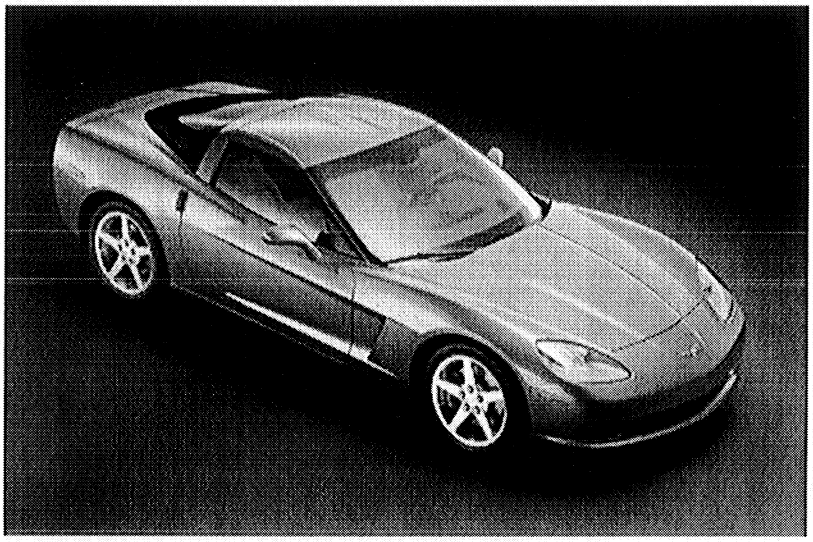
Chevrolet

Corvette



2006

Table of Contents

Product Information

2006 Corvette: Z06 Hits The Ground Running; New Six-Speed Automatic Available For Coupe And Convertible

Model year 2006 will always be known as the year the 505-horsepower* Z06 was let loose on the sports car world. With its 505-horsepower (377 kw) LS7 7.0L engine, racing-bred suspension, hydroformed aluminum frame and unique bodywork, the Z06 is the fastest, most technologically advanced production model in Corvette's 53-year history.

Performance enhancements also are found on '06 Coupe and Convertible models, with the availability of a new electronically controlled 6-Speed Paddle Shift transmission with automatic modes. The transmission has three driving modes – Drive, Sport and Paddle Shift – and a wide, 6.04:1 overall ratio that enables a balance of stirring acceleration and excellent fuel economy.

Other changes for 2006 Corvettes include a new three-spoke, 370-mm-diameter (9.4 inches) steering wheel. The wheel is smaller in diameter than the previous steering wheel, allowing the driver to maintain a "tighter" feel on the wheel and help improve turn-in response. The three-spoke design is characteristic of a sporty design that is being implemented in other performance-oriented Chevrolet vehicles.

Here's a look at the rest of Corvette's changes for '06:

GM Passenger Sensing System – Replacing the previous manually controlled air bag switch, all '06 Corvettes come with advanced dual-stage frontal air bags with GM's Passenger Sensing System (PSS). PSS uses the latest sensing technology to turn the front passenger air bag on or off. If the sensor system detects an unoccupied front passenger seat or the presence of a smaller occupant, the front passenger air bag is designed to automatically turn off so it would not deploy in the event of a frontal collision. A status indicator on the inside rearview mirror alerts occupants that the passenger air bag is on or off.

XM Satellite Radio combined with Bose audio – For vehicles sold in the 48 contiguous states, XM Satellite Radio is included with the uplevel Bose audio system. The XM radio antenna is "hidden," allowing for a smoother exterior appearance.

New exterior colors – Velocity Yellow Tintcoat and Monterey Red Metallic Tintcoat join the Corvette's color palette, replacing Millennium Yellow and Magnetic Red Metallic. (Monterey Red Metallic Tintcoat is not available on Z06.) The color changes were implemented on late-2005 models.

New interior color – Titanium Grey replaces Steel Grey as one of Corvette's interior color choices.

New convertible top color – Storm Grey replaces Grey as a color choice for convertible tops.

6-Speed Paddle Shift automatic details

The new electronically controlled 6-Speed Paddle Shift automatic transmission is one of the most technologically advanced transmissions in the industry, featuring clutch to clutch operation, manual control shift operation and an integrated 32-bit electronic controller. A wide, 6.04:1 overall ratio helps deliver exciting acceleration performance along with excellent fuel economy.

The six forward gears have smaller "steps" between them, which enhances the feeling of performance and smoothness. The smaller steps also enable a steep, 4.02:1 first gear, which provides an improved-performance launch feel when compared with the previous four-speed automatic's 3.06:1 first gear. There are two overdrive gears: a 0.85:1 ratio in fifth gear and a 0.67:1 ratio in sixth. The final drive ratio of Corvette models equipped with the new transmission is 2.56:1.

Technological sophistication is exemplified by two electronically controlled automatic modes, Drive and Sport; plus manual Paddle Shift. The Drive mode follows a specific shift schedule of predetermined shift points, while the Sport mode enables Performance Algorithm Shifting (PAS). PAS modifies shift patterns when performance driving is recognized by the controller. The Drive mode optimizes shifts for smoothness, while the Sport mode enables firmer shifts for better performance. With the Paddle Shift mode, gear changes are made with manual control paddles located on the steering wheel.

The performance and functions of the six-speed paddle shift transmission with automatic modes are guided by an integrated controller. The controller is located inside the transmission, reducing complexity. A new 300-mm torque converter, new rear bell housing, new driveline support and revised-length driveshaft also support the transmission's integration into the Corvette.

Coupe and convertible details

The 2006 Corvette's new features and refinements enhance a groundbreaking sports car that was all-new in 2005. It is a performance car that is home in virtually any environment, whether daily commuting or weekend racing. Coupe and Convertible models come with the LS2 6.0L V-8 engine that produces 400 horsepower (298 kw) and 400 lb.-ft. of torque (542 Nm). It is matched to a rear transaxle that helps improve vehicle weight balance – a six-speed manual is standard and the new six-speed paddle shift transmission with automatic modes is available. The front and rear short/long arm suspensions reflect the most competition-influenced suspension tuning in the Corvette's history.

Dramatic fender forms and exposed headlamps combine with the grille to create a strong visual identity for the Corvette, while the tapered rear deck and fascia improve high-speed performance. The lean rear design sports round taillamps and center-exit exhaust. The fixed Xenon high-intensity discharge headlamps provide superior lighting performance. With a 0.286 coefficient of drag, the Coupe models are the most aerodynamic Corvettes ever.

The 2006 Corvette Convertible features an optional power-operated soft top; an easy-to-operate manual top is standard. Both configurations use a five-layer fabric that conceals the underlying structure for a good top-up appearance, plus it helps preserve the car's excellent aerodynamics and reduces road noise.

Corvette's interior is inspired by the car's dual-cockpit heritage. High-quality materials, craftsmanship and functionality help deliver premium quality meant to enhance performance driving. The instrument panel and doors are covered with cast-skin foam-in-place trim that looks like a leather-wrapped, padded panel. It is warm and inviting and has double the life of conventional trim materials.

An AM/FM radio with CD player and MP3 capability is standard. New technology enhances conventional radio reception. An improved optional Bose audio system with an in-dash six-disc changer and XM Satellite Radio (continental U.S. only) add to the choices available to the audiophile owner.

A full-function OnStar system is available and an onboard navigation system is available. Using a 6.5-inch (165 mm) color touch-screen display, the DVD-based system contains all the map data for the 48 contiguous states and most of Canada on one disc.

OnStar-equipped Corvette models feature OnStar dual-mode (analog-digital) equipment. OnStar's digital equipment also includes enhanced hands-free voice recognition capabilities including more intuitive continuous digit dialing and improved voice recognition accuracy. OnStar is the leading provider of in-vehicle safety, security and information services in the United States and Canada . Using the GPS satellite network and wireless technology, OnStar features core safety services and OnStar Hands-Free Calling that allows drivers to make and receive voice-activated phone calls using an externally mounted antenna for greater reception.

Corvette Coupe and Convertible have a hydroformed steel rail backbone structure, which features cored composite floors, an enclosed center tunnel, rear-mounted transmission and aluminum cockpit structure. Suspension cradles, control arms, knuckles, springs, dampers, bushings, stabilizer bars and steering gear have all been redesigned. New Goodyear Extended Mobility Tires (EMT) take advantage of the latest sidewall design and compound technology for run-flat capabilities.

Three suspension choices allow drivers to choose the setup that best suits their driving style. The standard suspension is tuned for a balance of ride comfort and precise handling. Corvette is now more poised at even higher handling levels, yet easier to drive.

The optional Magnetic Selective Ride Control suspension features magneto-rheological dampers able to detect road surfaces and adjust the damping rates to those surfaces almost instantly for optimal ride control. The system has been improved to deliver more differentiation between the system's "Tour" and "Sport" settings.

The Z51 Performance Package brings Coupe and Covertible performance very close to the widely admired C5 Z06. The Z51 offers more aggressive dampers and springs, larger stabilizer bars, Goodyear Eagle F1 Supercar EMT tires, enhanced cooling and larger cross-drilled brake rotors (13.4 inches/340 mm in front and 13 inches/330 mm in rear) for optimum track performance while still providing a comfortable ride.

With each suspension, three standard dynamic chassis control systems – anti-lock braking, traction control, and Active Handling – operate in concert. In all, the new dynamic chassis control systems are smarter, less intrusive and more adept at making the total driving experience precisely what drivers have come to expect from their Corvette.

Corvette Z06 details

The 2006 Corvette Z06 comprises an unprecedented level of capability and technology, making it one of the best performance values on the market. And with an unmistakably muscular appearance, the '06 Z06 has a visual attitude that always looks ready to demonstrate Corvette's winning attitude to any challenger around the globe.

"The new Z06 is the dividend from competing so successfully in endurance racing," said Dave Hill, Corvette's chief engineer. "It combines the strong attributes of the new, sixth-generation Corvette with the spirit, technology and know-how from the race program to form an American supercar with outstanding credentials."

The Z06's new LS7 7.0L engines delivers 505 horsepower (377 kw) in an approximately 3,130-pound (1,420 kg) package – a combination that is expected to deliver 0-60 performance of less than 4 seconds, quarter-mile elapsed times of less than 12 seconds and a top speed of more than 190 mph on a racetrack.

Links between racing and the production Z06 are both direct and indirect, as the vehicle was developed in conjunction with the C6-R. The technology transfer includes the application of lessons that could only have been learned after countless laps of endurance racing – everything from suspension geometry to aerodynamics. What engineers developed in the Z06 is a totally unique vehicle that has powertrain, body structure and chassis system features that are distinct from other Corvette models. In fact, the Z06 has a different body structure compared to Corvette Coupe and Convertible.

Previous Z06 models, from the original 1963 model to the 2001-04 editions, incorporated suspension and/or engine upgrades that complemented existing Corvette systems. None was as comprehensively revised as the 2006 Z06 is compared to previous Z06 models. The specifics include:

- LS7 7.0-liter/427-cubic-inch Gen IV V-8 with lightweight reciprocating components
- 505 horsepower (377 kw)* @6300 rpm
- 470 lb.-ft. of torque (637 Nm) @ 4800 rpm
- 7000 rpm redline
- Titanium connecting rods and intake valves
- Dry-sump engine lubrication system
- Aluminum structure with one-piece hydroformed perimeter rails frame, magnesium front cradle and magnesium roof panel
- Fixed roof design optimizes body rigidity and aerodynamics
- Carbon-fiber composite front fenders, front wheelhouses and floor panels
- Unique front fascia incorporating a larger grille, cold-air scoop and lower air splitter
- Wide-body rear fenders and a unique rear spoiler incorporated with the CHMSL
- Huge 14-inch (355-mm) cross-drilled front disc brakes with six-piston calipers and 13.4-inch (340-mm) cross-drilled rear rotors with four-piston calipers
- 18 x 9.5-inch front wheels with 275/35ZR18 tires and 19 x 12-inch rear wheels with 325/30ZR19 tires
- Three-inch-diameter exhaust with bi-mode mufflers and larger polished stainless steel tips
- Engine, transmission and differential oil coolers; and steering cooler
- Rear-mounted battery to improve weight distribution

- Unique interior features including revised gauge cluster, lightweight two-tone seats with more supportive bolsters
- Curb weight of 3,130 pounds / 1,420 kg (estimated)
- Three inches (76.2 mm) wider than other Corvette models

Inside the LS7

The all-new LS7 in the '06 Z06 reintroduces the 427-cubic-inch engine to the Corvette lineup. Unlike the previous 427 engine, which was a big-block design, the new 7.0-liter LS7 is a small-block V-8 – the largest-displacement small-block ever produced by Chevrolet and GM, and a tribute to its 50 years as a performance icon.

With 505 horsepower (377 kw) and 470 lb.-ft. of torque (637 Nm), it also is the most powerful passenger car engine ever produced by Chevrolet and GM. The LS7 is easily identified under the hood by red engine covers with black lettering. The LS7 shares the same basic Gen IV V-8 architecture as the Corvette's 6.0-liter LS2, but it uses a different cylinder block casting with pressed-in steel cylinder liners to accommodate the engine's wide, 104.8-mm-wide cylinder bores. Compared with the LS2, the LS7 also has a different front cover, oil pan, exhaust manifolds and cylinder heads – among many other components.

Internally, the LS7's reciprocating components make use of racing-derived lightweight technology, including titanium connecting rods and intake valves, to help boost horsepower and rpm capability. The rpm fuel shut-off limit is 7000 rpm. The LS7's details include:

- Dry-sump oiling system
- Unique cylinder block casting with large, 104.8-mm bores and pressed-in cylinder liners
- Forged steel main bearing caps
- Forged steel crankshaft
- Titanium connecting rods with 101.6-mm stroke
- Cast aluminum flat-top pistons
- 11.0:1 compression
- High-lift camshaft
- Racing-derived CNC-ported aluminum cylinder heads with titanium intake valves and sodium-filled exhaust valves
- Low-restriction air intake system
- Hydroformed exhaust headers with unique "quad flow" collector flanges.

One of the clearest examples of the LS7's race-bred technology is its use of titanium connecting rods. They weigh just 464 grams apiece, almost 30 percent less than the rods in the LS2 V-8. Besides lightweight, which enhances high-rpm performance and rpm range, titanium makes the rods extremely durable.

The LS7's CNC-ported aluminum cylinder heads are all-new and designed to meet the high airflow demands of the engine's 7.0-liter displacement, as it ingests approximately 100 cubic feet more air per minute than the Corvette's 6.0-liter LS2 V-8 – an 18-percent increase in airflow. Consequently, a hydraulic roller camshaft with .591/.591-inch valve lift is used to allow plenty of air to circulate in and out of the engine.

To ensure optimal, uninterrupted airflow, the LS7's heads have straight, tunnel-like intake runners. Very large by production-vehicle standards – even racing standards – they are designed to maintain fast airflow velocity, providing excellent torque at low rpm and exhilarating horsepower at high rpm. The heads feature 70-cc combustion chambers that are fed by huge, 56-mm-diameter titanium intake valves. The lightweight titanium valves weigh 21grams less than the stainless steel valves used in the LS2, despite the valve head having 22 percent more area. They are complemented by 41-mm sodium-filled exhaust valves, vs. 39.4-mm valves in the LS2. To accommodate the large valve face diameters, the heads' valve seats are siamesed; and, taken from experience with the engines of C5-R racecars, the LS7's valve angles are held at 12 degrees – vs. 15 degrees for the LS2 – to enhance airflow through the ports.

The LS7 has a dry-sump oiling system designed to keep the engine fully lubricated during the high cornering loads the Corvette Z06 is capable of producing. An engine compartment-mounted 8-quart

reservoir delivers oil at a constant pressure to a conventional-style oil pump pick-up at the bottom of the engine. The pressurized oil feed keeps the oil pick-up continually immersed in oil at cornering loads exceeding 1 g.

Oil circulates through the engine and down to the oil pan, where it is sent back to the reservoir via a scavenge pump. The large-capacity reservoir, combined with a high efficiency air-to-oil cooler, provides necessary engine oil cooling under the demands of the engine's power output. With the dry-sump system, oil is added to the engine via the reservoir tank – which includes the oil level dipstick.

The LS7's dry-sump system was developed and tested on racetracks in the United States and Europe , including Germany 's famed Nürburgring. And while common in racing cars, the Corvette Z06 is one of just a handful of production vehicles – and the only production Corvette – ever to incorporate such a high-performance oiling system.

Z06 drivetrain and chassis

The Corvette Z06's powertrain and drivetrain systems are matched to the LS7's performance capability. The light, four-into-one headers discharge in to new, close-coupled catalytic converters and through to new "bi-modal" mufflers. The mufflers each feature a vacuum-actuated outlet valve, which controls exhaust noise during low-load operation but opens for maximum power.

At the rear of the LS7 engine, a single-mass flywheel and lightweight, high-capacity clutch channel torque to the rear transaxle. The six-speed manual transmission has been strengthened to handle the LS7's increased torque load. The transmission includes a pump that sends transmission fluid to the front radiator for cooling. Upon its return, the fluid removes additional heat from the differential lube before returning to the transmission. The six-speed transmission connects to a limited-slip differential, with enlarged ring and pinion gears. Stronger axle half-shafts with tougher universal joints transmit power to the rear wheels.

The Z06 has a unique aluminum body structure for optimum stiffness and light weight for the fixed-roof bodystyle. Perimeter rails are one-piece hydroformed aluminum members featuring cast suspension nodes, which replace many welded steel components on other Corvette models. Other castings, stampings and extrusions are combined into the innovative structure with state-of-the-art manufacturing technologies.

Advanced structural composites featuring carbon fiber are bonded to the aluminum structure. The wider front wheelhouses, for example, are carbon composites and the passenger compartment floors combine carbon-fiber skins with an ultra-lightweight balsa wood core.

The Z06 has a new magnesium cradle that serves as the attachment point for the engine and some front suspension components. Magnesium is lighter than aluminum yet incredibly strong. The magnesium cradle helps improve the front-to-rear weight distribution, as do carbon-fiber front fenders and wheelhouses. Engineers also moved the battery from underhood to a position in the rear cargo area, behind one of the rear wheels.

The mass reductions are offset by some added performance enablers, including dry-sump lubrication, exhaust system with outlet valves, larger wheels and tires, larger brakes and larger roll stabilizers.

Suspension and brakes

The Z06 retains the 105.7-inch (2686-mm) wheelbase of other Corvette models, as well as the short-long arm suspension and transverse leaf spring design, but it rides on all-new wheels, tires, brakes, as well as its own rear spring and roll stabilizer.

The firmer suspension works harmoniously with large 18 x 9.5-inch cast-spun aluminum wheels and 275/35ZR18 tires in the front, and 19 x 12-inch cast-spun aluminum wheels with 325/30ZR19 tires in the rear – the largest wheel-and-tire combination ever offered on a Corvette. The tires use the latest extended-mobility technology from Goodyear to provide a satisfactory ride, but still allow the vehicle to achieve lateral acceleration of more than 1 g. The extended-mobility tires eliminate the need – and weight – for a spare tire and jack or inflator kit, while also reducing the chance of a sudden loss of handling capability.

Complementing the suspension system and large rolling stock is an equally capable four-wheel disc brake system, consisting of 14-inch (355-mm) vented and cross-drilled front rotors and 13.4-inch (340-mm) vented and cross-drilled rear rotors. For comparison, Corvette Coupe and Convertible models have 12.8-inch (325-mm) front and 12-inch (305-mm) rear rotors, while the '06 Corvette with the Z51 sport package has 13.4-inch (340-mm) and 13-inch (330-mm) rotors.

The front rotors are acted upon by huge, red-painted six-piston calipers that use six individual brake pads. Individual brake pads are used because they deliver more equalized wear compared to what would otherwise be a pair of very long single-piece pads. For the rear brakes, four-piston calipers with four individual brake pads are used. A Delphi four-channel ABS system is standard, as is a very competent active handling system – complete with a Competitive Driving mode.

The large brakes bring an excellent level of stopping capability with the Z06, and with their four-wheel brake cooling, they provide excellent fade resistance and lining life during track duties.

Design details

The new Z06 has an unmistakable and aggressive appearance, with design cues that include:

- A wide front fascia with a large, forward-facing grille opening, a splitter along the bottom and wheel opening extensions along the sides to provide aerodynamic downforce
- A cold air scoop in front of the hood that integrates an air inlet system for the engine
- The trailing edge of the front wheel opening is radiused to achieve improved drag, but protects the body finish with a tough molding, and a large air extractor is located behind the wheel
- A fixed-roof bodystyle optimizes body rigidity and mass
- Wider rear fenders with flares cover the massive rear tires and a brake cooling scoop in front of the wheels visually balances the fender extractor
- A tall rear spoiler houses the CHMSL on the top of the rear fascia
- 10-spoke wheels (18-inch, front; 19-inch, rear)
- Four larger stainless steel exhaust outlets
- New-design Z06 badging on the carbon fiber front fenders

The aerodynamics of the Z06's exterior were shaped by the experiences of the Corvette racing program, where high-speed stability and cornering capability are paramount. And while the racecars use large rear wings, the Z06's elevated spoiler provides sufficient downforce to balance the road-worthy front splitter without adversely affecting aerodynamic drag. The Z06's Cd is .31.

For all its race-inspired functionality, the Z06 is designed to be a daily driveable high-performance vehicle. To that end, comfort and convenience are held to a very high standard. High-Intensity Discharge llighting, fog lamps, leather seating, dual-zone air conditioning, cabin air filtration and head-up display (HUD) with track mode and g-meter are standard.

The Z06 also has a revised gauge cluster that displays the Z06 logo on the 7000-redline tachometer and has a new readout on the oil pressure gauge to reflect the higher standard pressure of the dry-sump oiling system. And, like other 2006 Corvettes, the Z06 has a new, smaller-diameter 370-mm three-spoke steering wheel that provides a more agile, performance-oriented feel. The seats feature two-tone leather surfaces, with Z06-logo embroidery and contrasting stitching.

Z06 options include a Bose audio system with an in-dash six-CD changer, polished wheels, a telescoping steering wheel, heated seats, side air bags, a navigation system with GPS, universal home remote and XM Satellite Radio.

But for all its comfort, engineers did sacrifice a few components in the quest for lower weight and higher performance. Seat side bolsters are fixed and more supportive to better hold the driver when cornering and they weigh less. The passenger seat features manual controls, saving the weight of a power-adjust motor, and the Z06's acoustic package is revised to reduce weight and allow more aural feedback of the powertrain.

* *Horsepower and torque SAE certified. A new voluntary power and torque certification procedure developed by the SAE Engine Test Code committee was approved March 31, 2005 . This procedure (J2723) ensures fair, accurate ratings for horsepower and torque by allowing manufacturers to certify their engines through third-party witness testing. GM was the first auto manufacturer to begin using the procedure and expects to use it for all newly rated engines in the future.*

New For 2006

- 6-speed Paddle Shift automatic transmission available on Coupe and Convertible
- Three-spoke, 370 mm (9.4 in) diameter steering wheel
- Advanced dual-stage frontal air bags with GM Passenger Sensing System
- XM Satellite Radio included with Bose stereo (48 states)
- Two exterior colors: Velocity Yellow Tintcoat and Monterey Red Metallic Tintcoat
- Titanium gray interior color
- Storm Gray convertible top color

Corvette Z06 vehicle highlights

- Corvette Z06 fixed-roof hatchback coupe
- LS7 7.0L (427 cu in) V-8 engine with 505 hp (377 kw) and 7000-rpm redline
- Front P275/35ZR18 and rear P325/30ZR19 extended mobility Eagle F1 Supercar tires
- Five-spoke painted aluminum wheels: 18 x 9.5-inch front; 19 x 12-inch rear (polished wheels available)
- Unique front fascia with upper inlet, specific grille, fenders, quarters and rear spoiler
- Aluminized stainless-steel, dual-mode 3-inch exhaust with 4-inch polished stainless steel tips
- Special Ebony seats available with red or gray accents with Z06 embroidery
- All-aluminum frame structure with magnesium engine cradle
- Carbon-fiber fenders and floor panels
- Dry sump engine oil system, oil cooler, power steering cooler, transmission cooler and axle cooler
- Rear-mounted battery for improved weight distribution
- Six-piston high-performance cross-drilled front brakes and 4-piston cross-drilled rear brakes
- Front splitter, front and rear wheel opening extensions

Model Lineup

	Engines		Transmissions	
	LS2 6.0L V-8	**LS7 7.0L V-8**	**6-spd manual**	**6-spd Paddle Shift automatic**
Corvette Coupe	s	–	s	o
Corvette Convertible	s	–	s	o
Corvette Z06	–	s	s	–

Standard s
Optional o
Not available –

Specifications

Overview	
Models:	Chevrolet Corvette Coupe, Convertible and Z06
Body styles / driveline:	2-door hatchback coupe with removable roof; rear-wheel drive (Coupe and Convertible) 2-door hatchback coupe with fixed roof; rear-wheel drive (Z06)
Construction:	composite body panels, hydroformed steel frame with aluminum and magnesium structural and chassis components (coupe); composite and carbon-fiber body panels, hydroformed aluminum frame with aluminum and magnesium structural and chassis components (Z06)
Manufacturing location:	Bowling Green , Kentucky

Engines		
	6.0L V-8 LS2	**7.0L V-8 LS7 (Z06)**
Displacement (cu in / cc):	364 / 5967	427 / 7011
Bore & stroke (in / mm):	4 x 3.62 / 101.6 x 92	4.125 x 4 / 104.8 x 101.6
Block material:	cast aluminum	cast aluminum
Cylinder head material:	cast aluminum	cast aluminum
Valvetrain:	overhead valve, 2 valves per cylinder	overhead valve, 2 valves per cylinder
Fuel delivery:	SFI (sequential fuel injection)	SFI (sequential fuel injection)
Compression ratio:	10.9:1	11:1
Horsepower (hp / kw @ rpm):	400 / 298 @ 6000	505 / 377 @ 6300*
Torque (lb-ft / Nm @ rpm):	400 / 540 @ 4400	470 / 637 @ 4800*
Recommended fuel:	premium recommended	premium required
Estimated fuel economy (mpg city / hwy / combined):	manual: 19 / 28 / 23 automatic: TBD	TBD

Transmissions			
	6-speed manual	6-speed manual, w/ optional Z51 Performance Package	6-speed paddle-shift automatic
Application:	std	opt	opt
Gear ratios (:1):			
First:	2.66	2.97	4.02
Second:	1.78	2.07	2.36
Third:	1.30	1.43	1.53
Fourth:	1.00	1.00	1.15
Fifth:	0.74	0.71	0.85
Sixth:	0.50	0.57	0.67
Reverse:	2.90	3.28	3.06
Final drive ratio:	3.42	3.42	2.56

Chassis / Suspension		
	Coupe and Convertible	**Z06**
Front:	short/long arm (SLA) double wishbone, cast aluminum upper & lower control arms, transverse-mounted composite leaf spring, monotube shock absorber	short/long arm (SLA) double wishbone, cast aluminum upper & lower control arms, transverse-mounted composite leaf spring, monotube shock absorber
Rear:	short/long arm (SLA) double wishbone, cast aluminum upper & lower control arms, transverse-mounted composite leaf spring, monotube shock absorber	short/long arm (SLA) double wishbone, cast aluminum upper & lower control arms, transverse-mounted composite leaf spring, monotube shock absorber
Traction control:	electronic traction control; Active Handling	electronic traction control; Active Handling

Brakes		
	Coupe and Convertible	**Z06**
Type:	front and rear power-assisted disc with ABS; cross-drilled rotors with Z51 package	front and rear power-assisted disc with ABS with 6-piston front and 4-piston rear calipers, cross-drilled rotors
Rotor diameter x thickness (in / mm):	front: 12.8 x 1.26 / 325 x 32 rear: 12 x 1 / 305 x 26; Z51 Performance Package: front: 13.4 x 1.26 / 340 x 32 rear: 13 x 1 / 330 x 26	front: 14 x 1.3 / 355 x 32 rear: 13.4 x 1 / 340 x 26
Wheels & Tires		
Wheel size:	front: 18 inch x 8.5 inch rear: 19 inch x 10 inch	front: 18 inch x 9.5 inch rear: 19 inch x 12 inch
Tires:	Goodyear Eagle F1 Supercar (w/Z51) Extended Mobility front: P245/40ZR18 rear: P285/35ZR19	Goodyear Eagle F1 Supercar Extended Mobility front: P275/35ZR18 rear: P325/30ZR19

Dimensions

Exterior		
	Coupe and Convertible	**Z06**
Wheelbase (in / mm):	105.7 / 2685	105.7 / 2685
Overall length (in / mm):	174.6 / 4435	175.6 / 4460
Overall width (in / mm):	72.6 / 1844	75.9 / 1928
Overall height (in / mm):	49 / 1244	49 / 1244
Curb weight (lb / kg):	Coupe: 3179 / 1442 Conv.: 3199 / 1451	3130 / 1419.7
Interior		
Seating capacity	2	
Interior volume (cu ft / L):	52 / 1475 (all models)	
Headroom (in / mm):	38 / 962 (all models)	
Legroom (in / mm):	43 / 1092 (all models)	
Shoulder room (in / mm):	55 / 1397 (all models)	
Hip room (in / mm):	54 / 1371 (all models)	
Capacities		
Cargo volume (cu ft / L):	Coupe and Z06: 22 / 634 Convertible: 11 / 295 (top up); 5 / 144 (top down)	
Fuel tank (gal / L):	18 / 68.1	
Engine oil (qt / L):	Coupe and Convertible: 5.5 / 5.2 Z06: 8 / 7.5	

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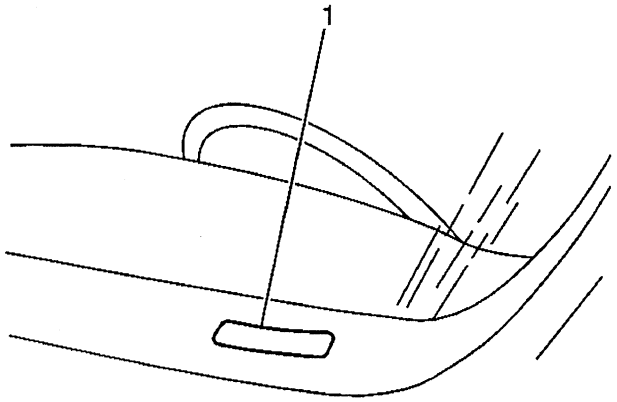
Vehicle Identification

Vehicle Identification Number (VIN)



The vehicle identification number (VIN) plate is the legal identifier of the vehicle. The VIN plate is located on the upper LH corner of the instrument panel (I/P) and can be seen through the windshield from the outside of the vehicle.

The last five digits of the assembly plant sequential number are stamped onto the rear side of the front sill (tie bar). This number is the same as the last five digits on the VIN plate. The VIN plate also has bar code characteristics.

