

Killer Chiller Drag-Kit Installation 2003-2004 Ford Mustang Cobra

Tools and materials required for upgrade:

Metric socket sets and open end wrenches

Hose cutter

Concrete nips (for A/C hose clamps)

Blue (1/2") and black (5/8") A/C spring lock coupler disconnects

R134A or ES12A refrigerant (3-4 cans)

3 to 5 oz. of PAG oil (accumulator)

2 oz. of pressurized PAG 46 oil.

DIY special equipment (optional):

A/C gauge set

Air vacuum pump

A/C can tapping valve

Read through the all these and the standard KC instructions before starting, this will improve your understanding of all the steps, but basic to intermediate automotive repair skills are assumed.

Make sure to follow standard safety rules associated with automotive maintenance and repair

Suggestions and tips are denoted by an *

The principal differences between the standard Killer Chiller (KC) kit and the drag kit are:

1. The default mode is A/C refrigerant flow to KC heat exchanger (HE) only. This improves the cooling of the KC HE, and eliminates moisture that can drain from the evaporator.
2. The solenoid valve activates parallel A/C refrigerant paths for the KC HE and the evaporator, the parallel path improves in-cab cooling over the basic kit. (The standard kit routes the A/C in serial, first to the KC HE then the evaporator)

The KC drag kit can be purchased as an upgrade or a complete kit. These instructions will focus on the upgrade only, the 03-04 cobra installation instructions for the standard KC kit already covers a number of topics including mounting the KC HE and routing of the intercooler lines. No removal or re-routing of the intercooler fluid lines is necessary for the drag kit upgrade -all modifications are to the A/C system only. If installing as a new kit, read the standard KC instructions for the other required steps in the order that will be provided. The standard kit installation instructions also include a number of tips and suggestions that apply to the upgrade. These instructions provide a guide to the mounting and location of some of the components, but strict adherence is not required, only suggested; modify as needed or desired.

A list of all A/C parts for the KC drag kit, is provided in the following table (hose clamps and cages for fittings are not shown).

Killer Chiller Drag Kit parts list				
Picture	Description	Number	Drag Kit upgrade	Location
	Accumulator	1	yes	Firewall
	KC heat exchanger	1	no	Front bumper support
	Orifice tube	1	yes	Evaporator inlet (lower)
	Spring lock connector	1	yes	Evaporator inlet (lower)
	Condenser T-fitting	1	yes	Condenser exit (lower)
	Peanut fitting	1	no	Condenser exit (lower)
	Expansion block	1	yes	Passenger side of front bumper support
	Solenoid valve	1	yes	Inside passenger side front fender well
	KC heat exchanger #10 AN to #8 AN adapter	1	Optional (depends on kit)	KC heat exchanger A/C outlet
	#6 - 90 female fitting	1	yes	Solenoid valve
	#8 - 90 female fitting	1	no	Orifice tube
	#12 - 90 female fitting	1	yes	Accumulator
	#6 female fitting	1	yes	Solenoid valve
	#8 female fitting	1	yes	Condenser T-fitting
	#6 male fitting	1	yes	Expansion block
	#8 male fitting	2	yes	
	#10 male fitting	1	yes	
	#8 AN male fitting	2	yes	KC heat exchanger (A/C)
	#8 hose	12 ft	yes	Multiple locations Expansion block to accumulator
	#12 hose	4 ft		

Parts list notes:

One 90 degree and one straight #8 female fitting can be re-used from the standard kit with new cages and clamps.

Not included in the above list are the following components included in the standard kit:

Heater hose (10 ft), coolant hose clamps (6), 90° PVC coolant hose couplers (2), KC support bracket (1) and support bracket rivets (3).

You will also need the following for installation and operation of the solenoid valve: Inline 5A fuse, SPST switch (10A), wire (and connectors), 2 screws (w/ lock washers).

