

1.0 Scope

The Raychem spin lock adapter is a variable angle backshell able to achieve angles of 0° (straight through), 45° and 90°, terminate the shield braid using Tinel-Lock rings and provide strain relief.

This assembly guide defines the general assembly requirements of TE Connectivity drawings for Raychem spin lock adapters with aluminum cable clamp strain relief.

2.0 Applicable Documents

TE Customer drawings

- SLC40 – Spin Lock Adapter Saddle Clamp, Code 40
- SLC41 – Spin Lock Adapter, Code 41
- SLC54 – Spin Lock Adapter, Code 54
- CH00-0250-019 – Spin Lock Adapter Ordering Information

TE Installation procedures

- ELE-3COP-452 – Installation and Torque Tightening of Standard and Type 2 Adapters
- TUS-41-3030 – Side Entry Bushing (SEB) High Temperature Cable Clamp Bushing Installation Instructions.

3.0 SAFETY PRECAUTIONS

All personnel performing the procedures outlined in this document should have the following safety protection equipment.

- Provide Eye Protection and other personal protection equipment (PPE) as required.
- Provide High Temperature Safety Equipment as required.
- Material Safety Data Sheets (MSDS) from the manufacturer should be made available. If none are available, contact the manufacturer as required. For Raychem products, MSDS are available on-line at www.tycoelectronics.com.

4.0 Part Description

Open SLC Series Spin Lock Adapters with Aluminum Saddle Clamp Strain Relief

The components for aluminum spin lock adapters are provided in a plastic bag under a specific part number and appear similar to the components shown in Figure 1.

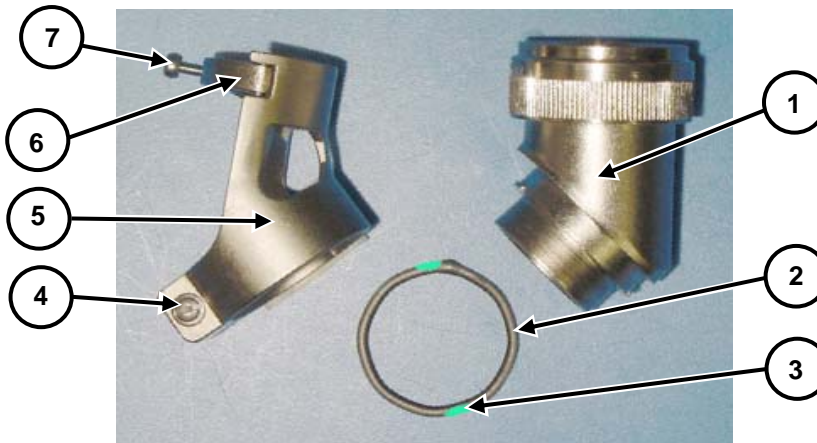


Figure 1. Aluminum Spin Lock Backshell Component Identifications

1. Backshell
2. Tinel-Lock ring
3. Thermochromic indicator (2 Places)
4. Collar screw
5. Aluminum spin lock strain relief
6. Saddle clamp
7. Saddle clamp screw

5.0 Application Tool Part Numbers/Descriptions

- CV-1981-PID – Heat Gun
- AD-5000-TINEL-ASSY (220/240V) – Tinel-Lock Installation Tool (available all locations)
- RH-3960-1-TINEL-KIT - 120V – Tinel-Lock Installation Tool (not available in Europe)
- DMC BT-ST-300D – Torque wrench (or equivalent)
- DMC BT-BS-610T – Torque strap wrench (or equivalent)
- LOCTITE® 243 – per ELE-3COP-452
- Medium Phillips screwdriver (1) and medium flat-blade screwdriver (1)

6.0 Installation Procedure

6.1 Installation Preparations

This procedure describes how to mark the backshell and the strain relief for use when aligning the strain relief to the backshell to create the desired angles for cable strain relief. The marks made in this procedure will be referred to later in Section 6.4, *Spin Lock Strain Relief Connection and Backshell Alignment*.

