Chevrolet

Suburban

2003

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Product Information

2003 Chevrolet Suburban: Building On A Legend

The Chevy Suburban provides legendary capability that is unequaled. How do you improve upon a legend? For 2003, the Chevy Suburban - the industry's oldest active vehicle nameplate - adds a wide range of performance, safety, comfort and convenience features.

"The 2003 Suburban is more capable, confident, and more comfortable. And that's why it will continue to be America's premier full-size SUV," said Marketing Director Rick Scheidt. "As we continue to add safety features such as StabiliTrak and creature comforts such as tri-zone heating, ventilation and air conditioning, it's no surprise Suburban's customer loyalty rate has exceeded 50 percent."

Stabilizing influences

StabiliTrak is a vehicle-stability-enhancement system that improves vehicle stability on various road surfaces at various speeds, particularly on slick surfaces or during emergency maneuvers. For the first time in 2003, it is available on half-ton, two- or four-wheel-drive Suburbans with the Vortec 5300 5.3L V8 engine.

StabiliTrak maximizes handling and braking dynamics by using a combination of systems and sensors including antilock brakes, traction control and electronic suspension. An array of sensors continually monitor the driver's intended vehicle path, measuring steering angle, wheel speed, brake pressure, lateral acceleration, longitudinal acceleration and yaw rate. This information is provided to an electronic control module that continually monitors vehicle dynamics and is programmed for intervention thresholds.

The system intervenes when it senses one or more of the wheels slipping, loss of lateral traction (side slip), or detects understeer ("snowplowing") or oversteer (fishtailing). Automatically, the system adjusts engine torque or brake pressure at individual wheels to help steer the vehicle in its intended path.

The 2003 Suburban features improved brake performance, "pedal feel" and quieter operation. Brake and accelerator pedals can be adjusted in unison by nearly 3 inches for better positioning and comfort, and are also available with or without a memory feature.

The 2003 Suburban provides more safety for its younger passengers as it meets compliance to 2005 federal seat standards for child restraint anchorages. The LATCH (Lower Anchors and Tethers for CHildren) child-seat system is provided in the front-passenger side seat and second and third row center and passenger-side seats.

Additional new safety enhancements for 2003 include a passenger-sensing system and dual-level air bags. The passenger-sensing air bag system automatically deactivates the passenger-side air bag under certain conditions to protect children. The system assesses whether the occupant in the seat is an adult or child, based on the measured weight in the seat cushion and tension in the belt system, if any. If these measurements are typical for a child, the air bag is disabled. If they are typical for an adult, the air bag is enabled.

A dual-level air-bag system is a supplemental restraint system designed to detect vehicle deceleration and, based on the deceleration data, provide an appropriate amount of air bag inflation. Sensors located in the front of the vehicle work with the sensing diagnostic module (SDM) to measure the severity of the impact. The SDM uses the data to determine the type of air-bag deployment (first stage or second stage) or non-deploy. Dual-stage air bags are designed to help reduce the occurrence of inflation-induced injuries by deploying the air bag less forcefully in lower speed crashes.

That's entertainment!

Impressive new infotainment systems - from available Bose sound systems to rear-seat entertainment systems that include a DVD player with a flip-down screen - add to Suburban's creature comforts. These systems (except the base fleet radio) feature the next-generation Radio Data System and can interface with services such as XM Satellite Radio. Available rear-seat audio controls allow second-row passengers to enjoy a separate audio source from front-seat occupants. For the first time in a full-size sport utility,

Chevy will offer a custom-designed Bose audio system that uses a new high-powered six-channel amplifier and eight speakers.

XM Radio features 100 coast-to-coast digital channels, including 71 music channels (more than 30 of them commercial free) from hip hop to opera, classical to country, bluegrass to blues and 29 channels of sports, talk, children's and entertainment programming. XM also brings to the vehicle, for the first time on radio, a diverse selection of 24-hour news sources previously available only in the home. XM's next-generation sound quality technology provides superior sound remarkably close to compact disc.

