hat{\sigma}$

$\bar{x}^2$

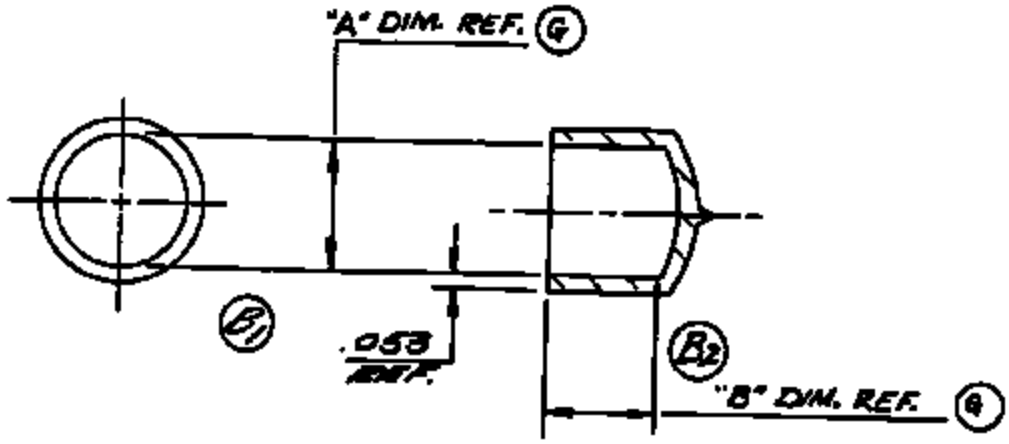
D^4

d^2

TITLE
THREAD CAP

REV. H

74179



NOTE:
1) IDENTIFICATION MEMO MUST ACCOMPANY EACH SHIPMENT STATING THE FOLLOWING:
SINCLAIR RUSH #SC 0.343-6(3/8"IL)TR 781-1R

(H)

TI-NHTSA 001893

PART Nos.	MATERIAL	DIM. "A"	DIM. "B"	VENDOR	COLOR
74179-2	VINYL	.333/.343	.313/.438	SINCLAIR & RUSH	RED
74179-1	VINYL	.355/.365	.281/.343	MOCAP	RED

REV.												
									Q13-1	Q1-1	Q2-1	P37-1	P35-1

BY Tom Dail 2/2/84	TEXAS INSTRUMENTS INCORPORATED ATTLEBORO, MASS. U.S.A.	KELDON	SIZE A	DWG. NO. 74179
CK K.H. Wu 2/13/84				
ENG. D. Stott 2/13/84				

CAGE Code No. 81647

57P344

TEXAS INSTRUMENTS

L. Dunnam.

May 31, 1991

Hilite Industries Inc.
P.O. Box 814649
1671 S. Broadway
Carrollton, TX 75006

Attn: Mr. George A. Conisby
Seniorr Quality Assurance Engineer

Subj: Corrective Action Request

Ref: Your May 14, 1991 Non-conforming Materials Advisor. Notice
Part Number 2-05949-01

Dear George,

Enclosed, please find the Corrective Action Report you had requested for the 30 pressure switches sent for thread evaluation.

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

Regards,

Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

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

encl: Corrective Action Report

[redacted] Texas Instruments Component Name: Pressure Switch
Location: Attleboro, Ma 02703 Hilite Part Number : 2-05949-01

Problem Description TI provided 30 switches for switch installation
---
evaluation on the proportioning valve. The threads on these switches were near the upper limit of acceptance, based upon installation torque into a "go" gage. TI' internal requirements call for a maximum of 4.5 in-lbs torque to assemble into the gage. The installation torque is not specified in the Ford specification or on the Ford release drawing, to which these switches are made.

Interim Corrective Action(s)

We will continue to work to improve the plating process to lessen the potential for thread rollover. In the interim, the threads will be re-rolled after plating to meet Pitt's torque requirements, yet to be specified.

[redacted]Definition

We believe that the slight binding on the hexport threads is the result of the hexport supplier s plating process. The relative movement of the parts in the barrel can cause the lead-in thread to become slightly rolled over, which tends to increase the installation torque. Corrective actions in similar parts has included changing the geometry of the threaded end to lessen the chances of this rollover condition. However, in this case, the thread geometry as defined by Ford, must conform to the SAE J512 specification.

Long Range Action

[redacted]I and Pitts arrive at an agreement for assembly torque, we [redacted]TI continue to work with our supplier to reduce the chances of thread rollover during plating.

Verification

Open pending final resolution on specification agreement between TI and Pitts.

Statistical Evidence

Open pending final resolution on specification agreement between TI and Pitts.

Outlook

Open pending final resolution on specification agreement between TI and Pitts.

Additional torque definition is required.

Prepared by: Jim Matt
QRA Engineer

HIGHLIGHTS

Stephen B. Offiler
Week Ending 91-05-31

FORD MY'92 ELECTRONIC SPEED CONTROL DEACTIVATE PS

SAMPLES: One hundred 77PS samples for Tokico were completed late Wednesday. A very high level of effort was required to stay on the aggressive schedule. We are now waiting for final instructions on exactly where to ship these samples.

Light Truck has requested another half-dozen silent 57PS's for further evaluations. At present, they have received only two silent samples, built with early lab-developed incipient discs. We plan to ship these N/C to Joe Schuck for hand-delivery mid-next-week. to Kevin Zajac Fr. W

We have placed an EEO with Ted Ballard for test-lots of low-differential discs at the Pass-Car specification. We will look at differentials of about 2, 4, and 6 psi to determine relative silence and manufacturability. Bruce Pease and WIN88 have both requested non-priority silent samples, which we should be able to build with these discs.

Hilite Industries (Pitts/Surfaces) has finally responded with their needs for special samples for Ford-required hydraulic tests, with some prodding from Bruce Pease. We immediately submitted a model shop job to create the special hexport dimensions. These will be built in a timely fashion but certainly not with any special priority.

It has been decided that we will build a few evaluation samples to determine our ability to meet the JI Case NBO. The spec calls for an actuation of 120 psi max, with release of 90-106 psi. The general plan is to use the low-differential PC discs to gain a better understanding of the amplification ratios yielded by the rebump cup, to help forecast if we could attain such tight tolerances and differentials in a finished device. A standard cup (27288) gives an actuation ratio over 9, and the release ratio is always lower, around 8. This makes it nearly impossible to build a low-differential device, since it calls for discs with almost zero or even negative differential. However, the rebumps (27713) seem to have a release ratio which is a little higher than the actuation ratio, which may make the JI Case spec achievable, but expect yields to be rather low.

57PS / PRODUCTION ISSUES: I have spoken with Bruce Pease about the thread situation with Hilite. He has promised to obtain a copy of ES20000-S100, which is referenced on certain Ford hexport prints. We assume this contains information pertaining to the 4.5 in-lb torque spec on the "GO" gage; if so, this will be used to create an objective thread-gaging standard for the Tier-1 customers which matches our internal standard.

Analysis of environmental seal compression is underway. The rebump cup is about .004" larger in the gland area than the standard cup, resulting in less compression. Several potential solutions are being considered: a slightly thicker gasket, which would result in compression in the 20-something percent range on the standard cup and low teens on the rebump; working with Valentine to try to make the gland dimension equivalent on both parts; a change to a smaller flange on the base with a correspondingly thicker gasket, such that the .004" difference becomes fairly insignificant in the percentage-compression calculation.

To appease engineers at Ford Light Truck on the terminal position issue, we are planning to perform a connector insertion force test. We will attempt to correlate terminal position with

insertion force by purposely placing terminals at various positions within and outside of the specification, then measuring the force required to install the mating connector. Ideally, the results would show that position has negligible effect on force, and we expect the actual results will confirm this. Most of the install force comes from friction between the plastic elements, especially from the locking tabs. Random variations in this friction force will probably be larger than the contribution from the terminals.

We are performing experiments to attempt to arrive upon some means of checking for creep on silent devices. We are looking at voltage traces at contact transfer, versus time and versus pressure. We've tried 12 volts, with resistive and inductive loads, with poor results. Electrical phenomena at contact transfer is not highly repeatable, and differences between a poorly pinned device and a good device are hard to discern. We are still working on it, next trying elevated voltages.

77PS / DESIGN ISSUES: Twelve devices built along with the Tokico samples passed a full-blown Impulse test, with 475K mechanical cycles plus 25K powered cycles, conducted at 121 C. This is the first time we've used Eastern Automation springs. At the end of the test, the springs and the contacts looked very normal. Drift of the low-differential discs was normal and very acceptable as well.

Resulting from the dimensional analysis of the EA springs last week, they have agreed to adjust the geometry. We've been informed that they are still on track to deliver turned parts early next week.

All EA movable-terminal assemblies in our possession have been built into switches and delivered to Mechanization for continuation of the calibrator evaluations. We have no ability to build 77PS samples at this point, but more EA parts are expected soon.

-MSG M#= 374176 FR=CZRN TO=PCQA SENT=05/31/91 08:21 AM
R#=038 ST=C DIV=0050 CC=00101 BY=CZRN AT=05/31/91 08:21 AM

TO:	MATT SELLERS	PCME
	STEVE OFFILER	SBO1
	DICK GARIEPY	MFPC
	TED BREDIKEN	MFPC
	TERRY RODRIGUES	MFPC
	PAUL WESTERLIND	B511
	RUSTY STRUBLE	RCS2
CC:	BILL SWEET	PCME
	RAY TOURANGEAU	PCME
	ED O'NEILL	EJON
	TOM CHARBONEAU	TC
	CHARLIE DOUGLAS	CPPC
	GARY SNYDER	CPPC
	STAN KOMOL	SE2
	LIN MATT	PCQA
FR:	DAVE CZARN	ZARN

cc = DONNA ML
FYI/Info

RE: 57PS P/C SWITCH FOR CCPS PROGRAM
ENVIRONMENTAL SEAL COMPRESSION

AS NOTED AT OUR START-UP MEETING, A POTENTIAL FOR INSUFFICIENT GASKET COMPRESSION EXISTS WITH THE CURRENT 57PS P/C SWITCH. BASED ON ACTUAL MEASUREMENTS OF BASES AND CUPS, A SEAL THAT IS AT THE LOW END OF THE SPEC WILL NOT HAVE SUFFICIENT COMPRESSION. THE ROOT CAUSE IS THE STEP IN THE P/C CUP, WHICH RESULTS IN A .004" GREATER "GLAND DEPTH". THIS DIMENSION IS NOT SPECIFIED ON THE PRINT.

THERE ARE 3 WAYS TO RESOLVE THIS ISSUE IN THE NEAR TERM; THEY'RE LISTED BELOW IN THE PREFERRED ORDER OF PRIORITY.

1. EXPEDITE DELIVERY OF 74247-3 (proposed revision - Matt has marked print). THE THICKNESS OF THE PROPOSED -3 GASKET IS .055/.045" VS. THE PRESENT .050/.040".