Basic diagram of KC drag kit A/C circuit

Figure 1 shows the A/C modifications. Additional information on the basic components of the Ford A/C system can be found in the standard KC instructions for the 03-04 Cobra. The line lengths in Figure 1 are approximate for this particular install and it is suggested not to cut A/C hoses prior to installation. The instructions are written such that only one line at a time can be installed.

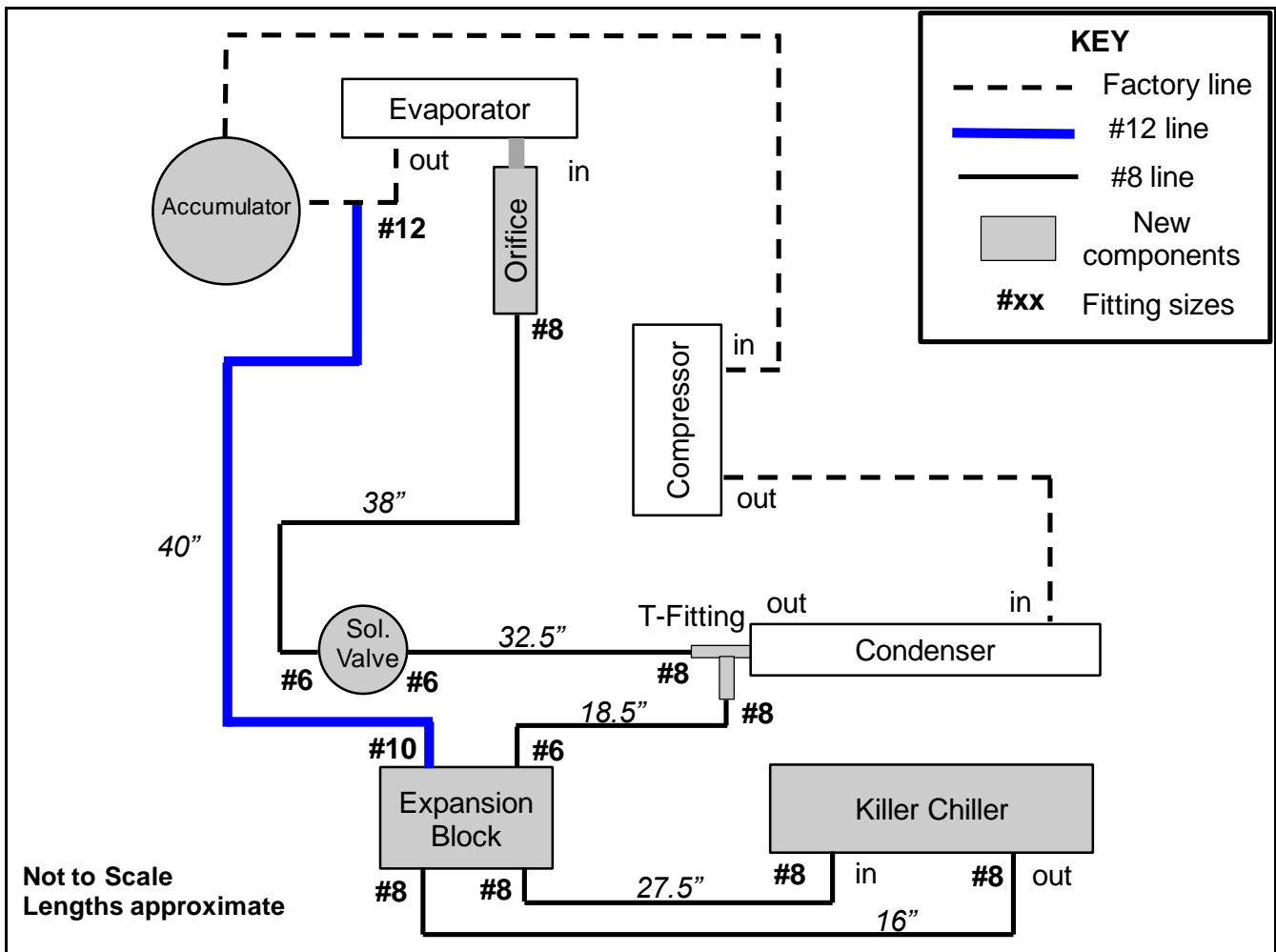


Figure 1. Diagram of KC Drag kit A/C modifications.

