ELE-3COP-452

Title – Installation and Torque Tightening of Standard and Type 2 Adaptors.

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 carrying out the installation and torque tightening of adaptors. The instructions in this document take preference over IPC/WHMA requirements, as do the drawing and any customer documentation.

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 installation procedure to be used when installing Standard (including STXR) and Type 2 adaptors to consistently tighten adaptors to specified torque figures in a controlled manner. This Code of Practice describes three methods of torque tightening, TE standard and type 2 adaptors, made from various materials and with a selection of finishes, onto circular electrical connectors.

3 Materials and Equipment:

Connector/Adaptor to be assembled
Loctite™ 243
Loctite™ 7649 primer. (See Section 7 – General Notes)
P80 Rubber Lubricant Emulsion (as required)
WD-40 lubricant
Glenair Assembly Tool Ref 600-006-X (modified as necessary to meet the dimensions in Table 2).
Glenair Bench mounted torque wrench type 600-007
Glenair Strap spanner TG70
Torqueleader torque wrench type TSN 25 O or TLS 1360
Torqueleader torque wrench type ADS 12A
Dummy receptacle
4mm artist flat end brush (See Detail 1)
Note - The use of soft jaw pliers such as Glenair TG69 are not recommended as distortion of the coupling nut may occur giving false torque readings

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.
Adhere to the manufacturers MSDS (Manufactures Safety Data Sheet) for the use of lubricants and primers.
Assemble parts in a well ventilated area.

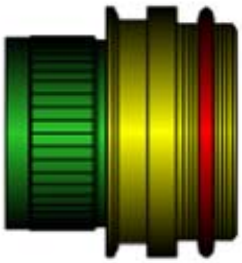
5 Adaptor Types

Standard adaptor - is generally a one-piece assembly comprising of a spin coupling nut, threaded to screw onto the connector, and a follower designed to accept a heat shrink moulded part and, if required, a method of terminating shield for shielding.
Standard adaptors have a maximum entry size for a given shell size of connector. If a larger entry size is required to clear a large cable diameter, an STXR or Type 2 adaptor can be supplied.

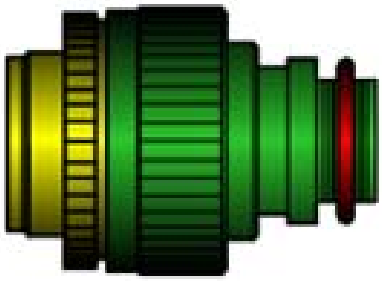
STXR adaptor – only available as Tinel adaptors, STXR parts are a single piece design which in a larger than standard entry size can be specified in a one piece assembly.

Type 2 adaptor - has an extra threaded component that screws onto the connector facilitating the use of a larger adaptor with the required entry size. Type 2 adaptors for codes with anti rotation teeth are supplied with an internal toothed bush.

Standard



STXR



Type 2

6 Adaptor Materials and Platings

There is a range of material and plating options available for an adaptor. It is important that you choose a combination to match the connector. If the materials are incompatible, galvanic corrosion could damage the components. The following table lists the most common material and finish options. Others are available, please contact TE Product Management for advice.

Material	Code	Plating Finish Coding
Aluminium Alloy Spin and Braided Tinel and Bandstrap	 19 A	B-Olive Drab Cadmium, C-Nickel, G-Anodize, U-Zinc Cobalt, Z-Zinc Nickel
Stainless Steel Spin and Braided Tinel and Bandstrap	 62 S	C-Nickel, J-Passivate, W-Shot Blast

Nickel Aluminium Bronze Spin and Braided Tinel and Bandstrap	01 B	W-Shot Blast
Brass Spin and Braided Tinel and Bandstrap	29 D	B-Olive Drab Cadmium, C-Nickel,

7 General Notes

General notes

When using Type 2 Adaptors extra care is required to ensure that the anti rotation teeth have interlocked. Feel for the positive alignment and meshing of the anti rotation teeth by gently twisting the adaptor follower back and forth. Only torque tighten when you feel that this has been achieved. Always hand check for tightness.

