



LS SERIES CYLINDER HEADS
Pro Port LS3 #77339, 77349 (LSX Block)
Pro Port LS7 #77369, 77379 (LSX Block)
INSTALLATION INSTRUCTIONS

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 performing this installation, it is recommended to have the installation completed by a qualified mechanic. 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.

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.

DESCRIPTION: Pro-Port LS3 and LS7 heads are designed as stock replacements with small ports and thick port walls to allow head porters more flexibility in port design than possible with stock castings.

IMPORTANT NOTES: READ BEFORE BEGINNING INSTALLATION!

For a successful installation, these heads require several specialized components. To complete your installation, you will need the following items:

- Head Gaskets: Use appropriate MLS head gaskets for LS3/7 and LSX heads.
- Intake Manifold Gaskets: Stock type intake manifold o-ring seals; GM #19256623 for LS3 intake manifolds.
- Exhaust gaskets: Fel-Pro #1440 or equivalent.
- Head Bolts/Studs: High performance head studs/bolts with hardened washers must be used for the primary head bolt locations; the additional LSX provisions will require 8mm x 1.25 studs and/or bolts. These can be special ordered through ARP.
- Valve Covers: Stock.
- Valve Cover Gaskets: Stock.
- Valves: The valve guides supplied are sized for stock 8mm stem valves. Reaming guides to the desired tolerance will be required prior to installation.
- Spark Plugs: 14mm x 3/4" reach x 5/8" hex, gasketed seal (heat range to be determined by specific application).
- Pistons: Check with your preferred piston manufacturer for specific recommendations.

CHECKING ENGINE CLEARANCES: As with any competition engine build, it is highly recommended that valve-to-piston clearances are checked prior to installation and corrected to minimum specs, if necessary. Minimum intake valve clearance should be .080". Minimum exhaust valve clearance should be .110". The point of minimum intake valve to piston clearance will usually occur somewhere between 5° and 20° After Top Dead Center during valve overlap. The point of minimum exhaust valve to piston clearance will usually occur 20° to 5° Before Top Dead Center during valve overlap. Some pistons may require notching depending upon the valves selected for your application. Also make sure that there is adequate clearance between the valves and the cylinder wall, as well as the rocker arms to the valve cover and the rocker arm to the valve cover rail.

REQUIRED MACHINE WORK: The intake and exhaust ports as supplied are deliberately undersized to allow sizing and shaping to the preference of the head porter. The valve seat provisions are also undersized and can be machined out to accept a maximum valve size of 2.165" (LS3) or 2.200" (LS7) on the intake and 1.60" (both) on the exhaust (Note that these values represent individual maximums, those sizes cannot be used together on the same head). The valve seats can be sunk into the head by up to .250" in order to increase chamber volume. The valve guide bores have already been finished to .500" and the supplied guides simply need to be installed.

COOLING REQUIREMENTS: All stock water passages are accommodated.

ACCESSORIES

• **HEAD BOLTS OR STUDS:** High quality M11 and M8 head studs or head bolts with hardened washers must be used to prevent galling of the aluminum bolt bosses. Bolt threads, underside of bolt heads, and washers should be lubricated with an oil/moly mix prior to installation and torquing. Apply liquid Teflon PST or suitable thread sealant on any bolt threads that go into coolant passages. Because factory bolts are a torque-to-yield type fastener, the stock head bolts **CANNOT** be re-used.

NOTE: LSX heads have provisions for eight (8) auxiliary fasteners per head. These provisions are located adjacent to each exhaust port and directly below each intake port. The LSX block has been tapped for 8mm x 1.25 threads on the exhaust side, while the intake holes are smooth and must be accessed from the engine valley. For ease of installation, Edelbrock recommends threading studs into the provisions on the intake side of the cylinder head before installing them on the block. Apply red Loctite to the exposed threads, then install washers and lock nuts.

• **ROCKER ARMS AND VALVE TRAIN:** These cylinder heads are designed to use the stock rocker arms or aftermarket replacement rocker arms designed for the Gen III and Gen IV engines. **Aftermarket stud & guideplate rocker arm conversions require machine work to the rocker stud pad for proper guideplate placement.** Due to the larger intake port designs possible on these heads, the factory rocker bolts may need to be shortened, or you may use aftermarket rocker bolts.

- **GASKETS:** Any head gasket designed for use with the Gen III/IV engine family will work with these cylinder heads. GM #19170419 or equivalent will allow the use of the additional head bolts on the LSX blocks.

- **PISTONS:** Valve geometry is all stock on these heads so any factory or aftermarket piston will work if compatible with LS3 heads in the case of 77339 and 77349 or with LS7 heads in the case of 77369 and 77379.

