



INSTALLATION INSTRUCTIONS

EVO 7-8-9 FUEL PUMP HANGER

Support: info@radiumauto.com

Document# 19-0160

WARNING: DO NOT EXPOSE WORK AREA TO ANY SPARKS OR FIRE. DO NOT SMOKE WHILE WORKING ON THE FUEL SYSTEM. CLEAN UP ALL FUEL SPILLS IMMEDIATELY. WORK IN A WELL VENTILATED AREA.

1. **Note: It is recommended to drain the tank to reduce fuel spills and make installation easier and safer. Remove the hex bolt on the bottom LH side of the tank using a 12mm socket wrench.**

Remove the rear seat bench by pulling forward on the 2 levers underneath. Note: removing the front left seat will provide additional working space but is not absolutely necessary.

Find the fuel pump access panel on the LH side under the lower seat cushion (shown). Unscrew the 4 Phillips head screws and remove the fuel pump access panel. Once removed, it is recommended to clean the top of the fuel pump housing and the surrounding area. This will prevent loose dirt from falling into the gas tank.



2. To depressurize the fuel system, first squeeze the tab and unplug the gray wiring connector on top of the pump housing (shown). Start the engine and allow it to stall. Remove the key from the ignition. Unscrew the gas tank filler cap temporarily to relieve any residual pressure.

Pop the hood and disconnect the battery's negative terminal with a 10mm socket wrench. CAUTION: Disconnecting the battery may cancel fault memories of some control units. Consequently, before disconnecting the car's battery, always interrogate the fault memories.



3. To detach the OEM feed line (shown top) and crossover line (shown left), simply squeeze the 2 opposing locking tabs and pull the female fitting away from the male tube. Be careful not to side load the white plastic fittings. Use a rag to clean up any spilled fuel.

Loosen the spring clamp on the return hose (shown bottom) with a pair of pliers. Carefully twist the hose to dislodge it from the 1/4" return barb.

Remove the six M5 nuts holding down the black metal retaining ring using an 8mm socket wrench. Set the nuts aside as they will be reused.

Spin the metal retaining ring around to remove. The metal retaining ring will NOT be reused.



4. Before removing the OEM fuel pump housing, place an empty bucket nearby. There will be residual fuel in the gas tank. Slowly lift the canister straight up then tilt the fuel pump housing towards the RH side to clear the level sender float, as shown.

Pull the OEM fuel pump housing out and drain into the bucket. Clean the fuel pump housing and set it onto a workbench.



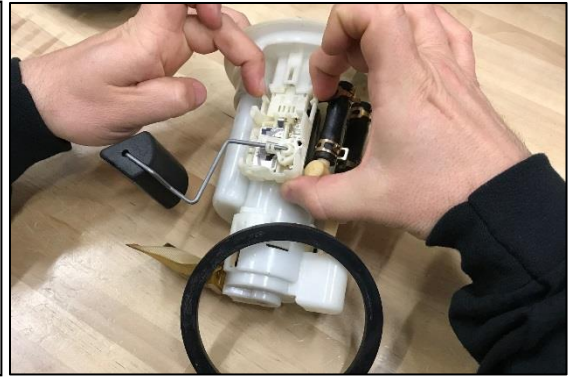
5. The only parts that will be reused from the OEM fuel pump housing is the fuel level sender and large black gasket shown.

Slide the gasket out and around the assembly.

To remove the fuel level sender, pry the 2 tabs outwards (as shown) and simultaneously slide the module downwards to release.

NOTE: Be careful not to damage the circuit board or bend the float arm.

If the fuel pump hanger kit was purchased with pump(s) included, skip Steps 6-12.



6. First, remove the 3 internal pump hanger bracket bolts using a 4mm Allen wrench.

For dual fuel pump applications, extra wiring is included in the kit. Using the provided lock nuts, connect the ring terminals to the PWR Pump 2 stud and GND Pump 2 stud. Extra nuts may be present in the kit and can be used as spares.

For single fuel pump applications, block-off the unused port on the underside of the top plate using the included 6AN ORB plug fitting. Lubricate the O-rings with light oil.



