



707, 727-787
STANDARD WIRING PRACTICES MANUAL

ASSEMBLY OF CONNECTORS WITH SOLDER TYPE CONTACTS

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1. GENERAL DATA

A. Applicable Conditions

CAUTION: DO NOT APPLY MORE THAN THE NECESSARY AMOUNT OF HEAT. DAMAGE TO THE CONNECTOR OR THE WIRE CAN OCCUR

CAUTION: DO NOT LET THE STRANDS OF THE CONDUCTOR THAT ARE IN THE INSULATION OF THE WIRE ABSORB THE SOLDER. THE WIRE:

- CANNOT BEND AT THE NECESSARY LOCATION
- CAN BREAK AT THE END OF THE SOLDER.

B. Minimum Wire O.D. for an Environmentally Sealed Connector

Refer to:

- Subject 20-60-08 for the identification of an environmentally sealed connector
- Table 1 for the minimum wire O.D. that is necessary for a satisfactory seal of a contact cavity hole
- Subject 20-60-08 for the procedure to increase the diameter of the wire.

Table 1
MINIMUM WIRE O.D. FOR A SATISFACTORY SEAL

Connector	Description	Contact Cavity Size	Minimum Wire O.D. (inch)
PT06E()	MIL-C-26482 series I type; front release, rear removal solder contacts	20	0.060
		16	0.066
		12	0.097
SM3106()	MIL-C-5015 type, front release, rear removal solder contacts	16	0.064
		12	0.114
		8	0.164
		4	0.272
		0	0.415

2. PART NUMBERS AND DESCRIPTION

A. Connector Part Numbers

Table 2
CONNECTOR PART NUMBERS

Part Number	Description	Supplier
CE9307-()	Rack and Panel Plug Connector	ITT Cannon
DPDN10-33S1B	Rack and Panel Plug Connector	ITT Cannon
DPDB18-33S1B	Rack and Panel Plug Connector	ITT Cannon
DPE60-33S	Plug Connector	ITT Cannon

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Table 2 CONNECTOR PART NUMBERS (Continued)

Part Number	Description	Supplier
DPXF40C1S	Rack and Panel Plug Connector	ITT Cannon
KO()	High Density Circular Plug Connector	ITT Cannon
PT06E()	Circular Plug Connector	Amphenol
SM3106()	Circular Plug Connector	Bendix
SRPA1N8AS1	Sliding Rack Plug Connector	Bendix
VB10-1PWC11-76	Relay Socket	Viking

B. Solder Adapter Part Numbers

Table 3
SOLDER ADAPTER PART NUMBERS

Boeing Standard	Part Number	Supplier
BACA14AB164	460-3094-01-01-00	Cambion

3. CONTACT ASSEMBLY

A. Installation of One Wire in a Contact Solder Cup

- (1) If a solder adapter is specified, make a selection of a solder adapter from Table 3.
- (2) If the connector does not have a grommet, put a 0.75 inch \pm 0.13 inch length of MIL-DTL-23053/5 Class 1 heat shrinkable sleeve on the wire.

Make sure that the sleeve has the smallest possible diameter that can be put on the wire.

NOTE: For alternative equivalent heat shrinkable sleeves, refer to Subject 20-00-11.

- (3) Remove the necessary length of insulation from the end of the wire.

NOTE: When the wire is fully installed in the contact, the end of the insulation must not be more than 0.06 inch from the rear end of the solder cup.

- (4) If a solder adapter is specified:
 - (a) Tin these components of the contact assembly:
 - The wire
 - The solder adapter
 - The contact solder cup.
 - (b) Solder the end of the wire in the adapter.
 - (c) Solder the adapter in the solder cup.
- (5) If a solder adapter is not specified:
 - (a) Tin these components of the contact assembly:
 - The wire
 - The contact solder cup.
 - (b) Solder the end of the wire in the solder cup.

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- (6) If the connector has a grommet and the contacts can be removed:
 - (a) Measure the O.D. of the wire.
 - (b) If the O.D. of the wire is less than the minimum seal diameter of the connector grommet hole, increase the O.D. of the wire. Refer to Paragraph 1.B.
- (7) If the connector does not have a grommet:
 - (a) Push the heat shrinkable sleeve forward until the forward end of the sleeve is between 0 inch and 0.06 inch from the rear face of the connector.
 - (b) Shrink the sleeve into its position. Refer to Subject 20-10-14.

B. Installation of More Than One Wire in a Contact Solder Cup

This paragraph gives the procedure to solder two or three AWG 22 wires in an size 20 contact with a solder cup.

- (1) Make a selection of a solder adapter from Table 3.
- (2) If the connector does not have a grommet, put a 0.75 inch \pm 0.13 inch length of MIL-DTL-23053/5 Class 1 heat shrinkable sleeve on the wire.

Make sure that the sleeve has the smallest possible diameter that can be put on the wire.

NOTE: For alternative equivalent heat shrinkable sleeves, refer to Subject 20-00-11.

- (3) Remove the necessary length of insulation from the end of the wire.

