

INSTALLATION INSTRUCTIONS

SUBARU FUEL RAILS

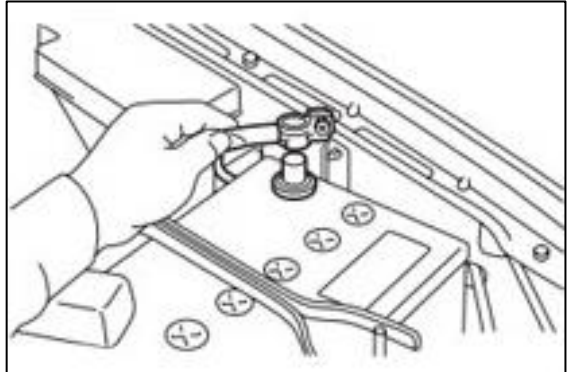
Support: info@radiumauto.com

Document# 19-0090

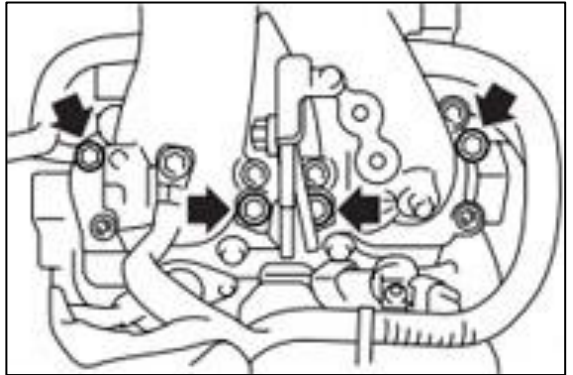
WARNING: DO NOT EXPOSE WORK AREA TO ANY SPARKS OR FIRE. DO NOT SMOKE WHILE OPERATING ON THE FUEL SYSTEM. CLEAN UP ALL FUEL SPILLS IMMEDIATELY. WORK IN A WELL VENTILATED AREA.

1. It is necessary to have access to a Factory Service Manual. Remove fuel pump fuse and start engine. Allow engine to stall to relieve fuel pressure. Remove ignition key and disconnect battery (as shown).

After engine has cooled, drain coolant per service manual. Remove top mount intercooler, air intake duct, upper cover, intake boot, coolant filler tank. Unbolt P/S pump and place on right wheel apron. Disconnect coolant hoses from throttle body and all electrical and vacuum connections including emission hose, PCV, brake booster, coolant temperature sensor, oil pressure sensor, cam/crank sensors, knock sensor, coils, etc.



2. Gently disconnect fuel feed, evaporation, and return hoses and catch all spilled fuel. Remove the bolts (shown) that secure the intake manifold/TGVs to the cylinder heads and place on a bench. Remove the M6 bolts that secure the hard fuel lines to the intake manifold with a 10mm socket wrench. Use a 12mm socket wrench to remove the two M8 mounting bolts on each fuel rail. Remove all OEM fuel components from the intake manifold/TGVs. Carefully remove the fuel rails and drain excess fuel into a safe container for disposal. Remove injectors and inspect O-rings.



3. If reusing the OEM Subaru (2-bolt flange type) fuel pressure regulator, transfer from the factory fuel rail to the Radium OEM FPR adapter (shown).

Prior to installation, pre-lubricate all 8AN ORB fitting O-rings.



4. Clean out any dirt or debris found in the lower injector seat bores.

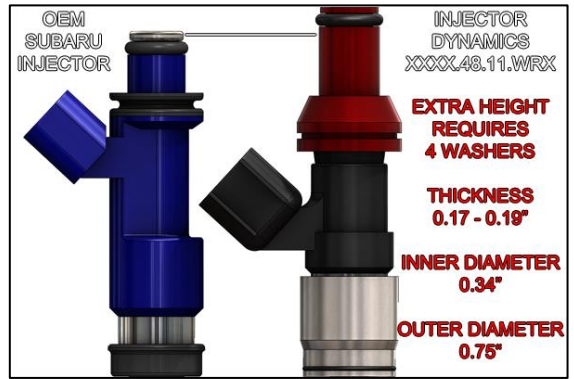
RADIUM 20-0168, 20-0304, 20-0335 Top Feed "CONVERSION" Kits ONLY: Lubricate the Radium billet injector seat O-rings with light oil. Press each Radium injector seat down firmly into the 4 intake manifold injector ports until fully seated. The 22mm injector seat from the 20-0168 conversion kit is shown. The 26mm seats are similar.



5. RADIUM 20-0167-0X Top Feed "UPGRADE" Kits ONLY: These rails are compatible with 11mm upper O-rings (same as OEM Subaru injectors). For fuel injector flexibility, there are 2 sets of phenolic spacers (15mm/27mm) and corresponding bolts included. OEM Subaru injectors require the short 15mm phenolic spacers.

