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STANDARD WIRING PRACTICES MANUAL

CONNECTOR AND TERMINAL ASSEMBLY WITH 65B47866() SHIELDED CABLE

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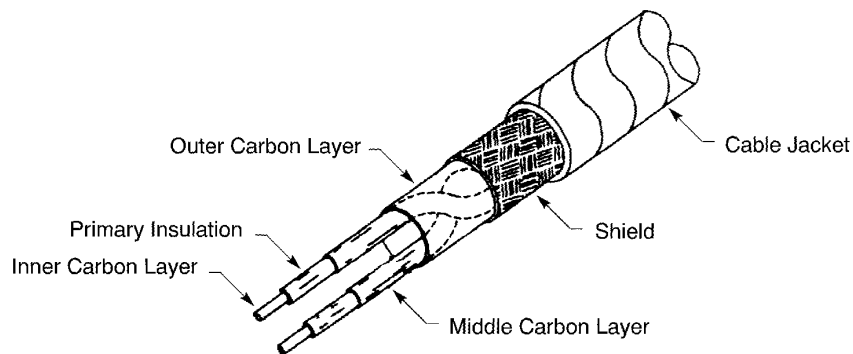
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1. PART NUMBERS AND DESCRIPTION

A. Cable Part Numbers

Table 1
CABLE PART NUMBERS

Boeing Specification	Wire Size (AWG)	Number of Conductors	Number of Shields
65B47866-1	18	2	1
65B47866-2	20	2	1
65B47866-3	18	2	1
65B47866-4	20	2	1
65B47866-5	20	2	2



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65B47866-1 AND 65B47866-2 CABLE CONFIGURATION

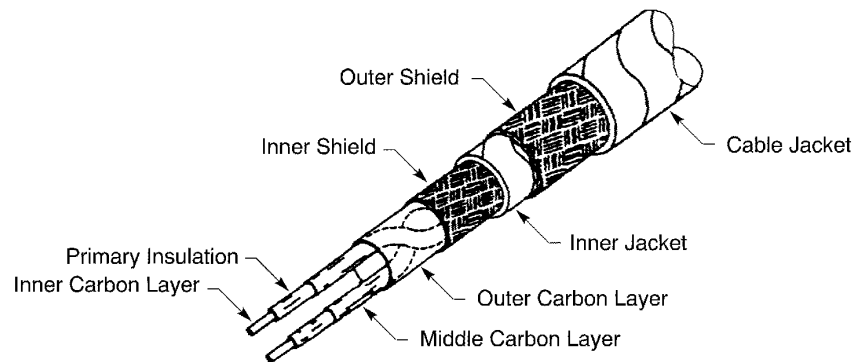
Figure 1

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65B47866-5 CABLE CONFIGURATION

Figure 2

2. CABLE PREPARATION

A. Applicable Connectors

**Table 2
APPLICABLE CONNECTORS**

Connector		Connector Assembly Reference
Part Number	Supplier	
10-244()	Bendix	Subject 20-61-18
9816KS()	Matrix	Subject 20-63-14
BACC45F()	Boeing	Subject 20-61-11
BACC63BN()	Boeing	Subject 20-61-11
BACC63BP()	Boeing	Subject 20-61-11
BACC63BR()	Boeing	Subject 20-63-13
BACC63BT()	Boeing	Subject 20-63-13
BACC63BV()	Boeing	Subject 20-61-11
BACC63CB()	Boeing	Subject 20-61-11
BACC63CC()	Boeing	Subject 20-61-11
BACC63CM()	Boeing	Subject 20-63-13
BACC63CN()	Boeing	Subject 20-63-13

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Table 2 APPLICABLE CONNECTORS (Continued)

Connector		Connector Assembly Reference
Part Number	Supplier	
CN0986-()	Cinch	Subject 20-61-11
FRF()	ITT Cannon	Subject 20-61-19
MT30K-()	Matrix	Subject 20-63-13
MT37K-()	Matrix	Subject 20-63-13

B. Cable Preparation for the Assembly of BACC45F(), BACC63(), CN0986-(), 9816KS(), and FRF() Connectors

Table 3
SHIELD GROUND WIRES

Area Of The Airplane	Temperature Grade	Boeing Specification	Wire Size (AWG)
Not Pressurized	A	BMS 13-16 Type 1 Black	18
	B	BMS 13-16 Type 1 Black	18
	C	BMS 13-16 Type 1 Black	18
	D	BMS 13-31 Type 1	18
		BMS 13-58 Type 1	18
		BMS 13-60 Type 7	18
Pressurized	A	BMS 13-16 Type 1 Black	20
	B	BMS 13-16 Type 1 Black	20
	C	BMS 13-16 Type 1 Black	20
	D	BMS 13-31 Type 1	20
		BMS 13-58 Type 1	20
		BMS 13-60 Type 7	20

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**Table 4
MECHANICAL FERRULE PART NUMBERS**

Cable		Ferrule				Wire Harness Temperature Grade
Part Number	Shield	Plating	Type	Part Number	Color	
65B47866-1	-	Nickel	Inner	BACS13S187BNP	-	A
						B
						C
						D
			Outer	BACS13S281CNP	-	A
						B
						C
						D
65B47866-1	-	Tin	Inner	BACS13S187B	Yellow	A
						B
			Outer	BACS13S281C	Purple	A
						B
65B47866-2	-	Nickel	Inner	BACS13S175BNP	-	A
						B
						C
						D
			Outer	BACS13S261CNP	-	A
						B
						C
						D
65B47866-2	-	Tin	Inner	BACS13S175B	Green	A
						B
			Outer	BACS13S261C	Yellow	A
						B

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Table 4 MECHANICAL FERRULE PART NUMBERS (Continued)

Cable		Ferrule				Wire Harness Temperature Grade
Part Number	Shield	Plating	Type	Part Number	Color	
65B47866-5	Inner	Nickel	Inner	BACS13S156BNP	-	A
						B
						C
						D
	Outer	Nickel	Outer	BACS13S232CNP	-	A
						B
						C
						D
			Inner	BACS13S205BNP	-	A
						B
						C
						D
Outer	Nickel	Outer	BACS13S281CNP	-	A	
					B	
					C	
					D	
65B47866-5	Inner	Tin	Inner	BACS13S156B	Red	A
			B			
	Outer	Tin	Outer	BACS13S232C	Orange	A
			B			
			Inner	BACS13S205B	Orange	A
			B			
Outer	Tin	Inner	BACS13S205B	Orange	A	
		B				
Outer	Tin	Outer	BACS13S281C	Purple	A	
		B				

NOTE: Refer to Subject 20-00-11 for approved suppliers and alternative part numbers for BACS13S ferrules.

**Table 5
CABLE TRIM DIMENSIONS**

Cable	Trim Dimension		
	Dimension	Target (inch)	Tolerance (inch)
65B47866-1	A	-	±0.06
	B	3.00	±0.06
	C	2.00	±0.06

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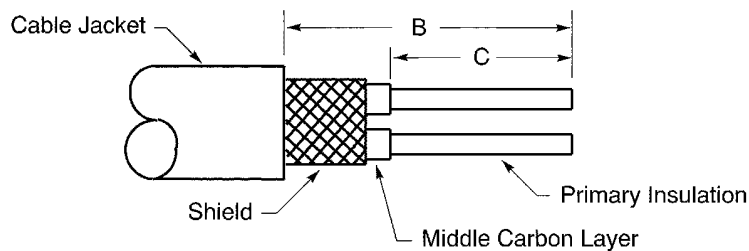


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Table 5 CABLE TRIM DIMENSIONS (Continued)

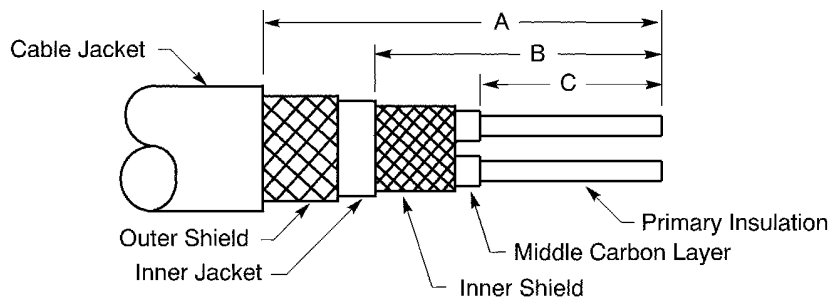
Cable	Trim Dimension		
	Dimension	Target (inch)	Tolerance (inch)
65B47866-2	A	-	±0.06
	B	3.00	±0.06
	C	2.00	±0.06
65B47866-5	A	3.75	±0.06
	B	3.00	±0.06
	C	2.00	±0.06



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65B47866-1 AND 65B47866-2 CABLE TRIM DIMENSIONS

Figure 3



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65B47866-5 CABLE TRIM DIMENSIONS

Figure 4

Refer to:

- Figure 1 and Figure 3 for the cable with one shield
- Figure 2 and Figure 4 for the cable with two shields
- Table 5 for the cable trim dimension values
- Table 2 for the location of the assembly procedures of the applicable connector.

- (1) Remove the necessary length of the cable jacket.

Make sure that the distance from the end of the jacket to the end of the cable is:

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- Dimension B for a cable that has one shield
 - Dimension A for a cable that has two shields
- (2) If the cable has two shields, remove the necessary length of the inner jacket.
Make sure that the distance from the end of the jacket to the end of the cable is dimension B.
- (3) Remove the necessary length of the middle carbon layer.
Make sure that the distance from the end of the layer to the end of the wires is dimension C.
- NOTE:** Damage of the primary insulation is permitted if the strands of the conductor cannot be seen.
- (4) Remove all of the unwanted carbon from the primary insulation with a fiberglass eraser or an abrasive pad.
- (5) Clean the insulation with acetone or an equivalent solvent.
- (6) Assemble a shield ground wire with mechanical ferrules for each shield. Refer to Subject 20-10-15.
- These conditions are applicable:
- The selection of the ferrules is from Table 4
 - The selection of the shield ground wire is from Table 3
 - The length of the shield ground wire is 3.0 inches maximum
 - The heat shrinkable sleeve is a 1.0 inch length of 3/8 inch diameter CRN or TFE 2X sleeve
 - The CRN sleeve has temperature grade A or B
 - The TFE 2X sleeve has a temperature grade C or D.
- (7) Remove the necessary length of the primary insulation from the end of each component wire.
Refer to the applicable Subject for the assembly of the connector.
- (8) Put the necessary length of a 1/8 inch diameter TFE 2X heat shrinkable sleeve on each component wire.
Make sure that:
- The rearward end of each sleeve is against the ferrule
 - The forward end of each sleeve is aligned with the end of the primary insulation of the component wire.
- (9) Shrink each sleeve into its position. Refer to Subject 20-10-14.

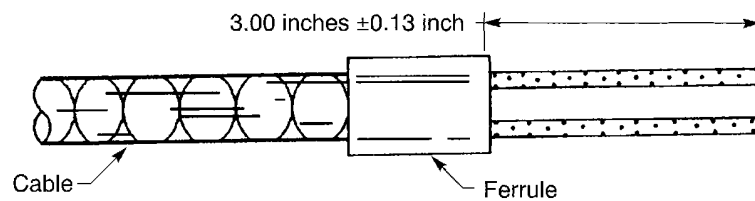
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C. 65B47866-1 and -2 Cable Preparation for the Assembly of Bendix 10-244() Connectors



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CABLE PREPARATION
Figure 5

Refer to Figure 5.

- (1) Remove 3.00 inches ± 0.13 inch of the cable jacket and the shield.
- (2) Cut the outer carbon layer along the longitudinal axis of the cable between the two component wires.
- (3) Remove the necessary length of the outer carbon layer.
Make sure that the end of the carbon layer is aligned with the end of the cable jacket.
- (4) Move the two component wires apart from the end of the cable to the end of the jacket.
- (5) Remove the necessary length of the middle carbon layer on each component wire.
Make sure that the distance from the end of the carbon layer to the end of the primary insulation is 0.50 inch ± 0.06 inch.

Refer to Subject 20-61-18.

CAUTION: MAKE SURE THAT DAMAGE TO THE PRIMARY INSULATION DOES NOT OCCUR.

- (6) Remove all of the unwanted carbon from the primary insulation with a fiberglass eraser or an abrasive pad.
- (7) Clean the insulation with acetone or an equivalent solvent.
- (8) Assemble a shield ground wire with mechanical ferrules. Refer to Subject 20-10-15.

These conditions are applicable:

- The selection of the ferrules is from Table 4
- The selection of the shield ground wire is from Table 3
- The length of the shield ground wire is 3.00 inches ± 0.13 inch maximum.

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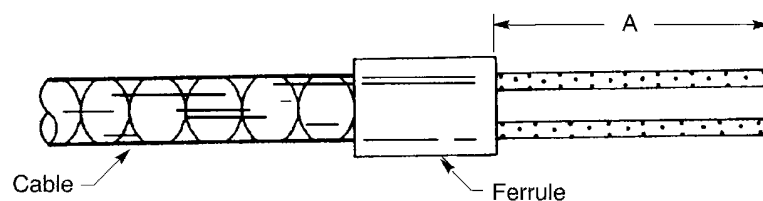
D. 65B47866-1 and -2 Cable Preparation for the Assembly of Matrix MT30K-() and MT37K-() Connectors

Table 6
CONNECTOR PART NUMBERS

Part Number	Supplier
MT30K-2219-299	Matrix
MT37K-1203-191	Matrix
MT37K-1203-299	Matrix

Table 7
CABLE TRIM DIMENSIONS

Connector	Trim Dimension		
	Dimension	Target (inch)	Tolerance (inch)
MT37K-1203-191	A	1-1/2	±1/8
MT37K-1203-299	A	1	±1/8
MT30K-2219-299	A	1-1/4	±1/8



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CABLE PREPARATION
Figure 6

- (1) Remove the necessary length of the cable jacket and the shield. Refer to Figure 6 and Table 7.
- (2) Cut the outer carbon layer along the longitudinal axis of the cable between the two component wires.
- (3) Remove the necessary length of the outer carbon layer.
Make sure that the end of the carbon layer is aligned with the end of the cable jacket.
- (4) Move the two component wires apart from the end of the cable to the end of the jacket.
- (5) Remove the necessary length of the middle carbon layer on each component wire.
Make sure that the distance from the end of the carbon layer to the end of the primary insulation is 0.50 inch ±0.06 inch.
Refer to Subject 20-63-13.

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CAUTION: MAKE SURE THAT DAMAGE TO THE PRIMARY INSULATION DOES NOT OCCUR.

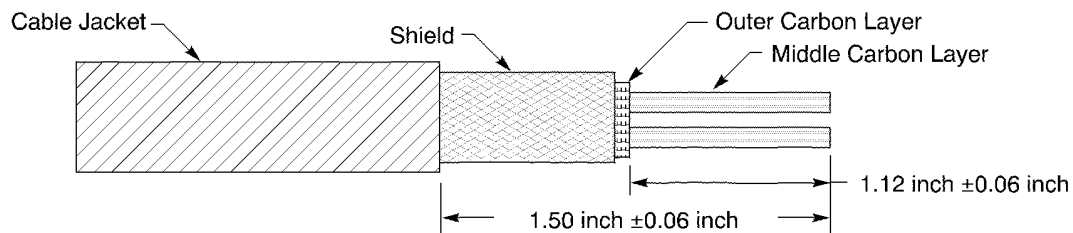
- (6) Remove all of the unwanted carbon from the primary insulation with a fiberglass eraser or an abrasive pad.
- (7) Clean the insulation with acetone or an equivalent solvent.
- (8) Assemble a shield ground wire with mechanical ferrules. Refer to Subject 20-10-15.

These conditions are applicable:

- The selection of the ferrules is from Table 4
- The selection of the shield ground wire is from Table 3
- The length of the shield ground wire is 3.00 inches ± 0.13 inch maximum.

E. 65B47866-1 and -2 Cable Preparation for the Assembly of Connectors with Glenair 387()020 and Boeing S280W603 Backshells

This paragraph gives the procedure to prepare the 65B47866-2 cable.



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CABLE TRIM DIMENSIONS

Figure 7

Refer to Figure 7.

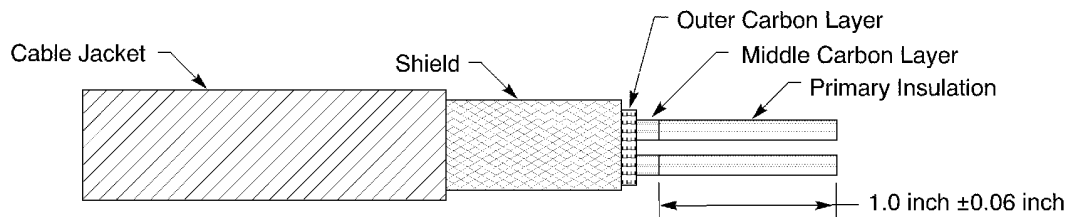
- (1) Put the backshell on the cable so that it is away from the end of the cable.
- (2) Remove 1.50 inches ± 0.06 inch of the jacket from the end of the cable.
- (3) Remove 1.12 inches ± 0.06 inch of the shield from the end of the cable.
- (4) Move the two wires apart from the end of the cable to the end of the jacket.
- (5) Cut the outer carbon layer along the longitudinal axis of the cable between the two component wires.
- (6) Remove 1.12 inches ± 0.06 inch of the outer carbon layer.
- (7) Remove 1.00 inch ± 0.06 inch of the middle carbon layer from the end of each component wire. Refer to Figure 8.

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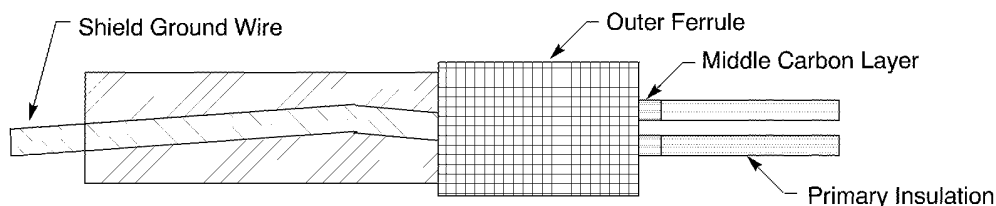


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REMOVAL LENGTH OF THE MIDDLE CARBON LAYER

Figure 8

- (8) Remove all of the unwanted carbon from the primary insulation with a fiberglass eraser or an abrasive pad.
- (9) Clean the insulation with acetone or an equivalent solvent.
- (10) Assemble the shield ground wire with mechanical ferrules and a 6.0 inch length of the shield from a BMS 13-58 Type 7 Class 1 AWG 20 wire. Refer to Subject 20-10-15.
Make sure that the shield ground wire makes an exit from the cable at the rear end of the ferrule. Refer to Figure 9.



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POSITION OF THE SHIELD GROUND WIRE

Figure 9

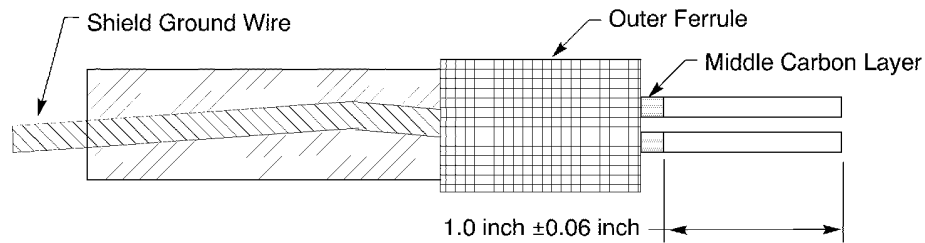
- (11) Remove 1.00 inch \pm 0.06 inch of insulation from the end of each wire. Refer to Figure 10.

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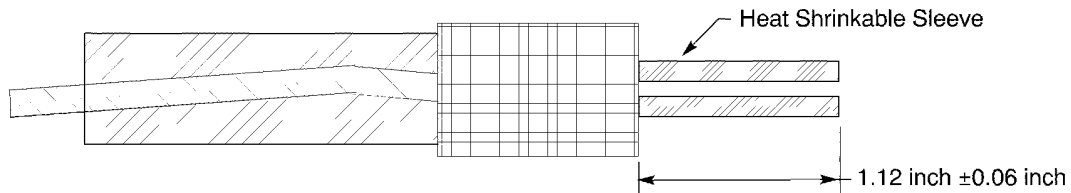
INSULATION REMOVAL

Figure 10

- (12) Put a 1.12 inch ± 0.06 inch length of 1/8 inch diameter of TFE 4X heat shrinkable sleeve on each conductor.

Make sure that the sleeve makes an overlap with the middle carbon layer of the conductor.

Refer to Figure 11.



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POSITION OF THE HEAT SHRINKABLE SLEEVE ON THE CONDUCTORS

Figure 11

- (13) Shrink each sleeve into its position. Refer to Subject 20-10-14.
- (14) Put a 1.00 inch ± 0.06 inch length of 3/8 inch diameter TFE 4X heat shrinkable sleeve on the cable.

Make sure that the center of the sleeve is aligned with the center of the ferrule.

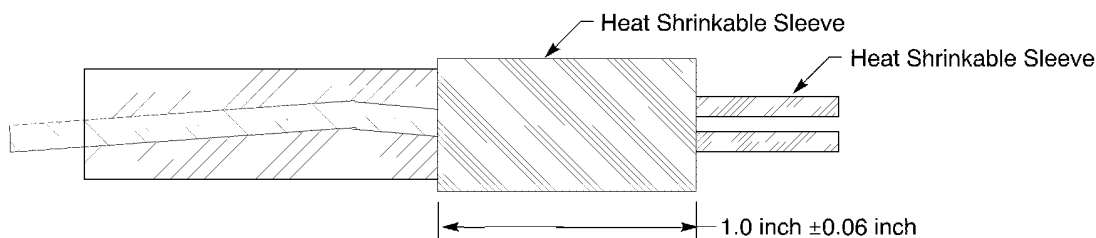
Refer to Figure 12.

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POSITION OF THE HEAT SHRINKABLE SLEEVE ON THE CABLE

Figure 12

- (15) Shrink the sleeve into its position. Refer to Subject 20-10-14.