INSTALLATION STEPS

1. Disconnect the battery (see original instructions)
2. Removal of the bumper cover (see original instructions)
3. Removal of the air intake and air filter assembly (see original instructions)
4. Installation of the KC HE (see original instructions)
5. Re-routing and installation of intercooler fluid lines (see original instructions)
6. Evacuate A/C refrigerant from system (see original instructions)
7. Installation of a #10 to #8 adapter on KC HE A/C outlet (on some KC HE's)
The adapter is included for KC HE's that have a #10 outlet, otherwise ignore this step. See the left side of Figure 2.

8. Remove the orifice tube from the KC inlet (standard kit, upgrade will not have this)

Remove both the coupler and the orifice tube from the KC inlet. The orifice tube may not be easy to remove, if necessary use some heat and pliers to remove it, making sure nothing enters the KC HE. The #8 AN female fitting is shown on the inlet following removal of the orifice tube and coupler in Figure 2.



Figure 2. Detail of installed KC HE.

9. KC HE A/C lines and expansion block

Install #8 AN female fittings to both the inlet and outlet of the KC HE, and run #8 hoses to the expansion block located near to the intercooler pump (Figure 3). In this configuration the outlet line from the KC is attached on the right side of the expansion block (opposite the #10 fitting).

* IT IS EASIER NOT TO FULLY TIGHTEN A/C FITTINGS UNTIL THE LINE IS FINISHED



Figure 3. Detail of expansion block and #8 lines from KC HE.

The location for the expansion block is not critical, but the position shown in Figure 3 is convenient for routing of lines. The tension on the lines keeps the block suspended but a bracket can be used to secure it, if desired. The line from the KC HE inlet goes opposite of the #6 and the outlet line goes opposite the #10 male fitting. On this particular vehicle intercooler fluid line ball valves are installed to bypass the HE.

10. Removal of the Accumulator

To aid in removal of the accumulator, detach the fuel line, the wiring harness and vacuum lines (Figure 4). Remove the A/C charge port line (spring lock coupling), and disconnect the pressure switch. Removing the pressure transducer from the accumulator will also allow more room to reach the evaporator outlet spring lock coupling. Remove the nut from the accumulator clamshell bracket so that the two sides can be fully released. This will also allow sufficient movement of the accumulator to disconnect the inlet line from the evaporator (top fitting on the firewall). Be careful of the vacuum line that runs into the firewall close to the connector. Figure 4 shows the aforementioned components on an installed modified accumulator.

