



INSTRUCTIONS

FAST® LSX_R™ 102mm Intake Manifold – LS3 Part #s 146102B, 146103B, 146104B

Thank you for choosing FAST® products; we are proud to be your manufacturer of choice. Please read this instruction sheet carefully before beginning installation, and also take a moment to review the included limited warranty information. Contact us toll free at 1.877.334.8355 or at www.fuelairspark.com under Tech Help with any questions.

BEFORE YOU START: OEM LS3 engines, and any application using OEM LS3 fuel rails and LS3 injectors, REQUIRE injector spacer kit #146025-KIT!!!

Warning: Please review the packaging contents to ensure you have all hardware and read the complete instructions, especially the torque specs, before installation. **Safety glasses are required throughout this installation.**

Package Contents

Hardware Included In Packet #CF007-638	
4	M6 x 40mm Socket Head Cap Screws (OEM DBW Throttle Bodies)
1	M4 x 20mm T-20 Torx Head Screw (MAP sensor hold down)
1	2010 Camaro Tensioner Spacer (29mm O.D. 2.75mm thick)
10	M6 x 110mm Socket Head Cap Screws (Bolts manifold to cylinder heads and upper shell)
10	M6 x 16.5mm O.D. x 3.5mm Thick Flat Washer (Manifold to cylinder head bolts)
10	M8 x 30mm Button Head Cap Screws (Replacement OEM valley plate bolts)
2	M6 x 15mm Socket Head Cap Screws (OEM throttle cable attachment)
2	Phillips Head Self Tapping Screw
4	M6 x 12mm Cap Screw Bolts (OEM fuel rail hold down)



FAST®
3400 Democrat Rd.
Memphis, TN 38118
Phone: (901) 260-3278 Fax: (901) 375-3408
www.fuelairspark.com

**Part #FAST4-158
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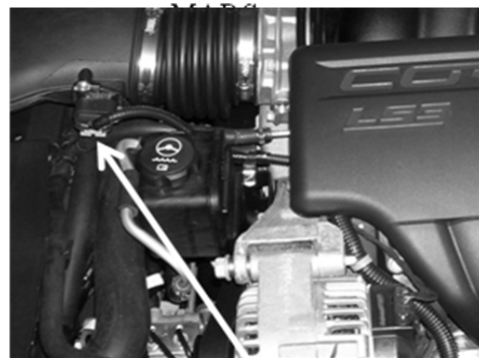


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Hardware Pre-Installed In LSX _R ™ Manifold #146102 / #146102B	
3	M6 x 16mm Socket Head Cap Screws (Rear upper shell hold down)
2	M6 x 40mm Socket Head Cap Screws (Front upper shell hold down)
5	M6 x 10mm Wide x 5mm Tall Hex Nuts (Upper shell hold down)
8	M4 x 20mm T-20 Torx Head Screw (Runner hold down)
8	M4 x 20mm T-20 Torx Head Self-Tapping Screw (LS3 Runner insert hold down)
5	6mm x 12mm O.D. x 1.5mm Thick Flat Washer (Upper shell front and rear hold downs)
2	Phillips Head Self Tapping Screw (Vacuum nipple)
O-Ring Gasket Included In Package	
3	Rubber Bumpers (Bottom of manifold)
1	102mm Seal (Throttle Body)
1	Optional Vacuum Nipple (Passenger side behind throttle body)

Stock Manifold Disassembly:

- 1) Allow engine to cool, disconnect the negative battery cable and remove coil (beauty) covers, if applicable. Relieve fuel pressure by depressing the Schrader valve on the end of the rail. Cover with a towel to absorb lost fuel.
- 2) Clean off any excess dirt and debris around the intake manifold that could become dislodged and fall into your engine during removal.
- 3) Disconnect fuel line from rail by using quick-connect separator tool (J37088-A). Place shop towels around connection to catch additional gasoline.
- 4) Disconnect Manifold Absolute Pressure (MAP) sensor connector located on the intake manifold. Also disconnect the Mass Air Flow (MAF) sensor, located between the air filter and throttle body. Remove the remaining air filter assembly.