3. TERMINAL ASSEMBLY

A. Cable Preparation

Table 8
APPLICABLE TERMINALS

Part Number	Supplier
321893	AMP

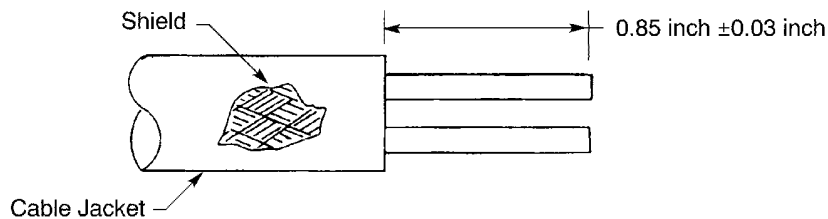
- (1) Remove 1.0 inch ± 0.1 inch of the cable jacket and the shield from the end of the cable.
Make sure that the end of the jacket and the shield are perpendicular to the longitudinal axis of the cable.
- (2) Move the two component wires in the outer carbon layer apart.
Make sure that the wires are parallel.
- (3) Cut the outer carbon layer along the longitudinal axis of the cable between the two wires.
- (4) Remove the necessary length of the outer carbon layer.
Make sure that the end of the carbon layer is aligned with the end of the cable jacket.
- (5) Remove all of the unwanted carbon from the primary insulation with a fiberglass eraser or an abrasive pad.
- (6) Clean the insulation with acetone or an equivalent solvent.
- (7) Cut each wire so that the distance from the end of the cable jacket to the end of the wire is 0.85 inch ± 0.03 inch. Refer to Figure 13.

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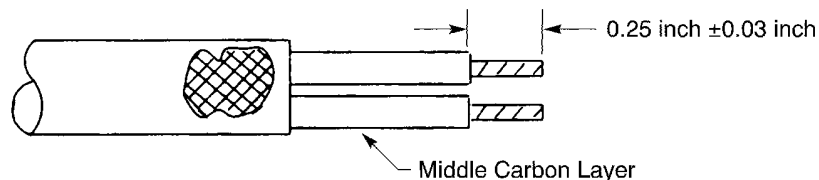


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NECESSARY LENGTH OF THE WIRES

Figure 13

- (8) Remove 0.25 inch \pm 0.03 inch of the primary insulation from each component wire. Refer to Figure 14.



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INSULATION REMOVAL

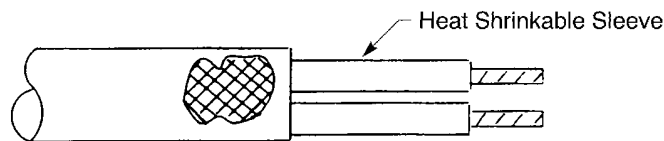
Figure 14

- (9) Remove the necessary length of the middle carbon layer.
Make sure that the distance from the end of the layer to the end of the primary insulation is 0.50 inch \pm 0.03 inch.
- (10) Remove all of the unwanted carbon from the primary insulation with a fiberglass eraser or an abrasive pad.
- (11) Clean the insulation with acetone or an equivalent solvent.
- (12) Measure the insulation resistance at 500V DC between:
- The conductors
 - The shield and each conductor.
- Make sure that there are no carbon tracks.
- (13) Put a 0.60 inch \pm 0.06 inch length of 1/8 inch diameter TFE 4X heat shrinkable sleeve on each component wire.
Make sure that the forward end of the sleeve is aligned with the end of the primary insulation of the component wire. Refer to Figure 15.

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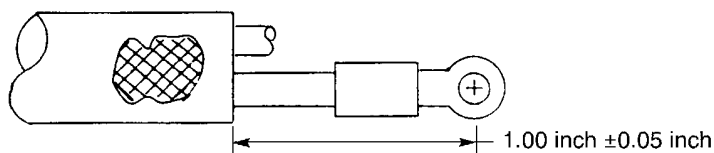
POSITION OF THE HEAT SHRINKABLE SLEEVE ON THE WIRES

Figure 15

- (14) Shrink the sleeve into its position. Refer to Subject 20-10-14.

B. Terminal Assembly

- (1) Make a selection of a terminal from Table 8.
- (2) Make a selection of a crimp tool. Refer to Subject 20-30-11.
- (3) Attach a terminal to each wire:
 - (a) Put the terminal on the wire. Refer to Figure 16.



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POSITION OF THE TERMINAL ON THE WIRE

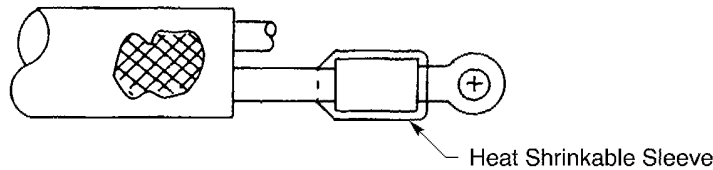
Figure 16

- (b) Crimp the terminal.
- (c) Put a 0.60 inch ± 0.06 inch length of 1/4 inch diameter TFE 4X heat shrinkable sleeve on the terminal. Refer to Figure 17.

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POSITION OF THE HEAT SHRINKABLE SLEEVE ON THE TERMINAL

Figure 17

- (d) Shrink the sleeve into its position. Refer to Subject 20-10-14.

4. ASSEMBLY OF THE VIBRO-METER CG505M1-03 CONNECTOR WITH 65B47866-1 AND -2 CABLE

A. Part Numbers and Description

Table 9
CONNECTOR PART NUMBERS

Part Number	Supplier
CG505M1-03	Vibro-Meter

Table 10
ALTERNATIVE CONNECTOR PART NUMBERS

Specified Connector		Alternative Connector	
Part Number	Supplier	Part Number	Supplier
CG505M3-01	Vibro-Meter	812-505-000	Vibro-Meter
CG505M3-01	Vibro-Meter	812-505-000-301	Vibro-Meter
CG505M3-01	Vibro-Meter	CG505M1-03	Vibro-Meter
CG505M3-01	Vibro-Meter	VMCG505M1-03	Vibro-Meter
CG505M3-01	Vibro-Meter	VMCG505M3-01	Vibro-Meter

Table 11
CONNECTOR ASSEMBLY KIT COMPONENTS

Component	Part Number	Supplier
Socket Contacts	-	-
Teflon Heat Shrinkable Sleeve	-	-
Insertion and Removal Tool	M15570-20	Deutsch

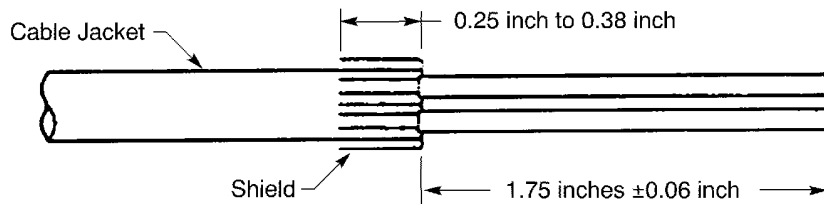
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B. Cable Preparation



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CABLE PREPARATION
Figure 18

- (1) Remove 1.75 inches ± 0.06 inch of the cable jacket from the end of the cable.
- (2) Move the strands of the shield apart.
- (3) Fold the strands back over the end of the cable jacket.
- (4) Remove the necessary length of the ends of the strands.
Make sure that the distance from the strand ends to the end of the jacket is 0.25 inch to 0.38 inch. Refer to Figure 18.
- (5) Put a 1.63 inch ± 0.06 inch length of TFE 2X heat shrinkable sleeve on the cable.
- (6) Move the two wires apart from the end of the cable to the end of the jacket.
- (7) Cut the outer carbon layer along the longitudinal axis of the cable between the two component wires.
- (8) Remove the necessary length of the outer carbon layer.
Make sure that the end of the carbon layer is aligned with the end of the cable jacket.
- (9) Remove the necessary length of the middle carbon layer on each component wire.
Make sure that the end of the layer is aligned with the end of the jacket.

CAUTION: MAKE SURE THAT DAMAGE TO THE PRIMARY INSULATION DOES NOT OCCUR.

- (10) Remove all of the unwanted carbon from the primary insulation with a fiberglass eraser or an abrasive pad.
- (11) Clean the insulation with acetone or an equivalent solvent.
- (12) Remove 0.16 inch ± 0.02 inch of the primary insulation from the end of each component wire.
- (13) Put the necessary length of a 1/8 inch diameter TFE 2X heat shrinkable sleeve on each component wire.

Make sure that:

- The rearward end of each sleeve is against the shield
- The forward end of each sleeve is aligned with the end of the primary insulation of the component wire.

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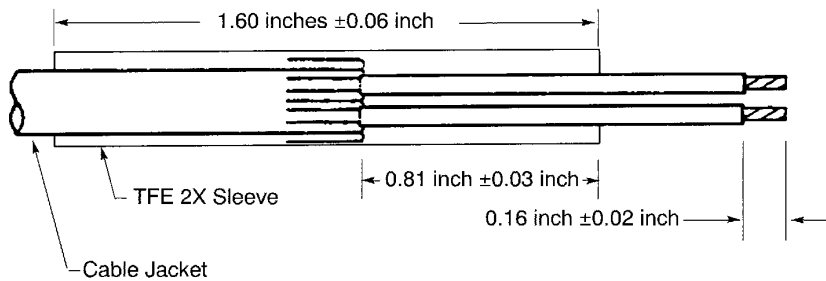
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- (14) Push the TFE 2X heat shrinkable sleeve toward the end of the cable until the forward end of the sleeve is beyond the end of the cable jacket or inner jacket.

Make sure that the distance from the forward end of the sleeve to the end of the cable jacket or inner jacket is 0.81 inch \pm 0.03 inch. Refer to Figure 19.



2445904 S00061545846_V1

POSITION OF THE HEAT SHRINKABLE SLEEVE ON THE CABLE

Figure 19

- (15) Shrink the sleeve into its position. Refer to Subject 20-10-14.

C. Connector Assembly

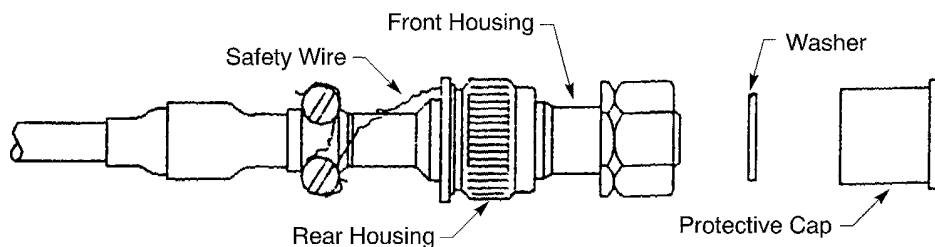
Table 12
CONTACT CRIMP TOOLS

Basic Unit	Locator
M22520/2-01	M22520/2-02



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CONNECTOR ASSEMBLY

Figure 20

- (1) Make a selection of a crimp tool from Table 12.
- (2) Assemble a contact, from the connector kit, on the end of both wires.
- (3) Put the 1.00 inch ± 0.06 inch Teflon heat shrinkable sleeve, from the connector kit, on the cable.
- (4) Push the rear housing of the connector, without the saddle clamp and the screws, rearward as far as possible on the wires and the TFE 2X heat shrinkable sleeve.
- (5) Make a selection of an insertion tool from Table 11.
- (6) With the red end of the tool, push each socket contact through the grommet of the connector front housing into the contact cavity until the contact is locked in position.
- (7) Lightly pull on the wire to make sure that the contact is locked in position.
- (8) If the contact is not locked in position:
 - (a) Push the white end of the tool forward on the wire into the contact cavity until it stops.
 - (b) At the same time, hold the wire against the tool and remove the wired contact and the tool.
 - (c) Turn the insertion tool 90 degrees on its longitudinal axis.
 - (d) Do Step 4.C.(6) and Step 4.C.(7) again.
- (9) Engage the threads of the rear housing and the front housing.
- (10) Tighten the rear housing.

Make sure that the clamp bar support at the rear of the connector housing is:

 - Parallel to the two socket contacts on the front of the connector
 - On the opposite side of the connector keyway.
- (11) Put the 1.0 inch ± 0.06 inch length of heat shrinkable sleeve on the TFE 2X sleeve. Refer to Figure 21.

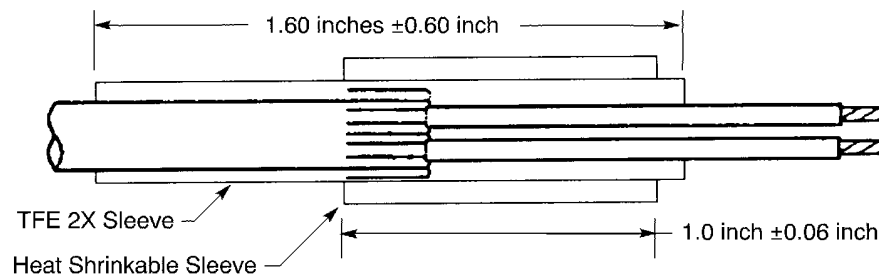
Make sure that the rear end of the sleeve is aligned with the end of the strands of the shield.

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2445906 S00061545848_V1

POSITION OF THE HEAT SHRINKABLE SLEEVE ON THE CABLE

Figure 21

- (12) Shrink the sleeve into its position. Refer to Subject 20-10-14.
- (13) Install the cable clamp on the connector.
- (14) Tighten the two saddle clamp screws.
- (15) Torque each screw 8.0 in-lbs \pm 0.5 in-lbs.
- (16) Install the safety wire on the screw heads. Refer to Figure 20.
- (17) Put the nickel washer on connector interface.
- (18) Put the protective cap on the engaging end of the connector. Refer to Figure 20.

D. Connector Installation

- (1) Remove the protective cap.
- (2) Engage the threads of the plug and the receptacle.
- (3) Tighten the coupling nut 80 inch-pounds to 110 inch-pounds.

5. ASSEMBLY OF THE VIBRO-METER VMCG505M3-01, VIBRO-METER 812-505-000-301, ENDEVCO 26574, AND GLENAIR GC501 CONNECTORS WITH 65B47866-1, -2, AND -5 CABLE

A. Part Numbers and Description

Table 13
CONNECTOR PART NUMBERS

Part Number	Supplier
CG505M3-01	Vibro-Meter
VMCG505M3-01	Vibro-Meter
26574	ENDEVCO
GC501	Glenair

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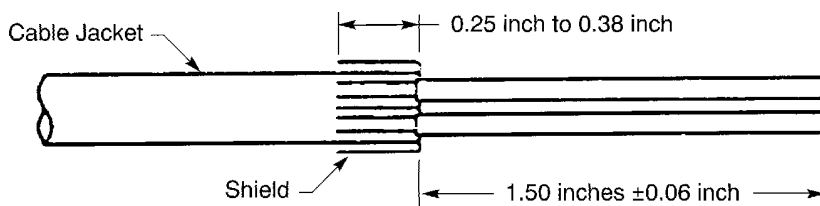
CONNECTOR AND TERMINAL ASSEMBLY WITH 65B47866() SHIELDED CABLE

Table 14
ALTERNATIVE PART NUMBERS

Specified Connectors		Alternative Connectors	
Part Number	Supplier	Part Number	Supplier
CG505M3-01	Vibro-Meter	812-505-000	Vibro-Meter
CG505M3-01	Vibro-Meter	812-505-000-301	Vibro-Meter
CG505M3-01	Vibro-Meter	CG505M1-03	Vibro-Meter
CG505M3-01	Vibro-Meter	VMCG505M1-03	Vibro-Meter
CG505M3-01	Vibro-Meter	VMCG505M3-01	Vibro-Meter

B. Cable Preparation

- (1) Remove the necessary length of the cable jacket from the end of the cable:
- 1.50 inches ± 0.06 inch for the 65B47866-1 and 65B47866-2 cables; refer to Figure 22
 - 2.75 inches ± 0.06 inch for the 65B47866-5 cable.



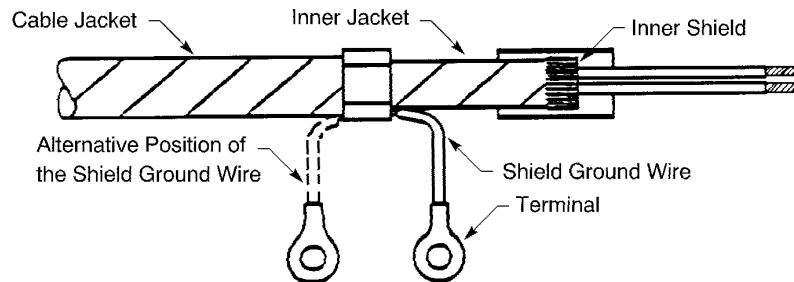
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65B47866-1 AND 65B47866-2 CABLE PREPARATION
Figure 22

- (2) For the 65B47866-5 cable, assemble a shield ground wire for the outer shield. Refer to Figure 23.



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CONFIGURATION OF THE SHIELD GROUND WIRE OF THE OUTER SHIELD OF THE 54B47866-5 CABLE

Figure 23

- (a) Assemble a shield ground wire with mechanical ferrules. Refer to Subject 20-10-15.
- These conditions are applicable:
- The selection of the ferrules is from Table 4
 - The selection of the shield ground wire is from Table 3
 - The length of the shield ground wire is 2.0 inches maximum.
 - The heat shrinkable sleeve is a 1.0 inch ± 0.06 inch length of TFE 2X sleeve.
- (b) Assemble a BACT12M terminal on the end of the shield ground wire. Refer to Subject 20-30-11.
- Make sure that a 1.0 inch ± 0.06 inch length of heat shrinkable sleeve is installed on the terminal.
- (c) Remove 1.50 inches ± 0.06 inch of the inner jacket from the cable.
- (3) Move the strands of the shield or the inner shield apart.
- (4) Fold the strands back over the end of the cable jacket or the inner jacket.
- (5) Remove the necessary length of the shield strands.
- Make sure that the distance from the strand ends to the end of the jacket is 0.25 inch to 0.38 inch. Refer to Figure 22.
- (6) Put a 1.63 inch ± 0.06 inch length of TFE 2X heat shrinkable sleeve on the cable.
- (7) Move the two wires apart from the end of the cable to the end of the jacket.

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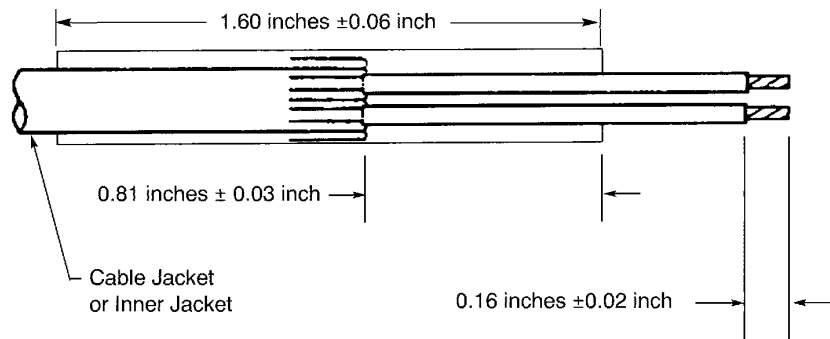
CONNECTOR AND TERMINAL ASSEMBLY WITH 65B47866() SHIELDED CABLE

- (8) Cut the outer carbon layer along the longitudinal axis of the cable between the two component wires.
- (9) Remove the necessary length of the outer carbon layer.
Make sure that the end of the carbon layer is aligned with:
- The end of the cable jacket for the cable with one shield
 - The end of the inner jacket for the cable with two shields.
- (10) Remove the necessary length of the middle carbon layer on each component wire.
Make sure that the end of the layer is aligned with the end of the jacket.
- CAUTION:** MAKE SURE THAT DAMAGE TO THE PRIMARY INSULATION DOES NOT OCCUR.
- (11) Remove all of the unwanted carbon from the primary insulation with a fiberglass eraser or an abrasive pad.
- (12) Clean the insulation with acetone or an equivalent solvent.
- (13) Remove 0.16 inch \pm 0.02 inch of the primary insulation from the end of each component wire.
- (14) Put the necessary length of a 1/8 inch diameter TFE 2X heat shrinkable sleeve on each component wire.
Make sure that:
- The rearward end of each sleeve is against the shield
 - The forward end of each sleeve is aligned with the end of the primary insulation of the component wire.
- (15) Push the TFE 2X heat shrinkable sleeve forward, toward the end of the cable, until the forward end of the sleeve is beyond the end of the cable jacket or inner jacket.
Make sure the distance from the forward end of the sleeve to the end of the cable jacket or inner jacket is 0.81 inch \pm 0.03 inch. Refer to Figure 24.

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POSITION OF THE HEAT SHRINKABLE SLEEVE ON THE CABLE

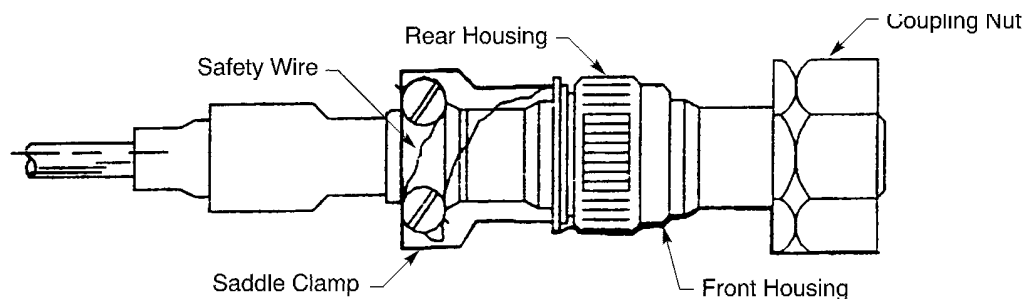
Figure 24

- (16) Shrink the sleeve into its position. Refer to Subject 20-10-14.
- (17) Remove 0.16 inch \pm 0.02 inch of the primary insulation from the end of each component wire.

C. Connector Assembly

Table 15
CONTACT CRIMP TOOLS

Basic Unit	Locator
ST2220-1-Y	ST2220-1-1



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CONNECTOR ASSEMBLY

Figure 25

- (1) Make a selection of a crimp tool from Table 15.

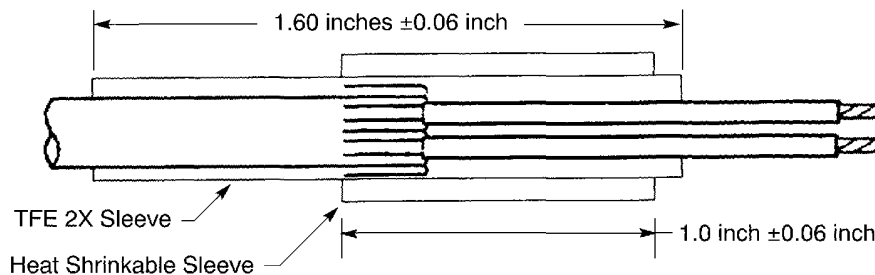
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- (2) Assemble a contact, from the connector kit, on the end of both wires.
- (3) Put the 1.0 inch ± 0.06 inch Teflon heat shrinkable sleeve, from the connector kit, on the cable.
- (4) Push the rear housing of the connector, without the saddle clamp and the screws, rearward as far as possible on the wires and the TFE 2X heat shrinkable sleeve.
- (5) Make a selection of a contact insertion tool from Table 11.
- (6) With the red end of the tool, push each socket contact through the grommet of the connector front housing into the contact cavity until the contact is locked in position.
- (7) Lightly pull on the wire to make sure that the contact is locked in position.
- (8) If the contact is not locked in position:
 - (a) Push the white end of the tool forward on the wire into the contact cavity until it stops.
 - (b) At the same time, hold the wire against the tool and remove the wired contact and the tool.
 - (c) Turn the insertion tool 90 degrees on its longitudinal axis.
 - (d) Do Step 4.C.(6) and Step 4.C.(7) again.
- (9) Put the 1.0 inch ± 0.06 inch length of heat shrinkable sleeve on the TFE 2X sleeve. Refer to Figure 26.