NOTE: When the wire is fully installed in the contact, the end of the insulation must not be more than 0.06 inch from the rear end of the solder cup.
- (4) Tin these components of the contact cavity:
 - The wire
 - The solder adapter
 - The contact solder cup.
- (5) Solder the end of the wire in the adapter.
- (6) Solder the adapter in the solder cup.
- (7) If the connector does not have a grommet:
 - (a) Push the heat shrinkable sleeve forward until the forward end of the sleeve is between 0 inch and 0.06 inch from the rear face of the connector.
 - (b) Shrink the sleeve into its position. Refer to Subject 20-10-14.

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ASSEMBLY OF THE GRIMES-HONEYWELL A-4135 MAP LIGHT

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ASSEMBLY OF THE GRIMES-HONEYWELL A-4135 MAP LIGHT

1. ASSEMBLY OF THE GRIMES-HONEYWELL A-4135 MAP LIGHT

This Subject is now located in Subject 20-84-11.

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TERMINATION OF WIRE IN MS25257 TYPE INDICATOR LIGHTS

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TERMINATION OF WIRE IN MS25257 TYPE INDICATOR LIGHTS

1. TERMINATION OF WIRE IN MS25257 TYPE INDICATOR LIGHTS

This Subject is now located in Subject 20-84-19.

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TERMINATION OF WIRE IN THE JOHNSON 105-0303-001 TIP PLUG CONNECTOR

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TERMINATION OF WIRE IN THE JOHNSON 105-0303-001 TIP PLUG CONNECTOR

This Subject gives the procedure to attach BMS 13-48 AWG 22 wire to the tip plug connector.

1. WIRE TERMINATION

A. Wire Preparation

- (1) Remove 1/4 inch \pm 1/16 inch of insulation from the end of the wire.
- (2) Tin the bare conductor strands.
- (3) Put the insulated handle on the wire.
- (4) Make a selection of these Grade B, Class 1 heat shrinkable sleeves from Subject 20-00-11:
 - 1/16 inch diameter sleeve
 - 3/16 inch diameter sleeve.
- (5) Put the heat shrinkable sleeves on the wire:
 - Two 1 inch lengths of 1/16 inch diameter sleeve
 - One 1 inch length of 3/16 inch diameter sleeve.

B. Installation of the Wire

- (1) Tin the area around the wire exit hole on the side of the pin body.
- (2) Put the sufficient amount of Kester 197 flux or an equivalent flux on the tinned area.
- (3) Put the end of the wire into the wire entry hole so that 1/8 inch to 3/16 inch of the wire is on the other side of the hole.
- (4) Solder the wire in the tip plug.
- (5) Install each heat shrinkable sleeve:
 - (a) Push the sleeve until the end of the sleeve is against the rear of the plug.
 - (b) Shrink the sleeve in position. Refer to Subject 20-10-14.
- (6) Engage the threads of the insulated handle and the body of the tip plug.
- (7) Tighten the handle.

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ASSEMBLY OF THE ITT GREMAR 150900-() TWINAXPLUG CONNECTOR

This Subject gives these procedures for the twinax plug connectors:

- Separation
- Disassembly
- Assembly
- Installation.

1. PART NUMBERS AND DESCRIPTION

A. Connector Part Numbers

Table 1
TWINAX PLUG CONNECTOR PART NUMBERS

Part Number	Contact Type	Clamp Configuration	Supplier
150900-0302	Socket	Shield clamp only	ITT Greomar
150900-0303	Pin	Shield clamp only	ITT Greomar
150900-2341	Socket	Shield clamp and jacket clamp	ITT Greomar
150900-2342	Pin	No clamps; does not accept a shield	ITT Greomar
150900-2343	Socket	No clamps; does not accept a shield	ITT Greomar
204-18291-2	Pin	Shield clamp only	Boeing

NOTE: Some Wiring Diagrams show the Boeing 204-18291-2 plug as an alternative to the 150900-0303 twinax plug.

B. Connector Description

The twinax plug connector has these technical features:

- Solder cup contacts
- Integral shield to connector shell electrical bond.

Refer to Figure 1 and Figure 2.

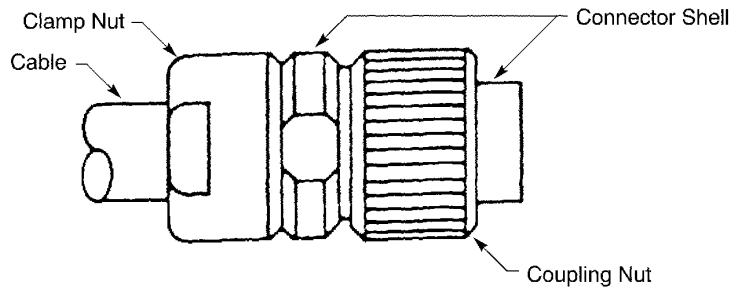
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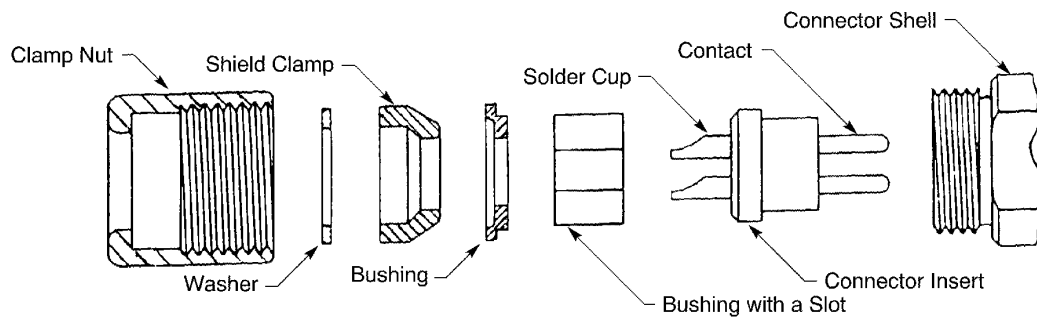
ASSEMBLY OF THE ITT GREMAR 150900-() TWINAXPLUG CONNECTOR



