

# SPEED PERFORMANCE

## Port Injection (PI) Fuel System

PI Fuel System for 2013-15 Ford Focus 2.0L Ecoboost



## Installation and User Guide

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Thank you for trusting Speed Performance with your auxiliary fueling needs for the Ford Focus ST – USDN.

Please pay close attention to the following warnings and instructions. These instructions are necessary to help you properly install the new auxiliary PI fueling system and be able to operate your vehicle in a safe manner as to avoid injury or death.

## **WARNINGS AND WARRANTY – PLEASE READ CAREFULLY**

**ALL parts are sold for OFF ROAD RACE-ONLY ground vehicle use only.**

**Aftermarket systems interacting with engine function are not for use on pollution-controlled vehicles. Alteration of emission related components constitutes tampering under most local emission regulation guidelines and can lead to fines and penalties.**

### **Limited Warranty**

**This Speed Performance product is warranted against defects in materials and workmanship for 1 year from date of purchase. During the warranty period, Speed Performance will repair, or at its option replace at no charge, components that prove to be defective. The product must be returned, shipping prepaid, to a Speed Performance facility. This limited warranty does not apply if the product is damaged by accident or misuse. The foregoing warranty is in lieu of all other warranties expressed or implied including but not limited to any implied warranty of merchantability, fitness, or adequacy for any particular purpose or use. Speed Performance is not responsible for any fines, injuries, or damages incurred as a result of the installation or use or misuse of our products. It is the complete responsibility of the purchaser of such products to ensure that they are used in a legal, safe, and appropriate manner.**

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## Features and Benefits

### **Protects your Engine from Fuel Starvation:**

To make more power you need two main components, Air and Fuel. With more boost and bigger turbochargers or superchargers, your OEM direct injection components can't supply the fuel needed for safe high power operation. This auxiliary port injection system is a proven method for keeping your motor safely fueled under the most demanding conditions.

### **Provides The Fuel you need for More Boost and Power:**

Direct injection cars use expensive and complex components. When upgrading your vehicle to produce more power than stock, more fuel is needed. Direct injection injectors and fuel pumps are often not upgradeable. This fuel system augments your fueling under high power levels with proven components allowing you to achieve you power goals.

### **Cleaner Valves, Efficient Motor:**

The direct injection (DI) system is very efficient and has cooling benefits. Keeping it in the car and working as intended is ideal. This is why a port injection system works so well. You keep the efficient DI fueling and augment it with port injection only under high power. This also has the benefit of keeping your intake valves cleaner.

### **Easy Installation:**

We have worked very hard to make our systems as plug and play as possible. The kit you purchased is built and tested for your vehicle. This means everything fits right and works as it should from the get-go making it a painless and effective installation process.

### **Tested, Proven, Safe Solution:**

We don't build and sell anything that we don't thoroughly test. The fuel system is a proven, safe solution for increasing fueling on your vehicle and we stand behind its performance, capabilities, and reliability.

### **E85 Safe, Simple Adjustments:**

All kit components are E85 safe. The controller that calculates the fuel delivery as well as all components are purpose built and safe. We make adjusting the fueling as simple as possible to make sure you get to your results quickly whether we tune the system or someone else does.

## Introduction and Precautions

### IMPORTANT

1. When installing and working with the Auxiliary Fuel System you are working with flammable fluids.
2. Take all safety precautions necessary during installation and operation of the fuel kit to prevent any fires or injuries.
3. Ensure you are installing the system in a well-ventilated area away from any spark or flame source.
4. After the installation and periodically thereafter check that the system continues to be leak free.

The Aux Fuel System Split Second Electronic Controller should be mounted within the vehicle's engine bay, but it is NOT waterproof. The controller should not be mounted directly on the engine. Do not spray or pressure wash the controller with water or any other liquids. Mount the controller in an area that is not in contact with the engine - preferably close to other vehicle electronics such as the fuse box.

The direct injection (DI) system in your vehicle is designed to supply enough fuel to run the OEM vehicle with OEM components. Most manufacturers build some headroom into their fueling systems but at some point, your quest for power requires more fuel. On a direct injected car this means that you need to upgrade at least the fuel injectors or high-pressure fuel pump or often both. These upgrades are expensive and often not available.

The Speed Perf6rmanc3 Auxiliary Fuel System is designed to work in conjunction with your DI fuel system and offer additional fuel when needed under high boost or high power demands. This means that your car remains efficient and drivable while having the fueling capacity to reach higher power goals.

