

VERY IMPORTANT!

Note that the mounting brackets for the fuel rails have one leg longer than the other. The longest leg (marked "A" in photo) with the longest slot must go down against the manifold. If you install these brackets the wrong way, it is very possible that you will not get a good seal on the injectors and a fuel leak will occur. Please make sure you have these brackets installed correctly.

Professional Products®

Installation Instructions

For 52060, 52061, 52062, 52063, 52064, and 52065

52060/52061 fits 1997-'04 GM LS1/LS6 V8s

52062/52063 fits 2005-'06 GM LS2 V8s

52064/52065 fits 1997-'04 GM LS1/LS6 V8s but requires LS2 style throttle body

IMPORTANT NOTES:

- Before starting the installation of your manifold be sure that the vehicle is in good operating condition. Retrieve the vehicle's trouble codes from the onboard computer following the manufacturer's directions. All trouble codes must be corrected before installing the manifold otherwise driveability problems may result. These problems will not be a result of installing the manifold and will be difficult to diagnose if you do have problems.
- If replacing your manifold requires removal of either the air compressor or the condenser, the A/C system must be evacuated. Do not release the freon to the atmosphere as this is illegal and also quite expensive. Take the vehicle to an A/C shop so the freon can

- be released and recovered it so it can be re-installed later.
- See the parts list below and check to make sure that your kit includes all the parts listed.
- Perform the installation in a well ventilated area. Do not smoke or have a lighted flame near gasoline vapors or an explosion could occur resulting in serious injury, property damage, or death.
- Always wear safety glasses when working on your vehicle to avoid eye injury.
- Unless you are thoroughly familiar with your vehicle's mechanical and electrical systems and are qualified to work on the vehicle, we strongly recommend having a professional mechanic perform the installation on your behalf.

MANIFOLD KIT CONTENTS

Manifold Portion of Kit

- (1) Intake Manifold
- (1) Bottom Cover Plate for Manifold
- (1) Bottom Cover to Manifold Gasket
- (10) Bottom Cover Screws - M6 x 12
- (2) Intake Gaskets
- (1) Throttle Body to Manifold Gasket
- (10) Intake Manifold Bolts - M6 x 90 long
- (10) M6 Flat Washers
- (1) Metal Retaining Clip
- (1) Retaining Clip Screw M3 x 6
- (2) Brass Fittings

Fuel Rail Portion of Kit

- (2) Fuel Rails (Red)
- (4) Fuel Rail Mounting Brackets S/S
- (1) Crossover Hose Assembly for Fuel Rails
- (1) Extension Hose Assembly
- (1) 52185 Fuel Inlet Fitting S/S
- (2) 3/8-NPT to -6 AN Adapter Fitting (Blue)
- (1) 15264 90° Fitting (Blue)*
- (1) 15262 90° Fitting (Blue)*
- (1) 10602-06 Reducer Fitting (Blue)
- (1) 1/8-NPT Pipe Plug
- (1) Black plastic Tee Fitting
- (4) M6 x 15 Pan Head Screw S/S
- (4) M6 x 30 Pan Head Screw S/S
- (4) M6 Nuts S/S
- (4) M6 Lockwasher S/S
- (8) M6 Flat Washer S/S

See page 3 for list of tools required for installation.

*These two fittings are supplied for use if you want to plumb your own fuel inlet line instead of using stock line. Two fittings are supplied; one is -6 and one is -8. Use a -6 line for vehicles making up to 500 hp and a -8 line for engines producing more than 500 hp.

Additional Parts Required for Installation

- Anti-seize Compound
- Permatex Ultrablue Sealer or equivalent
- Antifreeze (Coolant)
- LS6 Coolant Lines or you modify your stock lines**
 - Front LS6 Coolant Line GM #12578838
 - Rear LS6 Coolant Line GM #12563325
- Professional Products Regulator Kit #52160***

