
ELE-3COP-532

Title – Installation Procedure for TCFS/TCFR Feedthrough Assemblies

Before starting work please read this document carefully and note the guidance given.

1 Purpose and Scope

This COP describes the procedure to be used when installing 180° TCFS/TCFR feedthrough assemblies. The instructions in this document take preference over IPC/WHMA requirements, as do the drawing and any customer documentation.

It is good working practice that where trained operators have not installed this product for over 6 months, a sample installation should be carried out by the operator to refresh installation practice. Performance of the sample can be checked using the inspection standards described within this document.

2 Performance Objective

This code of practice is produced to support operators already trained in the installation of heat shrinkable and harnessing products. It identifies the procedure to be used when installing 180° TCFS/TCFR feedthroughs with screened boots and pre-installed adhesive on 'J' end of boot.

3 Materials and Equipment:

Appropriate 180° TCFS/TCFR feedthrough Assembly.

100 grit Emery Cloth or equivalent.

Degreasing Agent isopropyl alcohol or isopropanol (IPA) impregnated tissue wipe.

Heavy duty tissues.

22 SWG Tinned Copper Wire

Heat Gun CV1981 or equivalent. Other hot air guns may be used but these must be capable of delivering the temperatures required for installation of the moulded part. This also includes hot air guns with temperature displays.

Reflector PR 24, PR26 or equivalent.

Heat Resistant Gloves.

Safety Glasses.

4 Health and Safety

Adhere to local Codes and Regulations relating to Safe Working practices. For the U.K. adhere to requirements of the Health and Safety at Work Act 1974 and subsequent amendments.

The installation should be carried out in a well ventilated area.

Always wear heat resistant safety gloves when handling hot plastics and adhesives.

The use of suitable protective gloves and barrier cream is recommended when using solvents.

Avoid prolonged repeated skin contact with solvents and always wash hands after using solvents.

Care should be taken to wear safety glasses when using and handling chemical solvents. If eyes do become contaminated, flush with water and obtain medical assistance immediately.

Always ensure all equipment is calibrated before use.

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5 Procedure

This procedure covers two methods

Method 1

Used for end termination of a cable, e.g., at junction boxes or cabinets.

Method 2

Used for centre termination of a cable bulkhead.

5.1 METHOD 1.

Slide the TCFS/TCFR and the heat shrinkable packing sleeve onto the cable.

5.2 Assemble the cable into the cabinet or junction box.

5.3 Slide the TCFS/TCFR along the cable and temporarily position. Mark the cable where the boot ends. Release the TCFS/TCFR and slide back along the cable. See Figure 1.

5.4 Make a second mark, distance 'A' towards the cabinet from the first mark made in 5.3. See Figure 2. Distance 'A' depends upon the feedthrough size and is given in Table 1.