MAF Sensor

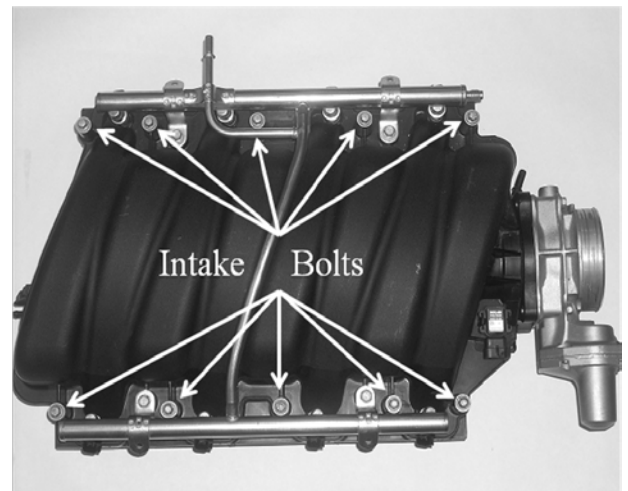


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- 5) Disconnect any PCV hoses or vacuum lines on the intake manifold, including the brake booster hose. Take note of positions for reinstallation.
- 6) Disconnect the electronic throttle body connector.
- 7) Unplug all eight (8) fuel injector harness clips.
- 8) Loosen all ten (10) intake manifold bolts (8mm hex).
- 9) The stock manifold is ready to be removed. Carefully lift the manifold and remove.
- 10) Clean any remaining dirt and debris that may dislodge and enter the engine.
- 11) Cover the open cylinder head ports with a clean, lint-free rag to prevent anything from entering your engine.
- 12) Remove the four (4) fuel rail mounting bolts and the stock fuel rail and injectors as an assembly.



Electronic Throttle Body



Intake Bolts

Required Modifications:

- 1) **IMPORTANT: Replace 10 valley plate bolts with the button head cap screws provided. Torque to 18ft./lbs. Failure to replace these bolts could damage the FAST® manifold.**
- 2) Coolant crossover tube modification and/or replacement may be required, depending on application. Use GM Part #12602544 front only crossover, and two (2) of Part #12602540 plugs, if needed.
- 3) Remove the upper shell from the manifold. Remove the ten (10) intake bolts and set them aside for now. There are also five (5) upper shell hold-down bolts pre-installed, two (2) in the front near the throttle body and three (3) in the rear of the LSXR™ manifold.



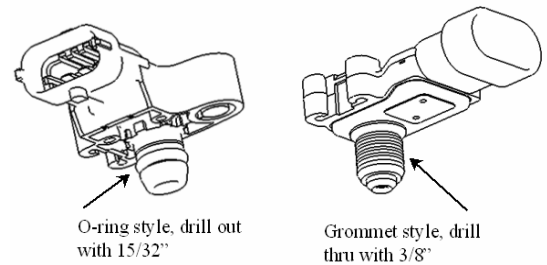
Coolant Crossover Tube



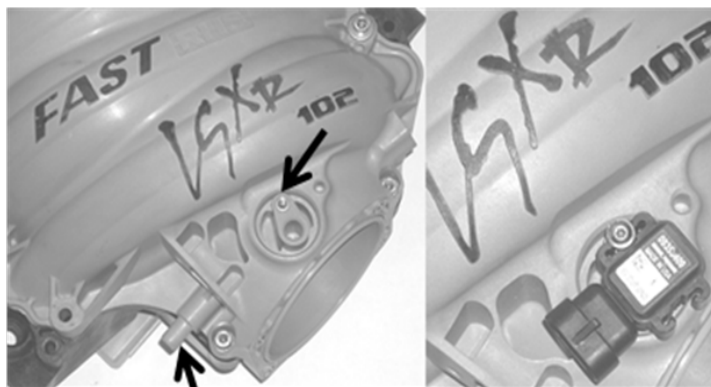
INSTRUCTIONS

- 4) Due to the wide range of applications the LSX_RTM was designed to fit, MAP sensor locations require drilling. There is a front and a rear location provided. Both are intentionally shipped plugged.
- 5) Decide which MAP sensor location will work the best for your application. It will need to be drilled all the way through to allow the MAP sensor to read manifold vacuum. Note that the rear MAP location is located in the lower shell and you must take extra precaution ensuring all debris from drilling is completely removed.

