



GenX® 255/280 HD/XD Aluminum Cylinder Heads

GM LS3 and Other LS Engines with 4.000"+ Bore

Thank you for purchasing Trick Flow GenX HD and XD aluminum cylinder heads designed for LS engines with a 4.000"+ bore.

Please follow the steps outlined in this instruction manual to ensure that the installation of your new cylinder heads is done correctly and that they perform according to design.

Please read all the enclosed information before beginning any work. If you have any questions regarding installation or the written materials supplied with your new heads, contact the Trick Flow technical department at 1-330-630-1555 for assistance, Monday through Friday from 9:00am to 5:00pm EST.

Tuning

LS3 HD and XD cylinder heads are intended for power adder and high horsepower N/A applications. For reference naturally aspirated LS3 on the dyno will take around 26 degrees of timing. We recommend starting around 23 degrees and slowly adding timing until ET or horsepower drops off, then back it down another degree to ensure there's no detonation. Less timing may be required for different applications. Improper tuning and valve float are the leading cause of cylinder head component damage.

Valves and Valve Springs

This cylinder head utilizes custom Manley Severe Duty intake valves. For exhaust valves, XD head use Extreme Duty Inconel and HD heads use Severe Duty SS. These all have high Ultimate Tensile and Fatigue Strength in high temperature environments. While these valves are made for power adder applications, proper tuning is still a key factor to ensuring extended life of these valves. Please note the specifications of the included springs and contact your cam manufacturer to ensure they fit your application.

Standard Springs (TFS-16306-16):

Cam Type: Hydraulic Roller
Diameter: Ø1.275 Dual
Seat Pressure: 150 lb @ 1.800
Spring Rate: 450 lb/in
Max Lift: .650"

Valve Options:

XD Exhaust: Ø1.600" – **TFS-32600213** (Manley XH-432)
Intake: Ø2.165" – **TFS-32600214** (Manley NK-844)
HD Exhaust: Ø1.600" – **TFS-32600215** (Manley XH-428)

Valve Guide Clearance

Intake and exhaust guide clearances are set from Trick Flow for the specific guide material and most applications. On more severe applications with power adders, looser guide clearances may be required.

Pushrod Length

It is required that pushrod length is checked. We do not recommend a specific length as every combination will be slightly different. Please visit TrickFlow.com to order a pushrod length checker.

Length Checker: **TFS-9507**

Pushrod Diameter

It is recommended to step up to a 3/8" diameter pushrod on higher spring pressures and high RPM to minimize deflection.

Port Matching

Port matching your intake manifold to the heads is a common step required when building your engine. *Do not use a gasket to port match* as you are almost guaranteed to get some mismatch when you're done grinding.

Porting

There's a lot of time spent in port development at Trick Flow, and we do not recommend porting or changing valve sizes as the entire package has been optimized on the flow bench and on the dyno. If you wish to change these heads, this will be done entirely at your own risk. Modifying these ports can result in a loss of performance and a chance of breaking through a pushrod hole or water jacket.

Pistons

If utilizing a Trick Flow camshaft, the valves *should* clear an OEM piston. However, these heads will require a special piston for high lift cams due to the valve angle and location being shifted from stock.

We still recommend checking piston to valve and piston to head regardless of the combination!

Valve Seats

We use high quality, heat treated ductile iron seats that are designed for longevity in applications using unleaded and leaded gasolines as well as E85 and methanol. For E85 and methanol applications, we recommend fogging the engine at the end of each race day to ensure the seats have a good coating of lubrication.

Head Gaskets

Use a good quality gasket from Trick Flow or Cometic with the proper bore size and thickness for your application. Head gaskets typically have smaller water holes than the block and/or head, so there is nothing to worry about if that is the case. The deck surface of our cylinder heads exceeds the surface finish required for a good MLS gasket. It is fine for the bore diameter of the head gasket to be larger than the bore diameter of the block.

4.125" Bore (Left): **TFS-30694125L051**

4.125" Bore (Right): **TFS-30694125R051**

4.180" Bore (Left): **TFS-30694180L051**

4.180" Bore (Right): **TFS-30694180R051**

Intake Gaskets

If your intake manifold does not utilize o-rings, use a good quality Fel-Pro intake gasket such as **Fel-Pro 12222**. When installing the gasket, make sure it fits around the port.

Exhaust Gaskets

Use **General Motors 12558573** or **Fel-Pro MS 92467** exhaust gaskets for all LS3 280 heads.

Valve Cover Gaskets

Use **Fel-Pro VS 50504 R** rubber gasket or equivalent.

Valve Cover

Any cast or billet LS valve cover should work with these cylinder heads. If more clearance is needed, we offer a 1/2" thick valve cover spacer **TFS-3060800**.

Headers

6-bolt cylinder heads do not fit 2010 and later Chevrolet Camaro OEM exhaust manifolds. Aftermarket headers are recommended. For optimum performance, we recommend 1-7/8" primary tube headers.

Cylinder Head Fastener Selection

High quality head bolts or studs are required for these cylinder heads. A hardened washer must be used to ensure proper torque and prevent damage to the head. We recommend using head studs if a power adder is being utilized. These heads are drilled for standard LS M11 and M8 fasteners. These heads can be drilled for larger studs with a maximum drill diameter of Ø0.534 for the 10 larger studs and Ø0.400 for the 4 outer row studs. **Holes must be drilled straight using a fixture, knee mill, or a CNC mill.** Recommendations below for non-LS9 applications. Some kits may require backing studs out 1-1.5 turns for good stud/nut engagement.

