



# LS3 CROSS-RAM DUAL PLENUM INTAKE MANIFOLD

## For GM LS3 V8 Engines

### Catalog # 7141 (Red Plenums) and # 71413 (Black Plenums)

#### INSTALLATION INSTRUCTIONS

**PLEASE** study these instructions carefully before beginning this installation. You should be familiar with and comfortable working on your vehicle. If you do not feel comfortable performing this installation, it is recommended to have the installation completed by a qualified shop. If you have any questions, please call our **Technical Hotline at: 1-800-416-8628**, 7:00 am - 5:00 pm, Pacific Standard Time, Monday through Friday.

**NOTE:** Proper installation is the responsibility of the installer. Improper installation may result in poor performance and engine or vehicle damage.

- **DESCRIPTION:** The LS3 Cross-Ram is a dual plenum, dual throttle body manifold, designed for excellent performance and stunning appearance. It's well suited to standard LS3 operating rpm ranges of 1500 to 7000rpm. This manifold is recommended for engine swap into pre-pollution controlled or race applications only. This kit is a manifold assembly only. A stand alone ECU or dual throttle body controller will be needed to run the dual throttle bodies.

- **KIT # 7141 CONTENTS:**

<u>QTY.</u>	<u>Description</u>	<u>QTY.</u>	<u>Description</u>
<input type="checkbox"/> 1	Base Intake Manifold	<input type="checkbox"/> 1	M6 x 1.0 x 20mm Hex Flange Head Bolt (MAP Sensor)
<input type="checkbox"/> 1	Left Side Plenum		
<input type="checkbox"/> 1	Right Side Plenum	<input type="checkbox"/> 10	M6 x 1.0 x 30mm Hex Flange Head Bolt (Top Row Plenum to Base and Fuel Rail)
<input type="checkbox"/> 1	Left Plenum to Base Gasket		
<input type="checkbox"/> 1	Right Plenum to Base Gasket	<input type="checkbox"/> 4	M6 x 1.0 x 40mm Hex Flange Head Bolt (Plenum to Base Ends)
<input type="checkbox"/> 2	Throttle Body Gaskets		
<input type="checkbox"/> 4	6mm x 12mm Spring Alignment Dowel	<input type="checkbox"/> 18	M6 x 1.0 x 45mm Hex Flange Head Bolt (Coil Top Mount and Base to Head Hold-Down Bolts)
<input type="checkbox"/> 8	Aluminum Coil Spacers .75" Long		
<input type="checkbox"/> 8	Aluminum Coil Spacers 1.25" Long	<input type="checkbox"/> 16	M6 x 1.0 x 60mm Hex Flange Head Bolt (Lower Coil and Plenum to Base Lower Row)

**NOTE:** The dual throttle body design requires a separate driver for the second throttle body or a stand-alone computer system such as the AEM Infinity 8 series or equivalent.

- **ACCESSORIES & INSTALLATION ITEMS:** Major recommendations are listed below. However, because this manifold system is intended for engine swaps into a variety of vehicles, some customization may be required.
- **FUEL RAILS:** The Edelbrock Cross-Ram LS3 Fuel Rail Kit, PN 3654, has been designed specifically for this manifold and is recommended. It uses -6 AN fittings on all four (4) ends. (NOTE: Refer to the Russell catalog for the desired fuel rail fittings).
- **FUEL INJECTOR RECOMMENDATIONS:** Stock injectors can be used safely in applications up to 500 HP (37 lb/hr). For higher HP applications, we offer PN 15903 (60 lb/hr) injector with Minitimer connector.
- **HEADERS:** Ø1.75 header recommended up to 550 HP applications. We used Ø1 7/8 headers for our 620 HP 416 cid build.
- **GASKETS:** Port exits use stock LS3 port seal gaskets, GM PN 19256623. Replacement base to upper gasket set is available as Edelbrock PN 7271.
- **THROTTLE BODY:** Dual plenum applications use two (2) 90mm throttle bodies, GM PN 12605109.
- **COIL WIRES:** Stock coil wires are not long enough to securely plug into the coils. For the appropriate length of wires, we recommend GM PN 19351572, which is a truck wire.
- **CAMSHAFT RECOMMENDATIONS:** For street level style performance up to 6500 rpm, we recommend using either our PN 2216 or our PN 2219 Rollin' Thunder camshafts. Our PN 2219 cam made 536HP on a 6.2L engine with stock LS3 heads.

