FIRST APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
FOR PARTS APPLICATION SEE OD 32190		J	CN N-0000103387, INC CR R-30762	11-12-5	

NOTE:

1. INTERPRET DRAWING IN ACCORDANCE WITH DOD-D-1000.

SOURCE CONTROL DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING			
TOLERANCES ON:			
BASIC DIMENSIONS	2 PLACE DECIMALS		3 PLACE DECIMALS
UP TO 6	±.02		±.010
ABOVE 6 TO 24	±.03		±.015
ABOVE 24	±.06		±.020
ANGULAR DIMENSIONS: ±1/2°			
DO NOT SCALE THIS DRAWING			

CONTRACT NO.	REL
N00024-79-C-5714	JJB

RCA CORPORATION
NEW YORK, N.Y. 10020

	APPROVED	DATE
PREPARED	J.J.BENES	82-3-19
CHECKED	J.J.BENES	82-4-16
ENGINEER	N.B.FRAIN	82-4-29
APPROVED FOR NAVSEA		DATE
	G.GRILLO	82-4-15

DEPARTMENT O F THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, D.C. 20362

BOOT, CONNECTOR ADAPTER, HEAT SHRINKABLE

SIZE	CODE IDENT NO.	NAVORD DWG NO.
A	53711	5617649
SCALE: NONE		SHEET 1 OF 12

MSWord

1. SCOPE

THIS DRAWING COVERS THE REQUIREMENTS FOR A FLEXIBLE, ELECTRICALLY INSULATING, LOW HALOGEN, HEAT SHRINKABLE BOOT FOR USE IN NAVAL SHIPBOARD ELECTRONIC EQUIPMENT,

2. APPLICABLE DOCUMENTS

THE FOLLOWING DOCUMENTS OF THE ISSUE IN EFFECT ON THE DATE OF INVITATION FOR BIDS ARE APPLICABLE TO THE EXTENT SPECIFIED HEREIN.

2.1 GOVERNMENT DOCUMENTS

SPECIFICATIONS

MIL-C-85049	GENERAL SPECIFICATION FOR ELECTRICAL CONNECTOR ACCESSORIES
PMS 400-881	GENERAL SPECIFICATION FOR SPECIAL PURPOSE, LIGHTWEIGHT, ELECTRIC CABLE

STANDARDS

MIL-STD-130	IDENTIFICATION MARKING OF US MILITARY PROPERTY
MIL-STD-105	SAMPLING PROCEDURES AND TABLES FOR TESTING BY ATTRIBUTES

2.2 NONGOVERNMENT DOCUMENTS

ASTM D635	RATE OF BURNING OR EXTENT AND TIME OF BURNING, OR BOTH, OF SELF SUPPORTING PLASTICS IN A HORIZONTAL POSITION
ASTM D412	TESTS FOR RUBBER PROPERTIES IN TENSION
ASTM D876	TESTING NONRIGID VINYL CHLORIDE POLYMER TUBING
ASTM D570	TEST FOR WATER ABSORPTION OF PLASTICS
ASTM D257	TESTS FOR DC RESISTANCE OR CONDUCTANCE OF INSULATING MATERIALS
ASTM D2863	TEST FOR MEASURING THE MINIMUM OXYGEN CONCENTRATION TO SUPPORT CANDLE-LIKE COMBUSTION OF PLASTICS
5617432	CABLE, ELECTRIC, SPECIAL PURPOSE, LIGHTWEIGHT
5617635	ADAPTER ELECTRIC, CONNECTOR, SHIELD TERMINATING, STRAIGHT.

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3. REQUIREMENTS

3.1 MATERIAL

3.1.1 BASE: CROSSLINKED, THERMALLY STABLIZED, FLAME RESISTANT, ELECTRICALLY INSULATING, SEMI-RIGID ELASTOMERIC MATERIAL.

3.1.2 ADHESIVE: INDIVIDUAL ADHESIVES EMPLOYED SHALL BE COMPATIBLE WITH JACKET MATERIAL OF 5617432 AND ADAPTER TYPICAL OF 5617635.

