

## Section 2 – Installing the Bypass Valve in the Heater Circuit

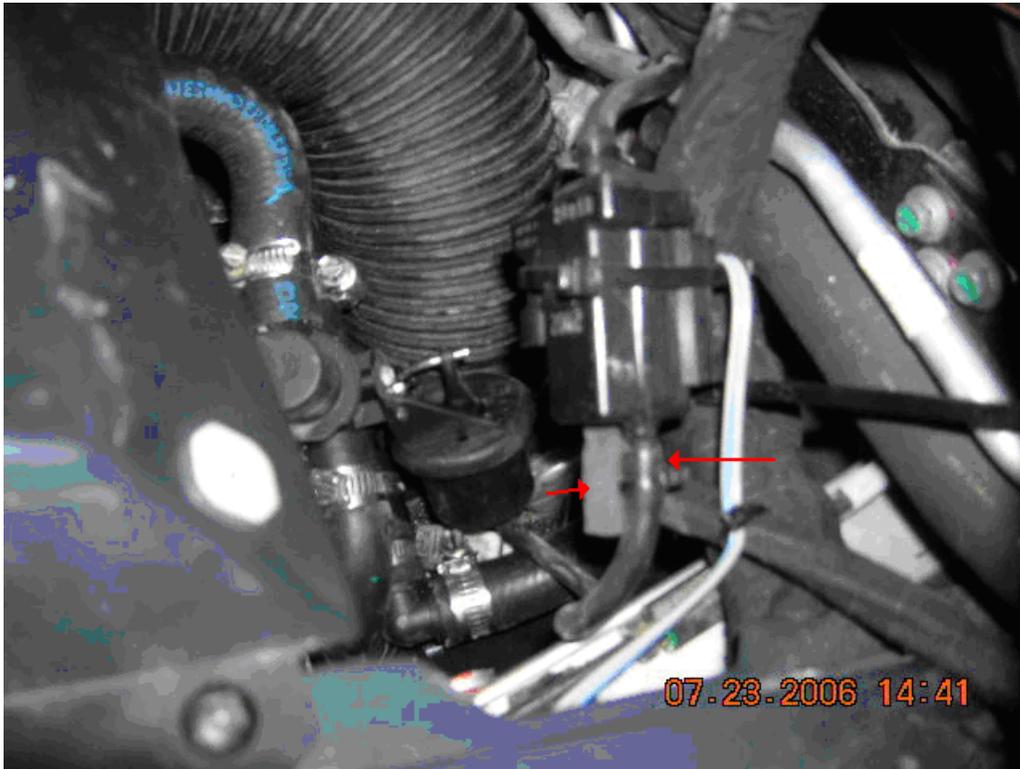
Next will be the cutting of the heater hoses and the installation of the by-pass valve. You can either drain the coolant down to minimize the amount of coolant lost when the lines are cut or you can try and work quickly.....having tried to work quickly, I would highly advise that the coolant be drained down first (maybe 2-3 quarts). However, I'm not sure if draining the system will actually drain the lines that will be cut....as I stated, I went the other way. Regardless, use an old bath towel to catch all you can (also a good way to keep parts from dropping all the way down into the frame). Whatever fluid leaks into the frame will stink for awhile...rinsing would probably help.

Here's the finished installation of the valve. The following steps will help you get there. The EGR vacuum switch can be seen in the foreground (right by my finger). Red arrows are normal flow, blue arrows indicate bypass flow.



- 1) Remove the large corrugated vent hose pulling it from the vent manifold at the top and the Heating/AC unit at the bottom. It is a slip fit, no clamps. Set it aside.
- 2) Look at the hose layout that feeds the heater core. The hot water flows from the passenger side and out through the driver's side.
- 3) Hold the valve up to the heater hoses and mark the hoses with a sharpie where they will be cut. Keep in mind that the large corrugated vent hose will be refitted, so the valve needs to be as far away from it as possible (keep it as far left as practical).
- 4) Cut the hoses and trial fit the valve without clamps. Be aware of the arrow on the valve that indicates the required flow direction. The inlet nipple should be on the upper right. Some section of the hoses (1" or so) will likely have to be removed to accommodate the width of the valve. Make sure that the hoses are fit to the proper nipple. The input hose (the top right hose in the picture) comes from the passenger side. The output hose (bottom right) goes to the driver side for water return. The upper left hose goes to the heater core nipple nearest the front of the car. The bottom left hose goes to the rear heater core nipple.
- 5) Once satisfied with the fit, remove the valve. Cut a 6" section of 1/8" vacuum hose and attach it to the nipple on the bypass valve vacuum pot. Secure it with a small tie-wrap if possible.
- 6) Reinstall the vent hose
- 7) Install the bypass valve tightening all clamps. Install and tighten one hose at a time to avoid obscuring the bottom hoses so that the clamps can't be tightened. Take one last look at the valve to make sure the right hoses are on the right nipples. Make sure the action of the valve will not foul against the vent hose.
- 8) Wire the EGR vacuum valve with two wires. The pins in this EGR valve require either a GM connector or push-on pins. I fortunately had the right female pin connectors for the job, so it was not a big problem. Push-on connectors can be made by carefully crimping two butt connectors to make a tight fit when the slide down onto the posts. This can be tedious, but effective. There are probably better ways to make this connection or a different switch with spade connectors is probably out there, but this is what I used. Please send me an email if you find an easier vacuum switch to work with and I will update these instructions. One of these conductors will go directly to ground (2 ft black wire) and the other conductor will be used to attach to the switch inside the cockpit, so leave the required slack. Install a tie wrap around the EGR valve to make a strain relief for the wires (so they won't be pulled off easily).

- 9) Tie wrap the EGR valve to the wiring harness so that the 6" vacuum hose from the valve can be slipped onto the vacuum nipple next to the foam filter on the EGR valve. Secure the hose with a small tie wrap. Arrows indicate foam filter and vacuum nipple.



- 10) Cut the 1/8" vacuum hose installed on the brake booster tee to the right length to allow attachment to the remaining EGR switch nipple. Secure the hose to the nipple with a small tie wrap. Use additional tie wraps as necessary to stabilize all the vacuum hoses and EGR valve.

Installation of the valve and EGR vacuum switch is now complete.

**End Section 2**