

GM LT2 V-8 ENGINE

Tonawanda-Built Next Gen 6.2L Small Block V-8 to Power All-New 2020 Chevrolet Corvette Stingray

BY **DAVE HAGEN** PHOTOS BY **GENERAL MOTORS**

The LT2 is a new eight-cylinder engine from General Motors that made its debut on the 2020 Chevrolet Corvette, also known as the mid-engine Corvette or Corvette C8. While the 6.2L displacement carries over and the pistons appear to be the same as the LT1, the supporting components have been updated for a mid-engine application. Some of those updates are responsible for the output increase from 460 to 495 hp in the first-ever mid-engine Corvette.

Moving an engine from the front to the middle of the car often requires significant modification. Most manufacturers will want the center of gravity to be as low as possible, taking the greatest possible advantage of a mid-engine layout's handling properties. Lowering an engine often means modifying exhaust manifolds; while the engine in a front-mounted car can send the manifolds to exit more or less directly below the block, the mid-mounted application specifies that they need to exit behind (and almost slightly above) the heads. This type of configuration allowed more efficient routing than used on the compact, cast log-style manifold that is present on the current LT1 engine.

Chevy took this opportunity and designed a large-volume, tubular manifold that appears to be comprised of equal-length runners. This not only solved the packaging issue but also resulted in more power being produced helping with the 35-hp bump on the Z51 performance-exhaust-equipped cars.

Since the engine is mounted so low, the current wet sump oil pan was out of the equation, with a new dry sump system in its place. While dry sump configurations have been used on higher performance trims of the Corvette in the past, this is the first time that one shows up on the base car. This system is also novel in that it is mostly self-contained. The whole system, which includes the tank and three scavenge pumps, is mounted directly on the engine—a departure from previous designs which had an oil tank mounted somewhere on the firewall with lines going to the oil pan.

The main advantage of dry sump oil system is the ability to maintain engine performance while driving the car at high cornering loads, but another big advantage of a dry sump system is that drag and windage of oil are reduced in the oil pan, since the scavenge pumps pull a certain quantity of oil away from the crankshaft. In some cases, this can cause an increase in engine efficiency and can contribute to a power increase if the vacuum level in the crankcase is increased as well.

Internally, the engine stays much the same. It retains the same 103.25 millimeter bore and 92mm stroke of the LT1 engine along with the same 11.5:1 compression ratio. The compression stays the same since the cylinder heads use the same casting as the LT1 and contain the same 54 mm intake valves and 40.4 mm sodium-filled exhaust valves. Since the compression ratio is the same, it is no

Specifications

Type	LT2 6.2L V8 VVT with direct injection and Active Fuel Management (cylinder deactivation)
Bore & stroke (in/mm)	4.06 x 3.62 / 103.25 x 92
Block Material	A319-T7 cast aluminum with cast-in iron cylinder liners and nodular main bearing caps
Oiling System	Dry sump-type (7.5-qt. capacity); includes oil-spray piston cooling
Oil Type	Dexos 2 0W40 synthetic
Cylinder Head Material	319-T7 cast aluminum
Combustion Chamber volume	59cc
Compression Ratio	11.5:1
Valvetrain	Overhead valve, two valves per cylinder; dual-equal variable valve timing
Valve Size (in/mm)	2.13 / 54 hollow (intake) & 1.59 / 40.4 sodium filled (exhaust)
Fuel Delivery	Direct injection with Active Fuel Management Max pressure: 2,175 psi (15 Mpa / 150 bar)
Firing Order	1-8-7-2-6-5-4-3 (all cylinders); 1-7-6-4 (with deactivation)
Throttle body	87mm single bore (electronic)
ECU	GM E99 (32-bit processing)

Vehicle Applications

Model Year	2020
Manufacturer	General Motors
Brand	Chevrolet
Model	Corvette
Power	495 HP / 369 kW @ 6450* RPM
Torque	470 lb-ft / 637 Nm @ 5150* RPM
Transmission	M1L 8-speed dual clutch (DCT)