## MANIFOLD INSTALLATION PROCEDURE

**CAUTION:** Make sure the vehicle's battery has been disconnected and that the vehicle is supported on a level surface to prevent any possibility of the vehicle moving during the installation procedure.

### • MANIFOLD INSTALLATION:

1. Reuse the stock LS3 port seal gaskets, GM PN 19256623. From under the manifold, install the fuel rails (PN 3654) and injectors using the supplied M6 X 30mm bolts. When installing the injectors onto both the manifold and fuel rails, make sure that the o-rings of the injectors create a complete seal to prevent any air or fuel leaks. Use o-ring assembly lube when installing the injectors. **(NOTE: The manifold is machined with standard 0.554 injector bore sizes. If the injectors being used are suited for larger 0.587 bores (most LS3 stock injectors), replace the large o-ring of the injector with a standard 2-203 (0.572 x .139w) Viton injector o-ring as shown in Figure 1).**

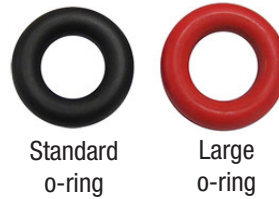


Figure 1 - O-Rings

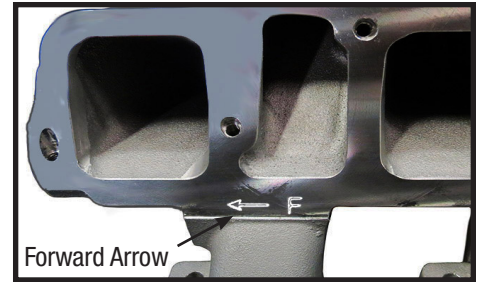


Figure 2 - Forward Arrow on the Flanges

2. Determine the front end of the manifold by locating the forward arrows marked on each side of the manifold flanges as shown in **Figure 2**. This is important as the right rear port is lower than the other ports for cowl clearance. Fully clean the cylinder head intake flanges and lower the manifold base onto the engine with the forward arrows facing towards the front end of the engine. As you position the base of the manifold onto the cylinder heads, connect the injector connectors to the appropriate fuel injectors. **(NOTE: Depending on the wire harness, injection connector extension wires may need to be used to simplify the installation).**
3. Secure the manifold to the cylinder heads by installing ten (10) of the supplied M6 X 45mm hex head bolts and finger tighten. Fully tighten the bolts using a 10mm socket in two steps to 96 inch/lbs. (8 ft/lbs.), following the torque sequence shown in **Figure 3**.

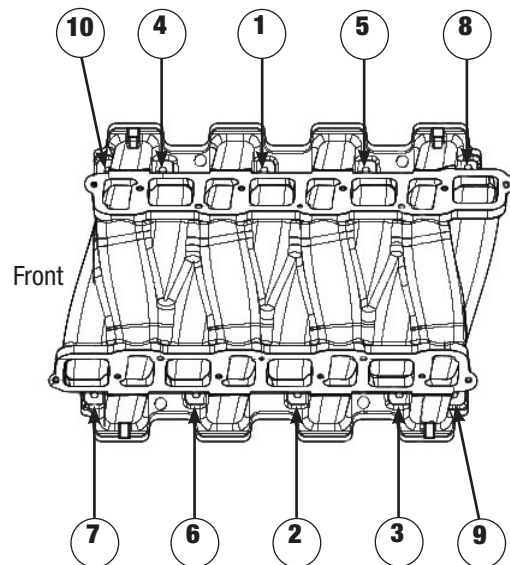


Figure 3 - Intake Manifold Tightening Sequence  
Torque all Bolts to 11 ft/lbs.

