Maintenance Manual

B-01286 USLR-XLT Maintenance Manual (11-25-19)

LOAD-RANGER® XLT Load Break Tool

USLR-XLT-1 Up To 27 kV Load Break Tool
USLR-XLT-2 27 kV - 38 kV Load Break Tool

Contents

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⚠ WARNING ⚠

Carefully read and fully understand this manual prior to operating, maintaining or testing this device. Improper operation, handling or maintenance of this device can result in death, grievous personal injury and or equipment damage.

⚠ WARNING ⚠

Only trained and qualified personnel should operate, inspect and maintain this device.

Overview

Utility Solutions suggests following the maintenance procedure outlined in this manual every 1,500-2,000 operations. However, a maintenance schedule should not solely depend on the number of operations.

Performing operations at or near the maximum amperage rating will result in more degradation, therefore requiring more frequent maintenance. How and where the tool is stored can also affect the maintenance schedule. Therefore, 1,500-2,000 operations between routine maintenance is only a benchmark.

Tools, Parts, and Supplies

Required Parts	
B-00159	Load Break Tool Fiberglass Cleaner / Wax (16 oz Container)
B-00856	Loctite® 425 (20 gram Container)
P-00484	XLT Repair Fastener Kit (2nd Gen) (Includes all necessary fasteners, B-01073 Loctite®, B-01274 Contact Grease and C-01080 Split "O" Ring)

Required Tools
1/8" Allen Wrench
#2 Phillips Screwdriver
Channel Lock Pliers
6LN Needle Nose Vise Grip
T25 Torx Drive

Required Supplies
All Purpose Very Fine Nylon Mesh Sanding Pad
Warm Soapy Water
Soft Clean Rag

Complete Parts List	
C-00497	XLT Guide Pin
C-00498	XLT Threaded Pin Plug
C-00507	XLT Stop Bar
C-00509	XLT Arc Shim
C-00513	XLT External Gasket
C-00517	XLT Female Contact
C-00519	XLT Short Conductor Path
C-00520	XLT-1 Long Conductor Path
C-00524	XLT End Cap (Molded)
C-00528	XLT-1 Spacer
C-00539	XLT Extended Hood
C-00541	XLT-2 Long Conductor Path
C-00554	XLT Arc Snuffer
C-00558	XLT-2 Spacer

P-00044	XLT Muffler Cap Assembly
P-00048	XLT-1 Yellow Tube Assembly
P-00049	XLT-1 Probe Shaft Assembly
P-00052	XLT Overhead Arm Assembly
P-00055	XLT Padmount Arm Assembly
P-00323	XLT-1 Black Tub / Can Assembly
P-00822	XLT Counter Assembly
P-00447	XLT-2 Yellow Tube Assembly
P-00449	XLT-2 Probe Shaft Assembly
P-00452	XLT-2 Black Tub / Can Assembly

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Components and Assemblies

P-00484 XLT Repair Fastener Kit (2nd Gen)
(Includes all necessary fasteners, B-01073 Loctite, B-01274 Contact Grease and C-01080 Split "O" Ring)

B-00159 LOAD BREAK TOOL FIBERGLASS CLEANER / WAX (16 oz Container)

B-00856 LOCTITE 425 (20 GRAM CONTAINER)

C-00497 XLT GUIDE PIN

C-00498 XLT THREADED PIN PLUG

C-00507 XLT STOP BAR

C-00509 XLT ARC SHIM

C-00513 XLT EXTERNAL GASKET

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C-00517 XLT FEMALE CONTACT

C-00519 XLT SHORT CONDUCTOR PATH

C-00520 XLT-1 LONG CONDUCTOR PATH

C-00524 XLT END CAP (MOLDED)

