

INSTALLATION INSTRUCTIONS

2GR-FE & 2GR-FZE Fuel Rail Kit

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Document: 19-0031

This instruction manual will focus on the 2GR-FE engine found in the N/A Lotus Evora and front engine Toyota vehicles. However, all other vehicles are similar in nature.

1. To unlatch and remove the engine cover, pull upwards. To relieve fuel pressure, pull the fuel pump fuse.

For the Lotus Evora only, pull the No. R19 (10A) "Fuel Pump" fuse. This fuse box is located in the cabin behind the rear left hand quarter trim panel. For access, use a coin to release the quarter turn fastener on the lower edge of the removable panel, and unhook the top edge. Use the fuse extractor tool clipped to the fuse box for removing the fuse.



2. Start the engine and allow it to stall. Reinsert the fuel pump fuse.

For the Evora, unlatch and remove the plastic battery panel in the left hand front of the rear luggage compartment (shown).

Unscrew and disconnect the negative terminal.

Check battery terminal symbols:

Orientation may differ

Negative terminal

Retaining clamp plate

Positive terminal

BATTERY ACCESS (cover removed)

3. Squeeze the thumb lock and pull away to disengage the mass air flow (MAF) sensor connector.



4. Pull to disconnect the air box vacuum hose. Next, unlatch the air box.

Locate the 5/8" crankcase breather hose on the intake (Evora resonator shown). Using a pair of pliers, squeeze the spring clamp and slide it down the breather hose a few inches. Now, pull this hose off the barbed fitting.

Next, loosen the 2 hose clamps on both sides of the intake using a 10mm socket or nut driver. Remove the coupler off the throttle body.



5. Unplug the throttle body connector.

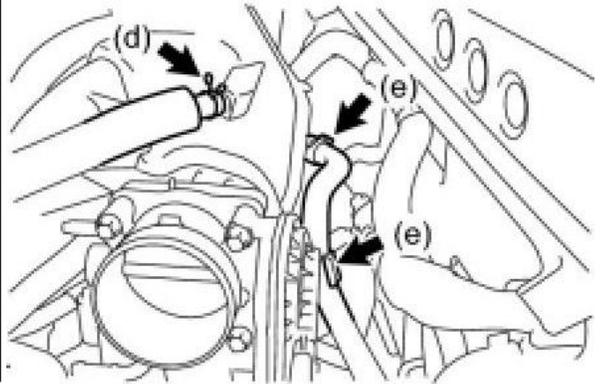
Using a 10mm socket, remove the four M6x1.0mm throttle body bolts.

As shown, set the throttle body to the side. The coolant hoses do NOT need to be removed.



6. Locate the 5/8" crankcase breather hose just downstream of the throttle body (d). Using a pair of pliers, squeeze the spring clamp and slide it down the breather hose a few inches. Now, pull this hose off the intake manifold plenum.

Disconnect the union to check valve hose (e) and cap it.



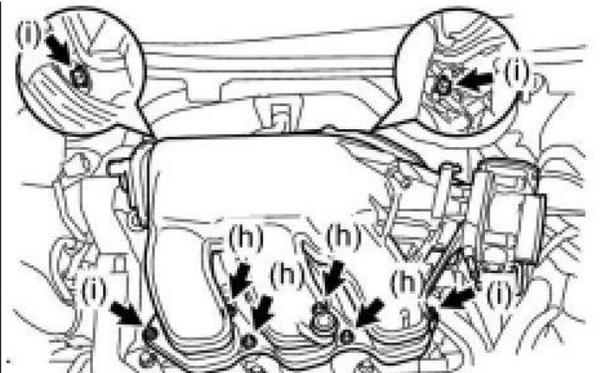
7. Disconnect the electrical connector for the actuator on the intake manifold plenum.



8. To access the fuel rails, the upper intake plenum must be removed from the lower intake manifold.

Remove the cam cover hardware (i) from the mounting bosses on the intake manifold plenum.

Next, the hardware depicted will be removed. Use a 12mm socket wrench for the plenum bolts and a 5mm Allen wrench for the lower intake manifold bolts.



9. **For the Lotus Evora ONLY:**

Some of the bolts cannot be accessed from the top of the engine. To remove the rear access panel in the trunk, pull the carpet back which is held in by Velcro.

Unscrew the bolts and remove the access panel. This will expose another access panel through the heat shield. Remove the second access panel.

Through this access hole, it is now possible to remove the last brace that holds the plenum to the cam cover. Once this is removed, carefully remove the plenum from the engine bay.



10. It is advised to plug (or tape over) all 6 cylinder intake ports to prevent objects from falling down into the engine.

