

PERRIN

PERFORMANCE

TOP FEED FUEL RAIL KIT for 2002-14 WRX

2014-07-17

Thank you for purchasing this PERRIN product for your car! Installation of this product should only be performed by persons experienced with installation of aftermarket performance parts and proper operation of high performance vehicles. If vehicle needs to be raised off the ground for installation, the installer must use proper jacks, jack-stands and/or a professional vehicle hoist for safety of the installer and to protect property. If the vehicle is lifted improperly, serious injury or death may occur! Please read through all instructions before performing any portion of installation. If you have any questions, please contact our tech department prior to starting installation. We can be reached in any of the following methods:

Email Tech@PERRINperformance.com
Instant Chat off the main page of www.PERRINperformance.com
Or simply call our tech team at 503-693-1702

GENERAL MODIFICATION NOTE

Modifications to any vehicle can change the handling and performance. As with any vehicle extreme care must be used to prevent loss of control or roll-over during sharp turns or abrupt maneuvers. Always wear seat belts, and drive safely, recognizing that reduced speeds and specialized driving techniques may be required. Failure to drive a vehicle safely may result in serious injury or death. Do not drive a vehicle unless you are familiar with its unique handling characteristics and are confident of your ability to maintain control under all driving conditions. Some modifications (and combinations of modifications) are not recommended and may not be permitted in your state or country. Consult the owner's manual, service manual, instructions accompanying these products, and local laws before purchasing and installing these modifications. You are responsible for the legality and safety of the vehicle you modify using these components.

SPECIAL NOTES:

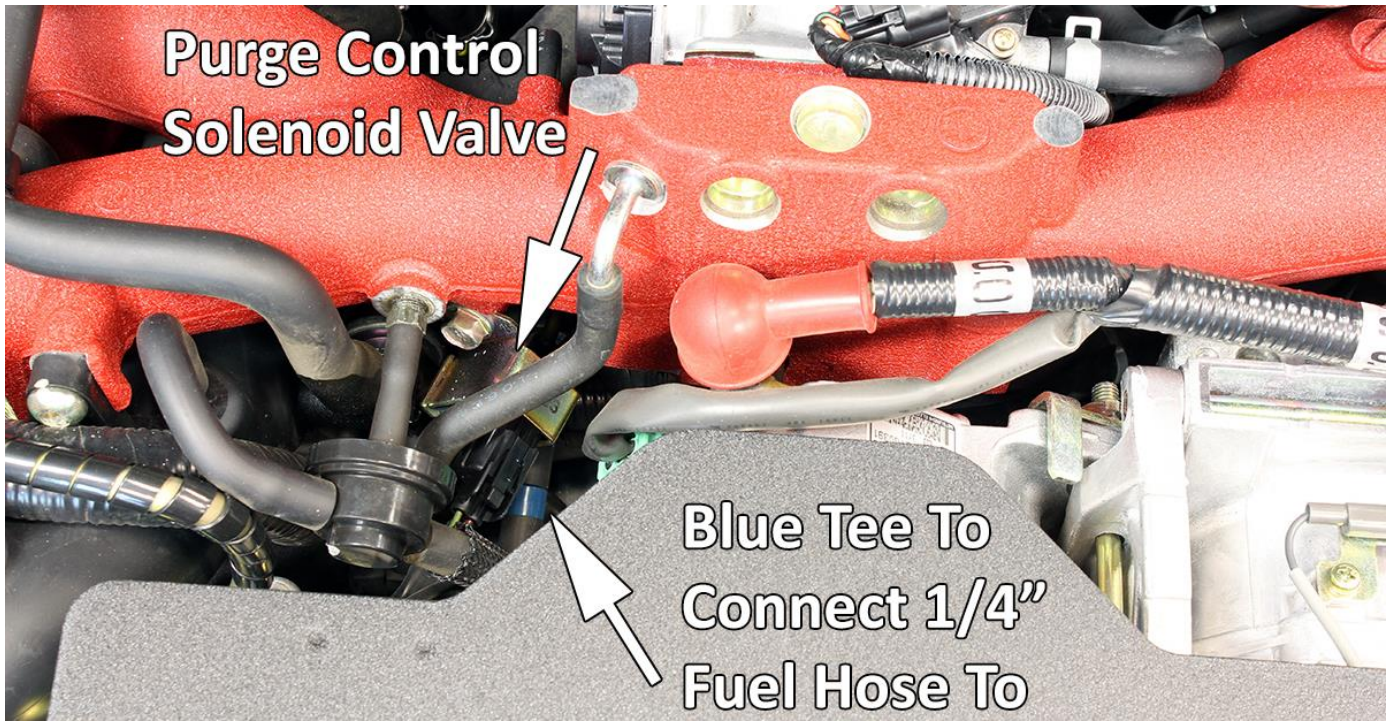
- Take time with determining hose length as this will pay off in a professional looking install.
- The use of a factory service manual is required to remove intake manifold. These can be purchased or downloaded online at <http://techinfo.subaru.com>
- The use of a nipper tool or Oetiker clamp tool is required for this installation. This tool can be purchased at any home improvement store or at www.PERRINPERFORMANCE.com
- Installing these fuel rails will increase the amount of fuel being delivered and having the car retuned is highly recommended.
- 08-14 WRX's will need to modify their fuel pressure regulator as shown below. What is highly recommended is that you purchase an OEM Regulator for a 02-07 WRX which will bolt in place. This reduces the chance of destroying the OEM part during modification.