2. SORT THROUGH EXISTING 74247-2 GASKETS; USE ONLY THOSE THAT MEET THE PROPOSED -3 THICKNESS.

3. EXPEDITE DELIVERY OF P/C CUPS WHICH MATCH THE L/T CUP IN THE STEP AREA, YIELDING THE SAME GASKET COMPRESSION.

DICK/TED/RUSTY,

UNTIL FURTHER NOTICE, PLEASE DO NOT BUILD ANY ADDITIONAL P/C SWITCHES (57PSL5-3'S). THIS DOESN'T PERTAIN TO THE L5-2'S FOR L/T.

STEVE/MATT,

PLEASE DEVELOP A PLAN TO EVALUATE OR RE-WORK THE ~1600 SWITCHES WHICH ARE ALREADY BUILT; LET'S DISCUSS AT THURSDAY'S START-UP MEETING.

AS WE KNOW, THIS ISSUE DEMANDS A HIGH PRIORITY. WE HAVE 22K SWITCHES TO BUILD THROUGH JUNE AND CANNOT BEGIN UNTIL WE RESOLVE THIS ISSUE.

THANK YOU,

DAVE CEARN
\1-PC

-MSG №= 371825 FR=CIRN TO=PCQA SENT=05/31/91 07:00 AM
R#=029 ST=C DIV=0050 CC=00101 BY=CIRN AT=05/31/91 07:00 AM

MAY 31, 1991

TO:	RUSTY STRUBLE	RCS2	CC:	TOM CHARBONEAU	TC
	MIKE DeNATTIA	PCQA		JOHN RODRIGUES	MDES
	CHARLIE DOUGLAS	CPPC		STEVE MAJOR	WHLS
	DICK GARIEPY	MFPC		ANDY McGUIRK	PCQA
	PAUL KOTCH	PRK1		ED GARELL	EJON
	JOE LAZARE	JHL8		JOE SCHUCK	WHLS
	STEVE OFFILER	SBO1		GARY SNYDER	CPPC
	MATT SELLERS	PCME		MARTHA SULLIVAN	CPPC
	BILL SWEET	PCME		RAY TOURANGEAU	PCME
	JIM WATT	PCQA		TED BALLARD	AVNE
	TED BREDIKEN	MFPC		STAN BOBOL	SH2
				CLAIRE BALTHASAR	MFPC
				BILL CONDON	MFPC
				STEVE MCCOOEY	MDES
				TERRY RODRIGUEZ	MFPC

FR: DAVE CEARN ZARN

SJ: FORD CRUISE CONTROL PRESSURE SWITCH START-UP MEETING:
05/30/91 MEETING MINUTES

MEETING

THE NEXT MEETING IS SCHEDULED FOR:

DATE: 06/06 (THURSDAY)
TIME: 10:00 - 11:30 AM
PLACE: MARKETING CONFERENCE ROOM

PLEASE CALL ME IF YOU ARE NOT ABLE TO ATTEND

* = ITEMS THAT ARE NEW OR HAVE BEEN REVISED OR COMPLETED SINCE PREVIOUS MEETING

57 L/T	WHO	WHEN	
Hexport:			
. L/T PILOT RUN (PUSHOUT DUE TO HEXPORT AVAILABILITY)	SELLERS/ GARIEPY	01/24 06/06	ORIG. REV.
. UPDATE HEXPORT SHIPPING SCHEDULE	KOTCH	ONGOING	
* COPY OF FORD'S INSTALLATION TORQUE SPEC (EE20000-E100); SEND TO TIA	DELETED; SEE STEVE O.'S ITEM UNDER 57 P/C		
* PLAN FOR EVALUATING POGLESS	KOTCH	05/16 05/31	ORIG. REV.
* PLAN FOR HEXPORT COST REDUCTION W/ELCO	KOTCH	06/06 05/30	ORIG. COMP.
* PUT 13K HEXPORT ORDER ON HOLD; PENDING RE-ROLL RESOLUTION	KOTCH	05/31	
ISR issues:			
. CONNECTOR INSTALLATION FORCE STUDY	OFFILER	06/06	
* GAGE CONCEPT FOR TERMINAL POS'N.	SELLERS	06/06 05/30	ORIG. COMP.
* DEVELOP TERM. POS'N GAGE CONCEPT	SELLERS	06/13	
. RELEASE PRINT FROM L/T (SEE DISCUSSION)	SCHUCK	05/09 06/20	ORIG. REV.
. SUBMIT ISR FOLLOW-UP TO FORD SQA (NEED RELEASE PRINT)	WATT	06/04 06/27	ORIG. REV.

57 P/C

* ISR SUPPLEMENT FOR SWITCHES W/BROWN OFFSET POLARITY KEY BASES (PUSHOUT DUE TO SREA DELAY)	WATT	04/10 06/06	ORIG. REV.
* UPDATE 57PS DFMEA PER STEVE'S INPUTS	WATT	06/06 05/23	ORIG. COMP.
* UPDATE QAS 296 AS REQ'D	WATT	05/23 05/23	ORIG. COMP.
* SHIP 21K L5-3'S (DELIV. DATE PUSHOUT BY FORD)	GARIEPY/ STRUBLE	06/03 07/01	ORIG. REV.
. PLAN FOR MAKING L/T AND P/C ENV. SEAL COMPRESSION CONSISTENT	OFFILER/ SELLERS	06/06	
. ADD MATING CONNECTOR FIT-UP CHECK TO INSP. REQMTS. - 5 PCS/HR.	WATT	05/30	
* DISPOSITION NEXPORTS W/REROLLED TEDS.	SELLERS	05/23 05/23	ORIG. COMP.
* DEFINE INSTALLATION TORQUE SPEC W/PEASE & TIER 1'S	OFFILER	06/20	
77PS			
. DESIGN UPDATE	OFFILER	ONGOING	
. MFG/MECH UPDATE	SELLERS	ONGOING	
. PROD. LINE SET-UP (RTE CARDS, ETC)	BALTHAZAR	ONGOING	
. UPDATE SPC FILES/RUN CAPABILITY STUDIES	BALTHAZAR	ONGOING	
* ESTABLISH OVERALL SCHEDULE OF DESIGN ENG. ACTIONS	OFFILER	05/02 06/06	ORIG. REV.
. 77PS PARTS LISTS	OFFILER	06/06	
. COMPLETE DESIGN FMEA	OFFILER	04/18 06/27	ORIG. REV.
. COMPLETE PROCESS FMEA	SELLERS	07/01	
* DETERMINE ACCEPTABLE CALIBRATION WINDOW BY DIMENSIONAL ANALYSIS	OFFILER/ SELLERS	03/14 06/06	ORIG. REV.
* VERIFICATION RUN FOR CALIBRATION WINDOW	OFFILER/ SELLERS	03/28 06/13	ORIG. REV.
. F/D CHARACTERIZATION OF SPRING ARMS	OFFILER	04/18 06/06	ORIG. REV.
* GAGING TECHNIQUE FOR IN-PROCESS F/D CHARACTERIZATION OF SPRING ARMS	SELLERS	04/25 06/06	ORIG. REV.
. STAKE PROD'N PARTS ON PROD'N STAKER AND MEASURE TERMINAL POSITION	SELLERS	05/02 06/06	ORIG. REV.
. COMMUNICATE ANY REQ'D TERMINAL CHANGES TO BASSLER	SELLERS	06/13	
. 57 TO 77 CONVERSION: PEASE 1 TESTING (PUSHOUT DUE TO COMPONENT AVAILABILITY)	HONDL	05/30 06/06	ORIG. REV.
. COST ESTIMATE FOR LOW DIFF. SWITCH	SELLERS	06/06	
. IDENTIFY INSPECTION REQMTS. FOR SOP	WATT	06/01	
. IDENTIFY AUTOMATION SPECIALIST	GARIEPY	06/06	
. 77PS QAS (PRELIMINARY)	WATT	07/01	
. 77PS CHARACTERISTICS SHEETS	WATT	07/15	
. GAGE R&R STUDIES	WATT	07/15	
. 77PS QAS (FINAL)	WATT	08/01	
. SET UP SPC FILES/RUN CAPABILITY STUDIES	BALTHAZAR	08/01	
* 57 STYLE SWITCHES TO JOHN K. FOR EVAL. ON FINAL ASM MACHINE	SELLERS	05/30 05/30	ORIG. COMP.
* CAN 57 SWITCHES BE BUILT ON F.A.M. ?	KOURTESIS	06/06 05/30	ORIG. COMP.
Production Components:			
* UPDATE CUP PRINT	OFFILER	03/28 06/06	ORIG. REV.
* RESOLVE OPEN ISSUES ON BASE	SELLERS	04/11 06/13	ORIG. REV.
* UPDATE TERMINAL PRINTS/BASE PRINT	OFFILER	05/09 06/06	ORIG. REV.
Manufacturing Equipment:			

. FINAL ASM MACHINE DEBUG COMPLETION	SELLERS/ KOURTESIS	06/03	
* BASE ASM MACHINE BUILD COMPLETION (NEED BASE BOWL FEED & E.A. MACHINE)	SELLERS/ KOURTESIS	05/31 06/13	ORIG. REV.
. PRESSURE TESTER BUILD COMPLETION	SELLERS/ KOURTESIS	06/20 06/06	ORIG. REV.
* PROVIDE DATES FOR EFFECTIVITY RUNS	SELLERS/ MCCOOKEY	05/30 05/30	ORIG. COMP.
* B.A.N. EFFECTIVITY RUN #1	SELLERS	07/03	
* F.A.N. EFFECTIVITY RUN #1	SELLERS	07/03	
Tokico:			
. REPORT ON TOKICO P.S. RESPONSIBILITY	DOUGLAS	ONGOING	
* SHIP 100 SAMPLES TO TOKICO USA	OFFILER	05/31 05/31	ORIG. COMP.

DISCUSSION

57 L/T AND P/C

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PAUL PRESENTED AN UPDATED HEXPORT SHIPPING SCHEDULE. THREAD RE-ROLLING IS ASSUMED INDEFINITELY FOR ALL 36900 HEXPORTS - AT A COST OF $.014 EA. 8,735 RE-ROLLED HEXPORTS ARE IN-HOUSE, 14,830 ARE DUE ON 06/05 AND 9,060 ARE DUE ON A T.B.D. DATE. THE BALANCE OF ~12K "NON-RE-ROLLED" HEXPORTS IN STOCK WILL BE RETURNED FOR RE-ROLL NEXT WEEK. 13K ADD'L PARTS ON ORDER WILL BE PUT ON HOLD FOR NOW. A SEPARATE MEETING WILL BE HELD TO DISCUSS CORRECTIVE ACTIONS TO ELIMINATE THE NEED FOR RE-ROLL IN THE LONG TERM.

