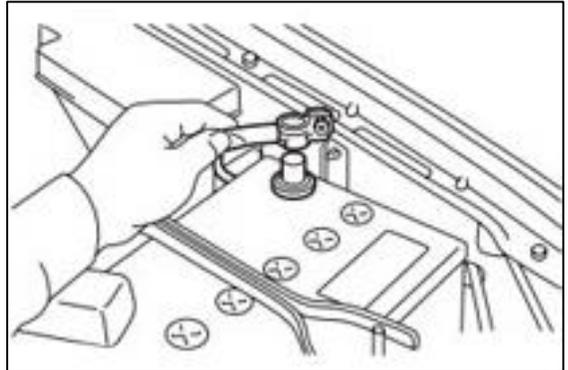


**WARNING: DO NOT EXPOSE WORK AREA TO ANY SPARKS OR FIRE. DO NOT SMOKE WHILE OPERATING ON THE FUEL SYSTEM. CLEAN UP ALL FUEL SPILLS IMMEDIATELY. WORK IN A WELL VENTILATED AREA.**

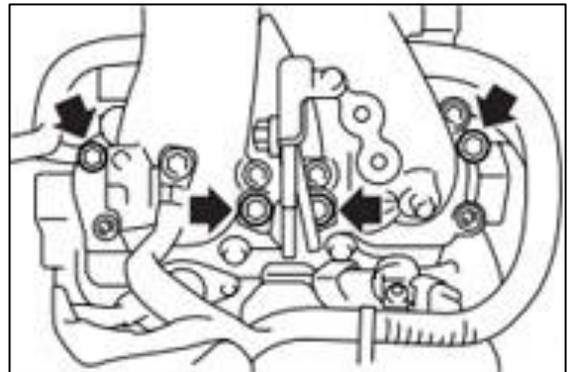
1. It is necessary to have access to a Factory Service Manual. Remove fuel pump fuse and start engine. Allow engine to stall to relieve fuel pressure. Remove ignition key and disconnect battery (as shown).

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



3. If reusing the OEM Subaru (2-bolt flange type) fuel pressure regulator, transfer to the appropriate Radium OEM FPR adapter (visit [www.radiumauto.com](http://www.radiumauto.com) for details).

If **Radium 20-0478 Fuel Rail Plumbing, Subaru EJ** was purchased, install the DMR to the rear end port (nearest the OEM feed line). For specific DMR installation information reference the instructions on the DMR product page. Next, install the low profile swivel fittings to the other 3 end ports. Install the two 8AN ORB plugs to the center (or top) ports unless fuel pulse dampers will be used instead.

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



4. **This step is for RADIUM 20-0168 and 20-0335 Fuel Rails ONLY**

Unlike the "upgrade" fuel rails, these "conversion" fuel rails require injector seats.

Lubricate the Radium injector seat O-rings with light oil and press the 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 injector seats are similar.

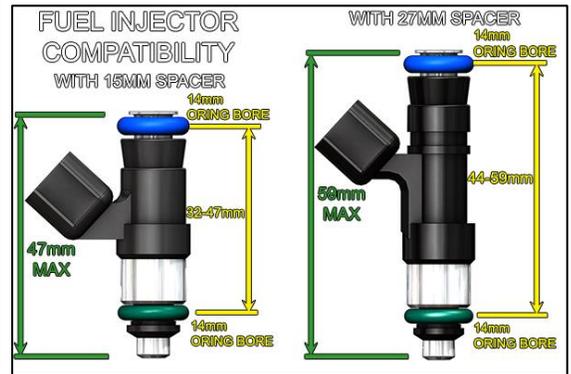


**5. This step is for RADIUM 20-0168 and 20-0335 Fuel Rails ONLY**

The “conversion” fuel rails are compatible with 14mm upper O-ring injectors.

For fuel injector flexibility, 20-0168-02 (only) includes two sets of spacers and bolts. Reference the diagram to the right and press the appropriate height spacers into the rail mounting bores.

