NOTE: DOD-STD-2003-3 has been redesignated as a standard practice. The cover page has been changed for Administrative reasons. There are no other changes to this Document.

INCH - POUND

DOD-STD-2003-3(SH)
24 June 1987
SUPERSEDING
NAVSEA S9300-AW-EDG-010/EPISM
(INCLUDING NAVSEA DWG. NO.
803-5001027) AND NAVSEC NO.
9000-S6202-73980

DEPARTMENT OF DEFENSE
STANDARD PRACTICE

ELECTRIC PLANT INSTALLATION STANDARD METHODS FOR SURFACE SHIPS AND SUBMARINES (PENETRATIONS)

SECTION 3 OF 5 SECTIONS

AMSC N/A

AREA GDRQ

DISTRIBUTION STATEMENT B. Distribution limited to U.S. Government agencies only for administrative and operational use. Other requests for this directive must be referred to NAVSEA (SEA 05Q).

SECTION 3

PENETRATIONS

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND

Washington, DC 20362-5101

Electric Plant Installation Standard Methods for Surface Ships and Submarines

1. This Military Standard is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FOREWORD

1. The criteria contained herein for the installation of the electrical plant on ships of the United States Navy supersede the data contained in Sections 1 through 5 of NAVSHIPS Drawing 9000-S6202-73980, NAVSEA Drawing No. 803-5001027 and NAVSEA PUBLICATION S9300-AW-EDG-010/EPISM.

2. This standard disseminates up-to-date information detailing Requirements for Standard Installation Methods Employed for Submarine and Surface Ship Electrical Distribution Systems.

3. These criteria apply to work on a specific ship or ships only when invoked by the Ship Specifications or similar contractual documents.

4. Although these criteria are primarily for application to new construction, their use may be considered in the conversion or alteration of existing ships. In such cases the degree of applicability of these criteria will be specified by the activity preparing the instructions for the work.

5. Considering the magnitude of this standard, along with the changing requirements imposed on the Electric Plant, it is inevitable that changes will be required to up-date these criteria. Therefore, as comments arise they should be forwarded to Naval Sea Systems Command (NAVSEA) 55Z3 to keep this standard as current as possible through subsequent revisions. Revisions will be accomplished by the issuance of additional or revised figures to be inserted in the basic standard sections. Document Improvement Proposal Form DD 1426 attached. Superseded pages may be retained for reference if so desired.

6. This standard is available in a 8-1/2 X 11 hard copy, in microfilm aperture cards, or in microfiche. It is available in 8-1/2 X 11 hard copy from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120. Microfilm aperture card or microfiche are available from Commanding Officer, Portsmouth Naval Shipyard, Code 202.2, Portsmouth, NH 03801. All revisions on microfilm aperture cards, or on microfiche are automatically distributed to a previously approved distribution list. (Tel: (207) 439-1000, Ext. 1718, Autovon 684-1718). Activities having a requirement to be placed on the distribution or for additional copies should forward these requests to Commander, Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101. Aperture cards have been distributed to those activities presently on the distribution for NAVSEA Standard and Type Drawing microfilm aperture card sets. Microfiche has been distributed to all active ships.

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CONTENTS - Continued

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CONTENTS - Continued

Group B - Stuffing Tubes (Surface Ships) (Continued)

Group C - Stuffing Tubes (General)

CONTENTS - Continued

Group C - Stuffing Tubes (General)

1. SCOPE

1.1 Purpose. The purpose of DOD-STD-2003-3 is to disseminate up-to-date information for swage tubes, stuffing tubes and kickpipes on surface ship and submarine.

1.1.1 Application. These installation standards shall be used by all installing activities. These standards do not identify ship or type, but do establish minimum standards of acceptance for NAVSEA ships. It is the responsibility of the user activity to determine which standard satisfies their requirements. It does not authorize relaxation of any requirement specifically invoked by new construction, conversion, overhaul, or refurbishment contracts. In instances where deviated design requirements (for example, ship type, ship class, and so forth) conflict with the requirements of this standard, the requirements of this standard shall govern. Any deviation for electric plant installation identified in this standard shall be submitted to NAVSEA 56Z2 for resolution.

2. REFERENCED DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standard. Unless otherwise specified, the following specifications and standard of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this standard to the extent specified herein.

SPECIFICATIONS

FEDERAL

GGG-W-646	- Wrench, Open End, Ratchet (TAC Pattern), for Tube Fittings, Electric Cable Terminals and Stuffing Tube Gland Nuts.

MILITARY

MIL-I-3064	- Insulation, Electrical, Plastic-Sealer.
MIL-R-15624	- Rubber Gasket Material, 50 Durometer Hardness (Maximum).
MIL-P-16685	- Packing, Material and Packing Preformed (Stuffing-Tube for Electric Cables).
MIL-S-19622	- Stuffing Tubes, Nylon; and Packing Assemblies; General Specification for.
MIL-S-24235	- Stuffing Tubes, Metal, and Packing Assemblies for Electric Cables, General Specification for.
MIL-S-24235/1	- Stuffing Tube, Bulkhead, Pressureproof.

STANDARD

MILITARY

MIL-STD-278	- Welding and Casting Standard.

2.1.2 Other Government documents. The following other Government documents form a part of this standard to the extent specified herein.

DOCUMENTS

DDS 100-1 - Reinforcement of Openings in Structure of Surface Ships Other than in Protective Plating.
DDS 100-2 - Openings in Decks and Bulkheads for Stuffing Tubes and Pipe.

(Copies of specifications, standards, and documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this standard and the references cited herein, the text of this standard shall take precedence.

3. DEFINITIONS

3.1 Metal stuffing tube. Metal stuffing tube is a system of passing single electrical cables through decks and bulkheads and entering enclosed equipment on Naval ships. These are manufactured in accordance with MIL-S-24235.

3.1.1 Nylon stuffing tube. Nylon stuffing tube is a system of passing single electrical cable through electrical equipment on Naval ships. These are manufactured in accordance with MIL-S-19622.

3.2 Kickpipe. Kickpipe is a pipe welded into the deck with a stuffing tube attached. Kickpipes provide protection of electrical cable at deck penetrations and are used to clear an obstruction or preserve alignment. Kickpipes may be aluminum, steel or brass to suit the installation or standard pipe sizes to suit the required stuffing tube.

3.3 Swage tube. Swage tube is a system of passing single cables through decks on Naval ships that combines the features of the stuffing tube and kickpipes.

3.4 Multiple cable penetrator (MCP). MCP is a system of passing multiple cables through water and non-watertight bulkheads and decks in order to provide watertight, airtight and firetight penetration of electrical cable.

3.5 Community stuffing tube for bulkheads. Community stuffing tube for bulkheads is a system of passing multiple cables through ballast tank bulkheads on submarines.

3.6 Collective protective system (CPS). CPS is a system designed to inhibit the entry of chemical, biological, and radiological contaminants into collective protection zones on board ship. A collective protection zone is a section of the ship which is defined by a physical boundary that inhibits the entry of CBR contaminants into the zone. A total protection zone is pressurized to 2 inches WG and its supply ventilation air is continuously filtered to remove chemical vapors and CBR particulate and aerosols.

4. GENERAL REQUIREMENTS

4.1 Cable penetrations. Cable penetrations of pressure hulls, pressure proof bulkheads, shielded bulkheads, ballistic bulkheads, false decks, riser boxes, decks, bulkheads and beams and other integral parts of the hull shall be in accordance with figures 3A1 through 3E7 and the requirements of DDS 100-1 and DDS-100-2.

4.1.1 Installation welding requirements. Unless otherwise specified on the individual figure, the welding of stuffing tubes, kickpipes, swage tubes and multi-cable penetrators shall be in accordance with the requirements of MIL-STD-278.

4.1.2 Cable penetration of structure. Cable penetrations of decks, bulkheads, beams and other integral parts of the hull shall conform to DDS 100-1 and DDS 100-2. Stuffing tubes in accordance with MIL-S-24235/1 shall be installed for cable penetrations of pressureproof submarine bulkheads and sonar domes which are filled with water under normal operating conditions. One half of the tube may be used for each penetration.

Metal stuffing tubes or multiple cable penetrators shall be used for cable penetrations of the following:

(a) CPS boundaries.
(b) Watertight cable trunks.
(c) Watertight bulkheads.
(d) Bulkheads designed to withstand a waterhead.
(e) The portion of bulkheads specified to be watertight to a certain height.
(f) That portion of bulkheads below the height of the sill or the coaming of compartment accesses.
(g) Bulkheads surrounding compartments subject to flooding by sprinkling:

    (1) Garbage disposal rooms.
    (2) Battery shops.
    (3) Medical operating rooms.
    (4) Medical wards.

4.1.3 Cable penetration of decks and bulkheads forming boundaries of spaces containing volatile combustible or explosive materials. Only metal stuffing tubes shall be installed in decks and bulkheads forming the boundaries of spaces containing volatile combustible or explosive materials.

4.1.4 Cable penetration of decks, structural bulkheads, airtight bulkheads and fumetight bulkheads. Unless otherwise specified, cable penetration of decks, structural bulkheads, airtight bulkheads and fumetight bulkheads shall employ one of the following:

(a) Airtight metal stuffing tubes or multiple cable penetrators.
(b) Fumetight chaffing collars (for multiple cable penetrations) or nipples (for single cable penetrations) having a minimum collar length of 3 inches with a minimum annular area between the cable and the collar of 1 inch with the entire void area within the collar (this includes the area between the collar and the cable and the area between the cables) packed with plastic sealer.

4.1.5 Multiple (two or more) penetrations of nonstructural steel bulkheads (other than wire mesh or expanded metal), bents, web frames, transverse girders, and longitudinal girders. Unless otherwise specified, multiple cable penetrations of nonstructural steel bulkheads, bents, web frames, transverse girders and longitudinal girders shall employ one of the following:

(a) Metal stuffing tubes, multiple cable penetrators, nipples (for single cable penetrations) having a minimum length of 2 inches with a minimum annular area between cable and the nipple of 1/4 inch packed with plastic sealer.
(b) Banding collars (for multiple cable penetrations) having a minimum collar length of 3 inches with a minimum annular area between the cable and the collar of 1 inch with the entire void area within the collar (this includes the area between the collar and the cable and the area between the cables) packed with plastic sealer.

Cable penetrations of vertical nontight structures within a compartment need not be sealed at intervals closer than every 20 feet horizontally. However, all chaffing collars of the structures selected for sealing shall be sealed.

4.1.6 Plastic sealer. After the cables are properly secured, plastic sealer electrical insulation, MIL-I-3064, type HF, shall be used to seal the space around the cable as follows:

(a) In cable clamps and bushings entering the top of an electrical enclosure.
(b) In bushings or nipples used for passing cables through light-tight and fumetight bulkheads.

Plastic sealer shall also be used to seal around cables as they enter stuffing tubes, kickpipes and sewage tubes as shown on the individual figures.

4.1.7 Cable penetrations spacing. The size of stuffing tube groups shall be limited to permit tightening of gland nuts in the group using stuffing tube wrench set, GGG-W-646, type II, class I, style A, form B, table VI. Penetration spacing is specified in DDS 100-2.

4.1.8 Stuffing tube packing. Stuffing tube packing shall be in accordance with MIL-P-16685, either the preformed (coil) class 2 or bulk class 1. When bulk packing is used, the first and last turns shall be part "A" (hard) and the intermediate turns shall be part "B" (soft) of class 1. Reinforced neoprene packing, in accordance with MIL-R-15624, CL I may be used as an alternate, asbestos free, packing material (see figure 3B48).

4.1.9 Kickpipes. Kickpipes, aluminum, brass or steel, shall be standard pipe sizes. Ends of pipe shall be chamfered and burrs existing on the inside wall shall be removed to prevent chafing of cable.

5. DETAILED REQUIREMENTS

See figures

6. NOTES

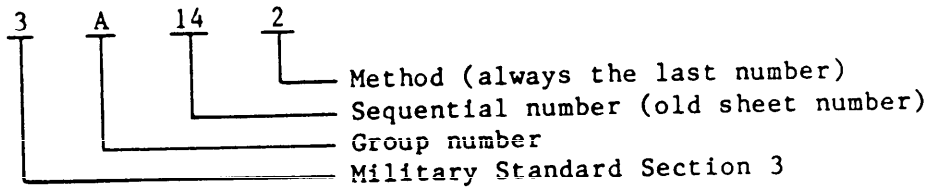
6.1 Intended use. This section specifies the requirements for swage tubes, stuffing tubes and kickpipe methods to be employed both on surface ships and submarines. Standard methods identified for electric plant installation are intended for new construction only.

6.2 Designation of Electric Plant Installation Standard Methods figures. The Electric Plant Installation Standard Methods (DOD-STD-2003-3), contains drawings that depict Standard Methods that are applicable for general electric plant installation on both surface ships and submarines. Each drawing has been assigned a figure number. The methods shown on the figures are grouped together providing similar functions. These groups are:

DOD-STD-2003-3 (Penetrations) Group
- A. Stuffing Tubes (Submarines)
- B. Stuffing Tubes (Surface Ships)
- C. Stuffing Tubes (General)
- D. Kickpipes

The methods shown on the figures are identified by the following alphanumeric designation system:

Method 3A142



Thus, method 3A142 identifies method 2, sequential number 14 in group A of DOD-STD-2003-3.

6.3 Subject term (key word) listing.

Stuffing tubes (submarines)
Stuffing tubes (surface ships)
Stuffing tubes (general)
Kickpipes

Preparing activity:
Navy - SH
(Project GDRQ-N066-3)

NOTES:

1. THE PACKING INSTRUCTIONS ARE APPLICABLE TO STUFFING TUBE ON DWG. NAVSEC NO. 9000-S6202-73899 SUBMARINES.
2. THIS FIGURE SUPERSEDES SHEET 3A1 OF DRAWING 803-5001027 AND SECTION 5, SHEET 72, OF DRAWING NAVSEC NO. 9000-S6202-73980.

INSTRUCTIONS FOR PACKING STUFFING TUBES - SUBMARINES
(SEE NOTE 1)

NOTES:

1. STUFFING TUBES DESIGNED FOR CABLES IN ACCORDANCE WITH MIL-C-915, MIL-C-24640, & MIL-C-24643
2. TUBES MAY BE THROWN OUT OF LINE BY WELDING. THIS IS PERMISSIBLE UP TO 1/16
3. SEALING COMPOUNDS AND ACTIVATORS ARE TO BE EQUAL TO ANY OF THE TYPES LISTED IN THE TABLE OF SEALING COMPOUNDS. THE INDIVIDUAL ACTIVATOR WITH ITS COMPOUND SHALL BE MIXED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. SEE NOTE 6.
4. AFTER THE CABLES ARE PROPERLY SECURED, PLASTIC SEALER ELECTRICAL INSULATION NAVY DEPARTMENT SPECIFICATION MIL-I-3064 TYPE HF SHALL BE USED TO SEAL THE SPACE AROUND THE CABLE WITHIN THE GLAND NUT, AND ALSO WITHIN THE OPEN END OF STUFFING TUBES AFTER THE TUBES ARE PACKED.
5. STUFFING TUBES WITH INSUFFICIENT CLEARANCE FOR PASSING CABLES MAY BE REAMED IN PLACE, NOT EXCEEDING .031
6. MANY THERMOSETTING PLASTIC INGREDIENTS HAVE POOR SHELF LIFE. IT IS RECOMMENDED THAT ACTIVATOR AND HARDNER OVER THREE MONTHS IN STORAGE BE DISCARDED AND REPLACED.
7. INSTRUCTIONS CONTAINED HEREIN ARE INTENDED FOR USE WITH PRESENTLY INSTALLED TUBES WHERE IT IS NECESSARY TO:
   A. REPLACE EXISTING CABLES.
   B. INSTALL UNDERSIZED CABLES.

SEALING COMPOUNDS		
BRAND NAME	CURING AGENT OR CATALYST	MANUFACTURERS NAME
XR-266 GROUP 3 ACME BULLETIN 575	AL-158 ACTIVATOR AL-77 HARDNER	ACME WIRE CO
MM & MEC-1130 RESIN & EC-776 PRIMER	MM & M ACCELERATOR	MINNESOTA MINING & MANUFACTURING COMPANY
PRO-RE-CO. PR-1201 L	PR-1201-A ACCELERATOR	PRODUCTS RESEARCH CO

1. TYPE 1
   A. BOTH ENDS OF TUBE MAY BE PACKED WITH PREFABRICATED PACKING IN ACCORDANCE WITH MIL-P-16685
   B. BOTH GLAND NUTS SHALL BE TIGHTENED TO GIVE THE PREFABRICATED PACKING AN INITIAL SET. THEN THE GLAND NUTS SHOULD BE REMOVED AND A SPLIT GLAND RING (3A113) ADDED TO EACH END OF THE TUBE.
   C. BOTH GLAND NUTS SHALL BE TIGHTENED FOR CABLES WITH A MINIMUM OUTSIDE DIAMETER. WHERE THE GLAND NUT CANNOT BE SUFFICIENTLY TIGHTENED, ADDITIONAL SPLIT GLAND RINGS (3A113) MAY BE ADDED TO EACH END OF THE TUBE. THE GLAND NUTS IN THE FINAL TIGHTENED POSITION SHALL HAVE THE UNDERCUT AND 2 OR 3 THREADS EXPOSED.

2. TYPE 2
   A. THE TUBES SHOULD BE INSTALLED IN THE BULKHEAD WITH THE AIR RELIEF SCREW ON THE TOP AND THE 90° 1/8 I.P.S. FITTING ON THE BOTTOM.
   B. SAME AS 1(A) ABOVE.
   C. SAME AS 1(B) ABOVE.
   D. SAME AS 1(C) ABOVE.
   E. WITH THE AIR RELIEF SCREW BACKED OFF AND USING A LEVER OPERATED, LUBRICATING GUN, SPEC MIL-G-16566 WITH A FLEXIBLE HOSE, FILL THE CENTER PORTION OF THE STUFFING TUBE WITH SEALING COMPOUND. SEE NOTE 3 OF NOTES FOR MATERIAL. WHEN SEALING COMPOUND EXUDES FROM THE AIR RELIEF SCREW, SECURE THE SCREW AND CONTINUE THE SEALING OF THE STUFFING TUBE WITH AN ADDITIONAL EIGHT TO FIFTEEN STROKES OF THE LUBRICATING GUN. THE ADDITIONAL STROKES ARE TO MAKE CERTAIN THAT THE CENTER PORTION OF THE TUBE IS COMPLETELY FILLED WITH THE COMPOUND FREE OR EXCESSIVE LEAKAGE OF THE SEALING COMPOUND AROUND THE GLAND NUTS INDICATES THAT THE TUBE HAS BEEN IMPROPERLY PACKED. WHERE THIS OCCURS, THE TUBE END MUST BE REPACKED.

3. TYPE 3
   A. SAME AS 1(A) ABOVE.
   B. SAME AS 1(B) ABOVE.
   C. SAME AS 1(C) ABOVE.

4. TYPE 4
   A. SAME AS 2(A) ABOVE.
   B. BOTH ENDS OF THE TUBE SHALL BE PACKED WITH A SINGLE RING, BUTT ENDED TIGHT OF (NAVY SYMBOL 1430) FLEXIBLE METALLIC PACKING FORCED TIGHTLY INTO PLACE, FOLLOWED BY ONE RING OF SEALING PACKING SPEC. MIL-P-16685 PART B AND ONE TAPERED RING OF RETAINER PACKING SPEC MIL-P-16685 PART A. THESE PACKING RINGS SHALL BE SET UP TIGHT USING THE SPACER SLEEVE WHICH PROVIDES THE CAVITY FOR THE SEALING COMPOUND. THE PURPOSE OF THE PACKING UP TO THIS POINT IS TO SEAL OFF THE SPACE AROUND THE CABLE WITHIN THE PIPE EXTENSION TO PREVENT ENTRY OF THE SEALING COMPOUND.
   C. SAME AS 1(A) ABOVE.
   D. SAME AS 1(B) ABOVE.
   E. SAME AS 1(C) ABOVE.
   F. SAME AS 2(E) ABOVE.

5. GENERAL INSTRUCTIONS (ALL TYPES)
   A. WITH GLAND NUTS, RINGS AND PACKING SETS IN PLACE CARE MUST BE TAKEN TO PROPERLY GUIDE THE CABLE THROUGH THE TUBE TO PREVENT DAMAGE OR INJURY TO THE PACKING SETS.
   B. ON CABLES WHERE THE INITIAL CLEARANCE BETWEEN THE PACKING SET AND THE ARMOR IS NOT SUFFICIENT TO ALLOW THE CABLE TO BE PULLED THROUGH THE STUFFING TUBE WITH THE PACKING SET AND GLAND NUT IN PLACE, THE PACKING SETS MAY BE STRETCHED AND THE GLAND NUT, RING AND PACKING ALLOWED TO RIDE FREE ON THE CABLE UNTIL THE CABLE IS PULLED INTO POSITION. THE PACKING SET MAY BE STRETCHED BY THE USE OF A SMOOTH TAPERED ROD.
   C. WHERE WELDING ROOM IS AVAILABLE, INSTALLATION SHALL BE THE SAME AS TYPES 1 & 2. IF BACKING PLATE IS NECESSARY IT SHALL BE THE DIAMETER OF THE TUBE PLUS 1" THICKNESS 3/16".
   D. WELDING SHALL BE IN ACCORDANCE WITH PUBLICATION NAVSEA 0900-LP-006-9010 AND NAVSEA 0900-LP-000-1000.

SH 132317077

FIGURE 3A1. Passing cable through pressure proof bulkheads–submarines instructions for packing stuffing tubes.

NOTES:

1. THIS FIGURE SUPERSEDES SHEET 3A2 OF DRAWING 803-5001027 AND SECTION 5, SHEET 73 THRU 79A AND SHEET 122 THRU 130 OF DRAWING, NAVSEC NO 9000-S6202-73980

MIL-S-24235/ TUBE SIZE & PACKING INFORMATION

SYM NO	TUBE SIZE	GLAND NUT PC NO	LOCK WSHR PC NO	GLAND RING PC NO	BEVEL WSHR PC NO	GROM PC NO
2405 1	1	1-019	1-028	2-120		2-061
2405 2				2-121		2-062
2405 3				2-122		2-063
2405 4				2-123		2-064
2405 5				2-124		2-065
2405 6				2-125		2-066
2405 7				2-126		2-067
2406 1	2	1-020	1-029	2-127		2-068
2406 2				2-128		2-069
2406 3				2-129		2-070
2406.4				2-131		2-071
2407 1	3	1-021	1-030	2-132		2-072
2407 2				2-133		2-073
2407 3				2-135		2-074
2407.7				2-137		2-075
2408 5	4	1-022	1-031	2-139	2-160	2-090
2408 1					2-161	2-091
2408 2					2-162	2-092
2408 3					2-163	2-093
2408 4					2-164	2-094
2409 2	5	1-023	1-032	2-140	2-166	2-096
2410 1	6	1-024	1-033	2-141	2-168	2-098
2411 5	7	1-025	1-034	2-142	2-171	2-101
2411 4					2-172	2-105
2412 2	8	1-026	1-035	2-143	2-177	2-107
2412 3					2-178	2-108

CABLE TYPES

9000-S6202-73899 TYPES 1,2,3&4 TUBE SIZE	CVSF NO	CVSF DIA	DCOP NO	DCOP DIA	DHOF NO	DHOF DIA	DLT NO	DLT DIA	DNW NO	DNW DIA	DNWA NO	DNWA DIA	DPS NO	DPS DIA	DRW NO	DRW DIA	DRWA NO	DRWA DIA	DSGA NO	DSGA DIA	DSGU NO	DSGU DIA	DSS NO	DSS DIA	DSWS NO	DSWS DIA	ECM NO	ECM DIA	ECMA NO	ECMA DIA
A			1	.255																										
			1-1/2	.315																										
			2	.330					3	.390											3	.391	2	.390						
B					3	.428			4	.430	3	.440	3	.455					3	.441	4	.427								
					4	.460					4	.480	4	.489					4	.477										
					6	.510																	3	.500						
																							4	.500						
C									9	.545											9	.544								
					9	.570							6	.585																
D									14	.610	9	.595	9	.628					9	.594										
											14	.660			—	.670					14	.670								
					14	.705	4	.710	23	.690			14	.730			—	.720	14	.720										
											23	.740																		
E																					23	.781			4	.800				
F																			23	.831										
G					23	.860			50	.910											50	.911								
J					30	960					50	.960							50	.961										
K																					75	1074								
									75	1.080																				
											78	1.130							75	1.124										
																					100	1.167								
L									100	1170																				
											100	1.220							100	1.217										
M																											—	1370		
N	4	1450			83	1450																							—	1420
P																					200	1583								
R																			200	1633										
S																					300	1841								
T																			300	1891										
V					250	2 100													400	2 119	400	2 069								
Y					400	2 500																								

SH 132317078

FIGURE 3A2. Steel stuffing tube cable assignment (submarines).

MIL-S-24235 TUBE SIZE & PACKING INFORMATION							CABLE TYPES																														9000-S6202-73899 TYPES 1, 2, 3 & 4
SYM NO	TUBE SIZE	GLAND NUT	LOCK WSHR	GLAND RING	BEVEL WSHR	GROM	FHOF		FNW		FNWA		FPS		FSGA		FSGU		FSS		MCOS		MCSF		MDU		MDY		MHOF		MMOP		MNW		MNWA		TUBE SIZE
		PC NO	PC NO	PC NO	PC NO	PC NO	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	
2405 1				2-120		2-061																									5	305					A
2405 2				2-121		2-062															5	390											7	400			
2405 3				2-122		2-063			3	447							3	447																	7	450	
2405 4	1	1-019	1-028	2 123		2-064	3	480													2	460															B
																					6	480															
2405 5				2-124		2-065			4	513	3	497					4	513	2	500	4	510							7	500			10	495			
																			3	500																	
2405 6				2-125		2-066	4	550																									14	535	10	545	
2405 7				2-126		2-067					4	563			4	563													10	585			19	590	14	585	C
2406 1				2-127		2-068			9	630							9	630	4	625	7	595							14	635							
2406 2	2	1-020	1-029	2 128		2-069	9	660			9	680			9	680																			19	640	
2406 3				2-129		2-070																							19	705			24	685			D
																																			30	725			
2406 4				2-131		2-071																													24	735		
																													24	795			37	785	30	775	E
2407 1				2-132		2-072			23	830			14	885																					37	835	F
24072				2-133		2 073					23	880					23	890											30	835			44	890			G
2407 3	3	1-021	1-030	2 134		2-074									23	940													37	925					44	940	
2407 7				2 137		2-075																			6	1000			44	1000							J
2407 4				2-138		2-076											50	1050																			
24085					2-160	2-090																															K
24081					2-161	2-091									50	1100																					
2408 2	4	1-022	1-031	2-139	2-162	2-092																															
24083					2-163	2-093																							61	1175							L
24084					2-164	2-094											75	1240									6	1190									
24091					2-165	2-095									75	1290																					M
24092	5	1-023	1-032	2-140	2-166	2-096											100	1358																			
24093					2-167	2-097	42	1380							100	1408					14	1395			14	1395											
24101					2-168	2-098																															N
24102	6	1-024	1-033	2 141	2-169	2-099	60	1510															4	1500													
24103					2-170	2-100																					14	1570									P
24115					2-171	2-101									150	1675	150	1625																			R
24113	7	1-025	1-034	2-142	2-174	2-104																			23	1765											
24114					2-175	2-105											200	1820																			S
24121					2-176	2-106									200	1870																					
24122	8	1-026	1-035	2-143	2-177	2-107	133	2000																			23	1960									T
24123					2-178	2-108																			40	2040											
24132	9	1-027	1-036	2-144	2 180	2-110																					40	2240									W
																									60	2330											X
																											60	2525									Y

NOTES:
1. THIS FIGURE SUPERSEDES SHEET 3A3 OF DRAWING 803-5001027 AND SECTION 5, SHEET 73 THRU 79A AND SHEET 122 THRU 130 OF DRAWING NAVSEC NO 9000-S6202-73880.

SH 132317079

FIGURE 3A3. Steel stuffing tube assignment (submarines).

NOTES
1. THIS FIGURE SUPERSEDES SHEET 3A4 OF DRAWING 803-5001027 AND SECTION 5, SHEET 73 THRU 79A AND SHEET 122 THRU 130 OF DRAWING NAVSEC NO 9000-S6202-73980

MIL-S-24235 TUBE SIZE & PACKING INFORMATION							CABLE TYPES																														9000-S6202-73980 TYPES 1,2,3 & 4
SYM NO	TUBE SIZE	GLAND NUT	LOCK WSHR	GLAND RING	BEVEL WSHR	GROM	MRI		MS		MSA		MSCA		MSCS		MSCU		MSP		MSPW		MA		MU		MUS		MWF		PBTM		PRTMU		PI		TUBE SIZE
		PC NO	PC NO	PC NO	PC NO	PC NO	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	
							D 1	075																													
24051				2-120		2-061	D 2	102																													A
							T 2	102																													
24052				2-121		2-062																			14	400											
24053	1	1-019	1-028	2-122		2-063																	14	450													
24054				2-123		2-064											7	484									14	460									B
24055				2-124		2-065																							7	500							
24056				2-125		2-066							7	534																			5	540			
24057				2-126		2-067									7	569															5	590					
																	10	622																			C
24061				2-127		2-068																							10	635							
																													14	635							
24062				2-128		2-069							10	672			14	668																			
24063	2	1-020	1-029	2-129		2-070							14	718	10	707																			3	685	D
24065				2-130																													15	750			
																	19	738											19	745							
24064				2-131		2-071			37	800			19	788	14	753															15	800					E
24071				2-132		2-072									19	823													24	836							F
24072				2-133		2-073					37	850					24	856																			
																	30	901																			
24075				2-134																															7	900	G
24073	3	1-021	1-030	2-135		2-074							24	905	24	940													30	945							
													30	951																							
24077				2-137		2-075									30	986																	30	980			
24074				2-138		2-076											37	1002											37	1045	30	1030					J
24085					2-160	2-090							37	1052																							
24081					2-161	2-091									37	1087	44	1114																			K
	4	1-022	1-031	2-139																															12	1155	
24083					2-163	2-093							44	1164																							L
24084					2-164	2-094									44	1199	61	1156																			
24091					2-165	2-095							61	1300																							M
24092	5	1-023	1-032	2-140	2-166	2-096									61	1335																					
24102					2-169	2-099											91	1480																			N
24103	6	1-024	1-033	2-141	2-170	2-100							91	1530	91	1565																					P
24115	7	1-025	1-034	2-142	2-171	2-101													–	1635	–	1636															R

SH 132317080

FIGURE 3A4. Steel stuffing tube cable assignment.

MIL-S-24235 TUBE SIZE & PACKING INFORMATION							CABLE TYPES																														9000-S6202-73899 TYPES 1 2 3 & 4	
SYM NO	TUBE SIZE	GLAND NUT	LOCK WSHR	GLAND RING	BEVEL WSHR	GROM	SHOF		SRW		SRWA		SSF		SSGA		SSGU		S2S		TCJA		TCJU		TCJX		TCKX		TCOP		TCTA		TCTU		TCTJX		TUBE SIZE
		PC NO	PC NO	PC NO	PC NO	PC NO	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA		
24051				2-120		2-061	3	210																														
24052				2-121		2-062			–	400																			2	345					1	350	A	
24053				2-122		2-063					–	450											4	430									4	430				
24054	1	1-019	1-028	2-123		2-084	23	460													4	480				1	456			4	480					B	
24055				2-124		2-065											50	520	–	500																		
24056				2-125		2-066																																
24057				2-126		2-067									50	570																			3	552	C	
24061				2-127		2-068	60	600									75	602																				
24062				2-128		2-069									75	652																						
24063	2	1-020	1-029	2-129		2-070											100	669																			D	
24065				2-130											100	719																						
24064				2-131		2-071																			3	742	3	742							3	742		
24072				2-133		2-073	150	870																													F	
24073	3	1-021	1-030	2-135		2-074									200	992	200	872																			G	
24077				2-137		2-075	200	980																														
24074				2-138		2-076											300	1001							7	983	7	983							12	964	J	
24085					2-160	2-090									300	1051																						
24081	4	1-022	1-031	2-139	2-161	2-091	250	1085					300	1100																							K	
24082					2-162	2-092											400	1118																				
24083					2-163	2-093									400	1168																						
24091	5	1-023	1-032	2-140	2-165	2-095																			12	1269	12	1269									M	
24093					2-167	2-097											650	1371																				
24101	6	1-024	1-033	2-141	2-168	2-098	500	1450							650	1421																					N	
24102					2-169	2-099											800	1485																				
24103					2-170	2-100									800	1533																						
24115	7	1-025	1-034	2-142	2-171	2-101	650	1610									1000	1620																			P	
							800	1670							1000	1670																					R	
24123	8	1-026	1-035	2-143	2-178	2-108									1600	2060	1600	2010																			T	
24132	9	1-027	1-036	2-144	2-180	2-110									2000	2260	2000	2210																			W	

NOTE:

1. THIS SHEET SUPERSEDS SECTION 5, SHEET 73 THRU 79A AND SHEET 122 THRU 130 OF DRAWING, NAVSEC NO 9000-S6202-73980

SH 132317081

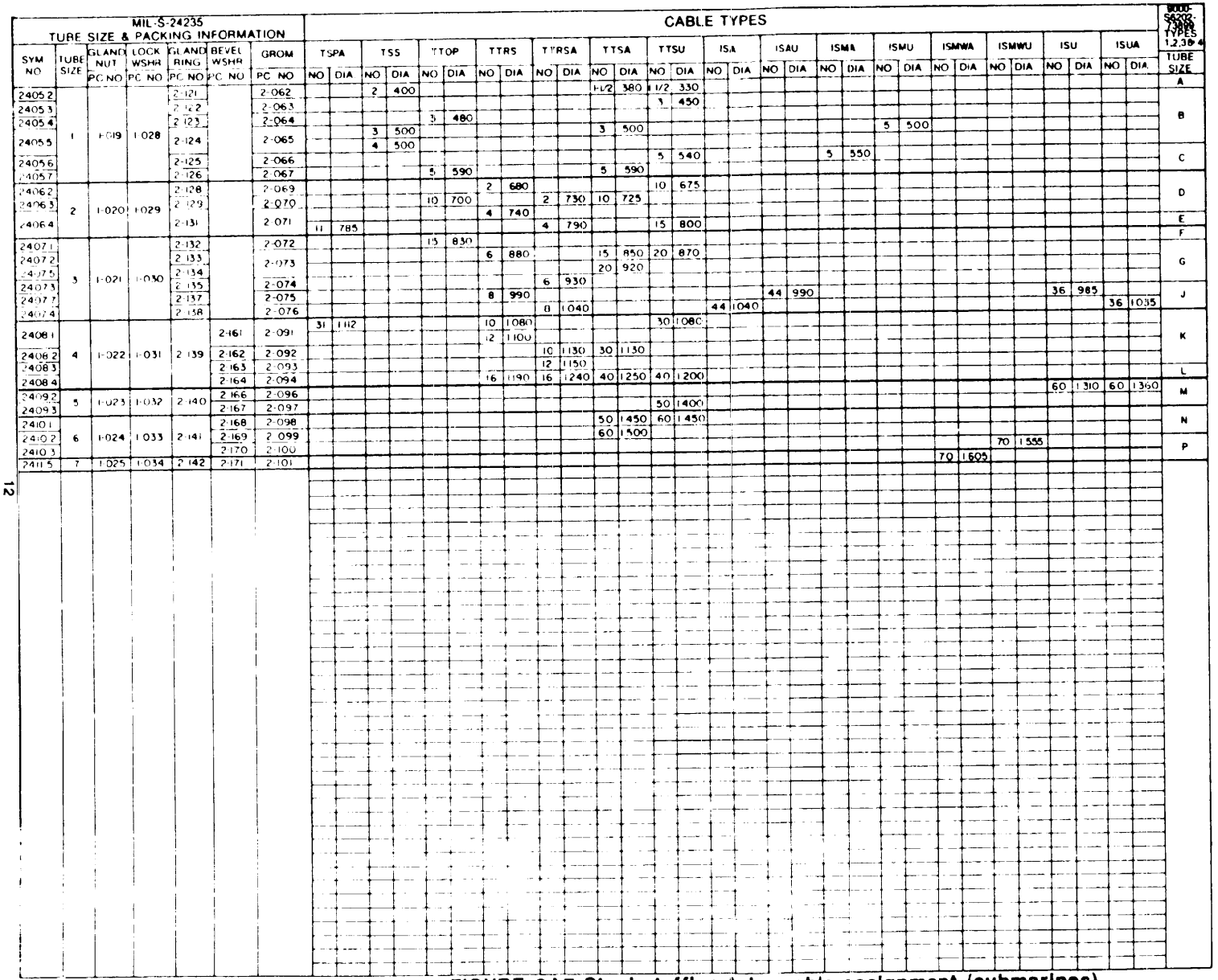
FIGURE 3A5. Steel stuffing tube cable assignment (submarines).

MIL-S-24235 TUBE SIZE & PACKING INFORMATION							CABLE TYPES																																9000-S6202-73980 TYPES 1,2,3 & 4
SYM NO	TUBE SIZE	GLAND NUT PC NO	LOCK WSHR PC NO	GLAND RING PC NO	BEVEL WSHR PC NO	GROM PC NO	THOF		TNW		TNWA		TPNW		TPNWA		TPS		TPU		TPUM		TRF		TRW		TRWA		TRXF		TSGA		TSGU		TSP		TUBE SIZE
							NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	
2405 1				2-120		2-061							1-1/2	235	1 1/2	285																					
2405 2				2-121		2-062							3	310																							A
2405 3				2-122		2-063	3	450	3	411					5	415																	3	411			
2405 4	1	1-019	1-028	2-123		2-064	4	480	4	449	3	461	10	470			3	475													3	461	4	449			B
2405 5				2-124		2-065					4	499																			4	499					
2405 6				2-125		2-066	6	550					15	530	10	520																					
2405 7				2-126		2-067							20	575	15	580	4	553															9	575			C
2406 1				2-127		2-068	9	600	9	625					20	625	6	620											84	600	9	625					
2406 2				2-128		2-069			14	670	9	675	30	680			9	657											105	680							
2406 3	2	1-020	1-029	2-129		2-070					14	720			30	730									710								14	718			D
2406 4				2-131		2-071							40	765			14	751					105	760			-	760	133	750	14	768			11	735	
2407 1				2-132		2-072	14	750	23	760	23	810											133	810									23	812			E
2407 2				2-133											40	815																					F
2407 5	3	1-021	1-030	2-134		2-073	23	900									23	866					168	860							23	862					G
2407 3				2-135		2-074															6	925															
2407 7				2-137		2-075			50	969							30	976	6	1000													50	969			J
2407 4				2-138		2-076					50	1019																			50	1019					
2408 5					2-160	2-090																													31	1062	K
2408 3	4	1-022	1-031	2-139	2-163	2-093			75	1134																							75	1134			L
2408 4					2-164	2-094	42	1250			75	1184																			75	1184					
2409 1	5	1-023	1-032	2-140	2-165	2-095			100	1266																							100	1266			M
2409 2					2-166	2-096					100	1316																			100	1316					
2410 2	6	1-024	1-033	2-141	2-169	2-099			150	1515																							150	1515			N
2410 3					2-170	2-100					150	1565																			150	1565					P
2411 5					2-171	2-101																											200	1669			R
2411 2	7	1-025	1-034	2-142	2-173	2-103																									200	1719					
2411 4					2-175	2-105	150	1820																													S
2412 2	8	1-026	1-035	2-143	2-177	2-107																											300	1957			T
2412 3					2-178	2-108																															
2413 2	9	1-027	1-036	2-144	2-180	2-110	250	2240																							300	2007					W
							400	2800																							400	2253	400	2203			AA
							500	3100																													BB
							600	3150																													

SH 132317082

FIGURE 3A6. Steel stuffing tube cable assignment (submarines).

NOTE
THIS FIGURE SUPERSEDES SHEET 3A6 OF DRAWING 803-5001027 AND SECTION 5, SHEET 73 THRU 79A AND 122 THRU 130 OF DRAWING, NAVSEC NO 9000-S5202-73980



MIL-S-24235 TUBE SIZE & PACKING INFORMATION							CABLE TYPES																																9000-S6202-73980 TYPES 1,2,3&4
SYM NO	TUBE SIZE	GLAND NUT PC NO	LOCK WSHR PC NO	GLAND RING PC NO	BEVEL WSHR PC NO	GROM PC NO	TSPA		TSS		TTOP		TTRS		TTRSA		TTSA		TTSU		ISA		ISAU		ISMA		ISMU		ISMWA		ISMWU		ISU		ISUA		TUBE SIZE
							NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	
2405 2	1	1-019	1-028	2-121		2-062			2	400							1-1/2	380	1 1/2	330																	A
2405 3				2-122		2-063													3	450																	
2405 4				2-123		2-064					5	480															5	500									B
2405 5				2-124		2-065			3	500							3	500																			
									4	500																											
2405 6				2-125		2-066													5	540					5	550									C
2405 7				2-126		2-067					5	590					5	590																			
2406 2	2	1-020	1-029	2-128		2-069							2	680					10	675																	D
2406 3				2-129		2-070					10	700			2	730	10	725																			
2406 4				2-131		2-071							4	740																							E
							11	785							4	790			15	800																	F
2407 1	3	1-021	1-030	2-132		2-072					15	830																									
2407 2				2-133		2-073							6	880			15	850	20	870																	G
2407 5				2-134													20	920																			
2407 3				2-135		2-074									6	930																					
2407 7				2-137		2-075							8	990									44	990									36	985			J
2407 4				2-138		2-076									8	1040					44	1040													36	1035	
2408 1	4	1-022	1-031	2-139	2-161	2-091	31	1112					10	1080					30	1080																	K
2408 2					2-162	2-092							12	1100	10	1130	30	1130																			
2408 3					2-163	2-093									12	1150																					L
2408 4					2-164	2-094							16	1190	16	1240	40	1250	40	1200																	
2409 2	5	1-023	1-032	2-140	2-166	2-096																											60	1310	60	1360	M
2409 3					2-167	2-097													50	1400																	
2410 1	6	1-024	1033	2-141	2-168	2-098											50	1450	60	1450																	N
2410 2					2-169	2-099											60	1500													70	1555					P
2410 3					2-170	2-100																							70	1605							
2411 5	7	1-025	1-034	2-142	2-171	2-101																															

NOTE:

THIS FIGURE SUPERSEDES SHEET 3A7 OF DRAWING 803-5001027 SECTION 5, SHEET 73 THRU 79A AND SHEET 122 THUR 130 OF DRAWING, NAVSEC NO 9000-S6202-73980

SH 132317083

FIGURE 3A7. Steel stuffing tube cable assignment (submarines).

NOTE:
THIS FIGURE SUPERSEDES SHEET 3A8 OF DRAWING 803-5001027 AND SECTION 5, SHEET 73 THRU 79A AND SHEET 122 THRU 130 OF DRAWING, NAVSEC NO. 9000-S6202-73980

MIL-S-24235 TUBE SIZE & PACKING INFORMATION

SYM NO	TUBE SIZE	GLAND NUT PC NO	LOCK WSHR PC NO	GLAND RING PC NO	BEVEL WSHR PC NO	GROM PC NO
2405 3	1	1-019	1-028	2-122		2-063
2405 5				2-124		2-065
2405 7				2-126		2-067
2406 1	2	1-020	1-029	2-127		2-068
2406 2				2-128		2-069
2406 3				2-129		2-070
2406 4				2-131		2-071
2407 1	3	1-021	1-030	2-132		2-072
2407 2				2-133		2-073
2407 3				2-135		2-074
2407 7				2-137		2-075
2407 4				2-138		2-076
2408 5	4	1-022	1-031	2-139	2-160	2-090
2408 1					2-161	2-091
2408 4					2-164	2-094
2409 1	5	1-023	1-032	2-140	2-165	2-095
2409 2					2-166	2-096
2409 3					2-167	2-097
2410 1	6	1-024	1-033	2-141	2-168	2-098
2410 3					2-170	2-100
2411 5	7	1-025	1-034	2-142	2-171	2-101
2411 2					2-173	2-103
2411 4					2-175	2-105

CABLE TYPES

ISWA		ISWU		ISWF		IS50MA		IS50MU		IS50MUS		IS75MA		IS75MU		2A		2AU		2AUS		2CS		2SA		2SU		2SUS		9000-S6202-73899 TYPES 1,2,38
NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	TUBE SIZE
		2	455																											
																						6	430							B
2	505																													
																										3	520			
																						18	590	3	570			3	580	C
				2	625																									
																										7	660			
																								7	710			7	720	D
																						42	800							E
																										10	830			F
		14	870			16	875	16	905	16	885																			
																								10	880			10	890	G
14	920							20	905																					
																						60	930			14	930			
						20	955			20	965																			
																								14	990			14	990	J
		20	1030																											
														8	1030															
																										19	1040			
																						77	1070							
20	1080																													
												8	1080																	
																								19	1090			19	1100	K
30	1250	30	1200			40	1235	40	1185	40	1245																			
																										24	1210			
																								24	1260					L
																										30	1280	24	1270	
																		40	1370											
																								30	1330			30	1340	M
																										37	1380			
																				40	1415									
																40	1420													
								70	1555																					
																										44	1550			
						70	1605			70	1615																			
																								44	1600			44	1610	P
																										61	1740			R
																								61	1790			61	1800	S

SH 132317084

FIGURE 3A8. Steel stuffing tube cable assignment.

NOTE:

1. SEE FIGURE 3A24 AND 3A25 FOR CONTINUED CABLE INFO AND STUFFING TUBE ASSIGNMENT CHARTS.
2. THIS FIGURE SUPERSEDES SHEET 3A9 OF DRAWING 803-5001027.

MIL-S-24235 TUBE SIZE & PACKING INFORMATION

SYM NO	TUBE SIZE	GLAND NUT PC NO	LOCK WSHR PC NO	GLAND RING PC NO	BEVEL WSHR PC NO	GROM PC NO
2405 1	1	1-019	1-028	2-120		2-061
2405 2				2-121		2-062
2405 3				2-122		2-063
2405 4				2-123		2-064
2405 5				2-124		2-065
2405 7				2-126		2-067
2406 1	2	1-020	1-029	2-127		2-068
2406 2				2-128		2-069
2406 3				2-129		2-070
2406 4				2-131		2-071
2407 1	3	1-021	1-030	2-132		2-072
2407 2				2-133		2-073
2407 3				2-135		2-074
2407 7				2-137		2-075
2407 4				2-138		2-076
2408 1	4	1-022	1-031	2-139	2-161	2-091
2408 4					2-164	2-094
2409 1	5	1-023	1-032	2-140	2-165	2-095
2409 2					2-166	2-096
2409 3					2-167	2-097
2410 1	6	1-024	1-033	2-141	2-168	2-098
2410 3					2-170	2-100
2411 5	7	1-025	1-034	2-142	2-171	2-101
2411 2					2-173	2-103
2411 3					2-174	2-104
2411 4					2-175	2-105
2412 1	8	1-026	1-035	2-143	2-176	2-106
2412 3					2-178	2-108

CABLE TYPES

2SJ NO	2SJ DIA	2SJA NO	2SJA DIA	2SWA NO	2SWA DIA	2SWAU NO	2SWAU DIA	2SWF NO	2SWF DIA	2SWL NO	2SWL DIA	2SWLA NO	2SWLA DIA	2WSU NO	2WSU DIA	2SWUA NO	2SWUA DIA	2U NO	2U DIA	2UA NO	2UA DIA	2UW NO	2UW DIA	2UWA NO	2UWA DIA	2UWS NO	2UWS DIA	2WA NO	2WA DIA	5000-S6202-73899 TYPES 1,2,38 TUBE SIZE
														1	255	1	305													
14	302	18	296																											
16	265	20	270																											A
18	246	22	253																											
20	220																													
22	203																													
12	400	14	352																											
		16	315																											
11	445	12	450															10	480											B
		11	495																	10	530									
9	530					3	520											15	560											
		9	580	3	570													19	580											C
																				15	610									
7	605																			19	630									
								3	625																					
								4	625																					D
		7	655			7	660							3	710			30	700											
				7	710															30	750									
																3	760					42	790							E
						10	830	7	815																					F
																								42	840	42	840			
																		45	870											G
				10	880																									
						14	930			7	910			7	910					45	920									
																		60	960											J
				14	980							7	960			7	960													
																				60	1010									
						19	1040																							K
				19	1090																									
						24	1210							12	1200	12	1250													L
				24	1260																									
						30	1280																							M
				30	1330																									
						37	1380							19	1380															
																												40	1420	N
																19	1430													
				37	1430																									
						44	1550																							P
				44	1600									24	1590															
																24	1640													R
						61	1740																							
														30	1760															
																30	1810													S
				61	1790																									
														37	1870															
																37	1920													T
														61	2300															W
														61	2350															X

SH 132317085

FIGURE 3A9. Steel stuffing tube cable assignment (submarines).

3A101

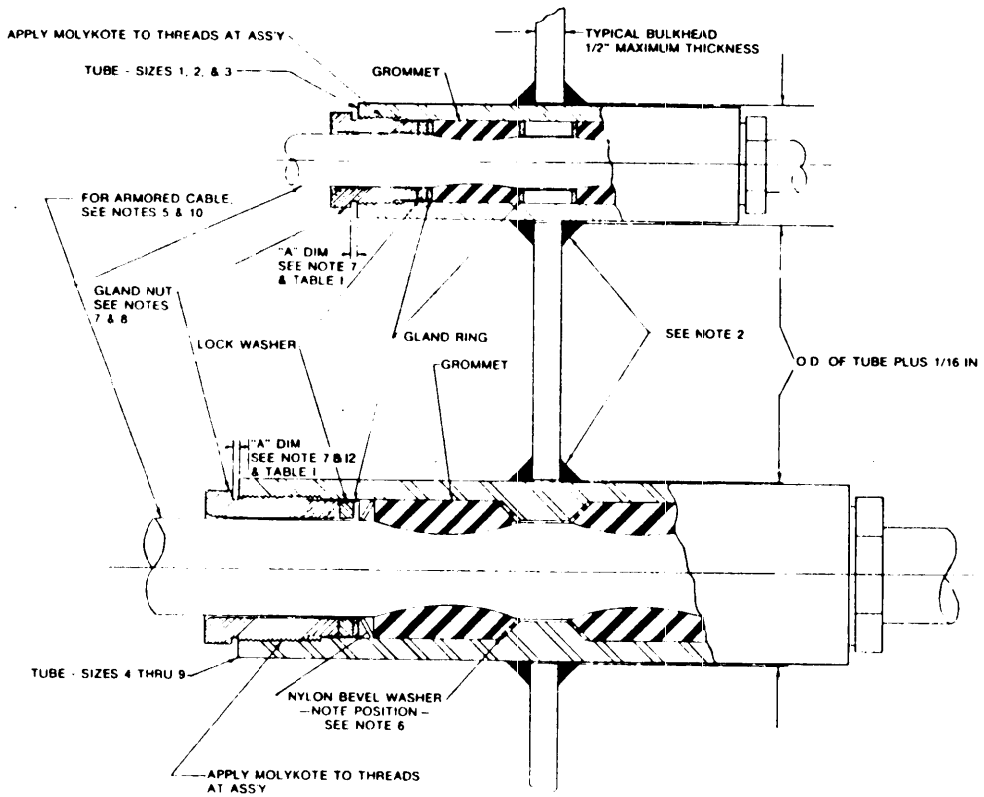


TABLE I (SEE NOTE 12)			
TUBE SIZE	TORQUE (FT-LB) MIN	MAX	MAX "A" DIM (INCHES)
1	17	30	1/4
2	20	35	1/4
3	40	80	1/4
4	50	100	1/4
5	60	NO MAX	1/8
6	70	NO MAX	1/8
7	100	NO MAX	1/8
8	110	NO MAX	1/8
9	125	NO MAX	1/8

TUBE SIZE	CENTER SECTION DIMENSION	"TUBE LENGTH "m" DIMENSION
1	1-3/4	6-1/2
2	1-3/4	7-1/8
3	1-3/4	8
4	1-3/4	9-3/8
5	1-3/4	10-7/8
6	1-3/4	11-1/2
7	1-3/4	12-1/4
8	1-3/4	12-1/2
9	1-3/4	12-3/4

10 METHODS FOR APPLYING GLASS FLOCK MIXTURE
(A) COAT ENTIRE INNER SURFACE AND LEADING EDGE OF SPLIT GROMMET WITH MIXTURE JUST PRIOR TO ATTACHMENT TO CABLE. GROMMET SHOULD BE ATTACHED JUST OUTSIDE OF TUBE TO MINIMIZE LOSS OF MIXTURE
(B) COAT THAT PORTION OF THE CABLE THAT WILL EVENTUALLY BE UNDER GROMMET (THIS SHALL BE DONE JUST PRIOR TO PULLING FINAL FEW INCHES OF CABLE INTO TUBE)

11 FOR BULKHEADS IN EXCESS OF 1/2 INCH BUT NOT GREATER THAN 1 INCH, TUBE BODY DIMENSIONS SHALL BE MODIFIED AS SHOWN

12 THE "A" DIMENSION FOR TUBE SIZES 5 THRU 9 SHOWN IN TABLE ONE ARE DESIRED DIMENSIONS. VARIATIONS FROM THIS DIMENSION CAN BE APPROVED LOCALLY AT THE DISCRETION OF THE NAVAL ELECTRICAL DESIGN REPRESENTATIVES UP TO A MAXIMUM "A" DIMENSION OF 5/16 INCH PROVIDED ALL STUFFING TUBE PARTS AND THE INSTALLED CABLE ARE FIRST INSPECTED TO DETERMINE COMPLIANCE WITH APPLICABLE SPECIFICATIONS.

13 THIS FIGURE SUPERSEDES SHEET 3A10 OF DRAWING 803-5001027 AND SECTION 5 SHEET 118 OF DRAWING NAVSEC NO 9000-86202-73980.

NOTES:

1 STUFFING TUBES ARE DESIGNED FOR CABLES IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS, LATEST REVISIONS: MIL-C-915

2 ALL WELDING SHALL COMPLY WITH APPROVED METHODS. ALL WELDING TO OR ON HY-80 MUST COMPLY WITH NAVSHIPS 0900-LP-006-9010

3 TUBES MAY BE THROWN OUT OF LINE BY WELDING. THIS IS PERMISSIBLE UP TO 1/16 INCH

4 FOR NON-NUCLEAR BULKHEADS, GROMMETS MAY BE OF NEOPRENE (BLACK). FOR NUCLEAR BULKHEADS, GROMMETS SHALL BE OF SILICONE (RED OR WHITE)

5 TO PREVENT WATER SEEPAGE WITH ARMORED CABLE, USE A MIXTURE CONSISTING OF 3 TO 4 PARTS BY WEIGHT OF DC-11 (DOW CORNING OR EQUAL) & 1 PART BY WEIGHT OF MILLED FIBRE GLASS (OWENS CORNING FIBRE GLASS CORP. OR EQUAL). SEE NOTE 10 FOR METHODS OF APPLYING THIS MIXTURE TO GROMMETS OR CABLE

6 CARE SHALL BE TAKEN TO ASSEMBLE THE BEVEL WASHERS IN THE POSITION INDICATED HEREON

7 ALL GLAND NUTS SHALL BE TIGHTENED WITH A TORQUE WRENCH, USING THE FOLLOWING PROCEDURE: TIGHTEN GLAND NUTS TO AN "A" DIM. OF APPROXIMATELY 1/8" (NO THREADS VISIBLE ON GLAND NUT) WHENEVER POSSIBLE WITHOUT EXCEEDING THE MAXIMUM TORQUE INDICATED IN TABLE I FOR A PARTICULAR TUBE SIZE (THIS MAXIMUM TORQUE RESTRICTION APPLIES ONLY TO TUBE SIZES 1 THRU 4 INCL). IF MAXIMUM TORQUE IS OBTAINED BEFORE THE 1/8" SPACING REQUIREMENT IS ACHIEVED, THE "A" DIM SHALL NOT EXCEED 1/4". IN THE EVENT MINIMUM TORQUE (AS INDICATED IN TABLE I) IS NOT OBTAINED AT 1/8", CONTINUE TO TIGHTEN THE GLAND NUT UNTIL THIS TORQUE IS REACHED. IF METAL TO METAL CONTACT IS ACHIEVED WITHOUT OBTAINING MINIMUM TORQUE, THE GLAND NUT SHALL BE BACKED OFF, AN ADDITIONAL SPLIT GLAND RING INSERTED IN THE STUFFING TUBE, AND THE GLAND NUT RE-TIGHTENED. NO MORE THAN TWO ADDITIONAL GLAND RINGS, INSERTED ONE AT A TIME, SHALL BE INSTALLED IN EACH END OF A TUBE TO RAISE THE TORQUE VALUE TO THE MINIMUM SPECIFIED IN TABLE I.

8 IT IS RECOMMENDED THAT SOCKETS (TYPE II, CLASS 1, STYLE A, FORM B, STANDARD WALL OCTAGON) AND WRENCH HEADS (TYPE I, CLASS 1, STYLE A, OPEN RATCHET, CROWFOOT, MULTIPURPOSE), MANUFACTURED IN ACCORDANCE WITH FEDERAL SPECIFICATION GGG-W-646 (AMENDMENT 3 OR LATER) BE USED WITH A SUITABLE TORQUE WRENCH (PREFERABLY A SENSORY SIGNALING TYPE) TO TIGHTEN GLAND NUTS. TORQUE VALUES LISTED IN TABLE WERE OBTAINED USING SOCKETS AND WRENCH HEADS LISTED ABOVE.

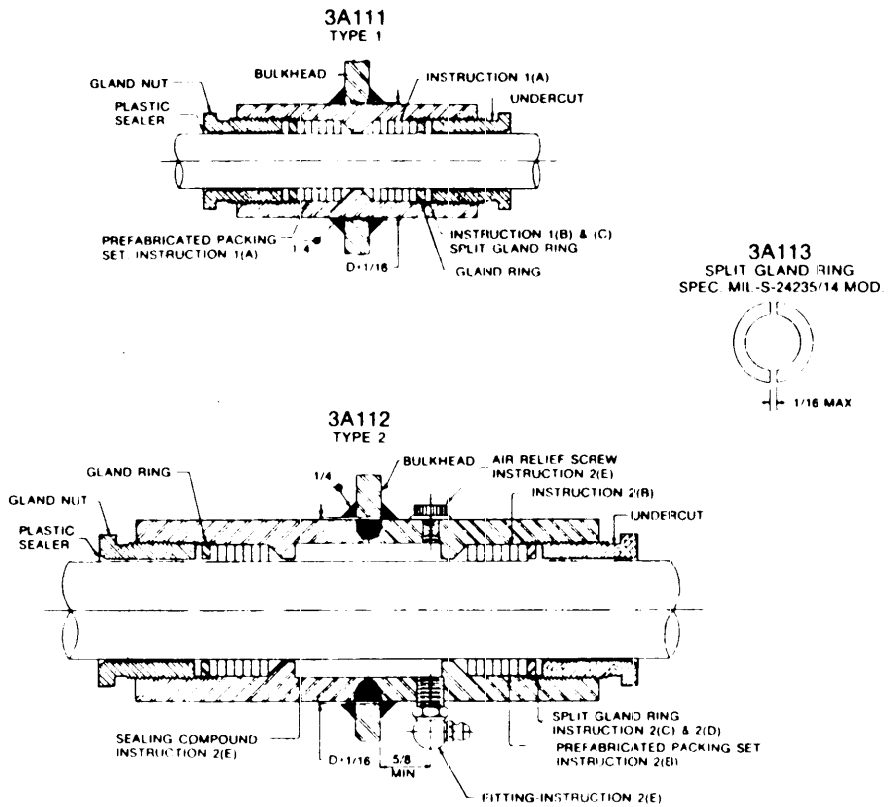
9 EXISTING GLAND NUTS (MANUFACTURED UNDER BUSHIPS DWG 815-1197030, REV A) MAY BE USED PROVIDING CARE IS TAKEN TO INSURE A GOOD FIT BETWEEN THE GLAND NUT AND THE APPLICABLE SOCKET. THIS IS NECESSARY TO PREVENT DEFORMING THE GLAND NUT CORNERS AND WEDGING OF THE SOCKET ON THE GLAND NUT, CAUSING ERRONEOUS TORQUE READINGS.

SH 132317086

FIGURE 3A10. Stuffing tubes for passing cables through pressure proof bulkheads (submarines).

NOTES:

1. SEE FIGURE 3A1 FOR INSTRUCTIONS.
2. THIS FIGURE SUPERSEDES SHEET 3A11 OF DRAWING 803-5001027 AND SECTION 5, SHEET 69 OF DRAWING NAVSEC NO. 9000-S6202-73980

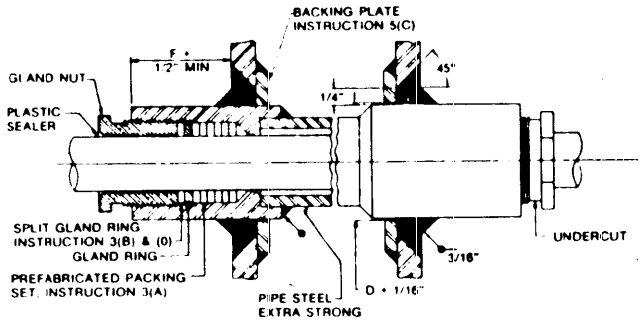


SH 132317087

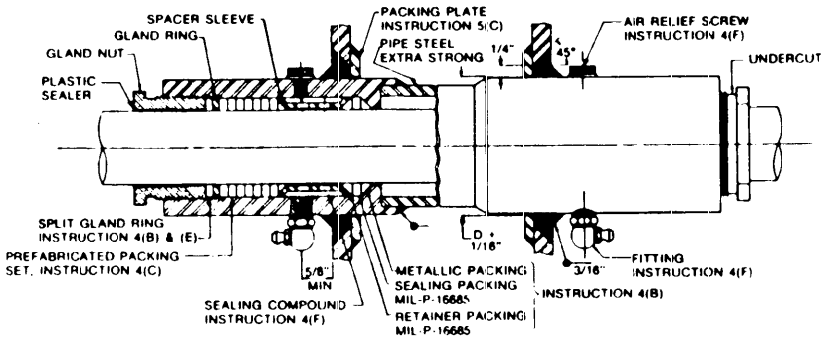
FIGURE 3A11. Stuffing tubes for passing cable through pressure proof bulkheads type 1&2 (submarines).

NOTES:
1. SEE FIGURE 3A1 FOR INSTRUCTIONS.
2. THIS FIGURE SUPERSEDES SHEET 3A12 OF DRAWING 803-5001027 AND SECTION 5, SHEET 70 OF DRAWING NAVSEC NO 9000-S6202-73980.

3A121
TYPE 3

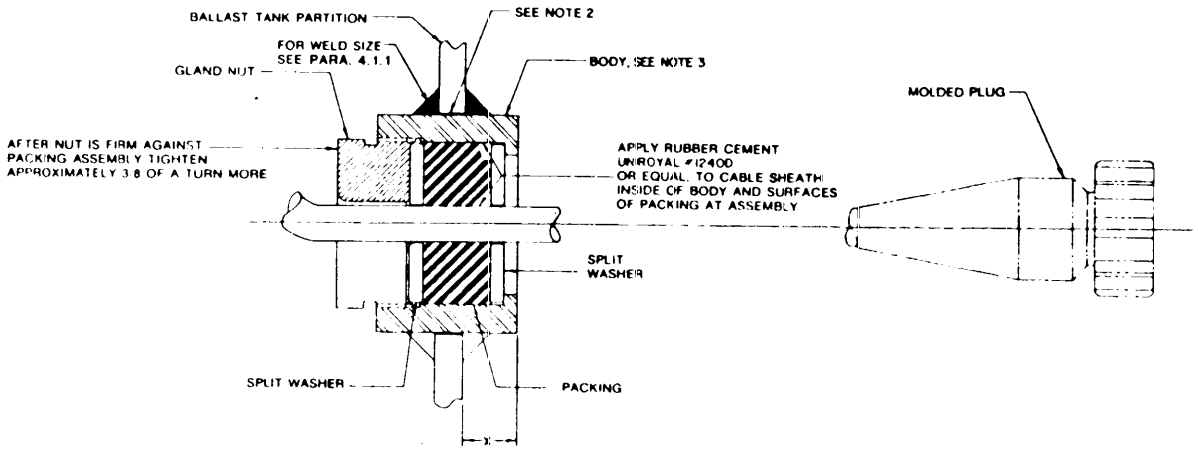


3A122
TYPE 4



SH 132317088

FIGURE 3A12. Stuffing tubes for passing cable through pressure proof bulkheads type 3&4 (submarines).



APPLICATION TABLE			
STUFFING TUBE SYM NO	CABLE TYPE	MOLDED PLUG SPEC MIL-C-24231	DIMENSION X
2425	TSS-4 DSS-3 DSS-4	713	9/16
2425 1	TSS-4 FSS-2	713 1	3/4
2425 2	FSS-4 MSS-6	713 1	3/4

NOTES:
1. TUBES MAY BE THROWN OUT OF LINE BY WELDING. THIS IS PERMISSIBLE UP TO 1/16".
2. HOLE DIA SHALL BE OUTSIDE DIA OF TUBE PLUS 1/16".
3. POSITION STUFFING TUBE SO THAT GLAND NUT IS ON THE MOST ACCESSIBLE SIDE OF BALLAST TANK PARTITION.
4. THIS FIGURE SUPERSEDES SHEET 3A13 OF DRAWING 803-5001027 AND SECTION 5, SHEET 133 OF DRAWING NAVSEC NO 9000-S6202-73980.

SH 132317089

FIGURE 3A13. Passing cable through ballast tank partitions (submarines).

NOTES

1. WHEN BACKING PLATE IS USED IT SHALL BE THE THE DIAMETER OF THE TUBE PLUS (1) ONE INCH 3/16 INCH THICK.
2. NOTES ON FIGURE 3A10.
3. PIPE SHALL BE IN ACCORDANCE WITH SPECIFICATIO N WW-P-406.
4. THIS FIGURE SUPERSEDES SHEET 3A14 OF DRAWING 803 5001027 AND SECTION 5, SHEET 120 OF DRAWING NAVSEC NO 9000-S6202-73910.

3A141

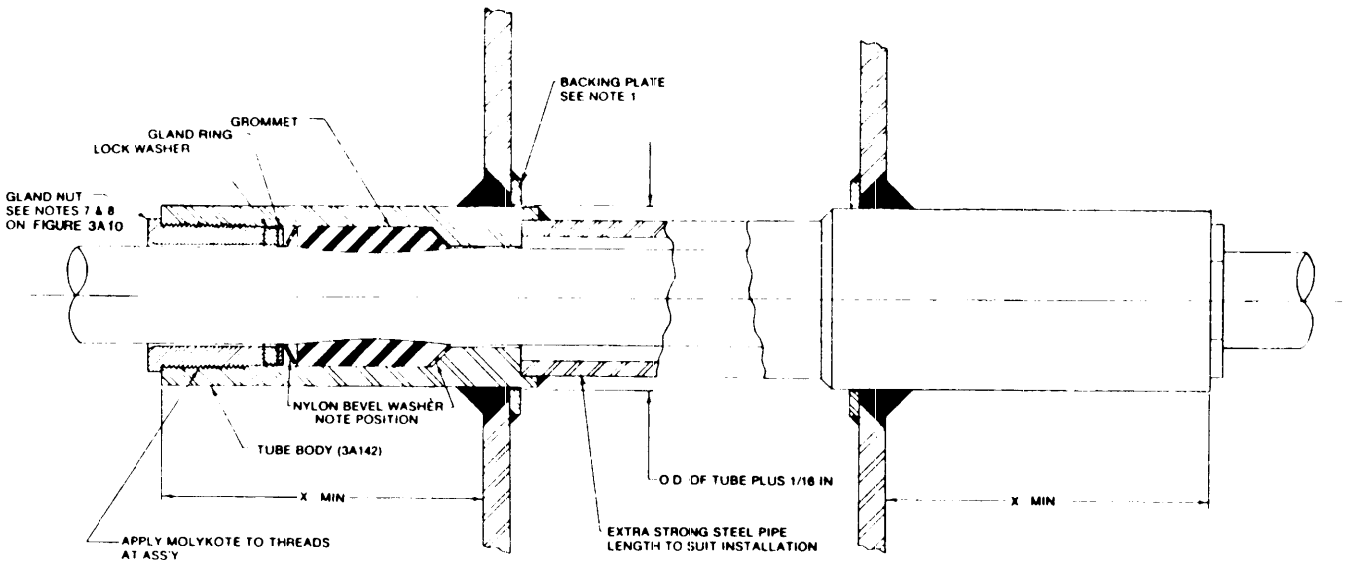
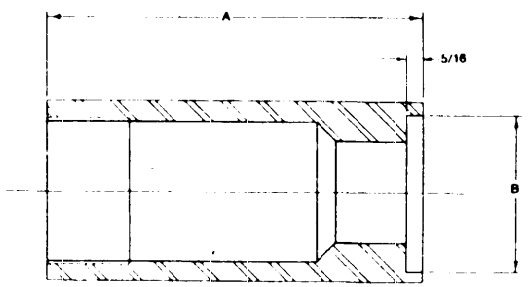


TABLE OF DIMENSIONS				
TUBE SIZE	EXTRA STRONG PIPE	"X"	"A"	"B"
1	3/4	3	4	1/065
2	1	3-5/16	4-5/16	1 330
3	1-1/4	3-3/4	4-3/4	1 675
4	1-1/2	4-7/16	5-7/16	1 915
5	2	5-3/16	6-3/16	2 400
6	2	5-1/2	6-1/2	2 400
7	2-1/2	5-7/8	6-7/8	2 906
8	3	6	7	3 546
9	3	6-1/8	7-1/8	3 546

3A142
SAME AS 1197030 EXCEPT AS SHOWN



SH 132317090

FIGURE 3A14. Passing cable through tanks (pipe extension) (submarines).

NOTES:
1. NOTES ON FIGURE 3A10 APPLY.
2. THIS FIGURE SUPERSEDES SHEET 3A15 OF DRAWING 803-5001027 AND SECTION 5, SHEET 120 OF DRAWING, NAVSEC NO. 9000-S6202-73980

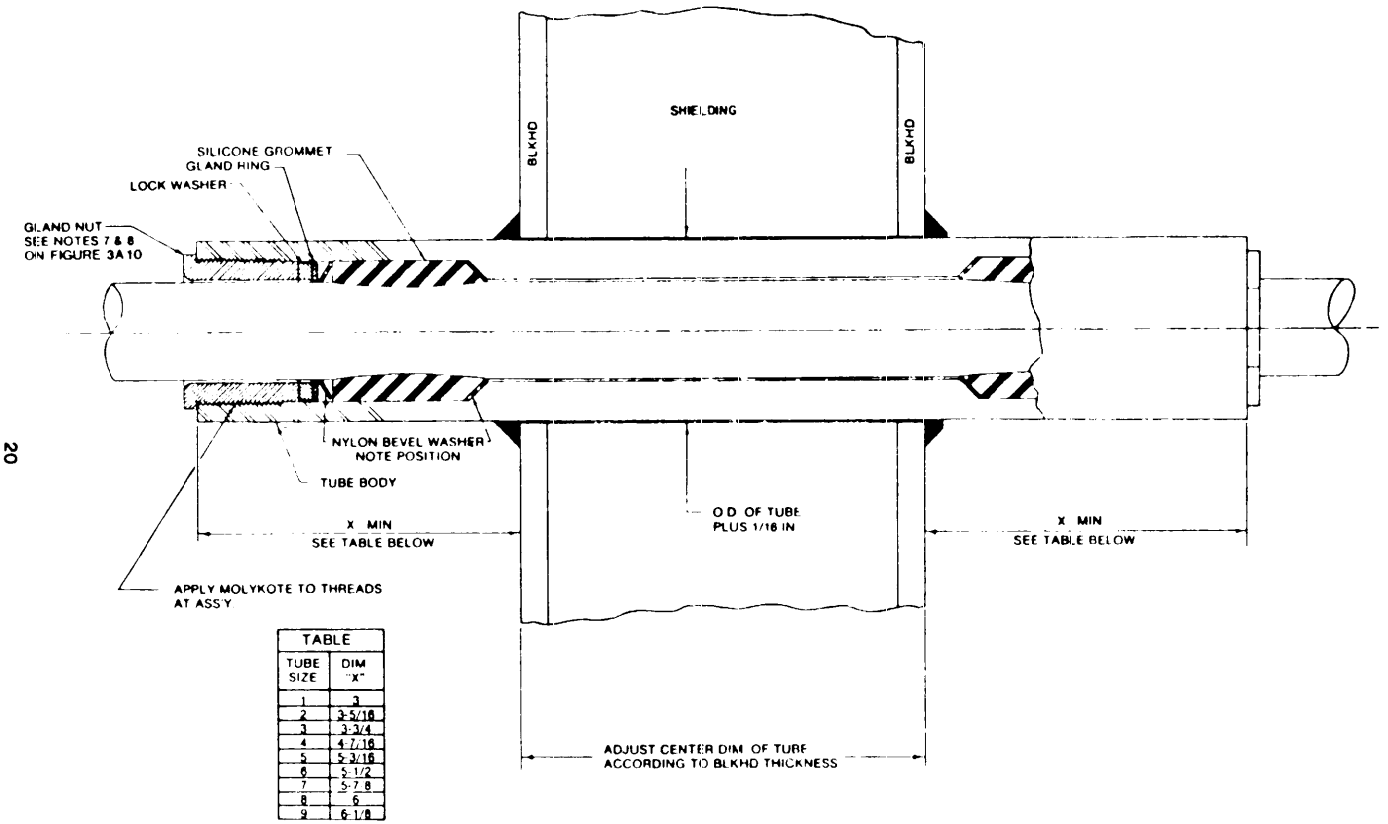
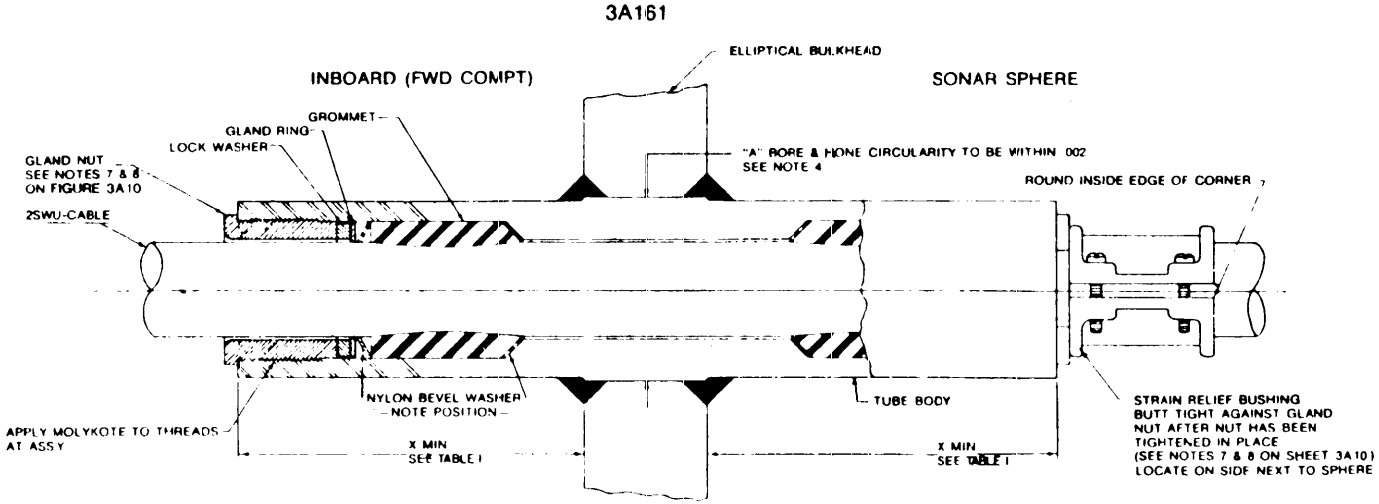


TABLE	
TUBE SIZE	DIM "X"
1	3
2	3-5/16
3	3-3/4
4	4-7/16
5	5-3/16
6	5-1/2
7	5-7/8
8	6
9	6-1/8

SH 132317091

FIGURE 3A15. Cables through shielded bulkheads (submarines).



