

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVAL
—	RELEASED	3/16/92	<i>[Signature]</i>

**SHEET REVISION STATUS**

SH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SH	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

ORIGINATOR <i>T.J. Perry</i> T.J. Perry/Paramax	DATE 3/6/92	FSC: 5935
APPROVED <i>[Signature]</i> S.E. Archer-Davies/Paramax	3/6/92	Backshell Kits, Connector Rectangular, EMI Shielding, Strain Relief (Sizes 1, 2, and 3) For Space Flight Use, Detail Specification For
CODE 311 APPROVAL S.A. Naus/GSFC <i>[Signature]</i>	3/9/92	
CODE 311 SUPERVISORY APVL G.P. Kramer, Jr./GSFC <i>[Signature]</i>	3/16/92	
ADDITIONAL APPROVAL		
		S-311-P-718/4

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
 GODDARD SPACE FLIGHT CENTER  
 GREENBELT, MARYLAND 20771

CAGE CODE: 25306 PAGE 1 OF 38

## 1. SCOPE

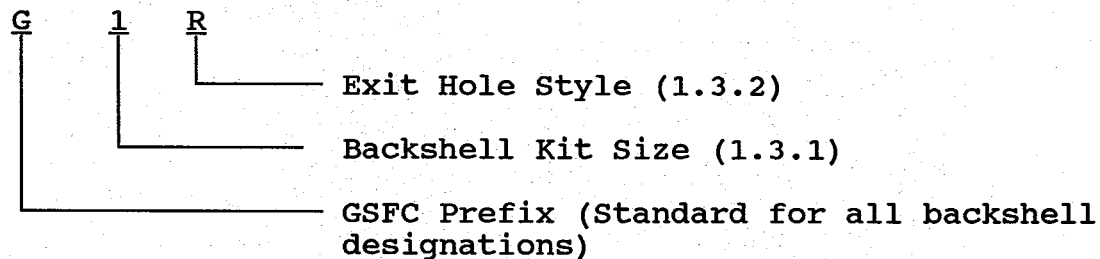
1.1 Purpose. This specification covers the detail provisions for connector backshell kits with strain relief capabilities, and for the suppression of radio frequency and electromagnetic interference. They are not intended to provide waterproofing and environmental sealing. The backshells covered by this specification are intended for use with electrical connectors covered by GSFC specifications delineated in Table 1.

Table 1. Backshell - connector compatibility.

Backshell Size	Exit Hole Style		Figure	Compatible Specification (GSFC)
	Square	Round		
1	S	R	1	S-311-P-718/3
2	--	R	2	S-311-P-718/5
3	--	R	3	S-311-P-718/6

1.2 General specification. Unless otherwise noted, all connector provisions and requirements of GSFC general specification S-311-P-718 and detail specifications S-311-P-718/3, S-311-P-718/5 and S-311-P-718/6 apply to this specification.

1.3 Backshell - type designations. Backshells shall be of the following type designations, and shall be ordered by their type designations only.



1.3.1 Backshell kit size. Select backshell kit size from Table 1.

1.3.2 Exit hole style. Select exit hole style from Table 1 (S for square, R for round).

## 2.0 APPLICABLE DOCUMENTS

The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

### 2.1 Specifications.

#### 2.1.1 Federal.

QQ-A-200 Aluminum Alloy, Bar, Rod, Shapes, Structural Shapes, Tube and Wire, Extruded, General Specification for

QQ-A-250 Aluminum and Aluminum Alloy Plate and Sheet, General Specification for

#### 2.1.2 Military.

MIL-A-21180 Aluminum Castings, High Strength

MIL-C-26074 Coatings, Electroless Nickel, Requirements for

MIL-S-5002 Surface Treatments and Inorganic Coatings for Metal Surfaces of Weapons Systems.

#### 2.1.3 NASA/Goddard.

GSFC S-311-P-718 Connectors, Electrical, Rectangular, (Power and Coaxial Contacts) (Including EMI Shielding) for Space Flight Use, Detail Specification for

GSFC S-311-P-718/3 Connectors, Electrical, Rectangular, Polarized Shell, EMI Shielding, (Size 1), for Space Flight Use, Detail Specification for

GSFC S-311-P-718/5 Connectors, Electrical, Rectangular, Polarized Shell, EMI Shielding, (Size 2), for Space Flight Use, Detail Specification for

GSFC S-311-P-718/6      Connectors, Electrical, Rectangular,  
Polarized Shell, EMI Shielding  
(Size 3), for Space Flight Use,  
Detail Specification for

2.2 Standards.

MS16995	Screw, Cap, Socket Head-Hexagon, Corrosion Resisting Steel, UNC-3A.
DOD-STD-100	Engineering Drawing Practices
MIL-STD-130	Marking of U.S. Government Property
MS35275	Screw, Machine-Drilled, Fillister Head, Slotted, Corrosion Resisting Steel, Passivated UNC-2A
MS35338	Washer, Lock-Spring, Helical, Regular (Medium) Series

2.3 Other publications.

NAS1922	Clamp, Hose
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2.4 Order of precedence. The order of precedence delineated in the general specification, S-311-P-718 shall apply.

3.0 REQUIREMENTS (1.2)

3.1 Materials, designs and construction. Backshells and their associated integral parts shall be of the materials, design, construction, platings, and physical dimensions as specified herein. (Figures 1 through 20) (Reference: Finishes not specified, which are known to sublime in a hard vacuum, such as cadmium, shall not be used.)

3.1.1 Material weight loss (vacuum). All backshell constituent parts used shall be such that in no case will outgassing limits of 3.1.4 be exceeded when tested in accordance with GSFC S-311-P-718.

3.1.2 Materials. Materials shall be suitable for the purpose intended and as specified (see 3.1), however, when a definite material is not specified, a material shall be used which will enable the backshells to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guarantee for acceptance of the finished product.

3.1.3 Backshell weight. The maximum weight of each backshell kit shall be in accordance with Figures 1, 11 and 16.

3.1.4 Vacuum effects (materials outgassing). The material outgassing limits of all materials used shall not exceed 1.0 percent in total weight loss and 0.1 percent in volatile-condensable material.

3.2 Identification marking. Each backshell housing (kit) shall be permanently and legibly marked per MIL-STD-130 with the backshell type designation and date-lot identification. Constituent kit parts need not be marked with the GSFC identifier, e.g. S-311-P-718/4-1.

3.3 Performance.

3.3.1 EMI effectiveness. The EMI effectiveness provisions of GSFC S-311-P-718 apply.

4.0 QUALITY ASSURANCE PROVISIONS (1.2)

4.1 Final inspection. Each backshell kit (and constituent piece part) shall be:

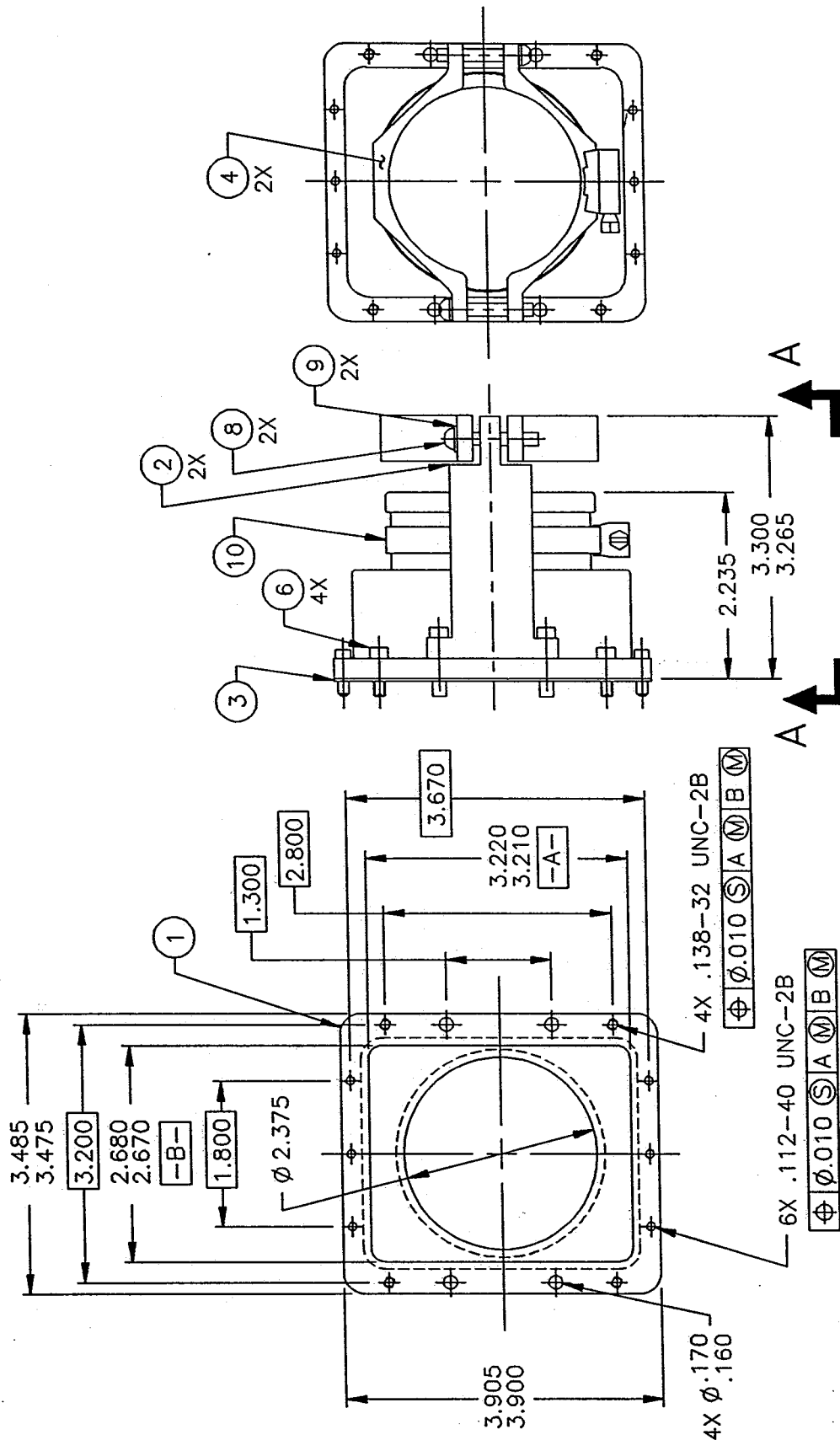
- a. 100% inspected per the workmanship provisions of the general specification, GSFC S-311-P-718
- b. checked for critical dimensions (per applicable figure)

5.0 PREPARATION FOR DELIVERY (1.2)

6.0 NOTES (1.2)

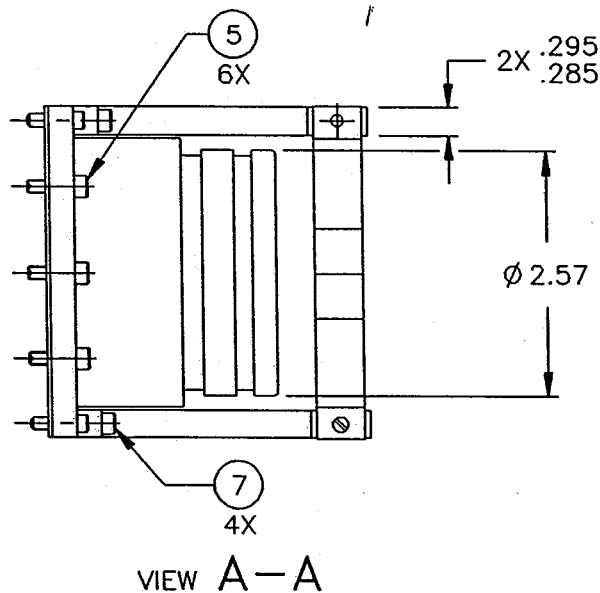
Custodian:

Code 408  
Goddard Space Flight Center  
Greenbelt, MD 20771



GIR

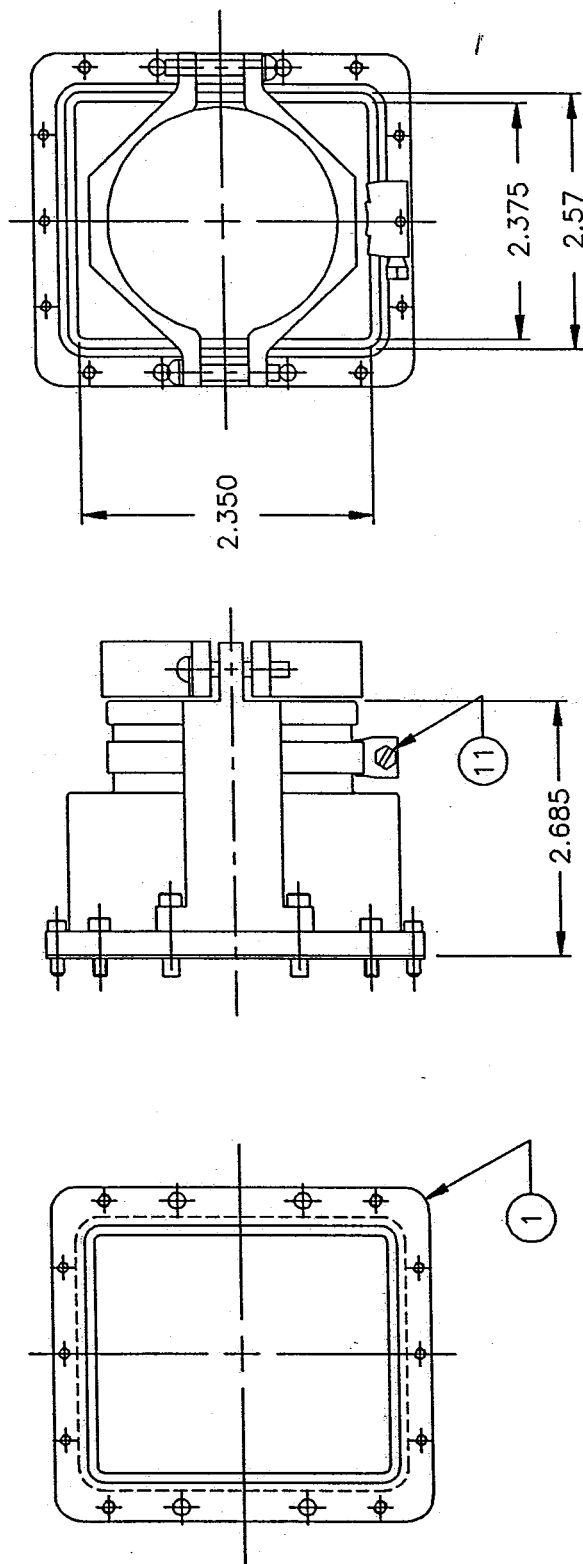
FIGURE 1 -- BACKSHELL KIT (SIZE 1) (GIR AND GIS)  
(PAGE 1 OF 4)



## NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.
2. THESE BACKSHELL KITS ARE DESIGNED TO FUNCTION IN CONJUNCTION WITH GSFC NUMBER S-311-P-718/3 CONNECTOR.
3. FN 3, EMI GASKET, IS A  $Cu/Ag$  FILLED SILICONE RUBBER ELASTOMER (CHO-SEAL 1215) PRODUCED BY CHOMERICS INC., (CAGE CODE 18565).
4. SHIELD TERMINATION CLAMPS SUPPLIED TO BE USED IN CONJUNCTION WITH A CONDUCTIVE EPOXY OR SOLDER. ALTERNATE TERMINATION METHODS SUCH AS "MAGNEFORMING", "HEAT SHRINKABLE" RINGS AND CALIBRATED BANDING SYSTEMS MAY ALSO BE USED. BACKSHELL USERS TO SELECT TERMINATION METHOD.
5. WHEN INSTALLING BACKSHELL TO CONNECTOR, RECOMMENDED TORQUE RANGE FOR FN 6 AND FN 7 SCREWS IS 12-14 IN-LBS AND FOR FN 5 SCREWS IS 6-8 IN-LBS.
6. ALL COMPONENTS OF THIS KIT SHALL BE PACKAGED SEPARATELY AS LOOSE ITEMS TO BE ASSEMBLED BY USER.
7. MAXIMUM WEIGHT PER KIT: 1.2 POUNDS.

FIGURE 1 - BACKSHELL KIT (SIZE 1) (GIR AND GIS) (CONTD)  
(PAGE 2 OF 4)



GIS  
SAME AS GIR EXCEPT AS SHOWN

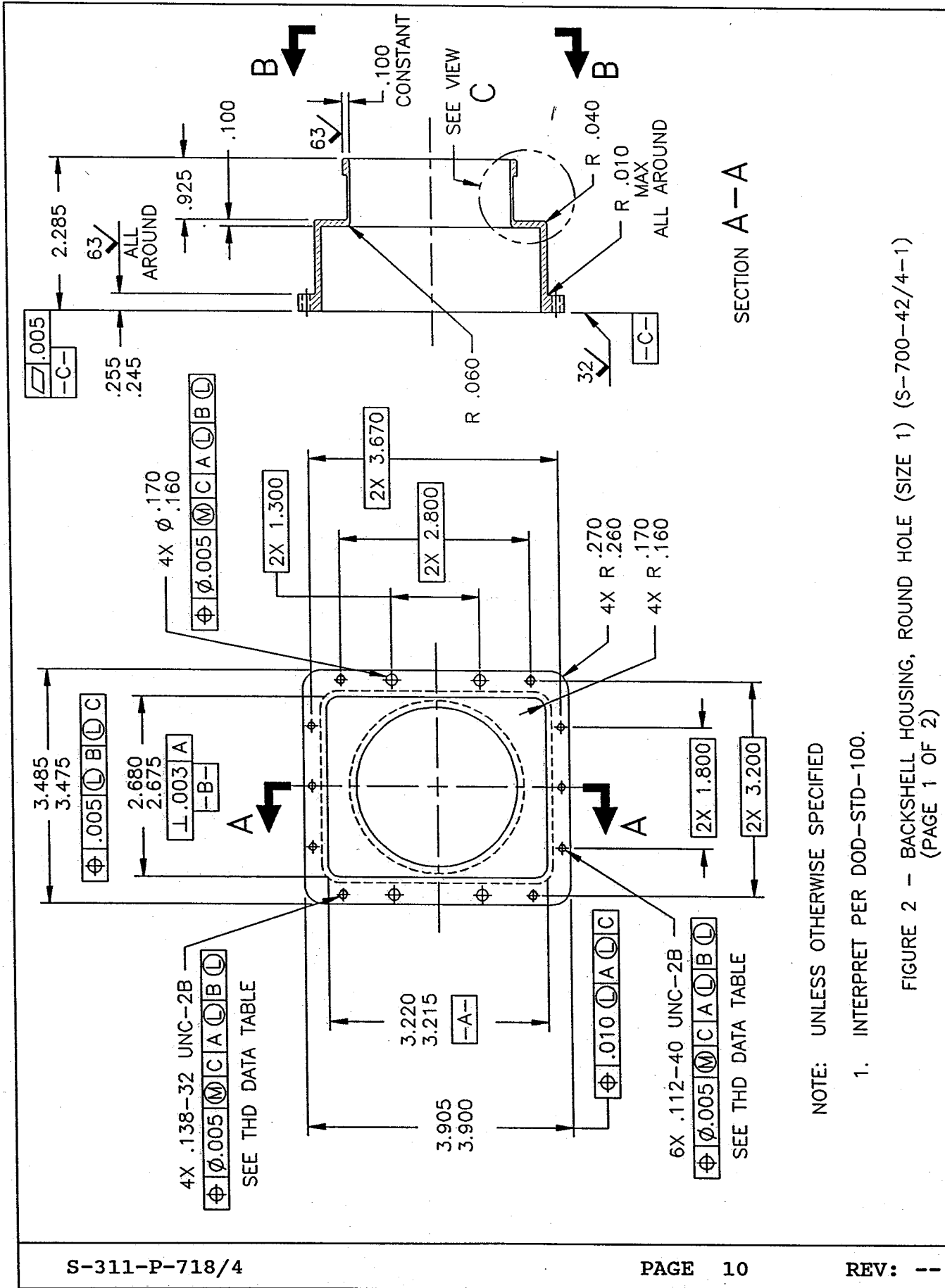
FIGURE 1 - BACKSHELL KIT (SIZE 1) (GIR AND GIS) (CONTD)  
(PAGE 3 OF 4)



## PARTS LIST

QTY PER ASSY		FIND NO.	FIG NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
GIS	GIR				
	1	1	2	S-700-42/4-1	HOUSING, BACKSHELL
1		1	3	S-700-42/4-2	HOUSING, BACKSHELL
2	2	2	4	S-700-42/4-3	BRACKET, CABLE, SUPPORT
1	1	3	5	S-700-42/4-4	GASKET, EMI
2	2	4	6	S-700-42/4-5	CLAMP, CABLE
6	6	5	7	S-700-42/4-6	SCREW, CAP, SCH
4	4	6	8	S-700-42/4-7	SCREW, CAP, SCH
4	4	7	9	S-700-42/4-8	SCREW, CAP, SCH
2	2	8		MS35275-249	SCREW, FILLISTER
2	2	9		MS35838-137	WASHER, LOCK
	1	10		NAS1922-0275-3H	CLAMP, HOSE
1		11	10	S-700-42/4-9	CLAMP, HOSE, BAND

FIGURE 1 - BACKSHELL KIT (SIZE 1) (GIR AND GIS) (CONTD)  
(PAGE 4 OF 4)

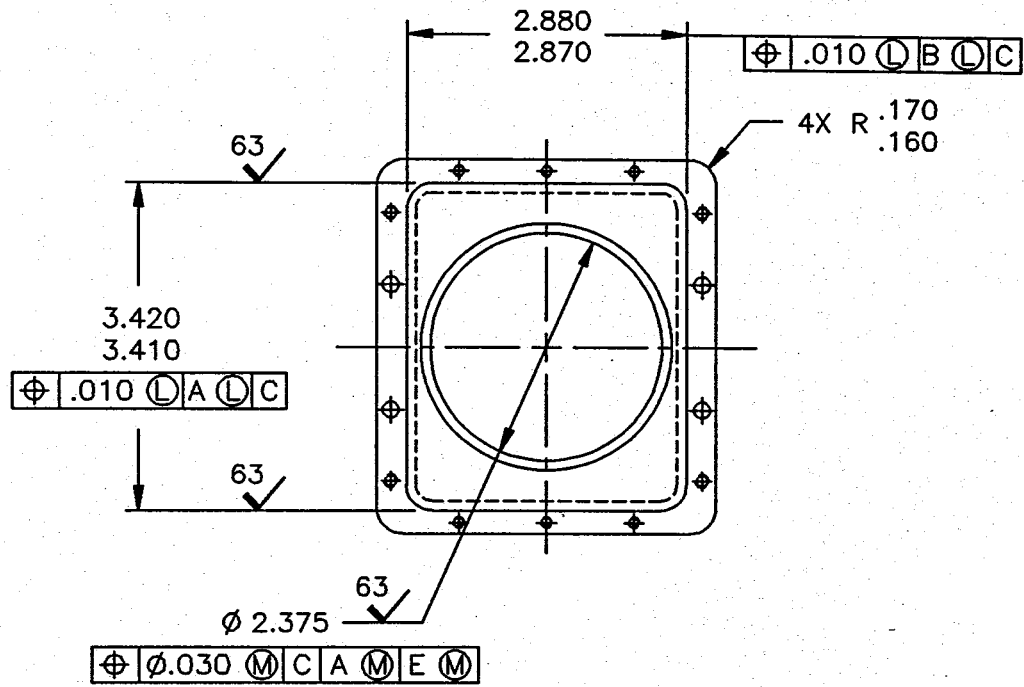


SECTION A-A

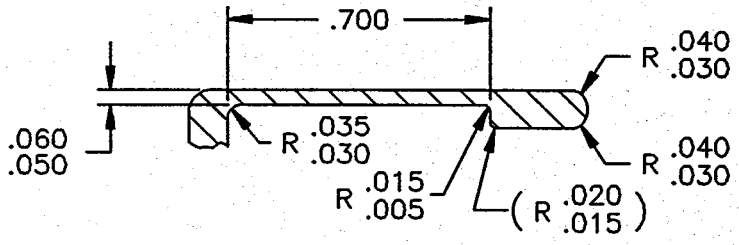
NOTE: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.

FIGURE 2 - BACKSHELL HOUSING, ROUND HOLE (SIZE 1) (S-700-42/4-1)  
(PAGE 1 OF 2)



VIEW B-B

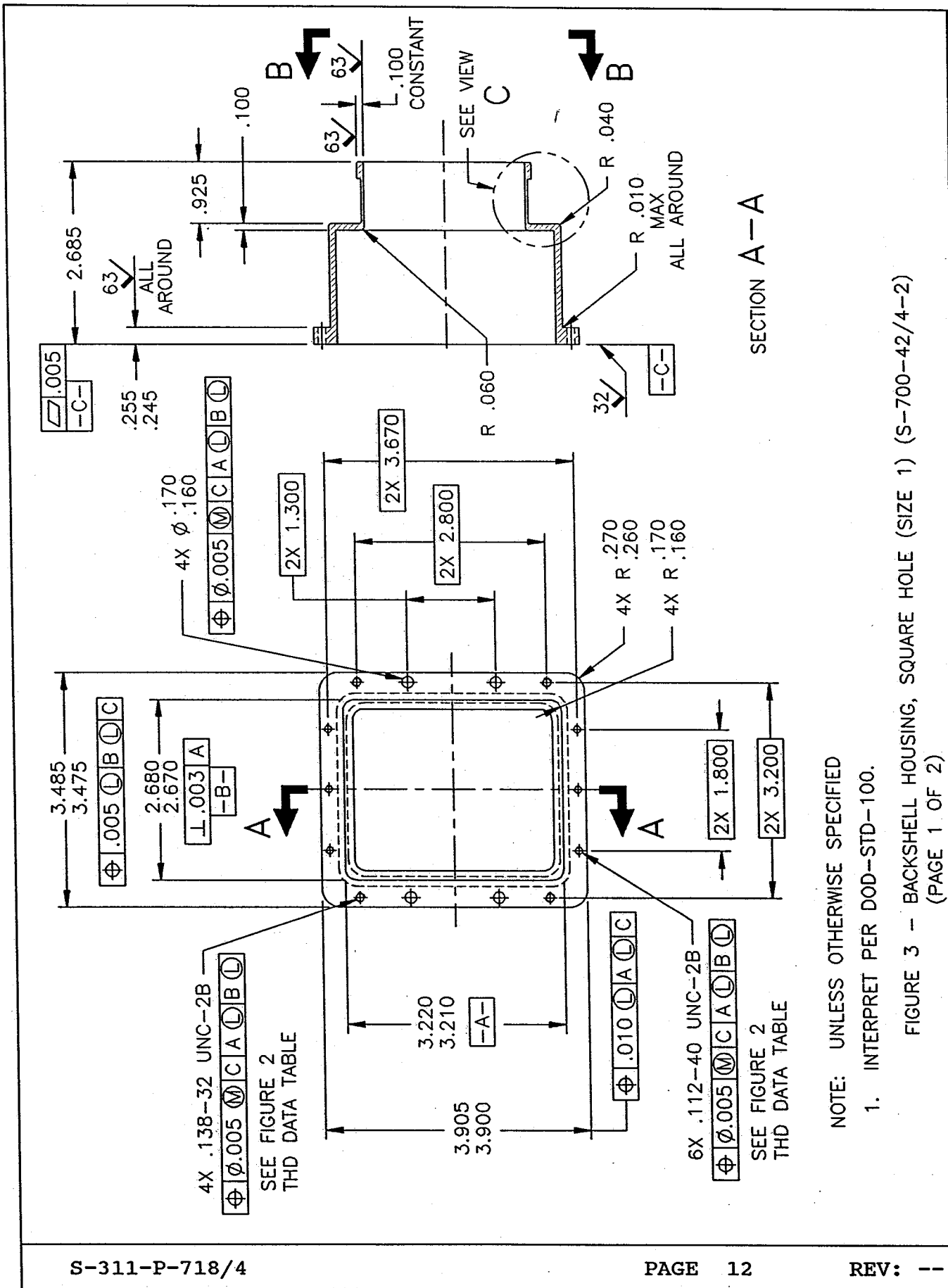


VIEW C SCALE 4/1  
CONSTANT ALL AROUND

THREAD DATA TABLE

NOMINAL THREAD SIZE AND SERIES	THREAD FORM DIAMETER	THREAD DIMENSIONS	
		BEFORE PLATING	AFTER PLATING
.138-32 UNC-2B	MAJOR	.1410 - .1487	.1380 - .1462
	PITCH	.1237 - .1264	.1177 - .1214
	MINOR	.1070 - .1165	.1040 - .1140
.112-40 UNC-2B	MAJOR	.1150 - .1214	.1120 - .1189
	PITCH	.1018 - .1041	.0958 - .0991
	MINOR	.0879 - .0964	.0849 - .0939

