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# INSTALLATION MANUAL

## GM LS FUEL RAIL KIT

### Item list included in this kit:

- 2 x Billet Fuel Rails to suit GM LS
- 4 x Billet Modular Mounting Brackets
- 4 x M6 x 1.00mm allen key S/S socket cap screws (UHL 15.5mm)
- 8 x M4 x 1.00mm allen key S/S button head screws (UHL 15mm)
- 8 x M4 S/S spring washers

### Additional items required that does not come with kit:

- Hose fittings or barb fittings to connect to your current fuel line (rubber or braid)
- Fuel hose for feed line and return line
- Aftermarket fuel regulator
- Standard or Aftermarket 14mm O-ring fuel injectors

## WARNING!

BEFORE PROCEEDING WITH INSTALLATION PLEASE READ INSTRUCTIONS CAREFULLY. THIS PRODUCT REQUIRES DETAILED KNOWLEDGE OF AUTOMOTIVE SYSTEMS. WE RECOMMEND THAT THIS INSTALLATION BE CARRIED OUT BY A QUALIFIED AUTOMOTIVE TECHNICIAN.

THE INSTALLATION OF THIS PRODUCT REQUIRES THE HANDLING OF FUEL. WE RECOMMEND TO WORK IN A WELL VENTILATED AND WEAR APPROPRIATE SAFETY WEAR FOR PROTECTION.

KEEP ALL IGNITION SOURCES AND OPEN FLAMES AWAY FROM VEHICLE AT ALL TIMES WHILE INSTALLING THIS PRODUCT.

THESE FUEL RAILS UTILIZE O-RING SEALED AN STYLE PORTS AND DO NOT REQUIRE THREAD SEALANT ONLY AN APPROPRIATE LUBRICATE SHOULD BE USED

### INTRODUCTION

Congratulations on your purchase of Aeroflow performance billet fuel rail. Aeroflow Performance Products cannot and will not be responsible for any damage, or other conditions resulting from misapplication of the parts described herein. However, it is our intention to provide the best possible products for our customer, products that perform properly and satisfy your expectations. Should you have any questions, please call technical support at +61 2 8825 1900 and have the product part number on hand when calling.

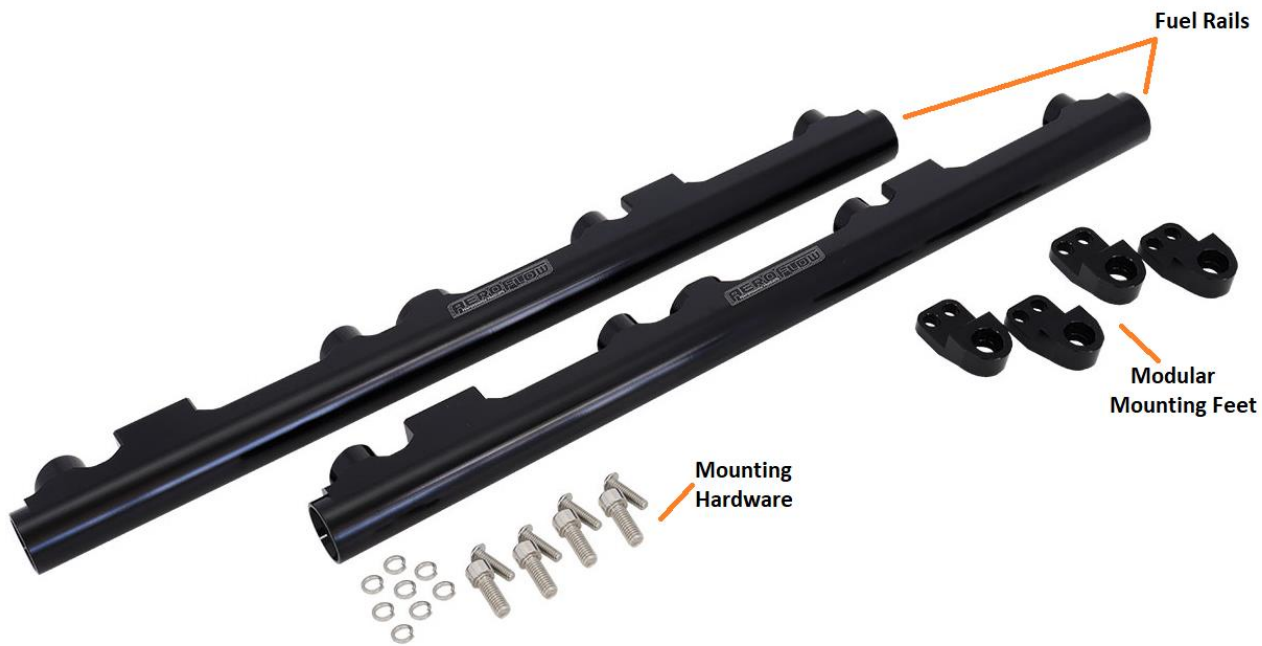
This suits GM LS1 engines which takes **full length injectors 60.65mm** (2-25/64") and **3/4" length injectors 48.50mm** (1-29/32"). This fuel rail also suits GM LS2 / LS3 engines which takes **short length injectors 33.60mm** (1-5/16").