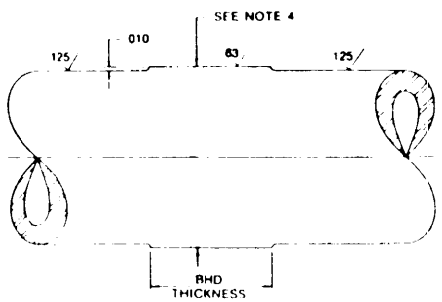


TABLE I

TUBE SIZE	STRAIN RELIEF BUSHING -SIZE-	DIM "X"	DIM "A"
1		3-1/4	1.488 1.484
2		3-9/16	1.669 1.664
3		4-3/16	2.109 2.103
4		4-7/8	2.299 2.292
5		5-13/16	2.669 2.662
6	5	6-3/16	2.799 2.792
7	5	6-9/16	3.299 3.291
8	6a	7-1/8	3.924 3.915
9	6a	7-1/8	3.924 3.916

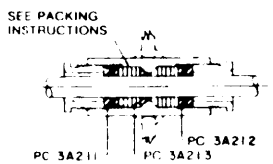
SH 132317092

FIGURE 3A16. Cables through elliptical bulkheads (submarines).

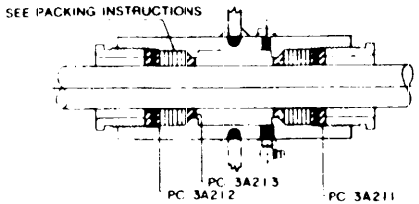
NOTES:
1. NOTES ON FIGURE 3A10 APPLY.
2. THIS FITTING WAS FIRST DEVELOPED FOR USE IN FWD ELLIPTICAL BULKHEAD ON SS(N)593 CLASS VESSELS.
3. INSTALLATION SHALL BE IN ACCORDANCE WITH NOTE 2 ON FIGURE 3A10 TUBE SPACING AND WELD JOINT EFFICIENCY SHALL BE IN ACCORDANCE WITH NAVSHIPS 0900-LP-006-9010.
4. PROVIDE AN INTERFACE FIT OF 000 AND 001 BETWEEN A BORE AND TUBE BODY
5. BORE AND LENGTH DIMENSIONS (X&Y) ARE BASED ON 2-5/16 THICK ELLIPTICAL BULKHEAD.
6. FOR CORRECT STRAIN RELIEF BUSHING SIZE, SEE TABLE 1 BELOW & NAVSEA DWG 9000-S6202-7341
7. THIS FIGURE SUPERSEDES SHEET 3A16 OF DRAWING 803-5001027 AND SECTION 5, SHEET 119 OF DRAWING NAVSEA NO. 9000-S6202-73980.

NOTES:
1. THIS FIGURE SUPERSEDES SHEET 3A17 OF DRAWING 803-5001027 AND SECTION 5, SHEET 71 OF DRAWING NAVSEC NO. 9000-S6202-73980.

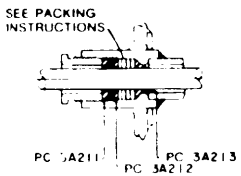
3A171
TYPE 1



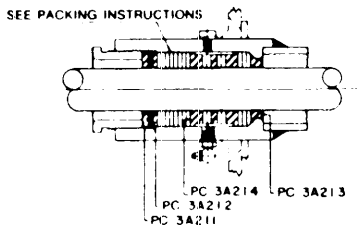
3A172
TYPE 2



3A173
TYPE 3



3A174
TYPE 4



METHOD OF CHANGING INSTALLED BULKHEAD TUBES TO ONE SIZE LARGER

INSTALLED BULKHEAD STUFFING TUBES, TYPES 1, 2, 3 & 4 AND 46-1 MAY BE MODIFIED TO PROVIDE FOR CABLES REQUIRING ONE SIZE LARGER TUBE BY REAMING THE TUBE BODY, GLAND NUT AND THE SPACER SLEEVE TO THE "a" DIMENSION AND THE GLAND RING TO THE "aa" DIMENSION OF THE NEXT LARGER SIZE, EXCEPT SIZES "C" AND "M" OF TYPES 3 AND 4 WHICH CAN BE REAMED ONLY TO .732" AND 1.490" DIAMETERS RESPECTIVELY.

METHOD OF CHANGING INSTALLED BULKHEAD TUBES TO SMALLER SIZES

INSTALLED BULKHEAD STUFFING TUBES, TYPES 1, 2, 3, 4 AND 46-1, MAY BE MODIFIED TO PROVIDE FOR CABLES REQUIRING SMALLER SIZE TUBES BY THE USE OF THE GLAND RINGS, BUSHINGS AND SPACER SLEEVES, PCS. 3A211, 3A212, 3A213, & 3A214 RESPECTIVELY IN LIEU OF THOSE FURNISHED WITH THE TUBES.

INSTRUCTIONS FOR PACKING

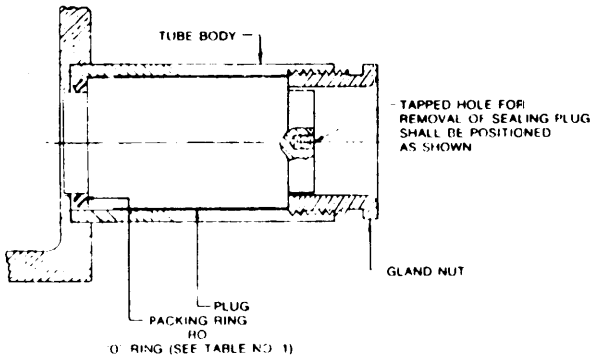
TUBES SHALL BE PACKED IN ACCORDANCE WITH "INSTRUCTIONS FOR PACKING" SHEET 3 GROUP A SEC I EXCEPT THAT PACKING MATERIAL, PARTS A AND B, SPECIFICATION MIL-P-16685 OF A SUITABLE SIZE AND QUANTITY SHALL BE INSTALLED BY HAND IN LIEU OF PREFABRICATED PACKING SET.

SH 132317093

FIGURE 3A17. Methods of changing sizes of installed bulkhead stuffing tubes types 1 to 4 & 46 – 1 (submarines).

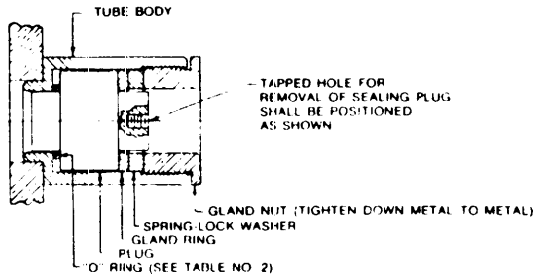
3A181

STUFFING TUBE
SPEC MIL-S-24235/7 & 8



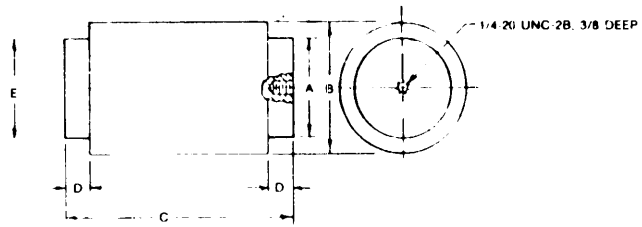
3A182

STUFFING TUBE
DWG NO S6202-1197101



3A183

PLUG BODY



3A184

HULL FITTING
DWG NO 815-1197096

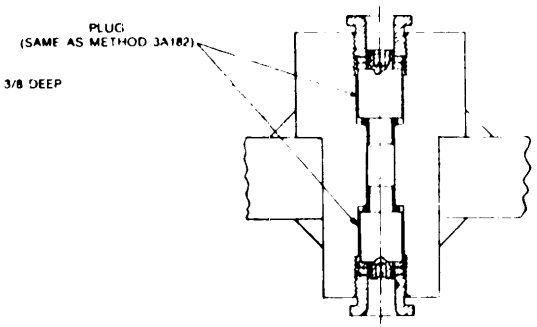


TABLE NO 1

M24235/7 & 8 TUBE SIZE	TABLE OF DIMENSIONS					
	A	B	C	D	E	"O" RING PC NO SEE NOTE 3
A	17/32	53/64	2-1/16	1/4	17/32	ARP 568-113
B	23/32	1 1/32	2-7/16	5/16	23/32	ARP 568-116
C	31/32	1-11/32	2-13/16	5/16	31/32	ARP 568-214
D	31/32	1 11/32	3-7/32	5/16	31/32	ARP 568-214
E	1-3/16	1 37/64	2-13/16	5/16	1-3/16	ARP 568-218
F	1-17/32	2	2-13/16	5/16	1-17/32	ARP 568-223

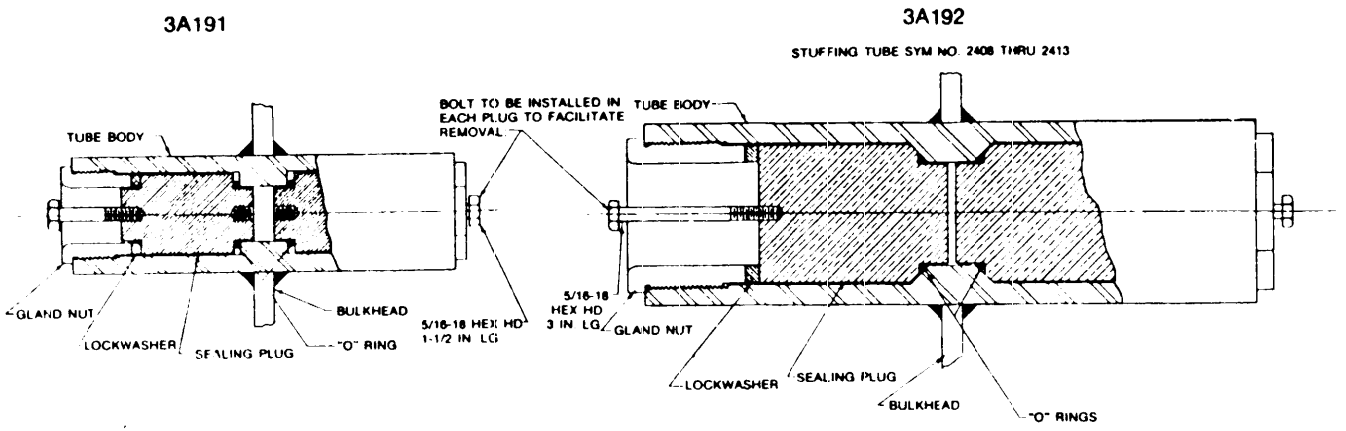
TABLE NO 2

815-1197096 SYM NO	S62-1197101 TUBE SYM NO	TABLE OF DIMENSIONS					
		A	B	C	D	E	"O" RING PC NO SEE NOTE 4
2449-1	2446-1	500	867	2.077	625	500	ARP 568-112
2449-2	2446-2	621	1.084	2.767	625	646	ARP 568-115
2449-3	2446-3	725	1.302	2.449	625	771	ARP 568-211
2449-4	2446-4	1.100	1.867	2.782	750	1.100	ARP 568-216

NOTES:
1. SEALING PLUGS COVERED BY THIS FIGURE ARE INTENDED FOR TEMPORARY BLANKING OF STUFFING TUBES INSTALLED PRIOR TO INSTALLATION OF CABLES.
2. MATERIAL FOR PLUG BODY TO BE BRASS, SPEC ASTM B121.
3. "O" RINGS SHALL BE IN ACCORDANCE WITH SPEC MIL-P-25732.
4. "O" RINGS SHALL BE SYNTHETIC RUBBER IN ACCORDANCE WITH SPEC MIL-P-25732.
5. THIS FIGURE SUPERSEDES SHEET 3A18 OF DRAWING 803-5001027 AND SECTION 5, SHEET 82, OF DRAWING, NAVSEC NO 9000-S6202-73980.

SH 132317094

FIGURE 3A18. Sealing plugs for blanking stuffing tubes (submarines).



NOTES:

1. THE PIECES AND METHODS SHOWN ON THIS FIGURE ARE MEANS OF TEMPORARILY PLUGGING AN ELECTRICAL FITTING WHICH, DUE TO DESIGN CHANGES, NO LONGER HAS A SPECIFIC CABLE ASSIGNED TO IT. TEMPORARY PLUGGING SHALL BE USED FOR ANY OF THE FOLLOWING CONDITIONS
   (A) FITTING IS SO INACCESSIBLE AS TO PREVENT ACCOMPLISHING A PERMANENT PATCH
   (B) WELDING HEAT INVOLVED IN PERMANENT PATCHING IS LIABLE TO DAMAGE ADJACENT FITTINGS AND CABLE
   (C) THE SHIP IS STILL IN THE CONSTRUCTION PERIOD
   (D) IMMEDIATE REUSE IS LIKELY ON ANOTHER SYSTEM
2. AT THE TIME OF FINAL PREPARATION FOR DELIVERY OF THE SHIP, ALL UNUSED CABLE FITTINGS NOT IN CATEGORIES (A), (B), OR (D) ABOVE SHALL BE PATCHED PERMANENTLY AS INDICATED BY THE APPLICABLE HULL STRUCTURAL PLANS FOR PERMANENT PATCHING OF BULKHEAD AND HULL PENETRATIONS
3. "O" RINGS SHALL BE SYNTHETIC RUBBER IN ACCORDANCE WITH SPEC MIL-P-25732
4. USE EXISTING LOCKWASHERS AND GLAND NUTS
5. MATERIAL FOR SEALING PLUGS SHALL BE BRASS OR PVC
6. THIS FIGURE SUPERSEDES SHEET 3A19 OF DRAWING 803-5001027 AND SECTION 5, SHEET 131, OF DRAWING NAVSEC NO. 9000-S6202-73980

3A191-1 THROUGH 3
SEALING PLUG DETAILS

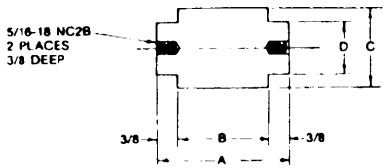


TABLE I

ASSOCIATED DATA & SEALING PLUG DIMENSIONS						
TUBE SIZE	"O" RING SIZE (2 REQ'D)	SEALING PLUG (2 REQ'D)	A	B	C	D
1	ARP568-113	3A191-1	1-53/64	1-5/64	986	594
2	116	3A191-2	2-9/64	1-25/64	1 173	797
3	214	3A191-3	2-1/2	1-3/4	1 486	1 047

3A192-4 THROUGH 9
SEALING PLUG DETAILS

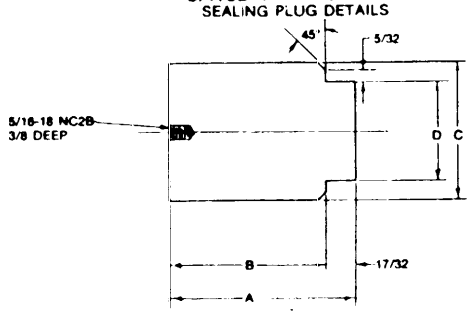
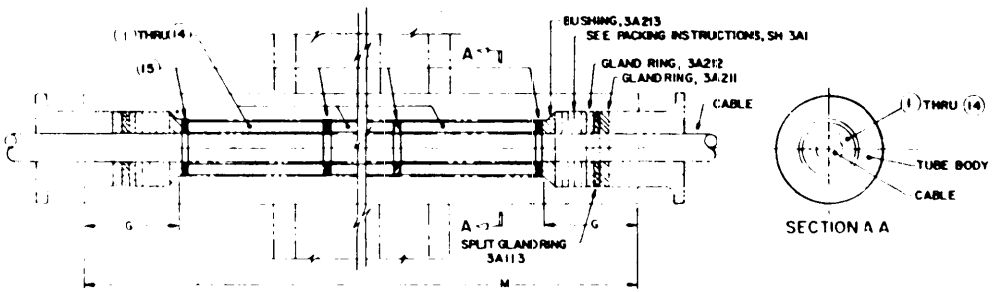


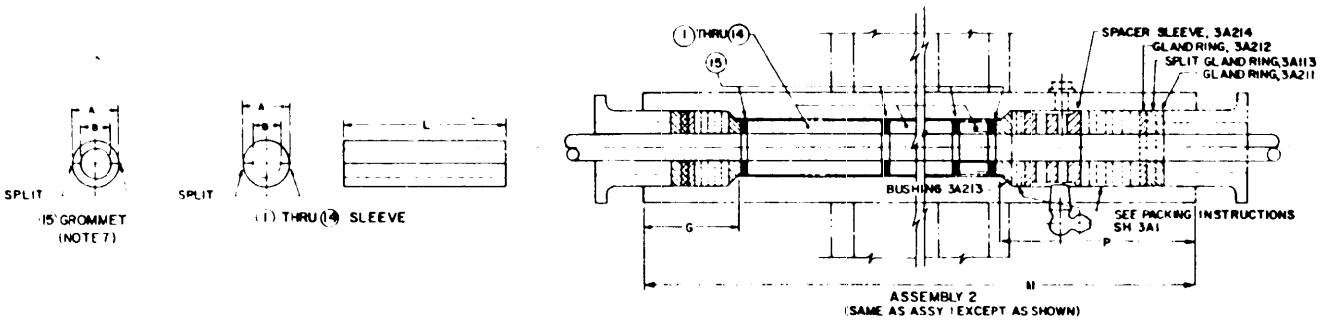
TABLE II

ASSOCIATED DATA & SEALING PLUG DIMENSIONS						
TUBE SIZE	"O" RING SIZE (2 REQ'D)	SEALING PLUG (2 REQ'D)	A	B	C	D
4	ARP568-218	3A192-4	2-1/2	1-31/32	1 673	1 250
5	220	3A192-5	3-1/8	2-19/32	1 923	1 422
6	223	3A192-6	3-5/16	2-25/32	2 173	1 610
7	225	3A192-7	3-1/2	2-31/32	2 548	1 860
8	227	3A192-8	3-5/8	3-3/32	2 861	2 172
9	228	3A192-9	3-11/16	3-5/32	2 996	2 297

SH 132317095

FIGURE 3A19. Temporary plugging of stuffing tubes (submarines).





NOTES:

1. DEVIATION FROM THIS DRAWING IS NOT PERMITTED WITHOUT PRIOR WRITTEN APPROVAL OF NAVSEA 08 OR THE NAVSEA DESIGNATED REACTOR PLANT DESIGN YARD.
2. ABBREVIATIONS ARE PER MIL-STD-12.
3. THE REQUIREMENTS OF THIS DRAWING ARE NOT RETROACTIVE FOR EXISTING BUSHED STUFFING TUBES.
4. STUFFING TUBE BUSHING SLEEVES IN ACCORDANCE WITH THIS FIGURE SHALL BE INSTALLED IN BUSHED STUFFING TUBES THROUGH SHIELDED BULKHEADS WHEN THE DIFFERENCE BETWEEN THE INNER DIAMETER OF THE STUFFING TUBE THROAT & THE OUTER DIAMETER OF THE CABLE IS 1/4 INCH OR GREATER.
5. STUFFING TUBE BUSHING SLEEVES ITEM 1 THRU 14 CAN BE INSTALLED IN ONE, TWO, OR THREE SECTIONS AS REQUIRED TO FACILITATE INSTALLATION.
6. STUFFING TUBE BUSHING SLEEVES ITEM 1 THRU 14 & GROMMETS ITEM 15 SHALL BE INSTALLED IN STUFFING TUBE & TUBE SHALL BE PACKED IN ACCORDANCE WITH INSTRUCTIONS ON FIGURE 3A1.
7. GROMMET ITEM 15 SHALL BE PACKED MANUFACTURED FROM SILICONE SHEET RUBBER, 0.25" THICK PER MIL SPEC ZZ-R-765, CL 2G GR50 AND SHALL BE CEMENTED TO BUSHING ITEM 1 THRU 14 PRIOR TO INSTALLATION USING ADHESIVE IN ACCORDANCE WITH FEDERAL SPEC MMM-A-121.
8. MATERIAL FOR ITEM 1 THRU 14 SHALL BE STEEL BAR ROUND WITH COLD FINISH PER MIL-P-24338 MAY BE SUBSTITUTED TO FACILITATE MACHINING PROVIDED THAT NO DEVIATIONS FROM THE TOLERANCES OF TABLE 1 ARE MADE.
9. FOR DIMENSIONS NOT DETAILED HEREIN, SEE DRAWINGS SS-302-1716060 AND SS-302-1885724.
10. THIS FIGURE SUPERSEDES SHEET 3A20 OF DRAWING 803-5001027.

METHOD DELINEATED ON THIS FIGURE IS APPLICABLE TO SSW SUBMARINES ONLY.

TABLE I (NOTE 8)

ASSY	EXISTING STUFFING TUBE SIZE	SLEEVE ITEM NO	DIM "A"	DIM "B"	DIM "L" (NOTE 5)	
1	A	-	-	-		
	B	-	-	-		
	C	1	0578	"B" CABLE O.D. +0.062	$\frac{(M-2G)-1}{3}+L$ WHEN SLEEVE IS INSTALLED IN THREE SECTIONS.	$(M-2G)-0.5+L$ WHEN SLEEVE IS INSTALLED IN ONE SECTION
	D	2	0688			
	E	2	0750		$\frac{(M-2G)-0.75}{2}+L$ WHEN SLEEVE IS INSTALLED IN TWO SECTIONS.	
	F	3	0781			
2	G	4	0891		$\frac{M-(G+P)-1}{3}+L$ WHEN SLEEVE IS INSTALLED IN THREE SECTIONS.	
	J	4	1 000			
	K	5	1 109			
	L	6	1 203		$\frac{M-(G+P)-0.75}{2}+L$ WHEN SLEEVE IS INSTALLED IN TWO SECTIONS	
	M	7	1 344			
	N	8	1 453		$M-(G+P)-0.5+L$ WHEN SLEEVE IS INSTALLED IN ONE SECTION	
	P	9	1 563			
	R	10	1 688			
	S	11	1 813			
	T	12	2 000			
	V	13	2 125			
	W	14	2 250			

TOLERANCES	
FRACTIONAL	± 1/32 INCHES
DECIMAL	± 005 INCHES
ANGLES	± 0°30' DEGREES
UNLESS OTHERWISE NOTED	

SH 132317096

FIGURE 3A20. Bushing sleeves for stuffing tubes thru shielded bulkheads.

NOTES:
1. ADAPTERS SHALL BE IN ACCORDANCE WITH MIL-S-24235/1/2.
2. GLAND RINGS SHALL BE NATIONAL STEEL ZINC PLATED, MIL-S-24235/1/2.
3. THIS FIGURE SUPERSEDES SHEET 3A21 OF DRAWING, NAVSEC NO. 9000-S6202-73980

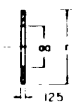
TABLE OF DIMENSIONS

BUSHED DOWN TO STUFFING TUBE SIZE TWO TUBE SIZES MAXIMUM WITHOUT NAVSEA APPROVAL

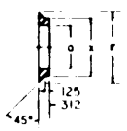
STUFFING TUBE 9-S 5100 L TYPE	STUFFING TUBE S6202 73899 TYPE	TUBE SIZE	A ø.406 ØØ .23/64"	B ø.515 ØØ .33/64"	C ø.640 ØØ .5/8"	D ø.750 ØØ .47/64"	E ø.812 ØØ .13/16"	F ø.843 ØØ .27/32"	G ø.953 ØØ .61/64"	J ø1.062 ØØ 1-3/64"	K ø1.171 ØØ 1-5/32"	L ø1.265 ØØ 1-1/4"	M ø1.406 ØØ 1-25/64"	N ø1.515 ØØ 1 1/2"	P ø1.625 ØØ 1-39/64"	R ø1.750 ØØ 1-47/64"	S ø1.875 ØØ 1-55/64"	T ø2.062 ØØ 2-3/64"	V ø2.187 ØØ 2-11/64"	TUBE SIZE
		A																		A
	1 3	B	.500																	B
		C	.625	.625																C
		D	.735	.735	.735															D
		E	.797	.797	.797	.797														E
		F	.828	.828	.828	.828	.828													F
		G	.938	.938	.938	.938	.938	.938												G
		J	1.047	1.047	1.047	1.047	1.047	1.047	1.047											J
46-1		K	1.156	1.156	1.156	1.156	1.156	1.156	1.156	1.156										K
		L	1.250	1.250	1.250	1.250	1.250	1.250	1.250	1.250	1.250									L
	2 4	M	1.391	1.391	1.391	1.391	1.391	1.391	1.391	1.391	1.391	1.391								M
		N	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500							N
		P	1.610	1.610	1.610	1.610	1.610	1.610	1.610	1.610	1.610	1.610	1.610	1.610						P
		R	1.735	1.735	1.735	1.735	1.735	1.735	1.735	1.735	1.735	1.735	1.735	1.735	1.735					R
		S	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860				S
		T	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047			T
		V	2.172	2.172	2.172	2.172	2.172	2.172	2.172	2.172	2.172	2.172	2.172	2.172	2.172	2.172	2.172	2.172		V
		W	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	2.297	W

3A211
GLAND RING
SAME AS 5235-L-3 EXCEPT AS SHOWN

3A212
GLAND RING
SAME AS 5235-L-3 EXCEPT AS SHOWN)



3A213
BUSHING



3A214
SPACER SLEEVE
(SAME AS 73899-7 EXCEPT AS SHOWN)

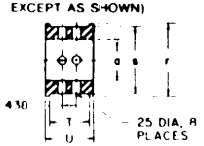


TABLE OF DIMENSIONS CONTINUED

TUBE SIZE	r	s	t	u
A	.750	–	–	–
B	.875	–	–	–
C	1.000	–	–	–
D	1.125	–	–	–
E	1.125	–	–	–
F	1.187	–	–	–
G	1.375	.187	1.000	1.250
J	1.500	.312	1.000	1.250
K	1.625	1.437	1.187	1.437
L	1.687	1.500	1.187	1.437
M	1.875	1.687	1.187	1.437
N	1.937	1.750	1.187	1.437
P	2.062	1.875	1.187	1.437
R	2.187	2.000	1.187	1.437
S	2.562	2.375	1.187	1.437
T	2.750	2.562	1.187	1.437
V	2.875	2.687	1.187	1.437
W	3.000	2.812	1.187	1.437

MATERIAL SHALL BE STEEL PER MIL-S-22698, ZINC PLATED

SH 132317097

FIGURE 3A21. Size & details of adapters used for changing size of installed bulkhead stuffing tubes (submarines).

TABLE OF DIMENSIONS

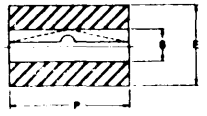
MIL-C-24235 TUBE MODIFIED PACKING ASSEMBLIES SYMBOL NUMBERS

TUBE SIZE	P	N	X	E	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048
					2406.1	2406.2	2406.3	2406.4	2406.6	2406.8	2406.7	2406.1	2406.2	2406.3	2406.5	2406.4	2407.1	2407.2	2407.5	2407.3	2407.6	2407.7	2407.4	2408.5	2408.1	2408.2	2408.3	2408.4	2408.1	2408.2	2408.3	2410.1	2410.2	2410.3	2411.5	2411.1	2411.2	2411.3	2411.4	2412.1	2412.2	2412.3
2	1 1/2	1.184	N/A	1.173	O=0.323 B=0.313	O=0.414 B=0.404	O=0.491 B=0.481	O=0.500 B=0.490	O=0.634 B=0.630	O=0.663 B=0.658	O=0.908 B=0.890	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	1 15/16	1.497	N/A	1.486								O=0.844 B=0.836	O=0.886 B=0.880	O=0.740 B=0.730	O=0.780 B=0.730	O=0.812 B=0.800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	2 1/2	1.884	1.200	1.873													O=0.882 B=0.856	O=0.908 B=0.900	O=0.927 B=0.900	O=0.961 B=0.950	O=0.982 B=0.950	O=1.032 B=1.000	O=1.062 B=1.050	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5	3	1.934	1.425	1.923																				O=1.266 B=1.078	O=1.266 B=1.116	O=1.266 B=1.130	O=1.266 B=1.174	O=1.266 B=1.200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6	3 1/4	2.184	1.610	2.173																								O=1.437 B=1.300	O=1.437 B=1.370	O=1.437 B=1.416	—	—	—	—	—	—	—	—	—	—	—	—
7	3 1/2	2.548	1.860	2.648	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—							O=1.828 B=1.470	O=1.828 B=1.626	O=1.828 B=1.626	O=1.828 B=1.870	—	—	—	—	—	—	—	—	—	—
8	3 5/8	2.880	2.175	2.861	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—										O=1.875 B=1.875	O=1.875 B=1.715	O=1.875 B=1.760	O=1.875 B=1.783	O=1.875 B=1.840	—	—	—	—
9	3 3/4	2.887	2.300	2.986	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—															O=2.187 B=1.888	O=2.187 B=2.000	O=2.187 B=2.119

NOTES

1. THIS FIGURE PROVIDES A METHOD FOR ADAPTING EXISTING MIL-S-24235 STUFFING TUBES TO ACCEPT CABLES ASSIGNED TO SMALLER TUBE SIZES. TO DETERMINE DIMENSIONS REQUIRED TO ADAPT A STUFFING TUBE FOR A PARTICULAR CABLE, OBTAIN THE PACKING ASSEMBLY SYMBOL NUMBER FOR THE CABLE FROM THE TABLES IN SECTION 3, GROUP A, SHEETS 2 THRU 8. ENTER TABLE OF DIMENSIONS AT LEFT WITH THE EXISTING TUBE SIZE AND PACKING SYMBOL NUMBER. A DASH INDICATES THAT PARTICULAR STUFFING TUBE SIZE/PACKING ASSEMBLY COMBINATION IS EITHER NOT APPLICABLE OR NOT ALLOWED.
2. BUSHING, GLAND RING , BEVEL WASHER AND GROMMET SHALL BE MANUFACTURED TO THE REQUIREMENTS OF MIL-S-24235 EXCEPT AS SHOWN ON THIS DRAWING. EACH ITEM SHALL BE MARKED WITH A PIECE NUMBER CONSISTING OF SYM. NO. AND (MOD), AS & "2405.3 (MOD)".
3. ADAPTER ASSEMBLY FOR STUFFING TUBES SIZE 2 AND 3 CONSISTS OF FOUR (4) GLAND RINGS, 3A224, AND TWO (2) GROMMETS, 3A221 ADAPTER ASSEMBLY FOR STUFFING TUBES SIZE 4 THRU 9 CONSISTS OF TWO (2) EACH: GLAND RING, 3A224, GROMMET, 3A222, BUSHING, 3A223, AND BEVEL WASHER, 3A225.
4. ADAPTER ASSEMBLY SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 3, GROUP A, SHEET 10, FOR NON-NUCLEAR BULKHEADS.
5. USE OF ADAPTER ASSEMBLIES ON NUCLEAR BULKHEADS SHALL BE IN ACCORDANCE WITH SECTION 3, GROUP A, SHEET 23.
6. ON NON-NUCLEAR BULKHEADS, STEP-DOWN OF TWO (2) SIZES IS PERMITTED WITHOUT NAVSEA APPROVAL: STEP-DOWN OF THREE (3) OR MORE SIZES REQUIRES SPECIFIC NAVSEA APPROVAL.
7. THIS FIGURE SUPERSEDES SHEET 3A22 OF DRAWING 803-5001027.

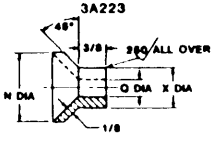
3A221



GROMMET FOR TUBE SIZE 2 & 3

1. SIMILAR TO M24236/2-061 THRU -076 EXCEPT FOR DIMENSIONS.

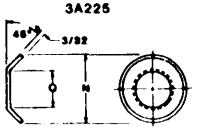
3A223



BUSHING

1. MATL AL BRZ MIL-B-24059
2. BREAK ALL SHARP CORNERS.

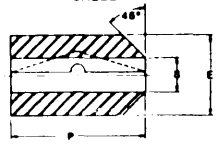
3A225



BEVEL WASHER

1. SIMILAR TO M24236/2-160 THRU 180 EXCEPT FOR DIMENSIONS.

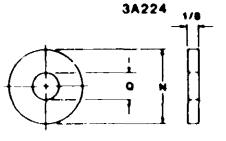
3A222



GROMMET FOR TUBE SIZE 4 THRU 9

1. SIMILAR TO M24236/2-090 THRU -110 EXCEPT FOR DIMENSIONS.

3A224

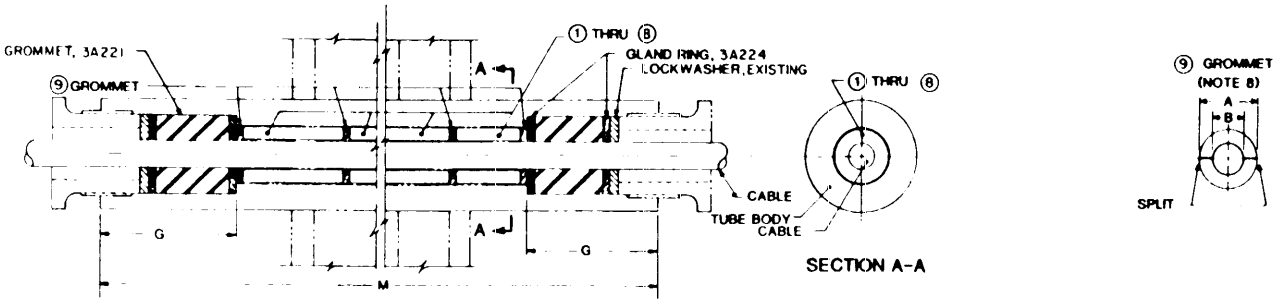


GLAND RING

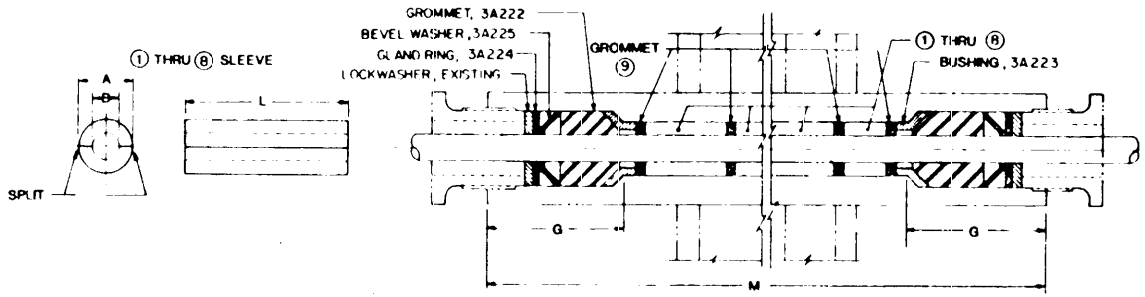
1. SIMILAR TO M24236/2-120 THRU -144 EXCEPT FOR DIMENSIONS.

SH 132317098

FIGURE 3A22. Adapter assemblies for stuffing tubes MIL-S-24235.



ASSEMBLY 1



ASSEMBLY 2

ASSY	STUFFING TUBE SIZE	SLEEVE ITEM NO.	DIM "A"	DIM "B"	DIM "L" (NOTE 5)
1	1	—	—	"B" = CABLE O.D. + 0.062	(M-2G)-0.50 = L — WHEN SLEEVE IS INSTALLED IN ONE SECTION
	2	1	0750		(M-2G)/2 - 0.75 = L — WHEN SLEEVE IS INSTALLED IN TWO SECTIONS
	3	2	1.000		(M-2G)/3 - 1.00 = L — WHEN SLEEVE IS INSTALLED IN THREE SECTIONS
2	4	3	1.203		(M-2G)-1.25 = L — WHEN SLEEVE IS INSTALLED IN ONE SECTION
	5	4	1.375		(M-2G)/2 - 1.50 = L — WHEN SLEEVE IS INSTALLED IN TWO SECTIONS
	6	5	1.563		(M-2G)/3 - 1.75 = L — WHEN SLEEVE IS INSTALLED IN THREE SECTIONS
	7	6	1.813		
	8	7	2.125		
	9	8	2.250		

FIGURE 3A23. Bushing sleeves for stuffing tubes thru shielded bulkheads.

SH 132317099

TOLERANCES	
FRACTIONAL	± 1/32 INCHES
DECIMAL	± .005 INCHES
ANGLES	± 0°- 30' DEGREES
UNLESS OTHERWISE NOTED	

NOTES:

1. ANY DEVIATIONS FROM THIS FIGURE ARE NOT PERMITTED WITHOUT PRIOR WRITTEN APPROVAL OF NAVSEA 08 OR THE NAVSEA DESIGNATED REACTOR PLANT DESIGN YARD
2. ABBREVIATIONS ARE IN ACCORDANCE WITH MIL-STD-12C.
3. THE REQUIREMENTS OF THIS FIGURE ARE NOT RETROACTIVE FOR EXISTING BUSHED STUFFING TUBES.
4. STUFFING TUBE BUSHING SLEEVES IN ACCORDANCE WITH THIS FIGURE SHALL BE INSTALLED IN BUSHED STUFFING TUBES THROUGH SHIELDED BULKHEADS WITH THE DIFFERENCE BETWEEN THE INNER DIAMETER OF THE STUFFING TUBE THROAT & THE OUTER DIAMETER OF THE CABLE IS 1/4 INCH OR GREATER.
5. STUFFING TUBE BUSHING SLEEVE ITEMS 1 THRU 8 CAN BE INSTALLED IN ONE, TWO, OR THREE SECTIONS AS REQUIRED TO FACILITATE INSTALLATION.
6. STUFFING TUBE BUSHING SLEEVES ITEMS 1 THRU 8 AND GROMMETS ITEM 9 SHALL BE INSTALLED IN STUFFING TUBE & TUBE SHALL BE PACKED IN ACCORDANCE WITH INSTRUCTIONS ON FIGURE 3A10.
7. MATERIAL FOR ITEMS 1 THRU 8 SHALL BE OF STEEL BAR, ROUND WITH COLD FINISH PER AISI-C1018 OR SEAMLESS CARBON STEEL PIPE PER MIL-P-24338 MAY BE SUBSTITUTED TO FACILITATE MACHINING PROVIDED THAT NO DEVIATIONS FROM THE TOLERANCES OF TABLE 1 ARE MADE.
8. GROMMET ITEM 9 SHALL BE MANUFACTURED FROM SILICON SHEET RUBBER, 0.25" THICK PER MIL SPEC ZZ-R-765, CL. 2G GR50 AND SHALL BE CEMENTED TO BUSHING ITEMS 1 THRU 8 PRIOR TO INSTALLATION USING ADHESIVE IN ACCORDANCE WITH FEDERAL SPEC MMM-A-121.
9. FOR DIMENSIONS NOT DETAILED HEREIN, SEE MIL-S-24235 AND FIGURE 3A22
10. THIS FIGURE SUPERSEDES SHEET 3A23 OF DRAWING 803-5001027. METHOD DELINEATED ON THIS SHEET IS APPLICABLE TO SSN SUBMARINES ONLY.

MIL-S-24235 TUBE SIZE & PACKING INFORMATION							CABLE TYPES																														
SYM NO	TUBE SIZE	GLAND NUT	LOCK WSHR	GLAND RING	BEVEL WSHR	GROM	2WAU		3SA		3SU		3SUS		3SF		3SJ		3SJA		3SWA		3SWU		3SWUS		3U		3UA		4NWB		4NWAB		4SJ		TYPES 1,2,3&4
		PC NO	PC NO	PC NO	PC NO	PC NO	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	TUBE SIZE
2405 1	1	1-019	1-028	2-120		2-061											16	285	20	284															20	280	A
																	18	264	22	267																	
																	20	234																			
																	22	217																			
2405 2				2-121		2-062											14	325	14	375															14	325	
																			16	335															16	370	
																			18	314																	
2405 3				2-122		2-063											12	400																			B
2405 4				2-123		2-064													12	490																	
2406 1	2	1-020	1-029	2-127		2-068											9	600									3	620									C
2406 2				2-128		2-069													9	650			3	655					3	670							D
2406 3				2-129		2-070					3	700									3	705			3	715											
2406 4				2-131		2-071			3	750																					—	740					
													3	760																			—	790			E
2407 1	3	1-021	1-030	2-132		2-072																					7	810									
2407 2				2-133		2-073																							7	860							G
2407 3				2-135		2-074					7	910											7	940													
2407 7				2-137		2-075			7	960			7	970							7	990			7	1000											J
2407 4				2-138		2-076									7	1040																					
2408 1	4	1-022	1-031	2-139	2-161	2-091																					12	1 090									K
2408 3					2-163	2-093																							12	1 140							
2408 4					2-164	2-094			10	1 240	10	1 190	10	1 250							10	1 230	10	1 180	10	1 240											L
2409 1	5	1-023	1-032	2-140	2-165	2-095					14	1 290											14	1 280													M
2409 2					2-166	2-096	40	1 370	14	1 340			14	1 350							14	1 330			14	1 340											
2410 1	6	1-024	1-033	2-141	2-168	2-098																	19	1 450													N
2410 2					2-169	2-099					19	1 480									19	1 500			19	1 510											
2410 3					2-170	2-100			19	1 530			19	1 540																							P
2411 5	7	1-025	1-034	2-142	2-171	2-101					24	1 670																									R
2411 2					2-173	2-103			24	1 720			24	1 730									24	1 740													
2411 3					2-174	2-104					30	1 770																									S
2411 4					2-175	2-105			30	1 820			30	1 830							24	1 790			24	1 800											
2412 1	8	1-026	1-035	2-143	2-176	2-106																	30	1 860													T
2412 2					2-177	2-107															30	1 910			30	1 920											
2412 3					2-178	2-108			37	1 980	37	1 930	37	1 990							37	2 040	37	1 990	37	2 050											
2413 1	9	1-027	1-036	2-144	2-179	2-109					44	2 150																									V
									44	2 200																											W
2413 2					2-180	2-110							44	2 210									44	2 240													
																					44	2 290															
																									44	2 300											

NOTES.

1. FOR CONTINUATION OF LISTING SEE FIGURE 3A9.

2. THIS FIGURE SUPERSEDES SHEET 3A24 OF DRAWING 803-5001027

SH 132317100

FIGURE 3A24. Steel stuffing tube cable assignment submarines.

SYM NO	TUBE SIZE	GLAND NUT	LOCK WSHR	GLAND RING	BEVEL WSHR	GROM	4SJA		5KVTSGA		5KVTSGU		5SS		6SGA		6SGU		7PS		7SGA		7SGU		7SS		8NW6		8NWA6		JAS						[illegible]-S6202-73899 TYPES 1,2,38
		PC NO	PC NO	PC NO	PC NO	PC NO	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	NO	DIA	TUBE SIZE
24052	1	1-019	1-028	2-121		2-062	16	330																													A
							20	375																													
24053				2-122		2-063	14	420																													B
24056				2-125		2-066																	3	545													C
24057				2-126		2-067							—	560																							
24061	2	1-020	1-029	2-127		2-068															3	595	4	595	2	625											
24062				2-128		2-069															4	645					—	670									D
24063				2-129		2-070																							—	720							
24064				2-[illegible]		2-071													6	775																	E
24115	7	1-025	1-034	2-142	2-171	2-101											100	1600																			P
															100	1650																					R
24112					2-173	2-103					100	1740																									
24[illegible]1					2-175	2-105			100	1790					125	1840	125	1790																			S
24122	8	1-026	1-035	2-143	2-177	2-107			150	2 000	150	1950					150	1960																			T
24123					2-178	2-108									150	2 010																					
[illegible]	9	1-027	1-036	2-144	2-179	2-109											200	2 200																			W
24132					2-180	2-110									200	2 250																					
									250	2 104																											
											250	2 054																									
									350	2500																											X
											350	2 450																									
											400	2 600																									Y
									400	2 650																											Z
																															250	1260					
																															—	2 480					

NOTE:
1. THIS FIGURE SUPERSEDES SHEET 3A25 OF DRAWING 803-5001027.

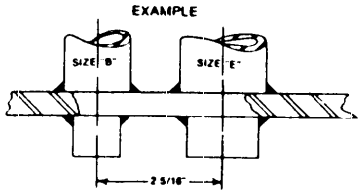
SH 132317101

FIGURE 3A25. Steel stuffing tube cable assignment submarines.

HOLE SPACING IN DECKS AND BULKHEADS

FROM DESIGN DATA SHEET DDS 100-2

3B11



NOTES:

1. THE TABLE REFERRED TO IN THE FOLLOWING NOTES IS THE HOLE SPACING TABLE ON SHEET 2 OF THIS GROUP.
2. THE DIMENSIONS SHOWN IN THE HOLE SPACING TABLE ARE SUITABLE FOR THE PIERCING OF SPECIAL TREATMENT STEEL, HIGH TENSILE PROTECTIVE PLATING, AND MEDIUM STEEL DECKS AND BULKHEADS.
3. THIS TABLE MAY BE USED FOR ALL PLATE THICKNESSES NOT EXCEEDING 3 INCHES.
4. THIS TABLE MAY ALSO BE USED FOR ALUMINUM DECKS AND BULKHEADS WHERE INSTALLATION OF STUFFING TUBES ARE REQUIRED.
5. THE VALUES OF THE TABLE ARE MINIMUM PERMITTED VALUES, AND MAY BE INCREASED AS JUDGED TO BE DESIRABLE FOR ANY PARTICULAR APPLICATION.
6. USE OF THIS TABLE DOES NOT REQUIRE ANY INCREASE IN THICKNESS OF PLATING OR ADDITION OF DOUBLER PLATES. THE METAL REMOVED TO A PLATE BY THE MOUNTING OF STUFFING TUBES OR THE PASSING OF PIPE IS ADEQUATE COMPENSATION FOR THE METAL REMOVED FROM THE PLATE DUE TO ANY DRILLING OF HOLES IN ACCORDANCE WITH THE TABLE, AND LIMITATIONS OF NOTE 2.
7. THIS TABLE IS APPLICABLE TO THE GREAT MAJORITY OF INSTALLATIONS. EXCEPTIONS TO THE TABLE ARE RECOGNIZED WHEN IT IS EXPEDIENT TO MOUNT STUFFING TUBES ON ALTERNATE SIDES OF THE PLATE BEING PIERCED, AND WHEN SPECIAL FITTINGS ARE REQUIRED IN PASSING ELECTRIC CABLES THROUGH THE PRESSURE HULL OF SUBMARINES INTO CONNING TOWER TRUNKS, OR AS OTHERWISE NOTED IN THIS INSTALLATION DRAWING.
8. FOR STRENGTH PRESERVATION OF BOTH MEDIUM AND SPECIAL TREATMENT STEEL PLATINGS, STUFFING TUBE HOLE SPACINGS SHALL IN NO CASE BE LESS THAN 1.9 MEAN DIAMETERS OF ANY TWO ADJACENT HOLES FOR MEDIUM STEEL CALCULATIONS. FOR THE HOLE DIAMETERS USE THE INTERNAL DIAMETERS OF THE EXTRA STRONG KICKPIPES. FOR SPECIAL TREATMENT STEEL, USE THE ACTUAL DRILLED HOLE DIAMETERS GIVEN IN COLUMN THREE OF THE TABLE.
9. IN LOCATING A HOLE FROM A BOUNDRY STRUCTURAL MEMBER OR CABLE SUPPORT THE DISTANCE SHALL NOT BE LESS THAN HALF THE CENTER TO CENTER SPACING GIVEN IN THE TABLE FOR TWO TUBES OF THE REQUIRED SIZE.
10. THIS TABLE DOES NOT IMPOSE ANY RESTRICTIONS ON HOW THE HOLES SHALL BE ARRANGED AS LONG AS THE RESTRICTION REGARDING MINIMUM ALLOWABLE SPACING IS NOT VIOLATED.
11. THE SPACINGS FOR TUBE SIZES "A" THROUGH "Z" ARE SUFFICIENT FOR THE USE OF THE STANDARD OPEN RATCHET WRENCHES SPEC GGG-W-648. SPACINGS FOR TUBE SIZES "AA" AND "BB" ARE SUFFICIENT FOR THE USE OF 32 POINT BOX TYPE CROWFOOT WRENCHES WITH SQUARE DRIVE. THIS DOES NOT HOWEVER EXCLUDE THE USE OF OTHER TYPES OF WRENCHES SUITABLE FOR THE PURPOSE.
12. THIS FIGURE SUPERSEDES SHEET 3B1 OF DRAWING 803-5001027 AND SECTION 4, SHEET 1, OF DRAWING, NAVSEC NO. 8000-S6202-73880.

FIGURE 3B1. Stuffing tube and kickpipes minimum spacing (surface ships).

HOLE SPACING IN DECKS AND BULKHEADS

REPRODUCED FROM DESIGN DATA SHEET DDS 100-2

3B2I

NOTE:

1. THIS FIGURE SUPERSEDES SHEET 3B2 OF DRAWING 803-5001027 AND SECTION 4, SHEET 2, OF DRAWING NAVSEC NO 9000-S6202-73980

SPACING OF HOLES FOR STUFFING TUBES AND PIPES

THIS TABLE ALSO APPLICABLE TO ARMOR PLATE

NOMINAL DIA OF KICKPIPE (IRON PIPE SIZE)	DRILL FOR PIPE (MEDIUM STEEL ONLY)	DRILL FOR PIPE (SPECIAL TREATMENT STEEL)	TUBE SIZE	A	B	C	D	E	F	G	J	K	L	M	N	P	R	S	T	V	W	X	Y	Z	AA	BB
		.406"	A	1 15/16"																						
		.515"	B	2"	2"																					
		.640"	C	2 1/16"	2 1/16"	2 1/16"																				
		.750"	D	2 1/4"	2 1/16"	2 1/16"	2 1/16"																			
1"		.812"	E	2 1/4"	2 1/16"	2 1/16"	2 1/16"	2 1/16"																		
1"		.843"	F	2 1/4"	2 1/16"	2 1/16"	2 1/16"	2 1/16"	2 1/16"																	
1"		.953"	G	2 1/4"	2 1/16"	2 1/16"	2 1/16"	3"	3"	3 1/16"																
1 1/4"		1.062"	J	2 1/4"	2 1/16"	2 1/16"	2 1/16"	3"	3"	3 1/16"	3 1/16"															
1 1/4"		1.171"	K	2 1/4"	2 1/16"	2 1/16"	2 1/16"	3"	3"	3 1/16"	3 1/16"	3 1/16"														
1 1/4"		1.265"	L	2 1/4"	2 1/16"	2 1/16"	2 1/16"	3"	3"	3 1/16"	3 1/16"	3 1/16"	3 1/16"													
1 1/4"		1.406"	M	2 1/4"	2 1/16"	2 1/16"	2 1/16"	3"	3"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"												
1 1/4"		1.515"	N	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4"											
2"		1.625"	P	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4 1/16"	4 1/16"										
2"		1.750"	R	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4 1/16"	4 1/16"	4 1/16"									
2"		1.875"	S	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"								
2 1/4"		2.062"	T	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"							
2 1/4"		2.187"	V	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"						
2 1/4"		2.312"	W	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"					
3"		2.500"	X	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	5 1/16"	5 1/16"	5 1/16"			
3"		2.609"	Y	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"		
3"		2.781"	Z	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	3 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"		
3"		2.875"	AA	3 1/16"	3 1/16"	3 1/16"	4"	4"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	
3 1/2"		3.157"	BB	4"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	4 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	5 1/16"	6 1/16"

SH 132317103

FIGURE 3B2. Stuffing tube and pipe minimum spacing (surface ships).

HOLE SPACING IN DECKS AND BULKHEADS

TABLE DERIVED FROM REQUIREMENTS OF DESIGN DATA SHEET DDS 100-2

3B31

NOTE:

1. THIS FIGURE SUPERSEDES SHEET 3B3 OF DRAWING 803-5001027 AND SECTION 4, SHEET 2, OF DRAWING , NAVSEC NO. 9000-S6202-73980.

SPACING OF HOLE FOR SWAGE TUBES
THIS TABLE DOES NOT APPLY TO ARMOR PLATE

DRILL FOR SWAGE TUBE M24235/17	NOMINAL OUTSIDE DIA OF SWAGE TUBE	TUBE SIZE	A	B	C	D	E	F	G	J	K	L	M	N	P	R	S	T	V	W	X	Y	Z	AA	BB
1 3/8	1 1/16	A	2 3/32																						
1 3/8	1 1/16	B	2 3/32	2 5/32																					
1 11/32	1 3/16	C	2 11/32	2 11/32	2 9/16																				
1 11/32	1 3/16	D	2 11/32	2 11/32	2 9/16	2 9/16																			
1 3/8	1 3/16	E	2 11/32	2 11/32	2 9/16	2 9/16	2 9/16																		
1 11/32	1 3/16	F	2 11/32	2 11/32	2 9/16	2 9/16	2 9/16	2 9/16																	
1 11/32	1 5/16	G	2 11/32	2 11/32	2 9/16	2 11/32	2 11/32	2 11/32	3 5/32																
1 3/8	1 11/32	J	2 11/32	2 11/32	3 1/8	3 1/8	3 1/8	3 1/8	3 11/32	3 11/16															
1 13/16	1 11/32	K	2 11/32	2 11/32	3 1/8	3 1/8	3 1/8	3 1/8	3 13/32	3 11/16	3 11/16														
1 13/16	1 11/32	L	2 11/32	2 11/32	3 1/8	3 1/8	3 1/8	3 1/8	3 15/32	3 11/16	3 11/16	3 11/16													
2 1/16	2 1/16	M	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	4 1/16	4 1/16	4 1/16	4 1/16												
2 1/16	2 1/16	N	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16											
2 1/16	2 1/16	P	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16										
2 1/16	2 1/16	R	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16									
2 1/16	2 1/16	S	3 1/16	3 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	5 1/16	5 1/16	5 1/16	5 1/16	5 1/16								
3 1/16	3 1/16	T	4 3/16	4 3/16	4 3/16	4 3/16	4 3/16	4 3/16	4 3/16	4 7/16	4 7/16	4 7/16	5 11/16	5 11/16	5 11/16	5 11/16	5 11/16	6 1/16							
3 3/16	3 1/16	V	4 3/16	4 3/16	4 7/16	4 7/16	4 7/16	4 7/16	4 3/4	5	5	5	5 7/16	5 7/16	5 7/16	5 7/16	5 7/16	5 13/16	6 3/16	6 3/16					
3 3/16	3 1/16	W	4 7/16	4 7/16	4 13/16	4 13/16	4 13/16	4 13/16	5	5 1/4	5 1/4	5 1/4	5 11/16	5 11/16	5 11/16	5 11/16	5 11/16	6 3/16	6 7/16	6 17/32	6 53/64				
3 3/16	3 1/16	X	4 7/16	4 7/16	4 13/16	4 13/16	4 13/16	4 13/16	5	5 1/4	5 1/4	5 1/4	5 11/16	5 11/16	5 11/16	5 11/16	5 11/16	6 3/16	6 7/16	6 17/32	6 53/64	6 59/64			
4 1/16	4	Y	4 17/32	4 17/32	5 3/32	5 3/32	5 3/32	5 3/32	5 13/32	5 13/32	5 13/32	5 13/32	5 13/16	6 3/16	6 3/16	6 3/16	6 3/16	6 3/16	6 53/64	7 1/32	7 1/4	7 1/4	7 13/32		
4 1/16	4	Z	4 17/32	4 17/32	5 3/32	5 3/32	5 3/32	5 3/32	5 13/32	5 13/32	5 13/32	5 13/32	6 3/16	6 3/16	6 3/16	6 3/16	6 3/16	6 3/16	6 59/64	7 1/32	7 1/4	7 1/4	7 13/32	7 13/32	
4 1/16	4	AA	4 17/32	4 17/32	5 3/32	5 3/32	5 3/32	5 3/32	5 13/32	5 13/32	5 13/32	5 13/32	6 3/16	6 3/16	6 3/16	6 3/16	6 3/16	6 3/16	6 59/64	7 1/32	7 1/4	7 1/4	7 13/32	7 13/32	7 11/32
4 3/16	4 1/16	BB	5 3/16	5 3/16	5 3/16	5 3/16	5 3/16	5 3/16	5 13/16	6 1/16	6 3/16	6 3/16	6 3/16	6 3/16	6 3/16	6 3/16	6 3/16	7 1/16	7 3/16	7 1/16	7 53/64	7 59/64	8 1/32	8 1/32	8 11/32

SH 132317104

FIGURE 3B3. Swage tube minimum spacing (surface ships).

NOTES:

1. THE CABLES LISTED ON THIS FIGURE ARE PER MIL-C-915E.
2. THIS FIGURE SUPERSEDES SHEET 3B4 OF DRAWING 803-5001027 AND SECTION 4, SHEET 3-10 OF DRAWING, NAVSEC NO. 9000-S6202-7S960.

CABLE	TUBE SIZE
CVSF-4	N
DCOP-1	A
-1 1/2	A
-2	A
DHOF-3	B
-4	B
-6	B
-9	C
-14	D
-23	G
-30	J
-83	N
-250	V
-400	Y
DLT-4	D
DNW-3	A
-4	B
-9	C
-14	C
-23	D
-50	G
-75	K
-100	L
DPS-3	B
-4	B
-6	C
-9	C
-14	D
DRW	D
DRWA	D

CABLE	TUBE SIZE
DSGA-3	B
-4	B
-9	C
-14	D
-23	F
-50	J
-75	K
-100	L
-200	R
-300	T
-400	V
DSGU-3	A
-4	B
-9	C
-14	D
-23	E
-50	G
-75	K
-100	K
-200	P
-300	S
-400	V
DSS-2	A
-3	B
-4	B
DSWS-4	E
ECM	M
ECMA	N
FHOF-3	B
-4	C
-9	D
-42	M
-60	N
-133	T

CABLE	TUBE SIZE
FNW-3	B
-4	B
-9	C
-23	F
FPS-14	F
FSGA-3	B
-4	C
-9	D
-23	G
-50	K
-75	M
-100	N
-150	R
-200	S
FSGU-3	B
-4	B
-9	C
-23	G
-50	J
-75	L
-100	M
-150	R
-200	S
FSS-2	B
-3	B
-4	C
MCOS-2	B
-4	B
-5	A
-6	B
-7	C

CABLE	TUBE SIZE
MCSF-4	N
MDU-6	J
-14	M
-23	S
-40	T
-60	X
MHOF-7	B
-10	C
-14	C
-19	D
-24	E
-30	F
-37	G
-44	J
-61	L
MMOP-5	A
MNW-7	A
-10	B
-14	C
-19	C
-24	D
-30	D
-37	E
-44	G
MRI-D-1	A
-D-2 1/2	A
-T-2 1/2	A
MS-37	E
MSA-37	G

CABLE	TUBE SIZE
MSCA-7	C
-10	D
-14	D
-19	E
-24	G
-30	G
-37	J
-44	L
-61	M
-91	P
MSCU-7	B
-10	C
-14	D
-19	D
-24	G
-30	G
-37	J
-44	K
-61	L
-91	N
MSP	R
MSPW	R
MU-14	A
MWF-7	B
-10	C
-14	C
-19	D
-24	F
-30	G
-37	J

CABLE	TUBE SIZE
PBTMU-5	C
-10	D
-15	J
PI-3	D
-7	G
-12	K
SHOF-3	A
-23	B
-60	C
-150	F
-200	J
-250	K
-500	N
-650	P
-800	R
SRW	A
SSF-300	K
SSGA-50	C
-75	D
-100	D
-200	G
-300	J
-400	K
-650	N
-800	P
-1000	R
-1600	T
-2000	W

CABLE	TUBE SIZE
SSGU-50	C
-75	C
-100	D
-200	G
-300	J
-400	K
-650	M
-800	N
-1000	P
-1600	T
-2000	W
S2S	C
TCJA-4	B
TCJU-4	B
TCJX-3	D
-7	J
-12	M
TCKX-1	B
-3	D
-7	J
-12	M
TCOP-2	A
TCTA-4	B
TCTU-4	B
TCTX-1	A
-3	C
-7	D
-12	J

SH 132317105

FIGURE 3B4. Aluminum and steel stuffing tubes cable assignment.

CABLE	TUBE SIZE
THOF 3	B
-4	B
-6	C
-9	C
-14	E
-23	G
-42	L
150	S
-250	W
-400	AA
-500	BB
-600	BB
TNW-3	B
-4	B
-9	C
-14	D
-23	E
-50	J
-75	K
-100	M
-150	N
TPNW-1 1/2	A
-3	A
-5	A
-10	B
-15	C
-20	C
-30	D
-40	E

CABLE	TUBE SIZE
TPS-3	B
-4	C
-6	C
-9	D
-14	E
-23	G
-30	J
TPU-6	J
TRF-105	E
-133	E
-168	G
TSP-11	D
-31	J
TRXF-84	C
-105	D
-133	E
TSGA-3	B
-4	B
-9	C
-14	E
-23	G
-50	J
-75	L
-100	M
-150	P
-200	R
-300	T
-400	W

CABLE	TUBE SIZE
TSGU-3	B
-4	B
-9	C
-14	D
-23	E
-50	J
-75	L
-100	M
-150	N
-200	R
-300	T
-400	W
TSS-2	A
-3	B
-4	B
TTOP-3	B
-5	C
-10	D
-15	F
TTRS-2	D
-4	D
-6	G
-8	J
-10	K
-12	K
-16	L

CABLE	TUBE SIZE
TTSA-1-1/2	A
-3	B
-5	C
-10	D
-15	G
-20	G
-30	K
-40	L
-50	N
-60	N
TTSU-1-1/2	A
-3	B
-5	C
-10	D
-15	E
-20	G
-30	K
-40	L
-50	M
-60	N
1SAU-44	J
1SMA-5	C
1SMU-5	B
1SMWU-70	P
1SU-36	J
-60	M
1SWU-2	B
-14	G
-20	J
-30	L
1SWF-2	C

CABLE	TUBE SIZE
1SS0MU-16	G
-20	G
-40	L
-70	P
1S75MU-8	J
2AU-40	M
2SU-3	C
-7	D
-10	F
-14	G
-19	J
-24	L
-30	M
-37	M
-44	P
-61	R
2SJ-22	A
-20	A
-18	A
-16	A
2SWAU-3	C
-7	D
-10	F
-14	G
-19	J
-24	L
-30	M
-37	M
-44	P
-61	R

CABLE	TUBE SIZE
2SWF-3	D
-4	D
-7	F
2SWL-7	G
2SWU-1	A
-3	D
-7	G
-12	L
-19	M
-24	P
-30	S
-37	S
-61	W
2U-10	B
-15	C
-19	C
-30	D
-45	G
-60	J
2WAU-40	M
3SU-3	D
-7	G
-10	L
-14	M
-19	N
-24	R
-30	S
-37	T
-44	V
3SF-7	J

CABLE	TUBE SIZE
3SJ-22	A
-20	A
-18	A
-16	A
-14	A
-12	B
-9	C
3SWU-3	D
-7	G
-10	L
-14	M
-19	N
-24	R
-30	S
-37	T
-44	W
3U-3	C
-7	E
-12	K
4NW8	D
4SJ-20	A
-16	A
-14	A
5KVTSGA-100	S
-150	T
-250	W
-350	X
-400	Z

NOTES:
1. THE CABLES LISTED ON THIS FIGURE ARE PER MIL-C-915E
2. THIS FIGURE SUPERSEDES SHEET 3A5 OF DRAWING 803-500127 AND SECTION 4, SHEET 3-10 OF DRAWING NAVSEC NO. 9000-98202-73980.

SH 132317106

FIGURE 3B5. Aluminum and steel stuffing tubes cable assignment.

CABLE	TUBE SIZE
5KVTSGU-100	S
-150	T
-250	W
-350	X
-400	Y
5SS	C
6SGA-100	R
-125	S
-150	T
-200	W
6SGU-100	P
-125	S
-150	T
-200	W
7PS-6	E
7SGA-3	C
-4	D
7SGU-3	C
-4	C
7SS-2	C
8NW6	D
8NW6	D
DNWA-3	B
-4	B
-9	C
-14	D
-23	D
-50	J
-75	K
-100	L

CABLE	TUBE SIZE
FNWA-3	B
-4	C
-9	D
-23	G
JAS-250	—
—	—
MDY-6	L
-14	P
-23	T
-40	W
-60	Y
MNWA-7	B
-10	C
-14	C
-19	C
-24	D
-30	E
-37	F
-44	G
MSCS-7	C
-10	D
-14	E
-19	F
-24	G
-30	J
-37	K
-44	L
-61	M
-91	P
MA-14	B
MUS-14	B

CABLE	TUBE SIZE
PBTM-5	C
-15	E
-30	J
SRWA	B
TNWA-3	B
-4	B
-9	D
-14	D
-23	E
-50	J
-75	L
-100	M
-150	P
TPNWA-1-1/2	A
-3	A
-5	B
-10	C
-15	C
-20	C
-30	D
-40	F
TPUM-6	G
TRW	D
TRWA	E
TSPA-11	E
-31	K
TTRSA-2	D
-4	E
-6	G
-8	J
-10	K
-12	K
-16	L
ISA-44	J

CABLE	TUBE SIZE
ISMWA-70	P
ISUA-36	J
-60	M
ISWA-2	B
-14	G
-20	K
-30	L
IS50MA-16	G
-20	J
-40	L
-70	P
IS50MUS-16	G
-20	J
-40	L
-70	P
2A-40	N
2AUS-40	N
2CS-6	B
-18	C
-42	E
-60	G
-77	K
2SA-3	C
-7	D
-10	G
-14	J
-19	K
-24	L
-30	M
-37	N
-44	P
-61	S

CABLE	TUBE SIZE
2SUS-3	C
-7	D
-10	G
-14	J
-19	K
-24	M
-30	M
-37	N
-44	P
-61	S
2SJA-22	A
-20	A
-18	A
-16	A
-14	A
-12	B
-11	B
-9	C
-7	D
2SWA-3	C
-7	D
-10	G
-14	J
-19	K
-24	L
-30	M
-37	N
-44	P
-61	S
2SWLA-7	J

CABLE	TUBE SIZE
2SWUA-1	A
-3	E
-7	J
-12	L
-19	N
-24	R
-30	S
-37	T
-61	X
2UA-10	C
-15	C
-19	C
-30	D
-45	G
-60	J
2UW-42	E
2UWA-42	F
2UWS-42	F
2WA-40	N
3SA-3	D
-7	J
-10	L
-14	M
-19	P
-24	R
-30	S
-37	T
-44	W

CABLE	TUBE SIZE
3SUS-3	E
-7	J
-10	L
-14	M
-19	P
-24	R
-30	S
-37	T
-44	W
3SJA-22	A
-20	A
-18	A
-16	A
-14	A
-12	B
-9	D
3SWA-3	D
-7	J
-10	L
-14	M
-19	N
-24	S
-30	T
-37	T
-44	W
3SWUS-3	D
-7	J
-10	L
-14	M
-19	N
-24	S
-30	T
-37	T
-44	W

NOTES:
1. THE CABLES LISTED ON THIS FIGURE ARE PER MIL-C-915L.
2. THIS FIGURE SUPERSEDES SHEET 3B6 OF DRAWING 803-5001027 AND SECTION 4, SHEET 3-10 OF DRAWING, NAVSEC NO. 9000-S6202-73980.

SH 132317107

FIGURE 3B6. Aluminum and steel stuffing tubes cable assignment.

CABLE	TUBE SIZE
BC-2	A
-3	A
DCOP-3	B
-4	B
-6	C
-9	C
-14	D
-23	G
-30	J
-83	N
-250	V
-400	Y
DCP-2	A
-3	B
-4	B
-6	C
-9	C
-14	G
-23	K
-30	L
-400	Y
-672	BB
DDGT-17	G
-53	K
-105	N
-212	S
-400	W

CABLE	TUBE SIZE
DFPA-4	E
-9	G
-14	G
-23	J
-30	K
-40	L
-50	L
-60	M
-75	N
-100	P
-125	R
-150	T
-200	T
-250	V
-300	W
-400	Y
DHFA-4	E
-9	G
-14	G
-23	J
-30	K
-40	L
-50	L
-60	M
-75	N
-100	P
-125	R
-150	T
-200	T
-250	V
-300	W
-400	Y
DHFTA-9	C
DLB-4	C

CABLE	TUBE SIZE
DLPA-4	D
-9	J
-14	J
-23	K
-30	L
-40	L
-50	M
-60	M
-75	N
-100	P
-125	R
-150	S
-200	T
-250	V
-300	W
-400	Y
DPS-14	D
DRI-2 1/2	A
-3	B
-4	A
-6	B
-9	C
DRIA-3	B
-4	B
-6	C
-9	C
-14	D
-23	D

CABLE	TUBE SIZE
DRIB-2-1/2	A
-3	B
-4	B
-6	C
-9	C
-14	C
-23	D
DRIP-3	B
-4	C
-9	C
-14	C
-23	D
DSGA-14	D
-30	G
-40	G
-60	J
-125	M
-150	N
-250	S
FBSP-3/5	A
-1	A
-2	A
-3	A
-4	B
FCOP-3	B
-4	C
-9	D
-133	T
FCOTP-4	B
FCP-1	C
-9	D

CABLE	TUBE SIZE
FCSF-66	M
-220	T
FHFA-3	C
-4	G
-9	G
-23	K
-50	N
FHFTA-9	D
FJF-17	B
-26	B
-42	C
-53	D
-66	D
-84	D
-105	E
-133	F
-168	G
-212	G
FJXF-84	C
-105	D
-133	E
-168	G
-212	G
FLA-4	G
FRI-4	B
-9	E

CABLE	TUBE SIZE
FRIA-3	B
-4	C
-6	C
-9	D
-14	E
-23	G
FRIB-3	B
-4	C
-6	C
-9	D
-14	E
-23	G
FRIP-3	B
-4	B
FT-2	A
-3	A
FTS-2	A
-3	A
GICA-2	C
GICF-7	D
-10	E
-14	J
-19	M
-22	N
26	K
-30	P
-37	P
-44	P
GICP-2	C
MA-14	B

CABLE	TUBE SIZE
MCGC	C
MCMB-7	D
MCOP-2	B
-4	C
-5	C
-7	D
-10	F
-12	F
-14	G
-19	J
-22	K
-24	K
-26	L
-30	L
-37	M
-44	N
MCP-4	C
-5	C
-7	D
-10	D
-12	D
MCS-2	B
-4	C
-6	B
-7	C
MCSC-5	C
MDGA-19(6)	M
-19(14)	P
-19(23)	S
-19(40)	V

NOTES:
1. THE CABLES LISTED ON THIS FIGURE ARE PER MIL-C-9129E.
2. THIS FIGURE SUPERSEDES SHEET 3B7 OF DRAWING 803-5001027 AND SECTION 4, SHEET 3-10 OF DRAWING NAVSEC NO. 9000-S6202-73960.

SH 132317108

FIGURE 3B7. Aluminum and steel stuffing tubes cable assignment.

CABLE	TUBE SIZE
MDGB-12(1½)	C
-12(1)	B
MDGD-3(14)	C
-7(14)	D
MDGL-19(6)	M
MDGT-17	G
-53	K
-105	N
-212	S
-400	W
MDGW-17(4)	Y
-15(3)	Y
-12(2)	Y
MDGY-17(4)	X
-15(3)	X
-12(2)	X
MDY-6	L
-14	P
-23	T
-40	W
-60	Y

CABLE	TUBE SIZE
MFPA-2	D
-4	E
-7	G
-10	K
-14	K
-19	L
-22	M
-26	N
-30	N
-37	P
-44	S
MHFA-4	E
-7	G
-10	J
-14	K
-19	L
-22	M
-24	M
-26	N
-30	N
-37	P
-44	S
MHFF-2	B
-4	C
-7	D
-10	F
-14	G
-19	J
-22	K
-24	K
-26	L
-30	L
-37	M
-44	N
PBJX-4	B

CABLE	TUBE SIZE
PBLW-4	B
PBTM-5	C
-10	F
-15	J
PBTX-4	B
SCOP-23	B
-60	C
-150	G
-150	G
-250	K
-253	K
-800	R
SCP-1	A
-23	B
-60	C
-153	G
-200	K
-253	L
-814	T
SDGA-400	M
-500	M
-650	N
-800	P
-1000	R
-1300	T
-1600	T
-2000	W
SDU-500	L
-800	N

CABLE	TUBE SIZE
SFPA-9	C
-14	C
-23	D
-30	D
-40	D
-50	D
-60	E
-75	F
-100	F
-125	G
-150	G
-200	J
-400	L
-500	M
-650	N
-800	P
SHFA-3	A
-4	C
-9	D
-14	D
-23	D
-30	E
-40	E
-50	F
-60	G
-75	G
-100	G
-125	J
-150	J
-200	K
-300	L
-400	M
-500	N
-650	P
-800	R

CABLE	TUBE SIZE
SHFL-400	N
-500	P
-650	R
-800	S
-1000	T
SHFP-200	M
-300	M
-(3)300	M
-400	P
-(3)400	N
-500	P
-(3)500	P
-650	R
-800	S
-(3)800	S
SHFR-4	C
SLPA-4	A
-9	C
-14	D
-23	D
-30	E
-40	E
-50	E
-60	G
-75	G
-100	G
-125	J
-150	J
-200	J
-250	L

CABLE	TUBE SIZE
SLPA-300	M
-400	M
-500	N
-650	P
-800	R
-1000	V
SRIA-3	A
-4	A
-6	A
-9	A
-14	A
-23	A
SRLL-4	A
SSGA-3	A
-4	A
-9	A
-14	B
-23	B
-30	B
-40	C
-150	G
-500	M
-1300	S
SS5P-200	J
-300	L
-400	M
-500	N
-650	P
-800	R

CABLE	TUBE SIZE
TBSP-3/5	A
-1	A
-2	A
-3	A
-4	A
-6	B
-9	B
-14	C
-23	D
TCP-1	A
-2	A
-3	A
-4	B
-6	C
-9	C
-23	K
42	M
-153	S
-400	AA
THFR-4	G
TFPA-14	J
-23	J
-30	K
-40	K
-50	L
-60	M
-75	P
-100	R
-125	S
-150	T
-250	W
-300	X
-400	Z

NOTES:

1. THE CABLES LISTED ON THIS FIGURE ARE PER MIL-C-915, MIL-C-2194, MIL-C-23206, AND MIL-C-24143 AND ARE OBSOLETE OR MANUFACTUREING HAS BEEN DISCONTINUED.
2. THIS FIGURE SUPERSEDES SHEET 3B8 OF DRAWING 803-5001027 AND SECTION 4, SHEET 3-10 OF DRAWING, NAVSEC NO. 9000-S6202-73980.

