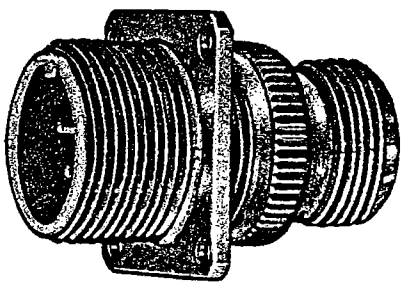
Service Instructions

Bendix®

HIGH TEMPERATURE ELECTRICAL CONNECTORS

HT, BT-MA, BT-M



Scintilla Division
SIDNEY, NEW YORK

THE Bendix CORPORATION

REVISED FEBRUARY 1966

PRINTED IN U.S.A.

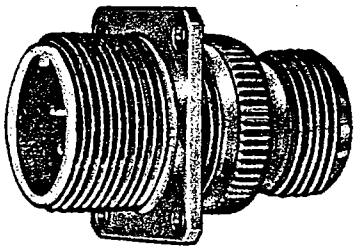
FORM L-406-3

INTRODUCTION

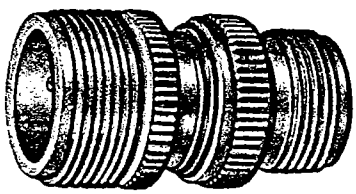
This publication contains instructions for installing, disassembling, inspecting and reassembling the Bendix High Temperature Electrical Connectors manufactured by the Scintilla Division. The HT connectors are designed according to requirements of MIL-C-5015B, while the BT-M and BT-MA connectors are designed to the requirements of MIL-C-5015D. The BT-M and BT-MA series connector incorporates ceramic inserts while the HT series connector incorporates mycalex inserts. The BT-MA and HT series connectors utilize a conduit adapter for termination of cable conduit, while the BT-M series connectors utilize a MS-R type silicone grommet and clamp for termination of open wiring.

Stainless steel metal parts and a silicone middle insert are also used. Inserts are retained within the shell by a threaded retaining ring. Silver plated crimp type contacts are used with wire wells designed for use with wire conforming to Military Specification MIL-W-5086.

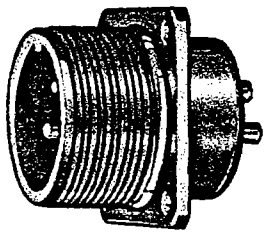
Figures 1 through 5 show typical assemblies of the HT and BT-MA series connectors. Figure 6 through 10 show typical assemblies of the BT-M series connector.



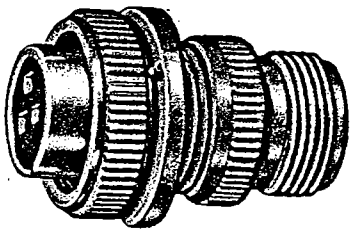
BT00MA or HT3100
Wall Mounting Receptacle
Figure 1



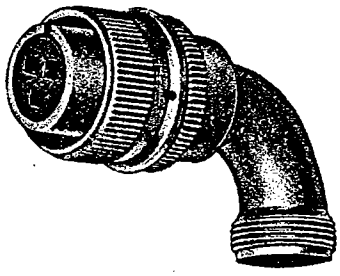
BT01MA or HT3101
Cable Connecting Receptacle
Figure 2



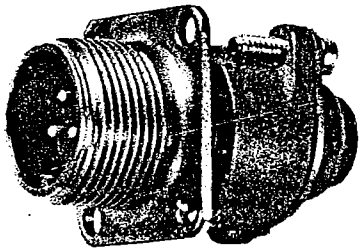
BT02MA or HT3102
Box Mounting Receptacle
Figure 3