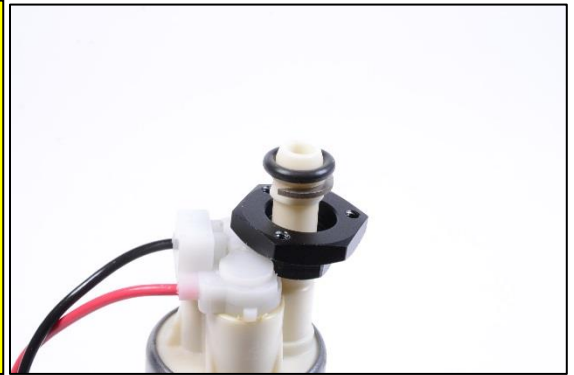
7. WALBRO F900002XX FUEL PUMP INSTALLATION ONLY

First, inspect the pump outlet barb. If deformed, modified or damaged, the provided fuel pump adapter will not install correctly and the pump cannot be used.

Slide the black collar over the pump outlet with the flat surface upward.

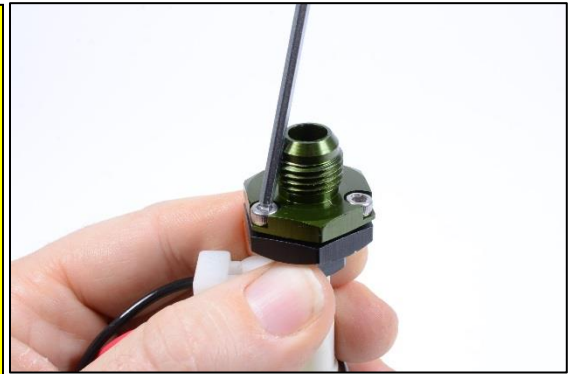
Slip the retainer between the 2 large hose barbs. When assembled, it will lodge itself under the hose barb ridge closest to the end of the pump outlet opening. **NOTE: If purchased prior to March 2020, the retainer will be C-shaped (as shown). If purchased after March 2020, the retainer will be 2-piece half circles.**

Place the included O-ring on the pump outlet, as shown.



8. WALBRO F900002XX FUEL PUMP INSTALLATION ONLY

Apply a medium strength thread locking compound to the 3 included bolt threads. Slide the black collar upward and line up the green fitting holes to the black fitting threads. Secure and tighten all bolts evenly using a 2.5mm Allen wrench, as shown.



9. WALBRO F900002XX FUEL PUMP INSTALLATION ONLY

Lubricate the O-ring (not shown) on the male 6AN green fitting and install the fuel pump into one of the ports on the underside of the top plate using a 15mm wrench. Either of the 2 ports can be used as they share the same external outlet.



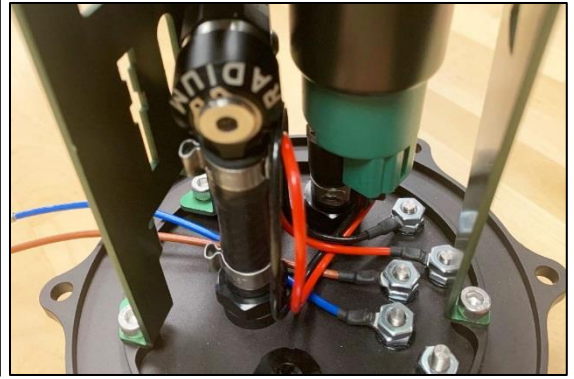
10. AEM 50-1220 FUEL PUMP INSTALLATION ONLY

For dual pump applications, install the provided 6AN ORB to barb fitting in the second port underneath. First lubricate the O-ring.