* when equipped with performance exhaust

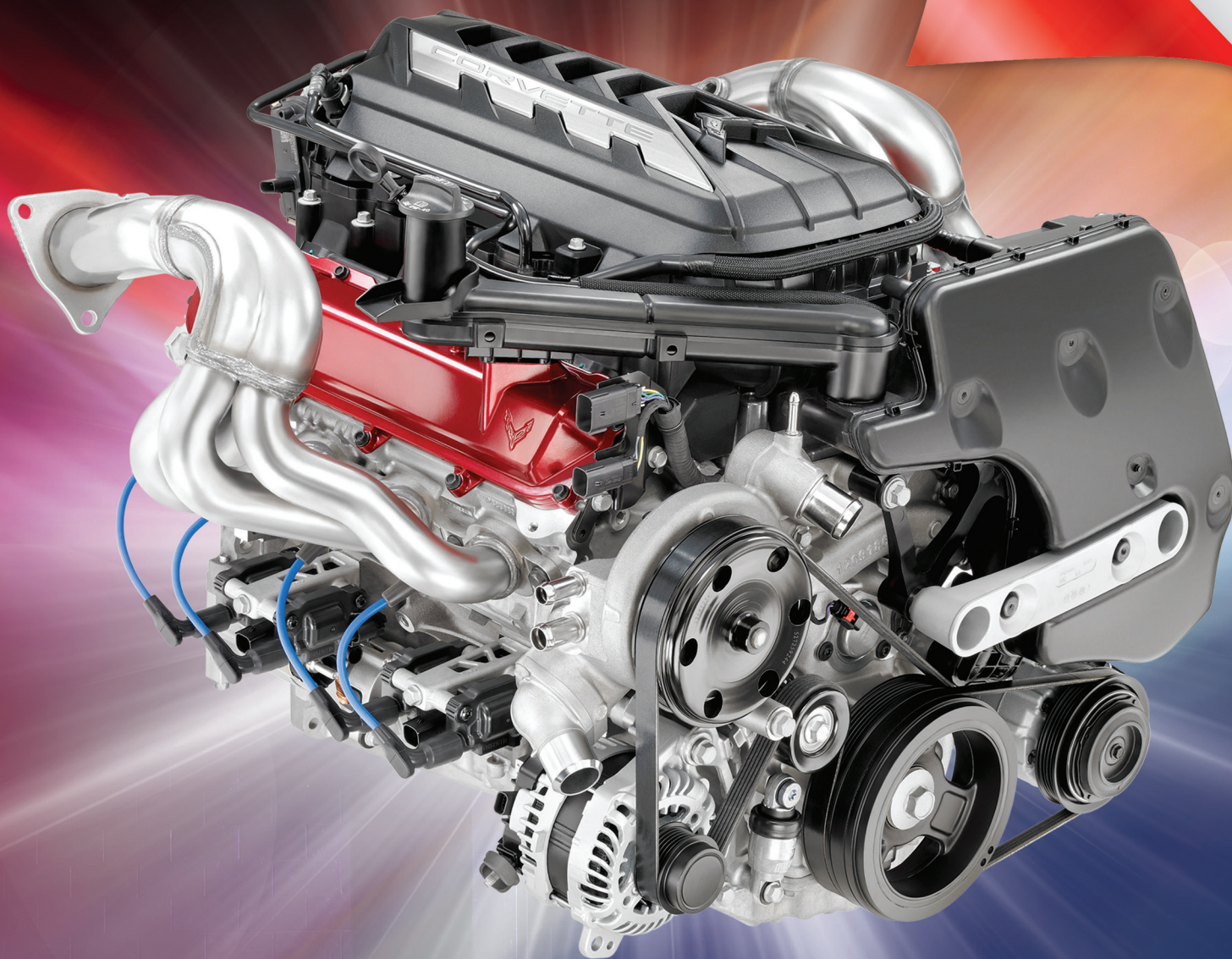
Next-gen 6.2L Small Block V-8 LT2 engine delivers the most horsepower and torque of any entry Corvette: SAE-certified to 495 hp and SAE-certified to 470 lb.-ft. of torque (when equipped with performance exhaust).

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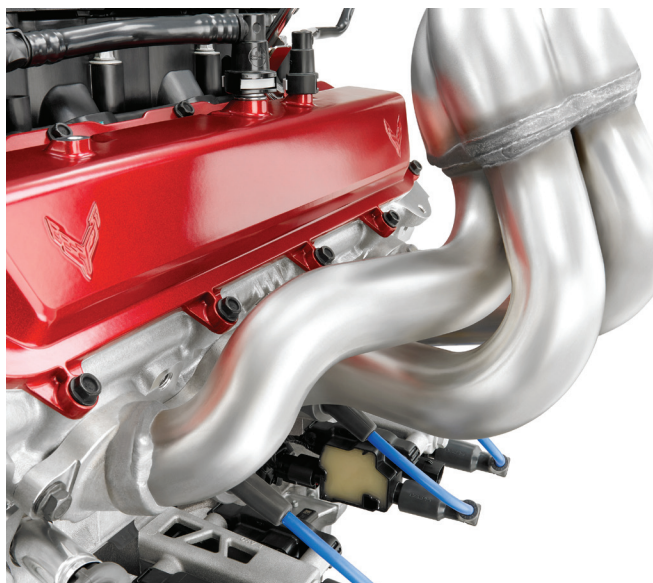
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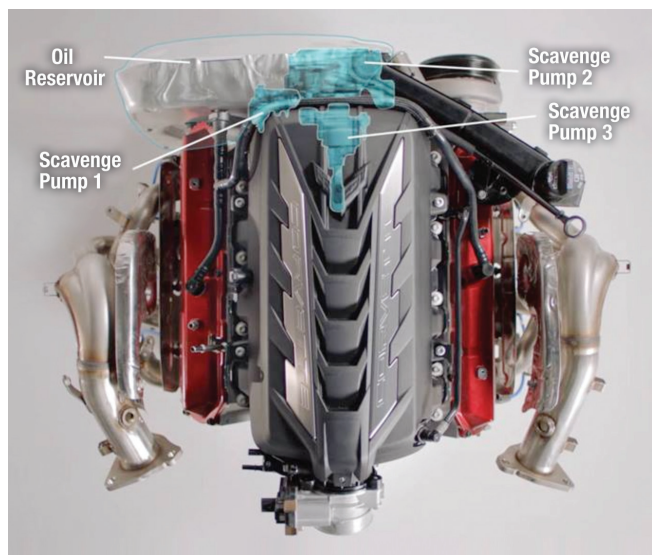
GM 2020 LT2 Corvette Unique Exhaust

