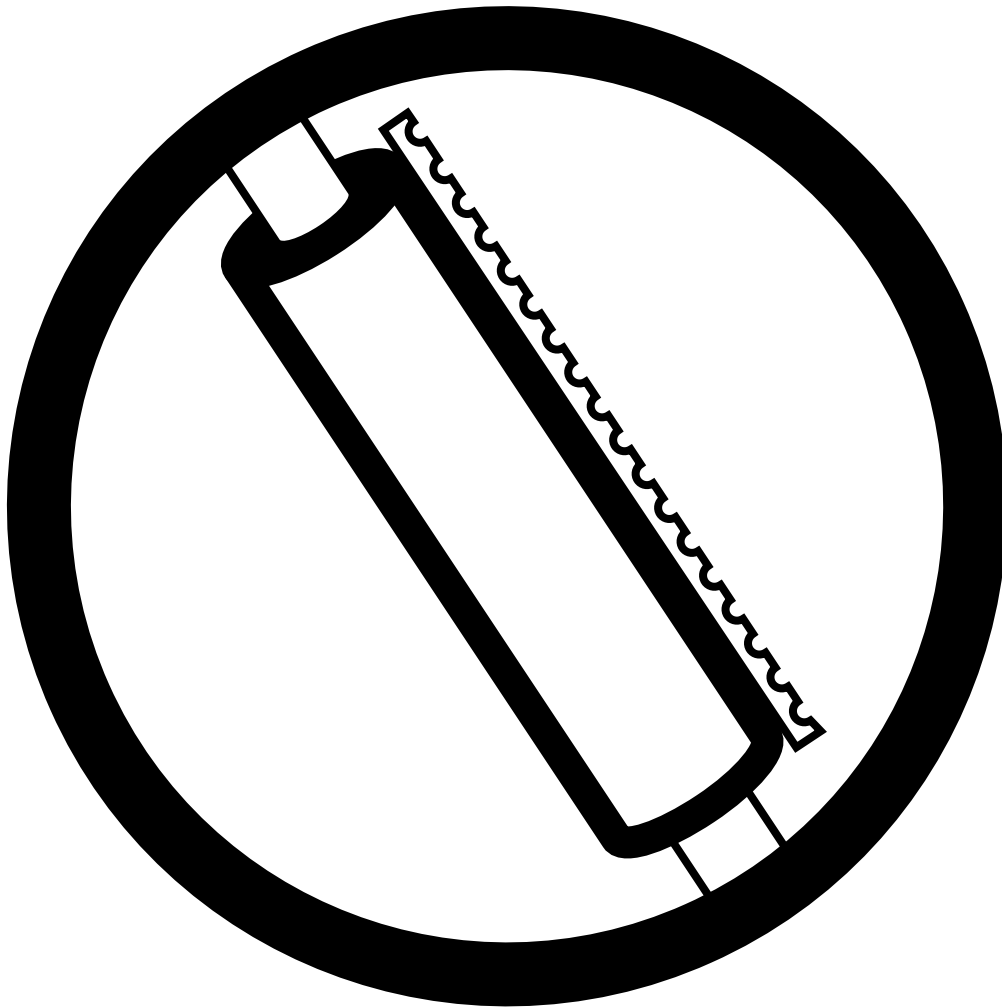


HVS-LR

Repair Kit for
PILC/VCLC Cable
Sheaths or Lead Splices



General Instructions

Suggested Installation Equipment (not supplied with kit)

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|---|---|--|
| <ul style="list-style-type: none"> • Cable preparation tools • Raychem P63 cable preparation kit or cable manufacturer approved solvent | <ul style="list-style-type: none"> • Clean, lint-free cloths • Non-conducting abrasive cloth, 120 grit or finer | <ul style="list-style-type: none"> • Electrician's tape • Connector(s) and installation tools • Raychem recommended torch |
|---|---|--|

Recommended Raychem Torches

Install heat-shrinkable cable accessories with a "clean burning" torch, i.e., a propane torch that does not deposit conductive contaminants on the product.

Clean burning torches include the Raychem FH-2609, FH-2629 (uses refillable propane cylinders) and FH-2616A1 (uses disposable cylinder).

