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INSTALLATION MANUAL

AEROFLOW PERFORMANCE

GM LS INTAKE MANIFOLD

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.

PLEASE CHECK THE INTAKE MANIFOLD THOROUGHLY IN EVERY POSSIBLE WAY. IF YOU SUSPECT A DEFECT OR SHIPPING DAMAGE, CONTACT AEROFLOW PERFORMANCE OR THE DEALER IT WAS PURCHASED FROM BEFORE ANY WORK HAS BEGUN. AEROFLOW PERFORMANCE WILL NOT BE RESPONSIBLE FOR DEFECTS AFTER ANY WORK HAS BEEN STARTED.

It is recommended to inspect all intake passages for defects. Also, wash the manifold using mild soap and water solution. Check the fit on all bolt holes for proper alignment and thread any fittings in first by hand. Failure to perform these simple checks could result in engine damage and may void your warranty.

INTRODUCTION

Congratulations on your purchase of Aeroflow Performance GM LS Intake Manifold. 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 1979 and have the product part number on hand when calling.

The Aeroflow Performance sheet metal fabricated intake manifolds perform well and offer an extremely good value for a performance intake manifold for the very popular GM LS engine family. This low profile and compact design were developed to allow the end user to clear under an OEM bonnet. Short intake runners with tapered top are designed to increase air velocity and more evenly distribute airflow to all 8 cylinders improving performance and throttle response.

We use thick 3mm (1/8") T6061 sheet aluminium for the intake plenum for maximum rigidity, so you will not have any issues with the intake manifold distorting under boost or warping during installation.

These LS intake manifolds are available for both GM OE LS cylinder head types, LS1/2/6 (cathedral port) or LS3 rectangle ports. Powered coated black creates stealthy engine bay styling. All of these intake manifolds are designed to work with OE or aftermarket cylinder heads as long as the head is configured with the intake flange bolt pattern and intake port opening locations matching the appropriate OE application.

Each manifold is ready to bolt on out of the box and are designed to accept 95,102 and 105mm throttle bodies and includes:

- **I.** High flow female -8ORB fuel rails x2
- **II.** Fuel Rail mounting hardware kit (consisting of allen key socket cap screws M6 UHL 25mm x 6, Button head screws M6 UHL 15mm x 6, spring washers, nuts and fuel rail mounting brackets)
- **III.** Intake O-ring gaskets x 8
- **IV.** Throttle Body O-ring gasket x 1
- **V.** Intake manifold bolts M6 UHL 30mm x 16
- **VI.** Straight 8mm barb to 1/8" NPT x 2
- **VII.** Straight 11mm Barb to 1/8" NPT x 1
- **VIII.** Straight 13mm barb to 1/4 NPT x 1

Installation Guideline

For a complete installation of the Aeroflow Performance intake manifold you will require some extra components as well as the original parts that must be purchased separately.

Installation is the same as for the original equipment intake manifold. Consult the factory service manual for specific procedures, if necessary.

The following list is a guideline of suggested parts that may or may not need to be purchased;

- NPT plugs if required.
- Throttle/Kickdown Brackets (OEM/Aftermarket may fit with modifications)
- Throttle Body, TPS sensor, IAC Sensor.
- Fuel Injectors standard OE injectors will work if required.
- Fittings and lines to suit -8ORB fuel rails.
- ECU must be tuned to the intake manifold and fuel injectors.

The following installation instructions must be carefully read and understood before you begin the installation procedure below. Improper application or installation of this product may result in unsatisfactory performance, fuel mileage, or emissions.

Check that this intake manifold is the correct choice for your engine application, desired performance level, and local emissions laws.

Check for sufficient bonnet clearance with this intake manifold with the correct throttle body. Always check bonnet clearance prior to removal of original manifold to determine how much clearance you have. This can be carried out with modelling clay or putty. Position the putty onto the highest point of the intake manifold or throttle body. Close the bonnet and lock into the closed position. Open the bonnet and measure the height of the putty, this figure will give you the amount of clearance you have between the bonnet and the manifold.