NOTES:

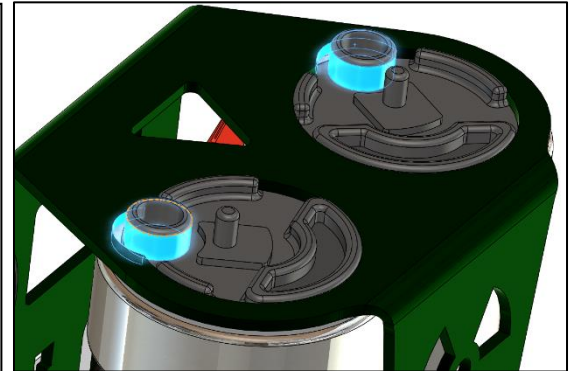
1. The fuel pumps share the same external outlet so ports are interchangeable.
2. Each pump requires the provided submersible fuel hose to be 1.5 inch (38mm) in length.

Secure the hose with the provided EFI hose clamps.



11. Before reinstalling the internal pump hanger bracket, rotate and align the fuel pump(s) concentrically with the cut-outs in the internal pump bracket, as shown.

Next, plug in the fuel pump connector(s). NOTE: For dual Walbro F900002XX fuel pump applications, the electrical connectors will need to be strategically placed in the unit. Reinstall the 3 internal pump bracket bolts.



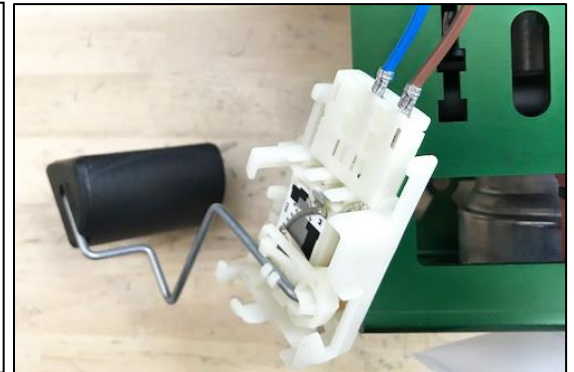
12. This kit was designed to be used with a specific filter sock (**RADIUM P/N: 14-0143**). Large fuel pump filter socks may NOT fit properly. Press the filter sock(s) onto each pump inlet and secure with the star washer (shown).

There will already be a zip tie securing the duckbill valve to the jet pump outlet barb from Radium Engineering. However, find the other "loose" zip tie included in the kit. Secure the venturi jet pump outlet barb (near the duckbill valve) to the internal pump hanger bracket.

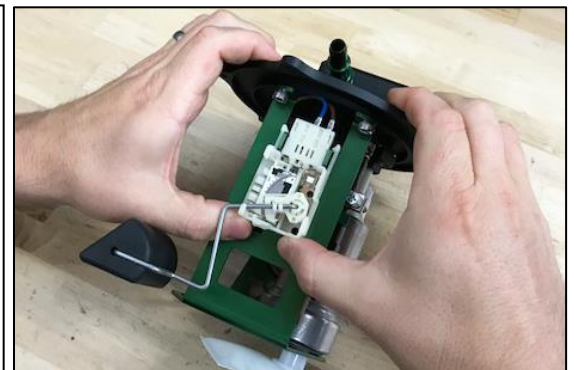


13. Insert the male flat blade terminals from the blue and brown wires into the 2 functioning fuel level sender electrical slots. It does not matter which wire goes into which slot.

CAUTION: Do not mistakenly insert one of the terminals into the empty slot. 1 of the 3 slots is not used in the OEM level sender connector.

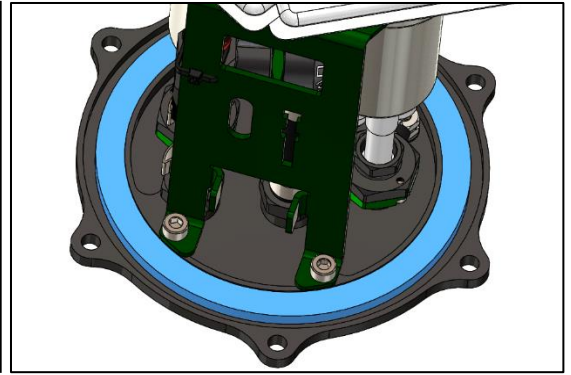


14. Next, insert the fuel level sender unit through the fuel pump hanger bracket slots towards the bottom. Carefully slide the fuel level sender upwards until the white plastic tabs lock onto the Radium fuel hanger bracket.