**Required on LS1 installations only.

***This kit is for early LS1's which have a return line to the fuel tank.

Removal of stock manifold

- Allow engine to cool. Disconnect battery.
- Disconnect the wiring harness from the mass flow sensor. Disconnect the air temperature sensor from the intake tube.
- Remove air cleaner housing. Disconnect air inlet duct from throttle body.
- Disconnect the wiring harness from the Throttle Position Sensor and Idle Air Control - both on the throttle body.
- Disconnect the cruise control and throttle cable from the throttle body. Later model LS1's and all LS2's do not have a throttle cable.
- Remove the Exhaust Gas Return tube from the manifold (LS1 only).
- Disconnect the coolant lines from the underside of the throttle body and remove the throttle body from the intake. Coolant lines are on LS1 only.
- Remove the throttle cable bracket (if so equipped) from the intake manifold and retain for later use.
- The fuel rails on the engine will have a Schrader valve (looks like a tire valve) on the front end of one of the rails. Remove the black plastic cap. Pressing in on the valve will relieve the fuel pressure in the fuel rails. Fuel will spray out so have a towel or large rag to capture the fuel. Mop up any spilled fuel. Completely relieve pressure.
- Disconnect the fuel inlet line. On early LS's there is a fuel return line. Disconnect it. Both the inlet and return lines are a "push-on" design that require an inexpensive special tool to remove them. This tool is available at most auto parts stores. Your local NAPA store might be your best bet.
- Disconnect the electrical connectors from the injectors. Remove the four bolts holding the fuel rails to the manifold. Lift up on the fuel rails to remove them. The injectors may remain stuck in the rails or in the manifold. If they remain in the rails, be careful they don't drop out and become damaged. Pull any injectors remaining in manifold out. Handle the injectors with care. Set injectors aside for now.
- On LS1 engines the MAP sensor plugs into the back of the manifold while the LS2 is at the front. Both are retained by a plastic clip. Pull the clip back and then pull the MAP sensor out of the manifold.
- Remove the ten bolts holding the manifold to the engine. Set the bolts aside. Remove the manifold.

(Instructions continued on next page)

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14. The stock manifold does not use gaskets between the manifold and the heads. There are rubber seals around each port in the manifold. The Professional Products manifold will use the supplied gaskets. Wipe the head surfaces clean with a clean cloth and a solvent.

Installing the Professional Products Manifold

Special Note about Coolant Tubes - These tubes connect to the throttle body and are found on LS1 and LS6 engines but not on LS2 or LS7. The stock 2000 and earlier LS1 coolant lines will not work with this manifold and need to be replaced with LS6 coolant lines. See page one for GM part numbers. The stock early LS1 lines can be modified to work but require significant cutting and brazing. We highly recommend you purchase LS6 lines if needed.

1. Some engine builders like to use a thin coat of gasket sealer on both sides of the intake gasket. While this assures a good seal, it does make it difficult to clean off gasket residue the next time you remove the manifold. Using sealer is an optional step. Position gaskets on head surfaces. However, to hold gaskets in position, you may want to use sealer (or spray adhesive) between the gasket and head.

2. Install any fittings into the rear of the manifold. Your kit has a black plastic tee fitting that goes into the back of the manifold. See Illustration #1 on page 4. The kit also has two supplied brass fittings that screw into each side of the front of the manifold just behind the inlet flange. Make sure that you put the fittings in locations to match the original plastic fittings on the stock manifold. See Illustrations #2 and #3 on page 4. Use pipe thread sealant on fittings.

3. Note that the MAP sensor is retained by a small spring clip that is attached to either the rear of the manifold (LS1 models, see Illustration #1) or the front of the manifold (LS2 models, see Illustration #3 on page 4). The clip is held in place by a supplied M3 screw. Slip the clip into the notch of the MAP sensor, push sensor into hole and install screw thru clip.

4. Place manifold onto the engine being careful to maintain the gaskets in position. Connect vacuum lines to the fittings on the back of the manifold. You will have to slide manifold forward to access these lines. Do not break oil sending unit.

5. Carefully slide manifold back into position. Put anti-seize compound on the threads and install ten manifold retaining bolts supplied with the Professional Products manifold. Run the bolts down snug. Using a torque wrench with a 5MM hex wrench, tighten the bolts in the sequence and to the torque shown in the illustration in these instructions.

6. This manifold cannot be used with the stock fuel rails. New high performance fuel rails are supplied with the manifold.

7. Inspect the o-rings on both ends of the injectors. While o-rings may be reused if they are in good condition, it is a good idea to install new ones available from your GM dealer. Put a thin coating of oil or silicone lubricant on the o-rings. Push the injectors into the manifold bores.