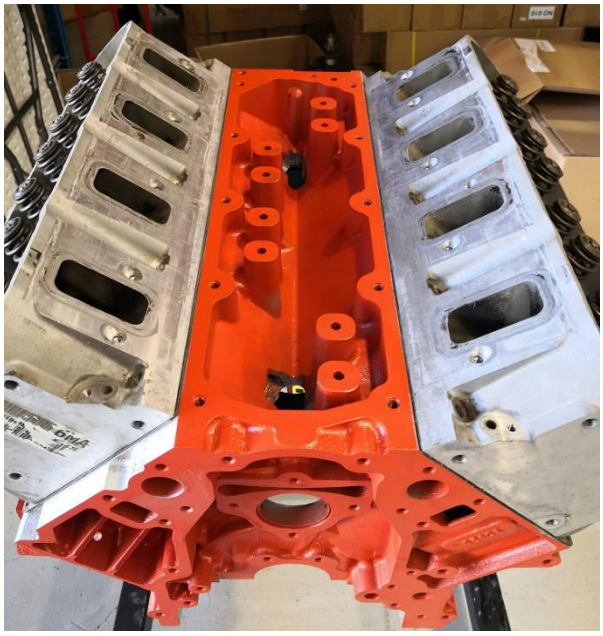
Before removing the old intake manifold ensure to measure the height and compare to the new manifold to ensure sufficient bonnet clearance. Lay a straightedge across the top of the intake manifold. Measure from the engine block to the highest point of the intake manifold. Record and compare both measurements on the old and new intake manifold. Ensure to dummy fit both intake manifolds with all require accessories such as intake gaskets and spacers if required.

If the engine block or cylinder head deck surfaces have been milled significantly, the alignment of the mounting bolt holes and the port flange openings to the cylinder head may be shifted and not match-up satisfactorily. If this is the case some modifications to the intake manifold may have to be carried out.

Intake Manifold Removal Guideline

1. Disconnect the ground cable from the battery.
2. Clean any loose debris, dirt, and grease from the top of the engine adjacent to the intake manifold and valve covers. This will help prevent harmful debris from falling into the engine during the installation process.
3. Identify the vacuum and crankcase ventilation hoses (if applicable) leading to the intake manifold, carburettor and air cleaner. Mark down the routing and connection points.
4. Disconnect the throttle linkage, transmission kick-down linkage (auto transmissions only), and throttle body assembly.
5. Loosen the fuel tank cap to relieve pressure from the fuel system. Disconnect the fuel lines.
6. Remove the fuel rail and fuel injectors.
7. Remove all water and vacuum fittings from the intake manifold. Mark down where each connection is located.
8. Remove all remaining brackets (if any) from the intake manifold.
9. Remove all intake manifold-to-cylinder head bolts
10. Remove the intake manifold. If the intake manifold is stuck hard to the mounting flanges, do not pry against cylinder head port flanges, as they could become damaged and compromise the gasket sealing with your new intake manifold. Double check that all of the bolts have been removed and pry upward carefully at the engine block end seal surfaces.