15. Find the OEM rubber gasket that was previously removed from the OEM module. Inspect to make sure there are no rips, tears, cuts, imperfections, etc.

Fully seat the gasket on the underside of the fuel pump hanger top, as shown in blue.



16. If the OEM fuel lines will be reconnected or if the Radium 20-0276-0X Fuel Hanger Plumbing Kit will be installed, there is a short OEM fuel tube that will need to be removed.

NOTE: Installation is much simpler if the gas tank is lowered. This will provide additional room.

Look into the sheet metal hole and follow the OEM fuel pump feed hose downstream. Using a flashlight, find the SAE quick connection point towards the front LH side of the opening.



17. Squeeze the 2 blue locking tabs and simultaneously pull the tube off the hard line. Have a rag handy. NOTE: This procedure is much easier without a fuel pump module installed, as shown.



18. Using a utility knife blade, carefully cut a slit into the barbed end of the SAE quick connect fitting and remove the hard plastic tube, as shown.

NOTE: O-ring can be discarded.



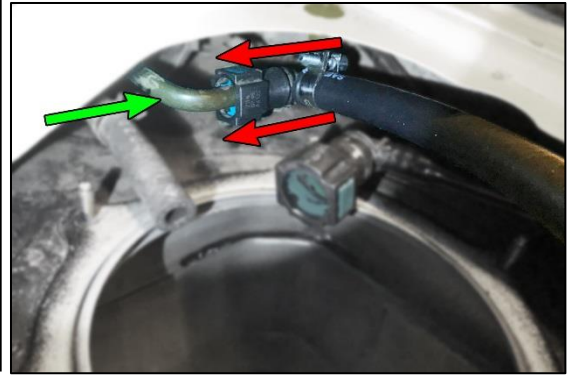
19. Insert this OEM SAE quick connect barb into the included short rubber fuel hose. Secure with the provided EFI clamp.

NOTE: If also installing the optional Radium 20-0376-0X Fuel Hanger Plumbing Kit, use the longer hose (shown) provided in that kit instead.



20. Take the new hose and reach back underneath the sheet metal to reconnect the fitting. Push on the SAE quick connect fitting until a “click” is felt. Gently pull back to verify the connection has been properly made.

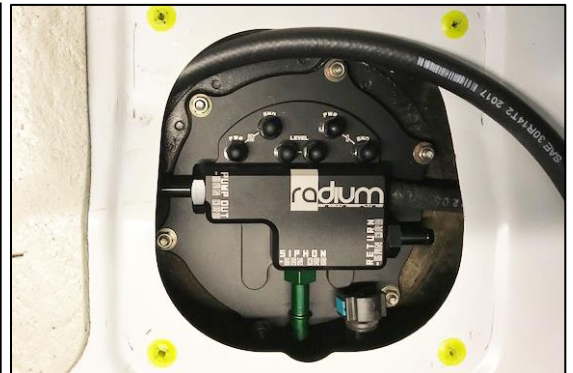
Temporarily tuck the hose underneath the sheet metal.



21. Carefully tip the fuel hanger assembly to angle in the fuel level sender float first. Next, readjust vertically and drop the fuel pump hanger down into the tank moving the connectors out of the way one by one.

Make note of the orientation of the assembly. The OEM studs are not exactly symmetrical so it cannot be misaligned.

The top plate and gasket should be flush with the fuel tank lid area. Reinstall the OEM nuts in a criss-cross pattern. CAUTION: Do not over tighten.



22. The OEM crossover will be slightly too long to connect as-is. A trick is to remove the RH access cover on the passive side of the gas tank using a Phillips head screwdriver. Squeeze the 2 blue locking tabs on the crossover fitting and simultaneously pull off, as shown. Have a rag handy.

Gently pull the crossover tube towards the RH side of the vehicle to slide it through the 2 clips underneath the sheet metal (not shown). Back on the LH side, connect the OEM SAE quick connect fitting to the Radium “Siphon” port first. Now reconnect the OEM SAE quick connect fitting back on the RH side. The fittings will be fully engaged when a “click” is felt.



