

CRATE EXPECTATIONS: OUR CHEVELLE GETS BLOWN LSA POWER

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THE #1 CHEVROLET ENTHUSIAST MAGAZINE



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while the LSA motor employs powdered metal rods and hypereutectic pistons. But both motors share the same 319-T7 aluminum block with cast iron cylinder liners. Bulkheads, the structural part of the block that supports the crank bearings, have been strengthened by 20 percent.”

Six-bolt, cross-bolted main caps add significantly to the bottom end stability of the short-block. Other commonalities between the two behemoths exist. The LSA gets the dual pressure fuel system used in the LS9. The dual pressure fuel system pushes 250 kPa (about 36 psi) at idle or low speeds, but then increases fuel pressure to 600 kPa (about 80 psi) when the driver presses the fun pedal. For the LSA, maximum pressure is reduced to 450 kPa (about 63 psi). Both motors share a forged steel crankshaft. The LSA is a wet sump engine, while the LS9 is a dry sump motor. However, both come with the same improved lubrication system featuring oil squirters that spray oil on the bottom of the pistons for lubrication and cooling.

GM Performance Parts has worked very hard to make the LSA as affordable as possible, and an easy to install crate motor for an older muscle car. We found an LSA for sale online at Pacer Performance for \$14,295.95 (not including the front accessory drive and the computer and harness, which should be available by the time you read this).

Dr. Meyer says, “What makes the LSA a great crate engine for GM Performance parts is that it is relatively affordable, absolutely every component in the engine is brand new, and

SUPERCHARGED ROTATIONAL FORCE OF MILITARY PROPORTIONS

PROJECT AMERICAN HEROES GETS FITTED FOR ITS GM PERFORMANCE PARTS LSA CRATE MOTOR.

By Arvid Svendsen | Photos by Agent 147

Shock and awe have come to Route 66 Motorsports as Bill Jelinek and the crew at this shop in New Lenox, Illinois, have “unboxed” the newly-arrived General Motors Performance Parts LSA crate engine. The Project American Heroes '70 Chevelle will play host to the 556 hp and 551 lb-ft of torque 6.2-liter Eaton supercharged masterpiece. A recent addition to the Gen IV LS family, the 376 ci LSA comes standard in the Cadillac CTS-V and will soon be found in the '11 Camaro Z28.

It shares many components with the supercharged 6.2 LS9 found in the Viper-squashing Corvette ZR1. Talking to General Motors Performance Parts Product Integration Manager Dr. Jamie Meyer, information was gathered on this incredible bullet, soon to be nestled in one black and red PAH 3 Chevelle.

“What’s most interesting about the LSA is that, like the ZR1’s 638hp LS9 motor, the LSA comes with the new four lobe design, sixth-generation

Eaton supercharger. The bigger horsepower LS9 boasts a larger 2.3-liter supercharger, while the LSA is equipped with a slightly smaller 1.9-liter version. The LS9 aftercooler has two separate air-to-liquid cooling ‘bricks’ just above the rotors in the supercharger case that reduces the temperature of air that enters the cylinders, while the LSA aftercooler has a single core that actually has more efficient airflow.

“The LS9 features forged pistons and titanium rods,

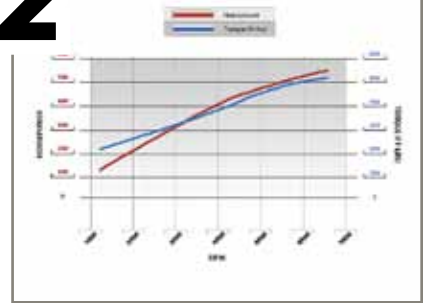


1



The GM Performance Parts LSA crate engine is a dream come true in the mail order muscle business. Supercharged and sophisticated, the engine is ready to be mocked up in the '70 Project American Heroes Chevelle.

2



Check out the dyno figures for the LSA motor, courtesy of GM Performance Parts. Notice the fat torque curve, where the numbers almost run together with the horsepower figures. Torque is greatly increased with the 1.9L Eaton supercharger.

3



Edelbrock brackets are bolted to the engine, to be mated with Energy Suspension PN 3.1117 rubber motor mounts on the stock engine pads.

4



The throwout bearing must be removed at this time for those running an automatic transmission. If the throwout bearing is not removed, there is a possibility of cracking the trans case when installation is attempted.

5



Matt Duque gently uses a slide hammer with puller hook attachment installed to remove the throwout bearing.

6



Engine pads are stock Chevelle V-8 items. Mock up is performed on the junk chassis that is currently holding up the body.

7



Jason Johns brings the transmission together with the motor without installing a torque converter, since the engine will be removed and reinstalled a few times during mock-up.

8



The TCI six-speed automatic trans is bolted to the motor to attempt to set both in the Chevelle.

9



Matt checks for clearance issues as the LSA is lowered into position. The large 4L80E trans case is a tight fit.

10



The engine and trans is a tight fit. Matt is attempting to make the CTS-V oil pan work in the Chevelle, but there are clearance problems with the oil cooler bosses and the front passenger side corner of the oil pan.

11



So close, and yet so far. The LSA gets hung up on this oil cooler boss, so small-block and trans are removed to do some quick grinding to see if the installation can take place.

12



Matt attempted to make the motor fit by grinding the boss for the oil cooler. It still did not solve the interference problem, so a pan from a '98-02 F-body was ordered.

it's all backed by our 24-month 50,000 mile warranty. It makes projects like the Project American Heroes '70 Chevelle very easy because you don't have to go to a custom calibrator for engine management. You just pull a brand new GMPP LS harness and controller out of the box, plug it into your LSA-powered

project car, with the factory sensors, and everything fires up and runs."