Revolutionary Quadrasteer control

Suburban 2500 series 2WD/4WD models are the first full-size SUVs to offer the revolutionary control and handling benefits of Quadrasteer - a four-wheel steering system that provides maneuverability and on-highway control never thought possible on a full-size SUV. The rear wheels turn in the opposite direction of the front wheels, which helps the vehicle make tighter turns, such as when cornering or getting into a tight parking space. The turning diameter of 2WD models is reduced 21 percent from 44.5 feet to 35.2 feet. For 4WD models, it goes from 44.3 feet to 35 feet.

More cabin comforts

A new dual-zone manual-control heating, ventilation and air conditioning (HVAC) system is standard on Suburban. It allows the driver and front passenger to adjust the temperature to their own comfort levels - up to a 30-degree Fahrenheit difference between the two front zones.

New tri-zone HVAC systems provide outstanding comfort. Customers can now opt for a sunroof and rear entertainment system with rear electronic climate control - a new system that automatically controls air delivery, fan speed, temperature and recirculating/outside air to provide faster warmups and cooldowns.

Manual rear air conditioning is standard. Rear electronic climate control is standard with the optional front system, providing second-row passengers an automatically controlled temperature setting independent from that of the front - in effect, creating tri-zone comfort.

Smarter electrical systems

An advanced new multiplexed electrical architecture makes Suburban even "smarter" so it can provide more functions for 2003. A communication network transfers data throughout the vehicle. It enables the driver information center, which can be programmed for English, Spanish or French, to monitor and report as many as 34 system functions, including new service indicators for StabiliTrak, "Ice Possible" and "Door Ajar." Suburban's instrument panel and cluster have been redesigned to accommodate these new features.

At your fingertips

An available eight-button steering wheel control allows owners to personalize several functions and safely access new infotainment systems. They include duplicate controls for calculating trip and fuel data and provide easy access to the OnStar system.

OnStar services include automatic notification of air-bag deployment, stolen vehicle location, remote door unlock, emergency services dispatch, roadside assistance, remote diagnostics, route support, convenience services and OnStar Concierge. OnStar Personal Calling allows drivers to make and receive hands-free, voice-activated phone calls through a nationwide network in cooperation with Verizon Wireless. Virtual Advisor gives subscribers access to personalized information in a hands-free, voice-activated manner with no screens or displays.

The battery rundown protection automatically turns off the headlamps, park lamps and interior lights after 10 minutes if left on inadvertently. A more powerful 145-amp generator - which provides a quicker battery charge and slows battery discharge during vehicle operation - is standard. A memory subsystem can remember preferences for seat, mirror, new adjustable brake and accelerator pedals, and climate control settings.

Electronic throttle control (ETC) - for more precise, consistent throttle operation - is now on all Suburban engines (the Vortec 8100 8.1L V8 had ETC for 2002). New oxygen sensors provide enhanced durability

and reduced emissions during engine warmup. Half-ton utilities with the Vortec 5300 5.3L V8 sold in California feature a more robust catalytic converter system that meets Ultra Low Emissions Vehicle (ULEV) standards.

Suburban's impressive powertrain lineup includes the ethanol-compliant Vortec 5300 (standard on half-ton models) and Vortec 6000 6.0L V8 (standard on the three-quarter-ton models). The powerful Vortec 8100 8.1L V8 is optional on the 2500 series three-quarter-ton models.

Exterior mirrors feature power-tilt glass and power folding to protect them in narrow spaces; heating elements that clear frost, snow or ice; left-side electrochromatic glass that dims glaring headlights; puddle lights; new turn signal indicators in the glass and a memory feature. An available new power-adjustable camper mirror can be extended to a vehicle width of as much as 106 inches.