2445931 S00061545944_V1

THE ITT GREMAR 150900-() TWINAX PLUG CONNECTOR ASSEMBLY

Figure 1



2445932 S00061545945_V1

COMPONENTS OF THE ITT GREMAR 150900-() TWINAX PLUG

Figure 2

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ASSEMBLY OF THE ITT GREMAR 150900-() TWINAXPLUG CONNECTOR

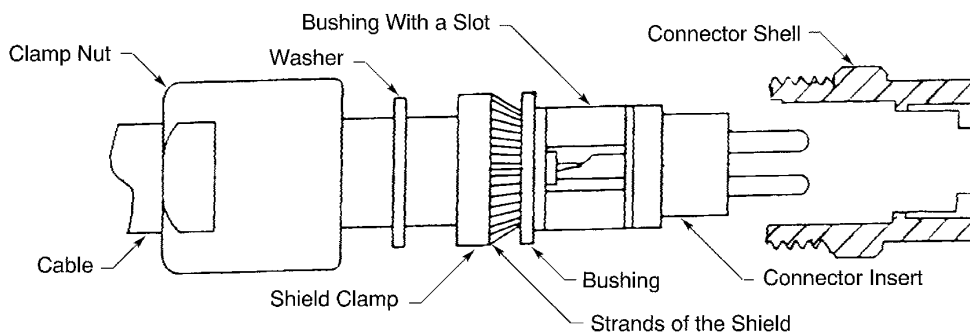
2. CONNECTOR DISASSEMBLY

A. Separation of the Plug from the Receptacle

- (1) Turn the coupling nut until the threads are disengaged from the threads on the receptacle receptacle. Refer to Figure 1.
- (2) Pull the shell of the plug away from the receptacle.
Make sure that the shell stays perpendicular to the receptacle.

CAUTION: DO NOT PULL THE CABLE TO DISCONNECT THE PLUG FROM THE RECEPTACLE. IT CAN CAUSE DAMAGE TO THE CABLE.

B. Contact Disassembly



2445933 S00061545947_V1

CONTACT DISASSEMBLY

Figure 3

Refer to Figure 3.

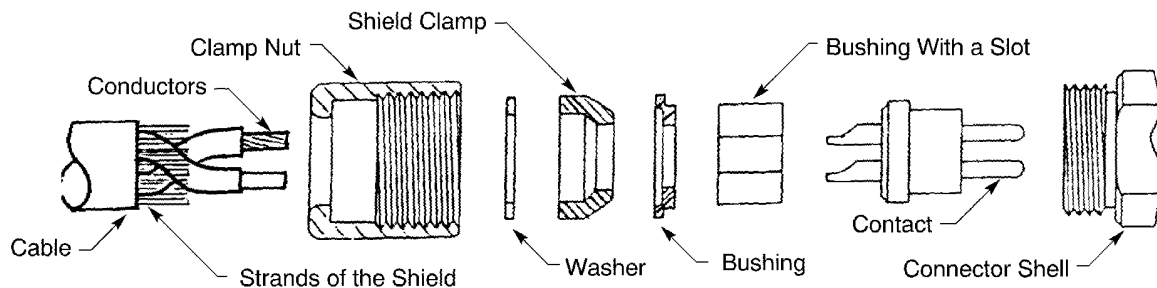
- (1) Disengage the threads of the clamp nut from the threads of the connector shell.
- (2) Move the nut and the washer away from the connector.
- (3) From the forward end of the connector, carefully push the connector insert out of the connector shell.
- (4) Remove the bushing with a slot.
- (5) For each contact:
 - (a) Apply heat to the solder cup of the contact with a soldering iron.
 - (b) Remove the conductor from the contact.

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C. Connector Disassembly



2445934 S00061545948_V1

**CONNECTOR DISASSEMBLY
Figure 4**

Refer to Figure 4.

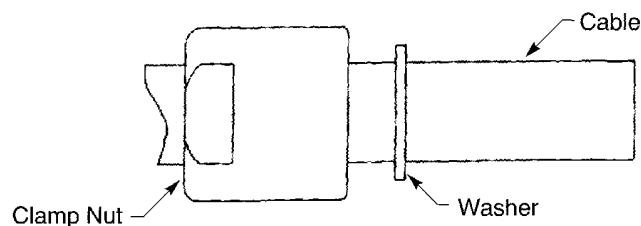
- (1) Remove the bushing from the cable.
- (2) Push the strands of the shield against the conductors.
Make sure that the strands are flat against the outer jacket of the cable.
- (3) In this order, carefully remove these components from the cable:
 - The shield clamp
 - The washer
 - The clamp nut.

3. CONNECTOR ASSEMBLY WITH RG108/U OR RAYCHEM 10599 TWINAX CABLE

A. Cable Preparation

- (1) In order, put these components on the end of the cable:
 - The clamp nut
 - The washer.