Safety Instructions

<p>Warning: When installing electrical power system accessories, failure to follow applicable personal safety requirements and written installation instructions could result in fire or explosion and serious or fatal injuries.</p>	<p>To avoid risk of accidental fire or explosion when using gas torches, always check all connections for leaks before igniting the torch and follow the torch manufacturer's safety instructions.</p>	<p>To minimize any effect of fumes produced during installation, always provide good ventilation of confined work spaces.</p>
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Adjusting the Torch

Adjust regulator and torch as required to provide an overall 12- inch bushy flame. The FH-2629 will be all blue, the other torches will have a 3- to 4-inch yellow tip. Use the yellow tip for shrinking.

Regulator Pressure

FH-2616A1	Full pressure
FH-2609	5 psig
FH-2629	15 psig

Cleaning the Cable

<p>Use an approved solvent, such as the one supplied in the P63 Cable Prep Kit, to clean the cable. Be sure to follow the manufacturer's instructions. Failure to follow these instructions could lead to product failure.</p>	<p>Some newer solvents do not evaporate quickly and need to be removed with a clean, lint-free cloth. Failure to do so could change the volume resistivity of the substrate or leave a residue on the surface.</p>	<p>Please follow the manufacturer's instructions carefully.</p>
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General Shrinking Instructions

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| <ul style="list-style-type: none"> • Apply outer 3- to 4-inch tip of the flame to heat-shrinkable material with a rapid brushing motion. • Keep flame moving to avoid scorching. • Unless otherwise instructed, start shrinking tube at center, working flame around all sides of the tube to apply uniform heat. | <p>To determine if a tube has completely recovered, look for the following, especially on the back and underside of the tube:</p> <ol style="list-style-type: none"> 1. Uniform wall thickness. 2. Conformance to substrate. 3. No flat spots or chill marks. 4. Visible sealant flow if the tube is coated. |
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1. Product selection.

Check kit selection with cable diameter dimensions in Table 1.

Note 1: For lead splice repair, verify that the lead sleeve and cable diameters fall within the use range of the HVS-LR kit.

Note 2: Allow the repair area to cool to ambient before installing repair kit.

Note 3: The 24.0" sleeve lengths are intended for single wipe and lead sheath repairs. The 48.0" sleeve lengths are for repairing and/or reinforcing both wipes of a lead sleeve up to 36.0" long.

Table 1: Lead Sheath Repair Selection Table

Kit	Diameter Range	Sleeve Length
HVS-LR-75/15-600	0.65-2.65" (17-67mm)	24" (610mm)
HVS-LR-75/15-1200	0.65-2.65" (17-67mm)	48" (1219mm)
HVS-LR-160/42-600	1.80-5.70" (46-145mm)	24" (610mm)
HVS-LR-160/42-1200	1.80-5.70" (46-145mm)	48" (1219mm)
HVS-LR-200/50-600	2.15-7.10" (55-180mm)	24" (610mm)
HVS-LR-200/50-1200	2.15-7.10" (55-180mm)	48" (1219mm)

2. Choose the application and action required.

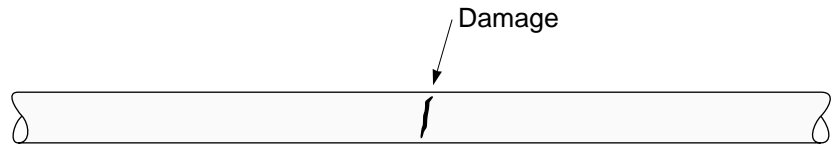
Application	Action
Lead Sheath Repair	go to Step 3, Page 3
Lead Splice Repair	go to Step 16, Page 6

Lead Sheath Repair

3. Determine the length of the repair area.

Note: If space allows, the full length of the sleeve may be used. If a smaller length is necessary, follow the directions for cutting the sleeve to the required length.

For jacketed cables, remove 6" (150mm) of cable jacketing material on each side of the damage area to expose the lead sheath.

