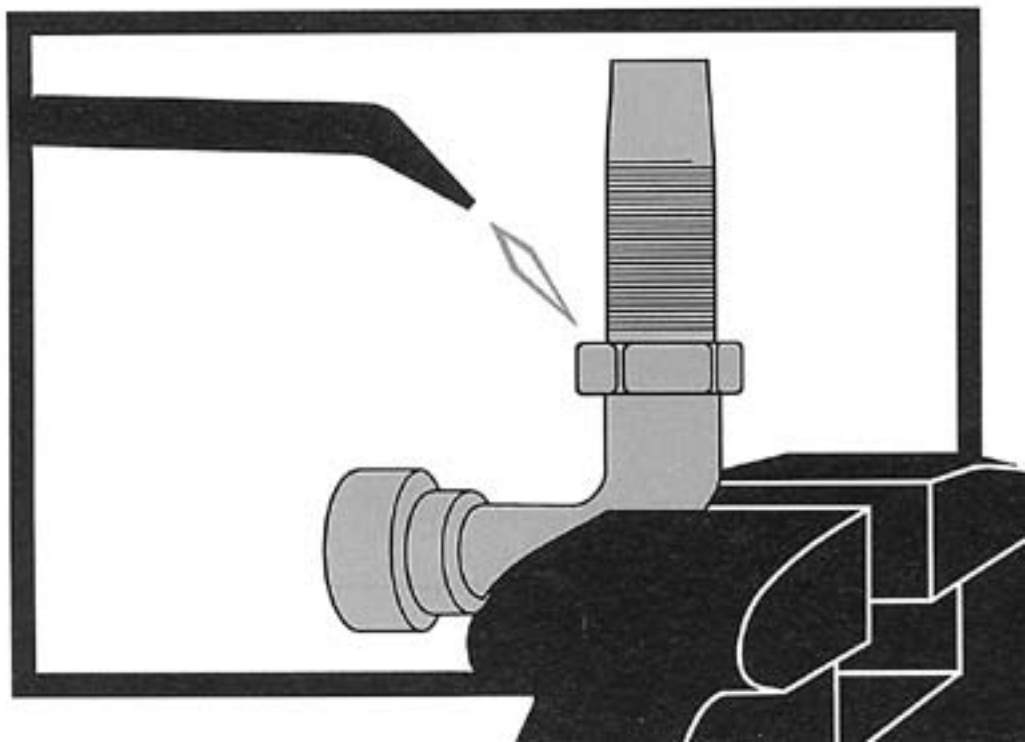




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HOW TO Braze Aeroquip Lifesaver™ Reusable Fittings



How to Braze Aeroquip Lifesaver™

Materials needed:

- Aeroquip FF9075 silver braze rings or 1/16-inch diameter, 45% silver alloy braze wire
- Water soluble flux
- Brazing outfit capable of +1200°F (propane or mapp gas)
- Small files—rattail and flat
- Spray paint (quick drying)
- Water (to cool joint)
- Needle nose pliers
- Tape measure
- Emery paper
- Hacksaw
- Pliers
- Pair of diagonals (or other tool to cut silver wire)
- Residue-free degreasing agent
- Wire brush



Reusable Fittings

Brazing and assembling Lifesaver reusable fittings is a simple process

Aeroquip Lifesaver reusable hose fittings are designed to simplify the replacement of failed hose lines which have unusual, steel, end configurations or thread styles. The process involves removing the old tube configuration, silver brazing it to an unused Lifesaver nipple and assembling the fitting onto the hose in the usual manner.

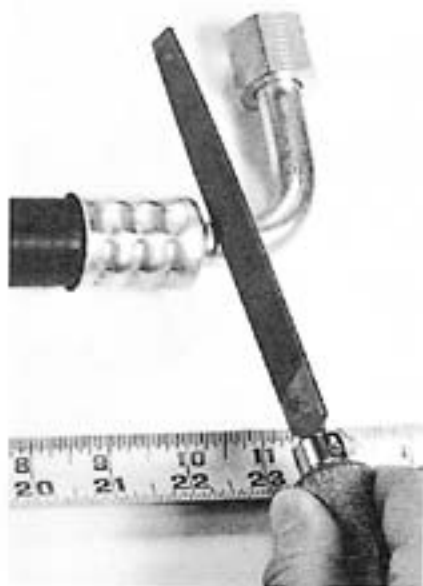
A few Lifesaver fittings, some bulk hose, the appropriate hand tools and accessories plus basic silver brazing equipment are all that is necessary to make up hose assemblies anywhere. Be sure to follow all applicable safety procedures when making Lifesaver fittings.

Step 1 Measuring

Measure and record the length of the old assembly.

For elbow assemblies, scribe a very light mark $\frac{5}{16}$ -inch or more from the 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 on. 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 is important to cut the tube so there is at least a ¼-inch length of straight, unbent tubing in order for it to properly enter into the counterbore of the Lifesaver nipple.