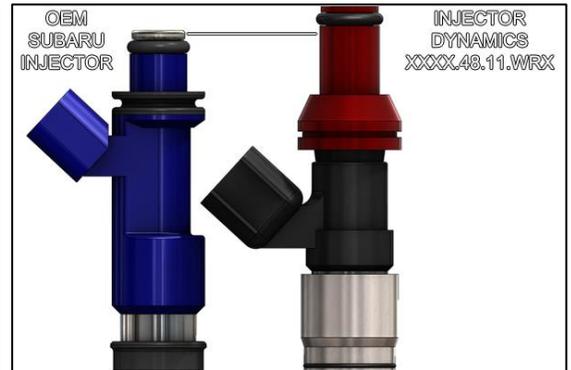
Lubricate each injector’s upper O-ring with light oil. Gently press the fuel injector into each of the 4 fuel rail injector ports.



**6. This step is for RADIUM 20-0467-02 and 20-0479-02 Fuel Rails ONLY**

Unlike the side feed “conversion” fuel rails, these “upgrade” fuel rails are compatible with 11mm upper O-rings (same as OEM Subaru injectors). For flexibility, there are 2 sets of phenolic spacers (15mm/20mm) included. OEM Subaru injectors require the short 15mm phenolic spacers. Injector Dynamics have OEM replacements that are taller than OEM injectors (as shown) and require the taller 20mm phenolic spacers.

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. This step is for RADIUM 20-0467-02 and 20-0479-02 Fuel Rails ONLY**

If Radium 20-0372 was purchased, use the included bolts and Allen wrench to secure in place. Secure the adapter as shown for the 2.5i EJ253 engine. Slide the adapter in the opposite direction for the Ver8/9 EJ207.

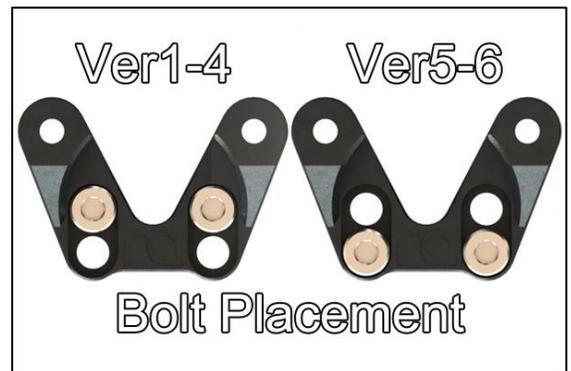
Position and line up each fuel rail over the intake manifold than press firmly on the fuel rail to seat the injectors’ lower O-rings. Once positioned correctly, install the provided M8 bolts. Torque to 10ftlbs (120inlbs, 13.6Nm) using a 6mm Allen wrench.



**8. This step is for RADIUM 20-0168 and 20-0335 Fuel Rails ONLY**

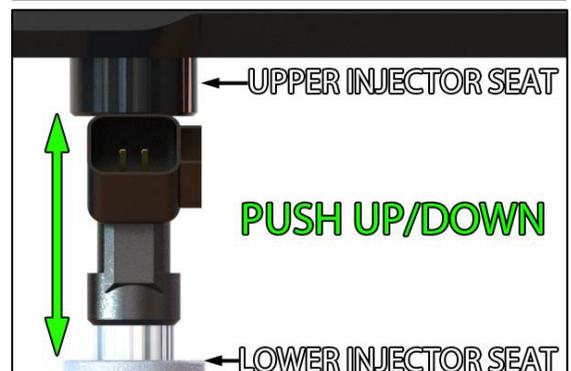
If 20-0335 was purchased, the adapter permits Ver1-4 and Ver5-6 mounting positions, as shown. Use the included bolts and an Allen wrench to secure in place.

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



9. 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 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.



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

The fuel rails do not include adapter fittings or hoses. For a complete plumbing kit, consider Radium P/N: 20-0478 Fuel Rail Plumbing, Subaru EJ (discussed below). If not, skip to the final step.