FIGURE 2 - BACKSHELL HOUSING, ROUND HOLE (SIZE 1)  
(S-700-42/4-1) (CONTD)  
(PAGE 2 OF 2)



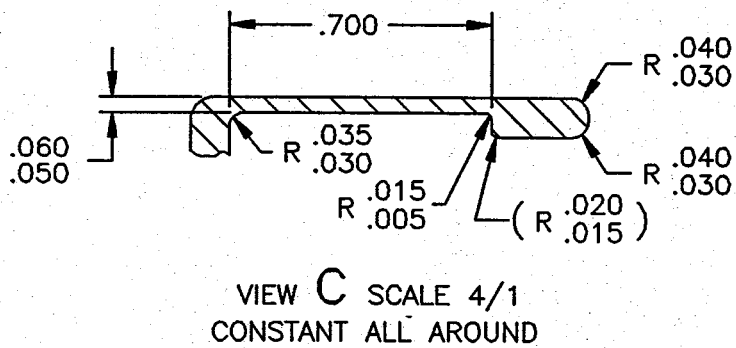
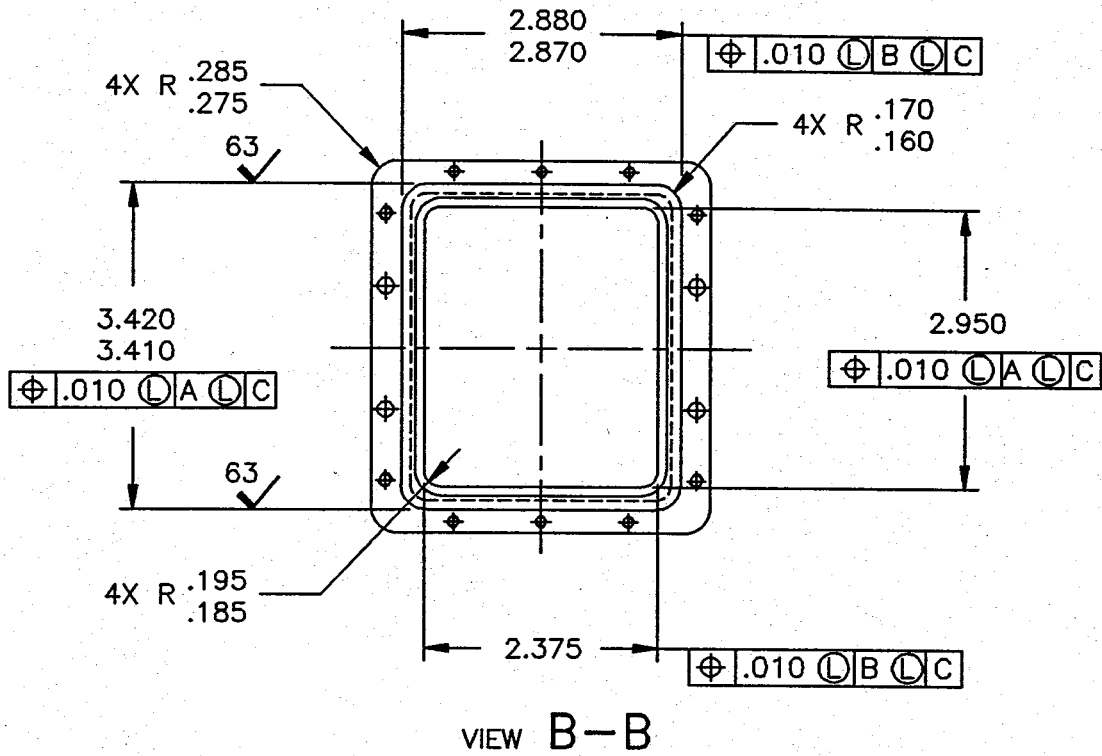
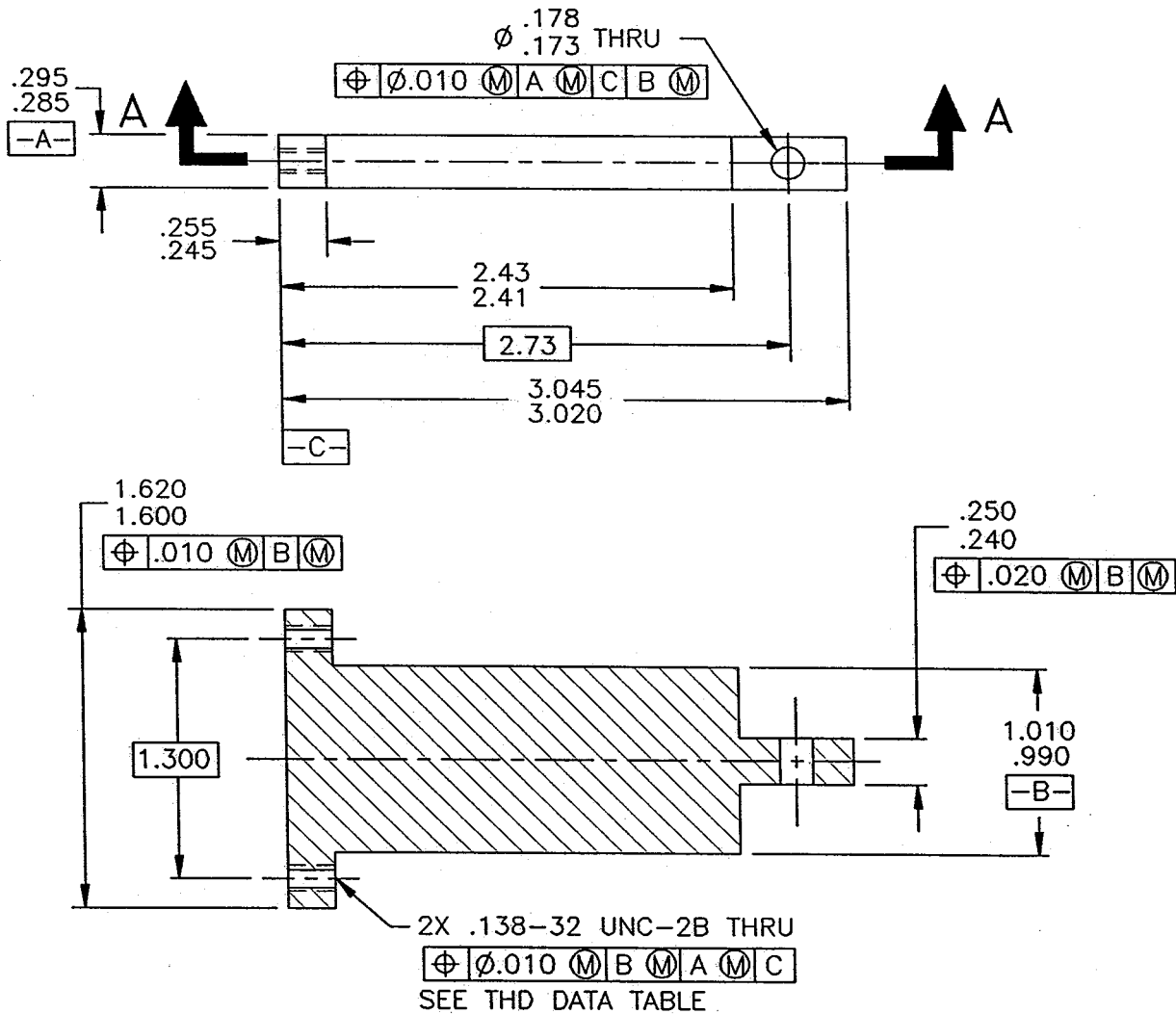


FIGURE 3 - BACKSHELL HOUSING, SQUARE HOLE (SIZE 1)  
(S-700-42/4-2) (CONTD)  
(PAGE 2 OF 2)

THREAD DATA TABLE

NOMINAL THREAD SIZE AND SERIES	THREAD FORM DIAMETER	THREAD DIMENSIONS	
		BEFORE PLATING	AFTER PLATING
.138-32 UNC-2B	MAJOR	.1410-.1487	.1380-.1462
	PITCH	.1237-.1264	.1177-.1214
	MINOR	.1070-.1165	.1040-.1140

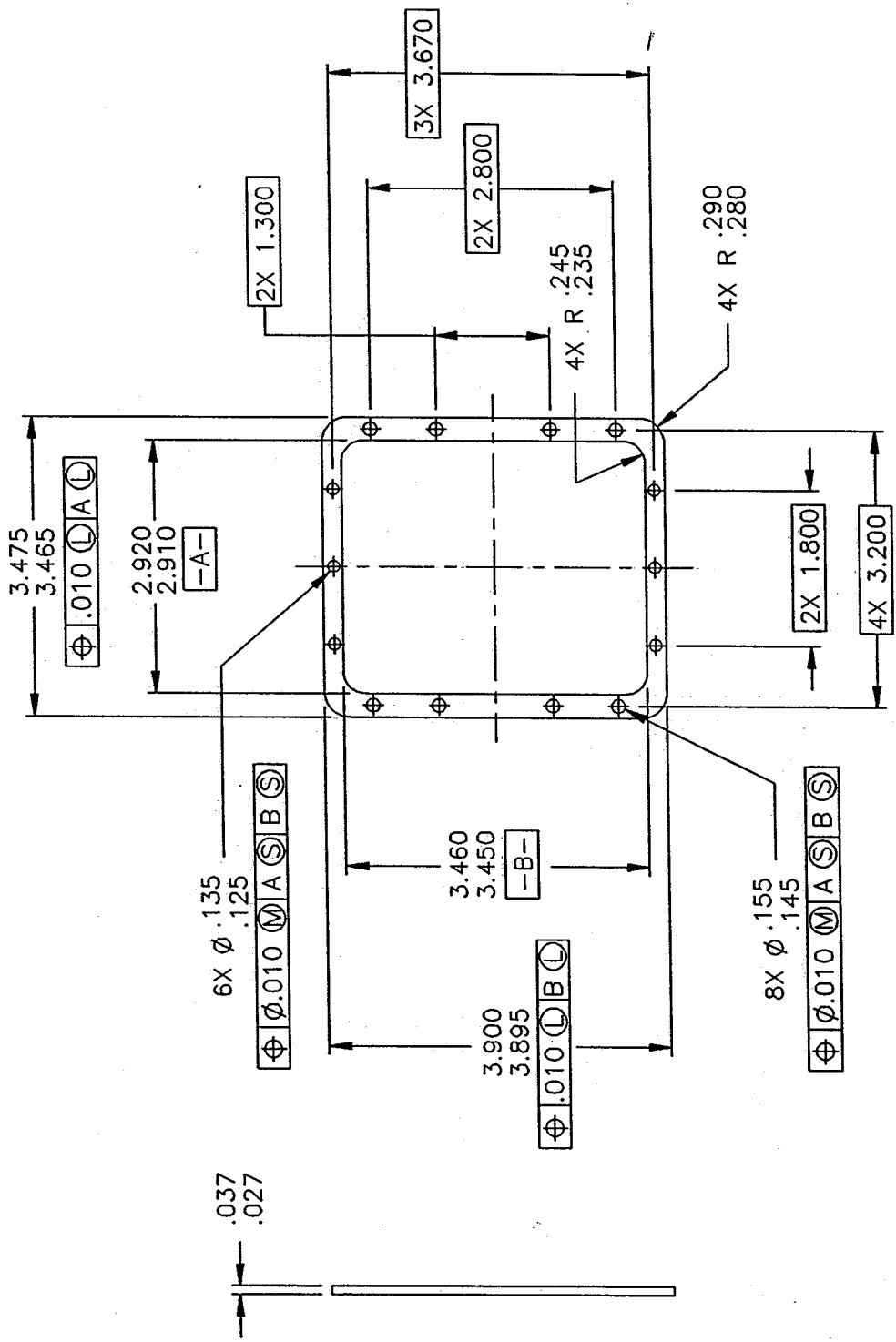


SECTION A-A

NOTE: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.