Position	Definition	Character	Description
1	Country of Origin	1	United States
2	Manufacturer	G	General Motors
3	Division	1	Chevrolet
4-5	Carline/Series	Y/Y	Corvette
6	Body Type	1 2 3	07 - Coupe, Two Door Plainback 67 - Coupe, Two Door Convertible 87 - Two-Door Fastback Special Z06
7	Restraint System	2	Active (Manual) Belts with Driver and Passenger Inflatable Restraint System
		4	Active (Manual) Belts with Driver and Pass Inflatable Restraints (Frontal & Side)
8	Engine	U E*	RPO LS2, V8, 6.0L, aluminum, SFI 7.0L (LS7) V8, SFI, Aluminum (*Y Up to Sequence No. 100161)
9	Check Digit	--	Check Digit
10	Model Year	6	2006
11	Assembly Plant	5	Bowling Green
12-17	Plant Sequence Number	100001	Plant Sequence Number

VIN Derivative

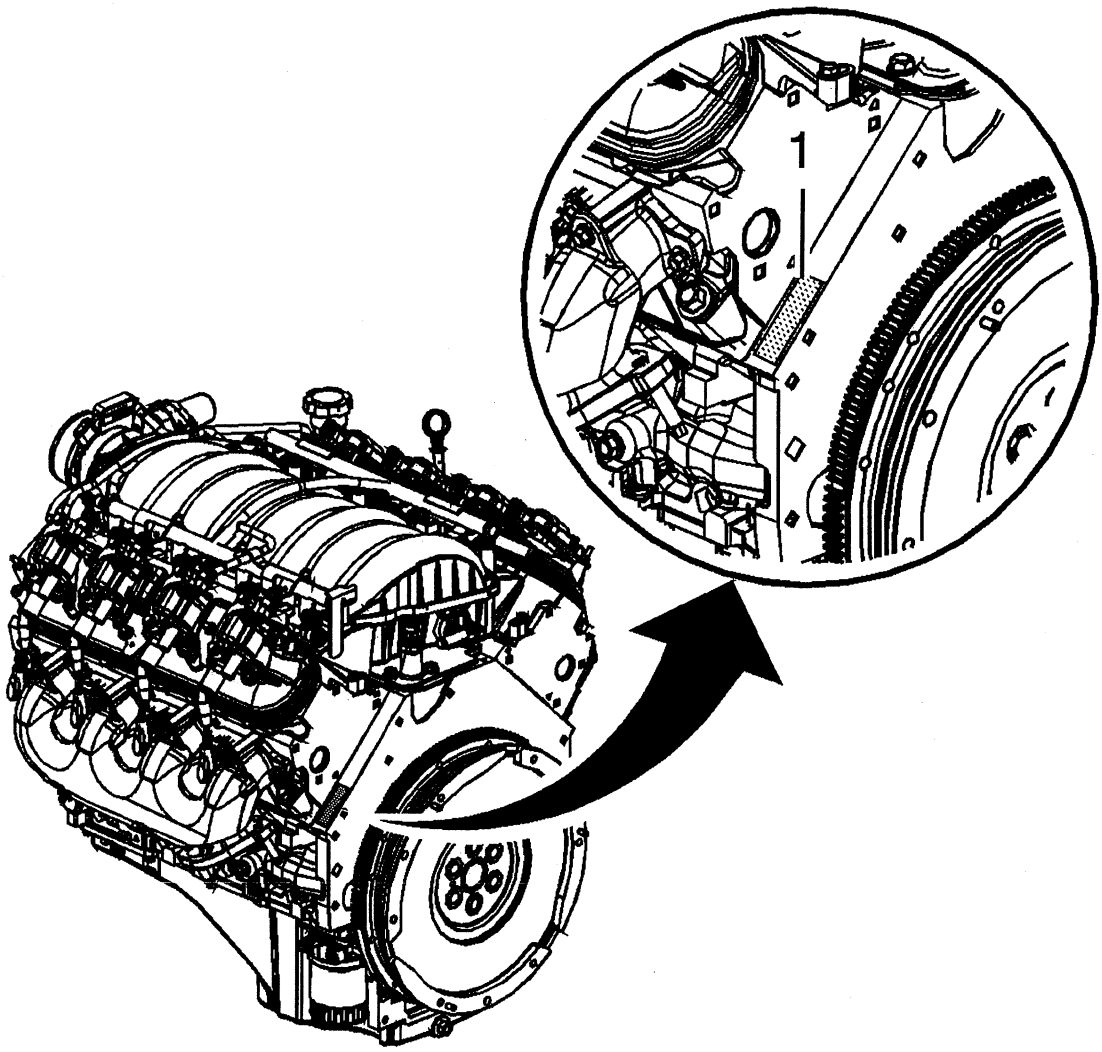
All engines and transmissions are stamped or laser etched with a partial vehicle identification number (VIN), which was derived from the complete VIN. A VIN derivative contains the following nine positions:

Position	Definition	Character	Description
1	GM Division Identifier	1	Chevrolet
2	Model Year	6	2006
3	Assembly Plant	5	Bowling Green, KY
4-9	Plant Sequence Number	100001	--

A VIN derivative can be used to determine if a vehicle contains the original engine or transmission, by matching the VIN derivative positions to their accompanying positions in the complete VIN:

VIN Derivative Position	Equivalent VIN Position
1	3
2	10
3	11
4-9	12-17

Engine ID and VIN Derivative Location 6.0L & 7.0L

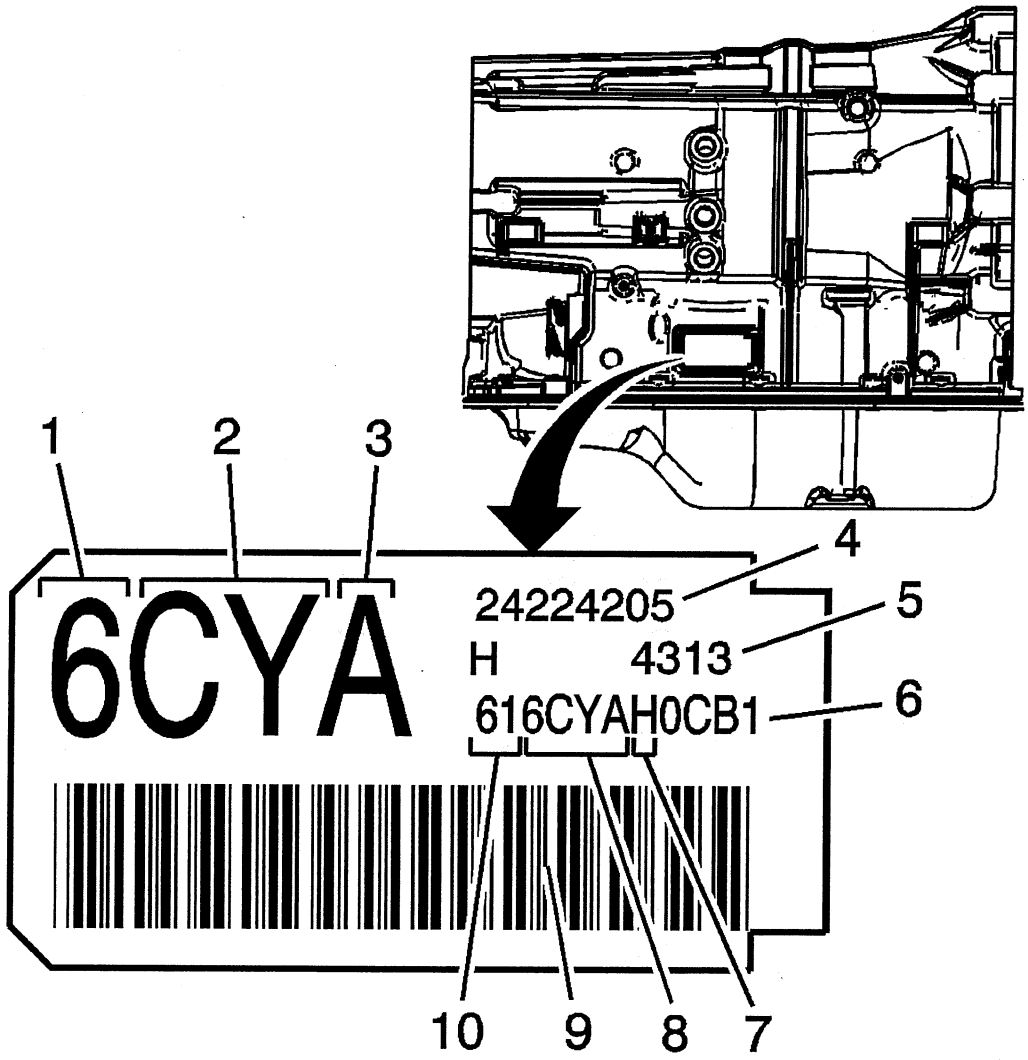


The vehicle identification number (VIN) is located on the left side rear of the engine block (1) and is typically a nine digit number stamped or laser-etched onto the engine at the vehicle assembly plant.

- The first digit identifies the division.
- The second digit identifies the model year.
- The third digit identifies the assembly plant.
- The fourth through ninth digits are the last six digits of the VIN.

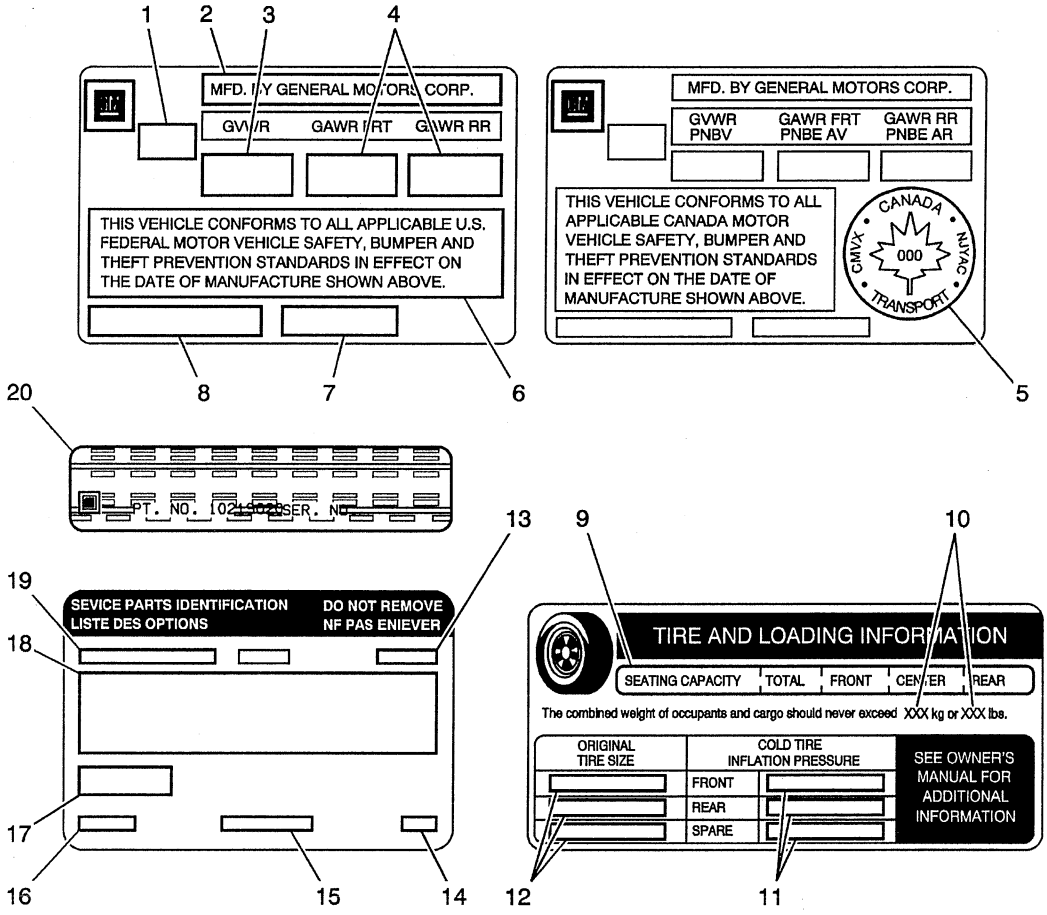
Transmission ID and VIN Derivative Location

6L80-E Automatic Transmission ID Number Location



(1) Model Year
(2) Model Code
(3) Transmission Family
(4) Transmission Assembly Number
(5) Julian date
(6) Sequential Serial Number
(7) Source Code
(8) Broadcast Code
(9) Bar Code
(10) Transmission I.D.

Label - Vehicle Certification, Tire Place Card, Anti-Theft and Service Parts ID



Callout	Description
Vehicle Certification Label	
	The vehicle certification label is located on the driver door and displays the following assessments: Gross Vehicle Weight Rating (GVWR) Gross Axle Weight Rating (GAWR), front and rear The gross vehicle weight (GVW) is the weight of the vehicle and everything it carries. The GVW must not exceed the GVWR. Include the following items when figuring the GVW: The base vehicle weight (factory weight) The weight of all vehicle accessories The weight of the driver and the passengers The weight of the cargo
1	Name of Manufacturer
2	Gross Vehicle Weight Rating
3	Gross Axle Weight Rating (Front, Rear)
4	Canadian Safety Mark (w/RPO Z49)
5	Certification Statement
6	Vehicle Class Type (Pass Car, etc.)
7	Vehicle Identification Number
8	Date of Manufacture (Mo/Yr)

Callout	Description
Tire Placard	
The tire placard label is located on the driver door and displays the following assessments:	
9	Specified Occupant Seating Positions
10	Maximum Vehicle Capacity Weight
11	Original Equipment Tires Size
12	Tire Pressure, Front, Rear, and Spare (Cold)
Service Parts ID Label	
The vehicle service parts identification label is located in the rear compartment under the spare tire cover. The label is use to help identify the vehicle original parts and options.	
13	Vehicle Identification Number
14	Engineering Model Number (Vehicle Division, Line and Body Style)
15	Interior Trim Level and Decor
16	Exterior (Paint Color) WA Number
17	Paint Technology
18	Special Order Paint Colors and Numbers
19	Vehicle Option Content
Anti-Theft Label	
20	The Federal law requires that General Motors label certain body parts on this vehicle with the VIN. The purpose of the law is to reduce the number of motor vehicle thefts by helping in the tracing and recovery of parts from stolen vehicles. Labels are permanently affixed to an interior surface of the part. The label on the replacement part contains the letter R, the manufacturer's logo, and the DOT symbol. The anti-theft label must be covered before any painting, and rustproofing procedures, and uncovered after the procedures. Failure to follow the precautionary steps may result in liability for violation of the Federal Vehicle Theft Prevention Standard and possible suspicion to the owner that the part was stolen.

RPO Code List

The production/process codes provide the description of the Regular Production Options (RPOs) used on the vehicle. The RPO list is printed on the Service Parts Identification Label. The following is a list of the RPO abbreviations and the description of each:

RPO	Description
AAB	Memory - Driver Convenience Package
AG2	Adjuster Pass ST - Power, Multi-Directional
AJ7	Restraint System - Seat, Inflatable, Driver & Pass, FRT & Side
AK5	Restraint System - Seat, Inflatable, Driver & Pass
AQ9	Seat - FRT BKT, Luxury
AR9	Seat - FRT BKT, Deluxe
AU5	Lock Control, Entry - Remote Entry, Low Power
AU8	Lock Control, Entry - Remote Entry, Specific Frequency
AX4	Restraint Conversion - Seat, Man, European
BAG	Parts PKG - Export
BGR	Plant Code - Bowling Green, KY, USA
BV7	Bumper Provisions - FRT & RR, Canadian Requirements
B4H	Modification - Noise Control, Export
B4P	Modification - Noise Control, Transmission Control Module
CC3	Roof - Hatch, Removable Panels, Plastic
CE4	Washer - Headlamp, High Pressure
CF7	Roof - Sun, Removable, Non-Transparent
CJ2	HVAC System - Air Conditioner FRT, Auto Temp Cont, AUX Temp Cont
CM7	Roof - Convertible, Folding, Power
C2L	Roof - Package, Dual Removable
DD0	Mirror O/S - LH & RH, Remote Control, Electric, Heated, LT Sensitive
DD8	Mirror I/S R/V - LT Sensitive
DL5	Decal - Roadside Service Information
DL8	Mirror O/S - LH & RH, Remote Control, Electric, Heated
D42	Shade - RR Compt
EXP	Export
FE1	Suspension System - Soft Ride
FE2	Suspension System - Ride, Handling
FE3	Suspension System - Sport
FE4	Suspension System - Special Ride & Handling
FE9	Certification - Emission, Federal
F55	Chassis - Continuously Variable Real Time Damping Magnetorheological
GB9	Label, Limited - Consignment - Delete
GM8	Axle Rear - 2.56 Ratio
GU6	Axle Rear - 3.42 Ratio
JAF	Brake Provisions - Europe
JL5	Control - Manual Trans, First To Fourth Gear Skip Shift
JL9	Brake System - PWR, FRT & RR Disc, Antilock, FRT & RR WHL
J55	Brake System - Heavy Duty
J56	Brake System - PWR, FRT & RR Disc, Antilock, FRT & RR WHL, Heavy Duty
KNR	Cooling System - Axle
KNP	Cooling System - Trans, HD
KPS	Cooler - Oil, Engine
KA1	Heater - Seat, FRT
KJ5	Protector - Shipping, Shock Absorber
K05	Heater Eng - Block
K63	Generator - 110 AMP

RPO	Description
LS2	Engine - Gas, 8 Cyl, 6.0L, SFI, Alum, GM
LS7	Engine - Gas, 8 Cyl, 7.0L, SFI, Alum, GM
MAE	Marketing Area - Europe
MYC	Transmission - Auto 6 Spd, HMD, 6L80
MM6	Transmission - Man 6 Spd, Tremec, 85mm, 2.66 1st, 0.50 6th, O/D
MN6	Merchandised Trans - Man 6 Spd Provisions
MX0	Merchandised Trans - Auto Provisions, O/D
MZ6	Transmission - Man 6 Spd, Tremec, 85mm, 2.97 1st, 0.57 6th, O/D
NA3	Emission System - Japan
NE1	Certification - Emission, Geographically Restricted Registration for Vehicles up to 14,000 lbs GVW (use 2003 mdl yr)
NF9	Emission System - General, OBD MIL Suppression
NK4	Steering Wheel - Sport Leather
NP7	Steering Column - EEC Approved
NT4	Emission System - EEC 05
NT9	Emission System - Federal, Tier 2 Phase-Out
NU4	Emission System - California LEV2 Plus
N33	Steering Column - Tilt Type
N37	Steering Column - Tilt, Telescoping
QL9	Wheel - 18 X 9.5 FRT & 19 X 12 RR, Polished
QG6	Wheel - 18 X 8.5 FRT & 19 X 10 RR, Aluminum, Styled
QG7	Wheel - 18 X 8.5 FRT & 19 X 10 RR, Polished
QX1	Wheel - 18 X 18.5 FRT & 19 X 10 RR, Aluminum, Painted, Flangless
QX3	Wheel - 18 X 8.5 FRT & 19 X 10 RR, Chrome, Flangless
Q10	Wheel - 18 X 9.5 FRT & 19 X 12 RR
SSG	Graphic - Switch Function Symbol
T62	Lamp System - Daytime Running - Delete
T79	Lamp - Fog, RR
T84	Headlamps - RH Rule of The Road, E Mark
T85	Headlamps - LH Rule of The Road, E Mark
T90	Lamp - Signaling & Marker, Export
UA2	Theft Deterrent Sys - Export Specific
UD4	Alarm - Vehicle Speed, 120 k/h
UE1	Communication System - Vehicle, G.P.S. 1
UH3	Indicator - Low Tire Press, VAR 2
UG1	Opener - Garage Door, Universal
UJ6	Indicator - Low Tire Press
UJ9	Indicator - Low Tire Press, VAR 2
UK1	Frequencies - Japanese
UL2	Frequencies - European
US3	Antenna - Diversity
US8	Radio - AM/FM Stereo, SEEK/SCAN, CD, Auto Tone, Clock, ETR, MP3, RDS
US9	Radio - AM/FM Stereo, SEEK/SCAN, RDS, Multiple Compact Disc, Auto Tone Control, Clock, ETR, MP3
UV6	Display - Head Up
U2K	Digital Audio System - S - Band
U3U	Radio - AM/FM Stereo, SEEK/SCAN, DVD, CD, Clock, ETR, Navigation, Voice Rec, MP3
U3Z	Radio - AM/FM Stereo, SEEK/SCAN, DVD, CD, Clock, ETR, Navigation, Voice Rec, MP3, VICS
U19	Speedometer - Inst, Kilo & Miles, Kilo Odometer
U52	Cluster - Inst, Electronic
U65	Speaker System - 7, Custom

RPO	Description
U66	Speaker System - 7, Custom
VBX	Language Label - Arabic
VDD	Vehicle Information - DVD, Customer Orientation
VA5	Language Label - English
VB1	Label - Shipping, Japan
VC4	Label - Price/Fuel Econ, Puerto Rico & Virgin Islands
VC5	Label - Shipping, Except US, US Possessions, or Japan
VD4	Provision Options - Poor Fuel Quality Characteristics
VH5	Plate - Vehicle Identification
VJ4	Label, Export - Child Seat Location
VK3	License Plate Front - FRT Mounting PKG
VL4	License Plate Front - FRT Mounting PKG, EEC
VL6	License Plate Front - FRT Mounting PKG, Japanese
VZ3	Label - Mercury Disposal Notification
V73	Vehicle Statement - USA/Canada
V76	Hook - Tow
V78	Vehicle Statement - Delete
V87	Vehicle Statement - Gulf States Organization
W11	Navigation Disc Data - Nav Data 1
W12	Navigation Disc Data - Nav Data 2
XFA	Tire Front - P275/35ZR1 8 BW TL HW4 EMT
XFV	Tire Front - P245/40ZR1 8-88Y BW HW4 (EMT)
XGN	Tire Front - P245/40ZR1 8-88Y BW HW4 (EMT) HI - Performance
YFJ	Tire Rear - P325/30ZR1 9 BW TL HW4 (EMT)
YFX	Tire Rear - P285/35ZR1 9-90Y BW HW4 (EMT)
YGJ	Tire Rear - P285/35ZR1 9-90Y BW HW4 (EMT) HI - Performance
YF5	Certification - Emission, California
Z5X	Mirror Provision - Arabic Language
Z49	Export - Canadian Modify Mandator Y base Equip
Z51	Performance Package - Handling
1SE	Package - LZ Option 05
1LZ	Package - LZ Option 1
2LZ	Package - LZ Option 2

Technical Information

Maintenance and Lubrication

Capacities - Approximate Fluid

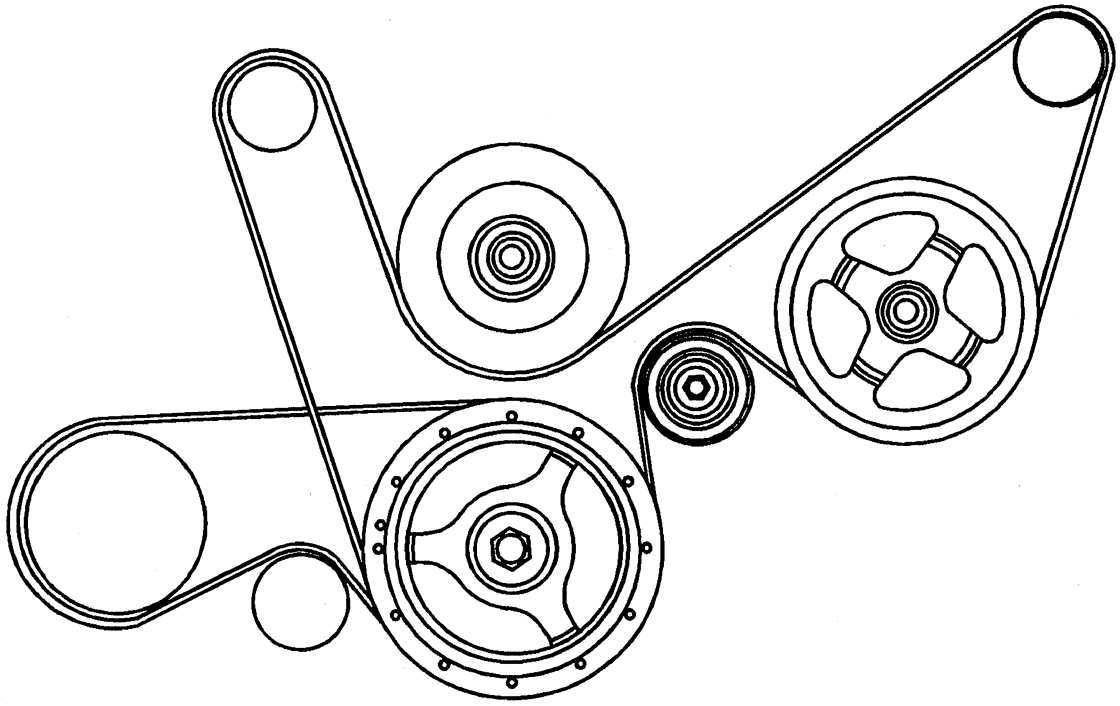
Application	Specification	
	Metric	English
Cooling System		
6.0L RPO (LS2)	11.9 liters	12.6 quarts
7.0L RPO (LS7)	11.9 liters	12.6 quarts
Engine Oil With Filter		
6.0L RPO (LS2)	5.2 liters	5.5 quarts
7.0L RPO (LS7)	7.57 liters	8.0 quarts
Engine Oil Without Filter		
6.0L RPO (LS2)	4.7 liters	5.0 quarts
7.0L RPO (LS7)	7.10 liters	7.5 quarts
Fuel Tank	68.0 liters	18.0 gallon
Transmission/Transaxle - 4L60-E/4L65-E/4L70-E		
Automatic - Complete Overhaul	--	--
Automatic - Dry	--	--
Automatic - Dry	--	--
Manual Transmission - TREMEC 6-speed	3.9 liters	4.1 quarts
Transmission/Transaxle - 6L80-E	--	--

Maintenance Items

Replacement parts identified below by name, part number, or specification can be obtained from your GM dealer.

Part	GM Part Number	AC Delco® Part Number
Engine Air Cleaner/Filter		
6.0L V8	10342024	A2945C
7.0L V8	15776148	A3077C
Engine Oil Filter		
6.0L V8	88984215	PF46
7.0L V8	89017524	PF48
Passenger Compartment Air Filter Element	10345066	CF131C
Spark Plug		
6.0L V8	12571164	41-985
7.0L V8	12571165	41-104
Windshield Wiper Blade **20.7 inches (52.5 cm)**		
Driver's Side	12335960	--
Passenger's Side	12335961	--

Engine Drive Belt Routing



Fluid and Lubricant Recommendations

Usage	Fluid/Lubricant
Engine Oil	The engine requires a special engine oil meeting GM Standard GM4718M. Oils meeting this standard may be identified as synthetic, and should also be identified with the American Petroleum Institute Certified for Gasoline Engines starburst symbol. However, not all synthetic API oils with the starburst symbol will meet this GM standard. You should look for and use only an oil that meets GM Standard GM4718M. GM Goodwrench® oil meets all the requirements for your vehicle.
Engine Coolant	50/50 mixture of clean, drinkable water and use only DEX-COOL® Coolant.
Hydraulic Brake System	Delco® Supreme 11 Brake Fluid or equivalent DOT-3 brake fluid.
Windshield Washer	GM Optikleen Washer Solvent.
Hydraulic Clutch System	Hydraulic Clutch Fluid. Use only GM Part No. U.S. 88958860, in Canada 88901244, Super DOT-4 brake fluid.
Power Steering System	GM Power Steering Fluid (GM Part No. U.S. 89021184, in Canada 89021186).
Chassis Lubrication (Rear Toe-Link Outer Ends with Z51 Option)	Chassis Lubricant (GM Part No. U.S. 12377985, in Canada 88901242) or lubricant meeting requirements of NLGI #2, Category LB or GC-LB.
Manual Transmission	DEXRON®-III Automatic Transmission Fluid. Look for "Approved for the H-Specification" on the label.
Automatic Transmission	DEXRON®-VI Automatic Transmission Fluid.
Key Lock Cylinders	Multi-Purpose Lubricant, Superlube (GM Part No. U.S. 12346241, in Canada 10953474).
Rear Axle (Limited-Slip Differential)	SAE 75W-90 Synthetic Axle Lubricant (GM Part No. U.S. 12378261, in Canada 10953455) meeting GM Specification 9986115. With a complete drain and refill add 4 ounces (118 ml) of Limited-Slip Axle Lubricant Additive (GM Part No. U.S. 1052358, in Canada 992694) where required.
Hood Latch Assembly, Secondary Latch, Pivots, Spring Anchor, and Release Pawl	Lubriplate Lubricant Aerosol (GM Part No. U.S. 12346293, in Canada 992723) or lubricant meeting requirements of NLGI #2, Category LB or GC-LB.
Hood and Door Hinges	Multi-Purpose Lubricant, Superlube (GM Part No. U.S. 12346241, in Canada 10953474).
Weatherstrip Conditioning	Dielectric Silicone Grease (GM Part No. U.S. 12345579, in Canada 992887).

Descriptions and Operations

Power Steering System

The hydraulic power steering pump is a constant displacement vane-type pump that provides hydraulic pressure and flow for the power steering gear. The hydraulic power steering pumps are either belt-driven or direct-drive, cam-driven.

The power steering fluid reservoir holds the power steering fluid and may be integral with the power steering pump or remotely located. The following locations are typical locations for the remote reservoir:

- Mounted to the front of the dash panel
- Mounted to the inner fender
- Mounted to a bracket on the engine

The 2 basic types of power steering gears are listed below:

- A recirculating ball system
- A rack and pinion system

In the recirculating ball system, a worm gear converts steering wheel movement to movement of a sector shaft. A pitman arm attached to the bottom of the sector shaft actually moves one tie rod and an intermediate rod move the other tie rod.

In the rack and pinion system, the rack and the pinion are the 2 components that convert steering wheel rotation to lateral movement. The steering shaft is attached to the pinion in the steering gear. The pinion rotates with the steering wheel. Gear teeth on the pinion mesh with the gear teeth on the rack. The rotating pinion moves the rack from side to side. The lateral action of the rack pushes and pulls the tie rods in order to change the direction of the vehicle's front wheels.

The power steering pressure hose connects the power steering pump union fitting to the power steering gear and allows pressurized power steering fluid to flow from the pump to the gear.

The power steering return hose returns fluid from the power steering gear back to the power steering fluid reservoir. The power steering return line may contain an integral fin-type or line-type power steering fluid cooler.

In a typical power steering system, a pump generates hydraulic pressure, causing fluid to flow, via the pressure hose, to the steering gear valve assembly. The steering gear valve assembly regulates the incoming fluid to the right and left chambers in order to assist in right and left turns.

Turning the steering wheel activates the valve assembly, which applies greater fluid pressure and flow to 1 side of the steering gear piston, and lower pressure and flow to the other side of the piston. The pressure assists the movement of the gear piston. Tie rods transfer this force to the front wheels, which turn the vehicle right or left.

Variable Effort Steering System Description and Operation

The Variable Effort Steering (VES) system, or MAGNASTEER II® varies the amount of effort required to steer the vehicle as vehicle speed changes or lateral acceleration occurs. At low speeds, the system provides minimal steering effort for easy turning and parking maneuvers. At high speeds, the system provides firmer steering (road feel) and directional stability. When the system senses lateral acceleration, steering becomes firmer to reduce oversteering. The Electronic Brake Control Module (EBCM) controls a bi-directional magnetic rotary actuator located in the steering rack and pinion. The EBCM varies the steering assist by adjusting the current flow through the actuator. The actuator adjusts the amount of power steering assist to achieve a given level of effort to steer the vehicle. The VES system accomplishes this by adding or subtracting torque on the input shaft to the rack and pinion. The main component of the system is an electromagnetic actuator, which consists of a multiple-pole ring-style permanent magnet, a pole piece, and an electromagnetic coil assembly. The VES system uses the Antilock Brake System (ABS) wheel speed sensor inputs to determine vehicle speed. When the EBCM senses vehicle speed, it commands a current to the actuator that is most appropriate for each speed. The system also uses inputs

such as Handwheel position, wheelbase, understeer coefficient and steering ratio to calculate lateral acceleration.

Steering Wheel and Column

The steering wheel and column has 4 primary functions:

- Vehicle steering
- Vehicle security
- Driver convenience
- Driver safety

Vehicle Steering

The steering wheel is the first link between the driver and the vehicle. The steering wheel is fastened to a steering shaft within the column. At the lower end of the column, the intermediate shaft connects the column to the steering gear.

Vehicle Security

Theft deterrent components are mounted and designed into the steering column. The following components allow the column to be locked in order to minimize theft:

- The ignition switch
- The steering column lock
- The ignition cylinder

Driver Convenience

The steering wheel and column may also have driver controls attached for convenience and comfort. The following controls may be mounted on or near the steering wheel or column.

- The turn signal switch
- The hazard switch
- The headlamp dimmer switch
- The wiper/washer switch
- The horn pad/cruise control switch
- The redundant radio/entertainment system controls
- The tilt or tilt/telescoping functions
- The HVAC controls

Driver Safety

The energy-absorbing steering column compresses in the event of a front-end collision, which reduces the chance of injury to the driver. The mounting capsules break away from the mounting bracket in the event of an accident.

Telescoping Description

The telescoping function of this column consists of the telescoping motor, the telescoping motor position sensor and the telescoping switch. The telescoping motor position sensor is an internal part of the telescoping steering motor. The telescoping switch operates the inward and outward movement of the steering wheel.

The energy absorbing and locking steering column includes three important features in addition to the steering function.

The steering column is energy absorbing and is designed to compress in a front-end collision which will lessen the chance of injury to the driver.

The steering column has a telescoping control system that consists of an electronic control module capable of class 2 serial data communication, a steering column power assembly with positioning motor and sensor, and a steering column control switch.

The multi-function lever provides for the control of the headlamp high beams, and the windshield washer and wiper.

The steering column may be removed, disassembled and reassembled with relative ease. It is important to use only the specified screws, bolts and nuts and to tighten them to the specified torque in order to ensure the proper energy absorbing functions. When the steering column assembly is removed from the vehicle, special care must be taken in handling it. Avoid the use of a steering wheel puller other than the special one recommended in this manual. Sharply striking the end of the steering shaft, leaning on the assembly or dropping the assembly could shear off or loosen the plastic fasteners which maintain the steering column rigidity.

Telescoping Operation

The telescoping steering column in/out switch is an input to the driver position module (DPM). The telescoping drive motor is an output function of the DPM.

Steering column memory settings are stored in the DPM. The steering column position sensor is an internal part of the telescoping motor assemblies, and is an input to the DPM. The DPM uses the position sensor input when storing and recalling memory settings.

Memory steering column, and the easy enter/exit operations are performed by the DPM. Commands for memory operations are sent to the DPM as class 2 messages by the driver door switch module (DDS).

Steering Wheel Theft Deterrent Lock Operation

The steering column lock control module (SCLCM) controls the steering wheel theft deterrent lock function, which allows the column to be electronically locked. The SCLCM controls the column lock motor using an internal lock relay, an internal unlock relay, and an internal lock enable relay. The lock and unlock relays provide a low input to the column lock motor. When the column needs to be locked the lock enable relay will energize the lock relay, which provides a high input to the lock side of the motor, energizing the motor to lock the steering column.