Suburban's legendary workhorse reputation means there's enough space to fit a 4 x 8-foot sheet of plywood on the load floor with the doors closed and rear seats removed. Suburban can trailer as much as 12,000 pounds when properly equipped.

New For 2003

- StabiliTrak stability-enhancement system
- Adjustable brake and accelerator pedals available with memory
- Dual-level air bags
- Passenger-sensing system
- New infotainment features: - New family of radios with Radio Data System (RDS) - XM Satellite Radio - Panasonic DVD Passenger Entertainment System - Bose speaker system (on models with front bucket seats)
- Tri-zone climate control with manual controls for LS and Z71, and electronic controls for LT
- Quadrasteer four-wheel steering system on 2500 Series
- Enhanced driver information center can report on as many as 34 system functions - more than any vehicle in its class.
- Power camper mirrors (optional) including power-adjust, power-extend and heat
- New exterior color choices - Sandalwood Metallic and Dark Spiral Gray Metallic
- New center console

Model Lineup

	Engines			Transmissions		
	Vortec 5300 SFI V8	Vortec 6000 SFI V8	Vortec 8100 SFI V8	4L60-E 4-spd auto	4L80-E 4-spd auto	4L85-E 4-spd auto
LS / LT 1/2-ton	S	–	–	S	–	–
LS / LT 3/4-ton	–	S	O	S	O	O

Standard: S
Optional: O
Not available: –

Specifications

Overview			
Models:	Chevrolet Suburban LS / LT 1/2-ton, LS / LT 3/4-ton		
Body style / driveline:	full-size, four-door sport utility vehicle, front engine, two- or four-wheel drive, 1/2- and 3/4-ton models		
Construction:	body on frame		
EPA vehicle class:	full-size sport utility vehicle		
Manufacturing location:	Janesville, Wisconsin, and Silao, Mexico		
Key competitors:	Ford Excursion		
Engines			
	Vortec 5300 5.3L V8 (L59)	**Vortec 6000 6.0L V8 (LQ4)**	**Vortec 8100 8.1L V8 (L18)**
Type:	5.3-liter V8	6.0-liter V8	8.1-liter V8
Displacement (cu in / cc):	327 / 5328	364 / 5967	496 / 8128
Bore & stroke (in / mm):	3.78 x 3.62 / 96 x 92	4.00 x 3.62 / 101.6 x 92	4.25 x 4.37 / 107.95 x 111
Block material:	cast iron	cast iron	cast iron
Cylinder head material:	cast aluminum	cast aluminum	cast iron
Valvetrain:	OHV	OHV	OHV
Ignition system:	coil near-plug ignition, platinum-tipped spark plugs, low-resistance spark plug wires	coil near-plug ignition, platinum-tipped spark plugs, low-resistance spark plug wires	coil near-plug ignition platinum-tipped spark plugs
Fuel delivery:	sequential fuel injection	sequential fuel injection	sequential fuel injection
Compression ratio:	9.5:1	9.4:1	9.1:1
Horsepower (hp / kw @ rpm):	285 / 213 @ 5200	320 / 239 @ 5000	340 / 254 @ 4200
Torque (lb-ft / Nm @ rpm):	325 / 441 @ 4000	360 / 488 @ 4000	455 / 617 @ 3200
Recommended fuel:	Ethanol-capable flex fuel	87 octane	87 octane
Maximum engine speed (rpm):	5900	5600	5000
Emissions controls:	three-way catalytic converter, positive crankcase ventilation, evaporative collection system	three-way catalytic converter, positive crankcase ventilation, evaporative collection system	air injection reaction (available)
Estimated fuel economy (mpg city / hwy / combined):	2wd: 14 / 18 / 16 4wd: 13 / 17 / 15		
Transmissions	**Hydra-Matic 4L60-E**	**Hydra-Matic 4L80-E**	**Hydra-Matic 4L85-E**
Type:	four-speed electronic automatic	four-speed electronic automatic	four-speed electronic automatic
Gear ratios (:1):			
First:	3.06	2.48	2.48
Second:	1.63	1.48	1.48
Third:	1.00	1.00	1.00
Fourth:	0.70	0.75	0.75
Reverse:	2.29	2.08	2.08
Final drive ratio (all models, optional):	3.42:1 – 4.10:1	3.42:1 – 4.10:1	3.42:1 – 4.10:1