Parts Included With PERRIN Fuel Rail Kit

- (2) PERRIN Fuel Rail (same left or right)
- (1) PERRIN Junction Block
- (10') PERRIN Flexguard Hose Cover
- (10') 3/8" Fuel Injection Hose
- (3') 5/16" Fuel Injection Hose
- (3') 1/4" Fuel Hose
- (6) 3/8" Barb, -6 PERRIN Fittings
- (1) 5/16" Barb, -6 PERRIN Fitting
- (1) Female Quick Connector
- (3') 5/32" Vacuum Hose
- (2) 3/8" Tee Connectors
- (2) 3/8" "Y" Connectors
- (1) 1/4" Tee Connector
- (2) 1/4" Straight Connectors
- (16) 19.8 Oetiker SS Clamps
- (5) M8x20mm SS Socket Head Bolt

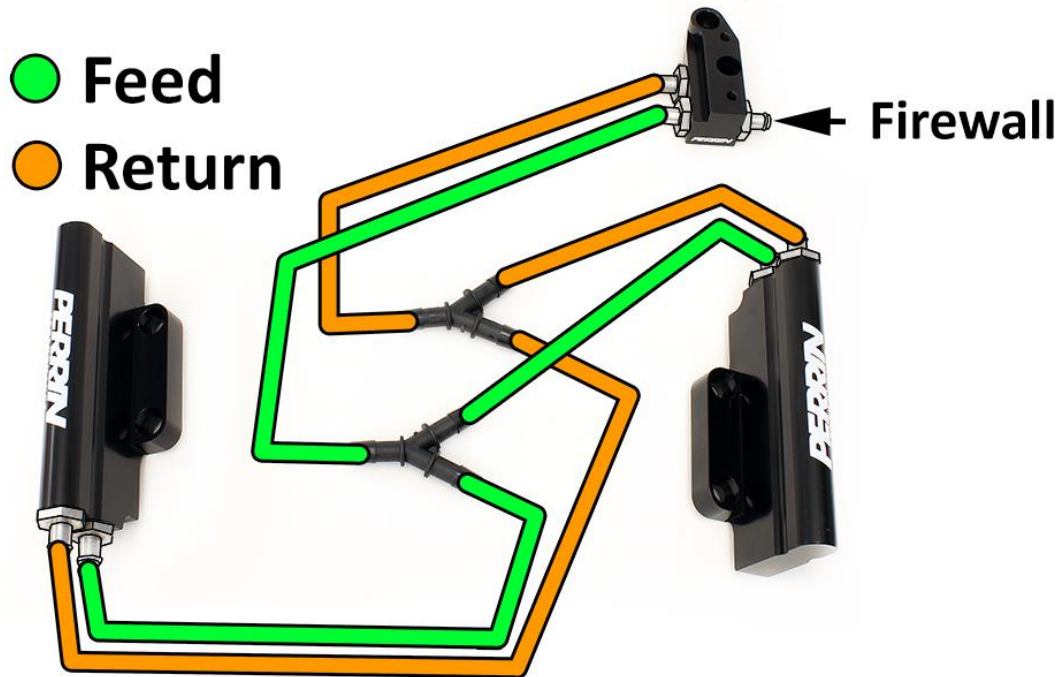
Removing Factory Fuel Rails

1. Follow factory service manual procedures for removing intake manifold.
2. Once intake manifold is removed from engine, remove steel brackets/guards surrounding each fuel rail.
3. Unplug all sensors, fuel injectors, grounds and solenoids connected to manifold. Make sure and keep track of where these plugged into to ensure no Check Engine Lights appear during the final steps.
4. Locate and remove hardware securing engine wiring harness to manifold. Take note of direction that harness was bolted to intake manifold.
5. Remove hardware securing fuel lines and rails to manifold.
6. Remove fuel injectors and fuel pressure regulator from rails. **NOTE: Take note of O-ring condition when removing. If any O-rings appear to be cut or ripped, replace with new proper O-ring.**
7. Remove hose clamps connecting rubber hoses to steel pipes.
8. Remove fuel rails from manifold. Take note of small blue tee (2007 cars have a black tee), short rubber hose and steel hose it connects to. This blue tee will be connected to a supplied 1/4" hose later in the installation process.



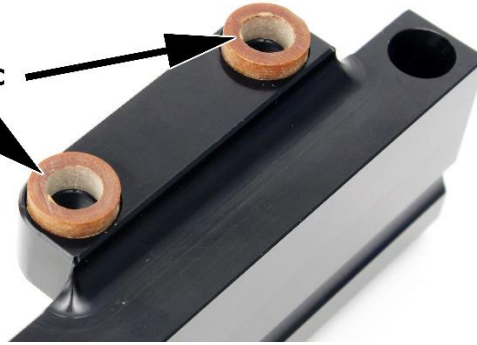
Setting Up PERRIN Rail and Hose Routing

Routing will vary greatly from install to install. Things like OEM intercoolers, aftermarket top mount intercoolers, front mount intercoolers, blow off valves, and other intake manifold modifications will affect how hoses will be routed. There is no perfect way to route them, but great caution must be taken when planning fuel hose routing. Also be prepared to set intake manifold on engine and remove it a few times while routing hoses.



1. Using supplied M8 socket cap screws, loosely install fuel rails to intake manifold making sure phenolic spacers are between manifold and rail. **Note: You may leave fuel injectors out of rails at this time as you may need to remove rails a few times during installation.**