Suspension Description and Operation

Front Suspension

The front suspension uses a single lightweight fiberglass transverse spring mounted to the lower control arms.

The upper control arms are made of high-strength forged aluminum. The lower control arms, the crossmember and the steering knuckles are made of cast aluminum.

The hub and bearing assembly is a sealed unit. The hub and bearing assembly eliminates the need for wheel bearing adjustment. The hub and bearing assembly requires no maintenance.

The high-strength tubular steel stabilizer shaft provides stability.

The shock absorbers attach at the upper end to the frame and attach at the lower control arm. The shock absorber helps keep the wheel in contact with the road surface under most road conditions. The shock absorber reduces crash-through at full jounce and rebound.

The standard gas shocks and the optional Electronic Suspension Control (ESC) shock absorbers are gas charged to reduce aeration (foaming) of the shock fluid. Aeration of the shock fluid results in unlimited damping control.

Rear Suspension

The rear suspension uses a single lightweight fiberglass transverse spring mounted to the crossmember and lower control arms. The following lightweight aluminum components are used throughout the rear suspension:

- Rear suspension knuckles
- Upper control arms
- Lower control arms
- Rear suspension toe links
- Crossmember
- Drive shaft support tube

The shock absorbers attach at the upper end to the frame and at the lower end, to the lower control arm. Shock absorbers help keep the wheels in contact with the road surface under most road conditions. Shock absorbers reduce crash-through at full jounce and rebound.

The electronically controlled shock absorbers are gas charged to reduce aeration (foaming) of the shock fluid. Aeration of the shock fluid results in poor damping control.

Tire Pressure Monitor System Description

The tire pressure monitor (TPM) system allows the driver to display all 4 tire pressures on the driver information center (DIC) while the vehicle is being driven. The system uses the remote control door lock receiver (RCDLR), body control module (BCM), powertrain control module (PCM), 4 radio frequency transmitting pressure sensors inside each wheel/tire assembly, and a class 2 serial data circuit to perform the system functions. When the vehicle is stationary for more than 20 minutes, the sensors go into power down mode. In this mode the sensors transmit tire pressure data once every 60 minutes. This minimizes sensor battery consumption. These batteries are not serviceable and require sensor replacement if low. As vehicle speed increases to 32 km/h (20 mph), the sensor's internal roll switches turn the sensors ON and they will each begin to transmit a unique identification code and a radio frequency signal. The RCDLR receives and translates this data in to tire location and tire pressure. The RCDLR sends this data to the DIC via a class 2 serial data circuit where the tire pressures are displayed. If the TPM system detects a tire pressure above 289 kPa (42 psi), the HIGH TIRE PRESSURE warning message is displayed. If the system senses a tire pressure between 34-172 kPa (5-25 psi), the LOW TIRE PRESSURE warning message is displayed. And if the system senses below 34 kPa (5 psi), the FLAT TIRE warning message is displayed. After this message, 2 chimes will sound followed by the message MAX SPEED 55 MPH. The next message to appear is REDUCED HANDLING. The TPM system can also compensate for high and low altitudes using the PCM's barometric pressure sensor via a class 2 serial data circuit. The RCDLR has the ability to detect malfunctions within the TPM system. Any malfunctions detected will cause the DIC to display the SERVICE TIRE MONITOR warning message.

Electronic Suspension Control Description

The Electronic Suspension Control system, also known as the Magneto-Rheological Real Time Damping (MRRTD) system independently controls the fluid viscosity in each of the four shock absorbers in order to control the vehicle ride characteristics. The ESC system is capable of making these changes within milliseconds. The ESC system consists of the following major components:

- The electronic suspension (ESC) module
- The front/rear position sensors
- The front/rear adjustable shock absorbers
- The shock absorber electrical actuators, which are integrated within the shock absorbers.

The ESC controls the damping mode selection according to the following factors:

- The vehicle speed
- The chassis pitch input
- The steering position
- The body to wheel displacement

The ESC module evaluates these inputs in order to separately control the shock absorbers, providing an enhanced ride and comfort level over the widest possible range of operating conditions.

Electronic Suspension Control Module

The ESC module provides electronic control logic and output drive for each shock absorber. The ESC module makes decisions due to road and driving conditions based on various inputs. The ESC module receives input information by sensors that are directly connected to the ESC module or by other systems through the serial data line.

The ESC module uses these inputs in order to independently control the shock absorbers at each corner. The ESC module is located in the LH rear storage.

Electronic Suspension Control Position Sensors

The ESC position sensors provide the ESC module with the body to wheel displacement input. The ESC module uses this and other inputs in order to control the position of the shock absorber. If any body or wheel motion is detected, the ESC module will determine how soft or firm each shock absorber should be to provide the best ride. The ESC position sensors are mounted at each corner of the vehicle between the control arm and the body.

Electronic Suspension Control Shock Absorber or Strut

The ESC shock absorbers are monotube type which provide damping by increasing magnetic flux to magnetic particles to resist suspension movement. The ESC shock absorber has the capability of providing multiple modes or values of damping forces, in both compression and rebound direction. The damping forces are achieved by increasing or decreasing the magnetic flux to shock absorbers.

The front ESC actuator connector is located at the base of the shock absorber. The rear ESC actuator connector is at the top of the shock absorber. Both front and rear shock absorbers have jumper harnesses for ease of maintenance.

Electronic Suspension Control Operation

The ESC system uses the information from other systems in order to execute certain functions.

The ESC system does not have a malfunction indicator lamp, but instead uses the Instrument Panel Cluster (IPC) for the display functions. When the ESC system detects a malfunction that sets a DTC, the ESC system sends a message on the serial data line directly or through the PCM to the IPC, which will display one of the following messages:

- SHOCKS INOPERATIVE
- SERVICE RIDE CONTROL
- MAXIMUM SPEED

The SHOCKS INOPERATIVE message will only be displayed if the ESC system detects a malfunction that sets a DTC and causes the ESC system to disable all four shock absorbers. The ESC system will send a message on the serial data line to the IPC to display this message.

The SERVICE RIDE CONTROL message will only be displayed if the ESC system detects any malfunction that sets a DTC. The ESC system will send a message on the serial data line to the IPC to display this message.

The MAXIMUM SPEED message will only be displayed if the ESC system detects a malfunction that sets a DTC and causes the ESC system to disable all four shock absorbers. The ESC system will send a message on the serial data line to the PCM indicating that all four shock absorbers were disabled. The PCM then sends a message to the IPC to display this message.

The ESC module has the ability to store Diagnostic Trouble Codes (DTCs) as current or history codes. Most ESC system malfunctions will display a message in the IPC and set a DTC. The message will remain ON until the RESET button is pressed on the Driver Information Center (DIC). As long as the DTC is current, the message will be displayed after every ignition cycle and the RESET button must be pressed to bypass the message.

The ESC system uses an ignition cycling diagnostic approach in order to reduce the occurrence of false or intermittent DTCs that do not affect the functionality of the ESC system. This allows for the fail-soft actions to be taken whenever a malfunction condition is current, but requires the malfunction to be current for a certain number of ignition cycles before the corresponding malfunction code and message will be stored or displayed.

If the ESC detects a malfunction, the ESC system defaults with a fail-soft action. A fail-soft action refers to any specific action the ESC system takes in order to compensate for a detected malfunction. A typical ESC fail-soft action would be if the ESC system detects a malfunction with the ride control switch, the ESC system will ignore this input and fail-soft to the TOUR ride setting.

Wheels and Tires

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Wheel Nuts In Sequence	140 N·m	100 lb ft

General Description

Factory installed tires and wheels are designed to operate satisfactorily with loads up to and including the full load capacity when inflated to the recommended tire pressures. Correct tire pressure and correct driving techniques have an important influence on tire life. Heavy cornerings, excessively rapid accelerations, and unnecessary sharp braking increase tire wear.

The Tire Pressure Monitoring system (TPM), required with extended mobility tires (EMT), continuously monitors system components and air pressure in each road tire while the vehicle is being driven. When the vehicle is being driven the system notifies the driver through the digital display message in the instrument cluster of system failure or low tire pressure.

Passenger Tire Service Description

Speed Symbol	Maximum Speed (km/h)	Maximum Speed (mph)
S	180	112
T	190	118
U	200	124
H	210	130
V	240	149
Z	Over 240	Over 149

Metric Wheel Nuts and Bolts Description

Metric wheel/nuts and bolts are identified in the following way:

- The wheel/nut has the word Metric stamped on the face.
- The letter M is stamped on the end of the wheel bolt.

The thread sizes of metric wheel/nuts and the bolts are indicated by the following example: M12 x 1.5.

- M = Metric
- 12 = Diameter in millimeters
- 1.5 = Millimeters gap per thread

Tire Inflation Description

When you inflate the tires to the recommended inflation pressures, the factory-installed wheels and tires are designed in order to handle loads to the tire's rated load capacity. Incorrect tire pressures, or under-inflated tires, can cause the following conditions:

- Vehicle handling concerns
- Poor fuel economy
- Shortened tire life

- Tire overloading

Inspect the tire pressure when the following conditions apply:

- The vehicle has been sitting at least 3 hours.
- The vehicle has not been driven for more than 1.6 km (1 mi).
- The tires are cool.

Inspect the tires monthly or before any extended trip. Adjust the tire pressure to the specifications on the tire label. Install the valve caps or the extensions on the valves. The caps or the extensions keep out dust and water.

The kilopascal (kPa) is the metric term for pressure. The tire pressure may be printed in both kilopascal (kPa) and psi. One psi equals 6.9 kPa.

Inflation Pressure Conversion (Kilopascals to PSI)

kPa	psi	kPa	psi
140	20	215	31
145	21	220	32
155	22	230	33
160	23	235	34
165	24	240	35
170	25	250	36
180	26	275	40
185	27	310	45
190	28	345	50
200	29	380	55
205	30	415	60
Conversion: 6.9 kPa = 1 psi			

Tires with a higher than recommended pressure can cause the following conditions:

- A hard ride
- Tire bruising
- Rapid tread wear at the center of the tire

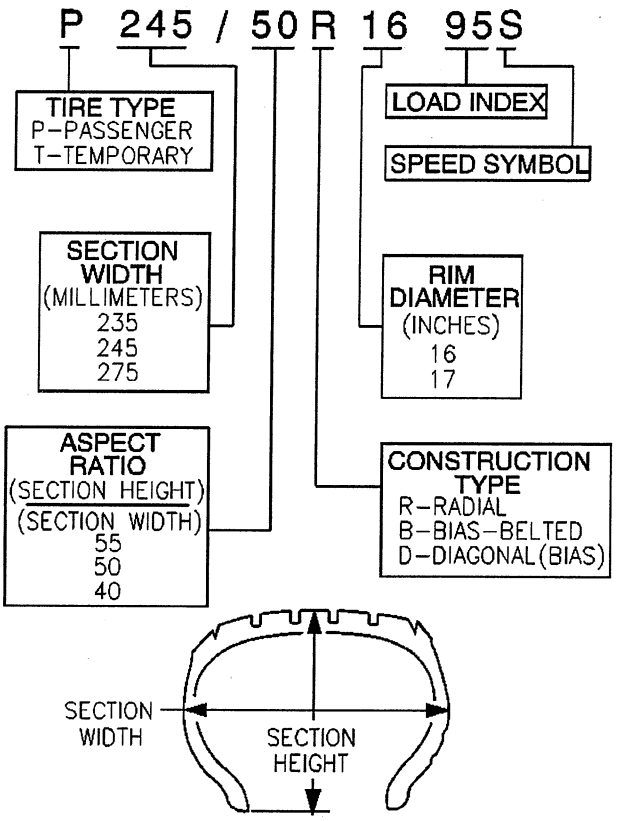
Tires with a lower than recommended pressure can cause the following conditions:

- A tire squeal on turns
- Hard steering
- Rapid wear and uneven wear on the edge of the tread
- Tire rim bruises and tire rim rupture
- Tire cord breakage
- High tire temperatures
- Reduced vehicle handling
- High fuel consumption
- Soft riding

Unequal pressure on the same axle can cause the following conditions:

- Uneven braking
- Steering lead
- Reduced vehicle handling

P-Metric Sized Tires Description

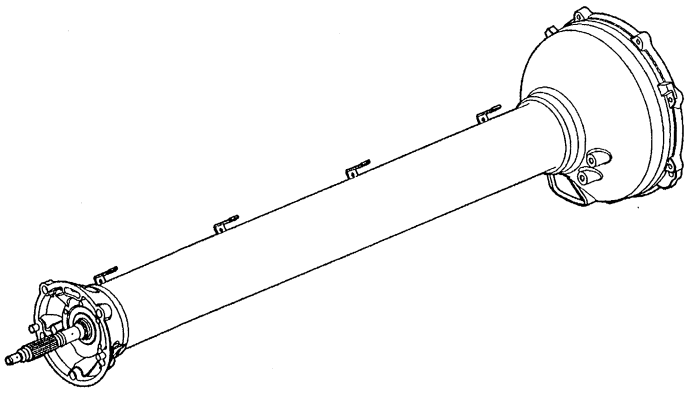


Most P-metric tire sizes do not have exact corresponding alphanumeric tire sizes. Replacement tires should be of the same tire performance criteria (TPC) specification number including the same size, the same load range, and the same construction as those originally installed on the vehicle. Consult a tire dealer if you must replace the P-metric tire with other sizes. Tire companies can best recommend the closest match of alphanumeric to P-metric sizes within their own tire lines.

Driveline System Description and Operation

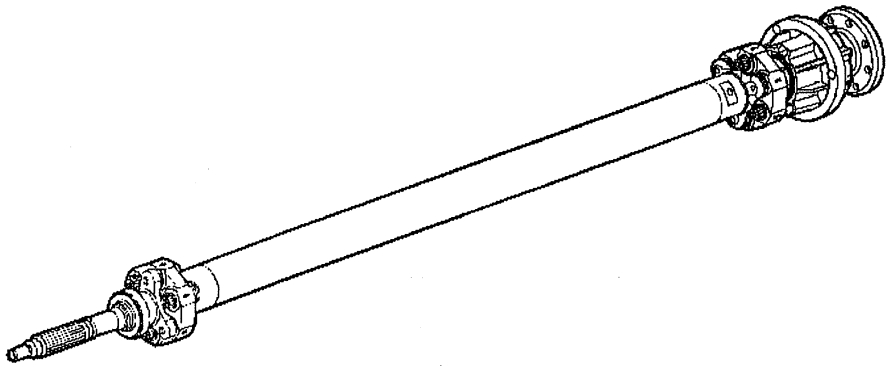
Driveline/Axle – Propeller Shaft

Driveline Support Assembly Description



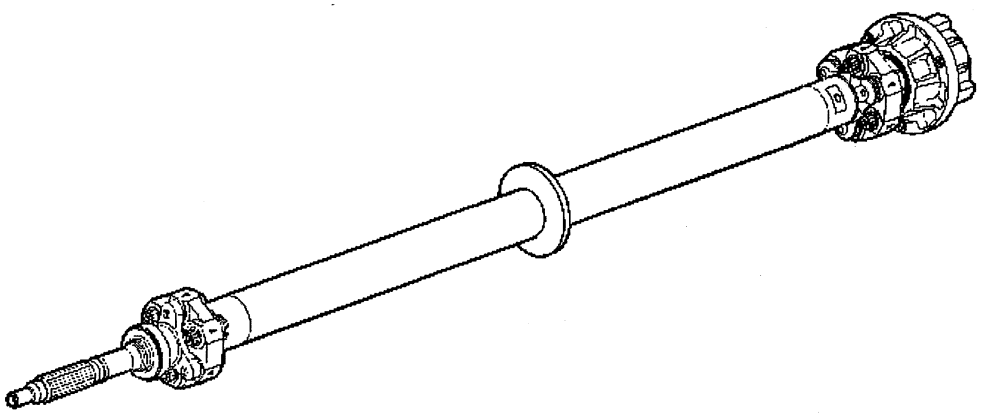
The driveline support assembly consists of a driveline support tube (with rear bell housing) and an internal propeller shaft assembly. The front of the driveline assembly mounts to the engine bellhousing. In manual transmission applications, the clutch actuator is retained to the front of the tube and the shifter linkage is mounted to brackets at the top center area. The driveline support assembly is specific for each vehicle as equipped (either automatic or manual transmission applications).

Propeller Shaft Assembly (Automatic Transmission)(c)



The automatic transmission propeller shaft assembly consists of a splined front input shaft, front coupling, propeller shaft, rear coupling, and bearing and housing assembly. The input shaft, propeller shaft, couplings and bearing and housing assembly are balanced as an assembly. The front of the propeller shaft assembly is supported (at the input shaft) by a ball type bearing. An O-ring, located in the front of the driveline support tube, prevents the front bearing outer race from spinning. The rear of the propeller shaft assembly is supported by a bearing and housing assembly. The bearing and housing assembly consists of a housing, internally splined input hub, externally splined flexplate spindle, O-rings, snap rings, and two ball type bearings. The propeller shaft assembly is retained in the driveline tube by an internal snap ring. The torque converter flex plate is retained to the flexplate spindle by bolts and is mated to the torque converter.

Propeller Shaft Assembly (Manual Transmission)(c)



The manual transmission propeller shaft assembly consists of a splined front input shaft, front coupling, propeller shaft, rear coupling, and bearing and housing assembly. The input shaft, propeller shaft, couplings and bearing and housing assembly are balanced as an assembly. The front of the propeller shaft assembly is supported (at the input shaft) by a ball type bearing. An O-ring, located in the front of the driveline support tube, prevents the front bearing outer race from spinning. The rear bearing of the propeller shaft assembly is supported by a bearing and housing assembly. The bearing and housing assembly consists of a housing, internally splined hub, pilot bushings, O-rings, snap rings, a wave washer, and two ball type bearings. The bearing housing hub internal splines couple to the manual transmission splined input shaft. The propeller shaft assembly is retained in the driveline tube by an internal snap ring. The propeller shaft tube has an overspeed limiter (snubber) that prevents permanent propeller shaft damage as a result of a downshift above recommended speeds.

Important

Disassembly and improper reassembly of the propeller shaft components may result in driveline vibration. The propeller shaft and components should be kept free of any foreign material which could upset balance and also produce driveline vibration.

When servicing the engine, transaxle, or driveline support assembly, the proper installation procedure must be followed. Automatic transmission applications have a specific installation procedure and sequence of installation steps. Failure to follow proper procedures may cause damage to other vehicle driveline components.

Wheel Drive Shafts Description and Operation

Drive axles are flexible assemblies consisting of an inner and outer constant velocity (CV) joint connected by an axle shaft. The inner joint is completely flexible, and can move in and out. The outer joint is also flexible, but cannot move in and out. These drive axles are used to transmit rotational force from the rear axle differential to the rear tire and wheel assemblies.

Seal and Clamp

The drive axle assemblies use inboard and outboard joint seals made of thermoplastic material, and clamps made of stainless steel. The functions of the seals are as follows:

- The seals protect the internal parts of the inboard and outboard joints.
  - They protect the joint lubricating grease from surrounding detrimental atmospheric conditions (such as extreme temperatures, ozone gas, etc.).
  - They protect the joint lubricating grease from foreign materials (such as stones, dirt, water, salt, etc.).
- The seals facilitate angular and axial movement of the inboard joint.
- The seals facilitate angular movement of the outboard joint.

The function of the clamps is as follows:

Provide a leak proof connection at both the housing and the axle shaft for the inboard and outboard joints.

The thermoplastic material performs well against normal handing, operational wear and conditions. This material however, is not strong enough to withstand abusive handling or damage due to objects such as sharp tools or the sharp edge of any other surrounding component on the vehicle.

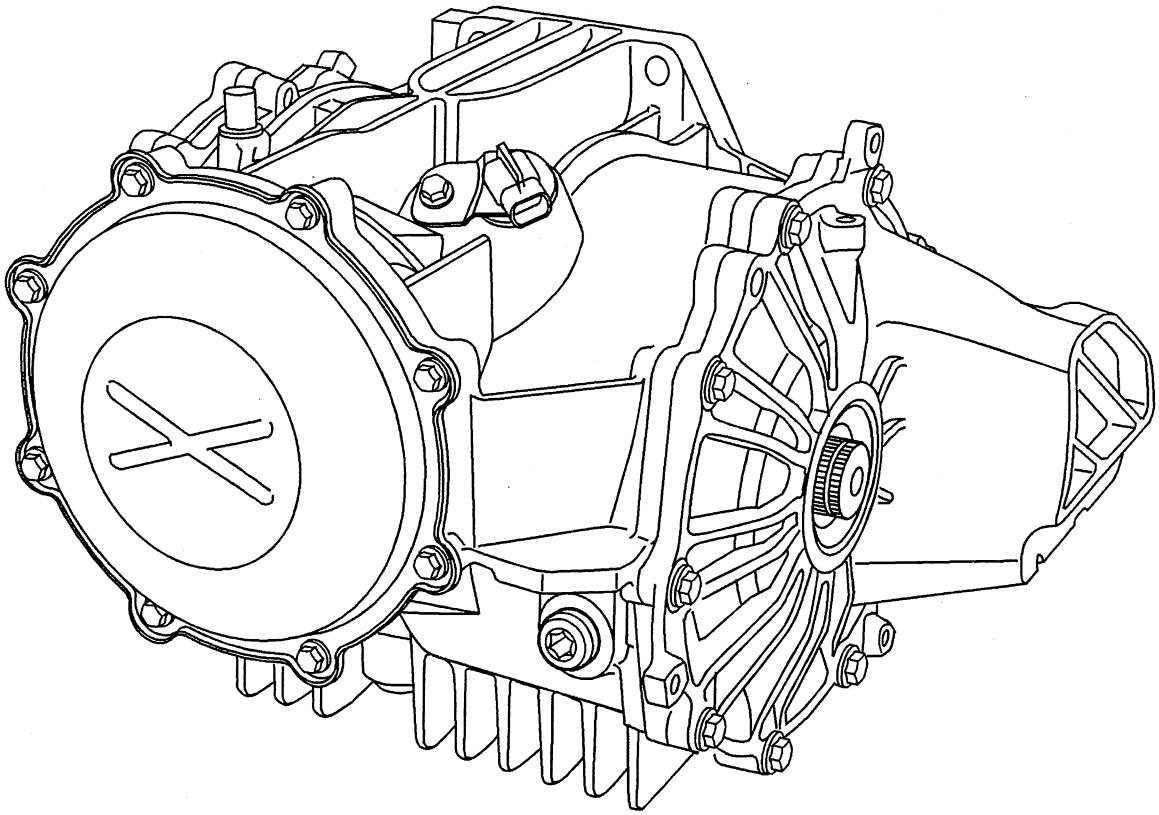
Inner Joint

The inner joints are of the enhanced double offset design. The inner joints use a female spline which is installed over a stub shaft protruding from the rear axle differential.

Outer Joint

The outer joints are of the Rzeppa joint design. The splined shaft end which mates with the knuckle and hub assembly, incorporates a helical spline to assure a tight, press-type fit. This design assures that no end play will exist between the hub bearing and the drive shaft assembly for added durability and reduced bearing noise.

Rear Drive Axle Description and Operation



The vehicle is powered by either the LS2 or LS7 V8 engine. Motion is transferred from the engine crankshaft/flywheel through the driveline support, propeller shaft, assembly to either the 6L80-E (MYC) automatic transmission or the Tremec 6-speed manual transmission. The splined output shaft of the transmission drives the pinion, which in turn, rotates the ring gear and differential case assembly. The limited slip differential distributes torque/power to the rear wheels via individual axle shaft assemblies. The limited-slip differential is of a conventional separator plate and friction disc type design.

The differential housing, side covers, pinion housing, and differential case halves are constructed of cast aluminum. The internal components incorporate a hypoid gear set, ring and pinion, carrier assembly, and pinion housing assembly. The pinion is supported in a pinion housing by tapered roller bearings. The pinion is positioned rearward of the ring gear centerline.

Pinion position, ring gear position, and carrier bearing preload are determined by shimming procedures.

Each ring gear has specific setup dimensions, A1 and A2 values, stamped onto the side area of the gear. The A1 and A2 values are unique to each ring gear/pinion and are determined during the manufacturers gear/pinion noise and vibration setup and testing. The vehicle speed sensor, in manual transmission applications, detect the rotational pulses produced by the ring gear teeth and send the signal to the vehicle control module (VCM).

The differential assembly is available in three gear ratios. The 3.42 ratio axle is used in all manual transmission applications. The 2.56 ratio axle is standard equipment for automatic and base manual transmission applications.

Some models have a differential lubricant pump and cooler. Oil is pulled from the sump through an external oil pipe into the pump. Oil is pumped through an external oil pipe to the cooler. The oil is cooled by dissipating heat with transmission oil returning from radiator mounted cooler.

Braking System Description and Operation

Hydraulic Brake System Description and Operation

System Component Description

The hydraulic brake system consists of the following:

Hydraulic Brake Master Cylinder Fluid Reservoir

Contains supply of brake fluid for the hydraulic brake system.

Hydraulic Brake Master Cylinder

Converts mechanical input force into hydraulic output pressure.

Hydraulic output pressure is distributed from the master cylinder through two hydraulic circuits, supplying diagonally-opposed wheel apply circuits.

Hydraulic Brake Pressure Balance Control System

Regulates brake fluid pressure delivered to hydraulic brake wheel circuits, in order to control the distribution of braking force.

Pressure balance control is achieved through dynamic rear proportioning (DRP), which is a function of the ABS modulator.

Hydraulic Brake Pipes and Flexible Brake Hoses

Carries brake fluid to and from hydraulic brake system components.

Hydraulic Brake Wheel Apply Components

Converts hydraulic input pressure into mechanical output force.

System Operation

Mechanical force is converted into hydraulic pressure by the master cylinder, regulated to meet braking system demands by the pressure balance control system, and delivered to the hydraulic brake wheel circuits by the pipes and flexible hoses. The wheel apply components then convert the hydraulic pressure back into mechanical force which presses linings against rotating brake system components.

Brake Assist System Description and Operation

System Component Description

The brake assist system consists of the following:

Brake Pedal

Receives, multiplies and transfers brake system input force from driver.

Brake Pedal Pushrod

Transfers multiplied input force received from brake pedal to brake booster.

Vacuum Brake Booster

Uses source vacuum to decrease effort required by driver when applying brake system input force.

When brake system input force is applied, air at atmospheric pressure is admitted to the rear of both vacuum diaphragms, providing a decrease in brake pedal effort required. When input force is removed, vacuum replaces atmospheric pressure within the booster.

Vacuum Source

Supplies force used by vacuum brake booster to decrease brake pedal effort.

Vacuum Source Delivery System

Enables delivery and retention of source vacuum for vacuum brake booster.

System Operation

Brake system input force is multiplied by the brake pedal and transferred by the pedal pushrod to the hydraulic brake master cylinder. Effort required to apply the brake system is reduced by the vacuum brake booster.

Disc Brake System Description and Operation

System Component Description

The disc brake system consists of the following components:

Disc Brake Pads

Applies mechanical output force from the hydraulic brake calipers to friction surfaces of brake rotors.

Disc Brake Rotors

Uses mechanical output force applied to friction surfaces from the disc brake pads to slow speed of tire and wheel assembly rotation.

Disc Brake Pad Hardware

Secures disc brake pads firmly in proper relationship to the hydraulic brake calipers. Enables a sliding motion of brake pads when mechanical output force is applied.

Disc Brake Caliper Hardware

Provides mounting for hydraulic brake caliper and secures the caliper firmly in proper relationship to caliper bracket. Enables a sliding motion of the brake caliper to the brake pads when mechanical output force is applied.

System Operation

Mechanical output force is applied from the hydraulic brake caliper pistons to the inner brake pads. As the pistons press the inner brake pads outward, the caliper housings draw the outer brake pads inward. This allows the output force to be equally distributed. The brake pads apply the output force to the friction surfaces on both sides of the brake rotors, which slows the rotation of the tire and wheel assemblies. The correct function of both the brake pad and brake caliper hardware is essential for even distribution of braking force.

Park Brake System Description and Operation

System Component Description

The park brake system consists of the following:

Park Brake Lever Assembly

Receives, multiplies, and transfers park brake system apply input force from operator to park brake cable system.

Releases applied park brake system when lever is returned to at-rest, lowered, position.

Park Brake Cables

Transfers input force received from park brake lever, through park brake cable equalizer, to park brake apply levers.

Park Brake Cable Equalizer

Evenly distributes input force to both the left and right park brake units.

Park Brake Apply Lever

Multiplies and transfers input force to park brake actuator/adjuster.

Park Brake Actuator/Adjuster

Uses multiplied input force from apply lever via the cables to expand park brake shoe toward the friction surface of the drum-in-hat portion of the rear brake rotor.

Threaded park brake actuators/adjusters are also used to control clearance between the park brake shoe and the friction surface of the drum-in-hat portion of the rear brake rotor.

Park Brake Shoe (Rear Disc, Drum-In-Hat System)

Applies mechanical output force from park brake actuator/adjuster to friction surface of the drum-in-hat portion of the rear brake rotor.

System Operation

Park brake apply input force is received by the park brake lever assembly being applied. The input force is multiplied by the lever assembly, transferred, and evenly distributed, through the park brake cables and the park brake cable equalizer, to the left and right park brake apply levers. The park brake apply levers multiply and transfer the apply input force to the park brake actuators. The park brake lever assembly releases an applied park brake system when it is returned to the at-rest, lowered, position.

ABS Description and Operation

Antilock Brake System

When wheel slip is detected during a brake application, the ABS enters antilock mode. During antilock braking, hydraulic pressure in the individual wheel circuits is controlled to prevent any wheel from slipping. A separate hydraulic line and specific solenoid valves are provided for each wheel. The ABS can decrease, hold, or increase hydraulic pressure to each wheel brake. The ABS cannot, however, increase hydraulic pressure above the amount which is transmitted by the master cylinder during braking.

During antilock braking, a series of rapid pulsations is felt in the brake pedal. These pulsations are caused by the rapid changes in position of the individual solenoid valves as the EBCM responds to wheel speed sensor inputs and attempts to prevent wheel slip. These pedal pulsations are present only during antilock braking and stop when normal braking is resumed or when the vehicle comes to a stop. A ticking or popping noise may also be heard as the solenoid valves cycle rapidly. During antilock braking on dry pavement, intermittent chirping noises may be heard as the tires approach slipping. These noises and pedal pulsations are considered normal during antilock operation.

Vehicles equipped with ABS may be stopped by applying normal force to the brake pedal. Brake pedal operation during normal braking is no different than that of previous non-ABS systems. Maintaining a constant force on the brake pedal provides the shortest stopping distance while maintaining vehicle stability.