C-00528 XLT-1 SPACER

C-00539 XLT EXTENDED HOOD

C-00541 XLT-2 LONG CONDUCTOR PATH

C-00554 XLT ARC SNUFFER

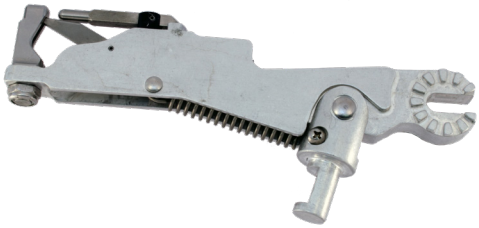
C-00558 XLT-2 SPACER

P-00044 XLT MUFFLER CAP ASSEMBLY

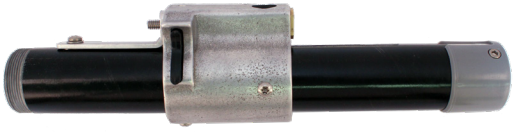
P-00048 XLT-1 YELLOW TUBE ASSEMBLY

P-00049 XLT-1 PROBE SHAFT ASSEMBLY

P-00052 XLT OVERHEAD ARM ASSEMBLY



P-00055 XLT PADMOUNT ARM ASSEMBLY



P-00323 XLT-1 BLACK TUB / CAN ASSEMBLY

P-00822 XLT COUNTER ASSEMBLY

P-00447 XLT-2 YELLOW TUBE ASSEMBLY

P-00449 XLT-2 PROBE SHAFT ASSEMBLY

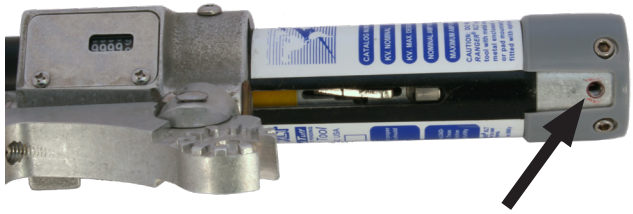
P-00452 XLT-2 BLACK TUB / CAN ASSEMBLY

Disassembly Procedure

1. Using a #2 Phillips Screwdriver remove the two 10-24 x 1/2” Fillister Head Machine Screw w/ Patch (B-01072) that fasten the XLT Muffler Assembly (P-00044) to the Yellow Tube Assembly (P-00048 XLT-1 or P-00447 XLT-2).
2. Remove the XLT Muffler Assembly (P-00044), XLT Female Contact (C-00517), and the XLT Arc Shim (C-00509).

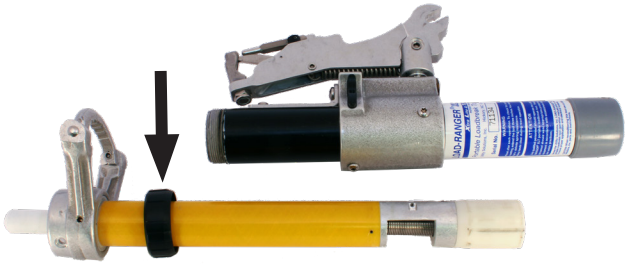
3. Using a #2 Phillips Screwdriver, remove the Long Conductor Path (C-00520 XLT-1 or C-00541 XLT-2) by unfastening the 10-24 x 5/16” PHMS (B-00577) and the 1⁄4”-20 x 3/8” PHMS (B-00555).

4. Remove the 1⁄4”-20 x 1⁄4” Cup Point SHSS w/ patch (B-00021) that fastens the Probe Shaft Assembly (P-00049 XLT-1 or P-00449 XLT-2) to the Black Tube Assembly utilizing a 1/8” Allen Wrench.



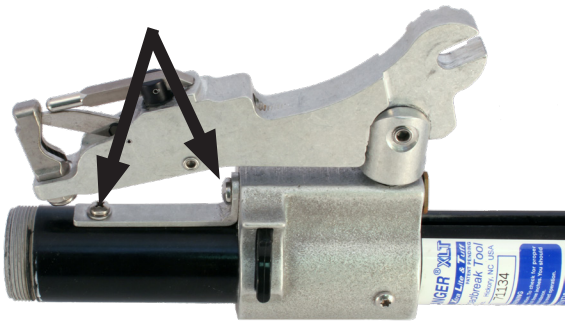
5. Use a 6LN Needle Nose Vise Grip to remove the Guide Pin (C-00497). Ensure any remnants from the Slit “O” Ring (C-01080) are also removed.