In the next few steps, there are a few braces that will need to be temporarily removed that is only found on certain 2GR-FE engine.

First, using a 14mm socket wrench, remove the bolt shown.



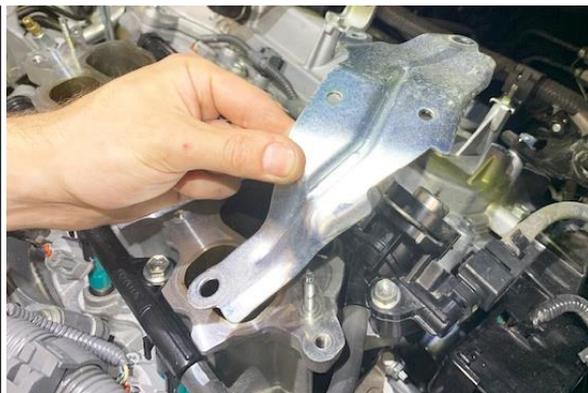
11. Using a 12mm socket wrench, remove the 2 nuts and 1 bolt from the two braces. Remove the black and silver braces from the engine.



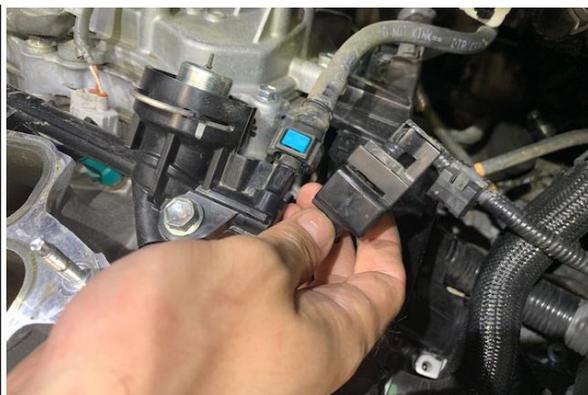
12. On the opposite side of the engine, pull the electrical stay up off the stud shown.



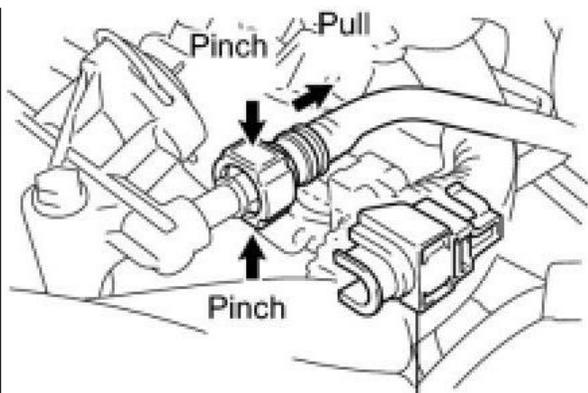
13. Unscrew the bolts and remove the brace shown from the rear of the engine (if equipped).



14. Pry and remove the plastic SAE quick connect fuel line cover shown.

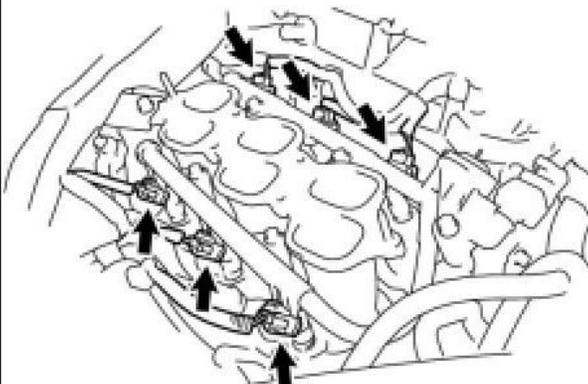


15. Squeeze the blue SAE quick connect locks and simultaneously pull the fuel feed line off the fuel rail. Be prepared with rags as fuel will leak out.



16. Disconnect all 6 injector connectors.

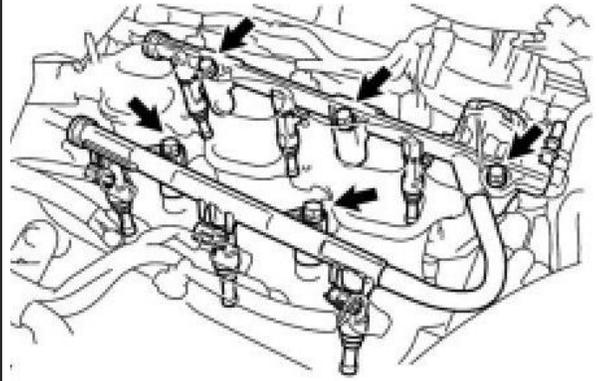
Take note that the hose that connects the two fuel rails together on the factory fuel rail system wrap around cylinders 5 and 6. The connecting hose in the Radium fuel rail plumbing kit wraps around cylinders 1 and 2.