3.2 CONFIGURATION AND DIMENSIONS

CONFIGURATION AND DIMENSIONS SHALL CONFORM TO FIGURE 1,

3.3 DIMENSIONAL RECOVERY

DIMENSIONAL RECOVERY SHALL BE IN ACCORDANCE WITH FIGURE 1.

3.4 ELASTIC MEMORY

WHEN TESTED PER 4.3.3 THE ELASTIC MEMORY SHALL BE 275 PERCENT MINIMUM EXPANSION AND 93 PERCENT MINIMUM RETRACTION.

3.5 TENSILE STRENGTH

THE TENSILE STRENGTH SHALL BE 1015 PSI MINIMUM WHEN MEASURED PER 4.3.4.

3.6 ULTIMATE ENLONGATION

THE ULTIMATE ENLONGATION SHALL BE 250 PERCENT MINIMUM WHEN MEASURED PER 4.3.5.

3.7 LOW TEMPERATURE FLEXIBILY

NO CRACKING SHALL BE OBSERVED AFTER TESTING AS SPECIFIED IN 4.3.6.

3.8 HEAT SHOCK

NO DRIPPING, FLOWING, OR CRACKING SHALL BE EVIDENT AFTER THE TREATMENT SPECIFIED IN 4.3.7.

3.9 HEAT AGING

AFTER CONDITIONING PER 4.3.8 THE TENSILE STRENGTH AND ULTIMATE ELONGATION SHALL BE AT LEAST 1015 PSI AND 150 PERCENT RESPECTIVELY.

3.10 DIELECTRIC STRENGTH

THE DIELECTRIC STRENGTH SHALL BE 380 VOLTS/MIL MINIMUM WHEN TESTED PER 4.3.9.

3.11 VOLUME RESISTIVITY

THE VOLUME RESISTIVITY SHALL BE 10^{12} OHM-CM WHEN TESTED PER 4.3.10.

3.12 FLAMMABILITY: PARTS SUPPLIED TO THIS DRAWING SHALL BE TESTED PER 4.3.11. MAXIMUM AVERAGE TIME OF BURN (ATB) SHALL BE 100 SECONDS. VALUE INCLUDES ADDED TIME FOR BOTH FLAMING AND GLOWING BURN MODES. AVERAGE EXTENT OF BURNING SHALL BE 25 MM MAX.

3.13 FLUID RESISTANCE

THE TENSILE STRENGTH AND ULTIMATE ELONGATION SHALL BE AT LEAST 725 PSI AND 150 PERCENT RESPECTIVELY AFTER CONDITIONING SPECIMENS PER 4.3.12.

3.14 ACID GAS GENERATION

ACID GAS GENERATION SHALL BE 1.5% MAXIMUM WHEN TESTED PER 4.3.13.

3.15 WATER ABSORPTION

WATER ABSORPTION SHALL BE 0.5% AT 23 DEGREES C AND 1.5% AT 70 DEGREES C WHEN TESTED PER 4.3.14.

3.16 LIMITING OXYGEN INDEX

THE LIMITING OXYGEN INDEX SHALL BE 30 MINIMUM WHEN TESTED PER 4.3.15.

3.17 TEMPERATURE INDEX

THE TEMPERATURE INDEX SHALL BE 225° MINIMUM WHEN TESTED PER 4.3.16. THE TEMPERATURE INDEX OF A MATERIAL IS THE TEMPERATURE AT WHICH THE LIMITING OXYGEN INDEX OF A MATERIAL IS 20.8 PERCENT.

3.18 TOXICITY INDEX

THE TOXICITY INDEX SHALL BE 3.0 MAXIMUM WHEN TESTED PER 4.3.17.

3.19 SMOKE INDEX

THE SMOKE INDEX SHALL BE 80 MAXIMUM WHEN TESTED PER 4.3.18.

