



# INSTALLATION INSTRUCTIONS

## GM VORTEC 8100 L18 BIG BLOCK FUEL RAILS

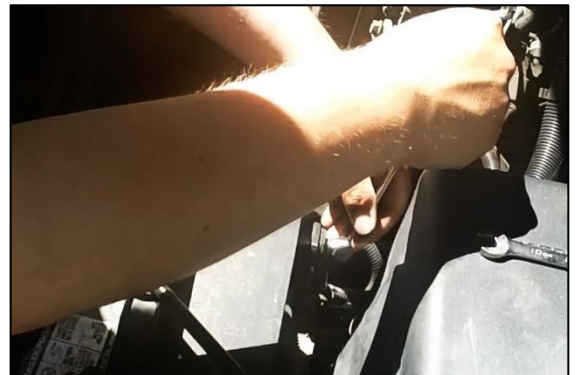
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Document# 19-0394

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

1. If accessible, refer to the factory GM Service Manual for disassembly questions.

After the engine has cooled, disconnect the battery's (-) negative terminal. Next, remove the cosmetic engine cover. NOTE: For early model engines, remove the short vacuum tube that connects to the fuel pressure regulator (FPR) port.



2. Unscrew the Schrader valve cap on the RH fuel rail (shown). Using a rag and a small object, press in the small internal needle to relieve fuel pressure. Check for any dirt or debris around the fuel injectors and wash it off with solvent parts cleaner and a clean shop towel.

Place shop towels down and unplug the 3/8" SAE quick connect fuel supply hose from the LH fuel rail. Catch any fuel that spills. NOTE: For early models, unplug the 5/16" SAE quick connect FPR return hose from the LH fuel rail.



3. Disconnect the 8 injector connectors. Using a 10mm socket wrench, remove the 4 fuel rail screws. To prevent fuel from draining, keep all injectors installed to the fuel rails and carefully remove the entire assembly with the sub harness from the vehicle. Clean out any dirt or debris found in the intake manifold injector seat bores.

On a workbench, carefully remove the OEM injector retaining clips and the injectors, as shown. Inspect the O-rings and replace, if necessary. Drain excess fuel into a safe container for disposal.



4. As shown, there are four stainless steel mounts and twelve M5x0.8mm flat head screws provided with the fuel rails.



5. Install the 4 mounts in the orientation shown. Apply a medium-strength thread locker to the 12 screws and secure using a 3mm Allen wrench.

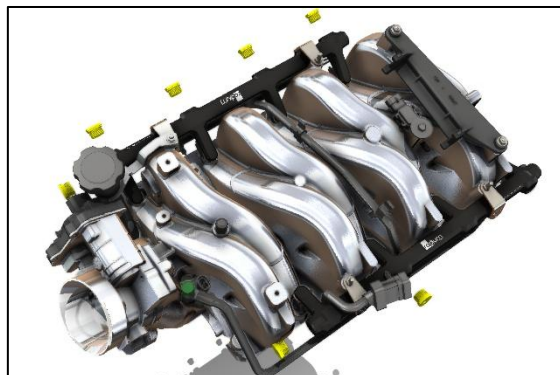


6. The 20-0862 fuel rails do NOT come with adapter fittings. Unless a plumbing kit (described below) was purchased, fittings will need to be purchased separately. Install the fittings to the fuel rails prior to installing to the intake manifold.

#### **FUEL RAIL PLUMBING KITS**

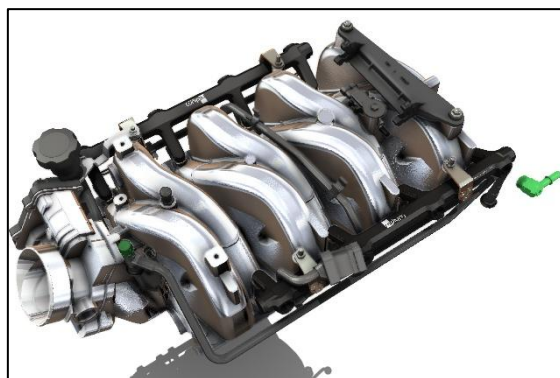
*NOTE: The intake manifold is only shown as a reference for the proper fitting port location. Do NOT install the fuel rails to the intake manifold yet.*

Lubricate the O-rings on the provided 8AN ORB plugs (yellow). Install these plugs to the fuel rail ports shown. Secure using a 5/16" Allen wrench.