Refer to Figure 5.



2445935 S00061545949_V1

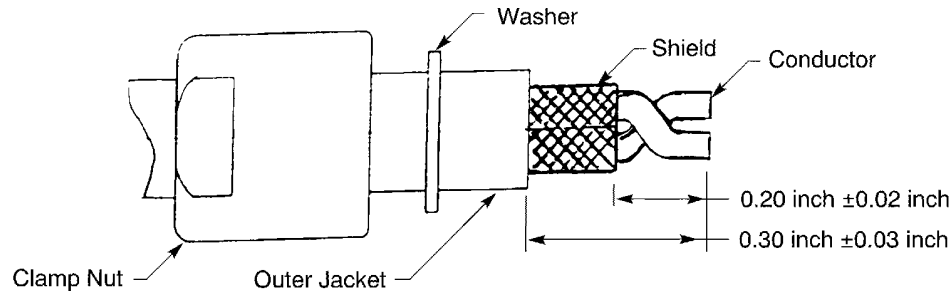
**POSITION OF THE CLAMP NUT AND THE WASHER ON THE CABLE
Figure 5**

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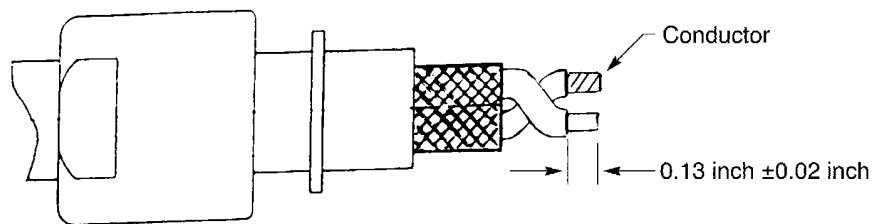
- (2) Remove 0.30 inch \pm 0.03 inch of the outer jacket from the end of the cable. Refer to Subject 20-00-15 and Figure 6.
- (3) Remove 0.20 inch \pm 0.02 inch of the shield from the end of the cable. Refer to Figure 6.



2445936 S00061545950_V1

OUTER JACKET AND SHIELD REMOVAL
Figure 6

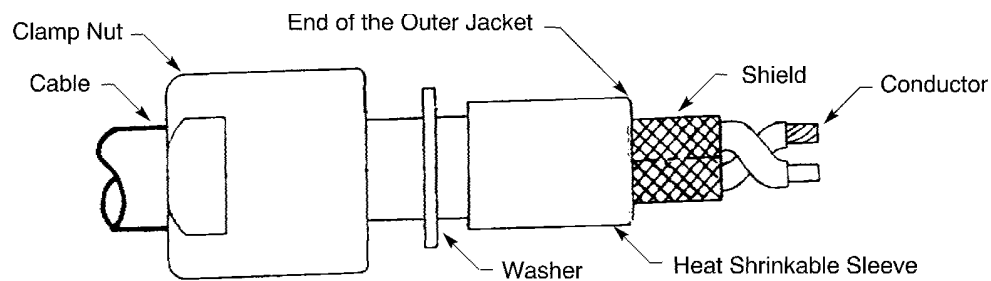
- (4) Remove 0.13 inch \pm 0.02 inch of the insulation from each conductor. Refer to Figure 7.



2445937 S00061545951_V1

INSULATION REMOVAL
Figure 7

- (5) For the Raychem 10599 cable, the outer diameter of the cable must be increased so that the clamp nut has the correct fit. Refer to Figure 8.



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POSITION OF THE HEAT SHRINKABLE SLEEVES
Figure 8

- (a) Make a selection of these Grade B, Class 1 heat shrinkable sleeves from Subject 20-00-11:

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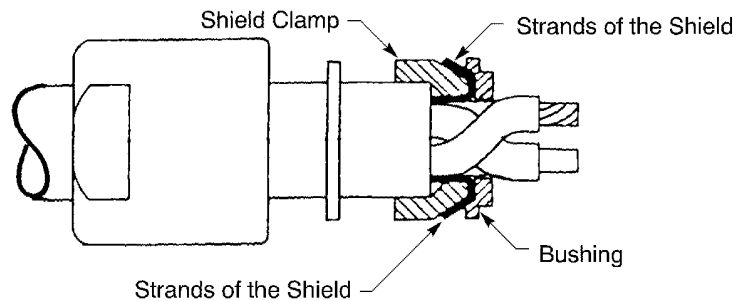
ASSEMBLY OF THE ITT GREMAR 150900-() TWINAXPLUG CONNECTOR