23. To reinstall the OEM fuel feed and return line, follow the steps below. For installing the Radium 20-0376-0X Fuel Hanger Plumbing Kit’s feed and return lines, skip these instructions and reference the instructions at the end of this document.

First, measure and cut the new rubber fuel feed hose to length (if necessary). Secure to the new “Pump Out” barbed fitting using the provided EFI clamp. **NOTE: Prior to April 2020, the pump out will be a straight fitting. After March 2020, the fitting will be a 90 degree elbow (pictured).**

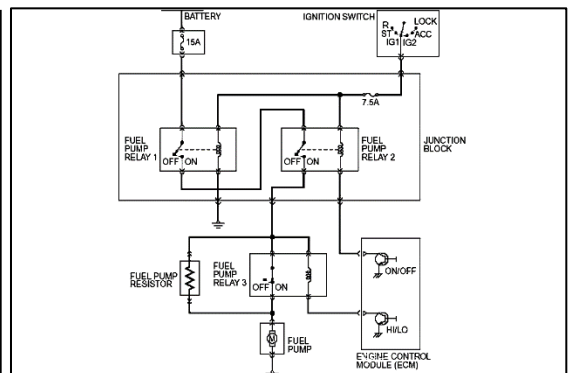
Finally, install the return hose to the new “Return” barb. Secure using the OEM clamp as shown.



24. As shown, the OEM Mitsubishi fuel pump uses a 15A fuse.

The OEM circuit uses a resistor to slow down the fuel pump when the engine is at low loads. At high loads, the ECM energizes “Fuel Pump Relay-3” to bypass the resistor and drive the fuel pump directly with high voltage.

If reusing the OEM wiring, use with caution! These Walbro turbine fuel pumps can potentially draw more current than the OEM electrical specified 15A. This is especially the case with high fuel pressures (high boost).



25. Using a pick, dislodge the 3 tabs on the OEM electrical connector and flip the lock upwards. Cut all 4 wires as close to the connector as possible, as shown.

Remove some of the electrical tape. Strip the insulation for all 4 wires about ¼" back.

Wire Identification:

BLACK - small gauge (AWG): Fuel Sender

BLACK - small gauge (AWG): Fuel Sender

WHITE - large gauge (AWG): Fuel Pump +

BLACK - large gauge (AWG): Fuel Pump -



26. Cut two ½" pieces of the small diameter shrink tube. Insert onto each sensor wire (two small gauge wires). Next, crimp on a small gauge (AWG) ring terminal to each wire. Slide the shrink tube over the crimped section of the ring terminal and shrink into place with a heat gun.

To reuse the OEM fuel pump power wiring, use the large diameter shrink tube and large gauge (AWG) ring terminals to connect the fuel pump wires.

WARNING: The OEM fuel pump power wiring cannot supply power directly for 2 fuel pumps!

Extra electrical connection parts may be present in the kit and can be used as spares. If black plastic connectors are found in the kit, they will not be used with this kit.

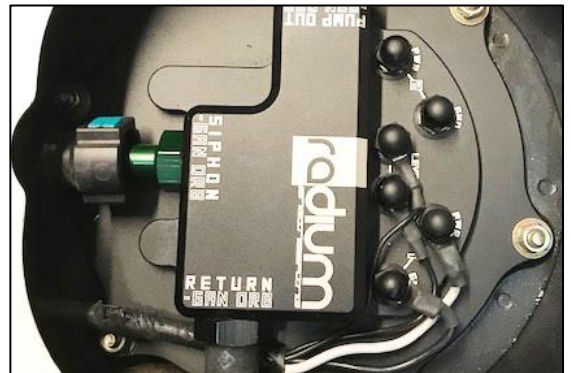


27. Attach the ring terminal with the large gauge (AWG) black wire to the ground "GND" pump-1 terminal.

Attach the ring terminal with the large gauge (AWG) white wire to the power "PWR" pump-1 terminal.