3.20 MARKING

PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THIS DRAWING NUMBER PREFIXED WITH "53711 SOCN" VENDORS IDENTIFICATION AND PART NUMBER NEED NOT BE REMOVED. THE FRONT OF THE BOOT SHALL BE MARKED OR EMBOSSED WITH AN "H" TO INDICATE THE "HARDWARE" SIDE OF THE TERMINATION AND THE REAR OF THE BOOT SHALL BE MARKED OR EMBOSSED WITH A "J" TO INDICATE THE "JACKET" SIDE OF THE TERMINATION. THE "H" AND "J" SHALL BE APPROXIMATELY 1/8 TO 1/4 IN. (REF) IN HEIGHT WHEN THE BOOT IS IN THE UNRECOVERED STATE. REFER TO VIEWS A-A AND B-B IN FIGURE 1 FOR THE RELATIVE LOCATION OF THE "H" AND "J" ON THE BOOT (NOTE: THE ORIENTATION OF THE "H" AND "J" MAY BE EITHER PARALLEL OR PERPENDICULAR TO THE CENTERLINE AXIS OF THE BOOT).

4. QUALITY ASSURANCE PROVISIONS

THE SUPPLIER IS RESPONSIBLE FOR ALL SPECIFIED TESTS.
TESTS SHALL BE PERFORMED AT THE MANUFACTURERS FACILITIES OR A FACILITY APPROVED BY THE PROCURING ACTIVITY.
THE PROCURING ACTIVITY RESERVES THE RIGHT TO WITNESS ALL TESTS.

4.1 QUALIFICATION

THE MANUFACTURER SHALL ASSURE THAT THE PARTS SUPPLIED TO THIS DRAWING ARE QUALIFIED TO MEET ALL REQUIREMENTS OF THIS DRAWING. QUALIFICATION MAY BE BASED ON EXISTING TEST ON USAGE DATA, SIMILARITY TO PREVIOUSLY QUALIFIED PARTS, ANALYTIC METHODS, OR BY QUALIFICATION TESTING. QUALIFICATION TESTING SHALL BE PERFORMED ONLY IF SPECIFICALLY INVOKED BY THE PROCURING ACTIVITY ON THE PURCHASE ORDER INDIVIDUAL TEST REQUIREMENTS MAY BE SATISFIED BY TESTS ON NEXT HIGHER ASSEMBLY (E.G. THE CABLE ASSEMBLY) WITH THE APPROVAL OF NAVSEA,WASHINGTON,DC OR ITS DESIGNATED TECHNICAL ACTIVITY.

4.4.1 QUALIFICATION TESTS

WHEN QUALIFICATION TESTING IS INVOKED IT SHALL BE IN ACCORDANCE WITH TABLE I. UNLESS OTHERWISE SPECIFIED IN A PARTICULAR TEST PROCEDURE, SIX SPECIMENS SHALL BE SUBMITTED FOR EACH QUALIFICATION TEST IN TABLE I. SPECIMENS SHALL BE EITHER OF THE FORM AND DIMENSIONS SPECIFIED IN FIGURE 1, OR CUT FROM MOLDED SLABS, WHICHEVER IS DICTATED BY THE TEST PROCEDURE. THE MOLDED SLABS SHALL BE 6X6XO.075 ±0.010 INCHES AND FABRICATED FROM THE SAME LOT OF MATERIAL AND SUBJECTED TO THE SAME DEGREE OF CROSSLINKING AS THE FORMED PARTS.

4.2 ACCEPTANCE TESTS

ACCEPTANCE TESTING IS THE BASIS ON WHICH ACCEPTANCE OR REJECTION OF A BATCH IS DETERMINED, AND SHALL BE IN ACCORD ANCE WITH TABLE I, SPECIMENS SHALL BE OF THE FORM AND DIMENSIONS SPECIFIED IN FIGURE 1. SAMPLING SHALL BE PER MIL-STD-105, SINGLE SAMPLING, SPECIAL INSPECTION LEVEL S-1, AND AQL OF 6.5.