Chassis/Suspension	
Front:	independent with torsion bars
Rear:	1/2-ton: 5-link coil spring; 3/4-ton: two-stage, semi-elliptic, multileaf springs and semifloating rear axle
Traction control:	full-function standard; Precision Control System
Steering type:	
1/2-ton:	2WD: power integral gear; 4WD: power integral gear w/EVO Variable Assist
3/4-ton:	2WD: power integral gear; 4WD: power integral gear
Gear ratio:	1/2-ton: 14:1 gear, 15.8:1 overall; 3/4-ton: 15 / 13:1 variable ratio gear, 16.2:1 overall
Steering wheel turns, lock-to-lock:	1/2-ton: 3.2; 3/4-ton: 3.2
Turning circle, curb-to-curb (ft / m):	1/2-ton: 43.0 / 13.1; 3/4-ton: 44.3 / 13.5
Brakes	
Type:	four-wheel disc, four-wheel ABS, dual-piston calipers w/ Dynamic Rear Proportioning
Rotor diameter x thickness (in / mm):	front : ½-ton: 12.01 x 1.14 / 305 x 29; 3/4-ton: 12.80 x 1.50 / 325 x 38
	rear : ½-ton: 13.0 x 1.18 / 330 x 30; 3/4-ton: 13.0 x 1.14 / 330 x 29
Wheels/Tires	
Wheel size and type:	• 1/2-ton: 16-inch x 7-inch cast aluminum • 3/4-ton: 16-inch x 6.5-inch forged cast aluminum
Tires:	• 1/2-ton: P265/70R16 all-season, steel-belted radials • 1/2-ton: P245/75R16 all-season, steel-belted radials • 3/4-ton: LT245/75R16 all-season, steel-belted radials

Dimensions

Exterior	
Wheelbase (in / mm):	130 / 3302
Overall length (in / mm):	219.3 / 5570
Overall width (in / mm):	½-ton: 78.9 / 2004 3/4-ton: 79.8 / 2027
Overall height w/roof rack (in / mm):	½-ton: 2WD: 73.6 / 1870 4WD: 75.4 / 1918 3/4-ton: 2WD: 76.4 / 1940 4WD: 76.5 / 1941
Minimum ground clearance (in / mm):	½-ton: 8.4 / 213.4 3/4-ton: 7.1 / 1803
Ground to top of load floor (in / mm):	½ ton: 2WD: 29.3 / 743.9 4WD: 30.6 / 777.2 3/4 ton: 2WD: 32.4 / 823 4WD: 31.8 / 807.7
Approach angle:	23-25°
Departure angle:	20-22°
Base curb weight (lbs / kg):	½-ton: 2WD: 4947 / 2244 4WD: 5219 / 2367 3/4-ton: 2WD: 5520 / 2504 4WD: 5796 / 2629
Weight distribution (% front / rear):	½ ton: 2WD: 52 / 48 4WD: 54 / 46 3/4 ton: 2WD: 51 / 49 4WD: 53 / 47

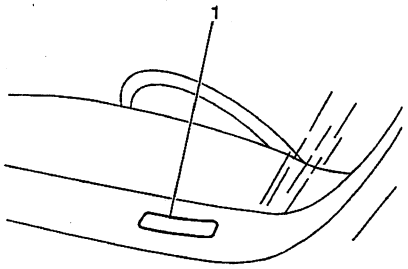
Interior	First Row	Second Row	Third Row
Seating capacity, 9 total:	3	3	3
Head room (in / mm):	40.7 / 1033.8	39.0 / 990.6	38.6 / 980.44
Leg room (in / mm):	41.3 / 1049	39.1 / 994	36.1 / 917.2
Shoulder room (in / mm):	65.2 / 1656.1	65.1 / 1653.6	64.4 / 1635.8
Hip room (in / mm):	61.4 / 1560	61.3 / 1557.2	49.2 / 1249.7
Cargo volume (cu ft / liters):	131.6 / 3726	90.0 / 2549	45.7 / 1294