Make sure that the rear end of the sleeve is aligned with the end of the strands of the shield.



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POSITION OF THE HEAT SHRINKABLE SLEEVE ON THE CABLE

Figure 26

- (10) Shrink the sleeve into its position. Refer to Subject 20-10-14.
- (11) Install the cable clamp on the connector.
- (12) For the 65B47866-5 cable, attach the terminal of the shield ground wire on one of the saddle clamp screws.
- (13) Tighten the two screws.
- (14) Torque each screw 8.0 in-lbs ± 0.5 in-lbs.
- (15) Install the safety wire on the screw heads. Refer to Figure 25.

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6. APPROVED TOOL SUPPLIERS

A. Crimp Tool Suppliers

Table 16
CRIMP TOOL SUPPLIERS

Tool	Supplier
M22520/2-01	QPL
M22520/2-02	QPL
ST2220-1-1	Boeing
ST2220-1-Y	Boeing

B. Contact Insertion and Removal Tools

Table 17
INSERTION AND REMOVAL TOOL SUPPLIERS

Tool	Supplier
M15570-20	Deutsch

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PREPARATION OF THE S280T004-1 AUDIO CABLE

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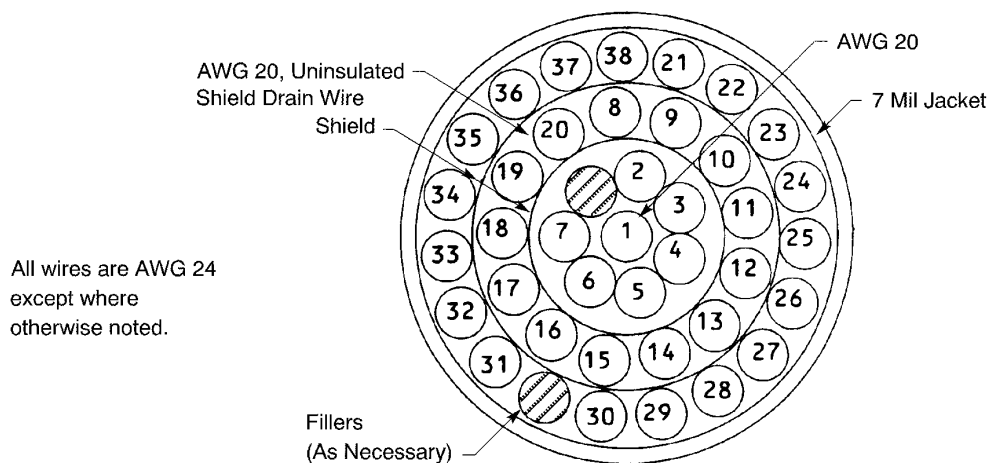
PREPARATION OF THE S280T004-1 AUDIO CABLE

1. S280T004-1 AUDIO CABLE

A. Part Numbers and Description

Table 1
CABLE PART NUMBERS

Boeing Specification	Description
S280T004-1	Audio Cable



2445912 S00061545855_V1

CONFIGURATION OF THE S280T004-1 CABLE

Figure 1

B. Cable Preparation

- (1) Put a 2 inch $\pm 1/2$ inch length of 3/8 inch diameter heat shrinkable sleeve over the cable.
- (2) Remove 2 inches $\pm 1/8$ inch of the cable jacket.

CAUTION: DO NOT CAUSE ANY DAMAGE TO ANY OF THE WIRES.

- (3) Cut the shield and the fillers so that the ends are within 1/8 inch of the jacket.

CAUTION: DO NOT CUT THE BLACK INSULATED WIRE WITH THE FILLERS.

- (4) Remove the wire insulation. Refer to Subject 20-61-11.
- (5) Put a Thermofit heat shrinkable sleeve on the uninsulated ground wire so that the sleeve:
 - Is within 1/8 inch of the insulation barrel of the contact
 - Is over the cable jacket
 - Extends 1/2 inch $\pm 1/8$ inch beyond the saddle bar.

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PREPARATION OF THE S280T004-1 AUDIO CABLE

- (6) Shrink the sleeve in position.

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1. PART NUMBERS AND DESCRIPTION

A. Spoiler Cable Part Numbers

Table 1
CABLE PART NUMBERS

Boeing Specification	Supplier
S280T006-1	Boeing
S280T006-2	Boeing

B. Connector Part Numbers

Table 2
CONNECTOR PART NUMBERS

Part Number	Type	Supplier
48-00R16-10S	Receptacle	Amphenol
BACC45FM14-7P	Receptacle	Boeing
BACC45FM16-10S	Receptacle	Boeing
BACC63BV14-7P	Receptacle	Boeing
BACC63BV16-10S	Receptacle	Boeing

C. Contact Part Numbers

Table 3
CONTACT PART NUMBERS

Boeing Standard	Contact Size		Contact Type	Supplier
	Engaging End	Crimp Barrel		
BACC47CP2T	16	16	Socket	Boeing

D. Necessary Assembly Components

Table 4
NECESSARY ASSEMBLY COMPONENTS

Component	Part Number	Supplier
Ferrule, Inner	BACS13S219B	Boeing
Ferrule, Outer	BACS13S297C	Boeing
Splice, Moisture Proof	D436-59	Raychem
Splice, Parallel	34137	AMP
Terminal Lug	BACT12M	Boeing

NOTE: Refer to Subject 20-00-11 for approved suppliers and alternative part numbers for BACS13S ferrules.

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2. CONNECTOR ASSEMBLY WITH THE S280T006-1 SPOILER CABLE

A. Connector Assembly

Refer to Subject 20-61-11.

3. ASSEMBLY OF THE BACC45FM16-10S, BACC63BV16-10S, AND 48-00R16-10S RECEPTACLES WITH S280T006-2 CABLE

A. Shield Ground Wire Preparation

- (1) For a shield ground wire that must be attached to a ground stud, cut a 12.00 inch ± 0.25 inch length of BMS 13-48 Type 8 AWG 18 wire.
- (2) For a shield ground wire that must be attached to a backshell, cut a 2.00 inch ± 0.25 inch length of BMS 13-48 Type 8 AWG 18 wire.
- (3) Remove 0.25 inch ± 0.06 inch of insulation from one end of the wire.
- (4) Make a selection of a terminal lug from Table 4.
- (5) Assemble the terminal lug on the wire. Refer to Subject 20-30-11.

B. Case Ground Wire Preparation

- (1) Cut a 12.00 inch ± 0.25 inch length of BMS 13-48 Type 8 AWG 18 wire.
- (2) Put the wire number code on the wire. Refer to Subject 20-10-11.
- (3) Remove 0.25 inch ± 0.06 inch of insulation from one end of the wire.
- (4) Make a selection of a terminal lug from Table 4.
- (5) Assemble the terminal lug on the wire. Refer to Subject 20-30-11.

C. Cable Preparation

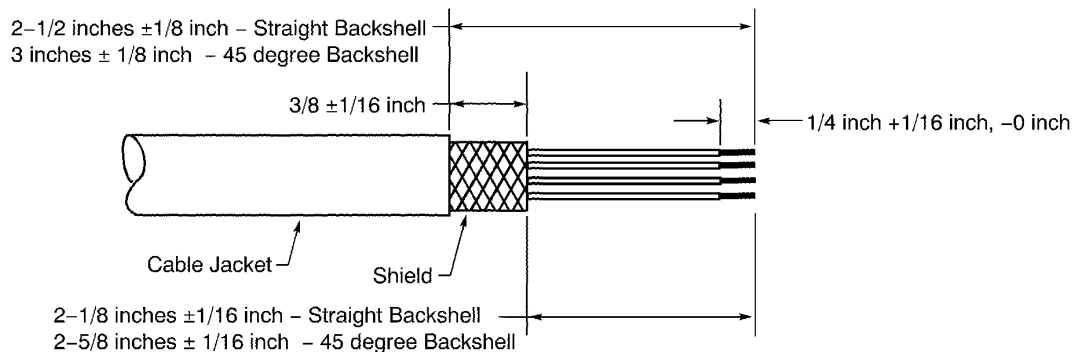
- (1) Put the connector backshell on the cable approximately 6 inches from the end.
- (2) Make a selection of a 0.5 inch diameter Grade B, Class 1 heat shrinkable sleeve from Subject 20-00-11.
- (3) Put a 2.50 inch ± 0.50 inch length of the heat shrinkable sleeve on the cable.
- (4) Put a 1.50 inch ± 0.13 inch length the heat shrinkable sleeve on the cable.
- (5) Prepare the cable. Refer to Figure 1.

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CABLE PREPARATION

Figure 1

- If it is necessary, cut the end of the cable to make the end perpendicular to its longitudinal axis.
- Remove the necessary length of cable jacket from the end of the cable:
 - 2.50 inches ± 0.13 inch for a straight backshell
 - 3.00 inches ± 0.13 inch for a 45 degree backshell
- Remove the necessary length of the shield from the end of the cable:
 - 2.13 inches ± 0.06 inch for a straight backshell
 - 2.63 inches ± 0.06 inch for a 45 degree backshell
- Remove 0.25 inch $+0.06$ inch, -0 inch of insulation from the end of each wire of the cable.

D. Shield Ground Wire Assembly with Mechanical Ferrules

A satisfactory alternative to the assembly of a shield ground wire with mechanical ferrules is the assembly with:

- A Shield-Kon; refer to Paragraph 3.E.
- A solder sleeve; refer to Paragraph 3.F.

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Table 5
FERRULE CRIMP TOOLS

Outer Ferrule	Crimp Tool			
	Basic Unit	Die		
		Part Number	Cavity	Dimension (inch)
BACS13S297C	44-000	44-140	A	0.290
	612648	612893	-	
	613214	613011	-	
	620175	620308	A	
	HX-4	Y140	A	
	M22520/5-01	M22520/5-41	A	
	ST2966M	-	10	
	ST965-2	-	L	
	ST965A-14	-	-	
	ST965B	ST965B-14	-	
	WT211-14	-	L	
	WT214	-	-	
	WT414	-	-	
	WT440	4414	-	

- (1) Make a selection of an inner ferrule and outer ferrule from Table 4.
- (2) Make a selection of a ferrule crimp tool from Table 5.
- (3) Make a selection of a 3/8 inch diameter Grade B, Class 1 heat shrinkable sleeve from Subject 20-00-11.
- (4) Put a 1.0 inch ± 0.13 inch length of the heat shrinkable sleeve on the cable.
- (5) Put the outer ferrule on the cable.
- (6) Put the inner ferrule on the cable. Refer to Figure 2.

Make sure that the ferrule is:

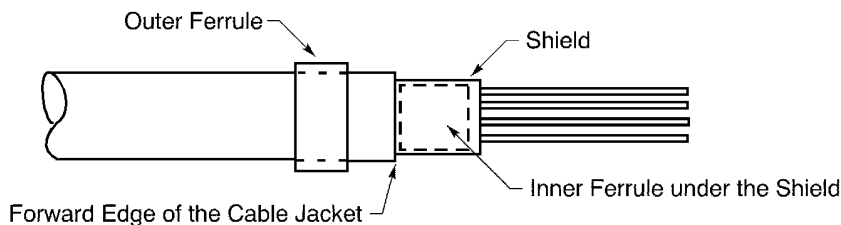
- Between the shield and the wires of the cable
- Tight against the end of the cable jacket.

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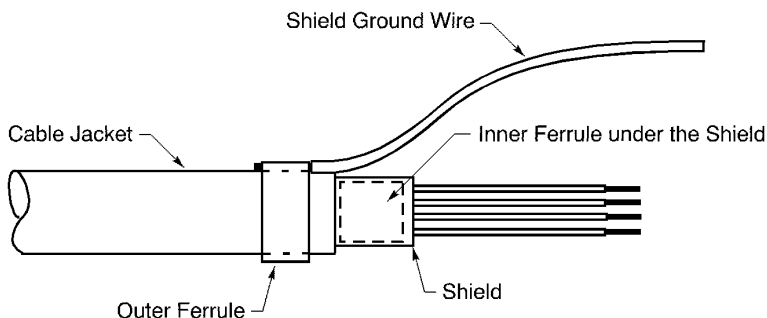


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POSITION OF THE INNER FERRULE

Figure 2

- (7) From the forward end of the cable, put the end of the shield ground wire without insulation between the cable jacket and the outer ferrule. Refer to Figure 3.



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INITIAL POSITION OF THE OUTER FERRULE AND THE SHIELD GROUND WIRE

Figure 3

- (8) Push the outer ferrule and the shield ground wire forward at the same time until the center of the outer ferrule is aligned with the center of the inner ferrule. Refer to Figure 4.

Make sure that:

- The distance from the forward edge of the inner ferrule to the forward edge of the outer ferrule is not more than 0.06 inch
- The end of the shield ground wire is between the rear edge of the outer ferrule and the rear edge of the inner ferrule.

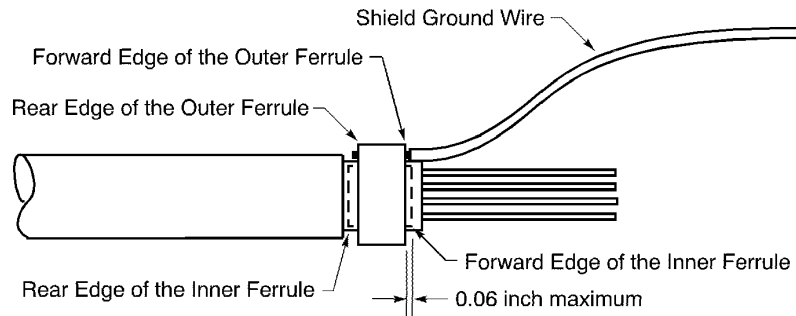
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CONNECTOR ASSEMBLY WITH S280T006-1 AND S280T006-2 SPOILER CABLES



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POSITION OF THE OUTER FERRULE AND THE SHIELD GROUND WIRE

Figure 4

- (9) Crimp the outer ferrule.
- (10) Remove the length of the shield that extends forward farther than the forward edge of the outer ferrule.

NOTE: The surface of the inner ferrule can be used to cut against.

- (11) Align the center of the 1 inch sleeve with the center of the outer ferrule.
- (12) Shrink the sleeve into position. Refer to Subject 20-10-14.

E. Shield Ground Wire Assembly with a Shield-Kon

Refer to Subject 20-10-15.

Make sure that the shield ground wire is extended forward from the forward end of the Shield-Kon. Refer to Figure 4.

F. Shield Ground Wire Assembly with a Solder Sleeve

Refer to Subject 20-10-15.

Make sure that the shield ground wire is extended forward from the forward end of the solder sleeve. Refer to Figure 4.

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G. Splice Assembly

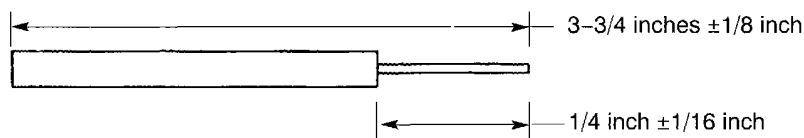
Table 6
SPLICE CRIMP TOOLS

Splice	Crimp Tool Basic Unit
34137	49900
	49935
	WT130
	WT1300
D-436-59	AD-1377

NOTE: The applicable shield termination mechanism can be:

- A mechanical ferrule
- A Shield-Kon
- A solder sleeve.

- (1) Make a selection of a splice from Table 4.
Two splices are necessary.
- (2) Make a selection of a crimp tool from Table 6.
- (3) Prepare four BMS 13-48 Type 8 AWG 20 splice wires. Refer to Figure 5.



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INSULATION REMOVAL LENGTH

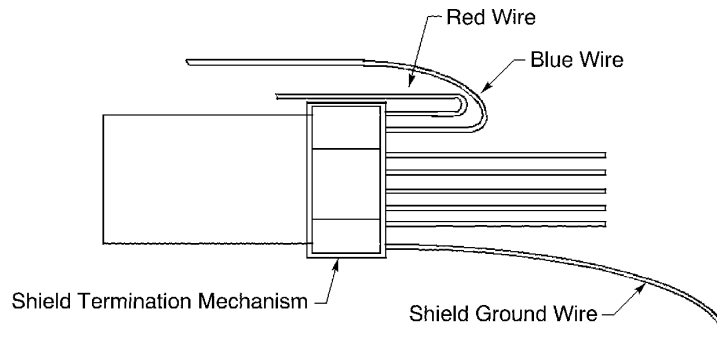
Figure 5

- (a) Cut each wire 3.75 inches ± 0.13 inch.
 - (b) Remove 0.25 inch ± 0.06 inch of insulation from the end of each wire.
- (4) Bend the red and the blue wires back across the applicable shield termination mechanism. Refer to Figure 6.

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PREPARATION FOR THE ASSEMBLY OF SPLICES

Figure 6

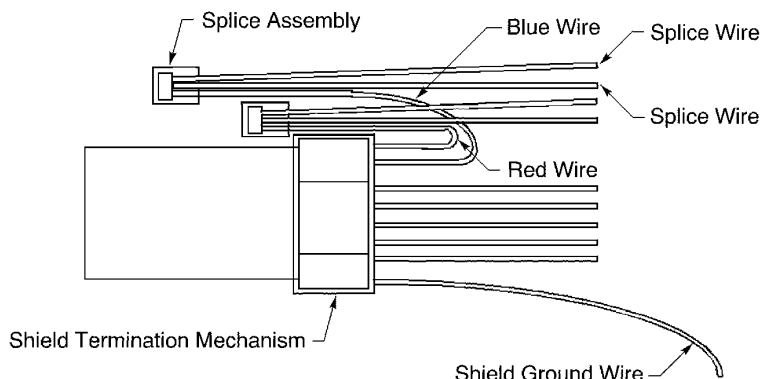
- (5) If the splice is a moisture proof splice:
 - (a) Put the end of the red wire and the ends of the two splice wires in the same end of the splice. Refer to Figure 7.

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CONFIGURATION OF THE SPLICES

Figure 7

- (b) Crimp the splice.
- (c) Put the moisture proof sleeve on the splice.
Make sure that the center of the sleeve is aligned with the center of the splice.
- (d) Shrink the sleeve. Refer to Subject 20-10-14.
Make sure that the lining of the sleeve is fully melted.
- (e) Do Step (a) through Step (d) again with the blue wire.
- (6) If the splice is a parallel splice:

Table 7
NECESSARY MATERIAL

Material	Part Number	Supplier
Heat Shrinkable Sleeve	DWP-125	Raychem

- (a) Put the end of the red wire and the ends of the two splice wires in the same end of the splice. Refer to Figure 7.
- (b) Crimp the splice.
- (c) Make a selection of heat shrinkable sleeve. Refer to Table 7.
NOTE: Refer to Subject 20-00-11 for an alternative heat shrinkable sleeve.
- (d) Put a 0.75 inch length of the selected shrinkable sleeve on the splice assembly.
Make sure that:

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- The sleeve has the smallest possible diameter that can move easily on the splice assembly
 - The center of the sleeve is aligned with the center of the splice.
- (e) Shrink the sleeve into position. Refer to Subject 20-10-14.
- (f) Do Step (a) through Step (d) again with the blue wire.
- (7) Cut the ends of the four splice wires to align them with the ends of the remaining wires of the cable. Refer to Figure 7.

H. Contact Assembly

- (1) Make a selection of a contact from Table 3.
10 contacts are necessary.
- (2) Remove 0.25 inch \pm 0.06 inch of insulation from the end of each splice wire. Refer to Figure 5.
- (3) Remove 0.25 inch \pm 0.06 inch of insulation from one end of the case ground wire.
- (4) Assemble a contact on the end of:
- Each of the five remaining AWG 20 wires of the cable
 - Each of the four AWG 18 splice wires
 - The AWG 18 case ground wire.

Refer to Subject 20-61-11.

I. Connector Assembly

NOTE: The applicable shield termination mechanism can be:

- A mechanical ferrule
 - A Shield-Kon
 - A solder sleeve.
- (1) Install each assembled contact in the connector.
- Refer to:
- Figure 8
 - Subject 20-61-11 for the contact insertion procedure.

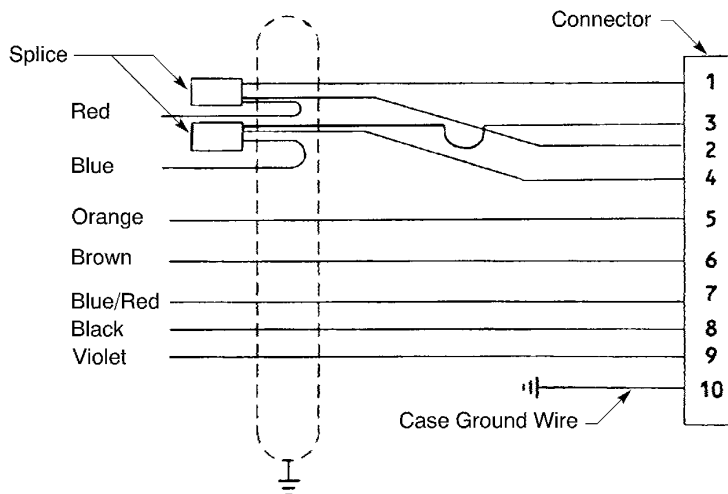
Make sure to install the contact of the case ground wire in pin 10 of the connector.

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CONTACT INSERTION

Figure 8

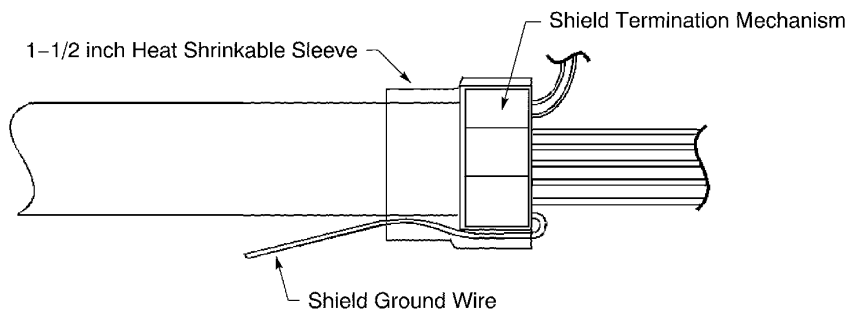
- (2) If the shield ground wire must be attached to a ground stud:
- (a) Bend the wire back across the applicable shield termination mechanism.
 - (b) Align the forward edge of the 1.5 inch sleeve with the forward edge of the shield termination mechanism. Refer to Figure 9.