Give your GM LS engine the capability to flow some serious flow to feed even the most fuel hungry applications. These GM LS fuel rails from Aeroflow Performance feature specifically designed billet modular mounts. These modular mounts can easily be flipped and reinstalled into different threaded holes on the fuel rail itself allowing it to suit GM LS1, LS2, LS3, LS6, L76 and L99 engines.

Each fuel rail is precision CNC machined from extruded 6063 aluminium with a large internal diameter bore with -8ORB ports on each end, as well as one in the middle of each rail for sensors or an extra feed/return.

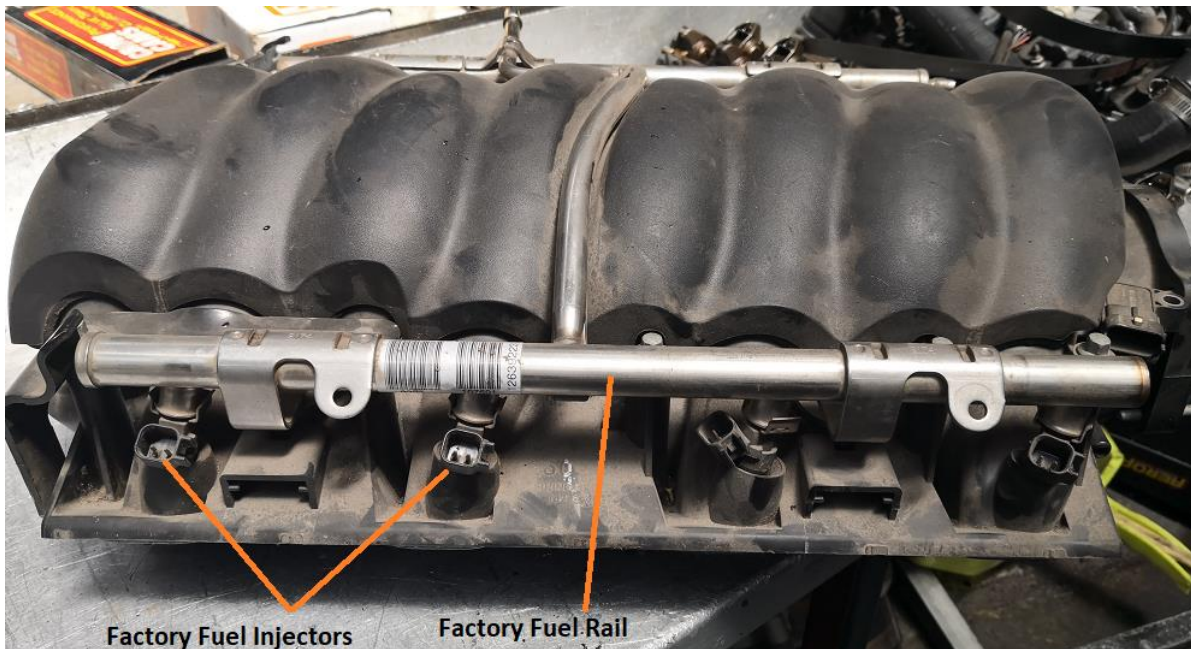
Like the OEM fuel rails, the injector bores are 14mm ID so factory injectors are permitted. This kit is compatible with all fuel types including popular alcohol mixtures such as E85.