SH 132317109

FIGURE 3B8. Aluminum and steel stuffing tubes cable assignment.

CABLE	TUBE SIZE
THFA-3	C
-4	F
-9	G
-14	J
-23	K
-30	L
-40	L
-50	M
-60	N
-75	P
-100	R
-125	S
-150	T
-200	V
-250	W
-300	X
-350	Y
-400	Z
TLPA-4	E
-9	J
-14	K
-23	L
-30	L
-40	M
-50	M
-60	N
-75	P
-100	R
-125	S
-150	T
-200	V
-300	X

CABLE	TUBE SIZE
TPTA-3	B
-5	D
-10	E
-15	F
-20	G
-25	G
-30	J
-40	J
-50	K
-60	K
TPTF-3	F
-5	J
-10	M
-15	P
TPTP-3	C
-5	D
-10	E
-15	F
-25	G
-30	G
40	J
50	K
60	K
TRI-2	A
-3	A
-4	B
-6	C
-9	C

CABLE	TUBE SIZE
TRIA-2	A
-3	B
-4	B
-6	C
-9	C
-14	D
-23	E
TRIB-2	A
-3	B
-4	B
-6	C
-9	D
-14	D
-23	E
TRIP-2	A
-3	B
-4	B
-9	C
-14	D
-23	D
TSGA-30	G
-40	J
-60	K
-125	N
-250	S
-250	V
TTHFA-1	B
-3	C
-5	C
-10	D
-15	E
-20	F

CABLE	TUBE SIZE
TTHFA-25	G
-30	G
-40	J
-50	J
-60	L
TTHFF-3	B
-5	C
-10	D
-15	G
20	J
-25	K
-30	K
-40	M
-50	P
-60	P
TTHFWA-1-1/2	A
-3	C
-5	C
-10	D
-15	F
-20	G
30	J
40	K
50	M
60	M
TTRSA-2	E
-4	F
-6	J
-8	K
-10	K
-12	L
-16	M
T3P-42	R
-400	BB

CABLE	TUBE SIZE
ISA-44	J
ISMA-16	G
-40	M
-70	P
ISMWA-70	P
ISWA-2	B
-14	G
-20	K
-30	L
ISSOMA-16	G
-20	J
-40	L
-70	P
IS75MA-8	J
2A-40	M
2SA-3	C
-7	D
-10	G
-14	J
-19	K
-24	L
-30	M
-37	N
-44	P
-61	S

CABLE	TUBE SIZE
2SWA-3	C
-7	D
-10	G
-14	J
-19	K
-24	L
-30	M
-37	N
-44	P
-61	S
2WA-40	M
3SA-3	D
-7	J
-10	L
-14	M
-19	N
-24	R
-30	S
-37	T
-44	W
3SWA-3	D
-7	J
-10	L
-14	M
-19	M
-24	R
-30	S
-37	T
-44	W
3UA-3	D
-7	G
-12	K
4NWA-8	E
4SJA-20	A
-16	A
-14	B

CABLE	TUBE SIZE

NOTES:

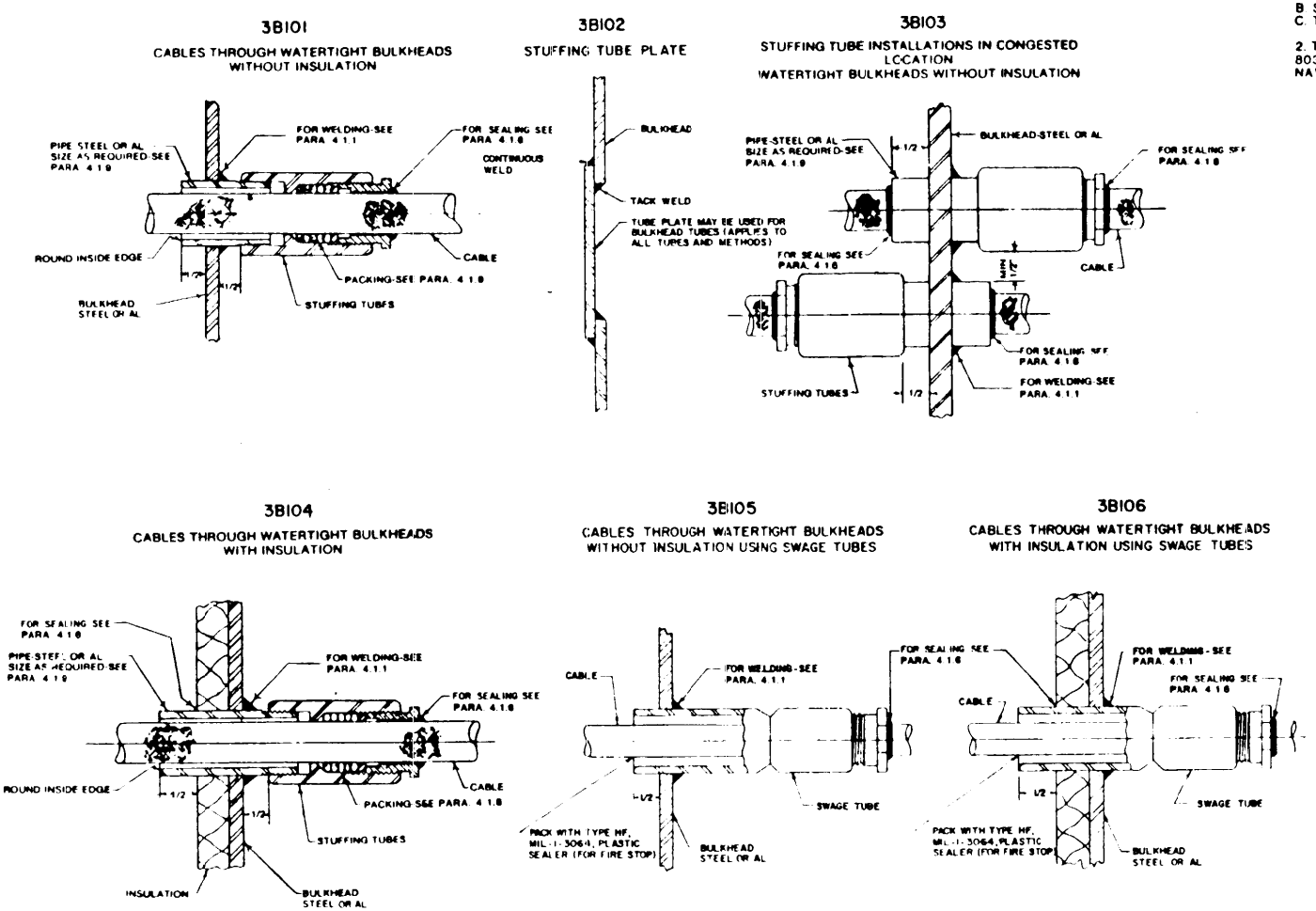
1. THE CABLES LISTED ON THIS FIGURE ARE PER MIL-C-915, MIL-C-2194, MIL-C-24145, AND ARE OBSOLETE OR MANUFACTURING HAS BEEN DISCINTINUED
2. LISTING CONTINUED ON FIGURE 3B61
3. THIS FIGURE SUPERSEDES SHEET 3B9 & 3B61 OF DRAWING 803-5001027 AND SECTION 4, SHEET 3-10 OF DRAWING, NAVSEC NO. 9000-S6202-73980

SH 132317110

FIGURE 3B9. Aluminum and steel stuffing tubes cable assignment.

NOTES:

1. PIPE USED IN CONJUNTION WITH STUFFING TUBES MAY BE WELDED ON ONE SIDE OF THE BULKHEADS WHERE WELDS ON BOTH SIDES ARE REQUIRED.
   A. BALLISTIC BULKHEADS
   B. SHELL PLATING
   C. TORPEDO DEFENSE SYSTEM BULKHEADS.
2. THIS FIGURE SUPERSEDES SHEET 3B10 OF DRAWING 803-5001027 AND SECTION 4, SHEET 14, OF DRAWING, NAVSEC NO. 9000-S6202-73980



SH 132317111

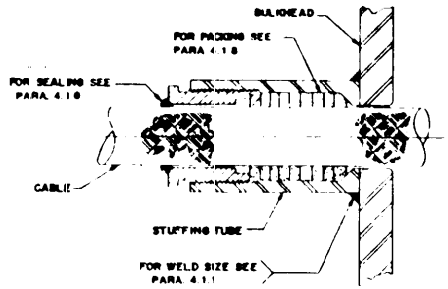
FIGURE 3B10. Stuffing tubes for steel or aluminum bulkheads (surface ships).

NOTE:

1. THIS FIGURE SUPERSEDESS SHEET 38111 OF DRAWING 8034-5001027 AND SECTION 4, SHEET 15 OF DRAWING, NAVSEC NO. 9000-S6202-73980

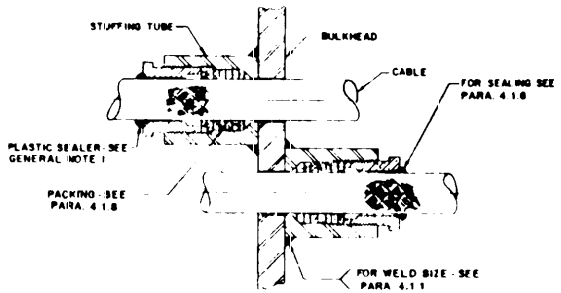
38111

CABLES THROUGH
WATERTIGHT MEDIUM STEEL BULKHEADS
WITHOUT INSULATION



38112

STUFFING TUBE INSTALLATION IN CONGESTED LOCATIONS
WATERTIGHT MEDIUM STEEL BULKHEAD
WITHOUT INSULATION



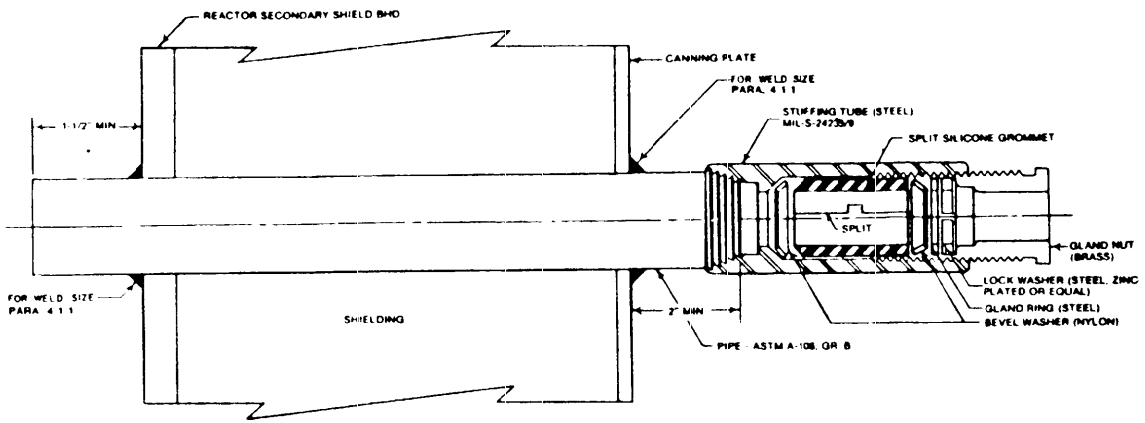
SH 132317112

FIGURE 3B11. Stuffing tubes for steel or aluminum bulkheads (surface ships).

NOTE:

1. THIS FIGURE SUPERSEDES SHEET 3B12 OF DRAWING 803-5001027 AND SECTION 4, SHEET 147 OF DRAWING NAVSEC NO 9000-S6202-73980.

3B121



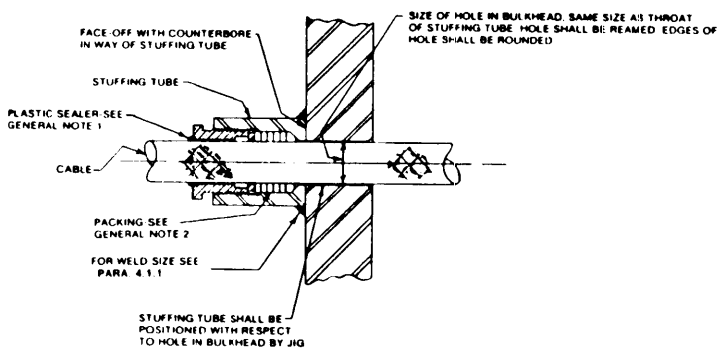
SH 132317113

FIGURE 3B12. Stuffing tubes through shielded bulkheads (surface ships).

NOTES:
1. THIS FIGURE SUPERSEDES SHEET 3B13 OF DRAWING 803-5001027 AND SECTION 4, SHEET 40, OF DRAWING, NAVSEC NO .9000-56202-73980.

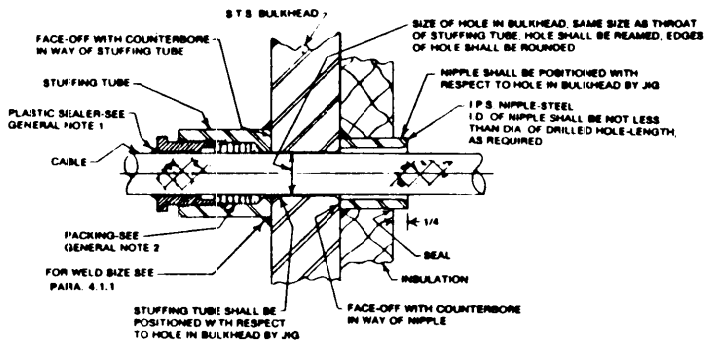
3B131

CABLES THROUGH S T S BULKHEADS WITHOUT INSULATION



3B132

CABLES THROUGH S T S BULKHEADS WITH INSULATION



SH 132317114

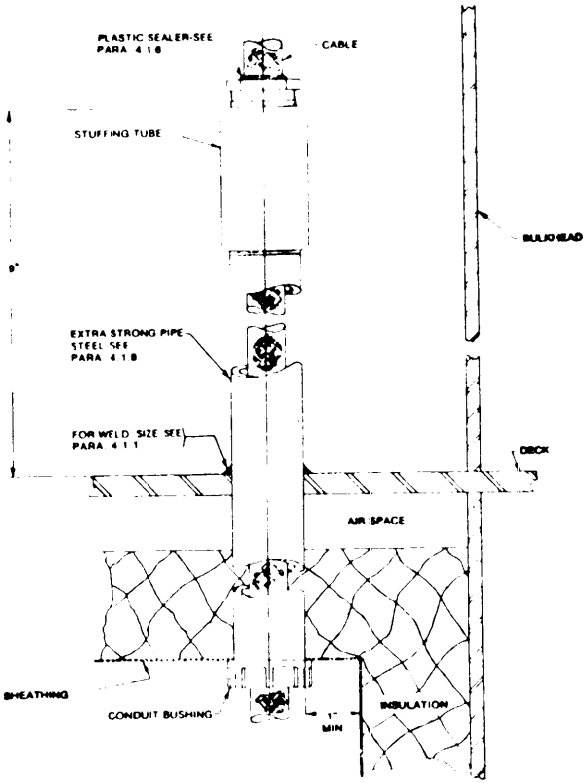
FIGURE 3B13. Stuffing tubes for ballistic bulkheads (surface ships).

NOTES:

1. THIS FIGURE SUPERSEDES SHEET 3B14 OF DRAWING 803-5001027 AND SECTION 4, SHEET 42, OF DRAWING, NAVSEC NO 9000- 9000-S6202-73980.

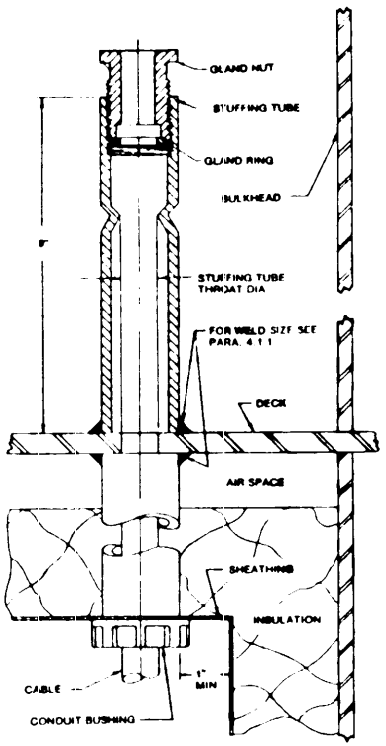
3B141

ONE OR TWO CABLES THROUGH OVERHEAD DECKS WITH INSULATION AND SHEATHING



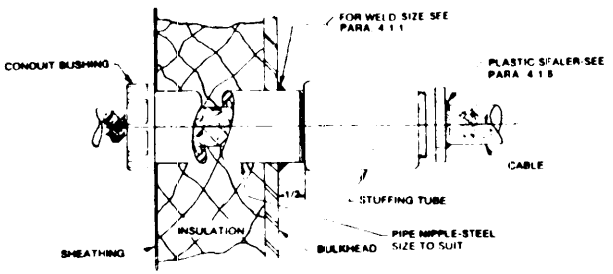
3B142

CABLES THROUGH OVERHEAD DECK WITH INSULATION AND SHEATHING USING SWAGE TYPE STUFFING TUBES



3B143

CABLES THROUGH BULKHEADS WITH INSULATION AND SHEATHING



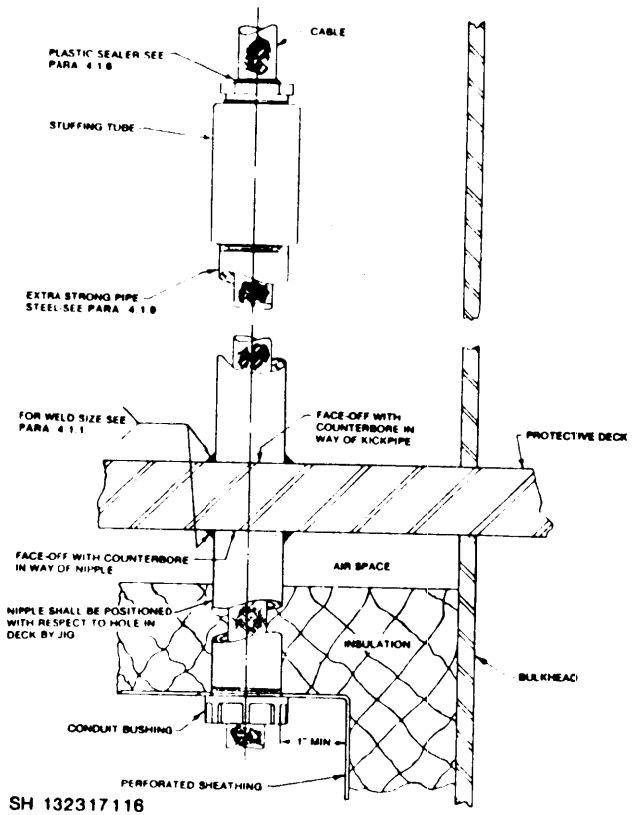
SH 132317115

FIGURE 3B14. Stuffing tubes through acoustical spaces (surface ships).

NOTE:
THIS FIGURE SUPERSEDES SHEET 3B15 OF DRAWING 803-5001027 AND SECTION 4, SHEET 43 OF DRAWING, NAVSEC NO. 9000-S6202 73980.

3B151

SINGLE OR MULTIPLE
CABLES THROUGH PROTECTIVE DECKS OVERHEAD
WITH INSULATION AND SHEATHING



SH 132317116

3B152

CABLES THROUGH PROTECTIVE BULKHEADS
WITH INSULATION AND SHEATHING

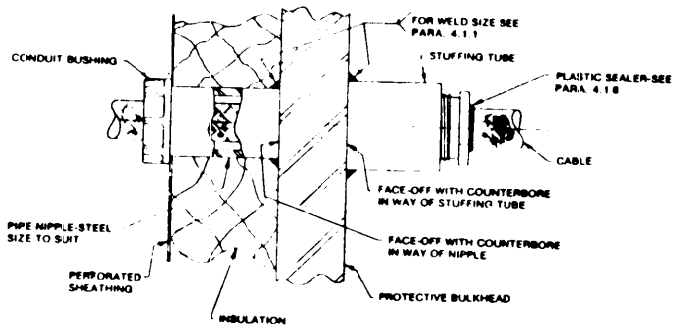


FIGURE 3B15. Stuffing tubes through acoustical spaces (surface ships).

NOTES:
1. THE KICKPIPE CAN EITHER BE STRAIGHT OR BENT TO SUIT INSTALLATION REQUIREMENTS.
2. THIS FIGURE SUPERSEDES SHEET 3B16 OF DRAWING 803-5001027 AND SECTION 4, SHEET 22, OF DRAWING NAVSEC NO 9000-S6202-73980

FIGURE 3B16. Stuffing tubes through false decks (surface ships).

SH 132317117

NOTES:
1. THIS FIGURE SUPERSEDES SHEET 3B17 OF DRAWING 803-5001027 AND SECTION 4, SHEET 23 OF DRAWING, NAVSEC NO. 9000-S6202-73980

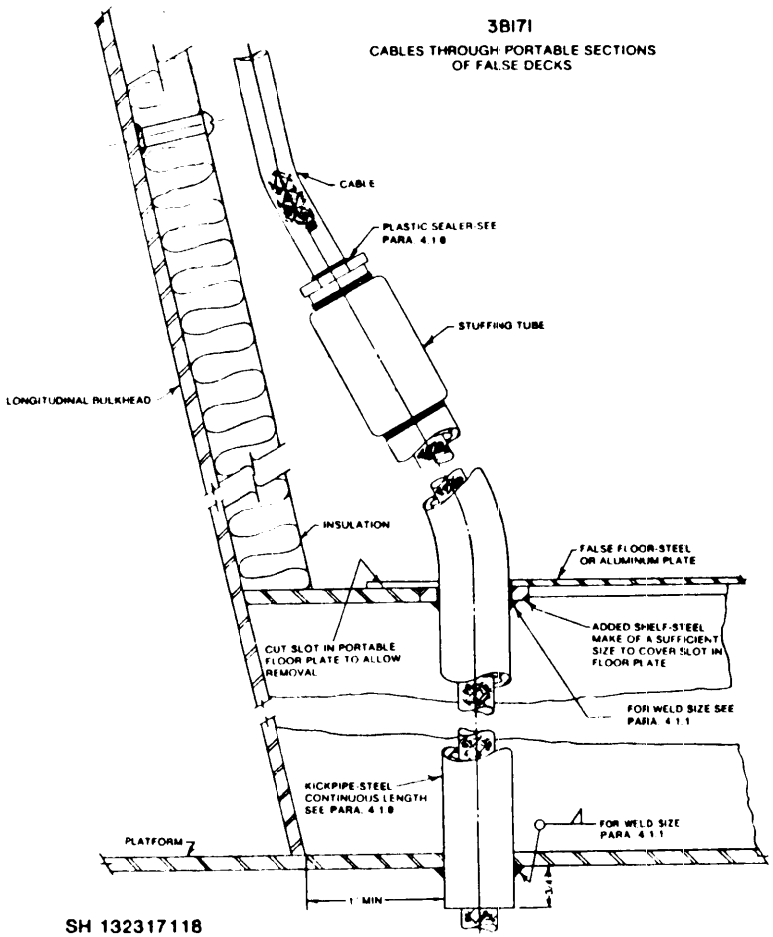
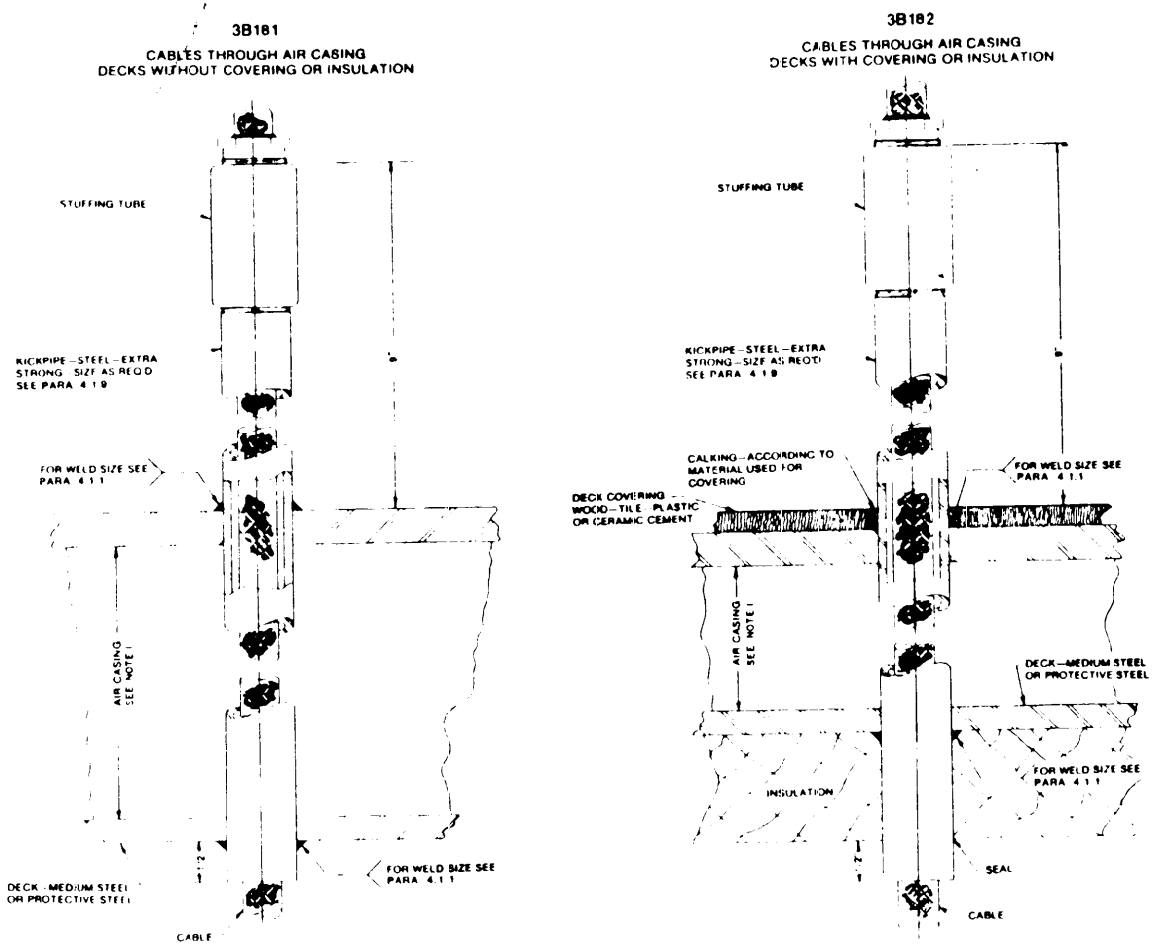


FIGURE 3B17. Stuffing tubes through false decks (surface ships).

NOTES:
1. FOR KICKPIPE INSTALLATIONS THROUGH PROTECTIVE DECKS BOUNDING AIR CASINGS, THE KICKPIPE SHALL EXTEND THROUGH THE AIR CASING, AND BOTH DECKS IN ONE CONTINUOUS PIECE.

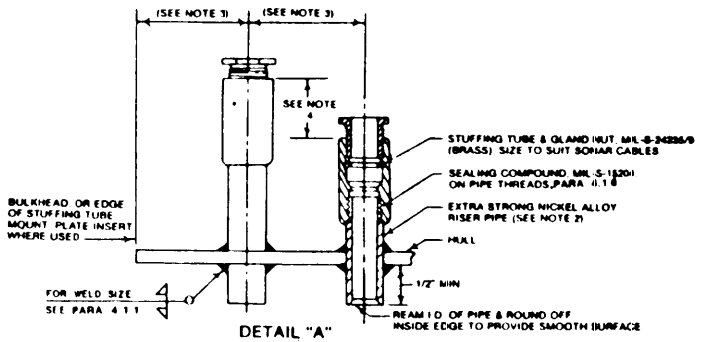
2. THIS FIGURE SUPERSEDES SHEET 3B18 OF DRAWING 803-5001027 AND SECTION 4 SHEET 24 OF NAVSEC DRAWING 9000-S6202-73980.



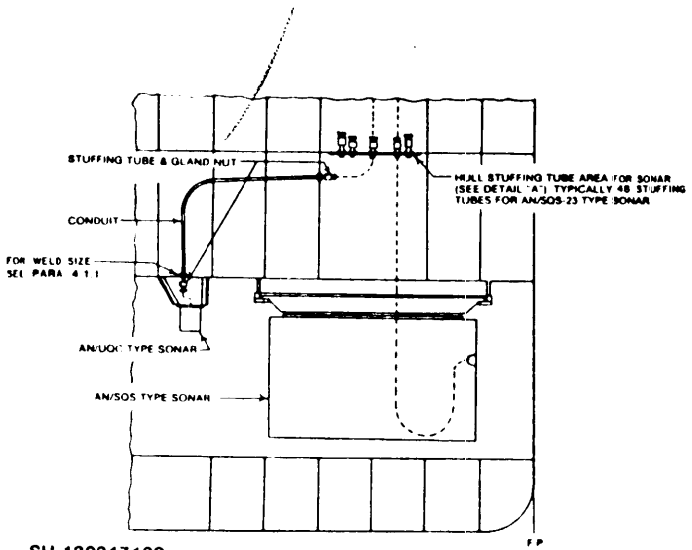
SH 132317119

FIGURE 3B18. Stuffing tubes through air spaces (surface ships).

3B191



INSTALLATION OF HULL STUFFING TUBES
FOR SONAR DOME TRANSDUCERS (NOTE 1)



SH 132317120 TYPICAL SONAR DOME ARRANGEMENT

FIGURE 3B19. Stuffing tubes for sonar dome area (surface ships).

NOTES:

1. ARRANGEMENT OF HULL STUFFING TUBE AREA FOR SONAR DOME TRANSDUCERS SHALL BE AS SPECIFIED ON DETAILED CONSTRUCTION DRAWINGS INSTALLATION OF STUFFING TUBES SHALL BE IN ACCORDANCE WITH THIS DRAWING.

2. HOLES FOR RISER PIPES SHALL BE DRILLED OR OTHER WISE MECHANICALLY CUT

3. STUFFING TUBE SPACING SHALL BE IN ACCORDANCE FIGURE 3B1&3B2

4. STAGGERED HEIGHTS MAY BE USED FOR ADJACENT RISER PIPES TO IMPROVE ACCESS TO STUFFING TUBES.

5. THIS FIGURE SUPERSEDES SHEET 3B19 OF DRAWING 803-5001027 AND SECTION 4, SHEET 113, OF DRAWING, NAVSEC NO. 9000-S6202-73980.

NOTES:
1. FOR SUITABLE CABLE SUPPORT SEE MIL-STD-XXX-4.
2. TUBES SHALL BE SPACED 1" MINIMUM FROM BULKHEAD AND FROM EACH OTHER IN ACCORDANCE WITH FIGURE 3B2 AND 3B3
3. THIS FIGURE SUPERSEDES SHEET 3B20 OF DRAWING 803-5001027 AND SECTION 4, SHEET 29, OF DRAWING NAVSEC NO 9000-SU202-73980.

3B20
THREE OR MORE CABLES THROUGH TOPSIDE WATERTIGHT DECKS WITH INSULATION APPLICABLE ALSO TO INBOARD INSTALLATIONS

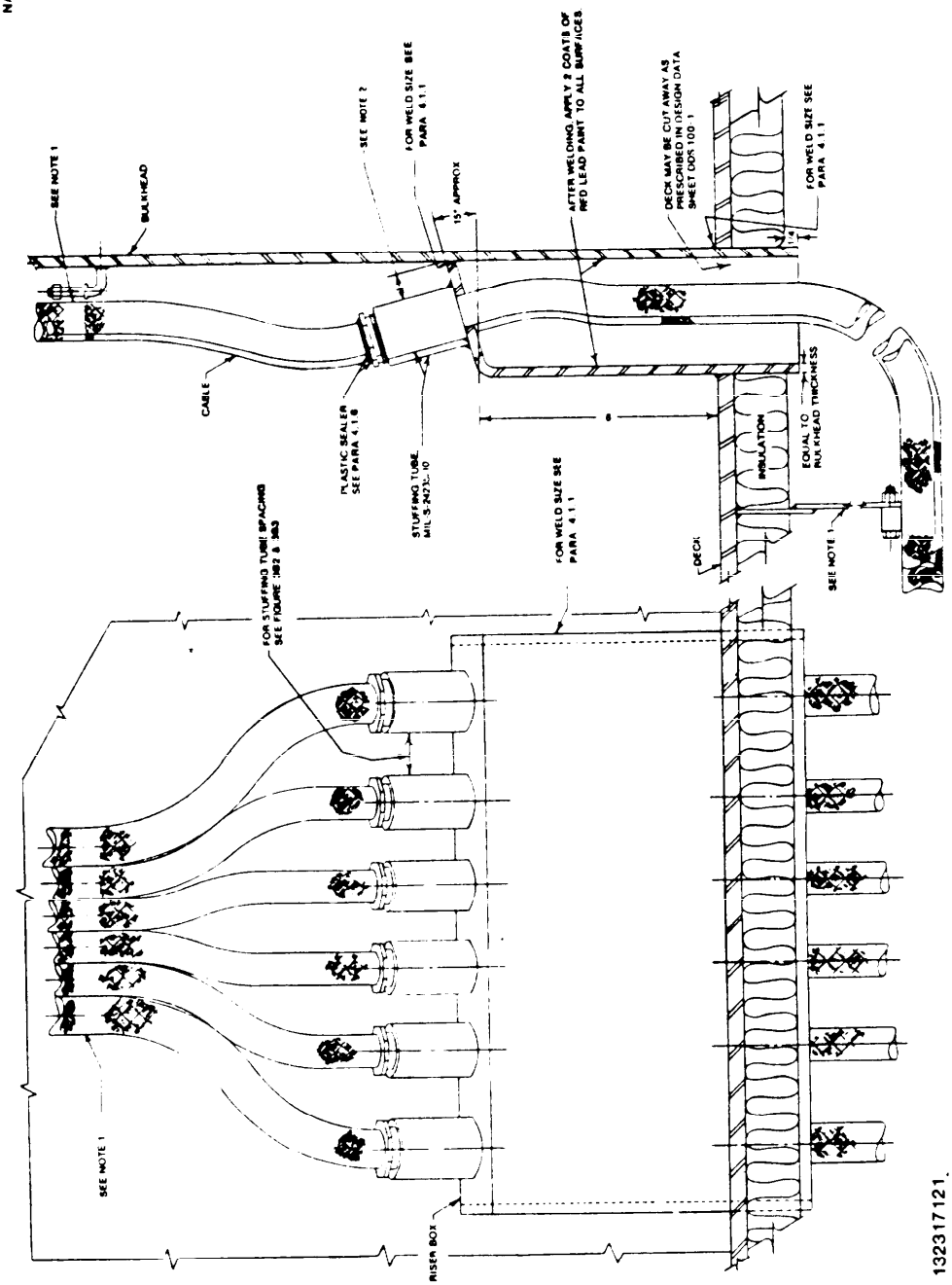
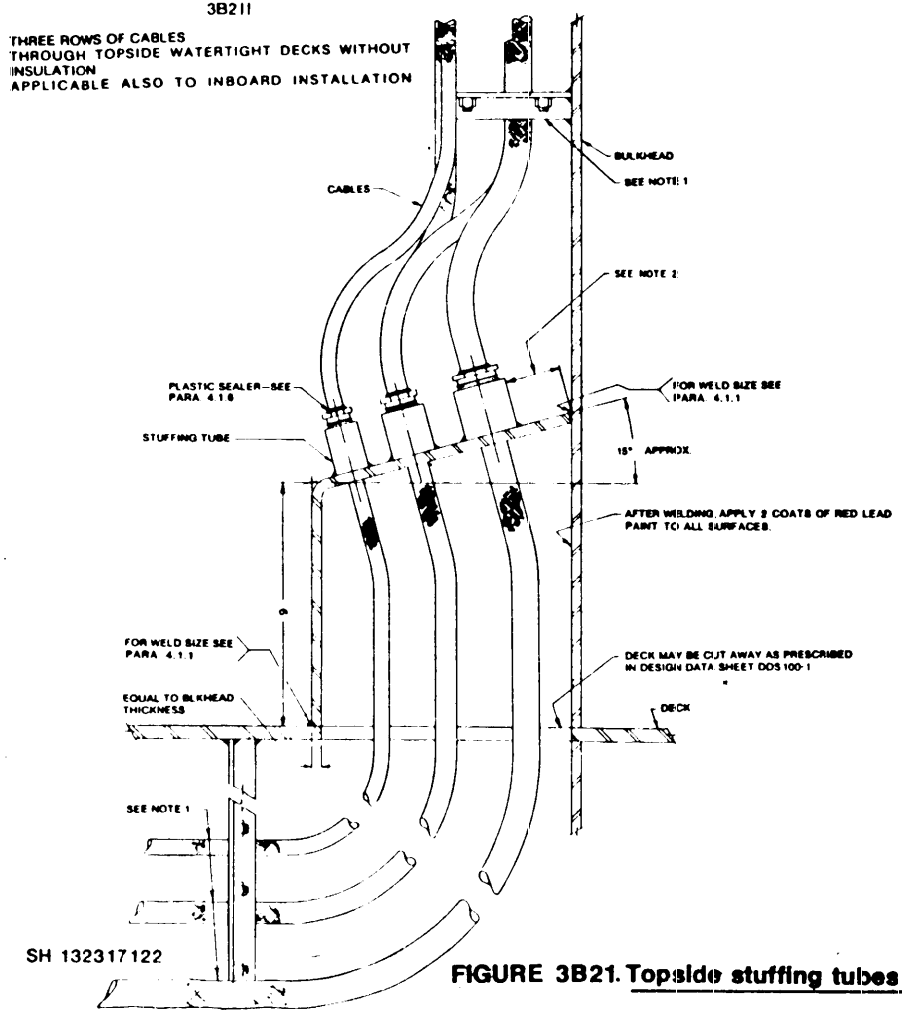


FIGURE 3B20. Topside stuffing tubes with riser box (surface ships).

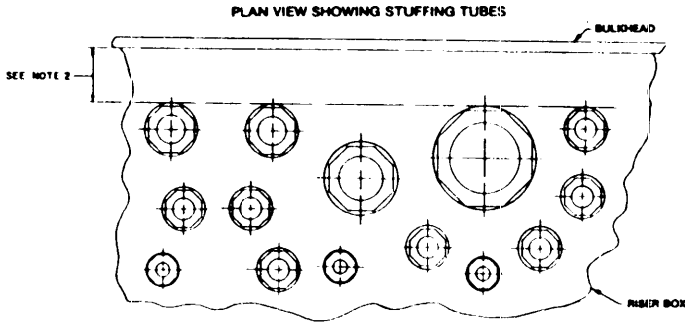
SH 132317121.

3B211

THREE ROWS OF CABLES
THROUGH TOPSIDE WATERTIGHT DECKS WITHOUT
INSULATION
APPLICABLE ALSO TO INBOARD INSTALLATION



PLAN VIEW SHOWING STUFFING TUBES



NOTE:

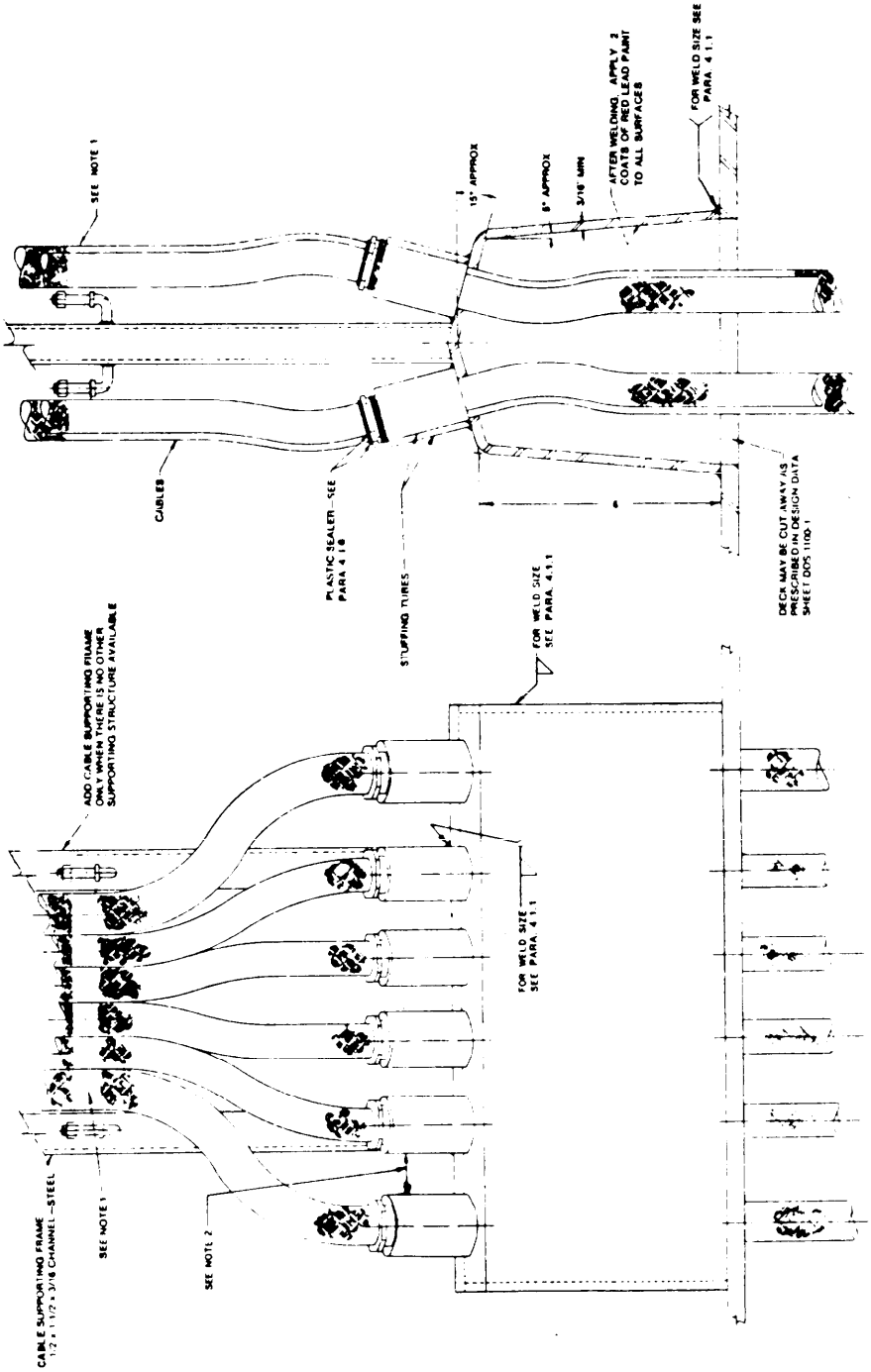
1. FOR SUITABLE CABLE SUPPORT SEE MIL-STD-XXX-4.
2. TUBES SHALL BE SPACED 1" MIN FROM BULKHEAD AND FROM EACH OTHER IN ACCORDANCE WITH STUFFING TUBE SPACING FIGURES 3B2 &3B3.
3. THIS FIGURE SUPERSEDES SHEET 3B21 OF DRAWING 803-5001027 AND SECTION 4, SHEET 30, OF DRAWING, NAVSEC NO. 9000-S6202-73980.

SH 132317122

FIGURE 3B21. Topside stuffing tubes with riser boxes for medium steel decks (surface ships).

NOTES
1. FOR SUITABLE CABLE SUPPORT SEE MIL-STD-XXX-4.
2. STUFFING TUBES SHALL BE SPACED FROM EACH OTHER AND FRAMEWORK AS PRESCRIBED ON FIGURES 382 AND 383.
3. THIS FIGURE SUPERSEDES SHEET 3822 OF DRAWING 803-5001027 AND SECTION 4 SHEET 32, OF DRAWING NAVSEC NO. 9000-S6202-73980.

3B22)
TWO ROWS OF CABLES;
THROUGH WATERTIGHT DECKS WITHOUT INSULATION



SH 132317123

FIGURE 3B22. Topside stuffing tubes with riser box on medium steel decks not adjacent to a bulkhead (surface ships).

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00-
BC-2	1	16-0005	202-2584
-3	1	16-0005	202-2584
DCOP-3	2	17-0004	202-2589
-4	3	18-0018	202-2590
-6	4T	19-0001	202-2591
-9	4T	19-0003	202-2593
-14	4T	19-0006	202-2596
-23	5	20-0003	788-8711
-30	5	20-0006	202-2604
-83	7	22-0001	202-2616
-250	9	24-0003	202-2630
-400	9	24-0007	202-2634
DCP-2	2	17-0001	202-2586
-3	2	17-0004	202-2589
-4	3	18-0018	202-2590
-6	4T	19-0001	202-2591
-9	4T	19-0002	202-2592
-14	5	20-0005	202-2603
-23	5	20-0009	202-2607
-30	6	21-0003	202-2611
-400	9	24-0007	202-2634
DDGT-17	5	20-0002	202-2600
-53	6	21-0001	202-2609
-105	7	22-0001	202-2616
-212	8	23-0003	202-2632
-400	9	24-0007	202-2634

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00-
DFPA-4	4T	19-0007	202-2597
-9	5	20-0002	202-2600
-14	5	20-0004	202-2602
-23	5	20-0005	202-2603
-30	5	20-0008	202-2606
-40	5	20-0010	202-2608
-50	6	21-0002	202-2610
-60	6	21-0005	202-2613
-75	7	22-0001	202-2616
-100	7	22-0002	202-2617
-125	8	23-0001	202-2620
-150	8	23-0004	202-2623
-200	8	23-0006	202-2625
-250	9	24-0002	202-2629
-300	9	24-0004	202-2631
-400	9	24-0006	202-2633
DHFA-4	4T	19-0007	202-2597
-9	5	20-0002	202-2600
-14	5	20-0004	202-2602
-23	5	20-0005	202-2603
-30	5	20-0008	202-2606
-40	5	20-0010	202-2608
-50	6	21-0002	202-2610
-60	6	21-0005	202-2613
-75	7	22-0001	202-2616
-100	7	22-0002	202-2617
-125	8	23-0001	202-2610
-150	8	23-0004	202-2623
-200	8	23-0006	202-2625
-250	9	24-0002	202-2629
-300	9	24-0004	202-2631
-400	9	24-0006	202-2633
DHFTA-9	3	18-0018	202-2590
DLB-4	3	18-0018	202-2590

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00
DLPA-4	4T	19-0005	202-2595
-9	5	20-0004	202-2602
-14	5	20-0005	202-2603
-23	5	20-0008	202-2606
-30	5	20-0010	202-2608
-40	6	21-0002	202-2610
-50	6	21-0004	202-2612
-60	6	21-0005	202-2613
-75	6	21-0007	202-2615
-100	7	22-0002	202-2617
-125	8	23-0001	202-2620
-150	8	23-0003	202-2622
-200	8	23-0005	202-2624
-250	9	24-0002	202-2629
-300	9	24-0003	202-2630
-400	9	24-0006	202-2633
DPS-14	4T	19-0005	202-2595
DRI-2-1/1	1	16-0005	202-2584
-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-6	3	18-0018	202-2590
-9	4T	19-0002	202-2592
DRIA-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-6	3	18-0018	202-2590
-9	4T	19-0002	202-2592
-14	4T	19-0003	202-2593
-23	4T	19-0005	202-2595

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00-
DRIB-2-1/2	2	17-0001	202-2586
-3	2	17-0004	202-2589
-4	3	18-0018	202-2590
-6	4T	19-0002	202-2592
-9	4T	19-0003	202-2593
-14	4T	19-0005	202-2595
-23	4T	19-0007	202-2597
DRIP-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-8	4T	19-0002	202-2592
-14	4T	19-0003	202-2593
-23	4T	19-0005	202-2595
DSGA-14	4T	19-0004	202-2594
-30	5	20-0002	202-2600
-40	5	20-0003	788-8711
-60	5	20-0006	202-2604
-125	6	21-0005	202-2613
-150	7	22-0001	202-2616
-250	8	23-0003	202-2622
FBSP-3/5	1	16-0004	202-2583
-1	1	16-0005	202-2584
-2	1	16-0005	202-2584
-3	2	17-0002	202-2587
-4	2	17-0004	202-2589
FCOP-3	3	18-0018	202-2590
-4	4T	19-0002	202-2592
-9	4T	19-0005	202-2595
-133	9	24-0001	202-2628
FCOTP-4	3	18-0018	202-2590
FCP-4	4T	19-0001	202-2591
-9	4T	19-0005	202-2595

NOTES
1. THE CABLES LISTED ON THIS SHEET ARE PER MIL-C-915, MIL-X-2194, MIL-C-23206 AND MIL-C-24145 AND ARE OBSOLETE OR MANUFACTURING HAS BEEN DISCONTINUED.
2. THIS FIGURE SUPERSEDES SHEET 3C8 OF DRAWING 803-500127 AND SECTION 4, SHEET 69-73, OF DRAWING, NAVSEC NO 9000-S6202-73980

SH 132317175

FIGURE 3C8. Nylon stuffing tubes cable assignment (obsolete or discontinued cable).

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL96221/	NSN 5330-00-
2SWLA-7	5	20-0004	202-2602
2SWU-1	1	16-0004	202-2583
-3	4T	19-0005	202-2595
-7	5	20-0004	202-2602
-12	6	21-0001	202-2609
-19	6	21-0005	202-2613
-24	7	22-0002	202-2617
-30	8	23-0002	202-2621
-37	8	23-0003	202-2622
-61	9	24-0004	202-2631
2SWUA-1	1	16-0004	202-2583
-3	4T	19-0005	202-2595
-7	5	20-0004	202-2602
-12	6	21-0001	202-2609
-19	6	21-0005	202-2613
-24	7	22-0002	202-2617
-30	8	23-0002	202-2621
-37	8	23-0003	202-2622
-61	9	24-0004	202-2631
2U-10	3	18-0018	202-2590
-15	4T	19-0002	202-2592
-19	4T	19-0002	202-2592
-30	4T	19-0005	202-2596
-45	5	20-0003	788-8711
-60	5	20-0005	202-2603
2WAU-40	6	21-0005	202-2613
3SU-3	4T	19-0005	202-2595
-7	5	20-0004	202-2602
-10	5	20-0010	202-2608
-14	6	21-0003	202-2611
-19	6	21-0007	202-2615
-24	7	22-0003	202-2618
-30	8	23-0002	202-2621
-37	8	23-0005	202-2624
-44	9	24-0001	202-2628
3SF-7	5	20-0007	202-2605

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL96221/	NSN 5330-00
3SJ-22	1	16-0001	202-2580
-20	1	16-0004	202-2583
-18	1	16-0004	202-2583
-16	1	16-0005	202-2584
-14	2	17-0001	202-2586
-12	2	17-0003	202-2588
-9	4T	19-0003	202-2593
3SWU-3	4T	19-0006	202-2596
-7	5	20-0004	202-2602
-10	6	21-0002	202-2610
-14	6	21-0004	202-2612
-19	6	21-0007	202-2615
-24	8	23-0001	202-2620
-30	8	23-0003	202-2622
-37	8	23-0006	202-2625
-44	9	24-0003	202-2630
3U-3	4T	19-0004	202-2594
-7	5	20-0002	202-2600
-12	5	20-0009	202-2507
3UA-3	4T	19-0004	202-2594
-7	5	20-0004	202-2602
-12	5	20-0009	202-2607
4NW8	4T	19-0007	202-2598
4NWA8	4T	19-0007	202-2598
4SJ-20	1	16-0004	202-2583
-16	1	16-0006	202-2585
-14	2	17-0002	202-2587
4SJA-20	1	16-0004	202-2583
-16	1	16-0006	202-2585
-14	2	17-0002	202-2587
5KVTSGA-100	8	23-0002	202-2621
-150	8	23-0005	202-2624
-250	9	24-0002	202-2629
-350	9	24-0005	202-2632
-400	9	24-0007	202-2634

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL96221/	NSN 5330-00-
5KVTSGU-100	8	23-0003	202-2621
-150	8	23-0005	202-2624
-250	9	24-0002	202-2629
-350	9	24-0005	202-2632
-400	9	24-0007	202-2634
5SS	4T	19-0002	202-2592
6SGA-100	8	23-0001	202-2620
-125	8	23-0004	202-2623
-150	8	23-0006	202-2625
-200	9	24-0003	202-2630
6SGU-100	8	23-0001	202-2620
-125	8	23-0004	202-2623
-150	8	23-0006	202-2625
-200	9	24-0003	202-2630
7PS-6	4T	19-0007	202-2597
7SGA-3	4T	19-0002	202-2592
-4	4T	19-0003	202-2593
7SGU-3	4T	19-0002	202-2592
-4	4T	19-0003	202-2593
7SS-2	4T	19-0004	202-2594
8NW6	4T	19-0004	202-2594
8NWA6	4T	19-0004	202-2594

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL96221/	NSN 5330-00
DNWA-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-9	4T	19-0002	202-2592
-14	4T	19-0004	202-2594
-23	4T	19-0005	202-2595
-50	5	20-0004	202-2602
-75	5	20-0009	202-2607
-100	6	21-0002	202-2610
FNWA-3	3	18-0018	202-2590
-4	4T	19-0001	202-2591
-9	4T	19-0004	202-2594
-23	5	20-0002	202-2600
MDY-6	6	21-0003	202-2611
-14	7	22-0003	202-2618
-23	9	24-0001	202-2628
-40	9	24-0004	202-2631
-60	9	24-0007	202-2634
MNWA-7	2	17-0003	202-2588
-10	3	18-0018	202-2590
-14	4T	19-0001	202-2591
-19	4T	19-0003	202-2593
-24	4T	19-0005	202-2595
-30	4T	19-0007	202-2597
-37	5	20-0001	01-032-3021
-44	5	20-0004	202-2602
MSCS-7	4T	19-0002	202-2592
-10	4T	19-0005	202-2595
-14	4T	19-0007	202-2597
-19	5	20-0002	202-2600
-24	5	20-0004	202-2602
-30	5	20-0005	202-2603
-37	5	20-0009	202-2607
-44	6	21-0002	202-2610
-61	6	21-0005	202-2613
-91	7	22-0002	202-2617

NOTES:
1. THIS FIGURE SUPERSEDES SHEET 3C7 ON DRAWING 803-5001027 AND SECTION 4, SHEET 69-73, OF DRAWING, NAVSEC NO. 0 9000-S6202-73980
2. LISTING CONTINUED ON FIGURE 3C21

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FIGURE 3C7. Nylon stuffing tubes cable assignment.

NOTES:
1. THIS FIGURE SUPERSEDES SHEET 3C6 OF DRAWING 803-5001027 AND SECTION 4 SHEET 69-73 OF DRAWING NAVSEC NO. 9000-S6202-73980

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00-
TPU-6	5	20-0006	202-2604
TPUM-6	5	20-0004	202-2602
TRF-105	4T	19-0007	202-2598
133	5	20-0002	01-032-3021
168	5	20-0003	202-2601
TRW	4T	19-0005	202-2595
TRWA	4T	19-0005	202-2595
TRXF-84	4T	19-0003	202-2593
105	4T	19-0005	202-2595
133	4T	19-0007	202-2597
TSGA-3	2	17-0003	202-2588
4	2	17-0004	202-2589
9	4T	19-0003	202-2593
14	4T	19-0007	202-2597
23	5	20-0002	202-2600
50	5	20-0005	202-2603
75	5	21-0010	202-2608
100	6	21-0004	202-2612
150	7	22-0002	202-2617
200	8	23-0001	202-2620
300	8	23-0006	202-2625
400	9	24-0003	202-2630
TSGU-3	2	17-0003	202-2588
4	2	17-0004	202-2589
9	4T	19-0003	202-2593
14	4T	19-0007	202-2597
23	5	20-0002	202-2600
50	5	20-0005	202-2603
75	5	20-0010	202-2608
100	6	21-0004	202-2612
150	7	22-0002	202-2617
200	8	23-0001	202-2620
300	8	23-0006	202-2625
400	9	24-0003	202-2630

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00-
TSP-11	4T	19-0007	202-2597
31	5	20-0008	202-2606
TSPA-11	4T	19-0007	202-2597
31	5	20-0008	202-2606
TSS-2	2	17-0003	202-2588
3	4T	19-0001	202-2591
4	4T	19-0001	202-2591
TTOP-3	3	18-0018	202-2590
5	4T	19-0003	202-2593
10	4T	19-0006	202-2596
15	5	20-0002	202-2600
TTRS-2	4T	19-0005	202-2595
4	4T	19-0007	202-2597
6	5	20-0003	202-2601
8	5	20-0008	202-2604
10	5	20-0009	202-2607
12	5	20-0009	202-2607
16	6	21-0001	202-2609
TTRSA-2	4T	19-0006	202-2596
4	4T	19-0007	202-2597
6	5	20-0004	202-2602
8	5	20-0006	202-2604
10	5	20-0009	202-2607
12	5	20-0009	202-2607
16	6	21-0001	202-2609
TTSA-1-1/2	2	17-0001	202-2586
3	2	17-0004	202-2589
5	4T	19-0001	202-2591
10	4T	19-0004	202-2594
15	4T	19-0007	202-2597
20	5	20-0002	202-2600
30	5	20-0006	202-2604
40	6	21-0002	202-2610
50	6	21-0007	202-2615
60	7	22-0001	202-2616

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00
TTSU-1-1/2	2	17-0001	202-2586
3	2	17-0004	202-2589
5	4T	19-0001	202-2591
10	4T	19-0004	202-2594
15	4T	19-0007	202-2597
20	5	20-0002	202-2600
30	5	20-0006	202-2604
40	6	21-0002	202-2610
50	6	21-0007	202-2615
60	7	22-0001	202-2616
ISA-44	5	21-0006	202-2604
ISAU-44	5	20-0006	202-2604
ISMA-5	4T	19-0001	202-2591
ISMU-5	4T	19-0001	202-2591
ISMWA-70	7	22-0003	202-2618
ISMWU-70	7	22-0003	202-2618
ISU-36	5	20-0005	202-2603
60	6	21-0004	202-2612
ISWU-2	2	17-0004	202-2589
14	5	20-0003	202-2601
20	5	20-0007	202-2605
30	6	21-0003	202-2611
ISWF-2	4T	19-0004	202-2594
IS50MU-16	5	20-0002	202-2600
20	5	20-0004	202-2602
40	6	21-0001	202-2609
70	7	22-0001	202-2616
IS50MUS-16	5	20-0004	202-2602
20	5	20-0005	202-2603
40	6	21-0003	202-2611
70	7	22-0003	202-2618
IS75MA-8	5	20-0007	202-2605
IS75MU-8	5	20-0007	202-2605
2A-40	6	21-0005	202-2613
2AU-40	6	21-0005	202-2613

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00
2SU-3	4T	19-0001	202-2591
7	4T	19-0005	202-2595
10	5	20-0002	202-2600
14	5	20-0004	202-2602
19	5	20-0007	202-2605
24	6	21-0001	202-2609
30	6	21-0004	202-2612
37	6	21-0004	202-2612
44	7	22-0002	202-2617
61	7	22-0003	202-2618
2SJ-22	1	16-0001	202-2580
20	1	16-0001	202-2580
18	1	16-0004	202-2583
16	1	16-0004	202-2583
14	1	16-0006	202-2585
12	2	17-0002	202-2587
11	2	17-0004	202-2589
9	4T	19-0001	202-2591
7	4T	19-0003	202-2593
2SWAU-3	4T	19-0001	202-2591
7	4T	19-0005	202-2595
10	5	20-0002	202-2600
14	5	20-0005	202-2603
19	5	20-0007	202-2605
24	6	21-0003	202-2611
30	6	21-0004	202-2612
37	6	21-0006	202-2614
44	7	22-0002	202-2617
61	8	23-0003	202-2622
2SWF-3	4T	19-0004	202-2594
4	4T	19-0004	202-2594
7	4T	19-0008	202-2599
2SWL-7	5	20-0004	202-2602

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FIGURE 3C6. Nylon stuffing tube cable assignment.

NOTES:
1. THIS FIGURE SUPERSEDES SHEET 3C5 OF DRAWING 803-5001027 AND SECTION 4 SHEET 69-73 OF DRAWING NAVSEC NO 9000-S6202-73980

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL9622 /	NSN 5330-00-
MSCA-7	3	18-0018	202-2590
-10	4T	19-0004	202-2594
-14	4T	19-0005	202-2595
-19	4T	19-0007	202-2597
-24	5	20-0003	202 2601
-30	5	20-0004	202-2602
-37	5	20-0006	202-2604
-44	5	20-0009	202-2607
-61	6	21-0003	202-2611
-91	7	22-0001	202-2616
MSCU-7	3	18-0018	202-2590
-10	4T	19-0004	202-2594
-14	4T	19-0005	202-2595
-19	4T	19-0007	202-2597
-24	5	20-0003	202-2601
-30	5	20-0004	202-2602
-37	5	20-0006	202-2604
-44	5	20-0009	202-2607
-61	6	21-0003	202-2611
-91	7	22-0001	202-2616
MSP	7	22-0003	202-2618
MSPW	7	23-0003	202-2618
MA-14	2	17-0003	202-2588
MU-14	2	17-0003	202-2588
MUS-14	2	17-0004	202-2589
MWF-7	3	18-0018	202-2590
-10	4T	19-0004	202-2594
-14	4T	19-0005	202-2595
-19	4T	19-0007	202-2597
-24	5	20-0002	202-2600
-30	5	20-0005	202-2603
-37	5	20-0007	202-2605
PBTM-5	4T	19-0002	202-2592
-15	4T	19-0007	202-2597
-30	5	20-0006	202-2604

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL9622 /	NSN 5330-00-
PBTMU-5	4T	19-0002	202-2592
-15	4T	20-0007	202 2597
-30	5	20-0006	202-2604
PI-3	4T	19-0004	202 2594
-7	5	20-0002	202-2600
-12	5	20-0009	202-2607
SHOF-3	1	16-0001	202-2580
-23	3	18-0018	202-2590
-60	4T	20-0004	202-2594
-150	5	20-0003	202-2601
-200	5	20-0006	202-2604
-250	5	20-0009	202-2607
-500	7	22-0001	202-2616
-650	7	22-0003	202-2618
-800	8	23-0001	202-2620
SRW	2	17-0003	202-2588
SRWA	2	17-0003	202-2588
SSF-300	5	20-0009	202-2607
SSGA-50	4T	19-0001	202-2591
-75	4T	19-0004	202-2594
-100	4T	19-0005	202-2595
-200	5	20-0003	202-2601
-300	5	20-0006	202-2604
-400	5	20-0010	202-2608
-650	6	21-0006	202-2614
-800	7	22-0001	202-2616
-1000	8	23-0001	202-2620
-1600	9	24-0001	202-2628
-2000	9	24-0004	202-2631

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL9622 /	NSN 5330-00
SSGU-50	4T	19-0001	202-2591
-75	4T	19-0004	202 2594
-100	4T	19-0005	202-2595
-200	5	20-0003	202-2601
-300	5	20-0006	202-2604
-400	5	20-0010	202-2608
-650	6	21-0006	202-2614
-800	7	22-0001	202-2616
-1000	8	23-0001	202-2620
-1600	9	24-0001	202-2628
-2000	9	24-0004	202-2631
S2S	4T	19-0001	202-2591
TCJA-4	2	17-0004	202-2589
TCJU-4	2	17-0004	202-2589
TCJX-3	4T	19-0005	202-2595
-7	5	20-0005	202-2603
-12	6	21-0003	202-2611
TCKX-1	2	17-0003	202-2588
-3	4T	19-0005	202-2595
-7	5	20-0005	202-2603
-12	6	21-0003	202-2611
TCOP-2	2	17-0001	202-2586
TCTA-4	2	17-0004	202-2589
TCTU-4	2	17-0004	202-2589
TCTX-1	1	16-0006	202-2586
-3	3	18-0018	202-2591
-7	4T	19-0005	202-2595
-12	5	20 0004	202-2602

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL9622 /	NSN 5330-00-
THOF-3	2	17-0004	202-2589
-4	3	18-0018	202-2590
-6	4T	19-0002	202-2592
-9	4T	19-0004	202-2594
-14	4T	19-0007	202-2597
-23	5	20-0004	202-2602
-42	6	21-0003	202-2611
-150	8	23-0004	202-2623
-250	9	24-0003	202-2630
-400	9	24-0008	202-2635
-500	—	—	—
-600	—	—	—
TNW-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-9	4T	19-0004	202-2594
-14	4T	19-0005	202-2595
-23	4T	19-0007	202-2598
-50	5	20-0005	202-2603
-75	5	20-0010	202-2608
-100	6	21-0004	202-2612
-150	7	22-0001	202-2616
TPNW-1-1/2	1	16-0004	202-2583
-3	1	16-0006	202-2585
-5	2	17-0001	202-2586
-10	3	18-0018	202-2590
-15	4T	19-0001	202-2591
-20	4T	19-0002	202-2592
-30	4T	19-0005	202-2595
-40	4T	20 0007	202-2598
TPS-3	2	17-0004	202-2589
-4	3	18-0018	202-2590
-6	4T	19-0002	202-2592
-9	4T	19-0003	202-2593
-14	4T	19-0006	202-2596
-23	5	20-0001	01 032 3021
-30	5	20-0004	202-2602

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FIGURE 3C5. Nylon stuffing tube cable assignment.

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M19622 /	NSN 5330-00
CVSF-4	6	21-0007	202-2588
DCOP	1	16-0004	202-2583
-1-1/2	1	16-0006	202-2585
-2	2	17-0001	202-2586
DHOF-3	2	17-0004	202-2589
-4	3	18-0018	202-2590
-6	4T	19-0001	202-2591
-9	4T	19-0003	202-2593
-14	4T	19-0007	202-2597
-23	5	20-0003	788-8711
-30	5	20-0005	202-2603
-83	6	21-0007	202-2615
-250	9	24-0002	202-2629
-400	9	24-0006	202-2633
DLT-4	4T	19-0006	202-2596
DNW-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-9	4T	19-0002	202-2592
-14	4T	19-0004	202-2594
-23	4T	19-0005	202-2595
-50	5	20-0004	202-2602
-75	5	20-0009	202-2607
-100	6	21-0002	202-2610
DPS-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-6	4T	19-0001	202-2591
-9	4T	19-0002	202-2592
-14	4T	19-0007	202-2597
DRW	4T	19-0005	202-2595
DRWA	4T	19-0005	202-2595

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M19622 /	NSN 5330-00
DSGA-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-9	4T	19-0002	202-2592
-14	4T	19-0006	202-2596
-23	5	20-0002	202-2600
-50	5	20-0004	202-2602
-75	5	20-0009	202-2607
-100	6	21-0001	202-2609
-200	7	22-0003	202-2618
-300	8	23-0004	202-2623
-400	9	24-0001	202-2628
DSGU-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-9	4T	19-0002	202-2592
-14	4T	19-0005	202-2595
-23	5	20-0002	202-2600
-50	5	20-0004	202-2602
-75	5	20-0009	202-2607
-100	6	21-0001	202-2609
-200	7	22-0003	202-2618
-300	8	23-0004	202-2623
-400	9	24-0001	202-2628
DSS-2	2	17-0003	202-2588
-3	4T	19-0001	202-2591
-4	4T	19-0001	202-2591
DSWS-4	5	20-0001	01-032-3021
ECM	6	21-0006	202-2614
ECMA	6	21-0006	202-2614
FHOF-3	3	18-0018	202-2590
-4	4T	19-0002	202-2592
-9	4T	19-0005	202-2595
-42	6	21-0006	202-2614
-60	7	22-0002	202-2617
-133	8	23-0006	202-2625

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M19622 /	NSN 5330-00
FNW-3	3	18-0018	202-2590
-4	4T	19-0001	202-2591
-9	4T	19-0004	202-2594
-23	5	20-0002	202-2600
FPS-14	5	20-0002	202-2600
FSGA-3	2	17-0004	202-2589
-4	4T	19-0001	202-2591
-9	4T	19-0004	202-2594
-23	5	20-0004	202-2602
-50	5	20-0008	202-2606
-75	6	21-0004	202-2612
-100	6	21-0006	202-2614
-150	8	23-0001	202-2620
-200	8	23-0004	202-2623
FSGU-3	2	17-0004	202-2589
-4	4T	19-0001	202-2591
-9	4T	19-0004	202-2594
-23	5	20-0004	202-2602
-50	5	20-0008	202-2606
-75	6	21-0004	202-2612
-100	6	21-0006	202-2614
-150	8	23-0001	202-2620
-200	8	23-0004	202-2623
FSS-2	4T	19-0001	202-2591
-3	4T	19-0001	202-2591
-4	4T	19-0004	202-2594
JAS-250	–	–	–
–	–	–	–
MCOS-2	2	17-0004	202-2589
-4	4T	19-0001	202-2591
-5	2	17-0003	202-2588
-6	3	18-0018	202-2590
-7	4T	19-0004	202-2594

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M19622 /	NSN 5330-00
MCSF-4	7	22-0002	202-2617
MDU-6	5	20-0006	202-2604
-14	6	21-0007	202-2615
-23	8	23-0003	202-2622
-40	9	24-0001	202-2628
-60	9	24-0005	202-2632
MHOF-7	4T	19-0001	202-2591
-10	4T	19-0003	202-2593
-14	4T	19-0004	202-2594
-19	4T	19-0006	202-2596
-24	5	20-0001	01-032-3021
-30	5	20-0002	202-2600
-37	5	20-0004	202-2602
-44	5	20-0006	202-2604
-61	6	21-0001	202-2609
MMOP-5	1	16-0006	202-2585
MNW-7	2	17-0003	202-2588
-10	3	18-0018	202-2590
-14	4T	19-0001	202-2591
-19	4T	19-0003	202-2593
-24	4T	19-0005	202-2595
-30	4T	19-0007	202-2597
-37	5	20-0001	01-032-3021
-44	5	20-0004	202-2602
MRI-D-1	1	16-0001	202-2580
-D-2-1/2	1	16-0001	202-2580
-T-2-1/2	1	16-0001	202-2580
MS-37	5	20-0001	01-032-3021
MSA-37	5	20-0001	01-032-3021

NOTES:
1. CABLE DIAMETER MAY BE INCREASED WITH HEAT SHRINK TUBING FOR PROPER GROMMET FIT.
2. THIS FIGURE SUPERSEDES SHEET 3C4 OF DRAWING 803-5001027 AND SECTION 4 SHEET 69-73 OF DRAWING NAVSEC NO 9000-S6202-73980

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FIGURE 3C4. Nylon stuffing tube cable assignment.

STRAIGHT TUBE SIZES 1 THRU 9, MIL-S-19622/1 (SHIPS)
ANGLE TUBE SIZES 1 THRU 6, MIL-S-19622/2 (SHIPS)
NPT TUBE SIZES 1 THRU 9, MIL-S-19622/3 (SHIPS)
"Y" TYPE TUBE SIZES 1 THRU 4, MIL-S-19622/4 (SHIPS)
(SEE NOTE 1)

NOTES:
1. SIZE 4 STRAIGHT AND ANGLE TUBE IS FOR REPLACEMENT ONLY IN EXISTING INSTALLATIONS WHERE SIZE 4T IS NOT INTERCHANGEABLE
2. THIS FIGURE SUPERSEDES SHEET 3C3 OF DRAWING 803-5001027 AND SECTION 4 SHEET 68 OF DRAWING NAVSEC NO. 9000-S6202-73980

STUFFING TUBE SIZES

TUBE SIZE	STRAIGHT TUBE					ANGLE TUBE					NPT TUBE			TUBE SIZE
	MILITARY PART NO. M196221/	NATIONAL STOCK NO. 5975-00-	O RING ARP NO	O RING NSN 5330-00-	CLEARANCE HOLE	MILITARY PART NO. M196221/	NATIONAL STOCK NO. 5975-00-	O RING ARP NO	O RING NSN 5330-00-	CLEARANCE HOLE	MILITARY PART NO. M196221/	NATIONAL STOCK NO. 5975-00-	NPT TAP	
1	1-001	-298-4082	568-212	-187-3838	886	2-001	-503-4884	568-212	-187-3838	886	3-001	-808-4083	1/2	1
2	1-002	-298-4083	568-214	-188-5382	1 010	2-002	-503-4883	568-212	-187-3838	886	3-002	-808-4084	3/4	2
3	1-003	-877-8867	568-216	-188-6177	1 135	2-003	-877-8868	568-216	188-6177	1 136	3-003	-877-8866	1	3
4	1-005	-296-4095	568-220	-188-6186	1 385	2 005	-503-4692	568-216	-188-5385	1 260	3-004	-808 9272	1	4
5	1-008	298-4088	568-226	298-0189	2 010	2-008	-503-4895	568-216	-258-0190	2 010	3-005		1 1/2	5
6	1-007	-298-4087	568-230	-054-8888	2 510	2-007	-503-4897	568-230	-054-8888	2 510	3-006	-808-4086	2	6
7	1-008	-298-4088	568-232	-194-3720	2 760						3-007	-808-4087	2 1/2	7
8	1-009	-298-4089	568-238	231-4107	3 260						3-008	-808-4088	3	8
9	1-010	298-4100	568-242	-194-3737	4 010						3-009	-808-4089	3 1/2	9
*4T	1-004	-989-5046	568-218	-188-5386	1 260	2-004	-989-5045	568-218	-171-8816	1 260		-892-92595		*4T

*SEE NOTE 1

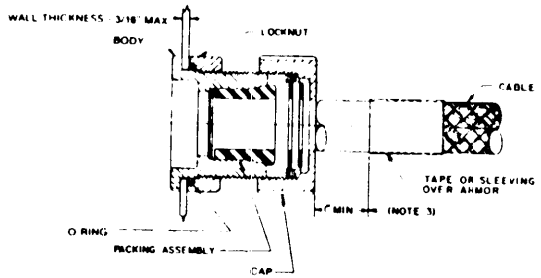
TUBE SIZE	"Y" TUBE				
	MILITARY PART NO. M196221/	NATIONAL STOCK NO. 5975-00-	O RING ARP NO	O RING NSN 5330-00-	CLEARANCE HOLE
1	4-01	-782-8139	568-212	-187-3838	0 886
2	4-02	-782-8140	568-214	-188-5382	1 010
3	4-03	-782-8141	568-216	-188-6177	1 136
4	4-04	-782-8142	568-220	-188-6186	1 386

FIGURE 3C3. Nylonstuffing tube data.