1. Mark the backshell and strain relief according to the desired angles found in Table 1.

The additional marking points help in finding the desired angle points, even though some of these marking points are not used in the actual alignment.

Table 1. Desired Connection Angle Marking Points

Desired Angle	Backshell Marking Locations	Strain Relief Marking Locations
0° (Straight Through)	Mark A	Mark G
45° Right	Mark D	Mark G
90°	Mark A	Mark F
45° Left	Mark D	Mark F

2. Mark backshell on upper body with a removable-ink pen, using the parting line as reference for mark A as shown in Figure 2.
3. Mark backshell at D and C reference marks in Figure 2, using a marking pen.
4. Mark backshell at approximately half way between mark A and B, or mark A and C, and label as mark E or mark D, as shown in Figure 2, using a marking pen.

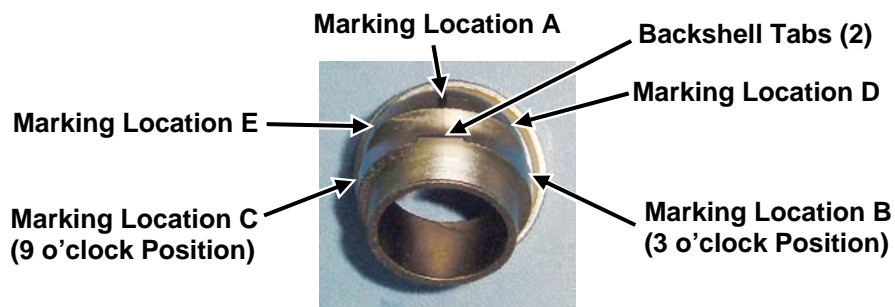


Figure 2. Backshell Tabs and Marking Locations

5. Mark the aluminum spin lock strain relief at the clamp opening (either side), as mark F on upper surface, and as mark G, on lower surface, using mold marks as the reference point. See Figure 3 and Table 1.

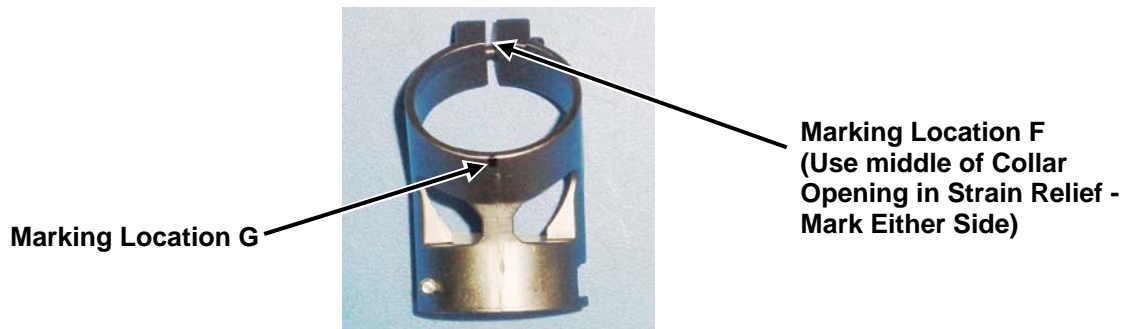


Figure 3. Aluminum Strain Relief Markings

6.2. Cable Preparations

1. Prepare the cable end by removing a portion of the cable jacket and cable shield to expose the wires at the end of the cable according to the application requirements.
Refer to cable/connection application instructions for details.
2. Terminate the wires/cables in the cable bundle (4) with the required contacts.
See Figure 4.
Refer to manufacturer's instructions.
3. Pass the strain relief (1) onto the cable bundle, followed by the Tinel-Lock ring (2), then the backshell (3) over the cable bundle as shown in Figure 4.

