

EA02-025

TEXAS INSTRUMENTS, INC.'S

9/10/03 ATTACHMENT TO ODI

REQUEST #3

BOX 5

PARTS A - P

PART B

164-01-150
CC: JEFF
FILE

SAMPLE ORDER

ORDER NO: CD91-40
REQUEST DATE: 08/27/91
CREDIT ACCOUNT: 5902
COST CENTER: 101
PRODUCT CODE: 060

CUSTOMER: KELSEY-HAYES COMPANY
CUSTOMER P.O. NO: A1E052740
TI PART NO: 77PSL2-1
CUSTOMER PART NO: F2VC-9F924-AB
QUANTITY: 150
PRICE: \$12.00 EACH

DELIVERY PROMISED: 8/30 (CRITICAL DELIVERY DATE)

SPECIAL INSTRUCTIONS: SENSORS BUILT BY PRODUCTION ON HAND-LINE
SW BUILT ON LINE (1.093 CHK STA. FACTORY)
FINAL ADM ON LINE (1.146 PINS)
TEST ON 77PS P.T.

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

TI-NHTSA 7141

Pitts INC.

Customer Information

Checklist Of Required Actions

Part Number:	77P562-1	Customer Requested Date:	8/28/92
Actions	Available/Completed	Status/Update	
1. Manufacturing feasibility (Discs, base, terminals,...)	✓		
2. Customer Print/Buyer/Buyer code Platform/MY/SQA/SQA code	✓		
3. Available product to accomplish testing/measurement (6 pcs for FAI,)	✓		
4. First Article Inspection (Also check ID code height against customer's print). external o-ring; threaded protective cap)	✓		
5. Design FMEA Process FMEA	✓		
6. Process Flow Diagram	✓		
7. Designated characteristics(kpc) (Significant characteristics)	TBD		
8. Manufacturing Control Plan	✓		
9. Gage R & R Studies (send copy to gage lab)	✓		
10. Process Capability Studies (Cpk) (Short term, quarterly, ...)	✓		
11. ES testing	✓		
12. Material Analysis (Date)	'92		
13. PIPC (Process potential Cp and process capability Cpk on a minimum of 300 switches once the process is stable for significant characteristics.)	✓		
14. PIST (Includes dimensional requirements on the print and also all engineering specification (ES) test results.)	✓		

TI-NHTSA 7142

16. Comments/negotiations:

11

shipped to:

(Date)

(Rev 3, 08/21/92, J. Watt)

HIGHLIGHTS

Stephen B. Offiler
Week Ending 92-08-28

Handwritten signature



The writeup of the 600 hour thermal ramping test for Light Truck was completed, and Norm Freda is delivering it to John Pelkey today. A potentially touchy issue arose during this test, where a device had failed at 49K cycles and was found to have been built with a "slightly" misplaced gasket. Subsequently, it was discovered by Mfg. Eng. that the gasket check station on the AMI would only turn up a "grossly" misplaced gasket. This has been corrected; however the concern is that some small (but unknown) percentage of all sensors ever built on AMI have a slightly misplaced gasket and reduced (but again unknown) life expectancy. If the problem were significant, RMR's should have highlighted it long ago. We are trying to be careful in how we report this failure to Ford to avoid unnecessary concern on their part. The report details findings on seven of the twelve which failed due to the familiar diaphragm rupture. Some dimensional data was taken which shows that no permanent shifts occur due to the extreme temperature excursions (182 C). The five surviving devices showed abnormally high contact resistance considering they carried only trace current throughout the test; the highest is out of spec. at 221 mV and will be analyzed further.

We have completed a detailed plan to address the very high vacuum withstand requirement for Ford Australia. Should this 11th-hour discovery require design or process modifications, production-intent prototypes are needed for a pre-production build Nov 1 and must ship (to clear customs, etc) by Oct 16. A detailed experiment is underway to characterize the ability of the standard design to withstand vacuum (application of vacuum followed by a diaphragm life test) plus prototype lots which explore various potential modifications. The tight schedule allows no time for iteration; thus care must be taken to maximize the possibility that we'll have a handle on the solution the first time.

TI-NHTSA 7144

TEXAS INSTRUMENTS



August 28, 1992

Pitts Industries, Inc.
1671 S. Broadway
Carrollton, Tx 75006

Attn: Mr. Medhat Habashi
QRA Manager

Subj: ISIR Ford Part Number F2VC-9F924-AB (Pressure Switch)
T.I. Part Number 77PEL2-1

Ref: OA/25/92 Telephone call

Dear Medhat,

Enclosed, please find a copy of the ISIR for Ford p.n.
F2VC-9F924-AB that was previously forwarded to Ford.
You can retain this copy for your files.

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

Regards,


Jim Watt
QRA Engineer
Precision Controls Department
Control Products Division

cc: Dave Czarn, MS 12-29; Steve Offiler, MS 12-29
Charlie Douglas, MS 12-33; Gary Snyder, MS 12-29
Joe Jorda, Pitts Industries Purchasing Dept., Carrollton, Tx.
Andy McGuirk, MS 12-27
Norm Freda, TI Farmington Hills, Michigan

encl: ISIR Ford P.N. F2VC-9F924-AB

TEST NO. 107831

TECHNICAL SERVICE LABS
[Signature] 8/27/91

TEST NO. 107831



REPORT OF RESULTS:

complete

DATE RECEIVED

8/28/91

DATE OUT

9-5

EMPLOYEE NO.									
JOB NO.									
NO. ANALYZED									
HOURS WORKED									

MILITE INDUSTRIES, INC.
INITIAL SAMPLE DATA REQUEST
(1204)

REQUIRE APPROVAL BY: Pitts

REQUEST DATE: 8/28/92

PART NUMBER: <u>F2VC-9F924-AB</u>		RECEIPTIFICATION:
REVISION LEVEL & DATE: <u>"G" 4-11-91</u>		INITIAL SAMPLE - PRODUCTION TOOLING: _____
PART DESCRIPTION: <u>PRESSURE SWITCH</u>		INITIAL SAMPLE - PROTOTYPE TOOLING: _____
APPLICATION: <u>HEAT GEN. SPEED CONTROL</u>		NEW SUPPLIER: _____
SUPPLIER: <u>TEXAS INSTRUMENTS INC</u>		DESIGN CHANGE: _____
SUPPLIER LOCATION: <u>ATLANTA GA 30205</u>		PROCESS CHANGE: _____
REQUESTED BY: <u>GEORGE COMSTOCK</u>		TOOLING CHANGE: _____

	Yes/No	Samples Required	Approved	Rejected
I. FEASIBILITY ASSESSMENT COMPLETION: DATE <u>12/5/91</u>	<u>YES</u>			
II. SUPPLIER INFORMATION REQUIRED:				
A. Dimensional Layout with Numbered Print	<u>YES</u>			
B. Material Certification	<u>YES</u>			
C. Process Potential Study on All Designated Characteristics	<u>YES</u>			
D. Functional Test	<u>YES</u>			
E. Control Plan	<u>YES</u>			
F. Process Flow Chart	<u>YES</u>			
G. Process FMEA	<u>YES</u>			
H. Other: _____				

III. SAMPLE REQUIREMENTS:

A. 6 Samples Due By 8/28/92 Attention: Madhat HASANI

B. _____ Samples Due By _____ Attention: _____

C. _____ TOTAL SAMPLES REQUIRED. (Purchase order is the governing document for actual released requirements. Here information is provided here on requirements to meet needs for approval.)

IV. REMARKS / SPECIAL INSTRUCTIONS (Design FREE, Special Cases, Cleanliness, Packaging, Designated Characteristics, Etc.)

FMEA ENCLOSED

V. MILITE APPROVING AUTHORITIES:	Yes/No	Samples	Approved	Rejected
A. Product Engineering				
B. Materials				
C. Quality Assurance				
D. Manufacturing Engineering				
E. Customer Approval				
F. Supplier Management				

Final Approval on This Form by Quality Assurance Authorizes Release to Purchase Order.

Approved: _____ Date: _____

For Recertification, Current Approval Expires: _____

VI. DISTRIBUTION: Supplier _____ Purchasing _____ Receiving Inspection _____ Material _____ Manufacturing _____

AREAS COVERED BY SUPPLIER QA MANUAL:

☒ ORGANIZATION AND FUNCTIONS
☒ LOT TRACEABILITY
☒ SUBS
☒ TRAINING AND CERTIFICATION
☒ PLANNING AND INSTRUCTIONS
☒ MANAGEMENT STATEMENT OF QUALITY
☒ EMPLOYEE INVOLVEMENT

☒ RECORDS & REPORTS
☒ NONCONFORMING MATERIALS
☒ CORRECTIVE ACTION
☒ DRAWINGS AND CHANGES
☒ CALIBRATION
☒ RQC UTILIZATION
☒ GAGE R&R

☒ CONTROL OF PURCHASES
☒ MATERIAL CONTROL
☒ IN-PROCESS INSPECTION
☒ FINAL INSPECTION
☒ STORAGE / DELIVERY
☒ MATERIAL CERTIFICATION
☒ OTHER (NOTE IN REMARKS)

REMARKS:

QA MANUAL ENCLOSED

J. Math
ORA Engr.
(28) 644-1719
8/28/92

NOTE: ATTACH COPIES OF COMPANY QA MANUAL/ORGANIZATION CHARTS AS APPLICABLE

IS SUPPLIER AN ACCEPTABLE SOURCE: ☐ YES ☐ NO
☐ PROBABLY

NOTE EXCEPTIONS ON CONTINUATION SHEETS --
 REVIEW INCOMING INSPECTION RECORDS FOR EXISTING SOURCES --

REVIEWED BY:

DATE:

APPROVED BY:

DATE:

TI-NHTSA 7148

04076

☐ Quotation Level

☐ Initial Production Level



HILITE MANUFACTURING FEASIBILITY SIGN-OFF

SUPPLIER TEXAS INSTRUMENTS INC.
CUSTOMER HILITE INDUSTRIES INC.
PART NUMBER & REVISION P2MC-98924-AB
CUSTOMER PART NUMBER & REVISION 77D518-1

DEFINITION:

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

FEASIBILITY CONSIDERATIONS:

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

YES NO

CONSIDERATIONS

☒ ☐

- Can the part be manufactured as specified on the attached drawings?
- Compatibility of specifications to accepted manufacturing standards.
 - Containability of tolerance stack-up.
 - Special equipment requirements.
 - Adequacy of part definition to enable feasibility evaluations.

☒ ☐

- Can you meet the Engineering Specification (ES) as written?
- Containability of all ES requirements.

☒ ☐

- Can you meet the quality control requirements of Q-101?
- Establishment of process capability at required volume levels.
 - Maintenance of required quality system controls.

☒ ☐

- Can you meet all specified requirements at the projected volume levels?
- Adequacy of capacity.

☒ ☐

- Does the design allow use of conventional efficient material handling equipment techniques?
- Attainability of shipping densities.

☒ ☐

- Can the part be manufactured without incurring any unusual costs (capital equipment, tooling or piece costs)?
- Product improvement proposals.
 - Cost reduction alternatives.

☒ ☐

- Can you maintain production capacity on the related part until incorporation of new/ revised design (for current suppliers only)?

FEASIBILITY ASSESSMENT:

☐

Feasible - Part can be produced as specified with no revisions.

☐

Changes Required - Design revision required to produce part within the specified requirements.

☒

Changes Recommended - Feasible but can be improved or less costly if proposed revision is incorporated. Note change revision reverse side.

-MSG MSG= 00570580 FM=VAGE TO=SE01 SENT=09/01/92 09:46 AM
R#151 ST=C DIV=0050 CC=00101 NY=VAGE AT=09/01/92 09:46 AM

TO: DAVE CHARN EARN
STEVE OFFLER SE01
DALE SOGGH FTUN

CC: BILL SWEET PCMH
TOM BURKE MWPC

FM: MATT SELLERS PCMH

SJ: QUIET SWITCH CUP MOD'S

GENTLEMEN,

QUOTES RECEIVED BACK TODAY FROM VALENTINE ON THE PROPOSED CUP BUMP
HEIGHT INCREASE INDICATE THAT EACH TOOL, IE. 27713-1 AND 27288-1, WILL COST
\$5000.00 TO MODIFY. ADDITIONALLY, THERE WILL BE A \$3000.00 CHARGE TO MAKE
PROVISIONS FOR SOME I.D. MARKS ON THE MODIFIED CUPS. IN TOTAL WE ARE
LOOKING AT A \$13,000.00 BILL TO MAKE THESE CHANGES. PLEASE RESPOND
FORMALLY ON THE APPROPRIATENESS OF THIS CHANGE AS A PERMANENT
SOLUTION. ALSO COULD YOU PLEASE COMMENT ON THE POSSIBILITY OF
CONVERTING 100% TO THE MODIFIED DESIGN ON ALL SEAF AND QUIET DEVICES.
WE NEED TO STEP UP THE PRIORITY ON IMPLEMENTING A CHANGE THAT WILL
RELIEVE PRODUCTION OF THE CURRENT LOOSE DISC PROBLEM. PLEASE
RESPOND ACCORDINGLY.

THANKS & REGARDS. . . MATT
X1245

TI-NHTSA 7152

-MSG N#- 24878 FR-JWW3 TO-PCQA SENT-09/02/92 04:01 PM
R#-763 ST-C DIV-0050 CC-00175 BY-JWW3 AT-09/02/92 04:01 PM

TO: JOHN KOURTESIS MARTHA SULLIVAN
LOU TOMASSO GARY SNYDER
BILL SWEET BOB BARTOSH
TIM SPOONER DAVE CEARN
DICK GARIEPY STEVE BUTLER
RICK MEYER STEVE MAJOR
NORM FREDA

FR: JIM WOOD

SJ: FORD VISIT TO TI - 21-22 SEPT - TOOL TIMELINE REVIEW

SID MASHIKE, FORD CCD TOOL AUDITOR WILL VISIT TI LATE IN THE DAY ON MONDAY, 21 SEPT (ARRIVE PROVIDENCE: 3:14PM). HE WILL RETURN ON TUESDAY, 22 SEPT AND WILL DEPART ON THE 4:00 FLIGHT.

THE PURPOSE OF HIS VISIT WILL BE TO REVIEW OUR TOOL TIMELINE. HE DOES NOT PLAN TO DISCUSS THE TOOL FUNDING OR THE TOOL SPLIT ISSUE.

SPECIFICALLY, HE PLANS TO REVIEW THE FOLLOWING:

- o DISCUSS TOOL TIMELINE (OVERVIEW AND DETAIL)
- o IDENTIFY PROGRESS TO DATE
- o IDENTIFY TIMING, ORDER/RECIPT DATES FOR OUTSIDE PURCHASED MATERIAL
- o IDENTIFY MAJOR TOOL SUPPLIERS (REVIEW)
- o IDENTIFY TIMING FOR INTERNALLY FABRICATED MATERIAL
- o PRESENT TIMING ON FORD TOOL DOCUMENTATION

WE WILL MOST LIKELY TOUR THE PRESSURE SWITCH LINE AND MECHANIZATION ARE AT SOME POINT DURING THE DAY ON TUESDAY.

THE FOLLOWING PRELIMINARY AGENDA IS PROPOSED:

MONDAY, 21 SEPT

4:00-5:00 REVIEW TOOL/HISTORY WOOD

TUESDAY, 22 SEPT

9:00-9:30	REVIEW PROCESS FLOW AND MANT STRATEGY	SPOONER, SWEET
9:30-10:00	PRESENT TOOL TIMING OVERVIEW	SPOONER, SWEET, KOURTESIS
10:00-12:00	DISCUSS TOOL TIMING DETAIL (SEE ABOVE)	" "
12:00-1:00	LUNCH	
1:00-2:30	OPEN	
2:30	DEPART FOR AIRPORT	

REGARDS,

TI-NHTSA 7153

-MSG N#- 304689 FR=PCQA TO=COPY SENT=09/14/92 11:59 AM
ST-C DIV=0050 CC=00149 BY=PCQA AT=09/14/92 11:59 AM

DOUG STROTT DBS1
CC: TOM CHARBONNEAU TC ED O'NEILL EJON
RAY TOURANGEAU RGT2 MARTHA SULLIVAN MNS
FR: ANDY MCGUIRK
SUBJ: Change Checklist
We should add: SFMEA (Supplier FMEA)
13 Step Certification
Supplier Selection