Capacities	1/2 Ton	3/4 Ton
GVWR, standard (lbs / kg):	2WD: 7000 / 3175 4WD: 7200 / 3265	2WD: 8600 / 3901 4WD: 8600 / 3901
Payload, maximum (lbs / kg)*:	2WD: 2086 / 946 4WD: 2077 / 942	2WD: 3153 / 1430 4WD: 2840 / 1288
Trailer towing maximum (lbs / kg):	2WD: 8400 / 3810 4WD: 8100 / 3674	2WD / 4WD: 12000 / 5443
Fuel tank (gals / liters):	31.0 / 117	37.5 / 142
Engine oil (qts / liters):	5.75 / 5.44	5.75 / 5.44
Cooling system (qts / liters):		
Vortec 5300:	16.5 / 15.6	16.5 / 15.6
Vortec 6000:	16.5 / 15.6	16.5 / 15.6
Vortec 8100:	24.3 / 23	24.3 / 23

* Includes weight of driver, passengers, optional equipment and cargo.

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 and can be seen through the windshield from the outside of the vehicle:

Position	Definition	Character	Description
1	Country of Origin	1	United States
2	Manufacturer	G	General Motors
3	Make	C	Chevrolet Truck
4	GVWR/Brake System	E F	6001-7000/Hydraulic 7001-8000/Hydraulic
5	Truck Line/Chassis Type	C K	4x2 4x4
6	Series	7	¾ Ton Luxury
7	Body Type	3	Four-Door Utility
8	Engine Type	T U N	GM 5.3L V8 MFI (LM7 GM 6.0L V8 SFI (LQ4) GM 6.0L V8 SFI (LQ9)
9	Check Digit	--	Check Digit
10	Model Year	3	2003
11	Plant Location	G J R	Silao Janesville Arlington
12-17	Plant Sequence Number	100,001	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:

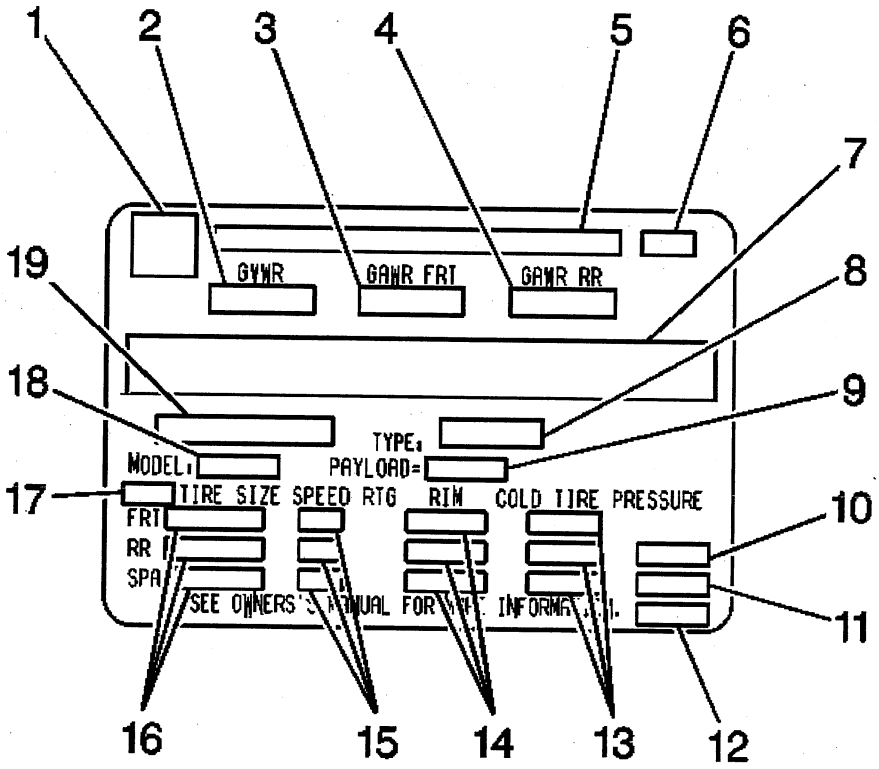
Position	Definition	Character	Description
1	Division	C	Chevrolet Truck
2	Model Year	3	2003
3	Plant Location	G J R	Silao Janesville Arlington
4-9	Plant Sequence Number	--	--