Aeroflow fuel rails are double anodised and are available in Blue, Black, Red and Silver finishes.

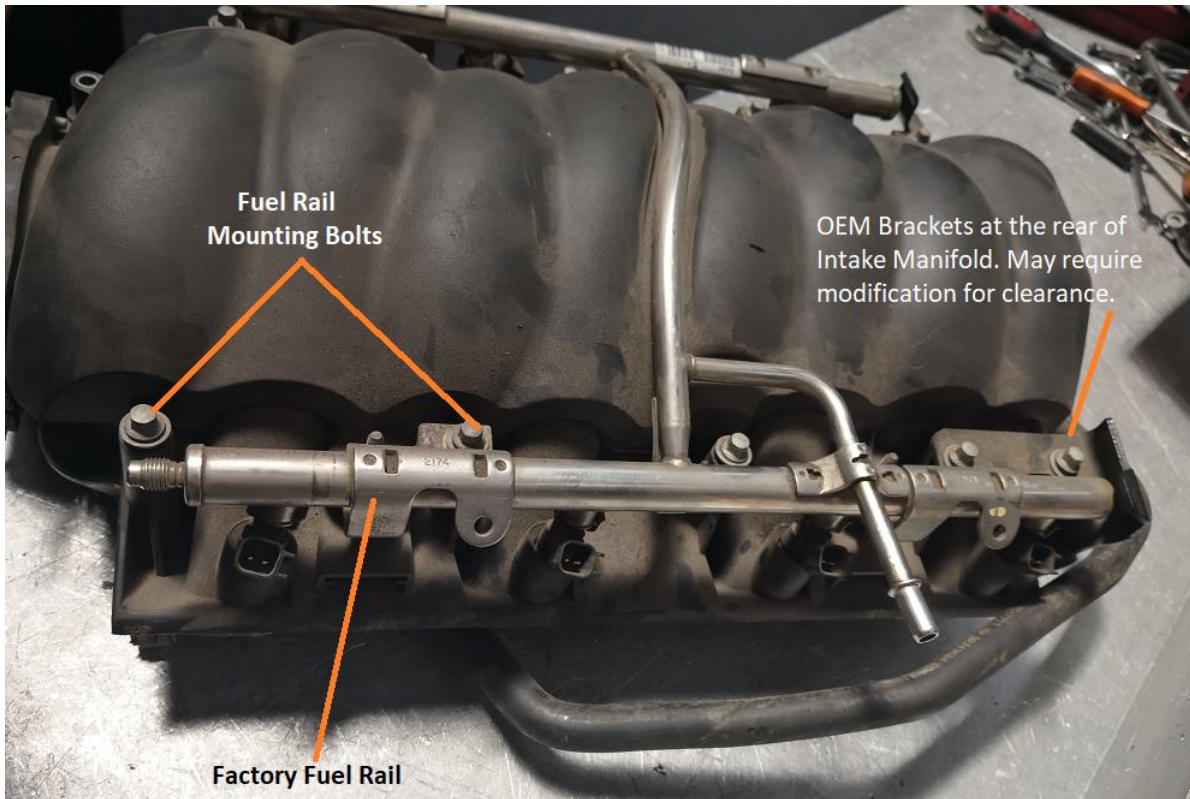


#### STEP 1: REMOVAL

1. Please refer to the factory service manual of the vehicle for the correct removal of the factory fuel rail. Below is a basic guideline to remove the factory fuel rail.
2. Remove fuel pump fuse and start engine. Allow engine to stall. This relieves pressure in lines. Replace fuel pump fuse. Disconnect battery.
3. Clean the area around the fuel rail to prevent dirt getting into injector holes and blocking them.
4. Allow the engine to cool before working with the fuel system.