The Traction Control System (TCS) also monitors rear wheel speed and compares the speed to the speed of the front wheel. If excessive rear wheel speed is detected in either rear wheels the TCS will be activated. The TCS uses the following to improved traction and vehicle stability:

- Throttle Shutdown
- Timing control
- Rear brake intervention

Engine Description and Operation

Engine Mechanical – LS2 6.0L

General Specifications

Application	Specification	
	Metric	English
General		
Engine Type	V8	
Displacement	6.0L	364 CID
RPO	LS2	
VIN	U	
Bore	101.618-101.636 mm	4.0007-4.0017 in
Stroke	92.0 mm	3.622 in
Compression Ratio	10.9:1	
Firing Order	1-8-7-2-6-5-4-3	
Spark Plug Gap	1.02 mm	0.04 in
Block		
Camshaft Bearing Bore 1 and 5 Diameter	59.58-59.63 mm	2.345-2.347 in
Camshaft Bearing Bore 2 and 4 Diameter	59.08-59.13 mm	2.325-2.327 in
Camshaft Bearing Bore 3 Diameter	58.58-58.63 mm	2.306-2.308 in
Crankshaft Main Bearing Bore Diameter	69.871-69.889 mm	2.75-2.751 in
Crankshaft Main Bearing Bore Out-of-Round	0.006 mm	0.0002 in
Cylinder Bore Diameter	101.618-101.636 mm	4.0007-4.0017 in
Cylinder Head Deck Height - Measuring from the Centerline of Crankshaft to the Deck Face	234.57-234.82 mm	9.235-9.245 in
Cylinder Head Deck Surface Flatness - Measured within a 152.4 mm (6.0 in) Area	0.11 mm	0.004 in
Cylinder Head Deck Surface Flatness - Measuring the Overall Length of the Block Deck	0.22 mm	0.008 in
Valve Lifter Bore Diameter	21.417-21.443 mm	0.843-0.844 in
Camshaft		
Camshaft End Play	0.025-0.305 mm	0.001-0.012 in
Camshaft Journal Diameter	54.99-55.04 mm	2.164-2.166 in
Camshaft Journal Out-of-Round	0.025 mm	0.001 in
Camshaft Lobe Lift - Intake	7.81 mm	0.307 in
Camshaft Lobe Lift - Exhaust	7.77 mm	0.306 in
Camshaft Runout - Measured at the Intermediate Journals	0.05 mm	0.002 in
Connecting Rod		
Connecting Rod Bearing Clearance - Production	0.023-0.065 mm	0.0009-0.0025 in
Connecting Rod Bearing Clearance - Service	0.023-0.076 mm	0.0009-0.003 in
Connecting Rod Bore Diameter - Bearing End	56.505-56.525 mm	2.224-2.225 in
Connecting Rod Bore Out-of-Round - Bearing End - Production	0.004-0.008 mm	0.00015-0.0003 in
Connecting Rod Bore Out-of-Round - Bearing End - Service	0.004-0.008 mm	0.00015-0.0003 in
Connecting Rod Side Clearance	0.11-0.51 mm	0.00433-0.02 in

Application	Specification	
	Metric	English
Crankshaft		
Connecting Rod Journal Diameter - Production	53.318-53.338 mm	2.0991-2.0999 in
Connecting Rod Journal Diameter - Service	53.308 mm	2.0987 in
Connecting Rod Journal Out-of-Round - Production	0.005 mm	0.0002 in
Connecting Rod Journal Out-of-Round - Service	0.01 mm	0.0004 in
Connecting Rod Journal Taper - Maximum for 1/2 of Journal Length - Production	0.005 mm	0.0002 in
Connecting Rod Journal Taper - Maximum for 1/2 of Journal Length - Service	0.02 mm	0.00078 in
Crankshaft End Play	0.04-0.2 mm	0.0015-0.0078 in
Crankshaft Main Bearing Clearance - Production	0.02-0.052 mm	0.0008-0.0021 in
Crankshaft Main Bearing Clearance - Service	0.02-0.065 mm	0.0008-0.0025 in
Crankshaft Main Journal Diameter - Production	64.992-65.008 mm	2.558-2.559 in
Crankshaft Main Journal Diameter - Service	64.992 mm	2.558 in
Crankshaft Main Journal Out-of-Round - Production	0.003 mm	0.000118 in
Crankshaft Main Journal Out-of-Round - Service	0.008 mm	0.0003 in
Crankshaft Main Journal Taper - Production	0.01 mm	0.0004 in
Crankshaft Main Journal Taper - Service	0.02 mm	0.00078 in
Crankshaft Rear Flange Runout	0.05 mm	0.002 in
Crankshaft Reluctor Ring Runout - Measured 1.0 mm (0.04 in) Below Tooth Diameter	0.7 mm	0.028 in
Crankshaft Thrust Surface - Production	26.14-26.22 mm	1.029-1.0315 in
Crankshaft Thrust Surface - Service	26.22 mm	1.0315 in
Crankshaft Thrust Surface Runout	0.025 mm	0.001 in
Cylinder Head		
Cylinder Head Height/Thickness - Measured from the Cylinder Head Deck to the Valve Rocker Arm Cover Seal Surface	120.2 mm	4.732 in
Surface Flatness - Block Deck - Measured within a 152.4 mm (6.0 in) Area	0.08 mm	0.003 in
Surface Flatness - Block Deck - Measuring the Overall Length of the Cylinder Head	0.1 mm	0.004 in
Surface Flatness - Exhaust Manifold Deck	0.13 mm	0.005 in
Surface Flatness - Intake Manifold Deck	0.08 mm	0.0031 in
Valve Guide Installed Height - Measured from the Spring Seat Surface to the Top of the Guide	17.32 mm	0.682 in
Intake Manifold		
Surface Flatness - Measured at Gasket Sealing Surfaces and Measured Within a 200 mm (7.87 in) Area that Includes Two Runner Port Openings	0.3 mm	0.118 in
Lubrication System		
Oil Capacity - with Filter	5.2 liters	5.5 quarts
Oil Capacity - without Filter	4.7 liters	5.0 quarts
Oil Pressure - Minimum - Hot	41 kPa at 1,000 engine RPM 124 kPa at 2,000 engine RPM 165 kPa at 4,000 engine RPM	6 psig at 1,000 engine RPM 18 psig at 2,000 engine RPM 24 psig at 4,000 engine RPM

Application	Specification	
	Metric	English
Oil Pan		
Front Cover Alignment - at Oil Pan Surface	0.0-0.5 mm	0.0-0.02 in
Rear Cover Alignment - at Oil Pan Surface	0.0-0.5 mm	0.0-0.02 in
Oil Pan Alignment - to Rear of Engine Block at Transmission Bell Housing Mounting Surface	0.0-0.25 mm	0.0-0.01 in
Piston Rings		
Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Production	0.20-0.41 mm	0.008-0.016 in
Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Service	0.20-0.41 mm	0.008-0.016 in
Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Production	0.37-0.69 mm	0.015-0.027 in
Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Service	0.37-0.69 mm	0.015-0.027 in
Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Production	0.22-0.79 mm	0.009-0.031 in
Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Service	0.22-0.79 mm	0.009-0.031 in
Piston Ring to Groove Clearance - First Compression Ring - Production	0.030-0.10 mm	0.0012-0.0040 in
Piston Ring to Groove Clearance - First Compression Ring - Service	0.030-0.10 mm	0.0012-0.0040 in
Piston Ring to Groove Clearance - Second Compression Ring - Production	0.035-0.078 mm	0.0014-0.0031 in
Piston Ring to Groove Clearance - Second Compression Ring - Service	0.035-0.078 mm	0.0014-0.0031 in
Piston Ring to Groove Clearance - Oil Control Ring - Production	0.013-0.201 mm	0.0005-0.0079 in
Piston Ring to Groove Clearance - Oil Control Ring - Service	0.013-0.201 mm	0.0005-0.0079 in
Pistons and Pins		
Pin - Piston Pin Clearance to Piston Pin Bore - Production	0.002-0.01 mm	0.0008-0.0004 in
Pin - Piston Pin Clearance to Piston Pin Bore - Service	0.002-0.015 mm	0.0008-0.0006 in
Pin - Piston Pin Diameter	23.952-23.955 mm	0.943-0.943 in
Pin - Piston Pin Fit in Connecting Rod Bore - Production	0.007-0.02 mm	0.00027-0.00078 in
Pin - Piston Pin Fit in Connecting Rod Bore - Service	0.007-0.0022 mm	0.00027-0.00086 in
Piston - Piston Diameter - Measured Over Skirt Coating	101.611-101.642 mm	4.0-4.001 in
Piston - Piston to Bore Clearance - Production	-0.022-0.08 mm	-0.0009-0.0012 in
Piston - Piston to Bore Clearance - Service Limit with Skirt Coating Worn Off	0.024-0.08 mm	0.00094-0.0031 in
Valve System		
Valves - Valve Face Angle	45 degrees	
Valves - Valve Face Width	1.25 mm	0.05 in
Valves - Valve Lash	Net Lash - No Adjustment	
Valves - Valve Lift - Intake	13.27 mm	0.522 in
Valves - Valve Lift - Exhaust	13.25 mm	0.521 in
Valves - Valve Seat Angle	46 degrees	
Valves - Valve Seat Runout	0.05 mm	0.002 in
Valves - Valve Seat Width - Exhaust	1.78 mm	0.07 in

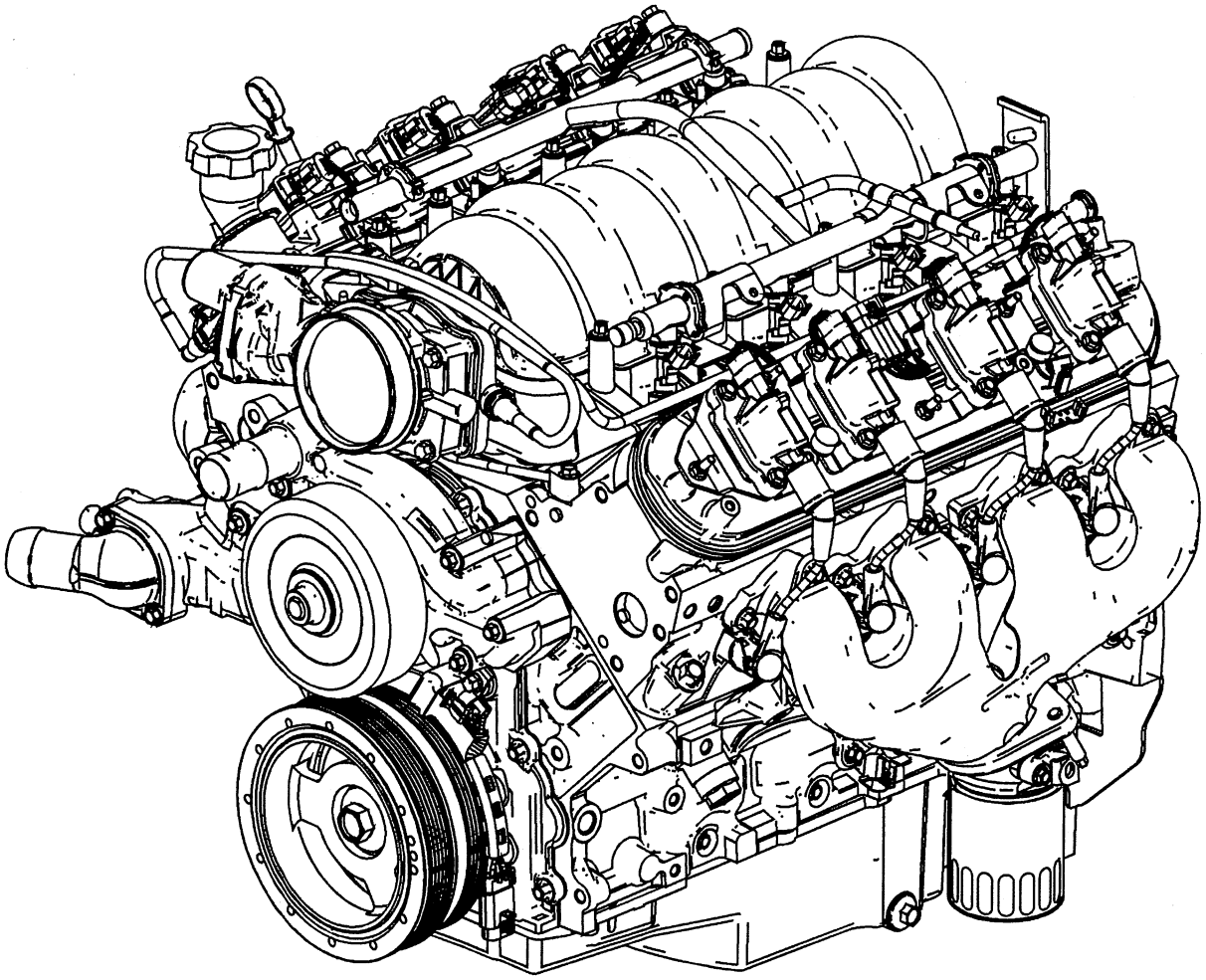
Application	Specification	
	Metric	English
Valves - Seat Width - Intake	1.02 mm	0.04 in
Valves - Valve Stem Diameter - Production	7.955-7.976 mm	0.313-0.314 in
Valves - Valve Stem Diameter - Service	7.95 mm	0.313 in
Valves - Valve Stem-to-Guide Clearance - Production - Intake	0.025-0.066 mm	0.001-0.0026 in
Valves - Valve Stem-to-Guide Clearance - Service - Intake	0.093 mm	0.0037 in
Valves - Valve Stem-to-Guide Clearance - Production - Exhaust	0.025-0.066 mm	0.001-0.0026 in
Valves - Valve Stem-to-Guide Clearance - Service - Exhaust	0.093 mm	0.0037 in
Rocker Arms - Valve Rocker Arm Ratio	1.70:1	
Valve Springs - Valve Spring Free Length	52.9 mm	2.08 in
Valve Springs - Valve Spring Installed Height	45.75 mm	1.8 in
Valve Springs - Valve Spring Load - Closed	340 N at 45.75 mm	76 lb at 1.8 in
Valve Springs - Valve Spring Load - Open	980 N at 33.55 mm	220 lb at 1.32 in

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Camshaft Position (CMP) Sensor Bolt	12 N·m	106 lb in
CMP Sensor Wire Harness Bolt	12 N·m	106 lb in
Camshaft Retainer Bolts	25 N·m	18 lb ft
Camshaft Sprocket Bolts	25 N·m	18 lb ft
Clutch Pressure Plate Bolts	70 N·m	52 lb ft
Connecting Rod Bolts - First Pass	20 N·m	15 lb ft
Connecting Rod Bolts - Final Pass	75 degrees	
Coolant Air Bleed Pipe and Cover Bolts	12 N·m	106 lb in
Coolant Temperature Sensor	20 N·m	15 lb ft
Crankshaft Balancer Bolt - Installation Pass to Ensure the Balancer is Completely Installed	330 N·m	240 lb ft
Crankshaft Balancer Bolt - First Pass - Install a NEW Bolt After the Installation Pass and Tighten as Described in the First and Final Passes	50 N·m	37 lb ft
Crankshaft Balancer Bolt - Final Pass	140 degrees	
Crankshaft Bearing Cap Bolts - Inner Bolts - First Pass in Sequence	20 N·m	15 lb ft
Crankshaft Bearing Cap Bolts - Inner Bolts - Final Pass in Sequence	80 degrees	
Crankshaft Bearing Cap Bolts - Outer Bolt/Studs - First Pass in Sequence	20 N·m	15 lb ft
Crankshaft Bearing Cap Bolts - Outer Bolt/Studs - Final Pass in Sequence	51 degrees	
Crankshaft Bearing Cap Side Bolts	25 N·m	18 lb ft
Crankshaft Oil Deflector Nuts	25 N·m	18 lb ft
Crankshaft Position (CKP) Sensor Bolt	25 N·m	18 lb ft
Cylinder Head Bolts - First Pass all M11 Bolts in Sequence	30 N·m	22 lb ft
Cylinder Head Bolts - Second Pass all M11 Bolts in Sequence	90 degrees	
Cylinder Head Bolts - Final Pass all M11 Bolts in Sequence	70 degrees	
Cylinder Head Bolts - M8 Inner Bolts in Sequence	30 N·m	22 lb ft
Cylinder Head Coolant Plug	20 N·m	15 lb ft
Engine Block Coolant Heater	40 N·m	30 lb ft
Engine Block Oil Gallery/Coolant Plugs	60 N·m	44 lb ft
Evaporative Emission (EVAP) Purge Valve Bracket Bolt	50 N·m	37 lb ft
Exhaust Manifold Bolts - First Pass	15 N·m	11 lb ft
Exhaust Manifold Bolts - Final Pass	20 N·m	15 lb ft
Exhaust Manifold Heat Shield Bolts	9 N·m	80 lb in
Exhaust Manifold Studs	20 N·m	15 lb ft

Application	Specification	
	Metric	English
Flywheel Bolts - First Pass	20 N·m	15 lb ft
Flywheel Bolts - Second Pass	50 N·m	37 lb ft
Flywheel Bolts - Final Pass	100 N·m	74 lb ft
Front Cover Bolts	25 N·m	18 lb ft
Fuel Rail Bolts	10 N·m	89 lb in
Ignition Coil Bracket-to-Valve Rocker Arm Cover Bolts	12 N·m	106 lb in
Ignition Coil-to-Bracket Bolts	10 N·m	89 lb in
Intake Manifold Bolts - First Pass in Sequence	5 N·m	44 lb in
Intake Manifold Bolts - Final Pass in Sequence	10 N·m	89 lb in
Knock Sensor Bolts	20 N·m	15 lb ft
Motor Mount Bracket Bolts	50 N·m	37 lb ft
Oil Filter	30 N·m	22 lb ft
Oil Filter Fitting	55 N·m	40 lb ft
Oil Level Indicator Tube Bolt	25 N·m	18 lb ft
Oil Level Sensor	20 N·m	15 lb ft
Oil Pan Closeout Cover Bolt - Left Side	9 N·m	80 lb in
Oil Pan Closeout Cover Bolt - Right Side	9 N·m	80 lb in
Oil Pan Cover Bolts	12 N·m	106 lb in
Oil Pan Drain Plug	25 N·m	18 lb ft
Oil Pan M6 Bolts - Oil Pan-to-Rear Cover	12 N·m	106 lb in
Oil Pan M8 Bolts - Oil Pan-to-Engine Block and Oil Pan-to-Front Cover	25 N·m	18 lb ft
Oil Pressure Sensor	20 N·m	15 lb ft
Oil Pump Cover Bolts	12 N·m	106 lb in
Oil Pump Relief Valve Plug	12 N·m	106 lb in
Oil Pump Screen Nuts	25 N·m	18 lb ft
Oil Pump Screen-to-Oil Pump Bolt	12 N·m	106 lb in
Oil Pump-to-Engine Block Bolts	25 N·m	18 lb ft
Rear Cover Bolts	25 N·m	18 lb ft
Service Lift Bracket M8 Bolt	25 N·m	18 lb ft
Service Lift Bracket M10 Bolts	50 N·m	37 lb ft
Spark Plugs - New Cylinder Heads	20 N·m	15 lb ft
Spark Plugs - All Subsequent Installations	15 N·m	11 lb ft
Throttle Body Bolts	10 N·m	89 lb in
Timing Chain Dampener Bolts	25 N·m	18 lb ft
Valley Cover Bolts	25 N·m	18 lb ft
Valve Lifter Guide Bolts	10 N·m	89 lb in
Valve Rocker Arm Bolts	30 N·m	22 lb ft
Valve Rocker Arm Cover Bolts	12 N·m	106 lb in
Water Inlet Housing Bolts	15 N·m	11 lb ft
Water Pump Bolts - First Pass	15 N·m	11 lb ft
Water Pump Bolts - Final Pass	30 N·m	22 lb ft

Engine Component Description



The 6.0 Liter V8 engine is identified as RPO LS2 VIN U.

Camshaft and Drive System

A billet steel one piece camshaft is supported by five bearings pressed into the engine block. The camshaft timing sprocket is mounted to the front of the camshaft and is driven by the crankshaft sprocket through the camshaft timing chain. The camshaft position sensor lobes are incorporated into the front face of the camshaft sprocket with the camshaft position sensor mounted in the engine front cover. A timing chain guide is mounted to the front of the engine block above the crankshaft sprocket. The externally splined crankshaft sprocket is positioned to the crankshaft by a key and keyway. The crankshaft sprocket external splines drive the oil pump drive gear. A retaining plate mounted to the front of the engine block maintains camshaft location.

Crankshaft

The crankshaft is cast nodular iron. The crankshaft is supported by five crankshaft bearings. The bearings are retained by crankshaft bearing caps which are machined with the engine block for proper alignment and clearance. The crankshaft journals are undercut and rolled. The center main journal is the thrust

journal. A crankshaft position reluctor ring is press fit mounted at the rear of the crankshaft. The reluctor ring is not serviceable separately.

Cylinder Heads

The cylinder heads are cast aluminum and have pressed in place powdered metal valve guides and valve seats. Passages for the engine coolant air bleed system are at the front of each cylinder head. The valve rocker arm covers are retained to the cylinder heads by four center mounted rocker arm cover bolts.

Engine Block

The engine block is a cam-in-block deep skirt 90 degree V configuration with five crankshaft bearing caps. The engine block is cast aluminum. The five crankshaft bearing caps each have four vertical M10 and two horizontal M8 mounting bolts. The camshaft is supported by five camshaft bearings pressed into the block.

Exhaust Manifolds

The exhaust manifolds are a one-piece cast iron design. The exhaust manifolds direct exhaust gasses from the combustion chambers to the exhaust system. Each manifold also has an externally mounted heat shield that is retained by bolts.

Intake Manifold

The intake manifold is a one-piece composite design that incorporates brass threaded inserts for mounting the fuel rail, throttle body, and wire harness studs. Each side of the intake manifold is sealed to the cylinder head by a non-reusable push-in-place silicone sealing gasket. The electronically actuated throttle body bolts to the front of the intake manifold. The throttle body is sealed by a one-piece push-in-place silicone gasket. The fuel rail assembly, with eight separate fuel injectors, is retained to the intake by four bolts. The injectors are seated into their individual manifold bores with O-ring seals to provide sealing. A fuel rail stop bracket is retained to the rear left of the intake manifold by mounting bolts. The manifold absolute pressure (MAP) sensor is installed and retained to the top front of the intake manifold and sealed by an O-ring seal. The evaporative emission (EVAP) solenoid valve is mounted to the front of the right cylinder head. There are no coolant passages within the intake manifold.

Oil Pan

The structural rear-sump oil pan is cast aluminum. Incorporated into the design is the oil filter mounting boss, drain plug opening and oil level indicator tube opening. The alignment of the structural oil pan to the rear of the engine block and transmission bell housing is critical.

Piston and Connecting Rod Assembly

The pistons are cast aluminum. The pistons use two compression rings and one oil control ring assembly. The piston is a low friction, lightweight design with a flat or recessed top and barrel shaped skirt. The piston pins are chromium steel and are a full-floating design. The connecting rods are powdered metal. The connecting rods are fractured at the connecting rod journal and then machined for the proper clearance. All applications use a piston with a graphite coated skirt. The piston and pin are to be serviced as an assembly.

Valve Rocker Arm Cover Assemblies

The valve rocker arm covers are cast aluminum and use a pre-molded silicon gasket for sealing. Mounted to each rocker cover are the coil and bracket assemblies. Incorporated into the right cover is the oil fill tube and the positive crankcase ventilation (PCV) fresh air passage.

Valve Train

Motion is transmitted from the camshaft through the hydraulic roller valve lifters and tubular pushrods to the roller type rocker arms. The nylon valve lifter guides position and retain the valve lifters. The valve rocker arms for each bank of cylinders are mounted on pedestals or pivot supports. Each rocker arm is retained on the pivot support and cylinder head by a bolt. Valve lash is net build.

Drive Belt System Description

The drive belt system consists of the following components:

- The drive belt
- The drive belt tensioner
- The drive belt idler pulley
- The crankshaft balancer pulley
- The accessory drive component mounting brackets
- The accessory drive components
  - The power steering pump, if belt driven
  - The generator
  - The A/C compressor, if equipped
  - The engine cooling fan, if belt driven
  - The water pump, if belt driven
  - The vacuum pump, if equipped
  - The air compressor, if equipped

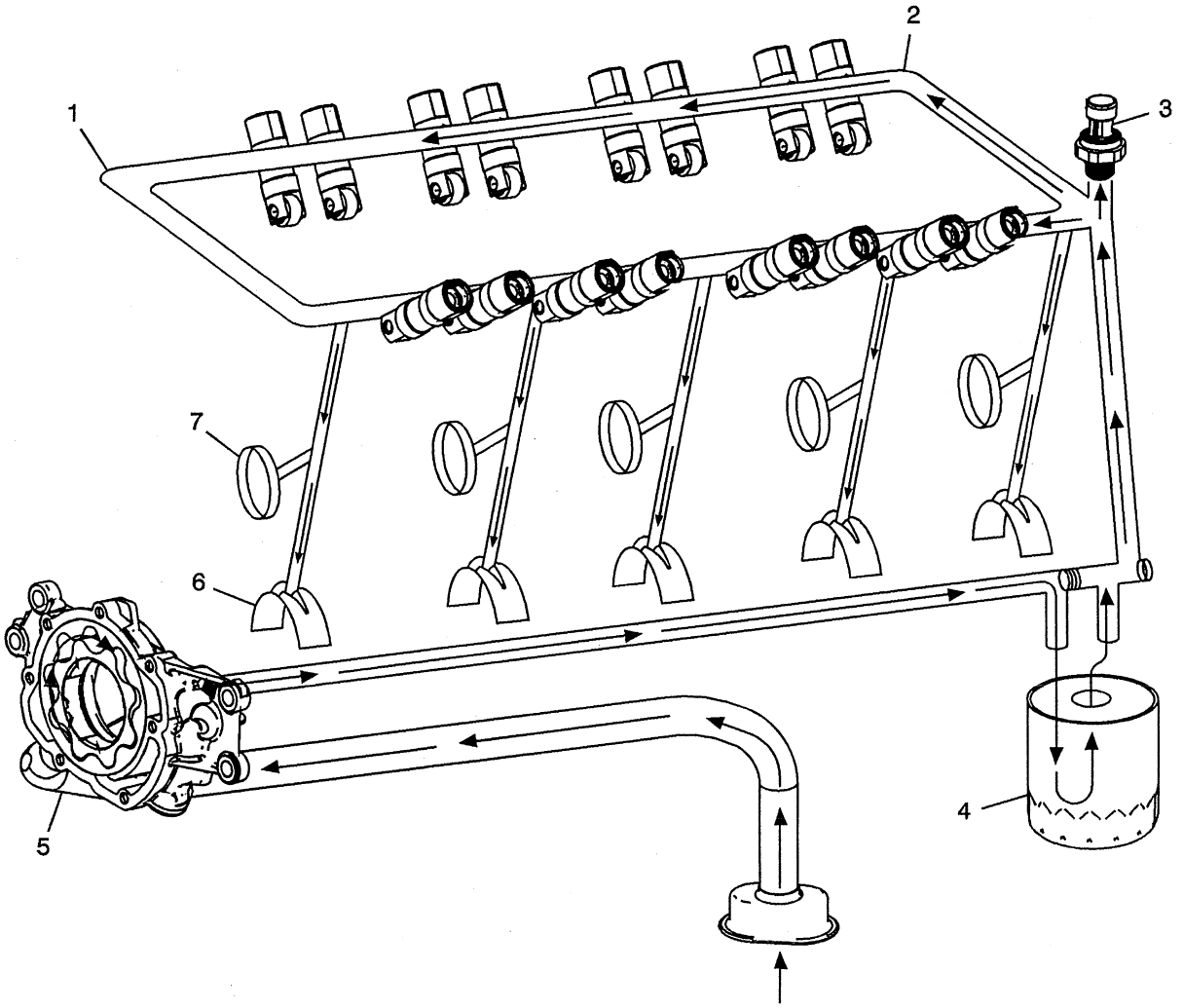
The drive belt system may use one belt or two belts. The drive belt is thin so that it can bend backwards and has several ribs to match the grooves in the pulleys. There also may be a V-belt style belt used to drive certain accessory drive components. The drive belts are made of different types of rubbers (chloroprene or EPDM) and have different layers or plys containing either fiber cloth or cords for reinforcement.

Both sides of the drive belt may be used to drive the different accessory drive components. When the back side of the drive belt is used to drive a pulley, the pulley is smooth.

The drive belt is pulled by the crankshaft balancer pulley across the accessory drive component pulleys. The spring loaded drive belt tensioner keeps constant tension on the drive belt to prevent the drive belt from slipping. The drive belt tensioner arm will move when loads are applied to the drive belt by the accessory drive components and the crankshaft.

The drive belt system may have an idler pulley, which is used to add wrap to the adjacent pulleys. Some systems use an idler pulley in place of an accessory drive component when the vehicle is not equipped with the accessory.

Lubrication



Engine lubrication is supplied by a gerotor type oil pump assembly (5). The pump is mounted on the front of the engine block and driven directly by the crankshaft sprocket. The pump gears rotate and draw oil from the oil pan sump through a pick-up screen and pipe. The oil is pressurized as it passes through the pump and is sent through the engine block lower oil gallery. Contained within the oil pump assembly is a pressure regulator valve that maintains oil pressure within a specified range.

Pressurized oil is directed through the engine block lower oil gallery to the full flow oil filter (4) where harmful contaminants are removed. A bypass valve is incorporated into the oil pan at the oil filter boss, which permits oil flow in the event the filter becomes restricted.

Oil is then directed from the filter to the upper main oil galleries (1). Oil from the left upper oil gallery is directed to the crankshaft bearings (6) and camshaft bearings (7). Oil that has entered both the upper main oil galleries also pressurizes the valve lifter assemblies (2) and is then pumped through the pushrods to lubricate the valve rocker arms and valve stems. Oil returning to the pan is directed by the crankshaft oil deflector. The oil pressure sensor (3) is located at the top rear of the engine.

Crankcase Ventilation System Description

A closed crankcase ventilation system is used in order to provide a more complete scavenging of crankcase vapors. Filtered air from the air induction system duct is supplied to the crankcase, mixed with blow-by vapors, and passes through a crankcase ventilation metering device before entering the intake manifold. The primary component in the positive crankcase ventilation (PCV) system is the PCV flow metering device (valve or orifice) . Vacuum changes within the intake manifold result in flow variations of the blow-by vapors. If abnormal operating conditions occur, the design of the PCV system permits excessive amounts of blow-by vapors to back flow through the crankcase vent tube and into the engine induction system to be consumed during normal combustion. This engine ventilation system design minimizes oil consumption and significantly reduces the potential for oil ingestion during vehicle limit handling maneuvers.

LS2 Engine

The LS2 engine utilizes an integral PCV system which is located in the engines valley cover beneath the intake manifold. The engine valley cover contains composite oil separating baffles and PCV plumbing. Filtered fresh air is routed from up stream of the throttle plate to the front of the right valve rocker arm cover through a formed nylon tube. The design of the rocker cover shields rocker arm oil spray thereby reducing the potential for oil being drawn into the throttle bore area during back flow of the ventilation system. Blow-by vapors are routed from the valley cover through a fixed orifice (2.5 mm) within a steel PCV tube, then through a formed rubber hose before entering the intake manifold behind the throttle body.