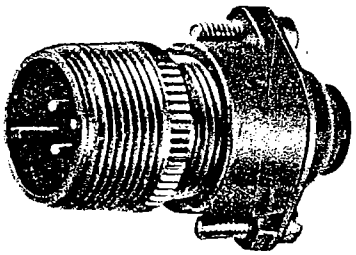
BT06MA or HT3106
Straight Plug
Figure 4



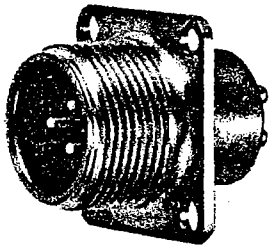
HT3108
90 Degree Plug
Figure 5



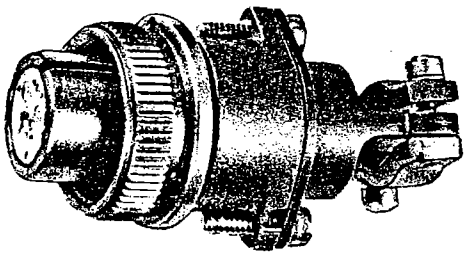
BT00M
Wall Mounting Receptacle
Figure 6



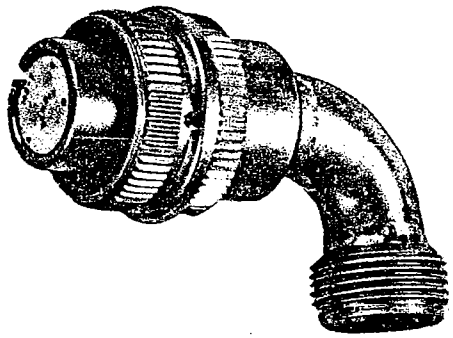
BT01M
Cable Connecting Receptacle
Figure 7



BT02M
Box Mounting Receptacle
Figure 8



BT06M (SR)
Straight Plug
Figure 9



BT08M
90 Degree Plug
Figure 10

SECTION I

GENERAL INFORMATION

Reference should be made to the exploded views, figures 11 and 12, for typical parts identification. Figure 11 shows the HT or BT-MA wall mounting receptacle, and figure 12 shows the BT-M wall mounting receptacle. The cutaway view of a HT 90 degree plug assembly shown in figure 13 illustrates the construction and the relationship of parts when assembled.

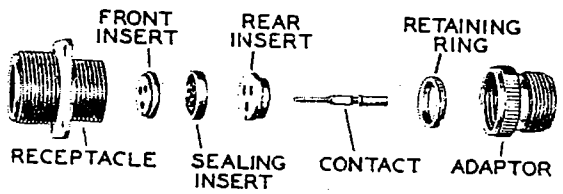


Figure 11

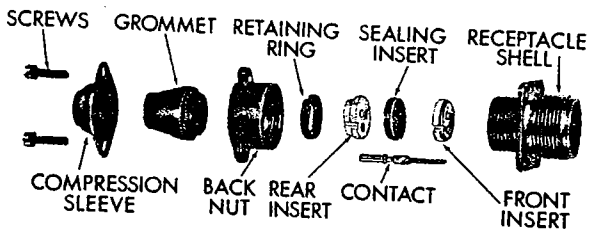


Figure 12

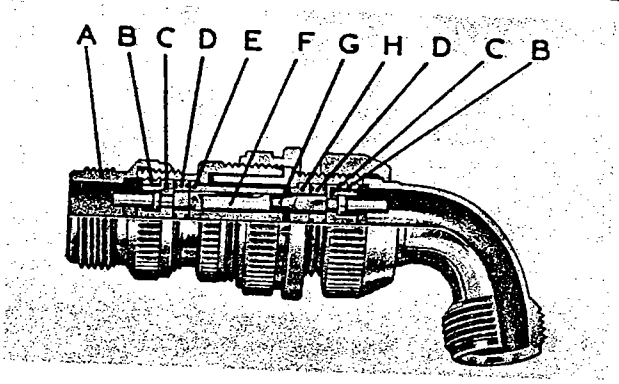


Figure 13

TABLE I

Contact P/N	Size	Pin or Socket	Crimping Tool	Locator or Positioner	Wire Approval
10-74661 **10-101649-17P	16L	PIN	11-6941-4	11-6932-6	
			11-7295	11-7771-22	MIL-W-7139A AWG 18 & 20 MIL-W-8777 AWG 20
10-74663 **10-101649-17S	16L	SOCKET	11-6941-4	11-6932-28	
			11-7295	11-7771-24	MIL-W-7139A AWG 18 & 20 MIL-W-8777 AWG 20
10-74670 **10-101649-16P	16	PIN	11-6941-4	11-6932-40	
10-74675 **10-101649-16S	16	SOCKET	11-7295	11-7771-23	MIL-W-8777 AWG 20 MIL-W-7139A AWG 18 & 20
10-407804-210 Chromel 10-407804-220 Alumel	16L	PIN	11-6941-4 11-7295	11-6932-5 11-7771-22	MIL-W-5846 Type I, Class E (#20) Type II, Class A (#16)
10-407805-210 Chromel 10-407805-220 Alumel	16L	SOCKET	11-6941-1 11-7295	11-6932-4 11-7771-24	MIL-W-5846 Type I, Class E (#20) Type II, Class A (#16)
10-74691 **10-101649-12P 10-74695 **10-101649-12S	12 12	PIN SOCKET	11-6941-4	11-6932-4	MIL-W-5086 AWG 16*, 14, & 12
10-74665 10-74666	8 8	PIN SOCKET	*MY29		
10-74678 **10-101649-4P 10-74684 **10-101649-4S	4 4	PIN SOCKET	*MY29		