Intake Manifold Install Guideline

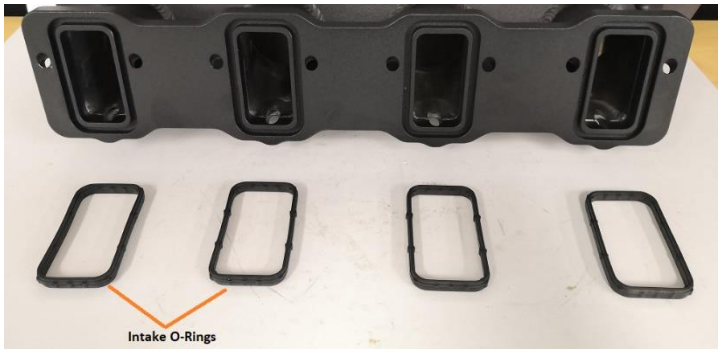


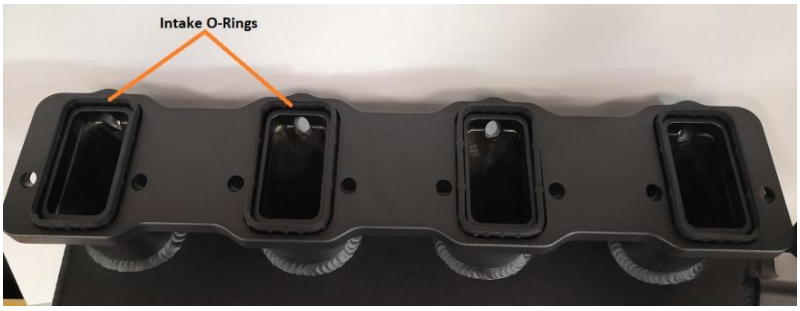
1. Clean the cylinder head port flange and the engine block end seal surfaces. To prevent gasket pieces from falling into ports and the lifter valley when cleaning old gaskets from head surfaces, stuff paper towels into all the ports and lay rags in the lifter valley. When clean, carefully remove the paper towels from the cylinder head ports and then the rags from the lifter valley. Make sure that all particles that fell on the rags are completely removed. Wipe surfaces with rags soaked in solvent, such as brake cleaner or lacquer thinner to remove any oils or grease. This is a must for proper manifold/gasket sealing.

2. Trail fit the new intake manifold into position; check that it sits down, properly seated on the intake manifold gaskets. Check to make sure all of the intake manifold bolts can be installed. If there are any other fit issues such as hood clearance or installation of components dependent on the manifold, they should be checked at this time.

If the cylinder heads have been milled or the cylinder block "decked", the cylinder head faces and the end surfaces of the manifold must be milled to compensate. This is necessary to maintain correct port alignment, minimize the possibility of manifold vacuum leaks, and assure proper engine performance.

3. For final installation, install the (8) O-rings provided in the mounting flange O-ring grooves. To make sure the O-rings do not fall from the grooves, apply a light coat of grease to the O-rings.





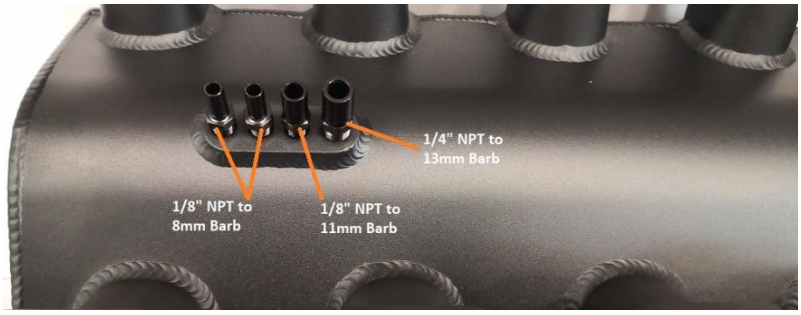
4. Install the Intake manifold bolts (M6 UHL 30mm) into the cylinder heads. Apply engine oil to the threads and thread in the bolts until all of the threads are engaged by hand.

I. Be sure that all of the O-rings are still in the grooves and are not being crushed between the flanges.

II. Threads in the aluminium cylinder head will not withstand abuse. Care must be taken to have proper thread alignment engagement and to tighten the fasteners to the proper specifications.

5. Gently tighten the bolts working side to side and out from the center, until manifold is seated on the mounting flanges and the O-rings have been compressed. In two steps, tighten the mounting nuts first to 3.6 ft-lbs (5 Nm) and then to 7.41 ft-lbs (10Nm). following the recommended factory bolt tightening sequence.

6. On the underside of the intake manifold plenum area, there is a plate with (4) holes tapped. (1) 1/4" NPT and (3) 1/8" NPT fittings are provided. These ports will provide ample vacuum port sources. Any of these ports can be utilized depending on required needs. Any unused ports can be easily plugged with a 1/8" NPT plug that can be capped for later use as needed.

