

# DIY Motorcycle Cable Making

Mark Seibert

The best way I know of to make a cable is to tape the outer sheath to the location on the bike that it will live in, using masking tape. Be sure all cable ends (ferrules) are in place and any slack adjusters are installed and screwed in to preserve as much adjustment as possible. If you are doing a clutch or brake cable, keep in mind that there is always some lever movement before the clutch is activated or the brake shoes start to contact the drum. Include this in your outer sheath and inner wire length calculations. Consider cable movement as well.

The first step is to make the outer sheath, including a ferrule or end cap, at each end. Ferrules can be recycled and generally come off if you either twist it or pull it while twisting side to side. The really tough ones will come off with a bit of heat. A common hinge pin from a household door is a perfect internal fit for the larger ferrules and tapped inside the open end, will smooth them out for reuse. To get the ferrule back off the door pin, put the pin lightly in the vise, with the closed end up and tap on the large end of the pin until it releases the ferrule.

Cutting outer sheath. One can use a good pair of side cutters to cut the outer sheath. This may leave you with a sharp wire sticking out of the end of the sheath and that must be ground off so that it will seat in the ferrule. In one of the pictures is a pointed cutter I use to clean up the hole. Be sure to blow out any dust, as the wire will ride inside. Also, be careful when grinding not to get it hot enough to melt the outer plastic/rubber casing, as this will complicate putting the ferrule back on. Once the cable is cut to length and both ferrules are installed, check fit on the bike.

Now we make the inner wire and solder on the nipples. Keeping in mind paragraph one, measure your inner wire length – twice. When you are satisfied that you have the length correct – and it can be a complicated measurement – cut your wire. Better too long than too short! If it didn't cut cleanly, wrap a bit of copper wire around the end to keep it from unravelling and lightly touch it up on the fine wheel of your grinder. Remove the copper wire and sand the outside of the wire to a shiny surface. Degrease it by letting it soak in your favorite degreaser.

Now we need to make a tool to grip the wire and allow it to stick up enough that we can splay out about 1/16" of the end. Note that in the picture there are two types of tool, one a hand held vise (my personal favorite), the other a broken old pair of needle nosed pliers. Use what you have, the process is the same for both. Center punch hole location at the crack between the contact faces of either tool and drill a hole that is a slightly smaller than the O.D. of your inner wire, all the way through. Once that is done, counter sink this hole about 1/16" deep and of a diameter just large enough to allow the wire to splay out like the arms of an umbrella. This is what ensures that your wire will not pull out of the nipple once completed and is probably the most important part of making a good cable, besides measuring correctly.

Next, put the nipple on the wire and allow it to slide down. If there is a slack adjuster at that end, make damn sure it is on! Put the wire into the tool and let about 1/16" stick up into the larger depression. Using a center punch, punch the center of the strands, causing them to bend over and splay out in the depression. They will not lay completely flat, so use something to flatten them further. Trim as necessary to allow the nipple to pull up and the bent wires to nest in the depression in the top. The bent wires should be either below the top of the nipple or even with it.

Note the solder pot, made from a 1" cast iron pipe cap. One of the pictures shows the solder just starting to melt. It makes little silver balls just before it completely melts. This is common plumbers silver based solder and companion flux. Actually, I prefer the older flux used for the lead based solder because I think it does a better job and isn't as messy. Once the solder has completely melted, give it a few minutes and flux your ferrule. Flux is what cleans the nipple and allows the solder to adhere. Heat the nipple/wire combo slightly, to get the flux to liquefy and flow inside. Use a handy item to scrape off slag from the top of the molten solder. Quickly immerse the nipple and about 1/8" of the wire in the solder for a ten count. The flux will bubble and catch fire, doing its cleaning job. Hold the nipple with the top side down and let it cool enough for the solder to solidify. Check to see if you have a nice, smooth covering over the splayed wire, like half a bubble. If not, dip it in the flux and give it another dip. Sometimes it takes multiple tries. Sometimes to get that nice bubble over the wire, you will have to put the nipple into the solder sideways, to allow gasses to escape. Get it as nice as you can.

So.....now you should have a nipple with a nice bubble over the top of the splayed wires and the brass outside of the nipple is probably coated as well. You can do the old "shoe shine bit" with a narrow strip of sandpaper to remove any excess solder. Put the wire in the vise to hold it. A file can come in handy as well. What we have done is to encapsulate the wires while the solder is adhering to the brass ferrule, locking the wire in place. Makes no difference if the wire is stainless steel or plain steel, the encapsulation is what does the trick. I've made cables this way for eons and have never had a wire pull out of a ferrule.

If you like, there is a second method to improve the mechanical connection between the nipple and the wire that might be applicable for brake cables? Drill a very small hole through the nipple below the widest part. Insert your wire and tap a common sewing needle through the hole, the cable and out the other side. Grind off the excess, splay the wires and dip in the solder bath.

There are methods on the Internet. There is one that I liked. The guy uses carbon center rod taken from a D cell battery, drills a hole into one end, folds over his wire like kinking a garden hose and used Stay Silv 6 silver solder to create a nice ball on the cable end. The kinked wire protrudes from the end of the ball, but that may not be a problem for some applications, or the fold could be pulled inside the ball? Silver solder is much harder, but requires a ton more heat, possibly weakening the cable. This may be overkill. The carbon rod idea is interesting.....?