Engine Mechanical – LS7 7.0L

General Specifications

Application	Specification	
	Metric	English
General		
Engine Type	V8	
Displacement	7.0L	427 CID
RPO	LS7	
VIN	E	
Bore	104.766-104.784 mm	4.125-4.125 in
Stroke	101.6 mm	4.0 in
Compression Ratio	11.0:1	
Firing Order	1-8-7-2-6-5-4-3	
Spark Plug Gap	1.02 mm	0.04 in
Block		
Camshaft Bearing Bore 1 and 5 Diameter	59.58-59.63 mm	2.345-2.347 in
Camshaft Bearing Bore 2 and 4 Diameter	59.08-59.13 mm	2.325-2.327 in
Camshaft Bearing Bore 3 Diameter	58.58-58.63 mm	2.306-2.308 in
Crankshaft Main Bearing Bore Diameter	69.871-69.889 mm	2.75-2.751 in
Crankshaft Main Bearing Bore Out-of-Round	0.006 mm	0.0002 in
Cylinder Bore Diameter	104.766-104.784 mm	4.125-4.125 in
Cylinder Head Deck Height - Measuring from the Centerline of Crankshaft to the Deck Face	234.57-234.82 mm	9.235-9.245 in
Cylinder Head Deck Surface Flatness - Measured within a 152.4 mm (6.0 in) Area	0.11 mm	0.004 in
Cylinder Head Deck Surface Flatness - Measuring the Overall Length of the Block Deck	0.22 mm	0.008 in
Valve Lifter Bore Diameter	21.417-21.443 mm	0.843-0.844 in
Camshaft		
Camshaft End Play	0.025-0.305 mm	0.001-0.012 in
Camshaft Journal Diameter	54.99-55.04 mm	2.164-2.166 in
Camshaft Journal Out-of-Round	0.025 mm	0.001 in
Camshaft Lobe Lift - Intake	8.4 mm	0.331 in
Camshaft Lobe Lift - Exhaust	8.34 mm	0.328 in
Camshaft Runout - Measured at the Intermediate Journals	0.05 mm	0.002 in
Connecting Rod		
Connecting Rod Bearing Clearance - Production	0.023-0.065 mm	0.0009-0.0025 in
Connecting Rod Bearing Clearance - Service	0.023-0.076 mm	0.0009-0.003 in
Connecting Rod Bore Diameter - Bearing End	56.505-56.525 mm	2.224-2.225 in
Connecting Rod Bore Diameter - Pin End	23.511-23.519 mm	0.926-0.926 in
Connecting Rod Bore Out-of-Round - Bearing End - Production	0.004-0.008 mm	0.00015-0.0003 in
Connecting Rod Bore Out-of-Round - Bearing End - Service	0.004-0.008 mm	0.00015-0.0003 in
Connecting Rod Side Clearance	0.11-0.51 mm	0.00433-0.02 in
Crankshaft		
Connecting Rod Journal Diameter - Production	53.318-53.338 mm	2.0991-2.0999 in
Connecting Rod Journal Diameter - Service	53.308 mm	2.0987 in
Connecting Rod Journal Out-of-Round - Production	0.005 mm	0.0002 in
Connecting Rod Journal Out-of-Round - Service	0.01 mm	0.0004 in

Application	Specification	
	Metric	English
Connecting Rod Journal Taper - Maximum for 1/2 of Journal Length - Production	0.005 mm	0.0002 in
Connecting Rod Journal Taper - Maximum for 1/2 of Journal Length - Service	0.02 mm	0.00078 in
Crankshaft End Play	0.04-0.2 mm	0.0015-0.0078 in
Crankshaft Main Bearing Clearance - Production	0.02-0.052 mm	0.0008-0.0021 in
Crankshaft Main Bearing Clearance - Service	0.02-0.065 mm	0.0008-0.0025 in
Crankshaft Main Journal Diameter - Production	64.992-65.008 mm	2.558-2.559 in
Crankshaft Main Journal Diameter - Service	64.992 mm	2.558 in
Crankshaft Main Journal Out-of-Round - Production	0.003 mm	0.000118 in
Crankshaft Main Journal Out-of-Round - Service	0.008 mm	0.0003 in
Crankshaft Main Journal Taper - Production	0.01 mm	0.0004 in
Crankshaft Main Journal Taper - Service	0.02 mm	0.00078 in
Crankshaft Rear Flange Runout	0.05 mm	0.002 in
Crankshaft Reluctor Ring Runout - Measured 1.0 mm (0.04 in) Below Tooth Diameter	0.7 mm	0.028 in
Crankshaft Thrust Surface - Production	26.14-26.22 mm	1.029-1.0315 in
Crankshaft Thrust Surface - Service	26.22 mm	1.0315 in
Crankshaft Thrust Surface Runout	0.025 mm	0.001 in
Cylinder Head		
Cylinder Head Height/Thickness - Measured from the Cylinder Head Deck to the Valve Rocker Arm Cover Seal Surface	127.9 mm	5.035 in
Surface Flatness - Block Deck - Measured within a 152.4 mm (6.0 in) Area	0.08 mm	0.003 in
Surface Flatness - Block Deck - Measuring the Overall Length of the Cylinder Head	0.1 mm	0.004 in
Surface Flatness - Exhaust Manifold Deck	0.13 mm	0.005 in
Surface Flatness - Intake Manifold Deck	0.08 mm	0.0031 in
Valve Guide Installed Height - Measured from the Spring Seat Surface to the Top of the Guide	17.32 mm	0.682 in
Intake Manifold		
Surface Flatness - Measured at Gasket Sealing Surfaces and Measured Within a 200 mm (7.87 in) Area that Includes 2 Runner Port Openings	0.3 mm	0.118 in
Lubrication System		
Oil Capacity - with Filter	7.57 liters	8.0 quarts
Oil Capacity - without Filter	7.10 liters	7.5 quarts
Oil Pressure - Minimum at 100°C (212°F)	41 kPa at 1,000 engine RPM 124 kPa at 2,000 engine RPM 165 kPa at 4,000 engine RPM	6 psig at 1,000 engine RPM 18 psig at 2,000 engine RPM 24 psig at 4,000 engine RPM
Oil Pan		
Front Cover Alignment - at Oil Pan Surface	0.0-0.5 mm	0.0-0.02 in
Oil Pan Alignment - to Rear of Engine Block at Transmission Bell Housing Mounting Surface	0.0-0.1 mm	0.0-0.004 in
Oil Pump Alignment - at Oil Pan Surface	0.0-0.1 mm	0.0-0.004 in

Application	Specification	
	Metric	English
Crankshaft Rear Oil Seal Housing Alignment - at Oil Pan Surface	0.0-0.5 mm	0.0-0.02 in
Piston Rings		
Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Production	0.22-0.47 mm	0.0087-0.0185 in
Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Service	0.22-0.47 mm	0.0087-0.0185 in
Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Production	0.40-0.66 mm	0.0157-0.0259 in
Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Service	0.40-0.66 mm	0.0157-0.0259 in
Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Production	0.25-0.76 mm	0.0098-0.0299 in
Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Service	0.25-0.76 mm	0.0098-0.0299 in
Piston Ring to Groove Clearance - First Compression Ring - Production	0.030-0.10 mm	0.0012-0.0040 in
Piston Ring to Groove Clearance - First Compression Ring - Service	0.030-0.10 mm	0.0012-0.0040 in
Piston Ring to Groove Clearance - Second Compression Ring - Production	0.035-0.078 mm	0.0014-0.0031 in
Piston Ring to Groove Clearance - Second Compression Ring - Service	0.035-0.078 mm	0.0014-0.0031 in
Piston Ring to Groove Clearance - Oil Control Ring - Production	0.013-0.201 mm	0.0005-0.0079 in
Piston Ring to Groove Clearance - Oil Control Ring - Service	0.013-0.201 mm	0.0005-0.0079 in
Pistons and Pins		
Pin - Piston Pin Clearance to Piston Pin Bore - Production	0.008-0.023 mm	0.0003-0.0009 in
Pin - Piston Pin Clearance to Piston Pin Bore - Service	0.008-0.023 mm	0.0003-0.0009 in
Pin - Piston Pin Diameter	23.497-23.503 mm	0.925-0.925 in
Pin - Piston Pin Fit in Connecting Rod Bore - Production	0.007-0.02 mm	0.00027-0.00078 in
Pin - Piston Pin Fit in Connecting Rod Bore - Service	0.007-0.0022 mm	0.00027-0.00086 in
Piston - Piston Diameter - Measured Over Skirt Coating	TBD mm	TBD in
Piston - Piston to Bore Clearance - Production	-0.022-0.08 mm	-0.0009-0.0012 in
Piston - Piston to Bore Clearance - Service Limit with Skirt Coating Worn Off	0.024-0.08 mm	0.00094-0.0031 in
Valve System		
Valves - Face Angle	45 degrees	
Valves - Face Width	1.754-2.254 mm	0.069-0.089 in
Valves - Lash	Net Lash - No Adjustment	
Valves - Lift - Intake	15.11 mm	0.595 in
Valves - Lift - Exhaust	15.01 mm	0.590 in
Valve Seat - Angle	45 degrees	
Valve Seat - Runout	0.05 mm	0.002 in
Valve Seat - Width - Exhaust	1.78 mm	0.07 in
Valve Seat - Width - Intake	1.02 mm	0.04 in
Valves - Stem Diameter - Intake	7.958-7.9735 mm	0.313-0.314 in
Valves - Stem Diameter - Exhaust	7.956-7.976 mm	0.313-0.314 in
Valves - Stem-to-Guide Clearance - Production - Intake	0.025-0.066 mm	0.001-0.0026 in
Valves - Stem-to-Guide Clearance - Service - Intake	0.093 mm	0.0037 in

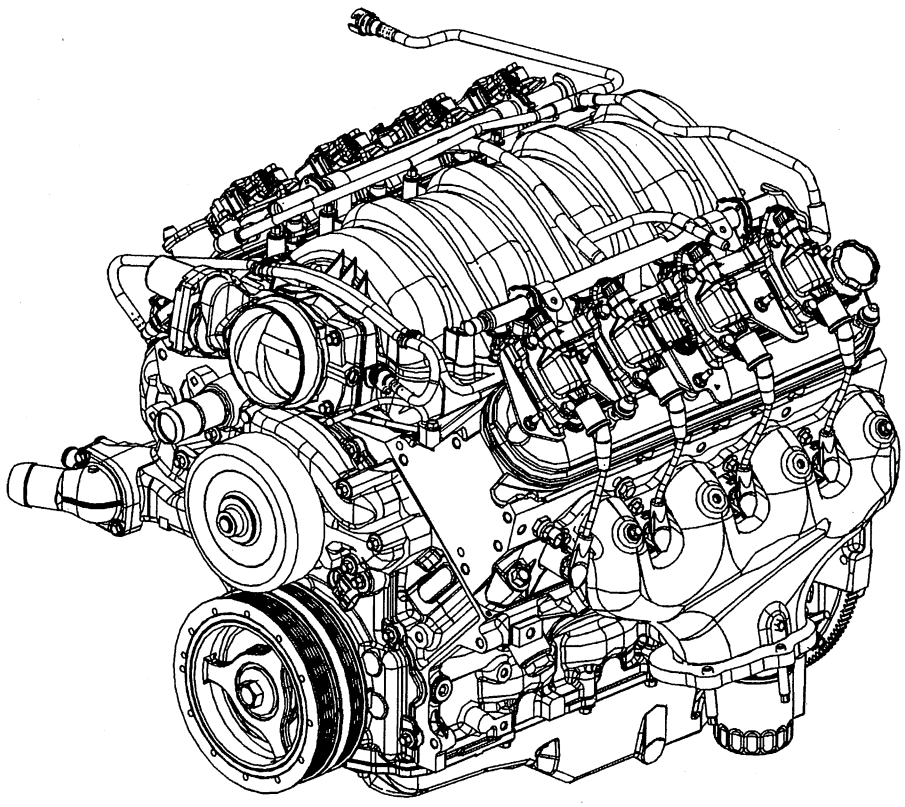
Application	Specification	
	Metric	English
Valves - Stem-to-Guide Clearance - Production - Exhaust	0.025-0.066 mm	0.001-0.0026 in
Valves - Stem-to-Guide Clearance - Service - Exhaust	0.093 mm	0.0037 in
Rocker Arms - Rocker Arm Ratio	1.80:1	
Valve Springs - Free Length	58.8 mm	2.313 in
Valve Springs - Installed Height	45.75 mm	1.8 in
Valve Springs - Load - Closed	450 N at 49.75 mm	101 lb at 1.96 in
Valve Springs - Load - Open	1380 N at 34.75 mm	310 lb at 1.37 in

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Camshaft Position (CMP) Sensor Bolt	12 N·m	106 lb in
Camshaft Retainer Bolts - Hex Head	25 N·m	18 lb ft
Camshaft Retainer Bolts - TORX® Head	15 N·m	11 lb ft
Camshaft Sprocket Bolts	25 N·m	18 lb ft
Clutch Pressure Plate Bolts	70 N·m	52 lb ft
Connecting Rod Bolts - First Pass	20 N·m	15 lb ft
Connecting Rod Bolts - Final Pass	75 degrees	
Coolant Air Bleed Pipe and Cover Bolts	12 N·m	106 lb in
Coolant Temperature Sensor	20 N·m	15 lb ft
Crankshaft Balancer Bolt - Installation Pass to Ensure the Balancer is Completely Installed	330 N·m	240 lb ft
Crankshaft Balancer Bolt - First Pass - Install a NEW Bolt After the Installation Pass and Tighten as Described in the First and Final Passes	50 N·m	37 lb ft
Crankshaft Balancer Bolt - Final Pass	140 degrees	
Crankshaft Bearing Cap M8 Bolts	25 N·m	18 lb ft
Crankshaft Bearing Cap M10 Bolts - First Pass in Sequence	20 N·m	15 lb ft
Crankshaft Bearing Cap M10 Bolts - Final Pass in Sequence	80 degrees	
Crankshaft Bearing Cap M10 Studs - First Pass in Sequence	20 N·m	15 lb ft
Crankshaft Bearing Cap M10 Studs - Final Pass in Sequence	51 degrees	
Crankshaft Oil Deflector Nuts	25 N·m	18 lb ft
Crankshaft Position (CKP) Sensor Bolt	25 N·m	18 lb ft
Crankshaft Rear Oil Seal Housing Bolts	25 N·m	18 lb ft
Cylinder Head Coolant Plug	20 N·m	15 lb ft
Cylinder Head M8 Bolts - in Sequence	30 N·m	22 lb ft
Cylinder Head M11 Bolts - First Pass in Sequence	30 N·m	22 lb ft
Cylinder Head M11 Bolts - Second Pass in Sequence	90 degrees	
Cylinder Head M11 Bolts - Final Pass in Sequence	70 degrees	
Engine Block Coolant Drain Hole Plug	60 N·m	44 lb ft
Engine Block Coolant Heater	50 N·m	37 lb ft
Engine Block Oil Gallery Plugs	60 N·m	44 lb ft
Engine Mount Bracket Bolts	50 N·m	37 lb ft
Evaporative (EVAP) Emission Canister Purge Solenoid Valve Bracket Bolt	50 N·m	37 lb ft
Exhaust Manifold Bolts - First Pass	15 N·m	11 lb ft
Exhaust Manifold Bolts - Final Pass	20 N·m	15 lb ft
Exhaust Manifold Heat Shield Bolts	9 N·m	80 lb in
Exhaust Manifold Studs	20 N·m	15 lb ft
Flywheel Bolts - First Pass	20 N·m	15 lb ft
Flywheel Bolts - Second Pass	50 N·m	37 lb ft
Flywheel Bolts - Final Pass	100 N·m	74 lb ft

Application	Specification	
	Metric	English
Front Cover Bolts	25 N·m	18 lb ft
Fuel Injection Fuel Rail Bolts	10 N·m	89 lb in
Ignition Coil Bracket-to-Valve Rocker Arm Cover Studs	12 N·m	106 lb in
Ignition Coil-to-Bracket Bolts	10 N·m	89 lb in
Intake Manifold Bolts - First Pass in Sequence	5 N·m	44 lb in
Intake Manifold Bolts - Final Pass in Sequence	10 N·m	89 lb in
J 41798 M8 Bolt	25 N·m	18 lb ft
J 41798 M10 Bolts	50 N·m	37 lb ft
Knock Sensor Bolts	25 N·m	18 lb ft
Oil Filter	30 N·m	22 lb ft
Oil Filter Fitting	55 N·m	40 lb ft
Oil Pan Closeout Cover Bolt - Left Side	9 N·m	80 lb in
Oil Pan Closeout Cover Bolt - Right Side	9 N·m	80 lb in
Oil Pan Cover Bolts	12 N·m	106 lb in
Oil Pan Drain Plugs	25 N·m	18 lb ft
Oil Pan M6 Bolts - Oil Pan-to-Rear Oil Seal Housing	12 N·m	106 lb in
Oil Pan M8 Bolts - Oil Pan-to-Engine Block and Oil Pan-to-Front Cover	25 N·m	18 lb ft
Oil Pressure Sensor	35 N·m	26 lb ft
Oil Pump Cover Bolts	12 N·m	106 lb in
Oil Pump Relief Valve Plug	12 N·m	106 lb in
Oil Pump Suction Pipe Bolts	12 N·m	106 lb in
Oil Pump-to-Engine Block Bolts	25 N·m	18 lb ft
Spark Plugs	15 N·m	11 lb ft
Throttle Body Bolts	10 N·m	89 lb in
Timing Chain Dampener Bolts	25 N·m	18 lb ft
Valley Cover Bolts	25 N·m	18 lb ft
Valve Lifter Guide Bolts	12 N·m	106 lb in
Valve Rocker Arm Bolts	30 N·m	22 lb ft
Valve Rocker Arm Cover Bolts	12 N·m	106 lb in
Water Inlet Housing Bolts	15 N·m	11 lb ft
Water Pump Bolts - First Pass	15 N·m	11 lb ft
Water Pump Bolts - Final Pass	30 N·m	22 lb ft

Engine Componant Description



The 7.0 Liter V8 engine is identified as RPO LS7 VIN E.

Camshaft and Drive System

A billet steel 1 piece camshaft is supported by 5 bearings pressed into the engine block. The camshaft timing sprocket is mounted to the front of the camshaft and is driven by the crankshaft sprocket through the camshaft timing chain. The camshaft position (CMP) sensor lobes are incorporated into the front face of the camshaft sprocket, with the CMP sensor mounted to the engine front cover. A timing chain dampener is mounted to the front of the engine block above the crankshaft sprocket. The externally splined crankshaft sprocket is positioned to the crankshaft by a key and keyway. The crankshaft sprocket external splines drive the oil pump drive gears. A retaining plate mounted to the front of the engine block maintains camshaft location.

Crankshaft

The precision-balanced crankshaft is forged steel and is supported by 5 crankshaft bearings. The bearings are retained by forged steel crankshaft bearing caps, which are machined with the engine block for proper alignment and clearance. The crankshaft journals are undercut and rolled. The center main journal is the thrust journal. A crankshaft position (CKP) reluctor ring is press-fit mounted at the rear of the crankshaft. The reluctor ring is not serviceable separately.

Cylinder Heads

The cylinder heads are cast aluminum and include pressed-in-place powdered metal valve guides, 56 mm (2.20 in) diameter titanium intake valves, 41 mm (1.61 in) diameter sodium filled exhaust valves, and 70 cubic centimeter combustion chambers. Passages for the engine coolant air bleed system are at the front of each cylinder head. The valve rocker arm covers are retained to the cylinder heads by 4 center mounted rocker arm cover bolts.

Engine Block

The engine block is a cam-in-block deep skirt 90 degree V configuration with 5 forged steel crankshaft bearing caps. The engine block is cast aluminum with press-in-place iron cylinder liners. The 5 crankshaft bearing caps each have 4 vertical M10 and 2 horizontal M8 mounting bolts. The engine block and bearing caps are aligned by dowel pins retained in the caps. The camshaft is supported by 5 press-in-place camshaft bearings.

Exhaust Manifolds

The hydro-formed exhaust headers are a 1 piece steel design with unique quad flow collector flanges. The exhaust manifolds direct exhaust gasses from the combustion chambers to the exhaust system. Each manifold also has an externally mounted heat shield that is retained by bolts.

Intake Manifold

The intake manifold is a friction welded 3 piece composite design that incorporates brass threaded inserts for mounting the fuel rail, throttle body, and wire harness studs. Each side of the intake manifold is sealed to the cylinder head by 4 non-reusable push-in-place silicone sealing gaskets. The 90 mm (3.54 in) electronically actuated throttle body bolts to the front of the intake manifold. The throttle body is sealed by a 1 piece push-in-place silicone gasket. The fuel rail assembly, with 8 separate fuel injectors, is retained to the intake by 4 bolts. The injectors are seated into their individual manifold bores with O-ring seals to provide sealing. 2 fuel rail stop brackets are retained to the rear of the intake manifold by mounting bolts. The manifold absolute pressure (MAP) sensor is installed and retained to the top front of the intake manifold and sealed by an O-ring seal. The evaporative (EVAP) emission canister purge solenoid valve is mounted to the front of the right cylinder head. There are no coolant passages within the intake manifold.

Oil Pan

The structural oil pan is cast aluminum. Incorporated into the design are the oil filter mounting boss, drain plug opening and internal oil passages. The alignment of the structural oil pan to the rear of the engine block and transmission bell housing is critical.

Piston and Connecting Rod Assembly

The pistons are cast aluminum. The pistons use 2 compression rings and 1 oil control ring assembly. The piston is a low friction, lightweight design with a recessed top and barrel shaped skirt. The piston pins are chromium steel and are a full-floating design. The connecting rods are forged titanium alloy with press-in-place piston pin bushings. The connecting rods and rod cap are aligned by dowel pins retained in the cap. All applications use a piston with a graphite coated skirt. The piston and pin are to be serviced as an assembly.

Valve Rocker Arm Cover Assemblies

The valve rocker arm covers are cast aluminum and use a pre-molded silicon gasket for sealing. Mounted to each rocker cover are the coil and bracket assemblies. Positive crankcase ventilation (PCV) fresh air passages are incorporated into both the left and right side covers. The cap on the right valve cover is not to be used for oil fill.

Valve Train

Motion is transmitted from the camshaft, through the hydraulic roller valve lifters and tubular pushrods, to the roller type rocker arms. The nylon valve lifter guides position and retain the valve lifters. The valve rocker arms for each bank of cylinders are mounted directly to the cylinder heads. Each rocker arm is retained to the cylinder head by a bolt. Valve lash is net build. Exhaust valves have sodium filled valve stems.

Drive Belt System Description

The drive belt system consists of the following components:

- The drive belt
- The drive belt tensioner
- The drive belt idler pulley
- The crankshaft balancer pulley
- The accessory drive component mounting brackets
- The accessory drive components
  - The power steering pump, if belt driven
  - The generator
  - The A/C compressor, if equipped
  - The engine cooling fan, if belt driven
  - The water pump, if belt driven
  - The vacuum pump, if equipped
  - The air compressor, if equipped

The drive belt system may use 1 belt or 2 belts. The drive belt is thin so that it can bend backwards and has several ribs to match the grooves in the pulleys. The drive belts are made of different types of rubbers, chloroprene or EPDM, and have different layers or plys containing either fiber cloth or cords for reinforcement.

Both sides of the drive belt may be used to drive the different accessory drive components. When the back side of the drive belt is used to drive a pulley, the pulley is smooth.

The drive belt is pulled by the crankshaft balancer pulley across the accessory drive component pulleys. The spring loaded drive belt tensioner keeps constant tension on the drive belt to prevent the drive belt from slipping. The drive belt tensioner arm will move when loads are applied to the drive belt by the accessory drive components and the crankshaft.

The drive belt system may have an idler pulley, which is used to add wrap to the adjacent pulleys. Some systems use an idler pulley in place of an accessory drive component when the vehicle is not equipped with the accessory.

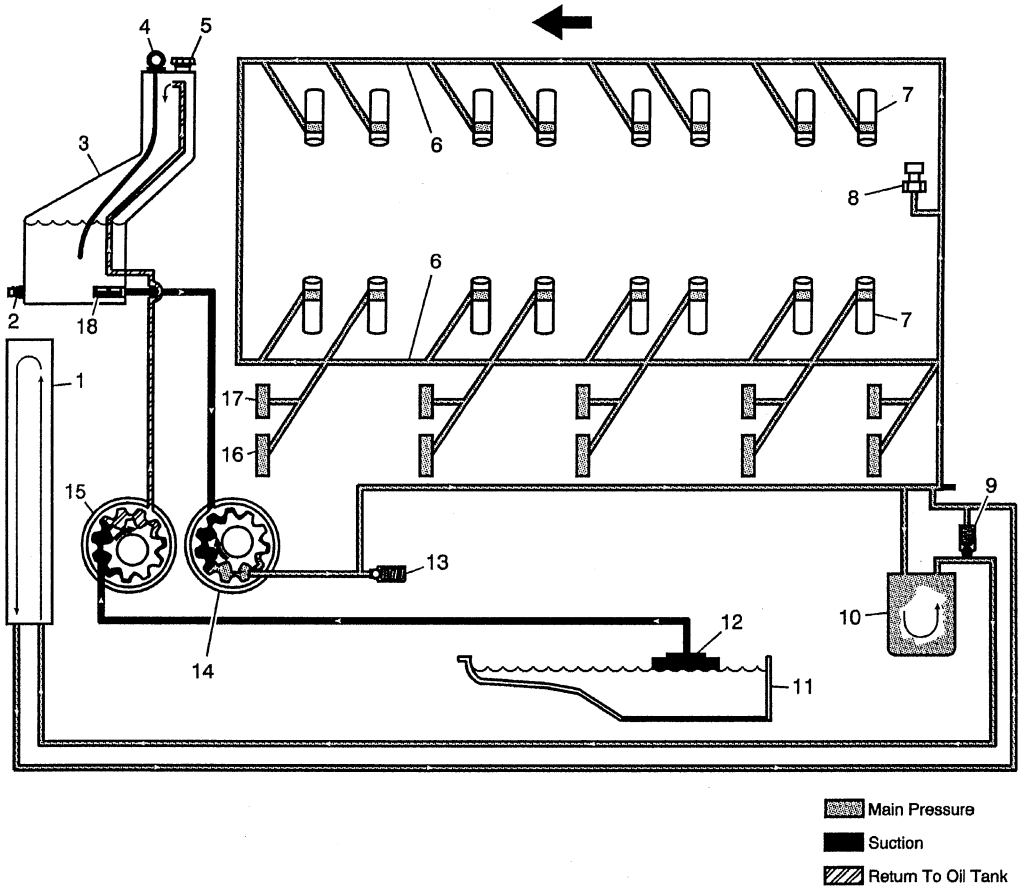
Crankcase Ventilation System Description

A closed crankcase ventilation system is used in order to provide a more complete scavenging of crankcase vapors. Filtered air from the air induction system duct is supplied to the crankcase, mixed with blow-by vapors, and passes through a crankcase ventilation metering device before entering the intake manifold. The primary component in the positive crankcase ventilation (PCV) system is the PCV flow metering device (valve or orifice) . Vacuum changes within the intake manifold result in flow variations of the blow-by vapors. If abnormal operating conditions occur, the design of the PCV system permits excessive amounts of blow-by vapors to back flow through the crankcase vent tube and into the engine induction system to be consumed during normal combustion. This engine ventilation system design minimizes oil consumption and significantly reduces the potential for oil ingestion during vehicle limit handling maneuvers.

LS7 Engine

The LS7 engine utilizes an integral positive crankcase ventilation (PCV) system which is located in the engine valley cover beneath the intake manifold. The engine valley cover contains composite oil separating baffles and PCV plumbing. Filtered fresh air is routed from up stream of the throttle plate to the engine oil tank where it mixes with crankcase gasses and is passed to both engine rocker arm covers. The design of the rocker cover shields rocker arm oil spray thereby reducing the potential for oil being drawn back into the tank during backflow of the ventilation system. Blow-by vapors are routed from the valley cover through a fixed orifice (2.5 mm) within a steel PCV tube, then through a formed nylon hose before entering the intake manifold behind the throttle body.

Lubrication System Description



(1) Engine Oil Cooler
(2) Oil Temperature Sensor
(3) Engine Oil Tank
(4) Oil Level Indicator
(5) Oil Fill Cap
(6) Upper Main Oil Galleries
(6) Upper Main Oil Galleries
(7) Valve Lifters
(7) Valve Lifters
(8) Oil Pressure Sensor
(9) Pressure Relief Valve - Oil Cooler
(10) Oil Filter
(11) Oil Pan Sump
(12) Oil Pump Screen
(13) Pressure Relief Valve - Oil Pump
(14) Oil Pump - Primary
(15) Oil Pump - Secondary
(16) Crankshaft Bearings
(17) Camshaft Bearings
(18) Oil Pump Screen - Oil Tank

Engine lubrication is supplied by a gerotor type oil pump assembly. The oil pump assembly consists of 2 pump housings, 2 separate gear sets, and 1 pressure relief valve. The front or forward gear set is the secondary pump (15). The rear or rearward gear set is the primary pump (14). The pump assembly is mounted at the front of the engine and driven directly by the crankshaft sprocket. The primary pump (14)

gears rotate and draw oil from the engine oil tank (3) through the oil pump screen (18). The oil is pressurized as it passes through the primary pump and is sent through the engine block lower oil gallery. Contained within the primary pump is a pressure relief valve (13) that maintains oil pressure within a specified range. Pressurized oil is directed through the engine block lower oil gallery to the full flow oil filter (10) where harmful contaminants are removed. A bypass valve is incorporated into the oil filter, which permits oil flow in the event the filter becomes restricted. Oil exits the oil filter and is then directed to the external oil cooler (1). A bypass valve (9) is incorporated into the oil cooler hse assembly in the event oil flow within the cooler is restricted. Oil returns from the oil cooler and is directed to the upper main oil galleries (6). Oil from the left upper oil gallery is directed to the crankshaft bearings (16) and camshaft bearings (17). Oil that has entered both the upper main oil galleries also pressurizes the valve lifter assemblies (7), and is then pumped through the pushrods to lubricate the valve rocker arms and valve stems. Oil returns to the oil pan (11), where the secondary pump (15) draws oil through a pump screen (12). The secondary pump (15) returns oil to the engine oil tank (3). Incorporated within the engine oil tank assembly are the oil level indicator (4), oil fill cap (5), oil temperature sensor (2), positive crankcase ventilation (PCV) fresh air port, and a serviceable oil pump screen (18). The engine oil pressure sensor (8) is located at the top rear of the engine assembly.

Engine Cooling

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Automatic Transmission Oil Cooler Line Fitting	25 N·m	18 lb ft
Auxiliary Engine Oil Cooler to Air Dam Bolts - Z06	10 N·m	7 lb ft
Auxiliary Engine Oil Cooler Pipe Assembly Bracket to Engine Bolt	25 N·m	18 lb ft
Auxiliary Engine Oil Cooler Pipe Assembly to Engine Bolts	12 N·m	9 lb ft
Auxiliary Engine Oil Cooler Quick Connect Fittings - Z06	25 N·m	18 lb ft
Auxiliary Engine Oil Hose (Dry Sump) Bracket to Cradle Bolt - Z06	16 N·m	12 lb ft
Auxiliary Engine Oil Hose (Dry Sump) to Dry Sump Tank Nuts - Z06	16 N·m	12 lb ft
Auxiliary Engine Oil Hose (Dry Sump) to Engine Bolts - Z06	16 N·m	12 lb ft
Coolant Air Bleed Bolt/Stud	12 N·m	106 lb in
Cooling Fan Motor Bolt	6 N·m	53 lb in
Drain Cock	2 N·m	18 lb in
Engine Cooling Fan Module Screw	6 N·m	53 lb in
Engine Coolant Heater	40 N·m	30 lb ft
Engine Coolant Heater Cord Clip Bolt	32 N·m	24 lb ft
Fan Blade Nut	6 N·m	53 lb in
Fan Shroud to Radiator Bolts	5 N·m	44 lb in
Fascia Deflector Screws	1.0 N·m	9 lb in
Radiator Air Baffle Screws	2.5 N·m	22 lb in
Radiator Baffle Bolt	10 N·m	89 lb in
Radiator Front Air Deflector to Skid Bar Bracket Bolts	9 N·m	80 lb in
Radiator Front Air Deflector to Skid Bar Bracket Screws	2.5 N·m	22 lb in
Radiator Support Bolts	9 N·m	80 lb in
Radiator Surge Tank Nut	10 N·m	89 lb in
Stabilizer Shaft Bracket Bolt	58 N·m	43 lb ft
Surge Tank Nuts	8 N·m	71 lb in
Transmission Oil Cooler Quick Connect Fittings	18 N·m	13 lb ft
Water Pump Bolt (First Pass)	15 N·m	11 lb ft
Water Pump Bolt (Final Pass)	30 N·m	22 lb ft
Water Pump Inlet	15 N·m	11 lb ft

Cooling System Description and Operation

General Description

The cooling system consists of the following major components:

- The radiator
- The radiator surge tank
- The cooling fans
- The thermostat
- The water pump
- The coolant air bleed pipe
- The heater pipe assembly
- The ECT sensor
- The transmission oil cooler
- All related coolant hoses
- The fan shroud
- The fan motor/blade
- Coolant Heater (optional)

The cooling system functions to maintain an efficient engine temperature during all engine operating conditions. The thermostat remains closed until the engine reaches the proper operating temperatures. When the engine is cold, the coolant does not circulate through the radiator, allowing the engine to warm up faster. When the engine reaches the normal operating temperatures, the thermostat opens and the coolant begins to circulate through the radiator in order to keep the engine from overheating.

The water pump draws the coolant from the radiator. The coolant is then circulated through the cooling jackets in the following components, then back to the radiator to be cooled:

- The cylinder heads
- The engine block
- The throttle body

The engine coolant is drawn from the water pump and circulated through internal passages in the cylinder heads and engine block. Vapor is vented off through the coolant air bleed pipe. The heated coolant is then directed back to the radiator. A separate coolant flow loop is available from the coolant pump to the heater core and back to the coolant pump to provide passenger compartment heat and defrost.

The radiator surge tank provides a coolant fill point and a central cooling system air bleed location. The tank is translucent on the lower half for coolant level viewing.

Cooling Cycle

Coolant flows from the radiator outlet and into the water pump inlet. Some coolant flows from the water pump, to the heater core, then back to the water pump. This provides the passenger compartment with heat and defrost capability as the coolant warms up.

Coolant also flows from the water pump outlet and into the engine block. In the engine block, the coolant circulates through the water jackets surrounding the cylinders where it absorbs heat.

The coolant then flows through the cylinder head gasket openings and into the cylinder heads. In the cylinder heads, the coolant flows through the water jackets surrounding the combustion chambers and valve seats, where it absorbs additional heat.

From the cylinder heads, the coolant flows to the thermostat. The flow of coolant will either be stopped at the thermostat until the engine reaches normal operating temperature, or it will flow through the thermostat and into the radiator where it is cooled. At this point, the coolant flow cycle is completed.

Efficient operation of the cooling system requires proper functioning of all cooling system components. The cooling system consists of the following components:

Coolant

The engine coolant is a solution made up of a 50-50 mixture of DEX-COOL and suitable drinking water. The coolant solution carries excess heat away from the engine to the radiator, where the heat is dissipated to the atmosphere.

Radiator

The radiator is a heat exchanger. It consists of a core and two tanks. The aluminum core is a tube and fin crossflow design that extends from the inlet tank to the outlet tank. Fins are placed around the outside of the tubes to improve heat transfer to the atmosphere.

The inlet and outlet tanks are a molded, high temperature, nylon reinforced plastic material. A high temperature rubber gasket seals the tank flange edge to the aluminum core. The tanks are clamped to the core with clinch tabs. The tabs are part of the aluminum header at each end of the core.

The radiator also has a drain cock located in the bottom of the left hand tank. The drain cock unit includes the drain cock and drain cock seal.

The radiator removes heat from the coolant passing through it. The fins on the core transfer heat from the coolant passing through the tubes. As air passes between the fins, it absorbs heat and cools the coolant.

Pressure Cap

The pressure cap seals the cooling system. It contains a blow off or pressure valve and a vacuum or atmospheric valve. The pressure valve is held against its seat by a spring, which protects the radiator from excessive cooling system pressure. The vacuum valve is held against its seat by a spring, which permits opening of the valve to relieve vacuum created in the cooling system as it cools off. The vacuum, if not relieved, might cause the radiator and/or coolant hoses to collapse.

The pressure cap allows cooling system pressure to build up as the temperature increases. As the pressure builds, the boiling point of the coolant increases. Engine coolant can be safely run at a temperature much higher than the boiling point of the coolant at atmospheric pressure. The hotter the coolant is, the faster the heat transfers from the radiator to the cooler, passing air.

The pressure in the cooling system can get too high. When the cooling system pressure exceeds the rating of the pressure cap, it raises the pressure valve, venting the excess pressure.