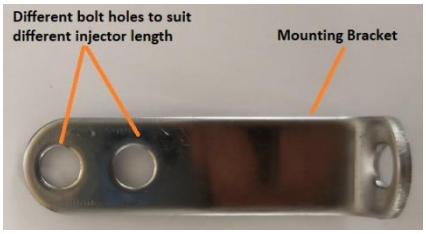


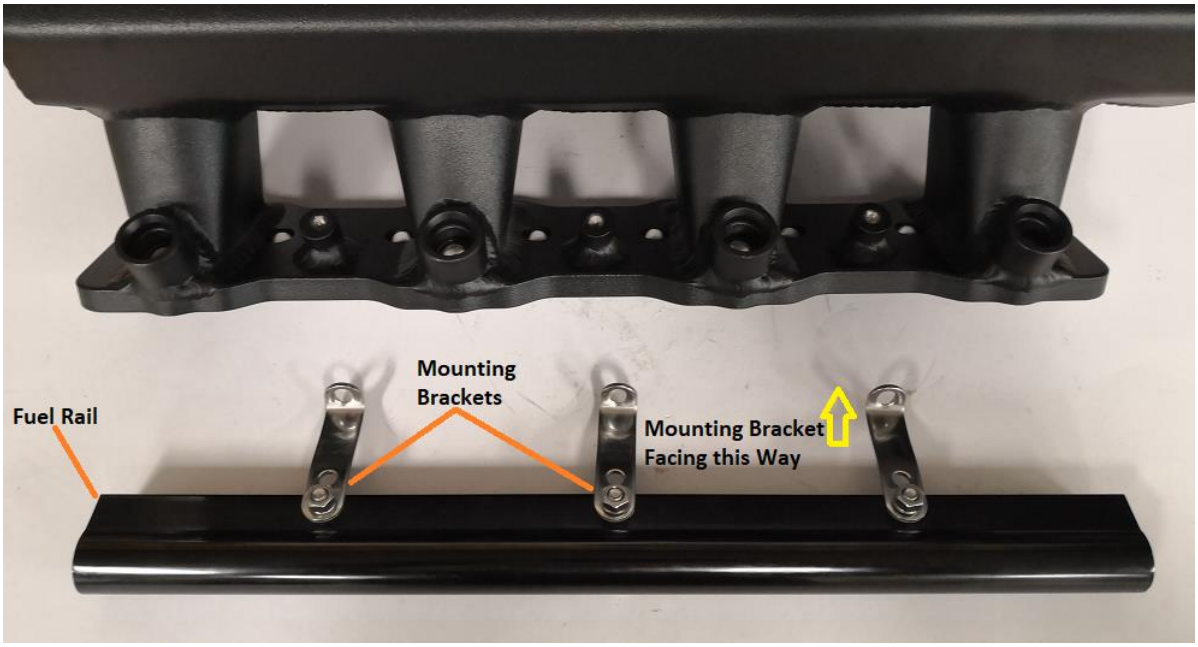
7. For the installation of the fuel rails please refer to **Installation of the Fuel Rails** below
8. Retighten the fuel tank cap and connect the battery cable.
9. Hook up the timing light and start the engine. Set the timing to factory specs.
10. Check for possible fuel, oil, or coolant leaks and for proper choke operation.
11. Operate the engine for 30 minutes. Allow the engine to cool and re-torque the intake manifold bolts. **NOTE;** It is advisable to periodically (every six months or 5000 kilometres) recheck the torque on the manifold bolts to minimize the possibility of a vacuum leak.