6. Unscrew the Black External Gasket (C-00513) and remove the combined Yellow Tube & Probe Shaft Assemblies. The use of a Channel Lock Pliers may be necessary to unthread the Black External Gasket (C-00513). It may require tapping the sides of the Black External Gasket to loosen the threadlocker prior to unthreading.



7. Grasp the White Probe Assembly and pull on it to remove the Probe Shaft Assembly (XLT-1 P-00049, XLT-2 P-00449) from the Yellow Tube Assembly (XLT-1 P-00048, XLT-2 P-00447).

8. Using a #2 Phillips Screwdriver remove the 10-24 x 5/16” PHMS (B-00577), #10 SS Flat Washer (B-00042) and 1⁄4”-20 x 3/8” PHMS (B-00555) that fasten the Short Conductor Path (C-00519) to the tool. Remove the Short Conductor Path (C-00519), and the XLT Stop Bar (C-00507). The XLT Stop Bar (C-00507) is located inside the Black Tube Assembly.



Probe Shaft Inspection and Cleaning

Ensure the white molded probe remains clean and free of oils, greases etc.

1. Verify the Pink Arc Snuffers (C-00554), two each for the XLT-1 and 4 each for the XLT-2, are not cracked, chipped or otherwise damaged. Replace if necessary.

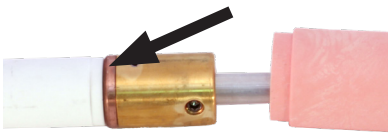
2. Inspect the Plastic Spacer (XLT-1 C-00528, XLT-2 C-00558) to verify it is not cracked, chipped or otherwise damaged. Replace if necessary.

3. Inspect the XLT Probe Shaft Assembly (XLT-1 P-00049, XLT-2 P-00449) for damage and replace if necessary. The assembly comes complete from the factory and should not be rebuilt.

   a) Inspect the white and black plastic discs to verify they are not cracked, chipped or otherwise damaged. Verify they slide freely along the probe-shaft without dragging.

   b) Inspect the inner copper coil for signs of fraying or damage. Insure it is firmly fastened at each end of the coil pack.

   c) Inspect the probe base for signs of excessive pitting or arcing.



   d) Verify the arc ring is not loose.

   e) Verify the white molded probe is firmly crimped to the probe base.

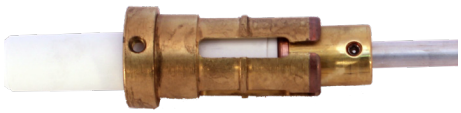
   f) Verify the white molded probe is not cracked or chipped.

   g) Use an all purpose very fine nylon mesh sanding pad to remove surface soot deposits from the probe base. Avoid making contact with the white molded probe.

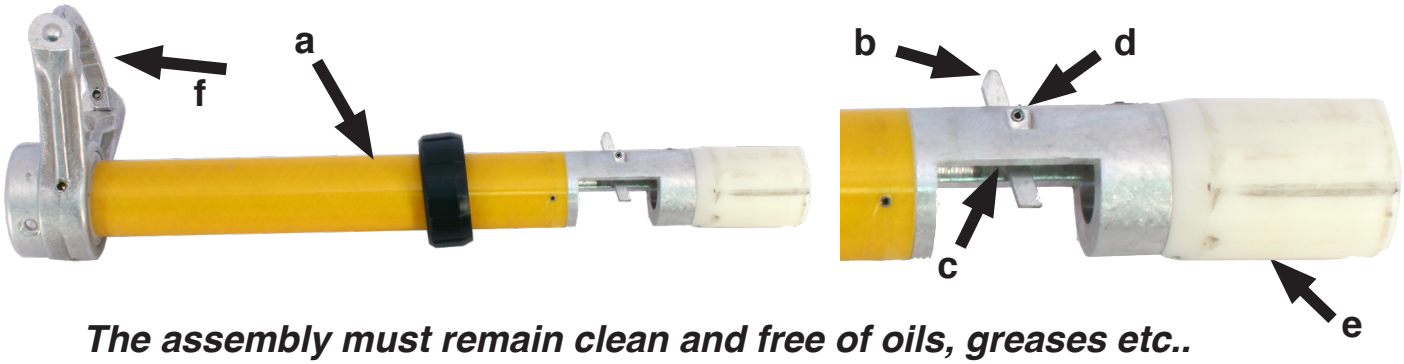
Yellow Tube & Components Inspection and Cleaning