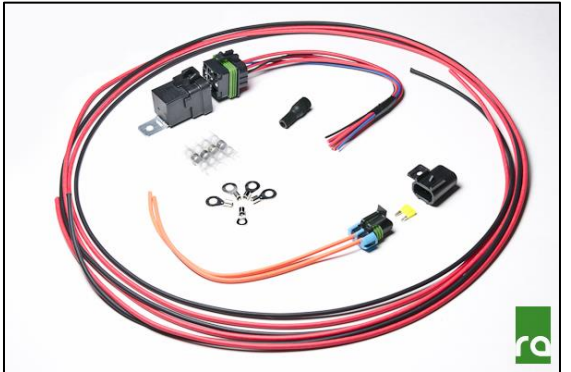
Attach the ring terminals with the small gauge (AWG) black wires to the "LEVEL" terminals. NOTE: There is no polarity on the fuel level sender so these wires cannot be installed backwards.

Secure all connections using the included acorn nuts.



28. **Optional:** Radium Engineering recommends upgrading to high current wiring.

Consider using Radium DIY wiring kit 17-0031 (shown) for each fuel pump. This includes a dedicated fuse, relay, 10AWG wire, etc. It is recommended to use the OEM fuel pump wiring to trigger this fused relay power source for each fuel pump.



29. **NOTE: A low micron aftermarket fuel filter is required for this kit. Consider purchasing the Radium 20-0276-0X Fuel Hanger Plumbing Kit (discussed at the end of this document).**

Reconnect the battery. Pressurize the fuel system and confirm the new fuel pump(s) are properly operating. Check for leaks. If no leaks are found, start the vehicle. The engine may run rough for a few seconds until all the air is bled from the fuel system. Recheck for leaks.

Reinstall the OEM metal cover plate and rear seat.

Installation Complete



1. **Optional Radium 20-0376-0X Fuel Hanger Plumbing Kit**

NOTE: For this kit, the OEM fuel feed line will be reassigned as the fuel return line.

Using light oil, lubricate the O-rings on the two included 10AN ORB to 8AN male adapter fittings. Secure the fittings to the fuel filter ports using a non marring 1" wrench.



2. Using a 4mm Allen hex wrench and 8mm wrench, secure the lower portion of the filter clamp to the mounting bracket using the included nuts and bolts (x3).



3. Place the fuel filter onto the lower clamp with the green "OUTLET" up against the bracket, as shown. Find the upper portion of the filter clamp and two M5 bolts provided in the kit. Clamp the fuel filter down to the mounting bracket using a 4mm Allen hex wrench.



4. Safely raise the vehicle.

Remove the hard line bracket mounting bolt shown using a 10mm socket wrench. Remove the front two bolts shown using a 12mm wrench. These bolts will NOT be reused.



5. Simply pry the OEM rubber plug out of the floor, as shown.

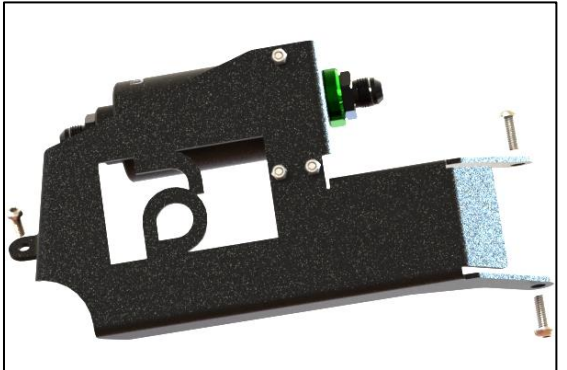


6. Flip the plug around and reinsert until it locks in place, as shown. This will provide additional room for the fuel filter assembly.



7. Lineup the filter bracket assembly to the open threaded holes. Install the 3 provided button head bolts to the chassis. If necessary, pull and spread the OEM hard lines to permit additional space.

Use a 4mm Allen hex wrench for the rear bolt (shown left) and a 5mm Allen hex wrench for the 2 front bolts (shown right).