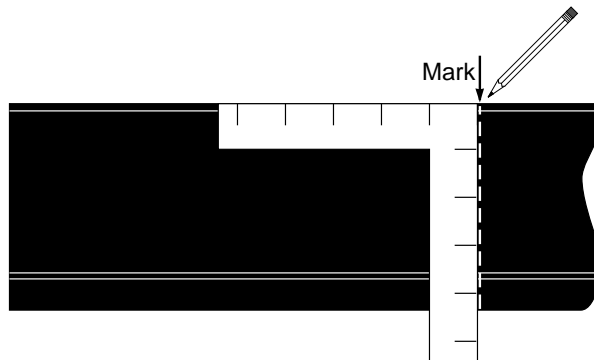


Cut Length of HVS-LR Sleeve = Damage + 12" (300mm)

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4. Mark cut length of the wraparound sleeve.

Lay the sleeve on a flat surface. Measure the required length of the sleeve using a straight edge (preferably a square) and mark along the line to be cut. Cut-line must be as nearly square to the rails as practical.



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5. Cut the HVS-LR sleeve to required length.

Cut the sleeve using tin snips or a sharp knife. Cut edges must be smooth, not jagged.

Note: If a knife is used, support the sleeve on a flat surface and use a straight edge guide.

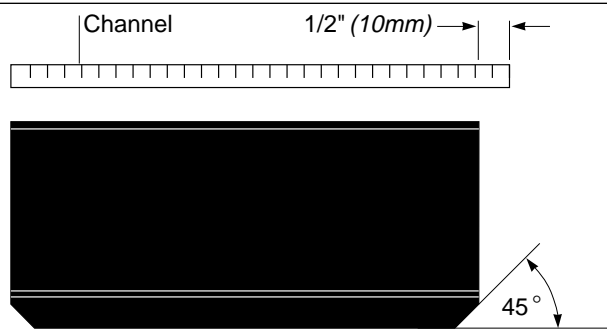


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6. Trim flap; cut channel to length.

For neater installation, trim the overlap flap as shown.

Cut or break the channel 1/2" (10mm) longer than the sleeve. Remove sharp corners and burrs from the channel. (If longer than one channel, lay end to end before measuring.)

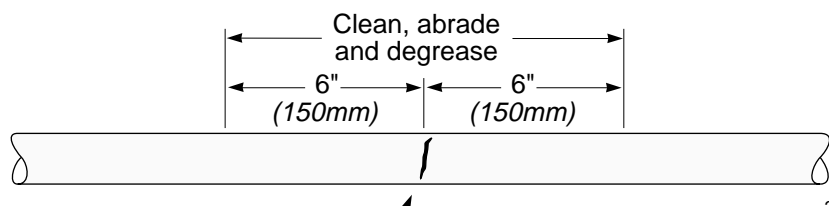


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7. Clean cable.

Using an approved solvent, clean, abrade, and degrease the damaged area and the cable on either side of the damage as shown. Remove any sharp points from the area to be covered with the sleeve.

Note: Raychem recommends conducting all sheath repairs when the applicable circuit is not energized.

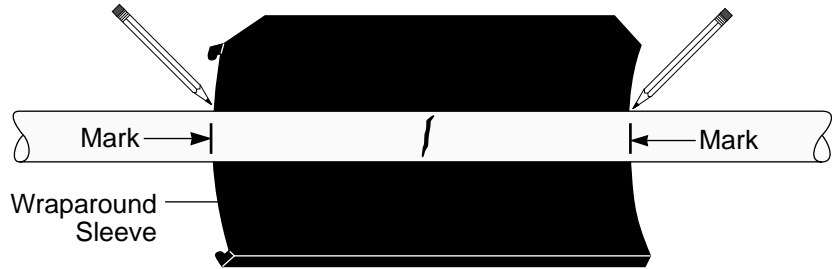


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Installation Instructions

8. Center sleeve; mark cable.

Center sleeve over damaged area.
Mark the cable as shown.

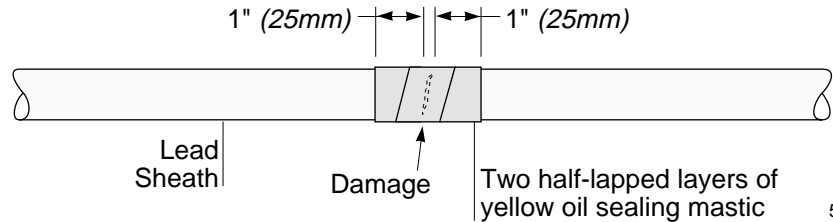


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9. Apply oil sealing mastic.