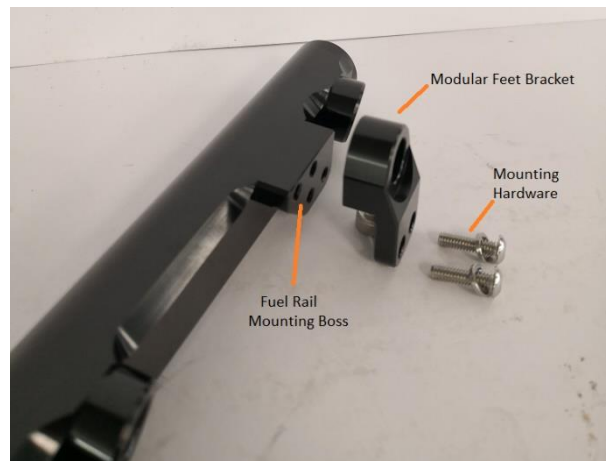
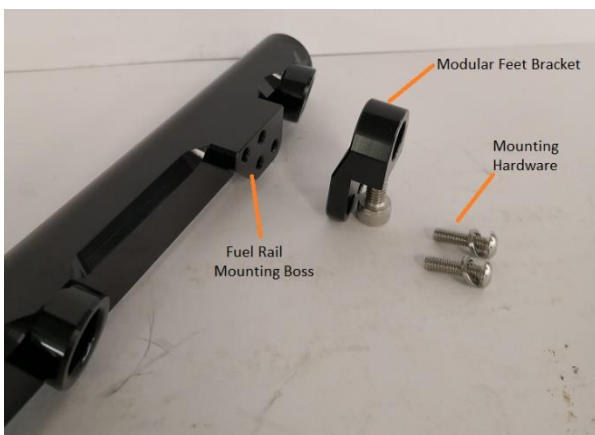
5. Disconnect the 8 fuel injectors.
  1. **Note:** The wiring harness of each injector is specific to the firing order. If the wiring harnesses are removed, they must be reinstalled on the correct engine bank and to each specific injector. This is best done by labelling each injector plug.
6. Disconnect any wiring, vacuum lines, and throttle body components interfering with the installation process.
7. Using the correct disconnect tool which is sold separately (AF98-2106), remove the fuel feed hose and, if applicable, the return hose.
  1. Ensure to use a container to collect any spilled fuel when removing these fuel lines.



8. Use a 10mm socket to remove the four M6 mounting bolts holding down the OEM fuel rail. These bolts will not be reused.
9. Gently lift both the fuel rails at the same up being careful to not lose anything. The fuel injectors should remain attached to the fuel rails. Remove the OEM fuel rail and fuel injectors from the vehicle and place onto a bench.
  - I. **NOTE:** For LS3 engines you will have to permanently remove the intake plenum cover.
10. Slide out all eight injector retaining clips.
11. Pull and twist fuel injectors to remove them from the fuel rail.
  - I. **Note:** the fuel rail will contain some excess fuel. Drain excess fuel into a safe container for disposal.

## STEP 2: ASSEMBLY

1. The first step in setting the fuel rails up for assembly on the bench. Is to work out which fuel injectors you will be using this will depend on which way the modular feet are installed.
  - I. GM LS1 engines will accept full length injectors 60.65mm (2-25/64") or 3/4" length injectors 48.50mm (1-29/32").
  - II. GM LS2 / LS3 engines will only accept short length injectors 33.60mm (1-5/16").
2. If you are unsure on which mounting feet you need to use follow these steps below.
  - a) Measure the fuel rail mounting boss spacing on the intake manifold you are using
  - b) For intake manifolds which have 209mm spacing between the 2 fuel rail mounting bosses, install the mounting feet using the inner threaded holes and flip them so they are tall.
  - c) For intake manifolds which have 224mm spacing between the 2 fuel rail mounting bosses, install the mounting feet using the outer threaded holes and flip them so they are short.

