

## **Braided Reinforced Clutch Line Installation Tips.**

In all year's manual transmission equipped Miatas, there is a section of the clutch line that is a flexible rubber hose. This is to allow the engine to shake and move without stressing a stiff metal tube. Over the years this rubber hose can become brittle and break in a worse case scenario. Another drawback of this flexible section is it can swell up some when you depress the clutch pedal, making the feel of the clutch engagement not very precise. Precise clutch engagement is important in racing, and just makes general driving and shifting thru the gears nicer. I got a gift certificate a while ago from Good-Win Racing, and my certificate covered almost all of the braided line. So here was a cheap project and article for me. You might find this helpful if you ever have a problem, or just want to improve the clutch feel.

I first got the front end of my Miata high enough to be able to crawl under the car to bleed the clutch slave cylinder, and also remove the driver's side wheel. I ran the car up on my ramps, and then put a jack stand under the driver's side so I could remove the wheel. Note these pictures are for a 2006 Miata, earlier model Miatas will be similar.

I removed the lid from the brake fluid reservoir and removed the rubber insert inside the lid. Then I put a plastic bag over the opening of the reservoir and tightened the lid down to seal it off. My idea was to create a vacuum of sorts in the reservoir so all of the fluid would not siphon out. This did help.

To be prepared for leaking brake/clutch fluid, I wrapped a paper towel under the fitting you see in the picture below left. Then I put another crumpled paper towel in a small zip-lock bag.

You can see in the picture below left, I used an open-end 10mm wrench to loosen the clutch line where it goes into the OEM flexible part that goes down towards the motor. These are regular right hand threads so turn the wrench to the left to loosen it. When I got the line off, I stuck the hard tubing end in the zip lock bag with paper towel to catch any dripping. Be careful the bag doesn't fall over and let clutch fluid drip out. Brake fluid is very hard on paint.

Right behind the wrench in the left picture is a "horseshoe" shaped clip. Pull up on that with pliers and the top of the OEM flexible hose is now free. It helps to have this free when working on the bottom.





The next step is down below in the wheel well, after you remove the driver's side wheel. The bottom fitting is accessible from the wheel well. See in the picture above top right. See the small plastic cover near where the brake line comes out of the engine compartment. There is a "1/4 turn" plastic pop-out fastener holding the front of the small plastic cover, but I could not see how it was held to the rear of the cover. I found there were 2 plastic tabs that stuck into the square opening you see to the rear of where the cover is placed. Not knowing what was there, I pried on it trying to look, and the tabs broke off. I don't know how to tell you to avoid this. But you need to remove this cover.

See the picture above, bottom left. The bottom fitting and bracket is accessible thru the opening created by removing the small cover. I wrapped a paper towel around the bottom metal tube and loosened the bottom fitting. After this is loosened, there is another horseshoe clip to pull straight out. Now that the bottom fitting is totally loosened, you can remove the OEM flexible hose from the top or bottom of the car. You will note all the fluid that was in the OEM hose soaked this bottom paper towel, so remove it and keep it away from all paint.

If you have A/C in your car, the new Braided Clutch Line seems a little short. Do not put it down thru the same plastic loop holder that the OEM was thru. It will be too short. I removed the OEM plastic looped holder.

You will note each end of the new braided cable has a hex fitting on it. See above picture bottom right. There is a matching hex recessed opening in each of the mounting brackets. Make sure the hex end fits into the recessed opening of the bracket, as this is what holds it from turning while you tighten the fitting into it.

Start with the bottom first. Put the hex fitting into the bracket, and put the horseshoe clip in place to hold it. Note the horseshoe clip is not flat, so put the curved side away from the bracket. Now put the solid tube end up into the braided fitting and carefully tighten it. Make sure it starts easily so it is not cross threaded. It will leak if it is cross threaded.

Now go up to the fitting under the hood, as seen in the picture above left. The A/C hose made the braided clutch line seem a little short. I adjusted the upper bracket to move closer to the motor about 3/16" when bolted in place. Then I put the hex end of the braided line into the bracket and installed the horseshoe clip. Last I put the solid tube end fitting into the braided end and tightened it.

Now is the time to remove the lid from the brake fluid reservoir and fill it. Don't forget to put the rubber insert into the reservoir cap when you fill it. Use DOT #3 Brake Fluid to fill the reservoir.

The next thing I did was to bleed the clutch slave cylinder. I had some help to push the clutch pedal as I opened and tightened the fitting on the slave cylinder under the car. Note that when you push in the clutch, and the fluid is pushed into your catch container, the clutch pedal does not come back out on its own. No problem, just reach down and pull the clutch pedal back up each time. Continue pumping and bleeding the line until all of the air bubbles are out. Now the clutch is ready to go.

My next problem was how to put the plastic cover with broken tabs back into place. You may find a better way, or even buy a new one. But this is how I did it. The "1/4 turn to remove" plastic pop-in retainer, like you removed at the front of the plastic cover, just fits into the rectangular opening where the tabs fit into. I had a spare one from previous projects, so I drilled a 5/16" hole in the cover between where the 2 tabs broke off. I put the cover in place and put the Pop-In plastic fasteners in the new hole to the back of it, and also one in the front hole where there was one originally.

I then put the wheel back on, torqued the lug nuts, removed the jack stand, and backed the Miata down off of the ramps. I took it for a drive and the clutch does feel a little different. Then I put it back up on the ramps to sit overnight. The next morning I bled the clutch line underneath again. I just wanted to "be sure" I had all of the bubbles out and everything was OK with no leaks. Make sure to keep the reservoir full while bleeding the lines so you don't get air bubbles in the clutch or brake lines.

I have driven the car for 2 weeks now after installing this. I can feel a little difference, but not enough to be earth shattering. But when one is trying to improve something, it can sometimes take several different small steps to accomplish a goal. Again, I installed this as an experiment to see if it helps my 06 6-spd MT shift smoother, to use my gift certificate, and to have a subject for an article.

So far, all is well.... Feel free to ask or comment if you have any questions!  
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