Remove backing from one side of the strip of oil sealing mastic. Roll the mastic and remaining backing strip into a convenient size.

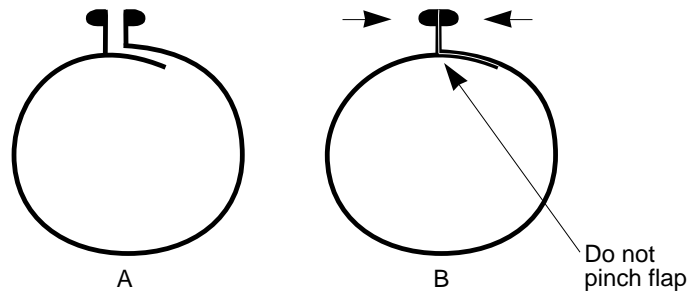
Removing the remaining backing strip and stretching the mastic to at least half its original width, tightly wrap two half-lapped layers of yellow oil sealing mastic over the damage area and overlap by 1" (25mm) onto the lead sheath at each end.



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10. Position sleeve between cable marks.

Remove the plastic protective wrapper from the wraparound sleeve before installing. Center sleeve between cable marks and butt the rails together taking care to not pinch the flap where the two ends connect (see drawing).



250c

11. If only one channel is needed, slide channel over rails.

Butt the rails together and slide the channel over the rails. Center sleeve between marks.

Note: Channel must extend beyond the sleeve edge as shown.

Skip to Step 15.

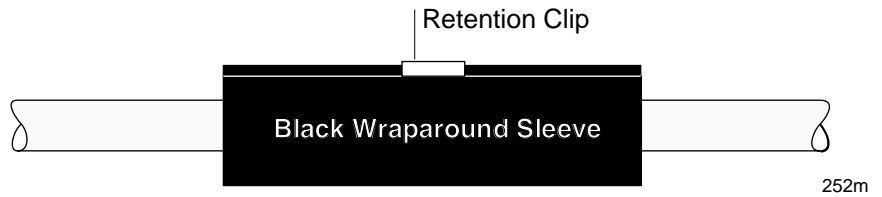


250b

Installation Instructions

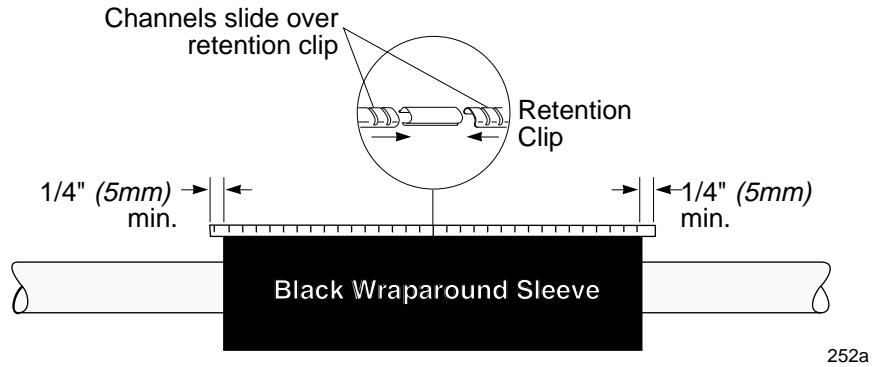
13. If two channels are needed, install retention clip.

Slide metal retention clip onto the butted rails as shown.



14. Install channels.

Connect the two channels with the short channel retention clip as shown.