#### **7. FUEL RAIL PLUMBING KITS**

Lubricate the O-ring on the provided 8AN ORB to 3/8" SAE quick connect banjo fitting (green). Install to the LH rear side fuel rail port shown and secure using a 5mm Allen wrench.



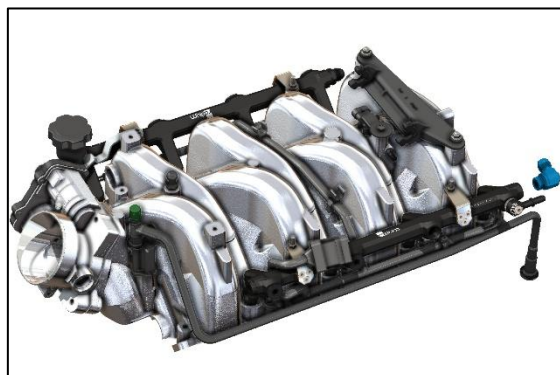
#### **8. FUEL RAIL PLUMBING KITS**

Lubricate the O-ring on the provided 8AN ORB to 8AN male fitting (red). Install to the RH rear fuel rail port shown and secure using a 7/8" wrench.



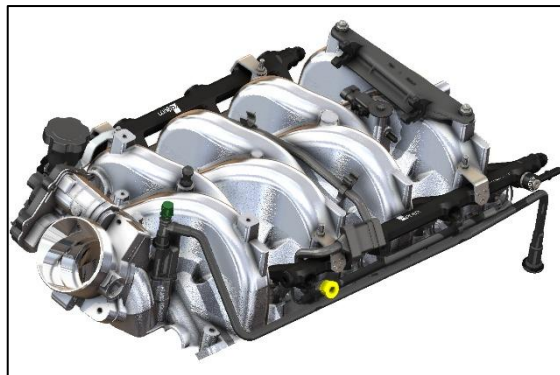
#### **9. FUEL RAIL PLUMBING KITS**

Lubricate the O-ring on the provided 8AN ORB to 8AN male banjo fitting (blue). Install to the rear LH end fuel rail port shown. Secure using a 5mm Allen wrench.



**10. 20-1162 FUEL RAIL PLUMBING KIT (04-10 ONLY)**

Lubricate the O-ring on the extra 8AN ORB plug (yellow) provided in the kit. Install this plug to the front LH side fuel rail port shown. Secure using a 5/16" Allen wrench. NOTE: A plug is NOT installed in this port for the 20-1062 fuel rail plumbing kit (01-03).

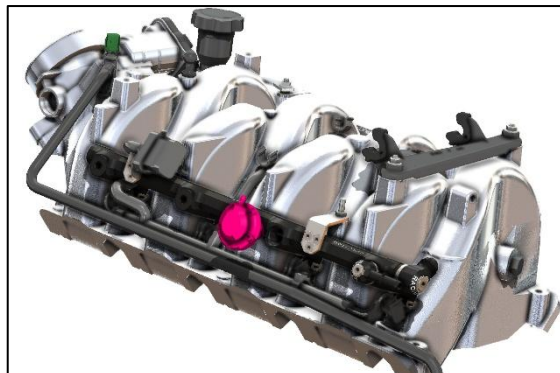


**11. 20-1162 FUEL RAIL PLUMBING KIT (04-10 ONLY)**

The fuel pulse damper (FPD) vacuum port is #10-32 thread tapped. An intake manifold vacuum line should ONLY be connected if fuel pressure operates within the specified FPD range when not in boost, but outside of the FPD range in boost. If fuel pressure operates within the specified FPD range in all dynamic scenarios, the vacuum port should be plugged using the included screw.