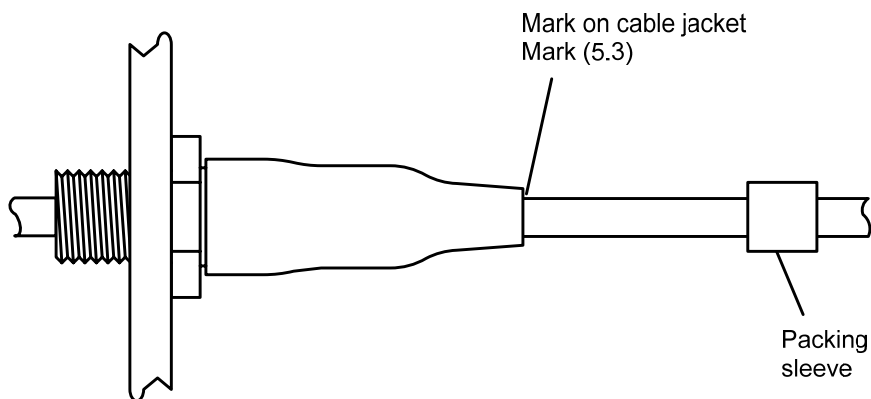


Figure 1

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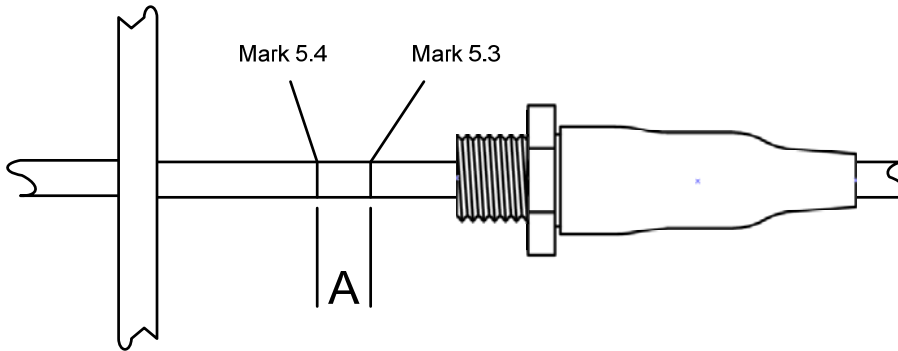


Figure 2

Feedthrough Size	Distance A (mm)
12	10
16	10
20	10
24	15
30	20
36	20
48	25

Table 1

5.5 From the second mark made in 5.4, strip the cable jacket towards the cabinet.

5.6 Cut back the cable shield leaving 20mm exposed from the end of the cable jacket.
See Figure 3

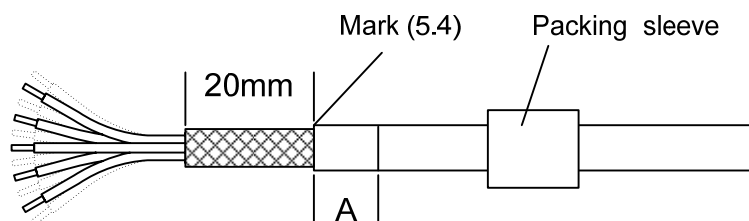


Figure 3

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5.7 Position the heat shrink packing sleeve under the 20mm of the cable shield and shrink in place. Secure the ends of the shield with tinned copper wire, ensuring that the twisted ends are folded flat against the shield. The shield is now built up to a similar diameter to the cable jacket. See Figure 4.

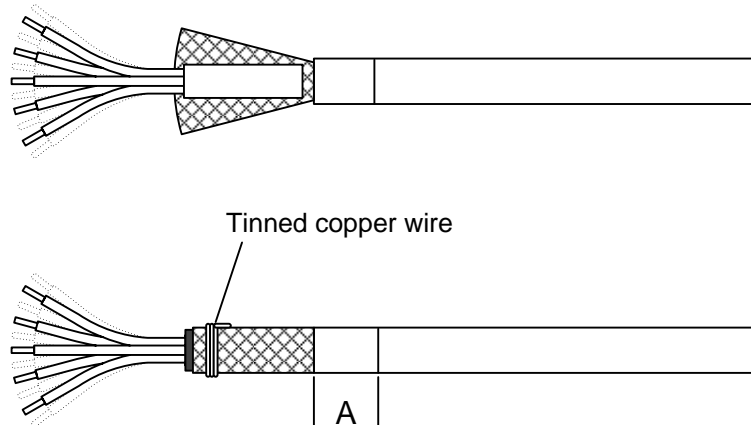


Figure 4

5.8 Degrease the area 'A' and the cable jacket with the cleaning tissue provided.

5.9 Thoroughly abrade area 'A' plus an extra 15mm with the 100 grit emery cloth and then remove any loose particles with a dry tissue. **DO NOT** use a solvent wipe. The whole surface of the cable jacket should be abraded removing any print on the cable jacket. See Figure 5. Take care to avoid abrading the plating of the shield.



Figure 5

This part of the cable preparation is very important in ensuring a strong bond to the moulded part.

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5.10 Assemble the TCFS/TCFR into position and tighten to the specified torque value. See Table 2.

Feedthrough Size	Torque	
	(Nm)	(lb ft)
12	15	10
16	20	15
20	30	20
24	35	25
30	40	30
36	45	35
48	55	40

Table 2

5.11 Shrink the rear of the boot using a CV1981 heat gun, setting 7-8 and a PR24 or PR26 Reflector. Heat until the hot melt adhesive extrudes out. Remove the excess adhesive to leave a small fillet. The total heating time should be 3½ to 4 minutes. SEE NOTE 1.