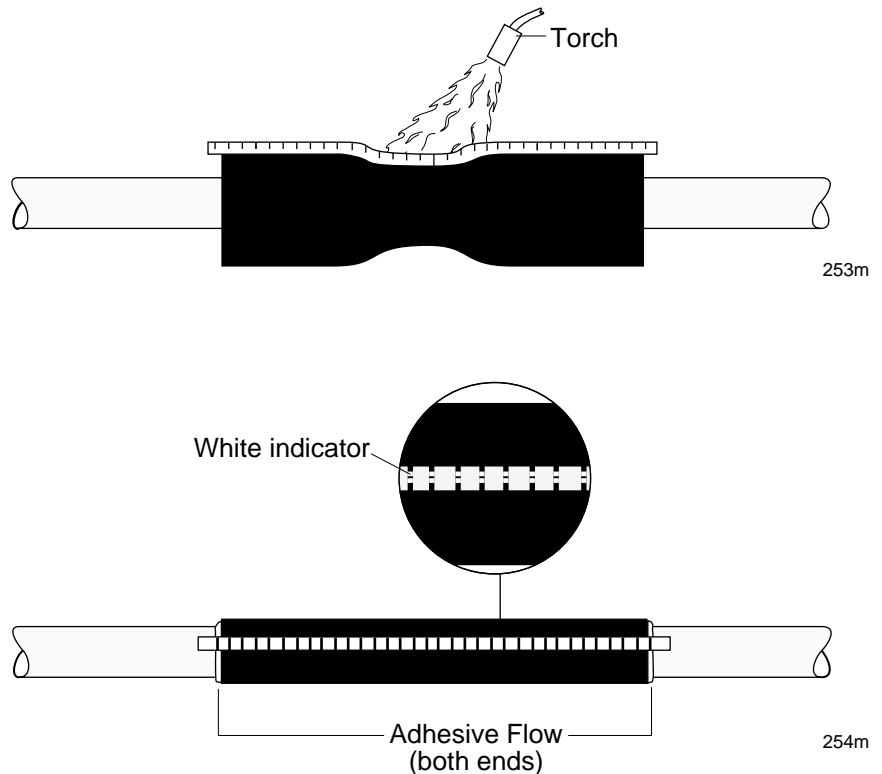
15. Shrink the wraparound sleeve.

Preheat evenly along both sides of the rail/channel area until this area begins to shrink. Begin shrinking at the center of the sleeve and work toward each end. Apply heat until the sleeve is fully shrunk and the heat-sensitive paint is completely converted. Continue heating the rail/channel area for another 5 seconds per foot. A white line should be visible in the channel gaps indicating sufficient heating.

Note: Heat-sensitive paint will turn black as sleeve shrinks in place.

Repair is complete.

Note: Allow to cool before moving or placing in service.



Lead Splice Repair

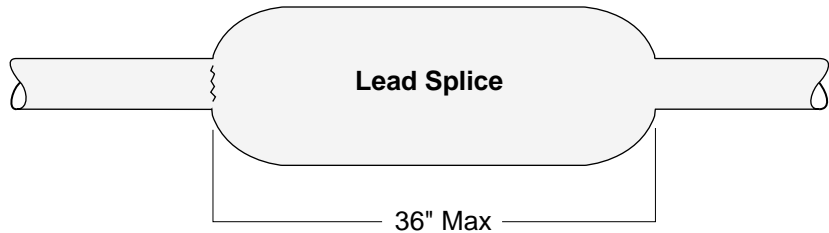
16. Determine the length of the repair area.

For jacketed cables, remove 12" (300mm) of cable jacketing material to expose the lead sheath.

For wiping bell damage on one side of the splice, use a 24" (610mm) cut length of the HVS-LR wraparound.

For complete coverage of lead splices up to 36" (900mm) in length, use a 48" (1200mm) cut length of the HVS-LR wraparound.

Note: Raychem recommends conducting all sheath repairs when the applicable circuit is not energized.

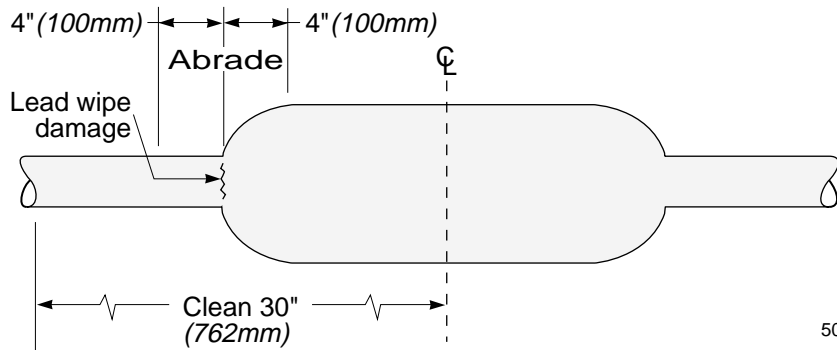


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17. Clean repair area.