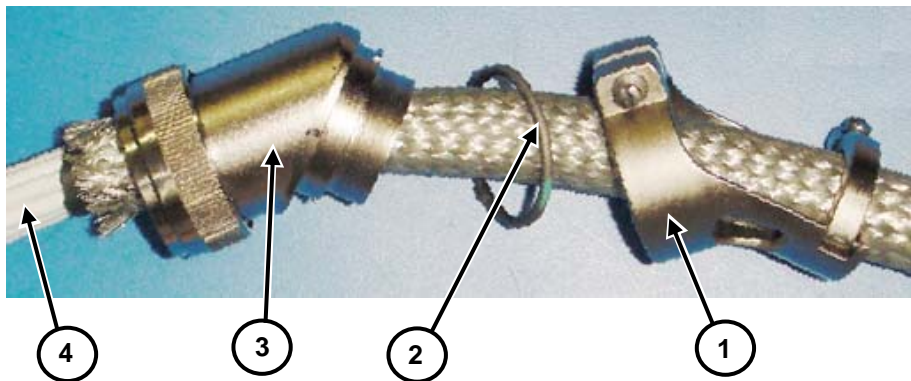


Figure 4. Mounting Backshell, Tinel-Lock Ring, and Strain Relief

4. Pin the connector before continuing with the procedure.
Refer to manufacturer's instructions for pinning the connector.
5. Finger-tighten the backshell onto connector thread, ensuring no wires are trapped.
Feel for the positive alignment and meshing of the anti rotation teeth by gently twisting the backshell back and forth until the connector is completely mated to backshell.

NOTE The anti-rotational teeth must be properly engaged between the backshell and the connector to have a complete fit and strong connection.

6. For cable assemblies without over braid, skip Section 6.3 and go to Section 6.4.
7. Go to the next procedure, Section 6.3, to install the Tinel-Lock ring on the backshell to terminate the braided shield.

6.3. Tinel-Lock Installation

- ◆ If using the AD-5000-TINEL-ASSY (220/240V) Tool, refer to ELE-3COP-359 and skip the following steps.
- ◆ If using the RH-3960-1-TINEL-KIT - 120V Tool, use the following steps as a guide.
 1. Position the backshell next to the braid before fanning the braid.
 2. Open the braid into a fan shape large enough to pass over the end of the backshell and slide it past the ring termination surface on the backshell.
 3. Slide the Tinel-Lock ring onto the center of the termination surface. See Figure 5.
 - It may help to ease the Tinel-Lock ring into place by rocking it side to side, using a walking motion, but don't use brute force to force it straight into place.
 - Ensure there is enough full braided weave past the Tinel-Lock ring. See Figure 5.
 - Ensure the Tinel-Lock ring is evenly spaced around the termination surface before applying heat to the ring.

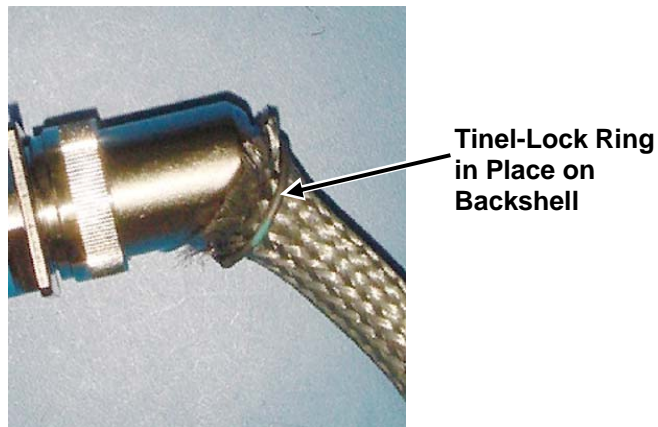


Figure 5. Tinel-Lock Ring on Backshell Prior to Heating

4. Place both electrodes on the either side of the ring, gripping it between the electrodes, and ensure at least one spot of thermochromic paint on the ring is visible. See Figure 6a.

NOTE	Avoid touching the backshell and the thermochromic paint with the electrodes.
-------------	---

WARNING

To prevent burns, allow the heating tool and the adapter assembly to cool down before handling. The heating tool and the cable assembly become hot during the installation of the Tinel-Lock ring.