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	2
2	10
3	11
4-5	12-17

Vehicle Certification Label (w/o RPO Z49)

Vehicle Certification Label -- Complete



(1) GM Logo
(2) Gross Vehicle Weight Rating
(3) Gross Axle Weight Rating - Front
(4) Gross Axle Weight Rating - Rear
(5) Name Of Manufacturer
(6) Final Manufacturer's Date
(7) Manufacturer's Statement
(8) Model Designation
(9) Payload
(10) DUAL - When Equipped
(11) Front Axle Reserve - When Equipped
(12) Total Capacity - When Required
(13) Tire Pressure
(14) Rim Size
(15) Speed Rating - When Required
(16) Tire Size
(17) GVW Rating Code
(18) Engineering Model
(19) Vehicle Identification Number

The vehicle certification label displays the following assessments:

- The Gross Vehicle Weight Rating (GVWR)
- The Gross Axle Weight Rating (GAWR) -- Front and Rear
- The vehicle's payload rating
- The original equipment tire sizes and the recommended tire pressures

Gross vehicle weight (GVW) is the weight of the vehicle and everything it carries. Include the following items when figuring the GVW:

- The base vehicle weight (factory weight)
- The weight of all vehicle accessories, like the winches or the plows
- The weight of the driver and the passengers
- The weight of the cargo

The gross vehicle weight must not exceed the Gross Vehicle Weight Rating.

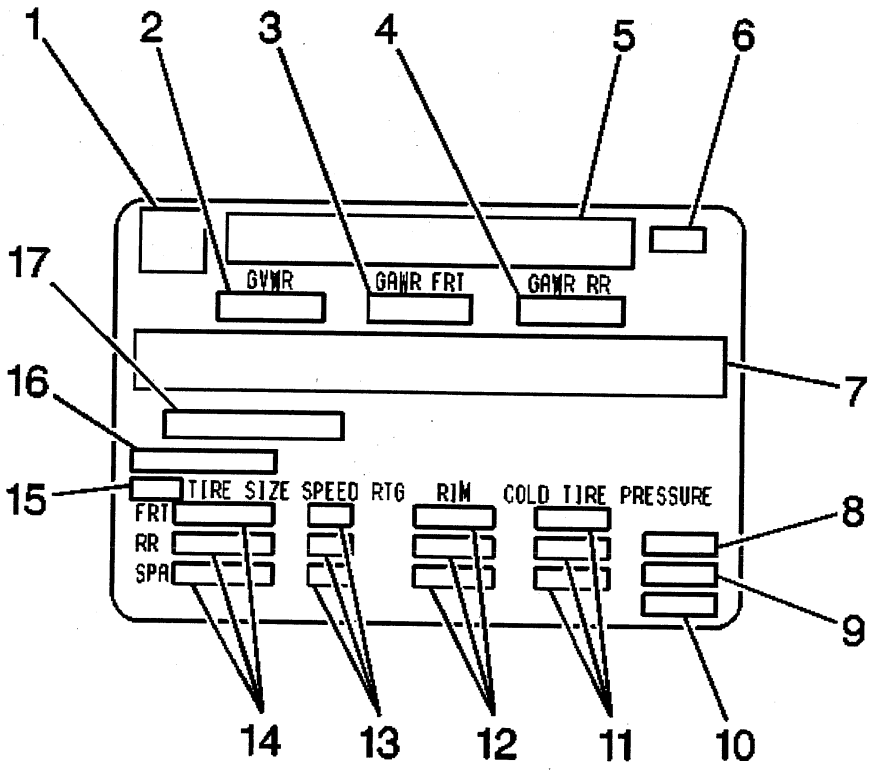
The front gross axle weight rating (GAWR FRT) is the weight exerted on the front axle. The rear gross axle weight rating (GAW RR) is the weight exerted on the rear axle. The front and rear gross axle weights must not exceed the front and rear gross axle weight ratings.