As the engine cools down, the temperature of the coolant drops and a vacuum is created in the cooling system. This vacuum causes the vacuum valve to open, allowing outside air into the surge tank. This equalizes the pressure in the cooling system with atmospheric pressure, preventing the radiator and coolant hoses from collapsing.

Coolant Recovery System

The coolant recovery system consists of a plastic coolant recovery reservoir and overflow tube. The recovery reservoir is also called a recovery tank or expansion tank. It is partially filled with coolant and is connected to the radiator fill neck with the overflow tube. Coolant can flow back and forth between the radiator and the reservoir.

In effect, a cooling system with a coolant recovery reservoir is a closed system. When the pressure in the cooling system gets too high, it will open the pressure valve in the pressure cap. This allows the coolant, which has expanded due to being heated, is allowed to flow through the overflow tube and into the recovery reservoir. As the engine cools down, the temperature of the coolant drops and a vacuum is created in the cooling system. This vacuum opens the vacuum valve in the pressure cap, allowing some of the coolant in the reservoir to be siphoned back into the radiator. Under normal operating conditions, no coolant is lost. Although the coolant level in the recovery reservoir goes up and down, the radiator and cooling system are kept full. An advantage to using a coolant recovery reservoir is that it eliminates almost all air bubbles from the cooling system. Coolant without bubbles absorbs heat much better than coolant with bubbles.

Air Baffles and Seals

The cooling system uses deflectors, air baffles and air seals to increase cooling system capability. Deflectors are installed under the vehicle to redirect airflow beneath the vehicle and through the radiator to increase engine cooling. Air baffles are also used to direct airflow through the radiator and increase cooling capability. Air seals prevent air from bypassing the radiator and A/C condenser, and prevent recirculation of hot air for better hot weather cooling and A/C condenser performance.

Water Pump

The water pump is a centrifugal vane impeller type pump. The pump consists of a housing with coolant inlet and outlet passages and an impeller. The impeller is mounted on the pump shaft and consists of a series of flat or curved blades or vanes on a flat plate. When the impeller rotates, the coolant between the vanes is thrown outward by centrifugal force.

The impeller shaft is supported by one or more sealed bearings. The sealed bearings never need to be lubricated. Grease cannot leak out, dirt and water cannot get in as long as the seal is not damaged or worn.

The purpose of the water pump is to circulate coolant throughout the cooling system. The water pump is driven by the crankshaft via the drive belt.

Thermostat

The thermostat is a coolant flow control component. It's purpose is to help regulate the operating temperature of the engine. It utilizes a temperature sensitive wax-pellet element. The element connects to a valve through a small piston. When the element is heated, it expands and exerts pressure against the small piston. This pressure forces the valve to open. As the element is cooled, it contracts. This contraction allows a spring to push the valve closed.

When the coolant temperature is below the rated thermostat opening temperature, the thermostat valve remains closed. This prevents circulation of the coolant to the radiator and allows the engine to warm up. After the coolant temperature reaches the rated thermostat opening temperature, the thermostat valve will open. The coolant is then allowed to circulate through the thermostat to the radiator where the engine heat is dissipated to the atmosphere. The thermostat also provides a restriction in the cooling system, after it has opened. This restriction creates a pressure difference which prevents cavitation at the water pump and forces coolant to circulate through the engine block.

Engine Oil Cooler

The engine oil cooler is a heat exchanger. It is located inside the left side end tank of the radiator. The engine oil temperature is controlled by the temperature of the engine coolant that surrounds the oil cooler in the radiator.

The engine oil pump, pumps the oil through the engine oil cooler line to the oil cooler. The oil then flows through the cooler where the engine coolant absorbs heat from the oil. The oil is then pumped through the oil cooler return line, to the oil filter, to the engine block oil system.

Transmission Oil Cooler

The transmission oil cooler is a heat exchanger. It is located inside the right side end tank of the radiator. The transmission fluid temperature is regulated by the temperature of the engine coolant in the radiator.

The transmission oil pump, pumps the fluid through the transmission oil cooler line to the transmission oil cooler. The fluid then flows through the cooler where the engine coolant absorbs heat from the fluid. The fluid is then pumped through the transmission oil cooler return line, to the transmission.

Engine Electrical

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Battery Hold Down Retainer Bolt	18 N·m	13 lb ft
Battery Tray Bolt	12 N·m	106 lb in
Engine Harness Cable Nut	13 N·m	10 lb ft
Generator Bolt	50 N·m	37 lb ft
Generator Bracket Bolt	50 N·m	37 lb ft
Generator Shaft Nut	75 N·m	55 lb ft
Ground Strap Bolt	32 N·m	24 lb ft
Ground Strap Nut	8 N·m	71 lb in
Instrument Panel (IP) Wiring Harness Junction Block Nut	10 N·m	89 lb in
Negative Battery Cable to Battery Bolt	15 N·m	11 lb ft
Negative Battery Cable Ground Nut	8 N·m	71 lb in
Negative Battery Cable Terminal Bolt	8 N·m	71 lb in
Positive Battery Cable Bolt	15 N·m	11 lb ft
Positive Battery Cable Nut (at solenoid)	10 N·m	89 lb in
Positive Battery Cable Nut (at fuse/relay center)	8 N·m	71 lb in
Positive Battery Cable to Starter Motor Stud Nut	15 N·m	11 lb ft
S Terminal Nut	4 N·m	35 lb in
Starter Motor Bolt	50 N·m	37 lb ft

Battery Usage

Application	Specification
Cold Cranking Amperage (CCA)	590 A
Reserve Capacity	110 minutes
Replacement Model Number	86-3YR

Battery Temperature vs Minimum Voltage

Estimated Temperature °F	Estimated Temperature °C	Minimum Voltage
70 or above	21 or above	9.6
50	10	9.4
32	0	9.1
15	-10	8.8
0	-18	8.5
Below 0	Below -18	8.0

Generator Usage

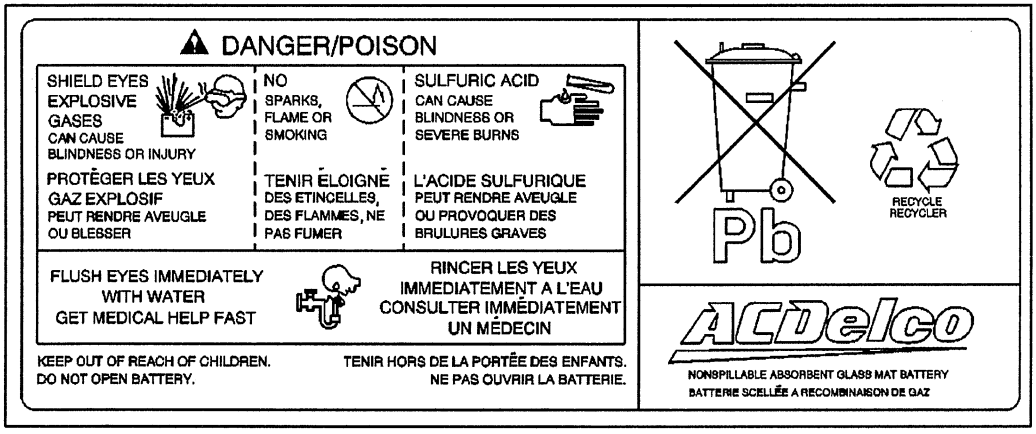
Engine	Generator Model	Rated Output AMPS	Load Test Output AMPS
LS2	Valeo TG15	140	98

Battery Description and Operation

Caution

Batteries produce explosive gases, contain corrosive acid, and supply levels of electrical current high enough to cause burns. Therefore, to reduce the risk of personal injury when working near a battery:

- **Always shield your eyes and avoid leaning over the battery whenever possible.**
- **Do not expose the battery to open flames or sparks.**
- **Do not allow the battery electrolyte to contact the eyes or the skin. Flush immediately and thoroughly any contacted areas with water and get medical help.**
- **Follow each step of the jump starting procedure in order.**
- **Treat both the booster and the discharged batteries carefully when using the jumper cables.**



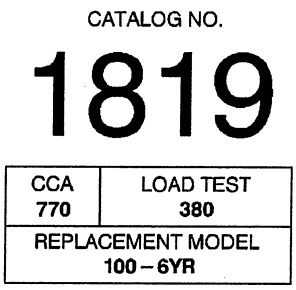
The maintenance free battery is standard. There are no vent plugs in the cover. The battery is completely sealed except for two small vent holes in the side. These vent holes allow the small amount of gas that is produced in the battery to escape.

The battery has three functions as a major source of energy:

- Engine cranking
- Voltage stabilizer
- Alternate source of energy with generator overload.

The battery specification label (example below) contains information about the following:

- The test ratings
- The original equipment catalog number
- The recommended replacement model number



A battery has 2 ratings:

- Reserve capacity
- Cold cranking amperage

When a battery is replaced use a battery with similar ratings. Refer to the battery specification label on the original battery or refer to Battery Usage .

Reserve Capacity

Reserve capacity is the amount of time in minutes it takes a fully charged battery, being discharged at a constant rate of 25 amperes and a constant temperature of 27°C (80°F) to reach a terminal voltage of 10.5 V. Refer to Battery Usage for the reserve capacity rating of the original equipment battery.

Cold Cranking Amperage

The cold cranking amperage is an indication of the ability of the battery to crank the engine at cold temperatures. The cold cranking amperage rating is the minimum amperage the battery must maintain for 30 seconds at -18°C (0°F) while maintaining at least 7.2 volts. Refer to Battery Usage for the cold cranking amperage rating for this vehicle.

Circuit Description

The battery positive terminal supplies Battery Positive voltage to the under hood fuse block and the rear fuse block. The under hood fuse block provides a cable connection for the generator and a cable connection for the starter.

The battery negative terminal is connected to chassis ground G305 and supplies ground for the AD converter in the DIM.

Starting System Description and Operation

The PG starter motors are non-repairable starter motors. They have pole pieces that are arranged around the armature within the starter housing. When the solenoid windings are energized, the pull-in winding circuit is completed to ground through the starter motor. The hold-in winding circuit is completed to ground through the solenoid. The windings work together magnetically to pull in and hold in the plunger. The plunger moves the shift lever. This action causes the starter drive assembly to rotate on the armature shaft spline as it engages with the flywheel ring gear on the engine. At the same time, the plunger closes the solenoid switch contacts in the starter solenoid. Full battery voltage is then applied directly to the starter motor and it cranks the engine.

As soon as the solenoid switch contacts close, current stops flowing thorough the pull-in winding as battery voltage is now applied to both ends of the windings. The hold-in winding remains energized; its magnetic field is strong enough to hold the plunger, shift lever, starter drive assembly, and solenoid switch contacts in place to continue cranking the engine. When the engine starts, the pinion gear overrun protects the armature from excessive speed until the switch is opened.

When the ignition switch is released from the START position, crank voltage is removed from the starter solenoid S terminal. Current flows from the motor contacts through both windings to ground at the end of the hold-in winding. However, the direction of the current flow through the pull-in winding is now in the opposite direction of the current flow when the winding was first energized.

The magnetic fields of the pull-in and hold-in windings now oppose one another. This action of the windings, along with the help of the return spring, cause the starter drive assembly to disengage and the solenoid switch contacts to open simultaneously. As soon as the contacts open, the starter motor is turned off.

Charging System Description and Operation

Generator

The generator features the following major components:

- The delta stator
- The rectifier bridge
- The rotor with slip rings and brushes
- A conventional pulley
- The regulator

The slip ring and the frame are liquid cooled.

The generator features permanently lubricated bearings. Service should only include tightening of mount components. Otherwise, replace the generator as a complete unit.

Regulator

The voltage regulator controls the rotor field current in order to limit the system voltage. When the field current is on, the regulator switches the current on and off at a rate of 400 cycles per second in order to perform the following functions:

- Radio noise control
- Obtain the correct average current needed for proper system voltage control

At high speeds, the on-time may be 10 percent with the off-time at 90 percent. At low speeds, the on-time may be 90 percent and the off-time 10 percent.

Circuit Description

The generator provides voltage to operate the vehicle's electrical system and to charge its battery. A magnetic field is created when current flows through the rotor. This field rotates as the rotor is driven by the engine, creating an AC voltage in the stator windings. The AC voltage is converted to DC by the rectifier bridge and is supplied to the electrical system at the battery terminal.

When the engine is running, the generator turn-on signal is sent to the generator from the ECM, turning on the regulator. The generator's voltage regulator controls current to the rotor, thereby controlling the output voltage. The rotor current is proportional to the electrical pulse width supplied by the regulator. When the engine is started, the regulator senses generator rotation by detecting AC voltage at the stator through an internal wire. Once the engine is running, the regulator varies the field current by controlling the pulse width. This regulates the generator output voltage for proper battery charging and electrical system operation. The generator F terminal is connected internally to the voltage regulator and externally to the ECM. When the voltage regulator detects a charging system problem, it grounds this circuit to signal the ECM that a problem exists. The ECM monitors the generator field duty cycle signal circuit. The system voltage sense circuit receives B+ voltage that is Hot At All Times through the GEN BAT fuse in

the underhood junction block. This voltage is used by the regulator as the reference for system voltage control.

Engine Controls

6.0L V-8 Engine

Ignition System Specifications

Application	Specification	
	Metric	English
Firing Order	1-8-7-2-6-5-4-3	
Spark Plug Wire Resistance	188-312 ohms	
Spark Plug Torque	15 N·m	11 lb ft
Spark Plug Gap	1.02 mm	0.040 in
Spark Plug Type	GM P/N 12571164 AC Spark Plug P/N 41-985	

Fastener Tightening Specifications

Application	Specifications	
	Metric	English
Accelerator Control Assembly to Floor Fasteners	20 N·m	15 lb ft
Camshaft Position (CMP) Sensor Bolt	25 N·m	18 lb ft
Crankshaft Position (CKP) Sensor Bolt	25 N·m	18 lb ft
Engine Coolant Temperature (ECT) Sensor	20 N·m	15 lb ft
EVAP Canister Bracket Bolt	7 N·m	62 lb in
Fuel and EVAP Pipe Retainer Nut	6 N·m	53 lb in
Fuel Crossover Hose Clamps	4 N·m	35 lb in
Fuel Filter and Fuel Pressure Regulator Bracket Nut	5 N·m	44 lb in
Fuel Pipe Assembly Clip Nuts	3 N·m	27 lb in
Fuel Rail Attaching Bolts	10 N·m	89 lb in
Fuel Tank Fill and Vent Pipe Bolts	3 N·m	22 lb in
Fuel Tank Fill Hose Clamp	4 N·m	35 lb in
Fuel Tank Fill Pipe Ground Strap Bolt	8 N·m	71 lb in
Fuel Tank Strap and Shield Bolts	25 N·m	18 lb ft
Fuel Tank Shield Mount Bolt	25 N·m	18 lb in
Fuel Tank Shield Nut	12 N·m	106 lb in
Heated Oxygen Sensor (HO2S)	41 N·m	30 lb ft
Ignition Coil Harness Mounting Bolt	12 N·m	106 lb in
Ignition Coil Mounting Bolts	12 N·m	106 lb in
Knock Sensor (KS)	20 N·m	15 lb ft
Powertrain Control Module (PCM) Electrical Connector Fasteners	8 N·m	70 lb in
Powertrain Control Module (PCM) Retaining Fastener	2N·m	17 lb in
PCV Hose Assembly Mounting Cable Nut	12 N·m	106 lb in
Secondary Air Injection (AIR) Check Valves	23 N·m	17 lb ft
Secondary Air Injection (AIR) Pipe To Exhaust Manifold Bolts	20 N·m	15 lb ft
Secondary Air Injection (AIR) Pump to Bracket	9 N·m	80 lb in
Secondary Air Injection (AIR) Solenoid Valve Retaining Nut	7 N·m	62 lb in
Secondary Air Injection (AIR) Check Valve to the AIR Pipe	23 N·m	17 lb ft
Spark Plug	15 N·m	11 lb ft
Spark Plug in New Cylinder Head	20 N·m	15 lb ft
Tank Crossover Hose Clamp	4 N·m	35 lb in
Throttle Actuator Control (TAC) Module to PCM Bracket	2 N·m	17 lb in
Throttle Actuator Control (TAC) Module to PCM Bracket Fasteners	2 N·m	17 lb in
Throttle Body Attaching Bolts	10 N·m	189 lb in

7.0L V-8 Engine

Ignition System Specifications

Application	Specification	
	Metric	English
Firing Order	1-8-7-2-6-5-4-3	
Spark Plug Wire Resistance	188-312 ohms	
Spark Plug Torque	15 N·m	11 lb ft
Spark Plug Gap	1.02 mm	0.040 in
Spark Plug Type	GM P/N 12671165 AC Spark Plug P/N 41-104	

Fastener Tightening Specifications

Application	Specifications	
	Metric	English
Accelerator Control Assembly to Floor Fasteners	20 N·m	15 lb ft
Camshaft Position (CMP) Sensor Bolt	25 N·m	18 lb ft
Crankshaft Position (CKP) Sensor Bolt	25 N·m	18 lb ft
Engine Coolant Temperature (ECT) Sensor	20 N·m	15 lb ft
EVAP Canister Bracket Bolt	7 N·m	62 lb in
Fuel and EVAP Pipe Retainer Nut	6 N·m	53 lb in
Fuel Crossover Hose Clamps	4 N·m	35 lb in
Fuel Filter and Fuel Pressure Regulator Bracket Nut	5 N·m	44 lb in
Fuel Pipe Assembly Clip Nuts	3 N·m	27 lb in
Fuel Rail Attaching Bolts	10 N·m	89 lb in
Fuel Tank Fill and Vent Pipe Bolts	3 N·m	22 lb in
Fuel Tank Fill Hose Clamp	4 N·m	35 lb in
Fuel Tank Fill Pipe Ground Strap Bolt	8 N·m	71 lb in
Fuel Tank Shield Mount Bolt	25 N·m	18 lb in
Fuel Tank Shield Nut	12 N·m	106 lb in
Fuel Tank Strap and Shield Bolts	25 N·m	18 lb ft
Heated Oxygen Sensor (HO2S)	41 N·m	30 lb ft
Ignition Coil Harness Mounting Bolt	12 N·m	106 lb in
Ignition Coil Mounting Bolts	12 N·m	106 lb in
Knock Sensor (KS)	20 N·m	15 lb ft
PCV Hose Assembly Mounting Cable Nut	12 N·m	106 lb in
Powertrain Control Module (PCM) Electrical Connector Fasteners	8 N·m	70 lb in
Powertrain Control Module (PCM) Retaining Fastener	2 N·m	17 lb in
Secondary Air Injection (AIR) Check Valves	23 N·m	17 lb ft
Secondary Air Injection (AIR) Check Valve to the AIR Pipe	23 N·m	17 lb ft
Secondary Air Injection (AIR) Pipe To Exhaust Manifold Bolts	20 N·m	15 lb ft
Secondary Air Injection (AIR) Pump to Bracket	9 N·m	80 lb in
Secondary Air Injection (AIR) Solenoid Valve Retaining Nut	7 N·m	62 lb in
Spark Plug	15 N·m	11 lb ft
Spark Plug in New Cylinder Head	20 N·m	15 lb ft
Tank Crossover Hose Clamp	4 N·m	35 lb in
Throttle Actuator Control (TAC) Module to PCM Bracket	2 N·m	17 lb in
Throttle Actuator Control (TAC) Module to PCM Bracket Fasteners	2 N·m	17 lb in
Throttle Body Attaching Bolts	10 N·m	189 lb in

Fuel System Specifications

Use premium unleaded gasoline rated at 91 octane or higher for best performance. You may use middle grade or regular unleaded gasolines, but your vehicle may not accelerate as well.

It is recommended that the gasoline meet specification which have been developed by the American Automobile Manufactures Association (AAMA) and endorsed by the Canadian Motor Vehicle Manufacturers Association for better vehicle performance and engine protection. Gasolines meeting the AAMA specification could provide improved driveability and emission control system performance compared to other gasolines. For more information, write to : American Automobile Manufacturer's Association, 7430 Second Ave, Suite 300, Detroit MI 48202.

Be sure the posted octane for premium is at least 91 (at least 89 for middle grade and 87 for regular). If the octane is less than 87, you may get a heavy knocking noise when you drive. If it's bad enough, it can damage your engine.

If you're using fuel rated at the recommended octane or higher and you hear heavy knocking, your engine needs service. But don't worry if you hear a little pinging noise when you're accelerating or driving up a hill. That's normal, and you don't have to buy a higher octane fuel to get rid of pinging. It's the heavy, constant knock that means you have a problem.

Notice

Your vehicle was not designed for fuel that contains methanol. Do not use methanol fuel which can corrode metal parts in your fuel system and also damage plastic and rubber parts. This kind of damage would not be covered under your warranty.

If your vehicle is certified to meet to meet California Emission Standards (indicated on the under hood emission control label), it is designed to operate on fuels that meet California specifications. If such fuels are not available in states adopting California emissions standards, your vehicle will operate satisfactorily on fuels meeting federal specifications, but emission control system performance may be affected. The malfunction indicator lamp on your instrument panel may turn on and/or your vehicle may fail a smog-check test. If this occurs, return to your authorized dealer for diagnosis to determine the cause of failure. In the event it is determined that the cause of the condition is the type of fuels used, repairs may not be covered by your warranty.

Some gasolines that are not reformulated for low emissions may contain an octane-enhancing additive called methylcyclopentadienyl manganese tricarbonyl (MMT); ask your service station operator whether or not the fuel contains MMT.

Exhaust System

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Exhaust Clamp Bolts	44 N·m	32 lb in
Exhaust Manifold Bolt (First Pass)	15 N·m	11 lb ft
Final Pass	25 N·m	18 lb ft
Exhaust Manifold Heat Shield Bolt	9 N·m	80 lb in
Exhaust Manifold Nut	20 N·m	15 lb ft
Exhaust Muffler Bolt	50 N·m	37 lb ft
Exhaust Muffler Hanger Nut	16 N·m	12 lb ft
Exhaust Pipe Brace Lower Bolt	50 N·m	37 lb ft
Exhaust Pipe Hanger Bolt	50 N·m	37 lb ft
Ignition Coil Bracket Stud	12 N·m	106 lb in
Oxygen Sensor	42 N·m	30 lb ft

Exhaust System Description

Important

Use of non-OEM parts may cause driveability concerns.

The exhaust system design varies according to the model designation and the intended use of the vehicle.

In order to secure the exhaust pipe to the exhaust manifold, the exhaust system utilizes a flange and seal joint coupling. A flange and gasket coupling secures the catalytic converter assembly to the muffler assembly.

Hangers suspend the exhaust system from the underbody, allowing some movement of the exhaust system and disallowing the transfer of noise and vibration into the vehicle.

Heat shields protect the vehicle from the high temperatures generated by the exhaust system.

Resonator

Some exhaust systems are equipped with a resonator. The resonator, located either before or after the muffler, allows the use of mufflers with less back pressure. Resonators are used when vehicle characteristics require specific exhaust tuning.

Catalytic Converter

The catalytic converter is an emission control device added to the engine exhaust system in order to reduce hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) pollutants from the exhaust gas.

The catalytic converter is comprised of a ceramic monolith substrate, supported in insulation and housed within a sheet metal shell. The substrate may be washcoated with 3 noble metals:

- Platium (Pt)
- Palladium (Pd)
- Rhodium (Rh)

The catalyst in the converter is not serviceable.

Muffler

The exhaust muffler reduces the noise levels of the engine exhaust by the use of tuning tubes. The tuning tubes create channels inside the exhaust muffler that lower the sound levels created by the combustion of the engine.

Transmission/Transaxle Description and Operation

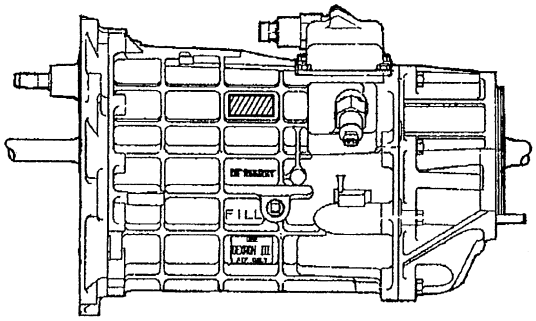
Tremac 6-Speed Manual Transmission – MM6/M12

Application	Specification	
	Metric	English
Backup Lamp Switch	20 N·m	15 lb ft
Differential to Transmission Bolts and Nuts	50 N·m	37 lb ft
Differential to Transmission Lower Nut	50 N·m	37 lb ft
Driveline Support Assembly to Engine Flywheel Housing Bolts	50 N·m	37 lb ft
EBTCM LH Mounting Bracket Mounting Bolts	50 N·m	37 lb ft
Gear Select/Skip Shift Solenoid	40 N·m	30 lb ft
Intermediate Exhaust Pipe to Muffler Bolts	50 N·m	37 lb ft
Negative Battery Cable Bolt	15 N·m	11 lb ft
Rear Shock Absorber Lower Mounting Bolt	220 N·m	162 lb ft
Rear Suspension Crossmember Mounting Nuts	110 N·m	81 lb ft
Reverse Lockout Solenoid	40 N·m	30 lb ft
Shift Control Mounting Bolts	30 N·m	22 lb ft
Shift Control Closeout Boot Retaining Nuts	12 N·m	106 lb in
Transaxle Mount Bracket to Differental Bolts	50 N·m	37 lb ft
Transaxle Mount to Rear Suspension Crossmember Nuts	50 N·m	37 lb ft
Transmission to Driveline Support Assembly Bolts/Studs	50 N·m	37 lb ft
Transmission Fluid Drain Plug	27 N·m	20 lb ft
Transmission Fluid Fill Plug	27 N·m	20 lb ft
Transmission Fluid Temperature Sensor	27 N·m	20 lb ft
Transmission Shift Rod Clamp Bolt	30 N·m	22 lb ft
Transmission Vent Tube Retaining Bolt	20 N·m	15 lb ft

Lubrication Specifications

Application	Metric	English
DEXRON® - III	3.9 liters	4.1 quarts

Manual Transmission Description and Operation



Manual transmissions are identified by the number of forward gears and the measured distance between the centerline of the output shaft and the counter gear.

The 6-speed, manual transmission (RPO MM6/M12), used in Corvettes, incorporates the following features:

- An aluminum case.
- Fully synchronized gearing with an enhanced synchronizer cone arrangement:
  - Tripple-cone: FIRST, SECOND
  - Double-cone: THIRD, FOURTH, FIFTH, SIXTH
  - Single-cone: REVERSE
- An internal shift rail mechanism.
- A remote transmission shift control mounted forward of the transmission.
- An external transmission shift rod enabling the forward mount location of the transmission shift control.
- An extended-length transmission output shaft mating directly to the rear axle drive pinion (in the rear of the differential housing).
- Tapered roller bearings supporting the mainshaft and countershaft.
- Caged roller bearings under all speed gears.
- Solenoid inhibit of SECOND and THIRD gears.
- Solenoid inhibit of REVERSE gear during predefined forward motion.

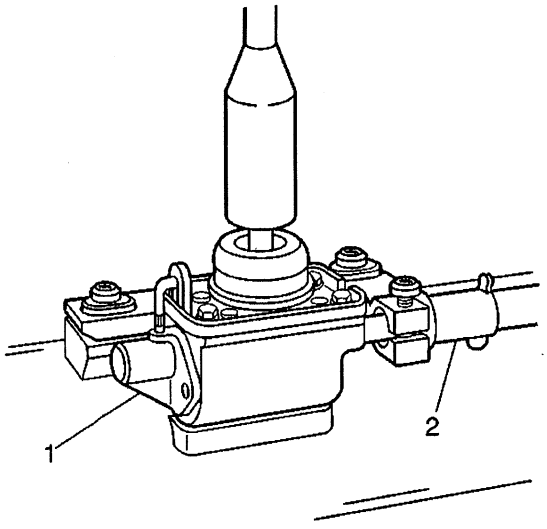
These features combine to yield a rugged, reliable system capable of handling input torques of up to 610 N·m (450 lb ft) for the MM6 and 540 N·m (400 lb ft) for the M12.

The gear ratios used in this transmission offer a wide operating range providing excellent acceleration and fuel economy.

The gear ratios are as follows:

Gear	MM6 Ratio (:1)	M12 Ratio (:1)
FIRST	2.66	2.97
SECOND	1.78	2.07
THIRD	1.30	1.43
FOURTH	1.00	1.00
FIFTH	0.74	0.84
SIXTH	0.50	0.57
REVERSE	2.90	3.28

Shift Control and Shift Rod



To allow the rear-of-vehicle transmission location, the transmission shift shaft has been relocated to the front of the transmission. The shift shaft is connected to a transmission shift rod (2) which contains two

sealed universal-style joints, enabling the range of motion necessary in order to shift gears. The shift rod (2) is connected to the transmission shift control (1) which is a lubricated and sealed unit, mounted to the driveline support assembly. The mounting system utilized for the shift control (1) incorporates rubber insulators. The cockpit of the vehicle is isolated from the driveline through the use of a shift control closeout boot which seals off the shift control and the driveline tunnel shift control opening.

Gear Select (Skip Shift)

To ensure good fuel economy and compliance with federal fuel economy standards, SECOND and THIRD gears are inhibited when shifting out of FIRST gear under the following conditions:

- Coolant temperature is above 50°C (122°F).
- Vehicle speed is between 20 and 29 km/h (12 and 19 mph).
- Throttle is opened 35 percent or less.

Reverse Lockout

A reverse lockout system (consisting of a reverse lockout solenoid which operates a reverse lockout mechanism) is utilized to prevent shifting into REVERSE gear when the vehicle is moving forward at a speed of 5 km/h (3 mph) or more.

Skip Shift Description and Operation

The skip shift solenoid is a performance feature which forces the driver to shift from first gear to fourth gear during light acceleration and low engine load conditions. This feature is used to ensure good fuel economy and compliance with federal economy standards. The skip shift system consist of the following components:

- The powertrain control module (PCM).
- The skip shift solenoid.
- The skip shift lamp.

With the ignition ON, battery voltage is supplied directly to the skip shift solenoid. The powertrain control module (PCM) controls the solenoid by grounding the control circuit. When the skip shift system is active the PCM also grounds the control circuit of the skip shift lamp. The lamp illuminates to inform the driver that the 1-4 skip shift is engaged. The PCM determines when the skip shift system is active when the following parameters are met:

- The vehicle speed is between 24-31 km/h (15-19 mph).
- The engine coolant temperature (ECT) is greater than 77°C (171°F).
- The BARO is greater than 76 kPa.
- The accelerator pedal position (APP) is less than 26 percent.

When the conditions are met the powertrain control module (PCM) grounds the skip shift solenoid control circuit. This energizes the skip shift solenoid and mechanically blocks the gear shift lever from going into the second or third gear positions. When the drivers pulls back on the shift lever with the system enabled the transmission will go into fourth gear.

When the conditions for skip shift engagement are no longer met the powertrain control module (PCM) disables the skip shift solenoid, allowing the driver to use second and third gears.

Once the skip shift solenoid is enabled the system will not be re-enabled until the vehicle speed returns to 0 km/h (0 mph) and the conditions for enabling skip shift solenoid are met.

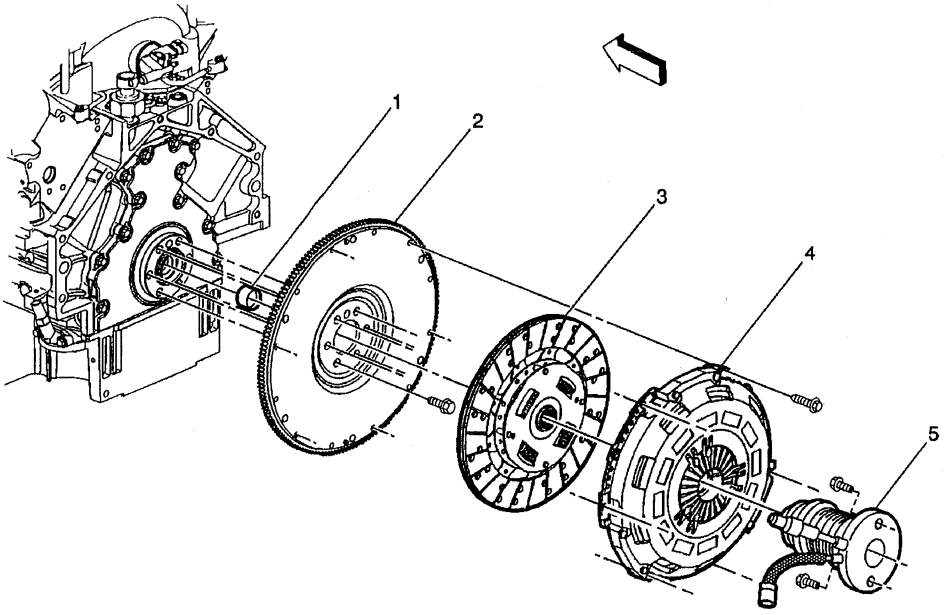
Clutch

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Clutch Actuator Cylinder Mounting Bolts	12 N·m	106 lb in
Clutch Pedal Bracket Mounting Nuts	27 N·m	20 lb ft
Clutch Pedal Nut	50 N·m	37 lb ft
Clutch Pressure Plate Bolts[1]	70 N·m	52 lb ft
Cruise Control Release Switch Bracket Retaining Bolts	12 N·m	106 lb in
Driver Foot Rest Bracket Retaining Bolt	8 N·m	71 lb in
Driver Foot Rest Bracket Retaining Nut	10 N·m	89 lb in
Engine Flywheel Inspection Cover Retaining Bolts	25 N·m	18 lb ft
Negative Battery Cable Bolt	15 N·m	11 lb ft

1 Clutch pressure plate bolts must be tightened in sequence and in even increments over three passes, then tightened to final specification on the fourth pass.