MAP Sensor Identification



- 6) There are two different MAP sensors that can be used. If your MAP is a grommet style, use a 3/8" drill bit to drill through the front MAP port location. If your MAP sensor is O-ring style you must drill out the front MAP sensor location with a 15/32" drill bit.
- 7) A MAP sensor hold-down insert and bolt has been added to the LSX_RTM intake to help hold the MAP sensor in position. The MAP sensor should not be torqued past 19 in./lb., when attaching the MAP sensor to the LSX_RTM intake.
- 8) **Optional:** Your application may have come with a clip on nipple on the passenger side of the intake manifold just behind the throttle body. If so, see the "Optional Vacuum Nipple Installation" section for instructions to install the correct nipple to your FAST LSX_RTM intake.
- 9) Remove all shavings left over from drilling the MAP sensor.



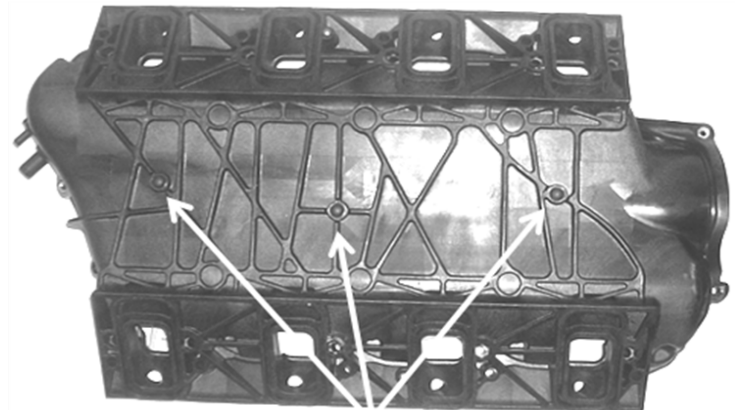
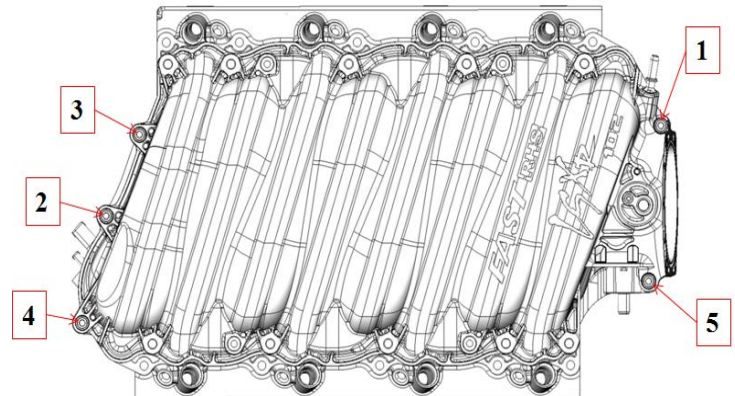
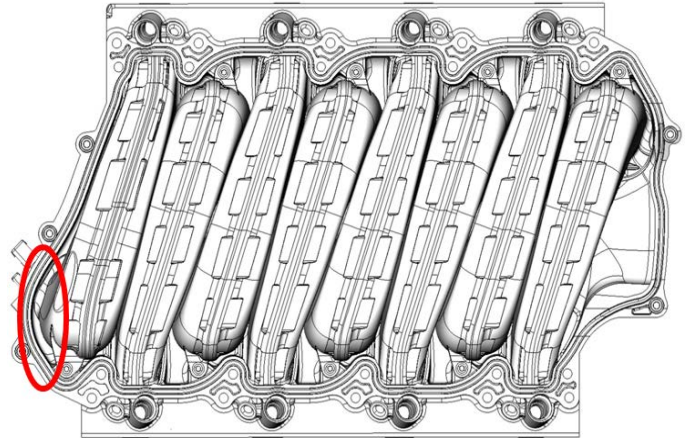
Optional PCV nipple and MAP sensor hold down



INSTRUCTIONS

Before Installation in Vehicle:

1. Before reassembly reapply a small amount of RTV in the rear seal groove to ensure a proper reseal of the manifold.
2. Carefully reinstall the intake upper shell onto the LSXR™ Intake Manifold, making sure the upper lid has seated correctly into the lower shell all the way around. There are five (5) upper shell hold-down bolts, two (2) in the front near the throttle body and three (3) in the rear of the LSXR™. Tighten using medium-strength thread locker in the proper sequence as pictured. Torque upper shell bolts to 70-89in./lbs. These were installed prior to shipping and were removed during upper lid removal. **IMPORTANT: Failure to properly align the upper shell to the lower shell could damage the FAST™ manifold.**
3. Flip the LSXR™ over. There are three circles molded into the base for rubber bumper installation. Because the bumpers are self-adhesive it is important to pre-clean the base of the manifold where the bumpers are to be installed with a cleaner (such as isopropyl alcohol) and allowed to dry. Next, install the three (3) included rubber bumpers to the bottom side of the intake by sticking them onto the clean surface.
4. Inspect the LSXR™ Manifold and ensure that there are not any loose nuts or bolts may fall into your engine.
5. Inspect injector o-rings for damage. The OEM recommends new o-rings after disassembly; however replacement is not necessary if seals are not worn or damaged. Lubricate ALL o-rings with clean engine oil - including injector spacer cup o-rings.

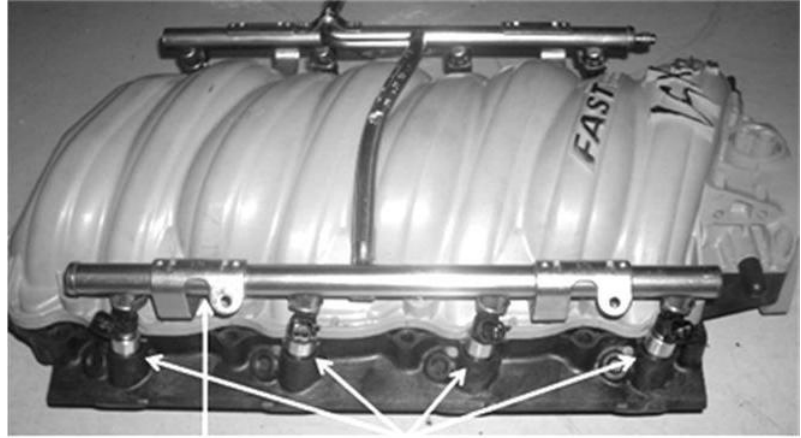


Rubber Bumpers Installed



INSTRUCTIONS

6. Install injector cup adapters with o-rings, Part #146025-KIT, to the bottom of the LS3 injectors.



OEM Type Fuel Rail with Injector Cup Adaptors

7. Install injectors into the LSXR™ manifold. Carefully start all injectors in pockets, then firmly seat one side at a time. **NOTE: Do not reuse the OEM fuel rail hold-down bolts. Be sure to use the four (4) M6 x 12mm button head bolts that are included in the hardware kit.** Add medium-strength thread locker to the four (4) supplied M6 x 12mm fuel rail hold-down bolts and tighten to 70-89in./lbs.

IMPORTANT: Do not reuse OEM fuel rail mounting bolts! Failure to replace these bolts may damage the FAST™ manifold.

8. Install intake port seals. You can reuse your OEM LS3 port seals or use FAST® Part #146003-1 intake port seals (sold separately) if you do not have OEM gaskets or need replacements. Failure to install these seals will cause massive vacuum leaks, causing a rough idle and possibly a dangerously lean condition.
9. Make sure your selected MAP sensor port has been drilled and is all the way through.

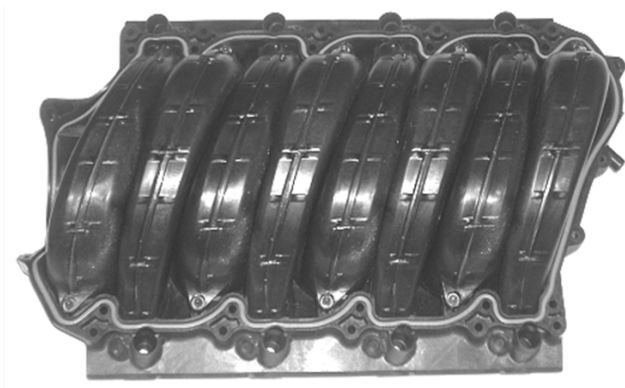
NOTE: If you have a 2010+ Camaro, it requires a small spacer to keep the pulley and the throttle body from contacting. The spacer is included with the hardware package and resembles a large flat washer. Remove the belt using a 15mm wrench. Then remove the tensioner pulley and install the spacer between the pulley and the tensioner assembly. Then reinstall the tensioner pulley and the belt.