surprise that the 59-cc combustion chamber volume is also retained. The last piece that appears to be a carryover at least in size is the throttle body, which at 87 millimeters is an exact match for the unit on the LT1.

That throttle body is mounted facing rearward in the C8 and feeds a new intake manifold. The intake routing also takes advantage of the mid-engine placement as the Stingray breathes through a massive oval air cleaner and a short, cylindrical intake tract that, unlike the C7, doesn't have to be contorted to reach cool air in front of a radiator.

Taking advantage of the newfound airflow capability afforded by the intake and exhaust is the camshaft, which has been swapped for a more aggressive unit with increased duration. Combine this new camshaft with the improved airflow, along with a new ECU, and it's not hard to see how the horsepower and torque increases over the LT1 were achieved.

GM 2020 LT2 Corvette Dry Sump System



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Engine Family

The LT2 engine belongs to GM's fifth-generation Small Block V8 engine family. In fact, it will be an updated version of the LT1, and will therefore has much in common with the following GM Gen 5 Small Block engines:

- 6.2L V-8 LT1 naturally-aspirated
- 6.2L V-8 LT4 supercharged
- 6.2L V-8 LT5 supercharged
- 6.2L V-8 L86 naturally-aspirated
- 5.3L V-6 L83 naturally-aspirated
- 4.3L V-8 LV3 naturally-aspirated
- 4.3L V-6 LV1 naturally-aspirated

First production mid-engine Corvette features most horsepower and torque of any entry Corvette

The General Motors engine plant in Tonawanda, New York, will build the company's next-generation 6.2L Small Block V-8 engine that is powering the all-new 2020 Chevrolet Corvette Stingray. Production of the 2020 Corvette Stingray begins at GM's Bowling Green, Kentucky assembly plant in late 2019.

Powered by the Tonawanda-built next-gen 6.2L Small Block V-8 LT2 engine, the 2020 Stingray offers customers the most horsepower and torque of any entry Corvette: SAE-certified to 495 hp and SAE-certified to 470 lb.-ft. of torque (when equipped with performance exhaust.)

"The 2020 Stingray is Chevrolet's first production mid-engine Corvette – the fastest, most powerful entry Corvette ever - offering new levels of performance, technology and craftsmanship," said Mark Reuss, GM president, during a visit to the plant to meet with employees and community leaders. "The Tonawanda team is up to the challenge to build this new LT2 engine at world-class quality levels that Corvette customers have come to expect."

Tonawanda currently builds a variety of award-winning engines used in a wide range of GM products including:

- 2.0L Turbo/2.5L – Chevrolet Camaro, Malibu, Colorado, Equinox, Traverse and Impala; Buick Regal, GMC Canyon, Acadia and Terrain and Cadillac ATS and CTS.
- 4.3L V-6, 5.3L V-8; 6.2L V-8 – Chevrolet Silverado, Suburban and Tahoe, GMC Yukon/Yukon Denali and Cadillac Escalade.
- 6.6L HD Small Block gas V-8 – 2020 Chevrolet Silverado HD and GMC Sierra HD.

In 2016, GM announced it would invest nearly \$300 million in the Tonawanda plant to prepare the facility for future engine production. The next-gen 6.2L V-8 completes the work related to the investment. GM has invested more than \$23 billion in its U.S. manufacturing operations over the past decade.

Tonawanda employs more than 1,500 people and the hourly workforce is represented by UAW Local 774. ■



AERA Technical Specialist Dave Hagen has over 44 years of experience in our industry. As an ASE-certified Master Machinist, Dave specialized in cylinder head work and complete engine assembly for the first 17 years of his career. For more information, email: dave@aera.org.