Installation of the Fuel Rails

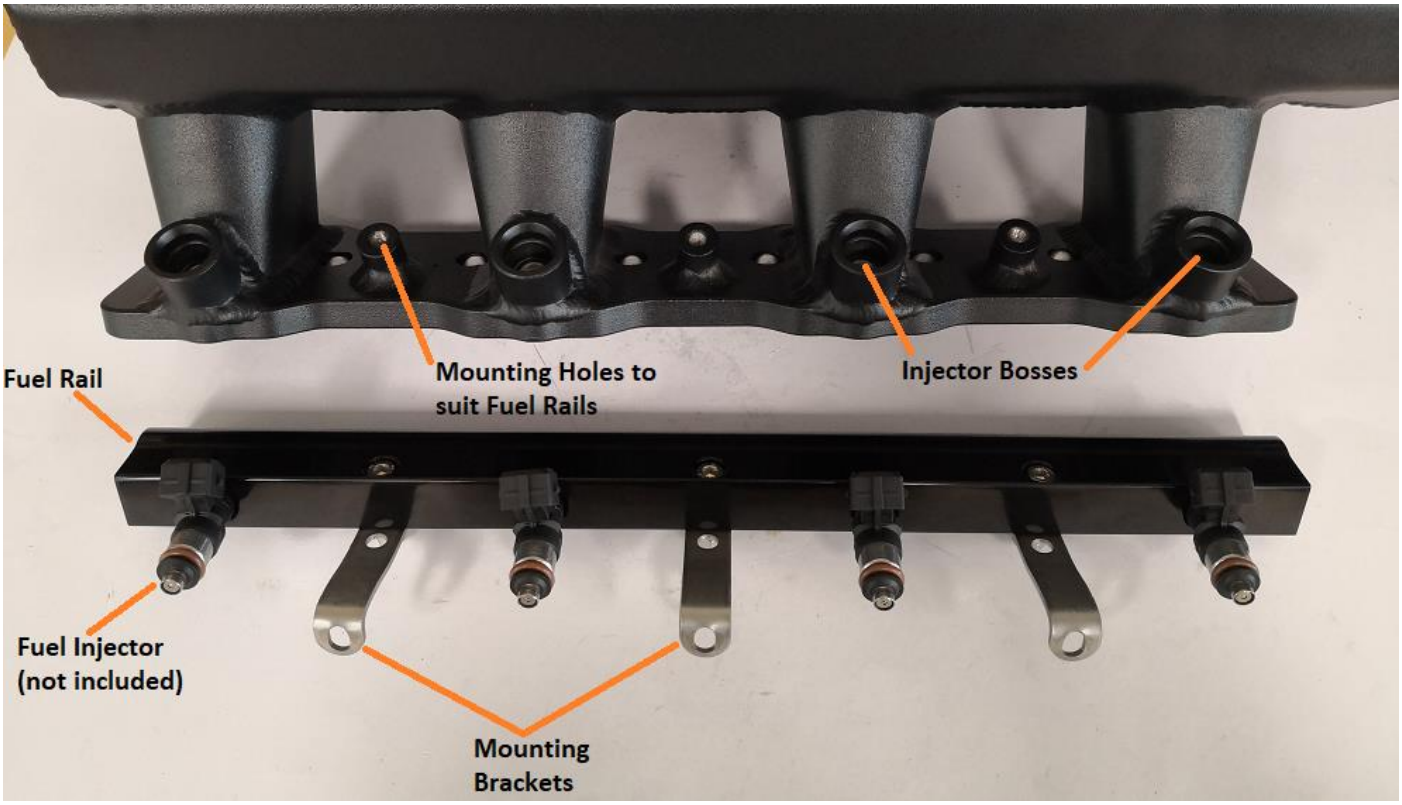
1. Install the mounting brackets supplied using the allen key socket cap screws (M6 UHL 25mm) to both fuel rails along with the washers and nuts on the back side of the fuel rail.

- ***I.*** Ensure the brackets are facing the correct way as shown.
- ***II.*** The bracket includes two different bolt holes to adjust the bracket depending on the fuel injector length. Ensure to test fit with the injectors that will be used in this application.