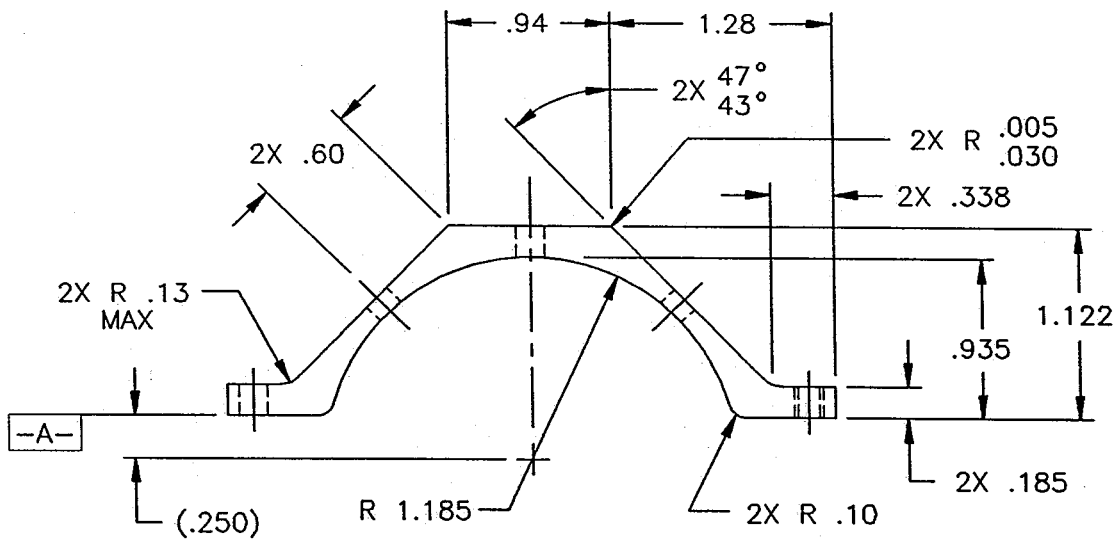
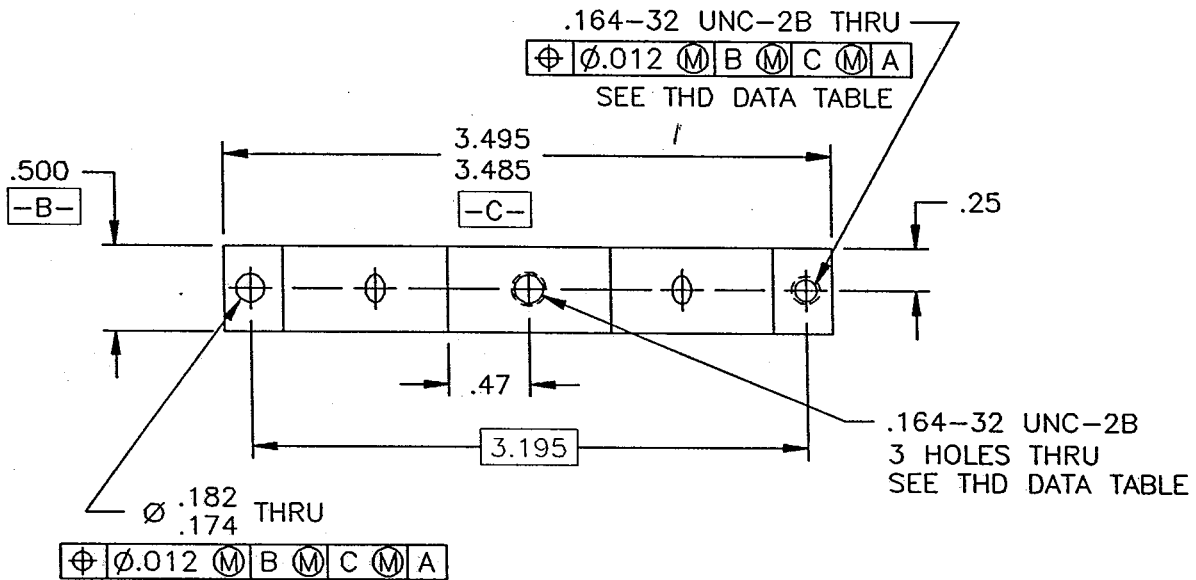
FIGURE 4 - CABLE SUPPORT BRACKET (SIZE 1) (S-700-42/4-3)



NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.
2. Cu/Ag FILLED SILICONE RUBBER, PURCHASE FROM CHOMERICS INC. (CAGE CODE 18565), PART NO. CHO-SEAL 1215 (COLOR GRAY)

FIGURE 5 - EMI GASKET (SIZE 1) (S-700-42/4-4)



THREAD DATA TABLE

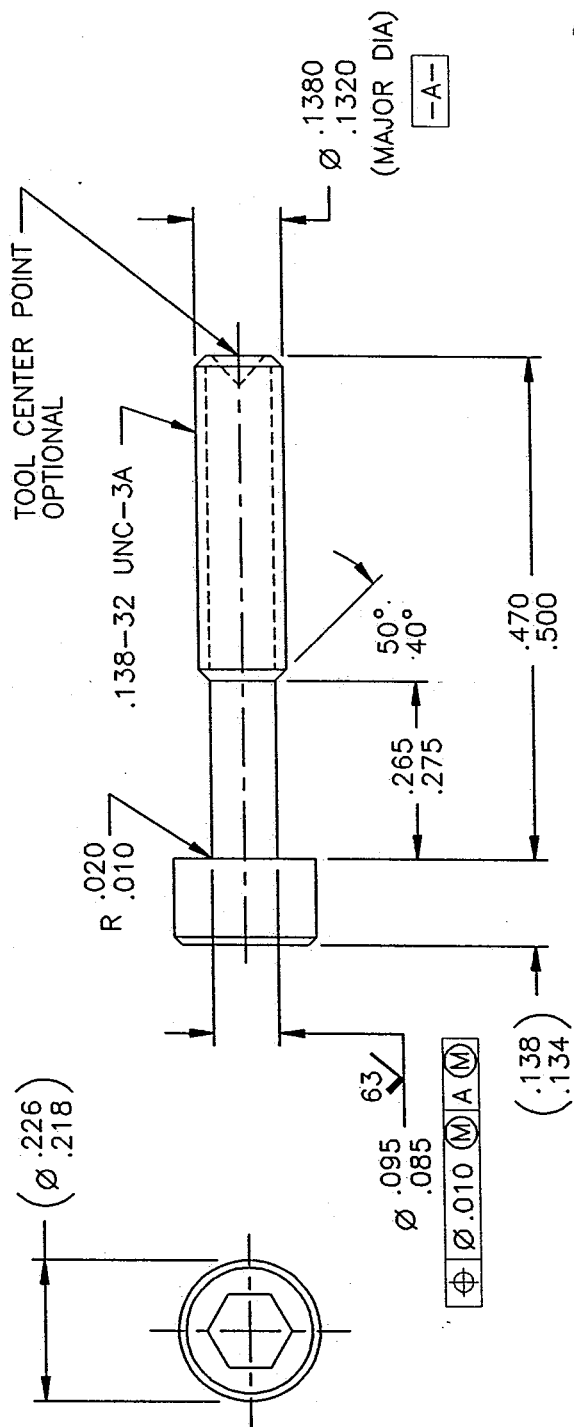
NOMINAL THREAD SIZE AND SERIES	THREAD FORM DIAMETER	THREAD DIMENSIONS	
		BEFORE PLATING	AFTER PLATING
.164-32 UNC-2B	MAJOR	.1670 - .1748	.1640 - .1723
	PITCH	.1497 - .1525	.1437 - .1475
	MINOR	.1330 - .1415	.1300 - .1390

NOTE: UNLESS OTHERWISE SPECIFIED  
 1. INTERPRET PER DOD-STD-100.

FIGURE 6 - CABLE CLAMP (SIZE 1) (S-700-42/4-5)



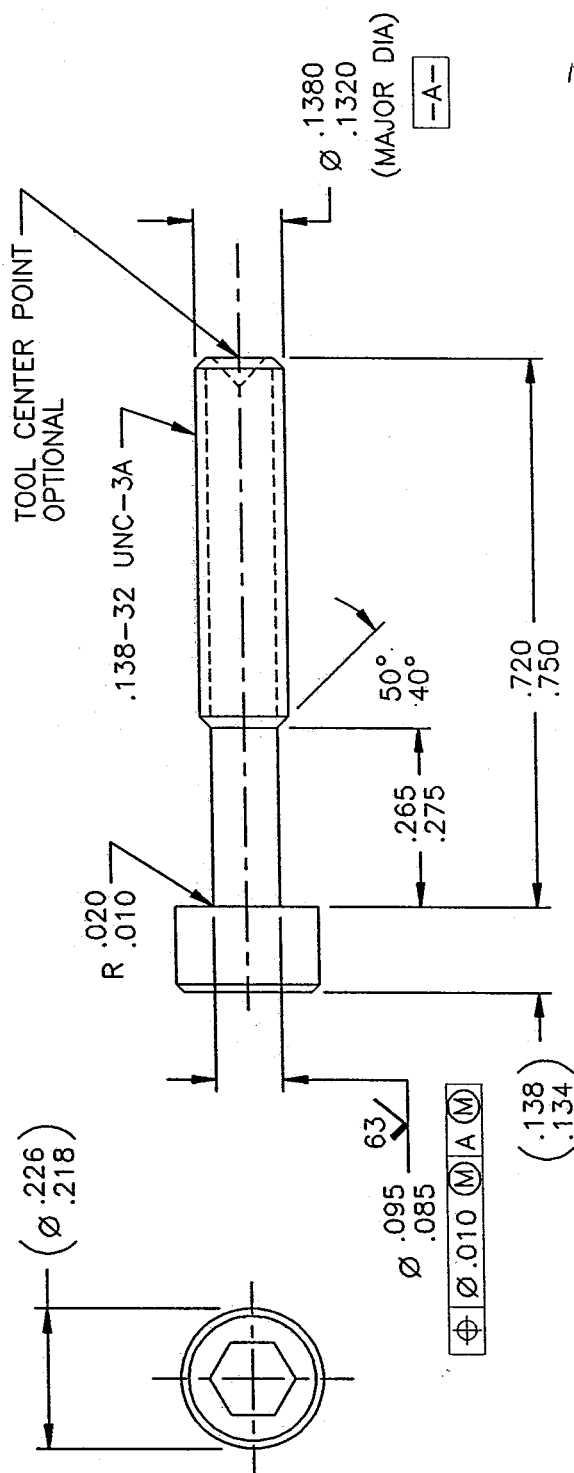




NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.
2. MAKE FROM MS16995-18.
3. AFTER MODIFICATION, PASSIVATE PER MIL-S-5002.

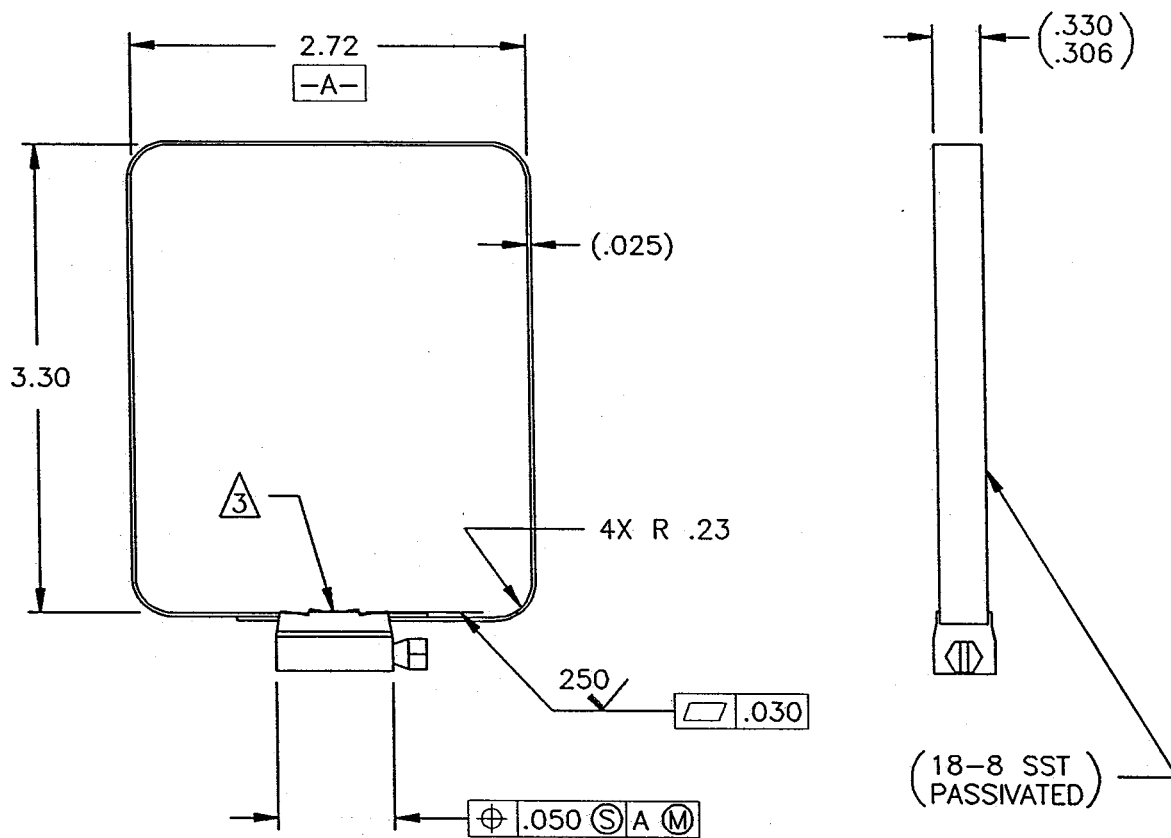
FIGURE 8 - SOCKET HEAD CAP SCREW, MODIFIED (SIZE 1) (S-700-42/4-7)



NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.
2. MAKE FROM MS16995-18.
3. AFTER MODIFICATION, PASSIVATE PER MIL-S-5002.

FIGURE 9 - SOCKET HEAD CAP SCREW, MODIFIED (SIZE 1) (S-700-42/4-8)



NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.

2. MAKE FROM NAS1922-0450-3H.

③ CLAMPS WITH CURVED SHAPE MUST BE GROUND FLAT AS SHOWN.