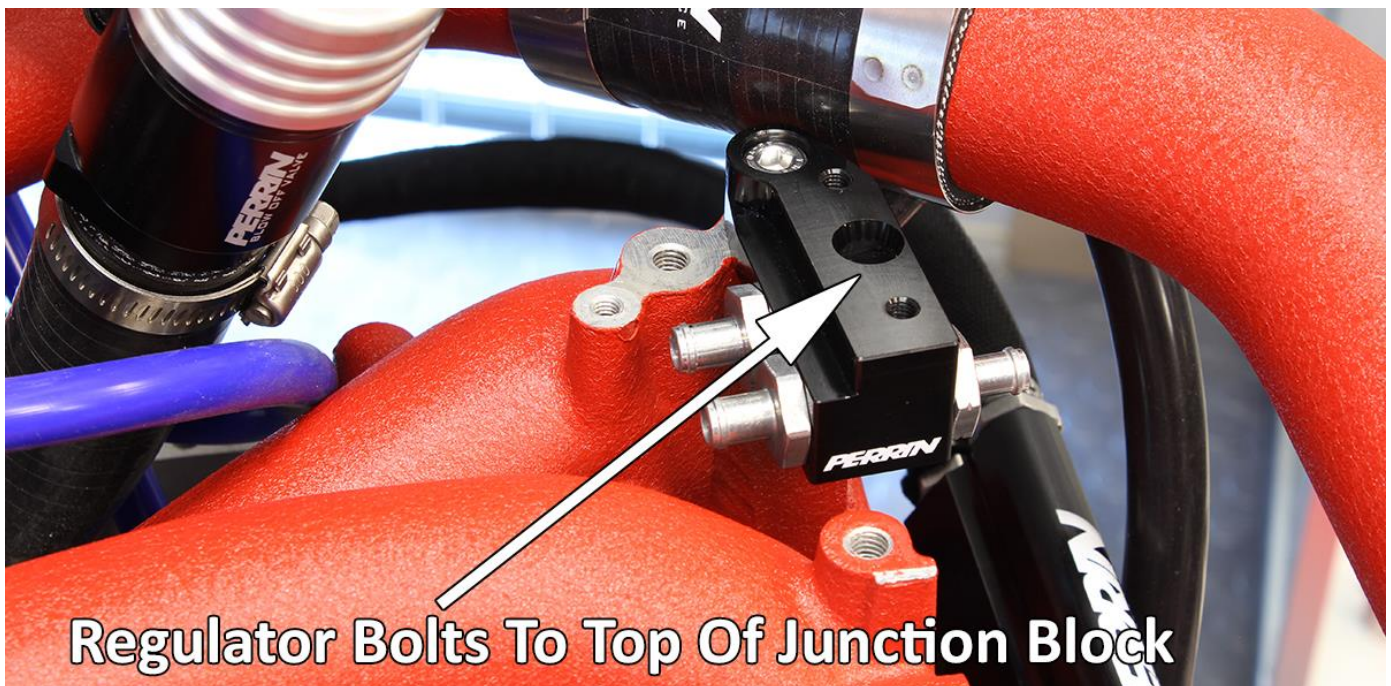
Make Sure the Phenolic Spacers are Installed



2. Set manifold onto engine and prepare to route fuel lines. Make sure to loosely install coolant fill tank as this can change the hose routing.
3. Route fuel lines as such that they stay away from moving parts or extreme heat. **NOTE: Included is 10' of PERRIN Flexguard hose cover which is very abrasion resistant, rated for 260F continuous heat, and 450F short term heat. This still means that you can't route hoses over turbochargers, or exhaust system parts. This cover will be installed in a future step, but planning ahead is important when dealing with fuel and potential fire hazard.**
4. Start with lower fittings (marked as FEED) on rails. Run supplied 3/8" Fuel injection hose to both lower fittings. Keep in mind that somewhere in middle of hose, you will cut it and install a "Tee" or "Y" fitting. This junction joins left and right fuel rails together, then to junction block (see diagram above). **Note: Do not install clamps, or "T" or "Y" fitting at this time.**



5. Install 3/8" Fuel injection hose to upper fittings (marked as RETURN) on rails. Keep in mind that somewhere in middle of hose, you will cut it and install a "Tee" or "Y" fitting. This junction will join left and right fuel rails together, then to junction block (see diagram above). **Note: Do not install clamps, or "T" or "Y" fitting at this time.**
6. Bolt junction block to left side of intake manifold as shown below. Use one of two mounting holes located on intake manifold and supplied M8 socket cap screw. **Note: Make sure phenolic spacer is installed between junction block and intake manifold.**