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IT'S BEEN DETERMINED THAT - WITH SOME MODIFICATIONS - THE FINAL ASM. MACHINE WILL BE ABLE TO BUILD 57PS STYLE SWITCHES. THE COST IS $6200, NPG. ENGINEERING WILL REVIEW MECH.'S PROPOSAL AND RELEASE THE TOOLING BY NEXT WEEK.

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STEVE HAS OUTLINED 4 POTENTIAL WAYS TO ENSURE THAT ENV. SEAL COMPRESSION IS NOT A PROBLEM WITH THE MODIFIED P/C CUPS. STEVE AND MATT WILL P/U ON THE ITEMS TO DETERMINE THE BEST SOLUTION.

MILESTONES	PLANNED	ACTUAL
57 L/T ISIR	11/21/90	11/21/90
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57 P/C ISIR	01/15/91	01/15/91
57 P/C JOB 1	06/03/91	
77PS ISIR	08/01/91	
77PS SOP (TI)	09/01/91	

PRODUCTION PLAN BY MONTH (THOUSANDS) - WITHOUT OVERAGE

P/C	L/T	P/C	L/T

-MSG M#= 360677 FR=SI1 TO=PCQA SENT=05/30/91 03:53 PM
R#=024 ST=C DIV=0050 CC=00176 BY=SI1 AT=05/30/91 03:53 PM

TO: DAN MORIN DM7
ART SMITH AJS2
PAUL PEARSON PCQA

CC: DAN ORFAN DJO
TON POTTER CPPC
BILL SWEET WSSO
PETE BERG PBPB
JOHN PECHONIS CPPC
PETER WHYMAN PWW1

FR: SANDRO IAMELE SI1

SUBJ: 6752 COST REDUCTION - BOEING

INITIALLY, ARLEN BLICKFELDT OF BOEING REVIEWED OUR PROPOSED CHANGES TO THE 6752 C/B AND CONCURRED. HOWEVER, BECAUSE THE 6752 IS UNDER A 10-60806 P/N AND NOT A BACC P/N, ARLEN DOES NOT HAVE FINAL APPROVAL AUTHORIZATION. JOHN KNOBEL, WHO IS PART OF THE 737 PROGRAM, HAS THE FINAL AUTHORIZATION FOR THE PROPOSED CHANGES. JOHN HAS REQUESTED THAT WE PROVIDE THE FOLLOWING INFORMATION BEFORE GRANTING FINAL APPROVAL.

- OSHA NOXIOUS FUME REQUIREMENTS FOR THE PLASTIC MATERIALS.

- COMPONENT DRAWINGS FOR THE PROPOSED CHANGES.

AT THIS TIME SAMPLE DEVICES WERE NOT REQUESTED. PLEASE PLAN ON PROVIDING ME WITH THIS INFORMATION ASAP, SO WE CAN OBTAIN FORMAL APPROVAL FROM BOEING WITHOUT FURTHER DELAYING OUR TOOLING SCHEDULE.

REGARDS,
SANDRO

-MSG N#= 371825 FR=PCQA TO=PCQA SENT=05/31/91 07:22 AM
R#=031 ST=C DIV=0050 CC=00149 BY=CERN AT=05/31/91 07:00 AM

MAY 31, 1991

TO:	RUSTY STRUBLE	RCS2	CC:	TOM CHARBONEAU	TC
	MIKE DeNATTIA	PCQA		JOHN KOUNTESIS	NDES
	CHARLIE DOUGLAS	CPPC		STEVE MAJOR	WNLS
	DICK GARIEPY	MFPC		ANDY McGUIRK	PCQA
	PAUL KOTCH	PRK1		ED O'NEILL	EJON
	JOE LAZARE	JNL0		JOE SCHUCK	WNLS
	STEVE OFFILER	SBO1		GARY SNYDER	CPPC
	~~MATT SELLERS~~	PCNE		MARTHA SULLIVAN	CPPC
	BILL SWEET	PCNE		RAY TOURANGEAU	PCNE
	JIM WATT	PCQA		TED BALLARD	AVNE
	TED BREDIKEN	MFPC		STAN BOHOL	SB2
				CLAIRE BALTHASAR	MFPC
				BILL CONGDON	MFPC
				STEVE MCCOOEY	NDES
				TERRY RODRIGUES	MFPC

FR: DAVE CEARN EARN

SJ: FORD CRUISE CONTROL PRESSURE SWITCH START-UP MEETING: 05/30/91 MEETING MINUTES

MEETING

THE NEXT MEETING IS SCHEDULED FOR:

DATE: 06/06 (THURSDAY)
TIME: 10:00 - 11:30 AM
PLACE: MARKETING CONFERENCE ROOM

PLEASE CALL ME IF YOU ARE NOT ABLE TO ATTEND

* = ITEMS THAT ARE NEW OR HAVE BEEN REVISED OR COMPLETED SINCE PREVIOUS MEETING

57 L/T	WHO	WHEN	
Hexport:			
. L/T PILOT RUN	SELLERS/	01/24	ORIG.
(PUSHOUT DUE TO HEXPORT AVAILABILITY)	GARIEPY	06/06	REV.
. UPDATE HEXPORT SHIPPING SCHEDULE	KOTCH	ONGOING	
* COPY OF FORD'S INSTALLATION TORQUE SPEC (ES20000-5100); SEND TO TIA	DELETED; SEE STEVE O.'S ITEM UNDER 57 P/C		
* PLAN FOR EVALUATING POULSEN	KOTCH	05/16	ORIG.
		05/31	REV.
* PLAN FOR HEXPORT COST REDUCTION W/ELCO	KOTCH	06/06	ORIG.
		05/30	COMP.
* PUT 13K HEXPORT ORDER ON HOLD; PENDING RE-ROLL RESOLUTION	KOTCH	05/31	
ISR issues:			
. CONNECTOR INSTALLATION FORCE STUDY	OFFILER	06/06	
* GAGE CONCEPT FOR TERMINAL POS'N.	SELLERS	06/06	ORIG.
		05/30	COMP.
* DEVELOP TERM. POS'N GAGE CONCEPT	SELLERS	06/13	
. RELEASE PRINT FROM L/T	SCHUCK	05/09	ORIG.
(SEE DISCUSSION)		06/20	REV.
. SUBMIT ISR FOLLOW-UP TO FORD SQA	WATT	04/04	ORIG.
(NEED RELEASE PRINT)		06/27	REV.

57 P/C

* ISR SUPPLEMENT FOR SWITCHES W/BROWN OFFSET POLARITY KEY BASES (PUSHOUT DUE TO SREA DELAY)	WATT	04/10 06/06	ORIG. REV.
* UPDATE 57PS DFMEA PER STEVE'S INPUTS	WATT	06/06 05/23	ORIG. COMP.
PDATE QAS 296 AS REQ'D	WATT	05/23 05/23	ORIG. COMP.
* SHIP 21K L5-3'S (DELIV. DATE PUSHOUT BY FORD)	GARIEPY/ STRUBLE	06/03 07/01	ORIG. REV.
. PLAN FOR MAKING L/T AND P/C ENV. SEAL COMPRESSION CONSISTENT	OFFILER/ SELLERS	06/06	
. ADD MATING CONNECTOR FIT-UP CHECK TO INSP. REQMTS. - 5 PCS/HR.	WATT	05/30	
* DISPOSITION NEXPORTS W/REROLLED THDS.	SELLERS	05/23 05/23	ORIG. COMP.
* DEFINE INSERTION TORQUE SPEC W/PEASE & TIER 1'S	OFFILER	06/20	
77PS			
. DESIGN UPDATE	OFFILER	ONGOING	
. MFG/MECH UPDATE	SELLERS	ONGOING	
. PROD. LINE SET-UP (RTE CARDS, ETC)	BALTHASAR	ONGOING	
. UPDATE SPC FILES/RUN CAPABILITY STUDIES	BALTHASAR	ONGOING	
* ESTABLISH OVERALL SCHEDULE OF DESIGN ENG. ACTIONS	OFFILER	05/02 06/06	ORIG. REV.
. 77PS PARTS LISTS	OFFILER	06/06	
. COMPLETE DESIGN FMEA	OFFILER	04/18 06/27	ORIG. REV.
. COMPLETE PROCESS FMEA	SELLERS	07/01	
* DETERMINE ACCEPTABLE CALIBRATION WINDOW BY DIMENSIONAL ANALYSIS	OFFILER/ SELLERS	03/14 06/06	ORIG. REV.
* VERIFICATION RUN FOR CALIBRATION WINDOW	OFFILER/ SELLERS	03/28 06/13	ORIG. REV.
F/D CHARACTERISATION OF SPRING ARMS	OFFILER	04/18 06/06	ORIG. REV.
* GAGING TECHNIQUE FOR IN-PROCESS F/D CHARACTERISATION OF SPRING ARMS	SELLERS	04/25 06/06	ORIG. REV.
. STAKE PROD'N PARTS ON PROD'N STAKER AND MEASURE TERMINAL POSITION	SELLERS	05/02 06/06	ORIG. REV.
. COMMUNICATE ANY REQ'D TERMINAL CHANGES TO BASSLER	SELLERS	06/13	
. 57 TO 77 CONVERSION: PHASE 1 TESTING (PUSHOUT DUE TO COMPONENT AVAILABILITY)	BOWOL	05/30 06/06	ORIG. REV.
. COST ESTIMATE FOR LOW DIFF. SWITCH	SELLERS	06/06	
. IDENTIFY INSPECTION REQMTS. FOR SOP	WATT	06/01	
. IDENTIFY AUTOMATION SPECIALIST	GARIEPY	06/06	
. 77PS QAS (PRELIMINARY)	WATT	07/01	
. 77PS CHARACTERISTICS SHEETS	WATT	07/15	
. GAGE R&R STUDIES	WATT	07/15	
. 77PS QAS (FINAL)	WATT	08/01	
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PRESSURE TESTER BUILD COMPLETION	SELLERS/ KOURTESIS	06/20 06/06	ORIG. REV.
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57 P/C JOB 1	06/03/91	
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PRODUCTION PLAN BY MONTH (THOUSANDS) - WITHOUT OVERAGE

P/C	L/T	P/C	L/T

	57PSL5-3	57PSL5-2	77PSL3-1	77PSL2-3
APR	0	0	0	0
MAY	2 (COMP.)	2	0	0
JUN	*22	0	0	0
JUL	10 (tentative)	2.3	0	0
AUG	10 "	2.3	2	0
SEP	10 "	*2.6	2	0
OCT	0	9.5	**9	2
NOV	0	8.5	25	2
DEC	0	0	25	**9.5

* = JOB1 FOR 57PS VERSIONS
** = TENTATIVE JOB1 FOR 77PS VERSIONS

REGARDS,
DAVE CZARN \24-FORD

cc - Dawn M.