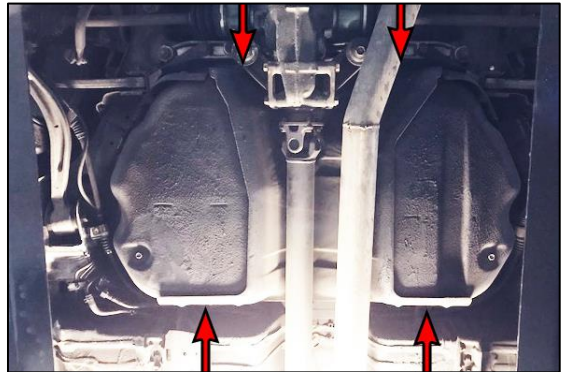


8. The Mitsubishi Evolution does not have sufficient space to fit a large -8AN fuel feed hose down from the top of the tank to below the tank. The modifications described below are required.

Using a 12mm wrench, temporarily remove the mounting bracket that secures the LH side emergency brake cable to the chassis, as shown.



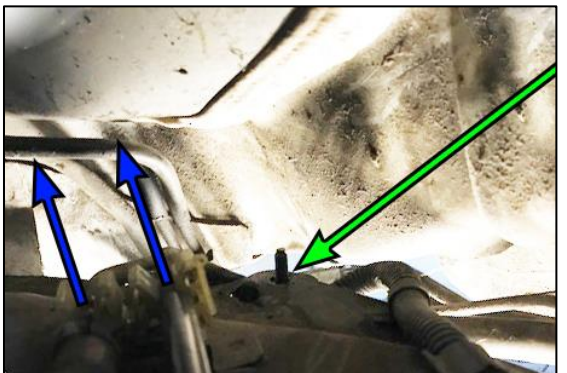
9. To drop the fuel tank down a few inches and allow extra working room, remove the 4 nuts shown using a 14mm socket wrench.



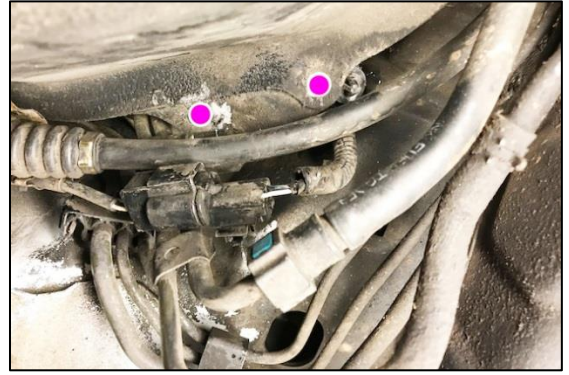
10. From inside the cabin, look into the fuel pump access hole towards the LH side of the tank.

Reach in and pull the OEM fuel and return hard lines upwards (shown blue) to release them from the clamps attached to the gas tank.

Using an 8mm socket wrench, remove the nut from the OEM stud (shown green) that secures the OEM fuel lines.



11. From underneath the car, find the two ABS electrical connector hold down clips. Dislodge the plastic clips so there are simply two holes, shown in purple.



12. Using a pair of pliers or channel locks, reach up and bend the gas tank tab downwards. This will permit the needed space to allow the -8AN fuel feed hose to safely pass through.



13. The gas tank tab bend will look similar to what is shown.

NOTE: this picture was taken with the gas tank uninstalled and outside of the vehicle for reference only.



14. If there are hoses connected to the "Pump Out" and "Return" ports, remove them. Have a rag handy. Flush out the fuel remaining in the OEM return as this line will no longer be used.

Install the provided rubber fuel hose referencing Steps 19 and 20 above. NOTE: This procedure is much easier without a fuel pump module installed.

Using a 3/4" wrench, remove the adapter fitting from the fuel pump hanger "Return" port. Lubricate the O-ring and install the larger barb fitting provided in this fuel hanger plumbing kit.

Using a 7/8" wrench, remove the fitting from the fuel pump hanger "Pump Out" port. Lubricate the O-ring and install the 8AN ORB fitting provided in the original fuel pump hanger kit.



15. Find the -8AN PTFE hose in the kit that has a 120 degree and a straight hose end. Run the PTFE hose through the area mentioned above. Loosely install the 120 degree hose end to the "Pump Out" port (do not tighten yet).