Regulator Bolts To Top Of Junction Block

7. Install 3/8" Fuel injection hose to larger fitting that passes straight through junction block (marked as FEED) and route hose to lower set of fuel hoses (connected to FEED on each rail). Trim hose to length, understanding that a T or Y connector will be installed in a later step. **Note: Leaving hose an inch or so longer is a good idea until hose cover and T or Y is installed.**
8. Install hose to other large fitting on junction block (marked as RETURN on opposite side of fitting) and route hose to upper set of fuel hoses (connected to RETURN on each rail). Trim hose to length, understanding that a T or Y connector will be installed in a later step. **Note: Leaving hose an inch or so longer is a good idea until hose cover and T or Y is installed.**
9. Hose routing is now complete. If done correctly hose routing will be smooth, free from kinks, and routed away from moving parts and extreme heat. **Note: "Y" or "T" connections are still NOT installed at this point. The above and below diagram only shows them for illustration purposes.**



Choose "T" Fitting or "Y" Fitting To Connect Left and Right Rails Together

Flexguard Hose Cover Installation

1. Once hose lengths are set (or very close), remove manifold from engine and prepare to install hose cover and clamps to permanently attach hoses.
2. Start with one section of hose and cut (using very sharp scissors) PERRIN Flexguard to fit over entire length (extra length will not hurt, but don't cut too short!). **Note: Installing Flexguard over fuel hose can be made easy by "inching" it onto hose. Simply slide Flexguard over hose as far as possible, then holding one side, slide hose on 1"-2" at a time. Continue with this method while working down hose until cover is completely installed. You can tighten up cover to hose by twisting around hose.**
3. Ensure fuel injection hose is pushed completely onto fitting on each fuel rail and junction before proceeding.
4. Slide hose cover up to fitting making sure to cover end of hose completely. Install one clamp over hose and hose cover all the way up to the fitting. Using proper crimping tool, crimp clamp as shown below. **Note: It is very important to make sure the clamp is placed as shown below to create a proper seal at each junction.**

Proper Clamp Placement



Improper Clamp Placement



5. Continue with installing and crimping clamps onto remaining barb fittings on fuel rails and junction block. Do not install clamps onto "T" or "Y" fittings at this time.
6. Preload (6) more clamps onto hoses with hose cover installed. Do any last trimming of hose or hose cover before moving to next step.
7. Making sure to keep corresponding lower (FEED) and upper (RETURN) hoses connected together, connect remaining hoses to the "Y" or "T" barbed

fitting.

- Slide clamp all the way up to fitting and over hose cover. Using proper crimping tool, crimp clamp as shown below. **Note: It is very important to make sure the clamp is placed as shown above to create a proper seal at each junction.**



- Double check that all clamps are installed properly and tighten properly before proceeding to next step.
- Loosely install manifold to engine, and recheck for clearances.



Bad Crimp

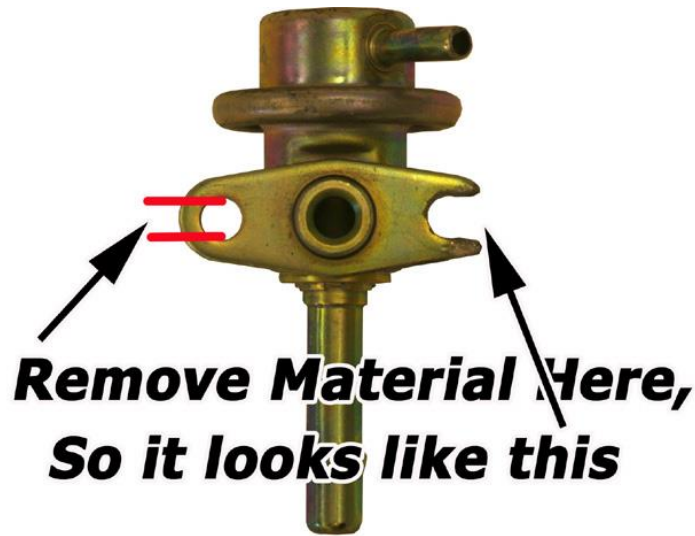
Good Crimp

Above diagram shows how to properly crimp the clamps. The proper tool is also shown.