5. Use the foot-pedal to activate the electrodes while ensuring the electrodes are squeezed against the ring to make good contact with the ring.

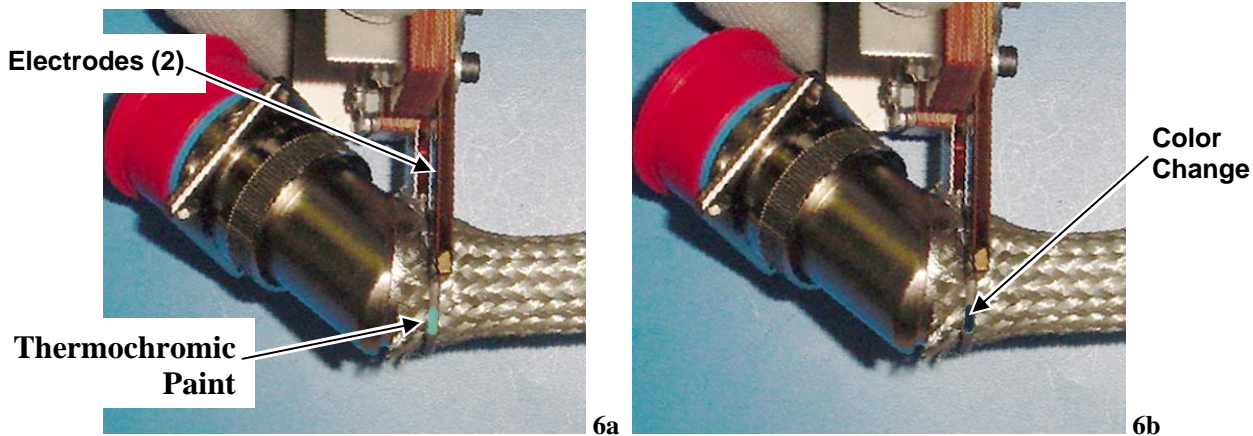


Figure 6. Heating Tinel-Lock Ring and Color Change

6. Observe the thermochromic paint closely and when it changes color (darkens), ease the pressure on the foot-pedal to deactivate the electrodes. See Figures 6a and 6b.

NOTE When the Tinel-Lock ring's thermochromic indicator changes color (darkens), it has shrunk to the backshell's termination surface.

7. Trim excess braid from connector side of Tinel-Lock ring, using small scissors or a small cutter to remove all excess braid evenly around Tinel-Lock ring. See Figure 7.
8. Ensure all stray braid strands are removed from the connector side of Tinel-Lock ring, to ensure no interference with the backshell or strain-relief collar clamp. See Figure 7.

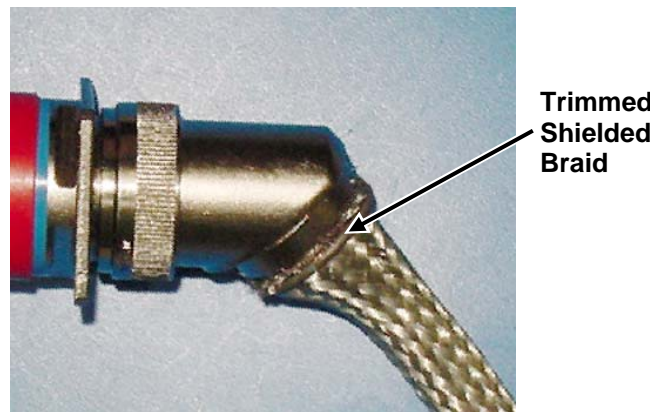


Figure 7. Trimmed Braid on Backshell

6.4. Spin Lock Strain Relief Connection and Backshell Alignment

This procedure describes how to connect the strain relief to the backshell and how to align the strain relief on the backshell to create the desired angles for the cable strain relief. This procedure uses the marks made earlier on the components. The cable is not shown for clarity in the backshell connection and the alignment.

1. Slide the aluminum strain relief up to the edge of the backshell and locate the tabs on the backshell and tab ways in the strain relief similar to those shown in Figure 8.