Regards, Andy McGuirk

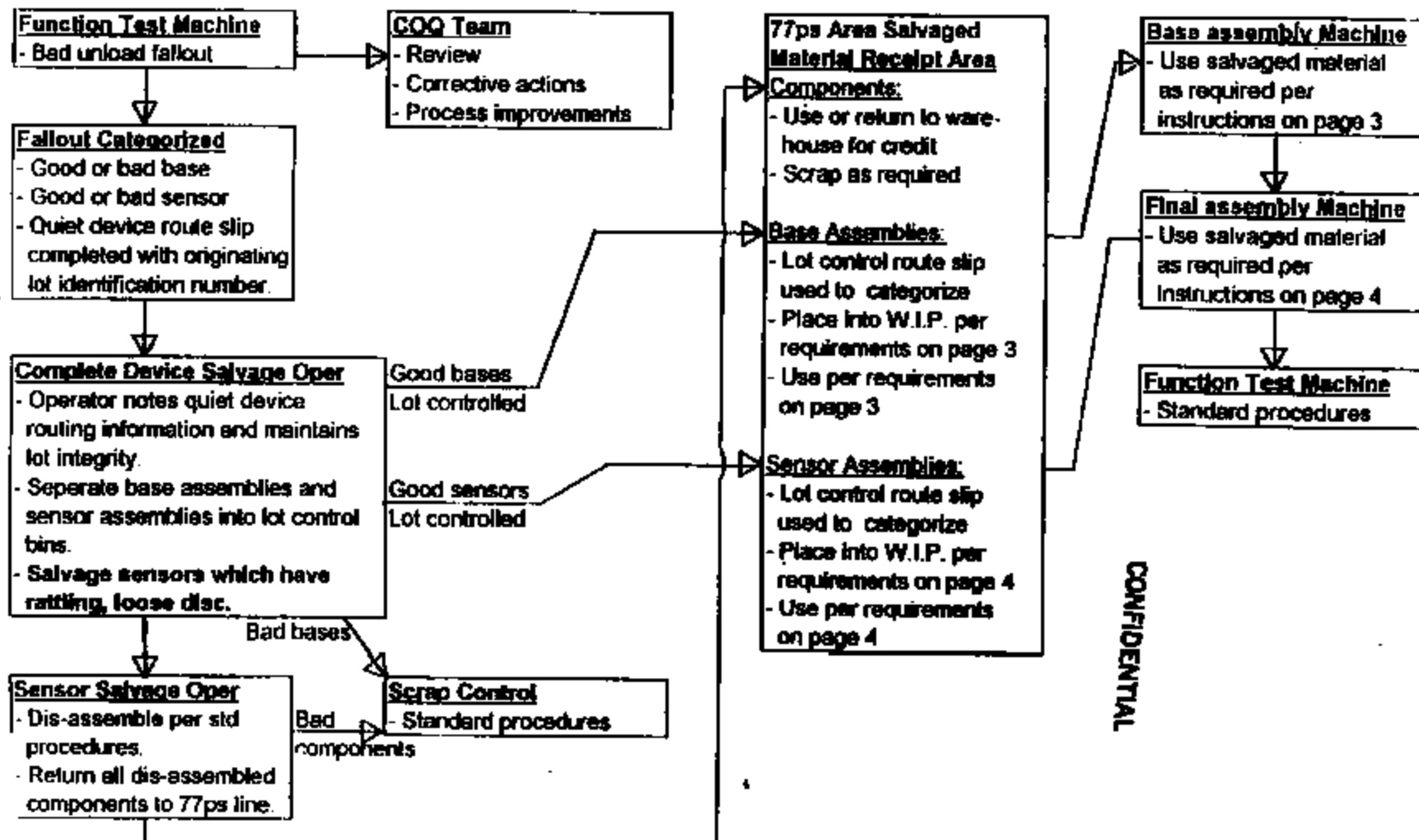
acm/lh f:chgchk

TI-NHTSA 7154

77PS FUNCTION TEST FALLOUT REWORK LOOP FLOW QUIET DEVICES

9/2/92

Revision: B



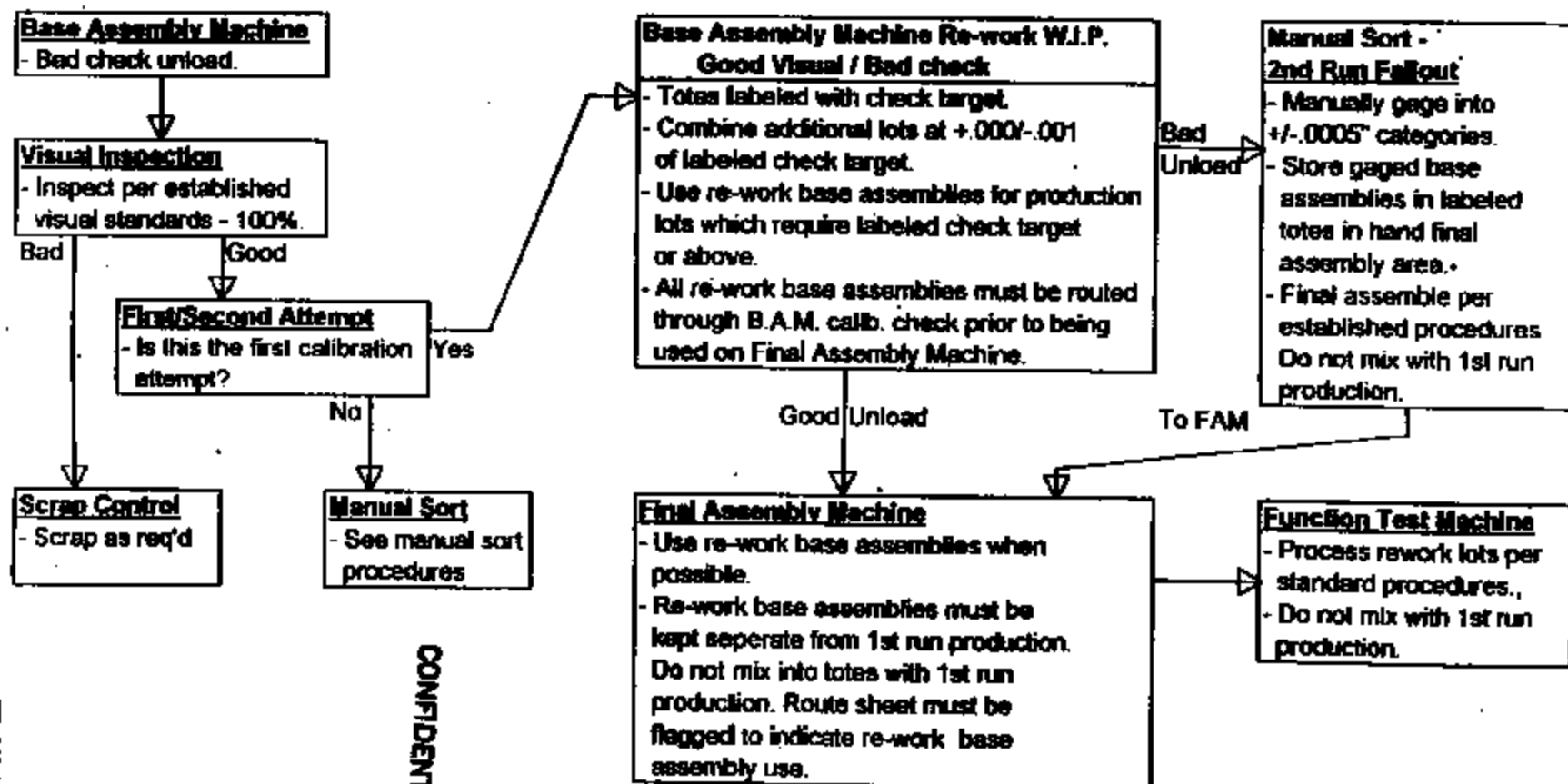
CONFIDENTIAL

TJ-NHTSA 7155

BASE ASSEMBLY MACHINE (B.A.M.) REWORK LOOP - CHECK FALLOUT QUIET DEVICES

8/6/92

Revision: A



CONFIDENTIAL

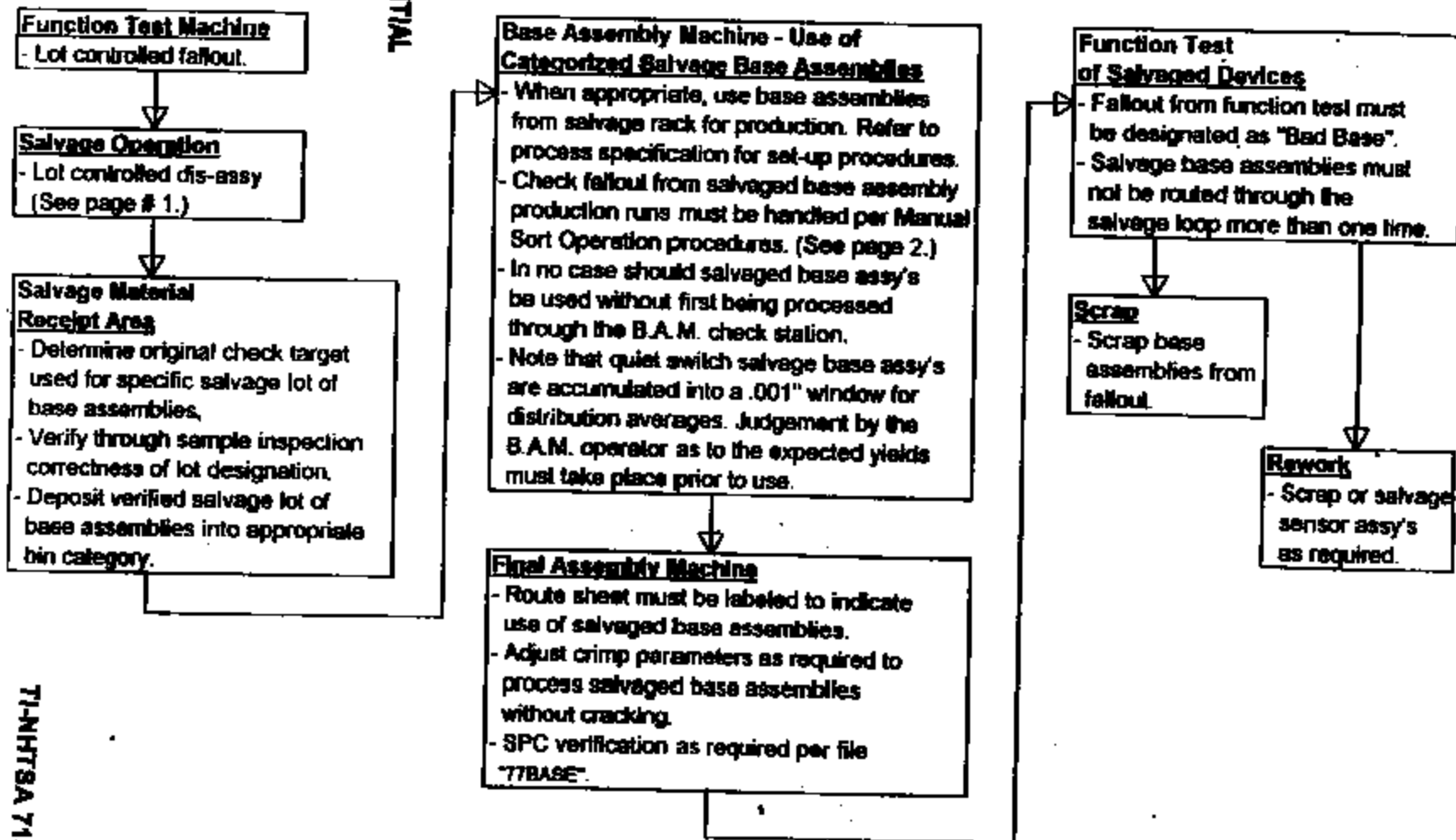
TI-NHTSA 7156

BASE ASSEMBLY MACHINE (B.A.M.) USE OF SALVAGED BASE ASSEMBLIES QUIET DEVICES

8/6/92

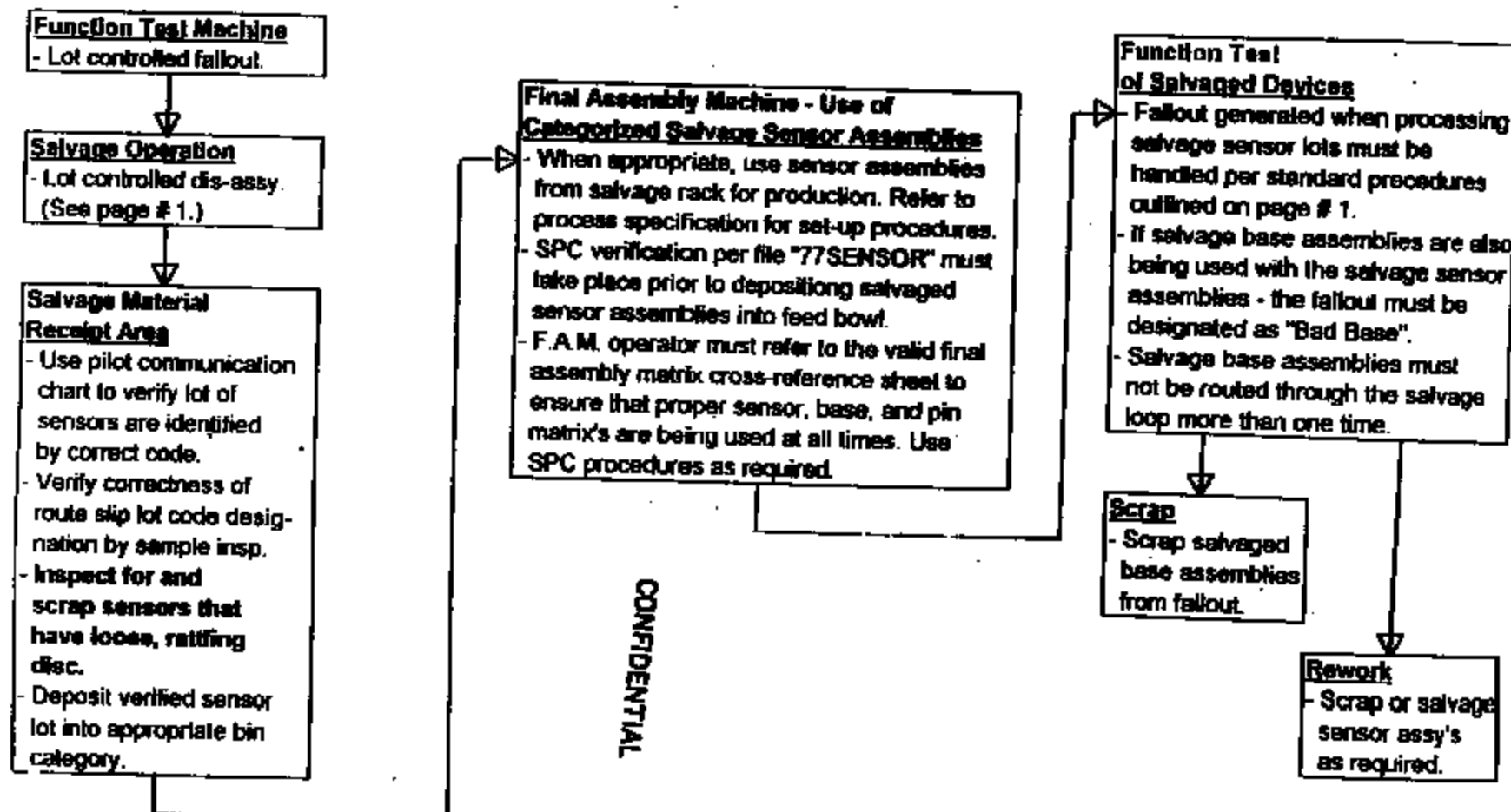
Revision: A

CONFIDENTIAL



TI-NHTSA 7157

FINAL ASSEMBLY MACHINE (F.A.M.) USE OF SALVAGED SENSOR ASSEMBLIES QUIET DEVICES



CONFIDENTIAL

- 27 14# 39041 FR=JW02 TO=PCME SENT=09/03/92 07:59 AM
R#174 ST=C DT=0050 CC=00149 B1=JW02 AT=09/03/92 07:59 AM

Memorandum

September 03, 1992

TO:	Ed Smith	PCQA	Elaine Rose	GAMY
	Steve Offiler	SB01	Math Sellers	PCME
	Bill Sweet	PCME	Dennis Natale	PCME
	Dave Czern	ZARN	Andy McGuirk	PCQA
	Charlie Douglas	CMP1	Stan Homol	SH2
	Gary Snyder	GJS1	Tom Charboneau	TC
	Dick Ganiepy	RWGS	Norm Freda	WHLZ
	Tom Burke	MFPC		

FM: Jim Watt JW02

Subj: Impulse Testing 52PS/57PS/77PS

who!

The proposal that we discontinue impulse testing every disc lot has received concurrence from many people. Recent disc lot failures continue to be addressed by the disc department (Ted Ballard). As noted by others, I also do not believe we have had cracked disc as an issue in field returns (RMRs).

We will modify our impulse testing frequency to accomodate periodic testing of pressure switch discs to identify significant disc problems.

Disc lot rejections will continue to be isolated, appropriately dispositioned, with corrective actions requested through the disc department.

The 57PS impulse tester motor is currently being repaired/replaced and lack of impulse testing will not impede production build or shipments. We will expedite restoral of 57PS impulse testing capability for pressure switches.

Regards,

Jim ext. 1719 msg: JW02

TI-NHTSA 7159

-MSG ##= 41839 FR=RWG3 TO=PCME SENT=09/03/92 09:11 AM
R#179 BT=C DIV=0050 CC=00127 BY=RWG3 AT=09/03/92 08:49 AM

Memorandum

September 03, 1992

TO:	Ed Smith	PCQA	Elaine Rose	GAMY
	Steve Offiler	SB01	Matt Sellers	PCME
	Bill Sweet	PCME	Dennis Natale	PCME
	Dave Czarn	ZARN	Andy McGuirk	PCQA
	Charlie Douglas	CMP1	Stan Homol	SH2
	Gary Snyder	BJS1	Tom Charboneau	TC
	JIM WATT	JW02	Norm Freda	WHLZ
	Tom Burke	MFPC		

FM: DICK GARIEPY RWG3

Subj: Impulse Testing 52PS/57PS/77PS

JIM WATT HAS INFORMED ME THAT THERE ARE NO CUSTOMER REQUIREMENTS WHICH REQUIRE US TO IMPULSE TEST EVERY LOT OF DISCS. THEREFORE EFFECTIVE TODAY IMPULSE TESTS ON ALL 52/57/77PS SWITCHES WILL BE DONE ON ONE LOT OF DISCS PER WEEK FOR EACH PRODUCT FAMILY.
I PROPOSE THE FOLLOWING SCHEDULE.

MONDAY =52PS PILOT MAKER WILL SUBMIT A SAMPLE TO Q.C FOR IMPULSE TEST.
WEDNESDAY =57PS " " " " " " " " " " " " " " " "
FRIDAY =77PS TEAM LEADER " " " " " " " " " " " " " " " "

IN THE EVENT A LOT IS SUSPECT AS A RESULT OF THE IMPULSE TESTING A SECOND LOT OF DISCS USING THE SAME COMPONENTS WILL IMMEDIATELY BE TESTED. IF THE SECOND LOT ALSO IS SUSPECT THE DISC ENGINEER (TED) WILL BE NOTIFIED TO DETERMINE IF SOMETHING HAS CHANGED. (BY Q.C) IF THE SECOND LOT IS NOT SUSPECT WE WILL ATTRIBUTE THE FIRST LOTS' CONCERNS TO EXCESSIVE SEVERITY OF THE TEST.

DESIGN ENG. SHOULD DETERMINE IF A SLOWER IMPULSE RATE IS A MORE REALISTIC TEST. (CAPACITY NOW AVAILABLE.)

DICK

X1141

TI-NHTSA 7160

0126 0000 59090 FR=VAGS TO=PCME SENT=09/03/92 02:48 PM
#4=133 ST=C DIV=0050 CC=00134 BY=VAGS AT=09/03/92 02:48 PM

TO: RICK GRIERY MFPC

CC: ED SMITH PCQA BILL SWEET PCME
STEVE OFFILER SB01 ELAINE ROSE GARY
DENNIS NATALE PCME DAVE CZARN ZARN
ANDY MCQUIRK PCQA CHARLIE DOUGLASCPC
STAN HOMOL GH2 GARY SNYDER GJS1
TOM CHARBONEAU TC JIM WATT PCQA
NORM FREDA WHLZ TOM BURKE MFPC
BOB BARTOSH PCME

FR: MATT SELLERS PCME

SJ: IMPULSE TESTING ON 77PS

SICP:

THERE ARE OTHER THINGS BESIDES DISC ENDURANCE THAT ARE EVALUATED DURING THE IMPULSE CYCLING OF THE 77PS DEVICES IN PARTICULAR WHICH SHOULD HAVE BEEN EVALUATED PRIOR TO MAKING THE DETERMINATION THAT IMPULSE TEST FREQUENCY COULD BE REDUCED FROM EVERY LOT TO ONCE EACH WEEK. I REFER MOST STRONGLY TO SPRING LIFE ON THE 77PS PRODUCT. WE HAVE DETECTED IN THE PAST INSTANCES WHERE AN IMPROPERLY BENT SPRING ARM, WHICH PASSES ALL SPC REQUIREMENTS, WILL BREAK DURING IMPULSE CYCLING. FOR THIS REASON ALONE I WOULD ADVISE NOT REDUCING THE IMPULSE TEST CYCLING FREQUENCY ON 77/87PS AT THIS TIME. PERHAPS THERE IS A COMPROMISE FREQUENCY THAT WOULD BE MUTUALLY AGREEABLE TO THE ENTIRE MRB. ADDITIONALLY, THERE ARE OTHER CONCERNS AS FOLLOWS:

- 1.) THIS MAY CONSTITUTE A CHANGE TO THE MANUFACTURING CONTROL PLAN WHICH WOULD REQUIRE CUSTOMER APPROVAL.
- 2.) D&P FMEAS REFER TO THESE CYCLING AUDITS AS ONE OF SEVERAL MANUFACTURING CONTROLS FOR SEVERAL PROCESSES.
- 3.) THE MRB TEAM MAY NEED TO REVIEW OTHER AREAS OF THE D&P FMEAS TO DETERMINE IF ANY OTHER ADVERSE IMPACTS MAY RESULT.

PLEASE CONSIDER THESE ITEMS AND RESPOND URGENTLY TO MYSELF AND THE REST OF THE MRB.

REGARDS...MATT
X1245

TI-NHTSA 7161

-MSG M# 60499 FR=SB01 TO=PCME SENT=09/03/92 03:12 PM
R#=187 ST=C DIV=0050 CC=00101 BY=SB01 AT=09/03/92 03:12 PM

TO:	Bob Bartosh	PCME	Dennis Natale	DUN1
	Tom Burke	MFPC	Elaine Rose	GAMY
	Tom Charboneau	TC	Matt Collins	PCME
	Dave Czarn	ZARN	Ed Smith	PCQA
	Charlie Douglas	CMP1	Gary Snyder	GJS1
	Norm Freda	WHLZ	Bill Sweet	PCME
	Dick Gariepy	RWGS	Chris Wagner	CDWS
	Andy McGuirk	PCQA	Jim Watt	JW02

FR: Steve Offiler SB01
Stan Homol SH2

SJ: In-Process Impulse Testing 52/57/77/87PS

=====

Stan and I have reviewed the ES requirements for in-process Impulse testing. The 57 and 87PS POWER STEERING devices require an Impulse test on 4 devices per lot; 57 and 77PS BRAKE devices require an Impulse test on 3 devices per quarter; 52PS has no in-process Impulse requirements.

Based on this information and Matt's MSG #51131 on 77/87PS Impulse needs, we can immediately reduce the in-process Impulse frequency ONLY on 52PS (ALL) and 57PS (BRAKE). Formal customer approval will be required to add 57PS (PWR STR) to these.

Regards, Steve O.

HIGHLIGHTS

Stephen B. Offler
Week Ending 92-09-11

Handwritten signature
non



The combined vacuum and diaphragm-life characterization experiment has gotten underway right on schedule. Devices have cycled, using ES impulse parameters, to about 140K at this point without problems. All devices (except control lot) were exposed to the Ford Australia requested vacuum level of 0.4 mBar (≈ 0.3 mm Hg ≈ 0.006 psia) using equipment belonging to the APT group under Mark Bissell's and Lydia Carlos' care. Included are the standard diaphragm configuration, with and without vacuum; as well as rubber diaphragm, Tefzel (1, fluid-exposed) plus Kapton (2), full-round Kapton, and roughened-hexapen-flange. Additional devices were built to be opened for inspection of the diaphragm and the effects of vacuum (if any). We have an aggressive schedule in place meant to define a switch configuration which can withstand high vacuum, then produce production-intent prototypes of this configuration for shipment in early October, followed by validation testing due later in November.

We are inspecting the two remaining survivors of the 600-hour LT Thermal Ramp test, one of which exhibited abnormally high contact resistance at 221 mV (device #3). Considering that they carried only trace current during the test, normal contact arcing/erosion is not the culprit. After disassembly, the preload is somewhat low at 5mils. However, a curve of mV drop versus preload on each, compared with the measured mV drop at final characterization, seems to suggest a preload of only a couple of mils. The 3-mil discrepancy could be crimp shift, measurement technique, etc. Nonetheless, #3 has significantly higher mV drop compared to #8 at the lower preloads, both dropping off to very low values at the higher preloads (higher contact forces). This seems to suggest some contact-surface phenomena at low contact force is at work on #3. Further analysis is planned.

We have been meeting with K.F. Bassler on the stationary terminal (p/n 36888), which according to Rick Bassler is a constant source of frustration. He reports that, with the given tool design approach combined with the way the part is designed and tolerated on the print, the tool requires constant "tweaks" to remain in-spec. Tweaks mean to correct a particular dimension will typically impact many other dimensions; the result being that we observe certain dimensions which vary widely and unpredictably from lot to lot. Our goal is to improve our process capability, especially on customer envelope dimensions, which are directly related to this terminal. Bassler maintains that significant time and effort have already been expended to improve the tool, and at this point relaxation of dimensions and/or tolerances, where appropriate and acceptable, will be the best course of action. This will result in a reduction of the tweaking, thus have the direct effect of providing us with more consistent parts. Rick's comments should be viewed in light of the fact that this part is a fairly complex stamping, with several bends, surfaces in several different planes, and certain dimensions which are impacted by the stackup of bend angle, bend radius, and bend allowance in addition to edge-to-edge cut tolerances. As we work through the print, it is possible that redimensioning certain areas to reduce this stackup effect aside from simple tolerance relaxation will also improve the capability. Rick has verbally agreed to make certain expensive tool modifications, without cost to TI, to help recenter a key controversial dimension; with our concession being leniency on as many other dimensions (non-envelope related) as we can.

-MSG MH= 249106 FR=SB01 TO=MJS2 SENT=09/11/92 09:39 AM
R#=035 ST=C DIV=0050 CC=00101 BY=SB01 AT=09/11/92 09:39 AM

TO:	Tom Burke	MFPC	George Holman	B512
	Danny O'Driscoll	DOD	Dick Gariepy	MFPC
	Jeff DiDomenico	DIDO	Mark	MJS2
	Charlie Douglas	CMP1	Rusty Struble	RCS
	Norm Freda	WHLZ	Jim Watt	JWO2

CC: Tom Charboneau (delivered separately)
Dave Czarn

FR: Steve Offiler SB01

SJ: BiWeekly Highlights

=====

The combined vacuum and diaphragm-life characterization experiment has gotten underway right on schedule. Devices have cycled, using ES Impulse parameters, to about 140K at this point without problems. All devices (except control lot) were exposed to the Ford Australia requested vacuum level of 0.4 mBar (=0.3 mm Hg =0.006 psia) using equipment belonging to the APT group under Mark Bissell's and Lydia Carlos' care. Included are the standard diaphragm configuration, with and without vacuum; as well as rubber diaphragm, Tefzel (1, fluid-exposed) plus Kapton (2), full-round Kapton, and roughened-hexport-flange. Additional devices were built to be opened for inspection of the diaphragm and the effects of vacuum (if any). We have an aggressive schedule in place meant to define a switch configuration which can withstand high vacuum, then produce production-intent prototypes of this configuration for shipment in early October, followed by validation testing due later in November.

We are inspecting the two remaining survivors of the 600-hour LT Thermal Ramp test, one of which exhibited abnormally high contact resistance at 221 mV (device #3). Considering that they carried only trace current during the test, normal contact arcing/erosion is not the culprit. After disassembly, the preload is somewhat low at 5mils. However, a curve of mV drop versus preload on each, compared with the measured mV drop at final characterization, seems to suggest a preload of only a couple of mils. The 3-mil discrepancy could be crimp shift, measurement technique, etc. Nonetheless, #3 has significantly higher mV drop compared to #8 at the lower preloads, both dropping off to very low values at the higher preloads (higher contact forces). This seems to suggest some contact-surface phenomena at low contact force is at work on #3. Further analysis is planned.

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Regards, Steve Q.

TI-NHTSA 7165

-MSG Nf- 249106 FR-SBO1 TO-JW02 SENT-09/11/92 09:39 AM
Rf-159 ST-C DIV-0050 CC-00101 BY-SBO1 AT-09/11/92 09:39 AM

TO: Tom Burke	MFPC	George Holman	B512
Danny O'Driscoll	DOD	Dick Gariepy	MFPC
Jeff DiDomenico	DIDO	Matt Sellers	NJS2
Charlie Douglas	CNP1	Rusty Struble	RCS
Norm Freda	WHL8	Jim Watt	JW02

CC: Tom Charboneau (delivered separately)
Dave Czarn

FR: Steve Offiler SBO1

SJ: BiWeekly Highlights

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(non-envelope related) as we can.

Regards, Steve O.

-MSG #= 00328840 FR=SB01 TO=SB01 SENT=09/15/92 07:11 AM
S#=025 ST=C DIV=0050 CC=00101 BY=SB01 AT=09/15/92 07:11 AM

TO: Dave Czarn EARN
Matt Sellers MJS2

FR: Steve Offiler SB01

SJ: Disc Dim. Meas. for Cup Modifications

As a quick check on Dale's previous work, we measured the assembled height of a dozen each, quiet and snap, discs. The disc measurement was taken with a dial indicator, as-assembled, using an actual 27713 cup and converter, measuring to the converter bump. Each test lot of 12 represents 3 discs taken from 4 different lots. Each disc measurement was repeated 3 times and averaged to obtain the numbers used in the statistics.

The results track Dale's extremely well. The difference observed was 0.0011" greater for the snap disc, versus 0.0012" in Dale's study. Standard Deviations also compared well with Dale's, at 0.00030"/0.00032" (snap/quiet) versus 0.00044/0.00024 in Dale's study.

Regards, Steve O.

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-27 SNAP DISCS

Device	1	2	3	Avg
1	0.3371	0.3368	0.337	0.336967
2	0.3363	0.3365	0.3368	0.336533
3	0.337	0.3371	0.3363	0.3368
4	0.3367	0.3367	0.3371	0.336833
5	0.3364	0.3369	0.3364	0.336567
6	0.3365	0.3367	0.3359	0.336367
7	0.3369	0.3369	0.337	0.336933
8	0.3368	0.3371	0.3366	0.336833
9	0.3368	0.337	0.3372	0.337
10	0.3361	0.3363	0.3362	0.3362
11	0.3372	0.337	0.3361	0.336767
12	0.3378	0.3372	0.3371	0.337367
				0.336764 <--Average
				0.000298 <--St Dev

.3368

-35 QUIET DISCS

1	0.3354	0.3354	0.3351	0.3353
2	0.3358	0.3361	0.3358	0.3359
3	0.3357	0.3357	0.3357	0.3357
4	0.3359	0.3359	0.3359	0.3359
5	0.336	0.3361	0.3358	0.335967
6	0.336	0.336	0.3361	0.336033
7	0.3357	0.335	0.3353	0.335333
8	0.3352	0.3354	0.3358	0.335467
9	0.336	0.3357	0.3359	0.335867
10	0.3357	0.3354	0.3353	0.335467
11	0.3351	0.3356	0.3353	0.335333
12	0.3361	0.3365	0.3364	0.336333
				0.335717 <--Average
				0.00032 <--St Dev

.3357

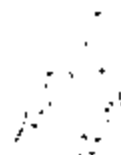
Δ .0011"



-27		READING "A"		.010 - DISCS IN ENV
ORVICE	1	2	3	
1	.3371	.3368	.3370	920915 - 1A 1B
2	.3363	.3365	.3368	
3	.3370	.3371	.3363	
4	.3367	.3367	.3371	
5	.3364	.3369	.3364	
6	.3365	.3367	.3359	
7	.3369	.3369	.3370	
8	.3368	.3371	.3366	
9	.3368	.3370	.3372	
10	.3361	.3363	.3362	
11	.3372	.3370	.3361	
12	.3378	.3372	.3371	

-35		"B"	
1	.3354	.3354	.3351
2	.3358	.3361	.3358
3	.3357	.3359	.3357
4	.3359	.3359	.3359
5	.3360	.3361	.3358
6	.3360	.3360	.3361
7	.3357	.3360	.3363
8	.3352	.3354	.3358
9	.3360	.3357	.3359
10	.3357	.3354	.3363
11	.3351	.3356	.3353
12	.3361	.3365	.3364

HIGHLIGHTS
Stephen B. Offiler
Week Ending 92-119-18



UPDATE ON VACUUM/DIAPHRAGM LIFE TESTING

Six lots of 6 devices each began cycling last week. The lots are composed of:

- * Standard diaphragm configuration, NO vacuum
- * Standard diaphragm configuration, vacuum (0.4 mBar)
- * Roughened hexport flange, vacuum
- * Rubber diaphragm, vacuum
- * Full-round Kapton, vacuum
- * Tefzel (fluid layer) plus two Kapton, vacuum

The first two lots will be directly compared to determine the impact of vacuum on diaphragm life (if any). The other four are experiments which can be compared with the second lot to determine a direction for design modifications (if required).

To-date, the test has progressed to about 1230K cycles. There have been NO failures in the lot of standard config/no vacuum, versus two in the vacuum lot (846 and 1219K). This data, while preliminary, is supporting the hypothesis that high vacuum ultimately results in shortened diaphragm life due to Kapton displacement and wrinkles. There have been four failures in the roughened hexport flange lot (870, 944, 952, and 1210K) and four failures in the Tefzel lot (844, 846, 992, and 1226K). There have been NO failures yet in the rubber diaphragm lot, or the full-round Kapton lot.

Extra test devices were built for visual analysis of the diaphragm in the as-built condition, which is done by cutting off the hex while retaining the crimp. As expected, the standard configuration parts w/ vacuum show general looseness and wrinkles across the Kapton. The roughened hexport flange lot shows some specific localized wrinkling. The rubber diaphragms, with and without vacuum, look identical - the rubber is protruding upward in a dome shape, which seems to be caused by the compression at the edges of the diaphragm. This is apparently not due to vacuum displacement. The full-round Kapton parts look quite good - no displacement from exposure to vacuum. The Tefzel parts look similar to the standard config. parts; their relatively early failure is likely to be caused by Tefzel's highly directional properties with sharply reduced elongation in the transverse direction.

4 LINES

NE 1111 9/8"

STEEL OFF 10

END ASTRA 2 101111 5 101111 10 101111 10 101111 10

As reported in various reports, all studies in both sub-
units, plus Teflon & even Biogas, are done. The only
real news is that we've had our first failure in fuel-
cured Kapton @ 1000K cycles. No failures in power dia. yet
but we're not going to think in terms of power dia. yet
more data on the failure rates of Biogas & power dia.
but we'll have an idea of the failure rates of power dia.
of evaluations with Larry O'D. being done in next
a month in the interim, we'll continue to monitor:

- Thermal Cycle (over 1000K cycles)
- Duct over to (good results)
- Thermal Char (over 1000K cycles)
- Aging (over 1000K cycles)

We've done about 100 cycles of power dia. & power dia.
other dia, still more, in a controls on the handling line
the hand handling power dia. for the power dia. & power dia.
the power dia. control, preheat, & power dia. & power dia.
the power dia. control, preheat, & power dia. & power dia.

Following the power dia. & power dia. & power dia. & power dia.
power dia. & power dia. & power dia. & power dia. & power dia.
power dia. & power dia. & power dia. & power dia. & power dia.
power dia. & power dia. & power dia. & power dia. & power dia.

-MSG MJ= 00183532 FR=SBO1 TO=SBO1 SENT=09/30/92 09:59 AM
SJ=054 ST=C DIV=0050 CC=00101 BY=SBO1 AT=09/30/92 09:59 AM

TO: Matt Sellers MJS2

FR: Steve Offiler SBO1

SJ: Cup Markup MX3355-115

Matt, I have completed a 100X scale dwg layout of the worst-case bump geometry with .003 x .025 fillet, and from this graphically determined the worst-case disc slope that would cause the fillet to interfere. Then, I did a calculation of the actual disc slope in the region of the bump (based upon assumption of constant radius) and found that there is no possibility of interference. The fillet would be a problem if the disc slope were 11.6 degrees, while the actual silent pass car disc has a slope of 2.5 degrees. I think we can go ahead with the fillet dimensions as they appear on the markup.

After you talk w/ Gerhard, I propose that we convert MX3355-115 to 27713-2. Keep me posted.

Regards, Steve O.

77PS Series

OCT '92 SUBMISSIONS/ANALYSIS/REPLIES

1. Dana/77PSL2-1 Low Actuation Correlation Study To Spec(L.Johnson)
(Requested 4/15/92)
2. K-H Milford/77PSL2-1 " " Correlation Study To Spec(John Shorkey)
(Requested 5/15/92)
3. Ford/77PSL3-3 X ---- Red Noryl (F3TA-9F924-BA) -----X 6/13/92
Red Noryl (F3TA-9F924-BA)
ISIR submission due 06/18/92 (sent 6/19/92 to John Pelkey)
Completion of validation tests due 08/31/92 to Ford's John Pelkey

Forwarded copy of 77PSL3-1 from design engineering 9/30/92.