Make sure that the shield ground wire is between the sleeve and the cable.

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CONFIGURATION OF THE SHIELD GROUND WIRE FOR INSTALLATION ON A GROUND STUD

Figure 9

- (c) Shrink the sleeve into position. Refer to Subject 20-10-14.
- (d) Fold the wire forward across the 1.5 inch sleeve.
- (e) Align the forward edge of the 2.5 inch sleeve with the forward edge of the shield termination mechanism. Refer to Figure 10.

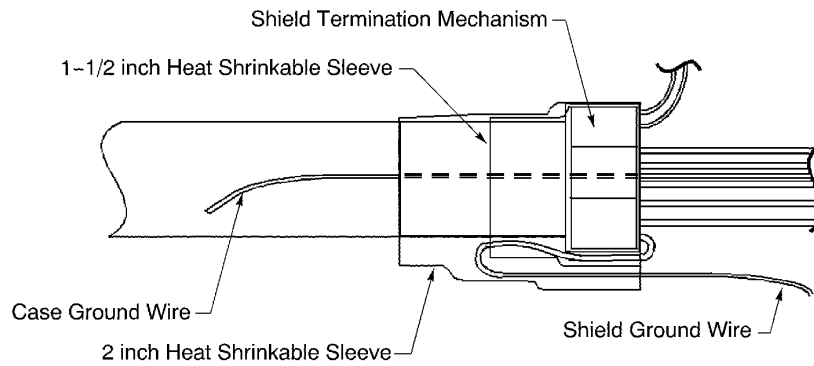
Make sure that:

- The shield ground wire is between the sleeves
- The case ground wire is between the sleeves.

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CONFIGURATION OF THE SHIELD GROUND WIRE FOR INSTALLATION ON A GROUND STUD

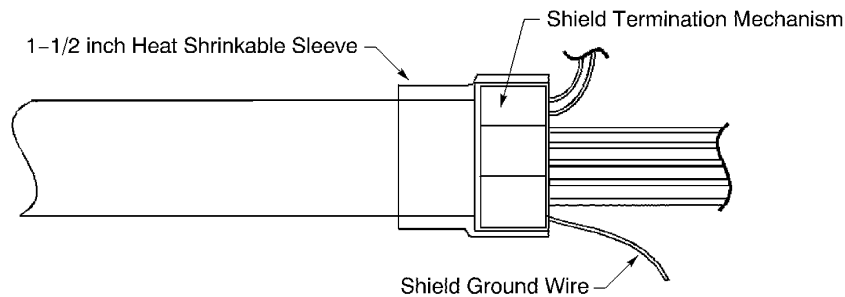
Figure 10

- (f) Shrink the sleeve into position. Refer to Subject 20-10-14.
 - (g) Install the backshell.
 - (h) To make a tight fit under the saddle clamp, put the necessary layers of Permacel P-440 tape on the cable.
- Make sure that:
- The center each layer of tape is aligned with the center of the saddle clamp
 - Each layer of tape makes 100 percent overlap.
- (3) If the shield ground wire must be attached to a backshell:
- (a) Align the forward edge of the 1.5 inch sleeve with the forward edge of the shield termination mechanism. Refer to Figure 11.

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2446952 S00061545869_V1

CONFIGURATION OF THE SHIELD GROUND WIRE FOR INSTALLATION ON A BACKSHELL

Figure 11

- (b) Shrink the sleeve into position. Refer to Subject 20-10-14.
- (c) Align the forward edge of the 2.5 inch sleeve with the forward edge of the shield termination mechanism. Refer to Figure 12.

Make sure that the case ground wire is between the sleeves.

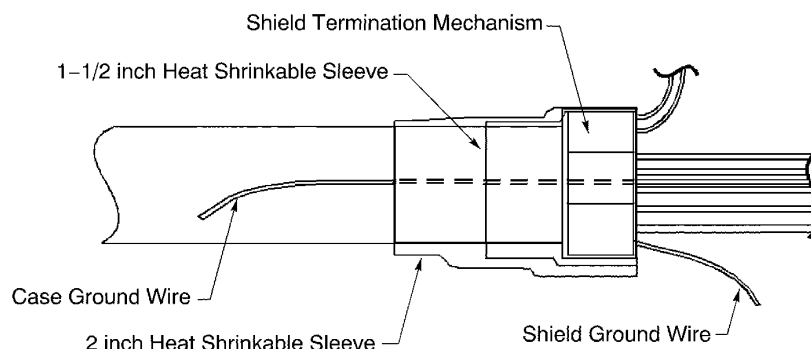
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2446954 S00061545870_V1

CONFIGURATION OF THE SHIELD GROUND WIRE FOR INSTALLATION ON A BACKSHELL

Figure 12

- (d) Shrink the sleeve into position. Refer to Subject 20-10-14.
- (e) Install the backshell.
- (f) To make a tight fit under the saddle clamp, put the necessary layers of Permacel P-440 tape on the cable.

Make sure that:

- The center each layer of tape is aligned with the center of the saddle clamp
- Each layer of tape makes 100 percent overlap.

- (g) Put the terminal lug of the shield ground wire on a saddle clamp screw.
- (4) Install the saddle clamp.

4. ASSEMBLY OF THE BACC45FM14-7P AND BACC63BV14-7P RECEPTACLES WITH S280T006-2 CABLE

A. Shield Ground Wire Preparation

- (1) For a shield ground wire that must be attached to a ground stud, cut an 8.00 inch ± 0.25 inch length of BMS 13-48 Type 8 AWG 18 wire.
- (2) For a shield ground wire that must be attached to a backshell, cut a 2.00 inch ± 0.25 inch length of BMS 13-48 Type 8 AWG 18 wire.
- (3) Remove 0.25 inch ± 0.06 inch of insulation from one end of the wire.
- (4) Make a selection of a terminal lug from Table 4.

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- (5) Assemble the terminal lug on the wire. Refer to Subject 20-30-11.

B. Cable Preparation

- (1) Put the connector backshell on the cable approximately 6 inches from the end.
- (2) Make a selection of a 0.5 inch diameter Grade B, Class 1 heat shrinkable sleeve from Subject 20-00-11.
- (3) Put a 2.50 inch ± 0.50 inch length of the heat shrinkable sleeve on the cable.
- (4) Put a 1.50 inch ± 0.13 inch length of the heat shrinkable sleeve on the cable.
- (5) Prepare the cable. Refer to Figure 1.
 - (a) If it is necessary, cut the end of the cable to make the end perpendicular to its longitudinal axis.
 - (b) Remove 2.50 inches ± 0.13 inch of the outer jacket from the end of the cable.
 - (c) Remove 2.13 inches ± 0.06 inch of the shield from the end of the cable.
 - (d) Remove 0.25 inch $+0.06$ inch, -0 inch of insulation from the end of each wire of the cable.

C. Shield Ground Wire Assembly with Mechanical Ferrules

A satisfactory alternative to the assembly of a shield ground wire with mechanical ferrules is the assembly with:

- A Shield-Kon; refer to Paragraph 4.D.
 - A solder sleeve; refer to Paragraph 4.E.
- (1) Make a selection of an inner ferrule and outer ferrule from Table 4.
 - (2) Make a selection of a ferrule crimp tool from Table 5.
 - (3) Make a selection of a 3/8 inch diameter Grade B, Class 1 heat shrinkable sleeve from Subject 20-00-11.
 - (4) Put a 1.0 inch ± 0.13 inch length of the heat shrinkable sleeve on the cable.
 - (5) Put the outer ferrule on the cable.
 - (6) Put the inner ferrule on the cable. Refer to Figure 2.

Make sure that the ferrule is:

 - Between the shield and the wires of the cable
 - Tight against the end of the cable jacket.
 - (7) From the forward end of the cable, put the end of the shield ground wire without insulation between the cable jacket and the outer ferrule. Refer to Figure 3.
 - (8) Push the outer ferrule and the shield ground wire forward at the same time until the center of the outer ferrule is aligned with the center of the inner ferrule. Refer to Figure 4.

Make sure that:

 - The distance from the forward edge of the inner ferrule to the forward edge of the outer ferrule is not more than 0.06 inch
 - The end of the shield ground wire is between the rear edge of the outer ferrule and the rear edge of the inner ferrule.

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- (9) Crimp the outer ferrule.
- (10) Remove the unwanted length of the shield that extends forward farther than the forward edge of the outer ferrule.

NOTE: The surface of the inner ferrule can be used to cut against.

- (11) Align the center of the 1 inch sleeve with the center of the outer ferrule.
- (12) Shrink the sleeve into its position. Refer to Subject 20-10-14.

D. Shield Ground Wire Assembly with a Shield-Kon

Refer to Subject 20-10-15.

Make sure that the shield ground wire is extended forward from the forward end of the Shield-Kon. Refer to Figure 4.

E. Shield Ground Wire Assembly with a Solder Sleeve

Refer to Subject 20-10-15.

Make sure that the shield ground wire is extended forward from the forward end of the solder sleeve. Refer to Figure 4.

F. Contact Assembly

- (1) Make a selection of the contacts from Table 3.
- (2) Assemble a contact on the end of each of the seven AWG 20 wires of the cable. Refer to Subject 20-61-11.

G. Connector Assembly

NOTE: The applicable shield termination mechanism can be:

- A mechanical ferrule
- A Shield-Kon
- A solder sleeve.

- (1) Install each assembled contact in the connector.

Refer to:

- Figure 8
- Subject 20-61-11 for the contact insertion procedure.

- (2) If the shield ground wire must be attached to a ground stud:

- (a) Bend the wire back across the applicable shield termination mechanism.
- (b) Align the forward edge of the 1.5 inch sleeve with the forward edge of the shield termination mechanism. Refer to Figure 9.

Make sure that the shield ground wire is between the sleeve and the cable.

- (c) Shrink the sleeve into position. Refer to Subject 20-10-14.
- (d) Fold the wire forward across the 1.5 inch sleeve.
- (e) Align the forward edge of the 2.5 inch sleeve with the forward edge of the shield termination mechanism. Refer to Figure 10.

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Make sure that the shield ground wire is between the sleeves.

- (f) Shrink the sleeve into position. Refer to Subject 20-10-14.
- (g) Install the backshell.
- (h) To make a tight fit under the saddle clamp, put the necessary layers of Permacel P-440 tape on the cable.

Make sure that:

- The center each layer of tape is aligned with the center of the saddle clamp
- Each layer of tape makes 100 percent overlap.

- (3) If the shield ground wire must be attached to a backshell:
 - (a) Align the forward edge of the 1.5 inch sleeve with the forward edge of the shield termination mechanism. Refer to Figure 11.
 - (b) Shrink the sleeve into position. Refer to Subject 20-10-14.
 - (c) Align the forward edge of the 2.5 inch sleeve with the forward edge of the shield termination mechanism. Refer to Figure 12.
 - (d) Shrink the sleeve into position. Refer to Subject 20-10-14.
 - (e) Install the backshell.
 - (f) To make a tight fit under the saddle clamp, put the necessary layers of Permacel P-440 tape on the cable.

Make sure that:

- The center each layer of tape is aligned with the center of the saddle clamp
- Each layer of tape makes 100 percent overlap.

- (g) Put the terminal lug of the shield ground wire on a saddle clamp screw.
- (4) Install the saddle clamp.

5. APPROVED TOOL SUPPLIERS

A. Crimp Tools

Table 8
CRIMP TOOL SUPPLIERS

Tool	Supplier
44-000	Balmar
44-140	Balmar
4414	Thomas & Betts
49900	AMP
49935	AMP
612648	Buchanan
612893	Buchanan

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Table 8 CRIMP TOOL SUPPLIERS (Continued)

Tool	Supplier
613214	Buchanan
613011	Buchanan
620175	Buchanan
620308	Buchanan
AD-1377	Raychem
HX-4	Daniels
M22520/5-01	QPL
M22520/5-41	QPL
ST2966M	Boeing
ST965-2	Boeing
ST965A-14	Boeing
ST965B	Boeing
ST965B-14	Boeing
WT130	Thomas & Betts
WT1300	Thomas & Betts
WT211-14	Thomas & Betts
WT214	Thomas & Betts
WT414	Thomas & Betts
WT440	Thomas & Betts
Y140	Daniels

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1. PART NUMBERS AND DESCRIPTION

A. Cable Part Numbers

Table 1
CABLE PART NUMBERS

Part Number	Supplier
0024A0014	Raychem

2. SHIELD TERMINATION

A. Cable Preparation

- (1) Remove 2 inches of the jacket from the end of the cable.
- (2) Remove the length of the shield so that the end of the shield is 1/4 inch from the end of the jacket.
- (3) For contact assembly with size 22 contacts:
 - (a) Remove 1-1/4 inches of insulation from the end of the wire.
 - (b) Put a 2 inch length of 1/16 inch diameter Kynar heat shrinkable sleeve on the wire and under the shield so that:
 - The end of the sleeve is against the end of the jacket
 - The other end of the sleeve extends a minimum of 5/8 inch beyond the end of the wire insulation.
 - (c) Shrink the sleeve in position. Refer to Subject 20-10-14.

B. Shield Ground Wire Assembly

- (1) Assemble a shield ground wire with a solder sleeve. Refer to Subject 20-10-15.

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1. PART NUMBERS AND DESCRIPTION

A. Connector Part Numbers

Table 1
CONNECTOR PART NUMBERS

Part Number	Type	Supplier
BACC63BP	Plug	Boeing

B. Shield Termination Components

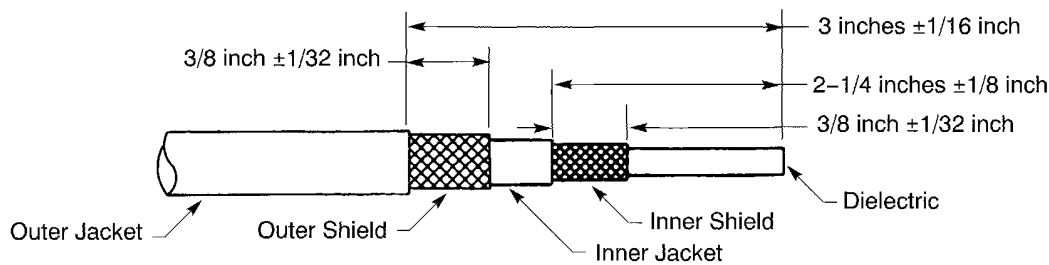
Table 2
SHIELD TERMINATION COMPONENTS

Component	Part Number	Supplier
Heat Shrinkable Solder Sleeve	BACS13BH2	Boeing
Terminal	BACT12AC3	Boeing

2. SHIELD TERMINATION

A. Cable Preparation

- (1) Prepare the cable. Refer to Figure 1.



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CABLE TRIM DIMENSIONS

Figure 1

- (a) Remove 3 inches $\pm 1/16$ inch of the outer jacket from the end of the cable.
- (b) Remove the length of the outer shield so that the end of the shield is 3/8 inch $\pm 1/32$ inch from the end of the outer jacket.
- (c) Remove 2-1/4 inches $\pm 1/8$ inch of the inner jacket from the end of the cable.
- (d) Remove the length of the inner shield so that the end of the shield is 3/8 inch $\pm 1/32$ inch from the end of the inner jacket.

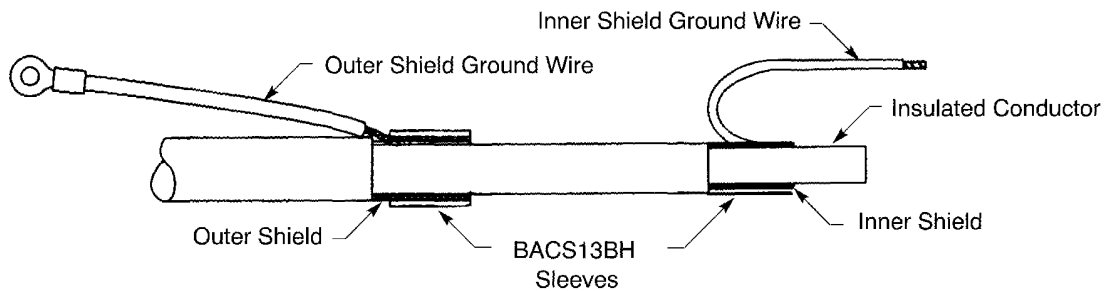
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B. Inner and Outer Shield Ground Wire Assembly



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INNER SHIELD AND OUTER SHIELD GROUND WIRES

Figure 2

- (1) Cut a 6 inch $\pm 1/16$ inch length of BMS 13-16 Type I Class 1 AWG 18 wire for the shield ground wire.
- (2) Remove the insulation from both ends of the wire. Refer to Subject 20-30-11.
- (3) Make a selection of a heat shrinkable solder sleeve from Table 2.
- (4) To terminate an inner shield with a shielded contact:
 - (a) Hold the shield ground wire on the inner shield.
 - (b) Put the sleeve on the cable and the end of the ground wire. Refer to Figure 2.
 - (c) Assemble the contact. Refer to Subject 20-61-11.
- (5) To terminate either an inner shield without a shielded contact or an outer shield:
 - (a) Make a selection of a terminal lug from Table 2.
 - (b) Crimp the terminal lug on one end of one ground wire. Refer to Subject 20-30-11.
 - (c) Hold the shield ground wire on the cable.
 - (d) Put the sleeve on the cable and the end of the ground wire. Refer to Figure 2.
 - (e) Shrink the sleeve in position.

Make sure that the shield ground wire points away from the end of the cable.

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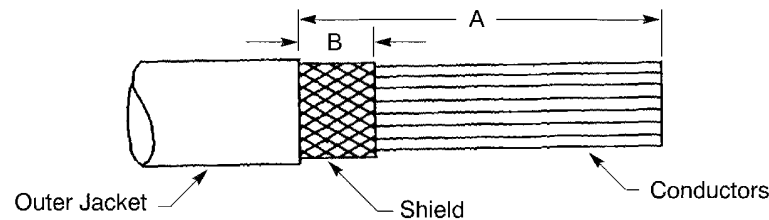
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SHIELD TERMINATION OF THE RAYCHEM (TYCO) 55A6090 CABLE

This Subject gives the procedures to terminate the outer shield of the Raychem 55A6090 cable.

1. CABLE SHIELD TERMINATION

A. Cable Preparation



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CABLE TRIM DIMENSIONS

Figure 1

Table 1

CABLE TRIM DIMENSIONS

Connector	Cable Trim		
	Dimension	Minimum (inch)	Maximum (inch)
BACC45FS20C	A	2-7/8	3-1/8
	B	11/32	13/32
BACC63BP18R	A	2-3/4	3
	B	11/32	13/32
BACC63BP22R	A	3	3-1/4
	B	11/32	13/32
BACC63BV18R	A	2-3/4	3
	B	11/32	13/32
BACC63BV22R	A	3	3-1/4
	B	11/32	13/32

(1) Prepare the cable.

Refer to Figure 1 and Table 1.

- Remove the necessary length of the outer jacket so that the distance from the end of the jacket to the end of the cable is Dimension A.
- Remove the necessary length of the shield so that the distance from the end of the shield to the end of the outer jacket is Dimension B.

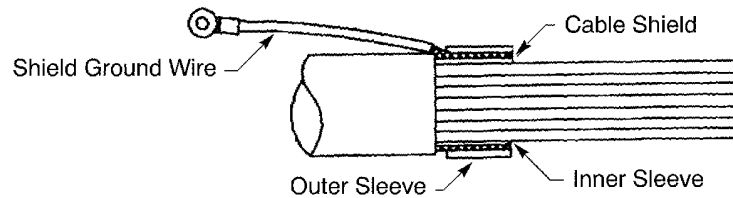
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B. Shield Ground Wire Assembly



2445918 S00061545877_V1

SHIELD GROUND WIRE ASSEMBLY

Figure 2

- (1) Prepare the shield ground wire. Refer to Subject 20-10-15.
 - (a) Make a selection of the shield ground wire.
 - (b) Cut a 6.0 inch ± 0.1 inch length of the wire.
 - (c) Remove the necessary insulation from both ends of the wire.
- (2) Assemble the BACT12AC3 general purpose terminal on the end of the ground wire. Refer to Subject 20-30-11.
- (3) Attach the shield ground wire to the shield with mechanical ferrules. Refer to Subject 20-10-15.
- (4) Make a selection of a 3/8 inch diameter Grade B, Class 1 heat shrinkable sleeve from Subject 20-00-11.
- (5) Put a 1.06 inch ± 0.06 inch length of the sleeve on the cable.
Make sure that the center of the sleeve is aligned with the center of the outer ferrule.
- (6) Shrink the sleeve into its position. Refer to Subject 20-10-14.

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B. Shield Ground Wire Assembly	3

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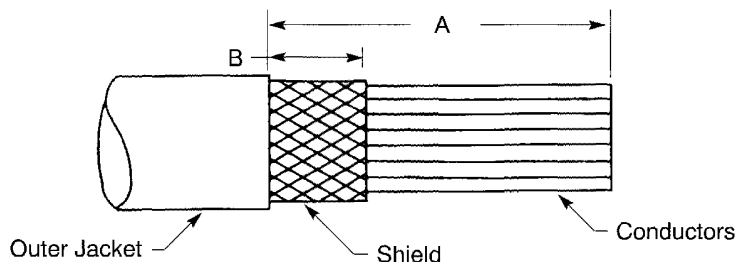
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STANDARD WIRING PRACTICES MANUAL

SHIELD TERMINATION OF THE RAYCHEM (TYCO) 55A6088 CABLE

This Subject gives the procedures to terminate the outer shield of the Raychem 55A6088 cable.

1. CABLE SHIELD TERMINATION

A. Cable Preparation



2445919 S00061545879_V1

CABLE TRIM DIMENSIONS

Figure 1

Table 1

CABLE TRIM DIMENSIONS

Connector	Cable Trim		
	Dimension	Minimum (inch)	Maximum (inch)
BACC45FS20	A	2-7/8	3-1/8
	B	11/32	13/32
BACC63BP14	A	2-3/8	2-5/8
	B	11/32	13/32
BACC63BP18	A	2-3/4	3
	B	11/32	13/32
BACC63BP20	A	2-7/8	3-1/8
	B	11/32	13/32
BACC63BP22	A	3	3-1/4
	B	11/32	13/32
BACC63BV18	A	2-3/4	3
	B	11/32	13/32
BACC63BV22	A	3	3-1/4
	B	11/32	13/32

- (1) Prepare the cable.
Refer to Figure 1 and Table 1.
- (2) Remove the necessary length of the outer jacket so that the distance from the end of the jacket to the end of the cable is Dimension A.