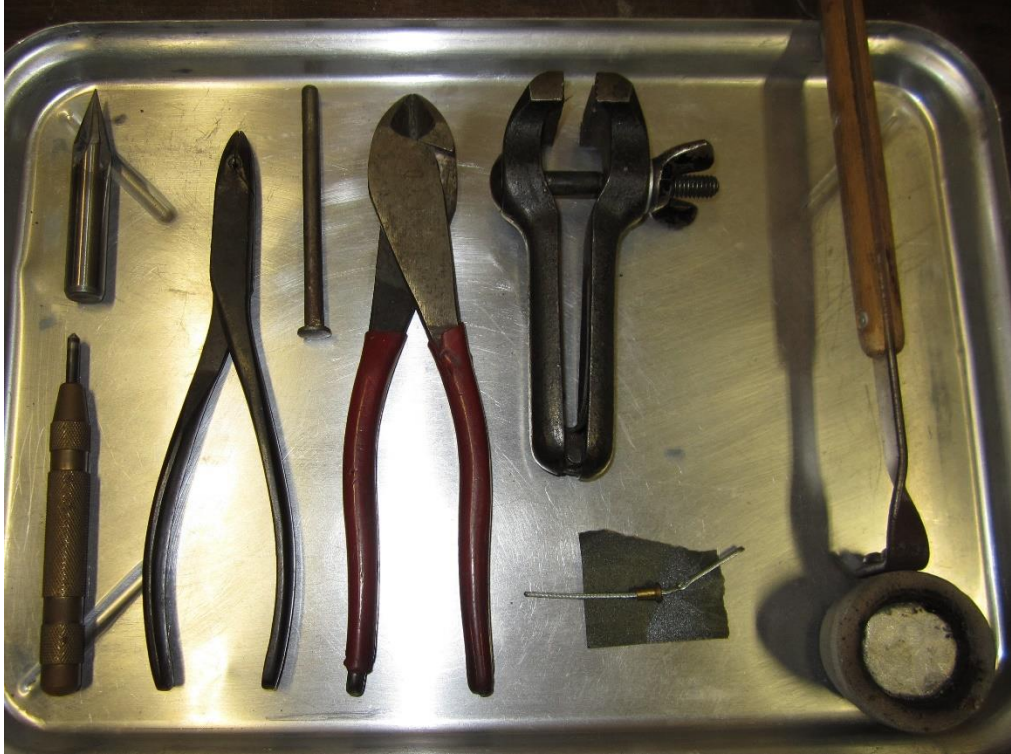
To shorten an outer sheath without re-doing the cable nipples, remove the plastic covering and pull off the ferrule for reuse. Taking a fine tooth hacksaw, cut through 2/3 of the wire thickness. Bend it away from the cut and it should snap off, leaving you with a free length. Next, very carefully, grip the end of the spiral wound sheath and unwind it without nicking the inner wire. Continue to do this until you can remove all of it. It ain't all that easy, but it can be done. This will leave you with a jagged edge where you made the cut. Square it off using your favorite method – without nicking the inner wire. Reinstall the ferrule and check fit.

My way of doing cables is just that – my way, based on what I was taught by those that came before me. I have improved it a bit and so can you. I encourage anyone reading this to look on-line and see if there is something you can use or adapt to fit your particular needs.

Pictures on the following pages...



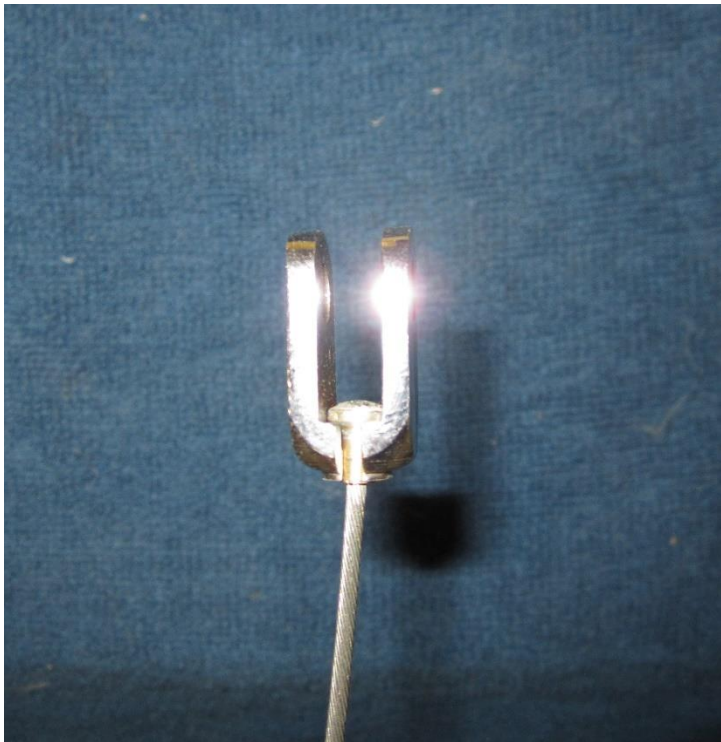
Nipples



Tools



Handheld Vise



Installed



Splayed wires



Vise in use



Solder pot



Just melting



Finished Nipple