Where a rubber bung or grommet is used with the connector / adaptor it is recommended to apply a light coating of P80 Rubber Lubricant to the outside of the bung if required to ease assembly.

The use of a primer is not normally required with TE adaptors. Loctite™ 7649 primer may be used where increased cure speed of Loctite™ 243 is required. Loctite™ recommend primer for applications when prevailing temperature is low <15°C. Users should independently evaluate the suitability of the use of primer for their application and refer to the Loctite™ technical data sheet.

All adaptor types use the same torque tightening procedure with the exception of parts with Zinc Cobalt plating which require lubricating and the application of Loctite™ 243 during assembly, as specified within this document. For Zinc Cobalt Plated Adaptors apply a light coating of WD-40 lubricant to the rear of the adaptor spin nut. This method avoids excessive WD40 contaminating other areas of the adaptor and causing problems with wrench strap slipping or the curing of Loctite™. Apply Loctite™ 243 to the connector threads as per ELE-3COP-451 and visual aids referred to in this document.

Application of lubricant

8 Procedure

Ensure equipment used for torque measurement will not scratch or damage the connector or adaptor plating and metal work. Ensure no damage occurs to connector mating face, keyways and shell during torque process. It is recommended that a regular check on the dummy receptacle is carried out for excessive wear / fit which may cause damage to the connector.