FIGURE 10 - CLAMP, HOSE, BAND, MODIFIED (SIZE 1) (S-700-42/4-9)

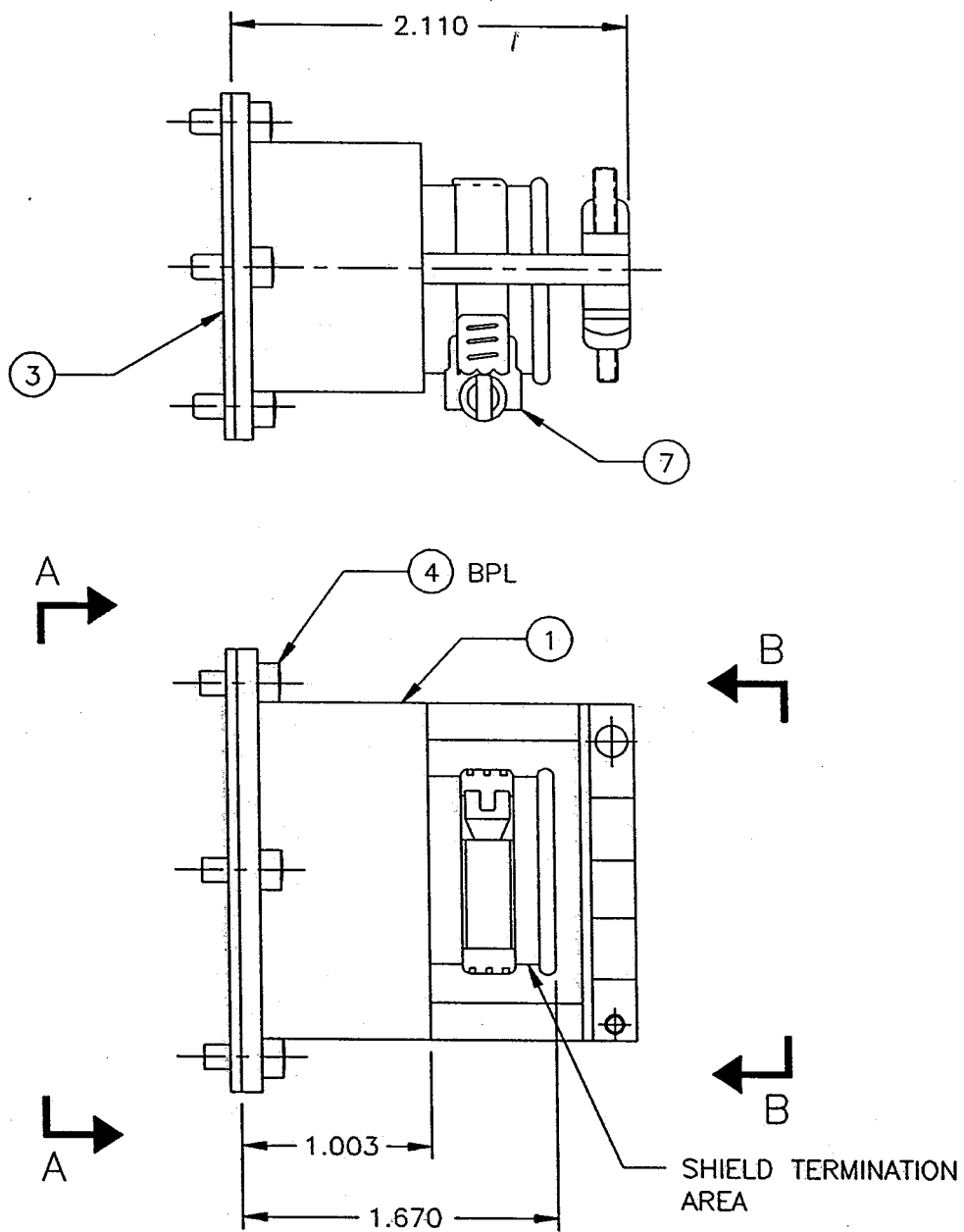


FIGURE 11 - BACKSHELL KIT, (SIZE 2) (G2R)  
(PAGE 1 OF 3)

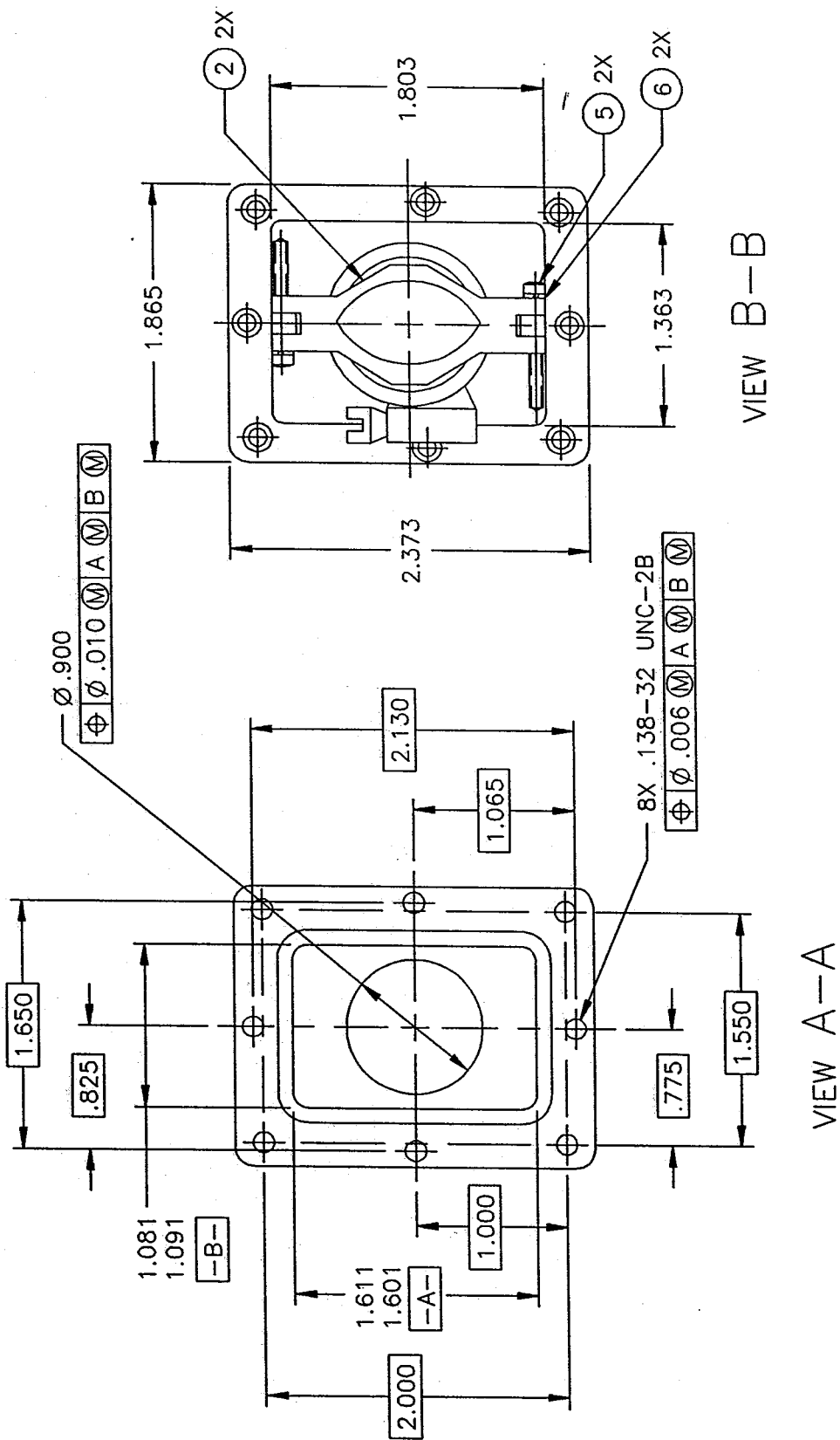


FIGURE 11 - BACKSHELL KIT, (SIZE 2) (G2R) (CONTD)  
(PAGE 2 OF 3)

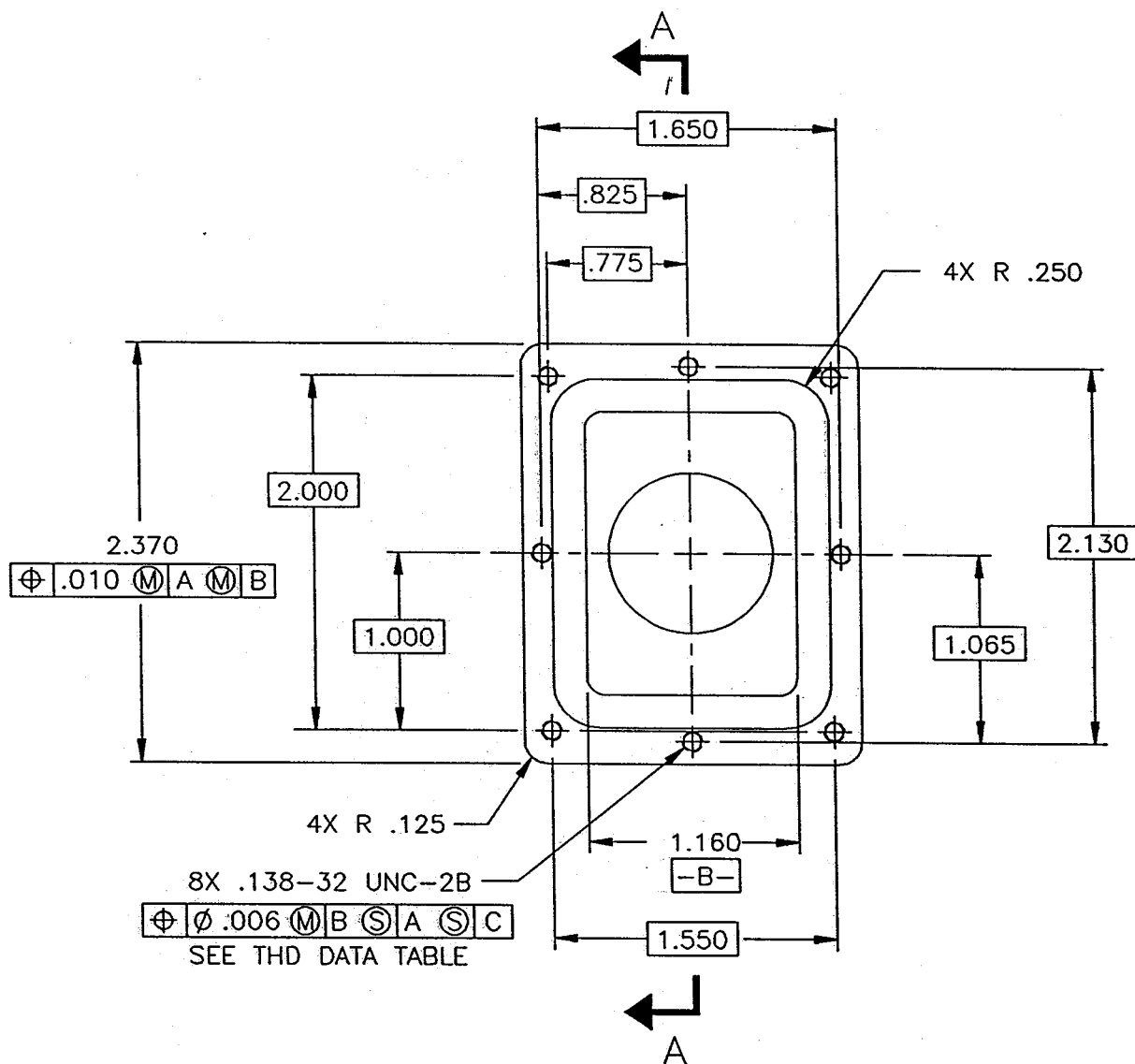
PARTS LIST

QTY PER ASSY	PKG NO.	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION
1	7		NAS1922-0125-1	CLAMP, HOSE, BAND		
2	6		MS35338-135	WASHER, SPLIT		
2	5		MS35275-217	SCR, FILLISTER, HD		
8	4		S-700-42/4-13	SCR, CAP, SCH, MOD		
1	3		S-700-42/4-12	GASKET, EMI		
2	2		S-700-42/4-11	CLAMP, CABLE		
1	1		S-700-42/4-10	BACKSHELL, EMI		

NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.
2. THESE BACKSHELL KITS ARE DESIGNED TO FUNCTION IN CONJUNCTION WITH GSFC S-311-P-718/5 CONNECTOR.
3. FN 3, EMI GASKET, IS A Cu/Ag FILLED SILICONE RUBBER ELASTOMER (CHO-SEAL 1215) PRODUCED BY CHOMERICS INC., (CAGE CODE 18565).
4. SHELL TERMINATION CLAMPS SUPPLIED TO BE USED IN CONJUNCTION WITH A CONDUCTIVE EPOXY OR SOLDER. ALTERNATE TERMINATION METHODS SUCH AS "MAGNEFORMING", "HEAT SHRINKABLE" RINGS AND CALIBRATED BANDING SYSTEMS MAY ALSO BE USED. BACKSHELL USERS SHOULD SELECT TERMINATION METHOD.
5. WHEN INSTALLING BACKSHELL TO CONNECTOR, RECOMMENDED TORQUE RANGE FOR FN 4 SCREWS IS 12-14 IN-LBS.
6. MAXIMUM WEIGHT PER KIT - 0.6 POUNDS.
7. ALL COMPONENTS OF THIS KIT SHALL BE PACKAGED SEPARATELY AS LOOSE ITEMS TO BE ASSEMBLED BY USER.

FIGURE 11 - BACKSHELL KIT, (SIZE 2) (G2R) (CONTD)  
(PAGE 3 OF 3)



THREAD DATA TABLE

NOMINAL THREAD SIZE AND SERIES	THREAD FORM DIAMETER	THREAD DIMENSIONS	
		BEFORE PLATING	AFTER PLATING
.138-32 UNC-2B	MAJOR	.1410 - .1487	.1380 - .1462
	PITCH	.1237 - .1264	.1177 - .1214
	MINOR	.1040 - .1140	.1070 - .1165

NOTE: UNLESS OTHERWISE SPECIFIED  
1. INTERPRET PER DOD-STD-100.