5.12 Allow to cool to room temperature before flexing.

6.0 METHOD 2.

6.1 Temporarily position the TCFS/TCFR into the bulkhead and ensure that the heat shrinkable adhesive lined sleeve is positioned along the cable away from the bulkhead.

6.2 Feed the cable through the TCFS/TCFR and support the cable in final position.

6.3 Mark the cable where the TCFS/TCFR boot ends. Release the TCFS/TCFR and slide along the cable. See Figure 6

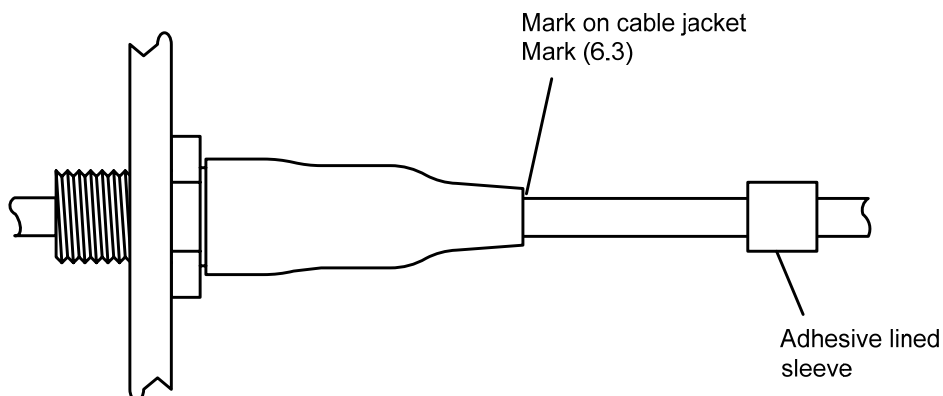


Figure 6

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6.4 Starting from the mark made in 6.3, strip a section of cable jacket towards the bulkhead. See Figure 7. The length to be stripped is determined by the feedthrough size and is given in Table 3. (Distance 'B').

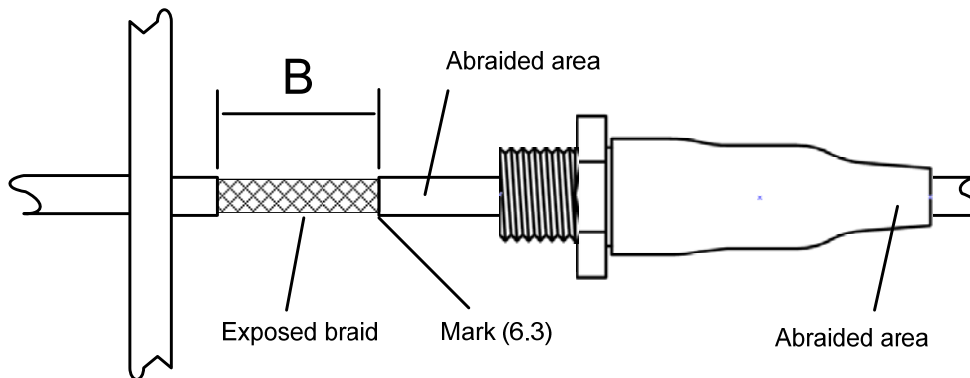


Figure 7

Feedthrough Size	Distance B (mm)
12	25
16	25
20	30
24	40
30	50
36	50
48	55

Table 3

6.5 Degrease the cable jacket, boot and cable shield with the cleaning tissue provided.

6.6 Abrade the cable jacket over a distance of 25mm and the outside cable end of the TCFS/TCFR boot with 100 grit emery cloth and then remove any loose particles with a dry tissue. **DO NOT** use a solvent wipe. The whole surface of the cable jacket should be abraded removing any print on the cable jacket. See Figure 5. Take care to avoid abrading the plating of the shield.