17. Remove the five M8 bolts securing the fuel rail to the cylinder heads using a 12mm socket wrench.

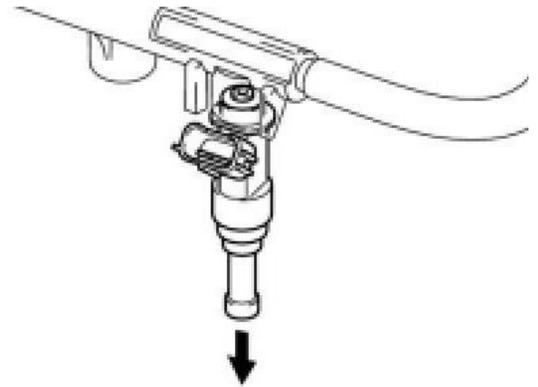
Carefully remove both fuel rails. The fuel injectors will likely still be attached.

Keep close track of the rubber grommets at the base of the injectors. They will likely remain in the lower intake manifold injector ports. These will be needed later. Take care not to allow dirt or debris into the injector ports.



18. Carefully remove the 6 fuel injectors from the 2 fuel rails by gently pulling away from the fuel rails. Caution: Fuel remaining in the rails will trickle out.

Removal is complete.



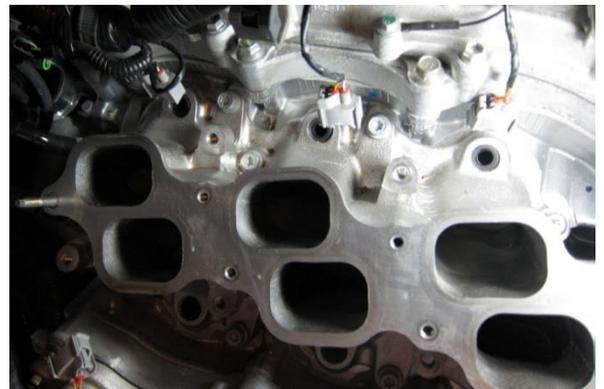
19. Prepare the Radium Engineering fuel rails for installation.

Apply a medium strength thread-locker to the eight provided M6 bolt threads. Using a 4mm Allen Wrench, install the mounting feet to the fuel rail, as shown.

For plumbing kits, install the provided adapter fitting components as shown. Be sure to apply a petroleum-based lubricant to the O-rings.



20. Inspect the lower grommets (shown) for debris and replace if needed. Verify that each injector port has a grommet.



21. To prevent failure, lubricate the injector O-rings with a petroleum-based oil. Install the fuel injectors previously removed from the factory rails into the Radium Engineering fuel rails. Be very careful not to damage the O-rings.

Install the Radium Engineering fuel rails. Make sure each injector is fully seated and rotationally orientated as shown.



22. Fasten down the fuel rails using the included M8 bolts and washers and a 5mm Allen wrench.

Next, plug in all 6 fuel injector electrical connectors.



23. For Toyota 2GR-FE engines which use the additional engine braces, modify the brace (shown) with a cut-off wheel in the area illustrated.



24. For those using the Radium Engineering plumbing kit, test fit the brace to make sure there is enough clearance with the crossover hose fittings. Once verified, reinstall the braces (if equipped).



25. For those using the Radium Engineering plumbing kit, temporarily install the provided PushLok hose ends to the fuel rail end port fittings. Lineup the included hose and cut to length. Every application is different, but 5 inches (127mm) is typically best.

To install PushLok hose ends, apply a petroleum based lubricant to the barbs. Fully insert each end to the hose. NOTE: Hose clamps are NOT necessary for PushLok hose ends.



26. Using a non marring 9/16" aluminum wrench, tighten the 6AN hose ends.

NOTE: As shown, the hose will require a slight bend for intake plenum clearance.



27. For those using the Radium Engineering plumbing kit, pop off the OEM fuel feed line from the plastic stay on the engine. This will free up the OEM line.



28. As shown, fully insert the OEM feed line to the SAE quick connect until a "click" is felt.

For those using the Radium Engineering plumbing kit, install the provided vacuum line from the fuel pulse damper (FPD-R) to an available intake manifold barb.

Reinstall all other components in reverse order. Cycle the ignition switch to the ON position a few times (without starting the engine) to allow the fuel pump to prime the system. Check for leaks. If no leaks are found, start the engine and check for leaks while the engine is running.

INSTALLATION COMPLETE