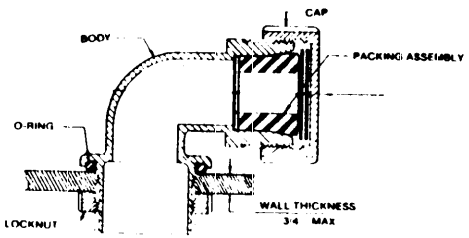
NOTES:

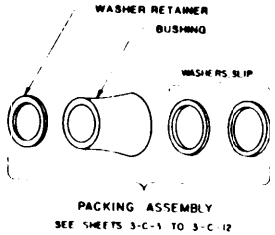
1. PACKING ASSEMBLIES AND "O" RINGS ARE NOT FURNISHED WITH STUFFING TUBES. THEY MUST BE ORDERED SEPARATELY BY INSTALLING ACTIVITY TO SUIT INSTALLATIONS.
2. "O" RINGS ARE NOT REQUIRED FOR NON-WATERTIGHT INSTALLATIONS.
3. SECURE ARMOR ON CABLE A MINIMUM OF 1" FROM PLASTIC TUBE FACE WITH PRESSURE SENSITIVE VINYL TAPE MIL-I-24391, OR BY A SHRINK FIT PLASTIC SLEEVE. METAL SQUEEZE RINGS SIMILAR TO BURNDY-HYRING MAY BE USED.
4. SEE FIGURE 3C1 FOR GENERAL INSTALLATIONS NOTES.
5. THIS FIGURE SUPERSEDES SHEET 3C2 OF DRAWING 803-5001027 AND SECTION 4 SHEET 65 & 66 OF DRAWING NAVSEC NO. 9000-S6202-73980.

3C21
STRAIGHT TYPE
MIL-S-19622/1

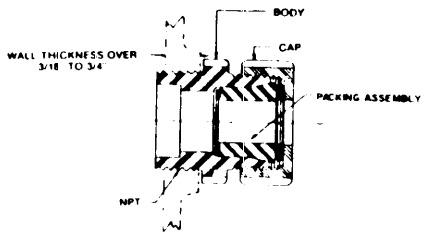


3C23
90° ANGLE TYPE
MIL-S-19622/2

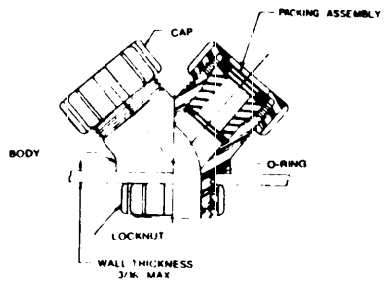




3C22
NPT TYPE
MIL-S-19622/3



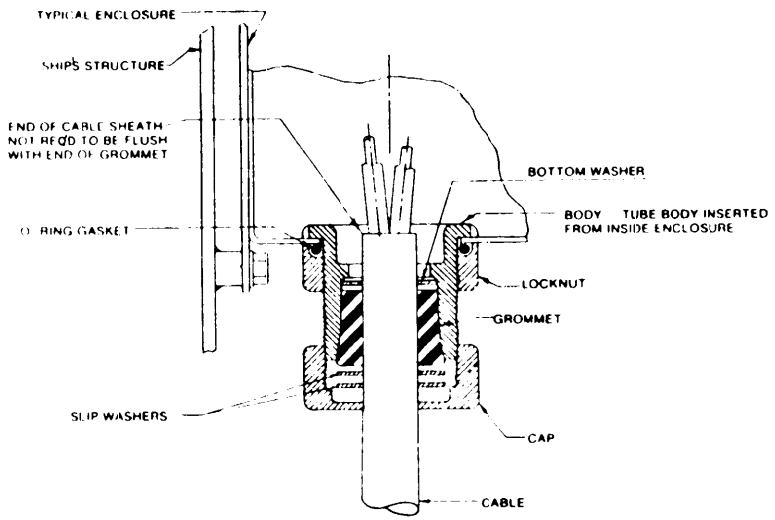
3C24
"Y" TYPE
MIL-S-19622/4



SH 132317169

FIGURE 3C2. Nylon stuffing tube assembly.

3C11
APPLIES ALSO TO ANGLE TUBES



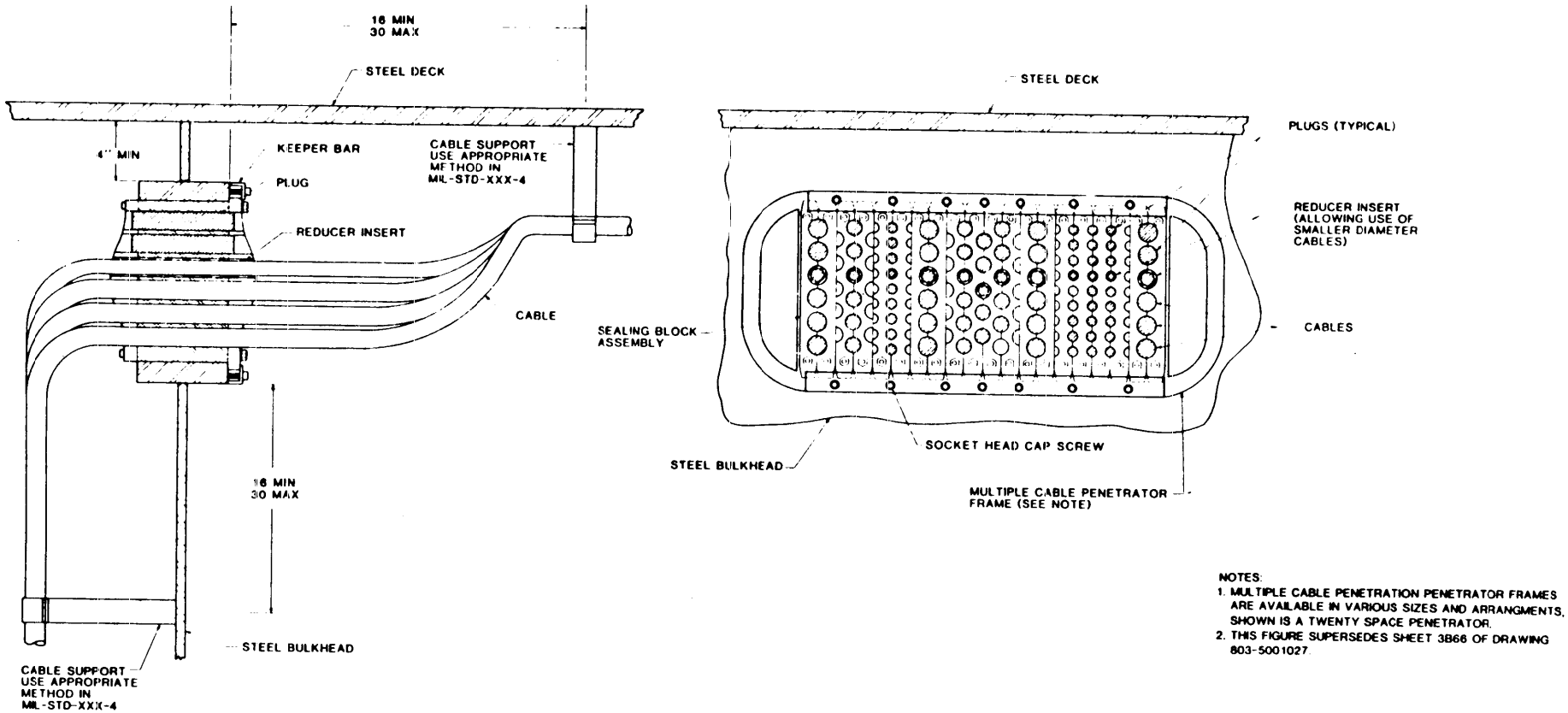
INSTALLATION NOTES

1. INSPECT THE HOLE IN THE ENCLOSURE FOR CONFORMANCE WITH THE CLEARANCE HOLE REQUIRED AS SHOWN ON FIGURES 3C3 THROUGH 3C12 AND REMOVE ANY BURRS OR IRREGULARITIES.
2. FOR STEEL ENCLOSURES, WHERE ROUGHNESS IS GREATER THAN A 125 MICRO INCH FINISH (NOT REQUIRED ON ALUMINUM ENCLOSURES) REMOVE PAINT, ROUGHEN SURFACE WITH EMERY PAPER 1/2" WIDE AROUND THE HOLE ON THE EXTERIOR OF THE ENCLOSURE, APPLY ONE COAT OF PRIMER, GATES ENG. CO. N-10 OR EQUAL AND ALLOW TO SET. DUST COATED SURFACE WITH TALC (SOAPSTONE) IF PRIMER IS THOROUGHLY DRY AT TIME OF TUBE INSTALLATION, OMIT TALC.
3. WITH STRAIGHT TUBE TYPE INSERT THE STUFFING TUBE BODY IN THE HOLE, FROM INSIDE THE ENCLOSURE. IF NECESSARY, REMOVE THE INTERIOR FITTING FROM THE ENCLOSURE.
4. WITH ANGLE AND "Y" TUBES, INSERT THE STUFFING TUBE BODY IN THE HOLE, FROM THE OUTSIDE OF THE ENCLOSURE. EXCESS LENGTH PROTRUDING INTO THE ENCLOSURE MAY BE REMOVED.
5. SCREW LOCKNUT ONTO BODY AND TIGHTEN AGAINST O RING GASKET SUFFICIENTLY TO OBTAIN PLASTIC TO METAL CONTACT OF THE STUFFING TUBE AND ENCLOSURE. IN CASES WHERE THIS PLASTIC TO METAL CONTACT CANNOT BE OBTAINED, TIGHTEN THE LOCKNUT UNTILL THE THREADS START TO SKIP. THIS WILL BE CONSIDERED A SATISFACTORY INDICATION OF TIGHTNESS. (SEE INSTALLATION NOTE 13)
6. REMOVE SUFFICIENT ARMOR FROM THE CABLE FOR CONNECTIONS WITHIN THE ENCLOSURE PLUS THE BODY LENGTH AND TRIM TO SUIT. AVOID CUTTING CABLE SHEATH. SEIZE END OF ARMOR OF CABLE WITH SLEEVING OR TAPE AND PLACE CAP AND THE TWO SLIP WASHERS OVER END OF CABLE.
7. DELETED.
8. PREPARE CONDUCTORS FOR MAKING ELECTRICAL CONNECTION.
9. PLACE BOTTOM WASHER OVER THE END OF CABLE AGAINST THE END OF THE GROMMET.
10. INSERT END OF CABLE THROUGH STUFFING TUBE, AND INTO THE ENCLOSURE SO AS TO SEAT THE GROMMET INTO TUBE BODY.
11. SCREW ON CAP AND TIGHTEN SUFFICIENTLY TO COMPRESS THE GROMMET TO FORM A TIGHT SEAL BETWEEN THE CABLE AND TUBE.
12. HOLD TUBE BODY WHEN TIGHTENING LOCKNUT TO PREVENT TURNING. ALSO HOLD TUBE BODY WHEN TIGHTENING CAP TO PREVENT BREAKING THE WATERTIGHT SEAL.
13. SEALING PLUGS ARE FOR USE IN SERVICE TO SEAL NYLON STUFFING TUBES FROM WHICH THE CABLES HAVE BEEN REMOVED. WHEN INSTALLING THE PLUGS, THE CABLE GROMMET SHALL BE DISCARDED BUT THE NYLON WASHERS SHALL BE RETAINED AND LEFT IN THE STUFFING TUBE. BONDING AGENT IS NOT REQUIRED ON PLUG.
14. "O" RINGS SHALL BE FURNISHED BY THE INSTALLING ACTIVITY IN ACCORDANCE WITH MIL-P-5516 OR MIL-G-18586, CL. 2, OIL RESISTANT TYPE.
15. WHEN NECESSARY TO PASS AIRTIGHT TEST, APPLY SILASTIC 731731 RTV SILICONE RUBBER TO THE GROMMET.

NOTES:

1. IN GENERAL, THE STUFFING TUBES SIZE IS THE SAME AS THAT ASSIGNED FOR THE CABLES BOTH WHEN END SEALING IS APPLIED OR IS NOT APPLIED. IN THOSE INSTANCES WHERE THE ADDITION OF THE REQUIRED SYNTHETIC RESIN TUBING INCREASES THE DIAMETER OF THE BUNCHED INDIVIDUAL LEADS LARGER THAN THE THROAT DIAMETER OF THE ASSIGNED TUBE, THE NEXT LARGER TUBE SIZE IS SPECIFIED.
2. IN THOSE CASES WHERE THE BUNCHED CONDUCTOR LEADS CANNOT BE ACCOMMODATED IN A STANDARD GROMMET, USE THE SEALING PLUG ASSIGNED TO THE TUBE. FREEZE THE PLUG TO -40° F AND DRILL A HOLE TO THE DIMENSION GIVEN, THUS MAKING A NEW GROMMET.
3. THIS FIGURE SUPERSEDES SHEET 3C1 OF DRAWING 803-5001027 AND SECTION 4, SHEET 64, OF DRAWING, NAVSEC NO. 99000-S6202-73980.

FIGURE 3C1. Nylon stuffing tube typical installation.



NOTES:
1. MULTIPLE CABLE PENETRATION PENETRATOR FRAMES ARE AVAILABLE IN VARIOUS SIZES AND ARRANGMENTS, SHOWN IS A TWENTY SPACE PENETRATOR.
2. THIS FIGURE SUPERSEDES SHEET 3B66 OF DRAWING 803-5001027.

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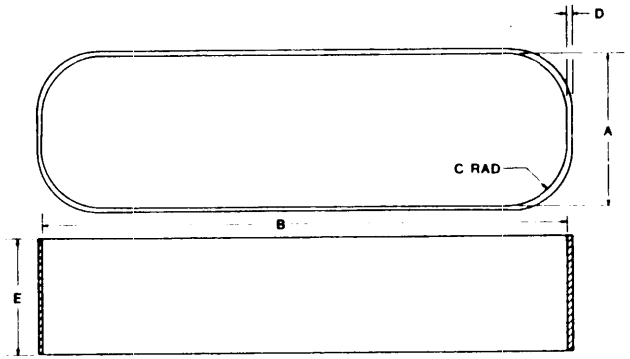
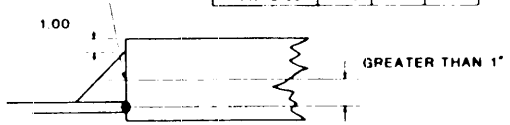
FIGURE 3B66. Multi-cable penetrators (type TW) typical installation in steel bulkhead.



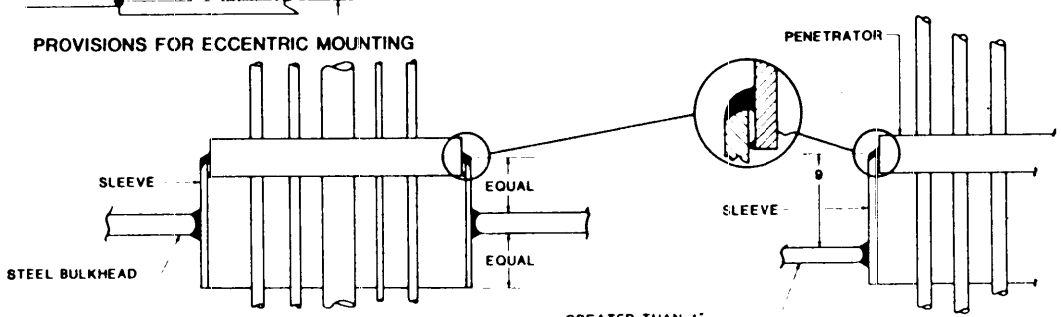
SLEEVE			
PENETRATOR	DIM "A"	DIM "B"	DIM "C"
TWFS 6	6.11	12.25	1.62
TWFS 10	9.36	14.75	3.63
TWFS 20	11.25	23.98	5.00
TWFS 30	11.75	32.08	5.00

WELD GUSSETS, .25 MIN. THICKNESS AT CENTER OF KEYED SIDE AND ON TWFS 30, WELD TWO MORE GUSSETS APPROX. 4 INCHES BOTH SIDES OF CENTER GUSSET.

	BULKHEADS										DECKS										
	DIMEN. "D"					DIMEN. "E"					DIMENSION "D"/DIMENSION "E"										
DK PL LBS / PENETRATOR	7.65# 10.2# 12.75# 15.3# 17.85# 20.4#	25.5#	30.6#	35.7#	40.8#	7.65# 10.2# 12.75# 15.3# 17.85# 20.4#	25.5#	30.6#	35.7#	40.8#	DK PL LBS / PENETRATOR	7.65#	10.20#	12.75#	15.3#	17.85#	20.4#	25.5#	30.6#	35.7#	40.8#
TWFS 6	N/R	N/R	N/R	N/R	.625	N/R	N/R	N/R	N/R	3.75	TWFS 6	1/4 / 10.0	1/4 / 10.25	5/16 / 10.25	5/16 / 10.5	3/8 / 10.5	3/8 / 10.75	7/16 / 11.0	1/2 / 11.25	1/2 / 11.5	5/8 / 11.5
TWFS 10	N/R	N/R	N/R	.625	.625	N/R	N/R	N/R	3.75	4.50	TWFS 10	1/4 / 10.0	5/16 / 10.5	5/16 / 10.5	3/8 / 10.5	3/8 / 11.0	3/8 / 11.0	1/2 / 11.5	1/2 / 11.5	5/8 / 12.0	5/8 / 12.0
TWFS 20	N/R	N/R	.625	.625	.75	N/R	N/R	4.25	5.00	4.75	TWFS 20	5/16 / 10.5	5/16 / 10.5	3/8 / 10.75	3/8 / 10.75	7/16 / 11.0	1/2 / 11.0	1/2 / 11.5	5/8 / 11.5	5/8 / 12.0	3/4 / 12.0
TWFS 30	N/R	.625	.625	.75	.75	N/R	4.00	4.75	5.00	5.50	TWFS 30	5/16 / 10.25	3/8 / 10.75	3/8 / 10.75	7/16 / 11.0	1/2 / 11.25	1/2 / 11.25	5/8 / 11.75	5/8 / 11.75	3/4 / 12.25	3/4 / 12.25



PROVISIONS FOR ECCENTRIC MOUNTING



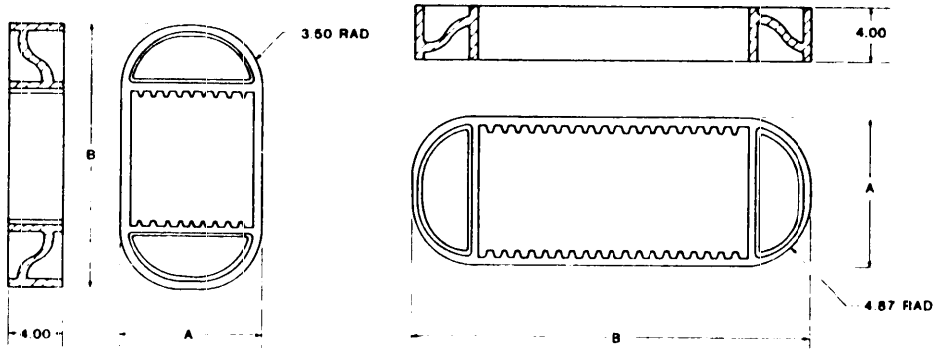
INSTALLATION FOR BULKHEADS
WHERE SLEEVE IS REQUIRED

INSTALLATION FOR DECKS

NOTE
1. THIS FIGURE SUPERSEDES SHEET 3B65 OF DRAWING 803-5001027.

SH 132317166

FIGURE 3B65. Multi-cable penetrator (type TW) sleeve installation.



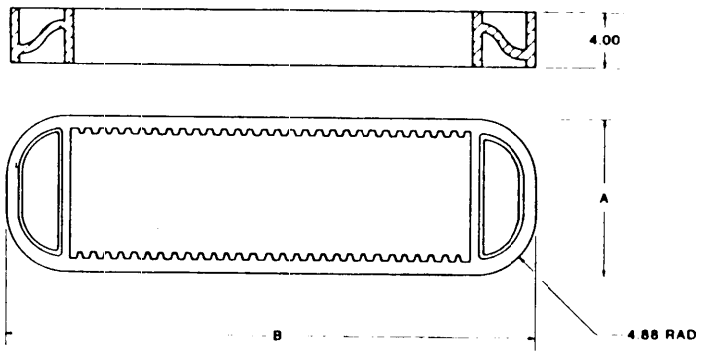
NOTE:
1. THIS FIGURE SUPERSEDES SHEET 3B64 OF DRAWING 803-5001027

TWFS 10

BHD PL / LBS / TWFS10	7.65ø	15.3ø	25.5ø
	10.2ø	17.85ø	30.6ø
	12.75ø	20.4ø	
DIM "A"	9.10	±.098	
DIM "B"	14.50	±.105	

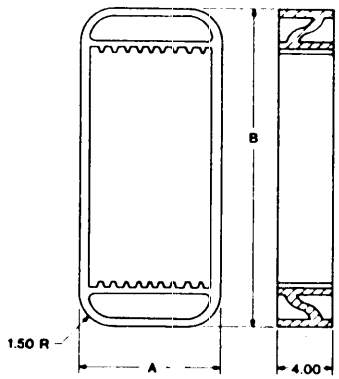
TWFS 20

BHD PL / LBS / TWFS20	7.65ø	15.3ø	25.5ø
	10.2ø	17.85ø	
	12.75ø	20.4ø	
DIM "A"	11.00	±.112	
DIM "B"	23.72	±.126	



TWFS 30

BHD PL / LBS / TWFS30	7.65ø	15.3ø
	10.2ø	17.85ø
	12.75ø	20.4ø
DIM "A"	11.50	±.117
DIM "B"	31.82	±.137



TWFS6

TWFS6		
"A"	5.86	.087
"B"	13.00	.015

SH 132317165

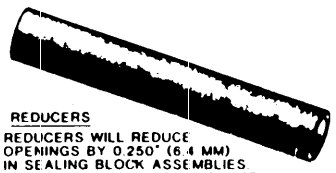
FIGURE 3B64. Multi-cable penetrator (type TW) frame details.

TABLE 1

OPENING SIZE RANGE in. / mm	0.250-0.500 6.4-12.7		0.500-0.750 12.7-19.1		0.750-1.000 19.1-25.4	1.000-1.250 25.4-31.8	1.250-1.500 31.8-38.1	1.500-1.750 38.1-44.5	1.750-2.000 44.5-50.8	2.000-2.250 50.8-57.2	2.250-2.500 57.2-63.5	2.500-2.750 63.5-69.9	2.750-3.000 69.9-76.2	3.000-3.250 76.2-82.6	3.250-3.500 82.6-88.9	BLANK 00 OPENINGS	
NO. OPENINGS IN BLOCK	11	11 ADDED	6	11 ADDED	6	5	4	3	3	3	2	2	2	2	2	DOME	DOME
SEALING BLOCK ASSEMBLY NUMBER	TWBS2111	TWBS1111	TWBS2062	TWBS2112	TWBS2063	TWBS3054	TWBS3045	TWBS30365	TWBS4038	TWBS40366	TWBS56027	TWBS56277	TWBS56028	TWBS56288	TWBS56029	TWBS1	TWBS3
FRAME SPACES REQUIRED	2	1	2	2	2	3	3	3	4	4	5	6	5	6	6	1	3
PLUG CAT. #	TWP1				TWP3		TWP5		TWP6		TWP7			TWP8			
REDUCER CAT. #			TWR2		TWR3	TWR4	TWR5	TWR55	TWR6	TWR66	TWR7	TWR77	TWR8	TWR88	TWR9		

PLUGS

PLUGS WILL CLOSE ANY UNUSED OPENINGS IN SEALING BLOCK ASSEMBLIES. SEE TABLE ABOVE FOR PLUG NUMBERS WHICH MATCH SPECIFIC SEALING BLOCK ASSEMBLIES.



REDUCERS

REDUCERS WILL REDUCE OPENINGS BY 0.250" (6.4 MM) IN SEALING BLOCK ASSEMBLIES. SEE TABLE ABOVE FOR REDUCER NUMBERS WHICH MATCH SPECIFIC SEALING BLOCK ASSEMBLIES.

EXAMPLE FOR SPECIFYING INFORMATION

CABLES SPECIFIED: 6 POWER CABLES - SIZES RANGING FROM 1.875" TO 2.180" O.D.
31 CONTROL CABLES - SIZES RANGING FROM .490" TO .945" O.D.
SPARE CAPACITY REQUIRED: 25%

STEP 1. GROUP CABLES BY O.D. AND RANK FROM LARGEST TO SMALLEST.

CABLE QTY	CABLE O.D.
2	2.180
2	2.140
2	1.875
1	.945
4	.890
5	.700
7	.637
6	.550
8	.490
TOTAL 37	

STEP 2. GROUP CABLES THAT FALL WITHIN THE SAME SEALING ASSEMBLY O.D. RANGE

CABLE QTY	SEALING BLOCK O.D. RANGE
4	2.000-2.250
2 (WITH 5 REDUCERS)	2.000-2.250
	.750-1.000
18	.500-.750
8 (WITH 37 REDUCERS)	.500-.750
TOTAL	

STEP 3. STARTING WITH THE LARGEST CABLE O.D. SELECT THE QUANTITY OF SEALING BLOCK ASSEMBLIES REQUIRED. SPECIFY TWR REDUCERS TO ACCOMODATE SMALLER DIAMETER CABLES WHERE POSSIBLE AND TWP PLUGS TO FILL OPENINGS NOT USED. (SEE EXAMPLE DIAGRAM.)

SEALING BLOCK ASSY CAT. #	O.D. RANGE	NUMBER OF OPENINGS	CABLES TO BE SEALED	OPENINGS NOT USED	FRAME SPACES REQ'D
TWBS40366	2.000-2.250	3	3		4
TWBS40366	2.000-2.250	3	3		4
TWBS2063	.750-1.000	6	5	1	2
TWBS2062	.500-.750	6	6		2
TWBS2112	.500-.750	11	11		2
TWBS2112	.500-.750	11	9	2	2
	TOTALS	40	37	3	16

NOTE: IN THIS EXAMPLE, TWO TWBS2112 SEALING BLOCK ASSEMBLIES ARE SANDWICHED BETWEEN TWO HALVES OF A TWBS2062. THIS DRAMATICALLY INCREASES CABLE DENSITY IN MINIMUM FRAME SPACE. ONE TWP3 PLUG IS REQUIRED FOR UNUSED OPENING IN TWBS2063 AND TWO TWP1 PLUGS ARE REQUIRED FOR UNUSED OPENINGS IN THE TWBS2112. TEN TWR2 AND TWO TWR66 REDUCERS ARE REQUIRED FOR SEALING CABLES OF SMALLER DIAMETER AND FOR USE IN CONJUNCTION WITH TWP1 IN .750 HOLES.

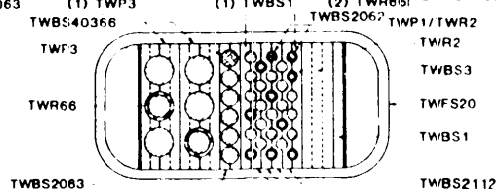
STEP 4. TOTAL THE FRAME SPACES REQUIRED FOR SEALING BLOCK ASSEMBLIES AND SELECT APPROPRIATE SIZE MOUNTING FRAME(S). FACTOR IN SPARE CAPACITY REQUIRED FOR FUTURE EXPANSION.

TOTAL FRAME SPACES REQUIRED	16
SPECIFICATION REQUIRES 25% SPARE CAPACITY	4
TOTAL	20 SPACES

SELECTION: ONE TWFS20 MOUNTING FRAME WITH TOTAL CAPACITY OF 20 SPACES. ONE TWBS3 AND ONE TWBS1 BLANK SEALING BLOCK ASSEMBLY TO FILL UNUSED FRAME SPACE. (CHOICE OF FRAME COULD VARY BASED ON FUTURE EXPANSION NEEDS AND/OR SPECIFIC CABLE ARRANGEMENT.)

STEP 5. BILL OF MATERIALS FOR SPECIFICATION SHOULD READ:

(1) TWFS20	(1) TWBS2062	(2) TWP1	(10) TWR2	FOR SEALING SMALLER DIA CABLES
(2) TWBS40366	(2) TWBS2112	(1) TWBS3		
(1) TWBS2063	(1) TWP3	(1) TWBS1	(2) TWR66	



NOTES

1. TWBS1111 AND TWBS2112 SEALING BLOCK ASSEMBLIES ARE USED TO INCREASE THE DENSITY OF THE CABLE FILL. USE THESE DOUBLE SIDED ASSEMBLIES WHEN THE QUANTITY OF CABLES EXCEEDS THE NUMBER OF OPENINGS IN THE TWBS 2111 OR TWBS2062 STANDARD SEALING BLOCK ASSEMBLIES.
2. ONE OR MORE OF THE DOUBLE-SIDED ASSEMBLIES CAN BE SANDWICHED BETWEEN HALVES OF THE STANDARD ASSEMBLIES. MAKE SURE THE TWBS1111 IS MATCHED WITH TWBS21111, AND TWBS2112 WITH TWBS2062.
3. THIS FIGURE SUPERSEDES SHEET 3063 OF DRAWING 803-5001027.

SH 132317164

FIGURE 3B63. Multi-cable penetrators ordering/selection criteria (type TW).

GENERAL

1. TW MULTI-CABLE PENETRATORS ARE DEVICES UTILIZING STANDARD UNITS AND DIMENSIONS WHICH ARE COMPATIBLE WITH VARIOUS NUMBERS AND SIZES OF CABLES, THAT MAY BE USED WHENEVER THERE IS A NEED TO SEAL CABLES PENETRATING WATERTIGHT, AIRTIGHT AND FIRE PROOF BULKHEADS AND DECKS
2. FEW PARTS REQUIRED TO SEAL A WIDE RANGE OF CABLE DIAMETERS.
3. HIGH DEGREE OF FLEXIBILITY WITH INTERCHANGEABLE SEALING BLOCK ASSEMBLIES AND A SELECTION OF DIFFERENT SIZE OF FRAMES
4. FRAME
   (A) ONE PIECE CAST STEEL MOUNTING FRAME TO BE WELDED DIRECTLY INTO BULKHEAD OR DECK
   (B) CAST KEYWAYS IN MOUNTING FRAME ALIGN AND POSITION SEALING BLOCK ASSEMBLIES.
   (C) FRAMES MAY BE INSTALLED SO THAT SEALING BLOCK ASSEMBLIES CAN BE USED INSERTED IN EITHER HORIZONTAL OR VERTICAL POSITION.
5. SEALING BLOCK ASSEMBLY
   (A) SPECIALLY FORMULATED ELASTOMERIC MATERIAL BETWEEN CAST MALLEABLE PRESSURE PLATES PROTECTS CABLE FROM MECHANICAL DAMAGE, PROVIDES HIGH PULLOUT RESISTANCE, PROVIDES POSITIVE CABLE SEPARATION, AND EXPANDS DURING FIRE TO SEAL ANY VOIDS LEFT BY BURNED CABLE INSULATION
   (B) INTERCHANGEABLE SEALING BLOCK ASSEMBLIES FIT ALL TW MULTI-CABLE PENETRATOR MOUNTING FRAMES.
   (C) CAST STOPS ON FRONT PRESSURE PLATE PREVENTS SEALING BLOCK ASSEMBLIES FROM SLIPPING THROUGH FRAME DURING INSTALLATION.
   (D) SEALING BLOCK ASSEMBLIES ARE OFFERED FOR ALL CABLE OUTSIDE DIAMETERS FROM 0.250 INCHES TO 3.500 INCHES (6.4 MM TO 88.9 MM)
   (E) DEPENDING ON OPENING SIZE RANGE, A STANDARD SEALING BLOCK ASSEMBLY WILL SEAL FROM TWO TO ELEVEN CABLES. IT IS POSSIBLE TO INCREASE CABLE DENSITY WITH DOUBLE-SIDED SEALING BLOCK ASSEMBLIES. (SEE TABLE 1, FIGURE 3B63) SANDWICHED BETWEEN HALVES OF A STANDARD ASSEMBLY
   (F) REDUCERS PERMIT SEALING BLOCK ASSEMBLIES TO ACCEPT CABLES WITH A SMALLER O.D. THAN THE SPECIFIED RANGE.
   (G) PLUGS ARE TO FILL UNUSED OPENINGS IN SEALING BLOCK ASSEMBLIES
6. BLANK SEALING BLOCK ASSEMBLIES ARE USED TO FILL UNUSED SPACES IN FRAMES, PROVIDING FOR FUTURE EXPANSION
7. TEMPLATE ALL WORK FROM SHIP
8. ALL WELDING AND INSPECTION TO BE IN ACCORDANCE WITH MIL-STD-278.
9. ALL PAINTING TO BE IN ACCORDANCE WITH MIL-E-917
10. THE STRUCTURAL REINFORCEMENT SHOWN ON THIS DRAWING DOES NOT APPLY TO FLIGHT DECK BENTS, FLIGHT DECK SUPPORT STRUCTURES OR OTHER SIMILAR TYPE STRUCTURE ON OTHER SHIPS. SUCH CASES MUST BE INDIVIDUALLY RESOLVED WITH STRUCTURAL DESIGN.
11. MATERIAL OR FLAT BAR REINFORCEMENT IS TO BE SIMILAR TO MATERIAL OF BULKHEAD OR DECK.
12. THIS PLAN WAS DEVELOPED FROM DESIGN DATA SHEET DDS1100-1, REINFORCEMENT OF OPENINGS IN STRUCTURE OF SURFACE SHIPS OTHER THAN IN PROTECTIVE PLATING, TO PERMIT INSTALLATION OF MULTI-CABLE PENETRATOR FRAME (CROUSE-HINDS PRODUCT) IN WATERTIGHT BULKHEADS AND DECKS ON SURFACE SHIPS
13. FILLET WELD REINFORCEMENT FOR T-2 WELD JOINT SHALL BE 1/8 INCH FOR PLATING UP TO 15.3Φ AND 1/4 INCH FOR PLATING ABOVE 17.85Φ.

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SELECTION OF PARTS

1. THE SELECTION OF COMPONENTS IS BASED ON THE QUANTITY AND SIZE OF CABLES GOING THROUGH THE PENETRATION. ONCE THEY ARE KNOWN, THE SEALING BLOCK ASSEMBLIES AND FRAMES CAN BE SELECTED.
2. GROUP CABLES BY OUTSIDE DIAMETER (O.D.) AND RANK FROM LARGEST TO SMALLEST. KEEPING IN MIND THAT SEALING BLOCK ASSEMBLIES ARE AVAILABLE IN ONE-QUARTER INCH INCREMENTS, GROUP CABLES THAT FALL WITHIN THE SAME SEALING BLOCK ASSEMBLY O.D. SIZE RANGE. STARTING WITH THE LARGEST CABLE O.D. SELECT THE SEALING BLOCK ASSEMBLIES REQUIRED. SPECIFY REDUCERS TO ACCOMODATE SMALLER DIAMETER CABLES AND PLUGS TO FILL OPENINGS NOT USED. ALL OPENINGS MUST BE FILLED.
3. TOTAL THE FRAME SPACES REQUIRED FOR THE SPECIFIED SEALING BLOCK ASSEMBLIES AND SELECT AN APPROPRIATE FRAME(S). KEEP "SPARE" REQUIREMENTS IN MIND WHEN SPECIFYING FRAME. SPECIFY BLANK SEALING BLOCK ASSEMBLIES TO FILL UNUSED FRAME SPACE.

INSTALLATION OF SEALING BLOCK ASSEMBLIES

1. CLEAN ALL INSIDE SURFACES OF FRAME AND EDGES OF FRAME OPENING, REMOVING ALL FOREIGN MATERIALS.
2. LUBRICATE ALL INSIDE SURFACES OF FRAMES, WITH A SILICONE BASED LUBRICANT.
3. MOVE CABLES FROM IMMEDIATE AREA OF FRAME WHERE FIRST SEALING BLOCK ASSEMBLY WILL BE INSTALLED. GROUP CABLES ACCORDING TO THEIR DIAMETER AND WITH RESPECT TO SIZES OF OPENINGS IN THE SEALING BLOCK ASSEMBLIES TO BE INSTALLED. THE DIAMETER OF OPENINGS OF SEALING BLOCK ASSEMBLIES ARE IN ONE-QUARTER INCH INCREMENTS (6.4 MM) AND EACH IS MARKED WITH THEIR SIZE RANGE. CABLES TO BE SEALED IN A GIVEN SEALING BLOCK ASSEMBLY NEED NOT ALL BE OF THE SAME SIZE. REDUCERS MAY BE USED WITH CABLES HAVING AN O.D. UP TO ONE-QUARTER INCH (6.4 MM) SMALLER THAN THE RANGE OF THE OPENING IN THE SEALING BLOCK ASSEMBLY.
4. SLIDE THE FIRST SECTION OF SEALING BLOCK ASSEMBLY INTO FRAME KEYWAYS, BEGINNING AT ONE END OR BOTTOM OF FRAME. BE CERTAIN THAT FLAT SIDE OF THIS ASSEMBLY IS AGAINST INSIDE SURFACE OF FRAME.
5. ARRANGE CABLES IN SLOTS OF SEALING BLOCK ASSEMBLY SECTION. WHILE HOLDING THESE CABLES IN PLACE, SLIDE THE MATING SECTION OF SEALING BLOCK INTO FRAME. CAUTION: WHEN INDIVIDUAL CONDUCTORS OF A POWER CIRCUIT ARE CARRIED THROUGH A FRAME, ALL CONDUCTORS OF THAT CIRCUIT SHOULD BE INSTALLED IN THE SAME SEALING BLOCK ASSEMBLY TO AVOID HEATING OF THE PRESSURE PLATE DUE TO ELECTRO-MAGNETIC INDUCTION. REPEAT OPERATIONS OF STEPS 4 AND 5 WITH APPROPRIATE SEALING BLOCK ASSEMBLIES UNTIL ALL SEALING BLOCK ASSEMBLIES ARE IN PLACE
6. INSTALL REDUCERS WHERE NEEDED. FILL UNUSED FRAME SPACES WITH BLANK SEALING BLOCK ASSEMBLIES. FILL UNUSED OPENINGS IN THE SEALING BLOCK ASSEMBLIES WITH CORRECT SIZE PLUGS. FOR HOLES ONE SIZE LARGER THAN PLUG USE PLUG AND REDUCER IN COMBINATION. BE SURE THAT PLUGS AND REDUCERS ARE FULLY INSERTED INTO OPENINGS OF SEALING BLOCK ASSEMBLIES.
7. ASSEMBLE KEEPER BAR OVER CAST STOPS OF FRONT PRESSURE PLATES.
8. TIGHTEN ALL NUTS ONLY A FEW TURNS AT A TIME UNTIL SEALING MATERIAL "ROLLS" INTO SPACES BETWEEN PRESSURE PLATES OF SEALING BLOCK ASSEMBLIES AND BETWEEN PRESSURE PLATES AND FRAME. THIS STEP TO BE PERFORMED WHEN AMBIENT TEMPERATURE IS AT LEAST 40 F (4.5 C).
   UNIFORM TIGHTENING OF COMPRESSION HARDWARE IS IMPORTANT. IT CAN BE PROPERLY DONE BY NOTING HOW FAR THREADED STUDS EXTEND THROUGH NUTS. IN GENERAL, WHEN ASSEMBLIES ARE ALL INSTALLED, EXTENSION OF THREADED STUDS WILL BE NEARLY THE SAME FOR THOSE ASSEMBLIES OCCUPYING THE SAME NUMBER OF FRAME SPACES.
   CAUTION: TORQUE VALUES ON NUTS SHOULD NOT EXCEED 12 FT LBS ON 5/16 BOLTS NOR 45 FT LBS ON 7/16 BOLTS. THESE TORQUE LEVELS ARE NOT ORDINARILY REQUIRED TO EFFECT A SEAL. HOWEVER, IF NUTS ARE TORQUED TO THESE VALUES AND A TIGHTER SEAL IS REQUIRED RETORQUE AFTER 24 HOURS.
9. CHECK TIGHTNESS OF ASSEMBLY BY PLACING A BRIGHT LIGHT SOURCE ON ONE SIDE OF THE ASSEMBLY AND INSPECTING IT FROM THE OPPOSITE SIDE TO SEE IF ANY LIGHT IS VISIBLE THROUGH THE ASSEMBLY. ANY VISIBLE LIGHT INDICATES THAT PROPER SEAL HAS NOT BEEN FORMED. TIGHTEN COMPRESSION HARDWARE FURTHER.

NOTE
1. THIS FIGURE SUPERSEDES SHEET 3B62 OF DRAWING 803-5001027.

FIGURE 3B62. Multi-cable penetrators installation notes (type TW).

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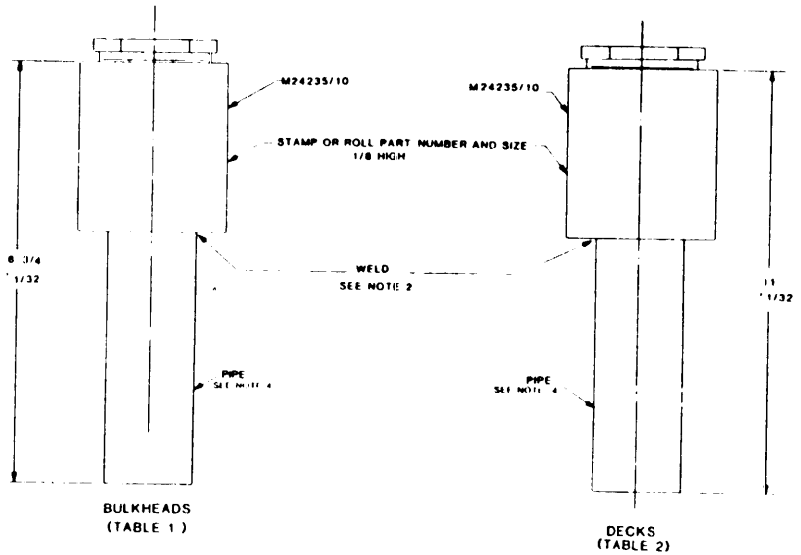

NOTES:

1. THIS METHOD IS EQUAL TO AND IS AN ACCEPTABLE REPLACEMENT FOR M24235/17 AND 18
2. WELDING SHALL BE IN ACCORDANCE WITH MIL-STD-278.
3. BREAK ALL SHARP EDGES.
4. PIPE SHALL BE PER ASTM-A106-80 GRADE A
5. THIS FIGURE SUPERSEDES SHEET 3B60 OF DRAWING 803-5001027

TABLE 1-FOR BULKHEADS

PART NO	TUBE SIZE	STUFFING TUBE	IPS PIPE SIZE	PIPE LENGTH 1/32
3B60B1	A	M24235/10-01	1/2 SCH 80-(27/32)	5
3B60B2	B	M24235/10-02	1/2 SCH 80-(27/32)	5
3B60B3	C	M24235/10-03	3/4 SCH 40-(1-1/16)	5
3B60B4	D	M24235/10-04	3/4 SCH 40-(1-1/16)	5
3B60B5	E	M24235/10-05	1 SCH 40-(1-21/64)	5
3B60B6	F	M24235/10-06	1 SCH 40-(1-21/64)	5
3B60B7	G	M24235/10-07	1 SCH 40-(1-21/64)	5
3B60B8	J	M24235/10-08	1-1/4 SCH 40-(1-21/32)	5-15/16
3B60B9	K	M24235/10-09	1-1/4 SCH 40-(1-21/32)	5-15/16
3B60B10	L	M24235/10-10	1-1/4 SCH 40-(1-21/32)	3-5/8
3B60B11	M	M24235/10-11	1-1/2 SCH 40-(1-29/32)	3-5/8
3B60B12	N	M24235/10-12	1-1/2 SCH 40-(1-29/32)	3-5/8
3B60B13	P	M24235/10-13	2 SCH 40-(1-5/16)	3-5/8
3B60B14	R	M24235/10-14	2 SCH 40-(1-5/16)	3-5/8
3B60B15	S	M24235/10-15	2 SCH 40-(1-5/16)	3-5/8
3B60B16	T	M24235/10-16	2-1/2 SCH 40-(2-7/8)	1-5/8
3B60B17	V	M24235/10-17	2-1/2 SCH 40-(2-7/8)	1-5/8
3B60B18	W	M24235/10-18	2-1/2 SCH 40-(2-7/8)	1-5/8
3B60B19	X	M24235/10-19	3 SCH 40-(3-1/2)	1-5/8
3B60B20	Y	M24235/10-20	3 SCH 40-(3-1/2)	1-5/8
3B60B21	Z	M24235/10-21	3 SCH 40-(3-1/2)	1-5/8
3B60B22	AA	M24235/10-22	-	-
3B60B23	BB	M24235/10-23	-	-

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TABLE 2-FOR DECKS

PART NO	TUBE SIZE	STUFFING TUBE	IPS PIPE SIZE	PIPE LENGTH 1/32
3B60D31	A	M24235/10-01	1/2 SCH80-(27/32)	9-1/4
3B60D32	B	M24235/10-02	1/2 SCH80-(27/32)	9-1/4
3B60D33	C	M24235/10-03	3/4 SCH40-(1-1/16)	9-1/4
3B60D34	D	M24235/10-04	3/4 SCH40-(1-1/16)	9-1/4
3B60D35	E	M24235/10-05	1 SCH40-(1-21/64)	9-1/4
3B60D36	F	M24235/10-06	1 SCH40-(1-21/64)	9-1/4
3B60D37	G	M24235/10-07	1 SCH40-(1-21/64)	9-1/4
3B60D38	J	M24235/10-08	1-1/4 SCH 40-(1-21/32)	9-3/16
3B60D39	K	M24235/10-09	1-1/4 SCH 40-(1-21/32)	9-3/16
3B60D40	L	M24235/10-10	1-1/4 SCH 40-(1-21/32)	7-7/8
3B60D41	M	M24235/10-11	1-1/2 SCH 40-(1-29/32)	7-7/8
3B60D42	N	M24235/10-12	1-1/2 SCH 40-(1-29/32)	7-7/8
3B60D43	P	M24235/10-13	2 SCH 40-(1-5/16)	7-7/8
3B60D44	R	M24235/10-14	2 SCH 40-(1-5/16)	7-7/8
3B60D45	S	M24235/10-15	2 SCH 40-(1-5/16)	5-7/8
3B60D46	T	M24235/10-16	2-1/2 SCH 40-(2-7/8)	5-7/8
3B60D47	V	M24235/10-17	2-1/2 SCH 40-2-7/8)	5-7/8
3B60D48	W	M24235/10-18	2-1/2 SCH 40-(2-7/8)	5-7/8
3B60D49	X	M24235/10-19	3 SCH 40-3-1/2)	5-7/8
3B60D50	Y	M24235/10-20	3 SCH 40-(3-1/2)	5-7/8
3B60D51	Z	M24235/10-21	3 SCH 40-(3-1/2)	5-7/8
3B60D52	AA	M24235/10-22	3 SCH 40-(3-1/2)	4-1/8
3B60D53	BB	M24235/10-23	3-1/2 SCH 40-(4)	4-1/8

3B60. Stuffing tubes reduced diameter for decks and bulkheads with pipe protection.

NOTE:
1. THIS FIGURE SUPERSEDES SHEET 3B59 OF DRAWING 803-5001027.

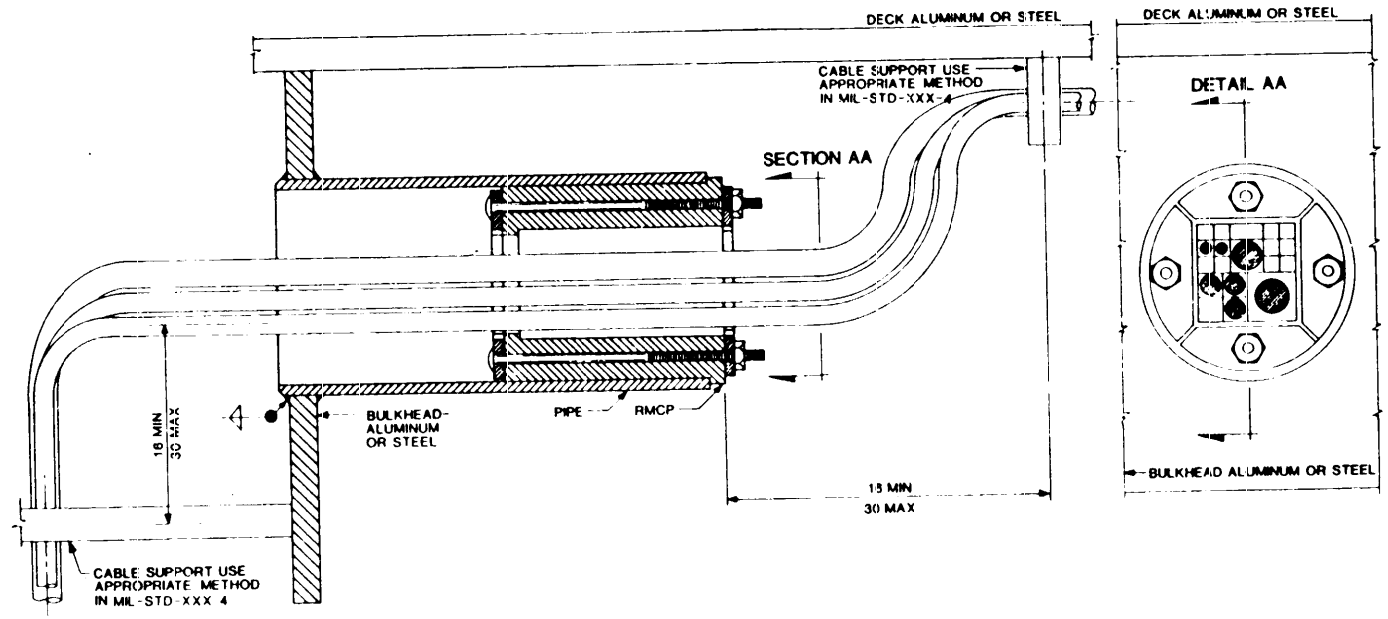

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FIGURE 3B59. Round multiple cable penetrator installation in steel or aluminum bulkhead.

NOTE:
1 THIS FIGURE SUPERSEDES SHEET 3B58 OF DRAWING 803-5001027

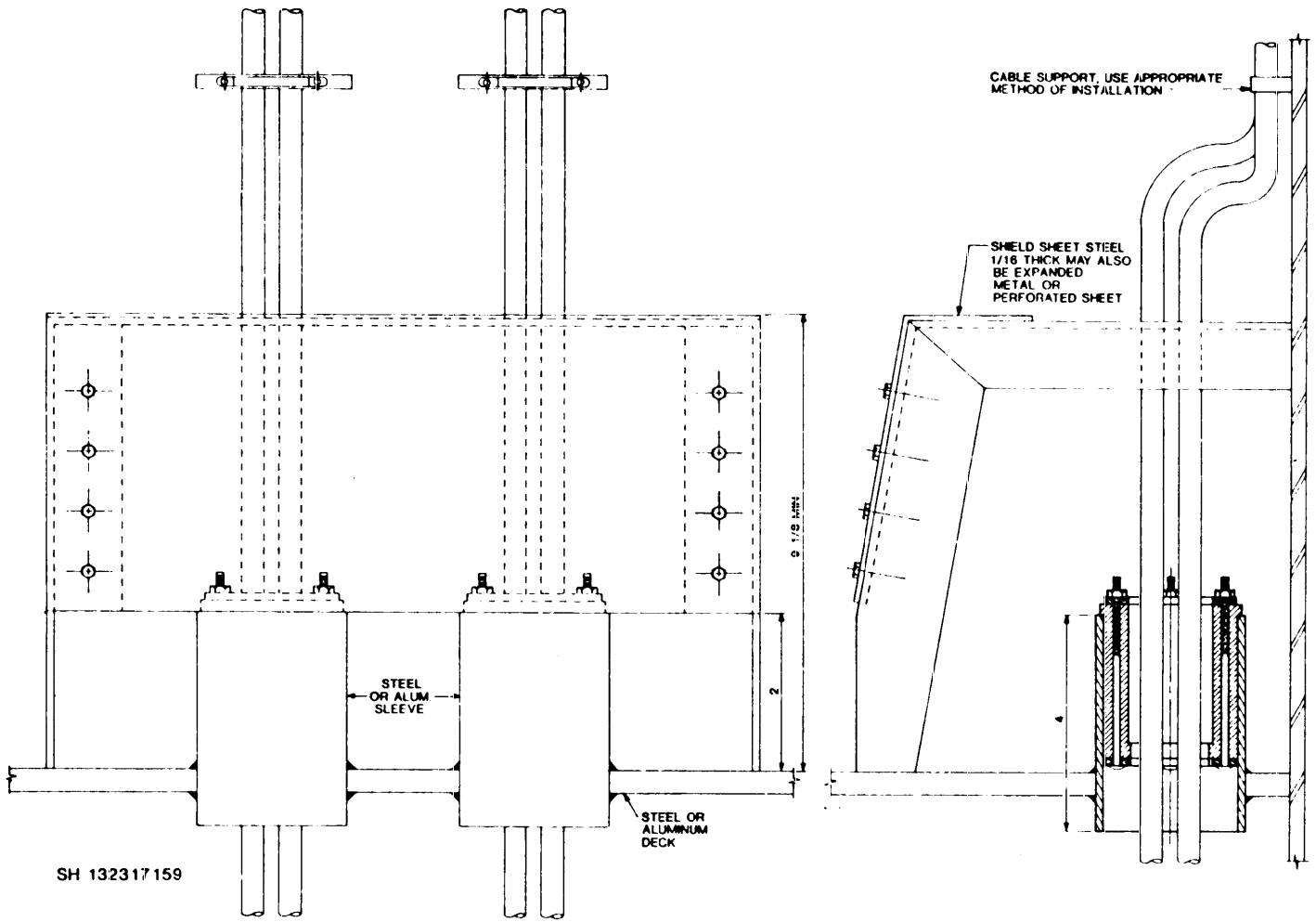

FIGURE 3B58. Round multiple cable penetrator shield.

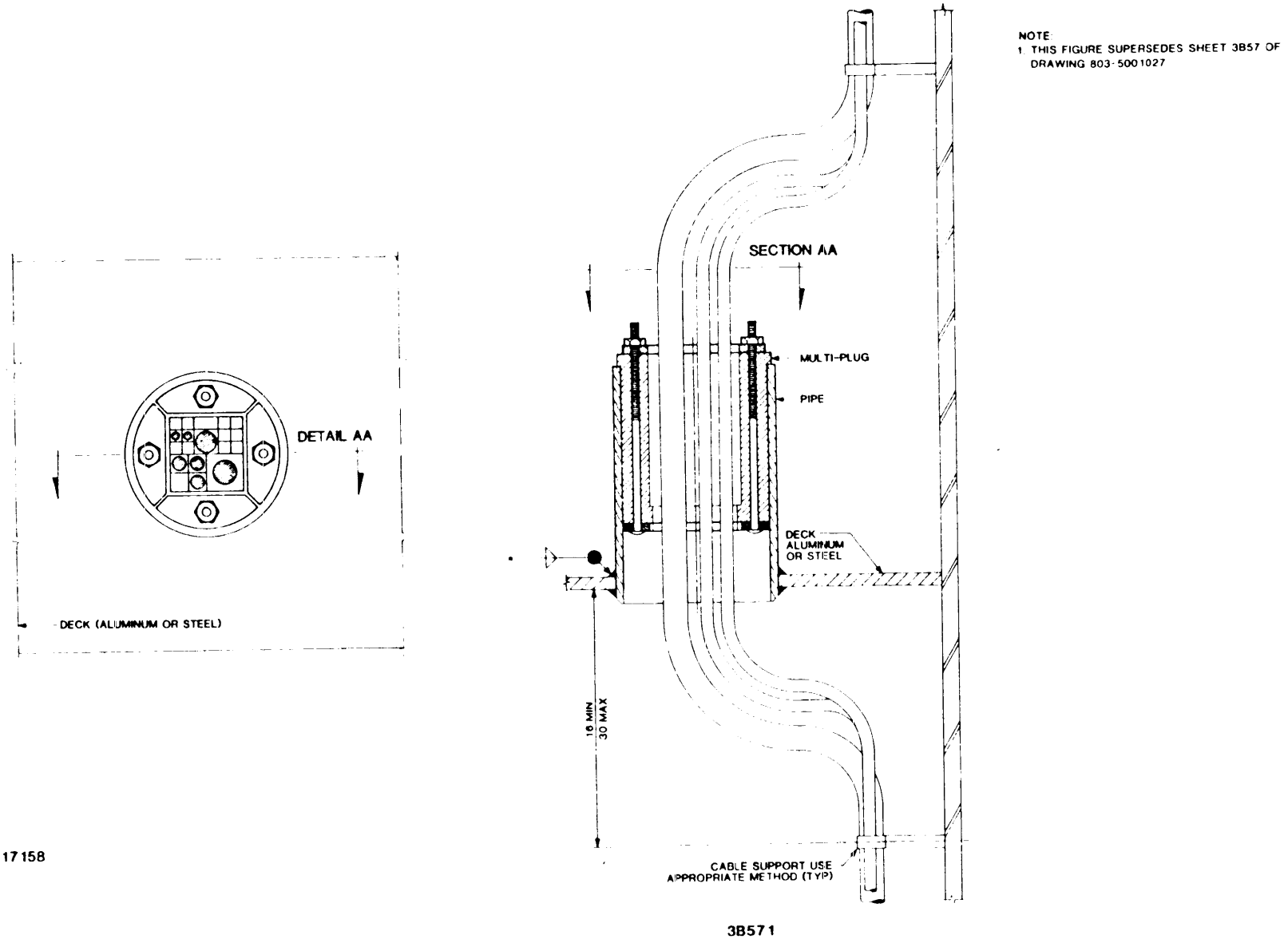

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FIGURE 3B57. Multiple cable penetrators installation in steel or aluminum decks adjacent to bulkheads.

NOMENCLATURE

ROUND MULTIPLE CABLE PENETRATORS (RMCP)
A SYSTEM OF PASSING CABLES THROUGH WATER AND NON-WATER TIGHT BULKHEADS AND DECKS DESIGNED TO SUIT PARTICULAR BULKHEAD AND DECK WEIGHTS.

(A) PHYSICAL ARRANGEMENT AND IDENTIFICATION
RMCP2-30
- T — SQUARE OPENING IN MILLIMETERS FOR CABLE ACCEPTANCE
- RMCP AND PIPE SIZE DESIGNATION
- ROUND MULTI-CABLE PENETRATOR BODY

(B) RMCP CONSISTS OF (7) SEVEN BASIC SIZES 2, 2.5, 3, 4, 5, 6 AND 8 FOR INSERTION INTO STEEL PIPE (TABLE 1) OR ALUMINUM PIPE (DETAIL 2).

(C) COMPRESSION HARDWARE FOR SEALING IS COMPRISED OF THE FOLLOWING:
(1) BACK COMPRESSION PLATE (DETAIL 1) WITH PRESS FITTED COMPRESSION BOLT (TABLE 3) TO MAKE FURNISHED ASSEMBLY (TABLE 2).
(2) FRONT COMPRESSION PLATE SIMILIAR TO BACK COMPRESSION PLATE ONLY IT IS FURNISHED WITHOUT COMPRESSION BOLT.
(3) HEX NUT (TABLE 4) TO BE USED WITH FRONT COMPRESSION PLATE AND STUD.

(D) INSERT BLOCKS
TWIN HALF BLOCKS ARE SPECIALLY FORMULATED OF A NEOPRENE ELASTOMER WITH A CENTERED SEMI-CIRCULAR GROOVE. WHEN MATCHED AROUND A CABLE, THESE BLOCKS FORM A SINGLE BLOCK WITH A TIGHT FIT. SEE NOTE 2.

(E) SPARES
SOLID BLOCKS ARE SPECIALLY FORMULATED OF A NEOPRENE ELASTOMER AND ARE USED AS FILLERS OR SPARE PROVISIONS FOR ADDITION OF FUTURE CABLES. SIZES SHOWN ON SHEET 3B26.

(F) FILL-INS
SAME MATERIAL AS INSERT BLOCKS AND SPARES AND ARE USED TO FILL THICKNESSES OF 5 OR 10 MILLIMETERS CREATED BY THE PRESENCE OF DIFFERENT SIZE BLOCKS IN THE SAME ROW. ALSO EMPLOYED TO INCREASE THE PRESSURE IN THE PENETRATOR UNIT WHEN EXCEPTIONALLY SOFT CABLES ARE USED. THESE FILL-INS ARE AVAILABLE IN TWO SIZES 24X5/0 OR 12X10/0. SEE SHEET 3B26. SERRATIONS HAVE BEEN PROVIDED TO PERMIT SLICING OF THE FILL-INS TO THE REQUIRED LENGTH. EXAMPLE: 6X10/0, 8X5/0 ETC.

(G) TALLOW
INSERT BLOCK LUBRICANT USED WHEN PACKING PENETRATOR UNIT ALLOWS THE BLOCKS SLIDE EASILY OVER EACH OTHER WHEN PACKING AND COMPRESSING THEM AROUND CABLES.

(H) SEALER
LIQUID SILICONE RUBBER APPLIED TO CABLE SIDE OF EACH GAUGE BLOCK. UPON COMPRESSION THIS PROVIDES A SEAL BETWEEN THE ARMOR OF THE CABLE AND ITS IMPERVIOUS INNER SHEATH.

(I) ASSEMBLY STEPS
(1) PLACE RMCP INTO APPROPRIATE PIPE SLEEVE AND LEAVE SLIGHTLY EXTENDED.
(2) PASS CABLE THROUGH RMCP.
(3) PLACE MODULES AROUND CABLE AND INSIDE RMCP.
(4) PRESS COMPLETE ASSEMBLY INTO PIPE UNTIL FLANGE IS FLUSH WITH END OF PIPE.
(5) THEN TIGHTEN HARDWARE FOR COMPRESSION AND EXPANSION OF MULTI-PLUG TO ACHIEVE AIR AND WATER SEAL.

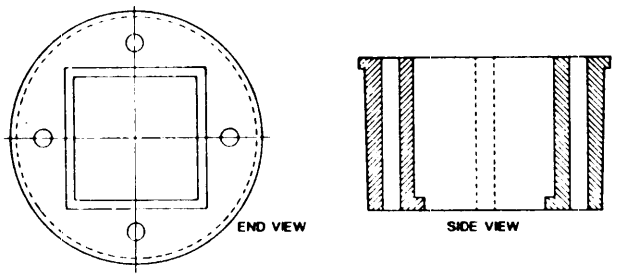
(J) ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWHISE STATED.

TABLE 1

ROUND CARBON STEEL TUBE							
IDENT NO	OD	WALL	THEORETICAL I.D.	TYPE	WT PER FT	LENGTH FOR BHD	LENGTH FOR DECK
RMCP2	2-3/8	.154	2.067	SCH 40 PIPE	3.653	4	12
RMCP2.5	2-7/8	.203	2.469	SCH 40 PIPE	5.793	4	12
RMCP3	3-1/2	.216	3.068	SCH 40 PIPE	7.576	4	12
RMCP4	4-1/2	.237	4.026	SCH 40 PIPE	10.790	4	12
RMCP5	5-9/16	.258	5.047	SCH 40 PIPE	14.620	4	12
RMCP6	6-5/8	.280	6.065	SCH 40 PIPE	18.970	4	12
RMCP8	8-5/8	.322	7.981	SCH 40 PIPE	28.550	4	12

TABLE 2

ROUND ALUMINUM (ALLOY 6061-T6)							
IDENT NO	OD	WALL	THEORETICAL I.D.	TYPE	WT PER FT	LENGTH FOR BHD	LENGTH FOR DECK
RMCP2	2-3/8	.154	2.067	SCH 40 PIPE	1.264	4	12
RMCP2.5	2-7/8	.203	2.469	SCH 40 PIPE	2.004	4	12
RMCP3	3-1/2	.216	3.068	SCH 40 PIPE	2.621	4	12
RMCP4	4-1/2	.237	4.026	SCH 40 PIPE	3.733	4	12
RMCP5	5-9/16	.258	5.047	SCH 40 PIPE	5.057	4	12
RMCP6	6-5/8	.280	6.065	SCH 40 PIPE	6.564	4	12
RMCP8	8-5/8	.322	7.981	SCH 40 PIPE	9.878	4	12

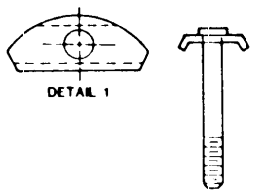


ROUND MULTI-CABLE PENETRATOR

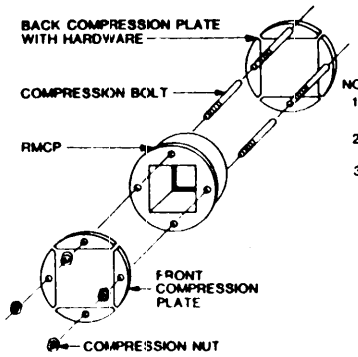
COMPRESSION BOLT

TABLE 3

1. #8-32 FLAT HEAD STRUX CLINCH BOLT (APPLICABLE ON SIZE 2, 2.5 AND 3 RMCP)
2. M-6 RD. HEAD STRUX CLINCH BOLT (APPLICABLE ON SIZE 4 AND 5 RMCP)
3. M-8 RD. HEAD STRUX CLINCH BOLT (APPLICABLE ON SIZES 6 AND 8 RMCP)



BACK COMPRESSION BOLT



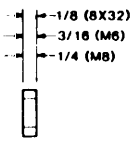
ROUND MULTI-CABLE PENETRATOR ASSEMBLY

NOTES:
1. BOLTS AND BACK COMPRESSION PLATES ARE FACTORY ASSEMBLED INTO ONE UNIT.
2. INSERT BLOCK CABLE ASSIGNMENTS ARE SHOWN ON SHEETS 3826,3841 AND 3842.
3. THIS FIGURE SUPERSEDES SHEET 3B56 OF DRAWING 803-5001027.

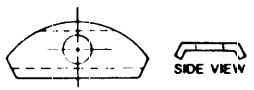
TABLE 4

HEX NUT
UTILIZED FOR UNIT COMPRESSING

5/16	8X32 HEX NUT APPLICABLE WITH RMCP2, 2.5 AND 3
3/8	M6 HEX NUT APPLICABLE WITH RMCP4 AND RMCP5
1/2	M8 HEX NUT APPLICABLE WITH RMCP6 AND RMCP8



COMPRESSION NUT



FRONT COMPRESSION PLATE

FIGURE 3B56. ROUND MULTI-CABLE PENETRATORS.

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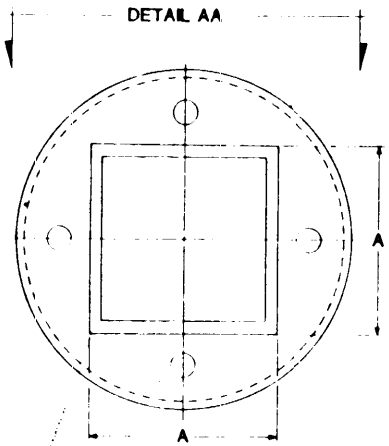
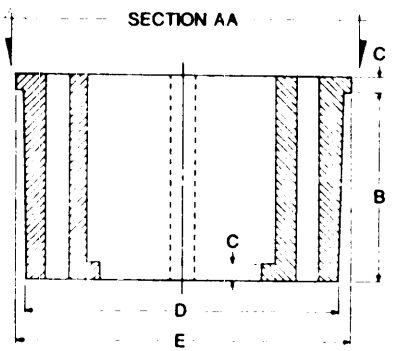




NOTE
1 THIS FIGURE SUPERSEDES SHEET 3B55 OF DRAWING 803-5001027

	A		B	C	D	E
	IN	MM				
RMCP2	1.181	30	2.559	.197	2.000	2.232
RMCP25	1.220	30	2.559	.197	2.302	2.634
RMCP3	1.614	40	2.559	.197	3.000	3.340
RMCP4	2.362	60	2.559	.197	4.000	4.282
RMCP5	3.188	80	2.559	.197	5.000	5.339
RMCP6	3.543	90	2.559	.197	6.000	6.375
RMCP8	4.763	120	2.559	.197	8.000	8.312

FOR FACTORY CUT CORNER FOR RETROFIT APPLICATIONS ADD "0" TO THE NOMENCLATURE IE "RMCP0"

MATERIAL: SPECIAL NEOPRENE ELASTOMER

FIGURE 3B55. ROUND MULTIPLE CABLE PENETRATORS (DIMENSIONS).

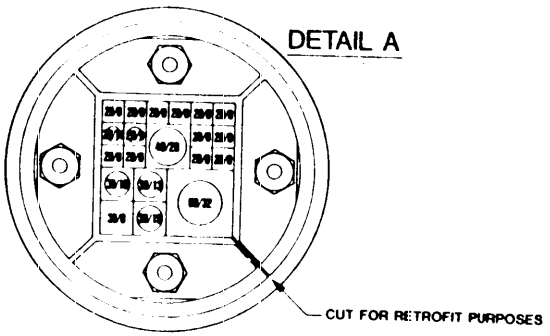
INSTALLATION NOTES ROUND MULTIPLE CABLE PENETRATORS

1. ROUND MULTI-CABLE PENETRATOR (RMCP) IS A MODULAR SYSTEM THAT UTILIZES STANDARD UNITS AND DIMENSIONS TO ALLOW MAXIMUM FLEXIBILITY AND COMPATIBILITY WITH VARIOUS NUMBERS AND SIZES OF CABLES. FINAL SEALED UNITS ARE DESIGNED TO PROVIDE WATERTIGHT, AIRTIGHT, AND FIREPROOF BULKHEAD OR DECK PENETRATIONS.

2. FREELY LUBRICATE OUTSIDE THE RMCP WITH (TALLOW) BEFORE INSERTING INTO PIPE SLEEVE, BUT DO NOT PUSH RMCP COMPLETLY INTO THE SLEEVE AT THIS TIME.

   PULL ALL CABLES THRU THE RMCP, BEARING IN MIND, CABLES SHALL ALWAYS APPROACH IN A HORIZONTAL PLANE TO THE PENETRATOR. THIS CAN BE ACCOMPLISHED IF THE NEAREST CABLE HANGER IS 16 MIN. FROM BULKHEAD. CABLES RUNNING UP THE BULKHEAD AND THRU AN RMCP MUST HAVE ITS FULL BENDING RADIUS OUTSIDE OF THE PENETRATOR WHILE IN THE PROCESS OF PULLING CABLES, IT IS IMPERATIVE THAT A REASONABLE AMOUNT OF SLACK SHOULD BE LEFT TO FACILITATE MOVEMENT OF CABLES WITHIN THE RMCP TO EASE PACKING OPERATION. ALSO, IT IS NECESSARY THAT EACH CABLE BE IDENTIFIED ON THE COMPRESSION NUT SIDE OF MULTIPLE CABLE PENETRATOR BY LEAD NUMBER AND CABLE SIZE. ALL CABLES THROUGH A NEW ROUND MULTIPLE CABLE PENETRATOR SHALL BE PULLED PRIOR TO INSTALLING INSERT BLOCKS.

3. AFTER PULLING ALL CABLES THROUGH A PARTICULAR ROUND MULTI-CABLE PENETRATOR, IT CAN BE PACKED. FIRST, APPLY A LIGHT COAT OF CABLE LUBRICANT (TALLOW) TO ALL OUTSIDE SURFACES OF THE INSERT BLOCKS AND INSIDE OF THE RMCP. APPLY GENERAL ELECTRIC'S RTV-106 SEALER ON THE SURFACE OF EACH BLOCK THAT CONTACTS THE CABLE (A 1/8 BEAD EVERY 1/2 AROUND THE CIRCUMFERENCE). EACH RMCP MUST BE LAID OUT (BLOCKED) SHOWING SOLID BLOCKS (USED AS SPARES) AND CABLE ASSIGNMENTS PRIOR TO PACKING. A TYPICAL EXAMPLE OF A PACKED RMCP UNIT WITH LOCATION ASSIGNMENTS FOR PACKING IS SHOWN BELOW.



   (A) SELECT INSERT BLOCKS AND SPARES (SEE NOTE 2) AND PREPARE AS ILLUSTRATED ABOVE. (LUBRICANT AND SEALER WHERE REQUIRED).

   (B) STARTING WITH LARGEST CABLE, PLACE THE LOWER HALF OF THE 60/32 INSERT BLOCK UNDER THE CABLE IN THE UNIT. NEXT, REPEAT THE PROCEDURE WITH THE 30/15. THEN ADD ONE 30/0 SPARE. ADD THE UPPER HALF OF THE 60/32 AND THE 30/15. PLACE LOWER HALF OF THE 30/13 AND 30/19 UNDER CABLE THEN ADD UPPER HALVES.