Ensure the Arc Tubes remain clean and free of oils, greases etc.

1. Use an all purpose very fine nylon mesh sanding pad to remove surface soot deposits on the XLT Internal Female Contact (C-00517).
2. Inspect the XLT Internal Female Contact (C-00517) for signs of excessive pitting or damage. Pay particular attention to the tips of the “fingers” along the bi-metal interface. Replace if necessary.



3. Resize the fingers on the XLT Internal Female Contact (C-00517) around the brass / arc ring if necessary. Each of the fingers should make light contact with the brass / arc ring portion of the Probe Shaft Assembly (P-00049 XLT-1 or P-00449 XLT-2).
4. Inspect the Yellow Tube Assembly (XLT-1 P-00048, XLT-2 P-00447). The assembly comes complete from the factory and should not be rebuilt. Replace as necessary based on these conditions:



The assembly must remain clean and free of oils, greases etc..

a) Ensure the fiberglass is not damaged or discolored.

b) Inspect both ends of the Load Break Trigger for signs of excessive wear.

c) Verify the Load Break Trigger Torsional Spring operates correctly.

d) Verify the Pin Plug is firmly fastened. It should not be loose, and should be seated slightly recessed in the housing. If necessary re-tighten and apply Loctite 263.

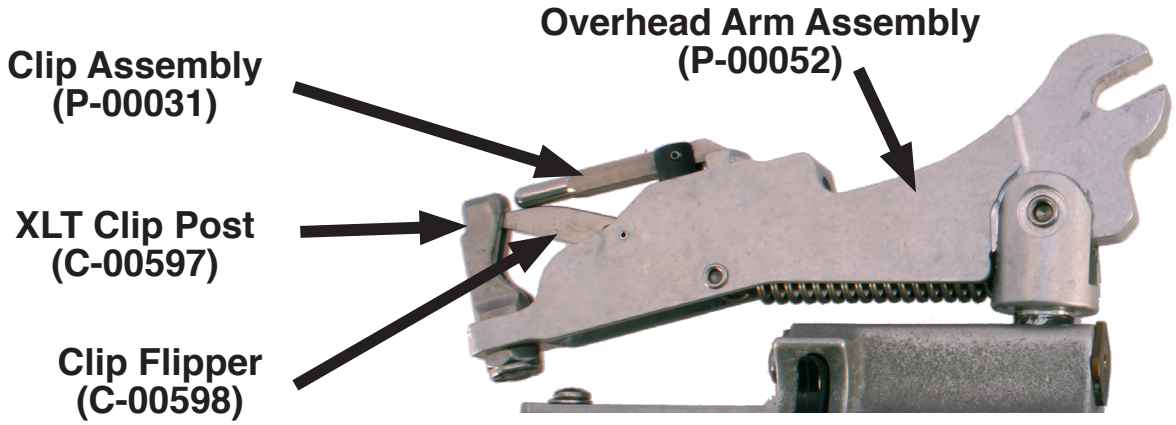
e) Ensure the white plastic XLT Gasket Tube (C-00504) is not damaged; particularly where the Reset Button engages.

f) Inspect the XLT Hook Loop Assembly for signs of excessive pitting or damage. It should pivot smoothly with positive spring pressure.

5. Wax the fiberglass portion of the assembly using Load Break Tool Fiberglass Cleaner / Wax (B-00159).

Overhead Arm Assembly Inspection and Cleaning

1. Inspect the Overhead Arm Assembly (P-00052) for damage and proper movement. The assembly should smoothly swing 30 degrees from center in both directions and return to center when released.