Using an approved solvent, clean and degrease the damaged area and the cable on either side of the damage as shown. Remove any sharp points from the area to be covered with the sleeve.

Abrade the surface for 4" (100mm) on both sides of the damage as shown.



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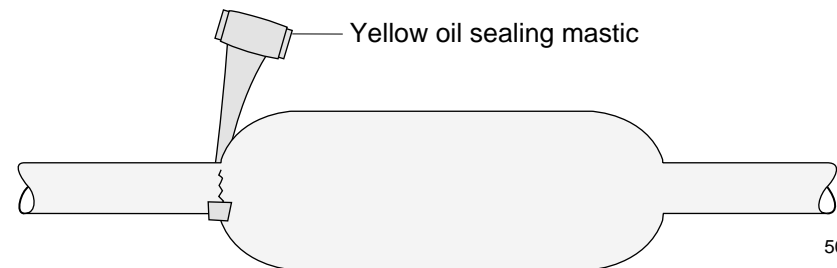
18. Apply oil sealing mastic.

Measure "X". Make a mark on the lead sheath equal to 2X from the edge of the damage area.

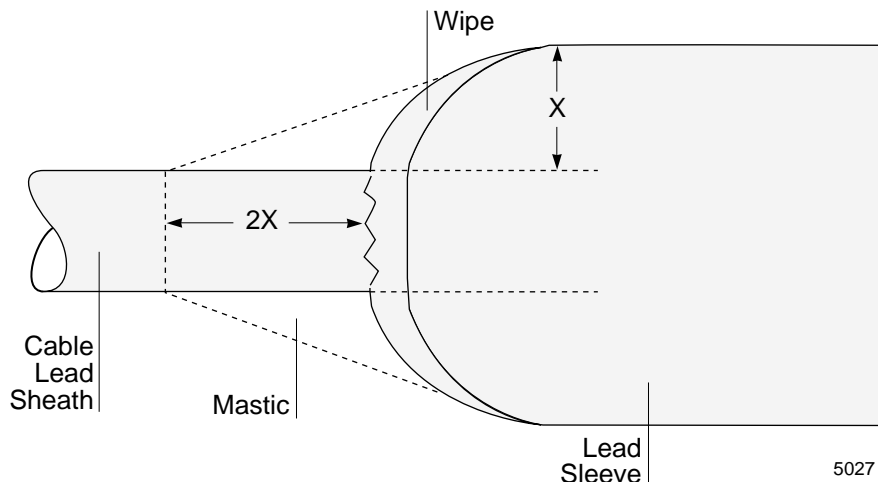
Remove backing from one side of the yellow oil sealing mastic. Roll the mastic and remaining backing strip into a convenient size.

Removing the remaining backing strip, tightly wrap the oil sealing mastic starting at the damage, extending to the top of the wipe and to the mark made on the cable sheath to form a straight profile as shown.

Note: For lead repair at the other side of the splice, repeat Steps 17 through 18.



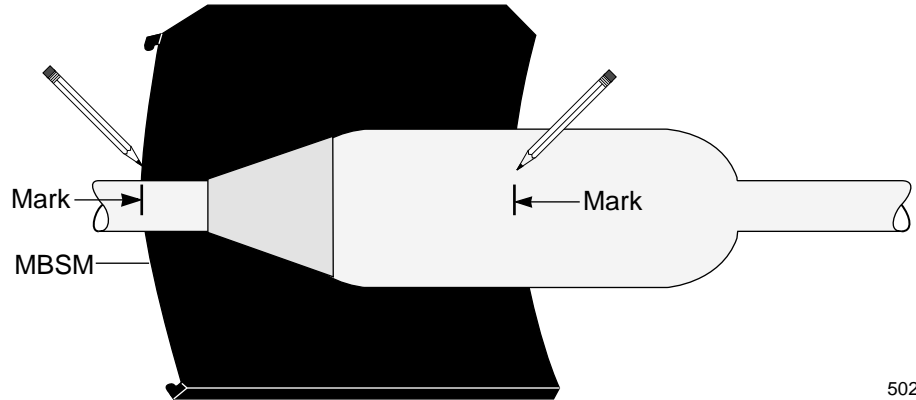
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20. Center sleeve; mark cable.