### • PLENUM INSTALLATION:

1. Install the four (4) Spring Alignment Dowels to the left and right flanges, (two (2) on each side), in the upper counterbored M6 holes.
2. Due to the right side flange of the manifold having the lower rear port, there is specifically a right side and left side gasket. Install the left and right gaskets over the dowels and ensure that both gaskets line up and are centered with the manifold flanges as shown in **Figure 4**. The gaskets are meant to be used dry with no sealer.

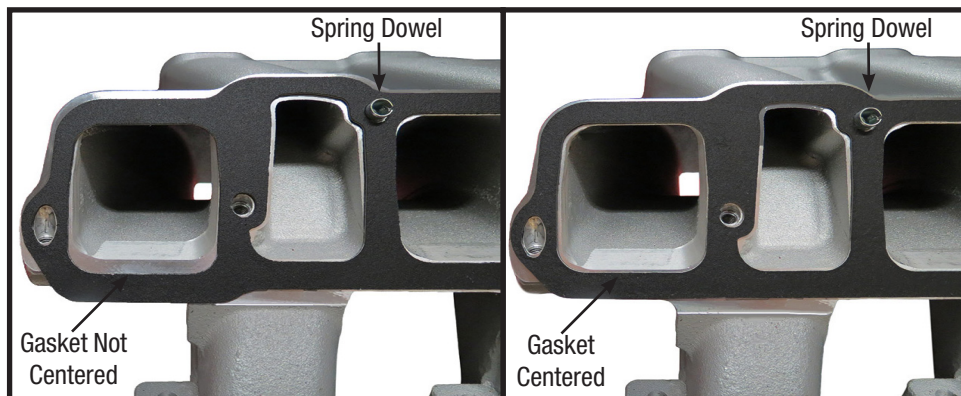
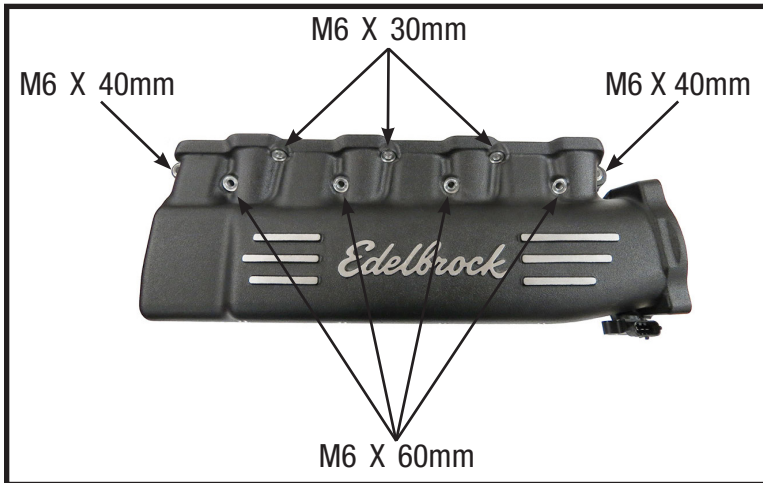
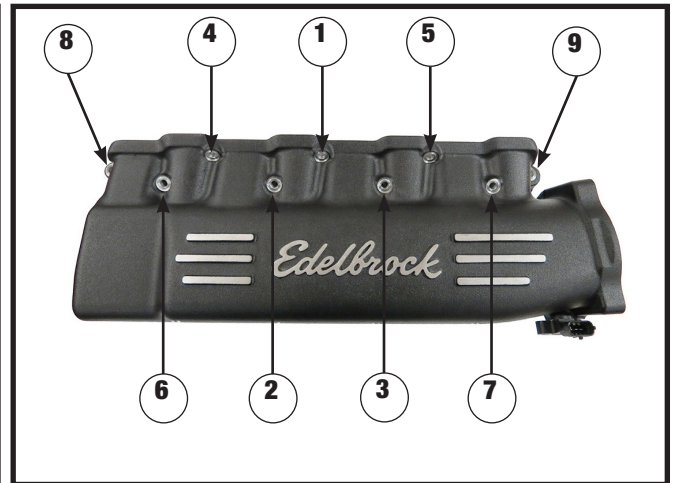