FIGURE 12 - BACKSHELL HOUSING, ROUND HOLE (SIZE 2) (S-700-42/4-10)  
(PAGE 1 OF 3)



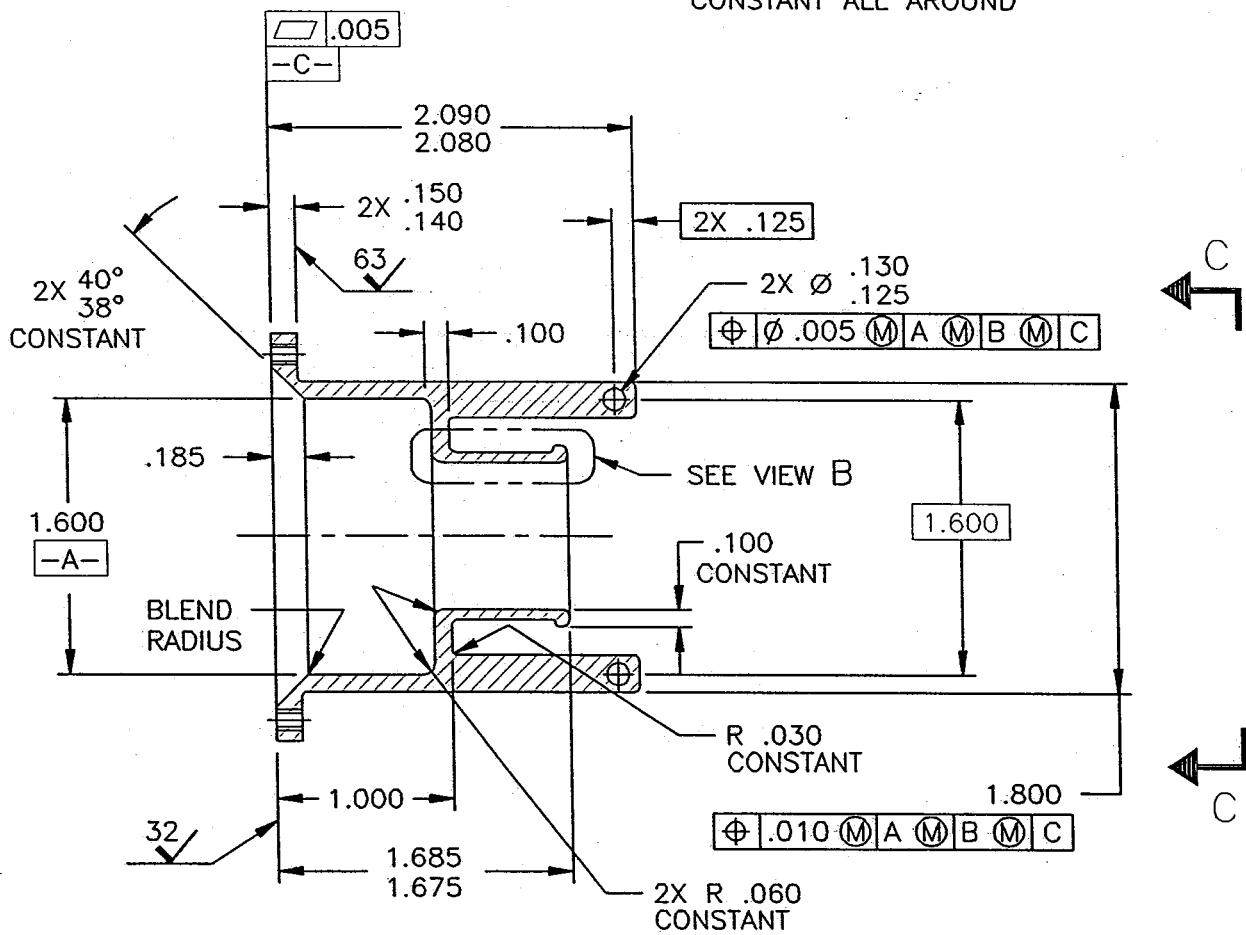
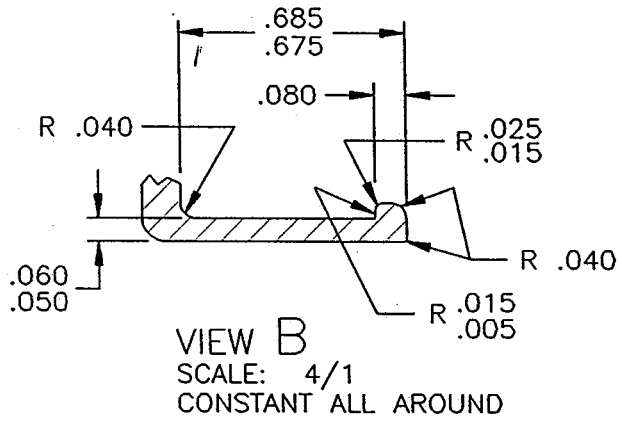
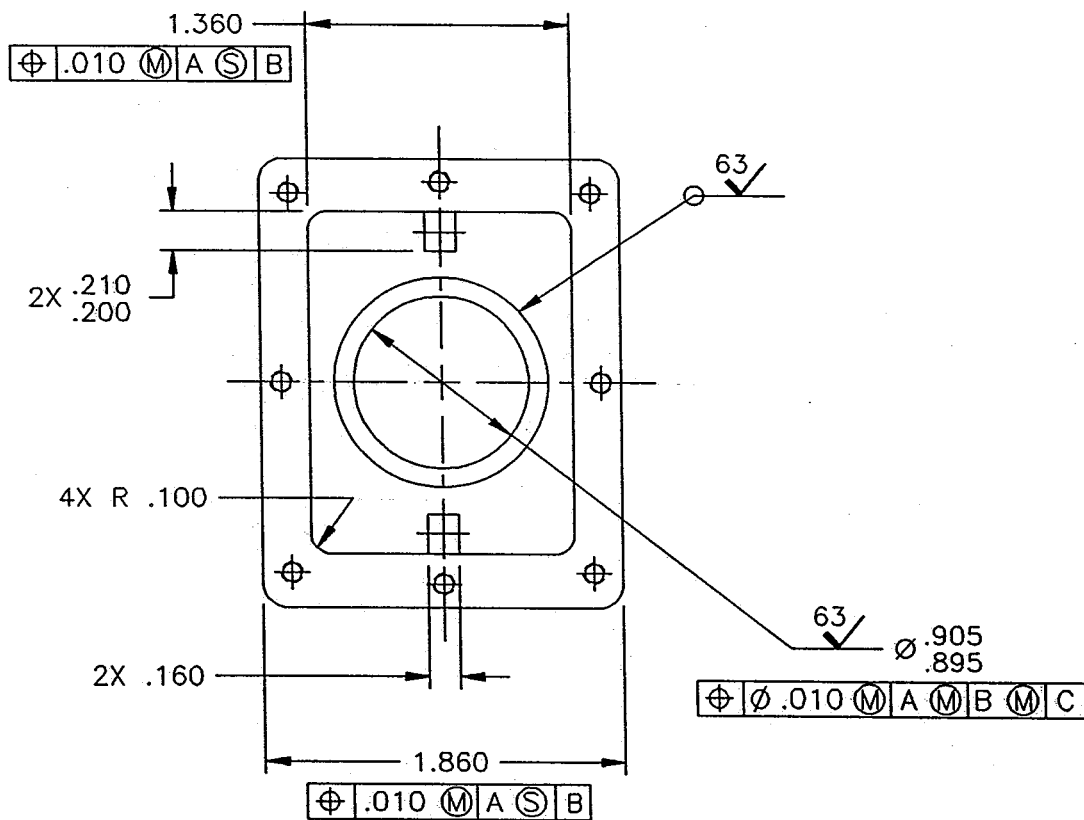


FIGURE 12 - BACKSHELL HOUSING, ROUND HOLE (SIZE 2)  
(S-700-42/4-10) (CONTD)  
(PAGE 2 OF 3)



VIEW C-C

FIGURE 12 - BACKSHELL HOUSING, ROUND HOLE (SIZE 2)  
 (S-700-42/4-10) (CONTD)  
 (PAGE 3 OF 3)

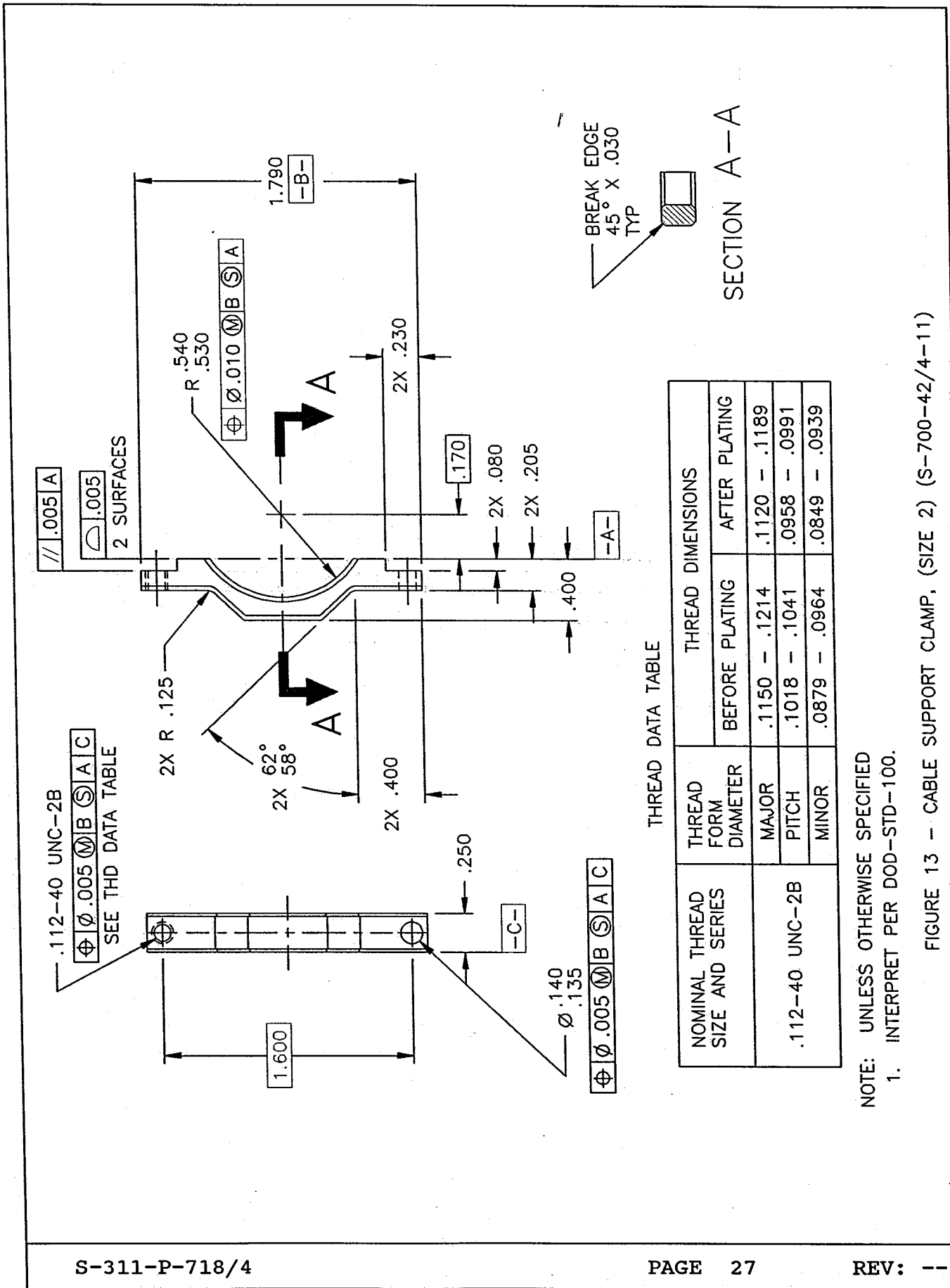
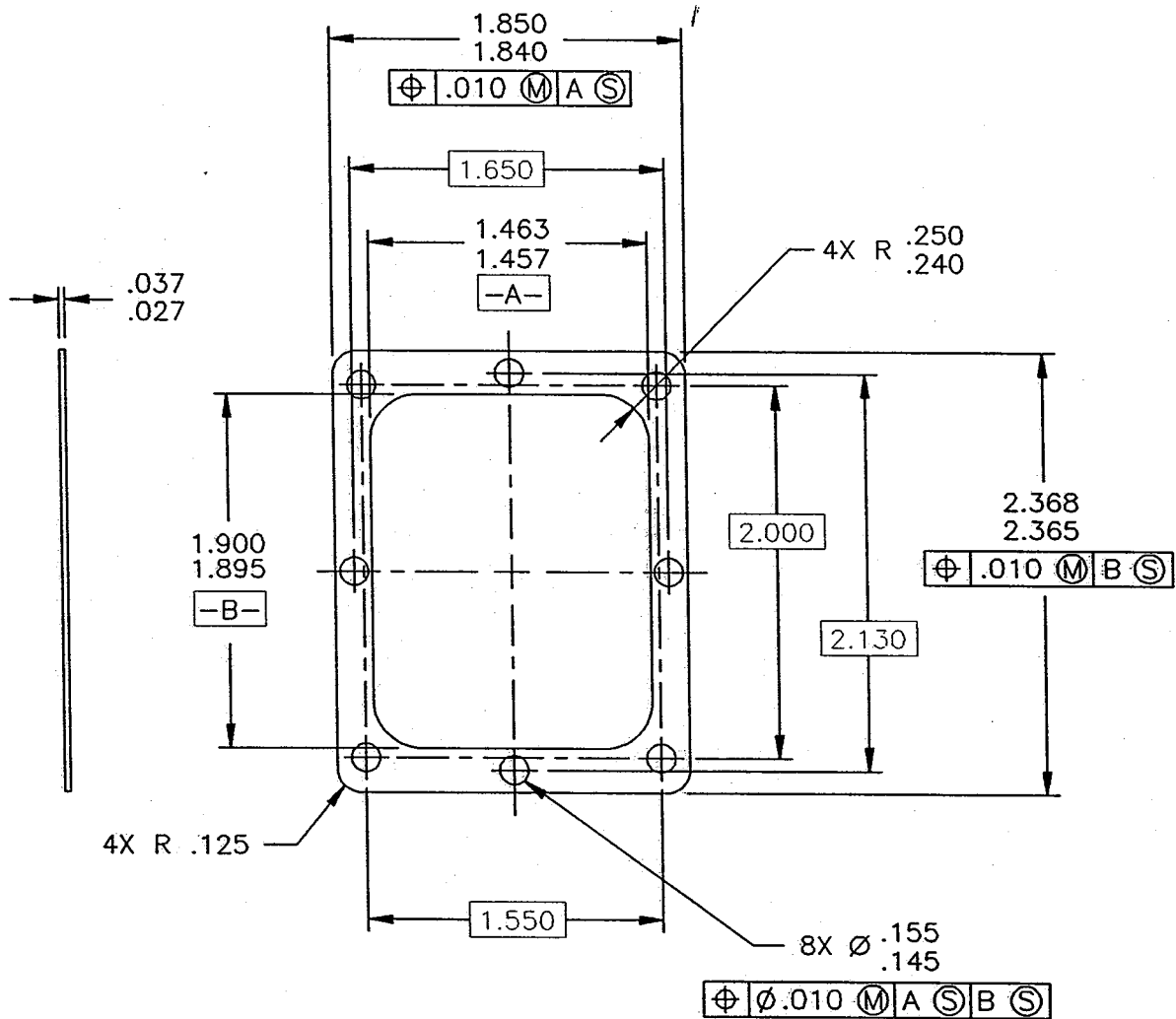