Hydraulic Clutch System Description and Operation



(1) Clutch Pilot Bearing
(2) Engine Flywheel
(3) Clutch Driven Plate
(4) Clutch Pressure Plate
(5) Clutch Actuator Cylinder

The following are the principal components of the clutch system:

- The driving members; attached to the engine and turning with the engine.
- The driven member; attached to the driveline and transmission and turning with the driveline and transmission.
- The operating members; including the spring, the clutch hydraulic system, and the clutch pedal linkages, required to apply and release the pressure, which holds the driving and driven members in contact with each other.

Clutch Driving Members

The clutch driving members consist of two, flat surfaced, iron plates, machined to a smooth finish. One of these surfaces is the rear face of the engine flywheel and the other is a comparatively heavy flat ring, with one side machined, known as the clutch pressure plate.

Clutch Driven Members

The driven member (clutch disc) has a splined hub that freely slides lengthwise along the splines of the input shaft, which also drives the shaft through these same splines. Suitable friction facings are attached to each side of the plate by rivets.

In order to make the clutch engagement as smooth as possible and eliminate chatter; the steel segments driving the splined hub are slightly waved, which causes the contact pressure on the facings to rise gradually as the waved springs flatten out.

Clutch Operating Members

The driving member and the driven member are held in contact by spring pressure. This pressure is exerted by a one-piece conical or diaphragm spring.

A diaphragm spring is a conical piece of spring steel that has been specially stamped to give it greater flexibility. The diaphragm is positioned between the cover and the pressure plate so that the diaphragm spring is nearly flat when the clutch is in the engaged position. The action of this type of spring is similar to that of an ordinary oil can.

The pressure of the inner rim of the spring on the pressure plate decreases as the flat position is passed. The inner rim of the diaphragm bears on the pressure plate and is pivoted on a ring on the outer edge of the pressure plate. The application of a pulling load on the inner section of the pressure plate will cause the inner rim to move away from the flywheel and allow the pressure plate to move away from the clutch disc, thereby releasing or disengaging the clutch. When the pressure is released from the inner section, the OIL CAN action of the diaphragm causes the inner section to move in, and the movement of the inner rim forces the pressure plate against the clutch disc, thus engaging the clutch.

The clutch release bearing is moved by the actuator assembly to move the release levers which move the pressure plate to the rear, thus separating the clutch disc from the flywheel when the clutch pedal is depressed by the driver. A piston return spring in the actuator cylinder preloads the clutch linkage and assures a small load on the release bearing with the actuator assembly at all times. As the clutch disc wears, the diaphragm spring fingers move forward forcing the release bearing, actuator assembly, and pushrod to move. This movement forces the actuator cylinder piston to move forward in its bore, consuming hydraulic fluid from the master cylinder reservoir, thereby providing the SELF-ADJUSTING feature of the hydraulic clutch linkage system.

Hydraulic Clutch Description

The clutch hydraulic system consists of a master cylinder and an actuator cylinder. When pressure is applied to the clutch pedal (pedal depressed), the pushrod contacts the plunger and pushes it down the bore of the master cylinder. In the first 0.8 mm (0.031 in) of movement, the recuperation seal closes the port to the fluid reservoir tank, and as the plunger continues to move down the bore of the cylinder, the fluid is forced through the outlet line to the actuator cylinder mounted to the driveline support assembly. As fluid is pushed down the pipe from the master cylinder, this in turn forces the piston in the actuator cylinder outward. As the actuator cylinder piston moves forward, it forces the release bearing to disengage the clutch pressure plate from the clutch disc. On the return stroke (pedal released), the

plunger moves back as a result of the return pressure of the clutch. Fluid returns to the master cylinder and the final movement of the plunger opens the port to the fluid reservoir, allowing an unrestricted flow of fluid between system and reservoir.

Automatic Transmission – 6L80E

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Auxiliary Transmission Oil Cooler Quick Connect Fittings	25 N·m	18 lb ft
Auxiliary Transmission Oil Cooler Brace to Skid Bar Bolt	25 N·m	18 lb ft
Auxiliary Transmission Oil Cooler Bracket to Body Nuts	8 N·m	6 lb ft
Auxiliary Transmission Oil Cooler to Bracket Mounting Bolts	22 N·m	16 lb ft
Case Extension Stud to Case Extension	15 N·m	11 lb ft
Case Extension to Case Assembly	50 N·m	37 lb ft
Control Solenoid Valve Assembly and Control Valve Lower Body Assembly to Control Valve Upper Body Assembly	8 N·m	6 lb ft
Control Solenoid Valve Assembly and Control Valve Lower Body Assembly to Control Valve Upper Body Assembly	8 N·m	6 lb ft
Control Solenoid Valve Heat Sink to Valve Body	8 N·m	6 lb ft
Control Valve Upper Body Assembly to Control Valve Lower Body Assembly	8 N·m	6 lb ft
Control (with Body and Valve) Valve Assembly to Case Assembly	8 N·m	6 lb ft
Fluid Pan Assembly to Case Assembly	9 N·m	7 lb ft
Fluid Pan Drain Plug Assembly to Fluid Pan Assembly	25 N·m	18 lb ft
Fluid Pump Cover Assembly to Torque Converter Housing	11 N·m	8 lb ft
Input and Output Speed Sensor Assembly to Control Valve Upper Body Assembly	12 N·m	9 lb ft
Line Pressure Test Hole Plug to Torque Converter Housing	11 N·m	8 lb ft
Manual Shaft Detent Assembly to Valve Body	12 N·m	9 lb ft
Torque Converter Housing Assembly to Case Assembly	72 N·m	53 lb ft
Transmission Oil Cooler Pipe Clip to Oil Pan Bolts	12 N·m	9 lb ft
Transmission Oil Cooler Pipe Clip to Oil Pan Nuts	10 N·m	89 lb in
Transmission Oil Cooler Pipe Clip to Torque Tube Bolts	12 N·m	9 lb ft
Transmission Oil Cooler Pipes to Transmission Bolt	25 N·m	18 lb ft

Transmission General Specifications

Name	6L80
RPO Codes	MYC
Production Location	Ypsilanti, Michigan (USA)
Transmission Drive	Rear Wheel Drive
1st Gear Ratio	4.027
2nd Gear Ratio	2.364
3rd Gear Ratio	1.532
4th Gear Ratio	1.152
5th Gear Ratio	0.852
6th Gear Ratio	0.667
Reverse	3.064
Torque Converter Size - Diameter of Torque Converter Turbine	258/300 mm
Pressure Taps	Line Pressure
Transmission Fluid Type	Dexron VI
Transmission Fluid Capacity	9.54 L (10.08 qt) - 6CDA 9.71 L (10.27 qt) - 6CZA 11.92 L (12.60 qt) - 6CYA
Transmission Type: 6	Six Forward Gears
Transmission Type: L	Longitude Mount
Transmission Type: 80	Product Series
Position Quadrant	P, R, N, D, S (some models)
Case Material	Die Cast Aluminum
Transmission Net Weight	95.1 kg (209.7 lb) - 6CDA 96.7 kg (213.2 lb) - 6CZA 103.7 kg (228.6 lb) - 6CYA
Maximum Trailer Towing Capacity	N/A

Fluid Capacity Specifications

Application	Specification	
	Metric	English
Pan Removal - Approximate Capacity	6.2 liters	6.5 quarts
Overhaul - Approximate Capacity (6CDA/6CZA)	9.5 liters	10 quarts
Overhaul - Approximate Capacity (6CYA)	11.8 liters	12.5 quarts
Complete Trans System Fluid Capacity (6CDA)	10.01 liters	10.58 quarts
Complete Trans System Fluid Capacity (6CZA)	10.32 liters	10.91 quarts
Complete Trans System Fluid Capacity (6CYA)	12.53 liters	13.24 quarts

Transmission General Description

The Hydra-matic 6-Speed RWD is a fully automatic, six-speed, rear-wheel drive, electronic-controlled transmission. It consists primarily of a four-element torque converter, an integral fluid pump and converter housing, a single and double planetary gear set, friction and mechanical clutch assemblies, and a hydraulic pressurization and control system. There are four variants of the transmission, all based on torque capacity. Architecture is common between the variants, and component differences are primarily related to size.

The four-element torque converter contains a pump, a turbine, a pressure plate splined to the turbine, and a stator assembly. The torque converter acts as a fluid coupling to smoothly transmit power from the engine to the transmission. It also hydraulically provides additional torque multiplication when required. The pressure plate, when applied, provides a mechanical direct drive coupling of the engine to the transmission.

The planetary gear sets provide the six forward gear ratios and reverse. Changing gear ratios is fully automatic and is accomplished through the use of a Transmission Control Module (TCM) located inside

the transmission. The TCM receives and monitors various electronic sensor inputs and uses this information to shift the transmission at the optimum time.

The TCM commands shift solenoids and variable bleed pressure control solenoids to control shift timing and feel. The TCM also controls the apply and release of the torque converter clutch which allows the engine to deliver the maximum fuel efficiency without sacrificing vehicle performance. All the solenoids, including the TCM, are packaged into a self-contained control solenoid valve assembly.

The hydraulic system primarily consists of a vane-type pump, two control valve body assemblies, converter housing and case. The pump maintains the working pressures needed to stroke the clutch pistons that apply or release the friction components. These friction components, when applied or released, support the automatic shifting qualities of the transmission.

The friction components used in this transmission consist of five multiple disc clutches. The multiple disc clutches combine with one mechanical sprag clutch to deliver seven different gear ratios, six forward and one reverse, through the gear sets. The gear sets then transfer torque through the output shaft.

The transmission may be operated in any of the following gear ranges:

PARK (P): This position locks the rear wheels and prevents the vehicle from rolling either forward or backward. PARK is the best position to use when starting the vehicle. Because the transmission utilizes a shift lock control system, it is necessary to fully depress the brake pedal before shifting out of PARK. For safety reasons, use the parking brake in addition to the PARK position.

REVERSE (R): This position allows the vehicle to be operated in a rearward direction.

NEUTRAL (N): This position allows the engine to be started and operated while driving the vehicle. If necessary, you may select this position in order to restart the engine with the vehicle moving. This position should also be used when towing the vehicle.

DRIVE (D): Drive range should be used for all normal driving conditions for maximum efficiency and fuel economy. Drive range allows the transmission to operate in each of the six forward gear ratios. Downshifts to a lower gear, or higher gear ratio, are available for safe passing by depressing the accelerator or by manually selecting a lower gear in the manual mode range.

SPORT MODE (S): This position allows the driver to utilize the Driver Shift Control (DSC) system, or manual mode. When the shift selector lever is moved to this position, the driver may select upshifts or downshifts by using the paddle switches located on the steering wheel. An upshift is requested by pushing either + button. A downshift is requested by pulling either + button rearward toward the driver. Refer to the vehicle owner's manual for more specific DSC information.

Transmission Component and System Description

The mechanical components of the 6-Speed RWD are as follows:

- A torque converter with an electronically controlled capacity clutch (ECCC)
- Vane-type fluid pump assembly
- 1-2-3-4 and 3-5 Reverse clutch assembly
- Input sun gear and carrier assembly
- 4-5-6 clutch assembly with turbine shaft
- 4-5-6 clutch hub assembly
- 1-2-3-4 clutch hub assembly
- 2-6 and 3-5 reverse clutch hub assembly
- Center support assembly, with 2-6 clutch assembly, and low and Reverse clutch assembly
- Low clutch sprag assembly
- A double planetary output carrier assembly
- Output shaft assembly
- Control valve body assembly

The electrical components of the 6-Speed RWD are as follows:

- Input and output speed sensor assembly
- Manual shift shaft position switch
- Control solenoid valve assembly, which contains the following components:
  - Transmission control module (TCM)
  - 5 variable bleed line pressure control (PC) solenoids
  - Transmission fluid pressure (TFP) switch assembly
  - Torque converter clutch (TCC) pressure control solenoid
  - 2 shift solenoids

Adaptive Functions

The 6L80 transmission utilizes a line pressure control system during upshifts to compensate for the normal wear of transmission components. By adjusting the line pressure, the transmission control module (TCM) can maintain acceptable transmission shift times. This process is known as "adaptive learning" or "shift adapts" and is similar to the closed loop fuel control system used for the engine.

In order for the TCM to perform a "shift adapt," the TCM must first identify if an upshift is acceptable to analyze. For example, upshifts that occur during cycling of the A/C compressor or under extreme throttle changes could cause the TCM to incorrectly adjust line pressure. When an upshift is initiated, a number of contingencies, such as throttle position, transmission temperature, and vehicle speed, are checked in order to determine if the actual shift time is valid to compare to a calibrated desired shift time. If all the contingencies are met during the entire shift, then the shift is considered valid and the adapt function may be utilized if necessary.

Once an adaptable shift is identified, the TCM compares the actual shift time to the desired shift time and calculates the difference between them. This difference is known as the shift error. The actual shift time is determined from the time that the TCM commands the shift to the start of the engine RPM drop initiated by the shift. If the actual shift time is longer than the calibrated desired shift time, a soft feel or slow engagement, then the TCM decreases current to the pressure control (PC) solenoid in order to increase line pressure for the next, same, upshift under identical conditions. If the actual shift time is shorter than the calibrated desired shift time, a firm engagement, then the TCM increases current to the PC solenoid in order to decrease line pressure for the next, same, upshift under identical conditions.

The purpose of the adapt function is to automatically compensate the shift quality for the various vehicle shift control systems. The adapt function is a continuous process that will help to maintain optimal shift quality throughout the life of the vehicle.

Abbreviations and Meanings

Abbreviation	Meaning
A	
A	Ampere(s)
ABS	Antilock Brake System
A/C	Air Conditioning
AC	Alternating Current
ACC	Accessory, Automatic Climate Control
ACL	Air Cleaner
ACR4	Air Conditioning Refrigerant, Recovery, Recycling, Recharging
AD	Automatic Disconnect
A/D	Analog to Digital
ADL	Automatic Door Lock
A/F	Air/Fuel Ratio
AH	Active Handling
AIR	Secondary Air Injection
ALC	Automatic Level Control, Automatic Lamp Control
AM/FM	Amplitude Modulation/Frequency Modulation
Ant	Antenna
AP	Accelerator Pedal
APCM	Accessory Power Control Module
API	American Petroleum Institute
APP	Accelerator Pedal Position
APT	Adjustable Part Throttle
ASM	Assembly, Accelerator and Servo Control Module
ASR	Acceleration Slip Regulation
A/T	Automatic Transmission/Transaxle
ATC	Automatic Transfer Case, Automatic Temperature Control
ATDC	After Top Dead Center
ATSLC	Automatic Transmission Shift Lock Control
Auto	Automatic
avg	Average
A4WD	Automatic Four-Wheel Drive
AWG	American Wire Gage
B	
B+	Battery Positive Voltage
BARO	Barometric Pressure
BATT	Battery
BBV	Brake Booster Vacuum
BCA	Bias Control Assembly
BCM	Body Control Module
BHP	Brake Horsepower
BLK	Black
BLU	Blue
BP	Back Pressure
BPCM	Battery Pack Control Module
BPMV	Brake Pressure Modulator Valve
BPP	Brake Pedal Position
BRN	Brown

BTDC	Before Top Dead Center
BTM	Battery Thermal Module
BTSI	Brake Transmission Shift Interlock
Btu	British Thermal Units
C	
°C	Degrees Celsius
CAC	Charge Air Cooler
CAFE	Corporate Average Fuel Economy
Cal	Calibration
Cam	Camshaft
CARB	California Air Resources Board
CC	Coast Clutch
cm^3	Cubic Centimeters
CCM	Convenience Charge Module, Chassis Control Module
CCOT	Cycling Clutch Orifice Tube
CCP	Climate Control Panel
CD	Compact Disc
CE	Commutator End
CEAB	Cold Engine Air Bleed
CEMF	Counter Electromotive Force
CEX	Cabin Exchanger
cfm	Cubic Feet per Minute
cg	Center of Gravity
CID	Cubic Inch Displacement
CKP	Crankshaft Position
CKT	Circuit
C/Ltr	Cigar Lighter
CL	Closed Loop
CLS	Coolant Level Switch
CMC	Compressor Motor Controller
CMP	Camshaft Position
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO2	Carbon Dioxide
Coax	Coaxial
COMM	Communication
Conn	Connector
CPA	Connector Position Assurance
CPP	Clutch Pedal Position
CPS	Central Power Supply
CPU	Central Processing Unit
CRT	Cathode Ray Tube
CRTC	Cathode Ray Tube Controller
CS	Charging System
CSFI	Central Sequential Fuel Injection
CTP	Closed Throttle Position
cu ft	Cubic Foot/Feet
cu in	Cubic Inch/Inches
CV	Constant Velocity Joint
CVRSS	Continuously Variable Road Sensing Suspension

Cyl	Cylinder(s)
D	
DAB	Delayed Accessory Bus
dB	Decibels
dBA	Decibels on A-weighted Scale
DC	Direct Current, Duty Cycle
DCM	Door Control Module
DE	Drive End
DEC	Digital Electronic Controller
DERM	Diagnostic Energy Reserve Module
DI	Distributor Ignition
dia	Diameter
DIC	Driver Information Center
Diff	Differential
DIM	Dash Integration Module
DK	Dark
DLC	Data Link Connector
DMCM	Drive Motor Control Module
DMM	Digital Multimeter
DMSDS	Drive Motor Speed and Direction Sensor
DMU	Drive Motor Unit
DOHC	Dual Overhead Camshafts
DR, Drvr	Driver
DRL	Daytime Running Lamps
DTC	Diagnostic Trouble Code
E	
EBCM	Electronic Brake Control Module
EBTCM	Electronic Brake and Traction Control Module
EC	Electrical Center, Engine Control
ECC	Electronic Climate Control
ECI	Extended Compressor at Idle
ECL	Engine Coolant Level
ECM	Engine Control Module, Electronic Control Module
ECS	Emission Control System
ECT	Engine Coolant Temperature
EEPROM	Electrically Erasable Programmable Read Only Memory
EEVIR	Evaporator Equalized Values in Receiver
EFE	Early Fuel Evaporation
EGR	Exhaust Gas Recirculation
EGR TVV	Exhaust Gas Recirculation Thermal Vacuum Valve
EHPS	Electro-Hydraulic Power Steering
EI	Electronic Ignition
ELAP	Elapsed
ELC	Electronic Level Control
E/M	English/Metric
EMF	Electromotive Force
EMI	Electromagnetic Interference
Eng	Engine
EOP	Engine Oil Pressure
EOT	Engine Oil Temperature

EPA	Environmental Protection Agency
EPR	Exhaust Pressure Regulator
EPROM	Erasable Programmable Read Only Memory
ESB	Expansion Spring Brake
ESC	Electronic Suspension Control
ESD	Electrostatic Discharge
ESN	Electronic Serial Number
ETC	Electronic Throttle Control, Electronic Temperature Control, Electronic Timing Control
ETCC	Electronic Touch Climate Control
ETR	Electronically Tuned Receiver
ETS	Enhanced Traction System
EVAP	Evaporative Emission
EVO	Electronic Variable Orifice
Exh	Exhaust
F	
°F	Degrees Fahrenheit
FC	Fan Control
FDC	Fuel Data Center
FED	Federal All United States except California
FEDS	Fuel Enable Data Stream
FEX	Front Exchanger
FF	Flexible Fuel
FFH	Fuel-Fired Heater
FI	Fuel Injection
FMVSS	Federal U.S. Motor Vehicle Safety Standards
FP	Fuel Pump
ft	Foot/Feet
FT	Fuel Trim
F4WD	Full Time Four-Wheel Drive
4WAL	Four-Wheel Antilock
4WD	Four-Wheel Drive
FW	Flat Wire
FWD	Front Wheel Drive, Forward
G	
g	Grams, Gravitational Acceleration
GA	Gage, Gauge
gal	Gallon
gas	Gasoline
GCW	Gross Combination Weight
Gen	Generator
GL	Gear Lubricant
GM	General Motors
GM SPO	General Motors Service Parts Operations
gnd	Ground
gpm	Gallons per Minute
GRN	Green
GRY	Gray
GVWR	Gross Vehicle Weight Rating

H	
H	Hydrogen
H2O	Water
Harn	Harness
HC	Hydrocarbons
H/CMPR	High Compression
HD	Heavy Duty
HDC	Heavy Duty Cooling
hex	Hexagon, Hexadecimal
Hg	Mercury
Hi Alt	High Altitude
HO2S	Heated Oxygen Sensor
hp	Horsepower
HPL	High Pressure Liquid
HPS	High Performance System
HPV	High Pressure Vapor
HPVS	Heat Pump Ventilation System
Htd	Heated
HTR	Heater
HUD	Head-up Display
HVAC	Heater-Ventilation-Air Conditioning
HVACM	Heater-Vent-Air Conditioning Module
HVIL	High Voltage Interlock Loop
HVM	Heater Vent Module
Hz	Hertz
I	
IAC	Idle Air Control
IAT	Intake Air Temperature
IC	Integrated Circuit, Ignition Control
ICCS	Integrated Chassis Control System
ICM	Ignition Control Module
ID	Identification, Inside Diameter
IDI	Integrated Direct Ignition
IGBT	Insulated Gate Bi-Polar Transistor
ign	Ignition
ILC	Idle Load Compensator
in	Inch/Inches
INJ	Injection
inst	Instantaneous, Instant
IP	Instrument Panel
IPC	Instrument Panel Cluster
IPM	Instrument Panel Module
I/PEC	Instrument Panel Electrical Center
ISC	Idle Speed Control
ISO	International Standards Organization
ISS	Input Speed Shaft, Input Shaft Speed
K	
KAM	Keep Alive Memory
KDD	Keyboard Display Driver
kg	Kilogram

kHz	Kilohertz
km	Kilometer
km/h	Kilometers per Hour
km/l	Kilometers per Liter
kPa	Kilopascals
KS	Knock Sensor
kV	Kilovolts
L	
L	Liter
L4	Four Cylinder Engine, In-Line
L6	Six-Cylinder Engine, In-Line
lb	Pound
lb ft	Pound Feet Torque
lb in	Pound Inch Torque
LCD	Liquid Crystal Display
LDCL	Left Door Closed Locking
LDCM	Left Door Control Module
LDM	Lamp Driver Module
LED	Light Emitting Diode
LEV	Low Emissions Vehicle
LF	Left Front
lm	Lumens
LR	Left Rear
LT	Left
LT	Light
LT	Long Term
LTPI	Low Tire Pressure Indicator
LTPWS	Low Tire Pressure Warning System
M	
MAF	Mass Air Flow
Man	Manual
MAP	Manifold Absolute Pressure
MAT	Manifold Absolute Temperature
max	Maximum
M/C	Mixture Control
MDP	Manifold Differential Pressure
MFI	Multiport Fuel Injection
mi	Miles
MIL	Malfunction Indicator Lamp
min	Minimum
MIN	Mobile Identification Number
mL	Milliliter
mm	Millimeter
mpg	Miles per Gallon
mph	Miles per Hour
ms	Millisecond
MST	Manifold Surface Temperature
MSVA	Magnetic Steering Variable Assist, Magnasteer®
M/T	Manual Transmission/Transaxle
MV	Megavolt

mV	Millivolt
N	
NAES	North American Export Sales
NC	Normally Closed
NEG	Negative
Neu	Neutral
NI	Neutral Idle
NiMH	Nickel Metal Hydride
NLGI	National Lubricating Grease Institute
N·m	Newton-meter Torque
NO	Normally Open
NOx	Oxides of Nitrogen
NPTC	National Pipe Thread Coarse
NPTF	National Pipe Thread Fine
NOVRAM	Non-Volatile Random Access Memory
O	
O2	Oxygen
O2S	Oxygen Sensor
OBD	On-Board Diagnostics
OBD II	On-Board Diagnostics Second Generation
OC	Oxidation Converter Catalytic
OCS	Opportunity Charge Station
OD	Outside Diameter
ODM	Output Drive Module
ODO	Odometer
OE	Original Equipment
OEM	Original Equipment Manufacturer
OHC	Overhead Camshaft
ohms	Ohm
OL	Open Loop, Out of Limits
ORC	Oxidation Reduction Converter Catalytic
ORN	Orange
ORVR	On-Board Refueling Vapor Recovery
OSS	Output Shaft Speed
oz	Ounce(s)
P	
PAG	Polyalkylene Glycol
PAIR	Pulsed Secondary Air Injection
PASS, PSGR	Passenger
PASS-Key®	Personalized Automotive Security System
P/B	Power Brakes
PC	Pressure Control
PCB	Printed Circuit Board
PCM	Powertrain Control Module
PCS	Pressure Control Solenoid
PCV	Positive Crankcase Ventilation
PEB	Power Electronics Bay
PID	Parameter Identification
PIM	Power Inverter Module
PM	Permanent Magnet Generator

P/N	Part Number
PNK	Pink
PNP	Park/Neutral Position
PRNDL	Park, Reverse, Neutral, Drive, Low
POA	Pilot Operated Absolute Valve
POS	Positive, Position
POT	Potentiometer Variable Resistor
PPL	Purple
ppm	Parts per Million
PROM	Programmable Read Only Memory
P/S, PS	Power Steering
PSCM	Power Steering Control Module, Passenger Seat Control Module
PSD	Power Sliding Door
PSP	Power Steering Pressure
psi	Pounds per Square Inch
psia	Pounds per Square Inch Absolute
psig	Pounds per Square Inch Gauge
pt	Pint
PTC	Positive Temperature Coefficient
PWM	Pulse Width Modulated
Q	
QDM	Quad Driver Module
qt	Quart(s)
R	
R-12	Refrigerant-12
R-134a	Refrigerant-134a
RAM	Random Access Memory, Non-permanent memory device, memory contents are lost when power is removed.
RAP	Retained Accessory Power
RAV	Remote Activation Verification
RCDLR	Remote Control Door Lock Receiver
RDCM	Right Door Control Module
Ref	Reference
Rev	Reverse
REX	Rear Exchanger
RIM	Rear Integration Module
RF	Right Front, Radio Frequency
RFA	Remote Function Actuation
RFI	Radio Frequency Interference
RH	Right Hand
RKE	Remote Keyless Entry
Rly	Relay
ROM	Read Only Memory, Permanent memory device, memory contents are retained when power is removed.
RPM	Revolutions per Minute Engine Speed
RPO	Regular Production Option
RR	Right Rear
RSS	Road Sensing Suspension
RTD	Real Time Damping
RT	Right

RTV	Room Temperature Vulcanizing Sealer
RWAL	Rear Wheel Antilock
RWD	Rear Wheel Drive
S	
s	Second(s)
SAE	Society of Automotive Engineers
SC	Supercharger
SCB	Supercharger Bypass
SCM	Seat Control Module
SDM	Sensing and Diagnostic Module
SEO	Special Equipment Option
SFI	Sequential Multiport Fuel Injection
SI	System International Modern Version of Metric System
SIAB	Side Impact Air Bag
SIR	Supplemental Inflatable Restraint
SLA	Short/Long Arm Suspension
sol	Solenoid
SO2	Sulfur Dioxide
SP	Splice Pack
S/P	Series/Parallel
SPO	Service Parts Operations
SPS	Service Programming System, Speed Signal
sq ft, ft^2	Square Foot/Feet
sq in, in^2	Square Inch/Inches
SRC	Service Ride Control
SRI	Service Reminder Indicator
SRS	Supplemental Restraint System
SS	Shift Solenoid
ST	Scan Tool
STID	Station Identification Station ID
S4WD	Selectable Four-Wheel Drive
Sw	Switch
SWPS	Steering Wheel Position Sensor
syn	Synchronizer
T	
TAC	Throttle Actuator Control
Tach	Tachometer
TAP	Transmission Adaptive Pressure, Throttle Adaptive Pressure
TBI	Throttle Body Fuel Injection
TC	Turbocharger, Transmission Control
TCC	Torque Converter Clutch
TCS	Traction Control System
TDC	Top Dead Center
TEMP	Temperature
Term	Terminal
TFP	Transmission Fluid Pressure
TFT	Transmission Fluid Temperature
THM	Turbo Hydro-Matic
TIM	Tire Inflation Monitoring, Tire Inflation Module
TOC	Transmission Oil Cooler

TP	Throttle Position
TPA	Terminal Positive Assurance
TPM	Tire Pressure Monitoring, Tire Pressure Monitor
TR	Transmission Range
TRANS	Transmission/Transaxle
TT	Tell Tail Warning Lamp
TV	Throttle Valve
TVRS	Television and Radio Suppression
TVV	Thermal Vacuum Valve
TWC	Three Way Converter Catalytic
TWC+OC	Three Way + Oxidation Converter Catalytic
TXV	Thermal Expansion Valve
U	
UART	Universal Asynchronous Receiver Transmitter
U/H	Underhood
U/HEC	Underhood Electrical Center
U-joint	Universal Joint
UTD	Universal Theft Deterrent
UV	Ultraviolet
V	
V	Volt(s), Voltage
V6	Six-Cylinder Engine, V-Type
V8	Eight-Cylinder Engine, V-Type
Vac	Vacuum
VAC	Vehicle Access Code
VATS	Vehicle Anti-Theft System
VCIM	Vehicle Communication Interface Mode
VCM	Vehicle Control Module
V dif	Voltage Difference
VDOT	Variable Displacement Orifice Tube
VDV	Vacuum Delay Valve
vel	Velocity
VES	Variable Effort Steering
VF	Vacuum Fluorescent
VIO	Violet
VIN	Vehicle Identification Number
VLR	Voltage Loop Reserve
VMV	Vacuum Modulator Valve
VR	Voltage Regulator
V ref	Voltage Reference
VSES	Vehicle Stability Enhancement System
VSS	Vehicle Speed Sensor
W	
w/	With
W/B	Wheel Base
WHL	Wheel
WHT	White
w/o	Without
WOT	Wide Open Throttle
W/P	Water Pump

W/S	Windshield
WSS	Wheel Speed Sensor
WU-OC	Warm Up Oxidation Converter Catalytic
WU-TWC	Warm Up Three-Way Converter Catalytic
X	
X-valve	Expansion Valve
Y	
yd	Yard(s)
YEL	Yellow

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Conversion - English/Metric

English	Multiply/ Divide by	Metric
In order to calculate English measurement, divide by the number in the center column. In order to calculate metric measurement, multiply by the number in the center column.		
Length		
in	25.4	mm
ft	0.3048	m
yd	0.9144	
mi	1.609	km
Area		
sq in	645.2	sq mm
	6.45	sq cm
sq ft	0.0929	sq m
sq yd	0.8361	
Volume		
cu in	16,387.00	cu mm
	16.387	cu cm
	0.0164	L
qt	0.9464	
gal	3.7854	
cu yd	0.764	cu m
Mass		
lb	0.4536	kg
ton	907.18	
	0.907	tonne (t)
Force		
Kg F	9.807	newtons (N)
oz F	0.278	
lb F	4.448	
Acceleration		
ft/s²	0.3048	m/s²
In/s²	0.0254	
Torque		
Lb in	0.11298	N·m
lb ft	1.3558	
Power		
hp	0.745	kW
Pressure (Stress)		
inches of H2O	0.2488	kPa
lb/sq in	6.895	
Energy (Work)		
Btu	1055	J (J= one Ws)
lb ft	1.3558	
kW hour	3,600,000.00	
Light		
Foot Candle	10.764	lm/m²

Velocity		
mph	1.6093	km/h
Temperature		
(°F - 32) 5/9	=	°C
°F	=	(9/5 °C + 32)
Fuel Performance		
235.215/mpg	=	100 km/L

Equivalents - Decimal and Metric

Fraction (in)	Decimal (in)	Metric (mm)
1/64	0.015625	0.39688
1/32	0.03125	0.79375
3/64	0.046875	1.19062
1/16	0.0625	1.5875
5/64	0.078125	1.98437
3/32	0.09375	2.38125
7/64	0.109375	2.77812
1/8	0.125	3.175
9/64	0.140625	3.57187
5/32	0.15625	3.96875
11/64	0.171875	4.36562
3/16	0.1875	4.7625
13/64	0.203125	5.15937
7/32	0.21875	5.55625
15/64	0.234375	5.95312
1/4	0.25	6.35
17/64	0.265625	6.74687
9/32	0.28125	7.14375
19/64	0.296875	7.54062
5/16	0.3125	7.9375
21/64	0.328125	8.33437
11/32	0.34375	8.73125
23/64	0.359375	9.12812
3/8	0.375	9.525
25/64	0.390625	9.92187
13/32	0.40625	10.31875
27/64	0.421875	10.71562
7/16	0.4375	11.1125
29/64	0.453125	11.50937
15/32	0.46875	11.90625
31/64	0.484375	12.30312
1/2	0.5	12.7
33/64	0.515625	13.09687
17/32	0.53125	13.49375
35/64	0.546875	13.89062
9/16	0.5625	14.2875
37/64	0.578125	14.68437
19/32	0.59375	15.08125
39/64	0.609375	15.47812
5/8	0.625	15.875
41/64	0.640625	16.27187

Fraction (in)	Decimal (in)	Metric (mm)
21/32	0.65625	16.66875
43/64	0.671875	17.06562
11/16	0.6875	17.4625
45/64	0.703125	17.85937
23/32	0.71875	18.25625
47/64	0.734375	18.65312
3/4	0.75	19.05
49/64	0.765625	19.44687
25/32	0.78125	19.84375
51/64	0.796875	20.24062
13/16	0.8125	20.6375
53/64	0.828125	21.03437
27/32	0.84375	21.43125
55/64	0.859375	21.82812
7/8	0.875	22.225
57/64	0.890625	22.62187
29/32	0.90625	23.01875
59/64	0.921875	23.41562
15/16	0.9375	23.8125
61/64	0.953125	24.20937
31/32	0.96875	24.60625
63/64	0.984375	25.00312
1	1.0	25.4

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Fasteners

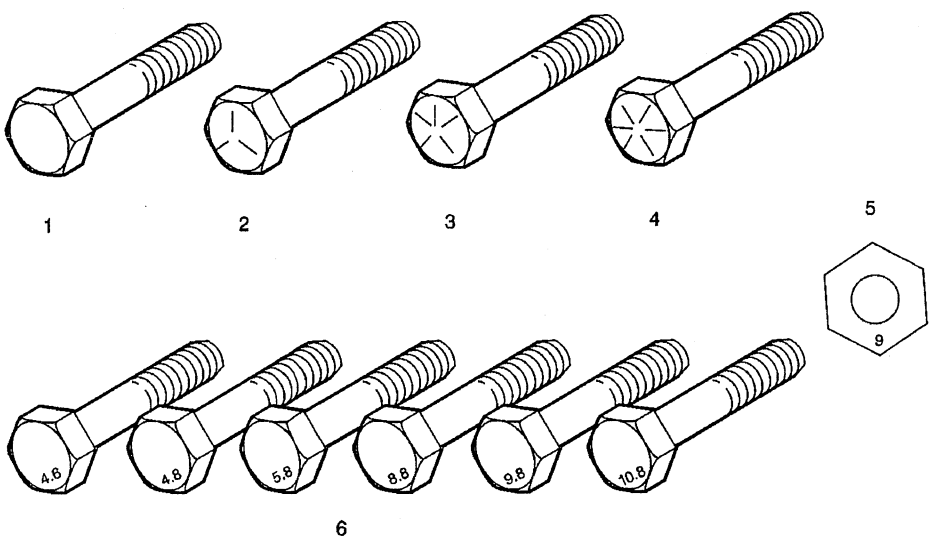
Metric Fasteners

This vehicle provides fastener dimensions using the metric system. Most metric fasteners are approximate in diameter to equivalent English fasteners. Make replacements using fasteners of the same nominal diameter, thread pitch, and strength.