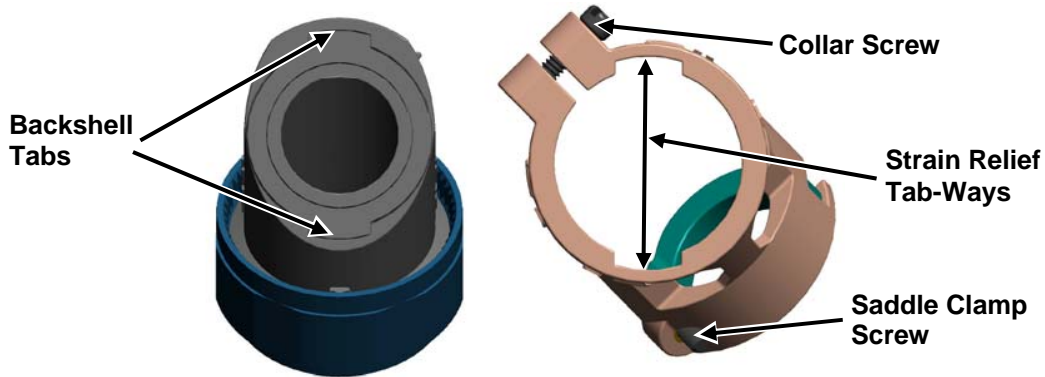


Figure 8. Backshell Tabs and Strain Relief Tab-Ways

2. Locate the orientation markings on the backshell previously applied. See Figures 2, 3, 9 and 10.
3. Match the desired orientation markings on the backshell with the marks on the strain relief in one of the following steps. See Table 2 and Figures 2, 3, 9 and 10.

Table 2. Desired Spin Lock Angle

Desired Angle	Backshell Marking Locations	Strain Relief Marking Locations
0° (Straight Through)	Mark A	Mark G
45° Right	Mark D	Mark G
90°	Mark A	Mark F
45°Left	Mark D	Mark F

4. If using 0° (straight through) or 45° right orientation, use the following steps.
 - a. Turn the collar screw on the strain relief down as shown in Figure 9, before matching the tabs on the backshell with the tab ways on the strain relief.
 - b. Insert the backshell into the tab ways and rotate the strain relief in one direction or the other to match the desired angle.
 - c. If using 45° right, rotate strain relief (cw) to align the reference marks G to D. See Figure 9 and Table 2.
 - d. If using 0° (straight through), rotate the strain relief counter clockwise (ccw) to align reference marks G to A, as shown in Figure 9. See Table 2.

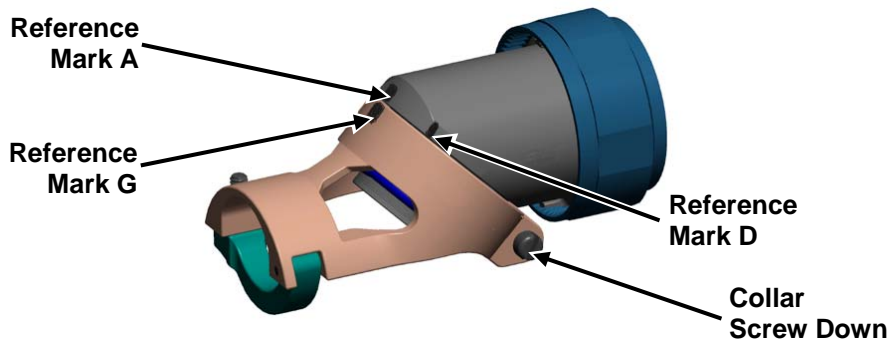


Figure 9. Straight Through (0°) Strain Relief Alignment

5. If using 90° or 45° left orientation, use the following steps.
 - a. Turn the collar screw on the strain relief up as shown in Figure 10, before matching the tabs on the backshell with the tab ways on the strain relief.
 - b. Insert the backshell into the tab ways and rotate the strain relief in one direction or the other to match the desired angle.
 - c. If using 45° left, rotate the strain relief clockwise (cw) to align the reference marks F to D. See Figure 10 and Table 2.
 - d. If using 90°, rotate the strain relief counter clockwise (ccw) to align reference marks F to A, as shown in Figure 10. See Table 2.
6. When the correct angle is found for the strain relief, finger-tighten the collar screw until the following steps have been completed.