4. Quiet Switch 77PSL3-1 X----ISIR completed -----X 7/16/92
Dana(Ford) (F2AC-9F924-AA) MY'93 F-Series CCPS (Norm Freda)
Crown Vic/Grand Marquis (Fluid resistance/dimensional)
Requested date is 7/16/92; push-out date is 08/14/92.
Bruce Maeroff/Judy Simmons (Ford) -----

(Will use the 4/09/92 "partial binder" initiated for Ford as
contents to build complete ISIR package for Dana Corporation).

	kpc	Valid.	FAI	PIPC	PIST	R&R	MAT'ANAL	PFMEA/	FLOW
(sent to		Test						DFMEA	DIAG
Ontario,Canada		08/14/92	X----	ISIR completed	-----				X
Angola, Indiana)		completed		and sent 08/19/92					

5. Quiet Switch 77PSL5-2 X----- ISIR completed -----X 7/16/92
Tavee(Ford) Bho Taurus (F3DC-9F924-AA)
Requested date is 7/16/92; push-out date is 08/14/92.
Bruce Maeroff/Judy Simmons -----
(Need 300 pcs for FAI by 08/01/92) Forwarded 08/19/92

	kpc	Valid.	FAI	PIPC	PIST	R&R	MAT'ANAL	PFMEA/	FLOW
		Test						DFMEA	DIAG

X --- Comp 08/18/92 ISIR completed ----- X

- A 6. Australia 77PSL6-1 X ----- Capri Platform MY '94 ---- X 7/14/92
(BCIA) From Charlie Douglas (6/19/92 a.m.)
Requested date is 7/14/92; pushed-out date to 08/15/92 for ES
must have PIPC and partial ISIR by 7/16/92; (forwarded 7/16/92).
Completed base/hexport measurements.
(8.72/8.30) & (27372-1 hexport p.d.)
Completed product certification, tags, and SQI forms. TI-NHTSA 7174

Need validation test results forwarded by Feb. 1, 1993 (?)

	kpc	Valid.	FAI	PIPC	PIST	R&R	MAT'ANAL	PFMEA/	FLOW
		Test						DFMEA	DIAG

(11/1/92) X ---- completed -----X

WZ
Eliminated
Fy 2/20

MSG #4= 487117 FR=SB01 TO=JUS2 SENT=10/09/92 10:10 AM
R#=079 ST=1 DIV=0050 IC=90101 FY=SEC. DT=10/09/92 10:10 AM

TO:	Tom Burke	MPFC	Dennis Natale	DUN1
	Jeff DiDomenico	DISD	Danny O'Donnell	DDO
	Charlie Douglas	CMPI	Mark Sellers	MS2
	Norm Freda	WHLZ	Jim West	WJO2
	Dick Garlepy	SWGS		

CC: Tom Charbonneau (delivered separately)
Dave Scann

FR: Steve Offiler SB01

SJ: BiWeekly Highlights

=====

DIAPHRAGM LIFE / HIGH VACUUM

The diaphragm life test with exposure to 0.4 mBar vacuum has been aborted at about 2.7 million cycles. None of the rubber diaphragm parts has failed at this point. The full-round Kapton was second-best, with a theta of 2238K and beta of 10.8. These both compare favorably with the control lots (standard diaphragm with and without high vacuum exposure) whose thetas were in the 1500's, and betas degraded with vacuum exposure.

The test battery of tests is characterizing the performance of the rubber diaphragm and full-round Kapton under various conditions: thermal cycling (-40 to +175 C), aging, drift over life, and characterization at temperature extremes. Further, these test devices were purposely built at the preload extremes of 4 and 9 mils. Also, small production lots of about 75 devices each were built on the hand-line for collection of statistics. Results to date indicate the following:

- * TC test: No failures to date; no other data collected at this point
- * Aging: No data collected at this point
- * Drift: Test is nearly completed; data is being analyzed
- * Temp Char: The data was analyzed for the magnitude of act/rel shift versus temperature. It was learned generally that the full-round acted similar to the control lot, although shift was consistently slightly worse, and the rubber diaphragms performed noticeably worse, except for the 9 mil preload / +175C results, where both the full-round and the rubber diaphragm performed similarly, and noticeably worse than the controls.
- * Stats: The full-round act/rel data is quite a bit higher than the control lot, with an average of 155/131 vs. 130/109. This is thought to be due to Kapton wetting differences. Sigma's (both act/rel) are around 6 for full-round vs. 3 for the controls. The rubber diaphragm produced devices around 149/117, with a poor act. sigma, over 7; although rel sigma was comparable to the other two lots at around 6. For rubber dia. the act. values are quite varied, while the release values remained fairly steady.

Overall, performance of the rubber diaphragm is somewhat worse in all tested areas except, of course, cycle life where they excel dramatically. However, since the test parts use 3 pieces of Kapton, it is thought that more consistent performance could be gained by removing some or all of the Kapton, which would also simplify manufacture and reduce cost. The next battery

TI-NHTSA 7175

effective-area calculations need to be generated to more fully understand the testing results. From the temp chart data, it seems the large shift seen in the rubber diaphragms (3 pc Kapton) may be explained by a significant slope in the pinning region.

We are assembling a Risk Analysis Report, to factually lay out all the options for Ford Australia, in order to have them assume whatever risks are associated with the chosen design for high-vacuum application. We are attempting to win additional time for development by moving out the ISR date.

Regards, Steve G.

HIGHLIGHTS

Stephen B. Offiler
Week Ending 92-10-09



DIAPHRAGM LIFE / HIGH VACUUM

The diaphragm life test with exposure to 0.4 mBar vacuum has been aborted at about 2.7 million cycles. None of the rubber diaphragm parts had failed at this point. The full-round Kapton was second-best, with a theta of 2238K and beta of 10.8. These both compare favorably with the control lots (standard diaphragm with and without high vacuum exposure) whose theta's were in the 1500's, and beta's degraded with vacuum exposure.

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- * Temp Char: The data was analyzed for the magnitude of act/rel shift versus temperature. It was learned generally that the full-round acted similar to the control lot, although shift was consistently slightly worse, and the rubber diaphragms performed noticeably worse: except for the 9-mil preload / +175 C results, where both the full-round and the rubber diaphragm performed similarly, and noticeably worse than the controls.
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Overall, performance of the rubber diaphragms is somewhat worse in all tested areas except, of course, cycle life where they excel dramatically. However, since the test parts use 3 pieces of Kapton, it is thought that more consistent performance could be gained by removing some or all of the Kapton, which would also simplify manufacturing and reduce cost. The next battery of tests will explore this possibility. Also, hatcher curves (and possibly effective-area calculations) need to be generated to more fully understand the testing results. From the temp char data, it seems the large shift seen in the rubber diaphragms (3 pc Kapton) may be explained by a significant slope in the pinning region.

We are assembling a Risk Analysis Report, to factually lay out all the options for Ford Australia, in order to have them assume whatever risks are associated with the chosen design for high-vacuum application. We are attempting to win additional time for development by moving out the ISR.

TI-NHTSA 7177

HIGHLIGHTS
Stephen B. Offler
Week Ending 92-10-23



FORD AUSTRALIA: We are about to move forward with the full-round Kapton design. However, based on the latest info from Danny O'Driscoll, a question has been raised regarding the vacuum level used in the US. We have never asked this question. If the vacuum levels are similar, then Australia perceives that the whole issue falls back into TI's lap as far as the development expense, etc. They would start up with the present design, and expect us to take care of the problem, with involvement of NAAO engineering as well as Australia. It is unclear at this point whether TI should approach NAAO, or if Australia is doing it directly.

In order to progress with the full-round, a production punch/die unit OR an outside source of pre-punched diaphragms is needed. We'll be putting together an component print right away. Australia needs a detailed timing chart for full-round, including ISR plans, by next Tuesday their time; we'll need to put this together ASAP and send it out by Monday evening our time.

LIGHT TRUCK SILENT DEVICE: LT has decided to go across-the-board with the silent device. This obsoletes the original 77PSL2-1, and results in conversion of 77PSL3-3 (red base, Noryl) to a silent disc. One concern involves high temperature operation, since we converted to Noryl to address a need for 175C operation. Combination of silent disc and 175C indicates use of a material with greater dimensional stability than Noryl (Ultem) however Pelkey seems to recognize the statistical improbability that 175C will every be actually reached (Arizona summer climate, pulling trailer uphill, followed by hot soak, in combination with brake light failure and speed control use). Furthermore, our device is actually covered by a heat shield, whose primary purpose is to protect the mating connector. Thus, direction from LT Eng. at this point is to stay with Noryl. We'll need to perform evaluations to decide how to set our preload pinning target. We'd like to obtain some of these shielded mating connectors to get a rough idea of what the max. temp really is.

RUBBER DIAPHRAGM: We remain convinced that the rubber diaphragm has significant potential as a design improvement, with the following potential benefits: dramatically improved diaphragm life; Japanese customer appeasement with isolation of Kapton; eliminate snubber while maintaining or improving the level of quietness with significant cost savings.

A key concern at present is the poor sigma observed on the first mini production run. We have noted a condition where there is wide variation in the geometry of the diaphragm after crimping, which is theorized to effect the sigma. We plan to analyze the geometry of devices which lie at the tails of the distribution to begin to get a handle on this.

-MSG #1- 00357995 FR-VAGS TO-SBO1 SENT-10/27/92 09:17 AM
R#-097 ST-C DIV-0050 CC-00101 BY-VAGS AT-10/27/92 09:17 AM
TO: STEVE OFFILER SBO1

CC: GEORGE HOLMAN B512
BILL SWEET PCME
DAVE CSARN EARN

FM: MATT SELLERS PCME

RE: 7728 CUP TOOLS

STEVE,

THE RESPONSE BACK FROM VALENTINE ON THE PROPOSED DETAIL "A" FOR 27713-1 AND 27288-1 CUP TOOLS WAS FAVORABLE. THEY INDICATE THAT THIS DETAIL ALLOWANCE WILL BE NEEDED TO ALLEVIATE UN-NEEDED MAINTENANCE DURING DIE/PUNCH CHANGES. THIS CONDITION WILL NOT ALWAYS EXIST AND WILL NOT EXCEED THOSE LIMITS YOU HAVE ESTABLISHED. VALENTINE HAS ALSO PROPOSED THAT WE USE AN ALPHA OR NUMERIC I.D. CODE BETWEEN THE CENTER EXTRUSION AND THE .472 DIAMETER TO HELP DISTINGUISH THE QUIET CUPS FROM THE SNAP CUPS IF BOTH ARE USED IN PRODUCTION AT THE SAME TIME. PERHAPS WE SHOULD USE THE DASH NUMBER OF THE CUP??? "-1", AND "-2".

WE NEED THE FORMAL PRODUCTION PRINTS FOR BOTH THE PASS CAR EX3355-115 CUP AND THE LIGHT TRUCK EX3355-116 CUP SO THAT TOOLING CAN BE KICKED OFF. TOOL LEAD TIME IS 6 WEEKS. ALTHOUGH WE ARE STILL EVALUATING THE QUIET TRUCK SENSORS FOR LOOSE DISC, AND DO NOT HAVE A DEFINITE ANSWER AS TO WHETHER OR NOT A TIGHTER ENVELOPE WILL BE NEEDED, YOU MAY WANT TO PUSH THROUGH A PRODUCTION MODIFIED VERSION NOW. THIS COULD POSSIBLY AVOID DELAYS LATER.

PLEASE ASSESS THE LENGTH OF TIME REQUIRED FOR YOU TO COMPLETE THESE PRINTS AND CALL ASAP.

REGARDS . . . MATT
X1245

PRECISION CONTROLS DEPARTMENT
CHANGE CHECKLIST

ATTRIBUTE	RESP	DATE
PROCESS CONTROL FLOWCHART		
MANUFACTURING CONTROL PLAN		
CPMFA		
PPMFA		
PROTOTYPE EVALUATIONS (COST ANALYSIS, DV TEST, DFM ANALYSIS, ETC.)		
SUPPLIER FMEA (DESIGN and/or PROCESS)		
MANUFACTURING PILOT; FUNCTIONAL, PERFORMANCE, YIELD ANALYSES, FAILURE ANALYSES		
SUPPLIER 13 STEP CERTIFICATION		
SUPPLIER SELECTION		
PRE-RELEASE MRE MEETING		
PROCESS SPECIFICATIONS DRAFTED AND REVIEWED		
QUALITY ASSURANCE SPECIFICATIONS (QAS) DRAFTED AND REVIEWED		
IQP DRAFTED AND REVIEWED		
PRODUCTION DRAWINGS RELEASED		
CUSTOMER APPROVAL		
INVENTORY DISPOSITION		
SCHEDULE FOR IMPLEMENTATION		
VISUAL AIDS PREPARED		
ROUTE CARDS PREPARED		
PRODUCTION EVALUATION: FUNCTIONAL, PERFORMANCE, YIELD ANALYSES, FAILURE ANALYSES		
POST-RELEASE MRE MEETING		

Add:
 - Key product characteristics (initially) approved -
 - update control plan designating additional
 - variable method -
 - update supplier control plan? COMMENTS ?
 - method -
 J. Blatt 11/1/92

30-Oct-92 DBS 050-0167

TI-NHTSA 7180

IT DPAC

Hoechst Celanese

NOVEMBER 4, 1992

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

Advanced Materials Group
Hoechst Celanese Corporation
26 Main Street
Chatham, NJ 07928
201 635 2800
Telex 198348
Fax 201 635 4330

**HOECHST CELANESE CELANEX
GRADE 4300 NATURAL HF3022**

In reference to your Purchase Order 500059491, our Order 907, this is to advise you that the 2205 pounds of CELANEX(R) Thermoplastic Polyester 4300 NATURAL HF3022 in number LJ21008321 shipped to you on NOVEMBER 3, 1992 is standard product and meets the following requirements:

SPECIFICATION Ford ENE NAD 354-A2

LOT RELEASE DATA-Actual Values (Tests performed on all lots)
(Specification Limit) (Actual Values)

Melt Index, gm./10min.	4-10	8.3
Ash, %	28-32	30.1

CERTIFIABLE VALUES
(Specification Limit) (Monitored Values)

Tensile Strength, MPa	103 MIN.	134.9
Elongation, %	3 MIN.	4.7
Flexural Strength, MPa	159 MIN.	210
Flexural Modulus, MPa	6,200 MIN.	7940
Notched Izod, J/m	101 MIN.	99

PERIODIC TESTS
(Specification Limit) (Test Values)

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

**ADDITIONAL
SPECIFICATIONS**

All test data is generated by standard ASTM test methods.

HOECHST CELANESE CORPORATION
ENGINEERING PLASTICS DIVISION

John K. Morrow
Dr. John K. Morrow
Quality Assurance Officer

TI-NHTSA 7161

Hoechst 

August 20, 1991

To: Donna Moynihan 12-27

From: Beth Kili 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110823

Sample Description:

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

Results:

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

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

Regards,

Beth X3069

ACME MILFORD GROUP
100 BRIDGEPORT AVE.
MILFORD, CONNECTICUT 06460

TEL: 203-876-4001 FAX: 203-876-7001, 203-876-1046

TO: TEXAS INSTRUMENTS

CERTIFICATE OF COMPLIANCE

ACME MILFORD CERTIFIES THAT:

P.O. NUMBER: 500086025
ACME/MILFORD CONTROL NUMBER: 021874
ACME/MILFORD P/N: 6254-A
QUANTITY: 402218

WAS PROCESSED TO CONFORM TO THE FOLLOWING

PART NUMBER: 74408-1
PART REVISION: 0
MATERIAL: COPPER CDA102

HEAT NUMBER:
TENSILE AFTER LIGHT DRAW:
FINISH: PLAIN

SIGNED: *Paul Molinari*

DATE: 12-30-92

PAUL MOLINARI
TITLE: VICE PRESIDENT QUALITY ASSURANCE

SWORN TO AND SUBSCRIBED BEFORE ME THIS/____ DAY ____ MONTH ____ YEAR

NOTARY PUBLIC _____

TI-NHTSA 7184



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

CERTIFICATE OF CONFORMANCE

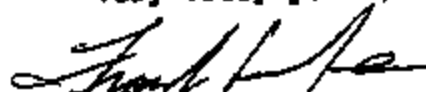
Texas Instruments Inc.
Materials & Controls
34 Forest Street
Attleboro, MA. 02703

Your P.O. No. - 500086112
Your Part No. - 74916-1 Rev. B
Qty. Shipped - 50,000
Date Shipped - 12-08-92

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

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

Very truly yours,


Frank Serafin

TI-NHTSA 7185



EST. 1948

K. F. BASSLER COMPANY, INC.
PRECISION TOOLING & METAL STAMPINGS

45 John William St. • Attleboro, MA 02703 • (508) 222-1081 • Fax: (508) 226-1805

MATERIAL CERTIFICATION

CUSTOMER: TEXAS INSTRUMENTS INC. ATTLEBORO
CUSTOMER ORDER NO.: 505112989
CUSTOMER PART NO.: 36887-1
REVISION: B
QUANTITY THIS SHIPMENT: 50,000
LOT NO. THIS SHIPMENT: N/A
SHIPMENT DATE: 10.8.92

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

AUTHORIZED SIGNATURE:

Kathleen A. Penkala
Inside Sales Specialist



A.J. OSTER CO.

Steel Mill Products • Steel • Powder • Casting Alloys

ORIGINATOR HRA

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

1982-1

*** CERTIFICATE OF COMPLIANCE ***

AJO ORD#:
0181203

CUST ORD#:
15404

QUANTITY:

Total 2608

DATE SHIPPED:

6-4-82

CUSTOMER NAME:
K. F. BASSLER CO.

CUST PART#:
260-025-112-2

DESCRIPTION:
QDA 260 COIL

GAUGE:
.02500

TEMPER:
20

WIDTH:
1.1200

CHEMICAL ANALYSIS

#36887

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

PHYSICAL TEST RESULTS

ROCKWELL.....	R30T 63.6-
TENSILE.....	62.4-
YIELD.....	51.7-
ELONGATION.....	27.5

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

June 3, 1982
DATE

A. Arroyo
QUAL. SUPERVISOR

TI-NHTSA 7167

BRUSH WELLMAN INC. 5 JUST ROAD FAIRFIELD NJ 07006 201-227-2336

CERTIFICATE OF MATERIAL QUALITY

TEXAS INSTRUMENT
34 FOREST STREET
BUILDING 11 DOOR 16
ATTLEBORO

MA 02703

OUR ORDER NO:
OUR ITEM NO:
YOUR P.O. NO:
YOUR SPEC NO:
YOUR PART NO:

FA6712 CUSTOMER NO:
01 SHIPMENT NO:
300013367
27716-1

897852
002
11/24/92

ALLOY	STRIP	190	HM	33306	0.005	+0.000E	-0.000E	THICK
		C17200	TM04		0.183	+0.002	-0.002	WID
								COIL

SHIPMENT NBR 002 = 100.0 LBS
HEAT NUMBER 33306

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

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

REMAINDER: CU

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

TENSILE	(KSI)	139.6	-	142.4
YIELD	(KSI)	117.9	-	123.9
ELONGATION	% IN 2"	13.0	-	13.0
HARDNESS-1	DPH	264.0	-	267.0
CONDUCTIVITY	% IACS	19.2		
GRAIN SIZE	(MM)	.015	-	.018

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

15- 8

Paul J. Freund
QUALITY ASSURANCE MANAGER

11/24/92
DATE

CERTIFICATION

December 30, 1992

PAGE 1 OF 7

TEXAS INSTRUMENTS INC
ACCTS PAYABLE DEPT
P.O. BOX 888
ATTLEBORO, MA 02703

This is to certify the parts furnished on your purchase order have been produced in accordance with specifications listed on purchase order and/or blueprint. This certification and accompanying documents may not be reproduced, except by written approval of Eloc Industries, Inc.

INSPECTION SHEET, SAMPLES, AND MILL SHEET ATTACHED

REV.: B

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

Purchase Order No.	505106996
Register No.	50347
Part No.	38900-1
Description	3/8-24 X .81
Quality Control No.	A9341-B
Mfg. Lot No.(s)	14255
Quantity	27,310

James A. Stigler

Authorized Signature
Quality Coordinator

CERTIFICATION



ELOC INDUSTRIES, INC.
PRECISION AUTOMOTIVE DIVISION
1111 Barnston Road • P.O. Box 7008
Rockford, Illinois 61125-7008
815/927-8181 • Fax 815/927-4580

F-61-2

TI-NHTSA 7189

== O&K COMPANY LIMITED ==

AISI10L10 SAF

D. O. A 9341-S
S. O. # 14255.

Chemical Composition of Steel	Heat No.	Cell No.	$\frac{C}{\%}$	$\frac{Mn}{\%}$	$\frac{P}{\%}$	$\frac{S}{\%}$	$\frac{Cu}{\%}$	$\frac{Ni}{\%}$	$\frac{Cr}{\%}$	$\frac{Mo}{\%}$	$\frac{Nb}{\%}$	$\frac{Ti}{\%}$
	D08709	0021 0022	10	42	7	5	21	1	1	2		
Physical Properties	Nominal Diameter		Tolerance of Diameter		Tensile Strength		Elongation					
	in	mm	in	mm	1,000 psi	kg/mm ²	2in	4in				
	0.565	14.361	+ 0.0040	+ 0.1015	88.9 MAX	48.5 MAX						
Packing	Coil Weight											
	ABT. 2.142LBS (ABT. 970KGS)											
WRAPPED WITH POLYPROPYLENE SHEET.												

Sample No.	Diameter mm	Tensile Strength Kg/mm ²	Tensile Strength 1,000psi	Sample No.	Diameter mm	Tensile Strength Kg/mm ²	Tensile Strength 1,000psi
0021	14.43	33.3	47.4				
0022	14.39	33.4	47.5				

TI-NHTSA 7190

77420215

TEXAS INSTRUMENTS, INC.
BUILDING 11-16
34 FOREST STREET
ATLANTIDA, GA 32703

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

J.B.L. Division of Parker Seal certifies that the material used to produce the product in this shipment, namely EPDM/ET104. Conforms to TI drawing and TI purchase order requirements.

PART TITLE... GASKET

CUST P/N... 74353-1

REV #

DATE SHIPPED

P/O... 500023679

J.B.L. P/N... 202152

M/N... 21658

11-25-82

COMPOUND... ET104

QUANTITY... 100,000

Very Truly Yours.
J.B.L. Division



DENNIS T. JOHNSON
Quality Control Manager

DTJ/MS

TI-NHTSA 7191

VALENTINE TOOL & STAMPING, INC.

171 WEST MAIN ST. MORTON, MASS. 02766
(508) 283-6911 224-0046

CERTIFICATE OF CONFORMANCE

DATE : FRIDAY NOVEMBER 6, 1992

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505111897

SUPPLIER INVOICE NO.: 82792

PART DESCRIPTION : 27713-1 CUP REV.B

SUPPLIER FJO NO. : 19053

QUANTITY SHIPPED : 22,000

SHIPMENT DATE : 11/09/92

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

SIGNED


Jeanne Laflamme
Quality Assurance Manager

VALENTINE TOOL & STAMPING, INC.

171 WEST MAIN ST. NORTON, MASS. 02786
(508) 285-6911

MATERIAL CERTIFICATION

DATE : FRIDAY NOVEMBER 6, 1992

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 525111897

SUPPLIER INVOICE NO. : 82792

PART DESCRIPTION : 27713-1 CLP REV.B

SUPPLIER FJO NO. : 19053

QUANTITY SHIPPED : 22,000

SHIPMENT DATE : 11/09/92

WE CERTIFY THAT THE MATERIAL USED
TO PRODUCE THE PRODUCT IN THIS
SHIPMENT, NAMELY
[C1806]
CONFORMS TO T.I. DRAWINGS AND
T.I. PURCHASE ORDER REQUIREMENTS.

SIGNED


(Supplier Representative)

Jeanne Laflamme Quality Assurance Manager

TI-NHTSA 7193

30APR 1992

30APR 1992

#27713-1

BOOK

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

COMPLIANCE #1

DATE

INVOICE NO.

09/17/92

20863

01000000

02016

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

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

ATTN: JEANNE LAFAMME, QUALITY MGR.

QTY CLAS. CO. CLS. NO. SIDE ON COIL MATERIAL COMPLETE SHIPPED BY
 9,192 072 12 COMP J AUSTIN

HT. IN. C HW P B ST SI SR NO
 R44829 04 31 012 014 01 01 03

COIL NO. 15112

COLOR CODE

2MM X 50.80MM

WELL NO. 74155
 PREPAID COLLECT

STAMPING

PAPER MEAP

FRAS

CRAFT

DOH

04000 X 2.0000

TEMPER

8 50 MAX

COILS ON CUT

COIL

440 LBS

STDS

REID BEE

PER. HT

WASTED

COARD

-001 +005 -005

NO3 SLIT

LENGTH REC

220 PIN 16 36

NUMBERS

WALCONS

OUTSIDE

BOARDS

CAP

-025MM +127 -127NR

DESA

3/4"

CANDET

FLATNESS

DEL

T-PCR

TEST REPORT

(15,056 KG)

33,192

Certificate of Compliance

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

Signature
 ROME STRIP STEEL CO., INC.

TI-NHTSA 7194



CIRCLEVILLE PLANT

P.O. Box 89
Circleville, OH 43113

NO: KC-11

Effective Date: 3/08/92

Expiration Date: 3/08/93

Page 1 of 1

MATERIAL CERTIFICATION

DATE: 12-30-92

CUSTOMER: TEXAS INSTRUMENTS, ATTLEBORO

CUSTOMER ORDER NO. 5000 85037

CUSTOMER PART NO. & REV. 27225-1 (REV. R)

QUANTITY THIS SHIPMENT 104.00

SHIPMENT DATE 12-30-92

We certify that the material used to produce the product in this shipment, namely 800FN131 Kapton*, 3/4" wide, conforms to TI drawing and TI purchase order requirements on file with the HPF Group of the Dupont Company.


SUPPLIER REPRESENTATIVE
ENGINEER - QUALITY CONTROL - TITLE

:dkh/smart no. 387

Chemical & Process for Excellence

TI-NHTSA 7195

DIEMASTERS MANUFACTURING, INC.