## **Kit Component List**

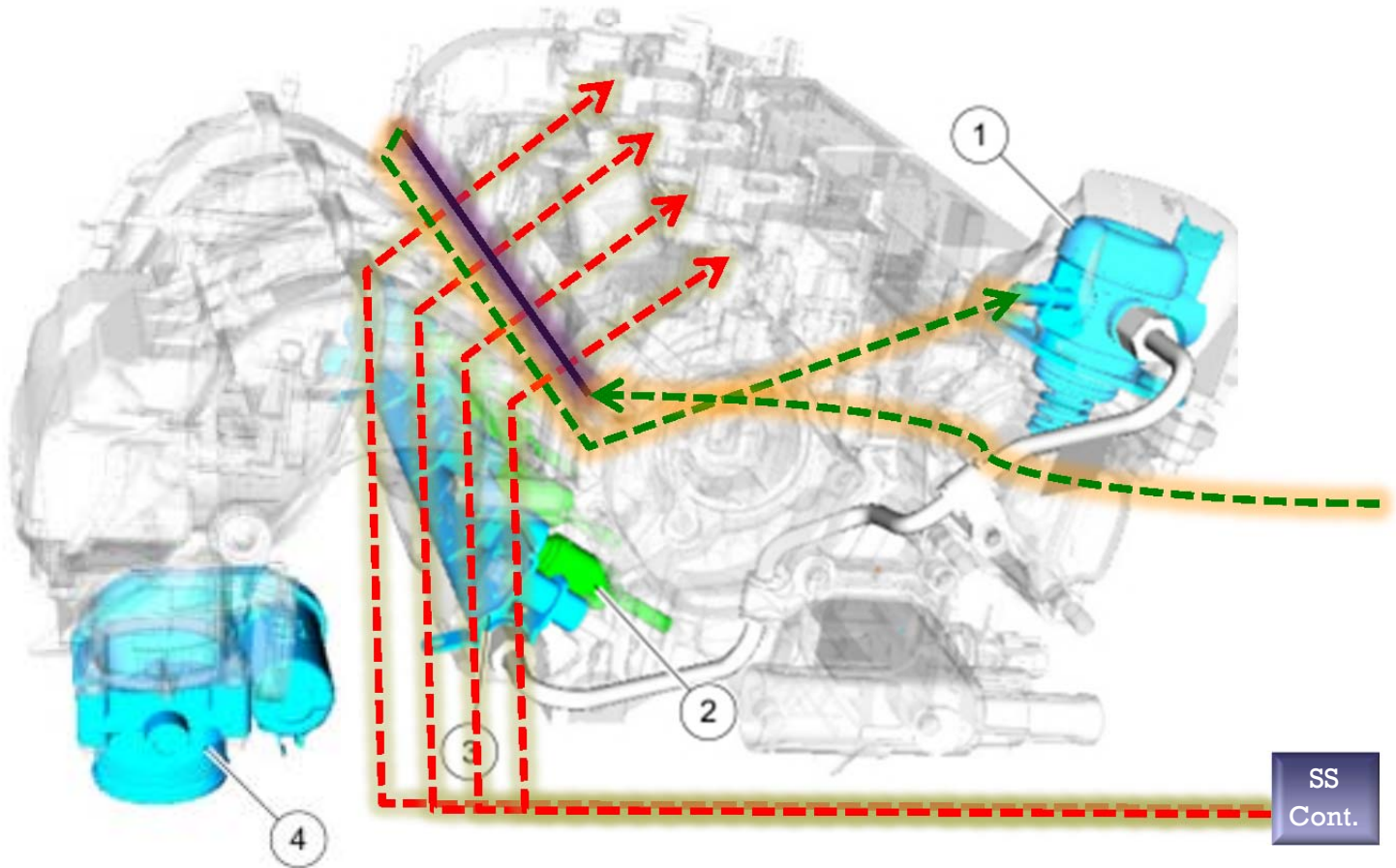
Verify that all these components are included with your fuel system kit:

- 1 x Fuel Rail and Spacer
- 4 x Fuel Injectors
- 1 x 27" Main Fuel Feed Line with -6AN Female Fittings
- 1 x 38" Return to HPFP Fuel Line with -6AN Female Fitting and 5/16" Fuel Line Fitting
- 1 x 5/16 Fuel Line to -6AN Adapter
- 1 x Split Second Additional Injector Controller
- 1 x Fuel Injector Wiring Harness
- 5 x 105mm Manifold Studs
- 5 x Locking Stud Cap Nuts

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## Installation Diagram



1	High Pressure Fuel Pump (HPFP)
2	Direct Injection Fuel Injectors
3	Direct Injection Fuel Rail
4	Throttle Body (TB)

## Installation Instructions

### IMPORTANT

**⚠ WARNING:** Before working on or disconnecting any of the fuel tubes or fuel system components relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

**⚠ WARNING:** Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

**⚠ WARNING:** Clean all fuel residues from the engine compartment. If not removed, fuel residue may ignite when the engine is returned to operation. Failure to follow this instruction may result in serious personal injury.

**⚠ WARNING:** Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

**⚠ WARNING:** Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

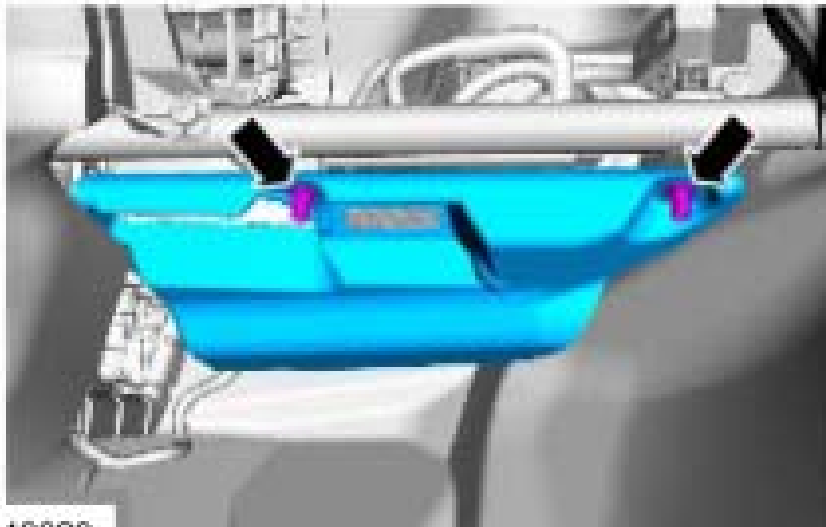
**⚠ WARNING:** When handling fuel, always observe fuel-handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

**⚠ WARNING:** Avoid contact with fuel during a visual inspection for fuel leaks with the engine running. Do not work on the fuel system until the pressure has been released and the engine has cooled. Fuel in the high-pressure fuel system is hot and under very high pressure. High-pressure fuel may cause cuts and contact with hot fuel may cause burns. Failure to follow these instructions may result in serious personal injury.



## Fuel System Pressure Release

1. Remove the 2 instrument panel insulator retainers and the instrument panel insulator.



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2. *NOTE: The Fuel Pump (FP) control module fuse is located in the Body Control Module (BCM), location F56.*
3. Remove the Fuel Pump (FP) control module fuse.



