Haytalras

GM LS Gen III & IV Street Single-Plane Intake Manifold

INSTALLATION INSTRUCTIONS

CATALOG #300-131/132/136/137

300-131 / 300-131BK	LS3 Street Single-Plane Intake Manifold, Carbureted/TB EFI
300-132 / 300-132BK	LS1/2/6 Street Single-Plane Intake Manifold, Carbureted/TB EFI
300-136 / 300-136BK	LS3 Street Single-Plane Intake Manifold, Port-EFI
300-137 / 300-137BK	LS1/2/6 Street Single-Plane Intake Manifold, Port-EFI

PLEASE study these instructions carefully before beginning this installation. Most installations can be accomplished with common tools and procedures. However, you should be familiar with and comfortable working on your vehicle. if you do not feel comfortable performin g this installation, it is recommended to have the installation completed by a qualified mechanic. If you have any questions, please feel fr ee to contact us by email **haytalras@gmail.com**

IMPORTANT NOTE: Proper installation is the responsibility of the installer. Improper installation will void your warranty and may result in poor performance and engine or vehicle damage.

APPLICATIONS:

The LS Street single-plane intake manifolds are designed for GM LS Gen III and IV engines used in retrofit engine installations into older classic/high performance cars and trucks. This product is intended for carbureted, throttle body EFI, or port EFI applications.

The LS Street single-plane intake manifolds are produced for street and performance engine applications, 5.3 to 6.2+ liter displacement, and maximum engine speeds of 6000-7000 rpm, depending on the engine combination. The Street single-plane design provides the lowest carburetor/throttle body flange height possible while providing maximum performance to 7000 rpm. These intake manifolds are sold for (pre-emissions control) applications only and will not accept stock components and hardware.

300-131 & 300-136 – Designed for GM LS Gen III and IV engines equipped with OE or aftermarket LS3/L92 cylinder heads.
300-132 & 300-137 – Designed for GM LS Gen III and IV engines equipped with OE or aftermarket LS1/2/6 cathedral-port cyl. heads.

NOTE: Intake manifold part numbers 300-136 and 300-137 require the purchase of a fuel rail kit which is sold separately.

Intake Manifold 300-136 – Fuel Rail Kit P/N 534-218
Intake Manifold 300-137 – Fuel Rail Kit P/N 534-219

EMISSIONS EQUIPMENT:

LS Street single-plane intake manifolds do not accept any emission-control devices. This part is not legal for sale or use for motor vehicles with pollution-controlled equipment.

IGNITION CONTROL:

For intake manifold P/N's 300-131 and 300-132, retrofit carbureted or throttle body EFI applications, ignition control will need to be accomplished with a separate ignition control module. It is recommended to use an MSD 6LS ignition controller, MSD P/N 6010 for LS1/LS6 (24 tooth crank trigger engines) or MSD P/N 6012 for LS2/LS7 (58 tooth crank trigger engines). The MSD ignition controller will function with the OE crank trigger, cam timing sensor, and coils. A separate map sensor will need to be used if vacuum timing advance is desired with the MSD ignition controller. Holley 1bar MAP sensor P/N 538-24 is recommended.

For intake manifold P/N's 300-136 and 300-137, port EFI applications, the EFI control unit used may not provide ignition control with the OE LS engine sensors and ignition coils. In that case, the MSD 6LS ignition controller is also recommended as specified above.

ELECTRONIC FUEL INJECTION:

Intake manifold P/N's 300-136 and 300-137 are intended for use with multi-point (or port) electronic fuel injection. While intake manifold P/N's 300-131 and 300-132 are designed for retrofit carbureted applications, a throttle body electronic fuel injection system may be fitted to these intake manifolds.

DIMENSIONS:

NOTE: All heights measure to the lifter valley cover flange on the engine block.

- A-B Height (Carbureted or EFI): Same for both.
  300-131 & 300-136 – A & B - 5.42" (0° carb flange angle)
  300-132 & 300-137 – A & B - 4.95" (0° carb flange angle)
- Port Size:
  300-131 & 300-136 – 2.50" Height x 1.15" Wide
  300-132 & 300-137 – 2.66" Height x 0.92" Wide
- Mounting Flange Gasket Type – 3/32" Round Viton O-Rings (mounting gasket o-rings included with the intake manifold):
  300-131 & 300-136 – Size 2-146, 2-5/8" I.D.
  300-132 & 300-137 – Size 2-151, 3" I.D.
- Carburetor Flange – Standard 4150 for up to 1-3/4" diameter throttle bores
- As-Cast Runner Cross-Sectional Area:
  300-131 & 300-136 – 3.00 in^2 at the runner entry tapered to 2.85 in^2 at the flange exit.
  300-132 & 300-137 – 2.81 in^2 at the runner entry tapered to 2.44 in^2 at the flange exit.
- Vacuum Port Size and Thread – 3/8 NPT
- MAP Sensor Port Size and Thread – 1/8 NPT
- Mounting Bolt Thread and Lengths:
  300-131 & 300-136 – M6 x 1 x 50mm long 6 places, M6 x 1 x 90mm long 4 places
  300-132 & 300-137 – M6 x 1 x 50mm long 6 places, M6 x 1 x 80mm long 4 places.
  (The mounting bolts and washers are included with the intake manifold installation kit).