CERTIFICATE OF CONFORMANCE

DATE: 12-22-92

CUSTOMER: TEXAS INSTRUMENTS

PURCHASE ORDER NUMBER: 505/20270

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

PART DESCRIPTION: WASHER

QUANTITY THIS SHIPMENT: 90,000

SHIPMENT DATE: 12-22-92

TRACEABLE LOT NUMBER: TL 201

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

SIGNED: Jim Nguyen
QUALITY ASSURANCE REPRESENTATIVE

TITLE: INSPECTOR

11-13-92 13104

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

#27639

SOLD TO DIEMASTERS MFG SHIP TO DIEMASTERS MFG
767 INDUSTRIAL DRIVE 767 INDUSTRIAL DRIVE
ELMHURST IL 60126-0000 ELMHURST IL 60126-0000
SHIP DATE : 11-08-92

ANALYSIS REPORT

CUSTOMER ORDER NO. BL-4762
THOMPSON ORDER NO. 2680800

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

HEAT NO. Y47629

TEXAS INSTR
27639-1

CI	MN	PI	SI	SI
.520	.790	.0080	.0060	.210
AL	CU	NI	CR	MO
.033	.020	.020	.030	.010

WEIGHT: 13.101 * COILS: 40
ROCKWELL: _____
BEND TEST: _____
OTHER: _____

NOTE:

QUALITY CONTROL
DEC 09 1992

CERTIFIED BY

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

TI-NHTSA 7197

DIEMASTERS, INC.
767 INDUSTRIAL DRIVE
ELMHURST IL
60126



PHONE: (708) 838-0118
FAX: (708) 838-0001
FPM CONTINUOUS PROCESSING
300 CHRY PONT DRIVE CHRY, IL

CERTIFICATION

Shop No. 096061

Order No. 111817

Quantity 148,400

Description 27639-1 WASHER TI-LOT 201

Material 1050

The following is certified:

Process AUSTENPERED TO 40-60RC

INSPECTION RESULTS: #6-47RC

QUALITY CONT. IN

DEC 08 1992

FPM CONTINUOUS PROCESSING

Authorized Signature: [Signature]

Date: 12/2/92

Belmont
PAINTING WORK

DATE 12/8/92

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

767 Industrial Drive Elmhurst, IL 60126

DEC 15 1992

Tatjana Sudžov

DIEMASTERS MANUFACTURING, INC.
CERTIFICATE OF MATERIAL ANALYSIS

DATE: 12-22-92
CUSTOMER: TEXAS INSTRUMENTS
SUPPLIER PURCHASE ORDER: BL-4762
CUSTOMER PURCHASE ORDER: 505120270
PART NUMBER: 27639-1 REV/ECO: D
PART DESCRIPTION: WASHER
QUANTITY THIS SHIPMENT: 90,000 SHIPMENT DATE: 12-22-92
TRACEABLE LOT NUMBER: TI-201
HEAT NUMBER: Y47629
TYPE OF MATERIAL: CRS 1050

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

ELEMENTAL CONSTITUENTS	SPECIFIED RANGE	ACTUAL RANGE
1. <u>C</u>	<u>0.47-0.55</u>	<u>.520</u>
2. <u>Al</u>	<u>0.60-0.90</u>	<u>.790</u>
3. <u>Pmax.</u>	<u>0.040</u>	<u>.0080</u>
4. <u>Smax.</u>	<u>0.050</u>	<u>.0060</u>
5. _____	_____	_____

ROCKWELL HARDNESS: B/80 DPH: _____
TS. K.S.I.: _____

SIGNED: Jim Nguyen
QUALITY ASSURANCE REPRESENTATIVE

TITLE: Inspector

DIEMASTERS MANUFACTURING, INC.

MATERIAL CERTIFICATION

DATE: 12-22-92

CUSTOMER: TEXAS INSTRUMENTS

SUPPLIER PURCHASE ORDER: BL-4762

CUSTOMER PURCHASE ORDER: 505120270

PART NUMBER: 27639-1 REV/ECO: D

PART DESCRIPTION: WASHER

QUANTITY THIS SHIPMENT: 90,000

SHIPMENT DATE: 12-22-92

TRACEABLE LOT NUMBER: TI-201

HEAT NUMBER: Y47629

TYPE OF MATERIAL: CRS 1050

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

SIGNED: Jim Nguyen
QUALITY ASSURANCE REPRESENTATIVE

TITLE: Inspector



EST. 1945

K. F. BASSLER COMPANY, INC.
PRECISION TOOLING & METAL STAMPINGS

45 John William St. • Attleboro, MA 02703 • (508) 222-1061 • Fax: (508) 228-1805

MATERIAL CERTIFICATION

CUSTOMER: Texas Instruments, Inc. -- Attleboro

CUSTOMER ORDER NO.: 505118095

CUSTOMER PART NO.: 27406-1

REVISION: "F"

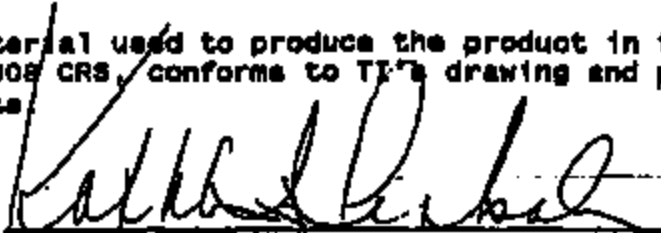
QUANTITY THIS SHIPMENT: 28,750

LOT NO. THIS SHIPMENT: 182

SHIPMENT DATE: 1 4 93

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

AUTHORIZED SIGNATURE:


Kathleen A. Penkala
Inside Sales Specialist



TI-NHTSA 7202

TELEX 881214
FAX 315-336-3510
PHONE 315-336-3800
CUMS 325-3128

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

COMPLIANCE #1

SALES CODE
08072016

0 1 1 0 0 0 0 0

DATE	INVOICE NO
10/22/92	22122

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

02703

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

QUANTITY (LBS)	NO. END	NO. SABS ON ROLL	PARTIAL COMPLETE	SHIPPED BY	HT. IN	C	MM	P	S	SH	HI	CR	NO
3,178	021	02	PART	R S S	R44829	04	31	012	014	01	01	03	

MEETS REQUIREMENTS OF:
CUST ORDER NO. 15463

COLOR CODE

7MM X 25.40MM

BUS

HMA NO
75638

PREPAID
COLLECT
PREPAID

SHAPING

PAPER TRAP

DOGS

CHUTES

BOX

.04600 X 1.0000

B 50 MAX

COILS ON CUT
COIL

200 LBS

1600

SEAM SIDE

PRO. HT

WASTERS

CORES

TOLERANCE

+00050-00050+005 -005

EDG
NO3 SLIT

LENGTH SPEC

200 PIW 16 34

NUMBER

SPACERS

SHOUL

BOARDS

CAPS

+013 -013MM +127 -127MM

CLASS
ALUM KILD

ANNO.
C-1008

JOHN

CARSEN
500/096

FLATHEAD

OIL

T-PCS

TEST REPORT

Certificate of Compliance

ATTEST:

052 06280/33 101092

Notary Public, Onondaga County
My commission expires 5/21/94

DATE 10/22/92

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

[Signature]
ROME STRIP STEEL CO., INC.

TI-NHTSA 7203

TELEX 981214
FAX 310-336-8810
PHONE 310-336-8800
CABLE 2231108

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

COMPLIANCE # 1

SALSY CODE
08072016

0 1 1 0 0 0 0 0

DATE	INVOICE NO
10/22/92	22123

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

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

QUANTITY (LBS)	NO. COIL	NO. SACS OR BALS	PARTIAL COMPLETE	SHIPPED BY
4,636	030	03	COMP	R S S

WT. NO.	C	WE	P	S	SI	PI	CR	NO
R44232	04	29	010	007	01	01	02	01
	AL	WE	CR	CA				

PRICE REQUIREMENTS BY:
CUST. ORDER NO. 15463

COLOR CODE

7MM X 25.40MM

.04600 X 1.0000

TOLERANCE

+00050-00050+005 -005

+013 -013MM +127 -127MM

TEMPER **B⁴⁴/45**

B 50 MAX

NO3 SLIT

ROLL NO.

75638

COIL OR CUT

COIL

200 LBS

200 PIM 16 34

PREPAID COLLECT
PREPAID

200 LBS

STRENGTH

1600

SPACING

500/096

PAPER WRAP

21 HI MAX

SPACING

500/096

REELS

21 HI MAX

SPACING

500/096

CRATES

21 HI MAX

SPACING

500/096

BOX

21 HI MAX

SPACING

500/096

TEST REPORT

Certificate of Compliance

ATTEST:

052 06269 33 201092

Notary Public, Onondaga County

My commission expires

DATE

10/23/92

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

[Signature]
ROME STRIP STEEL CO., INC.

TI-NHTSA 7204



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

NO: KC-13
Effective Date: 4/3/91
Expiration Date: 4/3/92
Page 1 of 1

MATERIAL CERTIFICATION

DATE: 11-19-92

CUSTOMER: TEXAS INSTRUMENTS, ATTLEBORO

CUSTOMER ORDER NO. 5000 85060

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

QUANTITY THIS SHIPMENT 41.30

SHIPMENT DATE 11-19-92

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



SUPPLIER REPRESENTATIVE
ENGINEER - QUALITY CONTROL - TITLE

:dkh/smart no. 189

TI-NHTSA 7205



PLASTIC FABRICATORS DIVISION
155 NO. MAIN STREET FRANKLIN, N.H. 03235
603-891-2770

CERTIFICATE OF CONFORMANCE

TO: TEXAS INSTRUMENTS

DATE: DEC 1 1992

ATT: QUALITY CONTROL SUP.

THIS CERTIFIES THAT:

SHIPMENT # 165917

PART # 73958-1 REVISION G

QUANTITY 200,000

MAT'L DESC. KAPTON HN

IS IN CONFORMANCE WITH THE REQUIREMENTS, SPECIFICATIONS, AND DRAWINGS
ON YOUR ORDER # 575109357-01A20

BY: INSULFAB PLASTICS
FRANKLIN, NH 03235

And Vigney
QUALITY CONTROL MANAGER

TI-NHTSA 7206

INSULFAB {
NARCELITE
MELAMINE
SILICONES
EPORIES

DISTRIBUTORS AND FABRICATORS OF

TEFLON	KEL-F	IMR	FLUORLAS	POLYSTYRENE	GLASS
NYLON	CLIPPER PAPER	RESOLITE	POLYETHYLENE		
DELNIN	LEARN	NYLON	NYOL	SCHLEZ	CONDUIT

VALENTINE TOOL & STAMPING, INC.

171 WEST MAIN ST. NORTON, MASS. 02744
(508) 285-6911 226-0040

CERTIFICATE OF CONFORMANCE

DATE : TUESDAY JANUARY 5, 1993

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505117282

SUPPLIER INVOICE NO.: 83078

PART DESCRIPTION : 74797-1 CRIMP RING REV.B

SUPPLIER PJO NO. : 19120

QUANTITY SHIPPED : 54,400

SHIPMENT DATE : 01/05/93

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

SIGNED


Jeanne LeFavre
Quality Assurance Manager

VALENTINE TOOL & STAMPING, INC.

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

MATERIAL CERTIFICATION

DATE : TUESDAY JANUARY 5, 1993

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 305117282

SUPPLIER INVOICE NO.: 83078

PART DESCRIPTION : 74797-1 CRIMP RING REV.B

SUPPLIER FJO NO. : 19120

QUANTITY SHIPPED : 54,400

SHIPMENT DATE : 01/05/93

WE CERTIFY THAT THE MATERIAL USED
TO PRODUCE THE PRODUCT IN THIS
SHIPMENT, NAMELY
C 5052 AL 1
CONFORMS TO T.I. DRAWINGS AND
T.I. PURCHASE ORDER REQUIREMENTS.

SIGNED


(Supplier Representative)

Jeanne Laflamme Quality Assurance Manager

TI-NHTSA 7208

UNITED ALUMINUM CORPORATION

UNITED DRIVE • P.O. BOX 111 • NORTH HAVEN, CONNECTICUT 06460



CUSTOM ROLLED™ ALUMINUM SHEET

#74797-1

85669958

SOLD TO: VA003
ATTN: DICK WHITNEY

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

DATE October 05, 1992
CUST. PO# 15363
ORDER SPECS 5052-O .03200 x 2.312
UA ORDER# 1702600
SPECIFICATIONS ASTM B209, OQ-A-2500

CHEMICAL COMPOSITION LIMITS

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

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

MECHANICAL PROPERTY RESULTS

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

TENSILE STRENGTH (KSI)	29.2
ELONGATION (%)	24

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

Copyright (c) 1991 United Aluminum Corp.
SHIP SHIP 2

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

TI-NHTSA 7209

Paratech, Inc.

MINIATURE TECHNICAL CERAMICS

18840 MINNESOTA AVENUE • P.O. BOX 718 • PARAMOUNT, CALIFORNIA 90723
TELEPHONE (213) 633-2048 • FAX (213) 633-6807

MATERIAL CERTIFICATION

DATE: 11-25-92

TEXAS INSTRUMENTS, INC.

ORDER NO.: 505128915

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

QUANTITY THIS SHIPMENT: 75,000

SHIPMENT DATE: 11-25-92

PART DESCRIPTION: PIN

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


PRODUCTION MANAGER

TS220721

TEXAS INSTRUMENTS, INC.
BUILDING 11-16
34 FOREST STREET
ATLANTA, GA 30303

PARKER HANFORD CORPORATION
JBL DIVISION
WEST CROFT CIRCLE
SPARTANBURG, S.C. 29302
TELEPHONE (803) 579-7232

J.B.L. Division of Parker Seal certifies that the material used to produce the product in this shipment, namely SILICONE/ 57424. Conforms to TI drawing and TI purchase order requirements.

PART TITLE... ENVIRONMENTAL SEAL

COST P/N... 74247 4 REV B

DATE SHIPPED

P/O... 500023000

J.B.L. P/N... 207218

12-11-92

P/N... 18485 & 18457

SILICONE COMPOUND... 57519

QUANTITY... 42,700

Very Truly Yours,
J.B.L. Division



DENNIS T. JOHNSON
Quality Control Manager

DT
07/78

TI-NHTSA 7211

004417

TI-NHT8A 7212

MASH

Ci

Cpk

-22

3.15

MASR

16

4.14

Ci = Cp

Ci =

1 ÷ .15 = 6.66

11.24 =

Ci

Handwritten signature

TEXAS
INSTRUMENTS

CERTIFICATION OF COMPLIANCE TEST

CUSTOMER: _____

Kelsey Hayer

CUSTOMER ORDER NO.: _____

TI ORDER NO.: _____

12590701

CUSTOMER PART NO.: _____

77PSL2-1

TI PART NO.: _____

CUSTOMER SPEC: _____

F2VC-9F924-AB

TI SR: _____

QUANTITY: _____

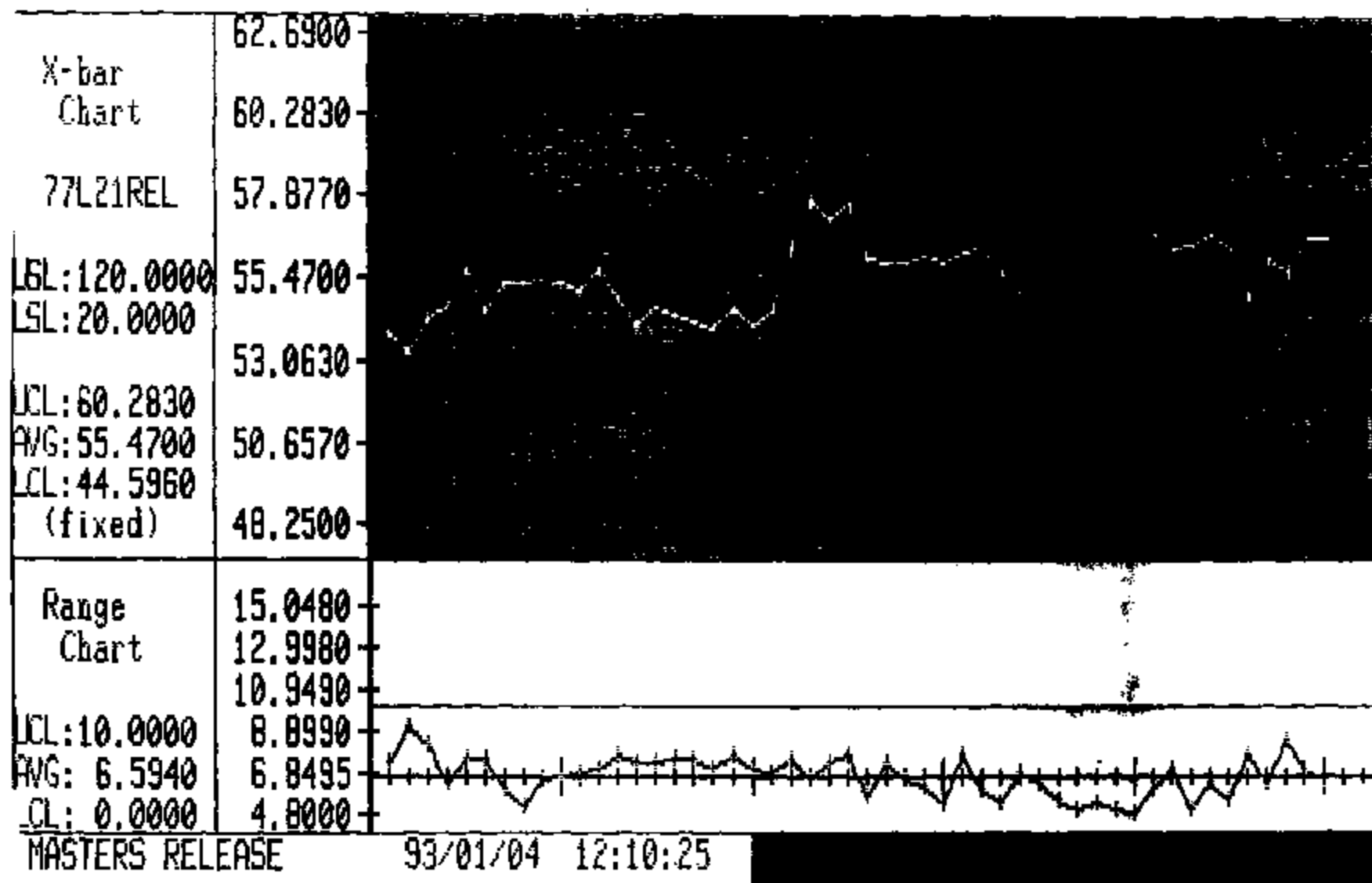
DATE SHIPPED: _____

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

[Signature]
PRECISION CONTROLS QUALITY CONTROL

DATED: _____

01/6/93



(o)perator (p)lot overlay (e)very n (l)imits

Histogram

77L21ACT

140

f 120

r 100

e 80

q 60

u 40

e 20

n

c

y

20

90.00

104

118

132

146

160

MASTERS ACTUATION

93/01/04

12:09:06

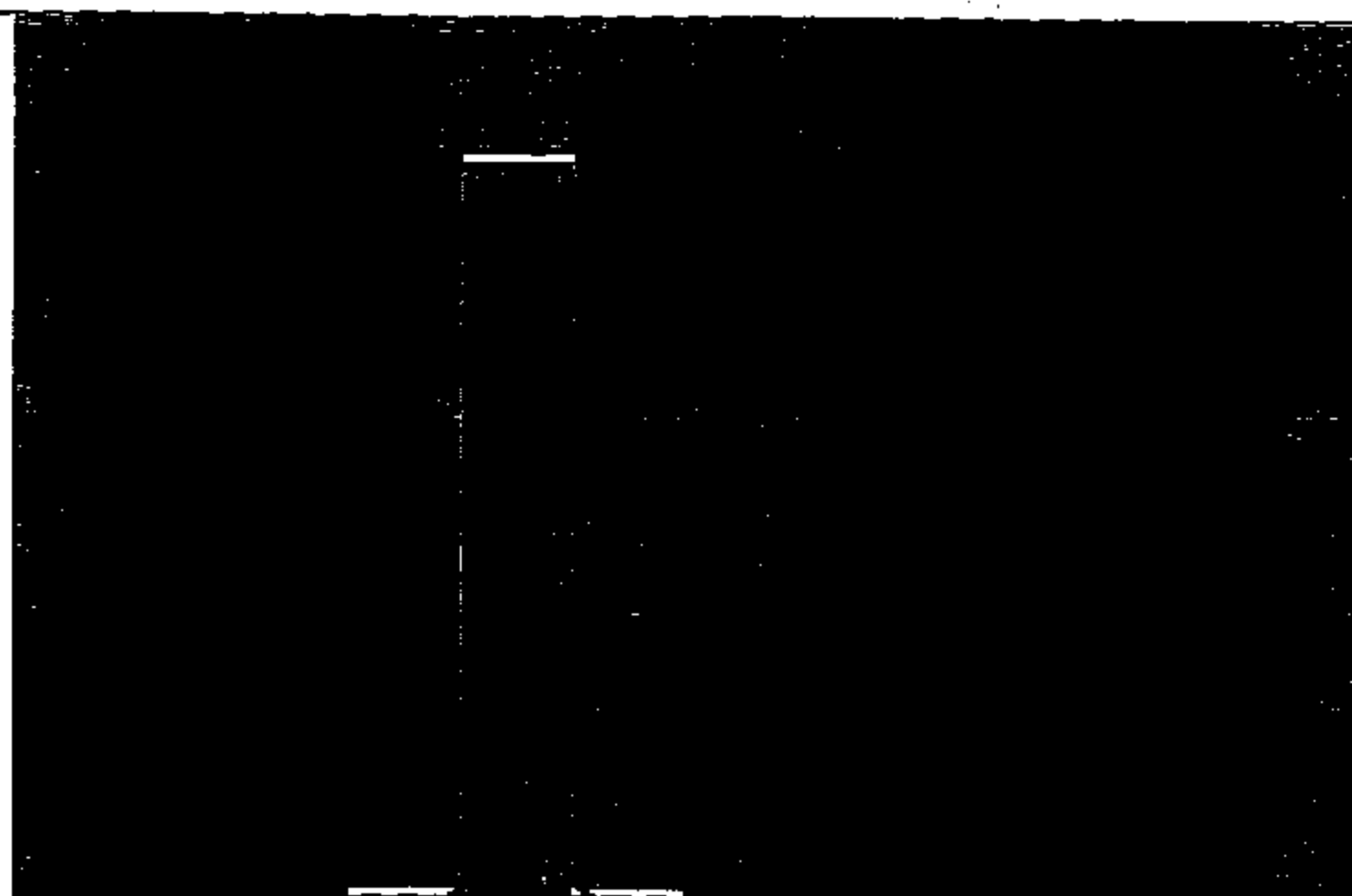
(d)ivisions (l)ast n (c)-index (q)uit

TI-NHTSA 7218

Histogram

77L21REL
175

f 150
r 125
e 100
q 75
u 50
e 25
n
c
y



20.00

40.00

60.00

80.00

100.00

120

MASTERS RELEASE

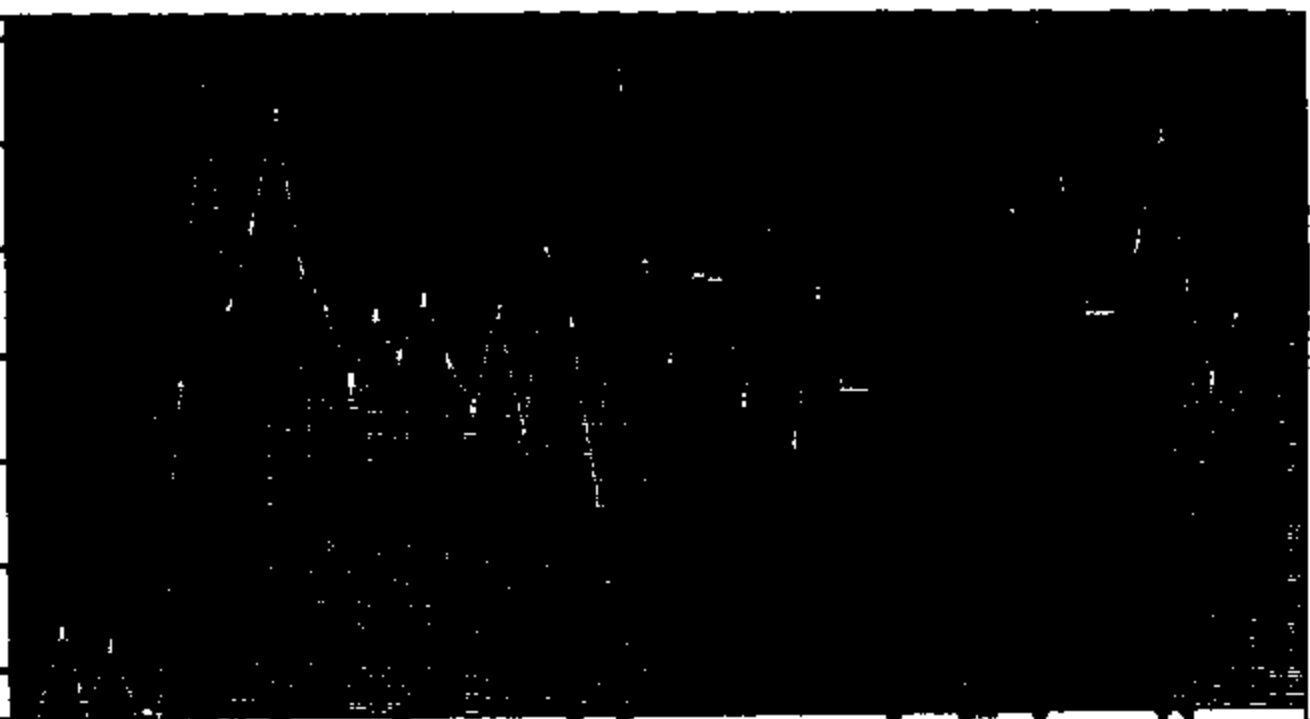
93/01/04 12:10:25

(d)ivisions (f)ast n (c)-index (q)uit

TI-NHTSA 7217

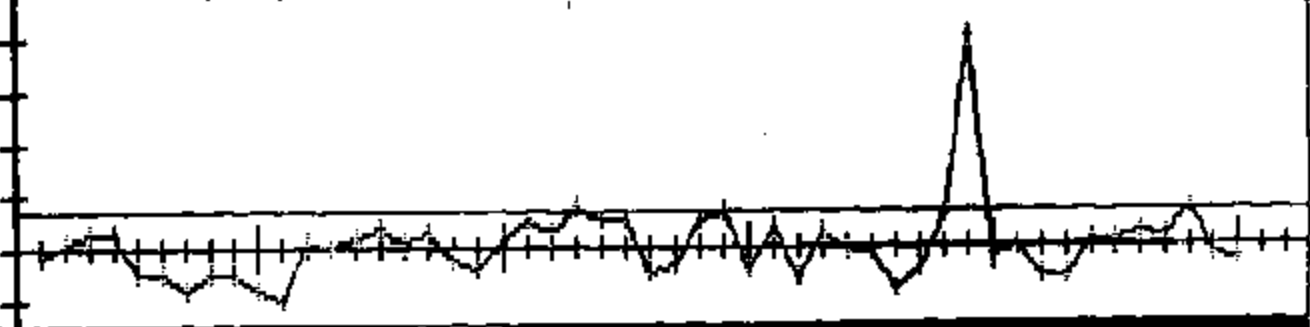
X-bar
 Chart
 77L21ACT
 USL:160.0000
 LSL:90.0000
 UCL:115.8800
 AVG:114.7200
 LCL:106.3300
 (fixed)