Center sleeve over damaged area. Mark the cable as shown.

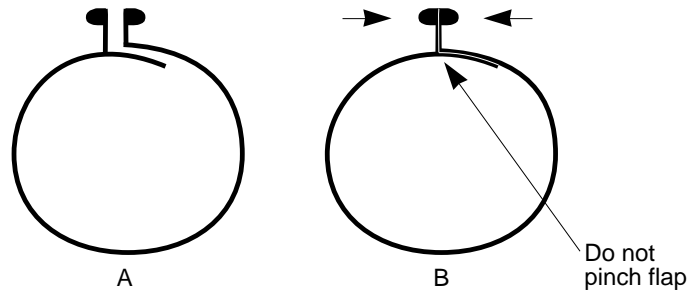


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21. Position sleeve between cable marks.

Remove the plastic protective wrapper from the wraparound sleeve before installing.

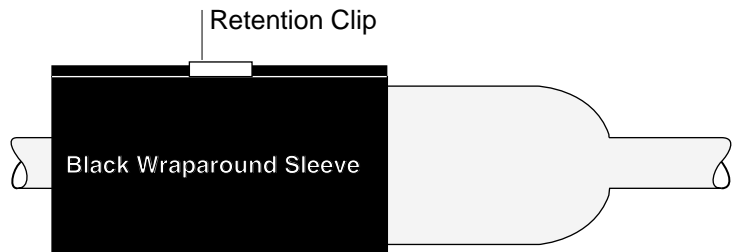
Center sleeve between cable marks and butt the rails together taking care not to pinch the flap where the two ends connect (see drawing).



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22. Install retention clip.

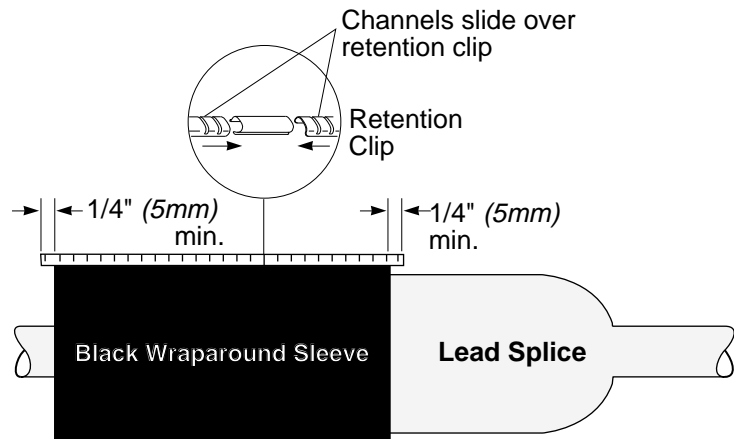
Slide metal retention clip onto the butted rails as shown.



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23. Install channels.

Connect the two channels with the short channel retention clip as shown.



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24. Shrink the wraparound sleeve.

Preheat evenly along both sides of the rail/channel area until this area begins to shrink.

For lead repair on only one side of the splice, start shrinking from the center of the lead splice towards the cable end. Keep the other end of the sleeve central over the cable by holding it clear of the cable until about six inches of the full circumference of the sleeve is recovered onto the lead sleeve.

For lead repair on both sides of the splice, begin shrinking at the center of the sleeve and work toward each end.

Apply heat until the sleeve is fully shrunk and the heat-sensitive paint is completely converted. Continue heating the rail/channel area for another 5 seconds per foot. A white line should be visible in the channel gaps indicating sufficient heating.

Note: Heat-sensitive paint will turn black as sleeve shrinks in place.

Installation tip: On both one and two side repairs, to prevent the underside of the sleeve from folding back on itself, shrink the last six inches of sleeve over the cable by shrinking the top and sides completely before finishing off the underside of the sleeve.

Repair is complete.

Note: Allow to cool before moving or placing in service.