INSTRUCTIONS

Individual Runner Removal (Not Required):

- 1) Remove intake from engine if installed.
- 2) Remove the upper shell from intake, being sure to account for any loose hardware, to expose runners.
- 3) Using a T-20 Torx, remove the runner hold down bolt for each individual runner.



Upper Lid Removed with Runners Exposed

Individual Runner Reinstallation:

- 1) To facilitate assembly of the runner tube and to minimize potential damage to the o-ring, apply a light coating of soap-water solution to the o-rings. The soap-water solution can be made by mixing one (1) tablespoon of gentle hand soap in one (1) cup of warm water.
- 2) Identify and install the rear most runner first and work your way to the front, labeled cylinder 7.
- 3) While holding the runner tube into the pocket of the lower manifold with light but firm force, install all eight (8) runners first before installing the M4 bolts. They should be torqued to 19 in./lb. Tightening the screws beyond this can result in stripping of the fastener or damaging of the inserts and is not necessary.
- 4) Thread-locker has been provided on the fasteners. Additional thread-locker should not be necessary but can be reapplied if the thread-locker is removed through repeat installation/removal of the runners.
- 5) For best engine performance the runner tube o-ring should always be used. Should your o-ring require replacement they can be ordered individually- Part #146006-1. They can also be ordered as a set of eight (8)- Part #146006-8.

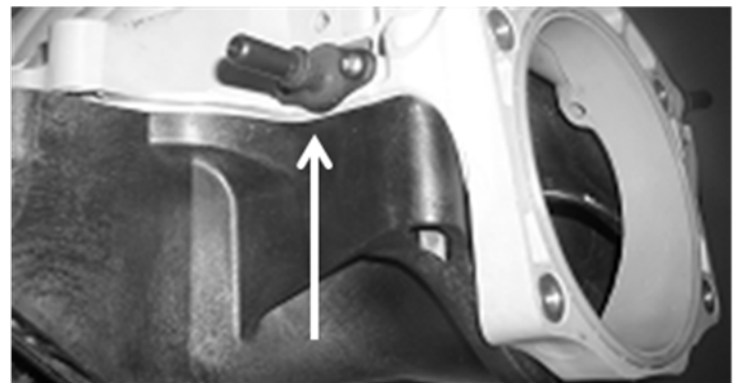
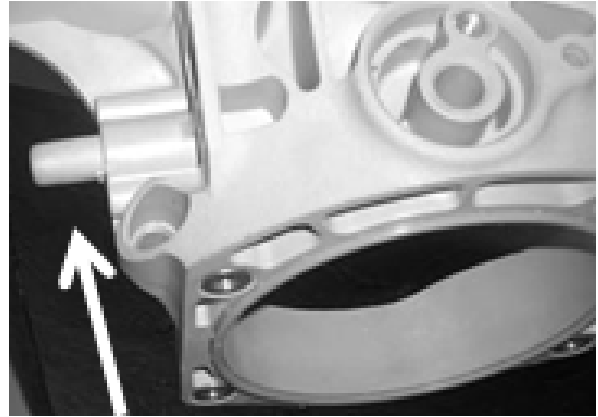
Caution: Do not remove the upper lid to expose the individual runners while the intake is still on the engine. The nuts that were previously installed to hold the upper and lower together may fall into your engine and cause catastrophic engine failure!



INSTRUCTIONS

Optional Vacuum Nipple Installation:

- 1) To install the optional vacuum nipple, make sure the upper lid has been removed from the intake manifold and is away from the engine.
- 2) Remove the existing PCV nipple. Carefully use a hacksaw to remove.
- 3) After cutting off the nipple flush with the base of the manifold, carefully drill out the hole using progressively larger drill bits to avoid damaging the manifold. Start by drilling through with a 5/16" drill bit, followed by 3/8", then 7/16" and finally with a 31/64" (.484"). Clean up all shavings after drilling and make sure to remove any pieces that may still be loosely attached.
- 4) Insert the vacuum nipple and install using the supplied self-tapping Phillips head screws.