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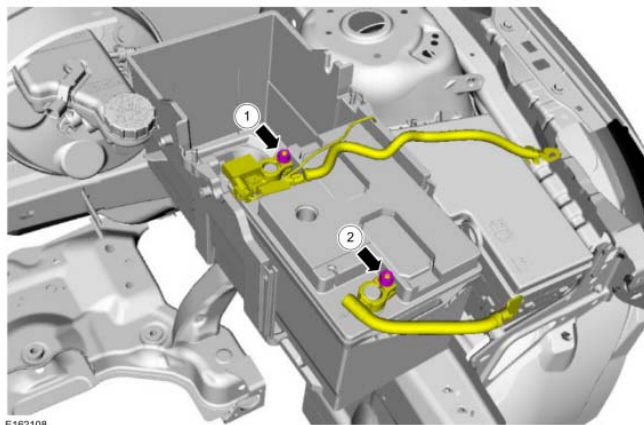
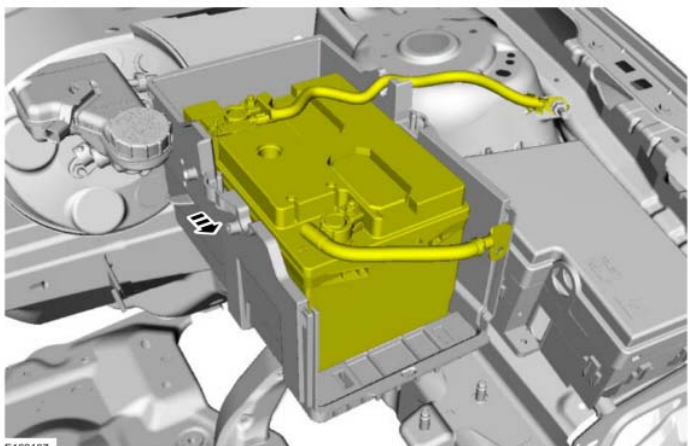
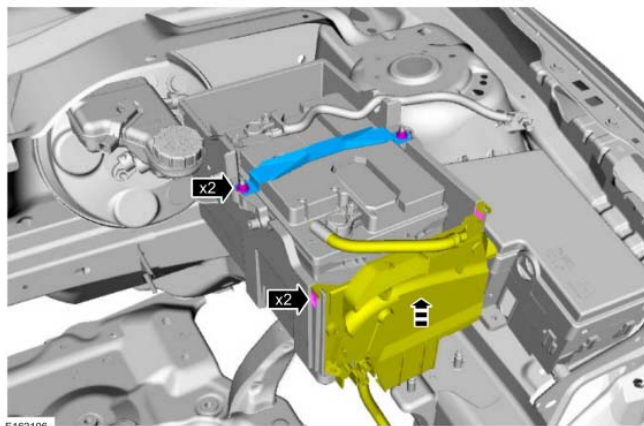
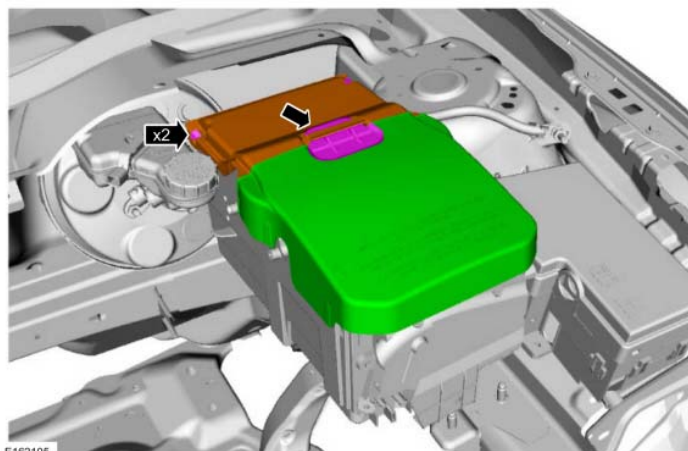
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4. *NOTE: A message center warning display 'engine malfunction service now' may display on the Instrument Panel Cluster (IPC). Reset the message center by pressing the OK button on the steering wheel controls.*
5. Start the engine and allow it to idle until it stalls.
6. After the engine stalls, crank the engine for approximately 20 seconds to make sure the fuel system pressure has been released.
7. Turn the ignition switch to the OFF position.
8. When fuel system service is complete, install the Fuel Pump (FP) control module fuse.
9. NOTE: It may take more than one key cycle to pressurize the fuel system.
10. Cycle the ignition key and wait 3 seconds to pressurize the fuel system. Check for leaks before starting the engine.
11. Install the instrument panel insulator and retainers.

## Disconnect and Remove the Main Battery and Tray

*NOTE: When the battery is disconnected and connected, some abnormal drive symptoms may occur while the vehicle relearns its adaptive strategy. The vehicle may need to be driven to allow the PCM to relearn the adaptive strategy values.*

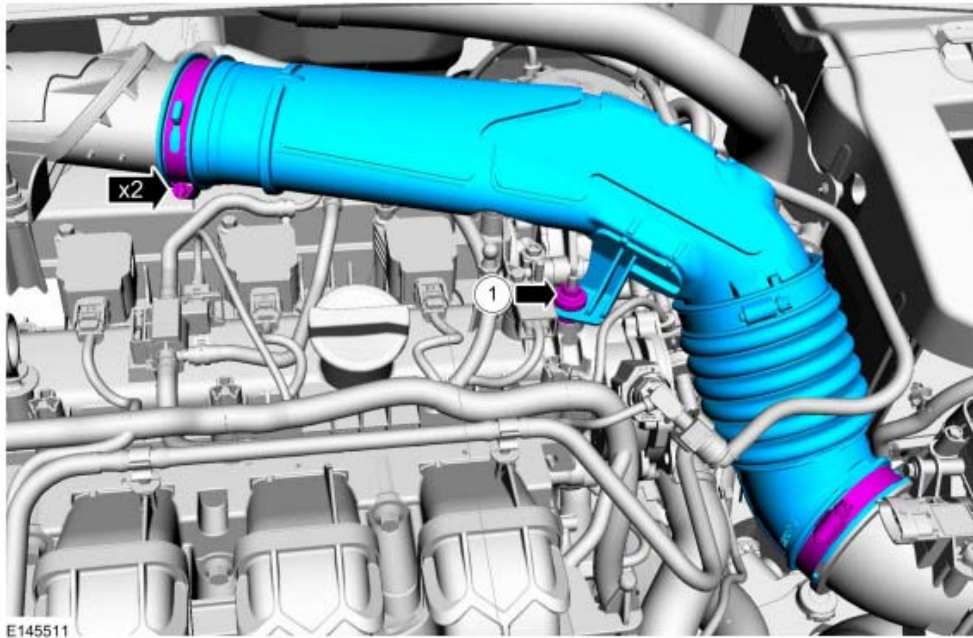


1. You should remove the entire battery tray, which is done by removing the three 10mm bolts in the bottom of the battery tray.