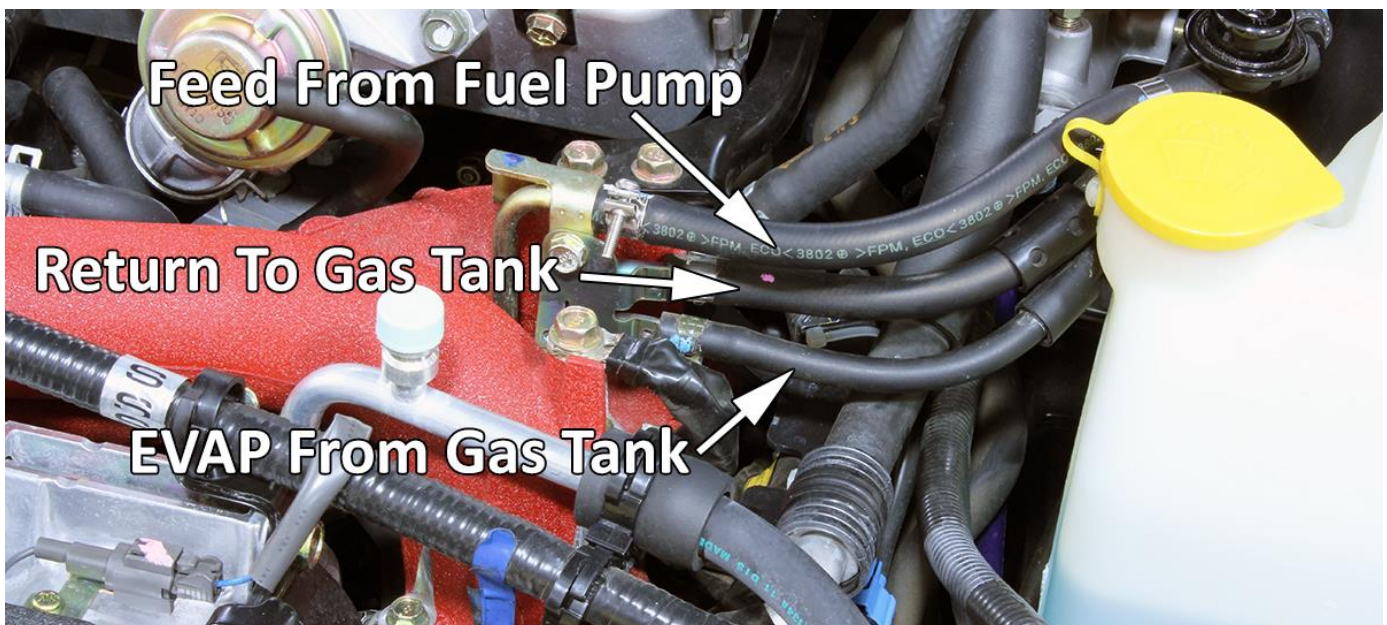
Fuel Rail / Injectors / Regulator Installation

- Remove intake manifold from car, and unbolt fuel rails from manifold. Place a small amount of grease inside of each injector port and around each O-ring of injector. This will help keep injector O-rings from getting cut during installation. **Note: Best type of grease to use is lithium, but any type of lighter grease will work.**
- Install injectors into fuel rails making sure to twist slowly and wiggle them slowly as you press them into each port. This will reduce the chance of an O-ring getting cut.
- Check that each port on intake manifold has a small rubber seal in the bottom of it. **Note: This is a very important seal that needs be installed. These seals sometimes fall out or get stuck to each injector as they are removed. Do not proceed without checking for these being installed.**

