**FAST™ LSXRTM 102mm Intake Manifold**
**Part #146202 LS7**

**Warning:** Please review the packaging contents listed on page 11 to ensure you have all hardware and read the complete instructions, especially the torque specs on pages 8-9, before installation.

**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) Unplug MAF and MAP connectors and remove air cleaner assembly.

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.
Stock Manifold Disassembly (continued):

7) Unplug all 8 fuel injectors.

8) Loosen all 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 remove the stock fuel rail and injectors as an assembly.

13) Remove injector clips using a screw driver to gently pry them off.

14) Remove injectors from the fuel rail, remembering the fuel rail is still full of fuel. Take precautions to contain the excess fuel that will leak out. Rubber gloves and safety glasses are required.
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 lines modification and/or replacement may be required depending on application, Use GM Part #12602544 front only crossover, and (2) #12602540 plugs if needed.

3) Remove the upper shell from the manifold. Due to the wide range of applications the LSXR™ was designed to fit, MAP sensor locations require drilling. There is a front and a rear location provided. Both are intentionally shipped plugged.

4) The LS7 uses the front MAP sensor location, it will need to be drilled all the way through, to allow the MAP sensor to read manifold vacuum.

5) 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.

6) A MAP sensor hold down insert and bolt has been added to the LSXR intake to help hold MAP sensor tightly in position. The map sensor should not be past 19 in/lb, when attaching the MAP sensor to the LSXR™ intake.

7) Remove all shavings left over from drilling MAP sensor.

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 upon reassembly.

2) You will notice that two of the upper shell bolts are installed for you during shipment. The other eight (8) need to be installed at this time using the supplied M6 x 80mm bolts and nuts. To install, using some soft clean rags, flip the manifold upside down (see picture).
3) Install an M6 x 80mm bolt and matching washer, noting that the washer’s bottom side is flat while the top side is slightly convex. Insert a bolt with washer into an upper shell hold down hole. Next, install the nut in its opening on the lower flange of the manifold near the port seals. At this time the nut should be laying flat on top of the bolt, start turning the bolt by hand to start the threads together. Repeat until all ten (10) upper shell hold down bolts are started. WARNING: It is critical to ensure the upper lid has seated correctly into the lower shell all the way around tightening the upper shell to the lower shell, failure to ensure this step may result in damage to the intake manifold.

4) Flip over the intake and when viewing the bottom side you will see 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 rubber bumpers included to the bottom side of the intake by sticking them onto the clean surface.

5) Flip the LSXR™ back over, and torque the upper shell bolts to 70-89 in/lbs. 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™ using medium strength thread locker and in the proper sequence as pictured. Torque upper shell bolts to 70-89 in/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.

6) Inspect LSXR™ manifold, ensuring there are not any loose nuts or bolts may fall into your engine.

7) Uncover cylinder heads ports.

8) Install injectors into the fuel rail, if using previously used injectors inspect o-rings for damage. The OEM recommends new injector o-rings after disassembly, however replacement is not necessary if seals are not worn or damaged.
Lubricate ALL o-rings with clean engine oil. Reinstall injector clips.

9) Install injector cup adapters, if using OEM type fuel rail kit (Part #146020-KIT), on to LS7 injectors. Lubricate ALL o-rings with clean engine oil.

10) Install injectors into LSXR™ manifold. Carefully start all injectors in pockets, then firmly seat one side at a time. Do not reuse the OEM fuel rail hold down bolts. Be sure to use the four M6 x 12mm button head bolts that are included in the 146020-KIT and torque to 70-89in/lbs. IMPORTANT: Do not reuse OEM fuel rail mounting bolts! Failure to replace these bolts with the ones supplied with FAST™ fuel rail kits may damage the FAST™ manifold.

11) Install intake port seals. Failure to install these seals will cause massive vacuum leaks.

12) Make sure your selected MAP sensor port has been drilled and is all the way through.