116.4600
 115.8800
 115.3000
 114.7200
 114.1400
 113.5600
 112.9800



Range
 Chart
 UCL: 7.8000
 AVG: 6.3840
 LCL: 0.0000

15.7000
 13.3800
 11.0600
 8.7400
 6.4200
 4.1000



MASTERS ACTUATION 93/01/04 12:09:06

(o)perator (p)lot overlay (e)very n (l)imits (q)uit

TI-NHTSA 7218

7762-1
 Base 46515-2 Rev Bote
 Starter 36888-1 N/A
 Valve Coat 74408-1 ✓
 Piston 74471-1 (74916-1) ✓
 Valve Term 36887-1 ✓
 Spring } 36889-1 2 N/A
 Spring } 27716-1 ✓
 Hex Nut 36900-1 ✓
 Gasket #74353-1 ✓
 Cup 27713-1 ✓ -1 or 2
 Seal #74176-1 ✓
 Nippon } #27225-1 ✓
 Strip }
 Washer #27639-1 ✓
 Camshaft 27406-1 ✓
 Spring #3958-4-3
 Nippon } #74224-1 ✓
 Taper }
 C.R. 74797-1 ✓
 Piston 74078-XX ✓
 Transfer x
 Piston 74247-4 ✓
 Endo Seal 74247-4 ✓
 Transfer 74247-4 ✓

F24C-9F924-AB

MATERIAL ANALYSIS

PARTS LIST

	PART NAME	PART #	CERTIFIED
1	BASE	46515-2	YES
2	STA. TERM.	36888-1	YES
3	MOVE. CONTACT	74408-1	YES
4	RIVET	74171-1	YES
5	MOVE. TERM.	36887-1	YES
6	SPRING ARM	36889-1	YES
7	J512 HEXPORT	86900-1	YES
8	BASKET	74353-1	YES
9	CLIP	27713-1	YES
10	SEAL	74176-1	YES
11	KAPTON STRIP	27225-1	YES
12	WASHER	27639-1	YES
13	CONVERTER	27406-1	YES
14	KAPTON TAPE	74224-1	YES
15	SPACER	73958-2/-3	YES
16	CRIMP RING	74797-1	YES
17	TRANSFER PIN	74078-SEL	YES
18	ENVIO. SEAL	74247- 2	YES
19	THREAD CAP	74179-2 74888-1	YES

submitted - 4 cert.
JAN. '92

August 28, 1991

To: Donna Moynihan 12-27

From: Beth Kili 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110822

Sample Description:

P/N 46515-2 Thermoplastic Polyester
Celanex 4300

Results:

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

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

Regards,

Beth X3069

August 20, 1991

To: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110823

Sample Description:

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

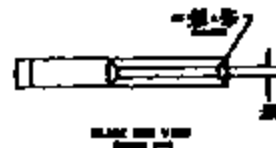
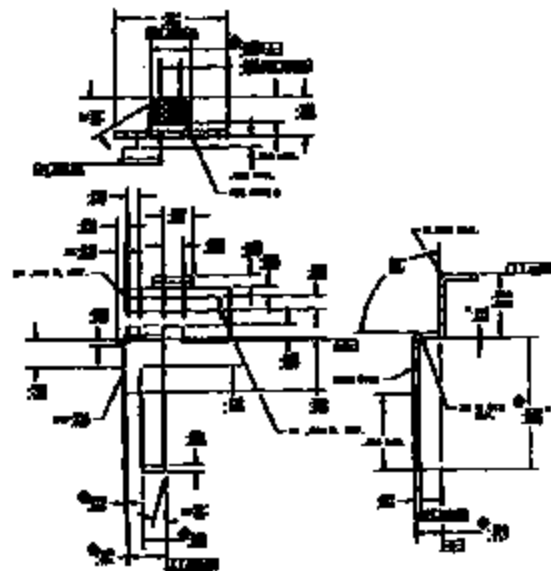
Results:

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

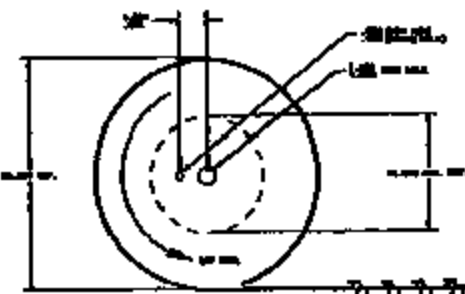
Results confirm the terminal is made of CDA 260 brass,
1/2 hard.

Regards,

Beth X3069



- NOTES:
1. JURY - APPROVE THIS DESIGN.
 2. RE-DESIGN OF PISTON & CRANKSHAFT TO BE MADE.
 3. RE-DESIGN OF PISTON & CRANKSHAFT TO BE MADE.
 4. RE-DESIGN OF PISTON & CRANKSHAFT TO BE MADE.
 5. RE-DESIGN OF PISTON & CRANKSHAFT TO BE MADE.
 6. RE-DESIGN OF PISTON & CRANKSHAFT TO BE MADE.



CERTIFIED COPY
 INC. NO. 1988 INC. 6
 JUL 1 1988

STATIONARY ENGINE		36888	
D 88647		36888	

TI-NHTSA 7224

1
101
ACME MILFORD
957 BRIDGEPORT AVE.
MILFORD, CONNECTICUT 06460

TEL: 203-878-4631 * FAX: 203-878-3071

TO: TEXAS INSTRUMENTS

CERTIFICATE OF COMPLIANCE

ACME MILFORD CERTIFIES THAT:

P.O. NUMBER: 800011076
ACME/MILFORD CONTROL NUMBER: 17642
ACME/MILFORD P/N: 6254-A
QUANTITY: 913425

WAS PROCEEDED TO CONFORM TO THE FOLLOWING

PART NUMBER: 74408-1
PART REVISION: D
MATERIAL: COPPER CDA 102

HEAT NUMBER:
TENSILE AFTER LIGHT DRAW:
FINISH: .0011-.0024 SILVER PLATE
; .0007 MIN OVER VENT

SIGNED:

DATE: 07-06-91

JOHN MICHAUD
TITLE: QUALITY CONTROL MANAGER

SWORN TO AND SUBSCRIBED BEFORE ME THIS/____DAY____MONTH____YEAR

NOTARY PUBLIC_____

RADCLIFF WIRE INC.

RONZO ROAD • P.O. BOX 603 • BRISTOL, CONNECTICUT 06010
TELEPHONE: 203 / 583-1306 • FAX: 203 / 583-6553

FLAT, SQUARE AND GALVANIZED WIRE

Properly Insulated • Bare • Galvanized Steel

ORDER NUM

5320

MATERIAL CERTIFIC

SOLD
TO

ACHE MILFORD
857 BRIDGEPORT AVENUE
MILFORD, CT 06460

SHIP TO

VA BUNTING

YOUR ORDER NO. 347-2	DATE ENTERED 6/28/91	DATE WANTED 7/29/91	DATE PROMISED	F.O.B. Bristol
QTY/WEIGHT ORDERED 300 lbs.	SIZE/TOLERANCE .0575 p/w .0005 Dia.			SHAPE Round
TEMPER	MATERIAL ETP 110 Copper	SIZES		FINISH
SPEC	TENSILE 45-55,000 PSI			
SPECIAL CONDITIONS CERTS/MATL.				SPOOL CON.

SHIPPING RECORD

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

HEAT	C	MN	SI	S	P	Cr	NI	Cu	B	Fe	Al
HARDNESS	TI	CS - TA	Ca	MD	V	Mg	Ca	N	Zn	Pb	
TENSILE STR.	ZA	CS	TA	Sn	Sn						
46,000 PSI											

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

TI-NHTSA 7226

RADCLIFF WIRE, INC.

Claire Boucher
AUTHORIZED SIGNATURE
Claire Boucher Quality Control Inspector



AMERICAN ELECTRO PRODUCTS INC.
1358 THOMASTON AVENUE
WATERBURY, CT 06704
(203) 758-7051

Certificate of Compliance

NO. 2184327
REL 1

HELPING ELIOT & HACH
857 BRIDGEPORT AVE

MILFORD CT 06460

DATE 05/20/71

YOUR ORDER NO. 133923
SHIPPED VIA UNITED P. S.

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

PART NO.	DESCRIPTION	QUANTITY
4254A	SILVER 0.001100-0.002400 MAX	750.000 0

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

Very truly yours,

AMERICAN ELECTRO PRODUCTS, INC.

Signed by:

Judy Sullivan
Q.C. Inspector

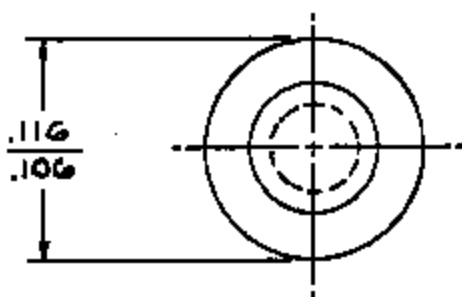
TI-NHTSA 7227

74408

MOVABLE CONTACT

REV. D

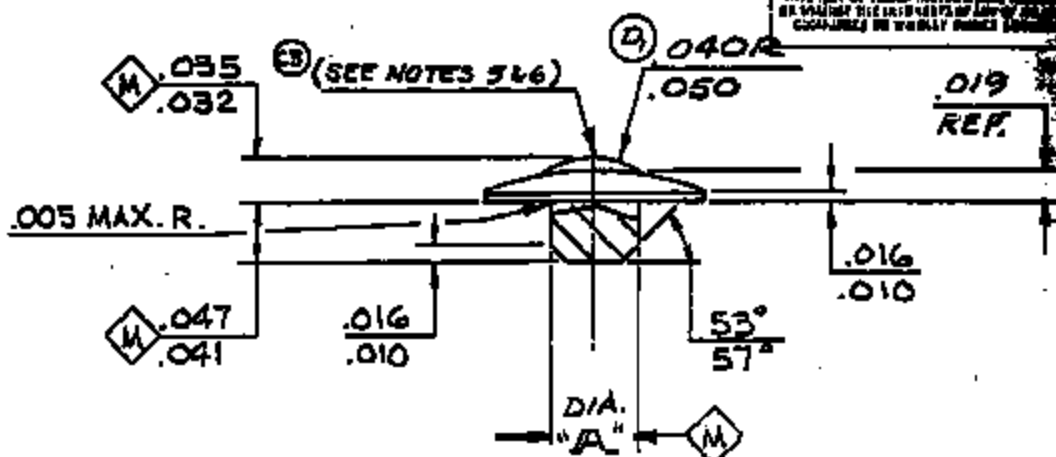
74408

CERTIFIED PRINT
Parts Made To This Print Must Conform To

ENG. STD. E9898 REV. E

Date JUL 1 1991

WHETHER THIS PRINT FOR THE MANUFACTURE OF THIS PART IS TO BE USED IN THE INTEREST OF TEXAS INSTRUMENTS OR AS A GUIDE FOR THE MANUFACTURE OF THIS PART BY OTHERS, IT IS THE PROPERTY OF TEXAS INSTRUMENTS AND IS NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF TEXAS INSTRUMENTS.



NOTES:

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

36PSLA-1

1. SEE CA - CR 98957
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97. SEE CA - CR 98957
98. SEE CA - CR 98957
99. SEE CA - CR 98957
100. SEE CA - CR 98957

74408-1	COPPER	SILVER PLT. .001/.0024 THK. (SEE NOTE #5)	.0605-.0631
PART NO.	MATERIAL	FINISH	DIA. "A"

REV.	MG-3 Q23	Q13-1	Q1-1	M21-1	P37	P3
BY T. Drip 1-6-85	CH R. Parker 1-13-86	ENG. Ben Barber 1-13-86	TEXAS INSTRUMENTS INCORPORATED ATTLEBORO, MASS. U.S.A.	KILXON CONTROL PRODUCTS DIVISION	DWG. SIZE A	PARTS LIST 74408

ACME MILFORD
857 BRIDGEPORT AVE.
MILFORD, CONNECTICUT 06460
TEL\ 203-878-4671 * FAX 203-878-5071

TO: TEXAS INSTRUMENTS

CERTIFICATE OF COMPLIANCE

ACME MILFORD CERTIFIES THAT:

P.O. NUMBER: 500011502
ACME/MILFORD CONTROL NUMBER: 10095
ACME/MILFORD P/N: 3031-A
QUANTITY: 99,995

WAS PROCESSED TO CONFORM TO THE FOLLOWING

PART NUMBER: 74171-1
PART REVISION: R
MATERIAL: BRASS CDA 260

HEAT NUMBER:
TENSILE AFTER LIGHT DRAW:
FINISH: PLAIN FINISH

SIGNED: *John Michaud* 
JOHN MICHAUD
TITLE: QUALITY CONTROL MANAGER

DATE: 05-06-93

SWORN TO AND SUBSCRIBED BEFORE ME THIS/ _____ DAY _____ MONTH _____ YEAR
NOTARY PUBLIC _____



SEYMOUR SPECIALTY WIRE COMPANY

(An Employee Owned Company)

15 Franklin Street

Seymour, Connecticut 06483

(203) 888-5775

ANALYSIS REPORT

Customer:	Milford River & Machine Co.	Date:	December 21, 1967
Address:	P.O. Box 4028	Customer P.O.:	37309
City:	Weymouth, OH 44095	Seymour #:	S-34738-2
Material:	GA 250 Wire	Date Shipped:	12-15-67
Size:	.060" Rd.	Weight:	335 lbs.
Specification:	U.S. 56/63,000 PSI GR #19 Heavy Soap Coat Conforms to UNS# G26000		

CHEMICAL ANALYSIS

COPPER	75.03
LEAD	*.01
IRON	*.01
ZINC	2.51
TIN	
SILICON	
MANGANESE	
PHOSPHOROUS	
NICKEL	
ALUMINUM	* Less than

PHYSICAL ANALYSIS

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

TI-NH78A 7230

State of Connecticut

County of New Haven

Sworn and subscribed to before me this 21 day of Dec 1967

NOTARY

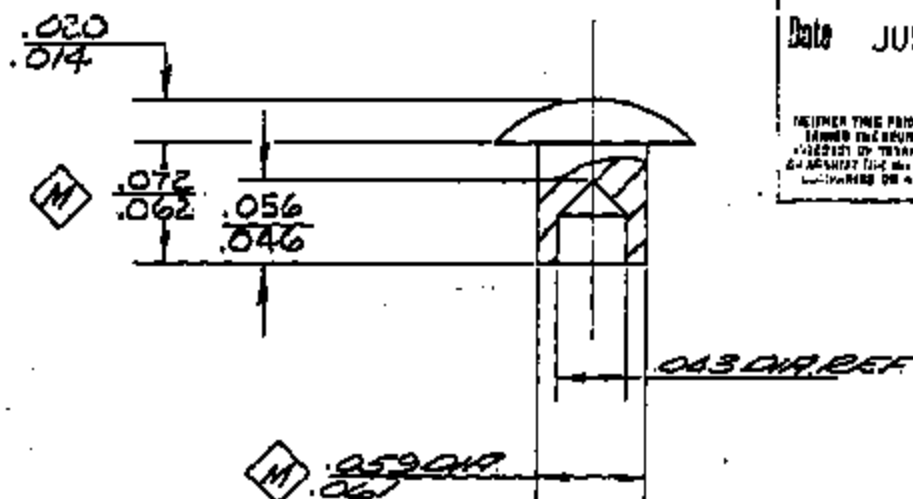
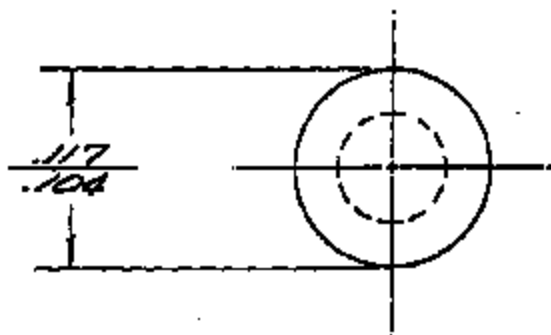
74171

TITLE

RIVET

REV.
B

74171



CERTIFIED PRINT
 PAPER MADE TO THIS PRINT MUST BE USED
 ENG. STD. E9898 REV. E
 Date JUL 1 1991
 NEITHER THIS PRINT NOR THE INFORMATION CONTAINED
 HEREIN IS TO BE USED WITHOUT THE
 WRITTEN PERMISSION OF TEXAS INSTRUMENTS INCORPORATED
 IN ANY MANNER THAT MAY BE IN VIOLATION OF ANY
 APPLICABLE OR FUTURE PATENT RIGHTS.

NOTE:

1. RIVETS MUST BE STORED IN PLASTIC BAGS THRU ALL SHIPPING AND HANDLING PROCESSES

TI-NHTSA 7231

1st ISSUE 57 PCL 1 R
 2-1-84
 SEE DCL
 2-27-84

74171-1		CDR #2608955	
RIVET NO.		14915614	
BY	2-1-84	TXS	03-10-7 14217
CH.	K.H. W...	CONTROL	P371 P372 P351 147
ENG.	P. ... 4/13/84	TEXAS INSTRUMENTS INCORPORATED ATTLEBORO, MASS., U.S.A.	74171

August 20, 1991

To: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110824

Sample Description:

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

Results:

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

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

Regards,

Beth X9069

August 20, 1991

To: Donna Moynihan 12-27

From: Beth Kill 10-16

Subject: GP-3 Material Confirmation
TSL Request # 110825

Sample Description:

P/N 36889-1 Spring C17200 Beryllium Copper

Results:

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

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

Regards,

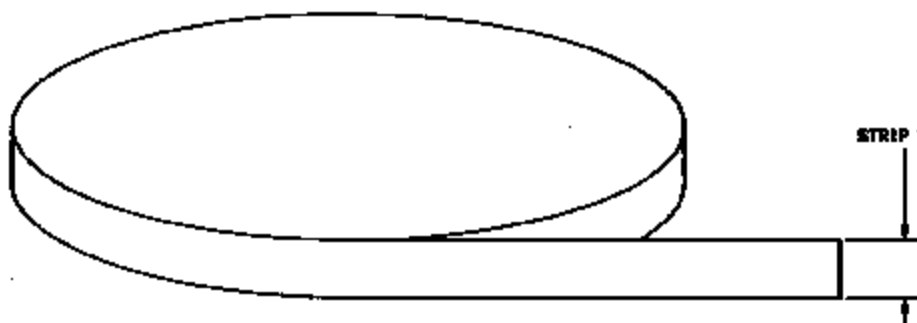
Beth X3069

5 4 3 2 1

REVISIONS				
REV	LEN	DESCRIPTION	DATE	APPROVED
1		NOTE 4 EDC WAS EDO, 2, ADDED NOTES 6, 7 AND 8	9-24-81	
2		OR 100000		

NOTES:

1. MATERIAL CERTIFICATION INCLUDING TENSILE STRENGTH AND HARDNESS DATA REQUIRED WITH EACH SHIPMENT.
2. EACH REEL TO BE LABELED WITH T.I. PART NUMBER ON INSIDE OF COIL.
3. MAX. ALLOWABLE BURR .007.
4. ROLLS SLITTED FROM EDGE OF MASTER COIL NOT ACCEPTABLE.
5. MAX. WEIGHT PER REEL IS 30 LBS.
MIN. WEIGHT PER REEL IS 10 LBS.
6. ROLL TO BE PAKCAGE STYLE.
12" TO 18" ID.
24" MAX OD
3/4" DRIVE HOLE
7. NO SPLICES ALLOWED.



27716-1	BERYLLIUM COPPER C17200, M11A HARDENED (BRUSH BELLMAN ALLOY 100 H&A)	138-140	285-343	.006 A.0002	.151-.186	TBD
PART NO	MATERIAL	TENSILE STRENGTH (KSI)	HARDNESS DPH	THICKNESS (IN)	STRIP WIDTH	PID PUT UP (FO) (CM)

TI-NHTSA 7236

THIS DRAWING SUPERSEDES 27716SH1 REV. A DATED: 11-14-80

APPROVED FOR SHIPMENT SPECIFIED DIMENSIONS AND TO BE SHOWN		BY T. SCHTEINBERG	DATE 11-14-80	TEXAS INSTRUMENTS ATTENDING ENGINEERS/DESIGNER		KLIXON CONTROL PRODUCTS DIVISION	
TOLERANCE ON FRACTIONS DECIMALS ANGLES		1/16" ±	1/32" ±	TITLE SPRING MATERIAL STRIP SPECIFICATION			
MATERIAL		100 H&A	343	PART NUMBER 27716SH1			
		100 H&A	343	PART NUMBER 27716SH1			



ELCO INDUSTRIES, INC.
PRECISION FORMING DIVISION
1111 Barnstable Road • P.O. Box 7000
Rockford, Illinois 61105-7000
Phone 815/397-8181 • Fax 815/397-8185 Ext. 748

CERTIFICATION

May 18, 1991

TEXAS INSTRUMENTS INC
ACCTS PAYABLE DEPT
P.O. BOX 886
ATTLEBORO, MA 02703

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

MATERIAL CERTIFICATION, FINAL INSPECTION AND SAMPLES SENT

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

Purchase Order No.	500016587
Register No.	78825
Part No.	38900-1
Description	3/8-24 X .81
Quality Control No.	A9341-S
Quantity	8.735

36700-1

CERTIFICATION

The times call for quality. Elco quality.

Julius A. Stiger
Authorized Signature
Quality Coordinator

P-51

TI-NHTSA 7237

COMPANY LIMITED

Type & Grade

SC-3595

AISI 1010 SAF

36-100-1

P# 03462

404107

Specification

Chemical Composition Of Steel	Heat No.	Coil No.	% C 100	% Mn 100	% Si 100	% P 1000	% S 1000	% Cu 100	% Ni 100	% Cr 100	% Nb 100	% V 1000
	C76314	0001 - 0018	10	41	8	5	21	1	1	3		
	PB 2X100 22											
Physical Properties	Nominal Diameter		Tolerance of Diameter				Tensile Strength		Description			
	in	mm	in	mm	1,000 psi		kg/mm ²	Des-F	Min-F			
	0.565	14.351	+ 0.0040	+ 0.1018	68.9 MAX	48.5 MAX			MAX			
Packaging	Coil Weight											
	ABT. 2.272LBS (ABT. 1.032KGS)											
	WRAPPED WITH POLYPROPYLENE SHEET.											

Test Results

Sample No.	Diameter mm	Tensile Strength kg/mm ²	Tensile Strength 1,000psi	Sample No.	Diameter mm	Tensile Strength kg/mm ²	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	14.36	34.3	48.8				
0014	14.36	33.8	48.1				
0015	14.37	34.2	48.6				
0016	14.36	35.5	50.6				
0017	14.36	35.5	50.5				
0018	14.36	34.2	48.6				

TI-NHTSA 7238

INSPECTION HARDNESS TESTING RESULTS

ITEM Relay SCALE USED B PART NO. 36900-1

731010

FILE NO. 1	RESULTS
1	72.3
2	72.3
3	73.9
4	72.3
5	72.3
6	72.3
7	73.9
8	72.3
9	72.3
10	72.3

AVERAGE 72.9

MAXIMUM 73.9

MINIMUM 71.0

TECHNICAL SERVICE LABS

TEST NO. 109407

127	STATE YOUR PROBLEM SAMPLE DESCRIPTION	INFORMATION DESIRED: Please section and 1725 measure 410-420 per attached drawing. Thank you, Sam
146		
060		
Sandy		
11-11		
3021		
AT&C		
5/23/91		
5/24/91		
3		
COMPOSITION		36900-1

REPORT OF RESULTS:

① 410 - 41
② 42 - 41
③ 41 - 41

DATE RECEIVED

5/24/91

DATE OUT

5/29/91 Sam

TECHNICIAN			
HOURS WORKED			
PROCEDURE USED			

*PCC I.D.

MC-325
PC-127
VERS-168
AFCC-483
IMD-430

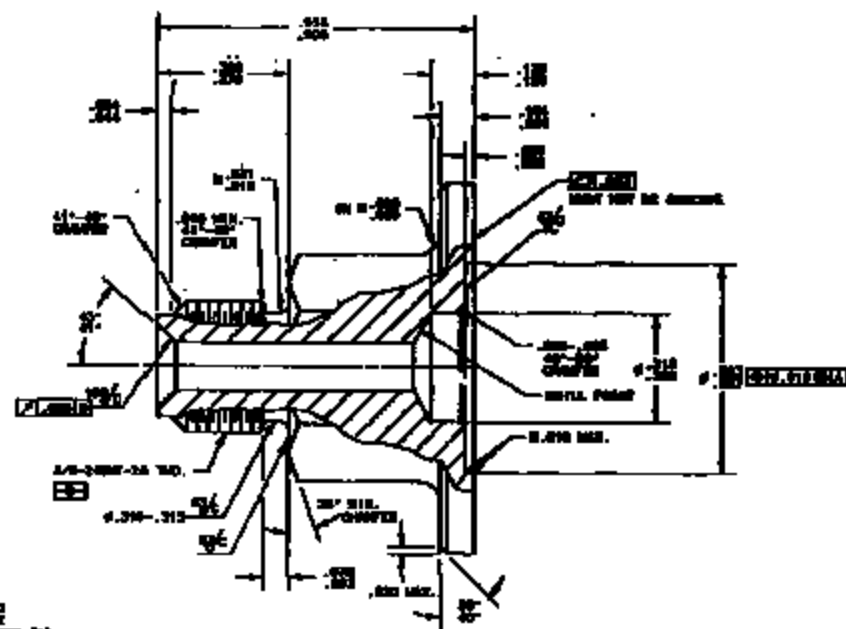
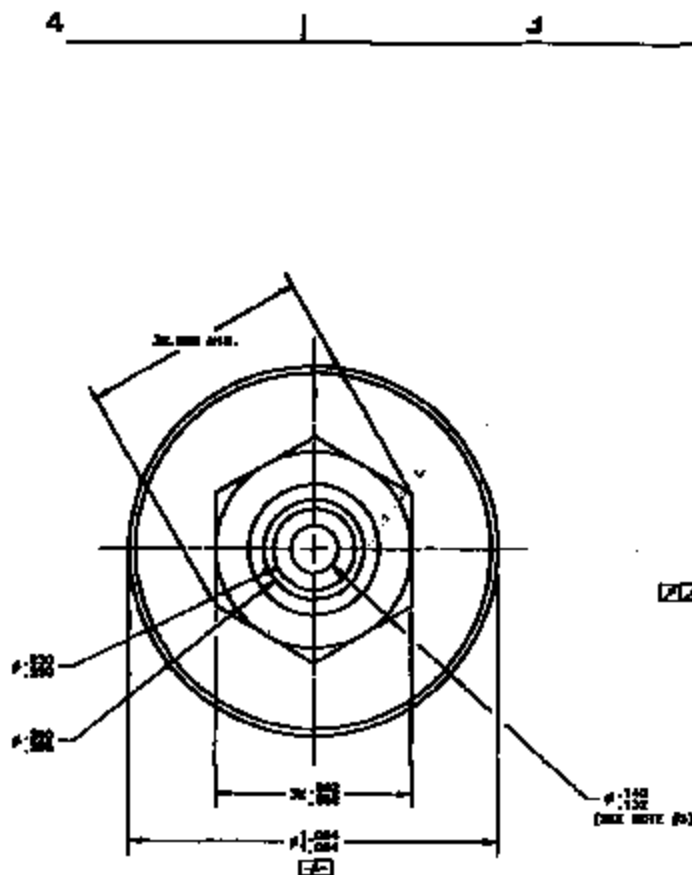
TM-431
WIRE-432
EPD-621
PEP-622
CSD-835

JOCY-126
CLKE-122
CAN-854
AD DEV-288
EMCD-677

FACIL-614
FACIL-521
FACIL-531
STAFF-855

DISTRIBUTION: White and Yellow - Lab Pink - Requestor

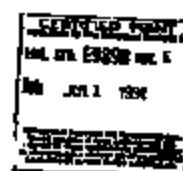
TI-NHTSA 7240



- NOTE:
1. DIMENSIONS APPLY AFTER PLATING.
 2. PARTS TO BE SHIPPED, INSURED, AND STORED IN SEALED PLASTIC BAGS.
 3. FINISHED PART PLATING MAXIMUM TO BE BICKELL B-73 ANNEAL.
 4. THREAD MUST CONFORM TO FPM SPEC. 300-2000-0100(0.5 IN-LIN MAX. TOLERANCE ON DIA. DIA.).
 5. .013" MAX. VARIATION ALLOWABLE IN 0.140 - 0.140 THROUGH HOLE WHEN DRILLED FROM BOTH ENDS OF PART.

