

7 Top LS7 Heads

A Stroker Short-Block Plus These Bad Boys = 763 to 810 HP on 100-octane.

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The Premise

In the Dec. '10 and Feb. '11 issues we took a vacation from our senses and performed a good old-fashioned cylinder-head shootout. Part one compared all the cathedral-port (LS1/LS2) heads on the market, and part two tested the available rectangular-port (LS3/L92) heads to see which flowed best and made the most power. The cathedral-port heads were run on a 408ci stroker, while we stepped things up to an even more powerful 468 stroker to properly test the LS3 heads. Now we've gone even crazier to evaluate the almighty LS7 heads. Though the LS7 castings share the rectangular ports of the LS3 heads,

they up the flow ante with raised ports, altered valve angle and locations, and even larger titanium valves. Not long ago these factory LS7 castings would have been considered full race heads.



The massive stroke required some reworking of the factory windage tray. To save time we in



The Stuff

We baselined the engine with factory GM LS7 castings. Four of the heads we tested were stock castings that had been CNC-ported by GM Performance Parts, Lingenfelter [Performance Engineering](#), Texas Speed, and Scoggin-Dickey Performance Center (SDPC). We also checked out the CNC-ported versions of the dedicated castings from Procomp Electronics, Mast Motorsports, and Texas Speed. All were run with appropriate valvesprings and factory LS7 rocker arms. We verified that all had 70cc combustion chambers.



Knowing our LS7 heads would support serious power levels, we stepped up to a tall-deck RHS



Though the combination was begging for a solid roller cam, running a hydraulic roller elim

The Test

Given the tremendous flow potential of ported LS7 heads (some eclipsing 400 cfm), we needed more displacement. A tall-deck RHS aluminum block offered the capability to swallow a massive 4.5-inch-stroke crank with plenty of deck height to spare for acceptable rod ratios. The A357-TR RHS aluminum block is a serious piece of hardware with a priority-main oiling system and billet main caps with ARP studs. A Lunati 4.5-inch billet stroker crank, 6.30-inch forged K1 rods, and 4.185-inch Wiseco forged, flat-top pistons filled the block. The bore and stroke combined to produce a big-block-like displacement of 495 ci.

The cubes combined with flat-top pistons and 70cc chambers to produce a static compression ratio of 13.5:1. Sealing the beast was a set of Cometic [MLS](#) head gaskets secured by ARP head studs. Additional components include a Moroso pan, pickup, and windage tray; a custom timing chain from Comp Cams designed specifically for the tall-deck block (one extra link per side); and the largest off-the-shelf hydraulic roller cam available in the Comp Cams catalog. The 309LRR HR15 offered 259/275 [degrees](#) of duration at 0.050 tappet lift and a 115-degree lobe-separation angle. This cam has 0.624-inch lift with the 1.7:1 rockers used on most LS applications, but we ran 1.8:1 rockers for 0.660 lift. Comp Cams also supplied a set of link-bar hydraulic roller lifters and hardened pushrods. The bill for the

short-block was \$12,159. All the heads were run with a Mast Motorsports high-rise, single-plane intake with a Holley 1050 Ultra Dominator carb.



Jetting and timing were performed to optimize power production, though every head made best power with 30 degrees total ignition lead using 100-octane Rockett Brand racing fuel. Note that the tall-deck RHS block required intake spacers.

The Results

We first ran the stroker with a set of as-cast, stock LS7 heads and found peak numbers of 742 hp and 684 lb-ft of torque and average numbers of 635 hp and 647 lb-ft. Every one of the aftermarket heads bested those numbers. See the results in the chart, where we reveal the peak power numbers as well as the average horsepower and torque from 3,600 to 6,700 rpm, the torque reading at 4,000 rpm, and the flow numbers at the standard 28 inches of water.



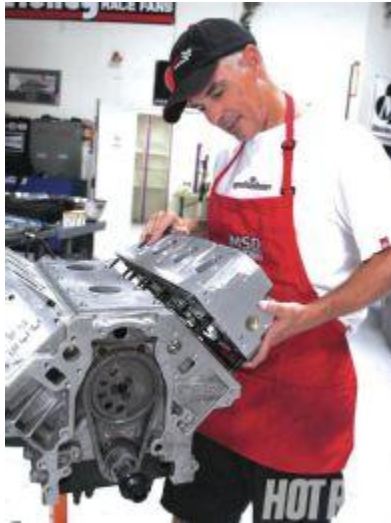
The RHS aluminum block included a dedicated cam retaining plate. Comp Cams supplied an adj



To ensure no one threw us a ringer, we verified that all heads had 70cc combustion chamber

Conclusions

There wasn't a dog in this bunch. There is a sizable gap in price between the most expensive and least expensive heads, but they all made big power. There was greater variance than what we saw in our LS3 test (where every head tested made virtually the same power), but in reviewing the numbers, we had to ask ourselves what the real difference in e.t. or seat-of-the-pants feel would be between the 13.5 average horsepower and 12.9 average torque numbers that separate the lowest-priced heads and the biggest-power heads we tested.



Prior to our dyno session, every head was installed and measured for proper pushrod length



The rpm potential and high-lift cam required proper valvesprings. Most manufacturers suppl



Every head was run with the same factory LS7 rockers. Like the LS3, the LS7 featured offse

We were also interested to note that, in general, the heads with the better flow numbers produced better power, as you'd expect. But the flow bench does not tell the whole story; looking at flow alone, you might

not select the SDPC heads, yet they outpowered some of the heads with similar or slightly higher flow numbers. There's still some magic in port and chamber shapes.

Bottom Line: Every LS7-based head is amazing. The Procomp heads clearly win the low-price contest, using import castings and domestic porting to make more power at a lower price than even the stock LS7 heads. Judging by the average power numbers, the Texas Speed PRC heads seem to offer the best value, and the Mast Black Label heads crank out the highest power.

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