- 0.19 inch diameter sleeve
 - 0.25 inch diameter sleeve.
- (b) Cut these lengths of the heat shrinkable sleeve:
- Two 1.0 inch ± 0.1 inch lengths of the 0.19 inch diameter sleeve
 - Two 1.0 inch ± 0.1 inch lengths of the 0.25 inch diameter sleeve.
- (c) Put one of the sleeves that has the smaller diameter on the cable.
Make sure that the end of the sleeve is aligned with the end of the outer jacket.
- (d) Shrink the sleeve into its position. Refer to Subject 20-10-15.
- (e) Put the other sleeve that has the smaller diameter on the cable.
Make sure that the end of the sleeve is aligned with the end of the outer jacket.
- (f) Shrink the sleeve into its position. Refer to Subject 20-10-15.
- (g) Do Step (c) through Step (f) again for the sleeves that have the larger diameter.
- (6) Move the strands of the shield apart with a plastic awl or an equivalent tool.
- (7) Push the shield against the conductors.
Make sure that the strands are flat against the cable jacket.
- (8) Put the shield clamp on the cable.
Make sure that the clamp is:
- On the strands of the shield
 - Against the end of the outer jacket of the cable.
- (9) Fold the strands of the shield on the front end of the clamp.
Make sure that the strands are:
- Even and symmetrical around the clamp
 - Flat against the clamp
 - The strands of the shield go on the edge of the clamp.
- (10) Put the bushing on cable.
Make sure that the bushing holds the strands of the shield against the shield clamp. Refer to Figure 9.

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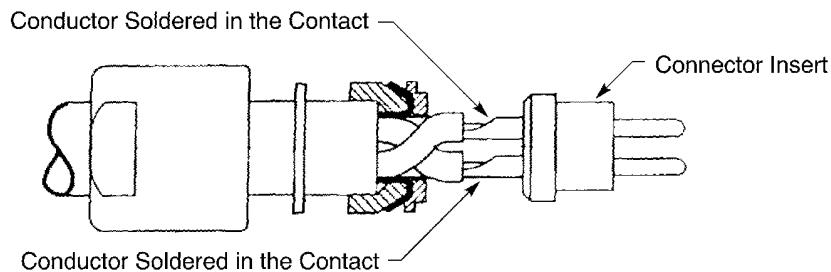
POSITION OF THE BUSHING, THE STRANDS OF THE SHIELD, AND THE SHIELD CLAMP

Figure 9

B. Contact Assembly

NOTE: The conductor that:

- Has tin coated strands is identified as White by the Wiring Diagram
- Is solid copper is identified as Blue by the Wiring Diagram.



2445939 S00061545954_V1

CONDUCTORS SOLDERED IN THE CONTACTS

Figure 10

- (1) Examine the rear end of the connector insert.
Make sure that there is not any of these types of damage:
 - Gouges or cracks between two contact cavities
 - Gouges or cracks from a contact cavity to the edge of the connector insert.
- (2) Solder each conductor in the solder cup of the applicable contact. Refer to Subject 20-40-00 and Figure 10.
Make sure that:
 - There are no bad solder joints
 - There are no broken strands of the conductor at the solder joint
 - There is no damage to the strands of the conductor that shows the base metal.

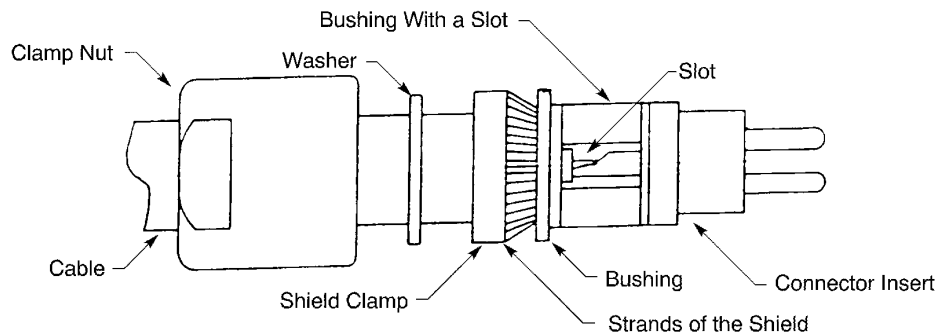
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C. Connector Assembly

- (1) Put the bushing that has the slot on the connector insert.

Make sure that the bushing is on the solder cups of the contacts and the conductors. Refer to Figure 11.



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POSITION OF THE BUSHING WITH A SLOT

Figure 11

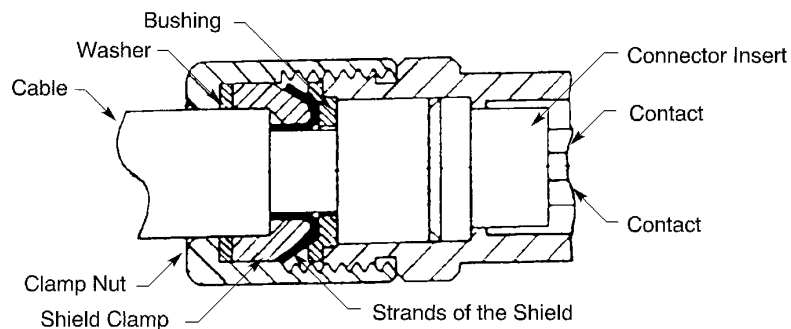
- (2) Push the connector insert into the connector shell until it stops.
- (3) Engage the threads of the clamp nut and the connector shell.
Make sure that there is no damage to the threads of the nut or the shell.
- (4) Tighten the nut until it stops. Refer to Figure 12.



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ASSEMBLED PLUG CONNECTOR

Figure 12

4. CONNECTOR INSTALLATION

A. Installation of a Plug into a Receptacle

- (1) Examine the front face.

Make sure that there is not an of these types of damage:

- A bent contact pin
- A crack or a chip from one contact cavity to another contact cavity
- A crack or a chip from a contact cavity to the edge of the connector insert.

- (2) Align the plug with the receptacle.

