

Front Expansion Valve Removal & Replacement

Dr. Bob writes:

“To replace it, you'll want to first evacuate the gas from the system. The air cleaner box needs to come off completely, and the clamps that hold the lines to the firewall need to be removed. On my '89 the ends of the tubes are retained by clamp plates that bolt through the aluminum [expansion] valve block. Earlier cars may have threaded nuts over each line according to the repair manual. There are o-rings at each port that need to be replaced with the valve. The replacement valve I got from David Roberts has the o-rings included, by the way (shameless plug...) Anyway, it took me a little bit of pulling and prying to get the lines clear of the valve from the firewall side, but it really can be done. Install the new o-rings and the new valve, restore all the clamps, the air cleaner parts and the tubes. Evacuate the system and recharge.”

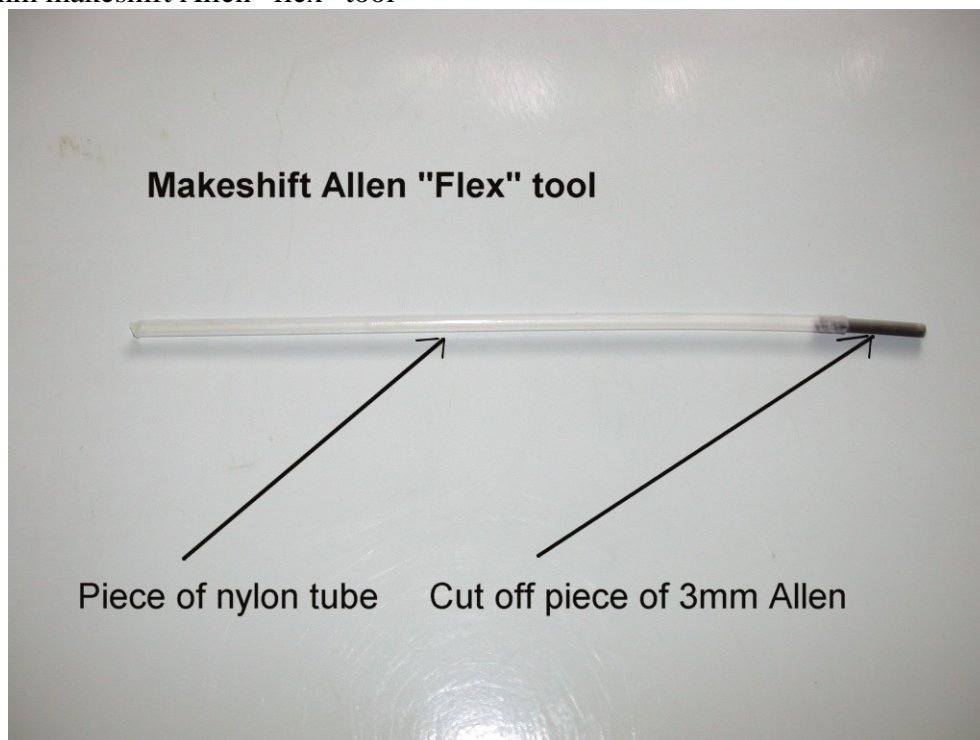
Submitted by JP TL:

Some additional notes & photos-

If you plan to remove the expansion valve prior to obtaining the new valve, cap off all 4 lines after removing the old valve. This keeps moisture/humidity out of the lines. Clean fingertips cut from disposable latex gloves & small rubber bands work well. The proper size allen keys, a modified allen key (see below) & a ratchet strap will make the job go much smoother.

Tools needed prior to the doing the job:

1. **Three Allen (Hex) Wrenches.** You will need the individual wrenches (L shaped). The foldout wrenches that come in the all-in-one tool will not work for this job!
 - 5mm Allen Wrench for the one outside Allen Head Bolt.
 - 3mm Allen Wrench for the two inside Allen Head Bolts (behind black plate)
 - 3mm makeshift Allen “flex” tool



This tool can be made by cutting off a 1” piece of the second 3mm Allen Wrench, and slipping into the end of a nylon tube with a 3mm I.D. Take a piece of nylon tube (can be found as the pickup tube to a pump spray bottle)

2. **Ratchet strap.**

This is to hold back the thick line going through the firewall to allow easy removal/installation of the valve.

3. O-rings

You will need to replace the 4 o-rings for each line for each port of the valve. Make sure to get the green rings. I believe that the thickness/cross section diameter should be 1.8mm. I've been told that the 2mm that are also available in these sizes are too thick. The I.D. of the rings should be as follows:

- (1) 7.5 mm I.D.
- (1) 10.6 mm I.D.
- (2) 14 mm I.D.