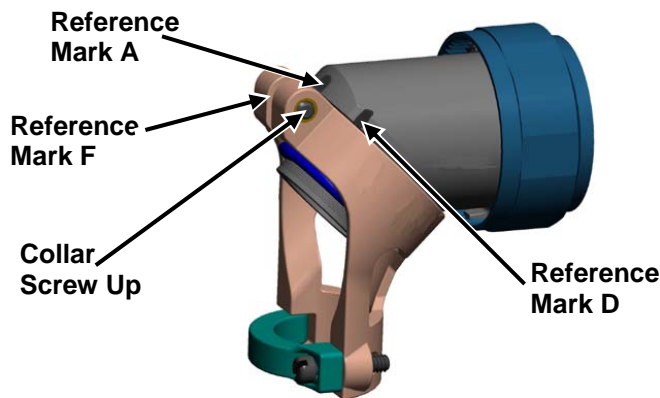


Figure 10. 90° Strain Relief Alignment

7. If the application requires an optional SEB, wrap the SEB around cable bundle in preparation for inserting the SEB under the saddle clamp.

Refer to TUS-41-3030 to prepare the SEB and the saddle clamp and, if desired, use tape to hold the SEB in place while it is inserted under the saddle clamp.
8. Slide the bushing forward and center it under the saddle clamp and close the clamp, if it does not have a captive screw. See Figure 11.



**SEB and
Saddle Clamp
in Place**

Figure 11. Completed Cable Assembly

9. Finger-tighten the saddle clamp screw and the collar screw for now, but return to this step later, to tighten both screws when completing the procedure. See Table 3.

Table 3. Strain Relief Torque Tightening Values

Order Number	Screw Torque Value (in lb)	
	Collar Screw	Clamp Screw
8	4.7	1.5
10	4.7	1.5
12	4.7	1.5
14	4.7	6.9
16	4.7	6.9
18	4.7	6.9
20	4.7	6.9
22	4.7	6.9
24	4.7	6.9

6.5. Completing the Installation

1. Unscrew the backshell from the connector enough to apply sealant in the next step.
2. Apply thread sealant (e.g. LOCTITE® 243) to the first two or three threads on the connector per ELE-3COP-452.

Finger-tighten the backshell onto connector thread, ensuring no wires are trapped.

Feel for the positive alignment and meshing of the anti rotation teeth by gently twisting the backshell back and forth until the connector is completely mated to backshell.

NOTE The anti-rotational teeth must be properly engaged between the backshell and the connector to have a complete fit and strong connection.

3. Tighten coupling nut to connector, using a strap wrench, and a torque wrench per ELE-3COP-452.

-
4. Return to Step 9 of Section 6.4 to tighten the collar screw and saddle clamp screw according to the torque values in Table 3. See Figure 8.
 5. Continue with any remaining harness assembly tests as applicable.
 6. This completes the procedures for the Raychem spin lock adapters with aluminum strain relief assembly guide.

© 2013 TE Connectivity, Ltd. All rights reserved. “All of the information in this specification, including illustrations, is believed to be reliable. TE Connectivity makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use. TE Connectivity’s only obligations are those in the company’s Standard Terms and Conditions of Sale for this product, and in no case will TE Connectivity be liable for any incidental, indirect, or consequential damages arising from the sale, resale, use or misuse of the product. Specifications are subject to change without notice.”

TE Connectivity, TE Connectivity (logo), Raychem, and Tinel-Lock are trademarks.

© 2013 Tyco Electronics Corporation, a TE Connectivity Ltd. Company. All Rights Reserved. . TE Proprietary & Confidential Information.
LOCKTITE is a registered trademark of Henkel Corporation.