Method 1- Production, high volume repetition

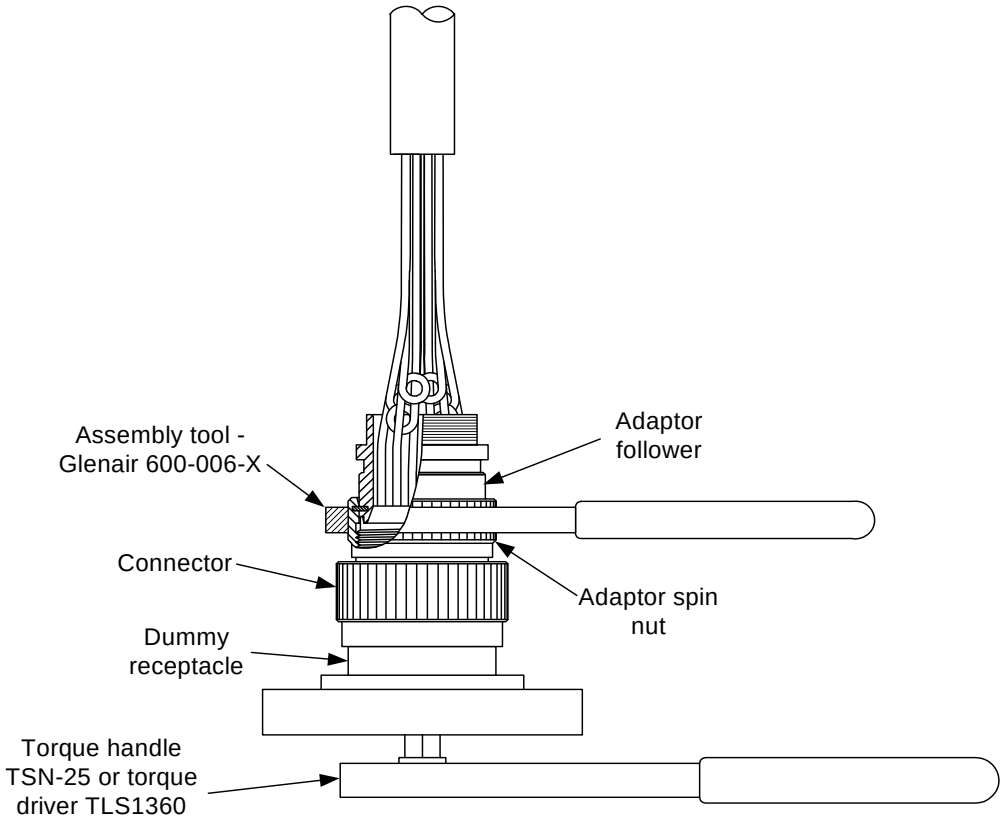


Fig 1

Refer to section 7 of this procedure regarding Zinc Cobalt plated adaptors, for other plating finishes apply Loctite™ 243* or as specified in manufacturing documentation.
Finger tighten adaptor onto connector thread, ensuring no wires are trapped. Feel for the positive alignment and meshing of the anti rotation teeth by gently twisting the adaptor follower back and forth.

Ensure the torque equipment is calibrated. Set the torque value for the adaptor shell size, as table 1.
Locate the dummy receptacle mounting plate on the torque wrench.
Locate connector with the dummy receptacle.
Select the appropriate Glenair Tool 600-006-X and hold the adaptor spin coupling nut. Do not use excessive grip.