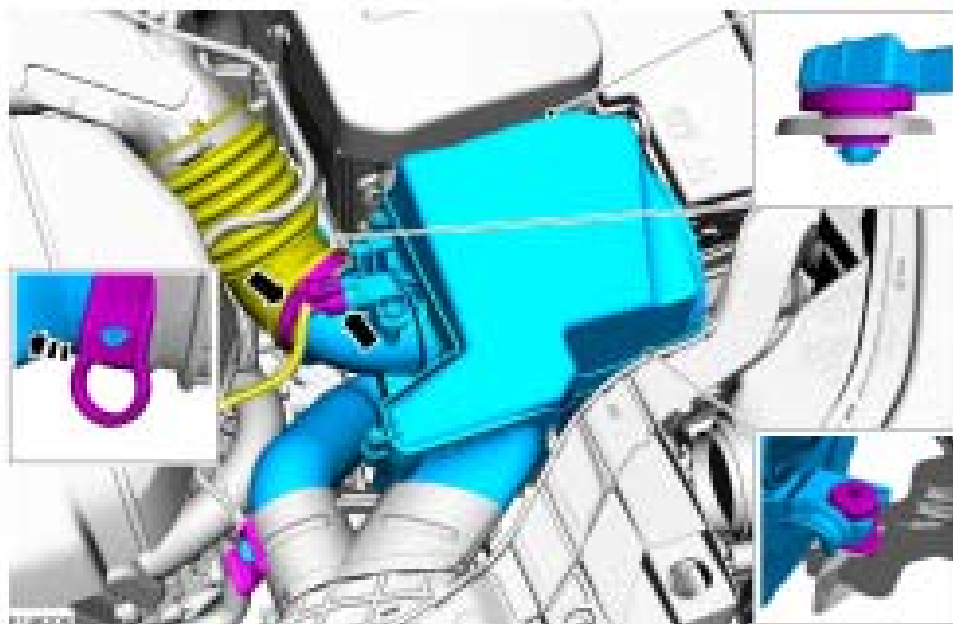


## Air Intake Removal

1. Remove the primary air intake tube to allow room to work on the rear fuel connections and HPFP.



2. Remove air filter and filter box.

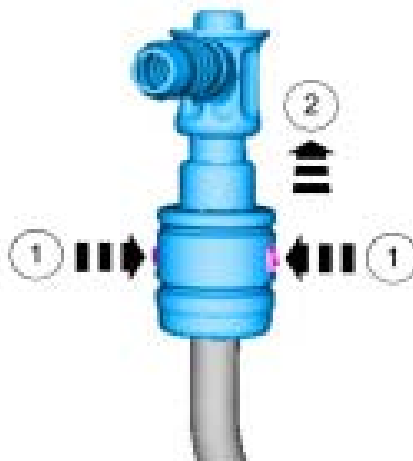


## HPFP Main Fuel Line Removal

1. Locate the main Fuel line connection. It's a flexible hose that is connected to a hard line behind the HPFP and connects to the front of the HPFP, shown below



2. Press both retaining tabs inward and remove quick release coupling from fuel tube.

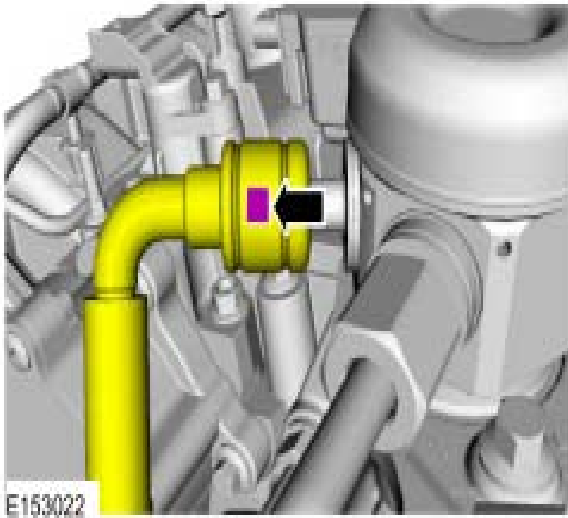


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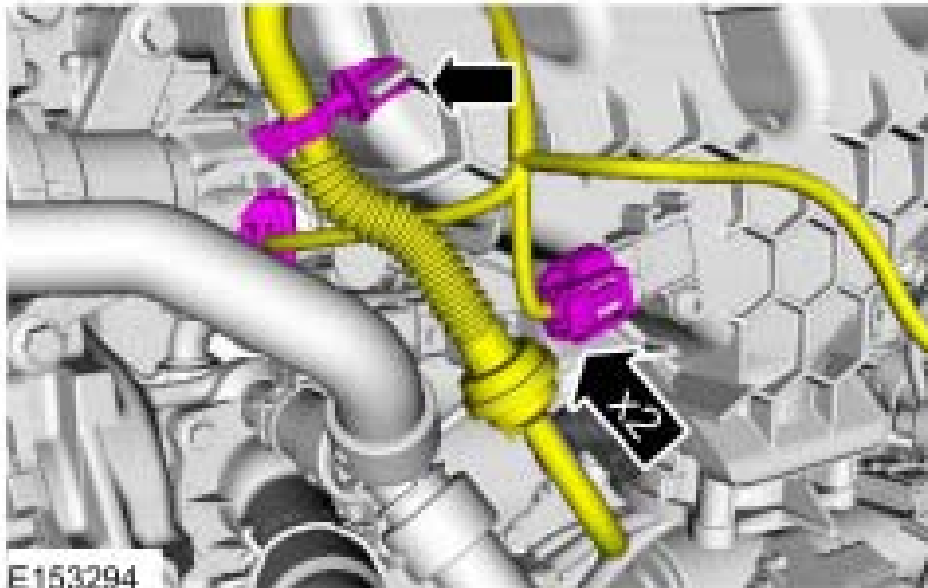


3. Disconnect other end of the flexible fuel line attached to the HPFP.
4. Once complete, you will be left with the main fuel feed line shown below. This line will not be used for the remainder of the installation. This part may be discarded once the installation has been completed and verified functional.