Make sure that:

- The contacts in the plug are aligned with the contacts in the receptacle
- The longitudinal axis of the plug is parallel to the longitudinal axis of the receptacle.

- (3) Push the plug into the receptacle.

Make sure that the contacts are fully engaged.

- (4) Engage the threads of the coupling nut and the threads of the receptacle shell.
- (5) Tighten the nut until it stops.

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ASSEMBLY OF THE W. W. FISHER D105A067-60 CONNECTOR

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1. PART NUMBERS AND DESCRIPTION

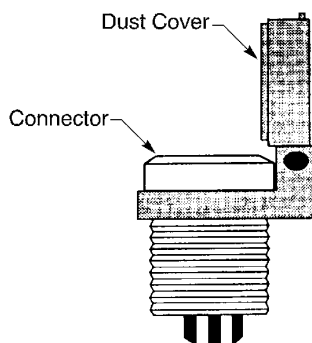
A. Necessary Parts for Assembly

**Table 1
ASSEMBLY PART NUMBERS**

Part Number	Description	Supplier
437-027	Backshell	Glenair
667-047	Dust Cover	Glenair
D105A067-60	Connector	W. W. Fisher

2. CONNECTOR ASSEMBLY

A. Dust Cover Installation



2445942 S00061545958_V1

POSITION OF THE DUST COVER ON THE CONNECTOR

Figure 1

Refer to Figure 1.

- (1) Install the dust cover over the rear of the connector.
- (2) Open the dust cover so that it is against the front end of the connector.

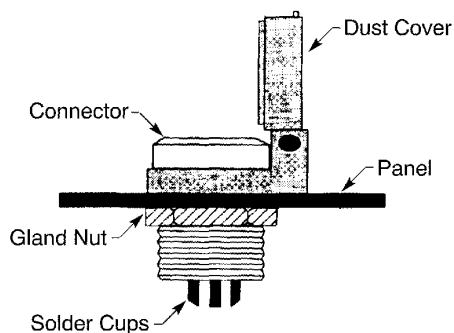
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B. Connector Assembly



2445943 S00061545959_V1

POSITION OF THE CONNECTOR ON THE PANEL

Figure 2

Refer to Figure 2.

- (1) Put the connector into the correct panel cutout.
- (2) Engage the threads of the gland nut the rear of the connector body.
- (3) Torque the gland nut 50 inch-pounds ± 5 inch-pounds.
- (4) Close the dust cover.

C. Wire Installation

- (1) Remove a 0.25 inch ± 0.1 inch length of insulation from the end of each wire. Refer to Subject 20-00-15.
- (2) Find the correct solder cup for each wire. Refer to the Wiring Diagram Manual.
- (3) Put each wire through the applicable hole in the insulator of the backshell.
- (4) Push each wire into the correct solder cup.
Make sure the distance from the end of the wire insulation to the end of the solder cup is less than 0.03 inch.
- (5) Solder each wire in the applicable solder cup.

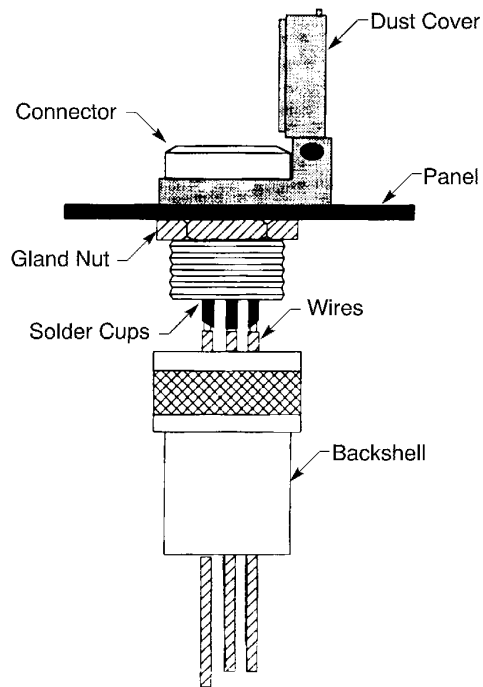
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ASSEMBLY OF THE W. W. FISHER D105A067-60 CONNECTOR

D. Backshell Installation



2445944 S00061545960_V1

INSTALLATION OF THE BACKSHELL

Figure 3

- (1) Align the holes in the insulator with the solder cups.
Refer to Figure 3.
- (2) Push the backshell until it is against the body of the connector.
- (3) Engage the threads of the coupling ring and the body of the connector.
- (4) Torque the backshell 50 inch-pounds ± 5 inch-pounds.