Available from Burndy Engineering Co., Inc., Bruckner Blvd., New York 54, N.Y.

*These contacts are the same as the 10-746xx series except they are plated with .000050 gold over silver.

SECTION II
INSTALLATION INSTRUCTIONS

1. GENERAL

In handling connector parts, keep inserts, contacts, and inside surfaces of shells free of oil, grease, and dirt. Remove foreign material with a clean cloth dampened in proprietary denatured ethyl alcohol (Federal Specification O-E-760 Grade IV).

When tightening or loosening threaded parts of connectors, support plug assemblies by mating them with the proper receptacle. Be sure the coupling nut is fully engaged. Support receptacles by clamping flanges in a vise having well-padded jaws. Standard connector pliers, Scintilla No. 11-6147-1, or strap wrenches are recommended for tightening or loosening threaded parts.

In order to crimp contacts to wires, the connector must be disassembled and contacts removed. Disassembly instructions are covered in Section III.

2. WIRE PREPARATION

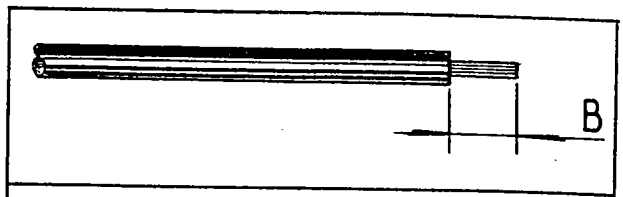
Strip insulation from wires to the dimensions indicated in figure 14. Hot wire stripping methods are recommended where applicable. If other methods are employed, use extreme care to avoid nicking or cutting wire strands.

3. CRIMPING CONTACTS TO WIRES

The 11-6941-4 or -1, (figure 15) Crimping Tool Kit is recommended for crimping size 12 or 16 contacts to wires. The 11-7295 (MS3191-1) (figure 16) Crimping Tool is also recommended for crimping of size 16 contacts to wires. With these tools, positive crimping is insured by use of ratchet type handles. Once the crimping cycle is started, the handles must be pressed together all the way before they can be released and the contact removed.

The 11-6941-4 or -1 kit includes locators which are designed to locate the contacts so that crimping is done at the proper location on the wire well. The 11-7295 (MS3191-1) Hand Crimping Tool uses positioners which are designed to locate the contact with respect to the tool's indentors and to determine depth of crimp and point of ratchet release. The 11-6941-4 or -1 kit utilizes a trip screw on the handle to control the depth of the crimp and point of ratchet release. Refer to Scintilla publication MG-1026, furnished with the 11-6941-4 or -1 kit, for recommended procedure of operation. Refer to Table I for the proper locator or positioner and tool to be used for the contact being crimped.

In applications where a contact must be crimped to a small gage wire, it is necessary to utilize a wire-



Contact Size	4	8	12	16
Dimension "B"	5/8 in.	5/8 in.	5/16 in.	5/16 in.