- **INTAKE MANIFOLD:** Cylinder Heads will accept stock intake manifolds, as well as Edelbrock's Super Victor Carbureted manifold for 4500 series carbs #2821, Super Victor Carbureted manifold for 4150 series carbs #2826, Super Victor EFI manifold for 4500 style throttle bodies #28215, or Super Victor EFI manifold for 4150 style throttle bodies #28265, (EFI manifolds requires fuel rail kit #3638, #3629 or equivalent). Use stock type LS3 individual port o-ring seals (GM 19256623).

- **EXHAUST HEADERS:** For optimum performance, exhaust headers and a low restriction exhaust system are highly recommended for use with these Edelbrock Cylinder Heads. Edelbrock #6962 exhaust gaskets are recommended for this application.

- **SPARK PLUGS:** Use 14mm x 3/4" reach gasketed spark plugs with a 5/8" hex. Heat range for competition engines will vary by application. Use anti-seize compound on the plug threads to prevent galling in the cylinder head, and torque to the spark plug manufacturer's specification for aluminum heads; usually 10 ft./lbs. **DO NOT OVER TIGHTEN.**

- **VALVES AND VALVE SPRINGS:** All stock valve sizes and lengths are compatible with these heads. Valve spring seats are 1.360" diameter and can be machined larger though Edelbrock does not recommend it.

INSTALLATION: Installation is the same as for original equipment cylinder heads. Consult a factory service manual for specific procedures, if necessary. Factory manuals can be purchased direct from Helm® at: www.helminc.com. Be sure that the surface of the block and the surface of the head are thoroughly cleaned to remove any oily film before installation. Use alcohol or lacquer thinner on a lint-free rag to clean.

NOTE: Be VERY careful to remove any coolant or other fluids that may be in the cylinder head bolt holes in the block. These bolt holes are sealed at the bottom, and any fluid trapped in the holes will cause the block to crack when torquing down the bolts.

This must be done on the top rows of the block (A1-A5 - See Fig 1) as oil will be present once the factory cylinder heads have been removed. Make sure to remove all oil from these bolt holes before installing the new heads.

When using the GM factory head bolts, be sure to replace all of the bolts with new bolts, and to follow the factory recommended installation procedures. The factory bolts and installation procedures do not call for the use of oil or any lubricant on the threads. When using aftermarket bolts or studs, follow the manufacturer's recommended torque specifications **(See Figure 1 for factory tightening sequence)**.

NOTE: A Torque Angle Gauge is required for proper installation. Torque to yield fasteners are not designed to be re-torqued after installation.

Figure 1 - Cylinder Head Bolt Torque Sequence

(Edelbrock and ARP head bolts only. Refer to manufacturer's recommendation if using different head bolts.)

Standard LS Blocks

(Four Bolts/Studs Per Cylinder)

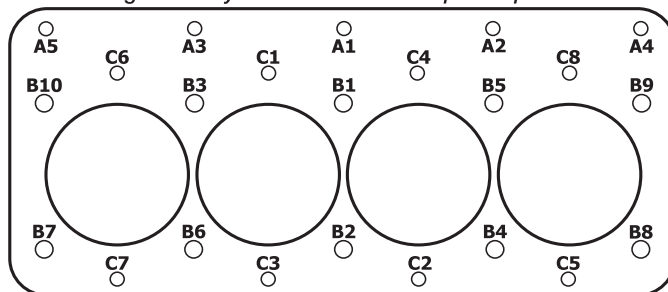
- First Pass:** Torque M11 bolts (B1-B10) in sequence, to 25 ft./lbs.
- Second Pass:** Torque M11 bolts (B1-B10) in sequence, to 45 ft./lbs.
- Final Pass:** Torque M11 bolts (B1-B10) in sequence, to 75 ft./lbs.
Torque M8 bolts (A1-A5) in sequence shown to 25 ft./lbs.

LSX Blocks

(Six Bolts/Studs Per Cylinder)

- First Pass:** Torque M11 bolts (B1-B10) in sequence, to 25 ft./lbs.
- Second Pass:** Torque M11 bolts (B1-B10) in sequence, to 45 ft./lbs.
- Final Pass:** Torque M11 bolts (B1-B10) in sequence, to 75 ft./lbs.
Torque M8 bolts (C1-C8) in sequence shown to 25 ft./lbs.
Torque M8 bolts (A1-A5) in sequence shown to 25 ft./lbs.

Figure 1 - Cylinder Head Bolt Torque Sequence



(EXHAUST PORT SIDE)

A Standard LS	8mm	Bolt/Stud
B Standard LS	11mm	Bolt/Stud
C LSX Only	8mm	Bolt/Stud