FYI/info

-MSG M#= 371825 FR=CZRN TO=PCQA SENT=05/31/91 07:00 AM
R#=029 ST=C DIV=0050 CC=00101 BY=CZRN AT=05/31/91 07:00 AM

MAY 31, 1991

TO:	RUSTY STRUBLE	RCS2	CC:	TOM CHARBONEAU	TC
	MIKE DeMATTIA	PCQA		JOHN KOURTESIS	MDES
	CHARLIE DOUGLAS	CPPC		STEVE MAJOR	WHLZ
	DICK GARIEPY	MFPC		ANDY McGUIRK	PCQA
	PAUL KOTCH	PRK1		~~ED O'NEILL~~	EJON
	JOE LAZARE	JML8		JOE SCHUCK	WHLZ
	STEVE OFFILER	SBO1		GARY SNYDER	CPPC
	MATT SELLERS	PCME		MARTHA SULLIVAN	CPPC
	BILL SWEET	PCME		RAY TOURANGEAU	PCME
	JIM WATT	PCQA		TED BALLARD	AVNE
	TED BREDIKEN	MFPC		STAN HOMOL	SH2
				CLAIRE BALTHAZAR	MFPC
				BILL CONGDON	MFPC
				STEVE MCCOOEY	MDES
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FR:	DAVE CZARN	ZARN			

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		05/30	COMP.
* DEVELOP TERM. POS'N GAGE CONCEPT	SELLERS	06/13	
. RELEASE PRINT FROM L/T	SCHUCK	05/09	ORIG.
(SEE DISCUSSION)		06/20	REV.
. [redacted]	MATT	04/04	ORIG.
[redacted]		06/27	REV.

57 P/C

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* DISPOSITION HEXPORTS W/REROLLED THDS.	SELLERS	05/23 05/23	ORIG. COMP.
* DEFINE INSTALLATION TORQUE SPEC W/PEASE & TIER 1'S	OFFILER	06/20	
77PS			
. DESIGN UPDATE	OFFILER	ONGOING	
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R#=024 ST=C DIV=0050 CC=00176 BY=SI1 AT=05/30/91 03:53 PM

TO: DAN MORIN DM7
ART SMITH AJS2
PAUL PEARSON PCQA

CC: DAN ORFAN DJO
TOM POTTER CPPC
BILL SWEET WSS0
PETE BERG PBPB
JOHN PECHONIS CPPC
PETER WHYMAN PNW1

FR: SANDRO IAMELE SI1

SUBJ: 6752 COST REDUCTION - BOEING

INITIALLY, ARLEN BLICKFELDT OF BOEING REVIEWED OUR PROPOSED CHANGES TO THE 6752 C/B AND CONCURRED. HOWEVER, BECAUSE THE 6752 IS UNDER A 10-60806 P/N AND NOT A BACC P/N, ARLEN DOES NOT HAVE FINAL APPROVAL AUTHORIZATION. JOHN KNOBEL, WHO IS PART OF THE 737 PROGRAM, HAS THE FINAL AUTHORIZATION FOR THE PROPOSED CHANGES. JOHN HAS REQUESTED THAT WE PROVIDE THE FOLLOWING INFORMATION BEFORE GRANTING FINAL APPROVAL.

- OSHA NOXIOUS FUME REQUIREMENTS FOR THE PLASTIC MATERIALS.

- COMPONENT DRAWINGS FOR THE PROPOSED CHANGES.

AT THIS TIME SAMPLE DEVICES WERE NOT REQUESTED. PLEASE PLAN ON PROVIDING ME WITH THIS INFORMATION ASAP, SO WE CAN OBTAIN FORMAL APPROVAL FROM BOEING WITHOUT FURTHER DELAYING OUR TOOLING SCHEDULE.

REGARDS,
SANDRO

kCap

CERTIFICATE OF CONFORMANCE

TO: TEXAS INSTRUMENTS
ATTLEBORO, MASSACHUSETTS

PURCHASE ORDER NUMBER: SCCC2384

CUSTOMER PART NUMBER: 74129-2

PART DESCRIPTION: .343 - 3/8" THK CRS

OUR JOB NUMBER: 16850-1

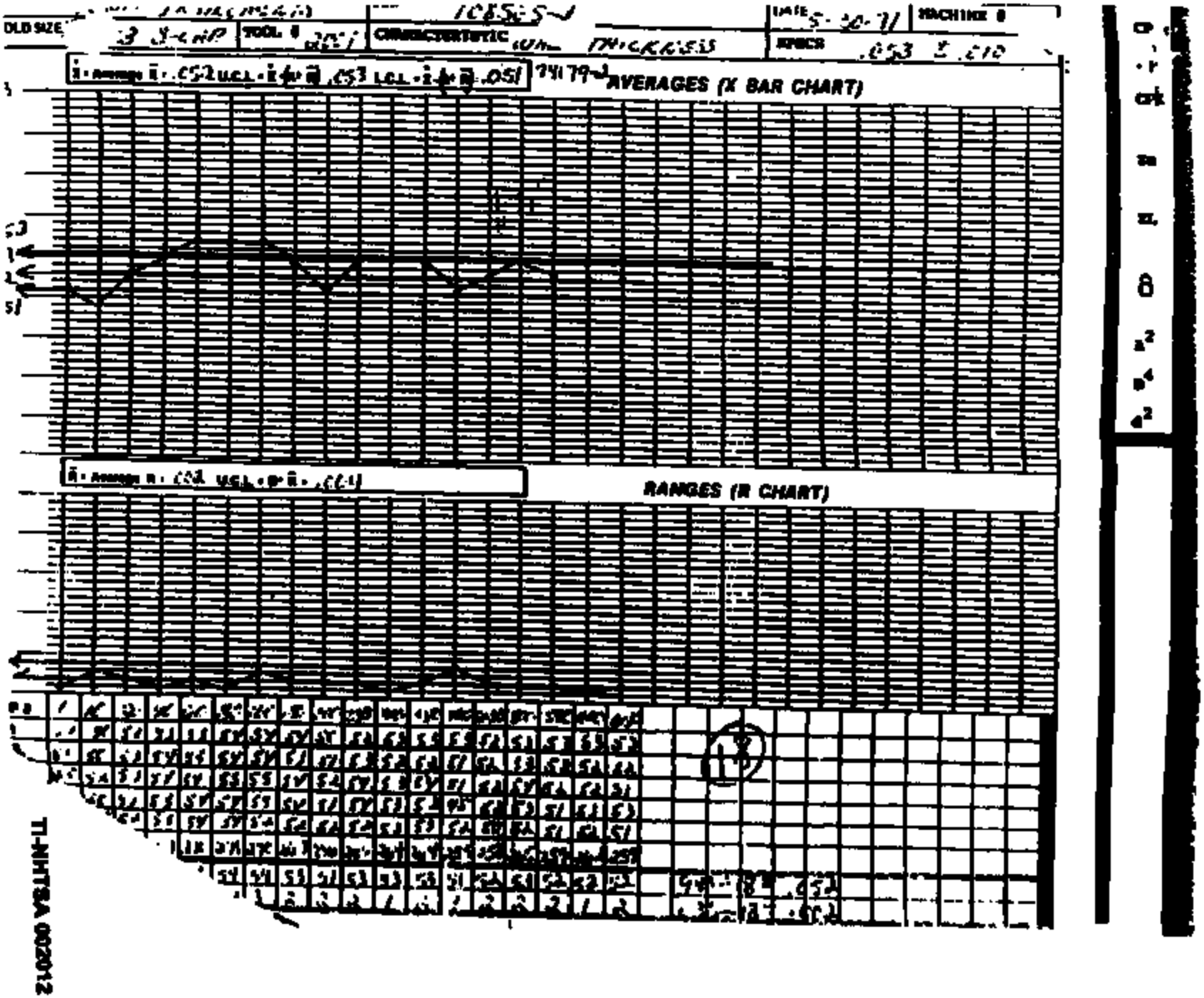
The supplier hereby certifies that adequate data is on file showing that all components and materials used in the article furnished comply with the physical and chemical properties required by our firm.

Roger J. Kimball 5-31-91

Roger J. Kimball
Quality Assurance Manager

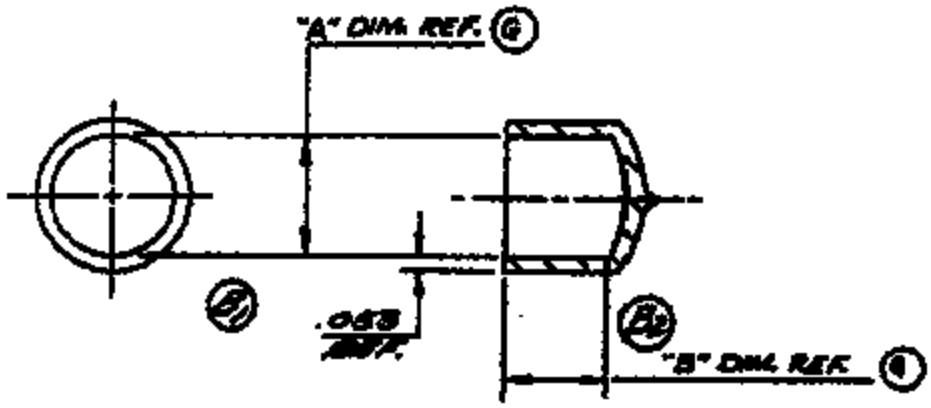
TI-NHTSA 0020

A SINCLAIR & RUSH COMPANY


AVERAGES (X BAR CHART)
RANGES (R CHART)

THREAD CAP

74179



NOTE:
1. IDENTIFICATION MARK MUST ACCOMPANY EACH SHIPMENT STATING THE FOLLOWING:
SINCLAIR RUSH P/C 74179-1 (OR -2) TI# 701-15

(H)

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

PART Nos.	MATERIAL	DIM. "A"	DIM. "B"	VENDOR	COLOR
74179-2	VINYL	.333/.343	.313/.438	SINCLAIR & RUSH	RED
74179-1	VINYL	.355/.365	.281/.343	MOCAP	RED

Tony Dail 2/3/84

TEXAS INSTRUMENTS INCORPORATED

DALLAS

74179

3-4 mos

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

ACT 125 PSI ± 35 → NEW CAP
REL 20 MIN

OFFSET POLARITY KEY → 46912 MOLD MOD

COLOR - GRAY

ALUMINUM CR.

HEXPART - SAE J512 INVERTED FLARE

3-4 mos

II. LITE TRUCK 57PS MY 91-95 MFG 4/91

ACT 250 ± 50 → STD 57 SENSOR
REL 90 MIN

CTR POLARITY, BLACK

ALUMINUM CR

HEX - J512

III. PASS CAR 77PS PERM. MOD DESIGN

NEW SWITCH ASS'Y (ANDY McKENNA)

[redacted] SAME AS I. ABOVE

FULLY AUTOMATED ASM'Y.
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

PRESSURE SWITCH DATA Form 21605 TEST NO. [illegible]

DEVICE	DATE REQUESTED	REQUESTED BY	REQUESTED COMP. DATE
5795 Bar [illegible]	[illegible]	[illegible]	
PERFORMED BY	**DATE STARTED**	**DATE COMPLETED**	**APPROVED BY**
[illegible]	[illegible]		

PROJECT TITLE: [illegible]

CUSTOMER

PURPOSE OF TEST: [illegible]

[illegible]

PROCEDURE:

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Ldg	Ldg			
1	[illegible]	3.96	4.2	4.4	4.7	3.4			
2	1.91	3.89	4.2	4.9	5.4	4.6			
3	1.86	4.1	4.7	4.7	4.7	3.2			
4	2.11	3.80	4.1	4.1	3.4	3.4			
5	1.91	3.11	3.6	3.3	3.1	3.7			
6	2.15	4.26	5.0	5.1	3.2	3.5			
7	1.90	4.11	4.8	5.2	5.0	3.1			
8	2.19	3.15		4.9	3.5	3.1			

Insulfab PLASTICS, INC.