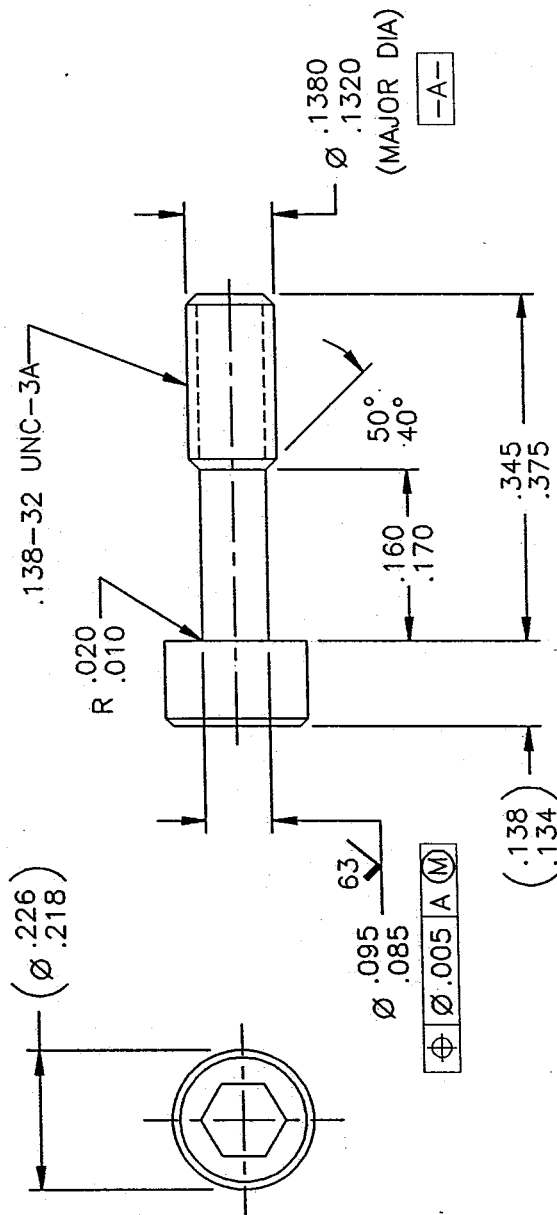
FIGURE 13 - CABLE SUPPORT CLAMP, (SIZE 2) (S-700-42/4-11)



NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.
2. Cu/Ag FILLED SILICONE RUBBER ELASTOMER, PURCHASE FROM CHOMERICS INC., (CAGE CODE 18565), PART NO. CHO-SEAL 1215 (COLOR-GRAY).

FIGURE 14 - EMI GASKET, (SIZE 2) (S-700-42/4-12)



NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.
2. MAKE FROM MS16995-18.
3. AFTER MODIFICATION, PASSIVATE PER MIL-S-5002.

FIGURE 15 - SOCKET HEAD CAP SCREW, MODIFIED (SIZE 2) (S-700-42/4-13)

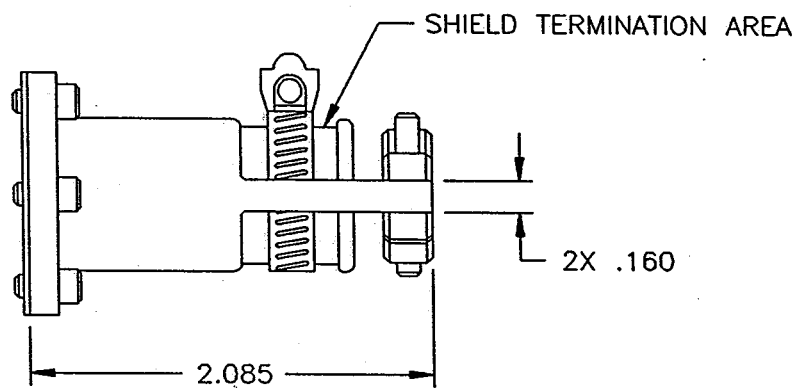
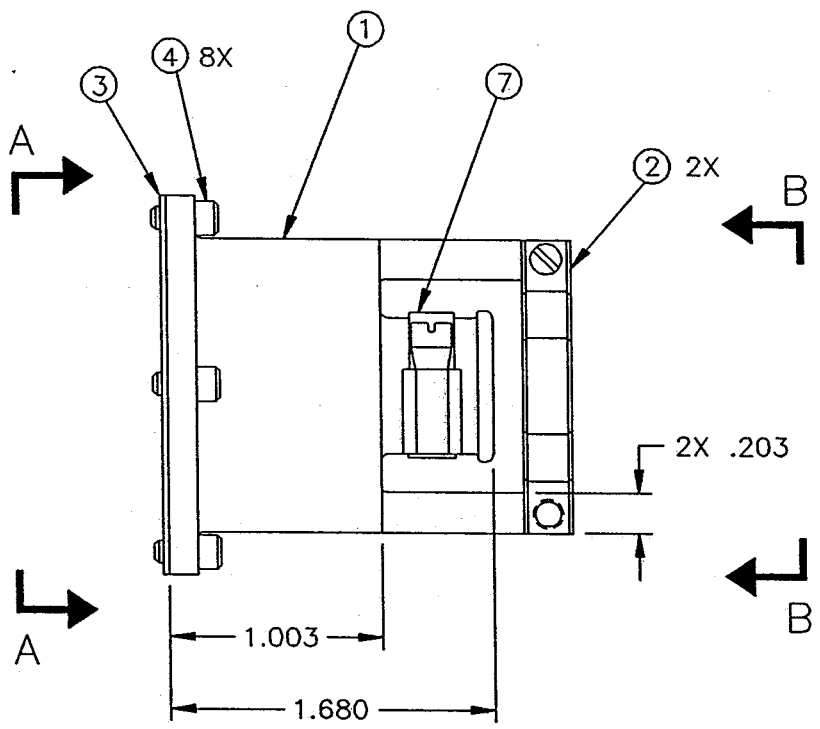


FIGURE 16 - BACKSHELL KIT, (SIZE 3) (G3R)  
(PAGE 1 OF 3)

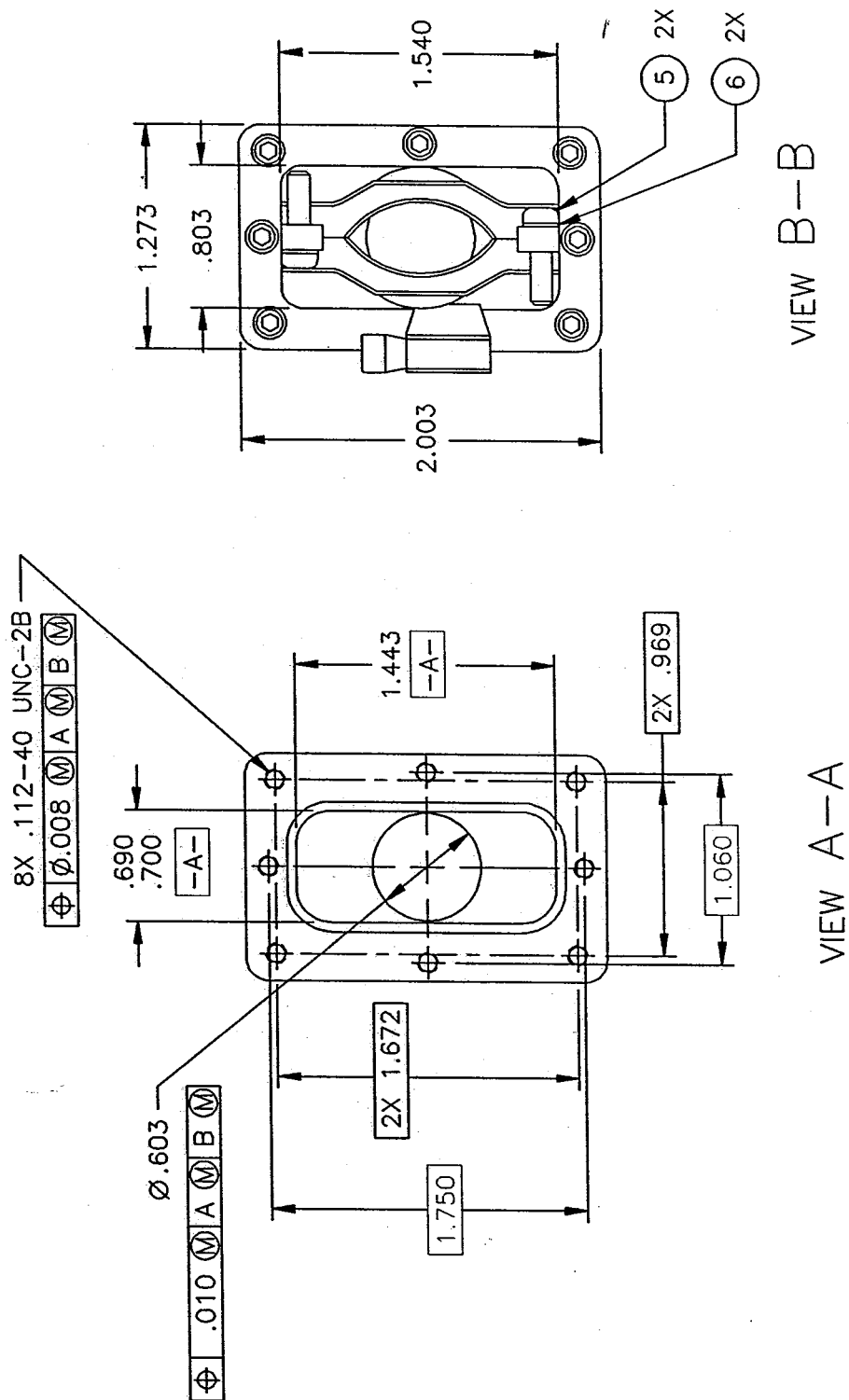
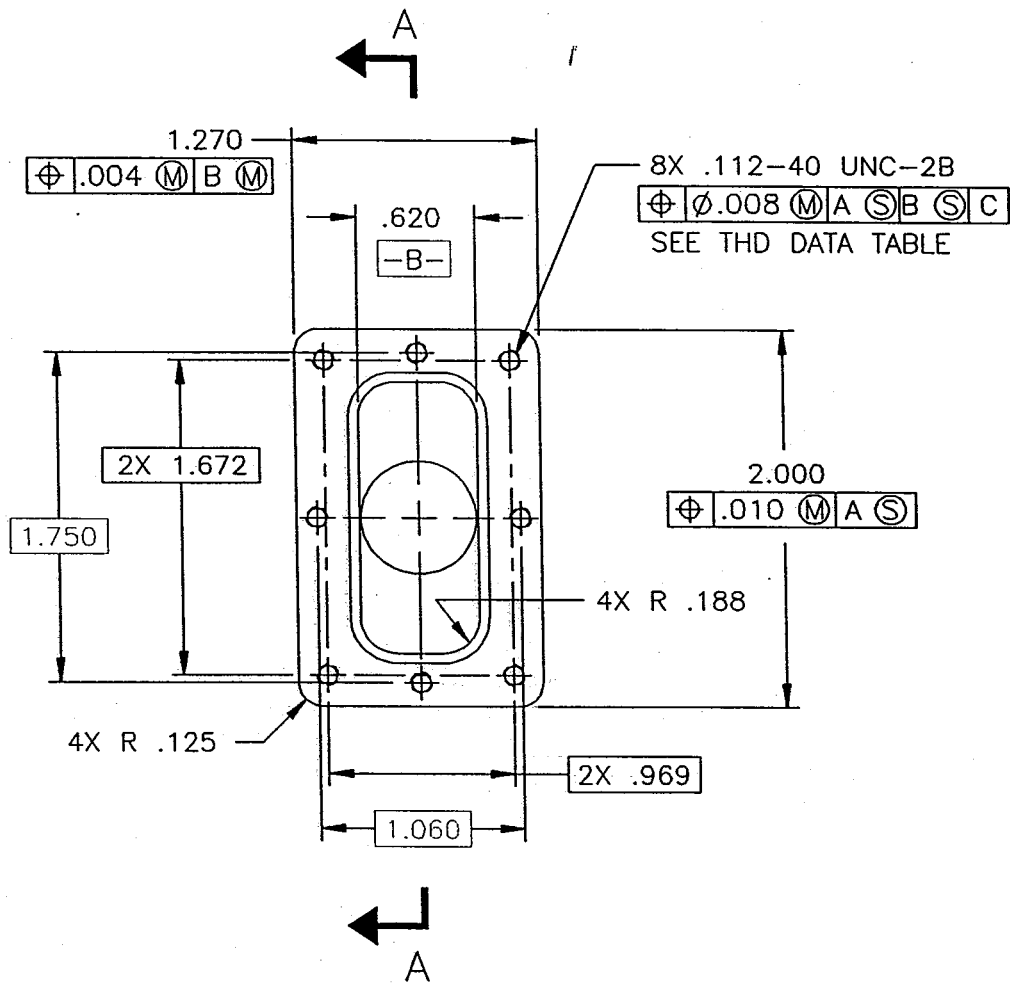


FIGURE 16 - BACKSHELL KIT, (SIZE 3) (G3R) (CONTD)  
(PAGE 2 OF 3)