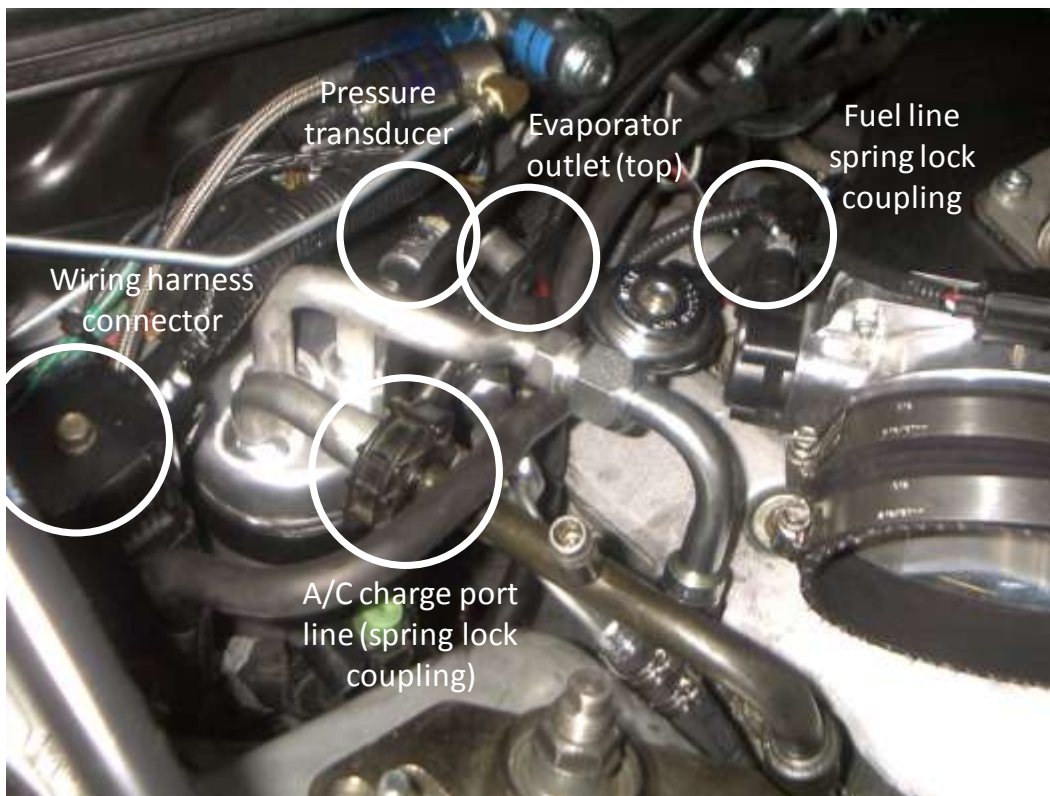


Figure 4. Detail of (modified) accumulator and related components.

Once the accumulator is removed, drain it by drilling a hole in the bottom, and measure the amount of oil that is removed. Replace the amount of PAG 46 recovered or add 3 oz. to the new accumulator. Installation of the new accumulator will be one of the last steps before sealing up the A/C system to avoid unnecessary saturation of the desiccant.

11. Install new evaporator inlet spring lock connector and orifice tube

The #8 line from the evaporator inlet (bottom firewall fitting) will go the outlet of the solenoid valve (see step No. 13).

* CHECK THAT THE SPRING LOCK COUPLINGS ARE SEATED PROPERLY USUALLY A CLICK CAN BE HEARD WHEN IT IS SEATED.

12. Installation of T-fitting

To make installation of the T-fitting easier, install the peanut fitting to the condenser first and then install the T-fitting with the attached lower #8 hose (bottom of the T) as a unit (lower the line down to the floor first). A close-up of the installed fitting and lines is shown in Figure 5. Install the #8 hose going out of the bottom of the T-fitting to the #6 male fitting on the expansion block.