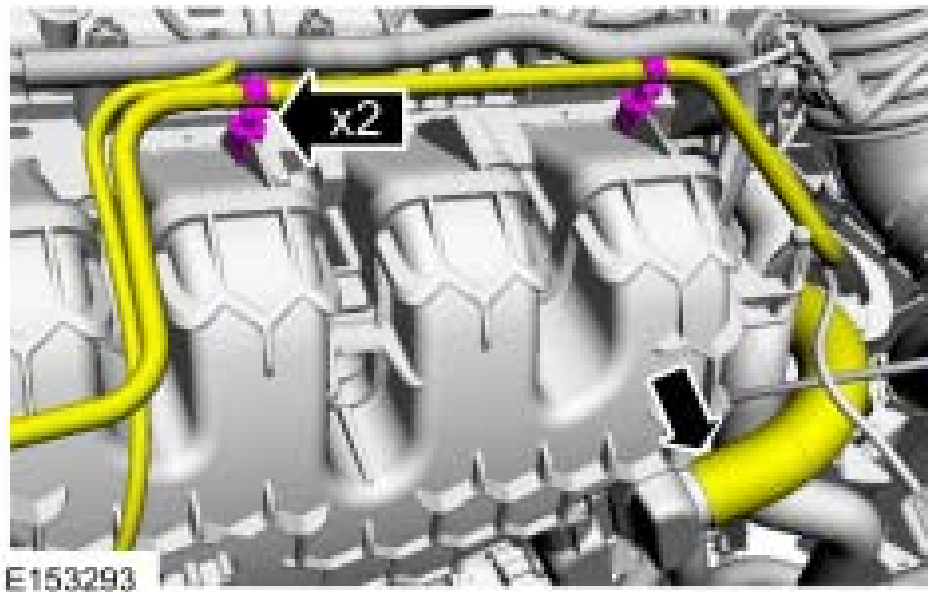


## Intake Manifold Removal

1. Disconnect the hard EVAP line from the retainer clips
2. Disconnect the Fuel Rail Sensor and MAP sensor connectors, shown below



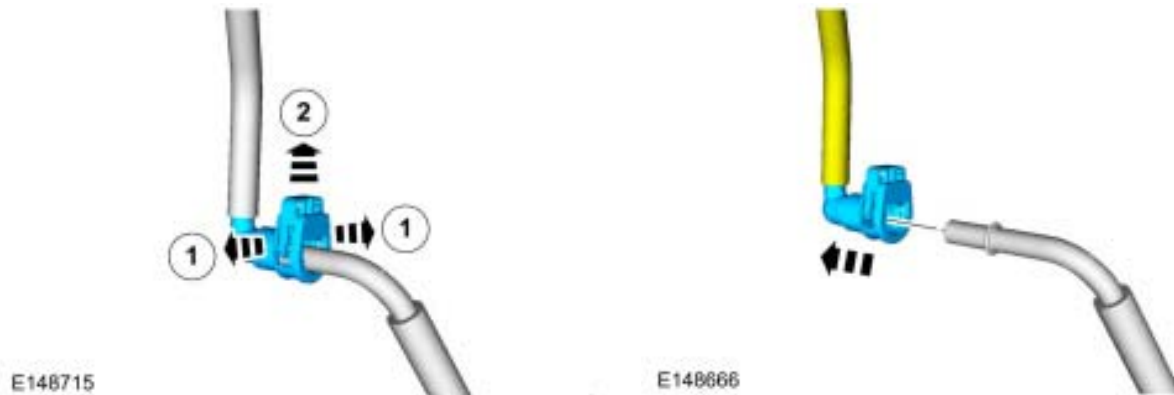
3. Continue to disconnect Hard EVAP line running over the Intake Manifold



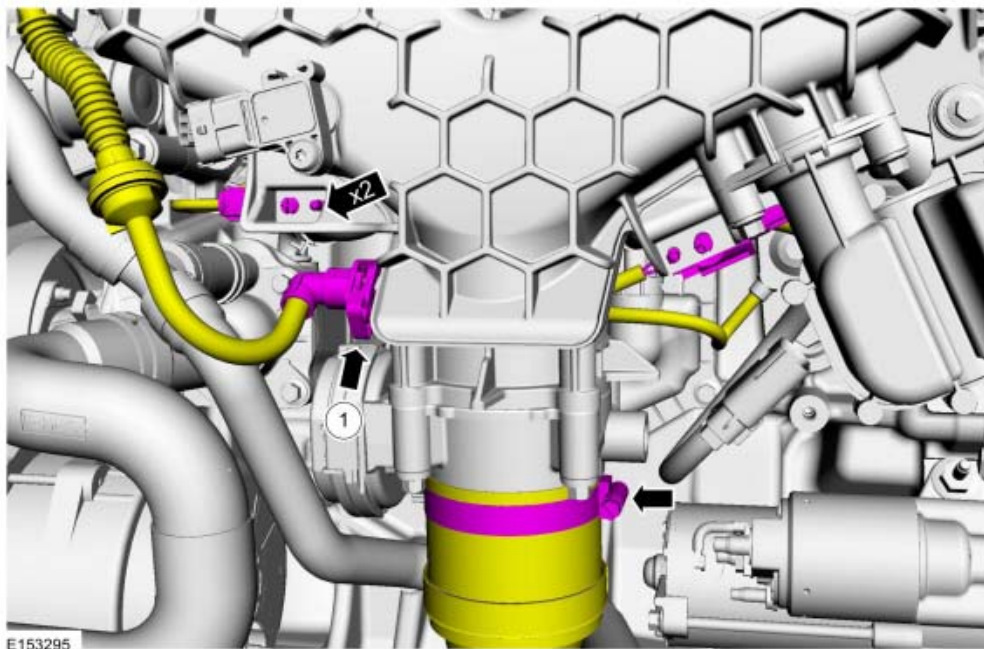
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4. Remove the EVAP quick release coupling. **PLEASE PAY CLOSE ATTENTION TO THIS COUPLING AS TO NOT BREAK THE RETAINER CLIPS**