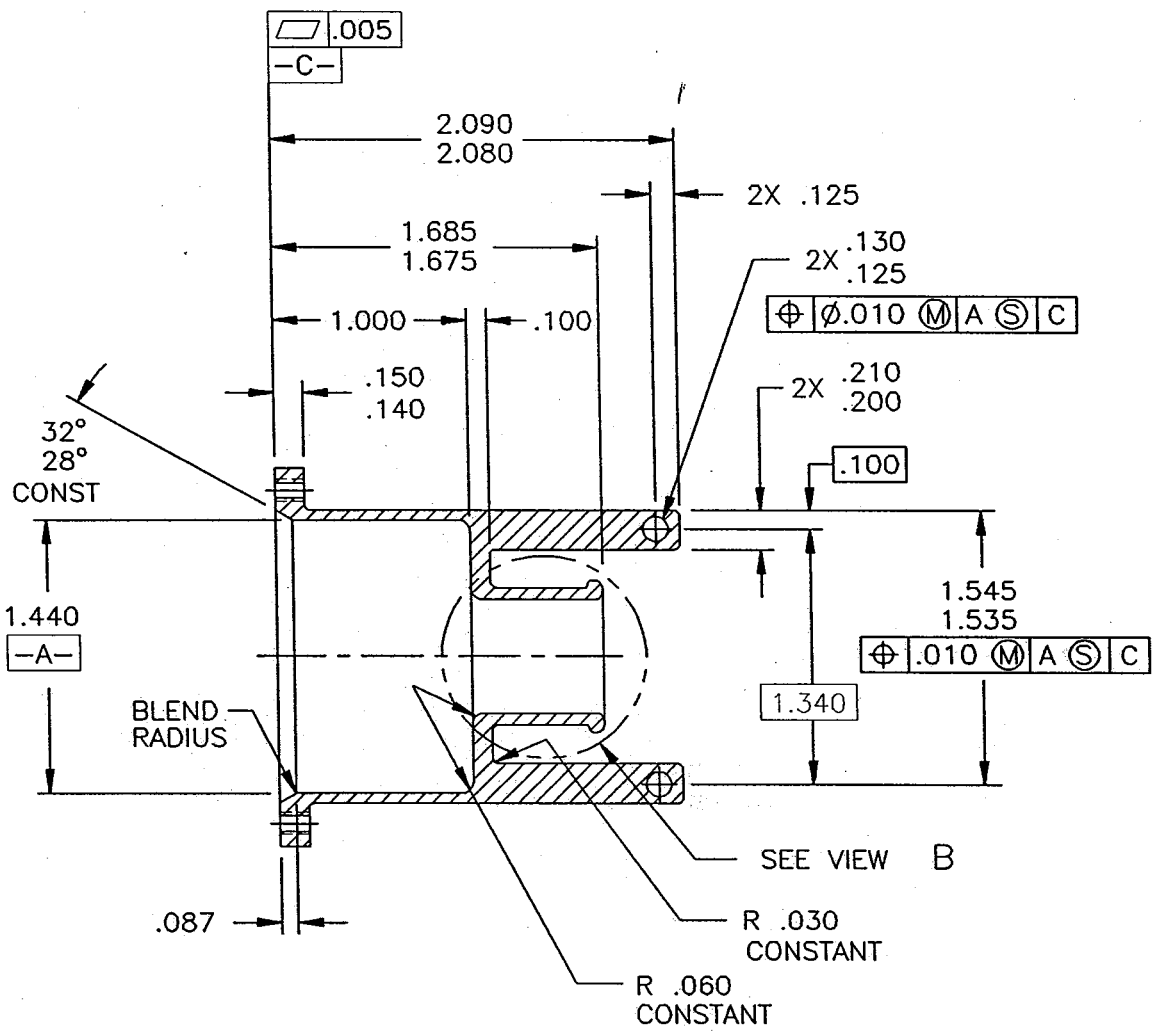


NOMINAL THREAD SIZE AND SERIES	THREAD FORM DIAMETER	THREAD DIMENSIONS	
		BEFORE PLATING	AFTER PLATING
.112-40 UNC-2B	MAJOR	.1150 - .1214	.1120 - .1189
	PITCH	.1018 - .1041	.0958 - .0991
	MINOR	.0879 - .0964	.0849 - .0939

NOTE: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.

FIGURE 17 - BACKSHELL HOUSING, ROUND HOLE (SIZE 3) (S-700-42/4-14)  
(PAGE 1 OF 3)



SECTION A-A

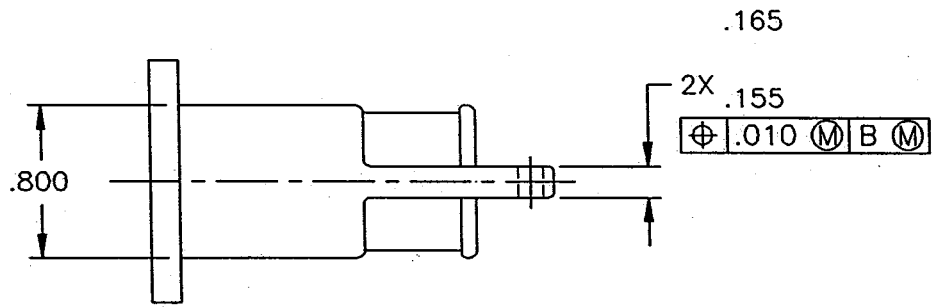
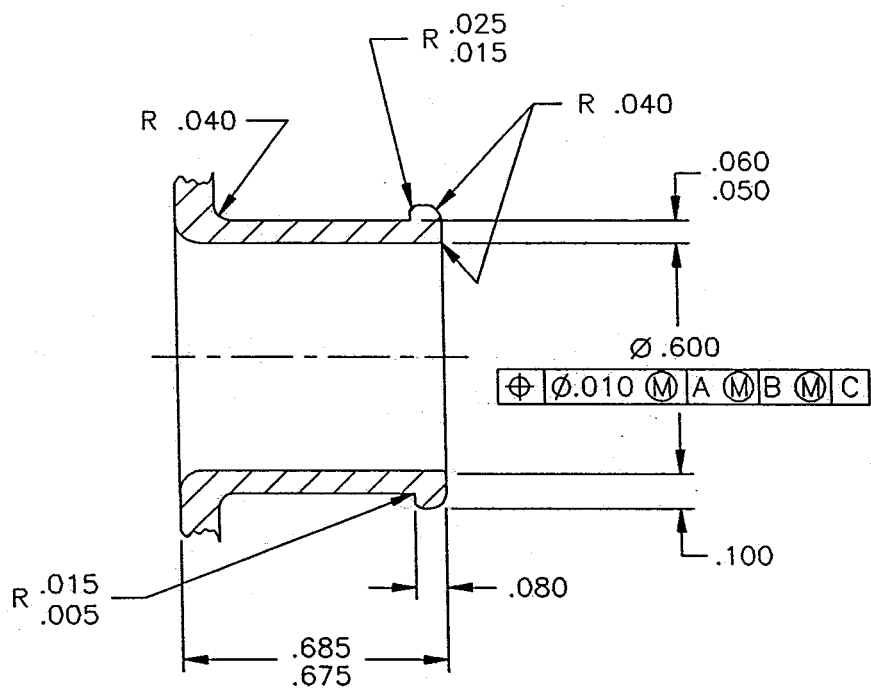


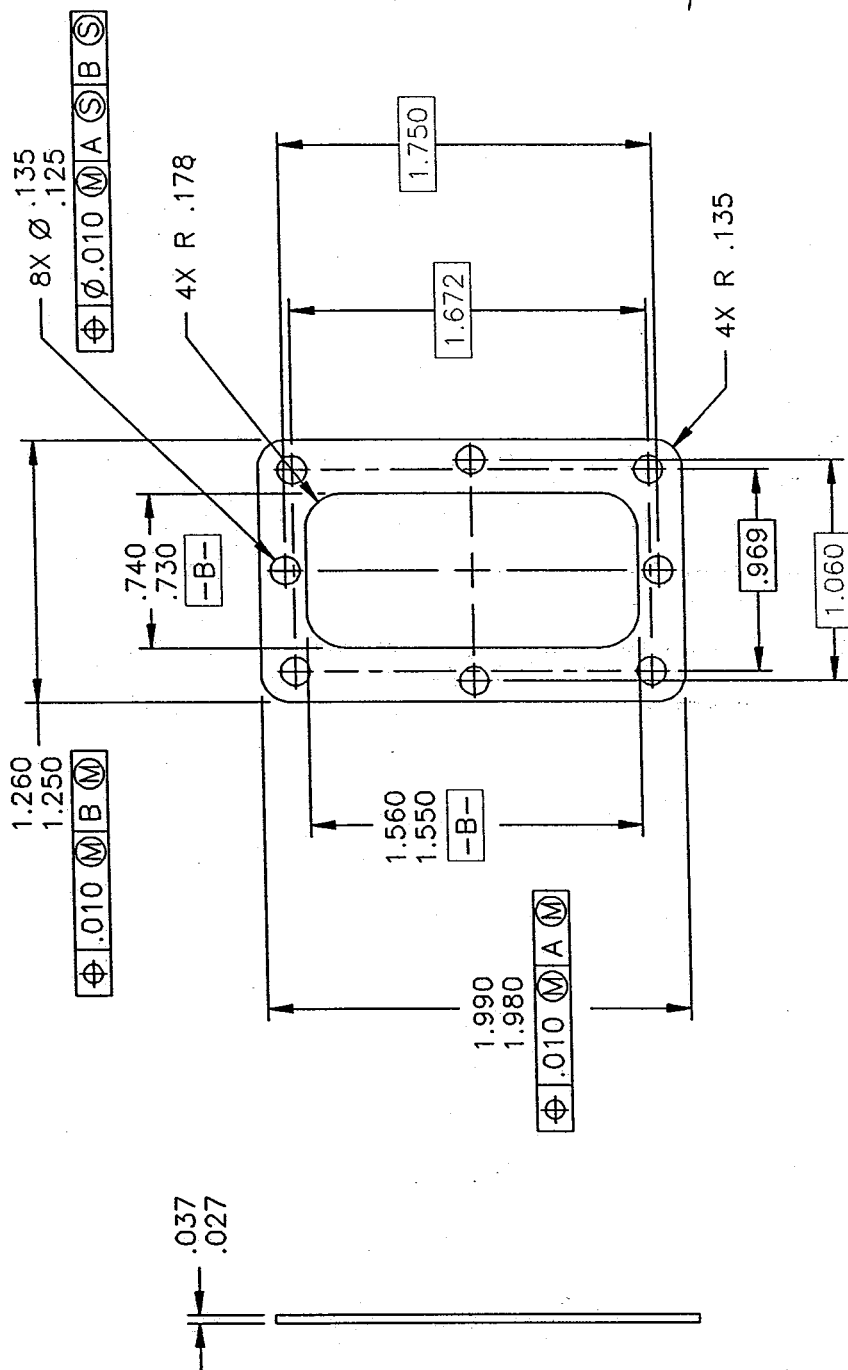
FIGURE 17 - BACKSHELL HOUSING, ROUND HOLE (SIZE 3)  
 (S-700-42/4-14) (CONTD)  
 (PAGE 2 OF 3)



VIEW B

FIGURE 17 - BACKSHELL HOUSING, ROUND HOLE (SIZE 3)  
 (S-700-42/4-14) (CONTD)  
 (PAGE 3 OF 3)

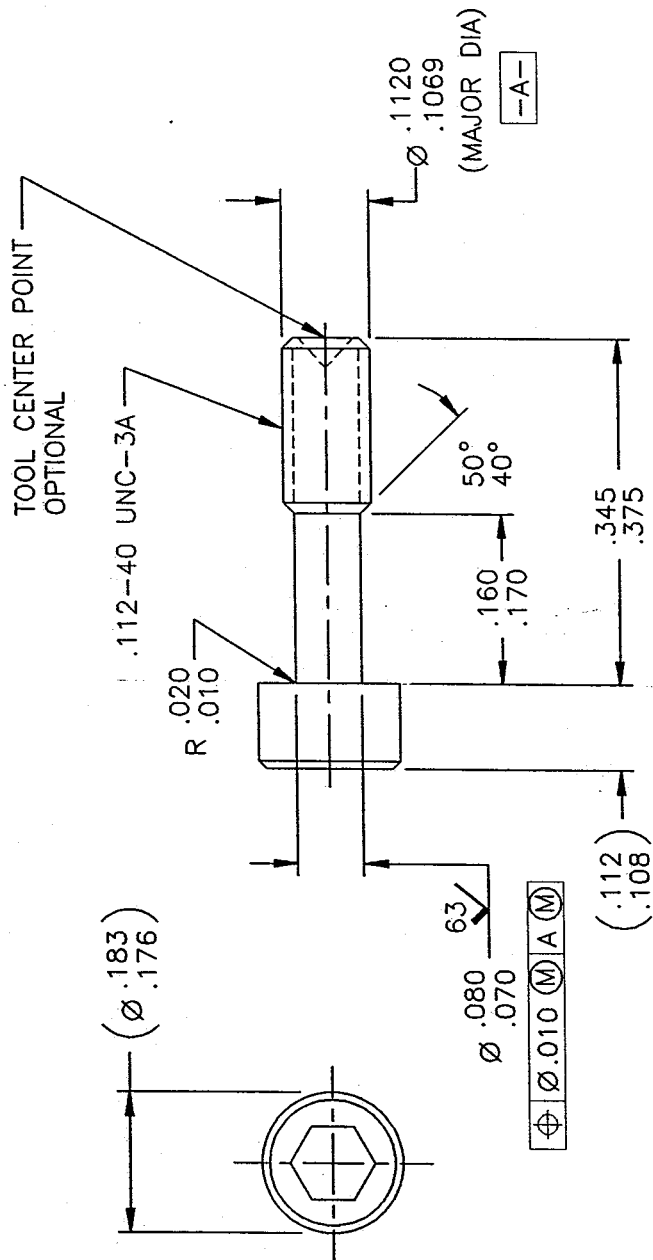




NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.
2. Cu/Ag FILLED SILICONE RUBBER ELASTOMER, PURCHASE FROM CHOMERICS INC., (CAGE CODE 18565), PART NO. CHO-SEAL 1215 (COLOR-GRAY).

FIGURE 19 - EMI GASKET (SIZE 3) (S-700-42/4-16)



NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET PER DOD-STD-100.
2. MAKE FROM MS16995-10.
3. AFTER MODIFICATION, PASSIVATE PER MIL-S-5002.

FIGURE 20 - SOCKET HEAD CAP SCREW, MODIFIED (SIZE 3) (S-700-42/4-17)