

Chain reaction - Tips on repairing broken chains

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Repairing broken chains is one of the two most often preformed jobs in the shop. (Sizing rings is the other) The difficulty of chain repair lies in the fact that the chain is made up of fine wires. These wires heat up quickly when trying to melt the solder. Two problems develop. The first is if the wire link gets too hot, it will quickly melt as you are trying to solder. When a link melts it forms a small ball of gold fused onto the next link. This of course melts forming a larger ball on the next link. This then melts forming a larger ball, etc. It is a chain reaction.

The other problem is, if too long a section of chain is heated the solder will flow from one link to the next. From there, the solder will flow to the next link on down the chain. It is that chain reaction thing again. This will cause several links to solder together forming a stiff place in the chain.

Both of these reactions by the chain result in an un-satisfactory repair.

Jewelers have devised many ways to over-come these problems. They include coating the chain with an anti-flux such as yellow orcher or white out, and covering the chain with a heat sink such as a washer, razor blade, or coins. My preferred method is to use paste solder and to master the art of torch control.

The method to repair a chain using paste solder is as follows.

Inspect the Chain

Look over the chain to ascertain how the links are put together. In order to re-assemble the chain where it is broken you must know how the links are assembled. At this time look for other areas in the chain that need repairs. Although the salesperson taking in the repair should have already done this, it is a good idea to double-check their work

Remove Damaged Links

Trim off any damaged links from the broken ends of the chain

Cut End Links

The end link needs to be cut in order to re-assemble the chain. Some chains require you to cut one or two links on each side. The number depends on how the chain is assembled. You can cut the links with a fine saw blade, small end cutters, or a cut-off wheel in your flex shaft.

Re-Assemble the Chain

Lay the chain on a clean ceramic soldering board. Using your tweezers fit the two ends of the chain back together. Then squeeze the links closed. Once assembled it is often difficult to find the break in the chain. To help you find the break, mark the broken links with a felt tip marker before assembly. On some chains like rope chains you can add the solder to the broken link before assembly.

Another method to help you locate the break in the chain is to cut a line down the center of a ceramic soldering board using a cut-off wheel in your flex-shaft or with the edge of a diamond file. Then, lay the chain on the soldering board placing the broken link over this line. With this method you can layout several chains about 1" apart. Then start at one end of the solder board and solder the first chain, and then proceed to the next one. With all the chains laid out, you can quickly solder each one and the line shows you where to solder, with no time wasted trying to find the correct link.

Add the Solder

Apply a small amount of paste solder to the joint. Do Not coat the chain with boric acid. The flux in the paste solder is all that is needed for the solder to flow. The slight oxidation on the chain from the heat will help keep the solder from flowing to the other links.

Heat the Chain

With a small pointed (oxidizing) flame heat the ceramic soldering pad next to the joint in the chain. Do Not use a bushy (reducing) flame as you will heat too much of the chain. On most chains, you will not need to place the flame directly on the chain. Place the flame on the solder pad and let the reflected heat melt the solder. This will help you from melting the chain. On larger chains, heat the solder pad on one side of the chain, then quickly move the flame across the chain to the other side. Heat the pad on this side and then move back across the chain. Repeat the process if the solder has not completely flowed. However never direct the flame on the chain for any length of time. Move it quickly across the joint and heat the solder pad allowing the reflected heat to melt the solder

Clean the Chain

When cool, hold the joint of the chain on your bench pin and clean off all flux and oxidation with a scratch brush. A brass brush or a small satin finish brush in your flex-shaft works well. The new 3M Radial Bristle Disc are excellent for this purpose. I prefer the blue wheels and stack 4 to 6 on my mandrel at one time. Pickling the chain before doing this can help, but is often not necessary.

Polish the Chain

DO NOT Polish Chains On A Polishing Machine. I do not know of any

other procedure in the shop that has cut and broken more fingers than a chain becoming tangled around a polishing wheel. (Not to mention the expense of replacing a customer's chain.) Polishing machines loves chains. They eat them up. Come near a polishing machine with a chain and it will snatch it right out of your hand and wrap it around its wheel and arbor.

To polish, lay the chain across your bench pin. Then hold the chain down tight with your thumb and index finger. With a bristle brush in your flex shaft polish at medium speed the area of chain between your thumb and finger. Polish the chain little by little in this manner. It is a safe and efficient means to accomplish the task.

If properly repaired, your customer will return with a different chain for you to repair, and then a third. Eventually they will return to purchase jewelry. Now, that is chain reaction we can all live with.