Using a wicking thread locker, such as Loc-Tite 290, install the vacuum fitting.

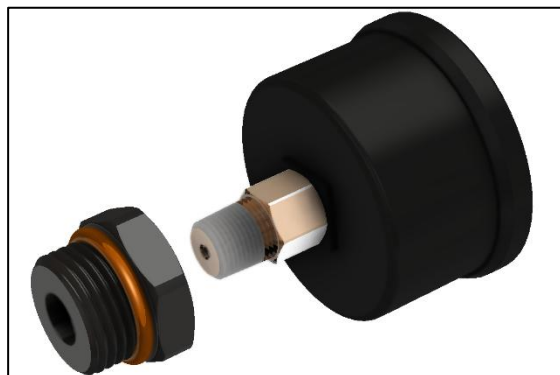
Lubricate the O-ring on the provided FPD (pink). Install to the LH side fuel rail port shown. Secure using a 7/8" wrench.



**12. 20-1062 FUEL RAIL PLUMBING KIT (01-03 ONLY)**

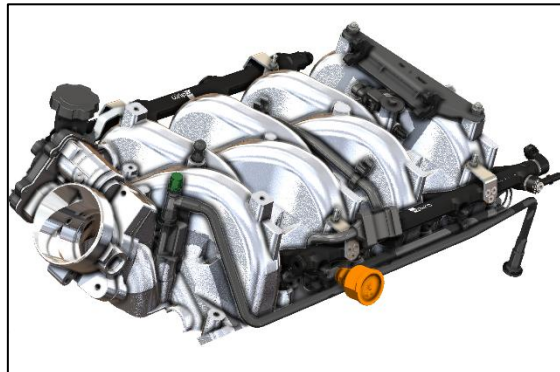
Apply PTFE (Teflon) paste to the tapered threads on the fuel pressure gauge.

Hand tighten the gauge to the 8AN ORB to 1/8" NPT fitting. Then add 1.5-3 turns with a 7/16" wrench.



**13. 20-1062 FUEL RAIL PLUMBING KIT (01-03 ONLY)**

Lubricate the O-ring on the fuel pressure gauge adapter (orange). Install the gauge assembly to the front LH side fuel rail port shown. Secure using a 7/8" wrench.



**14. 20-1062 FUEL RAIL PLUMBING KIT (01-03 ONLY)**

Find the direct mount regulator (DMR) in the kit. Install 1 of the 4 fittings to the vacuum port. All fittings (excluding the push-to-connect) require a wicking thread locker, such as green Loc-Tite 290. Simply finger tighten the fitting.

NOTE: If installing the 3AN fitting, do NOT over torque. Hold the fitting with a wrench when securing the hose end. These are manufactured from high strength steel, but are very small.





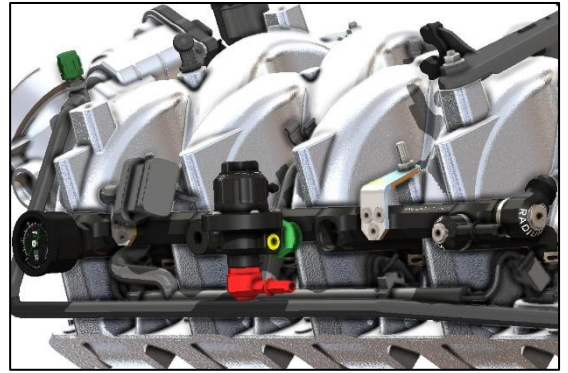
#### 15. 20-1062 FUEL RAIL PLUMBING KIT (01-03 ONLY)

Apply PTFE paste to the 1/8" NPT plugs (yellow) and insert them into the side ports. Hand tight each plug using a 3/16" Allen wrench, then add 1.5-3 turns.

Lubricate the O-ring and install the 5/16" SAE banjo fitting (red) into the bottom "return" port using a 4mm Allen wrench.