INSTALLATION KIT CONTENTS:

- ❑ 6 – M6 x 1.0 x 50mm Long Hex Head Cap Screws, Zinc Plated, Mounting Bolts
- ❑ 4 – M6 x 1.0 x 90mm Long Hex Head Cap Screws, Zinc Plated, Mounting Bolts **(Used for P/N's 300-131 & 300-136)**
- ❑ 4 – M6 x 1.0 x 80mm Long Hex Head Cap Screws, Zinc Plated, Mounting Bolts **(Used for P/N's 300-132 & 300-137)**
- ❑ 10 – Washers, M6 x 12mm O.D x 1.6mm Thick, Intake Manifold to Cylinder Head Mounting
- ❑ 1 – 3/8 NPT Hex Socket Steel Pipe Plug
- ❑ 1 – 1/8 NPT Hex Socket Steel Pipe Plug

MOUNTING FLANGE GASKET KIT CONTENTS:

For 300-131 & 300-136 – P/N 508-22

- ❑ 8 – O-Ring, 3/32" Dia. Round Sect. Viton, Size 2-146, 2-5/8" I.D. Port Flange Seals

For 300-132 & 300-137 – P/N 508-23

- ❑ 8 – O-Ring, 3/32" Dia. Round Sect. Viton, Size 2-151, 3" I.D. Port Flange Seals

INSTALLATION INSTRUCTIONS:

Installation on Modified Engine Components

The LS Street Single-Plane intake manifolds are designed to provide maximum performance for street/performance engine applications. The intake manifold will have the best fitment when the engine block and cylinder heads are machined to standard OE dimensions. 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 your engine has had the cylinder head or engine block deck surfaces milled, the following may be necessary for proper intake manifold installation.

- The bolt holes in the intake manifold would have to be slotted to allow the fastener to properly pass through the manifold mounting holes. The mounting fasteners must freely thread into the cylinder head while passing through the mounting holes or the manifold may not seat properly onto the cylinder head surfaces when the fasteners are tightened.

- As the o-ring grooves are located in the intake manifold mounting flanges, material may not be removed from the intake manifold mounting flanges without jeopardizing the sealing of the manifold. Any material removal required to align the port flange openings should be removed from the cylinder head not the intake manifold.

- When port matching the intake manifold port openings to the cylinder head openings, care should be taken not to break into or damage the o-ring groove, or the o-ring seal will not be effective. The intake manifold mounting surfaces on the cylinder heads should be in good condition (free of nicks or scratches) where the sealing o-rings will seat to ensure proper sealing.

Installation of the Intake Manifold

1. Before installing the intake manifold, perform a test fit of the intake manifold without the o-rings installed.

   PLEASE NOTE: There are two sets of four longer M6 mounting bolts in the installation kit. The 90 mm long bolts will be used at the four taller mounting bosses for intake manifolds 300-131 and 300-136 (the LS3 applications). The 80 mm long bolts will be used at the four taller mounting bosses for intake manifolds 300-132 and 300-137 (the LS1 applications). The six 50 mm long M6 mounting bolts are used at the six short intake manifold mounting bosses. Discard the unused bolts that are supplied.

   Make sure that the appropriate mounting bolts (supplied) thread freely into the cylinder heads through the intake manifold mounting holes. The mounting flange should seat properly and the mounting bolts should not bottom in the threaded holes with the bolts installed without the washer during the test fit.

2. Check the port opening alignment. Test fit the carburetor/throttle body, fuel and vacuum plumbing, throttle linkage, wiring, etc. to ensure there are not any fit issues before performing the final intake manifold installation. Due to the nature of the design, the clearance of the intake manifold to the lifter valley cover may be close. Please ensure that there is no interference with the lifter valley cover that prevents the intake manifold from properly seating on the mounting flanges.