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ASSEMBLY OF THE NEXUS TJT-120 AUDIO JACK

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A. Connector Assembly	2

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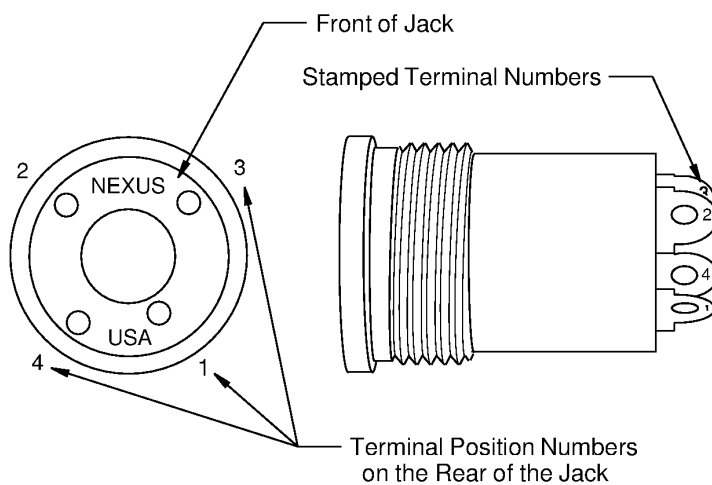
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ASSEMBLY OF THE NEXUS TJT-120 AUDIO JACK

1. PART NUMBERS AND DESCRIPTION

A. Audio Jack Part Numbers

Table 1
ASSEMBLY PART NUMBERS

Part Number	Description	Supplier
TJT-120TSL-M	4 Terminal Audio Jack	Comm Innovations



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TJT-120TSL-M AUDIO JACK
Figure 1

2. CONNECTOR ASSEMBLY

A. Connector Assembly

Table 2
NECESSARY MATERIALS

Part Number	Description	Application in this Procedure	Diameter (inch)	Supplier
DWP-125	Heat Shrinkable Sleeve	Shield Sleeve	3/16	Tyco/Raychem
M23053/5-102-C	Heat Shrinkable Sleeve	Build-up Sleeve	-	QPL
M23053/5 Class 1	Heat Shrinkable Sleeve	Insulation Sleeve	-	QPL

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- (1) Put a tag on each wire; Identify each wire with its terminal number to allow the jack to be assembled again. Refer to Figure 1 for the terminal numbers.

NOTE: Each terminal number is stamped into the metal terminal. The view of the terminal number is blocked by solder on the terminal.

NOTE: Terminal number 1 is on the rear face of the jack opposite the "A" in "USA" marked on the front face.

NOTE: Terminal number 2 is on the rear face of the jack opposite the "N" in "NEXUS" marked on the front face.

NOTE: Terminal number 3 is on the rear face of the jack opposite the "S" in "NEXUS" marked on the front face.

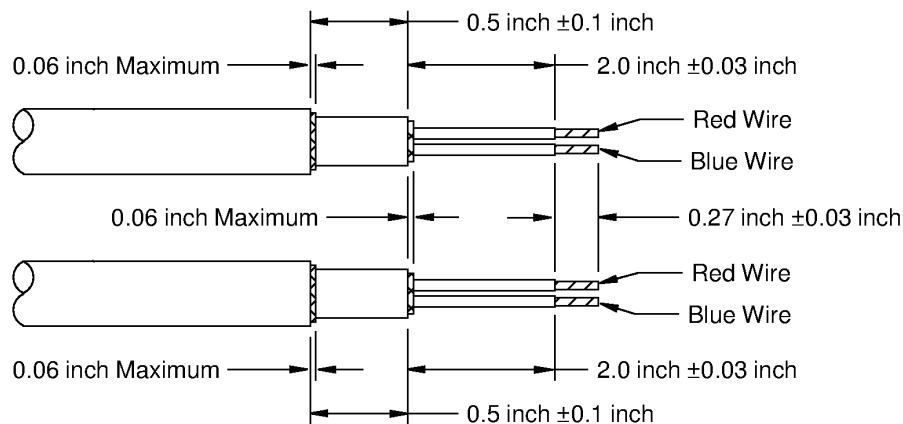
NOTE: Terminal number 4 is on the rear face of the jack opposite the "U" in "USA" marked on the front face.

- (2) Make a selection of 3/16 inch diameter DWP-125 heat shrinkable sleeve from Table 2.

- (3) Put a 2.50 inch ± 0.10 inch length of the DWP-125 sleeve on each of the two cables.

NOTE: These sleeves will be referred to as shield sleeves.

- (4) Prepare the end of the cables. Refer to Figure 2.



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CABLE PREPARATION

Figure 2

- (5) Tin each of the four conductors.
- (6) Make a selection of M23053/5-102-C heat shrinkable build-up sleeve from Table 2.
- (7) Put a 1.9 inch ± 0.05 inch length of the build-up sleeve on each of the four wires. Refer to Figure 2.

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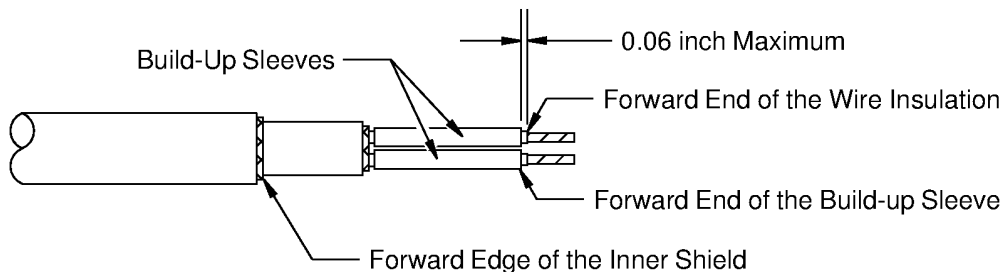
ASSEMBLY OF THE NEXUS TJT-120 AUDIO JACK

- (8) Shrink the build-up sleeves into position on each of the four wires.

Make sure that the forward end of each sleeve is not more than 0.06 inch from the forward end of the insulation.

