VAP Fuel Line DIY Replacement Procedure

Mance Etheredge 6/2010

Part 1 - Tools needed

I'll kick-off the workshop with special tools needed. This is only related to tools you'll need to install the DIY fuel line replacements and/or tighten the clamps on the DIY lines once installed. This will not cover the wrenches required to R&R your hex-end inverted flare wrenches for feed/return lines at their firewall connections. So aside from those 17mm/14mm open-end wrenches for compression nut removal/reinstallation the pictured items above are the only tools required for this conversion.

1. Dremel Tool with a cut-off disc. Any Dremel will work, ie; corded/cordless.

2. A screwdriver to "splay/pry apart" the cuts you'll make in both the UrS4 or UrS6 OEM crimped ends/ferrules.

3. A 3mm allen wrench which will be used on the DIY replacement lines to tighten/loosen the ABA injector clamps to either the fuel rail supply inlet, the return line outlet and both supply/return line firewall questions.

4. An X-Acto knife will also be helpful with the UrS4 lines as I'll explain later. But any "sharp" knife or razor blade, carpet cutter, utility knife etc will work.

Part 2 - Removing compression fittings/ferrules from UrS4/6 fuel supply and return lines

1. Allow engine to cool overnight. Remove supply and return lines from their firewall inverted flare hex connections slowly and catch any fuel that runs out in a rag/towel placed under those connections. Orient them downwards to allow the lines to clear of any fuel. Then take a gallon milk jug or pitcher and pour water over any area where raw fuel may have gathered/collected below the separated fuel lines.

2. After an hour or so of drainage place a towel, soaked with water under the supply/return fuel lines on top of the fuel rail and another over the fuel lines so the only areas exposed are the rail supply and FPR return line fittings and the fuel line's crimped ends/ferrules.

3. With the Dremel tool/cut-off disk make a vertical cut parallel with the fuel line on top in a spot where you have easy access with the cutting tool and slowly start cutting from near the rail's furnace-brazed fitting and thru the ferrule/crimp. On the S4 cut deep enough to cut through the SS braid but NOT deeply enough to cut the barb inside! Don't worry as there's plenty of meat between the braided sheath and that barb OD. This WILL create sparks so be sure you, with the upper towel create a dam or some sort of wall to prevent sparks from being thrown to where any raw fuel may have collected tho most should have evaporated by now or been sufficiently diluted when you poured water over that area.

4. Splay/pry apart the vertical cut you just made into the crimp/ferrule with the screwdriver.

5. On the S6 you should now be able to remove the rubber hose with firm twisting-pulling action.

6. On the S4 you'll need to pull back the braided sheath to expose the underlying rubber outer sheath which at this point will crumble and fall apart in your hands. But the inner plastic "line" will remain attached to the barb. To remove that line carefully run an X-acto blade, razor blade or knife blade down the barb's parallel "undulations" on that barb which reveal the barbs hiding underneath and preventing that line from being pulled off.

The next step will show a picture of what you need to do there in order to remove the inner line.

Once this has been done both S4/S6 lines can be moved to a workbench to remove the lines from their supply/return barbs.

Part 3 - UrS4-specific and S6 people can skip over this...

In this pic you can see what you're dealing with in EVERY UrS4 fuel line. The rubber sheathing between the outer braid mesh and internal line was toast YEARS ago. It's dried out, rotted, checked and cracked and crumbles in your hand. You can easily tear it off by hand with no tools whatsoever.

You can also see the cut that needs to be made parallel to the barb fittings in the internal plastic line in this pic. Once that cut is made you can then remove that line from the rail and FPR barb then move both remaining line assemblies to an easier, more convenient workplace.

Part 4 - Cutting hex union line-ends for UrS4/6 supply/return at their firewall barbs....

This is a little trickier than making a straight cut in the supply/return lines at their fuel rail connections.

For this you'll want to make 2 cuts in either S4/S6 crimped ends/ferrules. One from top at a reasonably extreme angle then a finish cut that is straight. If you try to make a straight cut as on the other end of these hoses you'll likely cut into the hex. Not a big deal unless you were to cut very deeply, but then again not desired either. And even making an angle cut you can still "nick" the hex as I did on the S$ line in pic just to left of the red hash mark I "painted" in.

Once this cut is made simply splay or pry apart your cut in the crimp/ferrule and pull the lines off using the same pulling/twisting motion you used at the other end. And same other rules apply as before between S4/S6 techniques, ie; cutting thru braid on S4 lines then sliding back SS sheathing and cutting thru the inner plastic liner on the S4 lines with an X-Acto or other.

I've done this on a dozen or so rails/lines over the past year and everything written to this point takes about 15 minutes total even the 1st time. Today it’s under 5 minutes to get the lines removed, and under 15 to do the entire project! So no need for intimidation to rear its ugly head. This is a total walk-in-the-park conversion!

Basically at this point you're finished and all we have to do now is install the new DIY replacement lines and drive.

Part 5 - This is it, end of story and where both car's lines come together...

Instructions for S4/S6 are identical.

1. Once you've finished with Part 4, reinstall the hex/barb fittings back on your firewall fuel inverted flare connections for both the supply and return lines. Be SURE to add a smear of grease on BOTH compression fitting's male/female sealing surfaces before reassembling! Then torque the 2 union nuts firmly together but not HARD!

2. Now install the hose on the fuel rail supply and return line hose barbs, make sure they are pushed ALL the way up to the shoulder they rest against and can be pushed no further. (All DIY replacement lines are internally pre-lubed at both ends here before shipping!) Tighten fuel line injector clamps snugly but DONT whail on them! In fact, using the short end of the allen wrench for torque usually works better as these are not ordinary clamps and seal VERY tightly/positively with little effort. Over-tightening just squishes/distorts the internal rubber liner and compromises potential down-the-road subsequent tightenings that may/may not prove necessary.

3. Then install the other end of the fuel line at the firewall barbs identically to the rail end of things and clean up/put things away except for the allen wrench.

4. Start car and allow to idle for 10-15 minutes while inspecting for leaks. If none are found you're ready for a test drive then re-inspect for leaks while your out on the drive (take the allen wrench with you) or immediately upon return. If everythings dry you're up and running again and shouldn't have spent even an hour doing this from start-to-finish.

And here's the icing on the cake! You're now set up to run ANY fuel injector line in the event of leaks temporarily until you can replace these lines with lines of similar/identical quality. And that easy swap remains in effect for the life of the car! You can now swap with any FLAPS fuel line of similar ID, length and pressure rating even with worm-drive clamps temporarily in under 10 minutes.

Top/larger diameter DIY replacement lines in pic are UrS6 while lower/smaller diameter line is UrS4. This last set of instructions apply to rail or firewall lines, supply or return lines and S4 or S6 lines and with/without decorative hose-ends. That is all...