Tighten adaptor spin coupling nut with the Glenair tool. When the nut begins to tighten, relax grip and rotate tool back 90°, then resume grip and continue to tighten. Repeat this operation until sufficient torque is applied for the torque wrench handle to 'break'.
Repeat applied torque four times consecutively, ensuring that the torque handle breaks at each operation.

Method 2- Prototype, low volume

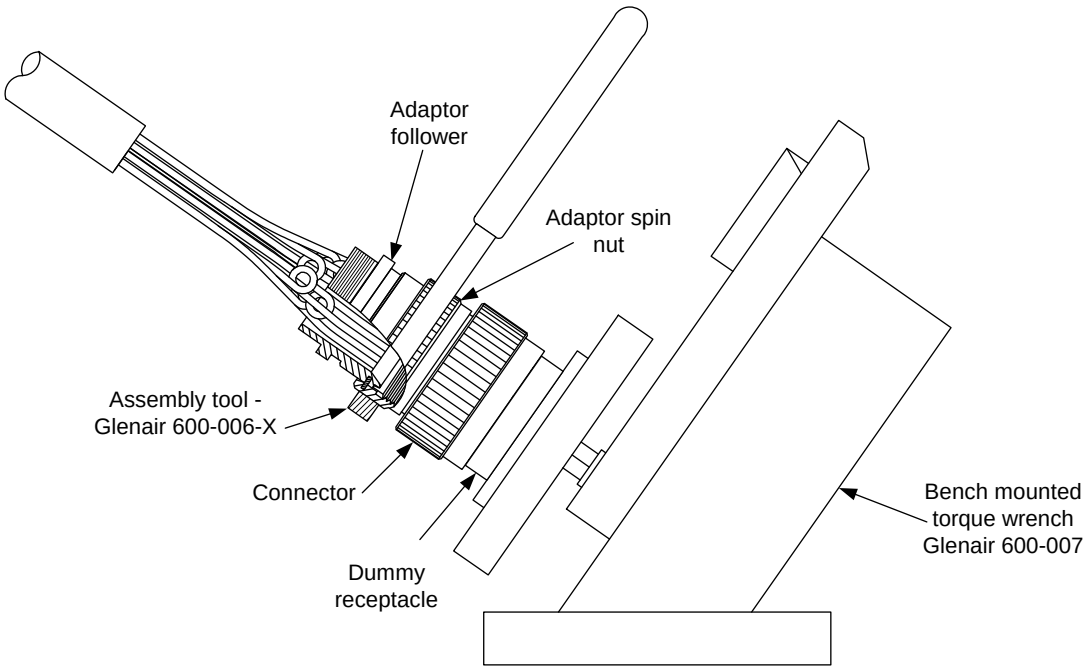


Fig 2

Refer to section 7 of this procedure regarding Zinc Cobalt plated adaptors, for other plating finishes apply Loctite™ 243 or as specified in manufacturing documentation.
Finger tighten adaptor onto connector thread, ensuring no wires are trapped. Feel for the positive alignment and meshing of the anti rotation teeth by gently twisting the adaptor follower back and forth.
Ensure bench mounted torque equipment is calibrated. Set the audio warning pointer to the required torque value for the adaptor shell size, as per table 1. Ensure that the main pointer is aligned with zero on the scale.