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

CERTIFICATE OF CONFORMANCE

TO: TEXAS INSTRUMENTS DATE: JUN 3 '99

ATT: QUALITY CONTROL SUP.

THIS CERTIFIES THAT:

SHIPMENT # 159463

PART # 73858-1 REVISION 6

QUANTITY 172000

MAT'L DESC. KAPTON HN

IS IN CONFORMANCE WITH THE REQUIREMENTS, SPECIFICATIONS, AND DRAWINGS

ON YOUR ORDER # 004168 2nd rel

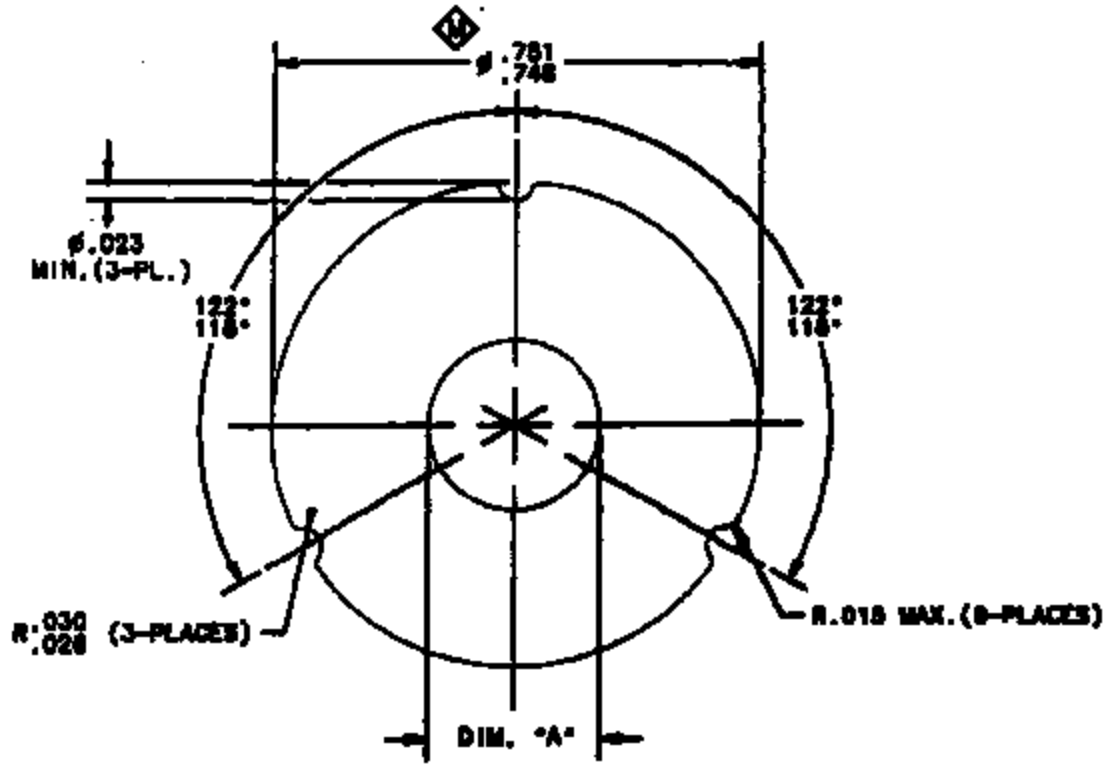
BY: INSULFAB PLASTICS
FRANKLIN, NH 03235

Fred Vuyan
QUALITY CONTROL MANAGER

Distributors and Fabricators of
KAPTON TEFLON FEP PFA ETFE PLENUMS POLYESTHERS

SPACER 73958

73958



NOTES:

1. .001 MAX. BURR ALLOWABLE.
2. PARTS TO BE SHIPPED, ISSUED, AND STORED IN SEALED PLASTIC BAGS.
3. ALL CONTAINERS OF PARTS MUST BE DATE CODED. DATE CODE IS TO REFLECT ANY MATERIAL LOT, TOOL OR PROCESS CHANGE.
4. MATERIAL CERTIFICATION REQUIRED WITH EACH [illegible]

ENG STD E9803 REV. -

DATE [illegible]

PART NO.	MATERIAL	DIM "A"
73958-3	MADE FROM 74224-1 (KAPTON TAPE)	NO HOLE
73958-2	DUPONTS, KAPTON 200M, .0017 - .0023 THICK	NO HOLE
73958-1	KAPTON .0017 - .0023 THICK	.260/.270

THIS DWG. SUPERSEDES 73958 REV. "F" DATED 10-14-88

BY TIM DAIL 10-10-88	TEXAS INSTRUMENTS ATTLEBORO MASSACHUSETTS 02703	XEROX	A	73958
CK				
ENG Hans Hengel 10/14/88				

TI-NHTSA 002017

K. F. BASSLER COMPANY, INC
PRECISION TOOLING & METAL STAMPINGS
45 John Wilson St. • Attleboro, MA 02703 • (508) 222-1051 • Fax (508) 226-6C2
EST 1945

MATERIAL CERTIFICATION

CUSTOMER: Texas Instruments Inc - Attleboro

CUSTOMER ORDER NO.: 5050970078

CUSTOMER PART NO.: 27406-1

REVISION: E

QUANTITY THIS SHIPMENT: 21 000

LOT NO. THIS SHIPMENT: 193

SHIPMENT DATE: 6-25-91

WE CERTIFY THAT THE MATERIAL USED TO PRODUCE THE PRODUCT ON 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

TELEX [redacted]
FAX [redacted]
PHONE 315 336 9500
DUNS [redacted]

ROME STRIP STEEL COMPANY, INC.

530 HENRY ST. BOX 190
ROME, NEW YORK 13440

DATE	INVOICE NO
02/28/91	02784

SALES CODE
08012016

0 1 0 0 0 0 0 0

INVOICE TO: K. F. BASSLER CO., INC.
P. O. BOX 995
ATTLEBORO, MA 02703

SHIP TO: K. F. BASSLER CO., INC.
13TH-JOHN WILLIAM STS
ATTLEBORO, MA

QUANTITY (LBS)	NO PCS	NO SKIDS OR BDLS	MATERIAL CONDITION	SHIPPED BY	
19,636	135	13	PART	PAUL N	

AC NO	C	RD	P	S	M	BL	CB NO
466708	07	36	014	008	01		

RECEIVING DEPARTMENT OR
COST CENTER NO 16474

[redacted]7RR X 29.40MM

.04600 X 1.0000 6 50 MAX

+00050-000504005 -005 N03 SLIT

+013 -013MM +127 -127MM

ORDER NO	PREPAID COLLECT				
58109	PREPAID				
LBS PER PCS					
COIL	200 LBS				
PACK					
200 PIN 16 34					

COLOR CODE

ORDERED	PAPER WRAP	ADDS	CREDIT	DUE
SHIPS	SKID SIZE	PRE PC	WASHERS	COILS
1600		21 M1 MAX		
ITEM	CARRIER	PACKAGING	OIL	PIECES
	500/096"			

ALLOY X160 0=1008

TEST REPORT

1 8,907 KGS 19,636

Certificate of Compliance

ATTEST:
[redacted]
Notary Public, Oneida County
My commission expires
DATE 3/1/91

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

ROME STRIP STEEL CO., INC.

THHTBA 002011

77 CREEP IMPULSE TEST

PURPOSE: To determine if any serious system failure mode may result if a creep device is used.

SCOPE: Twelve devices will be run on a 25K powered Impulse test. Note there will be no 475K mechanical cycles. Six devices will be pinned very high, and the other six very low. Silent LT discs will be used. Brown 77PS switches from the recent calibration iteration & Tokico sample build will be used. One of six diodes on each lot will be disabled, so one switch per lot sees the full inductive kick.

PROCEDURE:

1) Measure and sort twelve (or as many as possible if less) brown 77PS switches.

2) Build sensors with silent LT discs. Construct a manual-plot hatchet curve, or use the existing one if confidence is good that this will be accurate.

3) Build half the devices pinned a few mils short of the left side of the window, and the other half pinned a few mils long of the right side of the window. As usual, take into account the shift caused by final crimp.

4) Check actuation, release, and mV drop. Use these measurements to confirm that the devices are pinned as planned. Repin any if needed.

5) Disable two of the twelve diodes in the inductance load bank, identifying the leads which connect to these loads.

6) Run a 25K powered Impulse test as usual, one device per sublot connected to the no-diode load.

7) Recheck act, rel, and mV drop.

8) Open up the devices for visual inspection of the contacts.

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

DEVICE [illegible]	**DATE REQUESTED** [illegible]	**REQUESTED BY** [illegible]	**REQUESTED COMP. DATE**
PERFORMED BY [illegible]	**DATE STARTED** [illegible]	**DATE COMPLETED** [illegible]	**APPROVED BY**

PROJECT TITLE: [illegible]

CUSTOMER:

PURPOSE OF TEST: [illegible]

PROCEDURE:

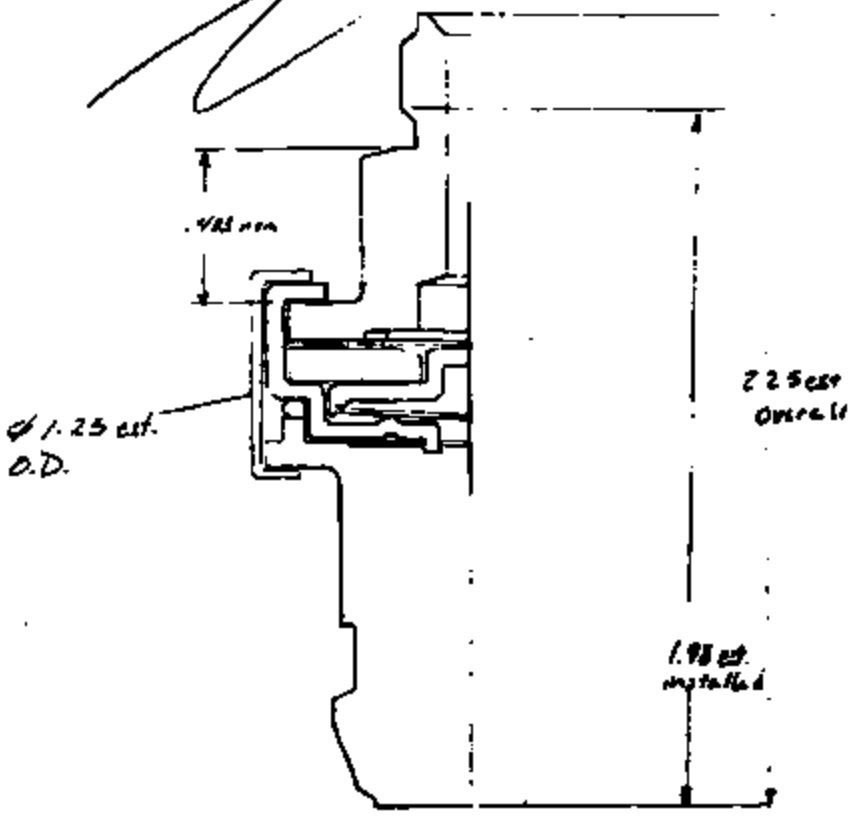
[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]		98	[illegible]	[illegible]	75/153	7.7	.45	[illegible]	[illegible]
[illegible]		106	[illegible]		[illegible]	7.2			
[illegible]		110	[illegible]		[illegible]	7.3			
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	5.5			
[illegible]		[illegible]	[illegible]		[illegible]	9.7			
[illegible]	H	91.0	110	[illegible]	263/214	3.9	151	[illegible]	[illegible]
		[illegible]	[illegible]		290/242	6.9	[illegible]	[illegible]	7.7
[illegible]		[illegible]	117		[illegible]	9.1	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	151		279/219	3.8	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	150	[illegible]	275/214	9.9	151	[illegible]	[illegible]

Reset Cycle

[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	5.1	Other Cycles [illegible]
[illegible]	53/51	5.7	[illegible]
[illegible]	[illegible]	7.5	[illegible] and [illegible]
[illegible]	[illegible]	8.8	
[illegible]	[illegible]	4.9	
[illegible]	[illegible]	31.2	Cycled [illegible]
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	No failure [illegible]
[illegible]	[illegible]	[illegible]	

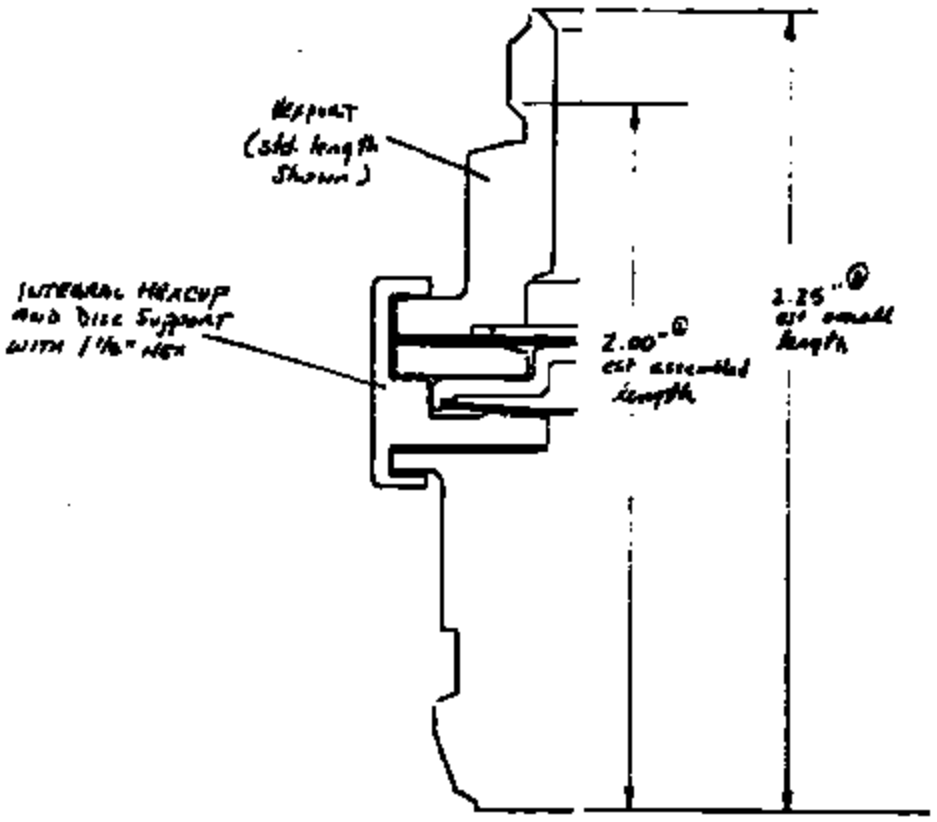
VIRT.



(E) INTEGRAL HEXCUP & DISC SUPPORT/ CONVERTER

Dec 5 89 4:

(Tom Chartrand Concept)