   CAUTION: FOR EASIEST PACKING DO NOT INSERT THE BLOCKS FULLY INTO THE SQUARE HOLE UNTIL ALL CABLE HOLDING AND SPARE BLOCKS ARE IN THEIR ASSIGNED LOCATIONS.

   (C) ON TOP OF THE PREVIOUSLY INSTALLED BLOCKS, PLACE FOUR 20/0 SPARES AND THE LOWER HALF OF THE 40/28 UNDER ITS CABLE. IN THE NEXT HIGHER ROW PLACE TWO 20/0 SPARES AND THE LOWER HALF OF 20/9 AND 20/11 UNDER THEIR RESPECTIVE CABLES THEN ADD UPPER HALVES OF 40/28, 20/9, 20/11 ON TOP.

   (D) ADD FINAL ROW OF (6) SIX 20/0 SPARES.

   (E) ALL BLOCKS AND THEIR RMCP CAN NOW BE FULLY INSERTED SIMULTANEOUSLY I.E. THE BLOCKS PUSHED COMPLETELY INTO THE SQUARE HOLE OF THE PLUG AND RMCP COMPLETELY INTO THE SLEEVE.

   (F) WHEN THE RMCP UNIT IS COMPLETELY FILLED AND INSERTED THEN THE NUTS ARE ALTERNATELY TIGHTENED UNTIL THE RMCP IS SECURE IN THE HOLE. THE INSTALLATION IS THEN COMPLETE.

4. TO ADD A NEW CABLE TO A PACKED RMCP UNIT, LOOSEN THE FOUR HEX NUTS AND REMOVE THE DESIRED SPARE INSERT MODULES. PULL THE NEW CABLE AND ADD MATCHING CABLE HOLDING BLOCKS PER PREVIOUS INSTRUCTIONS.

5. TEMPLATE ALL WORK FROM SHIP.

6. ALL WELDING AND INSPECTION TO BE IN ACCORDANCE WITH MIL-STD-278.

7. ALL PAINTING TO BE DONE IN ACCORDANCE WITH MIL-E-917.

8. THIS PLAN WAS DEVELOPED FROM DESIGN DATA SHEET DDS 1100-1, REINFORCEMENT OF OPENINGS IN STRUCTURE OF SURFACE SHIPS OTHER THAN IN PROTECTIVE PLATING TO PERMIT INSTALLATION OF ROUND MULTI-CABLE PENETRATOR IN WATERTIGHT DECKS AND BHDS OF SURFACE SHIPS.

9. FILLET WELD REINFORCEMENT FOR T2V. 1 WELD JOINT SHALL BE 1/8 FOR PLATING UP TO 15.3# AND 1/4 FOR PLATING ABOVE 17.85#.

10. THE BHDS AND DECKS WHICH ARE CONSIDERED TO BE LONGITUDINAL STRENGTH MEMBERS ARE DEFINED IN NAVSHIPS DESIGN DATA SHEET DDS 1100-1 AS COMPONENTS IN "STRENGTH ENVELOPE (I.E. IN OUTSIDE PLATING, UPPER MOST STRENGTH DECK, INNER BOTTOM, AND THEIR ASSOCIATED LONG'L FRAMING) AND FOR OTHER STRENGTH DECKS WITHIN THE MIDSHIP THREE-FIFTHS LENGTH." IF THERE IS DIFFICULTY IN DEFINITION, CONSULT WITH STRUCTURAL DESIGN.

11. AFTER INSTALLATION IS COMPLETE, PIPE SLEEVE OF PENETRATOR MAY BE PAINTED TO SUIT SURROUNDING STRUCTURE IN ACCORDANCE WITH GENERAL SPECIFICATIONS FOR BUILDING SHIPS FOR THE U.S. NAVY.

ROUND MULTI-CABLE PENETRATORS
FOR EXISTING CABLES

12. TEMPORARILY INSULATE CABLE FOR PROTECTION AGAINST WELDING AND BURNING.

13. REMOVE OLD NON-WATERTIGHT STRUCTURE.

14. PREPARE HOLE IN BULKHEAD TO RECEIVE ROUND MULTI-CABLE PENETRATOR (DESIGNATED "RMCPO"). ONE CORNER OF RMCP IS CUT (SEE DETAIL A) TO ALLOW IT TO BE OPENED AND PLACED AROUND THE EXISTING CABLES. PIPE SLEEVE MUST ALSO BE PLACED AROUND THE CABLE.

15. SEGREGATE AND CONFINE REQUIRED CABLES FOR PROTECTION AND INSTALLATION.

16. SLIDE UNIT INTO PREPARED SLEEVE IN BULKHEAD. THEN PROCEED AS OUTLINED IN NOTE 3.

NOTES:
1. THE ROUND MULTI-CABLE PENETRATOR SHALL NOT BE INSTALLED IN BULKHEADS AND DECKS WHICH ARE EXPOSED TO THE WEATHER.
2. INSERT BLOCK CABLE ASSIGNMENTS ARE SHOWN ON FIGURES 3B26, 3B41 AND 3B42.
3. THIS FIGURE SUPERSEDES SHEET 3B54 OF DRAWING 803-5001027.

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FIGURE 3B54. Round multi-cable penetrators installation notes.

NOTES:
1. ADAPTER SET CONSIST OF ONE(1) FLAT WASHER AND ONE(1) BEVEL REDUCING ADAPTER.
2. THIS FIGURE SUPERSEDES SHEET 3B53 OF DRAWING 803-5001027

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
23WUA-61	3B4821SAAX	3B4821AAAX	AA	X
2U-10	–	–	B	–
2U-16	3B4843DC	3B4843ADC	D	C
2U-19	3B4843DC	3B4843ADC	D	C
2U-30	–	–	D	–
2U-45	–	–	G	–
2U-60	3B4811SLJ	3B4811ALJ	L	J
2UA-10	3B4843DC	3B4843ADC	D	C
2UA-16	3B4843DC	3B4843ADC	D	C
2UA-19	3B4843DC	3B4843ADC	D	C
2UA-30	–	–	D	–
2UA-45	–	–	G	–
2UA-60	3B4811SLJ	3B4811ALJ	L	J
2WAU-40	3B4814SNM	3B4814ANM	N	M
33F-7	3B4811SLJ	3B4811ALJ	L	J
3BJ-8	3B4843DC	3B4843ADC	D	C
3BJ-12	–	–	B	–
3BJ-14	–	–	B	–
3BJ-16	3B4815BA	3B4815ABA	B	A
3BJ-18	3B4815BA	3B4815ABA	B	A
3BJ-20	3B4815BA	3B4815ABA	B	A
3BJ-22	3B4815BA	3B4815ABA	B	A
3BJA-8	–	–	D	–
3BJA-12	–	–	B	–
3BJA-14	3B4815BA	3B4815ABA	B	A
3BU-3	3B4843DC	3B4843ADC	D	C
3BU-7	3B4868GE	3B4868AGE	G	E
3BU-10	3B4811SLJ	3B4811ALJ	L	J
3BU-14	3B4812SLK	3B4812ALK	L	K
3BU-18	3B4814SNM	3B4814ANM	N	M
3BU-24	–	–	N	–
3BU-30	3B4819SSP	3B4819ASP	S	P
3BU-37	–	–	S	–
3BU-44	3B4819SWT	3B4819AWT	W	T
3BWA-3	–	–	D	–
3BWA-7	3B4811SLJ	3B4811ALJ	L	J
3BWA-10	–	–	L	–
3BWA-14	3B4814SNM	3B4814ANM	N	M
3BWA-18	–	–	N	–
3BWA-24	–	–	S	–
3BWA-30	3B4819SWT	3B4819AWT	W	T
3BWA-37	3B4819SWT	3B4819AWT	W	T
3BWA-44	–	–	W	–
3BWU-3	–	–	D	–
3BWU-7	–	–	G	–
3BWU-10	–	–	L	–
3BWU-14	3B4814SNM	3B4814ANM	N	M
3BWU-18	–	–	N	–
3BWU-24	3B4817SSR	3B4817ASR	S	R
3BWU-30	–	–	S	–
3BWU-37	3B4819SWT	3B4819AWT	W	T
3BWU-44	3B4820SWV	3B4820AWV	W	V
3BWUS-3	–	–	D	–
3BWUS-7	3B4811SLJ	3A4811ALJ	L	J
3BWUS-10	–	–	L	–
3BWUS-14	3B4814SNM	3B4814ANM	N	M
3BWUS-18	–	–	N	–
3BWUS-24	–	–	S	–
3BWUS-30	3B4819SWT	3B4819AWT	W	T
3BWUS-37	3B4819SWT	3B4819AWT	W	T
3BWUS-44	–	–	W	–
3U-3	3B4843DC	3B4843ADC	D	C
3U-7	3B4868GE	3B4868AGE	G	E
3U-12	3B4812SLK	3B4812ALK	L	K
4NW-8	–	–	D	–
4SJ-14	3B4815BA	3B4815ABA	B	A
4SJ-18	3B4815BA	3B4815ABA	B	A
4SJ-20	3B4815BA	3B4815ABA	B	A
5KVTSGA-100	–	–	S	–
5KVTSGA-150	3B4819SWT	3B4819AWT	W	T
5KVTSGA-250	–	–	W	–
5KVTSGA-350	3B4822SAAY	3B4822AAAY	AA	Y
5KVTSGA-400	3B4823SAAZ	3B4823AAAZ	AA	Z
5KVTSGU-100	–	–	S	–
5KVTSGU-150	3B4819SWT	3B4819AWT	W	T
5KVTSGU-250	–	–	W	–
5KVTSGU-350	3B4821SAAX	3B4821AAAX	AA	X
5KVTSGU-400	3B4823SAAZ	3B4823AAAZ	AA	Z
5SS	3B4843DC	3B4843ADC	D	C
6SQA-100	–	–	S	–
6SQA-125	–	–	S	–
6SQA-150	3B4819SWT	3B4819AWT	W	T
6SQA-200	–	–	W	–
6SQU-100	3B4819SSP	3B4819ASP	S	P
6SQU-125	–	–	S	–
6SQU-150	3B4819SWT	3B4819AWT	W	T
6SQU-200	–	–	W	–
7PS-6	3B4868GE	3B4868AGE	G	E
7SQA-3	3B4843DC	3B4843ADC	D	C
7SQA-4	–	–	D	–
7SQU-3	3B4843DC	3B4843ADC	D	C
7SQU-4	–	–	D	–
7SS-2	3B4843DC	3B4843ADC	D	C
8NW-6	–	–	D	–

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE

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FIGURE 3B53. Stuffing tubes cable assignment using reducer adapters.

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
TSQU-100	3B4616SSP	3B4616ASP	S	P
TSQU-200	3B4617SSR	3B4617ASR	S	R
TSQU-300	3B4619SWT	3B4619AWT	W	T
TSQU-400	3B4620SWV	3B4620AWV	W	V
TSP-11	3B4488SQE	3B4488AQE	Q	E
TSP-31	3B4611SLJ	3B4611ALJ	L	J
TSS-2	–	–	S	–
TSS-3	3B4484SDC	3B4484ADC	D	C
TSS-4	3B4484SDC	3B4484ADC	D	C
TTOP-3	–	–	S	–
TTOP-6	3B4484SDC	3B4484ADC	D	C
TTOP-10	–	–	D	–
TTOP-15	–	–	Q	–
TTRS-2	–	–	D	–
TTRS-4	3B4488SQE	3B4488AQE	Q	E
TTRS-6	–	–	Q	–
TTRS-8	3B4611SLJ	3B4611ALJ	L	J
TTRS-10	3B4612SLK	3B4612ALK	L	K
TTRS-12	3B4612SLK	3B4612ALK	L	K
TTRS-16	–	–	L	–
TTRSA-2	–	–	D	–
TTRSA-4	3B4488SQE	3B4488AQE	Q	E
TTRSA-6	–	–	Q	–
TTRSA-8	3B4611SLJ	3B4611ALJ	L	J
TTRSA-10	3B4612SLK	3B4612ALK	L	K
TTRSA-12				
TTRSA-16	–	–	L	–
TTSA-1 1/2	3B4615SBA	3B4615ABA	S	A
TTSA-3	3B4484SDC	3B4484ADC	D	C
TTSA-6	3B4484SDC	3B4484ADC	D	C
TTSA-10	–	–	D	–
TTSA-15	3B4489SQF	3B4489AQF	Q	F
TTSA-20	–	–	Q	–
TTSA-30	3B4611SLJ	3B4611ALJ	L	J
TTSA-40	3B4614SNM	3B4614ANM	N	M
TTSA-50	–	–	N	–
TTSA-60	3B4616SSP	3B4616ASP	S	P
TTSU-1 1/2	3B4615SBA	3B4615ABA	S	A
TTSU-3	–	–	S	–
TTSU-6	3B4484SDC	3B4484ADC	D	C
TTSU-10	–	–	D	–
TTSU-15	–	–	D	–
TTSU-20	3B4489SQF	3B4489AQF	Q	F
TTSU-30	3B4611SLJ	3B4611ALJ	L	J
TTSU-40	–	–	L	–
TTSU-50	–	–	N	–
TTSU-60	–	–	N	–
1BAU-44	3B4611SLJ	3B4611ALJ	L	J
1BMU-6	3B4484SDC	3B4484ADC	D	C
1BMWU-70	3B4616SSP	3B4616ASP	S	P
1BU-36	3B4611SLJ	3B4611ALJ	L	J
1BU-60	3B4614SNM	3B4614ANM	N	M
1BWA-2	–	–	S	–

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
1BWA-14	–	–	Q	–
1BWA-20	3B4612SLK	3B4612ALK	L	K
1BWA-30	–	–	L	–
1BWU-2	–	–	S	–
1BWU-14	–	–	Q	–
1BWU-20	3B4611SLJ	3B4611ALJ	L	J
1BWU-30	–	–	L	–
1BWF-2	3B4484SDC	3B4484ADC	D	C
1B50MA-16	3B4488SQE	3B4488AQE	Q	E
1550MA-20	–	–	Q	–
1560MA-40	3B4612SLK	3B4612ALK	L	K
1560MA-70	–	–	N	–
1B50MU-16	3B4489SQF	3B4489AQF	Q	F
1550MU-20	–	–	Q	–
1550MU-40	–	–	L	–
1560MU-70	3B4616SSP	3B4616ASP	S	P
1560MUS-16	3B4488SQE	3B4488AQE	Q	E
1550MUS-20	–	–	Q	–
1560MUS-40	3B4612SLK	3B4612ALK	L	K
1560MUS-70	–	–	N	–
1B75MA-6	3B4612SLK	3B4612ALK	L	K
1B75MU-6	3B4612SLK	3B4612ALK	L	K
2AU-40	3B4614SNM	3B4614ANM	N	M
2CS-6	–	–	S	–
2CS-16	3B4484SDC	3B4484ADC	D	C
2CS-42	3B4488SQE	3B4488AQE	Q	E
2CS-60	–	–	Q	–
2CS-77	3B4612SLK	3B4612ALK	L	K
2SA-3	–	–	S	–
2SA-7	3B4484SDC	3B4484ADC	D	C
2SA-10	–	–	D	–
2SA-14	–	–	D	–
2SA-16	–	–	Q	–
2SA-24	3B4611SLJ	3B4611ALJ	L	J
2SA-30	3B4611SLJ	3B4611ALJ	L	J
2SA-37	3B4612SLK	3B4612ALK	L	K
2SA-44	–	–	L	–
2SA-61	–	–	N	–
2SJ-7	3B4484SDC	3B4484ADC	D	C
2SJ-9	–	–	S	–
2SJ-11	–	–	S	–
2SJ-12	–	–	S	–
2SJ-14	3B4615SBA	3B4615ABA	S	A
2SJ-16	3B4615SBA	3B4615ABA	S	A
2SJ-18	3B4615SBA	3B4615ABA	S	A
2SJ-20	3B4615SBA	3B4615ABA	S	A
2SJ-22	3B4615SBA	3B4615ABA	S	A
2SJA-7	–	–	D	–
2SJA-9	3B4484SDC	3B4484ADC	D	C
2SJA-11	–	–	S	–
2SJA-12	–	–	S	–
2SJA-14	3B4615SBA	3B4615ABA	S	A

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
2SU-3	3B4484SDC	3B4484ADC	D	C
2SU-7	–	–	D	–
2SU-10	3B4489SQF	3B4489AQF	Q	F
2SU-14	–	–	Q	–
2SU-18	3B4611SLJ	3B4611ALJ	L	J
2SU-24	–	–	L	–
2SU-30	–	–	L	–
2SU-37	3B4614SNM	3B4614ANM	N	M
2SU-44	3B4616SSP	3B4616ASP	S	P
2SU-61	3B4616SSP	3B4616ASP	S	P
2SUS-3	–	–	S	–
2SUS-7	3B4484SDC	3B4484ADC	D	C
2SUS-10	–	–	D	–
2SUS-14	–	–	D	–
2SUS-18	–	–	Q	–
2SUS-24	3B4611SLJ	3B4611ALJ	L	J
2SUS-30	3B4611SLJ	3B4611ALJ	L	J
2SUS-37	3B4612SLK	3B4612ALK	L	K
2SUS-44	–	–	L	–
2SUS-61	–	–	N	–
2SWA-3	3B4484SDC	3B4484ADC	D	C
2SWA-7	–	–	D	–
2SWA-10	–	–	Q	–
2SWA-14	3B4611SLJ	3B4611ALJ	L	J
2SWA-24	–	–	L	–
2SWA-30	3B4614SNM	3B4614ANM	N	M
2SWA-37	–	–	N	–
2SWA-44	3B4616SSP	3B4616ASP	S	P
2SWAU-3	3B4484SDC	3B4484ADC	D	C
2SWAU-7	–	–	D	–
2SWAU-10	–	–	Q	–
2SWAU-14	–	–	Q	–
2SWAU-18	3B4611SLJ	3B4611ALJ	L	J
2SWAU-24	–	–	L	–
2SWAU-30	3B4614SNM	3B4614ANM	N	M
2SWAU-37	3B4614SNM	3B4614ANM	N	M
2SWAU-44	3B4616SSP	3B4616ASP	S	P
2SWAU-61	–	–	S	–
2SWF-3	3B4484SDC	3B4484ADC	D	C
2SWF-4	3B4484SDC	3B4484ADC	D	C
2SWF-7	3B4488SQE	3B4488AQE	Q	E
2SWL-7	–	–	Q	–
2SWU-1	3B4615SBA	3B4615ABA	S	A
2SWU-3	–	–	S	–
2SWU-7	–	–	Q	–
2SWU-12	–	–	L	–
2SWU-18	–	–	L	–
2SWU-2	3B4616SSP	3B4616ASP	S	P
2SWU-30	–	–	S	–
2SWU-37	3B4617SSR	3B4617ASR	S	R
2SWU-61	–	–	W	–
2SWUA-3	3B4488SQE	3B4488AQE	Q	E
2SWUA-7	3B4611SLJ	3B4611ALJ	L	J
2SWUA-12	–	–	L	–
2SWUA-18	–	–	N	–
2SWUA-24	3B4617SSR	3B4617ASR	S	R
2SWUA-30	–	–	S	–
2SWUA-37	3B4619SWT	3B4619AWT	W	T

NOTES
1 ADAPTER SET CONSIST OF ONE (1) FLAT WASHER AND ONE (1) BEVEL REDUCING ADAPTER
2 THIS FIGURE SUPERSEDES SHEET 3B51 OF DRAWING 803-5001027.

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FIGURE 3B52. Stuffing tubes cable assignment using reducer adapters.

NOTES:
1. ADAPTER SET CONSIST OF ONE(1) FLAT WASHER AND ONE(1) BEVEL REDUCING ADAPTER
2. THIS FIGURE SUPERSEDES SHEET 3B52 OF DRAWING 803-5001027

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
MSCS-81	3B4816SSP	3B4816ASP	S	P
MSCU-7	–	–	B	–
MSCU-10	–	–	D	–
MSCU-14	–	–	D	–
MSCU-19	–	–	D	–
MSCU-24	–	–	G	–
MSCU-30	–	–	G	–
MSCU-37	3B4811SLJ	3B4811ALJ	L	J
MSCU-44	3B4812SLK	3B4812ALK	L	K
MSCU-61	–	–	L	–
MSCU-81	–	–	N	–
MSP	3B4817SSR	3B4817ASR	S	R
MSPW	3B4817SSR	3B4817ASR	S	R
MU-14	–	–	B	–
MWF-7	3B4884SDC	3B4884ADC	D	C
MWF-10	–	–	D	–
MWF-14	–	–	D	–
MWF-19	3B4885GE	3B488AGE	G	E
MWF-24	–	–	G	–
MWF-30	3B4811SLJ	3B4811ALJ	L	J
MWF-37	3B4811SLJ	3B4811ALJ	L	J
PBTM-5	–	–	D	–
PBTM-10	3B489SGF	3B489AGF	G	F
PBTM-15	3B4811SLJ	3B4811ALJ	L	J
PI-3	–	–	D	–
PI-7	–	–	G	–
PI-12	–	–	L	–
SHOF-3	3B4815BA	3B4815BA	B	A
SHOF-23	–	–	B	–
SHOF-60	3B4884SDC	3B4884ADC	D	C
SHOF-150	–	–	G	–
SHOF-200	3B4811SLJ	3B4811ALJ	L	J
SHOF-250	3B4812SLK	3B4812ALK	L	K
SHOF-500	–	–	N	–
SHOF-650	3B4816SSP	3B4816ASP	S	P
SHOF-800	3B4817SSR	3B4817ASR	S	R
SRW	–	–	B	–
SSF-300	3B4812SLK	3B4812ALK	L	K
SSGA-50	3B4884SDC	3B4884ADC	D	C
SSGA-75	3B4884SDC	3B4884ADC	D	C
SSGA-100	–	–	D	–
SSGA-200	–	–	G	–
SSGA-300	3B4811SLJ	3B4811ALJ	L	J
SSGA-400	3B4812SLK	3B4812ALK	L	K
SSGA-650	3B4814SNM	3B4814ANM	N	M
SSGA-800	–	–	N	–
SSGA-1000	3B4816SSP	3B4816ASP	S	P
SSGA-1600	3B4819SWT	3B4819AWT	W	T
SSGA-2000			W	
SSGU-50	3B4884SDC	3B4884ADC	D	C
SSGU-75	3B4884SDC	3B4884ADC	D	C
SSGU-100	–	–	D	–
SSGU-200	–	–	G	–

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
SSGU-300	3B4811SLJ	3B4811ALJ	L	J
SSGU-400	3B4812SLK	3B4812ALK	L	K
SSGU-650	3B4814SNM	3B4814ANM	N	M
SSGU-800	–	–	N	–
SSGU-1000	3B4816SSP	3B4816ASP	S	P
SSGU-1600	3B4819SWT	3B4819AWT	W	T
SSGU-2000	–	–	W	–
S2S	3B4884SDC	3B4884ADC	D	C
TCJA-4	–	–	B	–
TCJU-4	–	–	B	–
TCJX-3	3B4885GE	3B488AGE	G	E
TCJX-7	3B4811SLJ	3B4811ALJ	L	J
TCJX-12	3B4814SNM	3B4814ANM	N	M
TCKX-1	–	–	B	–
TCKX-3	–	–	D	–
TCKX-7	–	–	G	–
TCKX-12	3B4814SNM	3B4814ANM	N	M
TCOP-2	3B4815BA	3B4815ABA	B	A
TCTA-4	–	–	B	–
TCTU-4	–	–	B	–
TCTX-1	3B4815BA	3B4815ABA	B	A
TCTX-3	3B4884SDC	3B4884ADC	D	C
TCTX-7	–	–	D	–
TCTX-12	3B4811SLJ	3B4811ALJ	L	J
THOF-3	–	–	B	–
THOF-4	–	–	B	–
THOF-6	3B4884SDC	3B4884ADC	D	C
THOF-9	3B4884SDC	3B4884ADC	D	C
THOF-14	–	–	D	–
THOF-23	–	–	G	–
THOF-42	3B4814SNM	3B4814ANM	N	M
THOF-150	–	–	B	–
THOF-250	–	–	W	–
THOF-400	–	–	AA	–
THOF-500	–	–	BB	–
THOF-600	–	–	BB	–
TNW-3	–	–	B	–
TNW-4	–	–	B	–
TNW-9	–	–	D	–
TNW-14	–	–	D	–
TNW-23	3B4885GE	3B488AGE	G	E
TNW-50	3B4811SLJ	3B4811ALJ	L	J
TNW-75	3B4812SLK	3B4812ALK	L	K
TNW-100	–	–	L	–
TNW-150	–	–	N	–
TNWA-3	–	–	B	–
TNWA-4	–	–	B	–
TNWA-9	–	–	D	–
TNWA-14			D	
TNWA-23	3B4885GE	3B488AGE	G	E
TNWA-50	3B4811SLJ	3B4811ALJ	L	J
TNWA-75	–	–	L	–
TNWA-100	3B4814SNM	3B4814ANM	N	M

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
TNWA-150	3B4816SSP	3B4816ASP	S	P
TPNW-1 1/2	3B4815BA	3B4815ABA	B	A
TPNW-3	3B4815BA	3B4815ABA	B	A
TPNW-6	3B4815BA	3B4815ABA	B	A
TPNW-10	–	–	B	–
TPNW-15	3B4884SDC	3B4884ADC	D	C
TPNW-20	3B4884SDC	3B4884ADC	D	C
TPNW-30	–	–	D	–
TPNW-40	–	–	D	–
TPNWA-1 1/2	3B4815BA	3B4815ABA	B	A
TPNWA-3	3B4815BA	3B4815ABA	B	A
TPNWA-6	–	–	B	–
TPNWA-10	3B4884SDC	3B4884ADC	D	C
TPNWA-15	3B4884SDC	3B4884ADC	D	C
TPNWA-20	3B4884SDC	3B4884ADC	D	C
TPNWA-30	–	–	D	–
TPNWA-40	3B489SGF	3B489AGF	G	F
TPS-3	–	–	B	–
TPS-4	3B4884SDC	3B4884ADC	D	C
TPS-8	3B4884SDC	3B4884ADC	D	C
TPS-9	–	–	D	–
TPS-14	3B4885GE	3B488AGE	G	E
TPS-23	–	–	G	–
TPS-30	3B4811SLJ	3B4811ALJ	L	J
TPU-8	3B4811SLJ	3B4811ALJ	L	J
TRF-106	3B4885GE	3B488AGE	G	E
TRF-133	3B4885GE	3B488AGE	G	E
TRF-168	–	–	G	–
TRW	–	–	D	–
TRWA	3B4885GE	3B488AGE	G	E
TRXF-84	3B4884SDC	3B4884ADC	D	C
TRXF-106	–	–	D	–
TRXF-133	–	–	D	–
TSGA-3	–	–	B	–
TSGA-4	–	–	B	–
TSGA-9	3B4884SDC	3B4884ADC	D	C
TSGA-14	3B4885GE	3B488AGE	G	E
TSGA-23	–	–	G	–
TSGA-50	3B4811SLJ	3B4811ALJ	L	J
TSGA-75	–	–	L	–
TSGA-100	3B4814SNM	3B4814ANM	N	M
TSGA-150	3B4816SSP	3B4816ASP	S	P
TSGA-200	3B4817SSR	3B4817ASR	S	R
TSGA-300	3B4819SWT	3B4819AWT	W	T
TSGA-400	–	–	W	–
TSGU-3	3B4815BA	3B4815ABA	B	A
TSGU-4	–	–	B	–
TSGU-9	3B4884SDC	3B4884ADC	D	C
TSGU-14	–	–	D	–
TSGU-23	–	–	G	–
TSGU-50	3B4811SLJ	3B4811ALJ	L	J
TSGU-75	3B4812SLK	3B4812ALK	L	K
TSGU-100	–	–	L	–

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FIGURE 3B51. Stuffing tubes cable assignment using reducer adapters.

NOTES:
1. ADAPTER SET CONSIST OF ONE (1) FLAT WASHER AND ONE (1) BEVEL REDUCING ADAPTER
2 THIS FIGURE SUPRESEDES SHEET 3B50 OF DRAWING 803-5001027

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
CVSF-4	–	–	N	–
DCOP-1	3B4815BA	3B4814BA	B	A
DCOP-11/2	3B4815BA	3B4814BA	B	A
DCOP-2	3B4815BA	3B4814BA	B	A
DHOF-3	–	–	B	–
DHOF-4	–	–	B	–
DHOF-6	–	–	B	–
DHOF-9	3B4848DC	3B4844DC	D	C
DHOF-14	–	–	D	–
DHOF-23	–	–	G	–
DHOF-30	3B4811BLJ	3B4811ALJ	L	J
DHOF-63	–	–	N	–
DHOF-250	3B48208WV	3B4820AWV	W	V
DHOF-400	3B48208WV	3B4820AWV	W	V
DLT 4	–	–	D	–
DNW-3	–	–	B	–
DNW-4	–	–	B	–
DNW-9	3B4848DC	3B4844DC	D	C
DNW-14	3B4848DC	3B4844DC	D	C
DNW-23	–	–	D	–
DNW-60	–	–	G	–
DNW-75	3B4812BLK	3B4812ALK	L	K
DNW 100	–	–	L	–
DNWA-3	–	–	B	–
DNWA-4	–	–	B	–
DNWA-9	3B4848DC	3B4844DC	D	C
DNWA-14	–	–	D	–
DNWA-23	–	–	D	–
DNWA 50	3B4811BLJ	3B4811ALJ	L	J
DNWA 75	3B4812BLK	3B4812ALK	L	K
DNWA-100	–	–	L	–
DPS-3	–	–	B	–
DPS-4	–	–	B	–
DPS-9	3B4848DC	3B4844DC	D	C
DPS-9	–	–	D	–
DRW	–	–	D	–
DSGA-3	–	–	B	–
DSGA-4	–	–	B	–
DSGA-9	3B4848DC	3B4844DC	D	C
DSGA-14	–	–	D	–
DSGA-23	3B4869GE	3B4868AGE	G	E
DSGA-60	3B4811BLJ	3B4811ALJ	L	J
DSGA-75	3B4811BLK	3B4811ALK	L	K
DSGA-100	–	–	L	–
DSGA-200	3B48175SR	3B4817ASR	S	R
DSGA-300	3B4819SWT	3B4819AWT	W	T
DSGA-400	3B48208WV	3B4820AWV	W	V
DSGU-3	–	–	B	–
DSGU-4	–	–	B	–
DSGU-9	3B4848DC	3B4844DC	D	C
DSGU-14	–	–	D	–
DSGU-23	3B4869GE	3B4868AGE	G	E
DSGU-60	3B4811BLJ	3B4811ALJ	L	J
DSGU-75	3B4812BLK	3B4812ALK	L	K
DSGU-100	–	–	L	–
DSGU-200	3B48175SR	3B4817ASR	S	R
DSGU-300	3B4819SWT	3B4819AWT	W	T
DSGU-400	3B48208WV	3B4820AWV	W	V

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
DSS-2	–	–	B	–
DSS-3	–	–	B	–
DSS-4	–	–	B	–
DSWS-4	3B4869GF	3B4868AGF	G	F
ECM	3B4814BNM	3B4814ANM	N	M
FHOF-3	–	–	B	–
FHOF-4	3B4848DC	3B4844DC	D	C
FHOF-9	–	–	D	–
FHOF-42	3B4814BNM	3B4814ANM	N	M
FHOF-60	–	–	N	–
FHOF-133	3B4819SWT	3B4819AWT	W	T
FNW-3	–	–	B	–
FNW-4	3B4848DC	3B4844DC	D	C
FNW-9	3B4848DC	3B4844DC	D	C
FNW-23	3B4869GF	3B4868AGF	G	F
FNWA-3	–	–	B	–
FNWA-4	3B4848DC	3B4844DC	D	C
FNWA-9	–	–	D	–
FNWA-23	–	–	G	–
FPS-14	3B4869GE	3B4868AGE	G	E
FSGA-3	3B4848DC	3B4844DC	D	C
FSGA-4	3B4848DC	3B4844DC	D	C
FSGA-9	–	–	D	–
FSGA-23	3B4811BLJ	3B4811ALJ	L	J
FSGA-60	3B4812BLK	3B4812ALK	L	K
FSGA-75	3B4814BNM	3B4814ANM	N	M
FSGA-100	3B4814BNM	3B4814ANM	N	M
FSGA-150	3B48175SR	3B4817ASR	S	R
FSGA-200	3B4819SWT	3B4819AWT	W	T
FSGU-3	3B4848DC	3B4844DC	D	C
FSGU-4	3B4848DC	3B4844DC	D	C
FSGU-9	–	–	D	–
FSGU-23	3B4811BLJ	3B4811ALJ	L	J
FSGU-60	3B4812BLK	3B4812ALK	L	K
FSGU-75	3B4814BNM	3B4814ANM	N	M
FSGU-100	–	–	N	–
FSGU-150	3B4816BSP	3B4816ASP	S	P
FSGU-200	3B4819SWT	3B4819AWT	W	T
FSS-2	–	–	B	–
FSS-3	–	–	B	–
FSS-4	3B4848DC	3B4844DC	D	C
MCOS-2	–	–	B	–
MCOS-4	–	–	B	–
MCOS-6	3B4818BA	3B4814BA	B	A
MCOS-6	–	–	B	–
MCOS-7	3B4848DC	3B4844DC	D	C
MCSF-4	3B4816BSP	3B4816ASP	S	P
MDU-6	3B4811BLJ	3B4811ALJ	L	J
MDU-14	3B4814BNM	3B4814ANM	N	M
MDU-23	–	–	S	–

CABLE	ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	HOST TUBE	EFFECTIVE REDUCTION SIZE
MDU-40	3B4819SWT	3B4819AWT	W	T
MDU-60	3B4821SAAX	3B4821AAAX	AA	X
MDY-6	–	–	L	–
MDY-14	3B4816BSP	3B4816ASP	S	P
MDY-23	3B4819SWT	3B4819AWT	W	T
MDY-40	–	–	W	–
MDY-60	3B4822BAAY	3B4822AAAY	AA	Y
MHOF-7	3B4848DC	3B4844DC	D	C
MHOF-10	3B4848DC	3B4844DC	D	C
MHOF-14	–	–	D	–
MHOF-19	–	–	D	–
MHOF-24	3B4869QF	3B4868AQF	G	F
MHOF-30	3B4869QF	3B4868AQF	G	F
MHOF-37	–	–	G	–
MHOF-44	–	–	L	J
MHOF-61	–	–	L	–
M4OP-6	3B4815BA	3B4814BA	B	A
MNW-7	–	–	B	–
MNW-10	–	–	B	–
MNW-14	3B4848DC	3B4844DC	D	C
MNW-19	3B4848DC	3B4844DC	D	C
MNW-24	–	–	D	–
MNW-30	–	–	D	–
MNW-37	3B4869GE	3B4868AGE	G	E
MNW-44	–	–	G	–
MNWA-7	–	–	B	–
MNWA-10	3B4848DC	3B4844DC	D	C
MNWA-14	3B4848DC	3B4844DC	D	C
MNWA-19	3B4848DC	3B4844DC	D	C
MNWA-24	–	–	D	–
MNWA-30	3B4869GE	3B4868AGE	G	E
MNWA-37	3B4869QF	3B4868AQF	G	F
MNWA-44	–	–	G	–
MRI-D-1	3B4815BA	3B4814BA	B	A
MRI-D-21/2	3B4815BA	3B4814BA	B	A
MRI-T-21/2	3B4815BA	3B4814BA	B	A
MS-37	3B4869GE	3B4868AGE	G	E
MSCA-7	–	–	B	–
MSCA-10	–	–	D	–
MSCA-14	–	–	D	–
MSCA-19	–	–	D	–
MSCA-24	–	–	G	–
MSCA-30	–	–	G	–
MSCA-37	3B4811BLJ	3B4811ALJ	L	J
MSCA-44	3B4812BLK	3B4812ALK	L	K
MSCA-61	–	–	L	–
MSCA-81	–	–	N	–
MSCS-7	3B4848DC	3B4844DC	D	C
MSCS-10	–	–	D	–
MSCS-14	3B4869GE	3B4868AGE	G	E
MSCS-19	3B4869QF	3B4868AQF	G	F
MSCS-24	–	–	G	–
MSCS-30	3B4811BLJ	3B4811ALJ	L	J
MSCS-37	3B4812BLK	3B4812ALK	L	K
MSCS-44	–	–	L	–
MSCS-61	3B4813SNM	3B4813ANM	N	M

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FIGURE 3B50. Stuffing tubes cable assignment using reducer adapters.

NOTES:

1. THIS FIGURE SUPERSEDES SHEET 3B49 OF DRAWING 803-5001027.

HOLE SPACING IN DECKS & BULKHEADS

TABLE DERIVED FROM REQUIREMENTS OF DESIGN DATA SHEET DDS 1100-2
(MIL-S-24235/18)

SPACING OF HOLE FOR SWAGE TUBES
THIS TABLE DOES NOT APPLY TO ARMOR PLATE

DRILL FOR SWAGE TUBE M24235/18	NOMINAL OUTSIDE DIA. OF SWAGE TUBE	TUBE SIZE	A	B	C	D	E	F	G	J	K	L	M	N	P	R	S	T	V	W	X	Y	Z	AA	BB
81	.840(27/32)	A	1 21/32																						
7	.840(27/32)	B	1 21/32	2																					
1 1/32	.1050(1 1/16)	C	1 21/32	2	2 1/16																				
1 1/32	.1050(1 1/16)	D	2 7/32	2 1/4	2 3/16	2 3/8																			
23/64	.1315(21/64)	E	2 7/32	2 1/4	2 3/16	2 3/8	2 13/32																		
23/64	.1315(21/64)	F	2 7/32	2 11/32	2 3/16	2 3/8	2 13/32	2 1/2																	
23/64	.1315(21/64)	G	2 7/32	2 11/32	2 13/32	2 17/32	2 7/8	2 29/32	2 15/32																
45/64	.1660(21/32)	J	2 21/32	2 23/32	2 13/32	2 17/32	2 7/8	2 29/32	2 15/32	3 1/16															
45/64	.1660(21/32)	K	2 21/32	2 23/32	2 13/32	2 17/32	2 7/8	2 29/32	2 15/32	3 1/16	3 1/16														
45/64	.1660(21/32)	L	2 21/32	2 23/32	2 13/32	2 17/32	2 7/8	2 29/32	2 15/32	3 1/16	3 1/16	3 1/16													
15/64	.1900(29/32)	M	2 29/32	2 31/32	2 13/32	2 17/32	2 7/8	2 29/32	3	3 15/32	3 15/32	3 15/32	3 1/8												
15/64	.1900(29/32)	N	3 1/4	3 5/16	3 3/8	3 7/16	3 15/32	3 1/2	3 9/16	3 19/32	3 11/16	3 23/32	3 3/4	3 27/32											
2 15/32	2.375(2 3/8)	P	3 1/4	3 5/16	3 3/8	3 15/32	3 15/32	3 1/2	3 9/16	3 7/8	3 7/8	3 7/8	4 3/16	4 3/32	4 11/32										
2 15/32	2.375(2 3/8)	R	3 1/4	3 5/16	3 3/8	3 13/32	3 17/32	3 17/32	3 9/16	3 7/8	3 7/8	3 7/8	4 3/32	4 3/16	4 11/32	4 15/32									
2 15/32	2.375(2 3/8)	S	3 1/4	3 5/16	3 11/32	3 13/32	3 17/32	3 17/32	4 1/32	3 7/8	3 7/8	3 7/8	4 3/32	4 7/32	4 11/32	4 15/32	4 15/32								
2 15/32	2.875(2 7/8)	T	3 9/16	3 23/32	3 27/32	4 1/32	4 1/32	4 1/32	4 1/32	4 11/32	4 11/32	4 11/32	4 15/32	4 19/32	5 1/32	5 1/32	5 1/32	5 1/32	5 1/2						
2 15/32	2.875(2 7/8)	V	3 9/16	3 11/16	3 27/32	3 15/16	4 1/32	4 1/32	4 1/32	4 11/32	4 11/32	4 15/32	4 15/32	4 19/32	5 1/32	5 1/32	5 1/32	5 1/32	5 1/2	5 1/2					
2 15/32	2.875(2 7/8)	W	3 9/16	3 11/16	3 27/32	3 15/16	4 1/32	4 1/32	4 1/32	4 11/32	4 11/32	4 15/32	4 15/32	4 19/32	5 1/32	5 1/32	5 1/32	5 1/32	5 1/2	5 1/2	5 1/2				
3 9/16	3.500(3 1/2)	X	4 3/32	4 5/32	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 13/16	4 13/16	4 13/16	4 13/16	5 1/16	5 3/16	5 3/16	5 3/16	5 3/16	5 3/16	6 3/32	6 3/32	6 3/32	6 11/16			
3 9/16	3.500(3 1/2)	Y	4 3/32	4 5/32	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 13/16	4 13/16	4 13/16	5 1/16	5 3/16	5 3/16	5 3/16	5 3/16	5 3/16	6 3/32	6 3/32	6 3/32	6 11/16	6 11/16			
3 9/16	3.500(3 1/2)	Z	4 3/32	4 5/32	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 13/16	4 13/16	4 13/16	5 1/16	5 3/16	5 3/16	5 3/16	5 3/16	6 3/32	6 3/32	6 3/32	6 11/16	6 11/16	6 11/16		
3 9/16	3.500(3 1/2)	AA	4 3/32	4 5/32	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	4 13/16	4 13/16	4 13/16	5 1/16	5 3/16	5 3/16	5 3/16	5 3/16	6 3/32	6 3/32	6 3/32	6 11/16	6 11/16	6 11/16	6 11/16	
4 1/16	4.000(4)	BB	4 15/32	4 15/32	4 17/32	4 27/32	5 1/32	5 1/32	5 1/32	5 13/32	5 13/32	5 13/16	5 13/16	5 21/32	6 3/32	6 3/32	6 3/32	6 3/32	6 3/16	6 3/16	6 3/16	7 3/32	7 3/32	7 3/16	7 3/32	7 21/32

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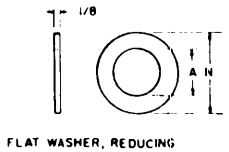
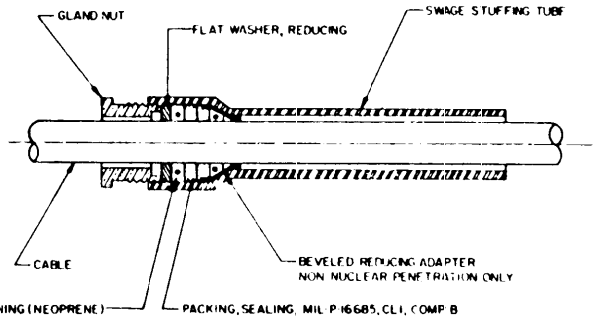
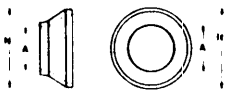
FIGURE 3B49. MIL-S-24235/18 Stuffing tube and kickpipes minimum spacing.

STUFFING TUBES BEVEL REDUCING ADAPTER ASSEMBLIES
(MIL-S-24235/18)

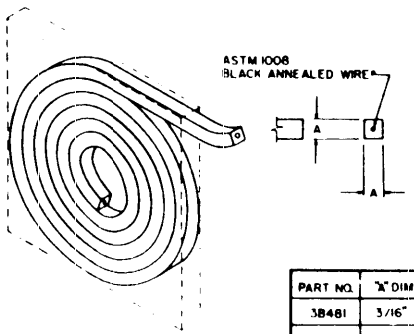


FLAT WASHER, REDUCING





BEVELED REDUCING ADAPTER

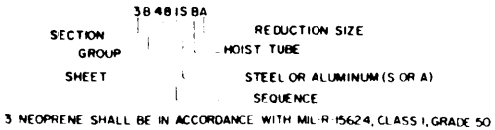


PART NO.	"A" DIM
3B481	3/16"
3B482	1/4"
3B483	5/16"
3B484	3/8"
3B485	7/16"
3B486	1/2"
3B487	9/16"

REINFORCED NEOPRENE PACKING

ADAPTER SET (STEEL)	ADAPTER SET (ALUMINUM)	EXISTING TUBE	"N" DIM O.D	EFFECTIVE REDUCTION SIZE	"A" DIM I.D
3B481SBA	3B481ABA	B	0.875	A	0.406
3B482SDA	3B482ADA	D	1.032	A	.406
3B483SDB	3B483ADB	D	1.032	B	.515
3B484SDC	3B484ADC	D	1.032	C	.640
3B485SGB	3B485AGB	G	1.360	B	.516
3B486SGC	3B486AGC	G	1.360	C	.640
3B487SGD	3B487AGD	G	1.360	D	.750
3B488SGE	3B488AGE	G	1.360	E	.812
3B489SGF	3B489AGF	G	1.360	F	.843
3B481OSLG	3B481OALG	L	1.703	G	.953
3B481ISLJ	3B481IALJ	L	1.703	J	1.062
3B481 2SLK	3B481 2ALK	L	1.703	K	1.172
3B481 3SNL	3B481 3ANL	N	1.875	L	1.265
3B481 4SNM	3B481 4ANM	N	1.875	M	1.406
3B481 5SSN	3B481 5ASN	S	2.562	N	1.515
3B481 6SSP	3B481 6ASP	S	2.562	P	1.625
3B481 7SSR	3B481 7ASR	S	2.562	R	1.750
3B481 8SWS	3B481 8AWS	W	3.000	S	1.875
3B481 9SWT	3B481 9AWT	W	3.000	T	2.062
3B4820SWV	3B4820AWV	W	3.000	V	2.187
3B4821SAAX	3B4821AAAX	AA	3.625	X	2.500
3B4822SAAY	3B4822AAAX	AA	3.625	Y	2.609
3B4823SAAZ	3B4823AAAZ	AA	3.625	Z	2.781

NOTES:
1. ADAPTER SET CONSIST OF ONE FLAT WASHER AND ONE BEVEL REDUCING ADAPTER
2. DEFINITION OF ADAPTER SETS NUMBERING SYSTEM FOLLOWS

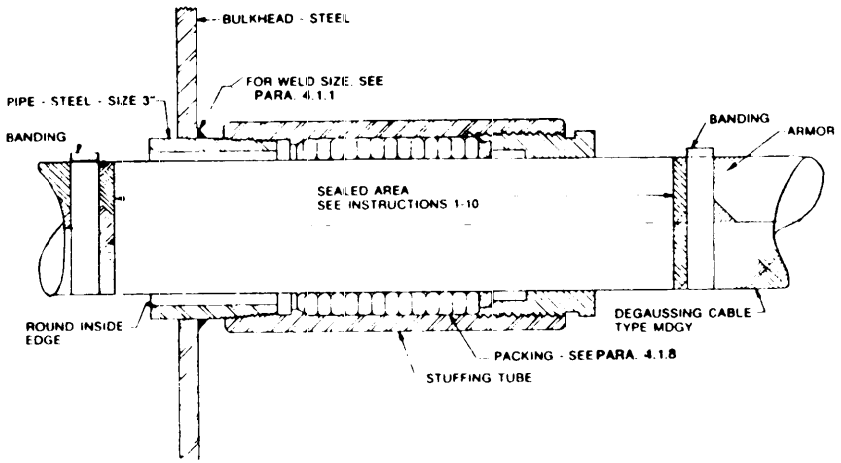


3. NEOPRENE SHALL BE IN ACCORDANCE WITH MIL-R-15624, CLASS 1, GRADE 50
4. THIS FIGURE SUPERSEDES SHEET 3B48 OF DRAWING 803-5001027

SH 132317149

FIGURE 3B48. Stuffing tubes bevel reducing adapter assemblies (MIL-S-24235/18).

3B471

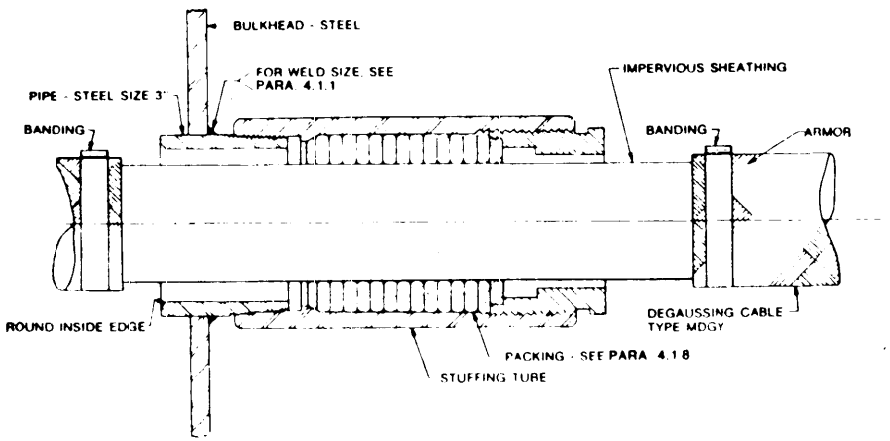


NOTE:
1. THIS FIGURE SUPERSEDES SHEET 3B47 OF DRAWING 803-5001027 AND SECTION 4 SHEET 148, OF DRAWING , NAVSEC NO 9000-S6202-73980

3B471

INSTRUCTIONS
1. CUT AWAY THE OUTER ARMOR IN THE WAY OF THE STUFFING TUBE AND REMOVE THE DUCK TAPE DOWN TO THE IMPERVIOUS SHEATHING
2. CLEAN THE IMPERVIOUS SHEATHING TO ALLOW BONDING OF THE SEALANT
3. WRAP THE CABLE AREA TO BE SEALED, WITH LAYERS OF POROUS PLASTIC SPACER TAPE UNTIL THE DIAMETER OF THE AREA TO BE SEALED IS NEARLY EQUAL TO THE OUTER DIAMETER OF THE MDGY CABLE
4. ATTACH THE INJECTION FITTING NEAR THE CENTER OF THE AREA TO BE SEALED
5. COVER THE AREA TO BE SEALED WITH A LAYER OF NO 72 SCOTCH ELECTRIC TAPE TO FORM THE OUTER MOLD FOR THE RESIN AND TO SECURE THE INJECTION FITTING IN PLACE
6. COVER THE ELECTRICAL TAPE WITH A CLOTH TAPE TIGHTLY WRAPPED TO RESTRAIN THE MOLD WHEN IT IS UNDER PRESSURE
7. INJECT "SCOTCHCAST" RESIN NO. 4 (MINNESOTA MINING & MFG. CO.) INTO THE SEALING AREA BY MEANS OF A PRESSURE GUN ATTACHED TO THE INJECTION FITTING
8. PRICK PIN HOLES THROUGH THE ELECTRICAL TAPE NEAR THE EXTREMITIES OF THE SEAL. THE SEALING AREA IS FILLED AND VOID FREE WHEN DROPS OF RESIN FORM AT THE PIN HOLES
9. AFTER THE RESIN HAS CURED, REMOVE THE CLOTH TAPE AND CUT OFF THE INJECTION FITTING
10. POSITION THE MOLDED AREA OF THE MDGY CABLE WITHIN THE STUFFING TUBE AND TIGHTEN GLAND NUT

3B472



3B472
ALTERNATE TO METHOD 3B471

INSTRUCTIONS
1. CUT AWAY THE OUTER ARMOR IN THE WAY OF THE STUFFING TUBE AND REMOVE THE DUCK TAPE DOWN TO THE IMPERVIOUS SHEATHING
2. INSERT EXTRA PACKING RINGS IN STUFFING TUBE
3. POSITION THE IMPERVIOUS SHEATHING AREA WITHIN THE STUFFING TUBE AND TIGHTEN GLAND NUT

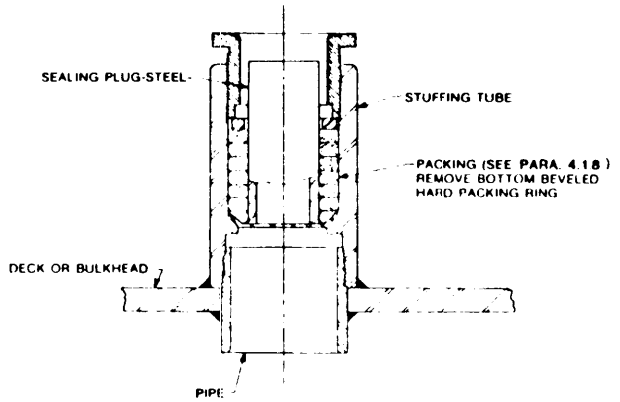
SH 132317148

FIGURE 3B47. Sealing degaussing cable in bulkhead stuffing tubes.

3B461

SEALING UNUSED STUFFING TUBES
IN DECKS AND BULKHEADS

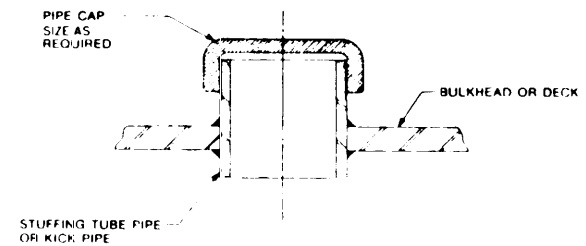
SEALING PLUG MIL-S-24235/19
APPLICABLE TO ALL DECK AND BULKHEAD TYPES



NOTES:
1. APPLICATION OF THE METHODS SHOWN (3B461 & 3B462) ARE INTENDED FOR EXISTING INSTALLED STUFFING TUBES WHOSE CABLES HAVE BEEN REMOVED AND NOT NECESSARILY REPLACED.
2. THIS FIGURE SUPERSEDES SHEET 3B46 OF DRAWING 803-5001027, SECTION 4, SHEET 17 OF DRAWING NAVSEC NO. 9000-S6202-73980.

3B462

SEALING UNUSED KICKPIPES AND
STUFFING TUBES WITH REMOVABLE
STUFFING TUBE BODY

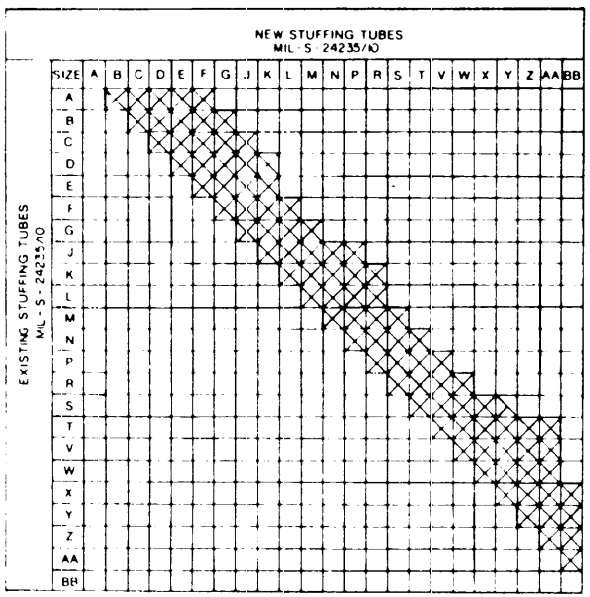


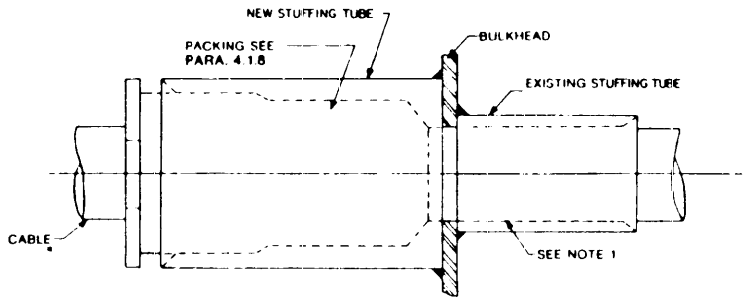
SH 132317147

FIGURE 3B46. Sealing unused stuffing tubes in medium steel bulkheads and decks.

NOTES:
1. TABLE B INDICATES NEW TUBE SIZE LIMITATIONS FOR ADAPTATION TO UNDERSIZED NON-REUSABLE STUFFING TUBES.
2. REAM SMOOTH AND ROUND OFF INSIDE EDGE OF EXISTING TUBE TO PREVENT CABLE CHAFING.
3. THIS FIGURE SUPERSEDES SHEET 3B45 OF DRAWING 803-5001027 SECTION 4, SHEET 103, OF DRAWING NAVSEC NO. 9000-S6202-73980.

TABLE A
STUFFING TUBE SIZES FOR ADAPTATION TO EXISTING UNDERSIZED STUFFING TUBES OF THE SAME TYPE TO ACCOMMODATE LARGER SIZE CABLE





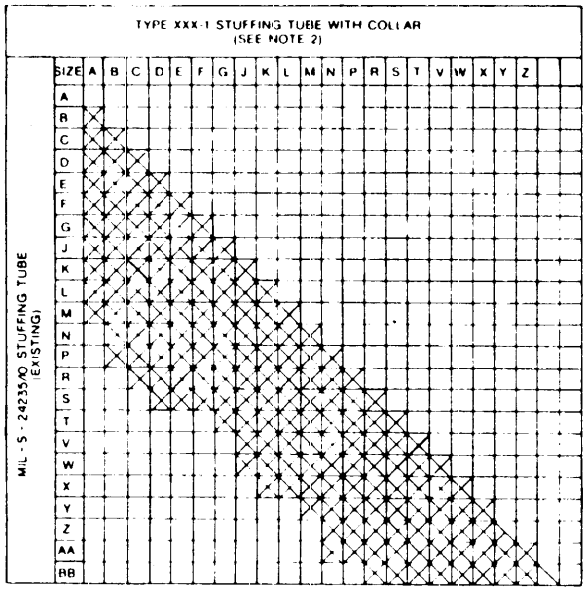
TYPICAL INSTALLATION

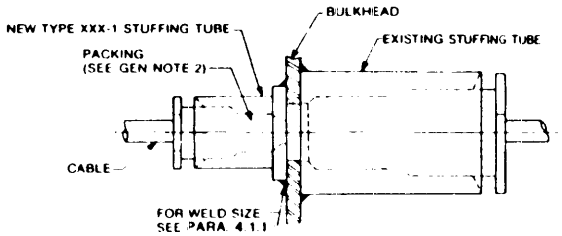
FIGURE 3B45. Changing stuffing tube sizes to accommodate larger cable.

NOTES:
1. FOR ALTERNATE METHODS, SEE METHOD 3B431.
2. THE USE OF THE METHOD SHOWN (3B441) DEPENDS UPON THE AVAILABILITY OF TYPE XXX-1 STUFFING TUBES, WHICH ARE OBSOLETE.
3. DICARD METAL GLAND WASHER BUT RETAIN GLAND NUT OF EXISTING TUBE TO PREVENT CABLE CHAFING.
4. TABLE A INDICATES TYPE XXX-1 TUBE SIZE LIMITATIONS FOR ADAPATION TO OVERSIZED NON-REUSABLE STUFFING TUBES.
5. THIS FIGURE SUPERSEDES SHEET 3B44 OF DRAWING 803-5001027 AND SECTION 4, SHEET 103 , OF DRAWING NAVSEC NO. 9000-73980.

TABLE A

TYPE XXX-1 STUFFING TUBE SIZES (WITH COLLAR) FOR ADAPTATION TO EXISTING OVERSIZED STUFFING TUBES TO ACCOMMODATE SMALLER CABLE



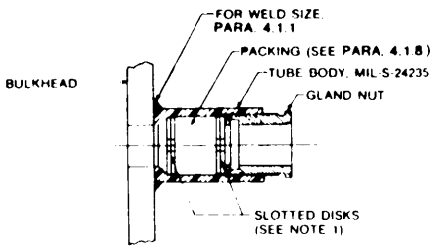


TYPICAL INSTALLATION

FIGURE 3B44. Changing stuffing tube sizes to accommodate smaller cables.

SH 132317145

3B43I
(SEE NOTE 2)



NOTES:
1. CUT A SLOT IN A DISK OR WASHER ON ONE SIDE OF THE CABLE HOLE ONLY. TWO SLOTTED DISKS OR SLOTTED WASHERS ARE THEN SLIPPED AROUND THE CABLE BOTH IN THE GLAND BOTTOM AND UNDER THE GLAND NUT. TO HOLD THE PACKING SECURELY IN PLACE.
2. THIS METHOD IS AN ALTERNATE TO METHOD 3B441.
3. THIS FIGURE SUPERSEDES SHEET 3B43 ON DRAWING 803-5001027 AND SECTION 4, SHEET 114 OF DRAWING , NAVSEC NO. 9000-S6202-73980.

FIGURE 3B43. Adapting stuffing tubes for smaller size cables using slotted packing disks.

NOTES:
1. FOR OBSOLETE CABLES AND COAXIAL CABLES SEE FIGURE 3B26.

CABLE TYPE	CABLE DIAMETER IN INCHES	CABLE DIAMETER IN MM	INSERT BLOCK PART NUMBER	INSERT BLOCK PART NUMBER
TNW-3	0.411	10.44	20/10	
TNW-4	0.445	11.40	20/11	
TNW-9	0.625	15.88	30/15	
TNW-14	0.670	17.02	30/17	
TNW-23	0.760	19.30	30/19	
TNW-50	0.969	24.61	30/24	40/24
TNW-75	1.134	28.80	40/28	
TNW-100	1.266	32.16	40/32	60/32
TNW-150	1.515	38.48	60/38	
TPNW-1/2	0.220	5.59	15/5	20/5
TPNW-3	0.290	7.37	15/7	20/7
TPNW-5	0.340	8.64	15/8	20/8
TPNW-10	0.450	11.43	20/11	
TPNW-15	0.510	12.95	20/13	30/13
TPNW-20	0.560	14.22	20/14	30/14
TPNW-30	0.680	17.27	30/17	
TPNW-40	0.750	19.05	30/19	
TPS-5	0.475	12.07	20/12	30/12
TPS-4	0.553	14.05	20/14	30/14
TPS-6	0.620	15.75	30/15	
TPS-9	0.657	16.69	30/16	
TPS-14	0.751	19.08	30/19	
TPS-23	0.866	22.00	30/22	40/22
TPS-30	0.976	24.79	30/24	40/24
TPU-6	1.000	25.40	30/24	40/24
TRF-105	0.760	19.30	30/19	
TRF-133	0.810	20.75	30/20	
TRF-168	0.860	21.84	30/21	
TRW-	0.710	18.03	30/18	
TRXF-84	0.600	15.24	30/15	
TRXF-105	0.680	17.24	30/17	
TRXF-133	0.750	19.05	30/19	
TSGA-3	0.461	11.71	20/11	
TSGA-4	0.499	12.68	20/12	30/12
TSGA-9	0.625	15.88	30/15	
TSGA-14	0.770	19.56	30/19	
TSGA-23	0.812	20.62	30/22	40/22
TSGA-50	1.019	25.88	30/24	40/24
TSGA-75	1.184	30.07	40/30	
TSGA-100	1.316	33.42	40/32	60/32
TSGA-150	1.565	39.75	60/38	
TSGA-200	1.719	43.66	60/42	
TSGA-300	2.007	50.89	60/50	90/50
TSGA-400	2.253	57.23	60/54	
TSGU-3	0.411	10.44	20/10	
TSGU-4	0.449	11.40	20/11	
TSGU-9	0.575	14.61	20/14	30/14
TSGU-14	0.720	18.29	30/18	
TSGU-23	0.870	22.10	30/22	40/22
TSGU-50	0.969	24.61	30/24	40/24
TSGU-75	1.134	28.80	40/28	
TSGU-100	1.266	32.16	40/32	60/32
TSGU-150	1.515	38.48	60/38	
TSGU-200	1.669	42.39	60/42	
TSGU-300	1.957	49.71	60/50	90/50
TSGU-400	2.203	55.96	90/55	
TSP-11	0.735	18.67	30/18	
TSP-31	1.062	26.97	40/26	

CABLE TYPE	CABLE DIAMETER IN INCHES	CABLE DIAMETER IN MM	INSERT BLOCK PART NUMBER	INSERT BLOCK PART NUMBER
TSS-2	0.400	10.16	20/10	
TSS-3	0.500	12.70	20/12	30/12
TSS-4	0.500	12.70	20/12	30/12
TTQP-5	0.480	12.19	20/12	30/12
TTQP-8	0.590	14.99	20/14	30/14
TTQP-10	0.700	17.78	30/17	
TTQP-15	0.830	21.08	30/21	
TTRS-2	0.680	17.27	30/17	
TTRS-4	0.740	18.80	30/18	
TTRS-6	0.880	22.35	30/22	40/22
TTRS-8	0.990	25.15	30/24	40/24
TTRS-10	1.080	27.43	40/26	
TTRS-12	1.100	27.94	40/26	
TTRS-16	1.190	30.23	40/30	
TTSA-1/2	0.380	9.65	20/9	
TTSA-3	0.500	12.70	20/12	30/12
TTSA-5	0.590	14.99	20/14	30/14
TTSA-10	0.725	18.42	30/18	
TTSA-15	0.850	21.59	30/21	
TTSA-20	0.920	23.37	30/23	
TTSA-30	1.130	28.70	40/28	
TTSA-40	1.250	31.75	40/30	
TTSA-50	1.450	36.83	40/34	60/34
TTSA-60	1.500	38.10	60/36	
TTSU-1/2	0.330	8.38	15/8	20/8
TTSU-3	0.450	11.43	20/11	
TTSU-5	0.540	13.72	20/13	30/13
TTSU-10	0.675	17.15	30/17	
TTSU-15	0.800	20.32	30/20	
TTSU-20	0.870	22.10	30/22	40/22
TTSU-30	1.080	27.43	40/26	
TTSU-40	1.200	30.48	40/30	
TTSU-50	1.400	35.56	40/34	60/34
TTSU-60	1.450	36.83	60/36	
TSWU-44	0.990	25.15	30/24	40/24
TSWU-5	0.500	12.70	20/12	30/12
TSWU-70	1.555	39.50	60/38	
TSU-36	0.985	25.02	30/24	40/24
TSU-60	1.310	33.27	40/32	60/32
TSWU-2	0.455	11.56	20/11	
TSWU-4	0.870	22.10	30/22	40/22
TSWU-20	1.030	26.16	40/26	
TSWU-30	1.200	30.48	40/30	
TSWF-2	0.625	15.88	30/15	
TSOMU-16	0.825	20.96	30/20	
TSOMU-20	0.905	22.99	30/22	40/22
TSOMU-40	1.185	30.10	40/30	
TSOMU-70	1.555	39.50	60/38	
TSSOMU-8	1.030	26.16	40/26	
TAU-40	1.370	34.80	40/34	60/34

CABLE TYPE	CABLE DIAMETER IN INCHES	CABLE DIAMETER IN MM	INSERT BLOCK PART NUMBER	INSERT BLOCK PART NUMBER
TSU-3	0.520	13.21	20/13	30/13
TSU-7	0.660	16.76	30/16	
TSU-10	0.830	21.08	30/21	
TSU-14	0.930	23.62	30/23	
TSU-19	1.040	26.42	40/26	
TSU-24	1.210	30.73	40/30	
TSU-30	1.280	32.51	40/32	60/32
TSU-37	1.380	35.05	40/34	60/34
TSU-44	1.550	39.37	60/38	
TSU-61	1.740	44.20	60/44	
TSJ-22	0.203	5.16	15/5	20/5
TSJ-20	0.220	5.59	15/5	20/5
TSJ-18	0.246	6.25	15/6	20/6
TSJ-16	0.265	6.73	15/6	20/6
TSJ-14	0.302	7.67	15/7	20/7
TSJ-12	0.400	10.16	20/10	
TSJ-11	0.445	11.30	20/11	
TSJ-9	0.530	13.46	20/13	30/13
TSJ-7	0.605	15.37	30/15	
TSWAU-3	0.520	13.21	20/12	30/12
TSWAU-7	0.660	16.76	30/16	
TSWAU-10	0.830	21.08	30/21	
TSWAU-14	0.930	23.62	30/23	
TSWAU-19	1.040	26.42	40/26	
TSWAU-24	1.210	30.73	40/30	
TSWAU-30	1.280	32.51	40/32	60/32
TSWAU-37	1.380	35.05	40/34	60/34
TSWAU-44	1.550	39.37	60/38	
TSWAU-61	1.740	44.20	60/44	
TSWF-3	0.625	15.88	30/15	
TSWF-4	0.625	15.88	30/16	
TSWF-7	0.815	20.70	30/20	
TSWU-7	0.910	23.11	30/23	
TSWU-1	0.255	6.48	15/6	20/6
TSWU-3	0.710	18.03	30/18	
TSWU-7	0.910	23.11	30/23	
TSWU-12	1.200	30.48	40/30	
TSWU-19	1.380	35.05	40/34	60/34
TSWU-24	1.580	40.38	60/40	
TSWU-30	1.760	44.70	60/44	
TSWU-37	1.870	47.50	60/46	
TSWU-44	2.300	58.42	90/55	
TU-10	0.480	12.19	20/12	30/12
TU-15	0.560	14.22	20/14	30/14
TU-19	0.580	14.73	20/14	30/14
TU-30	0.700	17.78	30/17	
TU-45	0.870	22.10	30/22	40/22
TU-60	0.960	24.38	30/24	40/24
TWAU-40	1.370	34.80	40/34	60/34
TSU-3	0.700	17.78	30/17	
TSU-7	0.910	23.11	30/23	
TSU-10	1.190	30.23	40/30	
TSU-14	1.290	32.77	40/32	60/32
TSU-19	1.430	36.32	40/34	60/34
TSU-24	1.670	42.42	60/42	
TSU-30	1.770	44.96	60/44	
TSU-37	1.930	49.02	60/48	
TSU-44	2.150	54.61	90/55	
TSF-7	1.040	26.42	40/26	

CABLE TYPE	CABLE DIAMETER IN INCHES	CABLE DIAMETER IN MM	INSERT BLOCK PART NUMBER	INSERT BLOCK PART NUMBER
TSJ-22	0.217	5.51	15/5	20/5
TSJ-20	0.234	5.94	15/5	20/5
TSJ-18	0.264	6.71	15/6	20/6
TSJ-16	0.285	7.24	15/7	20/7
TSJ-14	0.325	8.26	15/8	20/8
TSJ-12	0.440	11.18	20/11	
TSJ-9	0.600	15.24	20/14	30/14
TSWU-3	0.700	17.78	30/17	
TSWU-7	0.910	23.11	30/23	
TSWU-10	1.190	30.23	40/30	
TSWU-14	1.290	32.77	40/32	60/32
TSWU-19	1.430	36.32	40/34	
TSWU-24	1.670	42.42	60/42	
TSWU-30	1.770	44.96	60/44	
TSWU-37	1.930	49.02	60/48	
TSWU-44	2.150	54.61	90/55	
TU-3	0.620	15.75	30/15	
TU-7	0.810	20.57	30/20	
TU-12	1.090	27.69	40/26	
TNW-8	0.740	18.80	30/18	
TSJ-20	0.280	7.11	15/7	20/7
TSJ-16	0.325	8.26	15/8	20/8
TSJ-14	0.370	9.40	15/9	20/9
TXVTSGA-100	1.730	43.47	60/44	
TXVTSGA-150	2.000	50.80	60/50	90/50
TXVTSGA-200	2.270	57.66	90/55	
TXVTSGA-300	2.500	63.50	90/60	
TXVTSGA-400	2.650	67.31	90/65	
TXVTSGA-100	1.740	44.20	60/40	
TXVTSGA-150	1.950	49.53	60/50	90/50
TXVTSGA-200	2.220	56.39	90/55	
TXVTSGA-300	2.450	62.23	90/60	
TXVTSGA-400	2.60	66.04	90/65	
TSS-	0.560	14.22	20/14	30/14
TSGA-100	1.650	41.91	60/40	
TSGA-125	1.840	46.74	60/44	
TSGA-150	2.010	51.05	60/50	90/50
TSGA-200	2.250	57.15	90/55	
TSGU-100	1.600	40.64	60/40	
TSGU-125	1.790	45.47	60/44	
TSGU-150	1.960	49.78	60/50	90/50
TSGU-200	2.200	55.88	90/55	
TPS-6	0.775	19.69	30/19	
TSGA-3	0.595	15.11	30/15	
TSGA-4	0.645	16.38	30/16	
TSGU-3	0.595	13.84	20/13	30/13
TSGU-4	0.595	15.11	30/15	
TSS-2	0.625	15.88	30/15	
TNW-6	0.670	17.02	30/17	

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FIGURE 3B42. Multiple cable penetrator cable assignment (type RGS and RGA).