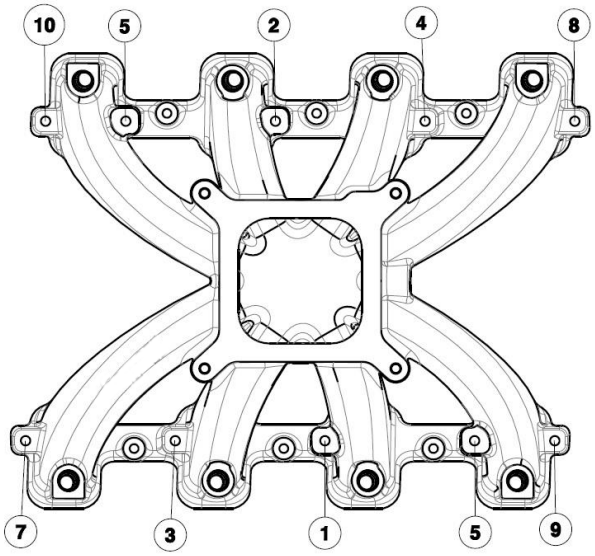
3. For final installation, install the eight o-rings (provided) in the mounting flange o-ring grooves. To make sure the o-rings do not fall from the grooves, apply a light coat of grease to the o-rings.

4. Place the intake manifold on the mounting flanges. Be sure that all of the o-rings are still in the grooves and are not being crushed between the flanges.

5. Apply engine oil to the threads of the bolts. Install the mounting bolts and washers into the manifold mounting holes and thread into the cylinder heads. Tighten the bolts lightly per the tightening sequence (see the tightening sequence diagram below), until the o-rings are compressed and the bolts are seated.

WARNING! The M6x1 threads in the aluminum cylinder head will not withstand abuse. Care must be taken to have proper thread engagement and to tighten the fasteners to the proper specifications.

6. In two steps, tighten the mounting bolts first to 50 in-lbs and then to 106 in-lbs (8.8 ft-lbs) following the tightening sequence diagram below.



Manifold Tightening Sequence

7. There is a 3/8 NPT port at the rear of the carb flange on the intake manifold for a major vacuum source. This port is connected to the carb/throttle body plenum of the manifold and can be used for power brakes, vacuum reservoir, etc. The carburetor or throttle body will normally also provide vacuum sources and ports for plumbing PCV (positive crankcase ventilation). If using a vacuum port on a carburetor or throttle valve, confirm whether the source is a full vacuum or a timed vacuum source. It is preferable to use the boss on the rear of the carb flange as a vacuum supply, not for PCV. It is best to route PCV to the proper port on the carburetor or throttle body to ensure proper distribution of the crankcase oil vapor into the intake manifold. Confirm that all unused vacuum ports on the intake manifold and the carburetor or throttle body are plugged or capped. NPT plugs for the manifold have been provided.

Installation of the Fuel Rails

The fuel rails are mounted to the intake manifold by three brackets per fuel rail. The fuel rail kit supplies brackets of two different lengths. The long brackets are for mounting the fuel rails at a height for a Bosch style EV1 type fuel injector. The short brackets are for mounting the fuel rails at a height for GM OE LS7 fuel injectors. When using an OE GM LS7 injector in the haytalras intake manifold, the o-ring on the outlet (intake manifold) end of the injector needs to be changed to the o-ring supplied in the fuel rail kit
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1. Apply a silicone lubricant to the o-ring on the inlet end of fuel injectors 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.

2. With the lettering on the fuel rail oriented outward, position the injectors to properly orient the wiring plugs, apply silicone lubricant to the injector outlet o-rings, and insert all four injectors into injector bosses in the base intake manifold applying gentle downward pressure on the fuel rail.

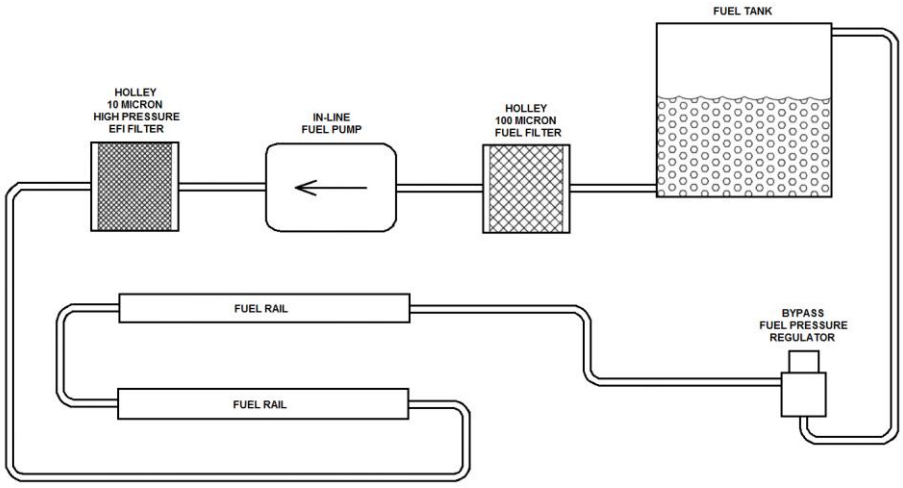
3. Once the injectors are inserted into the intake manifold, place the appropriate brackets in position. Before installing the fasteners, apply a drop of oil to the threads of the flanged hex head capscrews. Attach the brackets to the intake manifold with the 0.75" long flanged hex head capscrews. Attach the brackets to the fuel rail with the 0.50" long flanged hex head capscrews. Hand tighten the fasteners, making sure that the brackets are properly seated on both the intake manifold and the fuel rail. Make sure the fuel rail is properly positioned, and the fuel injectors are properly positioned. Ensure the injectors are floating on the o-rings. Rotate the injector back and forth to confirm that there is no load on the injector bodies. The injectors should have 0.020-0.040" of end play and the o-ring seals must stay in the o-ring seal counterbores.