Locate the dummy receptacle mounting plate on the torque equipment.
Locate connector on the dummy receptacle mounting plate.
Select the appropriate Glenair Tool 600-006-X and hold the adaptor spin coupling nut. Do not use excessive grip.
Tighten adaptor spin coupling nut with the Glenair tool. When the adaptor spin coupling nut beings to tighten, relax grip and rotate tool back 90°, then resume grip and continue to tighten.
Repeat this operation until sufficient torque is applied for the audio warning to operate.
Do not apply torque in excess of the signal setting. Excess torque may cause the pointer to reset and give erroneous readings.
Repeat applied torque four times consecutively, ensuring that the torque handle breaks at each operation.

Method 3- In service, field installation

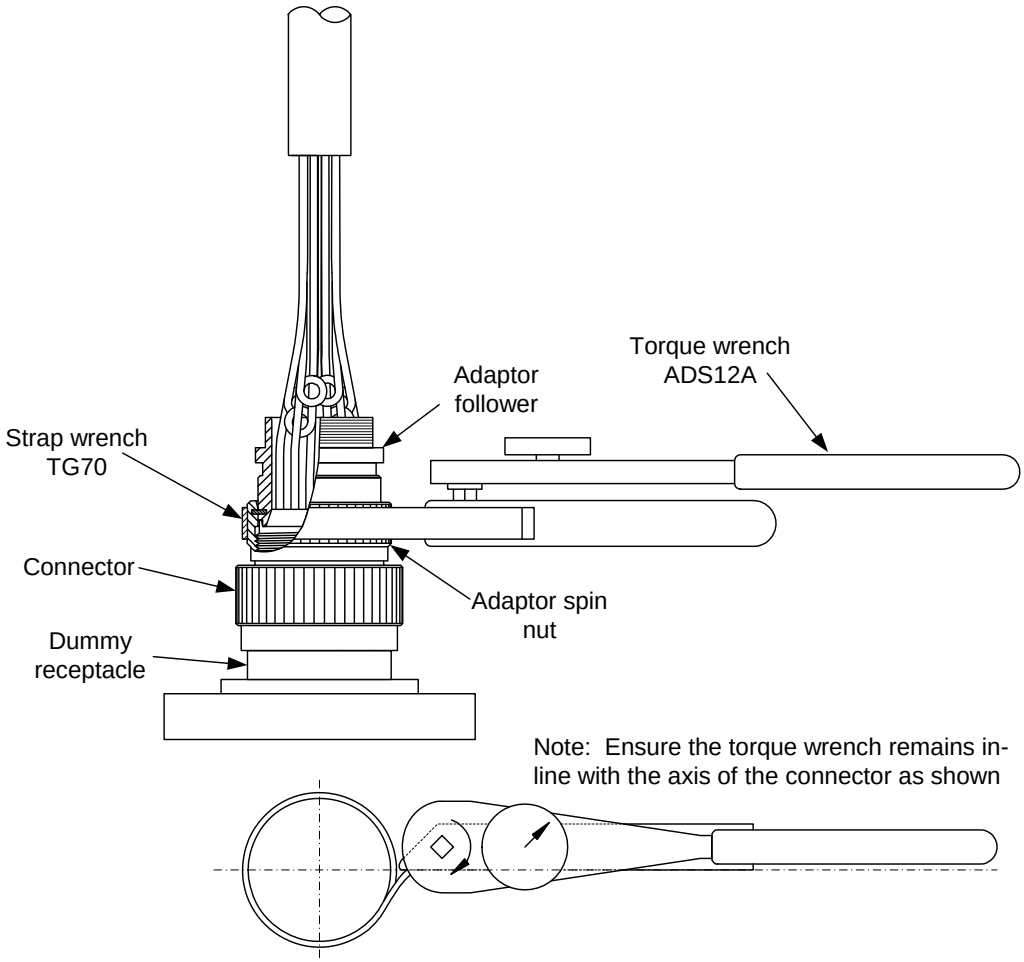
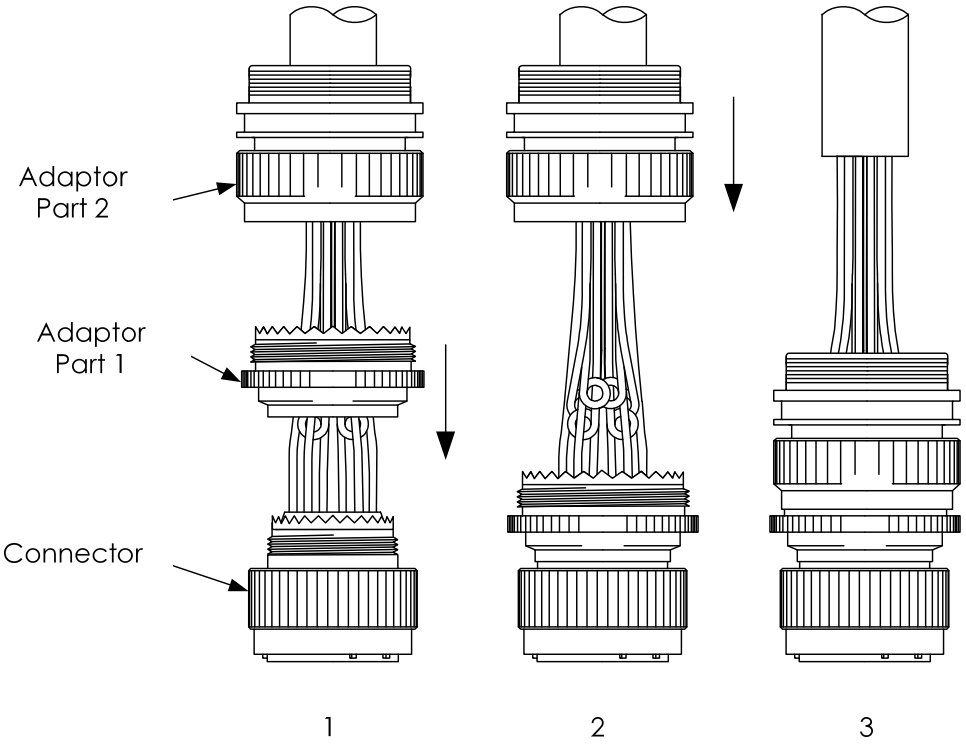