4. Bolt rails to manifold making sure that all injectors line up with ports on intake manifold as it's bolted on.
5. Install injectors facing the same direction as stock fuel rails aligned them. Injectors should be turned such that the plugs face in opposite directions (facing front and back of car). **NOTE: Some aftermarket injectors may need small tabs trimmed from plug. And many aftermarket injectors are taller and require spacers under the rail. These are supplied by the injector manufacture not by PERRIN Performance.**
6. Reinstall wire harness to manifold making sure to plug in all sensors, solenoids, and grounds.
7. Locate purge control solenoid valve on front of intake manifold, and locate tee (blue or black depending on year). Connect supplied 1/4" fuel hose to it and route under intake manifold toward junction block. This will connect to firewall after intake manifold is installed. **Note: 2007+ models will need to use (2) 1/4" tees to join the (2) purge control solenoid valves together before connecting them to the 1/4" fuel hose.**
8. Reinstall intake manifold per factory service manual.
9. Install Fuel pressure regulator to junction block
 - a. For 02-07 WRX, bolt fuel pressure regulator to junction block using OEM bolts. Aim fuel pressure regulator outlet towards left side shock tower.
 - b. For 08+ WRX, if you choose to modify your OEM regulator, follow the diagram below. Use a cut off wheel, with a Dremel or other air tool to cut slot on sides of regulator. Using same tool as above, cut vacuum fitting tube in half. Make sure to remove any and all debris. **Again, you can purchase a 02-07 WRX regulator, which will bolt on without modifications and far less risk of debris getting into the fuel system.**



10. Using supplied 5/32" hose, connect vacuum line from vacuum port on manifold to the fuel pressure regulator vacuum port. Route hose such that it will not ever become pinched or pass over extremely hot items like turbochargers and exhaust system parts.
11. Connect 1/4" fuel line (from purge control solenoid valve tee) to the evaporative line at the firewall. This is the smallest hard line in middle of three lines next to shock tower (marked as EVAP from gas tank in below picture).
12. Using OEM fuel injection clamps, connect fitting on junction block (marked FEED) to feed hose (marked as Feed from fuel pump in picture below). Use included 5/16" Fuel injection hose if needed or to extend hoses. **Note: Some cars have a fuel filter located on this line, make sure to connect rails to filter if installed. DO NOT BYPASS FILTER!**
13. Using OEM fuel injection clamps, connect fitting on regulator (marked as RETURN) to return hose (marked as Return to gas tank in below picture). Use included 5/16" Fuel injection hose if needed or to extend hoses. **Note: 2007+ cars will have to use supplied Female quick connector on regulator in place of a hose clamping directly to the fitting. Still use supplied hose and OEM clamp to secure hose to plastic quick connector.**



14. Double check all clamps are tight, and prime the fuel system prior to starting vehicle. Simply turn the key to the on position, but to do not start. Do this several times and check for leaks. **NOTE: DAMAGED O-RINGS WILL CAUSE A FUEL LEAK AND INCREASE THE RISK OF FIRE. REPLACE ANY DAMAGED O-RINGS.**
15. Look closely for fuel leaks around the fuel injectors, and smell for fuel. If there is a leak, you should be able to smell it after system is pressurized. **Note: If leaks are present stop installation. Double check all connections and O-rings for signs of damage. If nothing is found, please contact PERRIN Performance for technical assistance prior to proceeding.**
16. If no leaks are found, start engine.

If vehicle doesn't start or runs poorly please review the following items before seeking additional technical help:

1. Are each of the coil wires connected? Are they connected to the correct cylinders? White plugs go to front cylinders. Black plugs connect to rear cylinders.
2. Are all wire harness grounds bolted to intake manifold?
3. Are the crank and cam sensors plugged in, and snug to each sensor?
4. Are each of the injector O-rings (Fuel rail O-ring and manifold O-ring) undamaged and installed?
5. Was each manifold gasket installed undamaged and aligned with intake ports to avoid vacuum leaks?
6. Re-check each vacuum connection for leaks. Double check inlet hose, PCV etc.

If these check out to be ok, please contact technical support. Have all CEL codes available as this will significantly reduce the time needed to solve any problem you encounter.

Questions, Comments and Suggestions Contact: Tech@PERRINperformance.com

Visit Our Website for Instant Chat Options at www.PERRINperformance.com

Call Our Tech Team at 503-693-1702