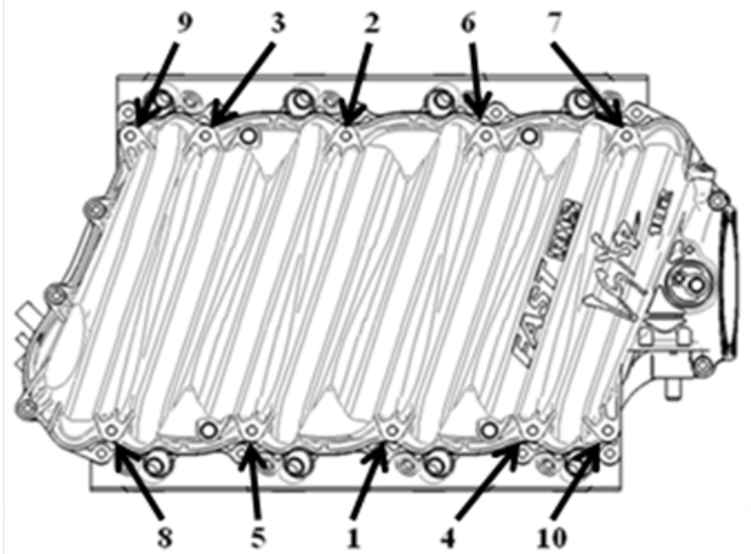


INSTRUCTIONS

Manifold to Engine Assembly:

- 1) Uncover cylinder head ports.
- 2) Place the manifold in valley but do not place all the way rearward. Attach the brake booster hose and push in MAP sensor by sliding in the small vacuum nipple, MAP sensor bolt-down insert threads are also provided with the LSXR™. Reconnect the MAP sensor to the harness.
- 3) Move the manifold into position. **DO NOT SLIDE THE MANIFOLD ON CYLINDER HEAD** because seals could be damaged or become dislodged. Once in correct position the bolt bosses will find counter bores in the cylinder heads.
- 4) Reconnect coolant crossover line hose. Torque crossover pipe bolts to 106 in./lbs.
- 5) Add medium strength thread-lock to all ten (10) intake bolt threads hand-start all ten (10) fasteners. Don't forget the fuel rail stop bracket(s) if required.

- 6) Using two (2) passes in the sequence shown to the right. First pass (45in./lbs.), final pass (70-89in./lbs.). **Caution: Over torquing will damage the manifold and cause improper sealing!**
- 7) Ensure the throttle body seal is installed. Next, install four (4) supplied M6 x 40mm bolts and throttle body, torque to 70-89 in./lbs. **IMPORTANT: Do not reuse your OEM throttle body bolts. Failure to replace these bolts could damage the FAST™ manifold.**



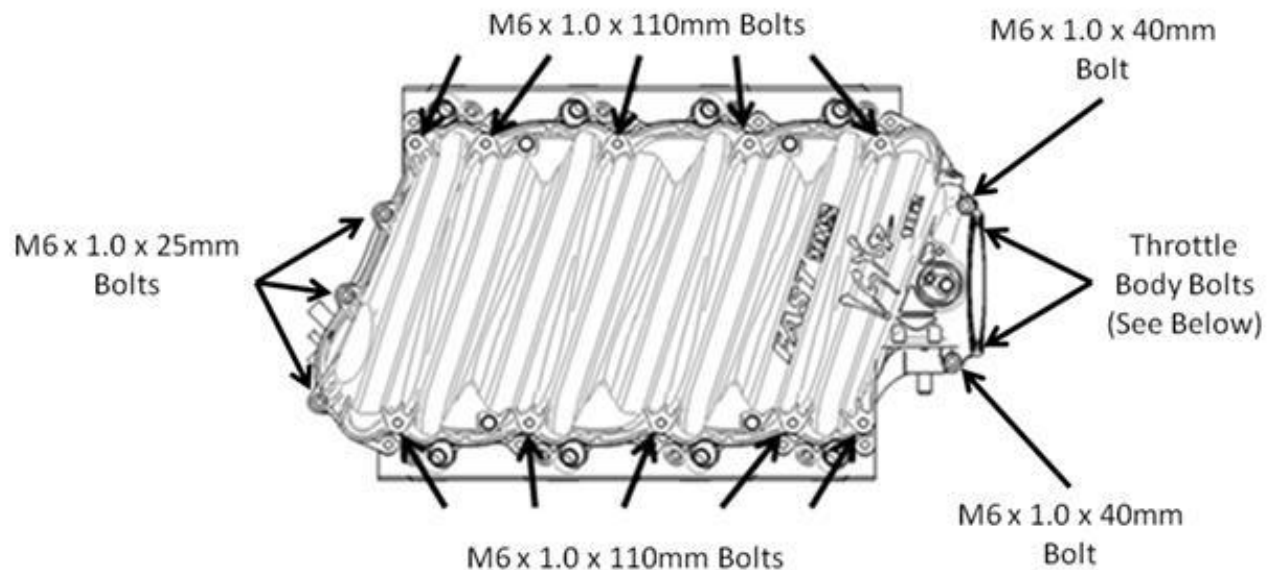
Manifold cylinder head fastener torque sequence for LS3