6.7 Assemble the TCFS/TCFR into position and tighten to the specified torque value. See Table 2.

6.8 Shrink the rear of the boot using a CV1981 heat gun, setting 7-8 and a PR24 or PR26 Reflector. Heat until the hot melt adhesive extrudes out. Ensure that the end of the boot is in contact with the cable shield and is butted against the cut shoulder of the cable jacket. The total heating time should be 3½ to 4 minutes.

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6.9 Position the outer adhesive lined sleeve across the joint between the cable jacket and the TCFS/TCFR boot. See Figure 8. Shrink using a CV1981 heat gun, setting 7-8 and a PR24 or PR26 Reflector. Heat until the hot melt adhesive flows out. SEE NOTE 1.

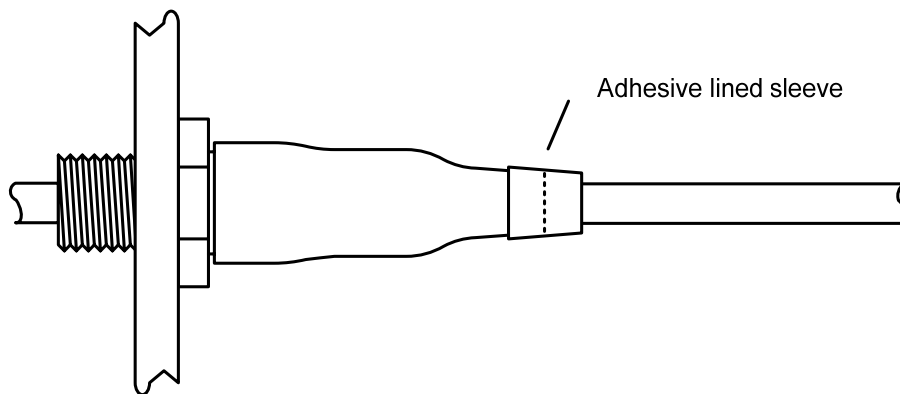


Figure 8

6.10 Allow to cool to room temperature before flexing

NOTE 1

Always ensure that the air vent on the rear of the hot air gun is open and that it is dust free. Always allow the hot air gun to stabilize at the required temperature and setting for two minutes before commencing calibration and installation.

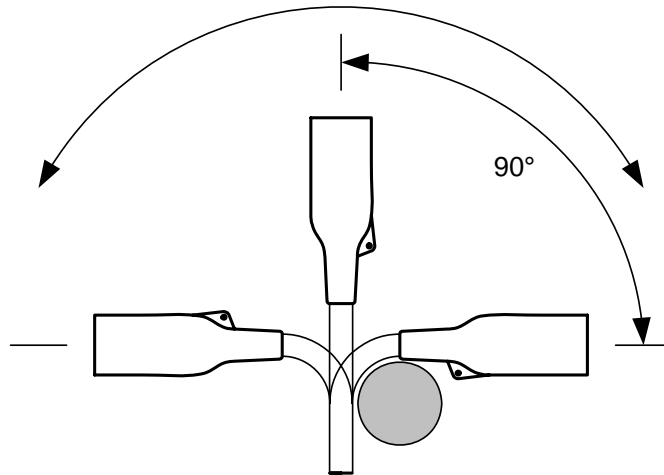
Setting of the gun should be carried out on a regular basis using the following temperatures. Frequency will depend on usage. It is recommended that the Heat gun is set daily using a Calibrated thermocouple 25 mm from the end of the reflector within the temperature range stated opposite. Please refer to the Manufacturers guide for Hot Air Gun Calibration and maintenance.

7 Inspection Requirements

If the installation allows the termination should be rotated so it is subjected to a flex test of 90° in each of four planes around a mandrel with a diameter equal to 6 x the cable diameter.

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There should be no separation between the moulded part H, J and K end and the cable jacket at the adhesive bond line.

The Moulded Part must be free from fingerprints and scorch marks.

7 Visual Standards

No visual standard currently available

Rev No	CR No	Date	Raised	Approved
1	Initial	06/04/11	Paul Newman	Neil Dorricott
2	Visual Identity	07/06/11	Paul Newman	Neil Dorricott

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