Figure 14

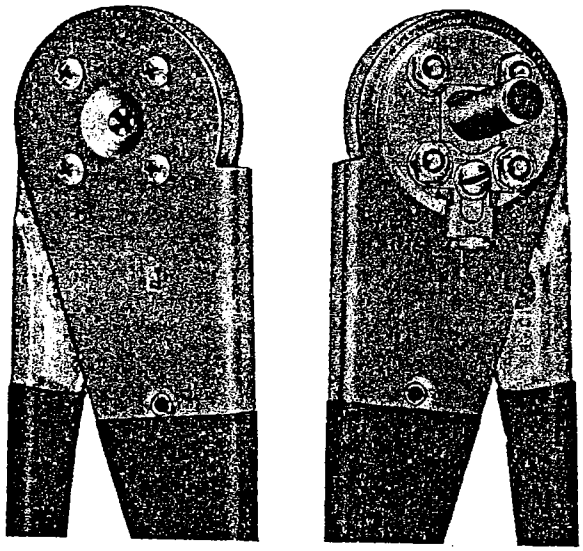


Figure 15

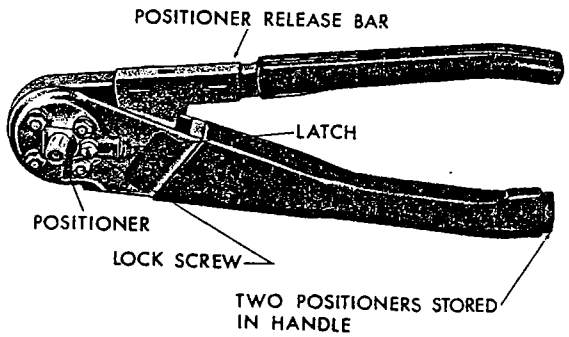


Figure 16

well adapter to obtain a satisfactory crimp joint. Insert the adapter in the contact wire well prior to insertion of the smaller gage wire. Table II lists the applicable wire-well adapters for the various wire and contact combinations.

TABLE II

Contact Size	Wire Size	Adapter for 10-746xx Contact	Adapter for 10-101649xx Contact
16	22	10-74696-6	10-242999-62
12	16	10-74696-4	10-242999-42
8	12	10-74696-5	10-242999-52
8	10	10-74696-1	10-242999-12
4	6	10-74696-2	10-242999-22

Insert the stripped end of wire into the contact wire-well and apply slight pressure until it is positively bottomed. Check visually to make certain the wire strands are visible in the inspection hole. With the wire in place, insert the contact into the 11-6941-4 or 11-7295 (MS3191-1) crimping tool, making sure the tool handles are fully opened. Make sure the contact and wire are inserted into the crimping tool as far as possible, using slight pressure with the hand. Close the tool handles to the fully closed position. The tool handles will not release until a complete uniform and reliable crimp is provided.

The Burndy Hytool, type MY29*, is recommended for crimping size 4 and 8 contacts to wires. For size 8 contacts, turn the knurled adjusting screw until the indexing line is aligned with the No. 8 line on the commercial cable index. For No. 4 contacts adjust until the index line is aligned with No. 4 on the cable index. Position the first shoulder on the contact from the wire well end against the nest (figure 17). Be sure the wire is fully seated in the wire well, then close the tool handles, release, and remove the crimped contact.

After crimping is completed with either tool, inspect the contacts to make certain the wire is visible

*Available from the Burndy Engineering Co., Inc., Bruckner Blvd., New York 54, N.Y.

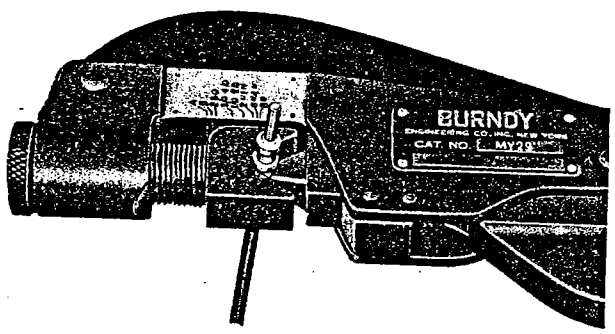


Figure 17

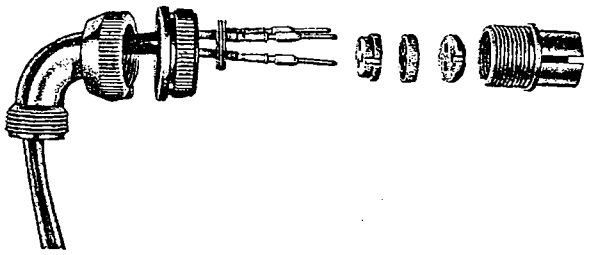


Figure 18

in the inspection hole. All strands of wire should be within the wire well. Inspect the wire well end of contact to be certain there is no evidence of rupture or excessive distortion.