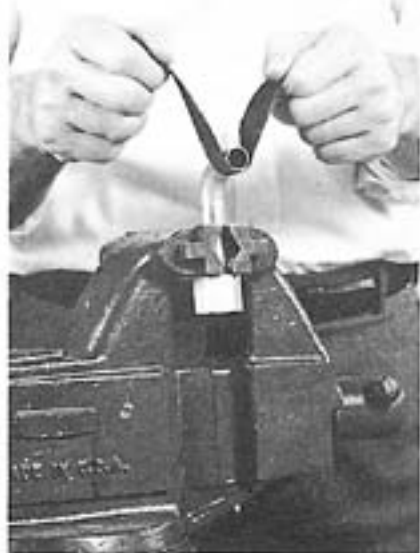


Step 3 Preparing the tube for brazing

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 end of the tube 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. Remember, attempting to braze contaminated or improperly cleaned sur-



faces 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 Aeroquip braze ring or making a ring for the application from bulk silver braze wire.

For quick, easy assembly, Aeroquip offers the following size range of FF9075 braze rings:

Part Number	Tube Size O.D. (inches)
FF9075-19	.25
FF9075-06	.38
FF9075-74	.50
FF9075-08	.63
FF9075-09	.75
FF9075-86	1.00
FF9075-87	1.25
FF9075-88	1.50



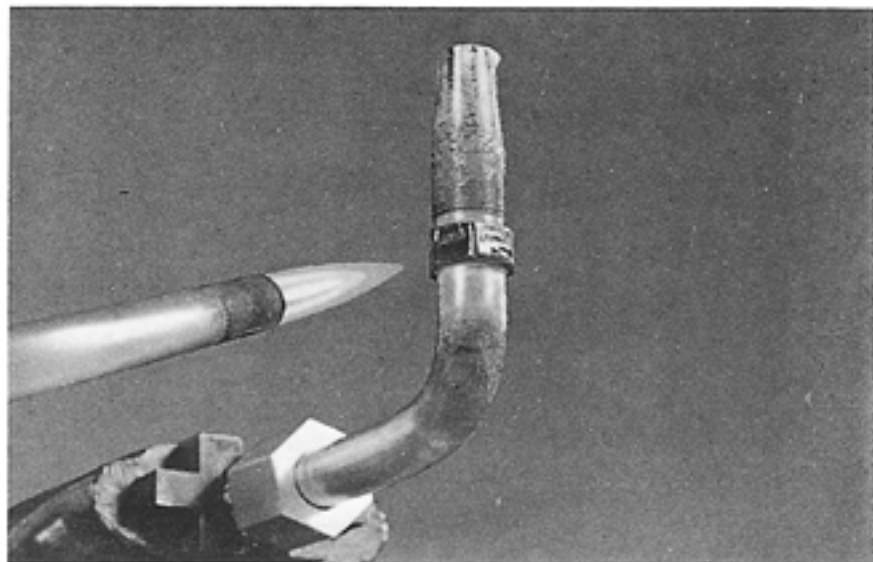
To assemble, simply place the appropriate size Aeroquip FF9075 braze ring into the counterbore of the Lifesaver nipple.

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 counterbore 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 its braze ring over the tube. Light the brazing torch and adjust the flame so that the base is blue with orange "feather-like licks" 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 overheat the thin section.

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

- At 212°F the water boils off.
- At 600°F the flux becomes white and 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 appear-

ance of water. At this point, a bright metal surface will be apparent underneath.

- The silver wire melts at 1125°F and flows at 1145°F.

CAUTION! 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 is completely cool. **CAUTION!** Steam may be directed through the fitting ends. To prevent burns, handle the fitting carefully! Hot water will facilitate flux removal.

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.

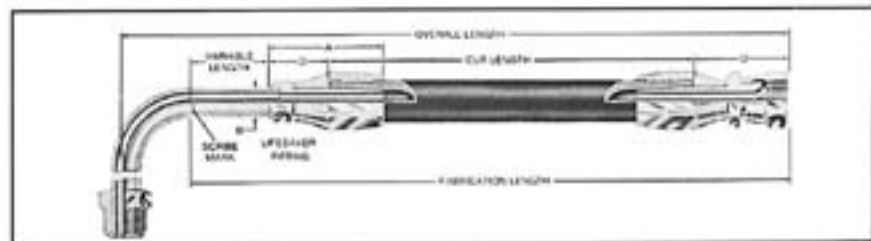


Step 8 Hose assembly

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 found in the "Fittings" section of the Aeroquip Hose & Reusable Fittings Catalog. For each Lifesaver fitting, subtract this sum from the fabri-

cation length previously recorded. When using Aeroquip fittings other than the Lifesaver type, subtract the appropriate "D" dimension found in the catalog. Cut the hose to this length and install both fittings.

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





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