

GENERAL MOTORS 496 CUBIC INCH GASOLINE ENGINE — BIG BLOCK V-8 POWER BUILT IN TONAWANDA, NEW YORK

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In this issue we look at an automotive gasoline engine built until recently by a multi-national car maker with a local engine-building plant. We're all "engine folk" here so we're familiar with the huge **GM Powertrain** plant in Tonawanda. Well, Friday, December 18, 2009 was a sad day in local history as the last **Tonawanda Big Block** was made. GM code name was **L18**, a.k.a. the **8.1L**, **Vortec 8.1**, **Vortec 8100**, or **Vortec 496**. Whatever you call it, *call it awesome*.

The reasons for ending production were clear. GM had discontinued its line of Medium Duty trucks (**Chevy Kodiak** and **GMC TopKick**) which featured the L18. Also, GM dropped the L18 option when it redesigned its light-duty ¾ & 1 ton trucks and SUV's, e.g., **Silverado & Sierra 2500HD/3500HD**; **Suburban & Yukon XT 2500**; **Avalanche 2500**. The L18 option was probably ended because the base 6.0 Liter V-8 gas engine had received improvements to the point where it offered similar performance and better fuel economy. Any buyer wanting stellar performance, great fuel economy, and super-long engine life opted for the Duramax Diesel. Sales from other markets (such as Marine) apparently didn't justify continuing L18 production. Plus, GM had new high-powered gasoline Marine engines with improved fuel economy in the works.

The **L18** (496 in³/8.1 Liters) debuted in 2001. It was a long-stroke derivative of the 454 in³ engine (same bore) built in Tonawanda. Rated power and torque for the L18 varied depending on the build year and requirements of the application (such as high torque for pickups). **Table 1** gives specifications and details for the L18 through its relatively short 2001-2009 lifespan.

When GM introduced the L18 it didn't take the easy route and merely lengthen the stroke of the 454 in³ engine. Many upgrades were made for the sake of performance, durability and longevity. Here's what GM stated in its literature about the new L18 engine when it was introduced.

The Vortec 8.1L is the debut of a new, highly-refined big block V8. Introduced in Chevrolet Silverado and GMC Sierra heavy-duty pickups and Medium Duty trucks, the Vortec 8.1L is the legendary GM big block for a new millennium, with 33 percent increase in expected useful life, and horsepower & torque that surpass the competition. The following aspects are new or have been changed: a revised engine block; new pistons with 5-millimeter top land; improved firing order; internally balanced crankshaft; replicated-port cylinder heads; low-noise & high-durability valve train; cast stainless steel exhaust manifolds; internal positive crankcase ventilation (PCV); modified sequential port fuel injection; electronic throttle control; coil-near-plug ignition; more durable water pump; improved cooling system with coolant loss protection; serpentine belt drive; oil-life monitor; oil-level sensors; raised rocker-cover rails; thermoplastic sight shield; cast aluminum oil pan; improved seals; and all metric fasteners. Before the Vortec 8.1L, Electronic Throttle Control (ETC) was largely reserved for premium passenger car engines. Because there is no mechanical link between the accelerator pedal and the throttle, a potentiometer at the pedal measures pedal angle and sends a signal to the Powertrain Control Module (PCM), which then directs an electric motor to open the throttle appropriately.

Back in 2003, GM truck buyers needing extra performance for hauling, towing or snowplowing with their 2500HD/3500HD Series Chevy Silverado or GMC Sierra pickups could select an optional engine such as the Duramax Diesel (a hefty \$5010 extra then) or they could opt for the L18 (a comparative bargain at \$850). Both the Duramax Diesel and the L18 options required a heavy-duty transmission: either the 5-speed HD manual or the legendary Allison 1000 five-speed HD automatic. While the L18 was only an extra \$850 in 2003, the mandatory Allison 1000 added to the options price tag by \$2,295. The Allison 1000 is said to have required a 1-inch body lift from the factory in the 2500HD/3500HD series pickup trucks for clearance. In 2004 GM angered truck buyers when it down-rated L18 horsepower slightly to help lower insurance costs. These 2003 option prices are off of the window sticker from my L18-equipped 2003 Chevy Silverado pickup, which I ordered in late-Fall 2002.

Ten years ago any Western New Yorker buying or ordering a Chevy or GMC ¾-ton or 1-ton pickup, van or SUV should've considered the monstrous Tonawanda Big Block... **you coulda had a V-8... a great big MADE-IN-WESTERN-NEW-YORK V-8!**

Terms & Abbreviations Used: in³ = cubic inches • HP = horsepower • GM = General Motors • a.k.a. = also known as • OHV = overhead valve • lb.ft. = pound-feet • MPG = miles per gallon • cm = centimeters • HD = heavy duty • in. = inches • lbs. = pounds • Exh. = exhaust • Hwy. = highway • RPM = revolutions per minute

TABLE 1 — L18 SPECIFICATIONS

| | |
|------------------------------|----------------------------------|
| Displacement | 496 in ³ / 8.1 Liters |
| Rated Horsepower | 325 to 550 HP |
| Rated Torque | 455 to 690 lb.ft. |
| Rated HP** | 340 HP |
| Rated Torque** | 455 lb.ft. |
| **In a 2003 GM 2500HD Pickup | |
| Materials | Iron Block, Heads |
| Bore | 4.25 in. / 10.79 cm |
| Stroke | 4.37 in. / 11.1 cm |
| Compression Ratio | 9.1:1 |
| Firing Order | 1-8-7-2-6-5-4-3 |
| Valve Train | Pushrod OHV |
| # of Valves | 1-Intake / 1-Exh. |
| Main Bearings | 5 – 4-Bolt |
| Dry Weight | 761 lbs. |
| EPA Rated Fuel Mileage | 9 MPG City 11 MPG Hwy. |
| Limited Speed | 5000 RPM |
| Design Lifespan | 200,000 miles |