4. INSTALLING COMPONENT PARTS

Any accessories to be used must be positioned on the wires before contacts are installed in the connector insert. The following is a general procedure and should be modified as required to suit individual installations.

a. When assembling the HT or BT-MA series connectors slide the elbow or adapter, retaining ring, and connector coupling nut on the wires. Make certain these parts are turned to face the connector shell as shown in figure 18.

b. When assembling the BT-M series, remove compression screws, sleeve and grommet. Remove back nut by unscrewing to the left. When preparing the 90° plug for assembly remove the elbow assembly and grommet by unscrewing the nut on the elbow. Slide the elbow assembly or sleeve, grommet, back nut, retaining ring, and coupling nut on the wire bundle, making sure they are turned to face the connector shell as shown in figure 19.

NOTE

Identifying letters on the rear face of the grommets are to be used as a guide in threading wires.

c. Install contacts with wires attached in proper holes of rear insert. Smallest outside diameter of rear insert must face toward wires. (Figure 20.) As each contact is installed, it must be rotated 90 degrees to lock it in the insert and properly align the flats so the sealing insert and front insert can be installed.

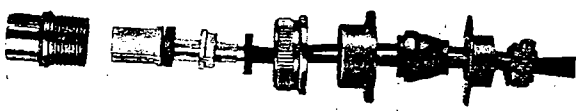


Figure 19

When wires are stiff, it may be necessary to twist contact and wire out of normal position far enough that when contact is installed in insert and is released it will turn back 90 degrees.

d. Align contact holes of sealing insert with contacts. Carefully work sealing insert down over contacts and position approximately $\frac{1}{16}$ of an inch from the front of the contacts. (Figure 20.) This will aid in holding the contacts in alignment while assembling the front insert.

e. Align keyway of front insert with keyway of back insert and start front insert, largest diameter first on contacts. After contacts are held by front insert, slide the sealing insert and front insert back along the contacts until the sealing insert butts against the rear insert.

NOTE

When assembling the socket inserts, it may be necessary to twist the front and rear inserts in opposite directions, thus aligning the flats on the contacts with the flats in the front insert.

f. Align keyway of assembled inserts with keyway in connector shell. Carefully push assembled inserts and contacts in back of shell (figure 21). If sealing insert catches on shell key, depress the insert at this point with a dull instrument passing it under the key.

g. Hold plug shell with a mated receptacle shell and tighten the retaining ring with proper spanner wrench (figure 22). A series of spanner wrenches have been designed for this application. The basic tool number is 11-4045. The dash number indicates the tool size for use on the same connector shell size. As an example, the 11-4045-24 spanner wrench should be used to install retaining rings of all size 24 connector assemblies. Use the 11-2934 Torque Wrench or a standard torque wrench handle (¼ inch drive) with the spanner wrenches. Tighten retaining ring to torque value indicated in Table III.

TABLE III

Connector Size	Spanner Wrench	Torque
10S	11-4045-10	10 lb in.
10SL	11-4045-11	11 lb in.
12S & 12	11-4045-12	12 lb in.
14S & 14	11-4045-14	14 lb in.
16S & 16	11-4045-16	16 lb in.
18	11-4045-18	18 lb in.
20	11-4045-20	20 lb in.
22	11-4045-22	22 lb in.
24	11-4045-24	24 lb in.
28	11-4045-28	28 lb in.
32	11-4045-32	32 lb in.