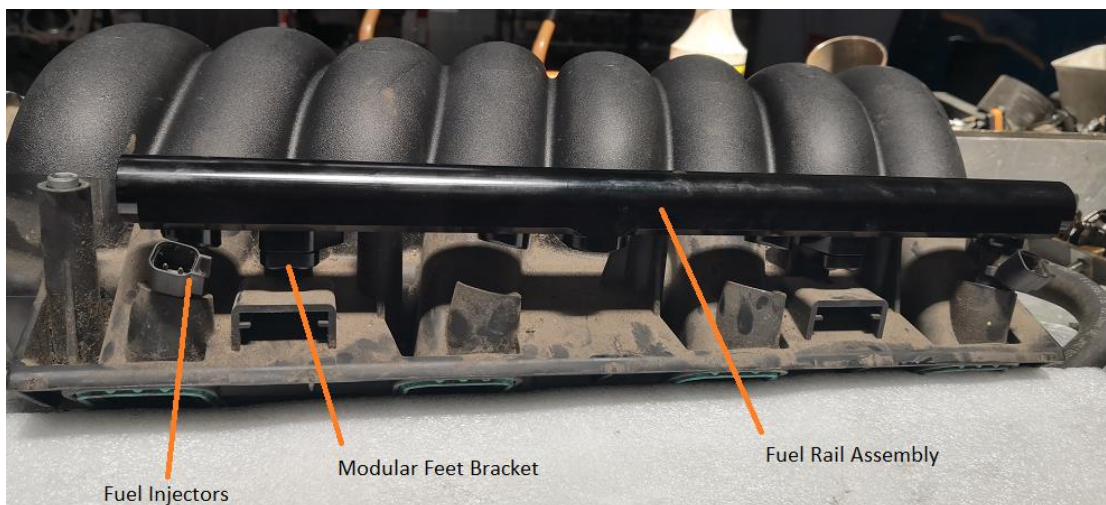




3. Once the desired mounting position on the modular feet are determined. Secure the mounting feet to the rails by installing the included split lock washer and M5 bolts.
4. Make sure the mounting feet are perpendicular to the rails.
5. Using a 3mm Allen hex wrench, torque to 5.6 ft. Lbs (7.7Nm).
6. Install the aftermarket or standard injectors into the fuel rail, ensure O-rings are not pinched when installing injectors. Always use appropriate lubrication on fuel injector O-rings.
  - I. Aftermarket injectors can be used. Can either be 14mm direct fit or 11mm with the use of AF889 (injector insert adaptors) not included in this kit.
  - II. We recommend the use of new injector O-rings if re-using the standard injectors
7. Install all fittings into the ports (front and rear on each rail). Lubricate O-rings prior to installing to avoid damage.
  - I. This fuel rail does not include adapter fittings or fuel hoses and must be purchased separately.

### STEP 3: INSTALLATION

1. Thoroughly clean out any dirt or debris found in the intake manifold injector seat bores.
2. Using appropriate lubrication, lubricate the injector seats and lower injector O-rings.
  - I. We recommend to replace the lower injector rubber washers in the intake manifold at this time.
3. Carefully, place the fuel rail assembly onto the intake manifold and line-up each injector one by one.
4. Once everything is in position, push the rail towards the intake manifold to fully seat the injectors. Do not fully tighten fuel rail to manifold until all injectors are correctly seated into the injector adaptors.
  - I. Note: On some LS engines, there are OEM brackets at the rear of one or both of the rails. If there is interference, slight modifications to these brackets may be required for clearance.
5. Secure the mounting bolts using a 5mm Allen wrench, torque the 4 bolts to 7.41 ft. Lbs (10Nm). Do not overtighten this may cause damage to fuel rail and injectors.
6. Install the fuel pressure regulator.
  - I. If an aftermarket fuel pressure regulator is required, please consult a professional or our sales team to provide options.
7. Install fuel feed lines and return lines to correct positions depending on the setup that is required for the vehicle. Ensure enough slack is left in the line as to not put pressure on the fuel rail with engine running.
8. Reconnect wiring harness and all connectors as per factory service manual. If using non factory injectors wiring plugs may require replacement or adaptors must be purchased separately.
9. Reconnect negative terminal on battery and the 3 electrical connectors at the rear of the fuel rail.
10. Turn the ignition the switch to the accessories position only at this point, wait two the three seconds and turn ignition back to off position. DO NOT ATTEMPT TO START ENGINE.
  - I. Repeat the above step and cycle the ignition three times.
  - II. Check all fittings, injector adaptors, fuel fittings for any signs of fuel leakage.
  - III. If there are any signs of leakage they must be corrected before proceeding on to the next step.
  - IV. If aftermarket injectors and/or fuel regulators have been installed ensure vehicle ECU has been adjusted to suit before attempting to start the engine.
11. If no signs of leakage have been found, then start the engine and be sure to check for any signs of leakage while engine is running. If no leakage is found on the final inspection, then the installation is complete.



*For more information or technical enquires*

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