CABLE TYPE	CABLE DIAME-TER IN INCHES	CABLE DIAME-TER IN MM	INSERT BLOCK PART NUMBER SIZE MM	INSERT BLOCK PART NUMBER SIZE MM
CVSF- 4	1 450	36 83	60 36	
DCOP - 1	0 250	6 35	15/6	20/6
DCOP-1½	0 315	8 00	15/7	20/7
DCOP- 2	0 330	8 38	15/8	20/8
DHOF - 3	0 425	10 80	20/10	
DHOF - 4	0 460	11 68	20/11	
DHOF - 6	0 510	12 95	20/12	30/12
DHOF - 9	0 570	14 48	20/14	30/14
DHOF -14	0 705	17 91	30/17	
DHOF -23	0 860	21 84	30/21	
DHOF -30	0 960	24 38	30/24	40/24
DHOF-83	1 450	36 83	60/36	
DHOF-250	2 100	53 34	60/52	
DHOF400	2 500	63.50	90/52	
DLT - 4	0.710	1803	30/18	
DNW - 3	0 390	991	15/9	20/9
DNW - 4	0 430	10 92	20/10	
DNW - 9	0 545	13 84	20/13	30/13
DNW - 14	0 610	15 49	30/15	
DNW -23	0 690	17 53	30/17	
DNW -50	0 910	23 11	30/23	
DNW - 75	1 080	27 43	40/23	
DNW -400	1 170	29 72	40/30	
DPS - 3	0 455	11 56	20/11	
DPS - 4	0 489	12 42	20/12	30/12
DPS - 6	0 585	14 86	20/14	30/14
DPS - 9	0 628	15 95	30/15	
DPS - 14	0 730	1854	30/18	
DRW -	0.670	17 02	30/17	
DSGA - 3	0 441	11 20	20/11	
DSGA - 4	0 477	11 35	20/12	30/12
DSGA - 9	0 594	15 09	30/15	
DSGA 14	0 720	18 29	30/18	
DSGA 23	0 865	21 97	30/22	40/22
DSGA-50	0 961	24 41	30/24	40/24
DSGA-75	1 124	28 55	40/28	
DSGA100	1 217	30 91	40/30	
DSGA200	1 633	41 48	60/40	
DSGA 300	1 891	48 03	60/48	
DSGA-400	2 119	53 82	60/52	
DSGU- 3	0 391	9 93	15/9	20/9
DSGU- 4	0 427	10 85	20/10	
DSGU- 9	0 544	13 82	20/13	30/13
DSGU-14	0 670	17 02	30/17	
DSGU-23	0 815	20 70	30/20	
DSGU-50	0 911	23 14	30/23	
DSGU-75	1 074	27 28	40/26	
DSGU100	1 167	29 64	40/28	
DSGU200	1 583	40 21	60/40	
DSGU-300	1 841	46 76	60/46	
DSGU-400	2 069	52 55	60/52	
DSS - 2	0 390	9 91	15/9	20/9
DSS - 3	0 500	12 70	20/12	30/12
DSS - 4	0 500	12 70	20/12	30/12
DSWS-4	0 800	20 32	30/20	
ECM_	1 370	34 80	40/34	60/34

CABLE TYPE	CABLE DIAME-TER IN INCHES	CABLE DIAME-TER IN M M	INSERT BLOCK PART NUMBER SIZE MM	INSERT BLOCK PART NUMBER SIZE MM
FHOF - 3	0 480	12 19	20/12	30/12
FHOF- 4	0 520	13 97	20/13	30/13
FHOF - 9	0 660	16 76	30/16	
FHOF-42	1 380	35 05	40/34	60/34
FHOF-60	1 510	38 35	40/38	60/38
FHOF-133	2 000	50 80	60/50	90/50
FNW - 3	0 447	11 35	20/11	
FNW - 4	0 513	13 03	20/13	30/13
FNW - 9	0 630	16 00	30/16	
FNW -23	0 830	21 08	30/21	
FPS - 14	0 815	20 70	30/20	
FSGA - 3	0 497	12 62	20/12	30/12
FSGA - 4	0 563	14 30	20/14	30/14
FSGA - 9	0 680	17 27	30/17	
FSGA-23	0 890	22 61	30/22	40/22
FSGA-50	1 100	27 94	40/26	
FSGA-75	1 290	32 77	60/32	
FSGA 100	1 408	35 76	60/34	
FSGA-150	1 675	42 55	60/42	
FSGA-200	1 870	47 50	60/46	
FSGU- 3	0 447	11 35	20/11	
FSGU- 4	0 513	13 03	20/13	30/13
FSGU- 9	0 630	16 00	30/16	
FSGU-23	0 950	24 13	30/24	40/24
FSGU-50	1050	26 67	40/26	
FSGU-75	1 240	31 50	40/30	
FSGU-100	1 358	34 48	40/34	60/34
FSGU-150	1 625	41 28	60/40	
FSGU-200	1 820	46 23	60/46	
FSS - 2	0.500	12 70	20/12	30/12
FSS - 3	0.500	12 70		
FSS - 4	0.625	15.88	30/15	
MU - 14	0.400	10 16	20/10	
MCOS-2	0.460	11.68	20/11	
MCOS-4	0.510	12 95	20/12	30/12
MCOS-5	0.390	9 91	15/9	20/9
MCOS-6	0.465	11 81	20/11	
MCOS-7	0.595	15.11	30/15	
MCSF- 4	1.500	38.10	60/38	
MDU - 6	1.000	25.40	30/24	40/24
MDU -14	1.395	35.45	40/34	60/34
MDU-23	1.765	44.83	60/44	
MDU-40	2.040	51 82	60/50	90/50
MDU-60	2.330	59 18	90/60	
MHOF- 7	0.500	12 70	20/12	30/12
MHOF-10	0.585	14.86	20/14	30/14
MHOF -14	0.635	16 13	30/16	
MHOF-19	0.705	17.91	30/17	
MHOF-24	0.795	20.19	30/20	
MHOF- 30	0.835	21 21	30/21	
MHOF- 37	0.925	23 50	30/23	
MHOF- 44	1.000	25.40	40/26	
MHOF-61	1.175	29.85	40/30	
MMOP- 5	0.305	7.75	15/7	

CABLE TYPE	CABLE DIAME-TER IN INCHES	CABLE DIAME-TER IN MM	INSERT BLOCK PART NUMBER SIZE MM	INSERT BLOCK PART NUMBER SIZE MM
MNW - 7	0 390	9 91	15/9	20/9
MNW -10	0 480	12 19	20/12	30/12
MNW -14	0 515	13 08	20/13	30/13
MNW -19	0 560	14 22	20/14	30/14
MNW -24	0 650	16 51	30/16	
MNW-30	0 685	17 40	30/17	
MNW-37	0 740	18 80	30/18	
MNW-44	0 840	21.34	30/21	
MS - 37	0 800	20 32	30/20	
MSCA- 7	0 534	13 56	20/13	30/13
MSCA-10	0 672	17.07	30/17	
MSCA-14	0 718	18 24	30/18	
MSCA 19	0 788	20 02	30/19	
MSCA-24	0 950	22 99	30/22	40/22
MSCA-30	0 951	24 16	30/24	40/24
MSCA-37	1 052	26 72	40/26	
MSCA-44	1 164	29 59	40/28	
MSCA-61	1 300	33 02	40/32	60/32
MSCA-91	1 530	38 86	60/38	
MSCU- 7	0 484	12 29	20/12	30/12
MSCU-10	0 622	15 80	30/15	
MSCU-14	0 668	16 97	30/16	
MSCU-19	0 738	18 74	30/18	
MSCU-24	0853	21 72	30/21	
MSCU-30	0 901	22 89	30/22	40/22
MSCU-37	1.002	25 45	30/24	40/24
MSCU-44	1.114	28 30	40/28	
MSCU-61	1 250	31 75	40/30	
MSCU-91	1.480	37.59	60/36	
MSP - 59	1.635	41.53	60/40	
MWF - 7	0 500	12 70	20/12	30/12
MWF -10	0 635	16 13	30/16	
MWF -14	0 635	16 13	30/16	
MWF -19	0 745	18 92	30/18	
MWF -24	0 836	21 23	30/21	
MWF -30	0 945	24 00	30/24	40/24
MWF-37	1.045	26.54	40/26	
PBTMU-5	0540	13 72	20/13	30/13
PBTMU-15	0750	19.05	30/19	
PBTMU30	0.980	24.89	40/24	
PI - 3	0 685	17 40	30/17	
PI - 7	0 900	22 86	30/22	40/22
PI - 12	1 155	29 34	40/30	
SHOF - 3	0 210	5 33	15/9	20/5
SHOF -25	0 480	11 68	20/11	
SHOF 60	0 600	15 24	30/13	
SHOF-150	0 870	22.10	30/22	40/22
SHOF200	0 980	24.89	30/24	40/24
SHOF-250	1 085	27 56	40/26	
SHOF-500	1 450	36 83	60/30	
SHOF-650	1610	40 89	60/40	
SHOF 800	1 670	42 42	60/42	
SRW -	0.400	10 16	20/10	
SSF 300	1.100	27 94	40/28	

CABLE TYPE	CABLE DIAME-TER IN INCHES	CABLE DIAME-TER IN MM	INSERT BLOCK PART NUMBER SIZE MM	INSERT BLOCK PART NUMBER SIZE MM
SSGA- 50	0 570	14 48	20/14	30/14
SSGA 75	0 652	18 56	30/18	
SSGA 100	0 719	18 26	30/18	
SSGA 200	0 922	23 42	30/23	
SSGA 300	1 051	26 70	40/26	
SSGA 400	1 168	29 67	40/28	
SSGA 650	1 421	36 09	60/36	
SSGA 800	1 535	38 99	60/38	
SSGA 1000	1 535	42 42	60/42	
SSGA 1600	2 070	52 58	60/52	
SSGA 2000	2 260	57 30	90/55	
SSGU- 50	0 520	13 21	20/13	30/13
SSGU- 75	0 602	15 29	30/15	
SSGU 100	0 669	16 99	30/16	
SSGU 200	0 872	22 51	30/22	40/22
SSGU- 300	0.001	25 43	30/24	40/24
SSGU 400	1 118	28.40	40/28	
SSGU 650	1 371	34 82	40/34	60/34
SSGU 800	1 485	37 72	60/38	
SSGU 1000	1 620	41.15	60/40	
SSGU 1600	2 010	51 04	60/50	90/50
SSGU-2000	2 210	5613	90/55	
S2S -	0 500	12.70	20/12	30/12
TCJA-4	0480	12.19	20/12	30/12
TCJU-4	0430	10.92	20/10	
TCJX - 3	0742	18 85	30/18	
TCJX - 7	0 983	24 97	30/24	40/24
TCJX-12	1269	32 23	40/32	60/32
TCKX - 1	0456	11 58	20/11	
TCKX - 3	0 742	18 85	30/18	
TCKX - 7	0 983	2947	30/24	40/24
TCKX-12	1.269	32.23	40/32	60/32
TCOP- 2	0.345	8.77	15/8	20/8
TCTA- 4	0.480	12.19	20/12	30/12
TCTU-4	0.430	10.92	20/10	
TCTX - 1	0 350	8 89	15/8	20/8
TCTX - 3	0.552	14.02	20/14	30/14
TCTX - 7	0.731	18 57	30/18	
TCTX-12	0.964	24.49	30/24	40/24
THOF - 3	0.450	11 43	20/11	
THOF - 4	0.480	12 19	20/12	30/12
THOF - 6	0.550	13 97	20/13	30/13
THOF - 9	0.600	15 24	30/15	
THOF-14	0.750	19.05	30/19	
THOF-23	0.900	22 86	30/22	40/22
THOF- 42	1 250	31 75	40/30	
THOF 80	1.820	46 23	60/46	
THOF-250	2 240	56 90	90/55	
THOF400	2 800	71 12	90/70	
THOF 500	3 100	78 74	120/80	
THOF 600	3 150	80 01	120/80	

NOTES:
1. FOR OBSOLETE CABLES AND COAXIAL CABLES SEE FIGURE 3B26.
2. THIS FIGURE SUPERSEDES SHEET 3B41 OF DRAWING 803-5001027

FIGURE 3B41. Multiple cable penetrator cable assignment (type RGS and RGA).

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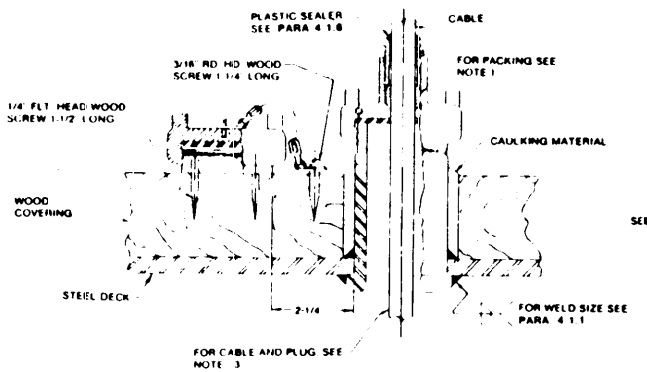
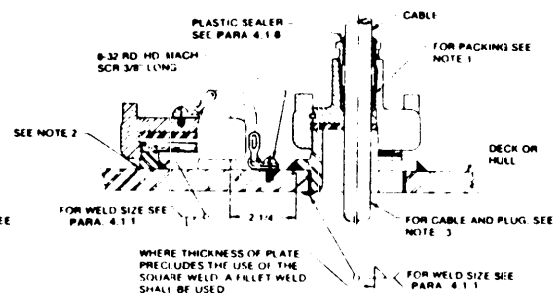
3B401

FOR PASSING CABLES THROUGH
WEATHER DECK WITH WOOD COVERING
SPEC MIL-S-24235



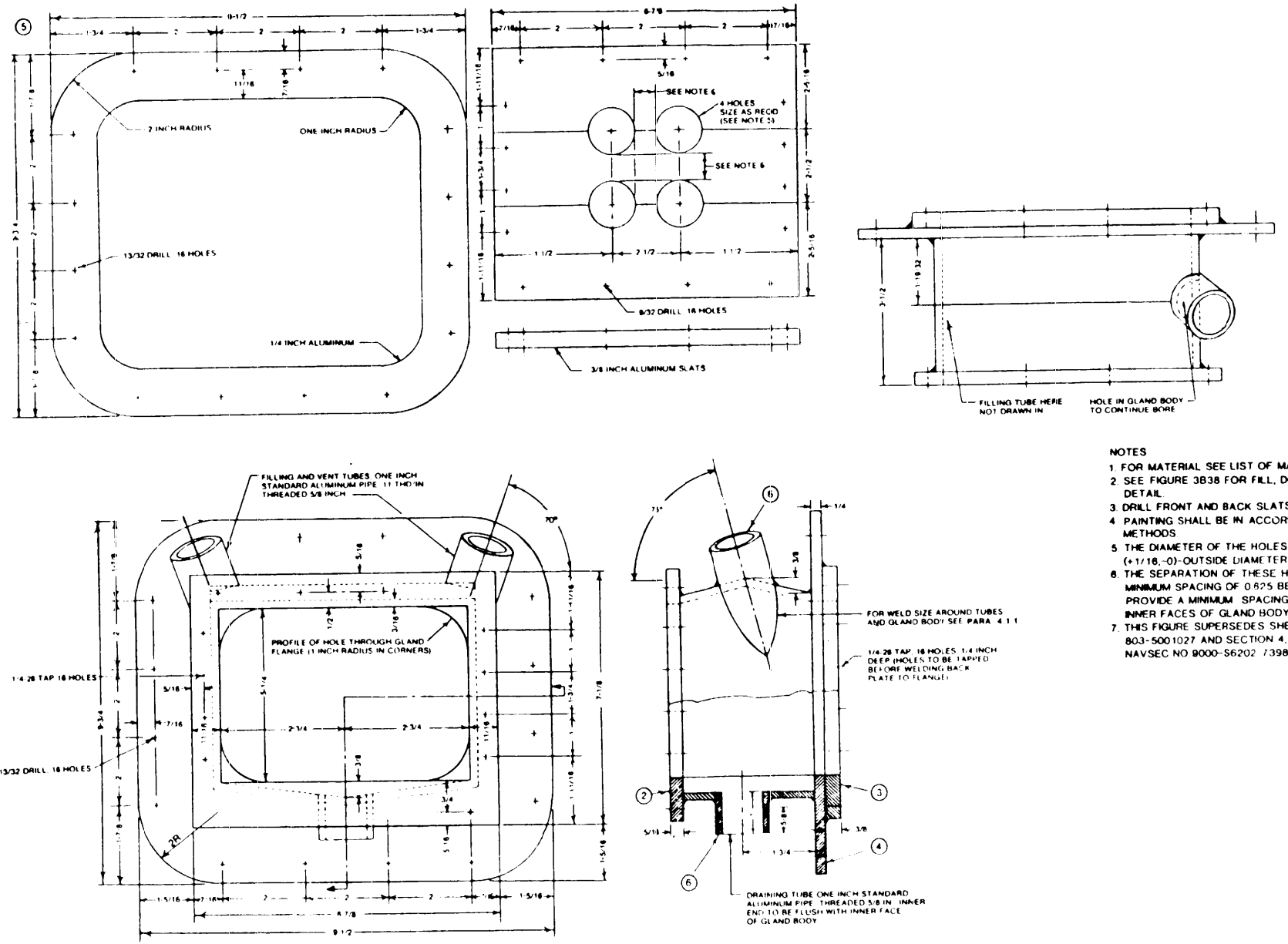
3B402

FOR PASSING CABLES THROUGH
WEATHER DECK AND HULL
SPEC MIL-S-24235



NOTES:
1. GLANDS OF OUTLETS SHALL BE PACKED WITH PREFABRICATED PACKING TYPE 2 SIZE "B" IN ACCORDANCE WITH SPEC MIL-P-16665.
2. AFTER WELDING DUMMY PLUG (SPEC MIL-P-24235) IN PLACE, AN APPROVED COAL TAR PITCH EMULSION SHALL BE USED TO SEAL THE CRACKS FILL THE INSIDE FLUSH.
3. OUTLETS ARE DESIGNED TO ACCOMMODATE A SINGLE CABLE AND TYPE CCC-2 PLUG IN ACCORDANCE WITH DRAWING MIL-R-2726/68.
4. THIS FIGURE SUPERSEDES SHEET 3B40 OF DRAWING 803-5001027 AND SECTION 4, SHEET 94 OF DRAWING NAVSEC NO 9000-S6202-73980.

FIGURE 3B40. Deck outlets for portable cables (surface ships).



NOTES

1. FOR MATERIAL SEE LIST OF MATERIAL ON FIGURE 3B38.
2. SEE FIGURE 3B38 FOR FILL, DRAIN & VENT CAP DETAIL.
3. DRILL FRONT AND BACK SLATS AT THE SAME TIME.
4. PAINTING SHALL BE IN ACCORDANCE WITH APPROVED METHODS.
5. THE DIAMETER OF THE HOLES SHOULD BE SAME SIZE (+1/16,-0)-OUTSIDE DIAMETER OF MINESWEEP CABLE USED.
6. THE SEPARATION OF THESE HOLES SHOULD PROVIDE A MINIMUM SPACING OF 0.625 BETWEEN CABLES AND ALSO PROVIDE A MINIMUM SPACING OF 0.5 BETWEEN CABLE AND INNER FACES OF GLAND BODY.
7. THIS FIGURE SUPERSEDES SHEET 3B39 OF DRAWING 803-5001027 AND SECTION 4,SHEET 146 OF DRAWING, NAVSEC NO 9000-S6202 -73980.

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FIGURE 3B39. Community stuffing tubes for minesweepers (details).

NOTE:

1. THIS FIGURE SUPERSEDES SHEET 3B37 OF DRAWING 803-5001027 AND SECTION 4, SHEET 159, OF DRAWING, NAVSEC NO. 9000-S6202-73980

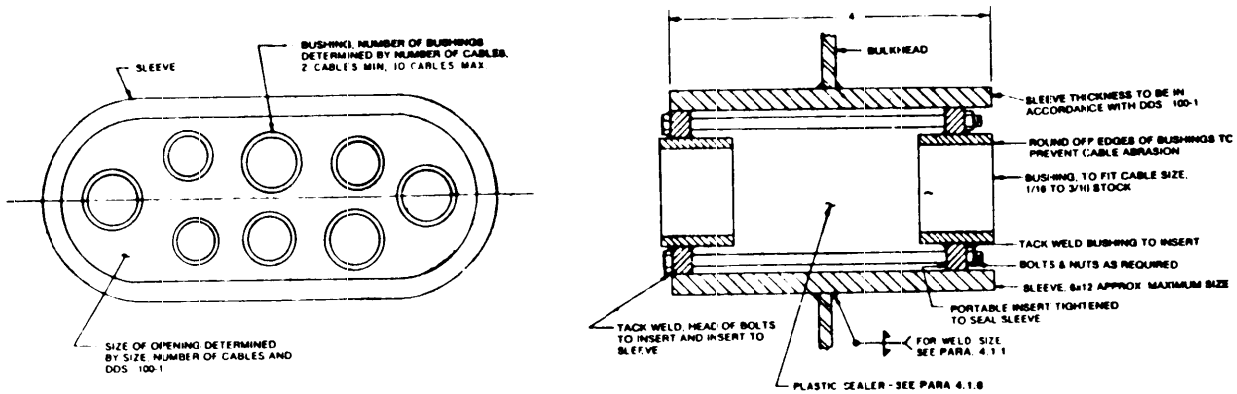
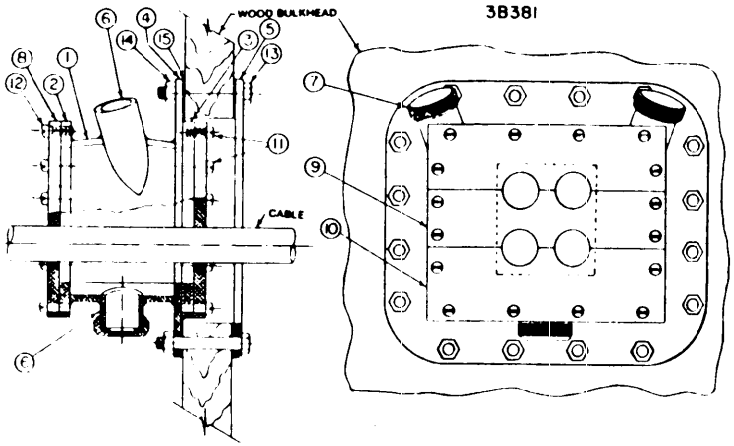


FIGURE 3B37. Community cable tube-watertight bulkheads (trowled seal).

NOTE:

1. THIS FIGURE SUPERSEDES SHEET 3B38 OF DRAWING 803-5001027 AND SECTION 4, SHEET 145, OF DRAWING, NAVSEC NO.9000-S6202-73980.



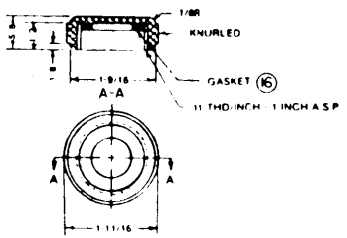
INSTALLATION NOTES

1. THE GLAND IS TO BE POSITIONED ON THE BULKHEAD SO THAT THERE IS REASONABLE ACCESS TO THE FILLING, DRAIN AND VENT TUBES, AND SO THAT THE TOP OF THE GLAND IS HORIZONTAL (MAXIMUM PERMISSIBLE TILT IS 5°)
2. AN OPENING 7-3/8 INCH HIGH BY 7-1/8 INCH WIDE SHOULD BE PREPARED IN THE BULKHEAD FOR RECEIVING THE GLAND
3. FIT RUBBER GASKETS AND BOLT GLAND TO BULKHEAD
4. WIPE THE GLAND INTERIOR COMPLETELY TO REMOVE TRACES OF GREASE OR OIL
5. PULL CABLES THROUGH GLAND, REMOVING, WHERE POSSIBLE, ALL DIRT AND GREASE FROM CABLES
6. THE PORTIONS OF THE CABLES PASSING THROUGH THE GLAND ESPECIALLY AT THE SLAT ASSEMBLY POSITIONS, MUST BE WIPED CLEAN WITH RAGS AND CYCLOHEXANONE TO REMOVE ALL TRACES OF GREASE OR OIL FROM THE CABLES
7. COAT THE CABLE HOLES, BUTTING EDGES AND BUTTING SIDE OF THE BOTTOM SLATS WITH SEALER (PIECE 18). FIT THE SLATS INTO POSITION AND SCREW TO GLAND BODY (1 SLAT EACH SIDE)
8. POSITION THE BOTTOM ROW OF CABLES ON THE SLATS
9. PROCEED IN A SIMILAR MANNER, TO POSITION THE CABLES UNTIL ALL SLATS ARE IN POSITION
10. AFTER CABLES ARE IN POSITION THEY SHOULD NOT BE DISTURBED
11. FINAL GLAND CLEANING OPERATION – REMOVE THE CAPS FROM THE FILLING, DRAIN AND VENT TUBES. FIT A HOSE TO THE DRAIN TUBE TO FEED INTO A CLEAN BUCKET AND PROVIDE A CLAMP ON THE HOSE NEAR THE GLAND. FILL THE GLAND WITH LIQUID DEGREASING AGENT. CAUTION – USE ADEQUATE VENTILATION, AVOID PROLONGED OR REPEATED BREATHING OF VAPOR AND AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. DO NOT TAKE INTERNALLY. AFTER ABOUT 5 MINUTES RELEASE THE CLAMP TO DRAIN THE GLAND AND BLOW COMPRESSED AIR THROUGH THE GLAND FROM THE TOP FOR ABOUT 5 MINUTES TO ENSURE COMPLETE ELIMINATION OF ANY FLUID THAT MIGHT REMAIN IN THE GLAND. ANY LEAKS NOTED DURING THE CLEANING OPERATION SHOULD BE REPAIRED.
12. THE LIQUID FILLING COMPOUND, PIECE 17, CONSISTS OF TWO SEPARATE LIQUIDS WHICH ARE MIXED TOGETHER IMMEDIATELY PRIOR TO USE. THE SUCCESS OF THE RESULTANT COMPOUND DEPENDS ON THOROUGH MIXING AND THIS SHOULD BE A STIRRING ACTION. THE COMPOUND SHOULD BE STIRRED FOR 5 MINUTES. COMPLETE MIXING INSTRUCTIONS ARE PRINTED ON THE FILLING COMPOUND CONTAINER.
13. POUR THE FILLING COMPOUND INTO THE GLAND UNTIL THE TUBES ARE FILLED
14. BOTH SIDES OF THE GLAND MUST BE INSPECTED DURING THE FILLING OPERATION FOR LEAKAGE. IT MAY BE POSSIBLE TO REPAIR SLIGHT LEAKS BY EXTERNAL APPLICATION OF SEALER. IF LEAKAGE PERSISTS, THE FILLING OPERATION MUST STOP. IMMEDIATELY DRAIN THE FILLING COMPOUND. AFTER LEAK HAS BEEN STOPPED, THE FILLING OPERATION MAY BE RESTARTED.
15. FIT FILLING AND VENT TUBE CAPS

ITEM	QTY	NAME	MATERIAL	MILITARY SPEC OR STD DRG NO
18	AS REQD	PLASTIC SEALER		MIL-I-3064
17	AS REQD	FILLING COMPOUND	RUBBER	MIL-C-18255 TYPE I
16	3	GASKET - CAP - .090 THK	RUBBER	MIL-J-2829
15	2	GASKET - FLANGE - .090 THK	RUBBER	MIL-J-2829
14	16	3/8" NUT	CRES	
13	16	3/8" BOLT, LENGTH AS REQD	"	
12	32	1/4" FILH SCREW 1/4" LONG	"	MS35361
11	32	1/4" FILH SCREW 5/8" LONG	"	MS35361
10	2	SLAT, 2-1/4 INCH	ALUM	QQ-A-250/8
9	2	SLAT, 1-3/4 INCH	"	"
8	2	SLAT, 2 INCH	"	"
7	3	CAP - FILL, DRAIN & VENT	"	"
6	3	PIPE - 1 INCH, LENGTH TO SUIT	"	"
5	1	BACKING PLATE, 1/4" PL	"	"
4	1	FLANGE, 1/4" PL	"	"
3	1	BACK FACE PLATE, 3/8" PL	"	"
2	1	FRONT FACE PLATE, 5/16" PL	"	"
1	1	GLAND BODY 3/16" PLATE	"	"

LIST OF MATERIAL QUANTITIES FOR ONE UNIT

FILLING, VENT AND DRAIN CAPS



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POLARITY AND ARRANGEMENT OF CABLES IN COMMUNITY STUFFING TUBE

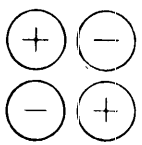
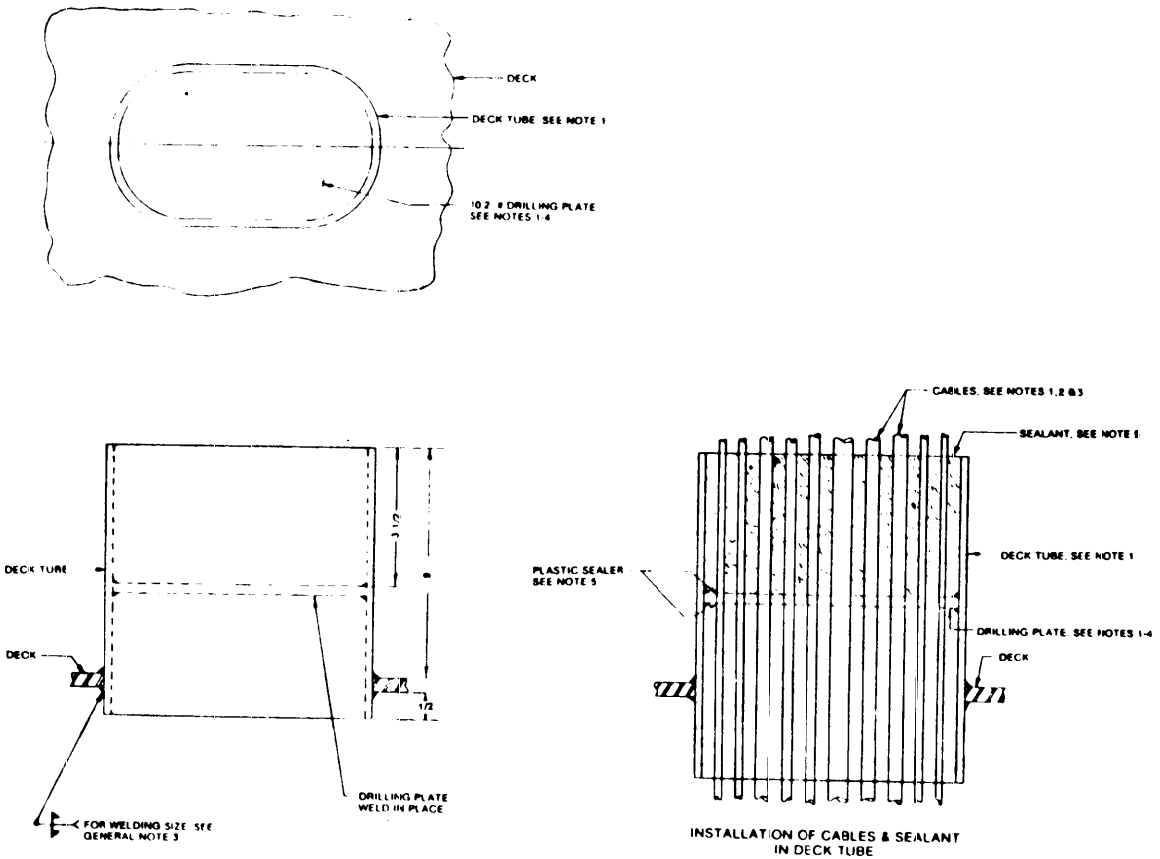


FIGURE 3B38. Community stuffing tube for minesweepers.



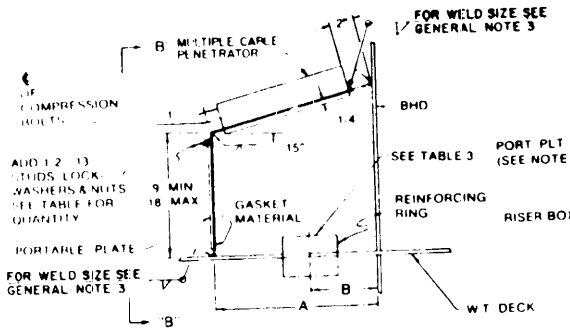
INSTALLATION OF CABLES & SEALANT IN DECK TUBE

SH 132317137

NOTES:

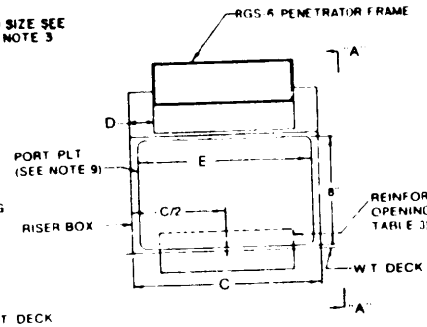
1. DECK TUBE WALL THICKNESS, MAXIMUM SIZE, AND MAXIMUM QUANTITY OF CABLES THROUGH DRILLING PLATE SHALL BE IN ACCORDANCE WITH DDS 100-1.
2. CABLE SIZE AND QUANTITY UP TO THE MAXIMUM ALLOWED, SHALL BE DETERMINED BY THE SHIPYARD.
3. CABLE CLEARANCE HOLES SHALL BE SIZED IN ACCORDANCE WITH STANDARD SHIPYARD PRACTICE. HOLES TO BE ROUNDED TO PREVENT ABRASION OF CABLE.
4. MINIMUM CLEARANCE BETWEEN HOLES IN DRILLING PLATE AND SIDE OF TUBE SHALL BE 3/8 INCH.
5. SEALANT SHALL BE PRODUCTS RESEARCH & CHEMICAL CORPORATION, SEALANT NUMBER 498 OR EQUAL, WITH A MINIMUM FINISHED POUR DEPTH OF THREE INCHES, PRIOR TO POURING. SEALANT GAPS AROUND THE CABLES SHALL BE PACKED WITH PLASTIC SEALER, MIL-I-3084, TYPE HF, TO RETAIN SEALER WHEN IN THE LIQUID STATE AND SERVE AS A PERMANENT FIRE STOP.
6. THIS FIGURE SUPERSEDES SHEET 3B36 OF DRAWING 803-5001027 AND SECTION 4 SHEET 158 OF DRAWING NAVSEC NO 9000-86702-73000.

FIGURE 3B36. Community cable tube–watertight decks (poured seal).



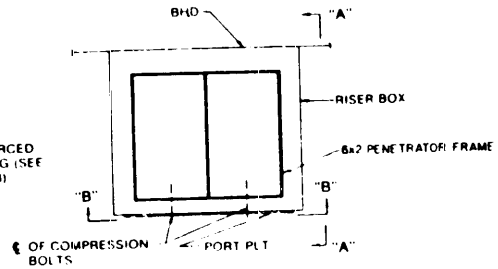
DETAIL A-A

SCALE 3 1 0



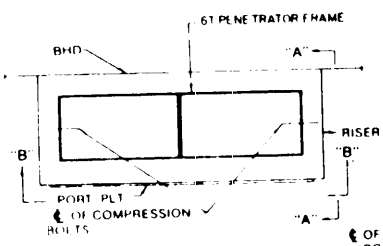
DETAIL B-B

TYPICAL VIEW - SEE CABLE PENETRATOR FRAMES CONFIGURATIONS I-V AND REFER TO TABLE 4 FOR DIMENSIONS

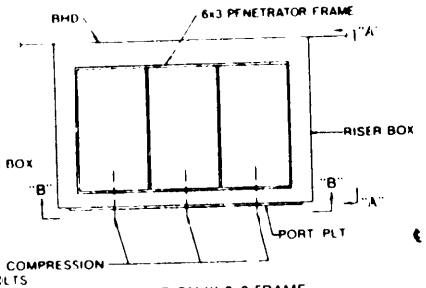


CONFIGURATION I - 6x2 FRAME
(FOR DIMENSIONS SEE TABLE 4)

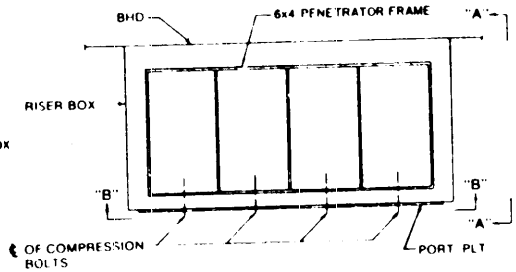
NOTES:
1. THIS FIGURE SUPERSEDES SHEET 3B35 OF DRAWING 803-5001027 AND SECTION 4, SHEET 180, OF DRAWING, NAVSEC NO 9000-S6202-73960



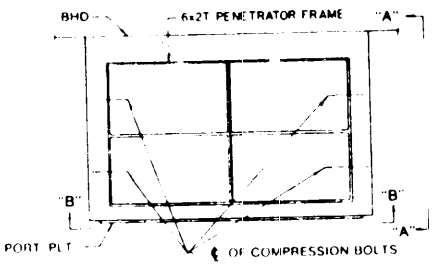
CONFIGURATION II-6T FRAME
(FOR DIMENSIONS SEE TABLE 4)



CONFIGURATION III-6x3 FRAME
(FOR DIMENSIONS SEE TABLE 4)



CONFIGURATION IV-6x4 FRAME
(FOR DIMENSIONS SEE TABLE 4)



CONFIGURATION V-6x2T FRAME
(FOR DIMENSIONS SEE TABLE 4)

NO FRAMES	SIZE OF OPG
6x2	10 x4
6x3	15 x4
6x4	20 x4 OR 16 x5

(MIN OF 20 SQ IN OPG FOR EACH FRAME)

TABLE NO 3

CONFIGURATION NUMBER	DIMENSIONS					
	A	B	C	D	E	BOLTS REQ D
I	12-1/2	5	14	1-3/4	13	14
II	8	4 1/2	21	1-1/8	20	16
III	12 1/2	5	19	1 5/8	18	16
IV	12 1/2	5	24	1 1 2	23	18
V	13 1 2	7	21	1-1-8	20	16

TABLE NO. 4

FIGURE 3B35. Multiple cable penetrator riser box.

NOTE:
1. THIS FIGURE SUPERSEDES SHEET 3B34 OF DRAWING 803-5001027 AND SECTION 4, SHEET 179, OF DRAWING, NAVSEC NO 9000-S6202-73980

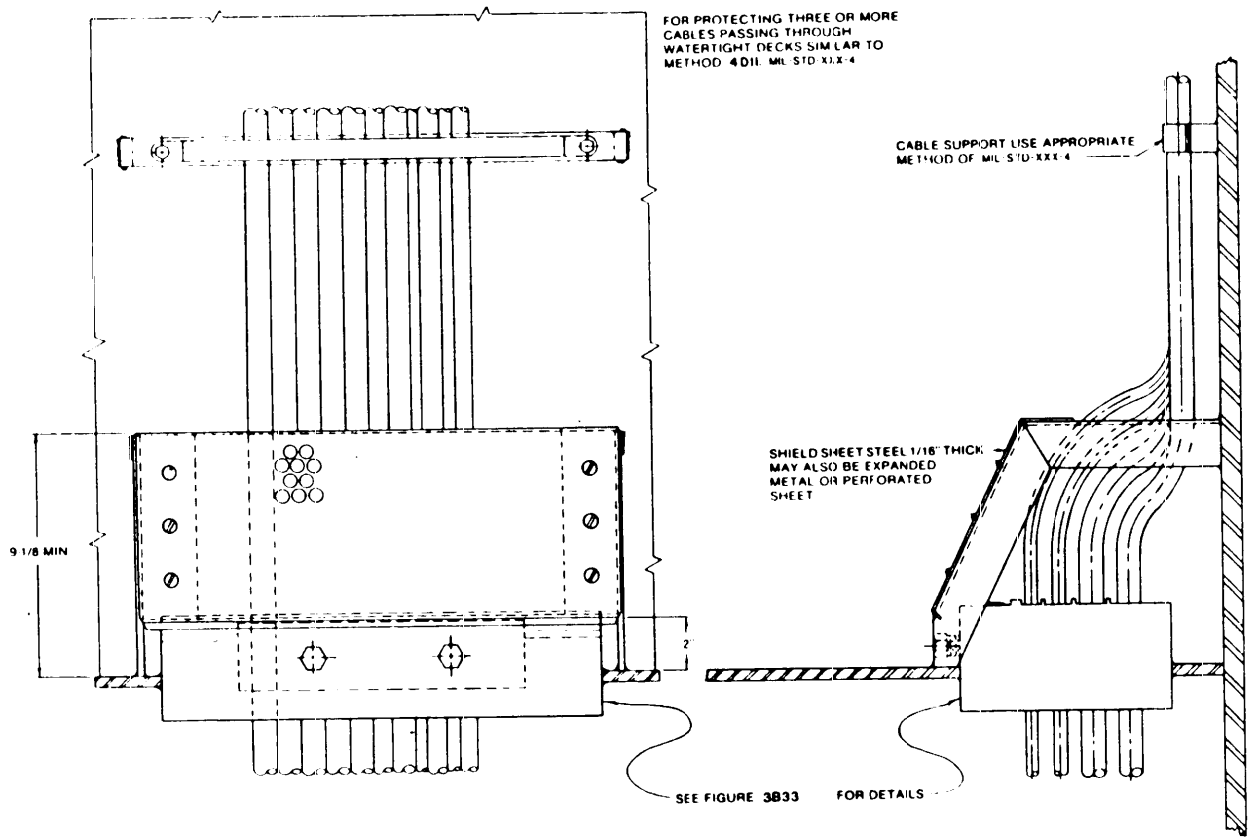


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FIGURE 3B34. Multiple cable penetrator (type RGS and RGA) shield.

NOTES:
1. MULTIPLE CABLE PENETRATOR FRAMES ARE AVAILABLE IN VARIOUS SIZES AND ARRANGMENTS SHOWN IS A TWO FRAME PENETRATOR
2. THIS FIGURE SUPERSEDES SHEET 3B33 OF DRAWING 803-5001027 AND SECTION 4, SHEET 178, OF DRAWING, NAVSEC NO. 9000-S6202-73980

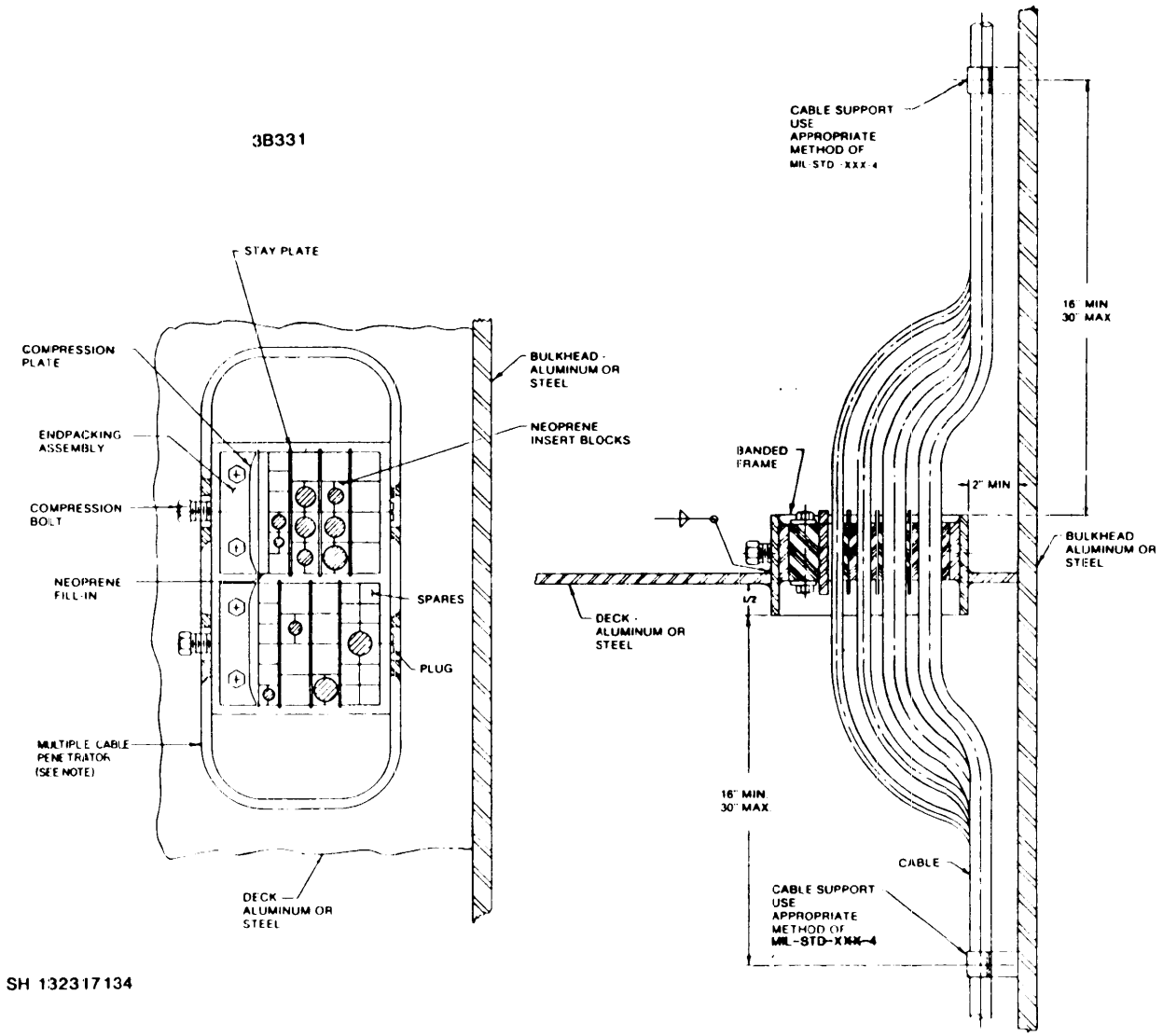


FIGURE 3B33. Multiple cable penetrator frame in decks (type RGS and RGA.

NOTES:

1. SEE FIGURE 3B27 NOTES 18 THROUGH 26 FOR ADDITIONAL DATA.

2. THIS FIGURE SUPERSEDES SHEET 3B32 OF DRAWING 803-5001027 AND SECTION 4, SHEET 177, OF DRAWING NAVSEC NO. 9000-S6202-73980.

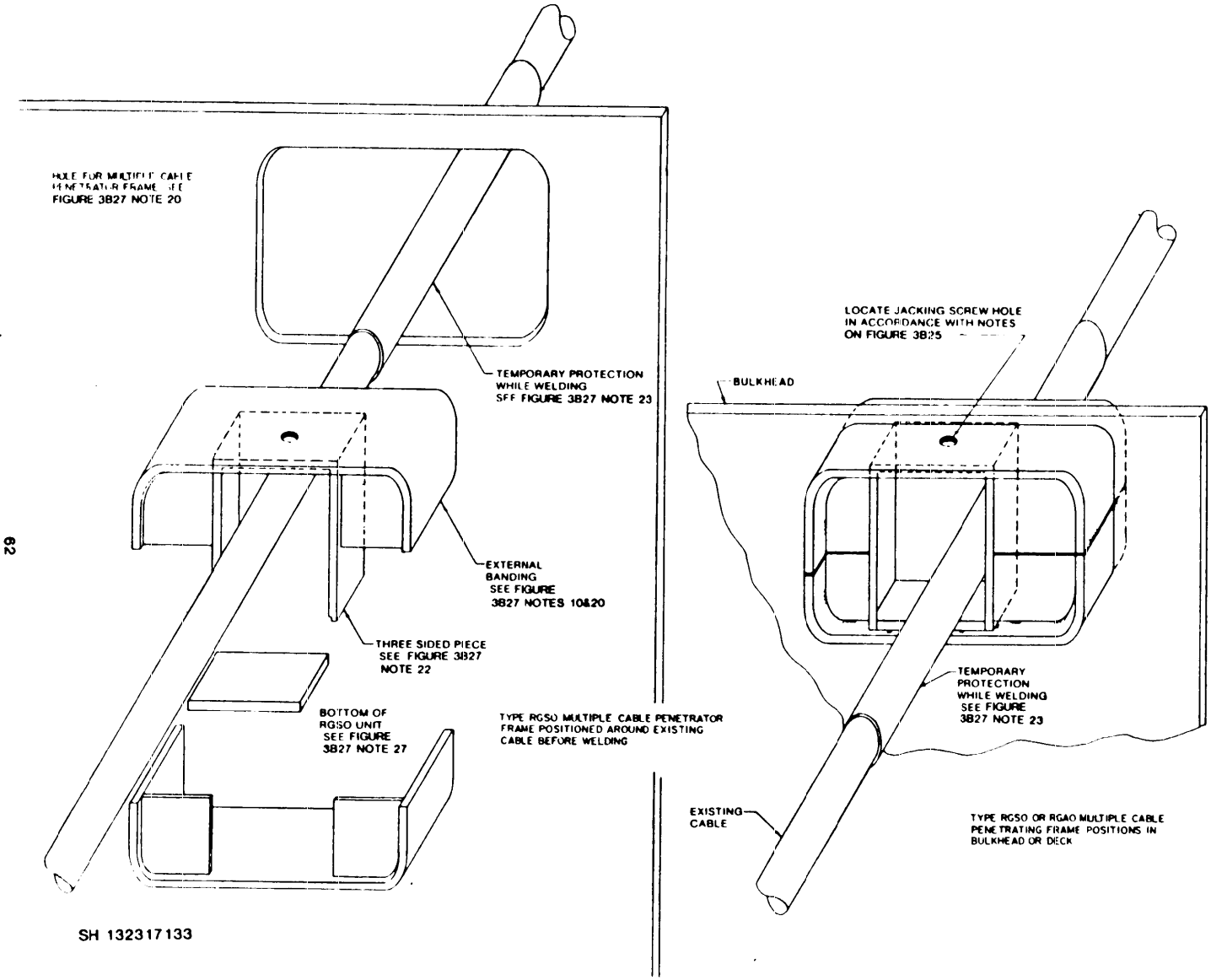
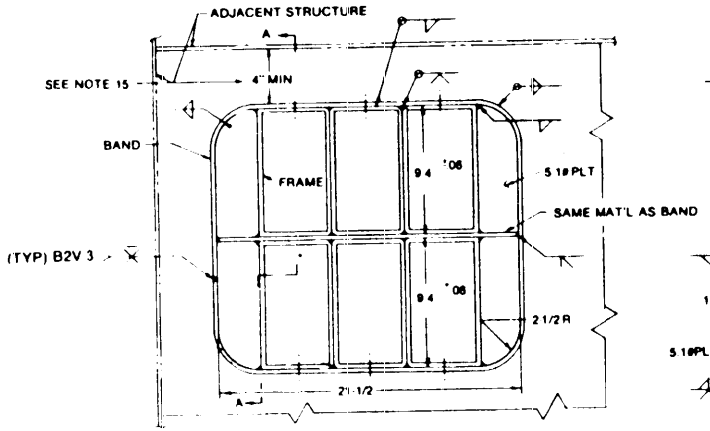
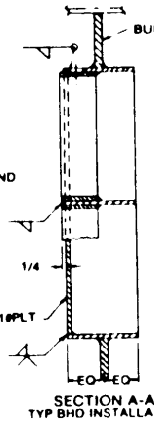


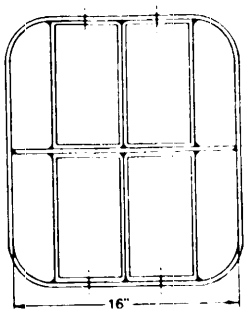
FIGURE 3B32. Multiple cable penetrator installation details (type RGS and RGA).



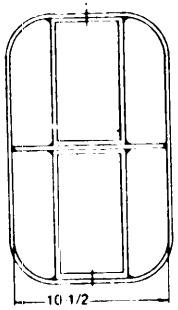
DOUBLE WALL 3 FRAME TANDEM BANDED



SECTION A-A
TYP BHD INSTALLATION



DOUBLE WALL 2 FRAME TANDEM BANDED



SINGLE FRAME TANDEM BANDED

NOTE:

1. THIS FIGURE SUPERSEDES SHEET 3B31 OF DRAWING 803-5001027 AND SECTION 4, SHEET 176, OF DRAWING, NAVSEC NO 9000-S6202-73980.

TYPE IV

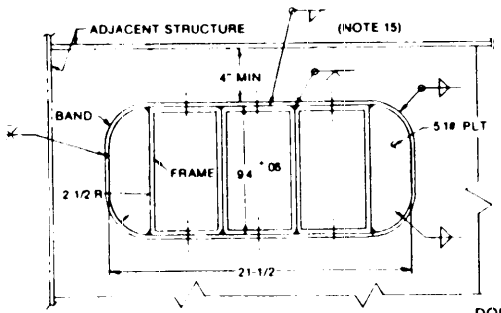
WT OF STRUCTURE PENETRATED	SIZE OF BAND: LONG'L STRENGTH MEMBER BHDS	LONG'L STRENGTH MEMBER DECKS	BHDS & DECKS OTHER THAN LONG'L STRENGTH MEMBERS
7 65 LBS	5"x5/16	12"x5/16	5"x5/16
10 2	5"x3/8	12"x3/8	
12 75			
15 3			
17 85	5"x1/2	12"x1/2	5"x3/8
20 4			
25 5	5"x5/8	12"x5/8	5"x1/2
30 6	5"x3/4	12"x3/4	5"x5/8
35 7	6"x3/4		5"x3/4

TYPE V

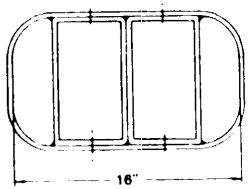
WT OF STRUCTURE PENETRATED	SIZE OF BAND: LONG'L STRENGTH MEMBER BHDS	LONG'L STRENGTH MEMBER DECKS	BHDS & DECKS OTHER THAN LONG'L STRENGTH MEMBERS
7 65 LBS	5"x5/16	12"x5/16	5"x5/16
10 2	5"x3/8	12"x3/8	
12 75			
15 3			
17 85	5"x1/2	12"x1/2	5"x3/8
20 4			
25 5	5"x5/8	12"x5/8	5"x1/2
30 6	5"x3/4	12"x3/4	5"x5/8
35 7	6"x3/4		5"x3/4

TYPE IV

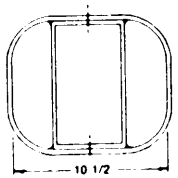
WT OF STRUCTURE PENETRATED	SIZE OF BAND: LONG'L STRENGTH MEMBER BHDS	LONG'L STRENGTH MEMBER DECKS	BHDS & DECKS OTHER THAN LONG'L STRENGTH MEMBERS
7 65 LBS	5"x5/16	12"x5/16	5"x5/16
10 2	5"x3/8	12"x3/8	
12 75			
15 3			
17 85	5"x1/2	12"x1/2	5"x3/8
20 4			
25 5	5"x5/8	12"x5/8	
30 6	5"x3/4	12"x3/4	5"x1/2
35 7			5"x3/4



DOUBLE WALL
3 FRAME BANDED



DOUBLE WALL 2 FRAME BANDED



SINGLE FRAME BANDED

TYPE III

WT OF STRUCTURE PENETRATED	SIZE OF BAND: LONG'L STRENGTH MEMBER BHDS	LONG'L STRENGTH MEMBER DECKS	BHDS & DECKS OTHER THAN LONG'L STRENGTH MEMBERS
7 65 LBS	6"x3/8	12"x3/8	5"x5/16
10 2			
12 75			
15 3	6"x7/16	12"x7/16	
17 85	6"x1/2	12"x1/2	5"x3/8
20 4	6"x5/8	12"x5/8	
25 5	6"x3/4	12"x3/4	5"x1/2
30 6	7"x3/4	12"x3/4	
35 7	7"x7/8	12"x7/8	5"x3/4

TYPE II

WT OF STRUCTURE PENETRATED	SIZE OF BAND: LONG'L STRENGTH MEMBER BHDS	LONG'L STRENGTH MEMBER DECKS	BHDS & DECKS OTHER THAN LONG'L STRENGTH MEMBERS
7 65 LBS	5"x5/16	12"x5/16	5"x5/16
10 2			
12 75			
15 3	5"x3/8	12"x3/8	
17 85	5"x1/2	12"x1/2	
20 4			
25 5	5"x5/8	12"x5/8	5"x3/8
30 6	5"x3/4	12"x3/4	5"x1/2
35 7	5"x7/8	12"x7/8	

TYPE I

WT OF STRUCTURE PENETRATED	SIZE OF BAND: LONG'L STRENGTH MEMBER BHDS	LONG'L STRENGTH MEMBER DECKS	BHDS & DECKS OTHER THAN LONG'L STRENGTH MEMBERS
7 65 LBS	5"x5/16	12"x5/16	5"x5/16
10 2			
12 75			
15 3			
17 85	5"x3/8	12"x3/8	
20 4			
25 5			5"x3/8
30 6	5"x1/2	12"x1/2	5"x1/2
35 7			

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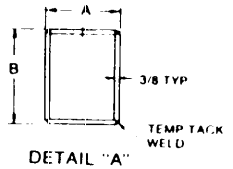
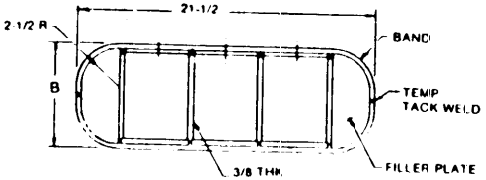
FIGURE 3B31. Multiple cable penetrator details (type RGS and RGA).



DETAIL "A"

3/8 THK SINGLE FRAME

TYPE	A	B
RGSO-2	5 506	4 726
RGSO-4	5 506	7 029
RGSO-6	5 506	9 333



DETAIL "F"

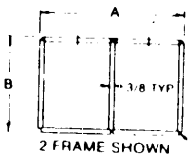
3/8 THK MULTI-FRAME BANDED

BHD PLT LBS	DIMENSION "B"		
	10 2 12 75	15 3 17 85 20 4	23 0 25 5 28 0 30 6
RGSO-2	5 9/16	5 13/16	6 5/16
RGSO-4	7 7/8	8 1/8	8 5/8
RGSO-6	10 3/16	10 7/16	10 15/16
BAND	3/8x4	1/2x4	3/4x4

NOTES:

1. RGSO FRAMES AND FILLER PLATES ARE MILD STEEL ASTM A36 REINFORCING BANDS ARE EITHER MILD STEEL (ASTM A36) OR HIGH TENSILE STEEL MIL-S-22698 IN ORDER FOR MATERIAL TO BE SIMILAR TO BULKHEAD OR DECK IN WHICH PENETRATION IS BEING MADE

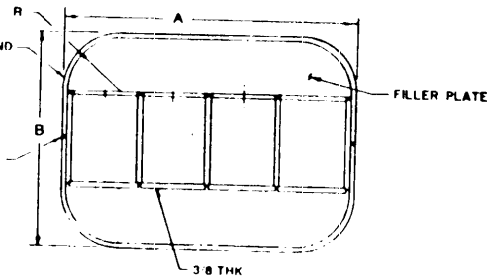
2. THIS FIGURE SUPERSEDES SHEET 3B30 OF DRAWING 803-5001027 AND SECTION 4, SHEET 175, OF DRAWING, NAVSEC NO. 9000-S6202-73980



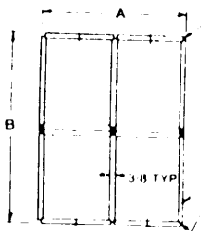
DETAIL "B"

3/8 THK 2 THRU 6 MULTI-FRAME

TYPE	DIM	2 FRAME	3 FRAME	4 FRAME	5 FRAME	6 FRAME
RGSO 2	A	10 637	15 768	20 889	26 030	31 161
RGSO 4	A	10 637	15 768	20 899	26 030	31 161
RGSO-6	A	10 637	15 768	20 899	26 030	31 161
RGSO 2	B	4 726	4 726	4 726	4 726	4 726
RGSO 4	B	7 029	7 029	7 029	7 029	7 029
RGSO-6	B	9 333	9 333	9 333	9 333	9 333



DETAIL "G"

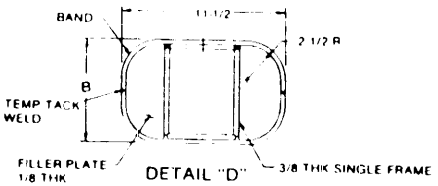


TYPE	DIM	T FRAME	2T FRAME	3T FRAME	4T FRAME	5T FRAME	6T FRAME
RGSO 2	A	5 506	10 637	15 768	20 899	26 030	31 161
RGSO 4	A	5 506	10 637	15 768	20 899	26 030	31 161
RGSO 6	A	5 506	10 637	15 768	20 899	26 030	31 161
RGSO 2	B	9 452	9 452	9 452	9 452	9 452	9 452
RGSO 4	B	14 058	14 058	14 058	14 058	14 058	14 058
RGSO 6	B	18 666	18 666	18 666	18 666	18 666	18 666

DETAIL "C"

3/8 THK 4 FRAME BANDED

BHD PLATE LBS			DIMENSION "B"			"A"	"R"	BAND
			RGSO-2	RGSO-4	RGSO-6			
10 2	12 75	15 3	11 1/16	13 3/8	15 11/16	21-3/4	3 1/8	3/8x4
17 85	20 4	23 0	11 9/16	13 7/8	16 3/16	22 1/4	3 3/8	5/8x4
25 5	28 0	30 6	11 15/16	14 1/8	16 7/16	22 1/2	3 1/2	3/4x4

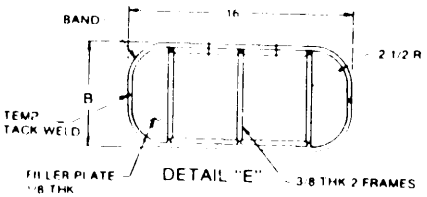


DETAIL "D"

3/8 THK SINGLE FRAME BANDED

BHD PLATE LBS	DIMENSION "B"		
	10 2 12 75 15 3	17 85 20 4	23 0 25 5 28 0 30 6
RGSO-2	5 9/16	5 13/16	6 5/16
RGSO-4	7 7/8	8 1/8	8 5/8
RGSO-6	10 3/16	10 7/16	10 15/16
BAND	3/8x4	1/2x4	3/4x4

CATALOG NO FOR RGSO-6 BANDED WITH 3/8x4 FLAT BAR WOULD BE RGSO-6 4375



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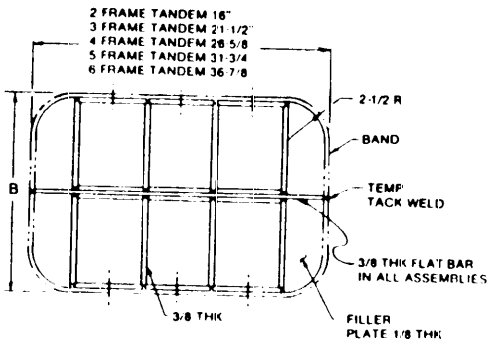
3/8 THK 2 FRAME BANDED

BHD PLATE LBS	DIMENSION "B"		
	10 2# 12 75 15 3	17 85 20 4	23 0 25 5 28 0 30 6
RGSO-2	5 9/16	5 13/16	6 5/16
RGSO-4	7 7/8	8 1/8	8 5/8
RGSO-6	10 3/16	10 7/16	10 15/16
BAND	3/8x4	1/2x4	3/4x4

CATALOG NO FOR RGSO-6x2 BANDED WITH 3 8x4 FLAT BAR WOULD BE RGSO-6x2 4375

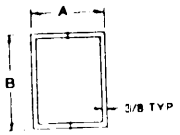


DETAIL "H"

3/8 THK TANDEM (T) FRAMES BANDED

BHD PLT LBS	DIMENSION "B"						
	7 65#	10 2#	12 75# 15 3	17 85# 20 4	25 5#	30 6# 35 7	
RGSO-2	10 5/8	10 7/8	11-1/8	11 3/8	11 5/8	11 5/8	
RGSO-4	15 3/16	15 7/16	15 11/16	15 15/16	16 3/16	16 3/16	
RGSO-6	19 13/16	20 1/16	20 5/16	20 9/16	20 13/16	20 13/16	
BAND	3/8x4	1/2x4	5/8x4	3/4x5	7/8x6	7/8x6 1/2	

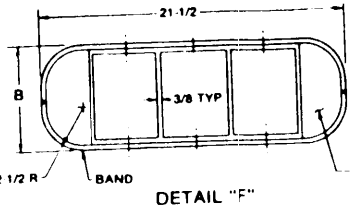
FIGURE 3B30. Multiple cable penetrator details (type RGS and RGA).



DETAIL "A"

3/8 THK SINGLE FRAME

TYPE	A	B
RGS-2	5 5	4 726
RGS-4	5 5	7029
RGS-6	5 5	9 333



DETAIL "F"

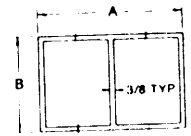
3/8 THK MULTI-FRAME BANDED

	DIMENSION "B"		
BHD PLATE LBS	10 2 12 75	15 3 17 85 20 4	23 0 25 5 28 0 30 6
RGS-2	5 9/16	5 13/16	6 5/16
RGS-4	7 7/8	8 1/8	8 5/8
RGS-6	10 3/16	10 7/16	10 15/16
BAND	3/8x4"	1/2x4"	3/4x4"

NOTES:

1. MATERIAL RGS FRAMES AND FILLER PLATES ARE MILD STEEL ASTM A36, REINFORCING BANDS ARE EITHER MILD STEEL (ASTM-A36) OR HIGH TENSILE STEEL MIL-S-22698 IN ORDER FOR MATERIAL TO BE SIMILAR TO BULKHEAD OR DECK IN WHICH PENETRATION IS BEING MADE

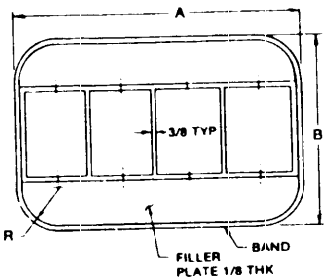
2. THIS FIGURE SUPERSEDES SHEET 3B29 OF DRAWING 803-5001027 AND SECTION 4, SHEET 174, OF DRAWING, NAVSEC NO 9000-S6202-73980.



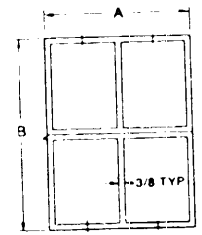
DETAIL "B"

3/8 THK 1 THRU 6 MULTI-FRAME

TYPE	DIM	1 FRAME	2 FRAME	3 FRAME	4 FRAME	5 FRAME	6 FRAME
RGS-2	A	5 506	10 637	15 768	20 899	26 030	31 161
RGS-4	A	5 506	10 637	15 768	20 899	26 030	31 161
RGS-6	A	5 506	10 637	15 768	20 899	26 030	31 161
RGS-2	B	4 726	4 726	4 726	4 726	4 726	4 726
RGS-4	B	7 029	7 029	7 029	7 029	7 029	7 029
RGS-6	B	9 333	9 333	9 333	9 333	9 333	9 333



DETAIL "G"



2 FRAME TANDEM

DETAIL "C"

3/8 THK 1 THRU 6 TANDEM MULTI-FRAME

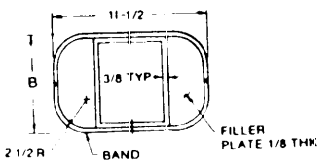
TYPE	DIM	T FR	2T FR	3T FR	4T FR	5T FR	6T FR
RGS-2	A	5 506	10 637	15 768	20 899	26 030	31 161
RGS-4	A	5 506	10 637	15 768	20 899	26 030	31 161
RGS-6	A	5 506	10 637	15 768	20 899	26 030	31 161
RGS-2	B	9 452	9 452	9 452	9 452	9 452	9 452
RGS-4	B	14 058	14 058	14 058	14 058	14 058	14 058
RGS-6	B	18 666	18 666	18 666	18 666	18 666	18 666

3/8 THK 4 FRAME BANDED

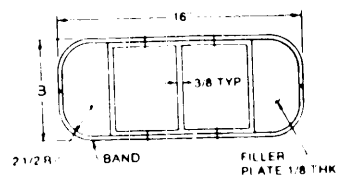
BHD PLATE LBS			"B" DIM RGS-2	"B" DIM RGS-4	"B" DIM RGS-6	"A"	"R"	BAND
10 2	12 75	15 3	11 1/16	13 3/8	15 11/16	21 3/4	3 1/8	3/8x4"
17 85	20 4	23 0	11 9/16	13 7/8	16 3/16	22 1/4	3 3/8	5/8x4"
25 5	28 0	30 6	11 13/16	14 1/8	16 7/16	22 1/2	3 1/2	3/4x4"

3/8 SINGLE FRAME BANDED

	DIMENSION "B"		
BHD PLATE	10 2# 12 75 15 3	17 85 20 4 23 0	25 5 28 0 30 6
RGS-2	5 9/16	5 13/16	6 5/16
RGS-4	7 7/8	8 1/8	8 5/8
RGS-6	10 3/16	10 7/16	10 15/16
BAND	3/8 x 4"	1/2 x 4"	3/4 x 4"



DETAIL "D"

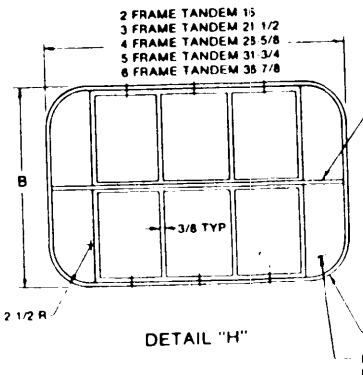


DETAIL "E"

SH 132317130

3/8 THK 2 FRAME BANDED

	DIMENSION "B"		
BHD PLATE	10 2# 12 75 15 3	17 85# 20 4	23 0# 25 5 28 0 30 6
RGS-2	5 9/16	5 13/16	6 5/16
RGS-4	7 7/8	8 1/8	8 5/8
RGS-6	10 3/16	10 7/16	10 15/16
BAND	3/8x4"	1/2x4"	3/4x4"

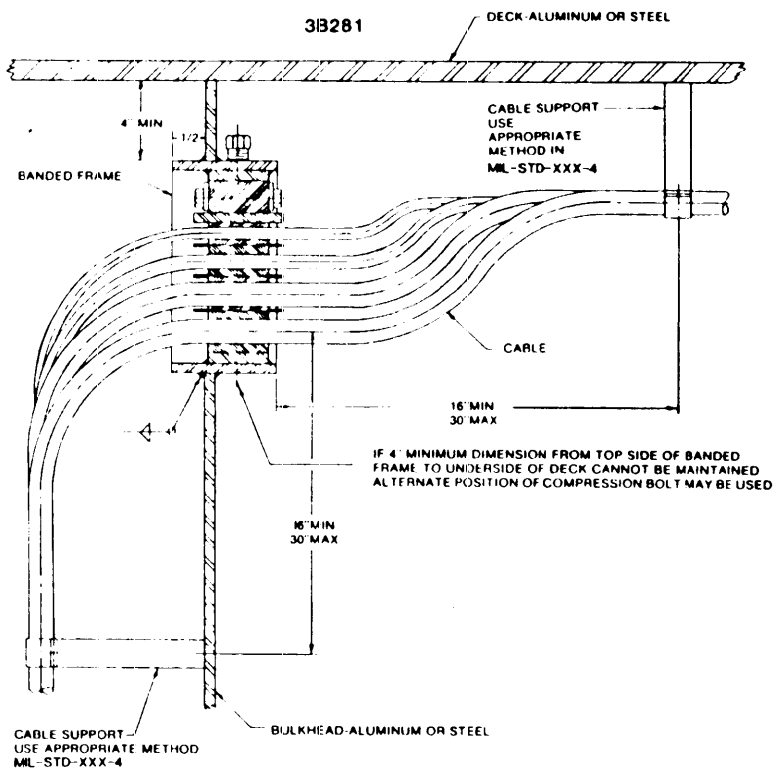


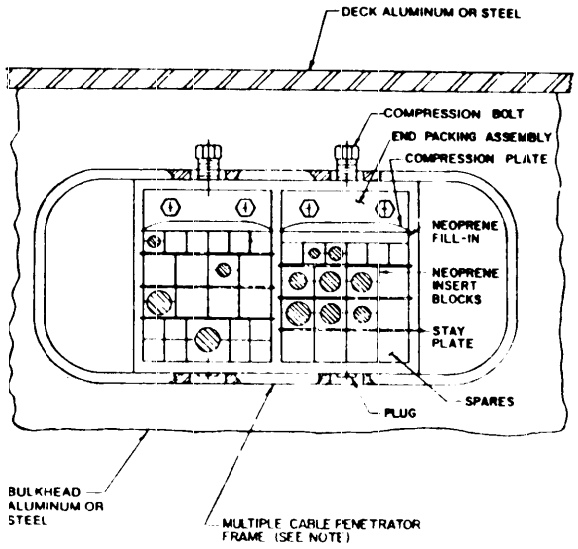
DETAIL "H"

3/8 THK 2 THRU 6 TANDEM MULTI-FRAME BANDED

	DIMENSION "B"					
BHD PLATE	7 85#	10 2#	12 75# 15 3	17 85# 20 4	25 5#	30 6# 35 7
RGS-2	10 5/8	10 7/8	11 1/8	11 3/8	11 5/8	11 5/8
RGS-4	15 3/16	15 7/16	15 11/16	15 15/16	16 3/16	16 3/16
RGS-6	19 13/16	20 1/16	20 5/16	20 9/16	20 13/16	20 13/16
BAND	3/8x4	1/2x4	5/8x4	3/4x5	7/8x6	7/8x6 1/2

FIGURE 3B29. Multiple cable penetrator details (type RGS and RGA).





NOTES:

1. MULTIPLE CABLE PENETRATOR FRAMES ARE AVAILABLE IN VARIOUS SIZES AND ARRANGMENTS SHOWN IS A TWO FRAME PENETRATOR.

2. THIS FIGURE SUPERSEDES SHEET 3B28 OF DRAWING 803-5001027 AND SECTION 4, SHEET 173, OF DRAWING, NAVSEC NO. 9000-S6202-73890.

FIGURE 3B28. Multiple cable penetrator installation in steel or aluminum bulkheads using two frame penetrator (type RGS and RGA).

SH. 132317120

INSTALLATION NOTES

RGS AND RGA
MULTIPLE CABLE PENETRATORS

1. MULTIPLE CABLE PENETRATOR IS A MODULAR SYSTEM THAT UTILIZES STANDARD UNITS AND DIMENSIONS TO ALLOW MAXIMUM FLEXIBILITY AND COMPATABILITY WITH VARIOUS NUMBERS AND SIZES OF CABLES. FINAL SEALED UNITS WILL PROVIDE WATERTIGHT AIRTIGHT AND FIRE PROOF BULKHEAD OR DECK PENETRATIONS.

2. PULL ALL CABLE THRU CABLE PENETRATOR BEARING IN MIND CABLES SHALL ALWAYS APPROACH IN A HORIZONTAL PLANE PERPENDICULAR TO THE PENETRATOR. THIS CAN BE ACCOMPLISHED IF THE NEAREST CABLE HANGER IS 16" MINIMUM FROM BULKHEAD. CABLES RUNNING UP A BULKHEAD AND THRU A CABLE PENETRATOR MUST HAVE ITS FULL BENDING RADIUS OUTSIDE OF THE PENETRATOR. WHILE IN THE PROCESS OF PULLING CABLES IT IS IMPERATIVE THAT A REASONABLE AMOUNT OF OF SLACK SHOULD BE LEFT TO FACILITATE MOVEMENT OF CABLE WITHIN THE CABLE PENETRATOR TO EASE PACKING OPERATION. ALSO IT IS NECESSARY THAT EACH CABLE BE IDENTIFIED ON THE COMPRESSION BOLT SIDE OF MULTIPLE CABLE PENETRATOR BY LEAD NUMBER AND CABLE SIZE. ALL CABLES THRU A NEW MULTIPLE CABLE PENETRATOR SHALL BE PULLED PRIOR TO INSTALLING INSERT BLOCKS.