M11 Head Bolts: **ARP-134-3610 (4 Bolt)**

M11 Head Studs (STD): **ARP-234-4317 (4 Bolt)**

M11 Head Studs (High Boost): **ARP-234-4314 (4 Bolt)**

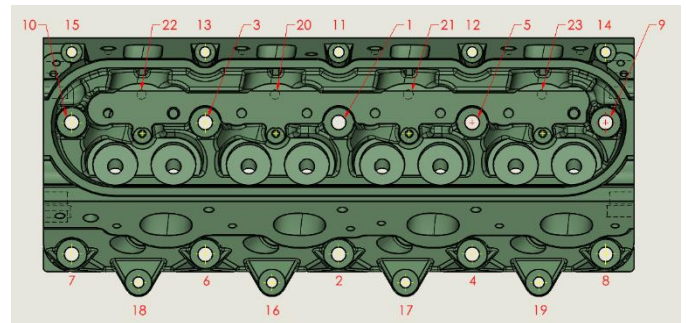
Studs (LSX Block): **ARP-234-4319 (6 Bolt)**

Studs (Dart LS Next Block): **ARP-234-4341 (6 Bolt)**

1/2" Head Studs: **Tick Perf. TPHSKG4**

Cylinder Head Fastener Torque

We recommend using the fastener manufacturer's instructions to determine the proper lubrication and torque. With there being so many various grades and sizes of bolts and studs for an LS, we will not provide any specifications here.



Spark Plugs

Specs: **14mm – .750" Reach – Gasketed – 5/8" Hex or**

14mm – .708" Reach – Tapered – 5/8" Hex

We recommend contacting your spark plug manufacturer for specific recommendations for your application. Below is our general guide to get started. There are many factors that can change which heat range to use.

Naturally Aspirated

Race, low compression **NGK 5671A-8**

Nitrous or Forced Induction

Start with a colder plug than naturally aspirated; this will typically be an **NGK 5671A-9** or **NGK 5671A-10**.

Rocker System

Do not torque or remove rocker arm bolts while the cam is at any lift. The lifter must be on base circle to prevent pulling the rocker arm threads out of the casting.

Stock Rockers:

Only use Trick Flow **TFS-326LS3** rocker stands on TFS LS3 280 cylinder heads. The rocker pad location and valve spacing is different from stock GM LS3 heads, therefore a stock stand will not work. These heads and rocker stands were designed to be used with OEM LS3 1.7 ratio rocker arms that have a trunnion upgrade kit installed.

Exhaust Rocker: **Chevrolet Perf. 12681275**

Intake Rocker: **Chevrolet Perf. 12696105**

Trunnion Upgrade: **Summit SME-143002**

CMD #3 on the pushrod tips and valve tips. The cylinder head side of the rocker arm fasteners will need thread sealer. Torque ARP studs to **25 ft-lbs with ARP lube** or stock GM rocker bolts to **22 ft-lbs**.

Rocker Bolts: **AC Delco 12560961**

Rocker Studs: **ARP 234-7207**

Note: It is very common to get a spiral pattern on the tip of the valve when using stock rockers on a new build. Do not be alarmed if you see this unless there are indentations in the valve.

Roller Rockers:

Always ensure there is proper clearance between the retainer/spring and the rocker arm. We would recommend a minimum clearance of **0.015"**. Upon installation, place CMD #3 on the pushrod tips and oil on the valve tips.

Shaft Rockers: **Scorpion SCP3612**

Jesel KPS-459187

T&D 20048

Pre-lubing the Valvetrain

It is highly recommended to use a good high-pressure lube such as CMD #3 on the pushrod tips and lubricant on the valve tip (see Rocker Arm section for details) prior to priming and firing the engine.

Intake Manifold

We highly recommend using a Trick Flow, Holley, or Summit Racing intake manifold depending on your specific combination.

Carbureted:

Trick Flow R-Series **TFS-32600111**

Fuel Injected:

Trick Flow R-Series **TFS-32600112**

Holley Hi-Ram **300-117**

Holley Lo-Ram **300-679**

Cylinder Head Specs

Head Material: A356-T61 Aluminum

Treatment: XD heads are HIP'd

Intake Port Location: Stock LS3

Intake Valve Angle: 12°

Intake Valve: 2.165" x 8mm

TFS-32600214

Intake Port Dimension: 2.550" x 1.250

Exhaust Port Location: Stock

Exhaust Valve Angle: 12°

Exhaust Valve: 1.600" x 8mm

TFS-32600213 (XD Inconel)

TFS-32600215 (HD SS)

Exhaust Port Dimension: 1.460" x 1.700"

Valve Guide: Powdered Metal

TFS-30700252

Valve Seal: Fluoroelastomer Canister

TFS-30600455

Intake Valve Seat: Ductile Iron

TFS-51600271

Exhaust Valve Seat: Ductile Iron

TFS-30600272

Valve Seat Angle: 45°

Valve Angle Count: 5 Intake, 3 Exhaust

Spring Pockets: 1.480"

ID Locator: 1.300"

TFS-21400442

Retainers: Titanium 7° x 1.500"

TFS-214T0415

Locks: 7° Steel Beadlock

TFS-30600444

Minimum Bore: 4.000"

Milling Specs: 0.006" per CC

Ultimate Bolt-On Performance® Lifetime Warranty

Trick Flow Specialties guarantees original, unmodified cylinder head castings against manufacturing defects. Trick Flow's liability is limited to replacing the casting.

The valves, valve guides, valve seats, valve job, valve springs, valve spring retainers, valve locks, rocker arm studs, guide plates, and valve stem seals included on assembled Trick Flow Specialties cylinder heads are warranted to the original purchaser to be free from defects in materials and workmanship for a period of two years from the date of purchase. All other Trick Flow Specialties products are warranted to be free from defects in materials and workmanship for a period of 90 days.

There are no mileage limitations.

PROPOSITION 65 WARNING

This product may contain one or more substances or chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

TRICK FLOW SPECIALTIES

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