4. Expansion Valve

If you aren't purchasing through one of the Big Three or Griffiths, it is important that you see what you're ordering/buying beforehand. There are some parts suppliers who reference the incorrect unit for '87-'95 928's. They can't be adapted & won't fit.

Removal Steps-

As Dr. Bob writes, the airbox must be removed in order to access the lines & the clamp on the firewall. After removing the airbox and the molded plastic rain shield above & behind the firewall:

- Remove the 5mm Allen Head screw attaching the front black plate to the valve. Be careful not to drop this screw - or anything else for that matter - into the abyss below the valve. They'll be hard to get out!



- Slide the plate on the line, and out of the way. Loosen the two 3mm Allen Head screws that secure the rear plate. After breaking the screws loose, this is where the makeshift 'flex' tool comes in handy. Since there's no room to get a decent twist with the standard Allen Head wrench, the flex tool will speed up the removal of these screws considerably, as well as avoiding cross-threading during install.

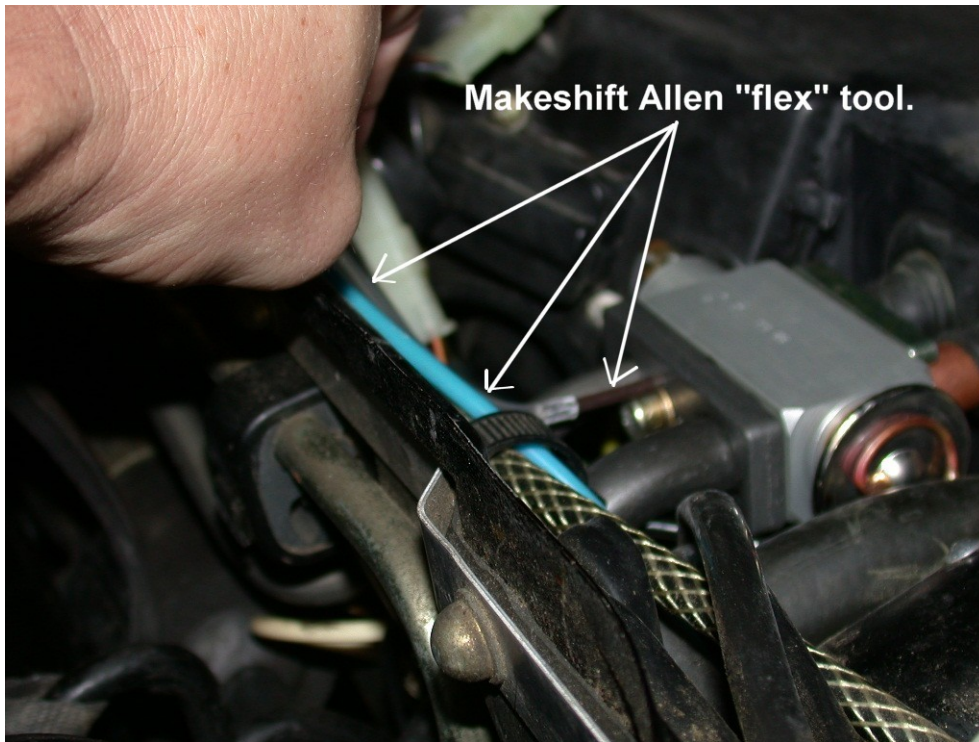
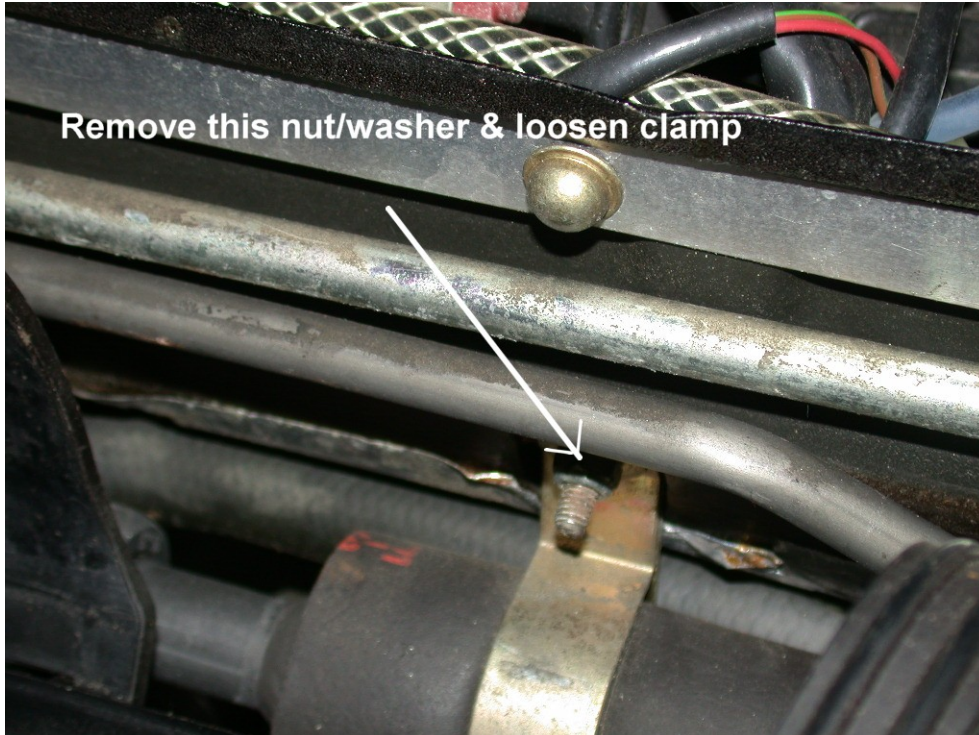
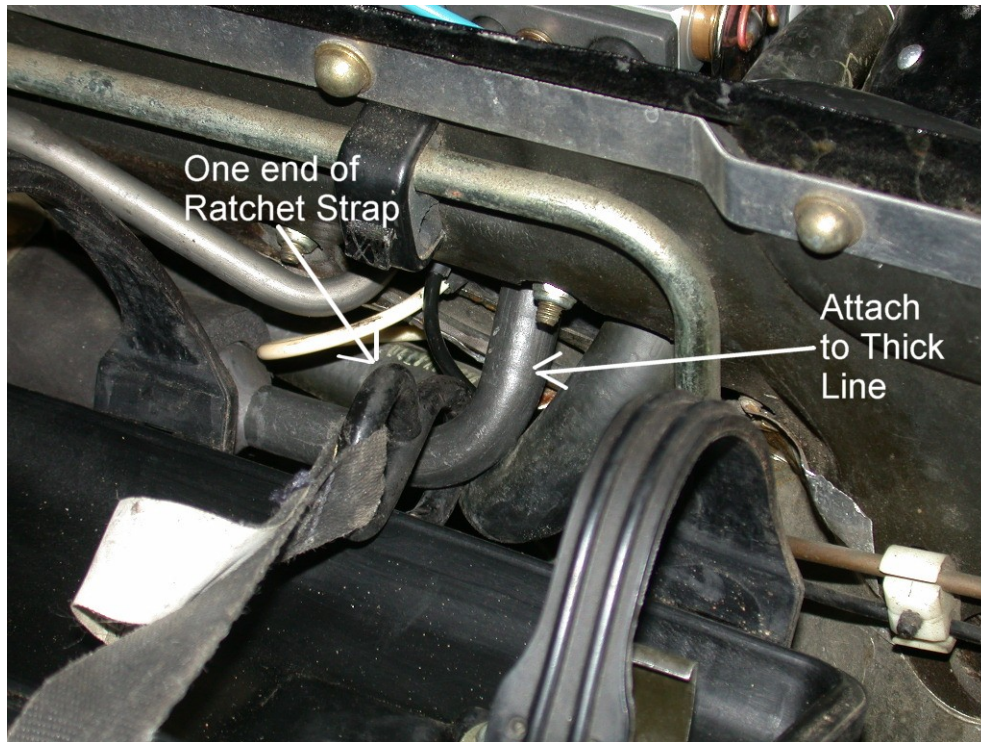


Photo shows 5mm screw & black plate in place. Sorry – I took this picture after the fact, and the plate needs to be removed in order to access the two 3mm screws.