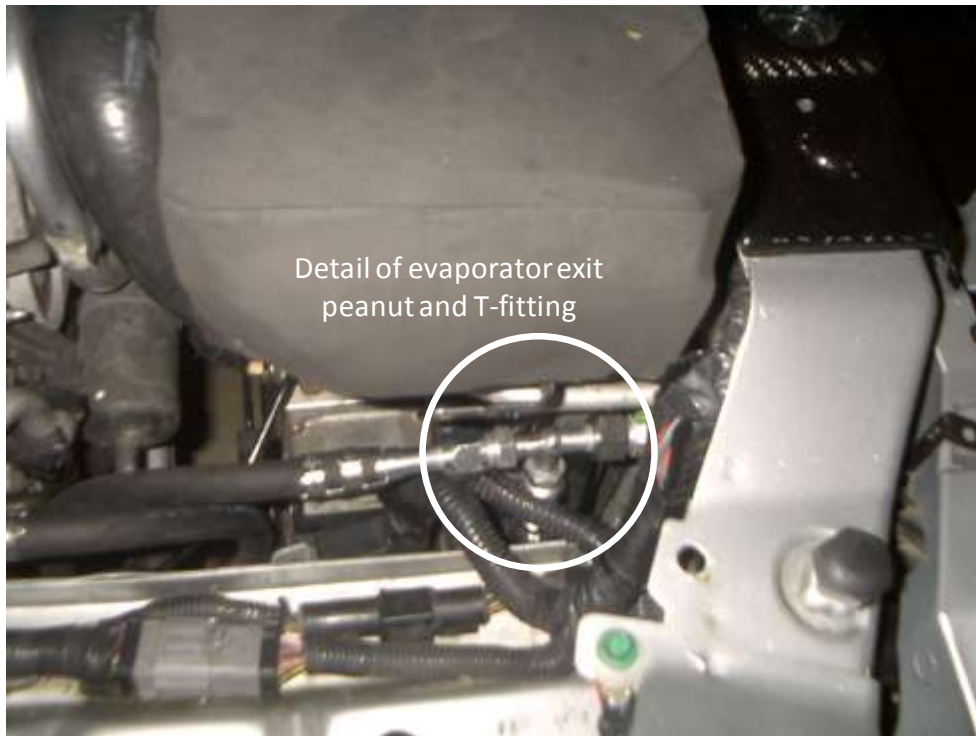


Figure 5. Detail of installed peanut and T-fitting on condenser outlet.

13. Solenoid valve and lines

Attach the #8 female fitting and line to the side of the T-fitting and run it to the inlet of the solenoid valve with the #8 90° female fitting (Figure 6). Attach the other #8 90° female fitting and line to the orifice tube and run the line to the outlet of the solenoid valve using the #6 straight female fitting and #8 hose. Before mounting the solenoid to the inner fender (using two screws and washers) install both inlet and outlet lines, to insure proper positing. Be sure to note the direction of flow when attaching the lines. If the orientation (and direction of flow) of the solenoid is changed, change the fittings accordingly.

A close-up of the three lines (two) from the accumulator and (one from the) evaporator is shown in Figure 7. The #12 hose (installed in Step 17) runs underneath and insulation of lines is suggested. For this installation reflective insulating tape was wound around the #12 hose.