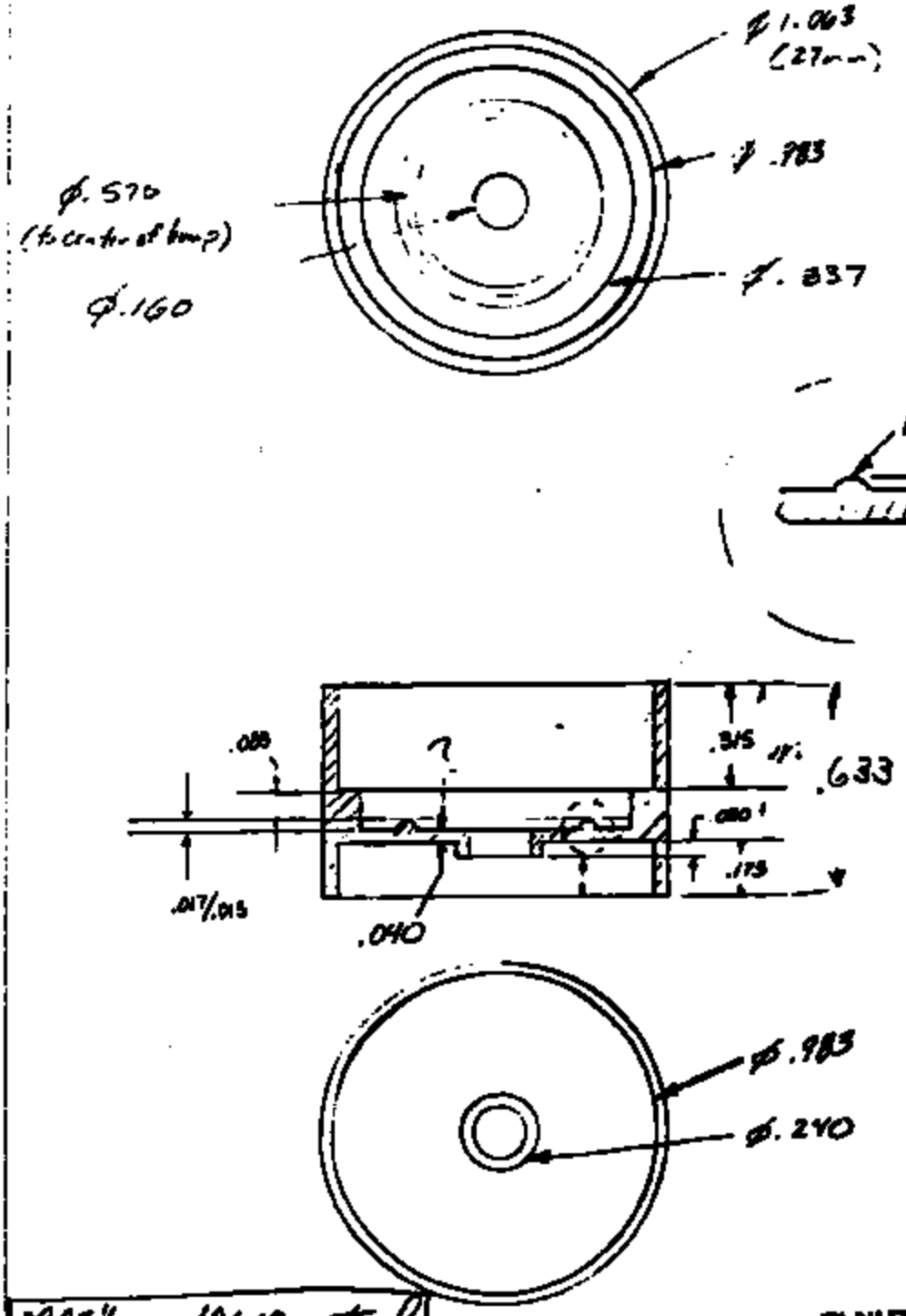


① 2.00" dimension could be reduced to ~ 1.80" by using a shorter profile hexport

② 2.25" dimension could be reduced to ~ 2.05" by using a shorter profile hexport

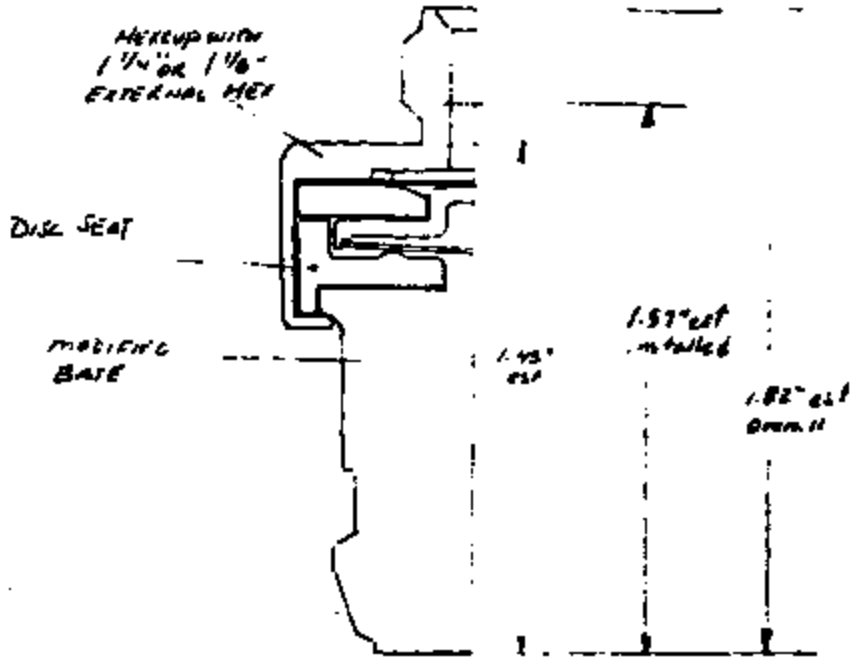
Dec 5/29/91

1 pc Cyl/ crimp Ring - 27mm



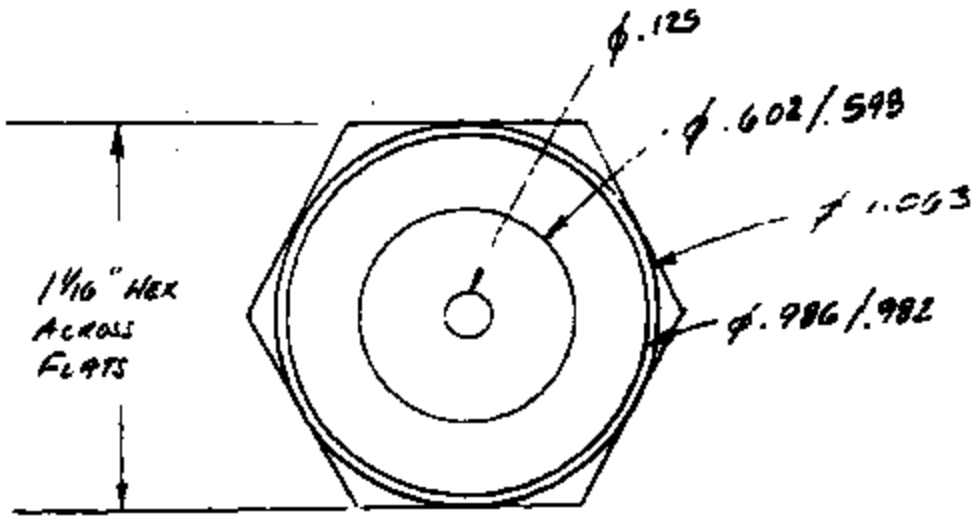
MAT'L 1010 steel

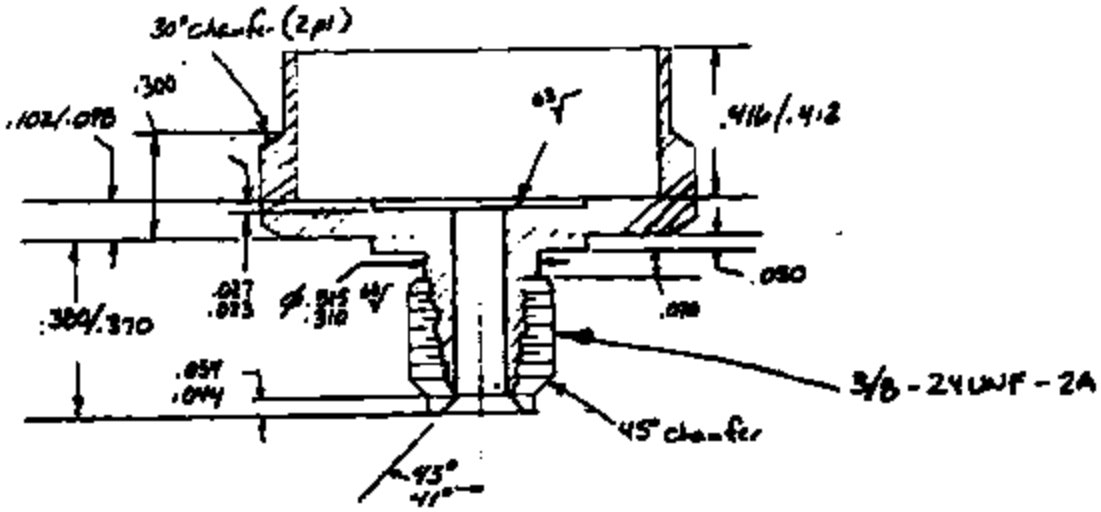
III EXTERNAL HEX-UP/ CONVERTER DESIGN

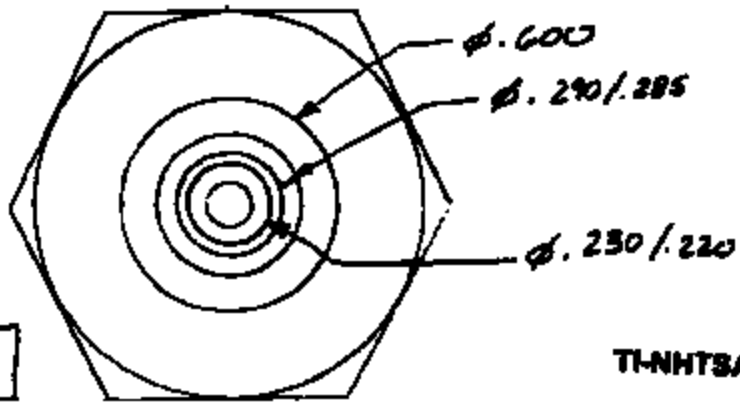


DAC 6/05/9.

HEXCUP



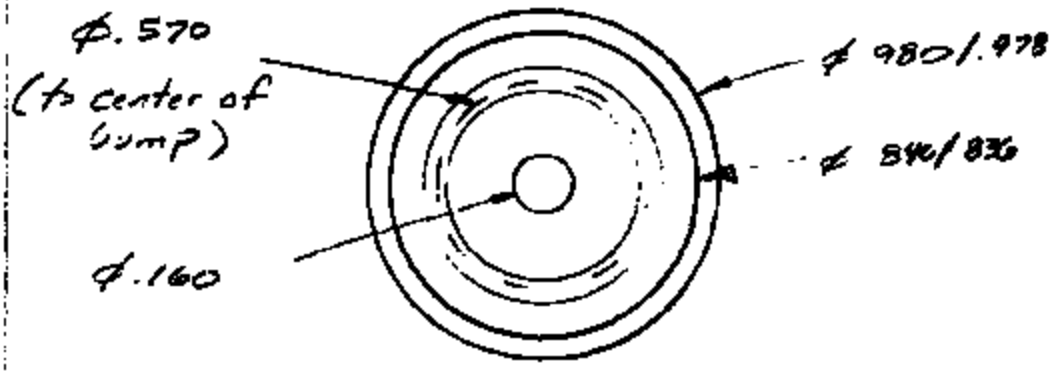


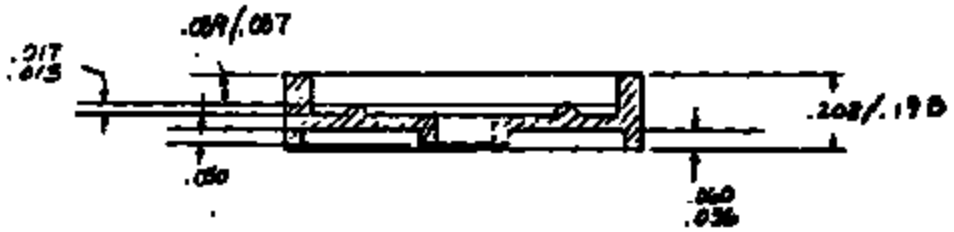


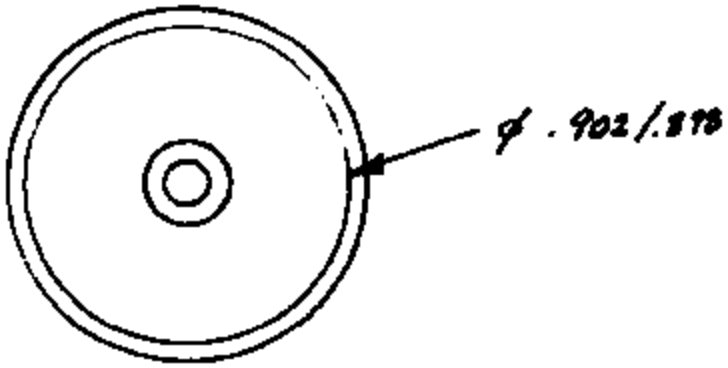
MAT'L: 10L10 Steel

DAC 6/05/91

Disc Support







MAT'L: 1010 steel

Potential TTPS Re-design

9:0605

77RS SWITCH CALIBRATION REQUIREMENTS

CONTRIBUTORS TO UNCERTAINTY:

1) SWITCH REFERENCE DIMENSION (C
2) CVP REFERENCE - VS - DISC ✓
3) DISC CHARACTERISTIC CURVE; LINEAR
4) PIN LENGTH ✓
5) SWITCH COMPRESSION DURING FIRE

DAVE -

I PUT THIS TOGETHER TO GIVE YOU A BRIEF STATUS UPDATE WHERE WE ARE GETTING ANYWHERE

✓ INDICATES THAT DATA HAS BEEN COLLECTED

X INDICATES THAT DATA HAS NOT BEEN COLLECTED

NO VALID CONCLUSIONS CAN BE DRAWN USING ONLY EXTANT DATA; FURTHERMORE COLLECTION OF MISSING DATA IS A MONUMENTALLY LARGE TASK.

* ISR SUPPLEMENT FOR SWITCHES W/BROWN OFFSET POLARITY KEY BASES (W'SHOUT DUE TO SREA DELAY)	WATT	04/10 06/06	ORIG. REV.
* UPDATE 57PS DFMEA PER STEVE'S INPUTS	WATT	06/06 05/23	ORIG. COMP.
PDATE QAS 296 AS REQ'D	WATT	05/23 05/23	ORIG. COMP.
* SHIP 21K L5-3'S (DELIV. DATE PUSHOUT BY FORD)	GARIEPY/ STRUBLE	06/03 07/01	ORIG. REV.
. PLAN FOR MAKING L/T AND P/C ENV. SEAL COMPRESSION CONSISTENT	OFFILER/ SELLERS	06/06	
. ADD MATING CONNECTOR FIT-UP CHECK TO INSP. REQMTS. - 5 PCS/HR.	WATT	05/30	
* DISPOSITION NEXPORTS W/REROLLED THDS.	SELLERS	05/23 05/23	ORIG. COMP.
* DEFINE INSTALLATION TORQUE SPEC W/PEASE & TIER 1'S	OFFILER	06/20	
77PS			
. DESIGN UPDATE	OFFILER	ONGOING	
. MFG/MECH UPDATE	SELLERS	ONGOING	
. PROD. LINE SET-UP (RTE CARDS, ETC)	BALTHAZAR	ONGOING	
. UPDATE SPC FILES/RUN CAPABILITY STUDIES	BALTHAZAR	ONGOING	
* ESTABLISH OVERALL SCHEDULE OF DESIGN ENG. ACTIONS	OFFILER	05/02 06/06	ORIG. REV.
. 77PS PARTS LISTS	OFFILER	06/06	
. COMPLETE DESIGN FMEA	OFFILER	04/18 06/27	ORIG. REV.
. COMPLETE PROCESS FMEA	SELLERS	07/01	
* DETERMINE ACCEPTABLE CALIBRATION WINDOW BY DIMENSIONAL ANALYSIS	OFFILER/ SELLERS	03/14 06/06	ORIG. REV.
* VERIFICATION RUN FOR CALIBRATION WINDOW	OFFILER/ SELLERS	03/28 06/13	ORIG. REV.
F/D CHARACTERIZATION OF SPRING ARMS	OFFILER	04/18 06/06	ORIG. REV.
* GAGING TECHNIQUE FOR IN-PROCESS F/D CHARACTERIZATION OF SPRING ARMS	SELLERS	04/25 06/06	ORIG. REV.
. STAKE PROD'N PARTS ON PROD'N STAKER AND MEASURE TERMINAL POSITION	SELLERS	05/02 06/06	ORIG. REV.
. COMMUNICATE ANY REQ'D TERMINAL CHANGES TO BASSLER	SELLERS	06/13	
. 57 TO 77 CONVERSION: PHASE 1 TESTING (PUSHOUT DUE TO COMPONENT AVAILABILITY)	HOWOL	05/30 06/06	ORIG. REV.
. COST ESTIMATE FOR LOW DIFF. SWITCH	SELLERS	06/06	
. IDENTIFY INSPECTION REQMTS. FOR SOP	WATT	06/01	
. IDENTIFY AUTOMATION SPECIALIST	GARIEPY	06/06	
. 77PS QAS (PRELIMINARY)	WATT	07/01	
. 77PS CHARACTERISTICS SHEETS	WATT	07/15	
. GAGE R&R STUDIES	WATT	07/15	
. 77PS QAS (FINAL)	WATT	08/01	
. SET UP SPC FILES/RUN CAPABILITY STUDIES	BALTHAZAR	08/01	
* 57 STYLE SWITCHES TO JOHN K. FOR EVAL. ON FINAL ASM MACHINE	SELLERS	05/30 05/30	ORIG. COMP.
* CAN 57 SWITCHES BE BUILT ON F.A.M. ?	KOURTESIS	06/06 05/30	ORIG. COMP.
Production Components:			
* UPDATE CUP PRINT	OFFILER	03/28 06/06	ORIG. REV.
RESOLVE OPEN ISSUES ON BASE	SELLERS	04/11 06/13	ORIG. REV.
* UPDATE TERMINAL PRINTS/BASE PRINT	OFFILER	05/09 06/06	ORIG. REV.
Manufacturing Equipment:			