Run the rubber hose clockwise around the perimeter of the Radium fuel pump hanger towards the "Return" barb. Measure and cut to length (if necessary). Secure the hose with the included EFI hose clamp.



16. From underneath the vehicle, be sure the -8AN PTFE hose is free of obstruction, sharp edges, suspension components, hot exhaust, etc. Connect the -8AN straight hose end to the black fuel filter "INLET" fitting (do not tighten yet).

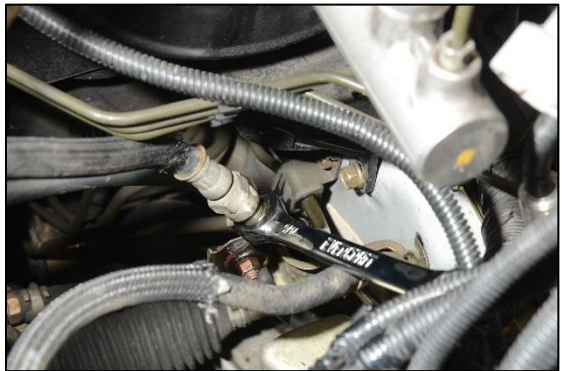
Remount the fuel tank and the emergency brake clamp to the chassis. Recheck that the -8AN feed hose is not pinched or against any sharp edges. Secure the ABS connector keeping it away from the suspension. Use the provided cable zip ties to secure the -8AN feed hose, as shown.

Tighten both ends of this -8AN hose using a 7/8" wrench. To prevent hose end marring, an aluminum wrench is recommended.



17. Find the junction that connects the OEM fuel feed hard line to the OEM fuel rail rubber hose underneath the brake master cylinder (LHD cars). To disconnect, use a 14mm flare nut wrench and a 17mm open-ended wrench. Significant force will be required. Be careful not to bend or distort the OEM hard line.

NOTE: The OEM rubber fuel feed hose will not be reused.



18. As shown, install the provided -6AN male to inverted flare fitting into the OEM "feed" hard line (now converted to a return line).

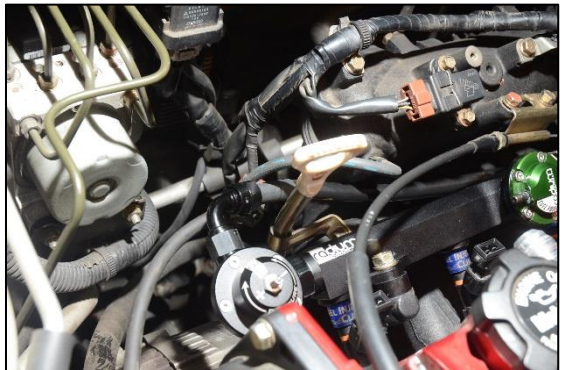


19. Find the -6AN PTFE hose in the kit. Install the 45 degree hose end to the -6AN to inverted flare fitting. Install the 90 degree hose end to a -6AN return fitting on the FPR (not included).

NOTE: If installing to a Radium 20-0119 Fuel Rail with a Radium 20-0223-0X DMR installed in the RH port, make sure the -6AN male return fitting is pointing towards the rear of the vehicle. This hose will route from right to left just above the intake manifold runners, as shown.

NOTE: Hose routing may differ if installing a different brand fuel pressure regulator.

Tighten the hose ends with a non marring 9/16" wrench.



20. Find the last -8AN PTFE hose end in the kit. Install the 45 degree hose end to the fuel rail. Radium 20-0029 Fuel Pressure Gauge and 14-0148-08 Inline Adapter Fitting is shown. Route the hose down towards the hard lines staying clear of any hot or moving parts.

Install the straight hose end to the -8AN fuel filter outlet fitting. Tighten the hose ends with a non marring 7/8" wrench.

Reconnect the battery. Pressurize the fuel system and check for leaks. If no leaks are found, start the vehicle. The engine may run rough for a few seconds until all the air is bled from the fuel system. Recheck for leaks. Reinstall the OEM metal cover plate and rear seat.

Installation Complete