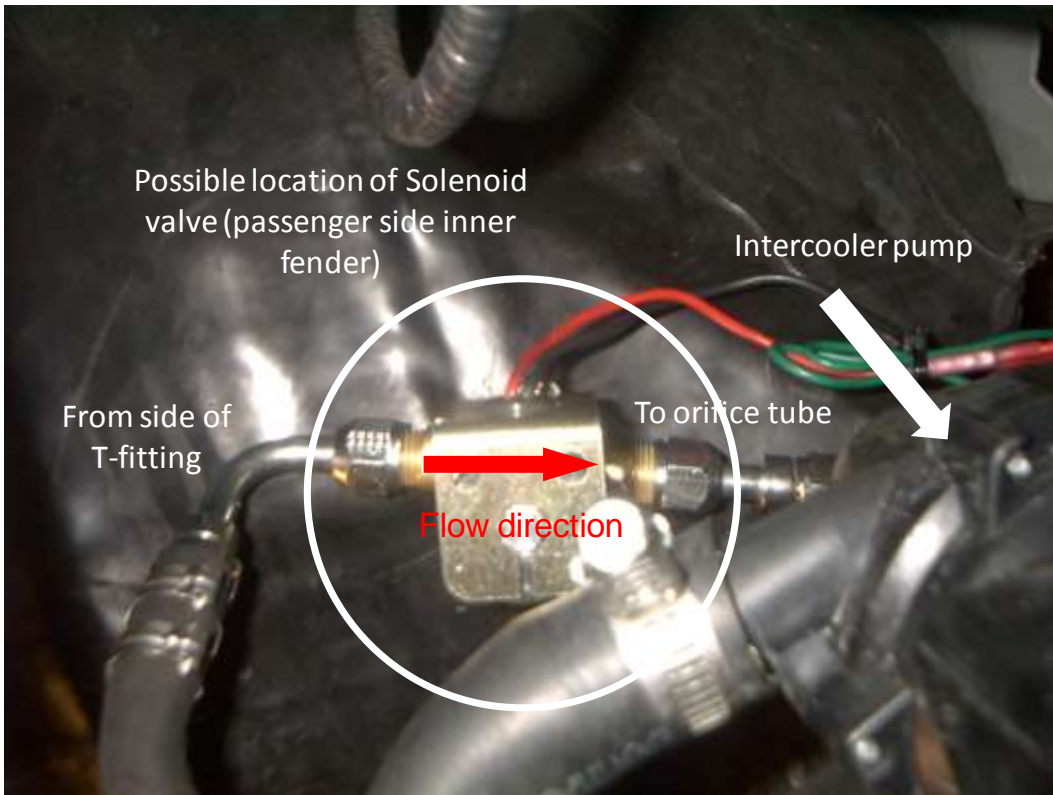


Figure 6. Location of the solenoid valve inside the passenger side inner fender.

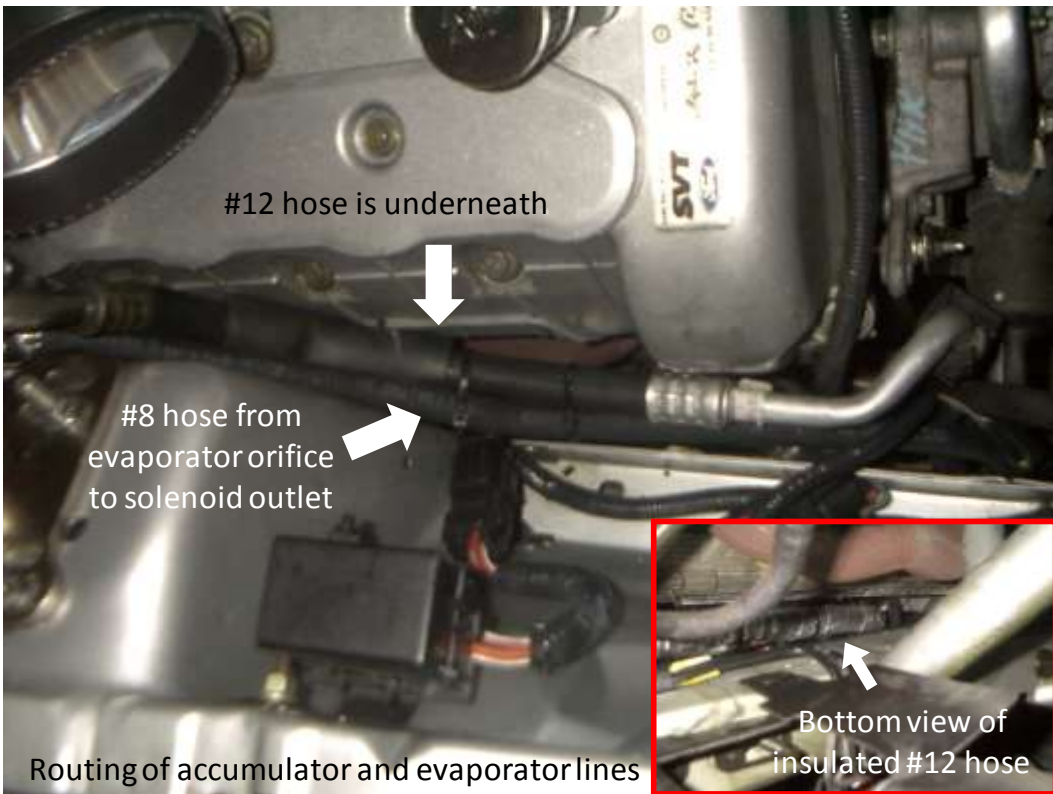


Figure 7. Routing of A/C lines next to the engine (passenger side).