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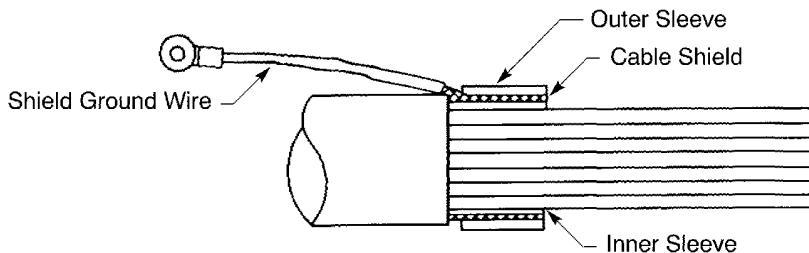


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SHIELD TERMINATION OF THE RAYCHEM (TYCO) 55A6088 CABLE

- (3) Remove the necessary length of the shield so that the distance from the end of the shield to the end of the jacket is Dimension B.

B. Shield Ground Wire Assembly



2445920 S00061545880_V1

SHIELD GROUND WIRE ASSEMBLY
Figure 2

- (1) Prepare the shield ground wire. Refer to Subject 20-10-15.
 - (a) Make a selection of the shield ground wire.
 - (b) Cut a 6.0 inch ± 0.1 inch length of the wire.
 - (c) Remove the necessary length of insulation from both ends of the wire.
- (2) If a terminal is specified:
 - (a) Assemble the BACT12AC3 general purpose terminal on the end of the ground wire. Refer to Subject 20-30-11.
 - (b) Attach the shield ground wire to the shield with mechanical ferrules. Refer to Subject 20-10-15.
- (3) If a contact is specified, install a contact on the shield ground wire. Refer to Subject 20-61-11.
- (4) Make a selection of a 5/8 inch diameter Grade B, Class 1 heat shrinkable sleeve from Subject 20-00-11.
- (5) Put a 1.06 inch ± 0.06 inch length of the sleeve on the cable.
Make sure that the center of the sleeve is aligned with the center of the outer ferrule.
- (6) Shrink the sleeve into its position. Refer to Subject 20-10-14.

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SHIELD TERMINATION OF RAYCHEM (TYCO) 55A6160 AND 55A6160-20 CABLES, AND CHAMPLAIN 61-02651 AND 61-02783 CABLES

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SHIELD TERMINATION OF RAYCHEM (TYCO) 55A6160 AND 55A6160-20 CABLES, AND CHAMPLAIN 61-02651 AND 61-02783 CABLES

1. CABLE PREPARATION

A. Cable Part Numbers

Table 1
CABLE PART NUMBERS

Part Number	Supplier
55A6160	Raychem
55A6160-20	Raychem
61-02651	Champlain
61-02783	Champlain

B. Cable Preparation

Table 2
CABLE TRIM DIMENSIONS

Cable	Cable Trim		
	Dimension	Target (inch)	Tolerance (inch)
55A6160	A	3-1/2	±1/8
	B	3/8	±1/32
	C	2-1/4	±1/8
	D	3/8	±1/32
55A6160-20	A	3-1/2	±1/8
	B	3/8	±1/32
	C	2-1/2	±1/8
	D	3/8	±1/32
61-02651	A	3-1/2	±1/8
	B	3/8	±1/32
	C	2-1/2	±1/8
	D	3/8	±1/32
61-02783	A	3-1/2	±1/8
	B	3/8	±1/32
	C	2-1/2	±1/8
	D	3/8	±1/32

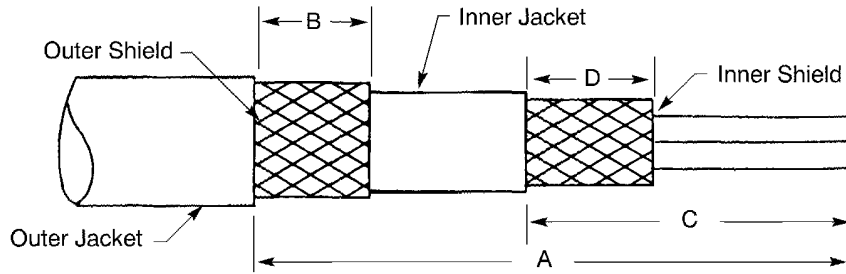
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SHIELD TERMINATION OF RAYCHEM (TYCO) 55A6160 AND 55A6160-20 CABLES, AND CHAMPLAIN 61-02651 AND 61-02783 CABLES



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CABLE PREPARATION

Figure 1

Refer to Table 2 and Figure 1.

- (1) Remove the necessary length of the outer jacket so that the distance from the end of the jacket to the end of the cable is dimension A.
- (2) Remove the necessary length of the outer shield so that the distance from the end of the outer shield to the end of the outer jacket is dimension B.
- (3) Remove the necessary length of the inner jacket so that the distance from the end of the inner jacket to the end of the cable is dimension C.
- (4) Remove the necessary length of the inner shield so that the distance from the end of the inner shield to the end of the inner jacket is dimension D.

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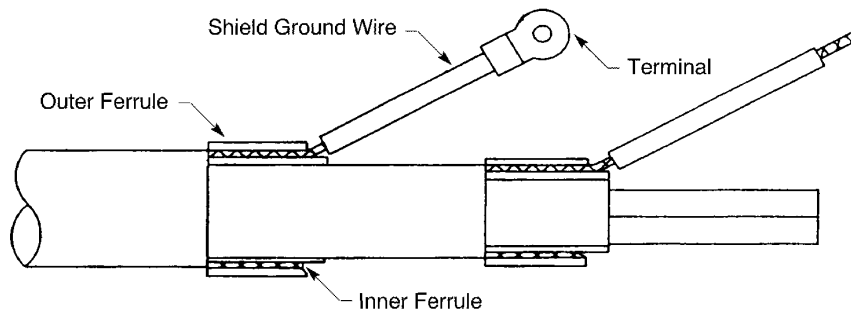
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SHIELD TERMINATION OF RAYCHEM (TYCO) 55A6160 AND 55A6160-20 CABLES, AND CHAMPLAIN 61-02651 AND 61-02783 CABLES

2. TERMINATION OF THE OUTER SHIELD

A. Shield Ground Wire Assembly



2445922 S00061545883_V1

SHIELD GROUND WIRE ON THE OUTER SHIELD

Figure 2

- (1) Assemble a shield ground wire with mechanical ferrules on the outer shield. Refer to Figure 2 and Subject 20-10-15.

NOTE: A satisfactory alternative for the Raychem 55A6160 cable is the assembly of the shield ground wire with a BACS13BH2 solder sleeve. Refer to Subject 20-10-15.

Make sure that:

- The shield ground wire is a 6 inch $\pm 1/16$ inch length of AWG 20 wire
- The length of the heat shrinkable sleeve is 1-1/8 inches $\pm 1/16$ inch.

NOTE: If the shield ground wire is assembled with a solder sleeve, the heat shrinkable sleeve is not used.

- (2) Assemble a BACT12M terminal on the ground wire. Refer to Subject 20-30-11.

3. TERMINATION OF THE INNER SHIELD

A. Shield Ground Wire Assembly

- (1) Assemble a shield ground wire with mechanical ferrules on the inner shield. Refer to Figure 2 and Subject 20-10-15.

NOTE: A satisfactory alternative for the Raychem 55A6160 cable is the assembly of the shield ground wire with a BACS13BH2 solder sleeve. Refer to Subject 20-10-15.

Make sure that:

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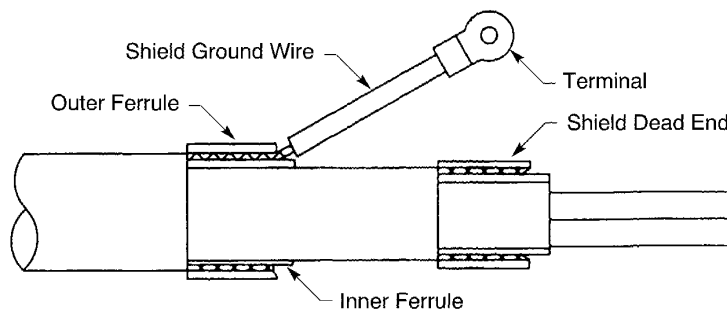
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- The shield ground wire is a 6 inch $\pm 1/16$ inch length of AWG 20 wire
- The length of the heat shrinkable sleeve is 1-1/8 inches $\pm 1/16$ inch.

NOTE: If the shield ground wire is assembled with a solder sleeve, the heat shrinkable sleeve is not used.

B. Assembly of a Shield Dead End



2445923 S00061545884_V1

SHIELD DEAD END ON THE INNER SHIELD

Figure 3

- (1) Assemble a shield dead end on the inner shield. Refer to Figure 3 and Subject 20-10-15.
Make sure that the length of the heat shrinkable sleeve is 1-1/8 inches $\pm 1/16$ inch.

C. Assembly of a Shield Ground Wire That Is Attached to a Cable Conductor

- (1) Assemble a shield ground wire with mechanical ferrules on the inner shield. Refer to Subject 20-10-15.

Make sure that:

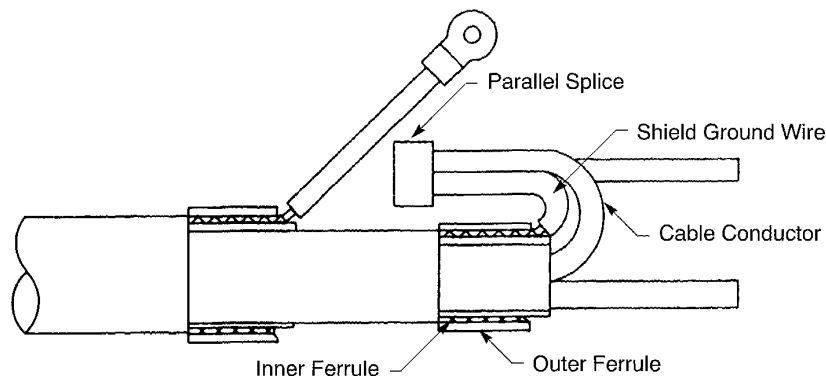
- The shield ground wire is a 4.5 inch ± 0.06 inch length of AWG 20 wire
 - The length of the heat shrinkable sleeve is 1.06 inches ± 0.06 inch.
- (2) Attach these wires with a parallel splice:
 - The end of the shield ground wire
 - One end of a 4.5 inch ± 0.06 inch length of the same type of wire as the shield ground wire
 - The specified conductor of the cable.

Refer to Figure 4 and Subject 20-30-12.

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CHAMPLAIN 61-02651 AND 61-02783 CABLES



2445924 S00061545885_V1

CONFIGURATION OF THE SHIELD GROUND WIRE

Figure 4

- (3) Put one layer of the TFE Stage B tape on the splice.
- (4) Make a selection of a heat shrinkable sleeve. Refer to 20-35-13 Table 7.

Table 3
NECESSARY MATERIAL

Material	Part Number	Supplier
Heat Shrinkable Sleeve	DWP-125	Raychem

NOTE: Refer to Subject 20-00-11 for alternative heat shrinkable sleeve.

- (5) For the Raychem 55A6160-20 cable, put the sufficient length of the selected heat shrinkable sleeve on the splice so that both ends of the sleeve extend beyond the ends of the splice.
- (6) For the Raychem 61-02651 and the 61-02783 cables, put one layer of PTFE tape on the splice so that both ends of the layer of tape extend beyond the ends of the splice.
- (7) Fold the shield ground wire and the cable conductor back over the ferrule so that free end of the wire opposite the splice is aligned with the end of the remaining conductor of the cable.
Refer to Figure 4.
- (8) Make a selection of a Grade B, Class 1 heat shrinkable sleeve from Subject 20-00-11.
- (9) Put a 1.5 inch ± 0.06 inch length of the sleeve on the wires with the splice and the cable.
- (10) Shrink the sleeve into position. Refer to Subject 20-10-14.

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CONNECTOR ASSEMBLY WITH MICRODOT 202-3836-0000 AVM CABLE

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CONNECTOR ASSEMBLY WITH MICRODOT 202-3836-0000 AVM CABLE

1. PART NUMBERS AND DESCRIPTION

A. Cable Part Numbers

Table 1
CABLE PART NUMBERS

Part Number	Supplier
202-3836-000	Microdot

B. Connector Part Numbers

Table 2
CONNECTOR PART NUMBERS

Boeing Standard	Type
BACC66()	Plug
	Receptacle
BACC45F()	Plug
	Receptacle
BACC63BP()	Plug
BACC63BV()	Receptacle

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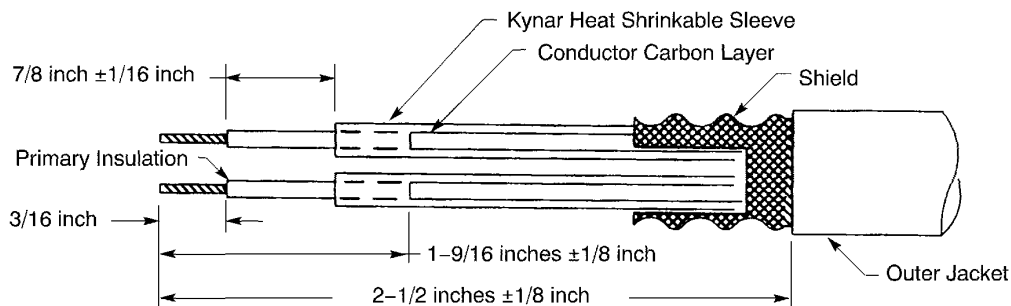
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CONNECTOR ASSEMBLY WITH MICRODOT 202-3836-0000 AVM CABLE

2. ASSEMBLY OF BACC66() CONNECTORS

A. **Cable Preparation**

Refer to Figure 1.



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CABLE TRIM DIMENSIONS

Figure 1

- (1) Remove 2-1/2 inches $\pm 1/8$ inch of the outer jacket from the end of the cable.
- (2) Push the shield back.
- (3) Remove 1-9/16 inches $\pm 1/8$ inch of the carbon layer from the end of each conductor.

CAUTION: MAKE SURE THAT DAMAGE TO THE PRIMARY INSULATION DOES NOT OCCUR.

- (4) Remove the remaining carbon from the primary insulation with acetone or an equivalent solvent.
- (5) Remove 3/16 inch of the primary insulation from the end of each conductor.

B. **Connector Assembly**

- (1) Assemble the contacts. Refer to Subject 20-71-14.
- (2) Put a 1-3/8 inch $\pm 1/8$ inch length of 1/16 inch diameter of Kynar heat shrinkable sleeve on each conductor.
Make sure that the distance from the end of the sleeve to the end of the primary insulation is 7/8 inch $\pm 1/16$ inch.
- (3) Shrink the sleeves in position. Refer to Subject 20-10-14.
- (4) Install the contacts in the connector. Refer to Subject 20-71-14.

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- (5) Assemble a shield dead end on the free end of the shield. Refer to Subject 20-10-15.
- (6) Make a selection of a Grade B, Class 1 heat shrinkable sleeve from Subject 20-00-11.
- (7) Put a 1.00 inch ± 0.25 inch length of the sleeve on the end of the cable.
Make sure that the end of the sleeve is 0.25 inch from the connector grommet.
- (8) Shrink the sleeve into its position. Refer to Subject 20-10-14.

3. ASSEMBLY OF BACC45F(), BACC63BP(), AND BACC63BV() CONNECTORS

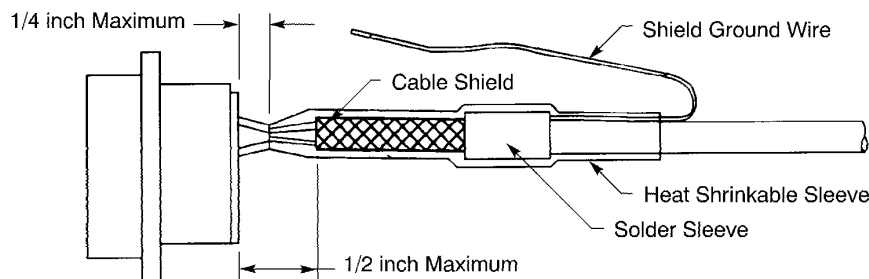
A. Cable Preparation

- (1) Remove 2 inches $\pm 1/8$ inches of the outer jacket from the end of the cable.
- (2) Remove 2 inches $\pm 1/8$ inches of the shield from the end of the cable.
- (3) Remove 1 inch $\pm 1/16$ inch of the carbon layer from the end of each conductor.

CAUTION: MAKE SURE THAT DAMAGE TO THE PRIMARY INSULATION DOES NOT OCCUR.

- (4) Remove the remaining carbon from the primary insulation with acetone or an equivalent solvent.

B. Connector Assembly



2445926 S00061545888_V1

CONNECTOR ASSEMBLY WITH A MICRODOT 202-3836-0000 CABLE

Figure 2

- (1) Assemble the contacts. Refer to Subject 20-61-11.
- (2) Put a $3/4$ inch $\pm 1/16$ inch length of $1/16$ inch diameter of Kynar heat shrinkable sleeve on each conductor.

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- (3) Shrink the sleeves in position. Refer to Subject 20-10-14.
- (4) Assemble the shield ground wire.
Refer to Figure 2 and Subject 20-10-15.
- (5) Make a selection of a Grade B, Class 1 heat shrinkable sleeve from Subject 20-00-11.
- (6) Put a 2.00 inch \pm 0.13 inch length of the sleeve on the cable.
- (7) Install the contacts in the connector. Refer to Subject 20-61-11.
- (8) Push the sleeve over the shield and the conductors until the end of the sleeve is 1/4 inch or less from the connector grommet.
- (9) Shrink the sleeve in position. Refer to Subject 20-10-14.

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SHIELD TERMINATION OF THE CHAMPLAIN 30-04749 ADF CABLE

1. PART NUMBERS AND DESCRIPTION

A. Cable Part Numbers

Table 1
CABLE PART NUMBERS

Part Number	Supplier
30-40749	Champlain

2. SHIELD TERMINATION

A. Cable Preparation

Table 2
CABLE TRIM DIMENSIONS

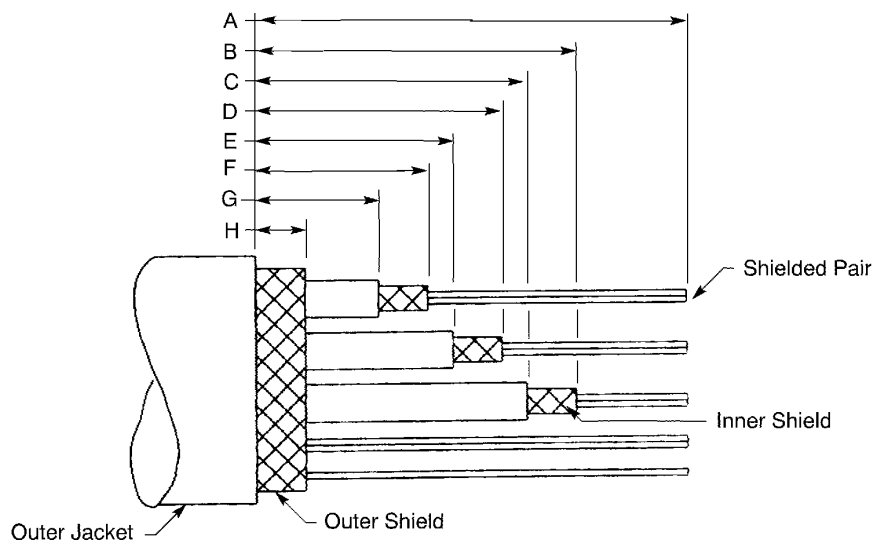
Dimension	Removal Length (inch)	
	Target	Tolerance
A	4-1/2	1/8
B	2-1/4	1/32
C	2	1/8
D	1-3/4	1/32
E	1-1/2	1/8
F	1-1/4	1/32
G	1	1/8
H	1/4	1/32

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SHIELD TERMINATION OF THE CHAMPLAIN 30-04749 ADF CABLE



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CABLE TRIM DIMENSIONS

Figure 1

- (1) If a connector clamp is specified, put the clamp on the cable.
- (2) Prepare the cable.
Refer to Table 2 and Figure 1.
 - (a) Remove the necessary length of the outer jacket so that the distance from the end of the jacket to the end of the cable is Dimension A.
 - (b) Remove the necessary length of the outer shield so that the distance from the end of the outer jacket to the end of the shield is Dimension H.
 - (c) Remove the necessary lengths of the outer jackets from each shielded pair.
 - (d) Remove the necessary lengths of the shields from each shielded pair.
- (3) Put a 4-1/2 inch $\pm 1/8$ inch length of heat shrinkable sleeve on the cable.
- (4) Put a 1/2 inch $\pm 1/16$ inch length of heat shrinkable sleeve on each shielded pair so that the end of each sleeve extends 1/8 inch under the shield.
- (5) Shrink the 1/2 inch sleeves in position. Refer to Subject 20-10-14.

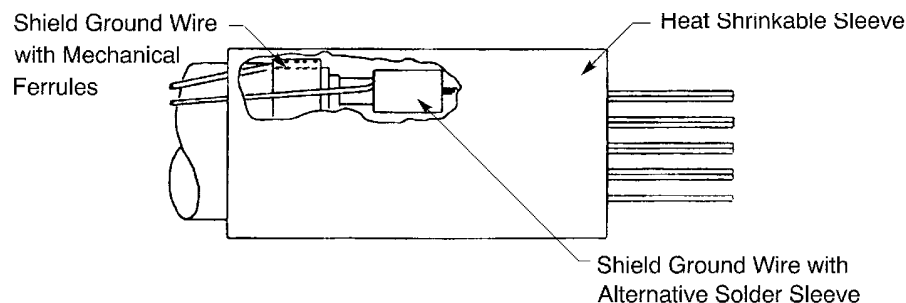
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B. Shield Ground Wire Assembly



2445928 S00061545891_V1

SHIELD GROUND WIRE ASSEMBLY AND INSULATION

Figure 2

- (1) Assemble a shield ground wire on each shield of the 3 shielded pairs. Refer to Subject 20-10-15 and Figure 2.

These conditions are applicable:

- The shield ground wires are 6 inches $\pm 1/16$ inch in length
- The shield ground wires are assembled with a BACS13S109B inner ferrule and a BACS13S175C outer ferrule.

NOTE: Refer to Subject 20-00-11 for approved suppliers and alternative part numbers for BACS13S ferrules.