. FINAL ASM MACHINE DEBUG COMPLETION	SELLERS/ KOURTESIS	06/03	
* BASE ASM MACHINE BUILD COMPLETION	SELLERS/	05/31	ORIG.
(NEED BASE BOWL FEED & E.A. MACHINE)	KOURTESIS	06/13	REV.
°RESSURE TESTER BUILD COMPLETION	SELLERS/	06/20	ORIG.
	KOURTESIS	06/06	REV.
* PROVIDE DATES FOR EFFECTIVITY RUNS	SELLERS/	05/30	ORIG.
	MCCOOEY	05/30	COMP.
* B.A.M. EFFECTIVITY RUN #1	SELLERS	07/03	
* F.A.M. EFFECTIVITY RUN #1	SELLERS	07/03	
Tokico:			
. REPORT ON TOKICO P.S. RESPONSIBILITY	DOUGLAS	ONGOING	
* SHIP 100 SAMPLES TO TOKICO USA	OFFILER	05/31	ORIG.
		05/31	COMP.

DISCUSSION

57 L/T AND P/C

.

PAUL PRESENTED AN UPDATED HEXPORT SHIPPING SCHEDULE. THREAD RE-ROLLING IS ASSUMED INDEFINITELY FOR ALL 36900 HEXPORTS - AT A COST OF $.014 EA. 8,735 RE-ROLLED HEXPORTS ARE IN-HOUSE, 14,830 ARE DUE ON 06/05 AND 9,060 ARE DUE ON A T.B.D. DATE. THE BALANCE OF ~12K "NON-RE-ROLLED" HEXPORTS IN STOCK WILL BE RETURNED FOR RE-ROLL NEXT WEEK. 13K ADD'L PARTS ON ORDER WILL BE PUT ON HOLD FOR NOW. A SEPARATE MEETING WILL BE HELD TO DISCUSS CORRECTIVE ACTIONS TO ELIMINATE THE NEED FOR RE-ROLL IN THE LONG TERM.

77PS

THE 100 PC. SWITCH BUILD FOR TOKICO WAS COMPLETED ON 05/29; TWO DAYS AHEAD OF AN ALREADY-AGGRESSIVE SCHEDULE. EXCELLENT WORK !

.

SPRINGS WITH THE CORRECTED BEND DIMENSION ARE DUE FROM E.A. BY TUESDAY 06/04. MATT AND STEVE MCCOOEY HAVE TENTATIVELY PLANNED A TRIP TO EASTERN FOR 06/06.

.

THE FIRST PASS E.A. SPRINGS - USED FOR TOKICO'S SWITCHES - WERE VALIDATED THROUGH A POWERED IMPULSE TEST (12 SWITCHES); NO PROBLEMS WERE FOUND.

.

IT'S BEEN DETERMINED THAT - WITH SOME MODIFICATIONS - THE FINAL ASM. MACHINE WILL BE ABLE TO BUILD 57PS STYLE SWITCHES. THE COST IS $6200, MFG. ENGINEERING WILL REVIEW MECH.'S PROPOSAL AND RELEASE THE TOOLING BY NEXT WEEK.

.

STEVE HAS OUTLINED 4 POTENTIAL WAYS TO ENSURE THAT ENV. SEAL COMPRESSION IS NOT A PROBLEM WITH THE MODIFIED P/C CUPS. STEVE AND MATT WILL F/U ON THE ITEMS TO DETERMINE THE BEST SOLUTION.

MILESTONES	PLANNED	ACTUAL
57 L/T ISIR	11/21/90	11/21/90
57 L/T JOB 1	09/03/91	
57 P/C ISIR	01/15/91	01/15/91
57 P/C JOB 1	06/03/91	
77PS ISIR	08/01/91	
77PS SOP (TI)	09/01/91	

PRODUCTION PLAN BY MONTH (THOUSANDS) - WITHOUT OVERAGE

P/C	L/T	P/C	L/T

-MSG M#= 371825 FR=PCQA TO=PCQA SENT=05/31/91 07:22 AM
R#=031 ST=C DIV=0050 CC=00149 BY=CZRN AT=05/31/91 07:00 AM

MAY 31, 1991

	RUSTY STRUBLE	RCS2	CC:	TOM CHARBONEAU	TC
	MIKE DeMATTIA	PCQA		JOHN KOURTESIS	MDES
	CHARLIE DOUGLAS	CPPC		STEVE MAJOR	WHLZ
	DICK GARIEPY	MFPC		ANDY McGUIRK	PCQA
	PAUL KOTCH	PRK1		ED O'NEILL	EJON
	JOE LAZARE	JML8		JOE SCHUCK	NHLZ
	STEVE OFFILER	SBO1		GARY SNYDER	CPPC
	MATT SELLERS	PCME		MARTHA SULLIVAN	CPPC
	BILL SWEET	PCME		RAY TOURANGEAU	PCME
	JIM WATT	PCQA		TED BALLARD	AVNE
	TED BREDIKEN	MFPC		STAN HOMOL	SH2
				CLAIRE BALTHASAR	MFPC
				BILL CONGDON	MFPC
				STEVE MCCOOEY	MDES
				TERRY RODRIGUEZ	MFPC

FR: DAVE CZARN KARN

SJ: FORD CRUISE CONTROL PRESSURE SWITCH START-UP MEETING:
05/30/91 MEETING MINUTES

MEETING

THE NEXT MEETING IS SCHEDULED FOR:

DATE: 06/06 (THURSDAY)
TIME: 10:00 - 11:30 AM
PLACE: MARKETING CONFERENCE ROOM

PLEASE CALL ME IF YOU ARE NOT ABLE TO ATTEND

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* = ITEMS THAT ARE NEW OR HAVE BEEN REVISED OR COMPLETED SINCE PREVIOUS MEETING

57 L/T	WHO	WHEN	
Hexport:			
. L/T PILOT RUN	SELLERS/	01/24	ORIG.
(PUSHOUT DUE TO HEXPORT AVAILABILITY)	GARIEPY	06/06	REV.
. UPDATE HEXPORT SHIPPING SCHEDULE	KOTCH	ONGOING	
* COPY OF FORD'S INSTALLATION TORQUE SPEC (ES20000-S100); SEND TO TIA	DELETED; SEE STEVE O.'S ITEM UNDER 57 P/C		
* PLAN FOR EVALUATING POULSEN	KOTCH	05/16	ORIG.
		05/31	REV.
* PLAN FOR HEXPORT COST REDUCTION W/ELCO	KOTCH	06/06	ORIG.
		05/30	COMP.
* PUT 13K HEXPORT ORDER ON HOLD; PENDING RE-ROLL RESOLUTION	KOTCH	05/31	
ISR issues:			
. CONNECTOR INSTALLATION FORCE STUDY	OFFILER	06/06	
* GAGE CONCEPT FOR TERMINAL POS'N.	SELLERS	06/06	ORIG.
		05/30	COMP.
* DEVELOP TERM. POS'N GAGE CONCEPT	SELLERS	06/13	
. RELEASE PRINT FROM L/T	SCHUCK	05/09	ORIG.
(SEE DISCUSSION)		06/20	REV.
. SUBMIT ISR FOLLOW-UP TO FORD SQA	WATT	04/04	ORIG.
(NEED RELEASE PRINT)		06/27	REV.

57 P/C

	57PSL5-3	57PSL5-2	77PSL2-1	77PSL2-3
APR	0	0	0	0
MAY	2 (COMP.)	2	0	0
JUN	*22	0	0	0
JUL	10 (tentative)	2.3	0	0
AUG	10 "	2.3	2	0
SEP	10 "	*2.6	2	0
OCT	0	9.5	**9	2
NOV	0	8.5	25	2
DEC	0	0	25	**9.5

* = JOB1 FOR 57PS VERSIONS
** = TENTATIVE JOB1 FOR 77PS VERSIONS

REGARDS,
DAVE CEARN \24-FORD

-MSG MS= 69415 FR=CNP1 TO=PCQA SENT=06/06/91 07:10 AM
RS=174 ST=C DIV=0050 CC=00175 BY=CNP1 AT=06/06/91 07:10 AM

TO:				
	ANDY MCGUIRK	PCQA	RAY TOURANGEAU	PCNE
	~~BILL EDWARDS~~	NFPC	LEO MARCOUX	AELN
	TOM CHARBONEAU	TC	STEVE FOSTER	SRF

CC: MARTHA SULLIVAN CPPC
FR: CHARLIE DOUGLAS CPPC

THIS IS TO INFORM YOU THAT A NEW CUSTOMER DRAWING HAS BEEN RECEIVED. PLEASE COMMUNICATE THIS CHANGE TO THE APPROPRIATE PEOPLE WITHIN YOUR GROUP. PERTINENT INFORMATION IS AS FOLLOWS:

CUSTOMER: FORD
CUSTOMER PART NUMBER: F2VC-9F924-BB
TI PART NUMBER: 57PSL5-3
ENGINEERING CHANGE LEVEL: J

REGARDS, CHARLIE