Run the power wire to the battery or a source that is powered when the ignition is on. Running the wire straight to battery will drain it if the solenoid is left powered when the engine is turned off. Include a 5A fuse on the power line, and make sure that the circuit selected can power the solenoid. The default state of the valve is **normally closed** so to enable in-cab cooling the solenoid must be activated. Run the ground wire to a switch, and then to a suitable ground. One possible location for the switch inside the cab is on the shifter console as shown in Figure 8.



Figure 8. Possible in-cab location for solenoid switch.

16. Install new accumulator and connections

The modified accumulator is slightly smaller in diameter, so the bracket will rest on the weld joint when fully tightened by the clamp (see Figure 4). Re-install pressure transducer and connector, keeping the A/C charge port line disconnected and out of the way for now. This will allow for easier installation of the #12 hose and the #8 90° female fitting and hose at the orifice tube.

17. Install #12 hose from accumulator to expansion block

A detail of the installed accumulator and lines is shown in Figure 9. Run the #12 hose from the 90 degree fitting at the accumulator to the expansion block, using the straight #12 male fitting at the expansion block. This line will run underneath the factory A/C charge port line and the #8 hose from the orifice tube. Insulate and tie-wrap the lines together as desired (e.g. Figure 7).

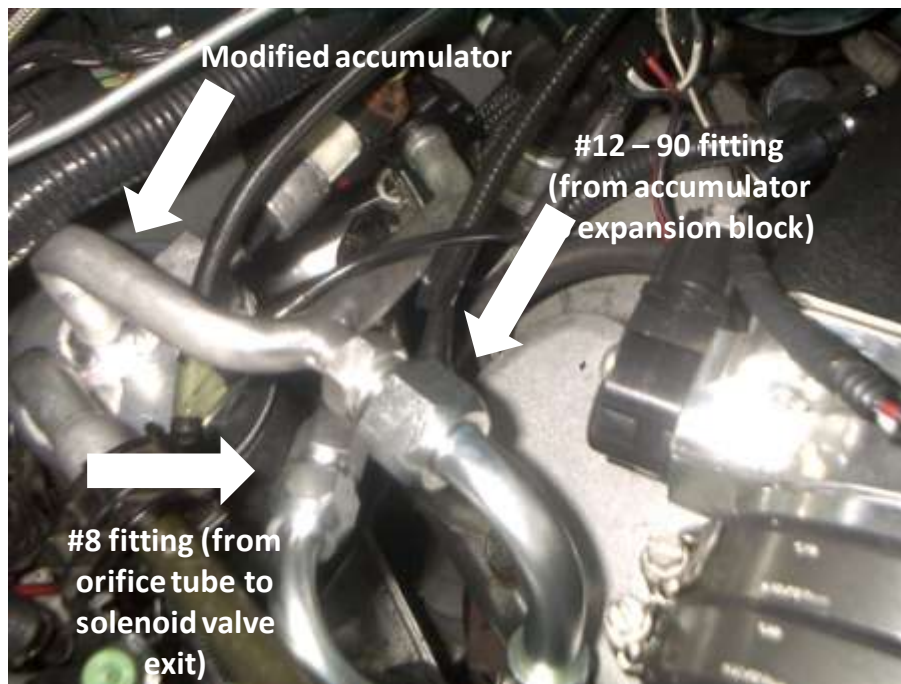


Figure 9. Modified accumulator installed in vehicle.

18. Install A/C charge line to accumulator

19. Vacuum the A/C system to remove moisture (see original instructions)

Following evacuation, monitor system for 30 or more minutes under vacuum to insure there are no leaks.

20. Re-connect the battery

21. Reinstall the intake and air filter assembly

22. Re-charge the A/C (see original instructions)

Add 2 oz. of pressurized PAG oil to the system prior to charging to compensate for all the additional lines and components.

23. Re-attach the front bumper cover