

# Eaton Lifesaver Fittings How to Braze Instructions



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# Lifesaver Fittings

## Brazing and assembling Lifesaver reusable fittings is a simple process

Eaton Lifesaver hose fittings are designed to simplify the replacement of failed hose lines which have unusual, steel end configurations, compound tubes, or thread styles. Refer to your master catalog for available sizes and hose configurations. The process involves removing the old configuration, silver brazing it to an unused Lifesaver nipple and assembling the fitting onto the hose in the usual manner.

A few Lifesaver fittings, some bulk hose, the appropriate hand tools and accessories plus basic silver brazing equipment are all that is necessary to make up hose assemblies anywhere. Be sure to follow all applicable safety procedures when brazing Lifesaver fittings.



### STEP 1 Measuring

Measure and record the length of the old assembly. For elbow assemblies, scribe a very light mark 5/16 inch or more from juncture of the tube and the existing hose socket. The distance from the scribe mark to the end of the other fitting should be recorded as the fabrication length. In the case of double elbows, make the scribe marks in line with one another so that you can duplicate the phase angle later. Record the distance between the two scribe marks as the fabrication length.



### STEP 2 Cutting

Using a hacksaw or tubing cutter, cut the tube at the juncture of the tube and the hose socket. It's important to cut the tube so there is at least 1/4 inch length of straight, un-bent tubing in order for it to properly enter into the counter bore of the Lifesaver nipple.



### STEP 3 Preparing the tube for brazing

Avoid touching the tube, oily or greasy surfaces tend to repel the flux and silver material leaving voids and inclusions. Clean the tube thoroughly using a residue-free degreasing agent, or hot caustic soda.

Using a flat file, remove the burrs on the outside of the tube and use a rattail file to remove the burrs on the inside. Polish the tube end on the outside with an emery cloth to remove the plating down to the base metal. It is important to remove oil and grease first because abrasives tend to scrub the oil into the surface and/or impregnate it with a fine abrasive powder, resulting in further contamination. Remem

## Lifesaver Fittings (cont...)

ber, attempting to braze contaminated or improperly cleaned surfaces will generally result in an unsatisfactory joint.



### STEP 4 Preparing the Lifesaver fitting for brazing

Clean the nipple and tube end thoroughly. Place the tube into the counterbore (it should fit freely into it). Measure the diameter of the counterbore to determine the braze ring size needed. At this point, you have the option of selecting a ready-made Eaton braze ring or making a ring for the application from bulk silver braze wire.

To assemble, simply place the appropriate size Eaton FF9075 braze ring into the counterbore of the Lifesaver nipple. To make a braze ring, multiply the diameter of the counterbore by 3 to determine the length of silver wire needed. For example, if the counter-bore diameter measures  $\frac{3}{4}$  of an inch, a  $2\frac{1}{4}$  inch length of wire would be needed ( $\frac{3}{4} \times 3 = \frac{9}{4}$  or  $2\frac{1}{4}$ "). Now cut off a piece of silver wire just short of  $2\frac{1}{4}$  inches, so it is about  $2\frac{3}{16}$  inches long. Using needle nose pliers, form the wire into a ring and, after wiping it off, place the ring into the counterbore of the Lifesaver nipple.



### STEP 5 Fluxing

Cover the counterbore, ring, outer hex and threads of the Lifesaver nipple and the outside of the tube with water soluble flux.



### STEP 6 Brazing

Place the tube assembly into a vise. Place the nipple with the installed braze ring over the tube. Light the brazing torch and adjust the flame so that the base is blue with orange "feather-like-flicks" at the end. Try to heat both the nipple and the tube uniformly so they both reach the brazing temperature at the same time. Don't over-heat the thin section.

As the temperature increases, the flux will undergo several changes:

- At 212°F or (100°C) the water boils off.
- At 600°F the flux becomes white puffy and starts to "work" (snow balling).
- At 800°F it lays against the surface and has a milky appearance.
- At 1100°F it is completely clear and active and has the appearance of water. At this point, a bright metal surface will appear underneath.
- The silver wire melts at 1125°F (600°C) and flows at 1145°F (620°C).

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### CAUTION!

Steam may be directed through the fitting ends. To prevent burns, handle the fitting carefully. Hot water will facilitate flux removal.



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Never heat the parts to a bright red color.

When the silver alloy melts, the flux will draw it throughout the joint and a small fillet of silver alloy will appear around the tube. When this happens the braze is completed.

Remove the heat source and allow the fitting to cool for five to ten seconds.

Using pliers, place the fitting into water until it completely cools.

### STEP 7 Removing Flux

It is necessary to remove residual flux from the area since it is corrosive and presents an unclean appearance and condition. Simply rub the surface using hot water and a wire brush. The water should be at least 120°F or hotter to be truly effective inside and out.



### STEP 8 Hose assembly or Shoulder

To determine the required amount of new hose, measure the distance from the scribe mark on the tube (refer to step 1) to the shoulder hex of the Lifesaver nipple. Add this measurement to the Lifesaver "D" dimension (cut off dimension) found in the "Fittings" section of the Eaton Master Catalog. For each Lifesaver fitting, subtract this sum from the fabrication length previously recorded. Cut the hose to this length and install the fitting.

Align the scribe marks to establish the phase angle. Spray paint brazed joints to prevent rusting.



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