3. AFTER PULLING ALL CABLES THROUGH A PARTICULAR MULTIPLE CABLE PENETRATOR IT CAN BE PACKED. FIRST APPLY A LIGHT COAT OF CABLE LUBRICANT (TALLOW) TO ALL OUTSIDE SURFACES OF THE INSERT BLOCKS, THE INSIDE PORTION OF THE FRAME AND THE CURVED SURFACE OF THE COMPRESSION PLATE. WHEN PACKING ARMORED CABLE, APPLY GENERAL ELECTRICS RTV-112 SEALER ON THE SURFACE OF EACH BLOCK THAT CONTACTS THE CABLE (A 1/8" BEAD EVERY 1/2" AROUND THE CIRCUMFERENCE). EACH FRAME MUST BE LAID OUT (BLOCKED) SHOWING SOLID BLOCKS (USED AS SPARES) AND CABLE ASSIGNMENTS PRIOR TO PACKING. A TYPICAL EXAMPLE OF A PACKED RGS-4 FRAME WITH INSTRUCTIONS FOR PACKING IS SHOWN BELOW. (SCALE 3/4)

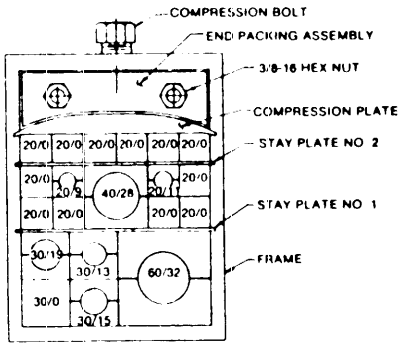


FIGURE NO 7

(A) SELECT INSERT BLOCKS AND SPARES FROM SHEET AND PREPARE AS ABOVE (LUBRICANT AND SEALER WHERE REQUIRED)

(B) STARTING WITH HEAVIEST CABLE PLACE THE LOWER HALF OF THE 60/32 INSERT BLOCK UNDER THE CABLE IN THE FRAME. NEXT REPEAT THE PROCEDURE WITH THE 30/15 THEN ADD ONE 30/0 SPARE. ADD THE UPPER HALF OF THE 60/32 AND THE 30/15. PLACE LOWER HALF OF 30/13 AND 30/19 UNDER CABLE THEN ADD UPPER HALVES ACROSS THE TOP OF THESE ADD STAY PLATE NO. 1

(C) ON TOP OF THE STAY PLATE PLACE FOUR 20/0 SPARES AND THE LOWER HALF OF THE 40/28 UNDER ITS CABLE. IN THE NEXT HIGHER ROW PLACE TWO 20/0 SPARES AND THE LOWER HALF OF 20/9 AND 20/11 UNDER THEIR RESPECTIVE CABLES. THEN ADD UPPER HALVES O 40/28 20/11 AND 20/9 ON TOP OF THESE ADD STAY PLATE NO. 2

(D) ADD COMPRESSION PLATE TO THE FRAME.

(E) LIFT COMPRESSION PLATE CLEAR OF STAY PLATE NO 2 ADD FINAL ROW OF SIX 20/0 SPARES. LOWER COMPRESSION PLATE TO THIS LEVEL.

(F) TIGHTEN COMPRESSION BOLT DOWN ON COMPRESSION PLATE TO COMPRESS ENTIRE CONTENTS OF FRAME AND PROVIDE JUST ENOUGH CLEARANCE TO INSERT END PACKING ASSEMBLY. APPLY A GENEROUS AMOUNT OF LUBRICANT TO THIS CAVITY TO ASSIST INSERTION OF END PACKING.

(G) DISASSEMBLE END PACKING ASSEMBLY AND INSTALL IN FRAME AROUND THE COMPRESSION BOLT. REASSEMBLE AND TIGHTEN 3/8-16 HEX NUTS EVENLY UNTIL END PACKING INSERT MATERIAL EXPANDS IN THE CAVITY AND THERE IS A SLIGHT ROLL OF THE MATERIAL AROUND THE END PACKING METAL WASHERS. BACK OFF COMPRESSION BOLT APPROX 1/8 OF A TURN, PACKING IS NOW COMPLETE.

4. WHEN A MULTIPLE CABLE PENETRATOR FRAME IS INSTALLED IN A STRUCTURE IN SUCH A MANNER THAT THE COMPRESSION BOLT IS LOCATED ON THE BOTTOM PACKING PROCEDURE IS THE SAME EXCEPT

(A) THE COMPRESSION PLATE IS INSTALLED FIRST

(B) THE FRAME IS PACKED FROM THE BOTTOM UP WITH THE SMALLEST CABLES BEING PACKED FIRST.

5. TO ADD A NEW CABLE TO A PACKED FRAME LOOSEN THE 3/8-16 HEX NUTS AND REMOVE THE END PACKING METAL WASHERS. TIGHTEN THE COMPRESSION BOLT UNTIL END PACKING INSERT MATERIAL IS LOOSE. REMOVE INSERT MATERIAL FROM FRAME. LOOSEN COMPRESSION BOLT AND LIFT COMPRESSION PLATE CLEAR OF TOP SIX 20/0 SPARES. REMOVE THESE INSERTS. REMOVE COMPRESSION PLATE AND FULL ACCESS TO THE INSERT BLOCKS AND CABLE IS AVAILABLE.

6. TEMPLATE ALL WORK FROM SHIP.

7. ALL WELDING AND INSPECTION TO BE IN ACCORDANCE WITH MIL-STD-278.

8. ALL PAINTING TO BE DONE IN ACCORDANCE WITH MIL-E-917.

9. THE STRUCTURAL REINFORCEMENT SHOWN ON THIS PLAN DOES NOT APPLY TO FLIGHT DECK BENTS. FLIGHT DECK SUPPORT STRUCTURES OR OTHER SIMILAR TYPE STRUCTURE ON OTHER SHIPS. SUCH CASES MUST BE INDIVIDUALLY RESOLVED WITH STRUCTURAL DESIGN.

10. MATERIAL OF F B REINFORCEMENT IS TO BE SIMILAR TO MATERIAL OF BHD, DECK OR RISER BOX PENETRATED.

11. THIS PLAN WAS DEVELOPED FROM DESIGN DATA SHEET DDS100-1 REINFORCEMENT OF OPENINGS IN STRUCTURE OF SURFACE SHIPS OTHER THAN IN PROTECTIVE PLATING, TO PERMIT INSTALLATION OF MULTIPLE CABLE PENETRATOR FRAME (TECRONA PRODUCTS OF NELSON ELECTRIC) IN WATERTIGHT DECKS AND BHDS OF SURFACE SHIPS.

12. FILLET WELD REINFORCEMENT FOR T2V 1 WELD JOINT SHALL BE 1/8" FOR PLATING UP TO 15.3# AND 1/4" FOR PLATING ABOVE 17.85#.

13. THE BHDS AND DECKS WHICH ARE CONSIDERED TO BE LONGITUDINAL STRENGTH MEMBERS ARE DEFINED IN NAVSHIPS DESIGN DATA SHEET DDS100-1 AS COMPONENTS IN "STRENGTH ENVELOPE (i.e. IN OUTSIDE PLATING, UPPERMOST STRENGTH DECK, INNER BOTTOM, AND THE R ASSOCIATED LONG'L FRAMING), AND FOR OTHER STRENGTH DECKS WITHIN THE MIDSHIP THREE-FIFTHS LENGTH". IF THERE IS DIFFICULTY IN DEFINITION CONSULT WITH STRUCTURAL DESIGN.

14. CARE SHOULD BE TAKEN WHILE INSTALLING MULTIPLE CABLE PENETRATORS, TO INSURE THAT ALL OF ITS FOAMING PROTRUDES THRU BHD SUFFICIENTLY TO WELD IN PLACE AFTER WELDING EXAMINE FOR CRACKS AND SHARP EDGES THAT MAY DAMAGE CABLE WHEN BEING PULLED THRU PENETRATOR IF GRINDING IS REQUIRED INSURE GRINDING AREAS DO NOT WEAKEN THE PENETRATOR.

15. IT IS MANDATORY TO MAINTAIN A MINIMUM OF 7/8" FROM BHD TO BOLT HOLE CENTER FOR WRENCH CLEARANCE. ALSO LEAVE 4" CLEARANCE TO ALLOW FOR INSTALLATION OF COMPRESSION BOLT (FROM BOLT HOLE SIDE OF C TO TO ANY STRUCTURE)

16. RISER BOX TO BE ATTACHED TO BHD OF 765# PLT OR HEAVIER. IF BHD IS LESS THAN 765# PLT ADJACENT TO RISER BOX INSTALLATION, INSTALL A BACK PLATE OF 102# PLT BETWEEN THE BACK OF THE RISER BOX AND THE BHD.

17. AFTER INSTALLATION IS COMPLETE ENTIRE PENETRATOR MAY BE PAINTED TO SUIT SURROUNDING STRUCTURE IN ACCORDANCE WITH THE GENERAL SPECIFICATIONS FOR BUILDING SHIPS FOR THE U.S. NAVY.

INSTALLATION NOTES

RGSO AND RGAO
MULTIPLE CABLE PENETRATORS

18. TEMPORARILY INSULATE CABLE FOR PROTECTION AGAINST WELDING AND BURNING.

19. REMOVE OLD NON-WATERTIGHT STRUCTURE.

20. PREPARE HOLE IN BULKHEAD TO RECEIVE MULTIPLE CABLE PENETRATOR FRAME (DESIGNATED "RGSO"). PICTURE SHOWS EXTERNAL BANDING – THIS IS USED ONLY WHEN REQUIRED.

21. BOTTOM OF "RGSO" UNIT IS TACK WELDED TO OTHER THREE SIDES – REMOVE THIS PIECE.

22. SEGREGATE AND CONFINE REQUIRED CABLES WITHIN EACH THREE SIDED FRAME.

23. WRAP WELDERS BLANKET AROUND CABLE, REPLACE BOTTOM PIECE AND CONTINUOUSLY WELD CORNERS. GRIND SMOOTH SAME AS TOP CORNERS.

24. SLIDE UNIT INTO PREPARED HOLE IN BULKHEAD POSITION SO THAT CENTER LINE OF TAPPED HOLE IS 7/8" OUT FROM FACE OF BULKHEAD TO PERMIT CLEARANCE FOR THE COMPRESSION SCREW.

25. WELD FRAME TO BULKHEAD WITH CONTINUOUS WELD ALL AROUND FRAME ON BOTH SIDES OF BULKHEAD.

26. PROCEED AS OUTLINED IN NOTE 3.

NOTES:

1. THE TABLES AND DIMENSIONS SHOWN ON THESE SHEETS ARE FOR TYPICAL STEEL INSTALLATIONS. OTHER UNIQUE SITUATIONS SHALL BE HANDLED AS A CASE - BY - CASE BASIS THROUGH THE STRUCTURES DEPARTMENT.

2. THIS FIGURE SUPERSEDES SHEET 3B27 OF DRAWING 803-5001027 AND SECTION 4, SHEET 172, OF DRAWING, NAVSEC NO. 9000-S6202-73890.

SH 132317128

FIGURE 3B27. Multiple cable penetrator installation notes (type RGS and RGA).

TABLE NO.2 CABLE INFORMATION AND ASSIGNMENT FOR MULTIPLE CABLE PENETRATOR INSERT BLOCKS

CABLE TYPE	CABLE DIAMETER IN INCHES	CABLE DIAMETER IN MM	INSERT BLOCK PART NUMBER SIZE MM	INSERT BLOCK PART NUMBER SIZE MM
SSBA-4	0 308	7 75	15/7	20/7
SSBA-8	0 323	8 20	15/8	20/8
SSBA-9	0 371	9 42	15/9	20/9
SSBA-14	0 416	10 81	20/10	
SSGA-23	0 453	11 50	20/11	
SSBA-30	0 488	12 50	20/12	30/12
SSBA-40	0 518	13 08	20/13	30/13
SSBA 150	0 844	21 44	30/21	
SSGA 500	1 290	32 77	40/30	
SSBA-1300	1 880	47 75	60/48	
DCOP-3	0 425	10 80	20/10	
DCOP-4	0 460	11 68	20/12	30/12
DCOP-6	0 510	12 96	20/13	30/13
DCOP 9	0 570	14 48	20/14	30/14
DCOP-14	0 705	17 91	30/18	
DCOP-23	0 860	21 84	30/22	
DCOP-30	0 960	24 38	30/24	40/24
DCOP-83	1 480	36 83	60/36	
DCOP 250	2 100	53 34	60/52	
DCOP-400	2 500	63 50	90/60	
DSGA-14	0 680	17 27	30/17	
DSGA-23	0 781	19 84	30/18	
DSBA-30	0 852	21 64	30/21	
DSGA-40	0 898	22 81	30/22	40/22
DSGA-50	0 961	24 41	30/24	40/24
DSGA-80	1 031	26 19	40/26	
DSBA-125	1 374	34 90	40/34	60/34
DSGA 150	1 479	37 57	60/36	
DSGA-250	1 759	34 68	60/44	
TSGA-14	0 718	18 23	30/18	
TSGA-30	0 902	22 91	30/22	40/22
TSGA-40	0 950	24 13	30/24	40/24
TSGA-80	1 110	28 19	40/28	
TSGA 125	1 456	37 03	60/36	
TSGA 250	1 844	46 84	60/48	
TSGA-380	2 123	53 92	60/52	
TSBA-60	1.200	30.61	40/30	
MDT-8	1.190	30.23	40/30	
MDT-14	1.570	39.88	60/40	
MDT-23	1.960	49.78	60/50	
MDT-40	2.240	56.90	90/55	
MDT-60	2.525	64.14	90/65	
ISA-44	1.040	26.42	40/26	
ISWA-70	1.606	40.77	60/40	
ISWA-2	0.506	12.83	20/12	30/12
ISWA-44	0.920	23.37	30/23	
ISWA-20	1.090	27.43	40/28	
ISWA-30	1.290	31.75	40/30	

CABLE TYPE	CABLE DIAMETER IN INCHES	CABLE DIAMETER IN MM	INSERT BLOCK PART NUMBER SIZE MM	INSERT BLOCK PART NUMBER SIZE MM
(THEWA)				
TTI-1/2	0.380	9.65	15/8	20/8
TT-3	0.500	12.70	20/12	30/12
TT-6	0.790	19.99	20/14	30/14
TT-10	0.990	17.53	30/17	
TT-15	0.800	20.32	30/20	
TT-20	0.880	22.35	30/22	40/22
TT-30	1.030	26.16	40/26	
TT-40	1.130	28.70	40/28	
TT-80	1.268	32.13	40/32	60/32
TT-60	1.350	34.29	40/34	60/34
TTRSA-2	0.740	18.80	30/18	
TTRSA-4	0.800	20.32	30/20	
TTRSA-6	0.940	23.88	30/23	
TTRSA-8	1.050	26.67	40/26	
TTRSA 10	1.140	28.96	40/28	
TTRSA-12	1.160	29.46	40/28	
TTRSA-16	1.250	31.78	40/30	
SSBA-3	0.870	14.48	20/14	30/14
-7	0.710	18.03	30/18	
-10	0.880	22.36	30/22	40/22
-14	0.960	24.89	30/24	40/24
-19	1.090	27.68	40/28	
-24	1.260	32.00	40/30	
-30	1.330	34.80	40/34	60/34
-37	1.430	36.32	60/36	
-44	1.600	40.64	60/40	
-61	1.790	45.47	60/44	
SSBA-3	0.750	19.05	30/19	
-7	0.940	24.36	30/24	40/24
-10	1.240	31.50	40/30	
-14	1.340	34.04	40/34	60/34
-19	1.480	37.59	60/36	
-24	1.720	43.69	60/42	
-30	1.820	46.25	60/46	
-37	1.980	50.29	60/50	90/50
-44	2.200	55.88	90/55	
-61	2.360	59.94	90/56	
PBJX-4	0.480	12.19	20/12	30/12
SHFR-4	0.840	13.72	20/13	30/13
PHFR-4	0.844	21.44	30/21	
THFR-4	0.903	22.43	30/22	40/22
1550MA-8	0.875	22.23	30/22	40/22
1550MA-20	0.956	24.26	30/24	40/24
1550MA-40	1.230	31.37	40/30	
1560MA-70	1.603	40.77	60/40	
1578MA-8	1.060	22.43	40/28	

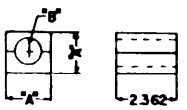
CABLE TYPE	CABLE DIAMETER IN INCHES	CABLE DIAMETER IN MM	INSERT BLOCK PART NUMBER SIZE MM	INSERT BLOCK PART NUMBER SIZE MM
RG-124/U	0.478	12.07	20/12	30/12
RG-228/U	0.420	10.67	20/10	
RG-27A/U	0.670	17.02	30/17	
RG-58C/U	0.198	4.98	15/4	20/4
RG-058/U	0.242	6.15	15/6	20/6
RG-62A/U	0.242	6.15	15/6	20/8
RG-63B/U	0.405	10.29	20/10	
RG-71B/U	0.250	6.35	15/6	20/8
RG-79B/U	0.478	12.07	20/12	30/12
RG-114A/U	0.480	12.45	20/12	30/12
RG-142B/U	0.198	4.96	15/4	20/4
RG-177/U	0.725	18.42	30/18	
RG-213/U	0.405	10.29	20/10	
RG-214/U	0.428	10.90	20/10	
RG-215/U	0.475	12.07	20/12	30/12
RG-218/U	0.870	22.10	30/22	40/22
RG-219/U	0.945	24.01	30/23	
RG-224/U	0.618	15.62	30/15	
RG-225U	0.490	12.45	20/12	30/12
RG-256/U	0.500	12.70	20/12	30/12
RG-258/U	1.888	47.90	60/44	
RG-311B/U	1.085	27.56	40/28	
RG-254/U	1.090	27.68	40/26	
RG-1798/U	0.100	2.54		
RG-393/U	1.082	28.72	40/26	
MFF-2	0.460	11.68	20/11	
MFF-4	0.520	13.21	20/13	30/13
MFF-7	0.627	15.93	30/15	
MFF-10	0.795	2020	30/20	
MFF-14	0.844	21.44	30/21	
MFF-19	0.995	25.28	30.24	40/24
MFF-24	1.120	28.45	40/28	
MFF-30	1.184	30.33	40/30	
MFF-37	1.290	32.77	40/32	60/32
MFF-44	1.420	36.07	60/36	

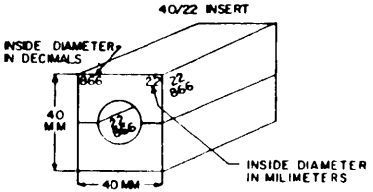
CABLE TYPE	CABLE DIAMETER IN INCHES	CABLE DIAMETER IN MM	INSERT BLOCK PART NUMBER SIZE MM	INSERT BLOCK PART NUMBER SIZE MM
MA-14	0.450	11.43	20/11	
TCOP-42	1.250	31.75	40/30	
MDGA-8(8)	1.285	32.63	40/32	60/32
MDGA-8(14)	1.520	38.61	60/38	
MDGA-8(23)	1.820	46.23	60/46	
MDGA-8(40)	2.100	53.34	60/52	
[illegible]	1.200	30.48	40/30	
19MU-5	0.500	12.70	20/12	30/12

INSERT BLOCK PART NO SIZE MM	"A" DIM IN.	"B" DIM IN
15/4	590	157
15/5	590	197
15/6	590	236
15/7	590	276
15/8	590	315
15/9	590	354
20/4	787	157
20/5	787	197
20/6	787	236
20/7	787	276
20/8	787	315
20/9	787	354
20/10	787	394
20/11	787	433
20/12	787	472
20/13	787	512
20/14	787	551
30/12	1181	472
30/13	1181	512
30/14	1181	551
30/15	1181	591
30/16	1181	630
30/17	1181	669
30/18	1181	709
30/19	1181	748
30/20	1181	787
30/21	1181	827
30/22	1181	866
30/23	1181	906
30/24	1181	946
40/22	1575	866

INSERT BLOCK PART NO SIZE MM	"A" DIM IN	"B" DIM IN
40/24	1575	945
40/26	1575	1024
40/28	1575	1102
40/30	1575	1181
40/32	1575	1260
40/34	1575	1339
60/32	2362	1260
60/34	2362	1339
60/36	2362	1417
60/38	2362	1496
60/40	2362	1575
60/42	2362	1654
60/44	2362	1732
60/48	2362	1811
60/48	2362	1890
60/50	2362	1968
60/52	2362	2047
60/54	2362	2126
90/50	3543	1969
90/55	3543	2165
90/60	3543	2362
90/65	3543	2559
90/70	3543	2756
120/78	4724	2953
120/80	4724	3150
120/85	4724	3346
120/90	4724	3543
120/95	4724	3740

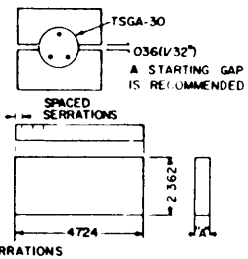
TABLE NO I
INSERT BLOCKS





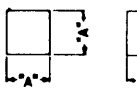
TYPICAL INSERT BLOCK IDENTIFICATION

TSGA-30 CABLE HAS AN OUTSIDE DIAMETER OF 0902 SELECT INSERT BLOCKS CONTAINING THE NEXT INSIDE DIAMETER THAT IS LESS THAN THE OUTSIDE DIAMETER OF THE CABLE A SIZE 22MM HOLE IS 0866 INCHES AND WILL PROVIDE THE FOLLOWING PRIOR TO COMPRESSION



FILL-INS IDENTIFICATION EXAMPLE
PART NO 24x5/0
5 MM SPACED SERRATIONS
24 SERRATIONS
LENGTH = 24x5x120 MM = 4724 INCHES

FILL-INS PART NUMBER	"A" DIM INCHES
24x5/0	196
12x10/0	393



SPARES PART NO SIZE MM	"A" DIM INCHES
15/0	590
20/0	787
30/0	1181

NOTES:

1. THIS FIGURE SUPERSEDES SHEET 3B28 OF DRAWING 803-5001027 AND SECTION 4, SHEET 171, OF DRAWING, NAVSEC NO. 8000-S6202-73890
2. SEE FIGURES 3B41 AND 3B42 FOR CURRENT CABLE ASSIGNMENT

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TABLE 2 CONTINUED ON FIGURES 3B41 & 3B42

FIGURE 3B26. Cable information and assignment for MCP insert blocks.

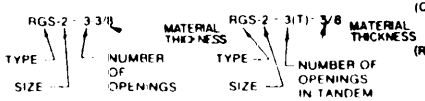
DOD-STD-2003-3(NAVY)
24 JUNE 1987

NOMENCLATURE

MULTIPLE CABLE PENETRATORS
A SYSTEM OF PASSING CABLES THRU WATER AND NON-WATER TIGHT BULKHEADS AND DECKS DESIGNED TO SUIT PARTICULAR BULKHEAD AND DECK WEIGHTS

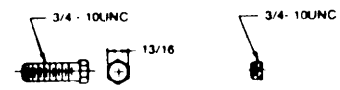
NOMENCLATURE
THROUGHOUT THIS STANDARD OF ELECTRIC PLANT INSTALLATION DRAWINGS THE FOLLOWING SHALL PREVAIL

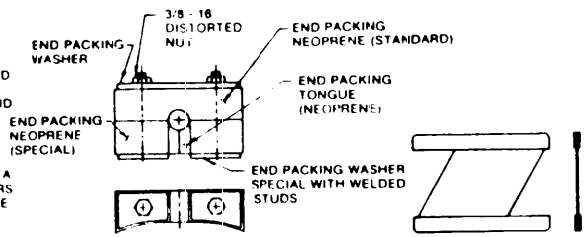
(A) FRAMES, UNBANDED
(a1) CONSISTS OF THREE BASIC SIZES 2, 4 AND 6. ALL ARE 5.506 WIDE. SIZE 2 IS 4.726 HIGH, SIZE 4 IS 7.029 HIGH AND SIZE 6 IS 9.333 HIGH.
(a2) MATERIAL SHALL BE EITHER STEEL OR ALUMINUM 1/4 OR 3/8 THICK (DEPENDING ON WEIGHT OF BULKHEAD OR DECK) IN STEEL OR 1/2 THICK IN ALUMINUM. ALL ARE 2 3/8 WIDE.
(a3) THERE ARE FOUR DIFFERENT TYPE FRAMES
RGS - STEEL, FOUR CORNERS WELDED (COMPLETELY CLOSED)
RGSO - STEEL, TWO CORNERS WELDED (OPEN BOTTOM)
RGA - ALUMINUM, FOUR CORNERS WELDED (COMPLETELY CLOSED)
RGAO - ALUMINUM, TWO CORNERS WELDED (OPEN BOTTOM)
(a4) TO RECAP SUB-PARAGRAPHS (a1) THRU (a3), AN UNBANDED FRAME IS IDENTIFIED AS FOLLOWS. AN RGS-2 x 3/8 IS A 3/8 THICK SIZE 2 STEEL FRAME WITH FOUR CORNERS WELDED (COMPLETELY CLOSED).
(B) FRAMES, BANDED
(b1) CONSISTS OF THREE BASIC SIZES SUB PARAGRAPH (a1) EACH OF WHICH IS ENCLOSED BY A REINFORCING BAND OF PROPER SIZE MATERIAL TO SUIT PARTICULAR BULKHEAD WEIGHT. IN ADDITION TO THE BAND FILLER PLATES ARE EMPLOYED TO SEAL EMPTY SPACES BETWEEN FRAME AND BAND.
(b2) RGS AND RGA BANDED FRAMES ARE COMPLETE UNITS READY TO BE INSTALLED IN BULKHEAD. RGSO AND RGAO BANDED FRAMES HAVE LOWER HALF OF BAND AND FRAME TEMPORARILY TACK WELDED AT INSTALLATION THIS TACK WELD IS BROKEN, FRAME IS WRAPPED AROUND CABLES, AND ALL WELDING IS COMPLETED
(C) PHYSICAL ARRANGEMENT AND IDENTIFICATION
(c1) VARIOUS ARRANGEMENTS OF FRAMES ARE AVAILABLE IN ALL SIZES AND TYPES. EXAMPLES AND DIMENSIONS ARE SHOWN ON FIGURES 3B29, 3B30, & 3B31
(c2) IDENTIFICATION OF VARIOUS ARRANGEMENTS ARE MADE BY THE FOLLOWING EXAMPLES



SINGLE OR DOUBLE WALL, BANDED OR UNBANDED MUST BE SPECIFIED
(D) COMPRESSION BOLT
(d1) STAINLESS STEEL 3/4 - 10 THREAD WHEN TIGHTENED SEATS THE COMPRESSION PLATE FARTHER DOWN INTO THE TRANSIT FRAME

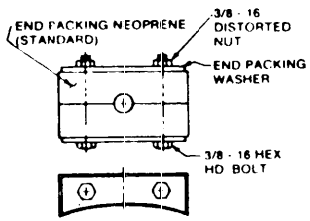
(E) PLUG
(e1) STAINLESS STEEL 3/4 - 10 THREAD USED TO PLUG TAPPED HOLE IN FRAME OPPOSITE COMPRESSION BOLT
(F) STAY PLATE
(f1) EITHER STEEL OR ALUMINUM NORMALLY PLACED BETWEEN EVERY OTHER ROW OF INSERT BLOCKS KEEPING THEM POSITIONED IN THE TRANSIT FRAME
(G) COMPRESSION PLATE
(g1) EITHER CAST IRON OR CAST ALUMINUM, SEATS AND COMPRESSES THE INSERT BLOCKS SO THAT THE ENDPACKING CAN BE INSERTED IN THE TRANSIT FRAME
(H) END PACKING - STANDARD
(h1) COMPRESSES THE INSERT BLOCKS USED WHEN FRAME CAN BE PACKED FROM EITHER SIDE
(h2) ASSEMBLY WHICH CONSISTS OF TWO NEOPRENE ELASTOMER BLOCKS AND TWO END PACKING WASHERS HELD TOGETHER BY TWO 3/8-16 BOLTS AND HEX NUTS. WASHERS, NUTS AND BOLTS ARE STEEL CADMIUM PLATED. FOR NON-MAGNETIC APPLICATIONS STAINLESS STEEL IS USED
(J) END PACKING-SPECIAL
(j1) COMPRESSES THE INSERT BLOCKS USED WHEN FRAME CAN ONLY BE PACKED FROM ONE SIDE
(j2) ASSEMBLY WHICH CONSISTS OF FOUR NEOPRENE ELASTOMER PIECES, ONE END PACKING WASHER, TWO END PACKING WASHERS SPECIAL AND TWO 3/8-16 HEX NUTS. ALL ARE STEEL CADMIUM PLATED. FOR NON-MAGNETIC APPLICATIONS STAINLESS STEEL IS USED
(K) INSERT BLOCKS
(k1) TWIN HALF BLOCKS ARE SPECIALLY FORMULATED OF A NEOPRENE ELASTOMER WITH A CENTERED SEMI-CIRCULAR GROOVE WHEN MATCHED AROUND A CABLE THESE BLOCKS FORM A SINGLE BLOCK WITH A TIGHT FIT. BASIC SIZES ARE SHOWN ON FIGURE 3B26
(L) SPARES
(l1) SOLID BLOCKS ARE SPECIALLY FORMULATED OF A NEOPRENE ELASTOMER AND ARE USED AS FILLERS OR SPARE PROVISIONS FOR ADDITION OF FUTURE CABLES. SIZES ARE SHOWN ON FIGURE 3B26
(M) FILL-INS
(m1) SAME MATERIAL AS INSERT BLOCKS AND SPARES USED TO PACK THICKNESSES OF 5 OR 10 MILLIMETERS CAUSED BY THE PRESENCE OF DIFFERENT SIZE BLOCKS IN THE SAME ROW. ALSO EMPLOYED TO INCREASE THE PRESSURE IN THE PENETRATOR FRAME WHEN EXCEPTIONALLY SOFT CABLES ARE USED. THESE FILL-INS ARE AVAILABLE IN TWO SIZES 24 x 5/0 OR 12 x 10/0 (SEE FIGURE 3B26). SERRATIONS HAVE BEEN PROVIDED TO PERMIT SLICING OF THE FILL-INS TO THE REQUIRED LENGTH EXAMPLE: 6 x 10/0, 8 x 5/0, ETC. - SERRATION SPACING MM
(N) TALLOW
(n1) INSERT BLOCK LUBRICANT USED WHEN PACKING PENETRATOR FRAME. ALLOWS THE BLOCKS TO SLIDE EASILY OVER EACH OTHER WHEN PACKING AND COMPRESSING THEM AROUND CABLES
(P) SEALER
(p1) LIQUID SILICONE RUBBER APPLIED TO CABLE SIDE OF EACH GAUGE BLOCK UPON COMPRESSION THIS PROVIDES A SEAL BETWEEN THE ARMOR OF THE CABLE AND ITS IMPERVIOUS INNER SHEATH
(Q) DISTORTED NUT
(q1) ALL NUTS ARE TO BE IN ACCORDANCE WITH MIL-N-25027C
(R) ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE STATED.



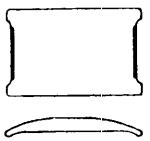


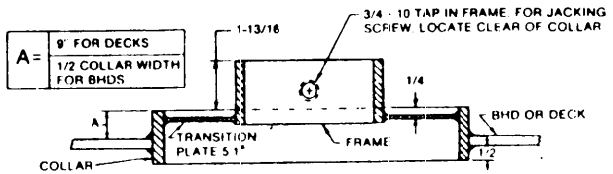
ENDPACKING SPECIAL
USE WHEN FRAME CAN BE PACKED FROM ONE SIDE ONLY

STAY PLATE



ENDPACKING STANDARD


COMPRESSION PLATE



TYPICAL SECTION THRU BANDED FRAME SHOWING LOCATION OF FRAME & PLATE WHEN WELDED IN COLLAR

NOTES

1. MULTIPLE CABLE PENETRATIORS SHALL NOT BE USED IN BULKHEADS OR DECKS WHICH ARE EXPOSED TO THE WEATHER
2. FOR ALTERNATE MULTIPLE CABLE PENETRATOR DESIGN SEE 3B26 THRU 3B66
3. THIS FIGURE SUPERSEDES SHEET 3B25 OF DRAWING 803-5001027 AND SECTION 4, SHEET 170, OF DRAWING, NAVSEC NO. 9090-S6202-73B90

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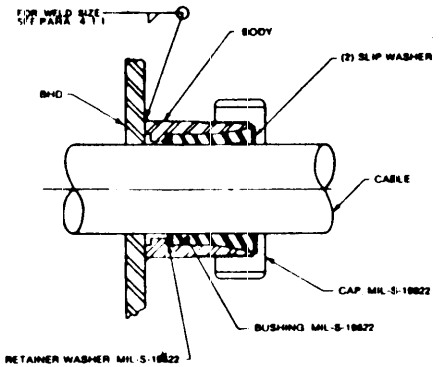
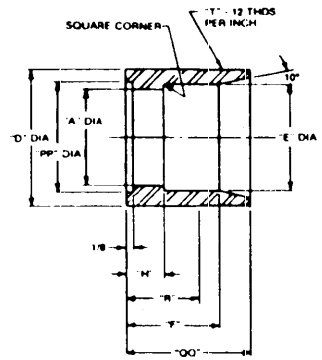
FIGURE 3B25. Multiple cable penetrator nomenclature.

3B1241

(ASSEMBLED VIEW AND BODY VIEW)



ASSEMBLED VIEW



SH 132317125

BODY VIEW

TUBE SIZE	TUBE BODY									CLEARANCE HOLE IN BULKHEAD	STD PIPE SIZE FOR RISER
	A	D	E	F	H	R	T	PP	QQ		
1	.3500	.8750	1.000	1.1870	.7500	.8430	.8750	1.100	1.437	.710	.375
2	.5640	1.000	1.250	1.1870	.7500	.8440	1.130	.8750	1.500	.875	.500
3	.8870	1.1250	1.460	1.1870	.7500	.8440	1.1750	.8750	1.500	1.110	.500
4	.8250	1.250	1.080	1.1870	.7500	.8440	1.250	1.083	1.500	1.125	.750
5	1.1870	2.000	1.343	1.500	.7500	.8750	2.130	1.888	1.875	1.625	1.125
6	1.505	2.500	1.750	1.562	.7500	.8750	2.50	1.838	2.125	1.838	1.500
7	1.648	2.750	1.837	1.625	.7500	.8750	2.750	2.438	2.250	2.125	2.00
8	2.089	3.250	2.315	1.750	.7500	1.000	3.125	2.838	2.500	2.582	2.50
9	2.842	4.000	3.250	1.841	.7500	1.1680	4.000	3.563	2.750	3.312	3.00

FIGURE 3B24. Stuffing tube for steel and aluminum bulkheads (surface ships).

NOTES:

1. METHOD 3B24 IS FOR WELDING TO KICK-PIPE (RISER) AND BULKHEADS.
2. THESE STUFFING TUBES ARE AUTHORIZED FOR USE ONLY ON WEATHER DECKS IN DECK HOUSE BULKHEADS AND BELOW DECKS ABOVE THE TIGHTNESS LEVEL IN SURFACE SHIPS.
3. THIS FIGURE SUPERSEDES SHEET 3B24 OF DRAWING 803-5001027 AND SECTION 4, SHEET 154, OF DRAWING, NAVSEC NO. 9000-S6202-73980.

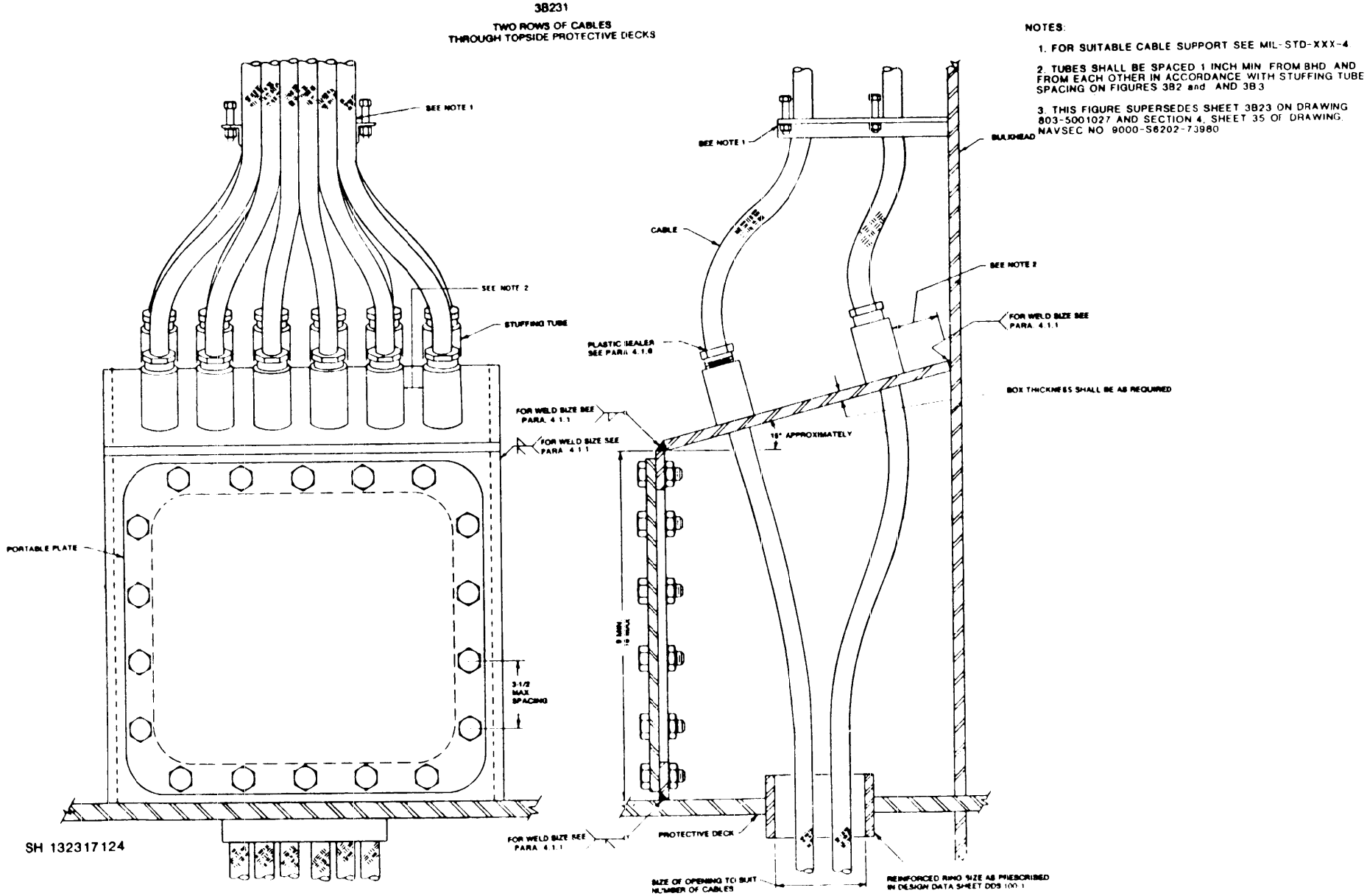


FIGURE 3B23. Topside stuffing tubes with riser box (surface ships).

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00-
FCSF-66	6	21-0006	202-2614
-220	9	24-0001	202-2628
FHFA-3	4T	19-0003	202-2593
-4	5	20-0002	202-2600
-9	5	20-0004	202-2602
-23	5	20-0009	202-2607
-50	6	21-0006	202-2614
FHFTA-9	4T	19-0003	202-2593
FJF-17	2	17-0004	202-2589
-26	3	18-0018	202-2590
-42	4T	19-0002	202-2592
-53	4T	19-0004	202-2594
-66	4T	19-0005	202-2595
-84	4T	19-0007	202-2597
-105	4T	19-0008	202-2599
-133	5	20-0002	202-2600
-168	5	20-0003	788-8711
-212	5	20-0005	202-2603
FJXF-84	4T	19-0004	202-2594
-105	4T	19-0006	202-2596
-133	4T	19-0008	202-2599
-168	5	20-0002	202-2600
-212	5	20-0004	202-2602
FLA-4	5	20-0004	202-2602
FRI-4	2	17-0004	202-2589
-9	4T	19-0003	202-2593
FRIA-3	2	17-0004	202-2589
-4	3	18-0018	202-2590
-6	4T	19-0002	202-2592
-9	4T	19-0004	202-2594
-14	4T	19-0006	202-2596
-23	4T	19-0008	202-2599

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00-
FRIB-3	3	18-0018	202-2590
-4	4T	19-0002	202-2592
-6	4T	19-0004	202-2594
-9	4T	19-0005	202-2595
-14	4T	19-0007	202-2597
-23	5	20-0002	202-2600
FRIP-3	2	17-0004	202-2589
-4	3	18-0018	202-2590
FT-2	1	16-0004	202-2583
-3	1	16-0004	202-2583
FTS-2	1	16-0004	202-2583
-3	1	16-0004	202-2583
GICA-2	4T	19-0001	202-2591
GICF-7	4T	19-0004	202-2594
-10	4T	19-0008	202-2599
-14	5	20-0005	202-2603
-19	6	21-0004	202-2612
-22			
-26			
-30	7	22-0001	202-2616
-37	7	22-0002	202-2617
-44	7	22-0002	202-2617
GICP-2	4	19-0001	202-2591
MA-14	2	17-0003	202-2588
MCGC-	4T	19-0004	202-2594
MCMB-7	4T	19-0005	202-2595

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00-
MCOP-2	3	18-0018	202-2590
-4	4T	19-0001	202-2591
-5	4T	19-0002	202-2592
-7	4T	19-0004	202-2594
-10	5	20-0002	202-2600
-12	5	20-0002	202-2600
-14	5	20-0003	788-8711
-19	5	20-0006	202-2604
-22	5	20-0010	202-2608
-24	5	20-0010	202-2608
-26	6	21-0001	202-2609
-30	6	21-0003	202-2611
-37	6	21-0005	202-2613
-44	7	22-0001	202-2616
MCP-4	4T	19-0001	202-2591
-5	4T	19-0002	202-2592
-7	4T	19-0004	202-2594
-10	4T	19-0005	202-2595
-12	4T	19-0006	202-2596
MCS-2	3	18-0018	202-2590
-4	4T	19-0001	202-2591
-6	3	18-0018	202-2590
-7	4T	19-0003	202-2593
MSCS-5	4T	19-0003	202-2593
MDGA-19(6)	8	21-0005	202-2613
-19(14)	7	22-0002	202-2617
-19(23)	8	23-0004	202-2623
-19(40)	9	24-0002	202-2629
MDGB-12(11/2)	4T	19-0003	202-2593
(1)	3	18-0018	202-2590
MDGD-3(14)	4T	19-0003	202-2593
-7(14)	4T	19-0007	202-2597

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M196221/	NSN 5330-00-
MDGL-19(6)	6	21-0005	202-2613
MDGT-17	5	20-0003	788-8711
-53	6	21-0001	202-2609
-105	7	22-0001	202-2616
-212	8	23-0004	202-2623
-400	9	24-0004	202-2631
MDGW-17(4)	9	24-0001	202-2628
-15(3)	9	24-0001	202-2628
-12(2)	9	24-0001	202-2628
MDGY-17(4)	8	23-0006	202-2625
-15(3)	8	23-0006	202-2625
-12(2)	8	23-0006	202-2625
MDY-6	6	21-0001	202-2609
-14	7	22-0002	202-2617
-23	8	23-0006	202-2525
-40	9	24-0003	202-2630
-60	9	24-0006	202-2633
MFPA-2	4T	19-0005	202-2595
-4	4T	19-0006	202-2596
-7	5	20-0002	202-2600
-10	5	20-0006	202-2604
-14	5	20-0009	202-2607
-19	6	21-0001	202-2609
-22	6	21-0004	202-2612
-26	6	21-0006	202-2614
-30	6	21-0007	202-2615
-37	7	22-0002	202-2617
-44	8	23-0002	202-2621

NOTES:
1. THE CABLES LISTED ON THIS SHEET ARE PER MIL-C-915, MIL-C-2194, MIL-C- 23206 AND MIL-C-24145 AND ARE OBSOLETE OR MANUFACTURING HAS BEEN DISCONTINUED.
2. THIS FIGURE SUPERSEDES SHEET 3C9 OF DRAWING 803-5001027 AND SECTION 4, SHEET 69-73, OF DRAWING NAVSEC NO 900-S6202-73980.

FIGURE 3C9. Nylon stuffing tubes cable assignment (obsolete or discontinued cable).

SH 132317176

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M19622/1/	NSN 5330-00-
MHFF-2	3	18-0018	202-2590
-4	4T	19-0001	202-2591
-7	4T	19-0004	202-2594
-10	5	20-0002	202-2600
-14	5	20-0003	788-8711
-19	5	20-0006	202-2604
-22	5	20-0010	202-2608
-24	5	20-0010	202-2608
-26	6	21-0001	202-2609
-30	6	21-0003	202-2611
-37	6	21-0005	202-2613
-44	6	21-0007	202-2615
PBJX-4	3	18-0018	202-2590
PBLW-4	3	18-0018	202-2590
PBTM-5	4T	19-0002	202-2592
-10	4T	19-0008	202-2599
-15	5	20-0006	202-2604
PBTX-4	3	18-0018	202-2590
SCOP-23	3	18-0018	202-2590
-60	4T	19-0004	202-2594
-150	5	20-0004	202-2602
-153	5	20-0003	788-8711
-200	5	20-0006	202-2604
-250	5	20-0009	202-2607
-253	5	20-0009	202-2607
-800	8	23-0002	202-2620
SCP-1	1	16-0001	202-2580
-23	2	17-0004	202-2589
-60	4T	19-0003	202-2593
-153	5	20-0003	788-8711
-200	5	20-0009	202-2607
-253	6	21-0001	202-2609
-814	9	24-0001	202-2628

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M19622/1/	NSN 5330-00-
SDGA-400	6	21-0003	202-2611
-500	6	21-0005	202-2613
-650	6	21-0007	202-2615
-800	7	22-0002	202-2617
-1000	8	23-0002	202-2617
-1300	8	23-0004	202-2623
-1600	9	24-0001	202-2628
2000	9	24-0003	202-2630
SDU-500	6	21-0003	202-2611
-800	7	22-0001	202-2616
SFPA-9	4T	19-0001	202-2591
-14	4T	19-0002	202-2592
-23	4T	19-0003	202-2593
-30	4T	19-0003	202-2593
-40	4T	19-0004	202-2594
-50	4T	19-0005	202-2595
-60	4T	19-0005	202-2595
-75	4T	19-0007	202-2597
-100	4T	19-0008	202-2599
-125	5	20-0002	202-2600
-150	5	20-0003	788-8711
-200	5	20-0005	202-2603
-400	5	20-0008	202-2606
-500	6	21-0004	202-2612
-650	6	21-0006	202-2614
-800	7	22-0001	202-2616

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M19622/1/	NSN 5330-00
SHFA-3	1	16-0008	202-2585
-4	3	18-0018	202-2590
-9	4T	19-0004	202-2594
-14	4T	19-0004	202-2594
-23	4T	19-0005	202-2595
-30	4T	19-0006	202 2596
-40	4T	19-0007	202-2597
-50	4T	19-0008	202-2599
-60	4T	19-0008	202-2599
-75	5	20-0002	202-2600
-100	5	20-0003	788-8711
-125	5	20-0004	202-2602
-150	5	20-0005	202-2603
-200	5	20-0007	202-2605
-300	5	20-0010	202-2608
-400	6	21-0004	202-2612
-500	6	21-0006	202-2614
-650	7	22-0001	202-2616
-800	7	22-0003	202-2618
SHFL-400	7	22-0001	202-2616
-500	7	22-0003	202-2618
-650	8	23-0001	202-2620
-800	8	23-0003	202-2622
-1000	8	23-0006	202-2625
SHFP-200	6	21-0003	202-2611
-300	6	21-0005	202-2613
(3)-300	6	21-0004	202-2612
-400	7	22-0001	202-2616
(3)-400	6	21-0007	202-2615
-500	7	22-0002	202-2617
(3)-500	7	22-0001	202-2616
-650	8	23-0001	202-2620
-800	8	23-0003	202-2622
(3)-800	8	23-0002	202-2621
SHFR-4	4T	19-0001	202-2591

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M19622/1/	NSN 5330-00-
SLPA-4	1	16-0004	202-2583
-9	4T	19-0002	202-2592
-14	4T	19-0003	202-2593
-23	4T	19-0004	202-2594
-30	4T	19-0005	202-2595
-40	4T	19-0006	202-2596
-50	4T	19-0007	202-2597
-60	4T	19-0008	202-2599
-75	5	20-0002	202-2600
-100	5	20-0003	788-8711
-125	5	20-0004	202-2602
-150	5	20-0006	202-2604
-200	5	20-0008	202-2606
-250	5	20-0010	202-2608
-300	6	21-0003	202-2611
-400	6	21-0005	202-2613
-500	7	22-0001	202-2616
-650	7	22-0002	202-2617
-800	8	23-0001	202-2620
-1000	9	24-0002	202-2629
SRIA-3	1	16-0001	202-2580
-4	1	16-0003	202-2582
-6	1	16-0003	202-2582
-9	1	16-0004	202-2583
-14	1	16-0004	202-2583
-23	1	16-0005	202-2584
SRLL-4	1	16-0005	202-2584

NOTES:
1. THE CABLE LISTE ON THIS SHEET ARE PER MIL-C-915, MIL-C-2194, MIL-C-23206 AND MIL-C-24145 AND ARE OBSOLETE OR MANUFACTURING HAS BEEN DISCONTINUED.
2. THIS FIGURE SUPERSEDES SHEET 3C10 OF DRAWING 803-5001027 AND DRAWING, NAVSEC NO9000-S6202-73980.

SH 132317177

FIGURE 3C10. Nylon stuffing tube cable assignment (obsolete or discontinued cable).

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL96221/	NSN 5330-00-
SSGA-3	1	16-0004	202-2583
-4	1	16-0005	202-2584
-9	2	17-0001	202-2586
-14	2	17-0002	202-2587
-23	2	17-0003	202-2588
-30	2	17-0004	202-2589
-40	3	18-0018	202-2590
-150	4T	19-0008	202-2599
-500	6	21-0004	202-2612
-1300	8	23-0004	202-2623
SS5P-200	5	20-0006	202-2604
-300	6	21-0001	202-2609
-400	6	21-0004	202-2612
-500	6	21-0006	202-2614
-650	7	22-0002	202-2617
-800	8	23-0001	202-2620
TBSP-3/5	1	16-0004	202-2583
-1	1	16-0004	202-2583
-2	1	16-0005	202-2584
-3	2	17-0001	202-2586
-4	2	17-0003	202-2588
-6	3	18-0018	202-2590
-9	4T	19-0001	202-2591
-14	4T	19-0003	202-2593
-23	4T	19-0005	202-2595
TCP-1	1	16-0004	202-2583
-2	2	17-0001	202-2586
-3	2	17-0003	202-2588
-4	3	18-0018	202-2590
-6	4T	19-0001	202-2591
-9	4T	19-0002	202-2592
-23	5	20-0009	202-2607
-42	6	21-0004	202-2612
-153	8	23-0004	202-2623
-400	9	24-0008	202-2635

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL96221/	NSN 5330-00-
THFR-4	5	20-0003	788-8711
TFPA-14	5	20-0004	202-2602
-23	5	20-0006	202-2604
-30	5	20-0008	202-2606
-40	5	20-0009	202-2607
-50	6	21-0001	202-2609
-60	6	21-0003	202-2611
-75	7	22-0002	202-2617
-100	8	23-0001	202-2620
-125	8	23-0003	202-2632
-150	8	23-0006	202-2625
-250	9	24-0004	202-2631
-300	9	24-0005	202-2632
-400	9	24-0006	202-2633
THFA-3	4T	19-0001	202-2591
-4	4T	19-0008	202-2599
-9	5	20-0002	202-2600
-14	5	20-0004	202-2602
-23	5	20-0006	202-2604
-30	5	20-0010	202-2608
-40	6	21-0002	202-2610
-50	6	21-0003	202-2611
-60	6	21-0006	202-2614
-75	7	22-0002	202-2617
-100	8	23-0001	202-2620
-125	8	23-0002	202-2621
-150	8	23-0006	202-2625
-200	9	24-0001	202-2628
-250	9	24-0003	202-2630
-300	9	24-0005	202-2632
-350	9	24-0006	202-2633
-400	9	24-0007	202-2634

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIL96221/	NSN 5330-00-
TLPA-4	4T	19-0006	202-2596
-9	5	20-0005	202-2603
-14	5	20-0006	202-2604
-23	5	20-0009	202-2607
-30	6	21-0002	202-2610
-40	6	21-0004	202-2612
-50	6	21-0005	202-2613
-60	6	21-0007	202-2615
-75	7	22-0001	202-2616
-100	7	22-0003	202-2618
-125	8	23-0003	202-2622
-150	8	23-0005	202-2624
-200	9	24-0001	202-2628
-300	9	24-0004	202-2631
TPTA-3	2	17-0004	202-2589
-5	4T	19-0004	202-2594
-10	4T	19-0006	202-2596
-15	4T	19-0008	202-2599
-20	5	20-0002	202-2600
-25	5	20-0003	788-8711
-30	5	20-0004	202-2602
-40	5	20-0005	202-2603
-50	5	20-0008	202-2606
-60	5	20-0009	202-2607
TPTF-3	5	20-0002	202-2600
-5	5	20-0005	202-2603
-10	6	21-0006	202-2614
-15	7	22-0003	202-2618

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO. MIL96221/	NSN 5330-00-
TPTP-3	4T	19-0003	202-2593
-5	4T	19-0004	202-2594
-10	4T	19-0006	202-2596
-15	5	20-0002	202-2600
-25	5	20-0004	202-2602
-30	5	20-0005	202-2603
-40	5	20-0006	202-2604
-50	5	20-0009	202-2607
-60	5	20-0010	202-2608
TRI-2	2	17-0001	202-2586
-3	2	17-0002	202-2587
-4	2	17-0004	202-2589
-6	3	18-0018	202-2590
-9	4T	19-0002	202-2592
TRIA-2	2	17-0001	202-2586
-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-6	4T	19-0001	202-2591
-9	4T	19-0002	202-2592
-14	4T	19-0004	202-2594
-23	4T	19-0006	202-2596
TRIB-2	2	17-0001	202-2586
-3	2	17-0002	202-2587
-4	2	17-0004	202-2589
-6	4T	19-0002	202-2592
-9	4T	19-0003	202-2593
-14	4T	19-0004	202-2594
-23	4T	19-0007	202-2597
TRIP-2	2	17-0001	202-2586
-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-9	4T	19-0002	202-2592
-14	4T	19-0005	202-2595
-23	4T	19-0005	202-2595

NOTES:
1. THE CABLES LISTED ON THIS SHEET ARE PER MIL-C-914, MIL-C-2194, MIL-C-23206 AND MIL-C-24145 AND ARE OBSOLETE OR MANUFACTURING HAS BEEN DISCONTINUED.
2. THIS FIGURE SUPERSEDES SHEET 3C11 OF DRAWING 803-5001027 AND SECTION 4, SHEET 69-73, OF DRAWING, NAVSEC NO. 9000-S6202-73980.

SH 132317178

FIGURE 3C11. Nylon stuffing tube cables assignment (obsolete or discontinued cable).

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M85221/	NSN 5330-00-
TSGA-30	5	20-0003	788-8711
-40	5	20-0004	202-2602
-60	5	20-0009	202-2607
-125	7	22-0007	202-
-250	8	23-0004	202-2623
-350	9	24-0002	202-2629
TTHFA-1	1	16-0003	202-2582
-3	4T	19-0001	202-2591
-5	4T	19-0002	202-2592
-10	4T	19-0004	202-2594
-15	4T	19-0005	202-2595
-20	4T	19-0007	202-2597
-25	5	20-0001	01-032-3021
-30	5	20-0002	202-2600
-40	5	20-0004	202-2602
-50	5	20-0005	202-2603
-60	5	20-0009	202-2607
TTHFF-3	3	18-0018	202-2590
-5	4T	19-0002	202-2592
-10	4T	19-0005	202-2595
-15	5	20-0002	202-2600
-20	5	20-0005	202-2603
-25	5	20-0008	202-2606
-30	5	20-0010	202-2608
-40	6	21-0004	202-2612
-50	7	22-0001	202-2616
-60	7	22-0003	202-2618

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M85221/	NSN 5330-00-
THFWA-1-1/2	2	17-0001	202-2586
-3	2	17-0004	202-2589
-5	4T	19-0002	202-2592
-10	4T	19-0004	202-2594
-15	4T	19-0007	202-2597
-20	5	20-0002	202-2600
-30	5	20-0005	202-2603
-40	5	20-0008	202-2606
-50	6	21-0003	202-2611
-60	6	21-0005	202-2613
TTRSA-2	4T	19-0006	202-2596
-4	4T	19-0007	202-2597
-6	5	20-0004	202-2602
-8	5	20-0008	202-2604
-10	5	20-0009	202-2607
-12	5	20-0009	202-2607
-16	6	21-0001	202-2609
T3P-42	8	23-0001	202-2620
-400			
ISA-44	5	20-0006	202-2604
ISMA-16	5	20-0002	202-2600
-40	6	21-0002	202-2610
-70	7	22-0003	202-2618
ISMWA-70	7	22-0003	202-2618
ISWA-2	2	17-0004	202-2589
-14	5	20-0003	788-8711
-20	5	20-0007	202-2605
-30	6	21-0003	202-2611
ISSOMA-16	5	20-0002	202-2600
-20	5	20-0004	202-2602
-40	6	21-0002	202-2610
-70	7	22-0003	202-2618

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M85221/	NSN 5330-00
IS75MA-8	5	20-0007	202-2605
2A-40	6	21-0006	202-2614
2SA-3	4T	19-0001	202-2591
-7	4T	19-0005	202-2595
-10	5	20-0002	202-2600
-14	5	20-0005	202-2603
-19	5	20-0007	202-2605
-24	6	21-0003	202-2611
-30	6	21-0004	202-2612
-37	6	21-0006	202-2614
-44	7	22-0002	202-2617
-61	8	23-0003	202-2622
2SWA-3	4T	19-0001	202-2591
-7	4T	19-0005	202-2595
-10	5	20-0002	202-2600
-14	5	20-0005	202-2603
-19	5	20-0007	202-2605
-24	6	21-0003	202-2611
-30	6	21-0004	202-2612
-37	6	21-0006	202-2614
-44	7	22-0002	202-2617
-61	8	23-0003	202-2622
2WA-40	6	21-0006	202-2614
3SA-3	4T	19-0006	202-2596
-7	5	20-0004	202-2602
-10	6	21-0002	202-2610
-14	6	21-0004	202-2612
-19	6	21-0007	202-2615
-24	8	23-0001	202-2620
-30	8	23-0003	202-2622
-37	8	23-0006	202-2625
-44	9	24-0003	202-2630

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO M85221/	NSN 5330-00-
2SWA-3	4T	19-0006	202-2596
-7	5	20-0004	202-2602
-10	6	21-0002	202-2610
-14	6	21-0004	202-2612
-19	6	21-0007	202-2615
-24	8	23-0001	202-2620
-30	8	23-0003	202-2622
-37	8	23-0006	202-2625
-44	9	24-0004	202-2631

NOTES:

1. THE CABLES LISTED ON THIS SHEET ARE PER MIL-C-915, MIL-C-2194, MIL-C-23206 AND MIL-C-24145 AND ARE OBSOLETE OR MANUFACTURING HAS BEEN DISCONTINUED
2. THIS FIGURE SUPERSEDES SHEET 3C12 OF DRAWING 803-5001027 AND SECTION 4, SHEET 69-73, OF DRAWING, NAVSEC NO 9000-S6202-73980

SH 132317179

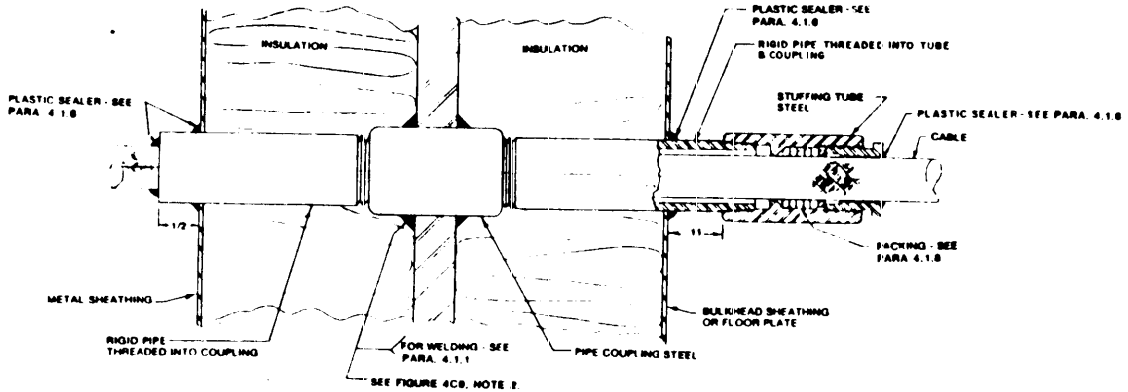
FIGURE 3C12. Nylon stuffing tubes cable assignment (obsolete or discontinued cable).

TUBE SPEC MIL-S-24235

NOTES:
1. THIS FIGURE SUPERSEDES SHEET 3C13 OF DRAWING 803-5001027 AND SECTION 4, SHEET 46, OF DRAWING, NAVSEC NO. 9000-56202-73980.

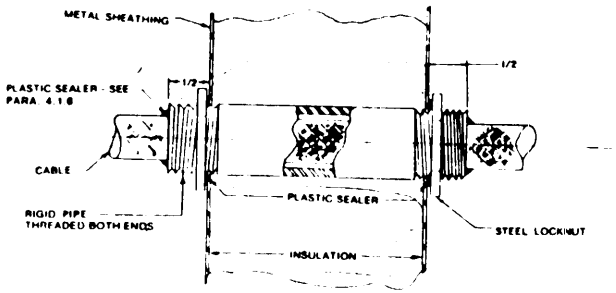
3C131

CABLES THROUGH STEEL PARTITION BULKHEADS OR DECKS WITH INSULATION AND SHEATHING ON BOTH SIDES



3C132

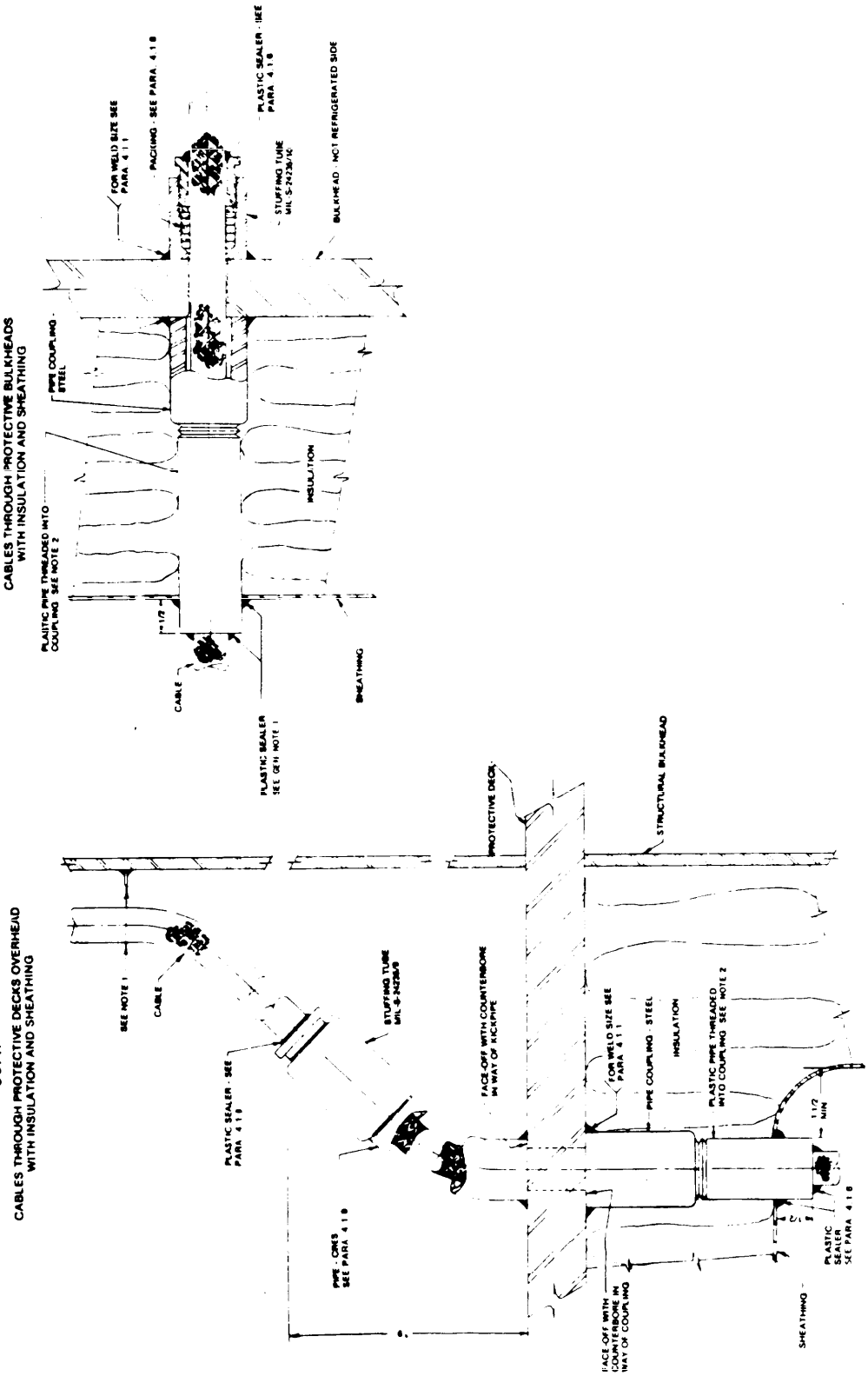
CABLES THROUGH PARTITION BULKHEADS OF FIBROUS GLASS AND SHEATHING



SH 132317180

FIGURE 3C13. Stuffing tubes through refrigerated spaces.

NOTES:
1. FOR SUITABLE CABLE SUPPORT SEE MIL-STD-XXX-4
2. PLASTIC PIPE AND FITTING SHALL BE NYLON OR PVC
3. THIS FIGURE SUPERSEDES SHEET 3C14 OF DRAWING 803-5001027 AND DRAWING NAVSEC NO 9000-S6202-73980.

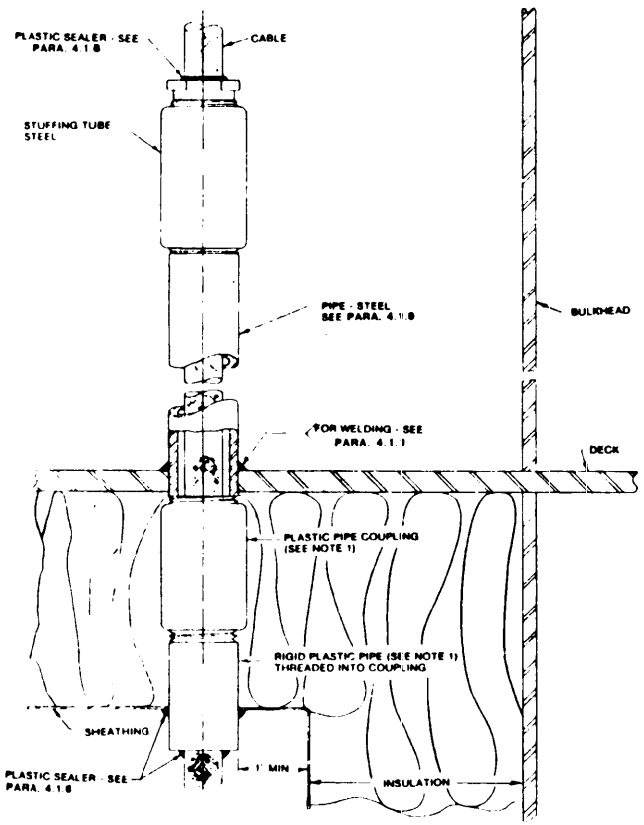


SH 132317181

FIGURE 3C14. Stuffing tubes through refrigerated spaces.

3C15I

CABLES THROUGH OVERHEAD STEEL DECKS
WITH INSULATION AND SHEATHING



SH 132317182

NOTES:
1. PLASTIC PIPE AND FITTINGS SHALL BE NYLON OR PVC.
2. THIS FIGURE SUPERSEDES SHEET 3C15 OF DRAWING 803-5001027 AND SECTION 4, SHEET 44, OF DRAWING NAVSEC NO. 9000-S6202-73980

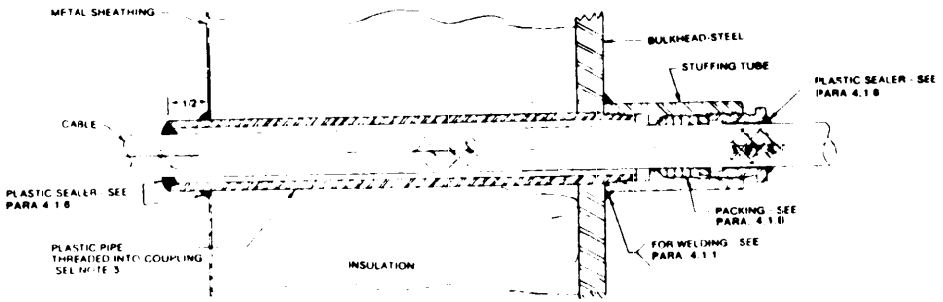
FIGURE 3C15. Stuffing tubes through refrigerated spaces.

NOTES:

1. CABLE ENTRANCE TO REFRIGERATED SPACES PREFERABY THROUGH BULKHEADS OR OVERHEAD DECKS
2. STUFFING TUBES ARE LOCATED PREFERABLY ON THE WARM SIDE OF BOUNDRY BULKHEADS OR OVERHEAD DECKS
3. PLASTIC PIPE AND FITTINGS SHALL BE NYLON OR PVC
4. THIS FIGURE SUPERSEDES SHEET 3C16 OF DRAWING 803-5001027 AND SECTION 4, SHEET 45, OF DRAWING NAVSEC NO. 9000-S6202-73980

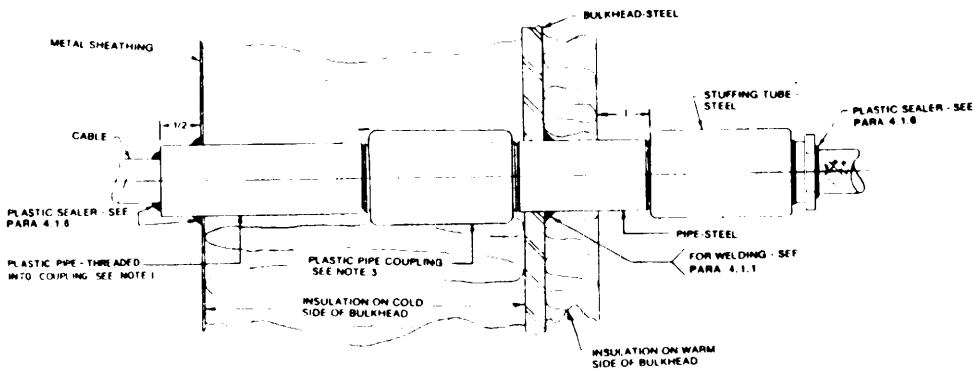
3C161

CABLES THROUGH BOUNDRY BULKHEADS OR OVERHEAD DECKS WITH INSULATION AND SHEATHING ON THE COLD SIDE



3C162

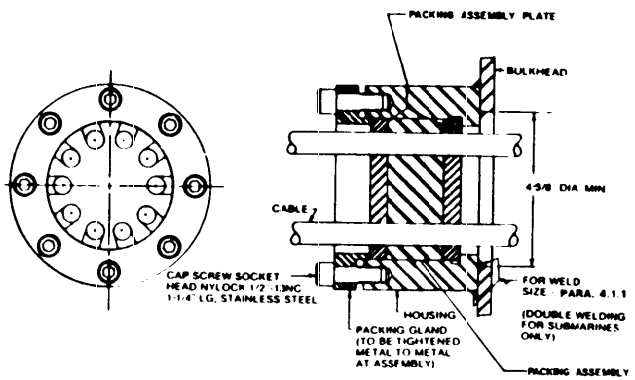
CABLES THROUGH BOUNDRY BULKHEADS OR OVERHEAD DECKS WITH INSULATION AND SHEATHING ON THE COLD SIDE AND INSULATION WITHOUT SHEATHING ON THE WARM SIDE



SH 132317183

FIGURE 3C16. Stuffing tubes through refrigerated spaces.

3C171

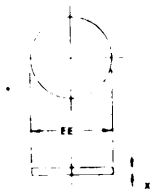


NOTES:

1. THE DESIGN SHOWN HEREON IS FOR USE FOR PASSING CABLES THROUGH BALLAST TANK BULKHEADS FOR SUBMARINES AND IS A TYPICAL INSTALLATION ONLY. BULKHEAD FITTINGS FOR SUBMARINES SHALL WITHSTAND MAXIMUM PRESSURE OF 45 PSI AND CONFORM TO SPEC MIL-S-24235.
2. THIS METHOD IS ALSO APPLICABLE TO SURFACE SHIPS BY VARYING SIZE TO SUIT THE NUMBER AND SIZE OF CABLES TO BE ACCOMMODATED AND THE SPECIFIED MATERIAL MAY BE CHANGED TO SUIT THE SHIPBUILDER EXCEPT THAT GROMMET SHALL REMAIN NEOPHRENE OF 40-45 DUROMETER AND GLAND RING SHALL BE BRASS. OTHER CHANGES MAY BE MADE TO LIGHTEN THE CONSTRUCTION SUCH AS DECREASE OF HOUSING THICKNESS AND FLANGE THICKNESS PROVIDING GLAND RING IS THREADED INTO HOUSING USING THE SAME CONSTRUCTION USED FOR SINGLE CABLE STUFFING TUBES. DESIGN FOR SURFACE SHIPS SHALL WITHSTAND MINIMUM PRESSURE OF 15 PSI.
3. FOR WOOD CONSTRUCTION, HOUSING SHALL BE DESIGNED WITH A SUITABLE FLANGE FOR SECURING TO WOOD BULKHEAD.
4. RADIAL STAGGERING OF CABLES TO ATTAIN MAXIMUM ACCEPTANCE OF CABLES IN MINIMUM SPACE IS SATISFACTORY. HOWEVER REQUIREMENTS OF GSS REGARDING BULKHEAD STRENGTH AND TIGHTNESS MUST BE MAINTAINED.
5. THIS SHEET SHOWING METHOD 3C171 IS CONSIDERED A WORKING PLAN. THE SUBMISSION OR PREPARATION OF PLANS SHOWING DETAILS OF ACCOMPLISHING THE METHOD OR THE PERMISSIVE NOTES THEREFOR, ON THIS SHEET IS NOT REQUIRED.
6. POSITION STUFFING TUBE SO THAT PACKING GLAND IS ON THE MOST ACCESSIBLE SIDE OF BALLAST TANK PARTITION.
7. THIS FIGURE SUPERSEDES SHEET 3C17 OF DRAWING 805-5001027 AND SECTION 4, SHEET 144, OF DRAWING, NAVSEC NO. 6000-56202-73980.