TI-NHTSA 7241

REVISIONS		DATE		APPROVED	
NO.	DESCRIPTION				
1	REV. 1000	7700	02 10 64	J.B.B.	



3000-1	STEEL	3000-1	STEEL	3000-1	STEEL
PART NO.	MATERIAL	PART NO.	MATERIAL	PART NO.	MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		DATE		03/17/80 001023P35	
TOLERANCE ON FRACTIONS DECIMALS ANGLES		TXS INSTRUMENTS		MODIFIED SAE J412 SEX PORT	
REVISION		36900		36900	
		36900		36900	

July 29, 1991

To: Donna Moynihan 12-27
From: Beth Kili 10-16
Subject: GP-3 Material Confirmation
TSL Request # 110831

Sample Description:

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

Results:

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

Regards,

Beth X3069



AKRON RUBBER DEVELOPMENT LABORATORY, INC.

300 KENMORE BOULEVARD • AKRON, OHIO 44301
Office (216) 434-6664 Telefax (216) 434-6665

July 24, 1991

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

SUBJECT: Chemical analysis on sample submitted by the above company.
PO# 800066978

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

POLYMER IDENTIFICATION: ASTM D 3677
Pyrolysis method

SAMPLE

#110831

POLYMER IDENTIFICATION

Ethylene-Propylene Rubber

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

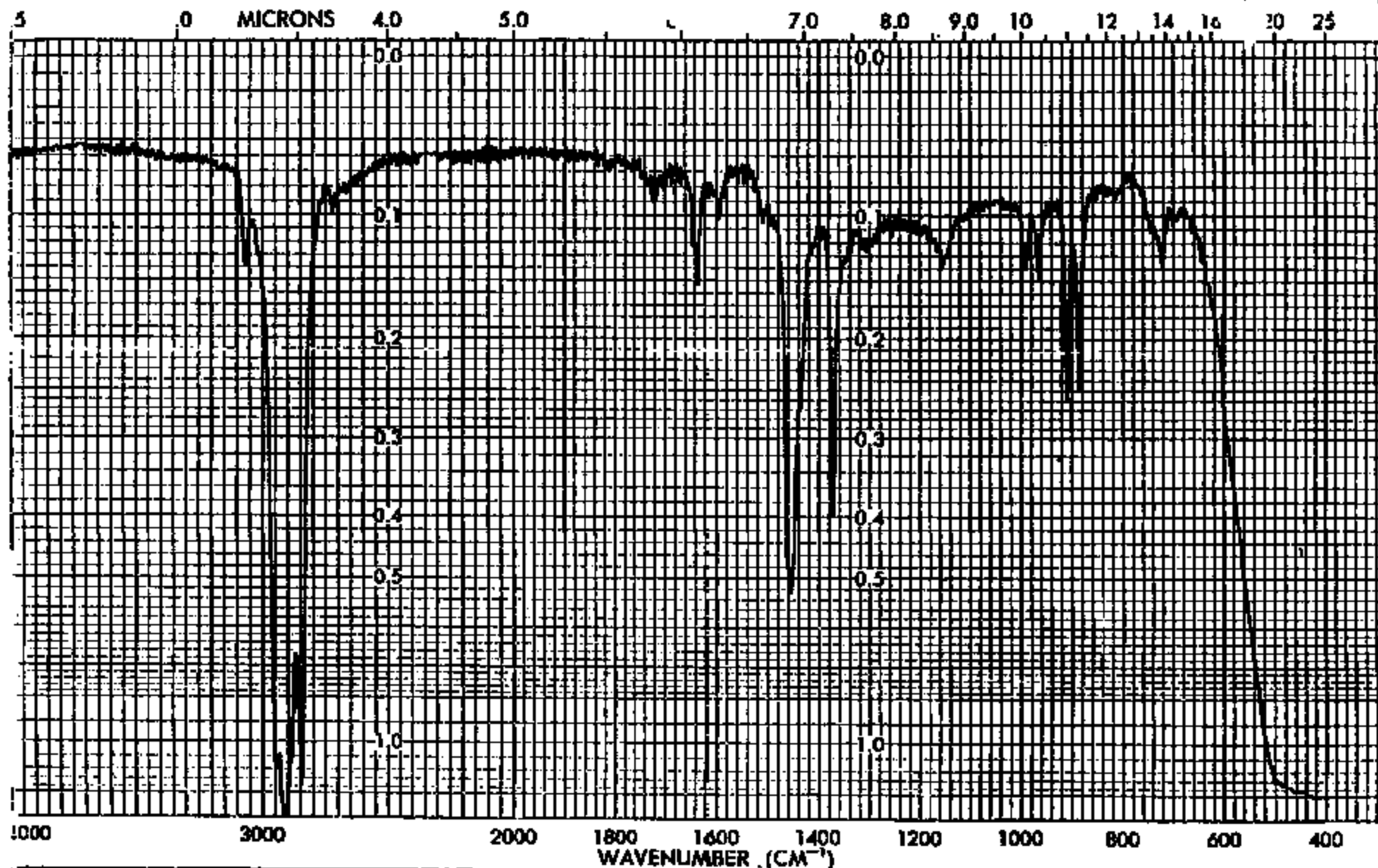
Thomas M. Knowles
Thomas M. Knowles
Vice President, Chemical Services

PN# 11726 INV# 31172601

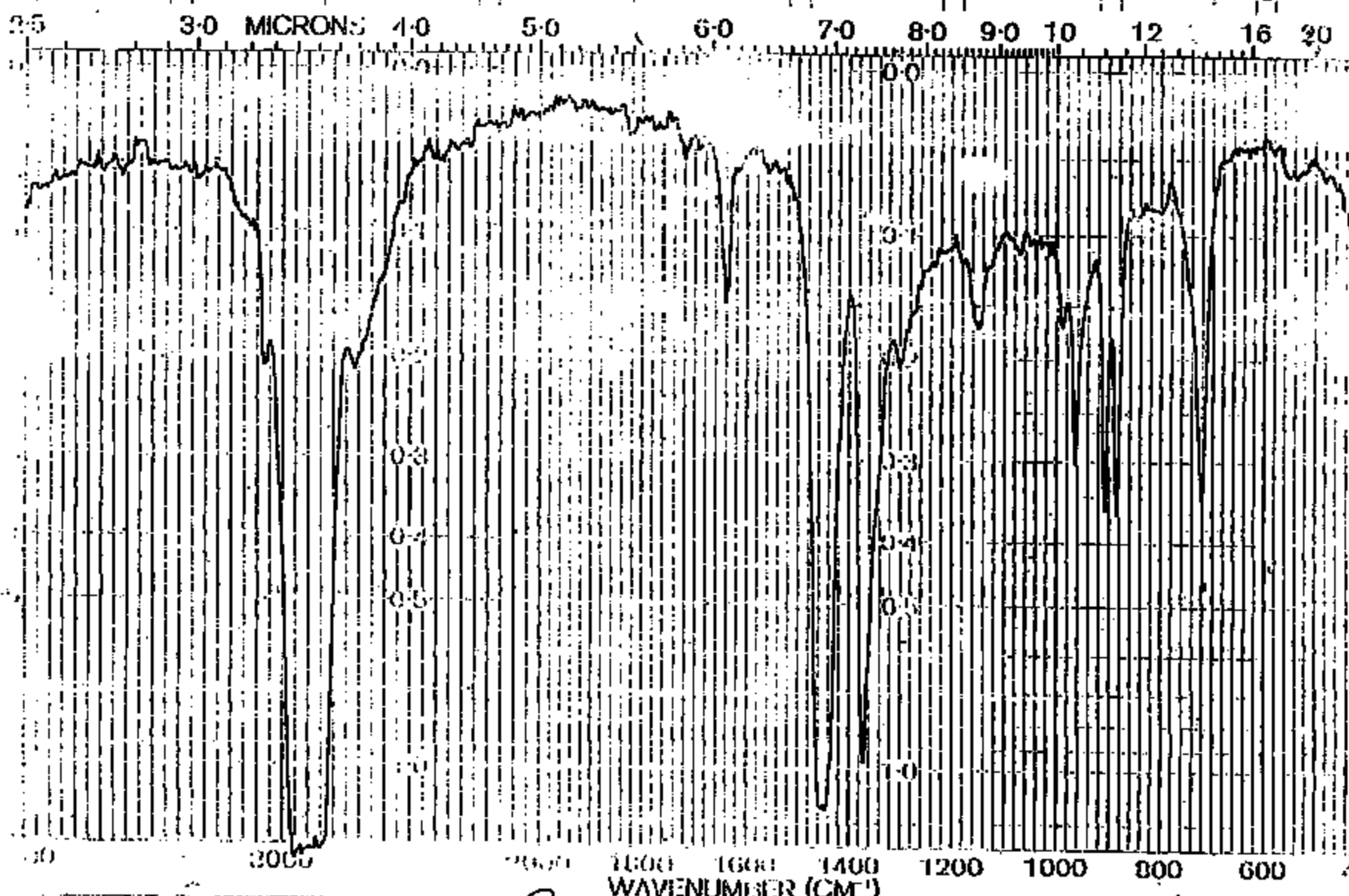
tk



TI-NHTSA 7244



SAMPLE <u> </u>	SOLVENT <u> </u>	SCAN <u> </u>	SINGLE <u> </u>	REMARKS <u> </u>
	CONC. <u> </u>	SIT <u> </u>		
ORIGIN <u> </u>	CELL PATH <u> </u>	OPERATOR <u> </u>	Q.D. <u> </u>	<u> </u>
	REFERENCE <u> </u>	DATE <u> </u>	INSTR. <u> </u>	
		No. PR 5102-1001		



TI-NHTSA 7245

SAMPLE
Ethylene Propylene Rubber

EXAMINER *Reynolds*
 GAGE
 QCT PATH
 INSTRUC.
 PAPER 0017

SCAN 5
 ATT 2
 OPERATOR *Tone*
 DATE
 FILE NUMBER

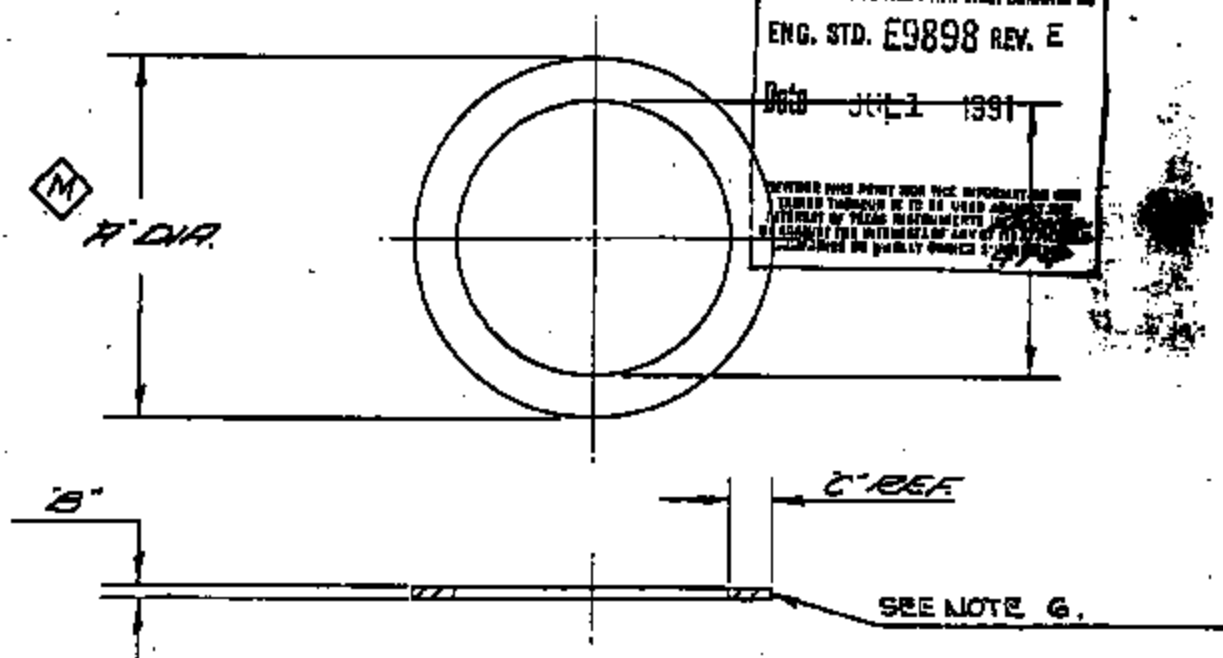
SINGLE R
 TA
 [REDACTED]

RECEIVED
Control

GASKET

G 74353

CERTIFIED PRINT
Parts Made To This Print Must Conform To
ENG. STD. E9898 REV. E
Date JUL 1 1991
REPRODUCED FROM THIS PRINT FOR INFORMATION ONLY
THIS PRINT IS TO BE USED AS A REFERENCE
FOR THE INTERPRETATION OF THE DRAWING
AND NOT AS A SUBSTITUTE FOR THE ORIGINAL
DRAWING OR FOR THE PART ITSELF



NOTES:

1. PARTS MUST BE PURCHASED FROM T.I. ENGINEERING APPROVED VENDORS, LISTED BELOW.
2. MATERIAL CERTIFICATION REQUIRED WITH EACH SHIPMENT.
3. MATERIAL TO BE COMPATIBLE WITH FIBER-12 & REFRIGERANT OIL.
4. PARTS TO BE SHIPPED, ISSUED & STORED IN SEALED PLASTIC BAGS. AND 30,000 PARTS PER BAG MAX.
5. ALL CONTAINERS OF PARTS MUST BE MARKED TO REFLECT ANY MATERIAL LOT, TOOL OR PROCESS CHANGE.
6. DASH 1(-1) AND DASH 4(-4) GASKET MUST HAVE FOUR(4) WHITE STRIPING INK MARKS, EQUALLY SPACED AROUND THE CIRCUMFERENCE, AND NOT LESS THAN 1/8 INCH WIDE. NO INK IS ALLOWED ON ANY OTHER SURFACE.

74353-4	ETHYLENE PROPYLENE JBL COMPOUND E-7104-70 JBL PART NO. 6197E	70	BLACK	.670-.662	.030-.036	.063
74353-3	ETHYLENE PROPYLENE JBL COMPOUND E-7054	70	WHITE	.670-.662	.030-.036	.063
74353-2	ETHYLENE PROPYLENE JBL COMPOUND E-7054	70	WHITE	.599-.591	.030-.036	.063
74353-1	ETHYLENE PROPYLENE JBL COMPOUND E-7104-70 JBL PART NO. 6197E	70	BLACK	.599-.591	.030-.036	.063

PART NO.	MATERIAL	DIMENSION	COLOR	A	B	C
				(M)	(M)	

BY T. Dail 3-18-85

CH. J. L. L. 3-20-85

END. J. L. L. 3-18-85



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

KILTON

SEMI-CONDUCTOR PRODUCTS
DIVISION

A

PARTS LIST

74353

CODE IDENT NO. 82547

TI-NHT8A 7240

VALENTINE TOOL & STAMPING, INC.

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

MATERIAL CERTIFICATION

DATE : FRIDAY JUNE 14, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505063392

SUPPLIER INVOICE NO.: 79580

PART DESCRIPTION : 27713-1 CUP REV.A

SUPPLIER FJO NO. : 18571

QUANTITY SHIPPED : 1,085

SHIPMENT DATE : 06/14/91

WE CERTIFY THAT THE MATERIAL USED
TO PRODUCE THE PRODUCT IN THIS
SHIPMENT, NAMELY
[C1008]
CONFORMS TO T.I. DRAWINGS AND
T.I. PURCHASE ORDER REQUIREMENTS.

SIGNED *Jeanne Lafiamme*
(Supplier Representative)

Jeanne Lafiamme Quality Control Manager

VALENTINE TOOL & STAMPING, INC.

171 WEST MAIN ST. NORTON, MASS. 02756
(508) 285-6911 226-0840

CERTIFICATE OF CONFORMANCE

DATE : FRIDAY JUNE 14, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505063392

SUPPLIER INVOICE NO.: 79580

PART DESCRIPTION : 27712-1 CUP REV.A

SUPPLIER FJO NO. : 18571

QUANTITY SHIPPED : 1.085

SHIPMENT DATE : 06/14/91

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

SIGNED

Jeanne Lafontaine
Jeanne Lafontaine
Quality Control Manager

1. 315 J36
2. 223 3136

530 HENRY ST
ROME, NEW YORK 13440

13-1-10

SALES CODE
502010

01000000

DATE INVOICE NO
02/26/91 02740

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

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

ATTN: JEANNE LAFLAMME, Q.C. MGR.

TITLE (LBS) NO. CLS NO. SHDS OR BOLS PREPAID COMPLETE SHIPPER BY
14,154 040 06 COMP R S S

MT NO C NR P S ST MI CA NO
466707 07 34 012 00b 01

AL UN CB CA

REQUIREMENTS OF:
ORDER NO 13428

COLOR CODE

125 025MM X 50.80MM

MT NO PREPAID COLLECT PREPAID
02456

STRAPPING

PAPER WRAP

BOLE

CRATE

BYE

04000 X 2.0000

TEMPER

CONS OR CUT

COIL

440 LBS

3000

SKIN SIZE

PRG MT

WASTERS

CONES

TABLE

INCH

LENGTH SPEC

BURNERS

SPRINGS

SHRIMP

BOARDS

CAP

101 -001 +005 -005

MUS SLIT

220 PIN 16 36

3/4"

125 -025MM +127 -127MM

CLASS
ALUM KILD

MT NO
C-1006

TEST REPORT

Certificate of Compliance

TEST: 052 07245 33 030291

Notary Public, Oneida County
My commission expires 7/7/92

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.

A. Zingulini
ROME STRIP STEEL CO., INC.

TI-NHT8A 7249

120.5

September 25, 1991

To: Donna Moynihan 12-27
From: Beth Kill 10-16
Subject: Material Confirmation
TSL Request # 110832

Sample Description:

P/N 74176-1 Seal Teflon and Kapton

Results:

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

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

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

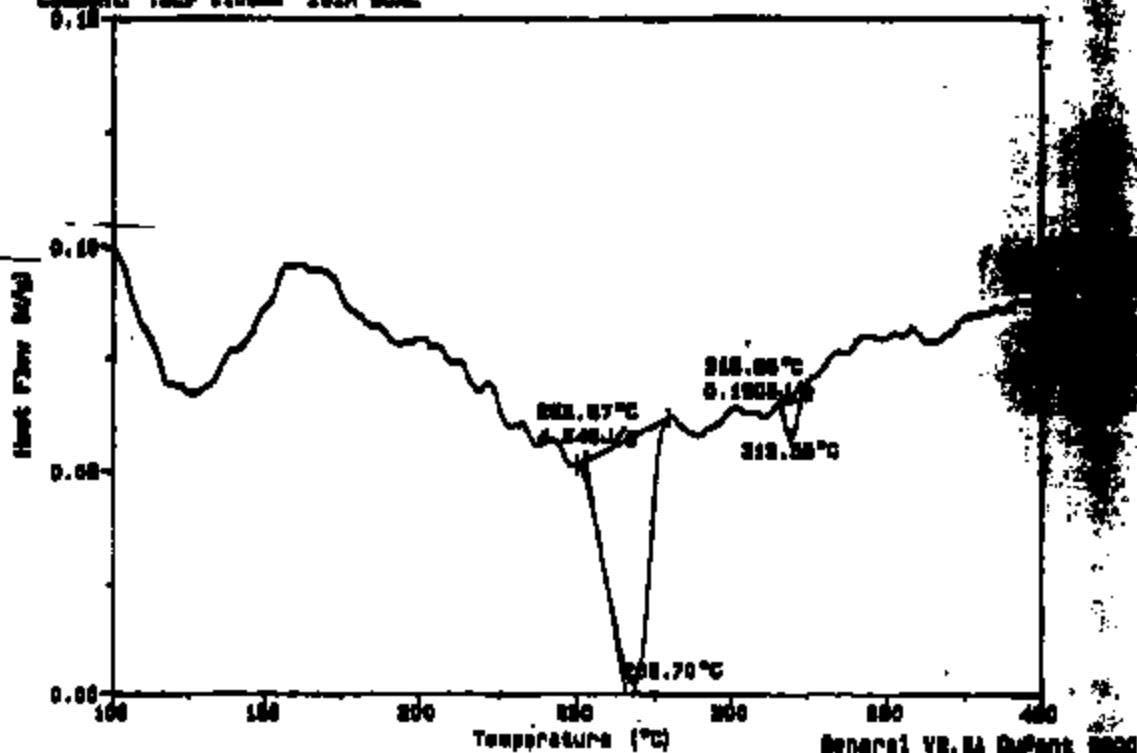
Regards,

Beth X3069

Sample: 78478-1 KAPTON TAPE
 Size: 3.3600 mg
 Method: KAPTON
 Comment: TMLP 110888 182A QUAL

DSC

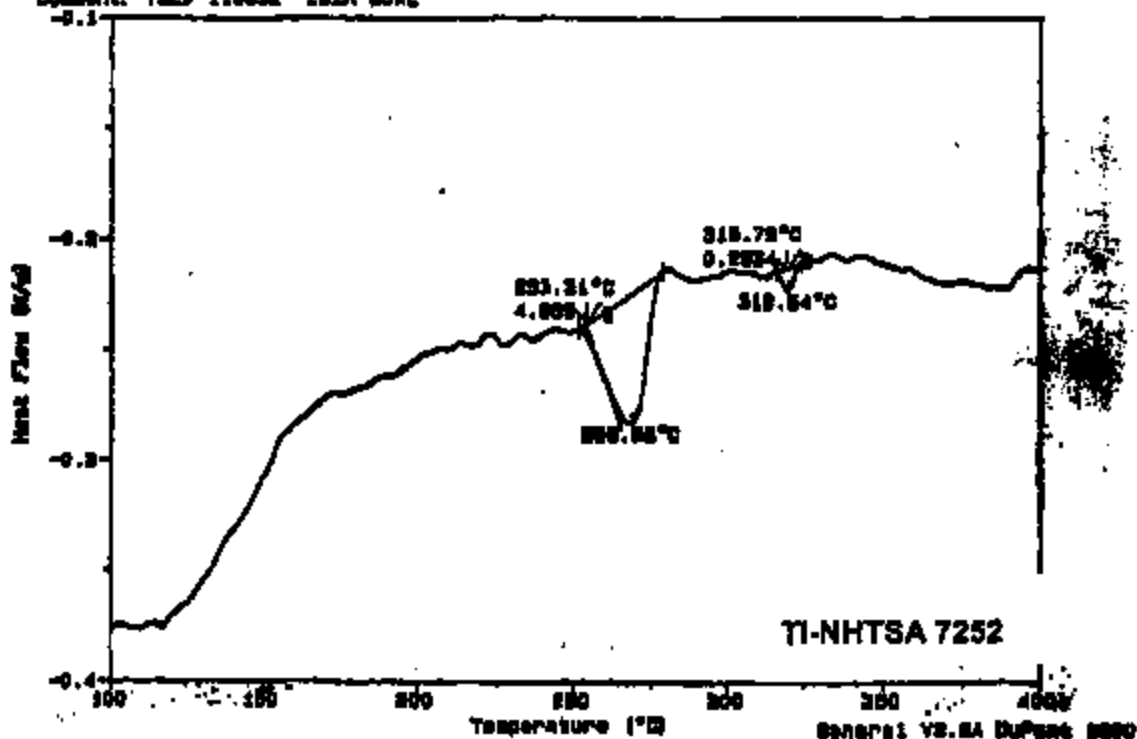
File: DKAPTON.08
 Operator: K ROSS
 Run Date: 08/22/81 08:18



Sample: 78478-1 KAPTON TAPE
 Size: 3.3600 mg
 Method: KAPTON
 Comment: TMLP 110888 182A QUAL

DSC

File: DKAPTON.10
 Operator: K ROSS
 Run Date: 08/23/81 08:18



NO. 007-1493

PERKIN-ELMER

CONCENTRATION

THICKNESS

PHASE

REMARKS

SCAN MODE

ACCY. ☐SURVEY ☐HI ENERGY ☐CAL. ☐RESOLUTION ☒

OPERATOR

EX

DATE

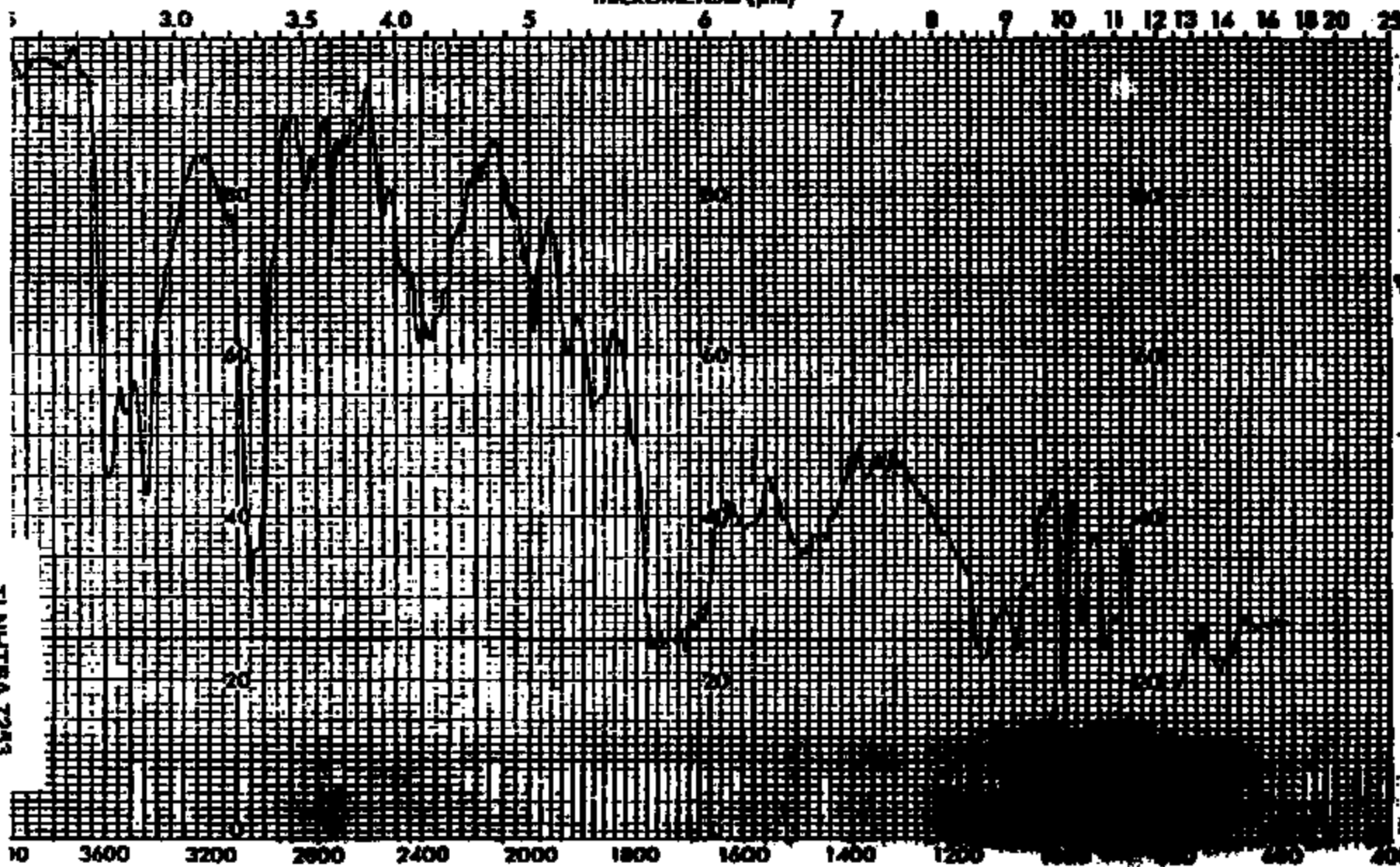
9/13/91

SPECTRUM NO.