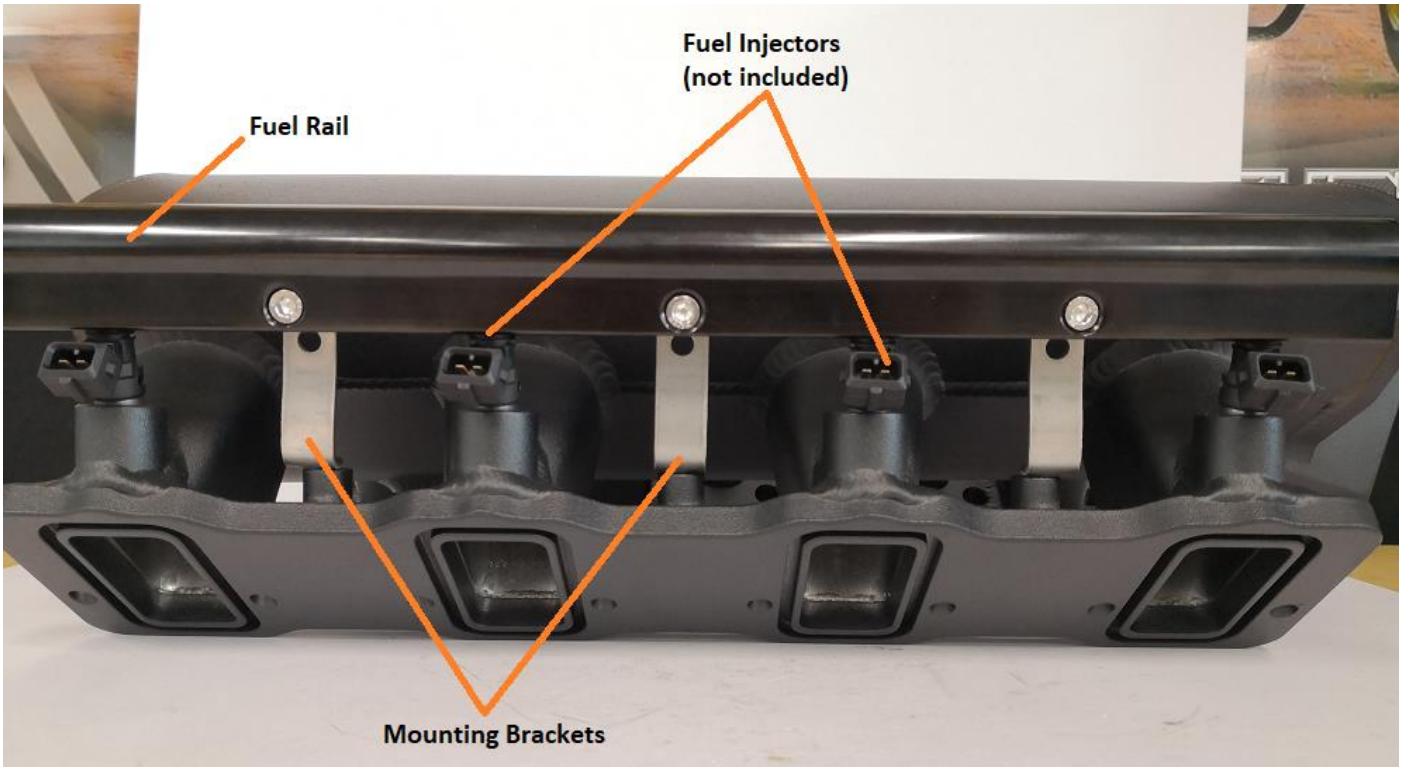




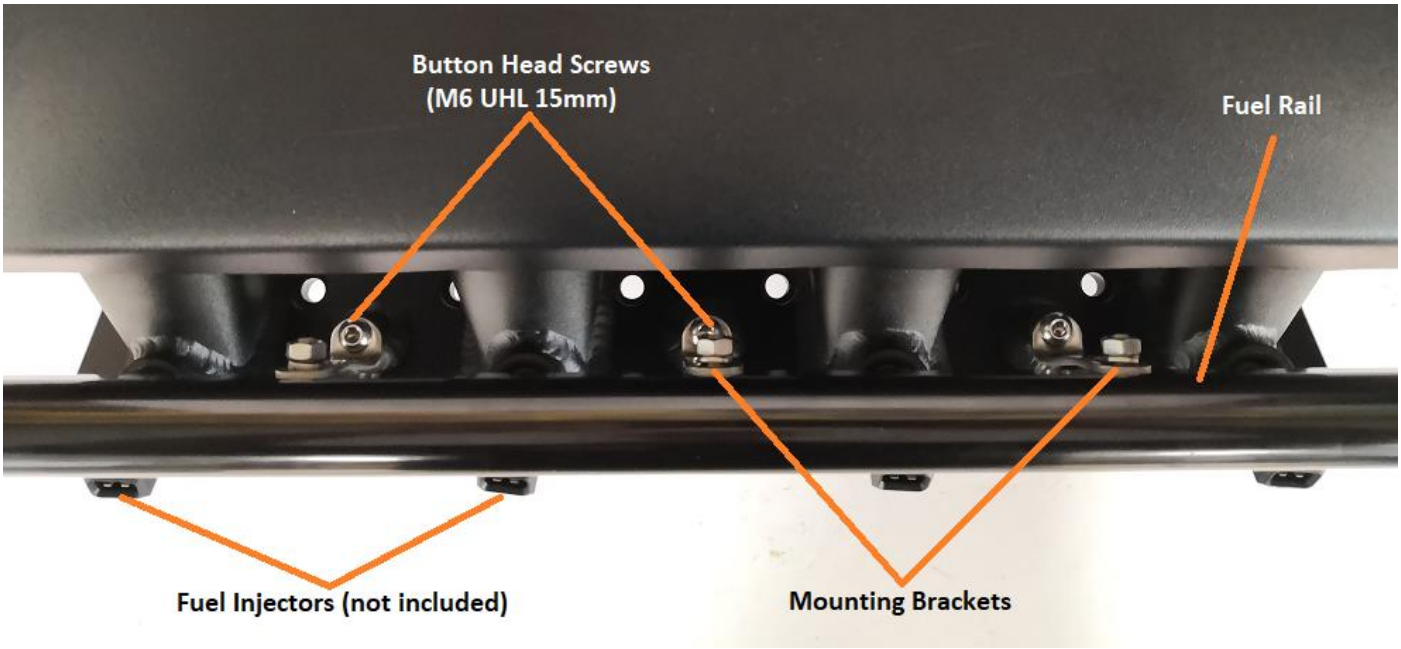
2. Apply a silicone lubricant to the O-ring on the inlet end of the factory OE fuel injector (sold separately) and insert the fuel injectors into the ports in the fuel rail. To insert the injector without tearing the O-ring, gently rock the injector in the inlet of the port while applying pressure to insert the injector.