2. Ensure the Clip Flipper (C-00598) pivots smoothly up and down and does not rub against the slot on the XLT Clip Post (C-00597).
3. Ensure the Clip Assembly (P-00031) pivots smoothly 45 degrees side to side and returns to center when released.
4. Clean with warm soapy water if necessary.

Note: Follow instructions below to remove and install the Overhead Arm Assembly (P-00052) if needed.

Remove

1. Remove the 1/4”-20 x 7/8” Cup Point SHSS (B-01268) inside the Can to allow the Overhead Arm Assembly (P-00052) to swivel 180 degrees using a 1/8” Allen Wrench.
2. Position the Overhead Arm Assembly 180 degrees from its original position with the Black Tube upside down. Remove the Overhead Arm Assembly.

Reassemble

1. Re-install the Overhead Arm Assembly (P-00052) in the correct orientation (spline end down). Insure the hole in the Can Assembly is not blocked by the Pressure Pin. Push the Pressure Pin back inside the hole if necessary.

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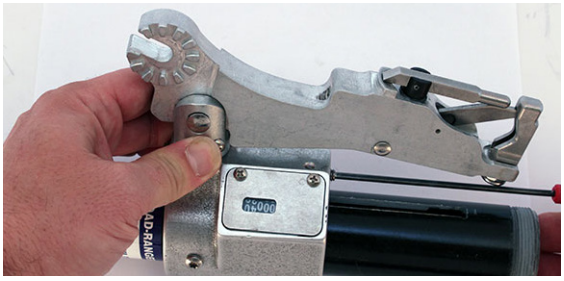
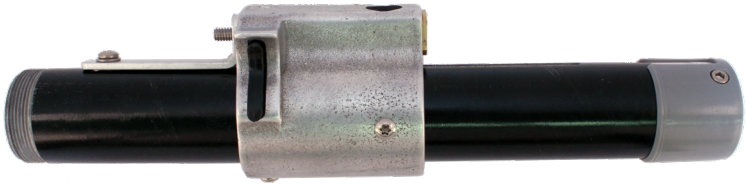
2. Apply a small amount of Loctite 263 (B-01073) to the 1/4”-20 x 7/8” Cup point SHSS (B-01268) and fasten using a 1/8” Allen wrench. Continue tightening until the Overhead Arm Assembly (P-00052) can support itself in the upright position.
3. Continue tightening the set screw 1/4 turn at a time, testing the arms movement in between turns. Stop tightening when the arm can only move 45 degrees off center in both directions and the spring force is firm and smooth.



Black Tube Assembly & Conductor Path Inspection and Cleaning

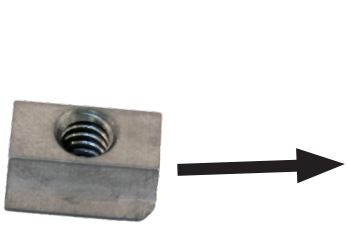


1. Inspect the Black Tube / Can Assembly (XLT-1 P-00323, XLT-2 P-00452) to verify the reset trigger operates correctly.
2. If necessary clean with warm soapy water.
3. Using a T25 Torx Drive, verify that all three 10-24 x 3/8 Torx PHMS (B-00806) are secure. DO NOT remove as they are difficult to install. (Older models may require a #2 Phillips Screwdriver)

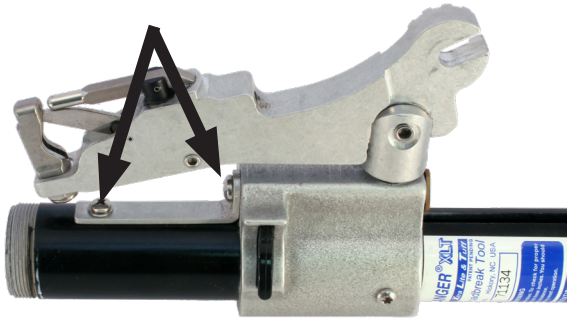
4. Inspect the Long Conductor Path (C-00520 XLT-1 or C-00541 XLT-2) and Short Conductor Path (C-00519) for signs of damage, including gouging or tracking on the underside. Replace if necessary.