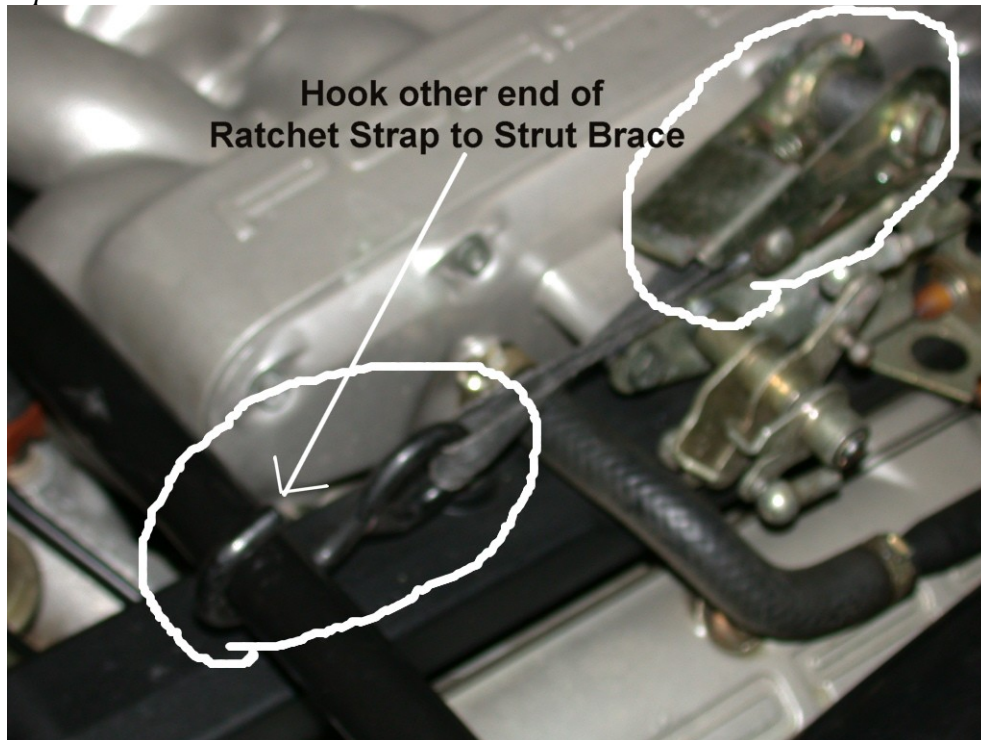
- After removing the two 3mm screws & their washers, pivot & remove the back plate from the valve.
- Remove the 10mm nut securing the clamp holding the fuel cooler. Loosen the clamp somewhat to allow some movement of the fuel cooler & thick line.



- Attach one end of the ratchet strap to the thicker of the two lines going into the firewall; the other to the strut brace.



Note that the airbox base isn't removed for this photo. It should be removed, as it will interfere with the strap.



- Since it is the thick black line & its lack of play that prevents easy removal of the valve, it must be pulled away from the valve. Gradually tighten the strap, pulling the thick line away from the valve, allowing just enough clearance for the line to clear the port. Gently use a screw driver to pry it downward & away from the valve, if necessary. Don't over crank the ratchet, or the line will bend & be a real pain to align into the port on install.
- Clearing the thick line from the valve should allow pivoting & removal of the thinner black line from the valve port. At this point, you should be able to remove the valve.
- Keep the strap taut for install, as the thick line will need to be clear for the install.

- Inspect the ends of the lines for crud. Carefully clean/wipe any crud from the line ends, keeping any debris out of the lines.
- If you aren't going to immediately install a new valve, seal the ends of each line to prevent moisture from getting inside the lines.

Installation of New Valve:

- Put new o-rings on each line end. Lightly lube them with compressor oil.
- Carefully line up the two inboard lines to the new valve ports, making sure that the valve is properly oriented. The lines must be fully in the bores of each port, or else they may bind on install. Install the back plate, and snug the lines into the ports. Pliers or vice grips may help with this.
- Lightly tighten the two 3mm screws to snug the back lines to the valve, but don't fully tighten at this point.
- While guiding the thick line toward the valve bore, slowly loosen the strap until the line seats into the port. Seat the thin black line into its port.
- Tighten the 3mm screws in steps progressing back & forth from screw to screw. Make sure that the plate is seated against the valve fully and evenly.
- Slide on the front black plate, and snug the lines into their ports.
- Install & tighten the 5mm screw.
- Reinstall all removed components.

Additional note:

After troubleshooting a leak to the compressor fittings and a successful install of *almost all* o-rings in the system, I opted not to replace the o-rings to the rear expansion valve, or even check the valve for leaks. Big mistake. After making another appointment with the A/C guy, the system was still not holding pressure. I went home without A/C, and with a feeling of ineptitude. I pulled the back covers off the rear A/C, and found considerable oil & dye under the expansion valve....a huge leak. After removing the expansion valve, I saw considerably more crud & corrosion in this valve than in the front valve. I'm speculating that the valve wasn't working properly, and forcing a leak at the line fitting.

Both appeared to be the original valves, so....don't assume that if you don't use your rear A/C much, that the expansion valve is in better shape than the front! It's well worth checking the rear valve for leaks & replacing o-rings. It's a much easier & cleaner job than that bear of a compressor & it's lines.