NOTE: The assembly of a shield ground wire with a solder sleeve is a satisfactory alternative.

- (2) Assemble a shield ground wire on the outer shield of the cable. Refer to Subject 20-10-15 and Figure 2.

These conditions are applicable:

- The shield ground wire is 6 inches $\pm 1/16$ inch in length
- The shield ground wire is assembled with a BACS13S297B inner ferrule and a BACS13S375C outer ferrule.
- The heat shrinkable sleeve is 4-1/2 inches $\pm 1/8$ in length.

- (3) Push the heat shrinkable sleeve over the shield ground wires and the shielded pairs.
- (4) Shrink the sleeve in position. Refer to Subject 20-10-14.

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SHIELD TERMINATION OF THE CHAMPLAIN 30-04680 ADF CABLE

1. PART NUMBERS AND DESCRIPTION

A. Cable Part Numbers

Table 1
CABLE PART NUMBERS

Part Number	Supplier
30-04680	Champlain

2. SHIELD TERMINATION

A. Cable Preparation

Table 2
CABLE TRIM DIMENSIONS

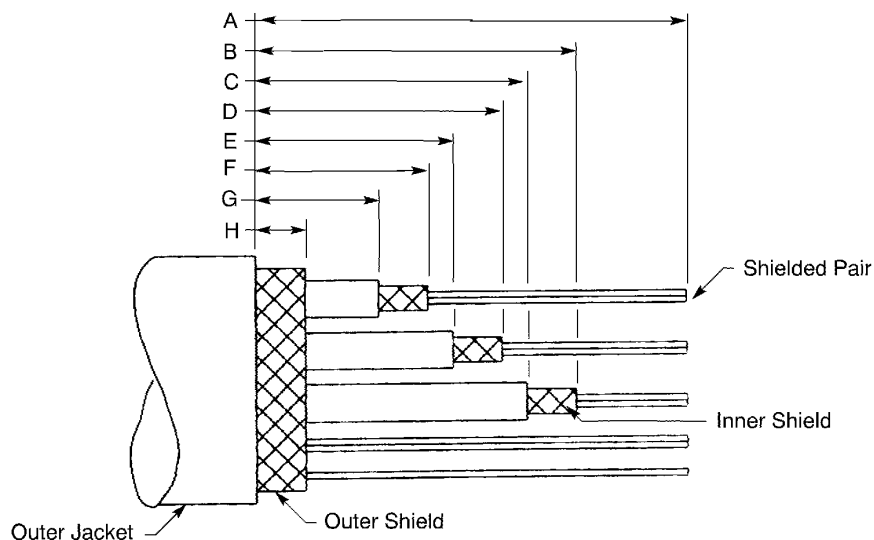
Dimension	Removal Length (inch)	
	Target	Tolerance
A	4-1/2	1/8
B	2-1/4	1/32
C	2	1/8
D	1-3/4	1/32
E	1-1/2	1/8
F	1-1/4	1/32
G	1	1/8
H	1/4	1/32

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SHIELD TERMINATION OF THE CHAMPLAIN 30-04680 ADF CABLE



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CABLE TRIM DIMENSIONS

Figure 1

- (1) If a connector clamp is specified, put the clamp on the cable.
- (2) Prepare the cable.
Refer to Table 2 and Figure 1.
 - (a) Remove the necessary length of the outer jacket so that the distance from the end of the jacket to the end of the cable is Dimension A.
 - (b) Remove the necessary length of the outer shield so that the distance from the end of the outer jacket to the end of the shield is Dimension H.
 - (c) Remove the necessary lengths of the outer jackets from each shielded pair.
 - (d) Remove the necessary lengths of the shields from each shielded pair.
- (3) Put a 4-1/2 inch $\pm 1/8$ inch length of heat shrinkable sleeve on the cable.
- (4) Put a 1/2 inch $\pm 1/16$ inch length of heat shrinkable sleeve on each shielded pair so that the end of each sleeve extends 1/8 inch under the shield.
- (5) Shrink the 1/2 inch sleeves in position. Refer to Subject 20-10-14.

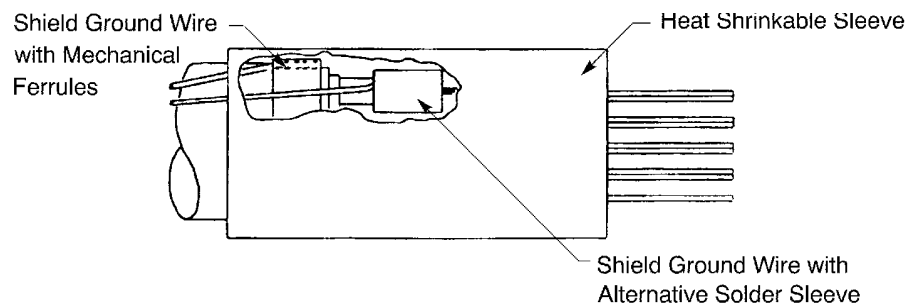
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B. Shield Ground Wire Assembly



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SHIELD GROUND WIRE ASSEMBLY AND INSULATION

Figure 2

- (1) Assemble a shield ground wire on each shield of the 3 shielded pairs. Refer to Subject 20-10-15 and Figure 2.

These conditions are applicable:

- The shield ground wires are 6 inches $\pm 1/16$ inch in length
- The shield ground wires are assembled with a BACS13S109B inner ferrule and a BACS13S175C outer ferrule.

NOTE: Refer to Subject 20-00-11 for approved suppliers and alternative part numbers for BACS13S ferrules.

NOTE: The assembly of a shield ground wire with a solder sleeve is a satisfactory alternative.

- (2) Assemble a shield ground wire on the outer shield of the cable. Refer to Subject 20-10-15 and Figure 2.

These conditions are applicable:

- The shield ground wire is 6 inches $\pm 1/16$ inch in length
- The shield ground wire is assembled with a BACS13S297B inner ferrule and a BACS13S375C outer ferrule.
- The heat shrinkable sleeve is 4-1/2 inches $\pm 1/8$ in length; refer to Paragraph 2.A., Step 2.A.(3).

- (3) Push the heat shrinkable sleeve over the shield ground wires and the shielded pairs.
- (4) Shrink the sleeve in position. Refer to Subject 20-10-14.

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SHIELD TERMINATION OF THE RAYCHEM (TYCO) CTC-0039-()-9/5-9 THERMOCOUPLE CABLE

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SHIELD TERMINATION OF THE RAYCHEM (TYCO) CTC-0039-()-9/5-9 THERMOCOUPLE CABLE

1. PART NUMBERS AND DESCRIPTION

A. Cable Part Numbers

Table 1
THERMOCOUPLE CABLE PART NUMBERS

Part Number	Supplier
CTC-0039-()-9/5-9	Raychem

2. SHIELD TERMINATION

A. Cable Preparation

Refer to Subject 20-00-15 and Figure 1.

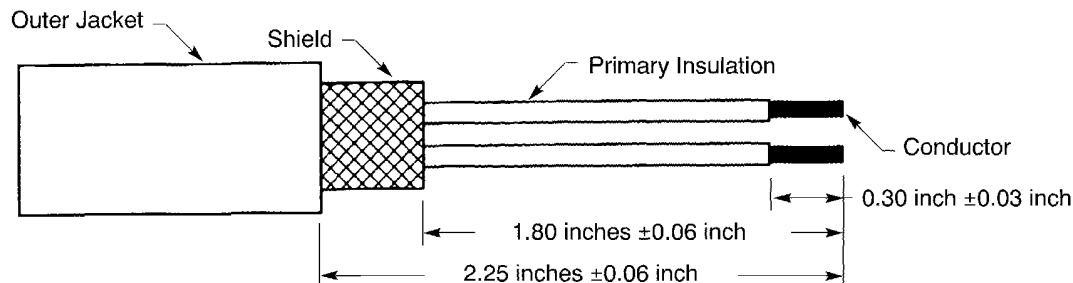
- (1) Remove 2.25 inches ± 0.06 inch of the outer jacket from the end of the cable.

Either of these tools can be used:

- A pair of Meisei 4C tweezers with a Meisei M-10 power supply
- An X-ACTO knife.

- (2) Remove 1.80 inches ± 0.06 inch of the shield from the end of the cable.

- (3) Remove 0.30 inch ± 0.03 inch of the insulation from the end of each wire.



2445929 S00061545894_V1

CABLE TRIM DIMENSIONS

Figure 1

B. Shield Ground Wire Assembly

- (1) Assemble a shield ground wire with either of these:

- A mechanical ferrule
- A solder sleeve.

Refer to Subject 20-10-15.

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STANDARD WIRING PRACTICES MANUAL
SHIELD TERMINATION OF THE ENDEVCO 16833 AVM CABLE

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SHIELD TERMINATION OF THE ENDEVCO 16833 AVM CABLE

1. PART NUMBERS AND DESCRIPTION

A. Cable Part Numbers

Table 1
CABLE PART NUMBERS

Part Number	Supplier
16833	Endevco

B. Connector Part Numbers

Table 2
CONNECTOR PART NUMBERS

Part Number	Configuration	Supplier
115-5066	Plug	Amphenol
115-5074	Plug	Amphenol
BACC63AE	Plug	Boeing
BACC63AF	Receptacle	Boeing
BACC63X	Plug	Boeing
BACC63Y	Receptacle	Boeing

2. SHIELD TERMINATION FOR THE ASSEMBLY OF AMPHENOL 115-5066 AND 115-5074 CONNECTORS

A. Shield Termination

Refer to Subject 20-62-12.

3. SHIELD TERMINATION FOR THE ASSEMBLY OF BACC63AE, BACC63AF, BACC63X AND BACC63Y CONNECTORS

A. Cable Preparation

- (1) Remove 1-3/4 inches $\pm 1/8$ inch of the outer jacket from the end of the cable.
- (2) Remove 1-3/4 inches $\pm 1/8$ inch of the shield from the end of the cable.
- (3) Carefully cut the outer carbon layer along the groove between the two conductors.
- (4) Pull the conductors apart back to the end of the outer jacket.
- (5) Remove the unwanted outer carbon layer.
- (6) Remove the inner carbon layer so that the end of the layer is 1/2 inch $\pm 1/16$ inch beyond the location on the wire that is specified for the assembly of the contact.

Refer to Subject 20-61-11.

CAUTION: MAKE SURE THAT DAMAGE DOES NOT OCCUR TO THE PRIMARY INSULATION.

- (7) Remove the remaining carbon from primary insulation with acetone or an equivalent solvent.

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SHIELD TERMINATION OF THE ENDEVCO 16833 AVM CABLE

B. Shield Ground Wire Assembly

- (1) Assemble a shield ground wire with a mechanical ferrule.
Refer to Subject 20-10-15.

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TERMINAL ASSEMBLY WITH ALUMEL-CHROMEL THERMOCOUPLE WIRE

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	B. Alumel-Chromel Thermocouple Cable Part Numbers	2
2.	<u>TERMINAL ASSEMBLY</u>	2
	A. Wire Preparation	2
	B. Terminal Assembly	3

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STANDARD WIRING PRACTICES MANUAL

TERMINAL ASSEMBLY WITH ALUMEL-CHROMEL THERMOCOUPLE WIRE

This Subject gives the procedure to assemble AMP and Thermo-Electric terminals with Alumel-Chromel (Al-Ch) thermocouple wire.

1. PART NUMBERS AND DESCRIPTION

A. Thermocouple Terminal Part Numbers

Table 1
ALUMEL AND CHROMEL THERMOCOUPLE TERMINAL PART NUMBERS

Material	Terminal	
	Part Number	Supplier
Alumel	1387-4	Thermo-Electric
	1-321898-0	AMP
Chromel	1387-3	Thermo-Electric
	1-321897-0	AMP

B. Alumel-Chromel Thermocouple Cable Part Numbers

Table 2
ALUMEL AND CHROMEL THERMOCOUPLE WIRE PART NUMBERS

Part Number	Supplier
WC-94102	Revere
252-94102	Galite
852-4000311	Pirelli
852-4985321	Pirelli

2. TERMINAL ASSEMBLY

A. Wire Preparation

Table 3
INSULATION REMOVAL LENGTH

Terminal	Wire Insulation		
	Color	Removal Length (inch)	
		Target	Tolerance
1-321897-0	White	1/4	±1/16
1-321898-0	Green	1/4	±1/16
1387-3	White	5/16	±1/16
1387-4	Green	5/16	±1/16

(1) Remove the necessary length of insulation from the end of each wire. Refer to Table 3.

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TERMINAL ASSEMBLY WITH ALUMEL-CHROMEL THERMOCOUPLE WIRE

B. Terminal Assembly

Table 4
TERMINAL CRIMP TOOLS

Terminal	Crimp Tool		
	Basic Unit	Setting	Supplier
1387-3	Y14MV	-	Burndy
	WT110M	-	Thomas & Betts
1387-4	Y14MV	-	Burndy
	WT110M	-	Thomas & Betts
1-321897-0	46673	3	AMP
1-321898-0	46673	3	AMP

- (1) Make a selection of a crimp tool from Table 4.
- (2) Put the end of the white wire into the crimp barrel of the chromel terminal.
NOTE: The Thermo-Electric 1387-3 terminals are identified on the under side with a CR mark.
- (3) Crimp the terminal.
- (4) Put the end of the green wire into the crimp barrel of the alumel terminal.
NOTE: The Thermo-Electric 1387-4 terminals are identified on the under side with a AL mark.
- (5) Crimp the terminal.
- (6) For the Thermo-Electric terminals, solder the terminal to the wire with Ag05B silver solder.

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REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS

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1. RECTANGULAR CONNECTOR PART NUMBERS AND DESCRIPTION

A. Rectangular Connector Part Numbers and Repair Kit Part Numbers

Table 1
CONNECTOR PART NUMBERS

Type	Contact Data	Part Number	Supplier
Plug	10 Size 16 and 2 Size 20 Socket Contacts	28969-1191	GKN
		AM30-1013A	Souriau

NOTE: GKN part number 28969-1191 and Souriau part number AM30-1013A are two different part numbers for the same connector.

NOTE: A GKN 28969-1191 or a Souriau AM30-1013A connector is included in the GKN connector repair kit 28969-1163. Replacement connectors must be ordered under the GKN repair kit part number.

Table 2
CONTENTS OF THE GKN 28969-1163 REPAIR KIT

Description	Part Number	Supplier
Rectangular Heater Mat Plug Connector	GKN 28969-1191 or Souriau AM30-1013A	GKN
Size 20 Red Plastic Seal Plug	MS27488-20-2	QPL
Size 16 Contact Insertion and Extraction tool	M81969/14-03	QPL
Size 20 Contact Insertion and Extraction tool	M81969/14-10	QPL
Heat Shrinkable Sleeve	M23053/5-108-0	QPL
Lacing Tape	BMS13-54GBT1C1FC85/14 WH	Boeing

NOTE: A GKN 28969-1191 or a Souriau AM30-1013A connector is included in the GKN connector repair kit 28969-1163. Replacement connectors must be ordered under the GKN repair kit part number.

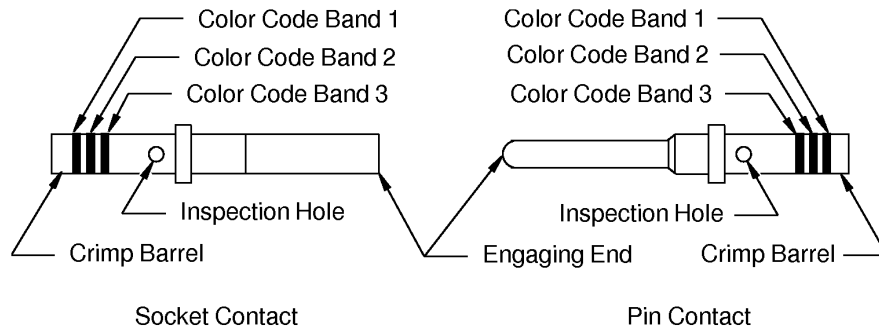
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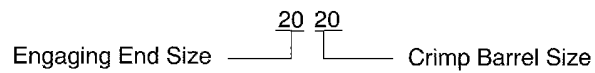
B. Rectangular Connector Contact Part Numbers



2448999 S00061545899_V1

LOCATION OF COLOR BANDS ON M39029 CONTACTS

Figure 1



2446651 S00061545900_V1

EXAMPLE OF A CONTACT SIZE

Figure 2

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REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS

Table 3
CONTACT PART NUMBERS

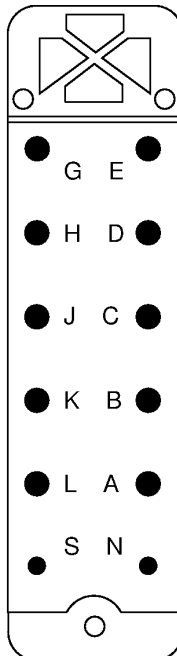
Contact Size		Contact Type	Color Code		Part Number	Supplier
Engaging End	Crimp Barrel		Band	Color		
20	20	Socket	1	Orange	M39029/57-357	QPL
			2	Green		
			3	Violet		
16	16	Socket	1	Orange	M39029/57-358	QPL
			2	Green		
			3	Gray		

C. Rectangular Connector Contact Configuration

Figure 3 shows the engaging face of the rectangular plug connector that has sockets.

Table 4
CONTACT CONFIGURATION OF THE SOURIAU AM30-1013A RECTANGULAR CONNECTOR

Contact Cavities		Cavity Identification	Reference
Count	Size		
10	16	A, B, C, D, E, G, H, J, K, and L	Figure 3
2	20	S and N	



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CONTACT CONFIGURATION OF THE SOURIAU AM30-1013A RECTANGULAR CONNECTOR
Figure 3

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2. CIRCULAR CONNECTOR PART NUMBERS AND DESCRIPTION

A. Circular Connector Part Numbers and Repair Kit Part Numbers

Table 5
CONNECTOR PART NUMBERS

Type	Contact Type	Description	Part Number	Supplier
Plug	Pins	Special Break-Away MIL-DTL-38999 Circular Connector	8D525X37PN402	Souriau

NOTE: A Souriau 8D525X37PN402 connector is included in the GKN repair kit 28969-1162.
Replacement connectors must be ordered under the GKN repair kit part number.

Table 6
CONTENTS OF THE GKN 28969-1162 REPAIR KIT

Description	Part Number	Supplier
Circular MIL-DTL-38999 Aircraft connector	8D525X37PN402	Souriau
Size 16 Green Plastic Seal Plug	MS27488-16-2	QPL
Size 16 Contact Insertion and Extraction tool	M81969/14-03	QPL
Size 20 Contact Insertion and Extraction tool	M81969/14-10	QPL
Backshell with Strain Relief Clamp	620HS042X025	Glenair
Rubber Cushion Strip	AS85049/127	QPL
Heat Shrinkable Sleeve	M23053/5-108-0	QPL
Lacing Tape	BMS13-54GBT1C1FC85/14 WH	Boeing

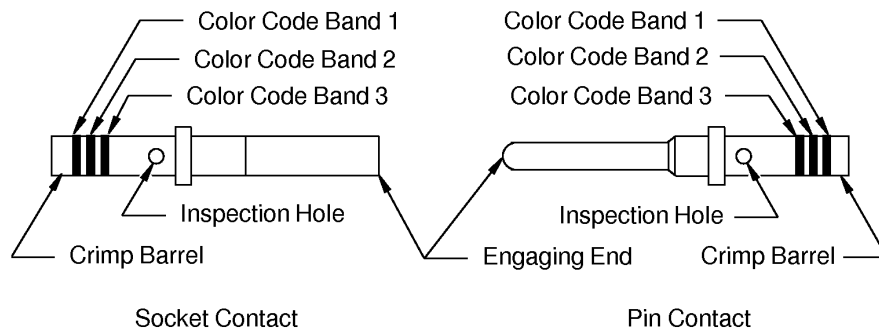
NOTE: A Souriau 8D525X37PN402 connector is included in the GKN repair kit 28969-1162.
Replacement connectors must be ordered under the GKN repair kit part number.



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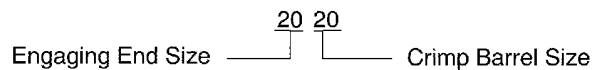
B. Circular Connector Contact Part Numbers



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LOCATION OF COLOR BANDS ON M39029 CONTACTS

Figure 4



2446651 S00061545900_V1

EXAMPLE OF A CONTACT SIZE

Figure 5

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REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS

Table 7
CONTACT PART NUMBERS

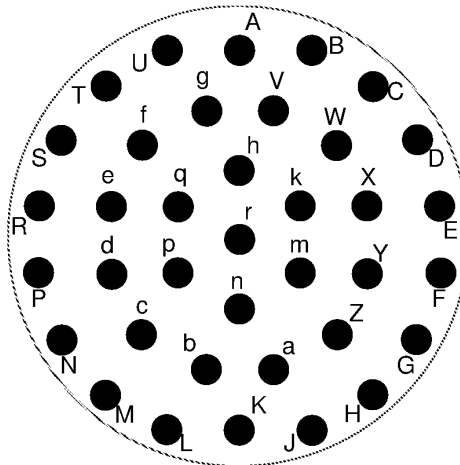
Contact Size		Contact Type	Color Code		Part Number	Supplier
Engaging End	Crimp Barrel		Band	Color		
20	20	Pin	1	Orange	M39029/58-363	QPL
			2	Blue		
			3	Orange		
16	16	Pin	1	Orange	M39029/58-365	QPL
			2	Blue		
			3	Yellow		

C. Circular Connector Contact Configuration

Figure 6 shows the engaging face of the circular connector that has pins.

Table 8
CONTACT CONFIGURATION 25-37 FOR MIL-DTL-38999 CONNECTORS

Contact Cavities		Cavity Identification	Reference
Count	Size		
37	16	A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, T, U, V, W, X, Y, Z a, b, c, d, e, f, g, h, k, m, n, p, q, and r	Figure 6



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CONTACT CONFIGURATION 25-37 FOR MIL-DTL-38999 CONNECTORS

Figure 6

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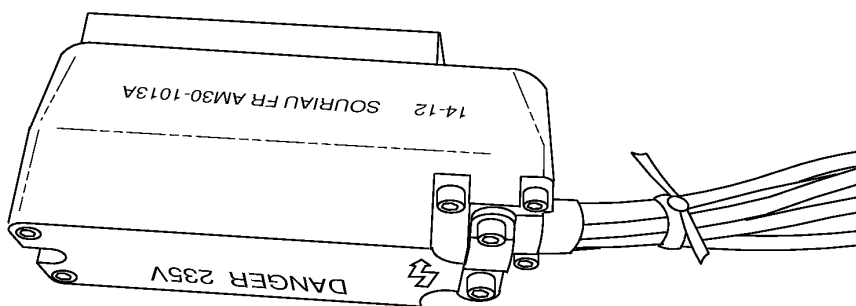
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3. RECTANGULAR CONNECTOR DISASSEMBLY

A. Rectangular Connector Repair - Backshell Removal

CAUTION: OBEY THE SAFETY PROCEDURES. REFER TO SUBJECT 20-00-10.