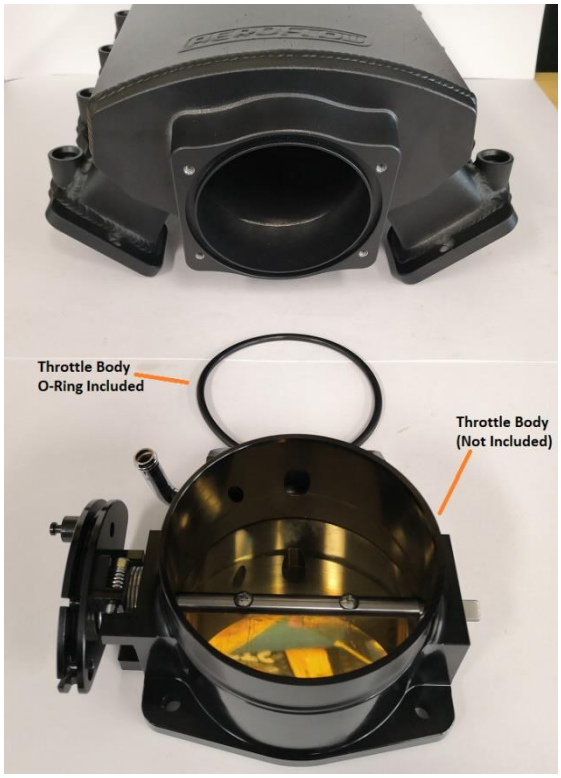
3. Position the fuel injectors to properly orient with the factory wiring plugs, apply silicone lubricant to the injector outlet O-rings, and insert all four injectors into the injector bosses in the base intake manifold applying gentle downward pressure onto the fuel rail.
4. Once the injectors are inserted into the intake manifold, place the washers on the supplied button head screws (M6 UHL 15mm).



5. Tighten the fasteners in two steps – 3.6 ft-lbs (5 Nm) and then to 7.41 ft-lbs (10Nm). Evenly tighten down fuel rail screws and ensure the fuel rail does not kink as this can cause the injector O-rings to pinch and leak when damaged.



6. Check and make sure the injector is floating on the O-ring. Rotate the injector back and forth to confirm that there is no load on the injector body.
7. The fuel rail is designed to provide enough flow and volume to dampen fuel pressure oscillations and variations at the inlet of the fuel injectors. The fuel rails are machined to receive the -8ORB fittings for the ends of the fuel rails. You will have to add new lines and fittings to suit your applications to finish the supply of the fittings from the fuel rail to your setup.
8. Once Fuel lines have been attached to the fuel rails, check for fuel leaks. This will allow the fuel pump to prime the fuel lines and create pressure to check for leaks.
9. Once Intake manifold have been mounted and checked for leaks. Before running the vehicle, the ECU must be tuned to the intake manifold. If engine is run without proper tuning it may cause severe damage and/or engine failure.



For more information or technical enquires

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