5. Separate the tabs of the retainer clip and pull it to the outward position in the quick release coupling
6. Depress the retainer clip and disconnect the quick release coupling from the tube.
7. Remove electrical connections on the rear of the Intake Manifold
8. Remove upper throttle body clamp

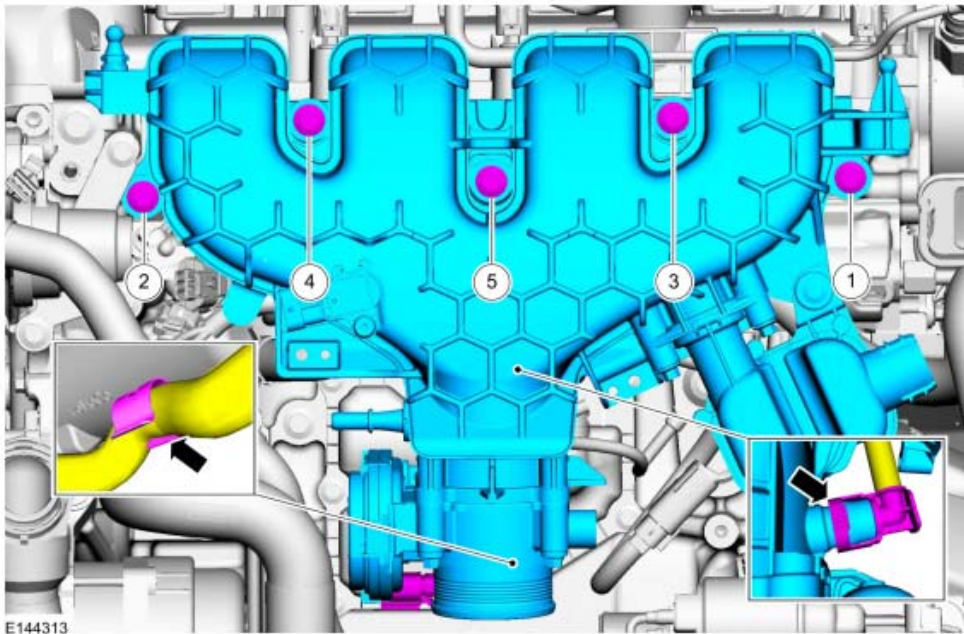


9. Carefully remove the PCV connection in the back of the Intake Manifold. You simply need to squeeze the connector and pull.
10. Remove the 5 pan head bolts holding the Intake Manifold in place

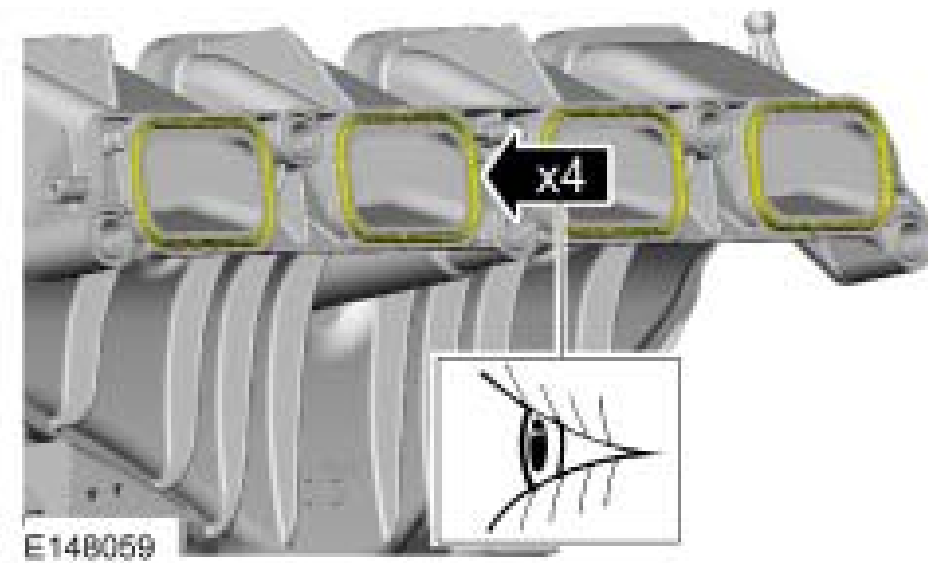


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*11. NOTE: Visually inspect the intake manifold gaskets for nicks, cuts and abrasions. If these conditions are not present, the gaskets may be re-used.*



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12. You will also want to visually inspect and clean the intake prior to installation of the Fuel Rail



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## Main Fuel Rail Spacer Installation

**IMPORTANT: Please double check all fittings included in the kit as some fittings may have come loose or improperly tightened from the distributor. While we strive to ensure everything is ready out of the box, it is prudent for the customer to double check prior to installation.**

## Aux Fuel Rail Spacer Installation

1. Install supplied 105mm studs into x5 intake bolt locations on the motor. Make sure they are seated all the way in.
2. Insert supplied spacer in between far right bolt of the 3 bolts holding the heat pump in place.
3. Insert Spacer over studs with the gaskets facing the motor and situate. Make sure all gaskets are still seated in the tracks
4. Insert Intake Manifold over studs. Make sure all gaskets are still seated in the tracks