- 8) Reconnect any PCV hose on the manifold previously removed, reconnect all eight (8) fuel injector wire connectors and finally reconnect the MAF sensor and induction system.
- 9) Add a few drops of clean engine oil to the male end and securely reconnect fuel line to rail.
- 10) Reconnect the battery and check for fuel leaks before starting the engine by cycling the key a few times to build pressure in the fuel system.
- 11) After the engine has started, again recheck for any fuel leaks.



INSTRUCTIONS

FAST 102mm LSXR Intake Manifold Bolt Placement For #146102 (LS3/L92)



Throttle Body Bolts

OEM Drive By Wire 90mm Throttle Body use M6 x 1.0 x 40mm



INSTRUCTIONS

Replacement Parts:

Your FAST® LSX_R™ manifold can be purchased in individual components:

FAST™ Part #	Description	QTY
146001	Lower Shell	1
146053	LS3 Runner Set	8
146000	Upper Shell – 102mm	1
146004	Throttle Body Seal – 102mm	1
146003-1	Cylinder Head Port Seal	1
146003-8	Cylinder Head Port Seals	8
146006-1	Runner Seal	1
146006-8	Runner Seals	8
146006-8	Runner Seals	8

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FAST®
3400 Democrat Rd.
Memphis, TN 38118
Phone: (901) 260-3278 Fax: (901) 375-3408
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FAST® LIMITED LIFETIME WARRANTY AND LIMITED WARRANTY

FAST® warrants that its EZ-EFI™ products are free from defects in material and workmanship for the lifetime of the product. This **Limited Lifetime Warranty** shall cover **only** the original purchaser. All other FAST® products are covered by a **Limited Warranty** which covers defects in material and workmanship for a period of **one year** from the date of purchase.

FAST's obligation under this warranty is limited to the repair or replacement of its product. To make a warranty claim, the part must be returned directly to FAST® at the address listed below with a valid Return Merchant Authorization Number (RMA), freight prepaid. Items covered under warranty will be returned to you freight collect. To obtain an RMA, call 877-334-8355 to report the issue you are experiencing. At that time, FAST® will attempt to trouble shoot your issue.

It is the responsibility of the installer to ensure that all of the components are correct before installation. We assume no liability for any errors made in tolerances, component selection or installation.

There is absolutely no warranty on the following:

- A. Any parts used in racing applications or subject to excessive wear;**
- B. Any product used in marine applications, unless that product is listed by FAST™ as a specific marine product;**
- C. Any product that has been physically altered improperly installed or maintained;**
- D. Any product used in improper applications, abused, or not used in conjunction with the proper parts.**

There are no implied warranties of merchantability or fitness for a particular purpose. There are no warranties which extend beyond the description of the face hereof. **FAST® will not be responsible for incidental and consequential damages, property damage or personal injury damages.** Where required by law, implied warranties or merchantability and fitness are limited to terms outline above.

This warranty gives you specific legal rights and you may also have other legal rights which vary from state to state.



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