8. Please follow these instructions for installing fittings into the fuel rails. Failure to follow these directions may result in damage to the rails and/or engine. Clamp rails in a vise using special soft or padded jaws to avoid damage. Do not use Teflon tape on the pipe threads. Use pipe thread sealant available in any hardware store. Teflon tape can shred and get into the fuel rail and will clog up the injectors. Thread the

supplied 90° blue -6 AN fitting in the back end of the driver's side rail. See Illustration #5 on page 4 for specifics on how to hook up fuel inlet line to this fitting. **Note:** If you have an early LS1 that has a fuel pressure regulator as part of the fuel rail assembly, see special note in the box below. When threading any pipe fittings into the rails, first coat the threads with pipe sealant. If it is an angle fitting, determine the position where you want it to end up. Thread the fitting in with a wrench until it stops. Then back it off about a quarter turn. Then tighten it again. It will go in further this time. Continue this procedure until the fitting is in the position that you want it. **Do not over tighten or you may split the rail.** The rails are not warranted against splitting due to over tightening fittings. Now thread one of the supplied 3/8-NPT to -6AN adapter fittings (blue) into the front of the driver's side rail. 9. Following the same procedures outlined above, place the passenger's side rail in the vise. Install the other 3/8-NPT to -6AN adapter fitting into the front end of the rail. Install the supplied 3/8-NPT to 1/8-NPT reducer bushing into the back end of the rail. Install the supplied 1/8-NPT pipe plug into the reducer fitting. If you want to maintain the Schrader valve feature for relieving pressure or bleeding the fuel rails, you can purchase one from a Ford dealer that will thread into the reducer bushing in place of the 1/8-NPT pipe plug. Ask for Ford part number E0AY-9H321-A.

Special Note to early LS1 applications using a fuel pressure regulator mounted on the stock fuel rails. If your fuel rails have two fuel lines connected to them, you have an early LS1. In order to complete your installation you will need our special LS1 Fuel Regulator Kit #52160. This kit includes an adjustable fuel pressure regulator and additional fittings. Follow the instructions shown in Diagram 1 in this instruction booklet.

10. Coat o-rings on top end of injectors with oil or silicone spray. Firmly push rails onto injectors. Using supplied stainless steel 90° brackets, thread supplied M6 x 15 stainless screws through supplied flat washer and through slotted holes in long side of bracket into tapped holes in manifold. **(Note: It is critical that you have the long side of the "L" shaped stainless bracket bolted to the manifold and not to the fuel rails. See Figure 6 on back page.)** Do not tighten. Now thread the supplied M6 x 30 stainless screws through fuel rails and through brackets. Put supplied flat washers, lockwashers, and nuts onto screws. Tighten screws that go through bracket into manifold. While pushing down on fuel rail, tighten nuts on screws through rails. See Illustration #4 on page 4 for special instructions.

11. Attach the supplied crossover fuel hose assembly to the ends of the rails by threading the -6AN 90° hose ends onto the fittings in the front end of the rails. Tighten with an 11/16" open end wrench. Do not over tighten.

12. Attach throttle body to front of manifold. Use supplied gasket. Professional Products offers oversize throttle bodies to match the front inlet opening on your new manifold. LS1 manifolds have either an 85mm opening (52060/52061) and use LS1 style throttle bodies, or have a 96mm opening (52064/52065) and use LS2 style throttle bodies. The LS2 manifolds (52062/52063) have a 96mm opening and use LS2 style throttle bodies. You can use either your stock throttle body or a larger aftermarket unit.

13. Connect the fuel supply line to the fuel rails - See photo #5 on page 4 of these instructions for fuel line connection.
14. Reconnect harness to the injectors and canister purge.

15. Connect the vacuum line to the canister purge from the manifold.

16. Install the LS1/LS6 EGR tube into the manifold and bolt down. If you elect to not use this tube, use supplied blockoff plate to cover the hole. Apply thin coat of Permatex sealer to both plate and manifold. The LS2 does not have an EGR tube.

17. Remount the throttle body to the manifold.

18. Reconnect the wiring harness to the throttle position sensor (mechanical linkage vehicles only) and the Idle Air Control Valve.

19. Reconnect the coolant lines to the underside of throttle body. LS1/LS6 only.

20. Reconnect the vacuum line from the throttle body to the Positive Crankcase Ventilation (PCV) system.

21. Attach the stock throttle cable bracket (if originally equipped) to the manifold.

22. Reconnect the stock throttle cable and cruise control cable (if originally equipped) to the throttle body.

23. Reinstall the cold air intake tube to the throttle body. Reconnect the wiring harness to the Mass Air Sensor and air temperature sensor.