Lubricate the O-ring and install the swivel union adapter (green) into the front "fuel rail" port of the DMR using an 8mm Allen wrench.

Tighten this swivel union adapter into the LH fuel rail side port shown using a 7/8" (22mm) wrench. NOTE: The DMR can be oriented any way, including upside down.



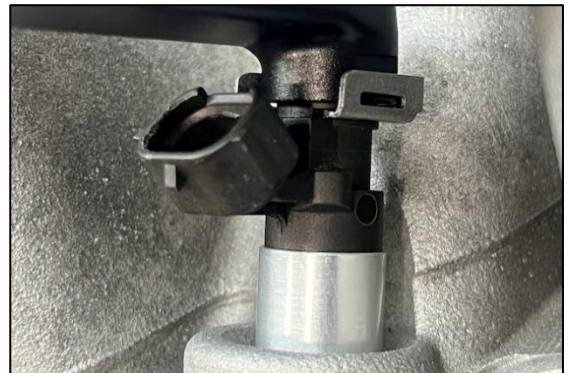
16. The Radium Engineering fuel rails are compatible with OEM GM fuel injectors and equivalent aftermarket replacements that use 14mm upper O-rings.

Lubricate the top and bottom O-rings of each fuel injector and the injector bores with light oil. Fully insert the injectors into the fuel rail bores.



17. There are machining features on each fuel rail injector port. These are designed specifically for the smaller retaining clips commonly used with popular Bosch Motorsport EV14 style injectors (shown).

The injector port machining features are not compatible with the larger retaining clips used with the GM injectors. However, these are not a necessity for operation.



18. Position and line up each fuel rail over the intake manifold. Press firmly down and verify that the lower injector O-ring seal is fully inserted and seated. Once everything is positioned correctly, reuse the 4 OEM screws (shown red) and tighten using a 10mm socket.

Plug in each of the fuel injector connectors and the sub harness. If applicable, connect the vacuum line to the FPR.



#### 19. FUEL RAIL PLUMBING KITS

Temporarily thread on the 2 provided 8AN pushlok hose ends (shown blue).

NOTE: For clearance on spinning the hose end B-nut, the RH fuel rail may need to be loosened and slightly pulled outwards temporarily.

Verify there will be clearance in this area for a crossover hose.



#### 20. **FUEL RAIL PLUMBING KITS**

Lubricate the barbs on one of the 8AN pushlok hose ends included in the kit. Insert the 8AN pushlok hose end into one end of the provided 1/2" (8AN) EFI hose.

NOTE: Pushlok hose ends do NOT require clamps.



#### 21. **FUEL RAIL PLUMBING KITS**

Temporarily thread the hose end into the 8AN male port fitting shown. Line up the hose and make a cut mark.



#### 22. **FUEL RAIL PLUMBING KITS**

The cut length of the hose will likely be just under 14" (355mm) long.

Lubricate the barbs on the other 8AN pushlok hose end. Insert the 8AN pushlok hose end into the other end of the 1/2" (8AN) EFI hose.

NOTE: Pushlok hose ends do NOT require clamps.



#### 23. **FUEL RAIL PLUMBING KITS**

As shown, slide the provided thermal sleeve over the crossover hose.



#### 24. **FUEL RAIL PLUMBING KITS**

Install the crossover hose using a 7/8" wrench.



25. After everything is reinstalled, cycle the ignition a few times (without starting engine). This allows the fuel pump to prime the system.

CHECK FOR LEAKS! If no leaks are found, start the engine and check for leaks again while the engine is running.



**26. 20-1062 FUEL RAIL PLUMBING KIT (01-03 ONLY)**

The static fuel pressure of the 01-03 8100 Vortec L18 engine is 4bar (58psi). To properly calibrate, temporarily disconnect the vacuum line from the DMR and plug the vacuum hose. Turn the DMR knob (shown) clockwise to increase pressure and counterclockwise to decrease pressure. Once target pressure is achieved, reconnect the vacuum hose. After the engine is fully warmed up, verify fuel pressure.

**INSTALLATION COMPLETE**