2449927 S00061545904_V1

SOURIAU AM30-1013A CONNECTOR

Figure 7

Table 9
NECESSARY TOOLS

Tool	Size or Description
Torque tool	Wrench
Hex Bit and Driver	3/32 inch
Cutters	Sidecutters or Flush Cutters

- (1) Examine the wire harness for:
 - Nicks
 - Cuts
 - Evidence of damage.
- (2) If the wires of the harness have nicks, cuts, or evidence of damage, repair the wires. Refer to Subject 20-10-13.
- (3) Make a selection of a 3/32 inch hex bit and driver from Table 9.
- (4) Remove the three connector installation screws from the connector with the 3/32 inch hex bit and driver. Refer to Figure 8.

NOTE: These three screws:

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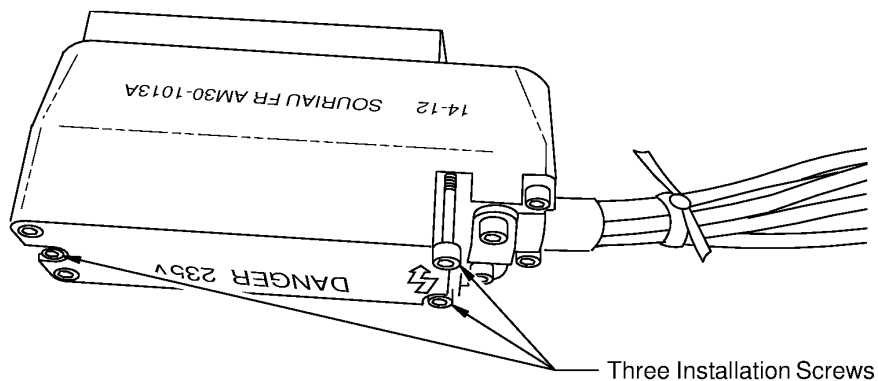
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- Are used to hold the plug connector to the receptacle connector
- Are captivated within the rectangular plug connector shell
- Are longer than the other screws in the connector assembly
- Must be completely removed from the plug connector for the disassembly of the plug.

Continue to turn each of these screws in the counterclockwise direction through its captivation area until each can be completely removed from the connector assembly.

Make sure to keep the screws for the reassembly of the connector.



2449928 S00061545905_V1

LOCATION OF THE THREE INSTALLATION SCREWS

Figure 8

- (5) Remove the two saddle clamp screws from the connector with the 3/32 inch hex bit and driver. Refer to Figure 9.

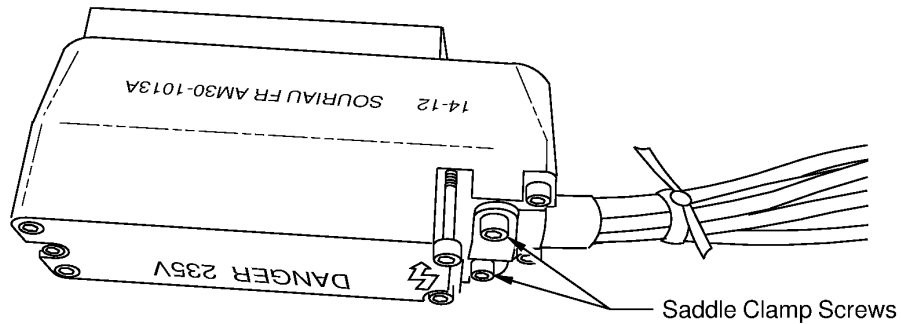
Make sure to keep the screws for the reassembly of the connector.

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REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS



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LOCATION OF THE TWO SADDLE CLAMP SCREWS

Figure 9

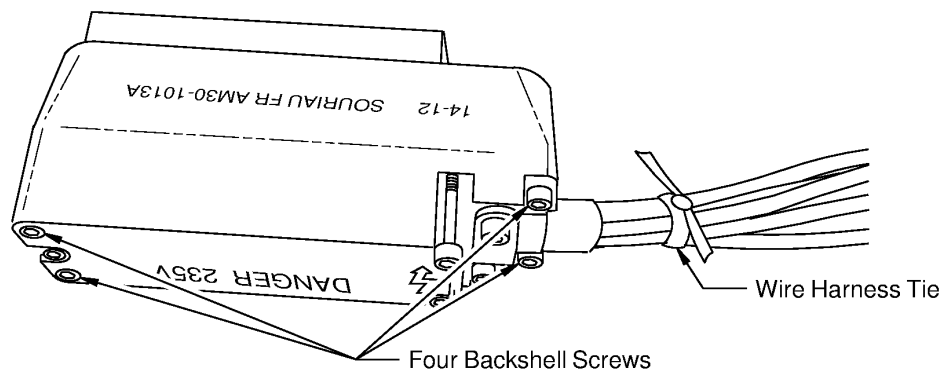
- (6) Remove the four remaining screws that hold the connector backshell. Refer to Figure 10. Make sure to keep the screws for the reassembly of the connector.

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REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS



2449930 S00061545907_V1

LOCATION OF THE FOUR BACKSHELL SCREWS

Figure 10

- (7) Carefully remove the wire harness tie. Refer to Figure 10.
- (8) Keep the connector backshell as close to parallel to the wire harness as possible, and at the same time, carefully vibrate and push the connector backshell rearward along the wire harness. Refer to Figure 11, Figure 12 and Figure 13.

Make sure that damage to the wire insulation, or the heat shrinkable sleeve does not occur.

NOTE: Vibration helps to prevent the sharp edge of the backshell from catching on the wire.

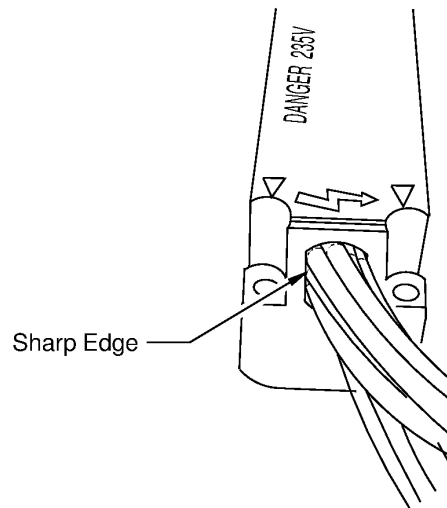
CAUTION: THE EDGE OF THE CONNECTOR BACKSHELL HAS A SHARP EDGE WHERE THE HARNESS EXITS THE BACKSHELL. DO NOT ALLOW THIS EDGE TO CAUSE DAMAGE TO THE INSULATION OF A WIRE OR THE HEAT SHRINKABLE SLEEVE. DAMAGE TO THE INSULATION OF A WIRE, OR THE SLEEVE MAKES A REPAIR OF THE WIRE, OR THE REPLACEMENT OF THE SLEEVE NECESSARY.

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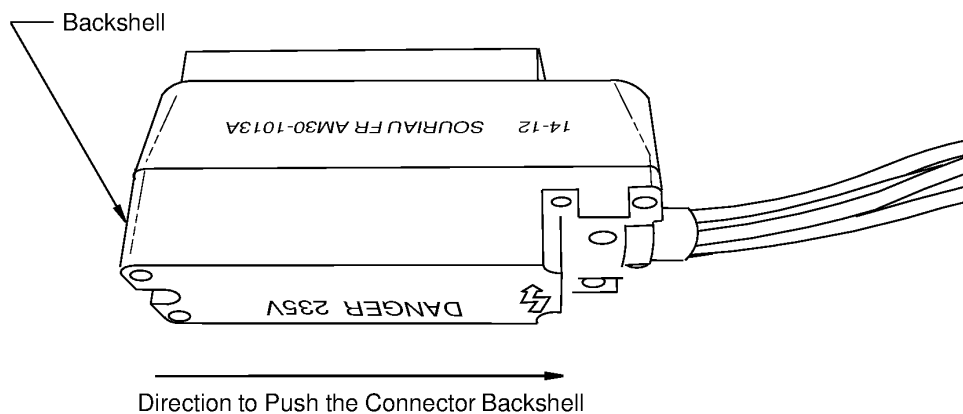
REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS



2449932 S00061545909_V1

SHARP EDGE OF THE CONNECTOR BACKSHELL

Figure 11



2449931 S00061545910_V1

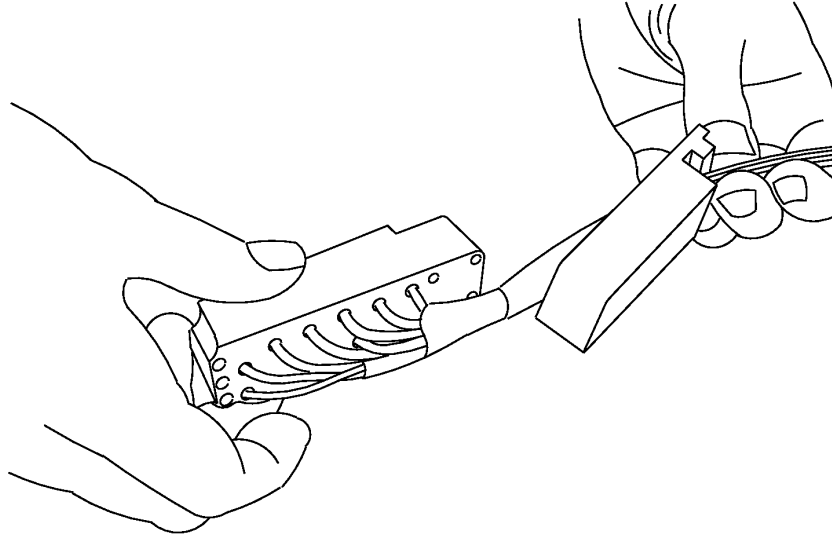
DIRECTION TO PUSH THE CONNECTOR BACKSHELL

Figure 12

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REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS



2449933 S00061545911_V1

REMOVAL OF THE CONNECTOR BACKSHELL

Figure 13

B. Contact Removal - Rectangular Connector

Table 10
CONTACT REMOVAL TOOLS

Contact Size	Removal Tool		
	Part Number	Supplier	Tool End Color
2020	M81969/14-10	QPL	Orange
1616	M81969/14-03	QPL	White

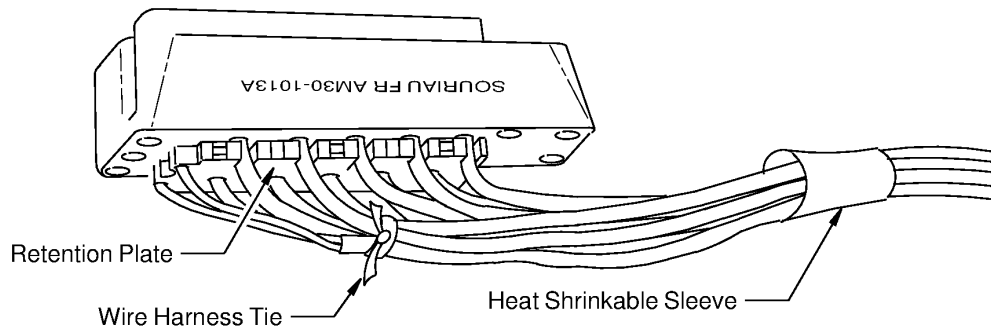
- (1) Carefully push the heat shrinkable sleeve rearward on the harness. Refer to Figure 14.



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REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS



2449934 S00061545912_V1

HEAT SHRINKABLE SLEEVE PUSHED REARWARD

Figure 14

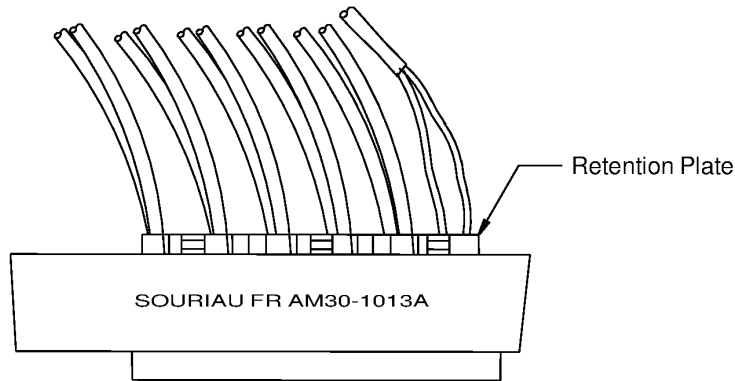
- (2) Remove the wire harness tie.
- (3) Move the wires to allow the retention plate to be moved away from the connector. Refer to Figure 15.

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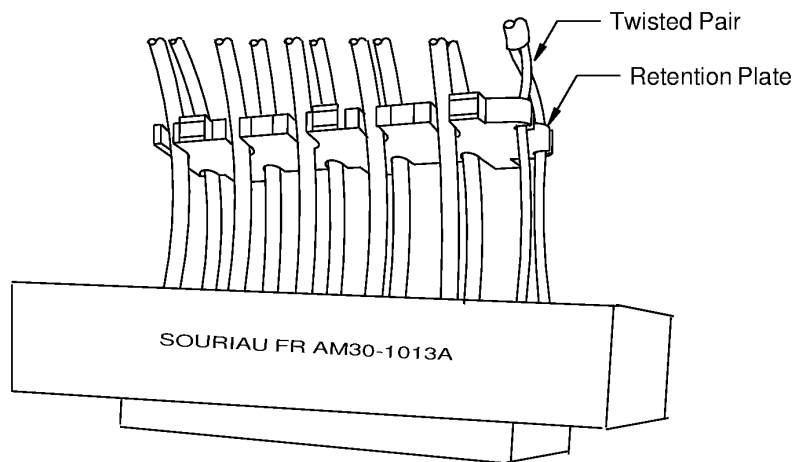


2449935 S00061545913_V1

CONFIGURATION OF THE WIRES

Figure 15

- (4) Pull the retention plate away from the rear face of the connector. Refer to Figure 16.



2449936 S00061545914_V1

RETENTION PLATE PULLED AWAY FROM THE CONNECTOR REAR FACE

Figure 16

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- (5) If it is necessary to provide more access for the removal of the contacts, remove the wires from the retention plate.

- (6) Identify each wire with a tape tag that indicates its contact cavity location in the connector.

NOTE: Identification of the wires is necessary for the correct assembly of the connector again

- (7) Make a selection of a contact removal tool from Table 10.

CAUTION: DO NOT USE A REMOVAL TOOL THAT HAS A DEFECT. A REMOVAL TOOL THAT HAS A DEFECT CAN CAUSE DAMAGE TO THE CONNECTOR.

- (8) At the rear of the connector, put the removal tool on the wire.

- (9) Axially align the removal tool and the contact cavity.

- (10) Carefully push the tool into the contact cavity until it stops.
Make sure that the tool stays aligned in the contact cavity.

CAUTION: DO NOT USE MORE THAN THE NECESSARY AMOUNT OF FORCE TO PUSH THE REMOVAL TOOL INTO THE CONTACT CAVITY. DAMAGE TO THE CONTACT RETENTION CLIPS CAN OCCUR.

CAUTION: DO NOT TURN THE TOOL CLOCKWISE OR COUNTERCLOCKWISE WHEN IT IS IN THE CONTACT CAVITY. DAMAGE TO THE CONTACT RETENTION CLIPS CAN OCCUR.

- (11) Hold the wire against the tool.
- (12) Pull the tool and the wire from the contact cavity.
Make sure that the tool and contact cavity stay aligned.
- (13) If the contact is not released from the connector:
- (a) Pull the removal tool out of the contact cavity.
 - (b) Turn the removal tool approximately 90 degrees.
 - (c) Do Step 3.B.(9) through Step 3.B.(12) again.

4. RECTANGULAR CONNECTOR ASSEMBLY

A. Contact Replacement - Rectangular Connector

Table 11
NECESSARY MATERIALS AND PARTS

Material	Part Number	Supplier
Heat Shrinkable Sleeve	RT555-3/16-0	Tyco/Raychem
Splice	D-436-83	Tyco/Raychem
Wire	BMS13-78 Type 1, Class 1, Gage 18	Boeing

If a size 1616 contact is to be replaced:

- (1) Make a selection of a new wire from Table 11.
- (2) Cut a 12 inch segment of the wire.

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REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS

CAUTION: A NEW WIRE SEGMENT MUST BE USED. THE REPLACEMENT OF A CONTACT ON THE INITIAL WIRE WILL DECREASE THE LENGTH OF THE INITIAL WIRE. IF THE LENGTH OF A WIRE IS DECREASED, THE REPAIRED CONNECTOR AND CABLE CANNOT OBEY THE DIMENSIONS NECESSARY FOR THE CABLE ASSEMBLY.

- (3) Assemble a new contact on the end of the new wire segment.

Refer to

- Table 3 for the contact part number
- Subject 20-63-19 for the procedure to assemble the contact on the wire.

- (4) After the connector is assembled with the new contact and wire assembly, connect the new wire to the initial wire with a splice away from the connector :

- Make a selection of a heat shrinkable sleeve from Table 11.
- Put a 2.0 inch ± 0.3 inch length of the heat shrinkable sleeve on the initial wire before the splice is assembled.
- Make a selection of a D-436-83 from Table 11.
- Assemble the D-436-83 splice. Refer to Subject 20-30-12.
- Shrink the sleeve into position on the completed splice. Refer to Subject 20-10-14.

Make sure that the center of the sleeve is aligned with the center of the splice.

B. Contact Insertion and Rectangular Connector Assembly

Table 12
CONTACT INSERTION TOOLS

Contact Size	Insertion Tool		
	Part Number	Supplier	Tool End Color
2020	M81969/14-10	QPL	Red
1616	M81969/14-03	QPL	Blue

Install the contact assemblies into the new connector:

- For harnesses without the twisted-pair cable, install the original spare contacts and sealing plugs into positions N and S of the new connector.
- Install the contact and wire assemblies into their correct positions in the new connector:

NOTE: As an option for contact installation, wired contacts can be inserted by hand, without an insertion tool

To insert the contact with an insertion tool:

- Make a selection of a contact insertion tool from Table 12.
- Examine the insertion tool.

Make sure that:

- The tool is not broken
- The tool tip is not bent or damaged

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- The tool tip does not have a burr, a nick, or a sharp edge.

- (c) Put the contact assembly in the insertion tool.
- (d) Align the contact assembly with the contact cavity.
- (e) Carefully push the contact assembly into the contact cavity until it stops.

Make sure that the contact assembly and the contact cavity stay aligned.

CAUTION: DO NOT USE MORE THAN THE NECESSARY AMOUNT OF FORCE TO PUSH THE INSERTION TOOL INTO THE CONTACT CAVITY. DAMAGE THE CONTACT RETENTION CLIPS CAN OCCUR.

CAUTION: DO NOT TURN THE TOOL CLOCKWISE OR COUNTERCLOCKWISE WHEN IT IS IN THE CONTACT CAVITY. DAMAGE THE CONTACT RETENTION CLIPS CAN OCCUR.

- (f) Carefully pull the tool out of the contact cavity.

Make sure that the tool and the contact cavity stay aligned.

- (3) Lightly pull the wires to make sure that the contact is locked in the connector.

CAUTION: DO NOT PULL THE WIRE WITH A STRONG OR A SUDDEN FORCE. DAMAGE TO THE CONNECTOR OR THE CONTACT CAN OCCUR.

CAUTION: DO NOT MAKE A DENT IN THE WIRE INSULATION WITH THE FINGERNAILS. UNSATISFACTORY PERFORMANCE OF THE WIRE CAN OCCUR.

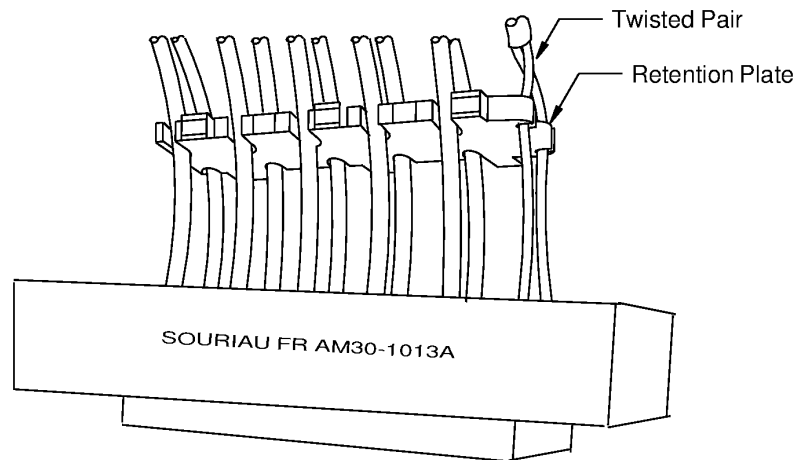
- (4) If the contact is not locked in the connector:
 - (a) Do Step 4.B.(2) and Step 4.B.(3) again.
- (5) Push the wires into their original positions in the slots in the retention plate. Refer to Figure 17.

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WIRES IN THE SLOTS OF THE RETENTION PLATE

Figure 17

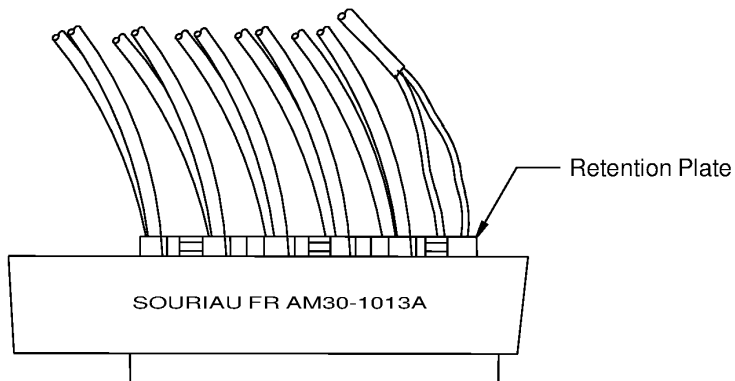
- (6) Move the retention plate toward the connector, along the wires until it stops. Refer to Figure 18. Make sure that the wires of the twisted pair do not bend under the plate.