#### 11. 20-0478 Fuel Rail Plumbing, Subaru EJ

This procedure will vary depending on the model year as there is a diversity of Subaru fuel feed line configurations. Some have fuel pulse dampers (shown at right) and/or a fuel filter (shown in following picture) in the center of the fuel feed line. Some use SAE quick connectors while some use barb connections, etc.

NOTE: Know your target static fuel pressure before starting this installation. This is the pressure you will set the Radium regulator to in the last step.



#### 12. 20-0478 Fuel Rail Plumbing, Subaru EJ

Completely remove the OEM rubber fuel return line that runs from the firewall to the OEM pressure regulator pipe. Also disconnect the feed line on the fuel filter outlet. If the vehicle does not have an engine bay fuel filter, disconnect the feed line from the hard pipe near the firewall.

##### Notes for early model Subarus only:

1. Use a Phillips head screwdriver to release the lines.
2. The fuel hard lines near the firewall are not secured to the unibody, which means they cannot be pulled very hard. Because of this it can be easier to make a slit in the rubber hoses in order to remove them from the OEM barb.



#### 13. 20-0478 Fuel Rail Plumbing, Subaru EJ

**For late model Subarus only:** First fully insert the provided SAE quick connect tool inside the yellowish-green locking tabs, as shown.



#### 14. 20-0478 Fuel Rail Plumbing, Subaru EJ

**For late model Subarus only:** Push the OEM fitting further into the OEM pipe, then push the SAE tool in as far as it allows. To release, immediately pull the OEM fitting off the OEM pipe. This may take a couple of tries. Perform this step for the fuel feed and fuel return lines.



15. **20-0478 Fuel Rail Plumbing, Subaru EJ**

Apply PTFE paste to the fuel pressure gauge threads. Install the fuel pressure gauge to the inline adapter fitting.

Next, install the inline adapter fitting to one of the front fuel rail ports using one of the swiveling adapters, as shown.



16. **20-0478 Fuel Rail Plumbing, Subaru EJ**

Using the provided -6AN Push Lok hose-ends and vapor shield hose, cut and assemble the hoses to length, as shown. Exact hose-end configurations will vary by application (straight vs 45deg vs 90deg). Extra hose-ends are included for this purpose. Test out several configurations before cutting hose to determine optimal routing. The system is designed to be run in series with the feed line from the firewall ran to the turbo side fuel rail port first, as shown in the picture.

NOTES:

- Hose clamps are NOT necessary for the Push Lok hose ends.
- Apply a small amount of oil to the hose-end barbs before pushing into the hose.



17. **20-0478 Fuel Rail Plumbing, Subaru EJ**

Tighten the included Direct Mount Regulator (DMR) fuel rail fitting to the rear port. Next, tighten the 6AN fitting and plug into the DMR return ports. NOTE: both ports function identically. The 6AN fitting should be installed into the port which permits optimal hose routing. Make sure all o-rings are prelubricated with oil.

Slip the regulator onto the DMR adapter fitting. Secure in place with the bracket and small screws. Avoid torquing any fittings while the DMR is installed on the rail as it may damage the bracket. Use a hose-end and hose from the kit to construct the return line from the DMR 6AN fitting to the hard line near the strut tower.



18. **20-0478 Fuel Rail Plumbing, Subaru EJ**

Connect the vapor shield fuel hose to the OEM hard lines.

For late model Subarus that use SAE quick connects, insert the provided SAE quick connect fittings to the hose and secure using the included EFI hose clamps, as shown.

For early model Subarus that use barb connection, the included SAE quick connect fittings will NOT be used. Instead, insert the hose directly to the OEM hard line barbs and secure using the included EFI hose clamps.



19. After everything is installed, 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, proceed to adjust fuel pressure by tightening or loosening the screw in the top of the regulator. This should be done with the fuel pump running but the vacuum port open to atmosphere. Once adjusted, lock the screw in place using the lock nut. Install

For more information on the direct mount regulator, consult the DMR instructions on the associated product page at [www.radiumauto.com](http://www.radiumauto.com).

**Installation Complete**