SAMPLE

110732
Kapton - Teflon

ORIGIN

MICROMETERS (μm)

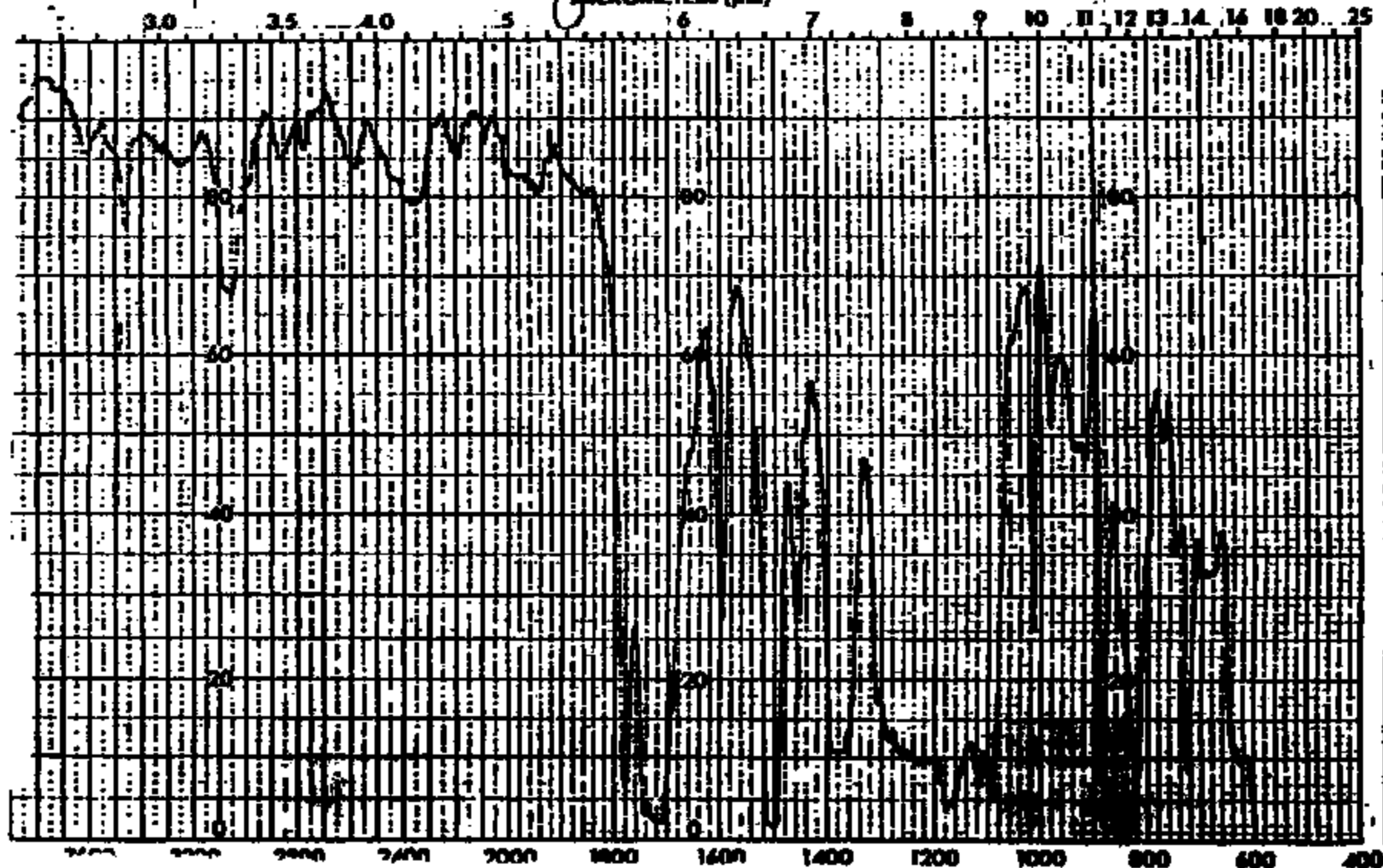
TI-NHTBA 7253

10:37 AM

SPECTRUM NO.

208

CONCENTRATION _____	SCAN MODE	ACCY. ☐	SURVEY ☐	SPECTRUM NO. _____
THICKNESS _____		HI ENERGY ☐	CAL ☐	SAMPLE <u>DUPONT KAPTON</u>
AGE _____		RESOLUTION ☒		<u>100EN899</u>
MARKS _____	OPERATOR <u>JS</u>	DATE <u>3/1/87</u>	ORIGIN _____	

MICROMETERS (μ m)

TI-NHTSA 7254

SAMPLE

SPECTRUM NO.

08.28.91 10137 AM

205

74176

TITLE

SEAL

REV.

B

74176

M

.732
.700.734
.706

M

.9255
0045NOTE:
1.001 MAX. CURR ALLOWED

CERTIFIED PRINT
Parts Made to This Print Must Conform To
ENG. STD. E9898 REV. E
Date JUL 1 1991
NEITHER THIS PRINT NOR THE INFORMATION CONTAINED THEREIN IS TO BE USED AGAINST THE INTEREST OF TEXAS INSTRUMENTS INCORPORATED OR AGAINST THE RIGHTS OF ANY OF ITS OFFICERS, EMPLOYEES OR WHOLLY OWNED SUBSIDIARIES.

TI-NHTSA 7255

74176-1

MAKE FROM 27225-1 (STEAMP)

B

PART NO.

MATERIAL

REV.

VS 100-1034 Q1-1 M2H M19 P371 P372 P351 P277

BY

J. L. W. 2-1-84

CH.

K. L. W. 2-17-84

ENG.

D. J. S. 2/18/87



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

KILKON
CONTROL PRODUCTS
DIVISION

SIZE
A

PART NO.

74176

REVISIONS				
ZONE	LEN	DESCRIPTION	DATE	APPROVAL
1		ADD "ONE MICRON" DIM. 3728-1 A-2 AND PUT IN 1.2 IN 13"	8-8-80	CPM

NOTES:

1. STRIP TO BE INSPECTED FOR TEFLON COATING, THICKNESS, DEFORMITIES, BUBBLES, AND LAMINATE SEPARATION.
2. EACH KAPTON STRIP ROLL MUST BE LABELED WITH T.I. PART NO. ON INSIDE OF CORE.
3. NO MORE THAN 2 SPLICES PER COIL PERMITTED. SPLICES TO BE CLEARLY MARKED WITH YELLOW MYLAR.
4. MATERIAL CERTIFICATION REQUIRED WITH EACH SHIPMENT.
5. ROLLS SLITTED FROM END OF MASTER COIL NOT ACCEPTABLE.
6. BUCKLING OF THE CORE ALLOWED UP TO 1/4" MEASURED RADIALLY AWAY FROM THE CORE.
7. DENT RIP OR JAGGED EDGES ON MATERIAL NOT ALLOWED.
8. ROLLS ARE TO BE SHIPPED WITH PROTECTIVE INSERT CORES IN THE PACKING BOX.

THIS FORM SUPERSEDES 27205 REV. 4-64 DATED 12-13-60

27225-3	EXPORT 300 FV82P	3 x 4 MILS	0.6	2	0.2	.982-.984	3 x 0 1/2	PLASTIC (WHITE)
27226-2	EXPORT 808 BW131	3 x 5 MILS	1	3	1	.982-.984	8 x 0 1/2	CORDBOARD
27226-1	EXPORT 608 BW131	3 x 5 MILS	1	3	1	.734-.736	6 x 0 1/2	CORDBOARD

PART NO.	MATERIAL	THICKNESS (IN.)	TEMP. (°F.)	TEMP. (°C.)	STRIP WIDTH (IN.)	FIN. CUT UP (IN. D.)	CODE MATERIAL
----------	----------	-----------------	-------------	-------------	-------------------	----------------------	---------------

ORDER WITH LINEAR APPROVED EXAMINATION AND NO INSURANCE		NO TON DATE	DATE 11-1-88	 TEXAS INSTRUMENTS MICROELECTRONICS CORPORATION	BUCKEN & CONTROL PRODUCTS DIVISION
VOLTAGE IN FUNCTIONING MECHANICAL ANALYSIS		CH.			
DATE 11-1-88		S-22-10		KAPTON STRIP SPECIFICATION	
MATERIAL		SPECIFICATION		27225	

DIEMASTERS

CERTIFICATE OF CONFORMANCE

SHIP TO:

**TEXAS
INSTRUMENTS**



FROM
Diemasters Manufacturing

757 Industrial Drive
Elmhurst, Illinois 60120

DATE SHIPPED: 6/18/91 PURCHASE ORDER #: 50001008
SHIPPING OR INVOICE NUMBER: 001821
MATERIAL TRACE NUMBER (P.O. # HEAT, LOT, OR ROUTE SHEET NUMBER): 65-7196
QUANTITY SHIPPED: 75,790
PART NUMBER: 27639-1 REVISION: D
PART DESCRIPTION: WASHER
OPERATION PERFORMED: MANUFACTURING
SPECIFICATION: 27639-1 REVISION: D

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

Mr. Dwyer
QUALITY CONTROL

08-14-91
DATE

ENCLOSURES: ☒ CERTIFICATE OF RAW MATERIAL

TRACEABLE LOT# 79

☐ INDEPENDENT LABORATORY TEST REPORT OF RAW MATERIAL

☐ INSPECTION REPORT(S)

☒ ^{HEAT-TREAT} SUB ~~PLATING~~ SUPPLIER'S CERTIFICATION(S) OF CONFORMANCE

☐ FORM _____ NON-CONFORMANCE RELEASED BY: _____

☐ REWORK EXPLANATION

TI-NHTSA 7257

RIVERDALE PLATING & HEAT TREATING, INC.

680 West 134th Street Riverdale, Illinois 60627-1194

TELEPHONES

(708) 849-2050

(312) 568-2400

DIAMETERS MANUFACTURING, INC.

157 INDUSTRIAL DR

ELMHURST

IL 60120-1525

27639-1

JUN - 3 1991

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

OUR ORDER NO	CUSTOMER ORDER NO	PROCESS DESCRIPTION	QUANTITY SHIPPED	WEIGHT SHIPPED	DATE SHIPPED
133431	100657	AUSTEMPER TO H/C 40-55	74,515	1,559	5/29/91
133431	100657	ZINC .0002 - .0006	74,515	1,559	5/29/91

Subscribed and sworn to before me

THIS 29 DAY OF MAY, 1991

Leonard O. Brynteson

Notary Public

"OFFICIAL SEAL"

Leonard O. Brynteson

Notary Public, State of Illinois

My Commission Expires 7/26/92

RIVERDALE PLATING & HEATING TREATING, INC.

Arvid K. Nelson

Vice President

TI-NHTSA 7258

that material meets ordered specification

Bally Diemasters

TEXAS INSTR.
27639-1

QUALITY CONTROL

APR 30 1991

L. BALLO

Mat
1 3/8 x 0.985
PO Number
021540
MHI Number
62276

Heat						AISI			Rockwell		
657196						C-105			B 74/78		
%C	%Mn	%P	%S	%Si	%Ni	%Cr	%Mo	%Al	%Cu	%V	%Nb
52	78	015	008	23							
Tensile Strength (psi)				2% Yield Strength (psi)				% Elongation in 2"			
Surface		Inclusion Rating		Grain Size							
J				Microstructure							
Decarburization											
Cold Band											
Parallel to the rolling direction over a						Radius Bend					
Perpendicular to the rolling direction over a						Radius Bend					
Hardness						Miscellaneous					

I certify that the above data is correct

[Signature] am 4/26/91
[Signature]
 Name: *[Signature]*
 Name: Public, State of New York, County of Onondaga
 My commission expires: 5/1/92

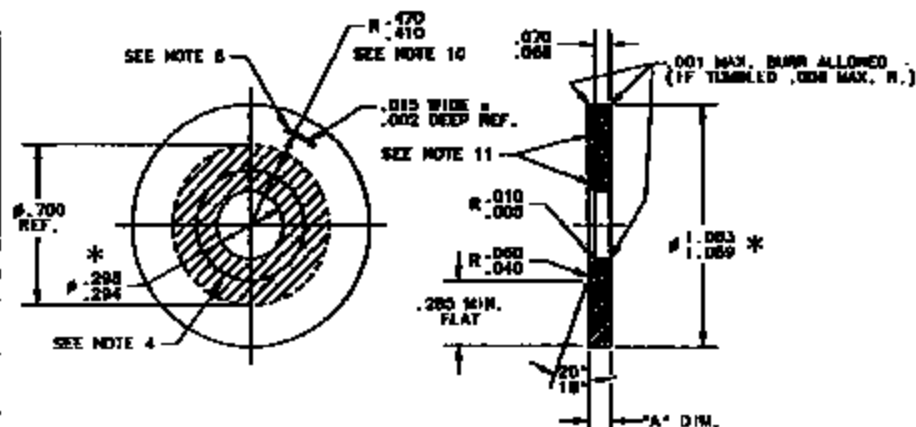
ROME STRIP STEEL

530 Henry St
 Rome, NY 13440

315-336-5500
 FAX 315-336-5510

TI-NHTSA 7259

1



NOTES:

1. PART MUST BE FLAT TO WITHIN .004 T.I.R..
2. DIAMETERS MARKED WITH * MUST BE CONCENTRIC TO WITHIN .004 T.I.R..
3. PARTS TO BE SHIPPED, ISSUED, AND STORED WITH APPLIED RUST PREVENTIVE BEFORE PLATING. AFTER PLATING, PARTS TO BE SHIPPED, ISSUED, AND STORED IN SEALED PLASTIC BAGS.
4. NO TOOL MARKS ALLOWED IN THE SHADED AREA ON BEVELED SIDE OF WASHER.
5. THE PARTS HARDNESS IS MEASURED AFTER A .005-.010 THICK SKIN IS REMOVED.
6. THIS PART IS LOT CONTROLLED. ANY PRESS CHANGE, NEW SETUP, PUNCH CHANGE, MAJOR TOOL WORK OR MATERIAL LOT CHANGE WILL SIGNIFY START OF A NEW LOT. NO MINIMUM LOT SIZE. EACH BOX WILL HAVE A LOT NUMBER. EACH LOT WILL HAVE IT'S OWN PACKING SLIP WITH LOT IDENTIFICATION.
7. MATERIAL CERTIFICATION REQUIRED WITH EACH SHIPMENT.
8. STAMP IDENTIFICATION CODE AS REQUIRED TO IDENTIFY SUPPLIER TOOL. CODE SHALL BE CLEARLY VISIBLE AFTER PLATING. NO BLUR OR SHARP EDGES PERMITTED. (-& ONLY)
9. DIM. "A" TO BE MEASURED WITH STANDARD WASHER GAUGE.
10. IDENTIFICATION MARKS ALLOWED BETWEEN .410-.470R..
11. THESE SURFACES MUST BE SMOOTH AND FREE OF ANY PLATING ASPERITIES OR INCLUSIONS. (I.e. NO FROSTED EFFECTS OR PARTICULATE CONTAMINATION IN THE PLATING.)

TIME 1000. REFERENCE SPIN 607. "C" DATE 2-25-60

REVISIONS				
NO.	LTN	DESCRIPTION	DATE	APPROVED
1		1: SEE NOTE 4: WAS "SEE NOTE 8"		
2		2: SEE NOTE 8: WAS "SEE NOTE 9"		
3		3: SEE NOTE 10: WAS "SEE NOTE 11"		
		ON 185088		



27639-1	1030 QRS	ZINC PLATE .0002 - .0008 THK	HEAT TREAT TO ROCKWELL C40-60	.007 - .101
PART NO	MATERIAL	FINISH	HEAT TREAT	"A" DIM.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		DY CU ALLOY	DITS 0-00-00	TEXAS INSTRUMENTS ESTABLISHED IN CALIFORNIA 1954	MILITARY STANDARDS SYMBOL
TOLERANCES UNLESS SPECIFIED DECIMALS AND/OR		CM	CAL. 2.5in. Holes		
REVISIONS	APPROVED <i>Alan [Signature]</i>		QTY B	QTY 82647	QTY 27639

TI-NHTSA 7260



EST. 1948

K. F. BASSLER COMPANY, INC.
PRECISION TOOLING & METAL STAMPINGS

45 John William St. • Attleboro, MA 02703 • (508) 222-1081 • Fax: (508) 228-1805

MATERIAL CERTIFICATION

CUSTOMER: Texas Instruments Inc. - Attleboro
CUSTOMER ORDER NO.: 505097078
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 CES, CONFORMS TO 773 DRAWING AND PURCHASE ORDER REQUIREMENTS.

AUTHORIZED SIGNATURE:

Kathleen A. Penkala
Kathleen A. Penkala
Inside Sales Specialist



TI-NHTSA 7261

TELEX 881214
FAX 375-336-1010
PHONE 375-336-1500
DUN-S 223-2139

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

COMPLIANCE

SALES CODE

08072016

DATE

INVOICE NO

02/28/91

02786

01000000

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) 19,636
NO. COILS 135
NO. SHEETS OR ROLLS 13
PARTIAL COMPLETE PART

SHIPPER BY
PAUL R

WT NO 466708
C 07
HR 36
F 014
S 008
ST 01
RI
CR NO

MEETS REQUIREMENTS OF:

CUST ORDER NO 14474

COLOR CODE

17MM X 25.40MM

MILL NO

58100

PREPAID

COLLECT

STRAPPING

PAPER WRAP

BOIS

CRAFT

BOX

04600 X 1.0000

TEMPER

B 50 MAX

COILS ON COT

COIL

200 LBS

SHOE

SLIP SIZE

PER HI

WARRANTY

CORES

TOLERANCE

+00050-00050+005 -005

EDGE

N03 SLIT

LENGTH SPEC

200 PIN 16 34

RIBBERS

SPRINGS

SHROUD

BOARDS

CAPS

+013 -013MM +127 -127MM

ALUM. YIELD C-1000

BURN

CAMBER

500/096

FLATNESS

OIL

T-PCS

TEST REPORT

(8,907 KG)

19,636

Certificate of Compliance

ATTEST:

057-06280-22-030291

Notary Public, Oneida County

My commission expires

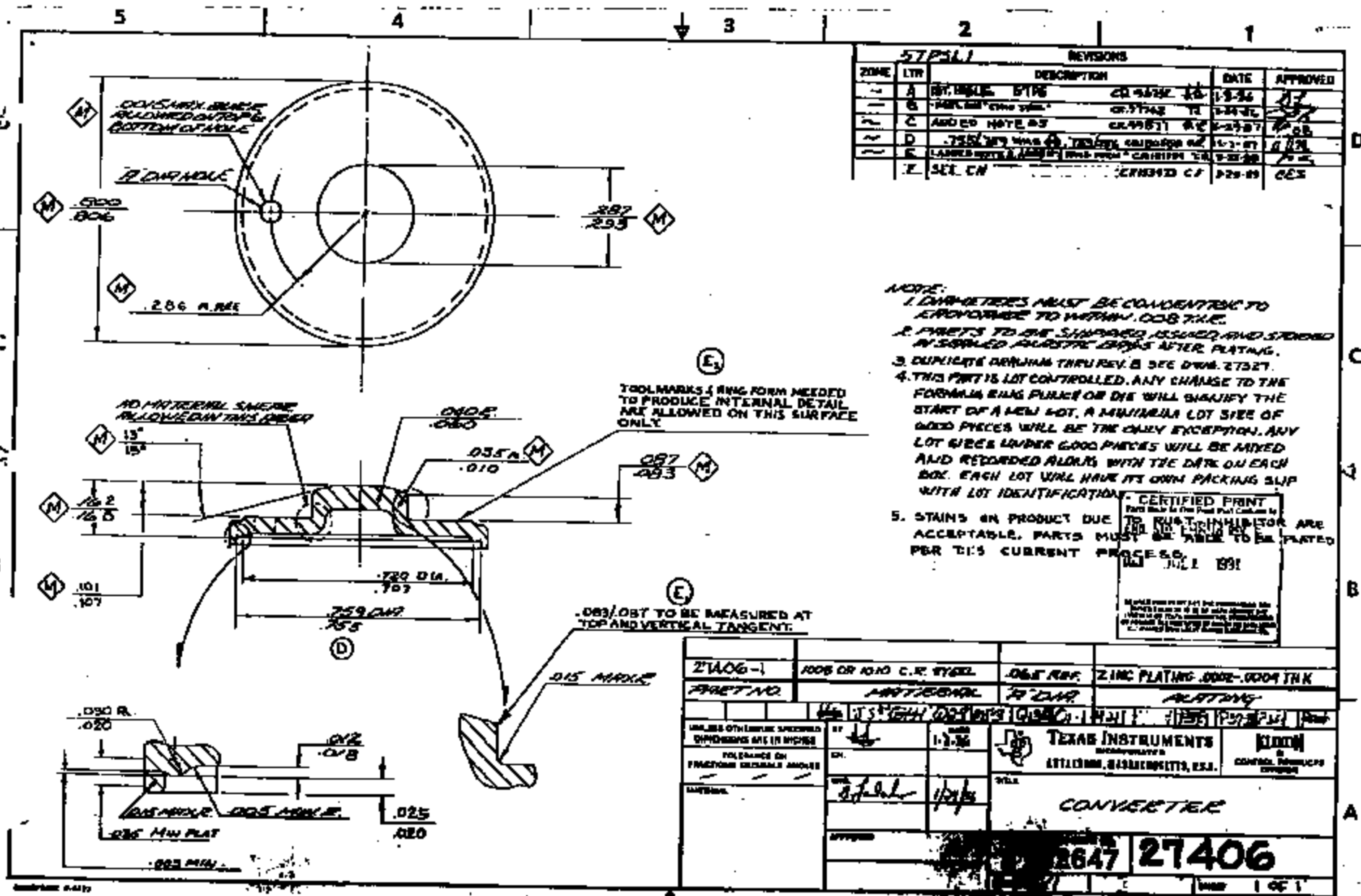
DATE

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.

TI-NHTSA 7262



Paratech, Inc.

A SUBSIDIARY OF JENSEN PACIFIC CORP.
MINIATURE TECHNICAL CERAMICS

18840 MINNESOTA AVENUE • P.O. BOX 718 • PARAMOUNT, CALIFORNIA 90723
TELEPHONE (213) 633-2045 • FAX (213) 633-8807

MATERIAL CERTIFICATION

DATE: 4-22-91

TEXAS INSTRUMENTS, INC.

ORDER NO.: 505049981

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

QUANTITY THIS SHIPMENT: 75,000

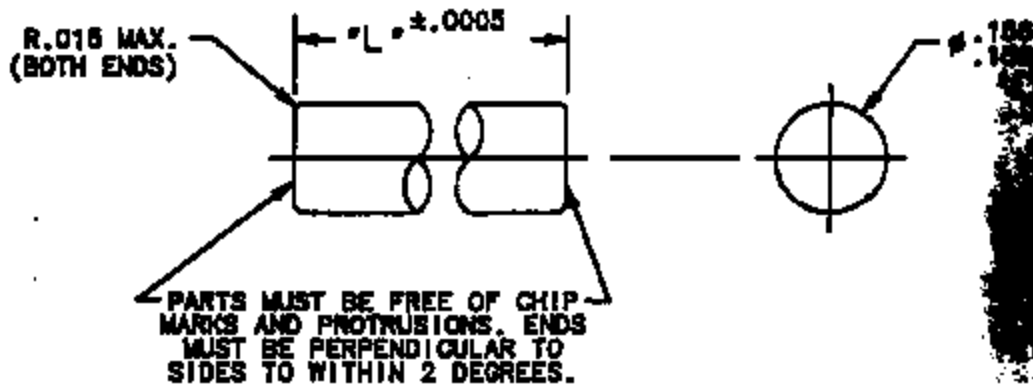
SHIPMENT DATE: 4-22-91

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

74078



L LENGTH IS DETERMINED BY THE SUFFIX OF THE PART NUMBER IN THOUSANDTHS OF AN INCH. I.E.; PART NO. *L*

PART NO.	*L*
74078-155	.155
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-18E8) OR
L-3 GRADE STEATITE (DC-144E) OR

CURE PER SPEC.----- 50502-2

SHRINKAGE SPEC.----- 80601-1

CERTIFIED PRINT
Parts Made To This Print Must Conform To

ENG. STD. E9898 REV. E

Date JUL 1 1991

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TI-NHTSA 7265

THIS DWG. SUPERSEDES 74078 REV. 'E' DATED 8-4-88

QWERTZ

BY

TEL 541 425 17 00

CH

F

211

Background



TEXAS INSTRUMENTS

ATTACHED MANUSCRIPTS 61703

KLDXON

CONTROL PRODUCTS MINIMUM

**DW
SIZE
A**

DISEASE NO.

74078

CODE IDENT NO. B2647

75220721

TEXAS INSTRUMENTS, INC.
P.O. BOX 644
ATLANTA, GA 30303

PARSONS HANFORD CORPORATION
JOL DIVISION
WEST CROFT CIRCLE
SPRINGHOUSE, S.C. 29340
TELEPHONE (803) 573-7332

J.R.L. Division of Parson Deal certifies that the material used to produce the product
in this shipment, namely SILICONE/ 87519. Conforms to IT drawing and IT purchase
order requirements.