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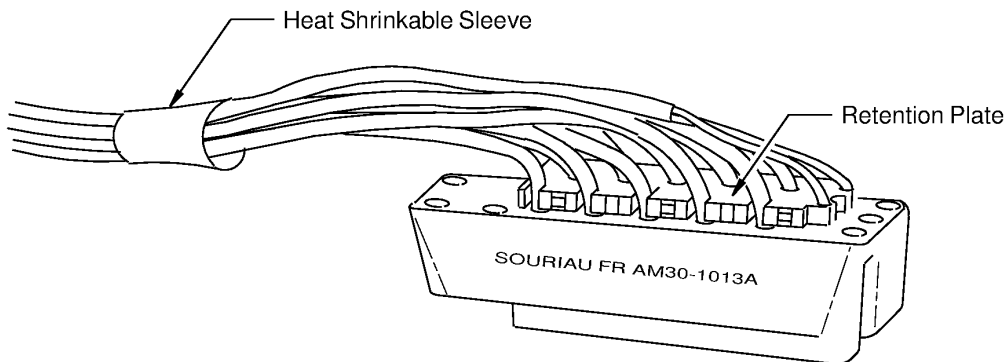


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POSITION OF THE RETENTION PLATE AGAINST THE REAR FACE OF THE CONNECTOR

Figure 18

- (7) Bend all of the wires approximately 90 degrees. Refer to Figure 19.



2449938 S00061545921_V1

APPROXIMATE 90 DEGREE BEND OF THE WIRES

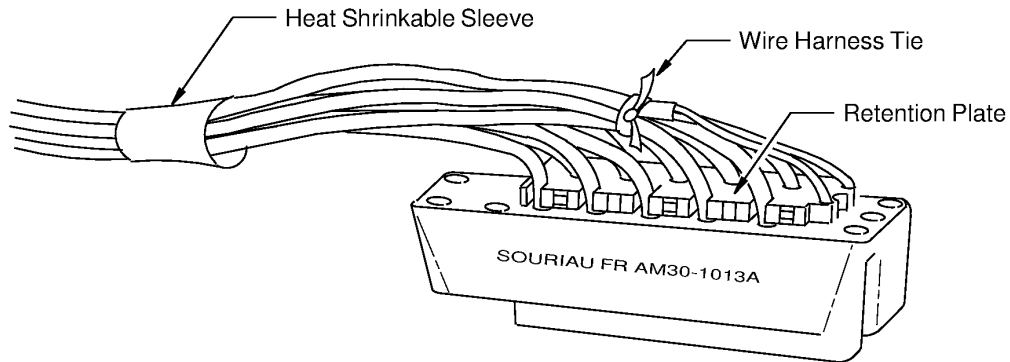
Figure 19

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- (8) Assemble a lacing tape wire harness tie around the wires from positions A, L, B and K (and the twisted-pair if it is there) approximately 1 inch from the back of the connector. Refer to Figure 20.



2449939 S00061545922_V1

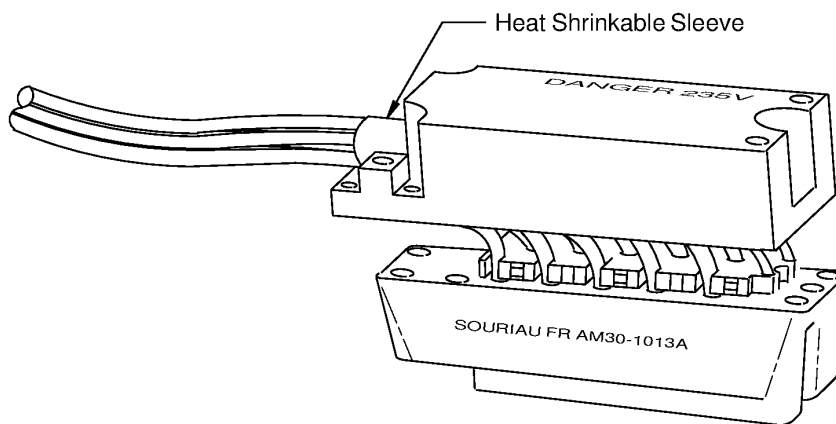
**POSITION OF THE LACING TAPE WIRE HARNESS TIE AROUND WIRES A, L, B, AND K
Figure 20**

- (9) Push the heat shrinkable sleeve back to the saddle clamp area of the wire harness.
- (10) Apply heat to the heat shrinkable sleeve to shrink it in its initial position. Refer to Subject 20-10-14.
- (11) Carefully, push the backshell on the connector. Refer to Figure 21.
Make sure not to cause damage to the insulation of the wires.



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2449940 S00061545923_V1

POSITION OF THE BACKSHELL FOR INSTALLATION ON THE CONNECTOR

Figure 21

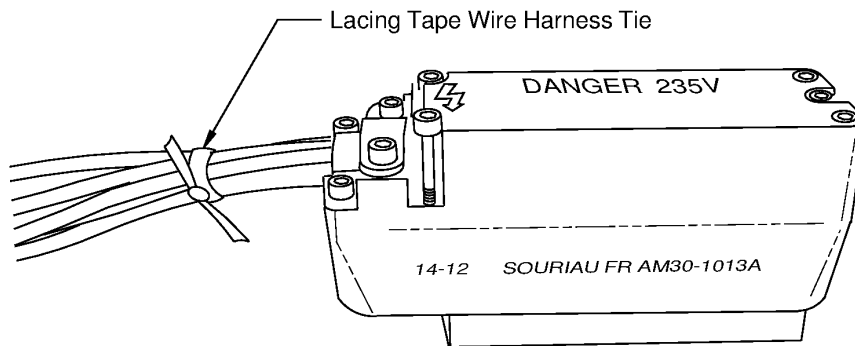
- (12) Install the four screws that hold the backshell to the connector. Refer to Figure 10.
- (13) Tighten these four screws to 8 inch-pounds ± 1 inch pound.
- (14) Install the saddle clamp and the two saddle clamp screws. Refer to Figure 9.
Make sure that the saddle clamp does not pinch the heat shrinkable sleeve and the wires.
- (15) Install the three longer, captivated screws that will hold the plug to the receptacle. Refer to Figure 8.
- (16) Assemble a lacing tape wire harness tie on the harness near the connector. Refer to Figure 22.

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2449941 S00061545924_V1

ASSEMBLED CONNECTOR

Figure 22

- (17) Do a test of the assembly that will make sure that the wires and contacts are in the correct locations in the connector.

5. CIRCULAR CONNECTOR DISASSEMBLY

A. Removal of the Circular Backshell and the Sleeve of the Harness

**Table 13
NECESSARY TOOLS**

Tool	Part Number or Description	Supplier
Connector Anti-Rotation Tool	CM389T-25A	Daniels
Screwdriver	Flat Blade	An available source
Strap Wrench	BT-BS-611	Daniels

**Table 14
NECESSARY MATERIALS**

Material	Description	Supplier
A-A-59163 Type I	Silicone Tape	Refer to Subject 20-10-11

CAUTION: OBEY THE SAFETY PROCEDURES. REFER TO SUBJECT 20-00-10.

- (1) Make a selection of a flat blade screwdriver from Table 13.
- (2) With the screwdriver, remove these from the backshell:

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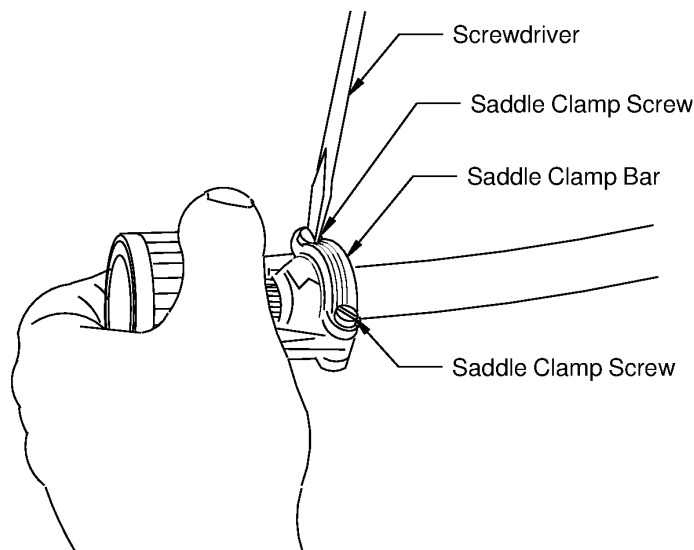
REPAIR OF THE 787 WING ICE PROTECTION SYSTEM (WIPS) WIRE HARNESS

- The saddle clamp screws
- The saddle clamp bars.

Refer to Figure 23.

Make sure to keep:

- The saddle clamp screws
- The saddle bars.



2449951 S00061545925_V1

REMOVAL OF THE SADDLE CLAMP SCREWS

Figure 23

- (3) Remove the backshell from the connector:
- (a) Make a selection of these tools from Table 13:
- A connector anti-rotation tool
 - A strap wrench.
- (b) Hold the connector with the anti-rotation tool, and at the same time, turn the backshell coupling ring with the strap wrench.

Make sure that:

- adapter socket of the anti-rotation tool is aligned with the polarizing keys of the connector shell.
- the adapter socket of the anti-rotation tool is fully inserted into the face of the connector shell.

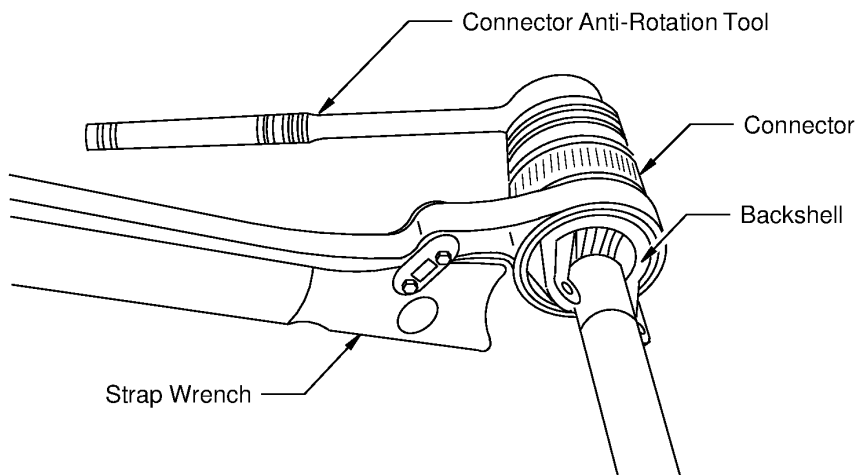
Refer to Figure 24.

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CAUTION: DAMAGE TO THE CONNECTOR CAN OCCUR IF THE ADAPTER SOCKET OF THE ANTI-ROTATION TOOL IS NOT:

- ALIGNED WITH THE POLARIZING KEYS OF THE CONNECTOR SHELL
- FULLY INSTALLED IN THE FACE OF THE CONNECTOR SHELL



2449952 S00061545927_V1

REMOVAL OF THE BACKSHELL FROM THE CONNECTOR

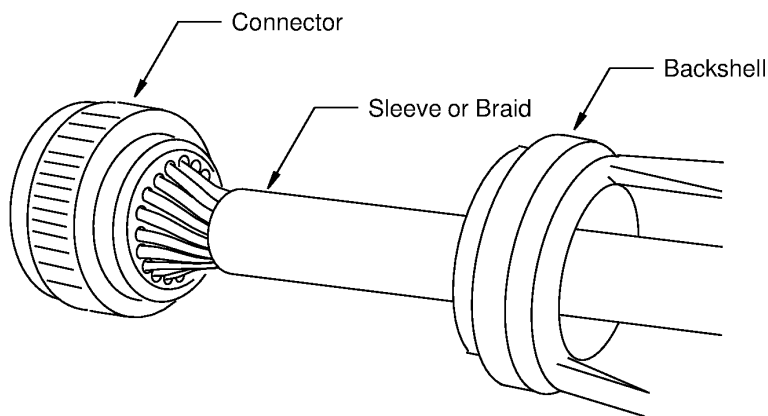
Figure 24

- (4) Remove the rubber cushion strip that is around the harness under the saddle bars.
For the assembly of the connector again, make sure to:
 - Record the position of the rubber cushion strip
 - Keep the rubber cushion strip.
- (5) Push the backshell rearward on the wire harness. Refer to Figure 25.



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2449953 S00061545928_V1

BACKSHELL REMOVED FROM THE CONNECTOR

Figure 25

- (6) Carefully remove approximately 3 inches of the sleeve or the nomex braid on the harness at the rear of the connector. Refer to Figure 26.

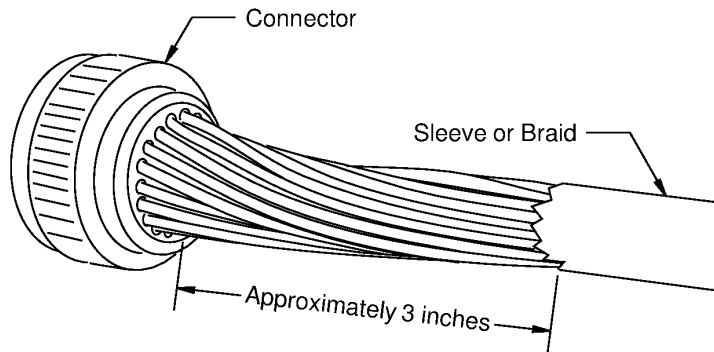
CAUTION: MAKE SURE TO PREVENT DAMAGE TO THE WIRES WHILE THE SLEEVE OR THE BRAID IS REMOVED.

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SLEEVE OR BRAID REMOVED

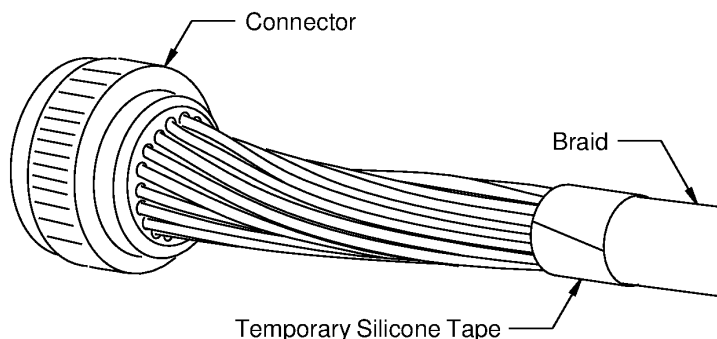
Figure 26

- (7) For a harness that has a braided sleeve, If 3 inches of the braided sleeve was removed:
 - (a) Make a selection of a silicone tape from Table 14.
 - (b) Wind two layers of the silicone tape around the harness on the end of the braided sleeve to help make sure that the end of the braided sleeve keeps its weave. Refer to Figure 27.

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POSITION OF THE TEMPORARY SILICONE TAPE
Figure 27

B. Circular Connector Contact Removal

- (1) Identify each wire with a tape tag that indicates its contact cavity location in the connector.

NOTE: Identification of the wires is necessary for the correct assembly of the connector again.

CAUTION: DO NOT CUT A WIRE, OR REMOVE A CONTACT FROM ITS WIRE. IF A CONTACT IS REMOVED FROM ITS WIRE, THE WIRE HARNESS WILL NOT HAVE THE LENGTH NECESSARY TO CORRECTLY INSTALL THE CONNECTOR AGAIN.

- (2) Remove the contact and wire assemblies from the connector.

Refer to Subject 20-63-19 for the procedures to remove the contacts from the connector.

6. CIRCULAR CONNECTOR ASSEMBLY

A. Wire Harness Sleeve or Braid Replacement - Circular Connector

Table 15
NECESSARY MATERIALS

Material	Part Number	Supplier
Heat Shrinkable Sleeve	M23053/5-110-0	QPL

- (1) If the sleeve of the harness is a braided sleeve, remove the temporary layers of the silicone tape.
- (2) If the initial sleeve of the harness is a braided sleeve, assemble a lacing tape wire harness tie on the end of the braided sleeve to keep the weave of the braid in its position.

Refer to Subject 20-10-11 for the procedure to assemble the tie.

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- (3) Remove the unwanted length of the lacing tape from the wire harness tie.
Make sure that the distance from the knot to the end of the lacing tape is approximately 0.25 inch.
- (4) Make a selection of a heat shrinkable sleeve from Table 15.
Make sure that the diameter of the sleeve is sufficient to fit on:
 - The harness
 - The initial sleeve or braid
 - The lacing tape tie.
- (5) Cut a length of the sleeve 4.0 inches ± 0.4 inch.
- (6) Push the sleeve on the contacts and the wire harness.

NOTE: The sleeve is to remain in the non-shrunk configuration until the completion of contact installation.

B. Circular Connector Contact Insertion

Table 16
NECESSARY PARTS

Item	Part Number	Supplier	Replacement Condition
Connector	8D525X37PN402	Souriau	Replace the connector if it has damage
Connector Backshell with Strain Relief Cable Clamp	620HS042XO25	Glenair	Replace the strain relief backshell if it has damage

- (1) If the initial backshell does not have damage, make sure that:
 - The backshell is on the wire harness
 - The legs of the backshell point rearward on the harness.
- (2) If the initial backshell has damage:
 - (a) Discard the initial backshell.
 - (b) Make a selection of a new backshell from Table 16.
 - (c) Put the new backshell on the wire harness.
Make sure that the legs of the backshell point rearward on the harness.
- (3) If the initial connector has damage:
 - (a) Discard the initial connector.
 - (b) Make a selection of a new connector from Table 16.

WARNING: DO NOT REPLACE THE 8D525X37PN402 CONNECTOR WITH A STANDARD MIL-DTL-38999 CONNECTOR. THE 8D525X37PN402 CONNECTOR IS A SPECIAL BREAK-AWAY CONNECTOR. THE USE OF A DIFFERENT CONNECTOR WILL DECREASE SAFETY.

- (4) Install the contact assemblies and the seal plugs into the connector.
Refer to Subject 20-63-19 for the procedures to Install the contact assemblies.

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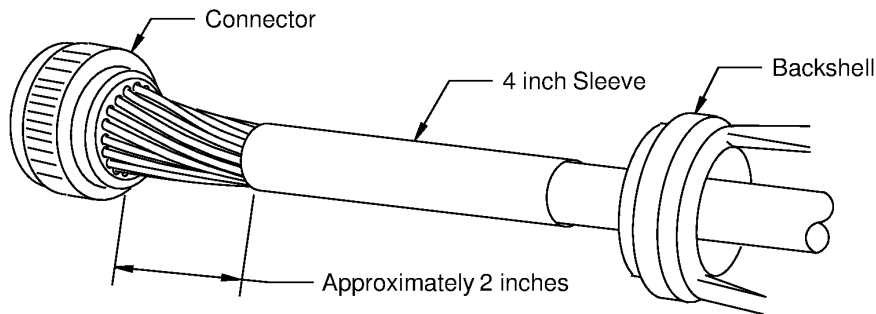
- (5) Do a test of the assembly that will make sure that the wires and contacts are in the correct locations in the connector.

C. Circular Connector Backshell Installation

**Table 17
NECESSARY TOOLS**

Tool	Part Number or Description	Supplier
Connector Anti-Rotation Tool	CM389T-25A	Daniels
Screwdriver	Flat Blade	An available source
Strap Wrench	BT-BS-611	Daniels
Torque Tool	Screwdriver	An available source

- (1) Push the backshell rearward on the wire harness away from the connector.
- (2) Push the heat shrinkable sleeve to its correct position on the wire harness. Refer to Figure 28.
Make sure that the forward end of the sleeve is approximately 2.0 inches from the grommet of the connector.



2449956 S00061545934_V1

POSITION OF THE NEW HEAT SHRINKABLE SLEEVE

Figure 28

- (3) Shrink the sleeve into its position on the harness.
Refer to
 - Figure 28
 - Subject 20-10-14 for the procedure to shrink the sleeve.
- (4) Temporarily, push the backshell forward to the connector.

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- (5) Mark the location on the wires where the saddle clamp will be located.
- (6) Push the backshell rearward on the wire harness away from the connector.
- (7) Wind the cushion strip around the wire harness at the location of the saddle clamp.
- (8) Install the backshell:
 - (a) Make a selection of these tools from Table 17:
 - A connector anti-rotation tool
 - A strap wrench.
 - (b) Push the backshell forward on the harness toward the connector.
 - (c) Engage the threads of the backshell coupling ring with the rear accessory threads of the connector.
 - (d) Hold the connector with the anti-rotation tool, and at the same time, turn the backshell coupling ring with the hand.
 - (e) Hold the connector with the anti-rotation tool, and at the same time, turn the backshell coupling ring with the strap wrench.

Make sure that

- The adapter socket of the anti-rotation tool is aligned with the polarizing keys of the connector shell.
- The adapter socket of the anti-rotation tool is fully inserted into the face of the connector shell.
- Make sure that the backshell coupling ring is one-quarter turn more than hand-tight on the connector.

Refer to Figure 29.

CAUTION: DAMAGE TO THE CONNECTOR CAN OCCUR IF THE ADAPTER SOCKET OF THE ANTI-ROTATION TOOL IS NOT:

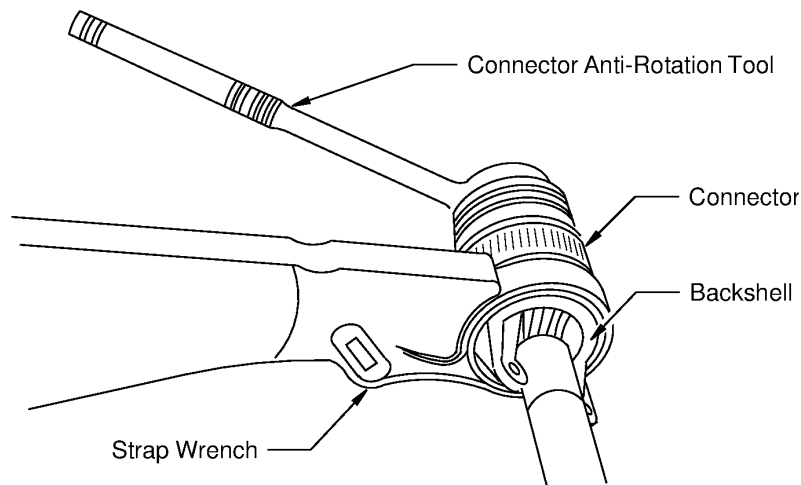
- ALIGNED WITH THE POLARIZING KEYS OF THE CONNECTOR SHELL
- FULLY INSTALLED IN THE FACE OF THE CONNECTOR SHELL

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POSITION OF THE CONNECTOR, THE ANTI-ROTATION TOOL AND THE STRAP WRENCH

Figure 29

- (f) Make sure that the backshell coupling ring is one-quarter turn more than hand- tight on the connector.
- (9) Install the saddle clamp bars and the saddle clamp screws.
Make sure that the saddle clamp is correctly aligned with the cushion strip.
- (10) Torque the saddle clamp screws to 6 inch-pounds ± 2 inch-pounds.

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