Reassembly Procedure

1. Install a XLT Stop Bar (C-00507) with the beveled edge facing toward the Can/Arm Assembly then set the Short Conductor Path (C-00519) in place.
2. Attach the Short Conductor Path (C-00519) to the XLT Stop Bar (C-00507) using a 10-24 x 5/16” PHMS (B-00577) and a #10 SS Flat Washer (B-00042) with Loctite 263 (B-01073). Attach the other end of the Short Conductor Path (C-00519) to the Can Assembly using a 1⁄4”-20 x 3/8” PHMS (B-00555) with Loctite 263 (B-01073).

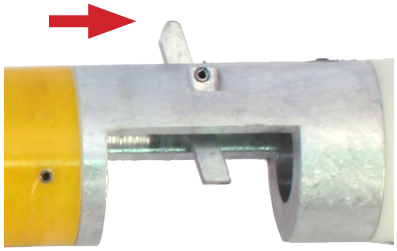


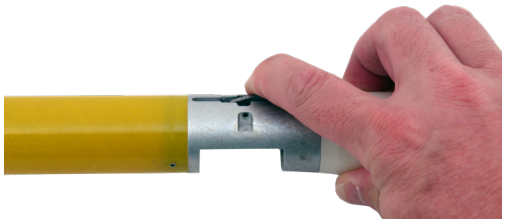
Beveled edge facing Arm Assembly



3. Orient the XLT Lifesaver (C- 00532), XLT Bumper (C-00531), and XLT Spacer on the Probe Shaft Assembly as shown.

4. Hold down the Trigger on the Yellow Tube Assembly (XLT-1 P-00048, XLT-2 P-00447) towards the white polymer end compressing the srping. The Trigger should be under tension and fit completely inside the channel on the aluminum body.



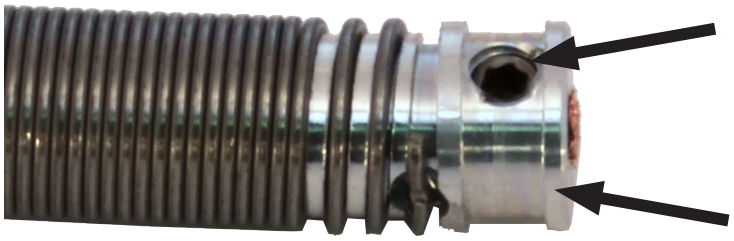


5. Slide the Probe Shaft Assembly (P-00049 XLT-1 or P-00449 XLT-2) into the Yellow Tube Assembly (XLT-1 P-00048, XLT-2 P-00447) completely until it stops. The Coil Pack Assembly will extend beyond the Tube.

6. Insert the Pink Arc Snuffers (C-00554) into the Yellow Tube assembly, pushing them down until they stop. Two Snuffers for the XLT-1 and four snuffers for the XLT-2.

7. Reinsert the Yellow Tube / Probe Shaft Assembly within the tool. Thread the Black External Gasket (C-00513) onto the Black Tube Assembly.
8. Rotate and push the Probe Shaft Assembly until it seats within the base of the Black Tube Assembly. Fasten the Probe Shaft Assembly to the Black Tube Assembly using a new 1⁄4-20 x 1⁄4 Cup Point Set Screw w/ Patch (B-00021) with a 1/8" Allen Wrench.

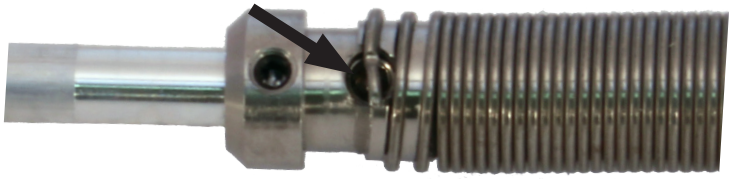
NOTE: A helpful hint is to look through the tapped hole for the 1⁄4"-20 x 1⁄4" SHSS fastener and align the "witness mark" where the coil pack had previously been fastened. This only works if the coil pack hasn't been replaced.