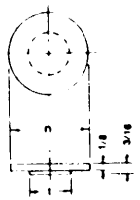
FIGURE 3C17. Community stuffing tubes for bulkheads.

3C181



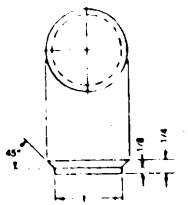
INSERT PC 3C181		
SIZE	DIMENSIONS	
	EE	X
1	.550	3/32
2	.615	
3	.755	
4	.896	1/8
5	1.333	
6	1.740	
7	1.927	
8	2.302	
9	3.240	

3C182



INSERTS PCS 3C182 & 3C183		
SIZE	DIMENSIONS	
	n	T
A	3/4	3/8
B	7/8	15/32
C	1	19/32
D	1 1/8	23/32
E	1 1/8	25/32
F	1 3/16	13/16
G	1 3/8	29/32
J	1 1/2	1 1/32
K	1 5/8	1 1/8
L	1 11/16	1 7/32
M	1 7/8	1 3/8
N	1 15/16	1 15/32
P	2 1/16	1 19/32
R	2 3/16	1 23/32
S	2 9/16	1 27/32
T	2 3/4	2 1/32
V	2 7/8	2 5/32
W	3	2 9/32
X	3 1/8	2 15/32
Y	3 1/4	2 9/16
Z	3 7/16	2 3/4
AA	3 5/8	2 27/32

3C183



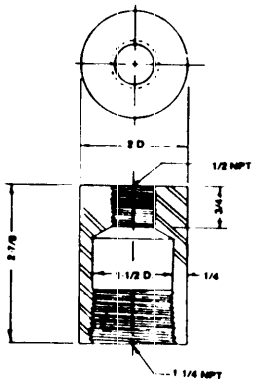
NOTES:

1. FOR METHOD OF SEALING CABLE ENDS SEE PARA. 4.1.6
2. FOR CABLE ASSIGNMENT SEE FIGURES 3C3 THRU 3C12
3. INSERT, PC. 3C181 USED WITH NYLON STUFFING TUBES , MIL-S-19622
4. INSERTS, PCS 3C182 & 3C183 USED WITH STEEL STUFFING TUBES, MIL-S-24235, DRAWN AND MACHINED RESPECTIVELY.
5. INSERTS PC 3C181, 3C182 & 3C183 MAY BE MADE OF THE FOLLOWING MATERIALS:
   (A) POLYAMIDE (NYLON) PLASTIC, SPEC MIL-M-20693.
   (B) LAMINATED PLASTIC, SPEC MIL-P-15037, THE LAMINATIONS SHALL BE PARALLIEL TO THE FACES OF THE INSERT.
   (C) MOLDED PHENOLIC TYPE MAI-60, MIL-M-14.
   (D) FIBER, SPEC. MIL-F-1148, GRADE "CH" FORM "R" OR "S". THE FIBER SHALL BE GIVEN A COAT OF INSULATING VARNISH SPEC. MIL-V-13497.
6. THIS FIGURE SUPERSEDES SECTION 1, SHEET 43, OF DRAWING, NAVSEC NO.9000-S6202-73980.

FIGURE 3C18. Stuffing tube inserts.

NOTES:
1. MATERIAL TO BE STEEL ASTM GRADE A36 OR ASTM GRADE A441
2. THIS FIGURE SUPERSEDES SHEET 3C19 OF DRAWING 803-5001027 AND SECTION 1, SHEET 83 OF DRAWING NAVSEC NO. 9000-S6202-73980

3C191



SH 132317186

FIGURE 3C19. stuffing tube adapter.

THIS SHEET INTENTIONALLY LEFT BLANK

FIGURE 3C20. NOT USED

SH 132317187

NOTES:

1. TABLE CONTINUED FROM FIGURE 3C7.
2. THIS FIGURE SUPERSEDES SHEET 3C21 OF DRAWING 803-5001027.

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIP6221/	NSN 5330-00
TNWA-3	2	17-0003	202-2588
-4	2	17-0004	202-2589
-9	4T	19-0004	202-2594
-14	4T	19-0005	202-2595
-23	4T	19-0007	202-2598
-50	5	20-0005	202-2603
-75	5	20-0010	202-2608
-100	6	21-0004	202-2612
-150	7	22-0001	202-2616
TPNWA-1-1/2	1	16-0004	202-2583
-3	1	16-0006	202-2585
-5	2	17-0001	202-2586
-10	3	18-0018	202-2590
-15	4T	19-0001	202-2591
-20	4T	19-0002	202-2592
-30	4T	19-0005	202-2595
-40	4T	19-0007	202-2598
1SUA-36	5	20-0005	202-2603
-60	6	21-0004	202-2612
1SWA-2	2	17-0004	202-2589
-14	5	20-0003	202-2601
-20	5	20-0007	202-2605
-30	6	21-0003	202-2611
1S50MA-16	5	20-0002	202-2600
-20	5	20-0004	202-2602
-40	6	21-0001	202-2609
-70	7	22-0001	202-2616
2SUS-3	4T	19-0002	202-2592
-7	4T	19-0006	202-2596
-10	5	20-0004	202-2602
-14	5	20-0006	202-2604
-19	5	20-0008	202-2606
-24	6	21-0003	202-2611
-30	6	21-0004	202-2612
-37	6	21-0007	202-2615
-44	7	22-0003	202-2618
-61	8	23-0003	202-2622

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIP6221/	NSN 5330-00
2SJA-22	1	16-0001	202-2580
-20	1	16-0001	202-2580
-18	1	16-0004	202-2583
-16	1	16-0004	202-2583
-14	1	16-0006	202-2585
-12	2	17-0002	202-2587
-11	2	17-0004	202-2589
-9	4T	19-0001	202-2591
-7	4T	19-0003	202-2593
2UA-10	3	18-0018	202-2590
-15	4T	19-0002	202-2592
-19	4T	19-0002	202-2592
-30	4T	19-0005	202-2595
-45	5	20-0003	788-8711
-60	5	20-0005	202-2603
2UW-42	4T	19-0007	202-2597
2UWA-42	4T	19-0007	202-2597
2UWS-42	5	20-0002	202-2600
2WA-40	7	22-0001	202-2616
3SA-3	4T	19-0005	202-2595
-7	5	20-0004	202-2602
-10	5	20-0016	202-2608
-14	6	21-0003	202-2611
-19	6	21-0007	202-2615
-24	7	22-0003	202-2618
-30	8	23-0002	202-2621
-37	8	23-0005	202-2624
-44	9	24-0001	202-2628
3SUS-3	4T	19-0007	202-2597
-7	5	20-0004	202-2602
-10	6	21-0002	202-2610
-14	6	21-0004	202-2612
-19	7	22-0001	202-2616
-24	7	22-0003	202-2618
-30	8	23-0003	202-2622
-37	8	23-0006	202-2625
-44	9	24-0002	202-2629

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIP6221/	NSN 5330-00-
3SJA-22	1	16-0001	202-2580
-20	1	16-0004	202-2583
-18	1	16-0004	202-2583
-16	1	16-0005	202-2584
-14	2	17-0001	202-2586
-12	2	17-0003	202-2588
-9	4T	19-0003	202-2593
3SWA-3	4T	19-0006	202-2596
-7	5	20-0004	202-2602
-10	6	21-0002	202-2610
-14	6	21-0004	202-2612
-19	7	21-0007	202-2615
-24	8	23-0001	202-2620
-30	8	23-0003	202-2622
-37	8	23-0006	202-2625
-44	9	24-0004	202-2625
3SWUS-3	4T	19-0001	202-2595
-7	5	20-0005	202-2603
-10	5	20-0010	202-2608
-14	6	21-0004	202-2612
-19	6	21-0007	202-2615
-24	7	22-0003	202-2618
-30	8	23-0004	202-2623
-37	8	23-0006	202-2625
-44	9	24-0003	202-2630
2AUS-40	6	21-0006	202-2614
2CS-6	2	17-0014	202-2589
-18	4T	19-0003	202-2593
-42	4T	19-0008	202-2599
-60	5	20-0004	202-2602
-77	5	20-0007	202-2605

CABLE	TUBE SIZE	PACKING ASSEMBLY	
		MIL PART NO MIP6221/	NSN 5330-00-
2SA-3	4T	19-0001	202-2591
-7	4T	19-0005	202-2595
-10	5	20-0002	202-2600
-14	5	20-0004	202-2602
-19	5	20-0007	202-2605
-24	6	21-0001	202-2609
-30	6	21-0004	202-2612
-37	6	21-0004	202-2612
-44	7	22-0002	202 2617
-61	7	22-0003	202-2618
2SWA-3	4T	19-0001	202-2591
-7	4T	19-0005	202-2595
-10	5	20-0002	202-2600
-14	5	20-0005	202-2603
-19	5	20-0007	202-2605
-24	6	21-0003	202-2611
-30	6	21-0004	202-2612
-37	6	21-0006	202-2614
-44	7	22-0002	202-2617
-61	8	23-0003	202-2622

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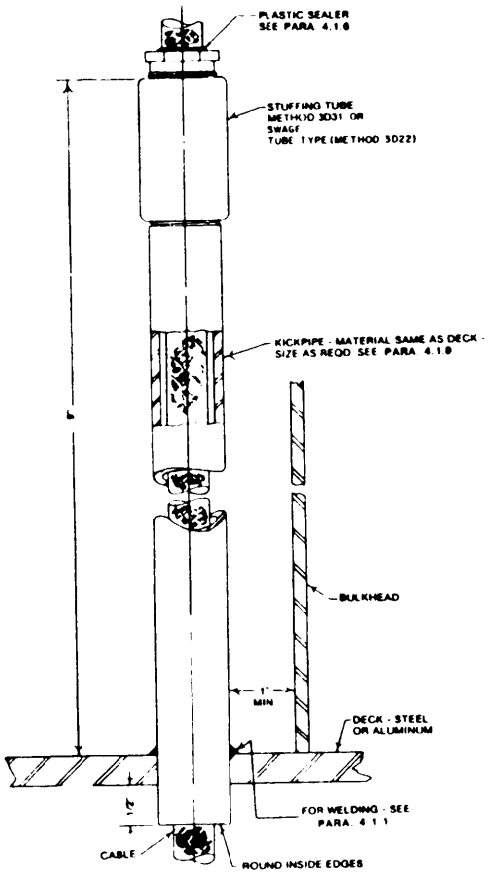
FIGURE 3C21. Nylon stuffing tubes cable assignment.

NOTES:
1. USE BENT KICKPIPE TO CONSERVE SPACE.
2. FOR SUITABLE CABLE SUPPORT SEE MIL-STD-XXX-4.
3. THIS FIGURE SUPERSEDES SECTION 4, SHEET 12, OF DRAWING NAVSEC NO. 9000-S6202-73980.

3D11
KICKPIPES
THROUGH WATERTIGHT DECK WITHOUT INSULATION



SH 132317189

3D12
KICKPIPES
THROUGH WATERTIGHT DECK WITH INSULATION

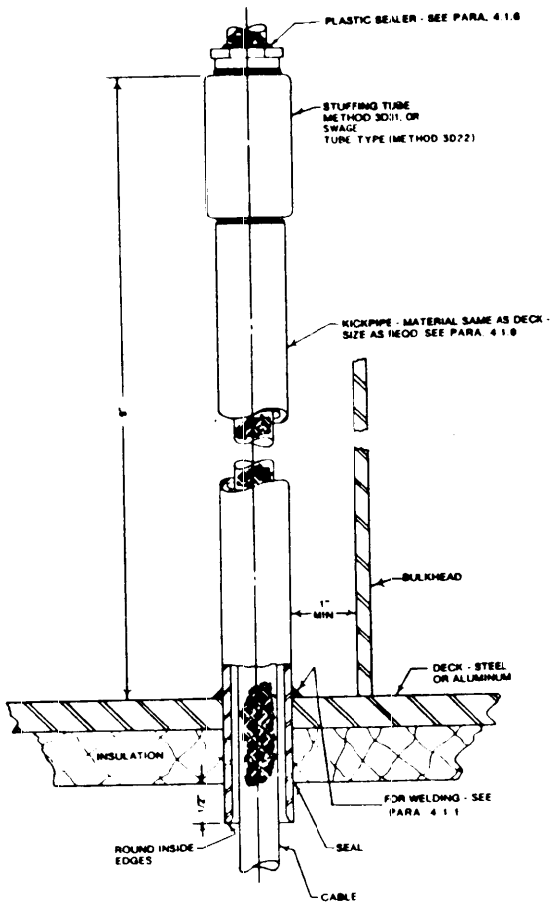
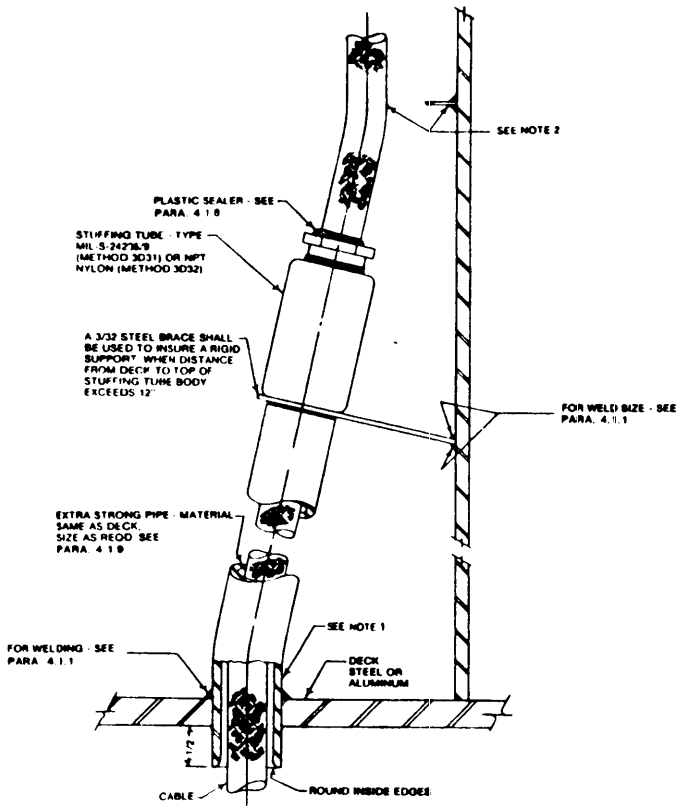


FIGURE 3D1. Kickpipes through steel or aluminum decks.

NOTES:
1. USE BENT KICKPIPE TO CONSERVE SPACE.
2. FOR SUITABLE CABLE SUPPORT, SEE MIL-STD-XXX-4
3. THIS FIGURE SUPERSEDES SECTION 4, SHEET 12, OF DRAWING, NAVSEC NO 9000-S6202-73980

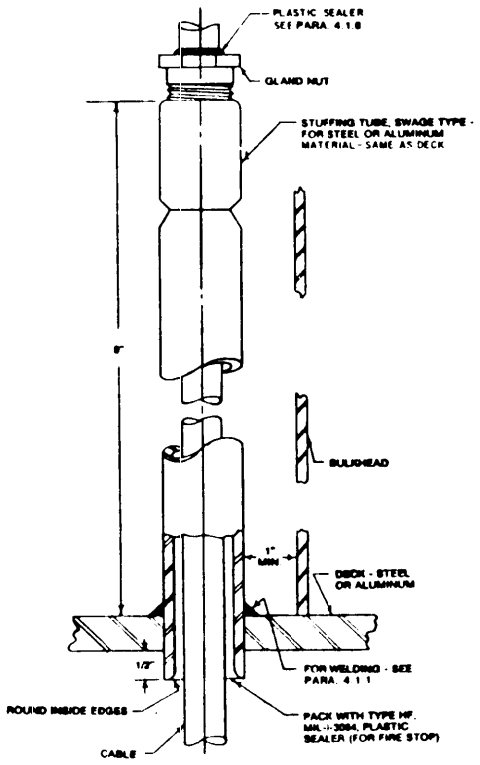
3D21

KICKPIPES THROUGH
WATERTIGHT DECKS WITH OR WITHOUT INSULATION



3D22

KICKPIPES
THROUGH WATERTIGHT DECKS
WITH OR WITHOUT INSULATION
USING SWAGE TYPE STUFFING TUBES



SH 132317190

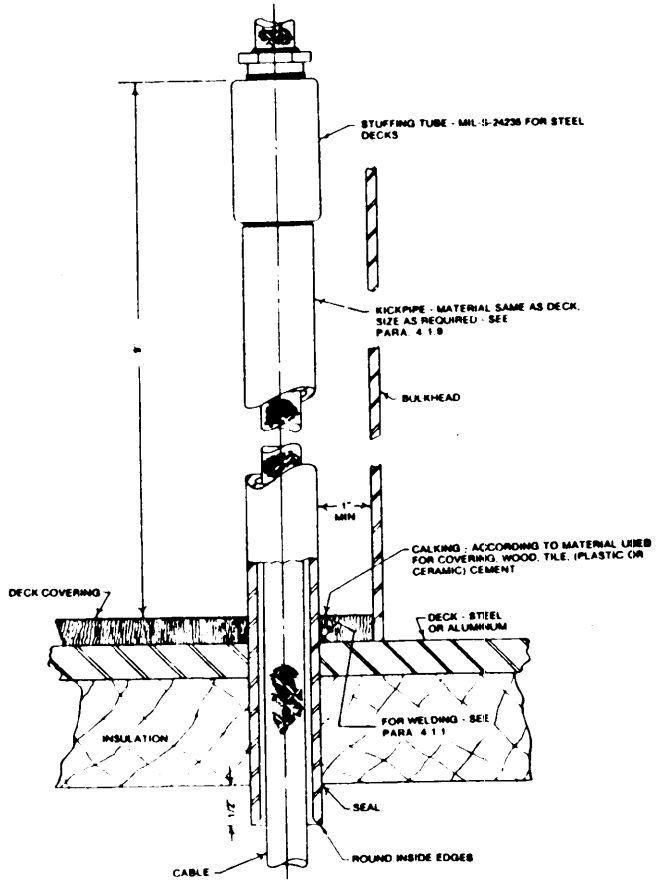
FIGURE 3D2. Kickpipes through steel or aluminum decks.

NOTES:

1. THIS FIGURE SUPERSEDES SECTION SHEET 3D3 OF DRAWING 803-5001027 AND SECTION 4, SHEET 13, OF DRAWING NAVSEC NO. 9000-S6202-73980.

3D31

KICKPIPES THROUGH WATERTIGHT DECKS WITH COVERING AND WITH OR WITHOUT INSULATION



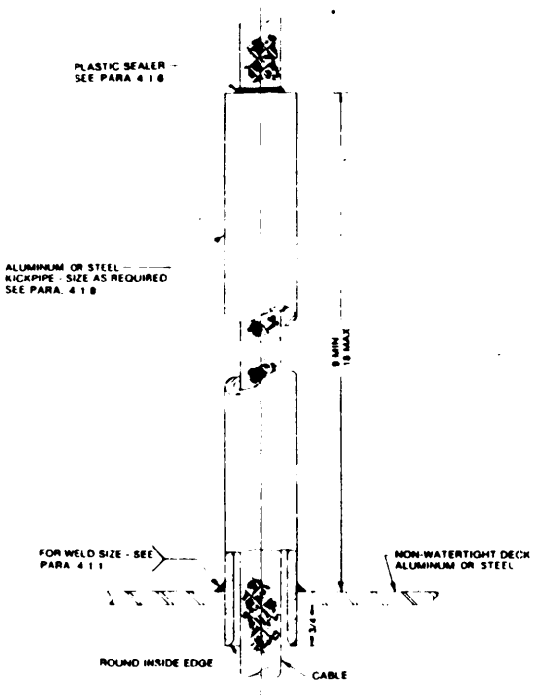
SH 132317191

FIGURE 3D3. Kickpipes through steel or aluminum decks.

NOTE:
1. THIS FIGURE SUPERSEDES SHEET 3D4 OF DRAWING 803-5001027 AND SECTION 4, SHEET 26 OF DRAWING NAVSEC NO. 6000-S6202-73980

3D41

ONE OR TWO SINGLE CABLES THROUGH NONTIGHT DECKS WITH KICKPIPE WELDED IN PLACE



3D42

ONE OR TWO SINGLE CABLES THROUGH NONTIGHT DECKS WITH KICKPIPE SECURED WITH LOCKNUTS APPLICABLE IN LOCATIONS INACCESSIBLE FOR WELDING

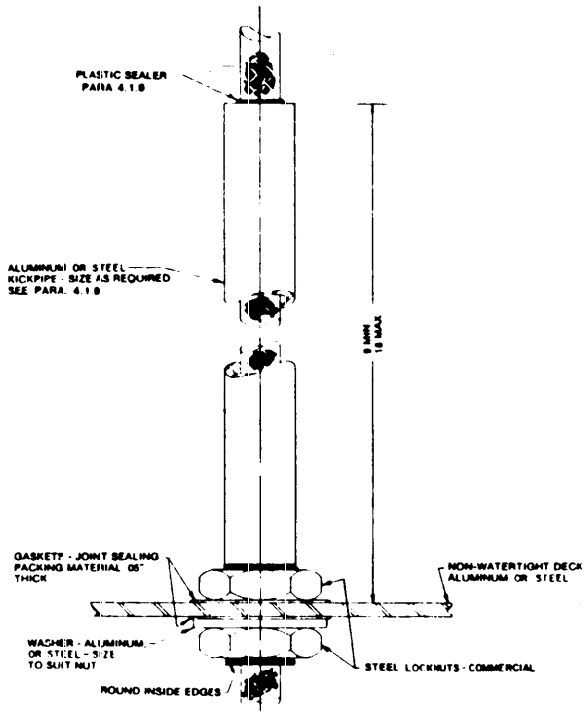
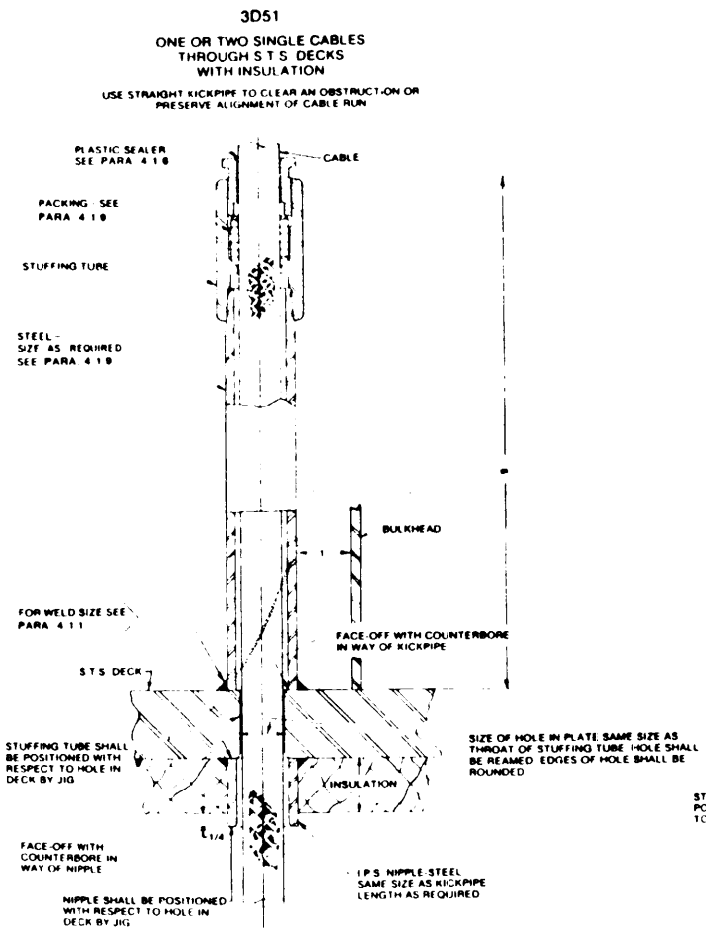
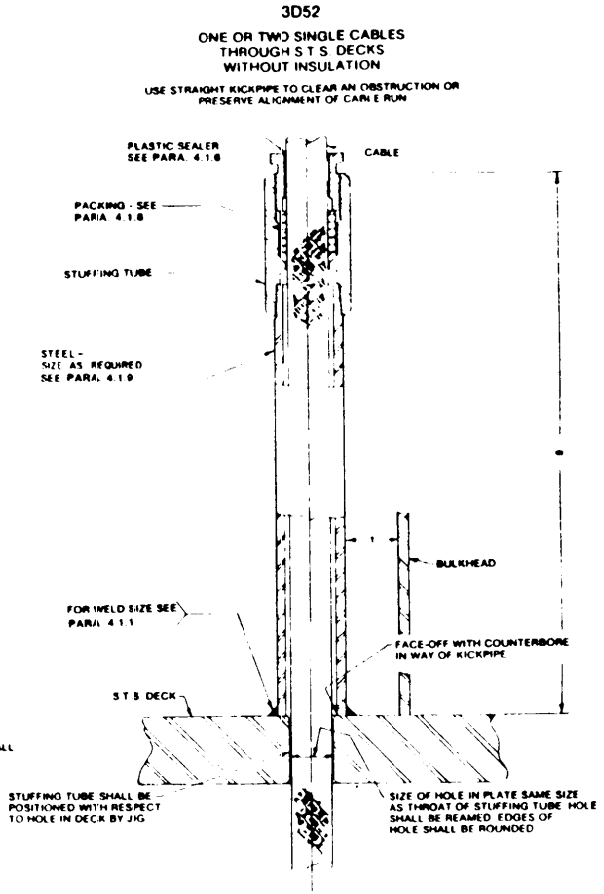


FIGURE 3D4. Kickpipes through non-watertight decks.

NOTE:
1. THIS FIGURE SUPERSEDES SHEET 305 OF DRAWING 803-5001027 AND SECTION 4 SHEET 38 OF DRAWING NAVSEC NO. 9000-S6202-73980.





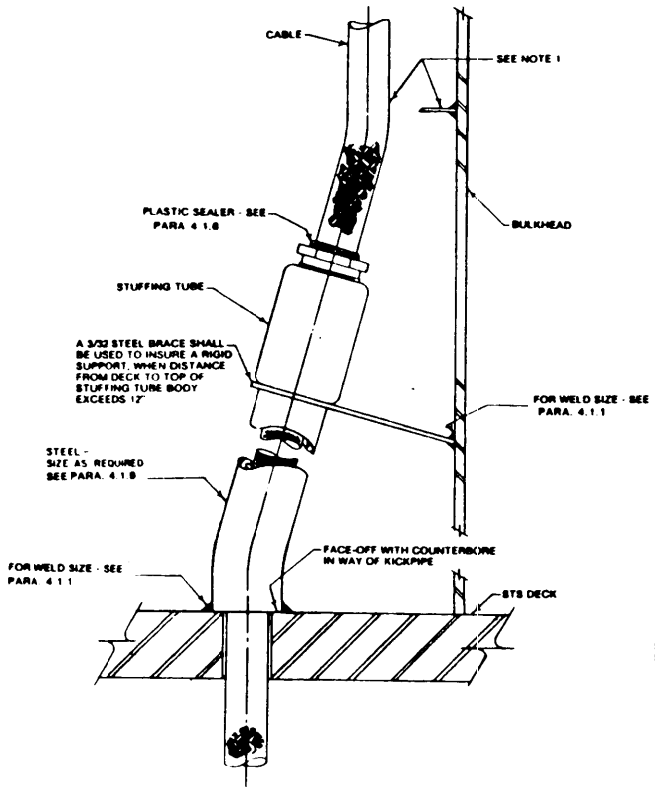
SH 132317193

FIGURE 3D5. Kickpipes through ballistic plating.

3D61

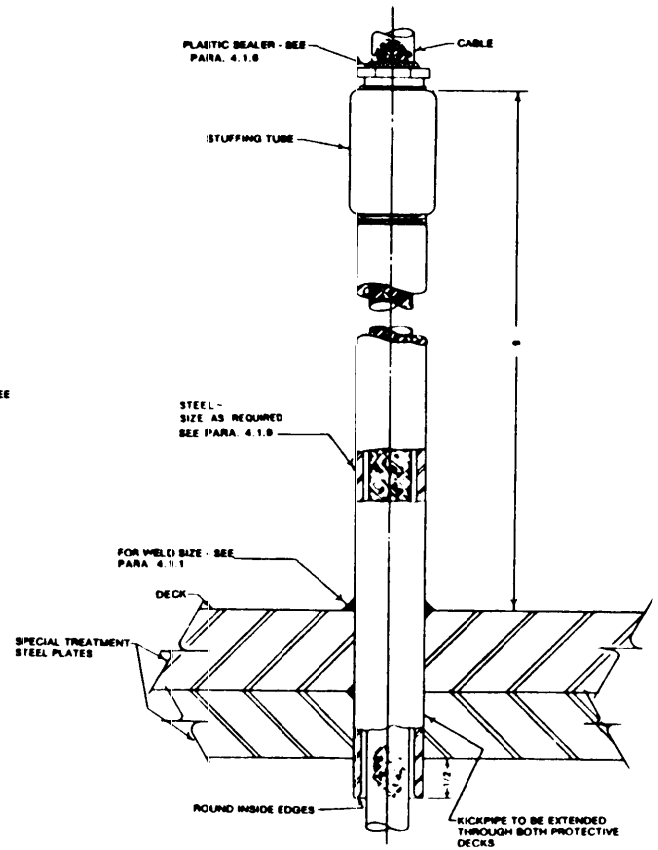
CABLES THROUGH PROTECTIVE DECKS
WITH OR WITHOUT INSULATION

USE BENT KICKPIPE TO CONSERVE SPACE
AND ALLOW SECURING OF CABLE DIRECT TO BULKHEAD



3D62

SINGLE OR MULTIPLE CABLES
THROUGH A TWO COURSE DECK



NOTES:

1. FOR SUITABLE CABLE SUPPORT SEE MIL-STD-XXX-4.
2. THIS FIGURE SUPERSEDES SHEET 3D6 OF DRAWING 803-5001027 AND SECTION 4 SHEET 39 OF DRAWING NAVSEC NO. 9000-S6202-73980.

FIGURE 3D6. Kickpipes through ballistic plating.

NOTES:

1. LAG OR WOOD SCREWS (CRES) NOT LESS THAN 1" LONG MAY BE USED IN LIEU OF BOLTS ON BULKHEADS OVER 1" THICK.
2. PLASTIC PIPE FITTINGS AND STUFFING TUBE MAY BE USED IN LIEU OF ALUMINUM TYPE SHOWN. STUFFING TUBE SHOULD BE NYLON METHOD 3891 OR MIL-S-19522 SIZE TO SUIT. FOR EXAMPLE M19622-/3 PIPE AND FITTINGS MAY BE NYLON OR PVC FOR CEMENTED ATTACHMENT PART MUST BE NYLON TO NYLON OR PVC TO PVC.
3. FOR SUITABLE CABLE SUPPORT MIL-STD-XXX-4
4. THIS FIGURE SUPERSEDES SHEET 3D7 OF DRAWING 803-5001027 AND SECTION 4 SHEET 47 OF DRAWING NAVSEC NO. 9000-S6202-73980.

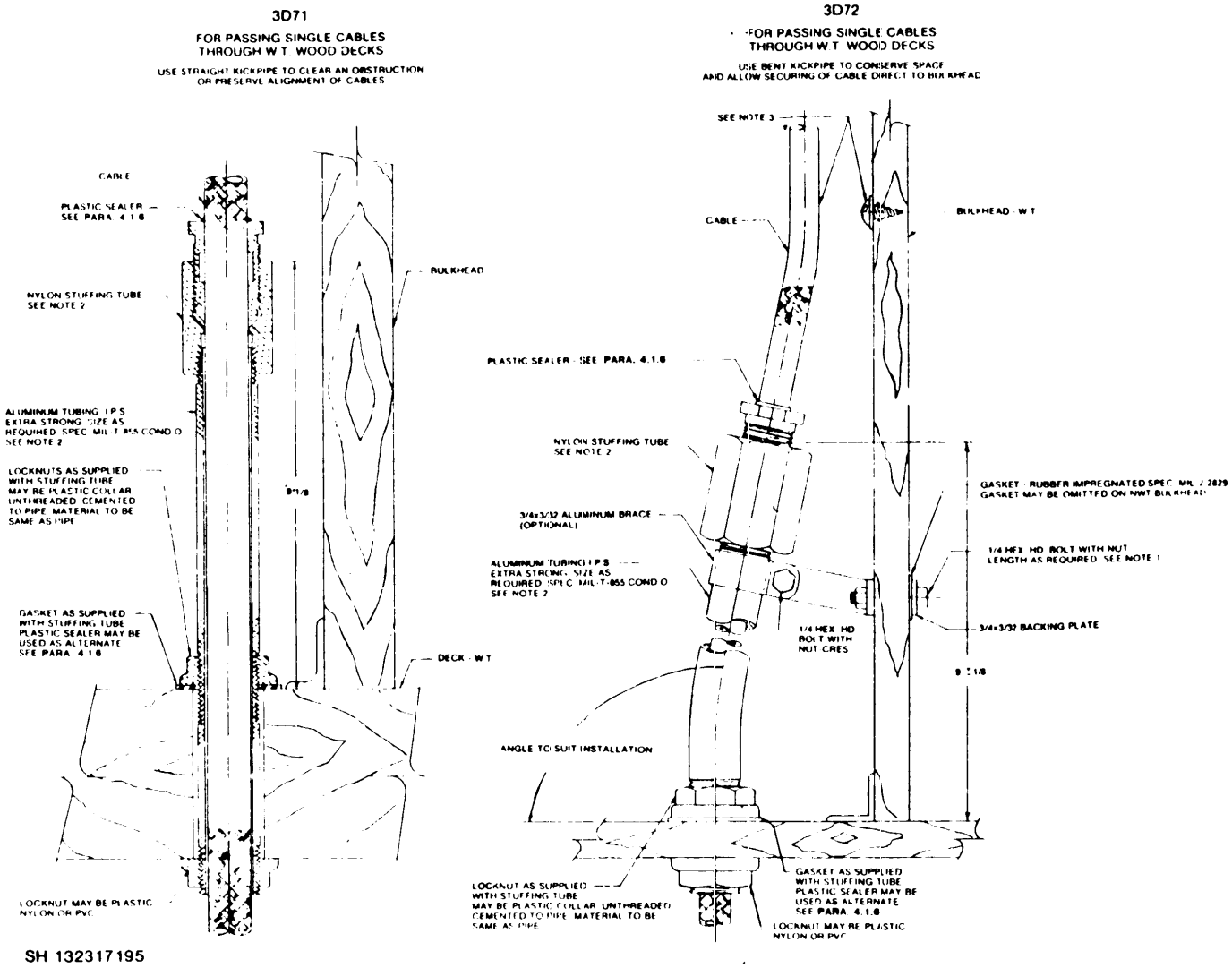
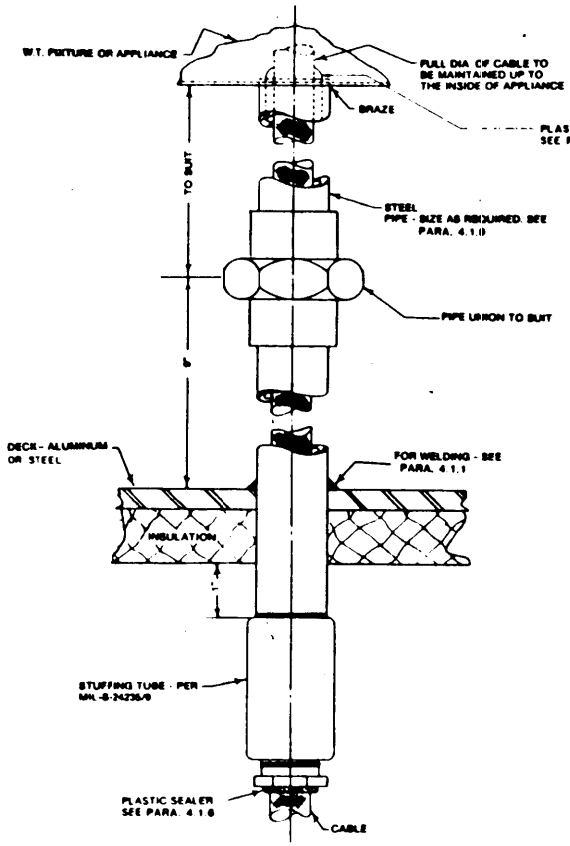


FIGURE 3D7. Kickpipes through wooden decks.

NOTE:
1. THIS FIGURE SUPERSEDES SHEET 3D8 OF DRAWING 803-5001027 AND SECTION 4, SHEET 25 OF DRAWING NAVSEC NO 9000-S6202-73980.

3D81

WATERTIGHT DECKS WITH INSULATION



3D82

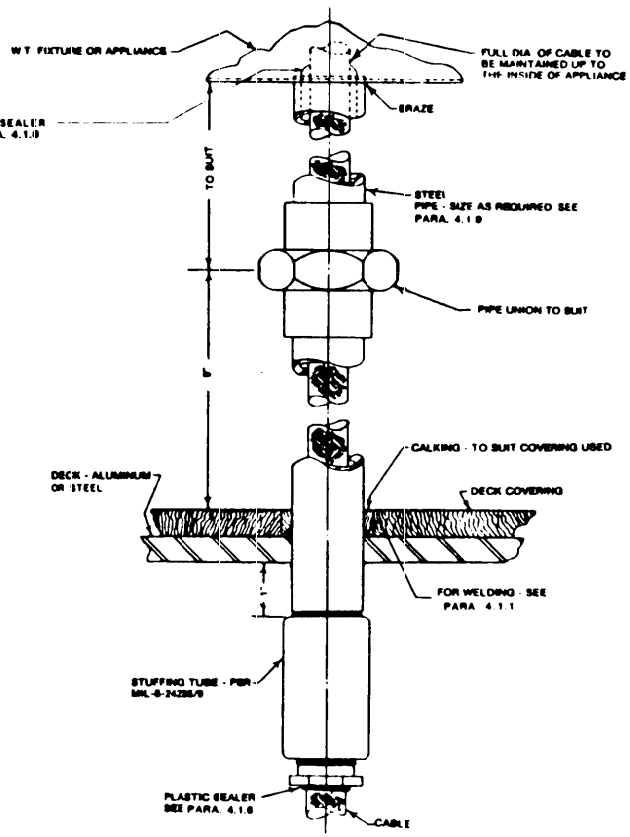


FIGURE 3D8. Kickpipes with unions.

SH 132317196

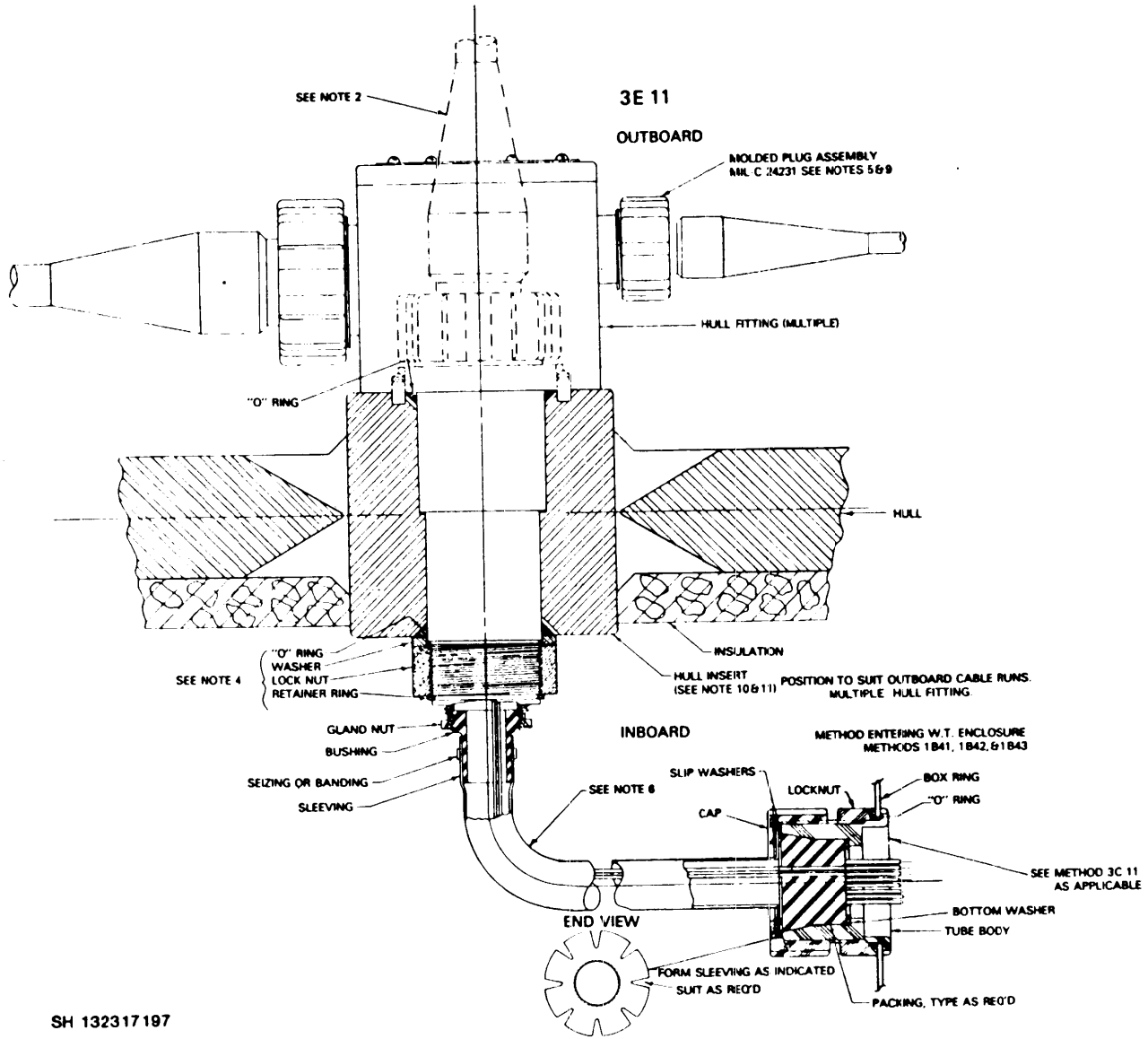
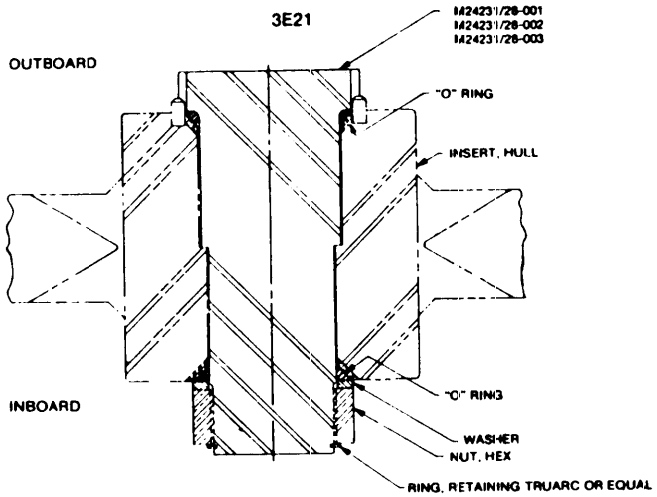


FIGURE 3E1 Cable connections through pressure hulls of submarines

NOTES

1. "O" RING SURFACES ON HULL INSERTS SHALL BE SUITABLY PROTECTED FROM DAMAGE OR WELD SPLATTER AT ALL TIMES PRIOR TO INSTALLATION OF HULL FITTING.
2. DOTTED LINE INDICATES OUTLINE FOR SINGLE CABLE HULL FITTING.
3. COAT "O" RINGS AND "O" RING SURFACES WITH GREASE CONFORMING TO SPEC MIL G 4343 (DC 7).
4. TO INSTALL HULL FITTING IN INSERT, POSITION "O" RINGS AS SHOWN AND SECURE IN PLACE WITH WASHER, LOCKNUT, AND RETAINER RING.
5. REMOVE RECEPTACLE CAPS PRIOR TO INSTALLATION OF MOLDED PLUG ASSEMBLIES (SEE NOTE 9).
6. SECURE INBOARD CABLE IN PLACE WITH CABLE SUPPORTS AS REQUIRED.
7. METHODS SHOWN HEREIN HAVE BEEN TESTED AND APPROVED FOR DEEP DIVING SUBMARINES.
8. METHODS FOR TEMPORARY SEALING HULL INSERTS AND PRESSURE PROOF PLUG ASSEMBLIES ARE SHOWN ON FIGURE 3E2.
9. WHEN MOLDED PLUG ASSEMBLIES ARE TEMPORARILY DISCONNECTED, REINSTALL CAPS. (SEE NOTE 5 ABOVE)
10. HULL INSERT TO BE FURNISHED BY SHIPBUILDER OF A STEEL COMPATIBLE WITH APPLICABLE HULL. FOR FURTHER DETAILED REQUIREMENTS SEE MIL C 24231.
11. POSITION HULL INSERT TO OUTBOARD CABLE RUNS (MULTIPLE HULL FITTINGS).
12. THIS FIGURE SUPERSEDES SHEET 3E1 OF DRAWING 803-5001027 AND OF SECTION 5 SHEET 105 OF DRAWING NAVSEC NO. 9000-S6202-731980.

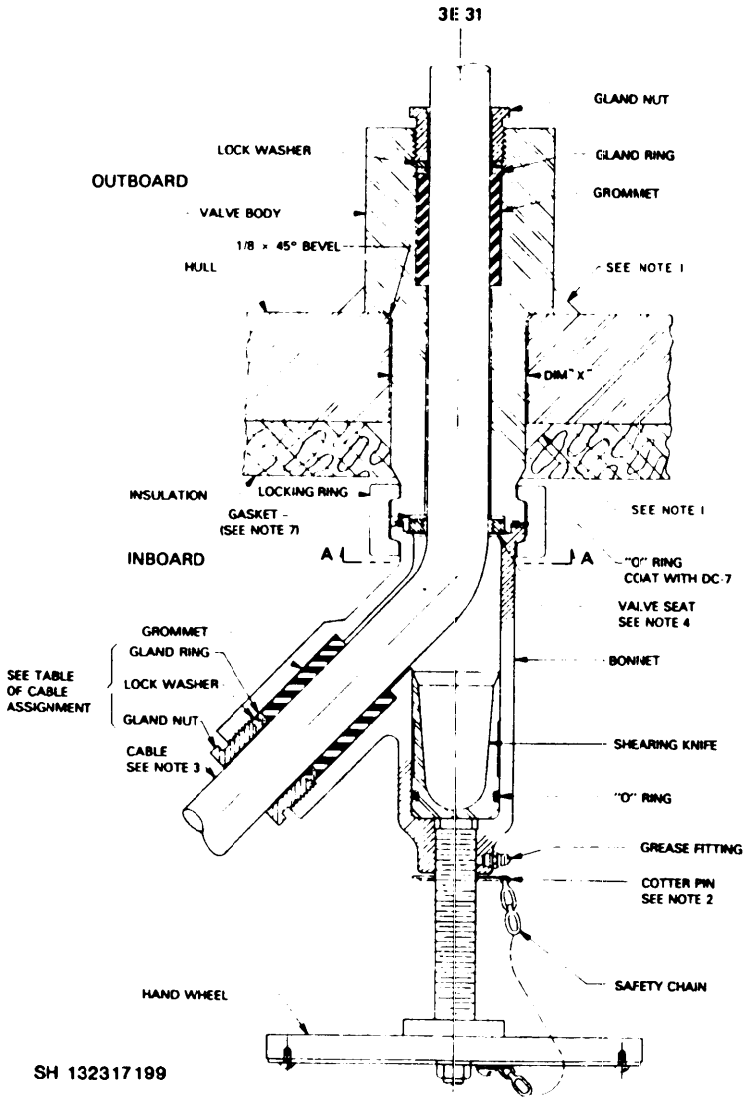


NOTES:
1. SEALING PLUGS ARE FOR CLOSURE OF THE HULL INSERTS.
2. HULL INSERTS SHALL BE FURNISHED WITH SEALING PLUGS IN PLACE TO PROTECT "O" RING SURFACES FROM DAMAGE. SEALING PLUGS SHALL REMAIN IN PLACE DURING WELDING AND SHALL NOT BE REMOVED UNTIL INSERTION OF SINGLE OR MULTIPLE CABLE HULL FITTING
3. EACH SEALING PLUG SHALL BE CHECKED WITH "GO" AND "NO GO" GAGES TO INSURE INTERCHANGEABILTY WITH HULL INSERTS.
4. FOR INSTALLATION OF HULL FITTINGS AND HULL INSERTS SEE FIGURE 3E1
5. SILICONE "O" RINGS ARE USED ONLY WHEN WELDING IN INSERT BUNA TYPE "O" RINGS ARE REQ'D FOR SERVICE INSTALLATION.
6. THIS FIGURE SUPERSEDES SHEET 3E2 OF DRAWING 803-5001027 AND SECTION 5, SHEET 104 OF DRAWING NAVSEC NO. 9000-S6202-73980.

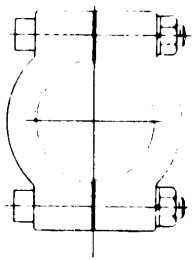
QUANTITIES FOR ONE SEALING PLUG ASSEMBLY							
INSERT PLUG ASSY	NUMBER REQUIRED - ONE						
	INSERT PLUG	RETAINING RING	NUT	WASHER	"O" RING * OUTBOARD	"O" RING * INBOARD	FOR HULL INSERT
M24231/28-001	M24231/28-010	M24231/5-078	M24231/5-074	M24231/5-075	ARP568-329	ARP 568-327	M24231/25-001
M24231/28-002	M24231/28-020	M24231/10-045	M24231/10-042	M24231/10-043	ARP568-334	ARP 568-332	M24231/25-002
M24231/28-003	M24231/28-030	M24231/19-014	M24231/19-024	M24231/19-025	ARP568-342	ARP 568-339	M24231/25-003

*MATERIAL
SILICONE RUBBER
SPEC ZZ-R-765
CLASS III

FIGURE 3E2 Sealing plugs for hull inserts on submarines



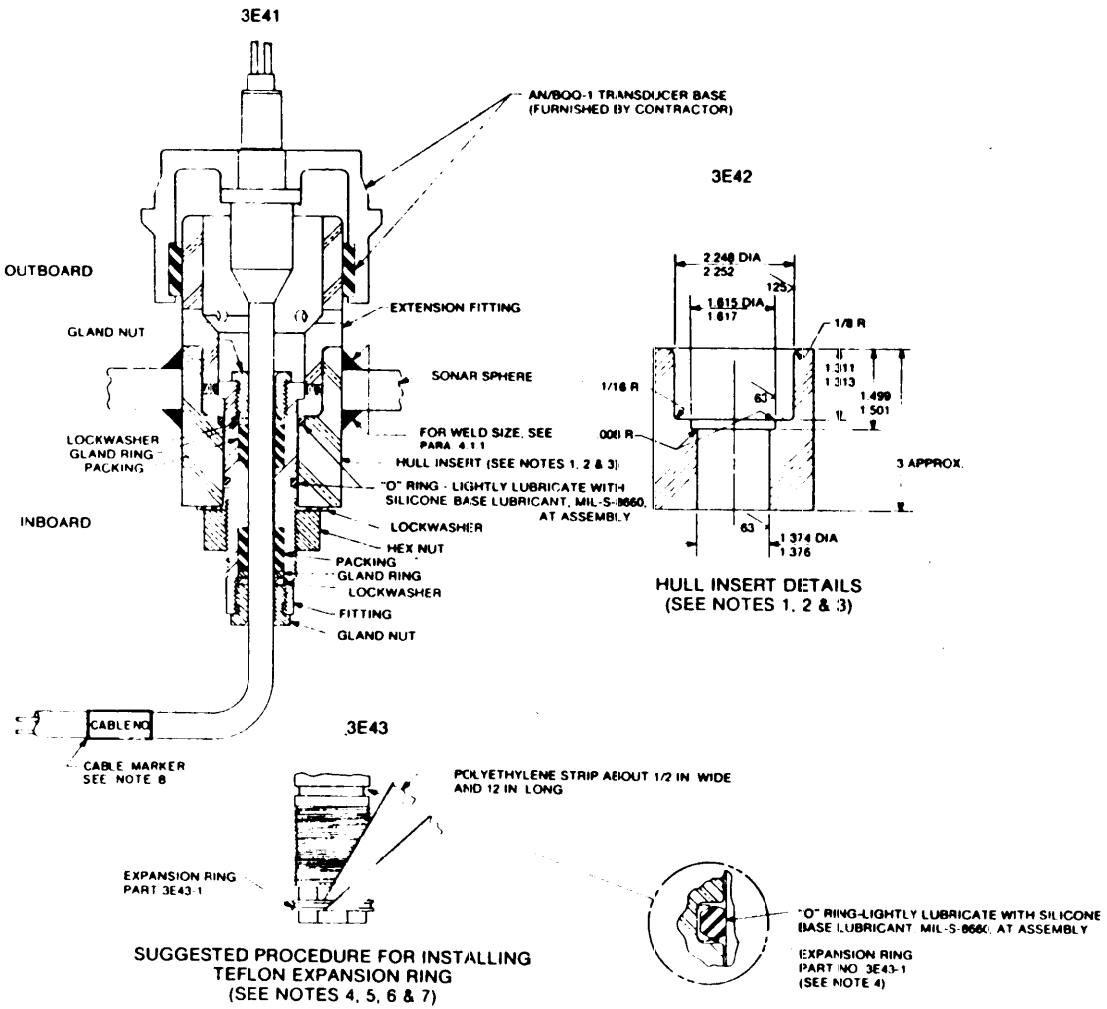
CABLE ASSIGNMENT					
SYMBOL NO.	CABLE SIZE	CABLE O.D.	GROMMET PC NO.	GLAND RING PC NO.	DIM "X"
512	12A/U	.475	46	59	2.062
	MCOS 4	.510	47	60	
	MHFF 4	.520			
	14A/U	.545	48	61	
512.1	MHFF 7	.627	49	62	
	TTRS 2	.632			
	TTRS 4	.720	50	63	
	28B/U	.750	51	64	
513	MHFF 10	.795	52	65	2.562
	28/U	.805			
	TTRS 8	.830	53	66	
	MHFF 14	.844			
	17A/U	.870	54	67	
513.1	MHFF 19	.995	55	68	
	TTRS 8	1.020	56	69	
	MHFF 22	1.115	57	70	
	MHFF 24	1.120			
	TTRS 10	1.150	58	71	
	MHFF 26	1.156			



SECTION A-A

NOTES:
1. WELDING SHALL COMPLY WITH NAVSHIPS 0900-LP-006-9010.
2. BEFORE ASSEMBLY, DRILL HOLE FOR COTTER PIN WITH VALVE IN FULL OPEN POSITION. PIN MUST BE EASILY REMOVED. BEND ONLY ENOUGH TO PREVENT FALLING OUT.
3. THE CABLE SHEARING VALVES ARE DESIGNED FOR CABLES IN ACCORDANCE WITH SPECIFICATION MIL-C-915.
4. IF VALVE SEAT BECOMES DAMAGED, IT CAN BE REVERSED AND REINSTALLED WITH A NEW VALVE SEAT GASKET. REMOVAL OF VALVE SEAT IS ACCOMPLISHED BY USE OF A 7/8-12 STUD FOR SYMBOL NO. 512 OR A 1 3/8-12 STUD FOR SYMBOL NO. 513.
5. TERMINATE INBOARD CABLE IN A JUNCTION BOX, WHICH WILL BE LOCATED IN THE VICINITY OF THE SHEAR VALVE.
6. FOR SPECIFICATIONS, SEE MIL-S-24235/16.
7. CEMENT GASKET TO VALVE SEAT AND BODY.
8. THIS FIGURE SUPERSEDES SHEET 3E3 OF DRAWING 803-5001027 AND SECTION 5, SHEET 80, OF DRAWING, NAVSEC NO. 9000-S16202-73980.

FIGURE 3E3 Passing cable through pressure hull of submarines using cable shearing valve



SH 132317200

FIGURE 3E4 Hull fitting installation for sonar sphere

NOTES:

1 FOR INSTALLATION DETAILS SEE APPLICABLE DRAWING FOR SHIPS CLASS.

2 HULL INSERT SHALL BE MACHINED TO FINISHED DIMENSIONS AS SHOWN UNDER METHOD 3E42 AFTER ALL WELDING HAS BEEN COMPLETED ON SONAR SPHERE.

3 HULL INSERT MATERIAL SHALL BE NI-CU (MONEL, SPEC QQ-N-281, CLASS A, HOT ROLLED. DIMENSIONS SHOWN ARE APPLICABLE AFTER WELDING IN SONAR SPHERE AND AFTER MACHINING TO ACCEPT PCS. 1, 3 & 9 OF DWG 815-1197218. OUTER DIAMETER SHALL BE SUCH AS TO PROVIDE ADEQUATE COMPENSATION. HULL INSERTS ARE TO BE FURNISHED BY THE SHIPBUILDER.

4 USE OF EXPANSION RING IS INTENDED TO PROVIDE ADDITIONAL "O" RING SQUEEZE TO OVERCOME OVERSIZE HOLE DIAMETER IN HULL INSERT WHICH HAS BEEN REPAIRED IN ACCORDANCE WITH PORTSMOUTH NAVAL SHIPYARD, PORTSMOUTH, N.H., PROCESS INSTRUCTION 5845-941-263, PARAGRAPH 1.1.13.

5 EXPANSION RING, PART 3E43-1, SHALL BE "KAPSEAL" KIN SIZE DASH NUMBER 5216, AS MANUFACTURED BY MINNESOTA RUBBER CO., 3630 WOODDALE AVENUE, MINNEAPOLIS, MINNESOTA 554.G.

6 USE OF EXPANSION RING IS NOT TO BE APPLIED TO NEW CONSTRUCTION WITHOUT SPECIFIC APPROVAL.

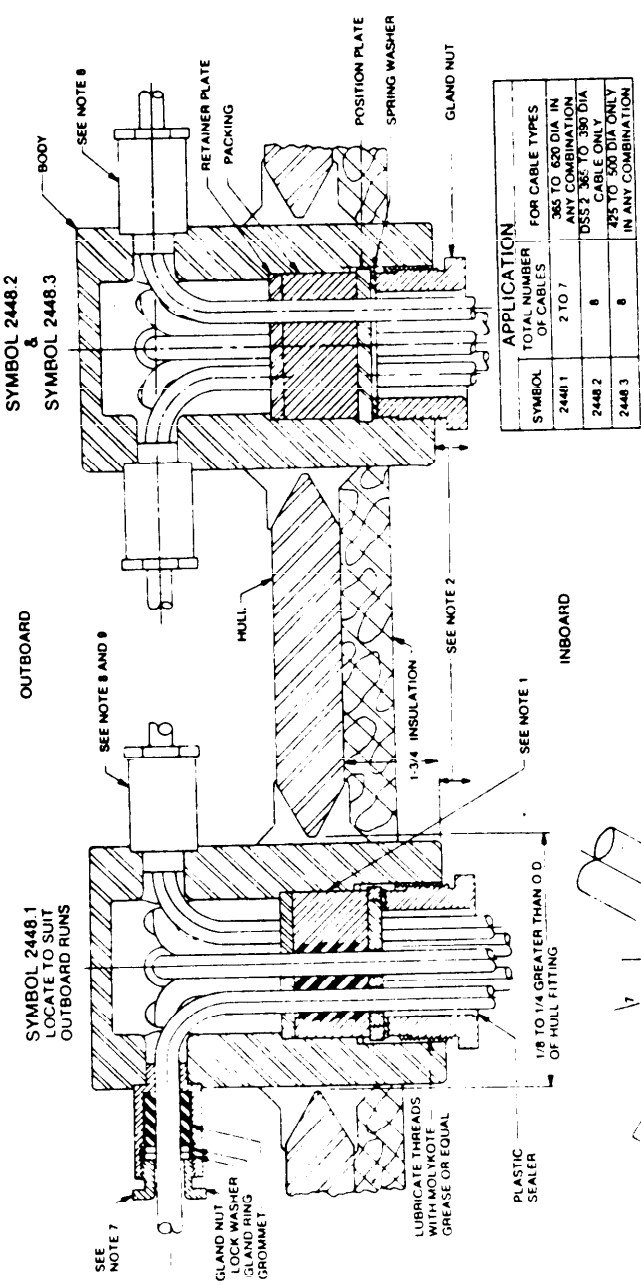
7 WITH THE AID OF A POLYETHYLENE STRIP AS SHOWN ON METHOD 3E43, WIND ON EXPANSION RING VERY CAREFULLY UP OVER THREADS AND INTO "O" RING GROOVE, WITHOUT OVERSTRETCHING TEFLON RING.

8 CABLE MARKER SHALL CONSIST OF HEAT SHRINKABLE TUBING - WHITE PER MIL-I-23053/5, CLASS 1, WITH CABLE DESIGNATION STAMPED AS REQUIRED AND THEN COVERED BY A CLEAR HEAT SHRINKABLE TUBING PER MIL-I-23053/5, CLASS 2. THIS METHOD MAY BE USED AS AN ALTERNATE TO THE STANDARD METHOD OF MARKING SONAR CABLES.

9 THE METHOD SHOWN HERE IS PER 815-1197218 FOR THE SSN637 CLASS. FOR OTHER SHIPS SEE THEIR APPLICABLE SDI.

10 THIS FIGURE SUPERSEDES SHEET 3E4 OF DRAWING 803-5001027 AND SECTION 5, SHEET 140, OF DRAWING NAVSEC NO. 9000-S6202-73980.

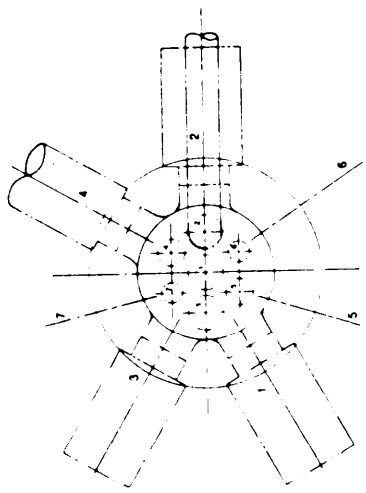
NOTES:
1. PRIOR TO WELDING, FITTING SHALL BE DISASSEMBLED BY REMOVING INTERIOR RUBBER PACKING. PLUGS SHALL REMAIN IN OUTBOARD TUBES UNTIL CABLES ARE INSTALLED
2. TURN GLAND NUT DOWN SO THAT THIS DIMENSION IS BETWEEN 19/32 AND 23/32 AT ASSEMBLY WITH CABLES DEPENDING ON TYPE AND NUMBER
3. CHECK COLOR CODING ON PACKING GROMMETS AND MEASURE O.D. OF CABLES TO INSURE THAT THE GROMMETS ARE IN ACCORDANCE WITH SIZES LISTED IN CABLE AND PACKING ASSIGNMENT TABLE
4. THREAD CABLES IN PLACE, MAINTAINING PROPER ALIGNMENT THROUGH POSITIONING PLATE, PACKING, RETAINER PLATE GROMMET AND ASSOCIATED STUFFING TUBE
5. SECURE CABLES IN OUTBOARD STUFFING TUBES WITH GLAND RING, LOCKWASHER AND GLAND NUT IN SEQUENCE INDICATED. GLAND NUTS SHALL BE TIGHTENED DOWN METAL TO METAL
6. TIGHTEN INBOARD GLAND NUT IN PLACE AS INDICATED
7. TURN GLAND NUT DOWN METAL TO METAL AT ASSEMBLY
8. SEALING PLUGS FURNISHED WITH HULL FITTING SHALL REMAIN IN PLACE UNTIL CABLES ARE INSTALLED
9. FOR REFERENCE ON PRESSURE PROOF HULL FITTING AND STUFFING TUBE ASSY. SEE BU DWG 815-1197098 AND TUBE DWG 9000-56202-1197101
10. THIS FIGURE SUPERSEDES SHEET 3E5 OF DRAWING 803-5001027 AND SECTION 5, SHEET 68 OF DRAWING NAVSEC NO 9000-56202-73980.



APPLICATION		
SYMBOL	TOTAL NUMBER OF CABLES	FOR CABLE TYPES
2441	2 TO 7	365 TO 620 DIA IN ANY COMBINATION
2448 2	8	DSS 2 365 TO 380 DIA CABLE ONLY
2448 3	8	425 TO 500 DIA ONLY IN ANY COMBINATION

CABLE AND PACKING ASSIGNMENTS FROM DWG. NO. 1197101

CABLE TYPE	CABLE O.D.	GROMMET SYM NO	GROMMET PC NO	COLOR CODING FOR GROMMETS	STUFFING TUBE SYMBOL NO.
DSS-2	365 TO 390	2441	2	3 BLUE DOTS	2446 1
DSS-3					
DSS-4	480 TO 500	24473	11	2 YELLOW DOTS	
TSS-4					
FSS-2					2446 2
FSS-4	600 TO 625	24474	12	4 GREEN DOTS	



VIEW SHOWING THE RELATIONSHIP OF STUFFING TUBES TO HOLE LOCATIONS IN PACKING, RETAINER AND POSITION PLATES, AND ALSO THE SEQUENCE OF SIZES TO BE FOLLOWED

SH 132317201

FIGURE 3E5 Passing SS type cable through pressure hull of submarines

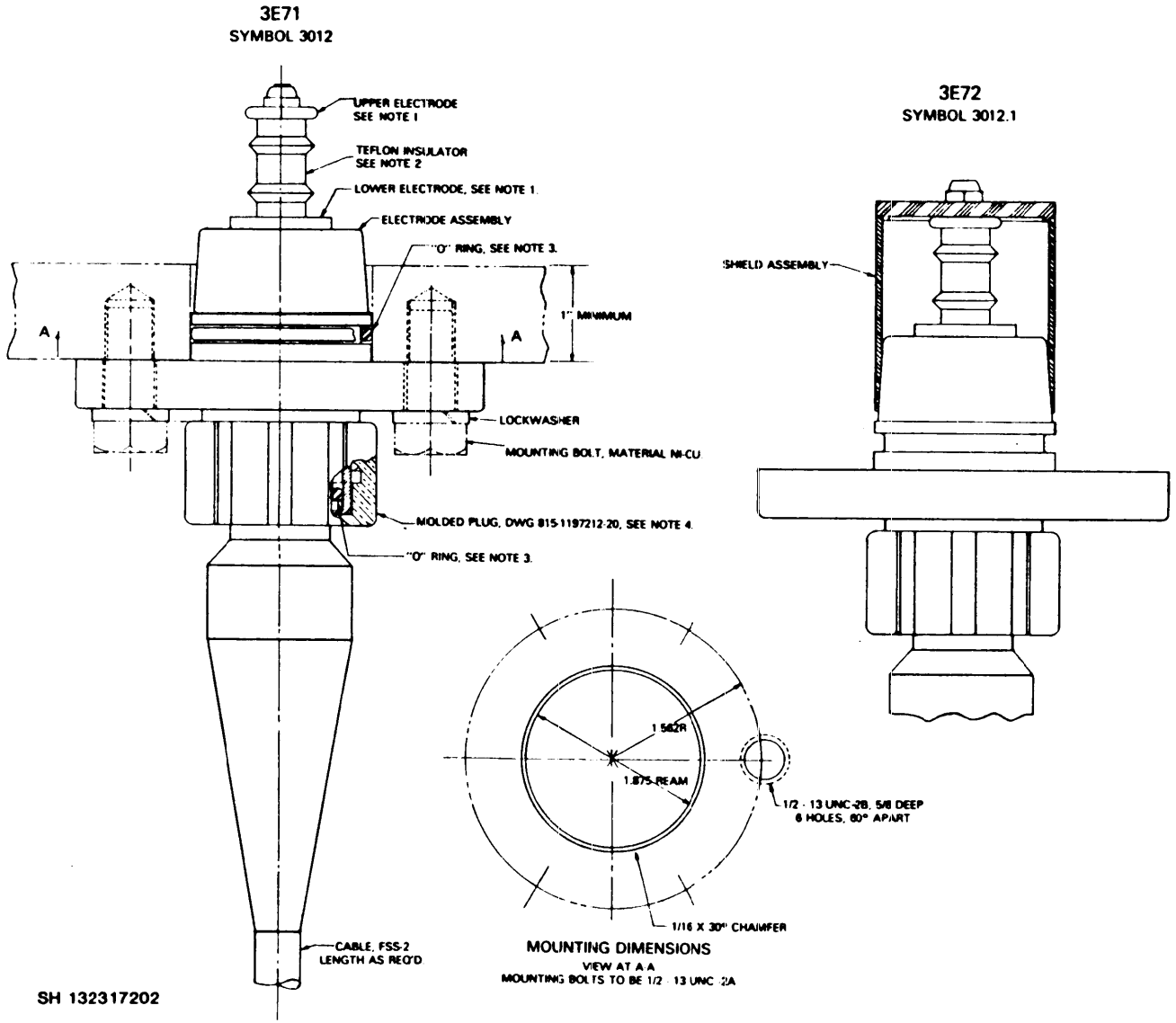
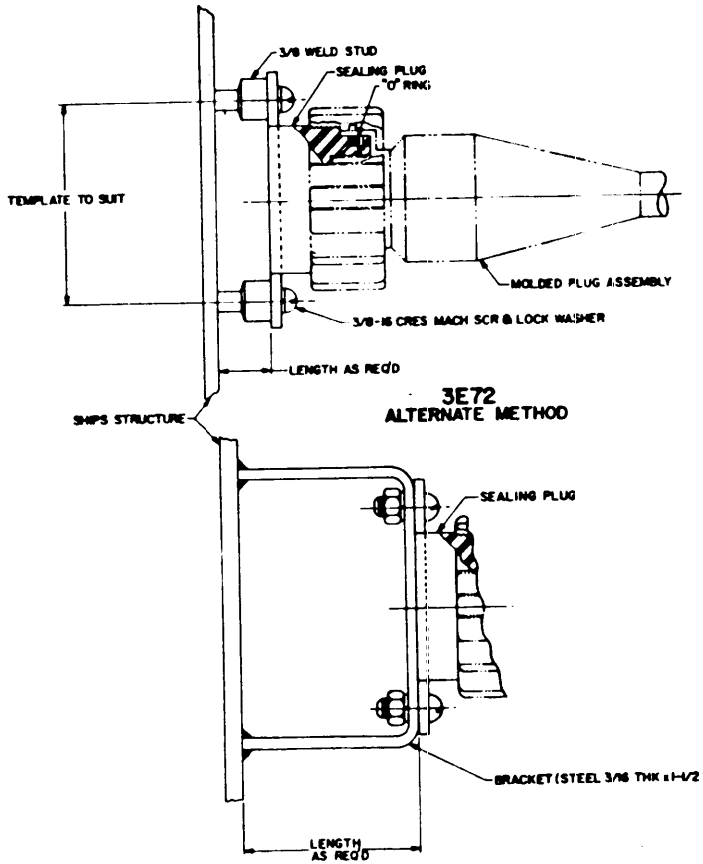


FIGURE 3E6 Mounting pressure proof electrodes on submarines

NOTES:
1. UPPER AND LOWER ELECTRODE SURFACES SHALL BE FREE FROM CONTAMINENTS TO INSURE CIRCUIT WHEN IMMERSED IN WATER.
2. SURFACES OF TEFLON INSULATOR SHALL BE PROTECTED DURING INSTALLATION TO PREVENT DAMAGE AND/OR CONTAMINATION BY DIRT, GREASE, ETC.
3. COAT "O" RINGS AND "O" RING SURFACES WITH GREASE CONFORMING TO SPEC MIL-G-4343 (DC7)
4. REMOVE RECEPTACLE CAP FURNISHED WITH ELECTRODE ASSEMBLY PRIOR TO INSTALLATION OF MOLDED PLUG ASSIEMBLY
5. THIS ELECTRODE IS DESIGNED TO WITHSTAND 2000 PSI HYDROSTATIC PRESSURE AGAINST EITHER THE ELECTRODE OR THE RECEPTACLE SIDE.
6. THIS DRAWING WAS DEVELOPED FROM BUREAU OF SHIPS DRAWING NO. 815-1197212.
7. THIS FIGURE SUPERSEDES SHEET 3E6 OF DRAWING 803-5001027 AND SECTION 5, SHEET 138, OF DRAWING NAVSEC NO. 9100-S6202-73980

NOTES:
1. TYPICAL METHODS SHOWN HEREON ARE FOR INFORMATION AND GUIDANCE TO INSTALLING ACTIVITES FOR SEALING AND/OR SECURING OF PRESSURE PROOF PIN TYPE MOLDED CONNECTORS THAT HAVE BEEN TEMPORARILY DISCONNECTED FROM THEIR ASSOCIATED RECEPTACLE.
2. TEMPORARY SEALING OF PIN CONNECTOR HULL FITTINGS OR RECEPTACLES ARE SHOWN ON FIGURES 3E1 & 3E2
3. CABLES SHALL BE PROPERLY SECURED OR PROTECTED TO PREVENT DAMAGE FROM CHAFFING , WELD SPATTER AND/OR OTHER HAZARDS.
4. THIS FIGURE SUPERSEDES SHEET 3E7 OF DRAWING 803-5001027

3E71



3E72
ALTERNATE METHOD

TABLE

MOLDED PLUG DWG NO	SEALING PLUG ASSY
MIL-C-24231 SYM 1118	M24231/1-020
MIL-C-24231 SYM 1114	M24231/3-020
MIL-C-24231 SYM 1113	
MIL-C-24231 SYM 1112	
MIL-C-24231 SYM 1115	M24231/4-020
MIL-C-24231 SYM 1154	
MIL-C-24231 SYM 1139	M24231/18-020
MIL-C-24231 SYM 1118	M24231/18-020

FIGURE 3E7 Temporary sealing and securing pressure proof molded plug assemblies

SH 132317203

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DOD-STD-2003-3(NAVY)	ELECTRIC PLANT INSTALLATION STANDARD METHODS FOR SURFACE SHIPS AND SUBMARINES (PENETRATIONS) SECTION 3 OF 5

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
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b. Recommended Wording:

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