Refer to:

- Figure 3 for the position of the sleeves on the wires
- Subject 20-10-14 for the procedures to shrink the sleeves.



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POSITION OF THE BUILD UP SLEEVES ON THE WIRES

Figure 3

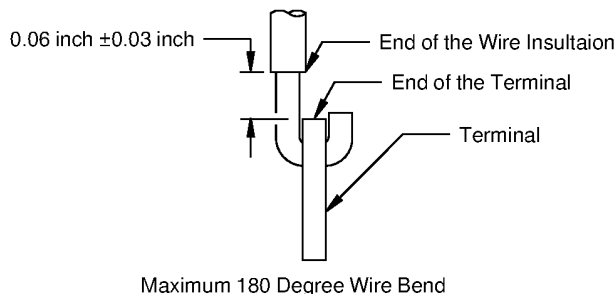
- (9) Make a selection of the smallest diameter M23053/5 Class 1 heat shrinkable insulation sleeve that will fit over the wire and the solder joint from Table 2.
- (10) Put a 1.25 inch ± 0.1 inch length of the insulation sleeve on each of the four wires.
- (11) Solder the end of each wire to its applicable terminal.

Refer to:

- Figure 2
- Figure 4
- Figure 5.

Make sure that:

- The bend in the wire is 90 degrees to 180 degrees
- The distance from the end of the terminal to the end of the wire insulation is 0.06 inch ± 0.03 inch.



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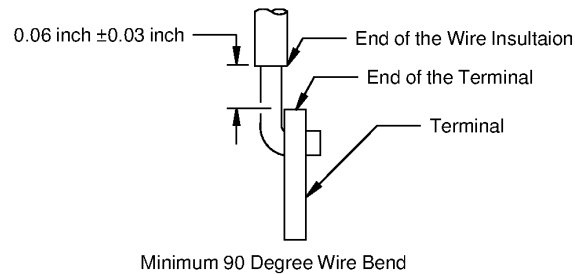
POSITION OF THE END OF THE WIRE ON THE TERMINAL - MAXIMUM 180 DEGREE BEND

Figure 4

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POSITION OF THE END OF THE WIRE ON THE TERMINAL - MINIMUM 90 DEGREE BEND

Figure 5

- (12) Push the insulation sleeves forward on each of the four wires and the solder joints until the end of the sleeves are against the rear of the audio jack.
- (13) Shrink each sleeve into position on each of the four wires.

Refer to:

- Subject 20-10-14 for the procedures to shrink the sleeves
- Figure 6.

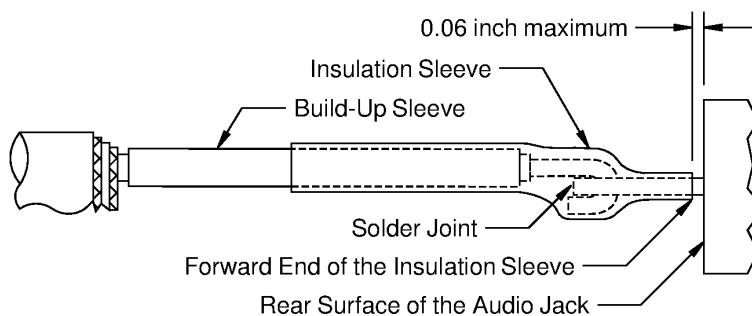
Make sure that:

- The forward end of each sleeve is not more that 0.06 inch from the rear surface of the audio jack
- Each sleeve makes an overlap with the wire insulation of at least 0.75 inch.

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POSITION OF THE INSULATION SLEEVE ON THE WIRE AND THE SOLDER JOINT

Figure 6

- (14) Shrink the shield sleeve on each of the two cables into position on the ends of the shields. Refer to Figure 7.

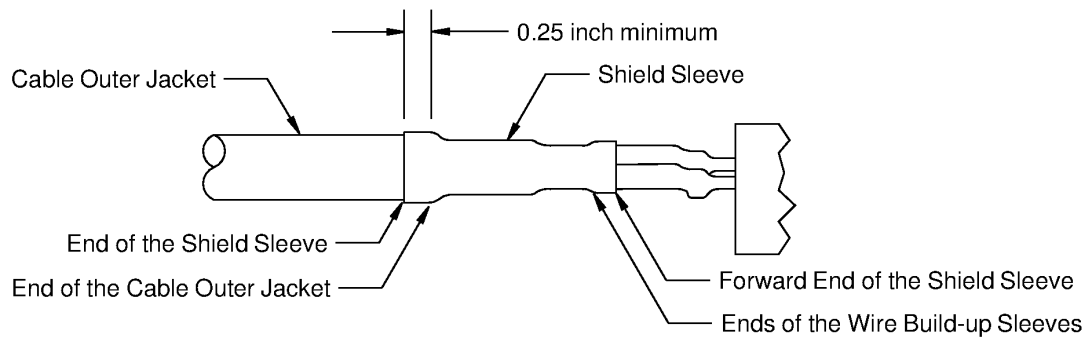
Make sure that:

- The rear end of each shield shield sleeve makes an overlap with the cable jacket of at least 0.25 inch
- The forward end of each shield sleeve makes an overlap with the insulation sleeves.

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POSITION OF THE SHIELD SLEEVE ON THE CABLE

Figure 7

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