24. Refill the coolant.

25. Reconnect the battery and start the engine.

26. Check for any fuel leaks for vacuum leaks. Note, fuel leaks must be corrected at once or a fire could occur.

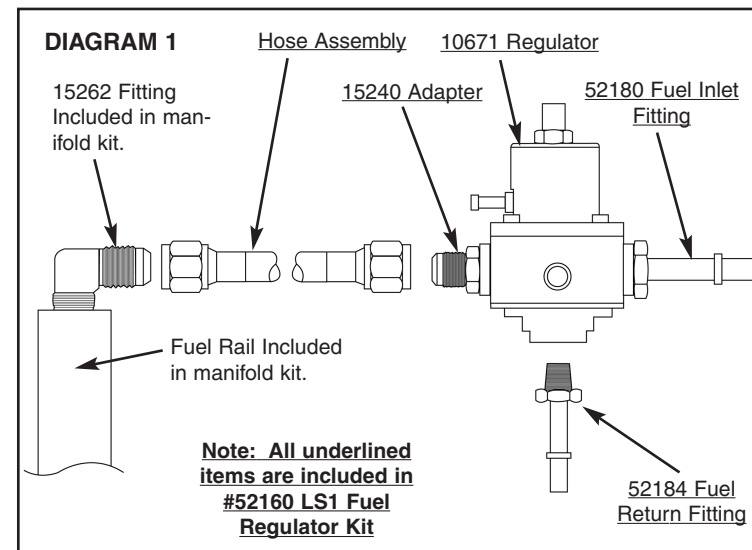
27. Re-torque intake manifold bolts after engine has reached operating temperature.

NOTE: The Professional Products manifold is equipped with nitrous bosses which can be drilled and tapped with 1/8-NPT threads to accept nitrous nozzles.

TOOLS AND OTHER PARTS REQUIRED

Set of metric hex wrenches (Allen style)
10 MM open end/box wrench (for throttle body bolts)
5/8" open end/box wrench (for brass fittings)
11/16" open end/box wrench for AN fittings
Inch Pound Torque Wrench (for intake manifold bolts)
5 MM Hex Key to fit torque wrench

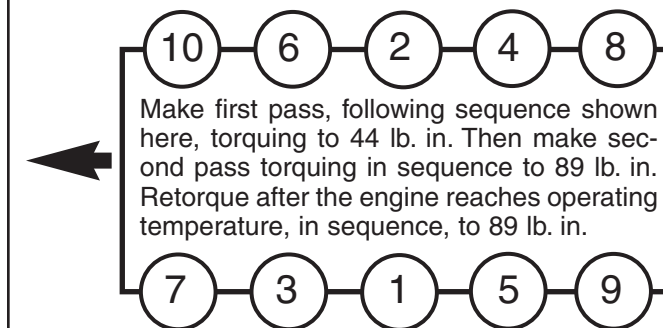
For Early LS1's with a fuel rail mounted pressure regulator and a return line, you will also need a Professional Products Fuel Pressure Regulator Kit #52160 or equivalent parts. See Diagram 1. See complete written directions below Diagram 1.



PLUMBING A FUEL REGULATOR FOR EARLY LS1'S:

Early LS1's used a fuel system with a return line to the tank and a fuel pressure regulator mounted on the fuel rail assembly. Note that later model LS1's had a device on the fuel rail assembly that can be mistaken for a regulator but is actually a damper device that is used to suppress pulsations in the fuel system. Removing this damper will not affect the performance of your engine. If your system does not have a return line, then you have the later model LS1 and the #52160 Fuel Regulator Kit is not needed. See Diagram 1 above for a sample layout of how to plumb this kit. All of the parts shown in the diagram are either included in the original manifold kit or in the supplemental #52160 kit. The supplied fuel regulator will need to be mounted in a position that will allow the stock fuel inlet line and the stock return line to connect to the fittings on the regulator. The parts supplied in the #52160 kit are all -6 AN fittings and hose which are suitable for a stock fuel line. However, if your engine is extremely high horsepower and you elect to replace it with a plumbed fuel line, we would recommend using -8. This will require substituting -8 AN fittings and hose for the -6 AN parts in the kit. The regulator is suitable for up to 200 gallons per hour which will handle over 2,000 hp. Note: The stainless inlet fitting supplied in the #52160 kit is also available in a 90° version and is our part number 52181. It can be ordered through your dealer.

TORQUE SPECIFICATIONS



Note: There is a very informative web site that addresses all kinds of modifications on LS1 engines. The web site is called LS1howto.com. The specific section on manifold replacement, which may be very helpful, as it includes many how-to photos, is:

<http://www.ls1howto.com/index.php?article=5>

This web site goes into more specific detail than is given in these instructions and provides differences between F-body and C5 installations. C6 and other LS2 installations are not addressed but should be similar in most respects.