PART TITLE... ENVIRONMENTAL SEAL

QNT P/N... 74217 4

REV B

DATH SHIPPED

P/O... 300023492

J.R.L. P/N... 207218

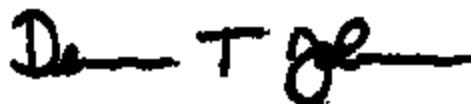
A/N... 11449-1

10-21-71

SILICONE COMPOUND... 87519

QUANTITY... 5,000

Very Truly Yours,
J.R.L. Division



DENNIS T. JOHNSON
Quality Control Manager

DTJ/MS



TI-NHTSA 7265

DEVICE # 52/57PS
PROJ. # 3355

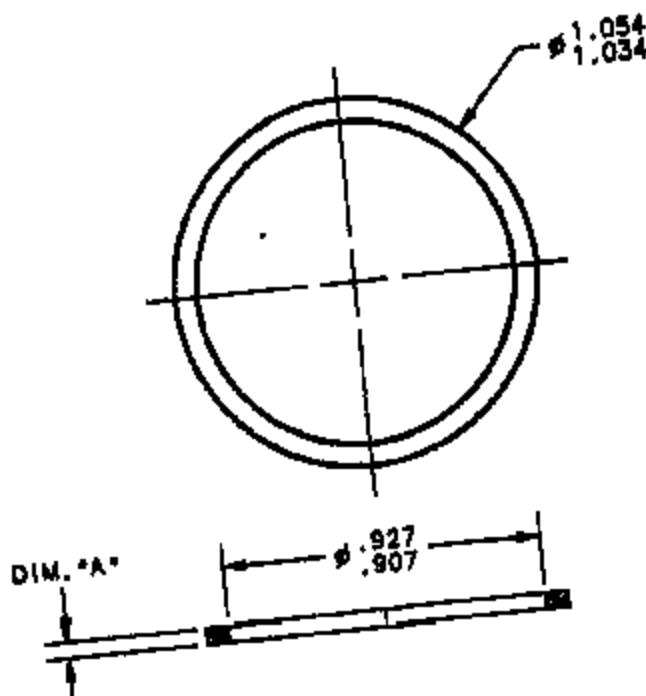
TITLE

ENVIRONMENTAL SEAL

REV
E

74247

742



NOTES:

1. MATERIAL CERTIFICATION REQUIRED WITH EACH SHIPMENT.
2. 74247-3 IS TO BE RED IN COLOR WITH 3 BLACK MARKS ON THE EXTERNAL CIRCUMFERENCE AT 120° INTERVALS.

TI-NHTSA 7267

THIS DWG. SUPERSEDES 74247 REV. "D" DATED 10-14-88

PART NO.	MATERIAL	DIAPHRAGM	COLOR	DIM.
74247-4	SILICONE JBL (T-8-D)	55 - 65	BLUE	.045-.05
74247-3	SILICONE JBL S7424-B	55 - 65	SEE NOTE 2	.045-.05
74247-2	SILICONE JBL S7424-B	55 - 65	RED	.040-.05
74247-1	BUNA N JBL N7D14-50	50 - 80	BLACK	.040-.05

1. ADD -3, -4 AND NOTE 2.
2. RED DIM. "A" TO TABLE.
E 100007, 10-1-91 CM

REV
TON DAIL 8-19-91



TEXAS INSTRUMENTS
ATLANTA, GEORGIA 30303

BLON
CONTR. PRODUCTS
DIVISION

REV
A

74247

752-6042

TEXAS INSTRUMENTS, INC.
BUILDING 11-16
34 FORREST STREET
ATLANTA, GA 30303

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

J.B.L. Division of Parker Seal certifies that the material used to produce the product
in this shipment, namely SILICONE/ 57424. Conforms to TI drawing and TI purchase
order requirements.

PART TITLE... ENVIRONMENTAL SEAL

CUST P/N... 74247 2

J.B.L. P/N... 000425

SILICONE COMPOUND... 57424

submitted / original pkg

REV D

DATE SHIPPED

6-28-91

P/O... 500023131

B/N... 16374

QUANTITY... 14,700

*REPLACED
with
BLUE - 4 SEAL*

Very Truly Yours,
J.B.L. Division

Dennis T. Johnson

DENNIS T. JOHNSON
Quality Control Manager

022/MS

Dig

TI-NHTSA 7268

752-8042

TEXAS INSTRUMENTS, INC.
BUILDING 11-16
34 FORREST STREET
ATLANTHA, GA 30263

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

J.B.L. Division of Parker Seal certifies that the material used to produce the product in this shipment, namely SILICONE/ 57424. Conforms to TI drawing and TI purchase order requirements.

PART TITLE... ENVIRONMENTAL SEAL

CUST P/N... 74347 2 REV D

DATE SHIPPED

P/O... 500023131

J.B.L. P/N... 06042S

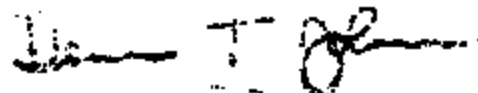
6-26-91

B/N... 17108

SILICONE COMPOUND... 57424

QUANTITY... 23550

Very Truly Yours,
J.B.L. Division



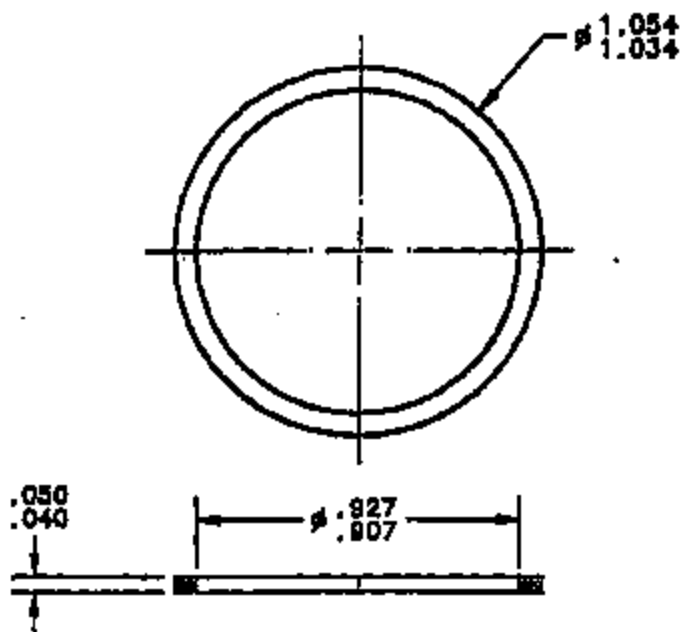
DENNIS T. JOHNSON
Quality Control Manager

DJJ/MS

078

TI-NHTSA 7269

74247



CERTIFIED PRINT
Parts Made To This Print Must Conform To

ENG. STD. E9898 REV. E

Date JUL 1 1991

NEITHER THIS PRINT NOR THE INFORMATION CONTAINED THEREIN IS TO BE USED AGAINST THE INTERESTS OF THE UNITED STATES GOVERNMENT OR AGAINST THE INTERESTS OF ANY OF ITS AFFILIATED COMPANIES OR SUBSIDIARIES.

1. MATERIAL CERTIFICATION REQUIRED WITH EACH SHIPMENT.

TI-NHTSA 7270

THIS DWD. SUPERSEDES 74247 REV. "C" DATED 9-20-55

74247-2	SILICONE JBL S7424-6	55 - 65	RED
74247-1	BUNA N JBL N7014-50	50 - 60	BLACK
PART NO.	MATERIAL	DUROMETER	COLOR

113

BT TCM DAIL 10-14-68

СН.

L.G. McKenna 11-10-88

WHERE



TEXAS INSTRUMENTS

ATTLEBORO, MASSACHUSETTS 02703

KIXON

CONTROL PRODUCTS DIVISION

546

TYPE

△

—

QWEN, MD.

74247

החברות המצטרפות הן:



PLASTIC FABRICATORS DIVISION
155 NO. MAIN STREET FRANKLIN, N.H. 03235
603-334-3770

CERTIFICATE OF CONFORMANCE

TO: TEXAS INSTRUMENTS

DATE: JUN 3 1991

ATT: QUALITY CONTROL SUP.

THIS CERTIFIES THAT:

SHIPMENT # 159462

PART # 73958-1 REVISION G

QUANTITY 172.000

MAT'L DESC. KAPTON H.R.

IS IN CONFORMANCE WITH THE REQUIREMENTS, SPECIFICATIONS, AND DRAWINGS
ON YOUR ORDER # 904163700000

BY: INSULFAB PLASTICS
FRANKLIN, NH 03235

Fred Vignone
QUALITY CONTROL MANAGER

TI-NHTSA 7271

HAARLITE
MELAMINES
SILICONES
FIBRES

TEFLON

DISTRIBUTORS AND FABRICATORS OF

NYLON
FIBRE

PEL-F

THOM

PLEXIGLAS

ALCOITE

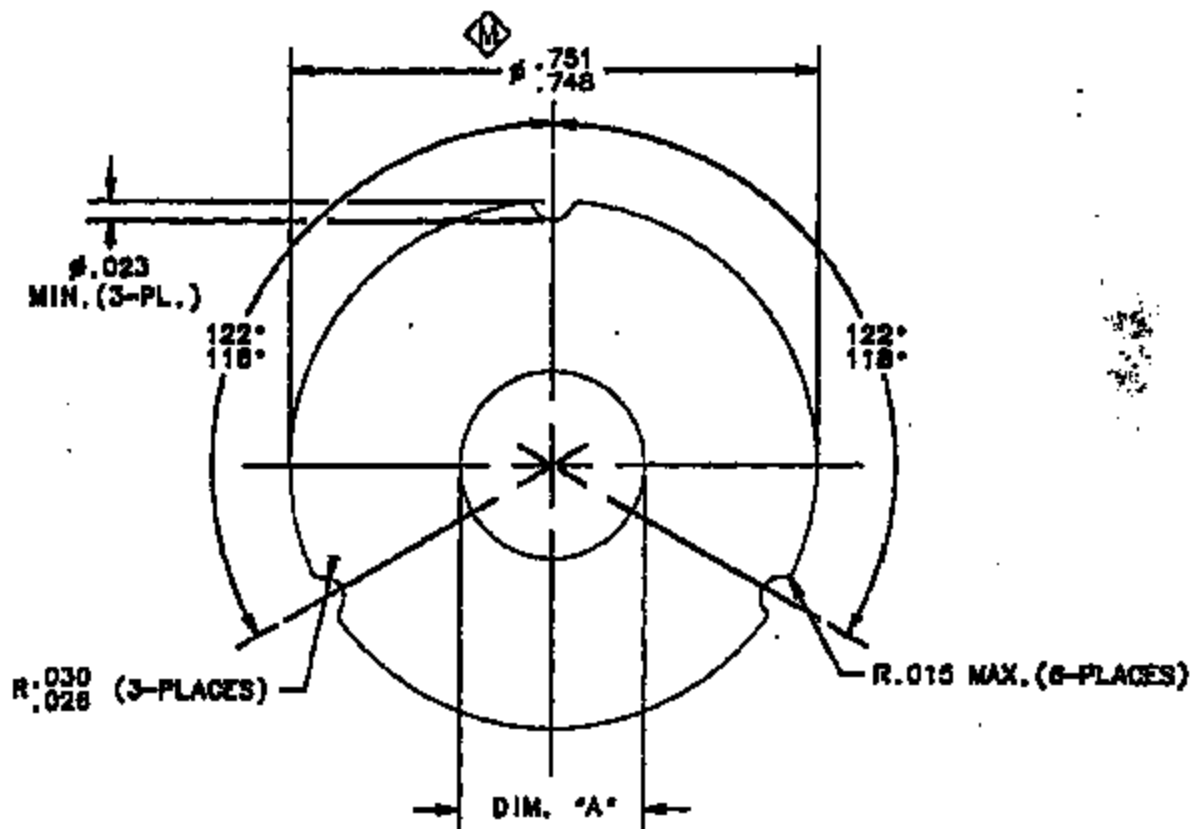
POLYSTYRENE

POLYETHYLENE

SPACER

REV.
G

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.
3. MATERIAL CERTIFICATION REQUIRED WITH EACH LOT.

ENG. STD. E9898 REV. E

Date JUL 1 1991

REVIEW THIS PRINT FOR THE INFORMATION CONTAINED HEREIN IS TO BE USED AS A GUIDE ONLY. IT DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE OF ANY KIND. THE USER ASSUMES ALL LIABILITY FOR THE USE OF THIS INFORMATION IN ANY MANNER.

73958-3	MADE FROM 74224-1 (KAPTON TAPE)	NO HOLE
73958-2	DUPONTS, KAPTON 200H, .0017 - .0023 THICK	NO HOLE
73958-1	KAPTON .0017 - .0023 THICK	.280/.270
PART NO.	MATERIAL	DIM "A"

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

BY TOM DALL 10-10-88

CH.

ENG. *John Hornol* 10/15/90

MAKEPEACE



TEXAS INSTRUMENTS

ATTLEBORO, MASSACHUSETTS 01943

CONTROL PRODUCTS
DIVISIONDWG.
NO.
A

DWG. NO.

73958

CODE IDENT NO. 82447

TI-NHTSA 7272

74224

TITLE

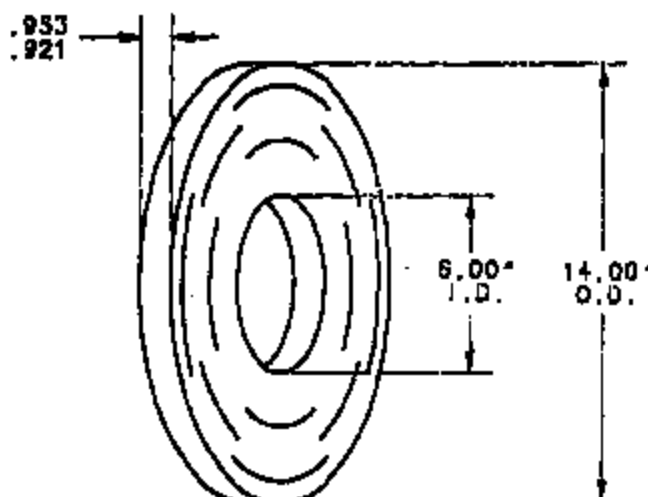
KAPTON TAPE

REV.
F

74224

NOTES:

1. ROLLS SLITTED FROM ENDS OF MASTER COIL NOT ACCEPTABLE.
2. BUCKLING OF THE CORE ALLOWED UP TO 1/4" MEASURED RADially AWAY FROM THE CORE.
3. DENTS, RIPS, OR JAGGED EDGES ON MATERIAL NOT ALLOWED.
4. ROLLS ARE TO BE SHIPPED WITH PROTECTIVE INSERT CORES IN THE PACKING BOX.



74224-1	DUPONTS, KAPTON 200H	.0017/.0023	TI-NHTSA 7273
PART NUMBER	MATERIAL	THICKNESS	

THIS DWG. SUPERSEDES 74224 REV. 'E' DATED 10-14-88

BY TOM DALL 10-14-88	 TEXAS INSTRUMENTS ATTLEBORO, MASSACHUSETTS 01903	KILKON CONTROL PRODUCTS DIVISION	DWG. SIZE A	74224
CH.				
ENG. <i>Attenuated</i> 10-16-90				

MARSPEACE

CONT. INVENTORY No. 49247

VALENTINE TOOL & STAMPING, INC.

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

MATERIAL CERTIFICATION

DATE : TUESDAY APRIL 30, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 5050537-5

SUPPLIER INVOICE NO. : 18319

PART DESCRIPTION : 74797-1 ORIGIN RING REV.8

SUPPLIER P.O. NO. : 18579

QUANTITY SHIPPED : 20,445

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

Jeanne Leflamme
(Supplier Representative)

JEANNE LAFLEMMES Quality Control Manager

TI-NHTSA 7274

VALENTINE TOOL & STAMPING, INC.

111 WEST MAIN ST. DUNSTON, MASS. 02756
(508) 295-6811 226-0040

CERTIFICATE OF CONFORMANCE

DATE : TUESDAY APRIL 30, 1991

CUSTOMER : TEXAS INSTRUMENTS INC

CUSTOMER P.O. NO : 505563716

SUPPLIER INVOICE NO.: 19319

PART DESCRIPTION : 74747-1 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 Lafamme
Jeanne Lafamme
Quality Control Manager

TI-NHTSA 7275

UNITED ALUMINUM CORPORATION

100 UNITED DRIVE • NORTH HAVEN, CONNECTICUT 06473 • (203) 338-8881



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/BF 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	28.9 KSI
ELONGATION IN 2"	20%

.032

2.312

5052-0

UNITED ALUMINUM CORPORATION

TI-NHTSA 7276

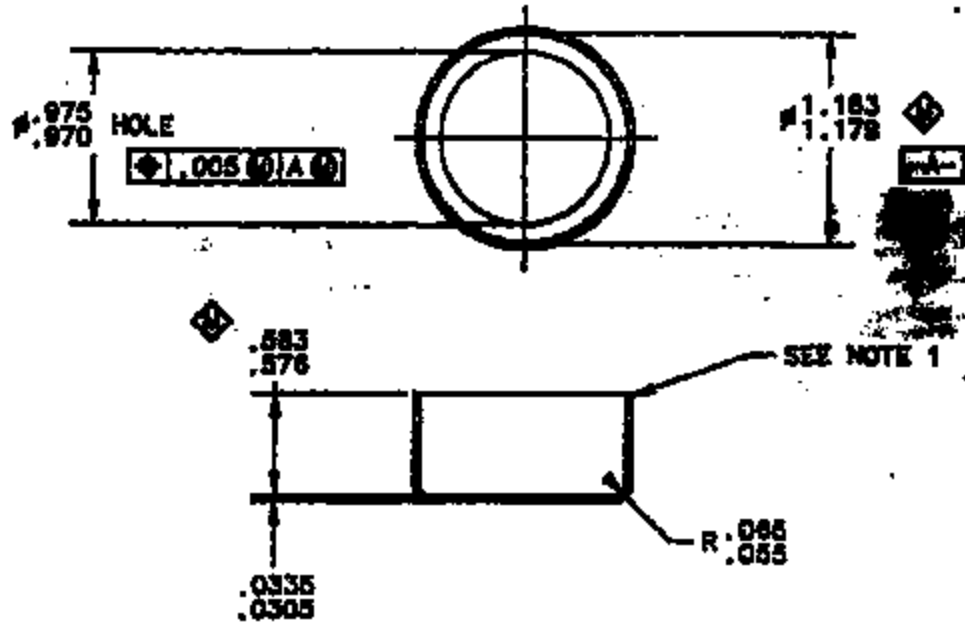
74797

TITLE

CRIMP RING

REV.
B

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.



SUPERSEDES DNG. 74797 REV. A DATED 11-2-80

TI-NHTSA 7277

74797-1	ALUMINUM 5052	
PART NO.	MATERIAL	FINISH

BY CH. <i>[Signature]</i> 11-2-80	TEXAS INSTRUMENTS ATTLEBORO, MASSACHUSETTS 01903	KIDSON CENTRAL PROCESSING DIVISION	QWA. SIZE A	QWA. NO. 74797
ENG. <i>[Signature]</i> 1-30-71			QWA. NO. 1013	QWA. NO. 1014

Cap

CERTIFICATE OF CONFORMANCE

TO: TEXAS INSTRUMENTS
ATTLEBORO, MASSACHUSETTS

PURCHASE ORDER NUMBER: 500023184

CUSTOMER PART NUMBER: 74179-2

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

OUR JOB NUMBER: 163505-1

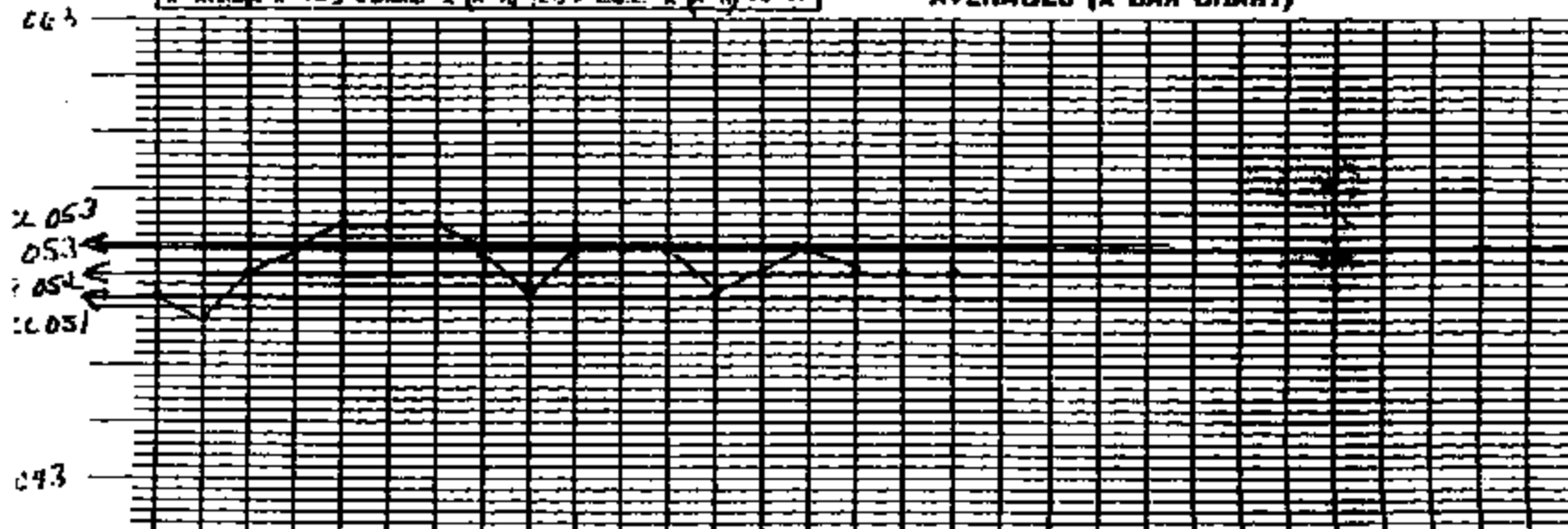
The supplier hereby certifies that adequate data is on file showing that all components and materials used in the article furnished comply with the physical and chemical properties required by our firm.

Roger J. Bankus 5-31-91
Roger J. Bankus
Quality Assurance Manager

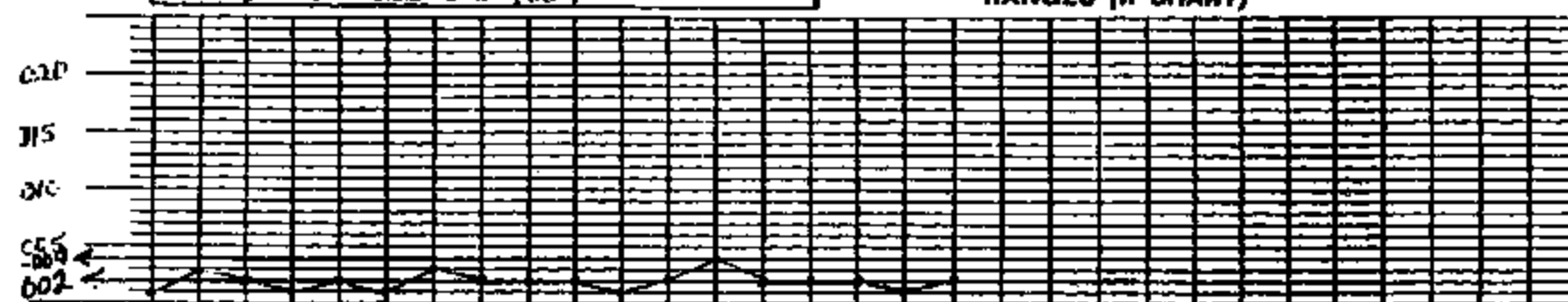
TI-NHTSA 7278

MOLD SIZE	3 S-CAP	TOOL #	2001	CHARACTERISTIC	WIRE THICKNESS	DATE	5-30-71	MACHINE	8
						SPEC	.053 ± .010		

$\bar{x}$ - Average $\bar{x}$ = .052 U.C.L. = $\bar{x} + (A \cdot \bar{R})$.053 L.C.L. = $\bar{x} - (A \cdot \bar{R})$.051 74179-1 AVERAGES (X BAR CHART)



$\bar{R}$ - Average $\bar{R}$ = .002 U.C.L. = $D_4 \cdot \bar{R}$.004 RANGES (R CHART)



DIP #	1	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300
1	51	50	51	53	53	54	54	54	54	54	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53
2	51	50	53	54	55	54	54	53	51	53	52	52	52	51	52	53	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
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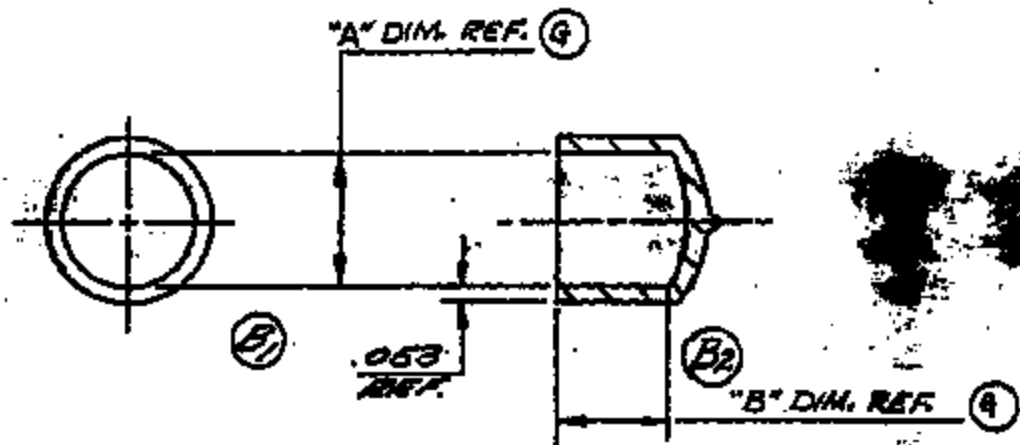
TI-NHTSA 7279

CP
- F
CFR
En
XL
0
A²
D⁴
A²

74.79

THREAD CAP

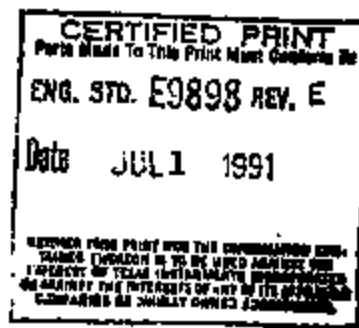
74179



NOTE:

1) IDENTIFICATION MEMO MUST ACCOMPANY EACH SHIPMENT STATING THE FOLLOWING:
SINCLAIR RUSH # SC 0.343-6 (A/B) TK 701-1R

(H)



TI-NHTSA 7280

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

BY: *Tom Dill* 2/3/84
CH: *K.H. Wilson* 2/13/84
ENG: *D. Smith* 2/13/84

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

KUDON
CAUTION: PROPERLY
STORAGE

Q13-1 Q1-1 M21-1
P37-1 P35-1
A 74179