TABLE I

EXAMINATION OR TEST	QUALI-FICATION	ACCEP-TANCE	REQUIRE PARA	METHOD PARA
CONFIGURATION AND DIMENSIONS	X	X	3.2	4.3.1
DIMENSIONAL RECOVERY	X	X	3.3	4.3.2
ELASTIC MEMORY	X		3.4	4.3.3
TENSILE STRENGTH	X		3.5	4.3.4
ULTIMATE ELONGATION	X		3.6	4.3.5
LOW TEMP FLEXIBILITY	X		3.7	4.3.6
HEAT SHOCK	X		3.8	4.3.7
HEAT AGING	X		3.9	4.3.8
DIELECTRIC STRENGTH	X	X	3.10	4.3.9
VOLUME RESISTIVITY	X		3.11	4.3.10
FLAMMABILITY	X		3.12	4.3.11
FLUID RESISTANCE	X		3.13	4.3.12
ACID GAS GENERATION	X		3.14	4.3.13
WATER ABSORPTION	X		3.15	4.3.14
LIMITING OXYGEN INDEX	X		3.16	4.3.15
TEMPERATURE INDEX	X		3.17	4.3.16
TOXICITY INDEX	X		3.18	4.3.17
SMOKE INDEX	X		3.19	4.3.18
MARKING	X	X	3.20	4.3.19

4.3 TEST METHODS

4.3.1 CONFIGURATION AND DIMENSIONS

THE PART SHALL BE DIMENSIONALLY CHECKED FOR CONFORMANCE TO FIGURE 1 (AS SUPPLIED).

4.3.2 DIMENSIONAL RECOVERY

THE PART SHALL BE CONDITIONED FOR 10 MINUTES AT 200±2°C, COOLED TO ROOM TEMPERATURE, AND MEASURED FOR CONFORMANCE TO FIGURE 1 (RECOVERED).

4.3.3 ELASTIC MEMORY

A 6-X 1/8 INCH SPECIMEN CUT FROM A MOLDED SLAB SHALL BE MARKED WITH TWO PARALLEL GAGE LINES 1 INCH APART IN THE CENTRAL PORTION OF THE SPECIMEN. THE DISTANCE BETWEEN GAGE LINES SHALL BE RECORDED AS THE ORIGINAL LENGTH. A 2 INCH PORTION OF THE SPECIMEN INCLUDING BOTH GAGE LINES THEN SHALL BE HEATED FOR 5 MINUTES IN A 200±2°C (392 ±4°F) OVEN OR EQUIVALENT, REMOVED FROM THE OVEN, AND STRETCHED WITHIN 10 SECONDS UNTIL THE GAGE LINES ARE 4 INCHES APART. THE EXTENDED SPECIMEN SHALL BE COOLED TO ROOM TEMPERATURE AND RELEASED FROM TENSION. AFTER 24 HOURS AT ROOM TEMPERATURE, THE DISTANCE BETWEEN THE GAGE LINES SHALL BE MEASURED AND RECORDED AS THE EXTENDED LENGTH, THE PORTION OF THE SPECIMEN INCLUDING BOTH GAGE LINES THEN SHALL BE REHEATED FOR 5 MINUTES IN A 200±2°C (392 ±4°F) OVEN OR EQUIVALENT AND THE DISTANCE BETWEEN GAGE LINES THEN SHALL BE MEASURED AND RECORDED AS THE RETRACTED LENGTH. EXPANSION AND RETRACTION SHALL BE CALCULATED AS FOLLOWS:

$$E = \frac{L_E - L_O}{L_O} \times 100$$

$$R = \frac{L_E - L_R}{L_E - L_O} \times 100$$

WHERE:
E = EXPANSION (PERCENT)
R = RETRACTION (PERCENT)
L_O = ORIGINAL LENGTH (INCHES)
L_E = EXTENDED LENGTH (INCHES)
L_R = RETRACTED LENGTH (INCHES)

4.3.4 TENSILE STRENGTH ; TENSILE STRENGTH SHALL BE TESTED PER ASTM D412 WITH EXTENSION RATE OF 100 MM/MINUTE. TEST SPECIMENTS SHALL BE "DUMBELLS" TYPE C,

4.3.5 ULTIMATE ELONGATION

ULTIMATE ELONGATION SHALL BE TESTED PER ASTM-DK12 WITH EXTENSION RATE OF 100 MM/MINUTE, TEST SPECIMENS SHALL BE DUMBELLS TYPE C.