Fig 3

Refer to section 7 of this procedure regarding Zinc Cobalt plated adaptors, for other plating finishes apply Loctite™ 243 or as specified in manufacturing documentation.
Finger tighten adaptor onto connector thread, ensuring no wires are trapped. Feel for the positive alignment and meshing of the anti rotation teeth by gently twisting the adaptor follower back and forth.
Set the torque value for the adaptor shell size, as Table 1.
Locate connector on the suitable dummy receptacle mounting plate.
Fit the torque wrench to the strap spanner, and locate the strap spanner centrally on the body of the adaptor spin coupling nut.
Tighten adaptor spin coupling nut with the strap spanner/torque wrench. When adaptor spin coupling nut begins to tighten, relax the strap spanners grip and rotate tooling back 90° then resume grip and continue to tighten. Repeat this operation until sufficient torque is applied for the torque handle to break.
Repeat applied torque 4 times consecutively. Ensure that the torque wrench remains axial to the connector centre line when carrying out the torque operation.

Type 2 Adaptors



Apply a light coating of WD-40 lubricant to the internal bush and any 'O' rings that are present in the Part 1 adaptor using a brush. Apply Loctite™ 243 to the Part 1 adaptor as per ELE-3COP-451 and visual aids referred to in this document.

Screw the Part 1 Adaptor onto connector thread, ensuring no wires are trapped. Feel for the positive alignment, meshing and bottoming of the anti rotation teeth whilst finger tightening. Unscrewing and re-tightening whilst checking for differences in thread engagement will show when the teeth are fully meshed. Torque tighten in accordance with relevant method described previously.
Apply Loctite™ 243 to the Part 2 adaptor as per ELE-3COP-451 and visual aids referred to in this document. Torque tighten the Part 2 adaptor in accordance with the relevant method described previously.

Tables

Table 1 gives the recommended torque values for use with TE adaptors described in this document.
Table 1

	DEF STAN 59-35 PATT 121B MIL-DTL-5015 (MS31 Series) MIL-DTL-26482 Series I MIL-C-26500 MIL-C-27599 MIL-DTL-38999 Series I & II MIL-C-81511 Series I - IV MIL-C-81703 Series I		MIL-DTL-5015 (MS34 Series) MIL-C-22992 MIL-DTL-26482 Series II MIL-C-28840 MIL-DTL-38999 Series III & IV MIL-C-81703 Series III MIL-C-83723 Series I, II, III	
Connector Shell Size	lbs ins ± 5	Nm ±0.5	lbs ins ± 5	Nm ±0.5
03	35	3.9	56	6.3
08	35	3.9	56	6.3
09,A	35	3.9	56	6.3
10, 10SL	35	3.9	76	8.6
11,B	35	3.9	76	8.6
12, 12S	50	5.4	108	12.2
13,C	50	5.6	108	12.2
14	50	5.6	116	13.1
15,D	50	5.6	116	13.1
16, 16S	70	7.9	116	13.1
17, E	70	7.9	116	13.1
18	70	7.9	116	13.1
19, F	70	7.9	116	13.1
20	90	10.1	136	15.4
21, G	90	10.1	136	15.4
22	90	10.1	136	15.4
23, H	90	10.1	136	15.4
24	110	12.4	136	15.4
25, J	110	12.4	136	15.4
28	110	12.4	148	16.7
32	120	13.6	148	16.7
36	120	13.6	148	16.7

For other adaptor codes, please contact TE Product Management for advice.

Table 2 defines the diameter modifications to the jaws of Glenair assembly wrench 600-006-X to ensure the correct fit to TE adaptor spin nuts. They only apply to the adaptor codes and shell sizes listed. It is the user's responsibility to ensure that the tooling used is a correct fit, and does not damage the adaptor or connector.

Table 2

	Adaptor Code				
Connector Shell Size	40	41	54	75/78	76
03			16.5		
08	17.0				
10	20.5				
12	24.5			20.0	
14		26.0		23.5	
16	32.0			26.5	31.5
18	35.5				
20	38.0			35.0	
22	41.0			38.0	
24	44.5	42.5		41.0	43.0
28				47.5	
32			56.0	54.0	

9 Inspection Requirements

Ensure that there is no excessive Loctite™ present.
Ensure that there is no excessive WD40 present.
Check for damage to the connector after torque tightening.
Check for damage to the adaptor after torque tightening.
Check by hand that each adaptor is tight.

10 Visual Standards

ACCEPTABLE
Loctite™ positioned on the first 2 to 3 threads

NOT ACCEPTABLE
Insufficient Loctite™ applied

NOT ACCEPTABLE
Loctite™ applied to incorrect position, must be first 2/3 threads

Rev No	CR No	Date	Raised	Approved
7	CR06-DM-071	02/05/06	John Cronin	Ken Wallington
8	CR09-DM-018	10/02/09	Paul Newman	Neil Dorricott
9	Visual Identity	06/06/11	Paul Newman	Neil Dorricott
10	SEE DMTEC	06/06/12	John Cronin	Paul Newman
11	SEE DMTEC	04/12/13	John Cronin	Frederik Morel