Figure 4 - Gasket Installation

- Secure both plenums to the manifold by installing three (3) of the supplied M6 X 30mm hex flange head bolts onto the top row of holes closest to the flanges, four (4) of the supplied M6 X 60mm hex flange head bolts onto the lower row of holes closest to the plenum, and two (2) of the supplied M6 X 40mm hex flange head bolts onto the ends of each plenum as shown in **Figure 5**. **(NOTE: Finger tighten all of the bolts first and ensure that the plenums are evenly positioned on the manifold before torquing them in place)**. Tighten the bolts in two steps to 10 ft/lbs. following the torque sequence shown in **Figure 6**.

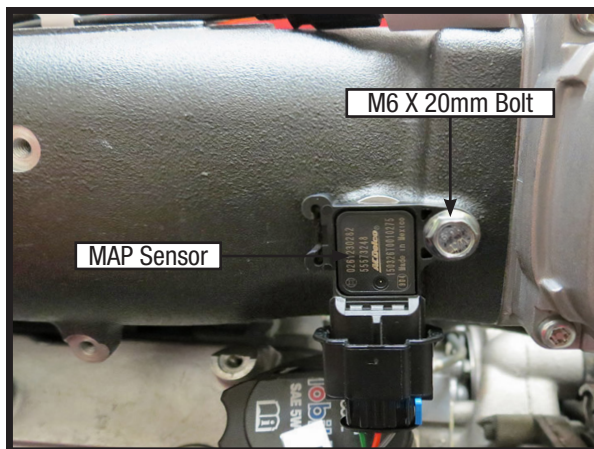


**Figure 5 - Plenum Bolt Placements**

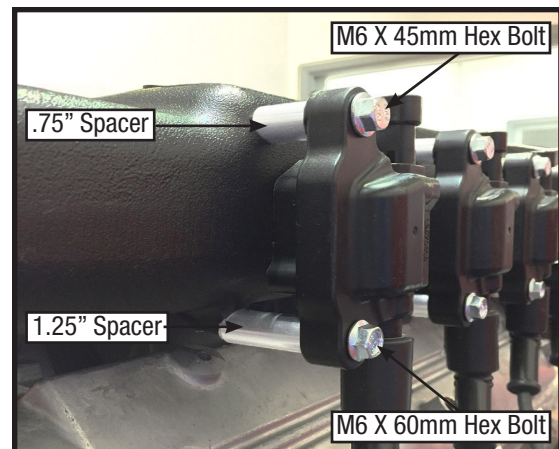


**Figure 6 - Bolt Tightening Sequence**  
Torque all Bolts to 10 ft/lbs.

- Install the factory MAP sensor into the passenger side plenum and secure it using the supplied M6 X 20mm bolt as shown in **Figure 7**.
- To install the coils onto the side of the plenums, use eight (8) of the supplied M6 X 45mm hex bolts and eight (8) of the supplied .75" spacers for the top. For the bottom, install eight (8) of the supplied M6 X 60mm hex bolts and eight (8) of the supplied 1.25" spacers as shown in **Figure 8**. Longer coil wires may be needed to connect securely into the coils. We recommend purchasing GM PN 19351572.



**Figure 7 - MAP Installation**



**Figure 8 - Coil Installation**

• **THROTTLE BODY INSTALLATION:**

- This dual plenum manifold is intended to be used with two (2) 90mm throttle bodies, GM PN 12605109. Using the two (2) supplied throttle body O-Ring gaskets and factory bolts, secure both throttle bodies onto each of the plenum inlets. **(NOTE: It is highly recommended to check hood clearance prior to installation. Clocking of the throttle bodies may be needed for proper hood clearance)**. Consistent results were found with the throttle bodies mounted in either right-side up or upside down positionings.

**Edelbrock LLC • 2700 California St. • Torrance, CA 90503**  
**Tech Line: (800) 416-8628**