A number marking identifies the OE metric fasteners except cross-recess head screws. The number also indicates the strength of the fastener material. A Posidrive® or Type 1A cross-recess identifies a metric cross-recess screw. For best results, use a Type 1A cross-recess screwdriver, or equivalent, in Posidrive® recess head screws.

GM Engineering Standards and North American Industries have adopted a portion of the ISO-defined standard metric fastener sizes. The purpose was to reduce the number of fastener sizes used while retaining the best thread qualities in each thread size. For example, the metric M6.0 X 1 screw, with nearly the same diameter and 25.4 threads per inch replaced the English 1/4-20 and 1/4-28 screws. The thread pitch is midway between the English coarse and fine thread pitches.

Fastener Strength Identification



1. English Bolt, Grade 2 (Strength Class)
2. English Bolt, Grade 5 (Strength Class)
3. English Bolt, Grade 7 (Strength Class)
4. English Bolt, Grade 8 (Strength Class)
5. Metric Nut, Strength Class 9
6. Metric Bolts, Strength Class Increases as Numbers Increase

The most commonly used metric fastener strength property classes are 9.8 and 10.9. The class identification is embossed on the head of each bolt. The English, inch strength classes range from grade 2 to grade 8. Radial lines are embossed on the head of each bolt in order to identify the strength class. The number of lines on the head of the bolt is 2 lines less than the actual grade. For example, a grade 8 bolt will have 6 radial lines on the bolt head. Some metric nuts are marked with a single digit strength identification number on the nut face.

The correct fasteners are available through GM SPO. Many metric fasteners available in the aftermarket parts channels are designed to metric standards of countries other than the United States, and may exhibit the following:

- Lower strength
- No numbered head marking system
- Wrong thread pitch

The metric fasteners on GM products are designed to new, international standards. The following are the common sizes and pitches, except for special applications:

- M6.0 X 1
- M8 X 1.25
- M10 X 1.5
- M12 X 1.75
- M14 X 2.00
- M16 X 2.00

Prevailing Torque Fasteners

Prevailing torque fasteners create a thread interface between the fastener and the fastener counterpart in order to prevent the fastener from loosening.

All Metal Prevailing Torque Fasteners

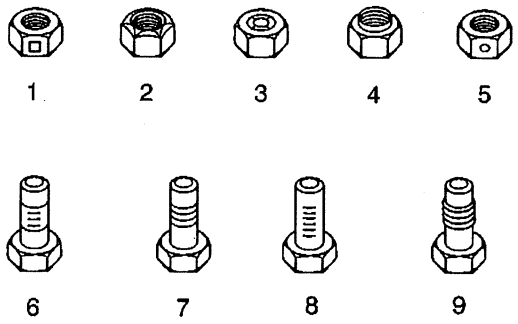
These fasteners accomplish the thread interface by a designed distortion or deformation in the fastener.

Nylon Interface Prevailing Torque Fasteners

These fasteners accomplish the thread interface by the presence of a nylon material on the fastener threads.

Adhesive Coated Fasteners

These fasteners accomplish the thread interface by the presence of a thread-locking compound on the fastener threads. Refer to the appropriate repair procedure in order to determine if the fastener may be reused and the applicable thread-locking compound to apply to the fastener.



1. Prevailing Torque Nut, Center Lock Type
2. Prevailing Torque Nut, Top Lock Type
3. Prevailing Torque Nut, Nylon Patch Type
4. Prevailing Torque Nut, Nylon Washer Insert Type
5. Prevailing Torque Nut, Nylon Insert Type

6. Prevailing Torque Bolt, Dry Adhesive Coating Type
7. Prevailing Torque Bolt, Thread Profile Deformed Type
8. Prevailing Torque Bolt, Nylon Strip Type
9. Prevailing Torque Bolt, Out-of-Round Thread Area Type

A prevailing torque fastener may be reused ONLY if:

- The fastener and the fastener counterpart are clean and not damaged
- There is no rust on the fastener
- The fastener develops the specified minimum torque against its counterpart prior to the fastener seating

Metric Prevailing Torque Fastener Minimum Torque Development

Application	Specification	
	Metric	English
All Metal Prevailing Torque Fasteners		
6 mm	0.4 N·m	4 lb in
8 mm	0.8 N·m	7 lb in
10 mm	1.4 N·m	12 lb in
12 mm	2.1 N·m	19 lb in
14 mm	3 N·m	27 lb in
16 mm	4.2 N·m	37 lb in
20 mm	7 N·m	62 lb in
24 mm	10.5 N·m	93 lb in
Nylon Interface Prevailing Torque Fasteners		
6 mm	0.3 N·m	3 lb in
8 mm	0.6 N·m	5 lb in
10 mm	1.1 N·m	10 lb in
12 mm	1.5 N·m	13 lb in
14 mm	2.3 N·m	20 lb in
16 mm	3.4 N·m	30 lb in
20 mm	5.5 N·m	49 lb in
24 mm	8.5 N·m	75 lb in

English Prevailing Torque Fastener Minimum Torque Development

Application	Specification	
	Metric	English
All Metal Prevailing Torque Fasteners		
1/4 in	0.5 N·m	4.5 lb in
5/16 in	0.8 N·m	7.5 lb in
3/8 in	1.3 N·m	11.5 lb in
7/16 in	1.8 N·m	16 lb in
1/2 in	2.3 N·m	20 lb in
9/16 in	3.2 N·m	28 lb in
5/8 in	4 N·m	36 lb in
3/4 in	7 N·m	54 lb in
Nylon Interface Prevailing Torque Fasteners		
1/4 in	0.3 N·m	3 lb in
5/16 in	0.6 N·m	5 lb in
3/8 in	1 N·m	9 lb in
7/16 in	1.3 N·m	12 lb in
1/2 in	1.8 N·m	16 lb in
9/16 in	2.5 N·m	22 lb in
5/8 in	3.4 N·m	30 lb in
3/4 in	5 N·m	45 lb in

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Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
	AK5	**Air bags,** frontal, driver and right front passenger with passenger side suppression **1 - Always use safety belts and proper child restraints, even with air bags. See the Owner's Manual for more safety information.**	S[1]	--
	CJ2	**Air conditioning,** dual-zone, automatic, includes individual climate settings for driver and right front passenger, automatic climate control and outside temperature display	S	S
		Air filtration, includes pollen filter	S	S
		Console, floor, lockable, includes 2 covered cupholders, ashtray with cigar lighter, auxiliary power outlet and CD storage	S	S
		Cruise control, electronic with set and resume speed	S	S
		Defogger, rear-window, electric	S	S
		Door locks, power, programmable, includes lockout protection	S	S
	B34	**Floormats,** carpeted	S	S
		Hatch release, push button open	S	S
	UV6	**Head-Up Display**, includes dot-matrix readouts for street mode, track mode with g-meter, vehicle speed, engine rpm, and readings from key gauges including water temperature and oil pressure	S	S
	U52	**Instrumentation,** analog, electronic, includes Driver Information Center with 2 line display	S	S
		Keyless Access, with push-button start, includes 2 remote transmitters which enable automatic door unlock and open by touching door switch	S	S
		Lighting, interior, courtesy, cargo and glovebox	S	S
		Mirror, inside rearview, manual day/night, includes dual reading lights	S	--
		Seat adjuster, power, driver 6-way	S	S
		Seats, front bucket with perforated leather seating surfaces, includes Z06 embroidery and contrasting stitching	S	S
	US8	**Sound system,** ETR AM/FM stereo with CD player and MP3 playback, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume, TheftLock and (U66) Sound system feature, 7-speaker system	S	--
		Steering column, manual, Tilt-Wheel	S	S
	NK4	NEW! **Steering wheel,** leather-wrapped, smaller, 3-spoke	S	S
		Storage, includes lockable glovebox, center console and 2 rear compartments with covers **1 - One compartment contains battery on Z06.**	S[1]	S[1]
		Theft-deterrent system, push button start, immobilizer and audible visual alarm	S	S
		Tire Pressure Monitor System, air pressure sensors in each tire, pressure display in Driver Information Center	S	S

Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
		Visors, illuminated vanity mirrors, driver and front passenger	S	S
		Windows, power, includes driver and passenger express-down	S	S
		Antenna, integral, hidden	S	S
		Daytime running lamps	S	S
		Engine access, rear opening hood, includes underhood lamp	S	S
		Fog lamps, front, integral in fascia	S	S
		Glass, Solar-Ray light tinted	S	S
		Headlamps, dual projector lamps, xenon high-intensity discharge low-beam, tungsten-halogen high-beam, includes automatic exterior lamp control	S	S
	DL8	**Mirrors,** outside rearview, power, heated, body-color	S	S
		NEW! **Tires,** front P275/35ZR18, extended mobility, Eagle F1 Supercar	S	S
		NEW! **Tires,** rear P325/30ZR19, extended mobility, Eagle F1 Supercar	S	S
	Q10	NEW! **Wheels**, Z06 silver painted aluminum, 18" x 9.5" (45.7 cm x 24.1 cm) , front and 19" x 12" (48.3 cm x 30.48 cm), rear	S	S
		Wipers, intermittent, front	S	S
		Active handling, improves traction and enhances vehicle stability	S	S
	GU6	**Axle,** 3.42 ratio, limited slip	S	S
		Brakes, 4-wheel antilock, 4-wheel disc	S	S
	LS7	NEW! **Engine**, 7.0L (427 ci) LS7 V8 SFI (505 hp [376.6 kW] @ 6300 rpm, 470 lb.-ft. [634.5 N-m] @ 4800 rpm), includes dry sump oil system	S	S
		NEW! **Exhaust**, dual mode, aluminized stainless-steel with polished 4" stainless-steel tips	S	S
		Oil life monitoring system	S	S
		Steering, power, speed-sensitive, rack and pinion	S	S
	FE4	**Z06 Performance Package**, 4-wheel independent, includes transverse composite springs, power steering, engine oil, axle and transmission coolers, stiffer springs and stabilizer bars, specific shock absorbers, larger brakes with 6 piston front and 4 piston rear cross-drilled rotors and specific tires	S	S
		Traction control, all-speed	S	S
	MN6	**Transmission,** 6-speed manual, short-throw **1 - Includes (GU6) Axle, 3.42 ratio.**	S[1]	S[1]

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Codes listed in the shaded column titled Ref. Only RPO Code are for internal use only and should not be ordered.

Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
	AJ7	**Air bags,** frontal and side impact, driver and front passenger with passenger side suppression **1 - Always use safety belts and proper child restraints, even with air bags. See the Owner's Manual for more safety information.**	--	■ [1]
		Cargo convenience net, in rear compartment area	--	■
	D42	**Luggage shade**	--	■
	AAB	**Memory Package**, 2 driver settings, remembers "presets" for 6-way power seat, outside mirrors and telescoping steering column	--	■
	DD0	**Mirrors,** inside rearview with compass and driver outside rearview, auto-dimming	--	■
	KA1	**Seats,** heated, driver and passenger	--	■
US9		**Sound system,** ETR AM/FM stereo with 6-disc, in dash CD changer, MP3 playback and (U65) Sound system feature, Bose premium 7-speaker system, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume and TheftLock **1 - Includes (U2K) Sound system feature, XM Satellite Radio. Upgradeable to (U3U) Sound system with Navigation.**	A	□ [1]
	U2K	**Sound system feature,** XM Satellite Radio features 67 channels of 100% commercial-free music included in its over 150 channels of the best in music, news, sports, talk, comedy, XM Instant Traffic and Weather, and more. Digital quality sound with coast-to-coast signal coverage. Three trial months - no obligation. **1 - Included and only available with (US9) Sound system, ETR AM/FM stereo with 6-disc, in dash CD changer or (U3U) Sound system with Navigation. Includes hidden antenna in outside mirrors. Subscription fees apply. Available only in the 48 contiguous U.S.** **2 - Includes hidden antenna in outside mirrors. Subscription fees apply. Available only in the 48 contiguous U.S.**	A [1]	■ [2]
	N37	**Steering column,** power telescopic, includes manual tilt	--	■
	UG1	**Universal Home Remote**, includes garage door opener, 3-channel programmable, located on driver visor	--	■

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Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
	AJ7	**Air bags,** frontal and side impact, driver and front passenger with passenger side suppression **1 - Always use safety belts and proper child restraints, even with air bags. See the Owner's Manual for more safety information.**	--	■ [1]
		Cargo convenience net, in rear compartment area	--	■
	D42	**Luggage shade**	--	■
	AAB	**Memory Package**, 2 driver settings, remembers "presets" for 6-way power seat, outside mirrors and telescoping steering column	--	■
	DD0	**Mirrors,** inside rearview with compass and driver outside rearview, auto-dimming	--	■
	KA1	**Seats,** heated, driver and passenger	--	■
US9		**Sound system,** ETR AM/FM stereo with 6-disc, in dash CD changer, MP3 playback and (U65) Sound system feature, Bose premium 7-speaker system, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume and TheftLock **1 - Includes (U2K) Sound system feature, XM Satellite Radio. Upgradeable to (U3U) Sound system with Navigation.**	A	□ [1]
	U2K	**Sound system feature,** XM Satellite Radio features 67 channels of 100% commercial-free music included in its over 150 channels of the best in music, news, sports, talk, comedy, XM Instant Traffic and Weather, and more. Digital quality sound with coast-to-coast signal coverage. Three trial months - no obligation. **1 - Included and only available with (US9) Sound system, ETR AM/FM stereo with 6-disc, in dash CD changer or (U3U) Sound system with Navigation. Includes hidden antenna in outside mirrors. Subscription fees apply. Available only in the 48 contiguous U.S.** **2 - Includes hidden antenna in outside mirrors. Subscription fees apply. Available only in the 48 contiguous U.S.**	A[1]	■ [2]
	N37	**Steering column,** power telescopic, includes manual tilt	--	■
	UG1	**Universal Home Remote**, includes garage door opener, 3-channel programmable, located on driver visor	--	■

ADDITIONAL OPTIONS

Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
US9		**Sound system,** ETR AM/FM stereo with 6-disc, in dash CD changer, MP3 playback and (U65) Sound system feature, Bose premium 7-speaker system, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume and TheftLock **1 - Includes (U2K) Sound system feature, XM Satellite Radio. Upgradeable to (U3U) Sound system with Navigation.**	A	□ [1]

ADDITIONAL OPTIONS				
Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
U3U		**Sound system with Navigation,** ETR AM/FM stereo with CD player and MP3 playback, (U65) Sound system feature, Bose premium 7-speaker system, DVD navigation with GPS, 6.5" LCD color display touch screen, voice recognition, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume and TheftLock **1 - Deletes 6-disc, in dash CD changer. Includes (U2K) Sound system feature, XM Satellite Radio.**	A[1]	A[1]
R8C		**Corvette Museum Delivery**, acknowledgement form required	A	A
VK3		**License plate bracket,** front	A	A
QL9		NEW! **Wheels**, Z06 polished aluminum, 18" x 9.5" (45.7 cm x 24.1 cm) , front and 19" x 12" (48.3 cm x 30.48 cm), rear	A	A
FE9		**Emissions,** Federal requirements	A	A
YF5		**Emissions,** California state requirements	A	A
NE1		**Emissions,** Maine, Massachusetts, New York or Vermont state requirements	A	A
NB8		**Emissions override**, California, Massachusetts, New York or Vermont (for vehicles ordered by dealers in states of California, Massachusetts, New York or Vermont with Federal emissions) **1 - Requires (FE9) Emissions, Federal requirements.**	A[1]	A[1]
NC7		**Emissions override,** Federal (for vehicles ordered by dealers in Federal emission states with California, New York, Vermont, Massachusetts or Maine emissions; may also be used by dealers in states of California, New York, Vermont, Massachusetts or Maine to order different state-specific emissions) **1 - Requires (YF5) Emissions, California state requirements or (NE1) Emissions, New York, Vermont, Massachusetts or Maine state requirements.**	A[1]	A[1]

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Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
	AJ7	**Air bags,** frontal and side impact, driver and front passenger		■
		Cargo convenience net		■
	D42	**Luggage shade**		■
	AAB	**Memory Package**		■
	DD0	**Mirrors,** inside rearview with compass and driver outside rearview		■
	KA1	**Seats,** heated		■
US9		**Sound system,** ETR AM/FM stereo with 6-disc **1 - Includes (U2K) Sound system feature, XM Satellite Radio. Upgradeable to (U3U) Sound system with Navigation.**		□ [1]
	U2K	**Sound system feature,** XM Satellite Radio		■
	N37	**Steering column,** power telescopic		■
	UG1	**Universal Home Remote**		■

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Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
	AK5	**Air bags,** frontal, driver and right front passenger with passenger side suppression **1 - Always use safety belts and proper child restraints, even with air bags. See the Owner's Manual for more safety information.**	S[1]	--
	AJ7	**Air bags,** frontal and side impact, driver and front passenger with passenger side suppression **1 - Always use safety belts and proper child restraints, even with air bags. See the Owner's Manual for more safety information.**	--	■[1]
	CJ2	**Air conditioning,** dual-zone, automatic, includes individual climate settings for driver and right front passenger, automatic climate control and outside temperature display	S	S
		Air filtration, includes pollen filter	S	S
		Cargo convenience net, in rear compartment area	--	■
		Console, floor, lockable, includes 2 covered cupholders, ashtray with cigar lighter, auxiliary power outlet and CD storage	S	S
		Cruise control, electronic with set and resume speed	S	S
		Defogger, rear-window, electric	S	S
		Door locks, power, programmable, includes lockout protection	S	S
	B34	**Floormats,** carpeted	S	S
		Hatch release, push button open	S	S
	UV6	**Head-Up Display**, includes dot-matrix readouts for street mode, track mode with g-meter, vehicle speed, engine rpm, and readings from key gauges including water temperature and oil pressure	S	S
	U52	**Instrumentation,** analog, electronic, includes Driver Information Center with 2 line display	S	S
		Keyless Access, with push-button start, includes 2 remote transmitters which enable automatic door unlock and open by touching door switch	S	S
		Lighting, interior, courtesy, cargo and glovebox	S	S
	D42	**Luggage shade**	--	■
	AAB	**Memory Package**, 2 driver settings, remembers "presets" for 6-way power seat, outside mirrors and telescoping steering column	--	■
		Mirror, inside rearview, manual day/night, includes dual reading lights	S	--
	DD0	**Mirrors,** inside rearview with compass and driver outside rearview, auto-dimming	--	■
		Seat adjuster, power, driver 6-way	S	S
		Seats, front bucket with perforated leather seating surfaces, includes Z06 embroidery and contrasting stitching	S	S
	KA1	**Seats,** heated, driver and passenger	--	■

Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
	US8	**Sound system,** ETR AM/FM stereo with CD player and MP3 playback, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume, TheftLock and (U66) Sound system feature, 7-speaker system	S	--
US9		**Sound system,** ETR AM/FM stereo with 6-disc, in dash CD changer, MP3 playback and (U65) Sound system feature, Bose premium 7-speaker system, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume and TheftLock **1 - Includes (U2K) Sound system feature, XM Satellite Radio. Upgradeable to (U3U) Sound system with Navigation.**	A	□ [1]
U3U		**Sound system with Navigation,** ETR AM/FM stereo with CD player and MP3 playback, (U65) Sound system feature, Bose premium 7-speaker system, DVD navigation with GPS, 6.5" LCD color display touch screen, voice recognition, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume and TheftLock **1 - Deletes 6-disc, in dash CD changer. Includes (U2K) Sound system feature, XM Satellite Radio.**	A [1]	A [1]
	U2K	**Sound system feature,** XM Satellite Radio features 67 channels of 100% commercial-free music included in its over 150 channels of the best in music, news, sports, talk, comedy, XM Instant Traffic and Weather, and more. Digital quality sound with coast-to-coast signal coverage. Three trial months - no obligation. **1 - Included and only available with (US9) Sound system, ETR AM/FM stereo with 6-disc, in dash CD changer or (U3U) Sound system with Navigation. Includes hidden antenna in outside mirrors. Subscription fees apply. Available only in the 48 contiguous U.S.** **2 - Includes hidden antenna in outside mirrors. Subscription fees apply. Available only in the 48 contiguous U.S.**	A [1]	■ [2]
		Steering column, manual, Tilt-Wheel	S	S
	N37	**Steering column,** power telescopic, includes manual tilt	--	■
	NK4	NEW! **Steering wheel,** leather-wrapped, smaller, 3-spoke	S	S
		Storage, includes lockable glovebox, center console and 2 rear compartments with covers **1 - One compartment contains battery on Z06.**	S [1]	S [1]
		Theft-deterrent system, push button start, immobilizer and audible visual alarm	S	S
		Tire Pressure Monitor System, air pressure sensors in each tire, pressure display in Driver Information Center	S	S
	UG1	**Universal Home Remote,** includes garage door opener, 3-channel programmable, located on driver visor	--	■
		Visors, illuminated vanity mirrors, driver and front passenger	S	S
		Windows, power, includes driver and passenger express-down	S	S

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Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
		Antenna, integral, hidden	S	S
R8C		**Corvette Museum Delivery**, acknowledgement form required	A	A
		Daytime running lamps	S	S
		Engine access, rear opening hood, includes underhood lamp	S	S
		Fog lamps, front, integral in fascia	S	S
		Glass, Solar-Ray light tinted	S	S
		Headlamps, dual projector lamps, xenon high-intensity discharge low-beam, tungsten-halogen high-beam, includes automatic exterior lamp control	S	S
VK3		**License plate bracket,** front	A	A
	DL8	**Mirrors,** outside rearview, power, heated, body-color	S	S
		NEW! **Tires,** front P275/35ZR18, extended mobility, Eagle F1 Supercar	S	S
		NEW! **Tires,** rear P325/30ZR19, extended mobility, Eagle F1 Supercar	S	S
	Q10	NEW! **Wheels**, Z06 silver painted aluminum, 18" x 9.5" (45.7 cm x 24.1 cm) , front and 19" x 12" (48.3 cm x 30.48 cm), rear	S	S
QL9		NEW! **Wheels**, Z06 polished aluminum, 18" x 9.5" (45.7 cm x 24.1 cm) , front and 19" x 12" (48.3 cm x 30.48 cm), rear	A	A
		Wipers, intermittent, front	S	S

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Codes listed in the shaded column titled Ref. Only RPO Code are for internal use only and should not be ordered.

Free Flow RPO Code	Ref. Only RPO Code	Description	Z06 1YY87	
			1LZ	2LZ
		Active handling, improves traction and enhances vehicle stability	S	S
	GU6	**Axle,** 3.42 ratio, limited slip	S	S
		Brakes, 4-wheel antilock, 4-wheel disc	S	S
FE9		**Emissions,** Federal requirements	A	A
YF5		**Emissions,** California state requirements	A	A
NE1		**Emissions,** Maine, Massachusetts, New York or Vermont state requirements	A	A
NB8		**Emissions override**, California, Massachusetts, New York or Vermont (for vehicles ordered by dealers in states of California, Massachusetts, New York or Vermont with Federal emissions) **1 - Requires (FE9) Emissions, Federal requirements.**	A[1]	A[1]
NC7		**Emissions override,** Federal (for vehicles ordered by dealers in Federal emission states with California, New York, Vermont, Massachusetts or Maine emissions; may also be used by dealers in states of California, New York, Vermont, Massachusetts or Maine to order different state-specific emissions) **1 - Requires (YF5) Emissions, California state requirements or (NE1) Emissions, New York, Vermont, Massachusetts or Maine state requirements.**	A[1]	A[1]
	LS7	NEW! **Engine**, 7.0L (427 ci) LS7 V8 SFI (505 hp [376.6 kW] @ 6300 rpm, 470 lb.-ft. [634.5 N-m] @ 4800 rpm), includes dry sump oil system	S	S
		NEW! **Exhaust**, dual mode, aluminized stainless-steel with polished 4" stainless-steel tips	S	S
		Oil life monitoring system	S	S
		Steering, power, speed-sensitive, rack and pinion	S	S
	FE4	**Z06 Performance Package**, 4-wheel independent, includes transverse composite springs, power steering, engine oil, axle and transmission coolers, stiffer springs and stabilizer bars, specific shock absorbers, larger brakes with 6 piston front and 4 piston rear cross-drilled rotors and specific tires	S	S
		Traction control, all-speed	S	S
	MN6	**Transmission,** 6-speed manual, short-throw **1 - Includes (GU6) Axle, 3.42 ratio.**	S[1]	S[1]

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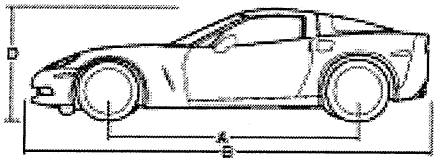
Model	Seat Type	Seat Code	Seat Trim	Interior		
				Ebony	Ebony w/Red accents	Ebony w/Titanium accents
Z06	Front bucket	AR9	Highwear Nuance Leather	193	023	843

Exterior Solid Paint	Color Code	Touch Up Paint Number	Interior		
			Ebony	Ebony w/Red accents	Ebony w/Titanium accents
LeMans Blue Metallic[1]	19U	WA-933L	A	A	A
Black	41U	WA-8555	A	A	A
Velocity Yellow Tintcoat[2]	45U	WA-300N	A	--	A
Machine Silver Metallic	67U	WA-994L	A	A	A
Daytona Sunset Orange Metallic	71U	WA-633H	A	--	A
Victory Red	74U	WA-9260	A	A	A

1 - Additional charge - premium paint.
2 - Additional charge - premium tint coat color.

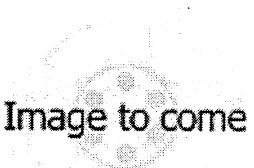
All dimensions in inches (mm) unless otherwise stated.

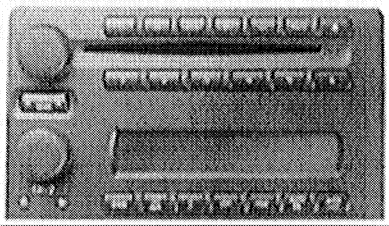
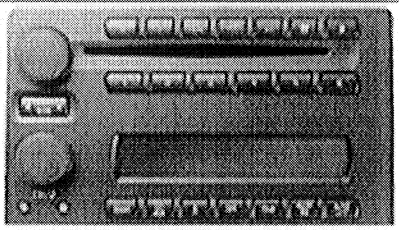
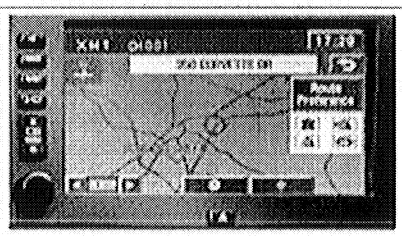


	Specifications	1YY87 Z06
A	**Wheelbase**	105.70 (2685)
B	**Overall length**	175.60 (4460)
	Body width, without mirrors	75.90 (1928)
D	**Overall height**	49.00 (1245)
	Front track width	63.50 (1613)
	Rear track width	62.50 (1588)
	Head room, front	37.90 (963)
	Shoulder room, front	55.20 (1402)
	Hip room, front	53.60 (1361)
	Leg room, front	43.10 (1095)

Published dimensions indicated are without optional equipment or accessories. Additional accessories or equipment ordered at the customer's request can result in a minor change in these dimensions.

	1YY87 Z06
Capacities	
Curb weight, lbs. (kg)	3130 (1420)
Cargo volume, cu. ft. (liters)	22.4 (634.4)
Fuel capacity, approximate, gallon (liters)	18 (68)

	Q10 **Wheels**, Z06 silver painted aluminum, 18" x 9.5" (45.7 cm x 24.1 cm) , front and 19" x 12" (48.3 cm x 30.48 cm), rear
	QL9 **Wheels**, Z06 polished aluminum, 18" x 9.5" (45.7 cm x 24.1 cm) , front and 19" x 12" (48.3 cm x 30.48 cm), rear

	US8 **Sound system,** ETR AM/FM stereo with CD player and MP3 playback, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume, TheftLock and (U66) Sound system feature, 7-speaker system
	US9 **Sound system,** ETR AM/FM stereo with 6-disc, in dash CD changer, MP3 playback and (U65) Sound system feature, Bose premium 7-speaker system, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume and TheftLock
	U3U **Sound system with Navigation,** ETR AM/FM stereo with CD player and MP3 playback, (U65) Sound system feature, Bose premium 7-speaker system, DVD navigation with GPS, 6.5" LCD color display touch screen, voice recognition, includes Radio Data System, seek-and-scan, digital clock, auto-tone control, automatic volume and TheftLock

Option Code	Description
AAB	Memory Package
AJ7	Air bags, frontal and side impact, driver and front passenger
AK5	Air bags, frontal, driver and right front passenger
B34	Floormats, carpeted
CJ2	Air conditioning, dual-zone, automatic
D42	Luggage shade
DD0	Mirrors, inside rearview with compass and driver outside rearview
DL8	Mirrors, outside rearview, power, heated, body-color
FE4	Z06 Performance Package
FE9	Emissions, Federal requirements
GU6	Axle, 3.42 ratio
KA1	Seats, heated
LS7	Engine, 7.0L (427 ci) LS7 V8 SFI
MN6	Transmission, 6-speed manual
N37	Steering column, power telescopic
NB8	Emissions override
NC7	Emissions override, Federal
NE1	Emissions, Maine, Massachusetts, New York or Vermont state requirements
NK4	Steering wheel, leather-wrapped
Q10	Wheels, Z06 silver painted aluminum
QL9	Wheels, Z06 polished aluminum
R8C	Corvette Museum Delivery
U2K	Sound system feature, XM Satellite Radio
U3U	Sound system with Navigation, ETR AM/FM stereo with CD player
U52	Instrumentation, analog
UG1	Universal Home Remote
US8	Sound system, ETR AM/FM stereo with CD player and MP3 playback
US9	Sound system, ETR AM/FM stereo with 6-disc
UV6	Head-Up Display
VK3	License plate bracket, front
YF5	Emissions, California state requirements