5. Using supplied stud nuts tighten all 5 stud locations.



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6. *NOTE: Once the fuel rail and intake manifold are together, all gaskets should be facing the Motor and the fuel rail should be tilted towards the front of the car as shown below.*

## Fuel Line Connection

1. Using the shorter supplied fuel line, connect the 5/16<sup>th</sup> fuel line connector to the hard main fuel line located behind the HPFP.
2. *NOTE: Please make sure this connection "clicks" into place. It is important this connection, and all other fuel connections are firmly seated and stable. Once the fuel system is energized, you must inspect for fuel leaks by either strong vapor or fluid.*
3. Connect the other end to the driver's side -6AN fitting on the new fuel rail. **The driver's side of the fuel rail is the low-pressure input from the gas tank. **DO NOT OVER TIGHTEN!****



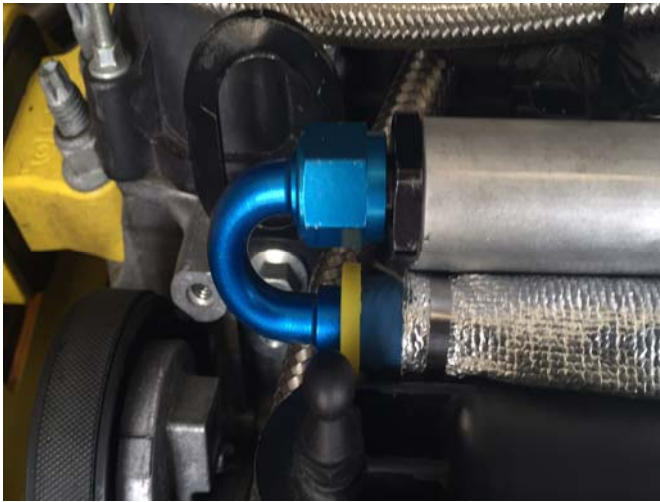


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4. Using the longer supplied fuel line assembly, please connect the 90 Degree fitting on the passenger side of the -6AN fitting and run the line underneath the fuel rail and route it up to the HPFP input connection. **The passenger's side of the fuel rail is now the low-pressure input of the HPFP.**



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5. Connect the 5/16<sup>th</sup> fuel-fitting end of the longer fuel line to the HPFP until you hear the “click” and it is seated. Please make sure you place the connector straight over the fuel line fitting to avoid tearing the seal inside of the new connector.
6. Verify the connector to the HPFP is not touching or rubbing against the intake tube and has room to move or rotate.



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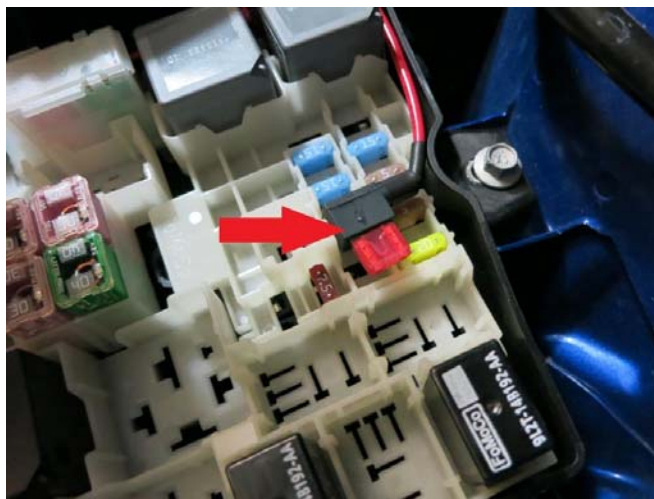
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## Mounting the Split Second Additional Injector Controller

1. Orient the Split Second controller module on to of the relay and fuse block panel on the driver's side of the engine bay. This provides the best location for easy access to power, ground, and computer access for updated maps.
2. Three (3) wires will be exposed from the harness.
  - a. Red – This is the positive power lead which will be attached to the main fuse block with the add-a-fuse provided in the kit
  - b. Black – This is the negative power lead which will be attached to the main negative tap to the engine body
  - c. Green – This is the MAP voltage reference wire which will be connected to the MAP voltage wire



3. Open the fuse box and install the Add-A-Fuse supplied to one of the switched fuse locations in the fuse box by the battery. The fuse port will NOT have a fuse located in that spot. If the location you use has an existing fuse, make sure that fuse is rated for at least 10A and is switched with ignition.
4. Place the removed fuse in the second position of the Add-A-Fuse holder or the circuit will not work.