Do not fasten the 1⁄4"-20 Set Screw (B-00021) into the threaded hole.

Do not fasten the 1⁄4-20 Set Screw (B-00021) onto ledge.

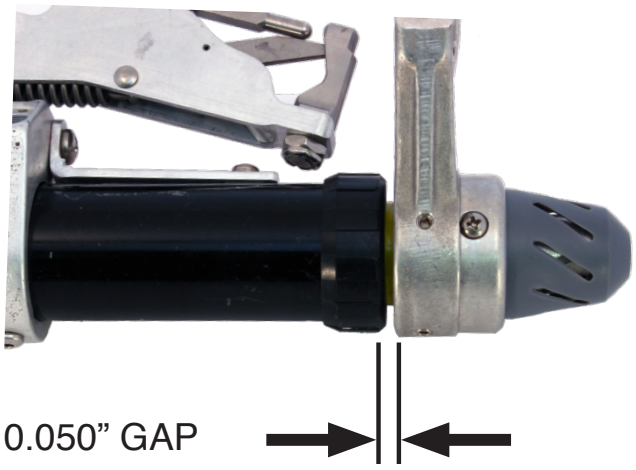
Also of critical importance is the need to rotate the Coil Pack Assembly so the Yellow Tube Trigger (C-00481) will not travel over the set screw on the opposite coil pack end.



Ensure the Trigger Foot will not travel over this set screw.

9. Attach a new Slit “O” Ring (C-01080) around the XLT Guide Pin (C-00497), apply a small amount of Contact Grease (B-01274) to the portion of the Guide Pin (C-01080) that is pressed into the Yellow Tube Assembly. Use a 6LN Needle Nose Vise Grip to install the assembly into the Yellow Tube Assembly. Note the orientation of the XLT Guide Pin (C-00497).

10. Insert the XLT Arc Shim (C-00509) followed by the XLT Female Contact (C-00517) then fasten the XLT Muffler Cap Assembly (P-00044) using two new 10-24 x 1⁄2” Fillister Head Machine Screw w/ Patch (B-01072).
11. Verify the Reset Gap Distance is at least 0.050” by operating the tool to determine the reset point (you should see a little of the yellow tube after the trigger resets on the return stroke). If the trigger gap distance is not correct the Probe Shaft Assembly will need to be adjusted by moving the location that the 1⁄4”-20 x 1⁄4” SHSS (B-00021) engages the bottom end of the coil pack assembly.
12. Once gap distance is correct, reattach the Long Conductor Path (C-00520 for the XLT-1 or C-00541 for the XLT-2 unit) to the Black Tube Assembly using a 10-24 x 5/16” PHMS (B-00577) and a 1⁄4”-20 x 3/8” PHMS (B-00555) with Loctite 263 (B-01073).



The trigger must reset before the yellow tube assembly fully retracts.

13. Utilize a standard voltmeter to check continuity (reading Ohms). Attach or hold one lead of the voltmeter to the Hook Loop of the tool. Hold or attach the other lead to the XLT Arm Assembly. When the tool is in the closed position you should measure approximately zero Ohms resistance. Slowly extend the Yellow Tube to open the tool and watch the Ohms readings. The Ohms should stay very low until the tool is almost fully extended. Just as the Yellow Tube reaches full extension, the tool should break load and simultaneously lock in the full open position. Measured Ohms should go “off scale” indicating that the electrical circuit between the Hook Loop and the Arm Assembly has been broken.

    If the measured Ohms go “off scale” as the Yellow Tube is being operated, but before the tool is fully extended, the tool needs repair and should not be used. The tool should also operate smoothly.

14. Unscrew the Black External Gasket (C-00513)and apply a single drop of Loctite 425 (B-00856) to the fiberglass threads on the Black Tube Assembly and re-tighten the Black External Gasket (C-00513). This will act to prevent the gasket from loosening during use.