4. Tighten the mounting fasteners in two steps, 7 ft-lbs for the first step and 12-15 ft-lbs for the second step.

5. Once the fasteners are tightened, re-check and ensure the injectors are floating on the o-rings; rotate the injectors back and forth to confirm that there is no load on the injector bodies.

6. 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 an adapter fitting for ¾-16 (AN-8) o-ring port.

- For power levels below 700-750HP, AN-6 (3/8") plumbing to and from the fuel rails should be sufficient.
- For power levels above 750HP, AN-8 (1/2") plumbing is recommended.
- It is always recommended to only use tubular hose ends when a non-straight hose end is required.



Plumbing Diagram

Installation of the Carburetors or Throttle Bodies

1. When installing the carburetor or throttle body, consult the manufacturer installation instructions for proper installation and tuning procedures. Confirm that the carburetor or throttle body to intake manifold gasket to be used will properly seal.

2. With the carburetor or throttle body mounted on the intake manifold and the throttle linkage connected, check to be sure that all throttle levers, linkage components, fuel lines, and vacuum lines have adequate clearance from the intake manifold and each other. Confirm that the throttle linkage has adequate return springs and that WOT is achieved when the throttle pedal is fully depressed.

3. Before starting the engine, run the fuel pump to build fuel pressure and confirm that there are no fuel leaks and that the fuel pressure is correct. To prevent the engine from flooding with fuel, confirm that there is not fuel running into the intake manifold from the carburetor boosters (proper needle and seat closing) or from the throttle body EFI fuel injectors (proper fuel injector closing).

Tuning with Carburetor /Throttle Body Spacers

The Street Single-Plane intake manifolds are designed to provide minimum carb flange height (maximum hood clearance). If there is enough air cleaner to hood clearance available, the use of carb spacers may provide opportunities for performance and/or drivability improvements. Tuning with carb spacers is an easy, usually inexpensive, and interesting exercise that can improve performance. The following carb spacer guidelines are typical, but your results may vary based on your engine combination:

1" Thick Four-Hole Spacer – Usually improves fuel distribution and may shield the carburetor from signal pulsations that could disrupt a smooth A/F curve. While peak horsepower may not be improved, often the torque curve may be broadened and drivability improved.

1" Thick Open Spacer – An open spacer increases the intake manifold plenum volume and depth. Increased plenum volume may change the tuning of the intake manifold to move the torque curve peak to a higher engine RPM. Increased plenum depth may provide the air/fuel charge a better flow path into the runner entries at higher engine RPM. Peak horsepower may be increased sometimes, trading some lower engine RPM torque for higher RPM power improvement.

2" Thick Open Spacer – The 2" spacer increases the intake manifold plenum volume and depth more than the 1" open spacer. Larger engine displacement combinations may benefit from a taller open spacer. As the open spacer height is increased, returns may be diminished. If a 2" spacer gives a substantial improvement over a 1" open spacer, the engine combination may benefit from an intake manifold with a larger runner cross-sectional area. Once again, peak power may be increased while low engine RPM performance may be sacrificed.

2" Thick Four-Hole/Open Combo Spacer – This spacer is a four-hole spacer for the first 1" exiting the carburetor and then is open under the four hole section. This spacer may combine the effects of the 1" four-hole spacer and the 1" open spacer. If there is space for a 2" spacer, the combo spacer may work well.

Various Height Reverse Taper or Contoured Section Spacers – With the use of current CNC machine technology there are a myriad of carb spacer designs available. The results on your engine combination will vary depending on many factors. Testing is the way to determine if a specific design will provide an improvement on a specific engine. Without testing on a specific engine combination, no one can claim with certainty that a given carb spacer will provide a performance improvement.