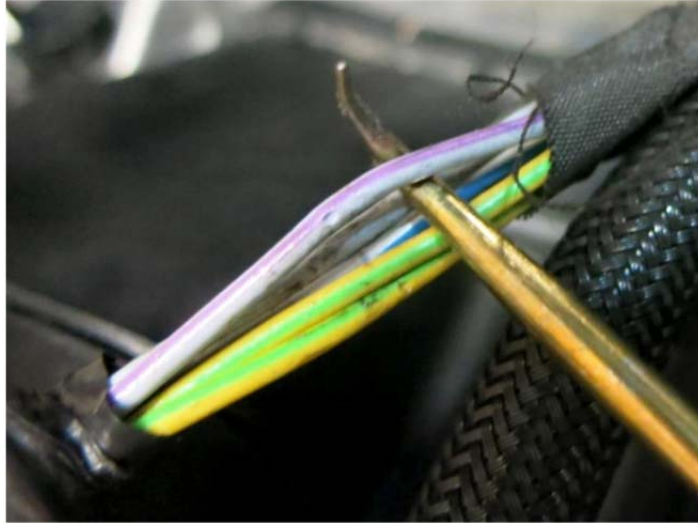


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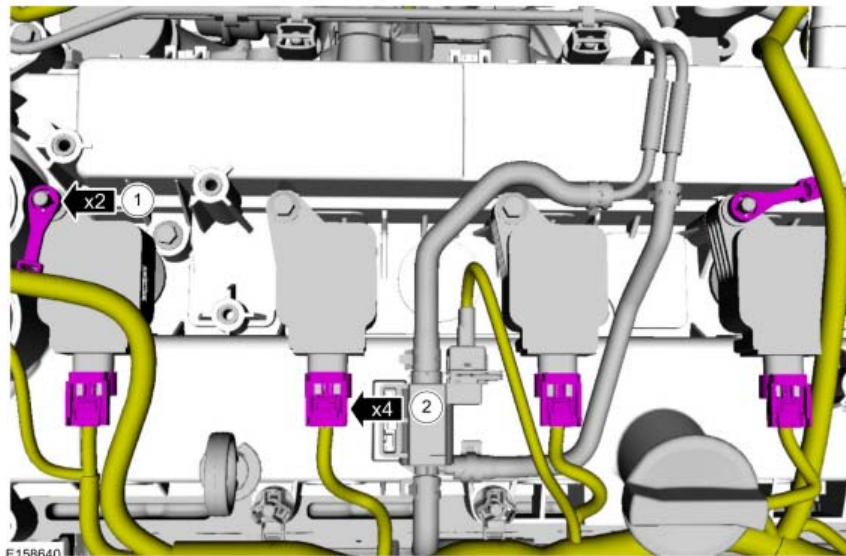
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## Wiring the Split Second Controller

1. Connect the GREEN wire noted above to the MAP sensor voltage wire, which is a **gray wire with a purple stripe**. This wire can be found right at the MAP sensor on the passenger side (front) of the intake manifold or a little higher up in the harness for a cleaner install.
2. Use a Posi-Tap connector to connect this MAP sensor wire to the **green** wire on the Aux Fuel Controller.



1. Disconnect the coil pack connectors on all 4 coil packs. Depress the locking tab on the ignition coil-on-plug electrical connector, and disconnect the electrical connector from the ignition coil-on-plug.



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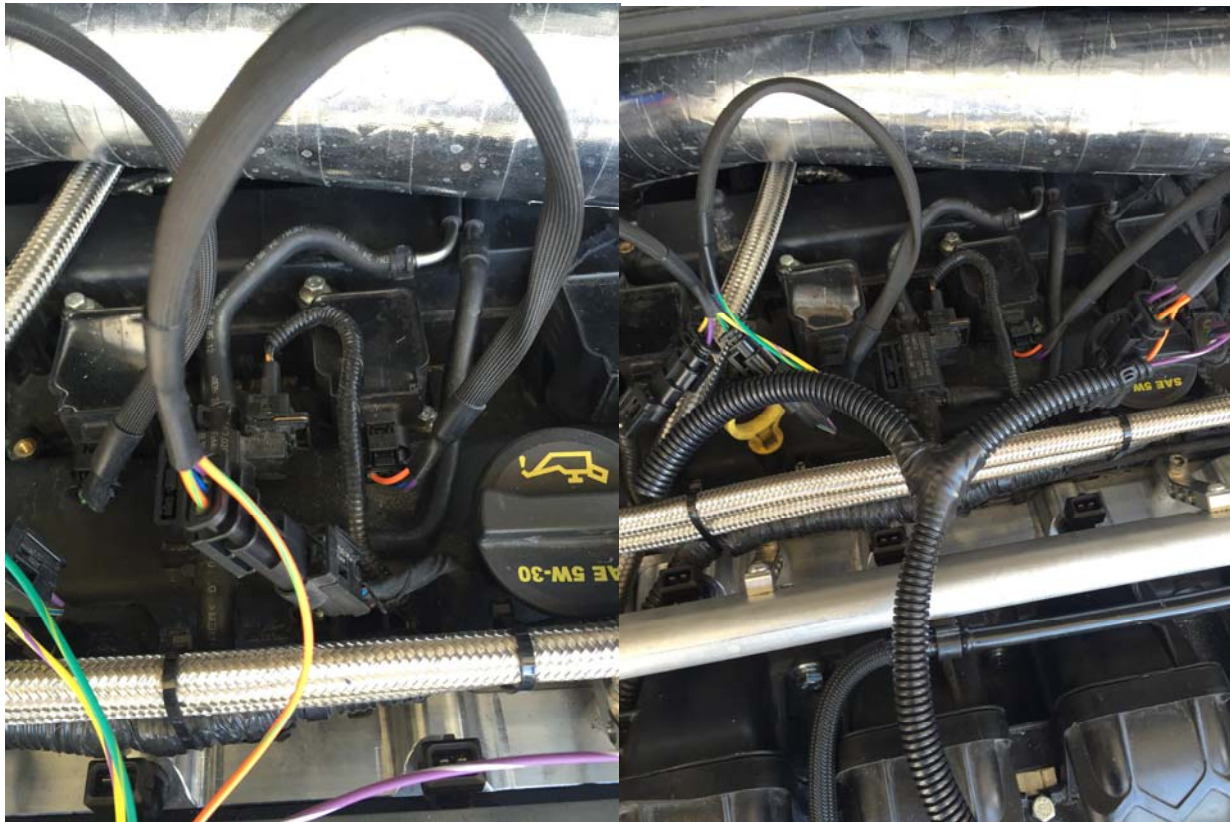
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**NOTE:** Use compressed air to remove any foreign material from the ignition coil-on-plugs and surrounding area before removing the ignition coil-on-plugs.

**NOTE:** When removing the ignition coil-on-plugs, a slight twisting motion will break the seal and ease removal.

**NOTE:** When installing, apply a small amount of silicone brake caliper grease and dielectric compound to the inside of the ignition coil-on-plug boots before installation.

2. Insert the original coil pack connector into one of the new harness connectors
3. Insert the terminating end of the same wire that the coil pack is plugged into, into the coil pack. This inserts the new aux fuel injector harness into the firing path of the original injectors.



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4. Once all injector packs are connected to the new harness, connect all 4 injector connectors to the aux fuel system.



**CONGRATULATIONS!**

*You have completed the installation. Please refer to the manual for installation material or feel free to contact us with any issues you may have. As always, Speed Perf6rmanc3 offers professional installation upon request.*