NOTE: It is not recommended that port adaptor and screw be removed from the intake assembly. If removed torque to 8-9 in/lbs. The port adaptor screw can strip easily and that is why removal is not recommended.
INSTRUCTIONS

Throttle Body Options:

1) GM 90mm ETC throttle bodies (electronic throttle – OEM on LS3, L76, and LS7 and most newer vehicles)

2) FAST™ 92mm Throttle Bodies (cable drive ONLY, custom applications only)
   - Part #54092 (92mm throttle body)
   - Part #54095 (92mm throttle body with TPS)
   *We also offer IAC sensors if needed, Part #307059

3) FAST™ 102mm Throttle Bodies (cable drive ONLY, custom applications only)
   - Part #54102 (102mm throttle body)
   - Part #54103 (102mm throttle body with TPS)
   *We also offer IAC sensors if needed, Part #307059

NOTE: FAST™ 92mm and 102mm Throttle Bodies will NOT work on the LS7, or any engine with electronic throttle control, installed from the factory. Removal of the drive-by-wire throttle body will disable the engine via the ECU.
Fuel Rail Options:

1) FAST™ billet fuel rail kit for LS7 fuel injectors, includes FAST™ billet fuel rails, mounting brackets, and AN fittings. Part #146027-KIT

2) FAST™ OEM-type fuel rail kit for LS7 fuel injectors, includes OEM type LS3 fuel rail, bolts, FAST™ injector cup adapters and necessary o-rings. Part #146020-KIT
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.

Individual Runner Reinstallation:

1) To facilitate assembly of the runner tube and to minimize potential damage to the o-ring, the customer should apply a light coating of soap-water solution to the o-rings. The soap water solution can be made with 1 tablespoon of gentle hand soap in 1 cup of warm water which should be mixed well.

2) Install the rear most runner first and work your way to the front.

3) While holding the runner tube into the pocket of the lower manifold with light but firm force to install the runner into the pocket, the M4 screws 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, these can be ordered individually (Part #146006-1). They can also be ordered as a set of eight (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 can fall into your engine and cause catastrophic engine failure!
**Manifold to Engine Assembly:**

1) Reconnect coolant crossover line hose. Torque crossover pipe bolts to 106 in/lbs.

2) Place manifold in valley but do not place all the way rearward. Attach brake booster hose, push in MAP sensor by sliding in small vacuum nipple, MAP sensor bolt down insert threads are also provided with the LSXR™. Reconnect MAP sensor to harness.

3) Move manifold into position. **DO NOT SLIDE MANIFOLD ON CYLINDER HEAD** because seals could be damaged or become dislodged. Once in correct position, the bolt bosses will find counter bores in cylinder heads.

4) Add medium strength thread lock to all (10) intake bolt threads hand start all (10) fasteners. Don’t forget the fuel rail stop bracket(s), if required.

5) Using two passes in the sequence shown below. First pass (45in/lbs), final pass (89in/lbs). **Caution:** Over-torquing will damage the manifold and cause improper sealing!

6) Ensure throttle body seal is installed. Next, install supplied four (4) 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 as listed in this step could damage the FAST™ manifold.

7) Reconnect any PCV hose on manifold previously removed, reconnect all 8 fuel injector wire connectors, finally reconnect MAF sensor and induction system.

8) Add a few drops of clean engine oil to the male end and securely reconnect fuel line to rail.

9) 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.

10) After the engine has started, again recheck for any fuel leaks.
FAST 102mm LSXR Intake Manifold Bolt Placement For #146202 (LS7)

- M6 x 1.0 x 80mm Bolts
- M6 x 1.0 x 40mm Bolt
- M6 x 1.0 x 25mm Bolts
- Throttle Body Bolts (See Below)

**Throttle Body Bolts**

FAST 102mm or 92mm Throttle Body use M6 x 1.0 x 22mm
OEM Drive By Wire 90mm Throttle Body use M6 x 1.0 x 40mm
Optional Modifications:

Your FAST™ LSX_R™ Manifold can be purchased in individual components:

<table>
<thead>
<tr>
<th>FAST™ (Part #)</th>
<th>Description</th>
<th>QTY</th>
</tr>
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<tbody>
<tr>
<td>146201</td>
<td>Lower Shell</td>
<td>1</td>
</tr>
<tr>
<td>146253</td>
<td>LS7 Runner Set</td>
<td>8</td>
</tr>
<tr>
<td>146000</td>
<td>Upper Shell – 102mm</td>
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</tr>
<tr>
<td>146004</td>
<td>Throttle Body Seal – 102mm</td>
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<tr>
<td>146203-1</td>
<td>Cylinder Head Port Seal</td>
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</tr>
<tr>
<td>146203-8</td>
<td>Cylinder Head Port Seals</td>
<td>8</td>
</tr>
<tr>
<td>146006-1</td>
<td>Runner Seal</td>
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<tr>
<td>146006-8</td>
<td>Runner Seals</td>
<td>8</td>
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<tr>
<td>54092</td>
<td>FAST™ 92mm Billet Throttle Body (Non ETC)</td>
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<tr>
<td>54193</td>
<td>FAST™ 102mm Billet Throttle Body w/ TPS (Non ETC)</td>
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<td>54102</td>
<td>FAST™ 102mm Billet Throttle Body (Non ETC)</td>
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</tr>
<tr>
<td>54103</td>
<td>FAST™ 102mm Billet Throttle Body w/TPS (Non ETC)</td>
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The LSX_R™ has the capabilities for the following performance modifications:

1) The intake manifold runners can be REMOVED and ported, or port matched, by removing material near the port. PORTING IS NOT REQUIRED and should be done by professionals only.

2) **CAUTION:** Improper porting can permanently destroy the intake lower shell, runners, or both.

3) Nitrous boss can be tapped. 1/8” NPT max.
Package Contents

<table>
<thead>
<tr>
<th>Hardware Included In Packet #CF007-711</th>
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<tbody>
<tr>
<td>2 M6 x 15mm Socket Head Cap Screws (Throttle cable bracket)</td>
</tr>
<tr>
<td>4 M6 x 40mm Socket Head Cap Screws (OEM DBW Throttle Bodies)</td>
</tr>
<tr>
<td>1 M4 x 20mm T-20 Torx head screw (MAP sensor hold down)</td>
</tr>
<tr>
<td>10 M6 x 10mm Wide x 5mm Tall Hex Nuts (Upper shell hold down)</td>
</tr>
<tr>
<td>18 M6 x 80mm Socket Head Cap Screws (Bolts manifold to cylinder heads and upper shell)</td>
</tr>
<tr>
<td>18 M6 x 16.5mm O.D. x 3.5mm Thick Flat Washer (Manifold to cylinder head bolts)</td>
</tr>
<tr>
<td>10 M8 x 30mm Button Head Cap Screws (Replacement OEM valley plate bolts)</td>
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<table>
<thead>
<tr>
<th>Hardware Pre-Installed In LSXR™ Manifold #146202</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 M6 x 16mm Socket Head Cap Screws (Rear upper shell hold down)</td>
</tr>
<tr>
<td>2 M6 x 40mm Socket Head Cap Screws (Front upper shell hold down)</td>
</tr>
<tr>
<td>2 M6 x 10mm Wide x 5mm Tall Hex Nuts (Upper shell hold down)</td>
</tr>
<tr>
<td>2 M6 x 80mm Socket Head Cap Screws (Bolts manifold to cylinder heads and upper shell)</td>
</tr>
<tr>
<td>8 M4 x 20mm T-20 Torx head screw (Runner hold down)</td>
</tr>
<tr>
<td>2 M6 x 16.5mm O.D. x 3.5mm Thick Flat Washer (Manifold to cylinder head bolts)</td>
</tr>
<tr>
<td>8 M4 x 10mm T-20 Torx head self tapping screw (LS7 Runner insert hold down)</td>
</tr>
<tr>
<td>5 6mm x 12mm O.D. x 1.5mm Thick Flat Washer (Upper shell front and rear hold downs)</td>
</tr>
<tr>
<td>2 Phillips head self tapping screw (Vacuum nipple)</td>
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<table>
<thead>
<tr>
<th>O-Ring Gasket Included in Package</th>
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<tbody>
<tr>
<td>8 Port Seals (Intake to cylinder head)</td>
</tr>
<tr>
<td>1 102mm seal (Throttle Body)</td>
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Limited Warranty

FAST, Inc. warrants that all of its products are free from defects in material and workmanship for a period of 1 year from the date of purchase. This limited warranty shall cover the original purchaser.

FAST, Inc.’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 within 1 year of purchase to the address listed below, freight prepaid. Items covered under warranty will be returned to you freight collect. 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:

• Any parts used in racing applications.

• Any product that has been physically altered, improperly installed or maintained.

• Any product used in improper applications, abused, or not used in conjunction with the proper parts.

• Damage due to excessive manifold pressure, i.e. nitrous backfires, engine misfire, etc.

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, Inc. will not be responsible for incidental and consequential damages, property damage or personal injury damages to the extent permitted by law. Where required by law, implied warranties or merchantability and fitness are limited to a term of 1 year from the date of original purchase.

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