4.3.6 LOW TEMPERATURE FLEXIBILITY

THE PROCEDURE FOR LOW TEMPERATURE FLEXIBILITY TESTING IS AS SPECIFIED IN MIL-C-85049/68.

4.3.7 HEAT SHOCK

THE PROCEDURE FOR HEAT SHOCK TESTING IS AS SPECIFIED IN MIL-C-85049/68.

4.3.8 HEAT AGING

THE PROCEDURE FOR HEAT AGING IS AS SPECIFIED IN MIL-C-85049/68 WITH A TEMPERATURE OF 150 ±3°C. TENSILE STRENGTH AND ULTIMATE ELONGATION TO BE TESTED AS PER 4.3.4 AND 4.3.5.

4.3.9 DIELECTRIC STRENGTH

DIELECTRIC STRENGTH TESTING SHALL BE IN ACCORDANCE WITH ASTM D876.

4.3.10 VOLUME RESISTIVITY

VOLUME RESISTIVITY SHALL BE MEASURED ACCORDING TO ASTM D257.

4.3.11 FLAMMABILITY

FLAMMABILITY TESTING SHALL BE IN ACCORDANCE WITH ASTM D635. SPECIMENS SHALL BE CUT FROM MOLDED SLABS AS SPECIFIED IN 4.3.5.

4.3.12 FLUID RESISTANCE

SPECIMENS SHALL BE DUMBELLS TYPE C, REFERENCE ASTM-D412 CUT FROM MOLDED SLABS SPECIFIED IN 4.1.1. 5 SPECIMENS SHALL BE IMMERSED IN EACH OF THE FLUIDS SPECIFIED IN ABLE II FOR 24 HOURS AT 25±3 DEGREES C (77±5 DEGREES F). THE VOLUME OF OF THE FLUIDS SHALL BE NOT LESS THAN 20 TIMES THAT OF THE SPECIMENS. AFTER CONDITIONING, THE SPECIMENS SHALL BF LIGHTLY WIPED AND THEN AIR DRIED FOR 3 1/2 HOURS TO 4 1/2 HOURS AT ROOM TEMPERATURF. THE SPECIMENS SHALL BE TESTED FOR TENSILE STRENGTH AND ULTIMATE ELONGATION IN ACCORDANCE WITH 4.3.4 AND 4.3.5 AND SHAL MEET THE REQUIREMENTS OF 3.13.

TABLE II

JP-4 FUEL

SKYDROL 500

HYDRAULIC FLUID (MIL-H-5606)

AVIATION GASOLINE (100/130)

WATER

LUBRICATING OIL
(MILL78O8, MILL23699, 0X38)

4.3.13 ACID GAS GENERATION

ACID GAS GENERATION SHALL BE DETERMINED IN ACCORDANCE WITH PMS 400-881, PARAGRAPH 4.7.2.3.2.

4.3.14 WATER ABSORPTION

WATER ABSORPTION SHALL BE MEASURED PER ASTM D570.

4.3.15 LIMITING OXYGEN INDEX

LIMITING OXYGEN INDEX SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D2863.

4.3.16 TEMPERATURE INDEX

TEMEPRATURE INDEX SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D2863.

4.3.17 TOXICITY INDEX

TOXICITY INDEX SHALL BE DETERMINED IN ACCORDANCE WITH PMS 400-881, PARAGRAPH 3.6.1.4.8. PROCEDURE SHALL BE THAT USED IN THE ASSESSMENT OF THE CABLE JACKET MATERIAL.

4.3.18 SMOKE INDEX

SMOKE INDEX SHALL BE DETERMINED IN ACCORDANCE WITH CLAUSE 0701 OF NES711, ISSUE 02. TEST SPECIMENS SHALL BE CUT FROM MOLDED SLABS DETAILED IN4.1.1.

4.3.19 MARKING

PARTS SHALL BE VISUALLY INSPECTED FOR CONFORMANCE TO 3.20.