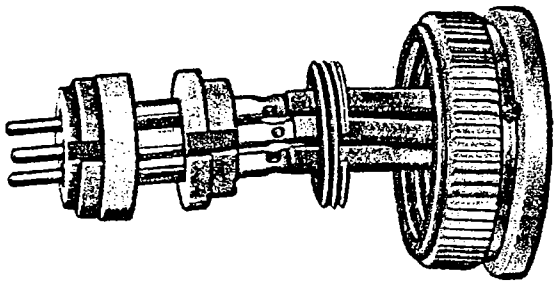


Figure 20

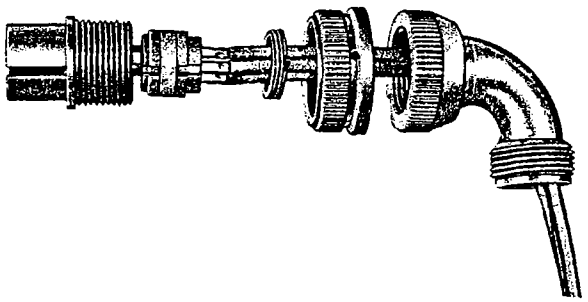


Figure 21

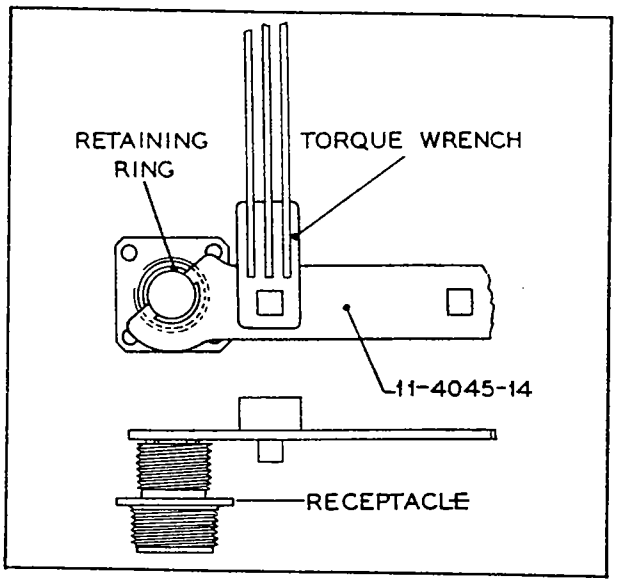


Figure 22

NOTE

Connectors as supplied do not have retaining ring tightened. The retaining ring is installed finger tight at the factory to hold parts in place for shipping.

h. When assembling the HT or BT-MA series connector, secure the adapter or elbow if used, to the shell using a standard strap wrench or 11-6147-1 connector pliers. Secure any accessory parts in a similar manner.

i. When assembling the BT-M series connector,

secure the back nut to the shell using a strap wrench or 11-6147-1 connector pliers. Seat the grommet into the back nut and over the contact wire wells. Press grommet until it is snug against the rear face of the insert. Place the compression sleeve over grommet, then thread and tighten the two compression screws provided, thus sealing the grommet around the wires. When assembling the 90° plug, seat the grommet against the rear face of the insert, then slide the elbow over the grommet and tighten the elbow nut to the connector shell using a strap wrench or 11-6147-1 connector pliers.

SECTION III

DISASSEMBLY

a. Support the shell and remove any accessories, with a suitable strap wrench or the 11-6147-1 Connector Pliers. Unscrew retaining ring using the proper size spanner wrench. See Table III.

b. Push insert and contact assembly out of shell. Remove front insert and sealing insert from contacts. Rotate contacts 90 degrees and push contacts back through rear insert. Care should be taken not to tear or cut sealing insert. Rotate contacts 90 degrees and slide them from rear of back insert.

c. Clean connector parts by wiping with a clean cloth dampened with proprietary denatured ethyl alcohol (Federal Specification O-E-760 Grade IV).

SECTION IV

INSPECTION

Carefully examine front and back inserts for cracks or chipping. If the connector has been subjected to extremely high temperatures, the sealing insert may require replacement. Check sealing insert for cuts or tears. Examine threads of shells, adapter, retaining rings, and coupling nuts. If lubrication is required, apply a light film of Uni-temp* grease or equivalent conforming to Military Specification MIL-G-3278.

The crimp-type contacts should be inspected as follows: Pin and socket contact should be straight and smooth. Check socket contacts with the same size pin contact. Sockets should grip the pin contacts. Do not attempt to reshape the spring clip on socket contacts or attempt to straighten pin contacts. Replace defective parts.

*Available from The Texas Co. (Texaco), Chrysler Towers, New York, N.Y.

SECTION V

REASSEMBLY

Information contained in this section is used only when connectors are being assembled to await further use and not when making an installation.

a. Slide contacts into holes in rear of back insert. Rotate contacts 90 degrees, this will lock contacts in back insert and align them for installation of the sealing insert and front insert.

b. Start sealing insert on contacts. Align keyway of front insert with keyway of back insert and slide front insert, large outside diameter end first, over contacts moving sealing insert to rear insert.

c. Align insert keyway with shell key. Carefully push the contact and insert assembly into the shell. Screw in retaining ring finger tight. Assemble adapter or elbow to connector shell.