For those of you who look at the full-frame A-body and immediately conclude "big-block", we say the '70 Chevelle was born for the LSA (sorry). Dr. Meyer had some thoughts about the big-block versus Gen IV LSA: "GM Performance

Parts still makes a modern version of the LS6, called a ZZ 454. SUPER CHEVY magazine tested it about five months ago, and it made over 500 hp stock, and that was on pump gas. The 454 big-block is a great engine, but as you would expect, great engineering at GM allows powertrains to advance, as evidenced in the LSA. I hope the SUPER CHEVY readers would expect that with an LSA in that '70 Chevelle, that car will be faster than with a ZZ 454. Both are great engines, but you've got to tip the hat to 40 years of engineering and engine development."

Dr. Meyer adds a further benefit over the Rat motor: "The other thing to keep in mind is that the LSA is a modern fuel-injected engine. It starts when its ice cold outside, it idles at under 1,000 rpm, and it revs up and behaves itself like a modern engine should. In addition, it makes big power while getting incredible fuel mileage. The base LS3 in the Corvette gets

13



Our 4L80E application called for a modified crossmember, so a chunk was removed from the center section. The lower mounting point for the transmission would create more room in the trans tunnel. A reinforcement plate is cut to size to serve as the base for the transmission mount.

14



Side pieces were fabricated to be welded in place on the crossmember. Pieces were MIG welded in place, and then ground smooth.

15



Welding side pieces in place provides a strong support for the transmission. Although an aftermarket crossmember might be available, it was quicker to modify the one we had.

16



The 10-gauge plate is also welded in place to complete the modification to the crossmember. The transmission mount is used to mark new holes.

17



The crossmember is placed in a vise and 3/4-inch holes are drilled. Use of the step bit makes the job of drilling through the thicker gauge metal easier to accomplish.

18



With holes drilled in the crossmember, a 5/8-inch inner diameter tube is installed and welded in place. The tubes prevent the bolts from pinching the crossmember during installation.

19



Modified transmission crossmember is ground smooth and ready for the trans mount. With the new oil pan on order, a completed rolling chassis is the next step in the build of the Project American Heroes Chevelle.

General Motors Performance Parts LSA Tech Specs

PART NUMBER:	19211708
ENGINE TYPE:	LS SERIES GEN IV SMALL-BLOCK V-8
DISPLACEMENT (CU IN):	376 CI (6.2L)
BORE X STROKE (IN):	4.06 X 3.62 (103.25 X 92MM)
BLOCK (P/N 12627939):	CAST-ALUMINUM WITH 6-BOLT, CROSS-BOLTED MAIN CAPS
CRANKSHAFT (P/N 12603616):	FORGED STEEL
CONNECTING RODS (P/N 12604857):	POWDERED METAL
PISTONS (P/N 12625119):	HYPEREUTECTIC ALUMINUM
CAMSHAFT TYPE (P/N 12605220):	HYDRAULIC ROLLER
VALVE LIFT (IN):	0.480" INTAKE / 0.480" EXHAUST
CAMSHAFT DURATION (@.050 IN):	198-DEGREE INTAKE / 216-DEGREE EXHAUST
CYLINDER HEADS (P/N 12604860):	ALUMINUM L92 STYLE PORT: AS CAST WITH 68CC CHAMBERS
VALVE SIZE (IN):	2.16 INTAKE / 1.59 EXHAUST
COMPRESSION RATIO:	9.1:1
ROCKER ARMS (P/N 12569167 INT):	INVESTMENT-CAST, ROLLER TRUNNION
ROCKER ARMS (P/N 10214664 EXH):	INVESTMENT-CAST, ROLLER TRUNNION
ROCKER ARM RATIO:	1.7:1
RECOMMENDED FUEL:	92 OCTANE
MAXIMUM RECOMMENDED RPM:	6,600
RELUCTOR WHEEL:	58X
BALANCED:	INTERNAL


almost 30 miles per gallon. I would imagine the supercharged CTS-V would get something like 20 mpg, and that is something that would be impossible with a carbureted 454 LS6 engine.”

Asked about what we should expect as far as driving characteristics of the LSA engine, Dr. Meyer replied, “Tom Stevens and our Powertrain group have developed that LS engine family to bring together the characteristics of a big-block and a small-block. An LS engine has incredible airflow up high like you would think of a real high revvin’ small-block. When you get in the bigger displacement 376 ci LS3 family that will produce more torque, adding a Roots blower to that package results in that instant burst, instant torque. That is what you have in the LSA motor.”

Call it a slightly detuned version of the LS9 motor, but don’t underestimate the performance of this LSA. Installed in the 4,300-pound CTS-V, acceleration from 0-to-60 mph is achieved in a blurry 3.9 seconds. Figuring

our ’70 Chevelle to weigh in at no more than 3,800 pounds, performance will be scary fast. Dr. Meyer is equally optimistic about the Chevelle’s performance potential, “You’re talking about an engine that will carry 400 lb-ft well below 4,000 rpm. Torque down low is critical for moving a big, heavy muscle car like a ’70 Chevelle. In stock configuration, I think the LSA powered Chevelle is probably a high-11-second car, all things being up to the right standards.

“If you go on and put headers on it and open up the intake, get a custom calibration for the higher octane fuel, you’re talking about something that makes a lot more power, and probably put the car in the low 11s. Driving it around town will produce that instant torque, big-block kind of feel, making for an incredibly fun experience.”

The ability to overcome resistance to rotation will be of military proportions. Follow along with the masterminds at Route 66 Motorsports as the state of the art LSA motor is mocked up. 

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