5. PREPARATION FOR DELIVERY

THE MANUFACTURER IS RESPONSIBLE FOR PACKAGING AND PACKING TO ASSURE THAT WHEN SHIPPED BY DOMESTIC COMMON CARRIER, THE PARTS ARE RECEIVED IN UNDAMAGED CONDITION.

6. NOTES

6.1 APPROVED SOURCE(S) OF SUPPLY

TYCO ELECTRONICS
DBA RAYCHEM CORPORATION
MENLO PARK, CA 94025
CAGE CODE: 06090

3M ELECTRICAL SPECIALTIES DIVISION
AUSTIN, TX 78726
CAGE CODE: 20999

APPROVED MANUFACTURING FACILITY:
TYCO ELECTRONICS
TIJUANA OPERATIONS PLANT
AV. PRODUCTION NO. 20, PARQUE IND INT TIJUANA
TIJUANA, B.C. MEXICO CP 22424

HELLERMAN TYTON
PLYMOUTH
DEVON
PL23NX
UNITED KINGDOM
CAGE CODE: K0720

GLENAIR, INC.
GLENDALE, CA 91201
CAGE CODE: 06324

VENDOR PART NUMBERS PER TABULATION

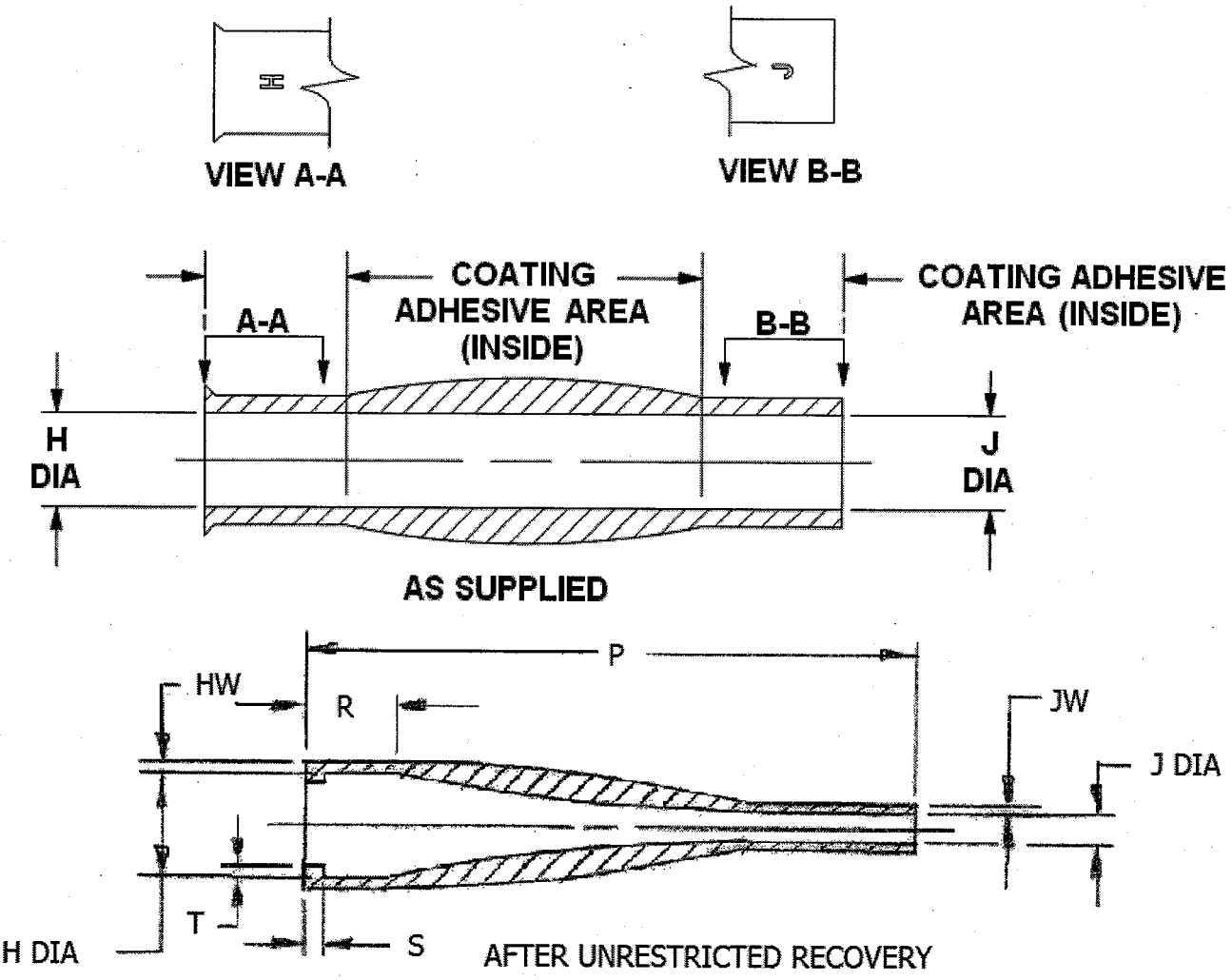
TABULATION

NAVSEA PART NUMBER	TYCO ELECTRONICS PART NUMBER	3M 1/ PART NUMBER	HELLERMAN TYTON PART NUMBER	GLENAIR PART NUMBER
5617649	207W613-100/184	318W724-3-350	1750-1-H-250	770-008S200W1BLK
5617649-1	207W623-100/184	318W734-3-350	1751-1-H-250	770-008S201W1BLK
5617649-2	207W634-100/184	318W745-3-350	1752-1-H-250	770-008S202W1BLK
5617649-3	207W644-100/184	318W755-3-350	1753-1-H-250	770-008S203W1BLK
5617649-4	207W656-100/184	318W767-3-350	1754-1-H-250	770-008S204W1BLK