Note if purchased before February 2017: Injector Dynamics has OEM replacements that are taller than OEM injectors and thus require 4 washers (not included) to be used under the phenolic spacers. Washer: Thickness .17-.19", ID .34", OD .75"

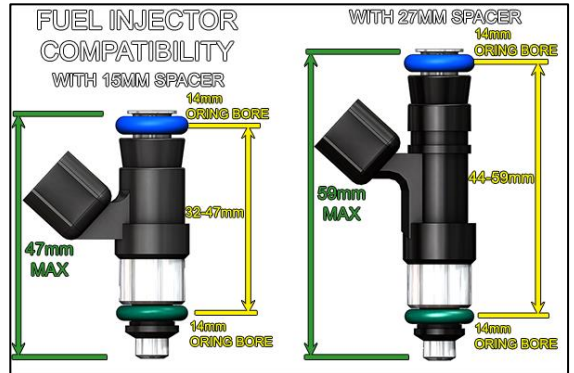
Lubricate each injector's upper O-ring with light oil. Gently press the fuel injector into each of the 4 fuel rail injector ports.



6. RADIUM 20-0168, 20-0304, and 20-0335 Top Feed "CONVERSION" Kits ONLY: As shown, these side feed to top feed conversion fuel rails are compatible with injectors that use a very common 14mm upper O-ring.

For fuel injector flexibility, 20-0168 includes two sets of spacers and bolts. Reference the diagram to the right and press the appropriate height spacers into the rail mounting bores.

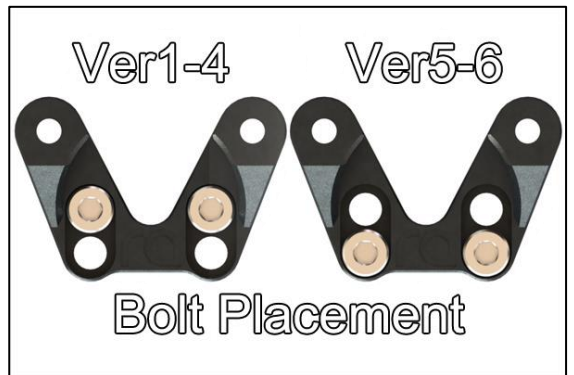
Lubricate each injector's upper O-ring with light oil. Gently press the fuel injector into each of the 4 fuel rail injector ports.



7. If a Radium adapter was purchased, use the included bolts and an Allen wrench to secure in place. The 20-0335 adapter permits Ver1-4 and Ver5-6 mounting positions, as shown. The 20-0372 Ver8-9 EJ207 and EJ253 adapter is similar.

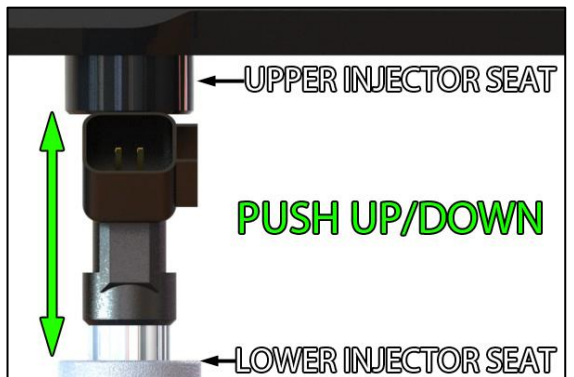
Position and line up each rail over the intake manifold than press firmly on the fuel rail to seat the injectors' lower O-rings.

Once everything is positioned correctly, install the appropriate M8 bolts using the included phenolic washer and torque to 10ftlbs (120inlbs, 13.6Nm) using a 6mm Allen wrench.



8. For fitment verification, push the fuel injectors downward until they bottom out in their respective seat. Now confirm each injectors' upper O-ring is still inserted into the fuel rail bores. Do not pressurize the fuel system until the proper height is achieved.

If wiring harness adapters were included with the purchase of the fuel injectors, install them now per the instructions provided by the manufacturer. Note: wiring polarity on each injector does not matter. Orientate the fuel injectors such that the electrical connectors do not experience any interference with the surrounding area.



9. Reminder: This kit does not include hoses as many Subaru tuners have preferred and specific hose routing schemes. For universal alcohol (E85) compliant PTFE fuel hose, check radiumauto.com. See following page for common hose routing.

NOTE: Some early Subaru coolant expansion tanks are larger than others and require modification to allow proper top feed fuel rail height clearance.

After everything is reinstalled, cycle the key a few times (without starting engine). This allows the pump to prime the system. CHECK FOR LEAKS! If no leaks are found, start the engine and check again while the engine is running. Installation complete.



COMMON HOSE ROUTING SCHEMES

The following schematics are provided as guidelines only. Please discuss with a professional Subaru tuner about which hose routing option is ideal for your particular application.

- **PARALLEL, FLOW-THROUGH**
Some Subaru tuners feel that plumbing the fuel hoses in a “parallel” fashion is necessary.
- **PARALLEL, DEAD-END**
Specifically using the Radium 20-0100 Multipump Regulator, fuel hose plumbing can be vastly simplified.
- **SERIES, AFTERMARKET FPR**
This routing scheme is similar to Subaru plumbing with the addition of an aftermarket fuel pressure regulator.
- **SERIES, OEM FPR**
This routing scheme duplicates Subaru fuel hose plumbing using the OEM fuel pressure regulator.