5617649-5	207W667-100/184	318W778-3-350	1755-1-H-250	770-008S205W1BLK

1/ THE SUPPLIER DESIGNATED BY THIS NOTE NO LONGER PRODUCES THE ITEMS DESCRIBED. PARTS MAY BE USED IF FOUND IN DISTRIBUTION OR STOCK.

IDENTIFICATION OF THE APPROVED SOURCE(S) OF SUPPLY HEREON IS NOT TO BE CONSTRUED AS A GUARANTEE OF PRESENT OR CONTINUED AVAILABILITY AS A SOURCE OF SUPPLY FOR THE ITEM(S).

ONLY THE ITEMS DESCRIBED ON THIS DRAWING WHEN PROCURED FROM THE VENDOR(S) LISTED HEREIN ARE APPROVED BY THE DEPARTMENT OF THE NAVY, NAVSEA, WASHINGTON, D.C. FOR USE IN THE APPLICATIONS SPECIFIED. SUBSTITUTE ITEMS SHALL NOT BE USED WITHOUT PRIOR APPROVAL BY NAVSEA, WASHINGTON, D.C.



NAVSEA PART NO.	AS SUPPLIED	AFTER UNRESTRICTED RECOVERY									
	H MIN	J MIN	H MAX	J MAX	P ±10%	R ±10%	S ±10%	T ±10%	HW ±20%	JW ±20%	ENTRY SIZE
5617649	0.78	0.60	0.55	0.21	5.3	1.1	0.12	0.06	0.16	0.04	6-7
5617649-1	0.94	0.94	0.65	0.33	6.0	1.2	0.12	0.06	0.16	0.06	8-10
5617649-2	1.24	1.24	0.80	0.43	6.0	1.2	0.12	0.06	0.16	0.06	10-14
5617649-3	1.64	1.64	0.90	0.56	6.9	1.5	0.12	0.06	0.16	0.08	12-18
5617649-4	2.04	2.04	1.10	0.70	6.9	1.5	0.12	0.06	0.16	0.08	16-22
5617649-5	2.79	2.79	1.45	0.95	7.2	1.6	0.12	0.06	0.20	0.10	22-28

FIGURE 1

SIZE	CAGE CODE	NAVSEA DWG NO.	REV
A	53711	5617649	J
SCALE: NONE		SHEET 12	