The payload rating defines the vehicle's maximum allowable cargo load. The cargo load includes the driver and the passengers. The payload rating is based on the vehicle's factory installed equipment. Deduct from the payload rating the weight of accessories added to the vehicle after the final date of manufacture .

The vehicle may have a Gross Combination Weight Rating (GCWR). The Gross Combination Weight Rating refers to the total maximum weight of the loaded tow vehicle (including driver and passengers) and a loaded trailer.

The vehicle's tires must be the proper size and properly inflated for the load the vehicle is carrying.

Vehicle Certification Label – Incomplete



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(10) Total Capacity - When Required
(11) Tire Pressure - Spare Optional
(12) Rim Size - Spare Optional
(13) Speed Rating - When required - Spare Optional
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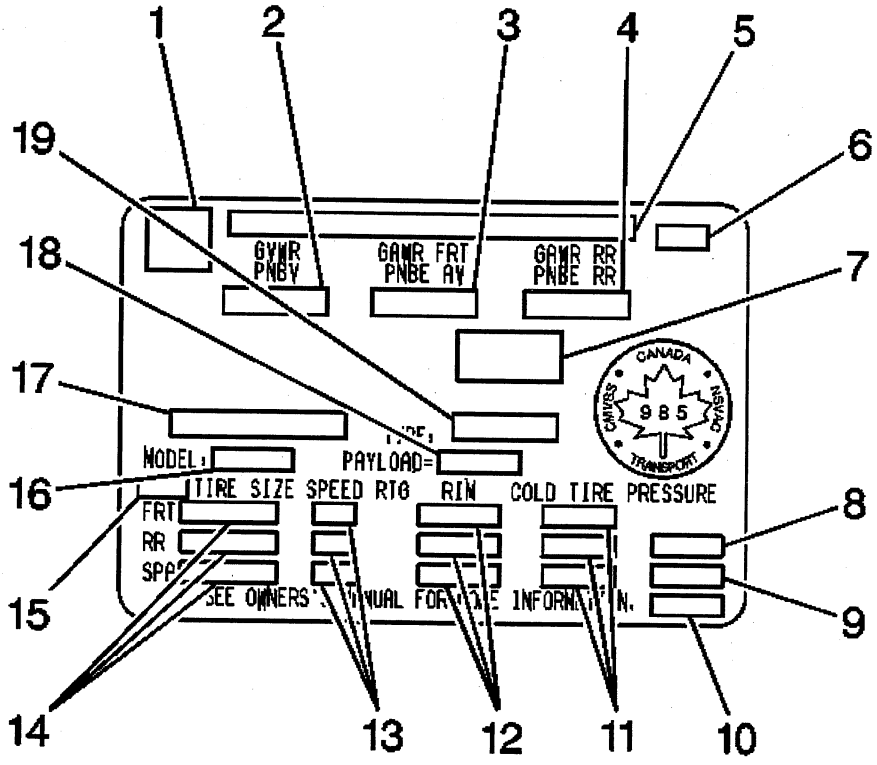

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(19) Model Designation

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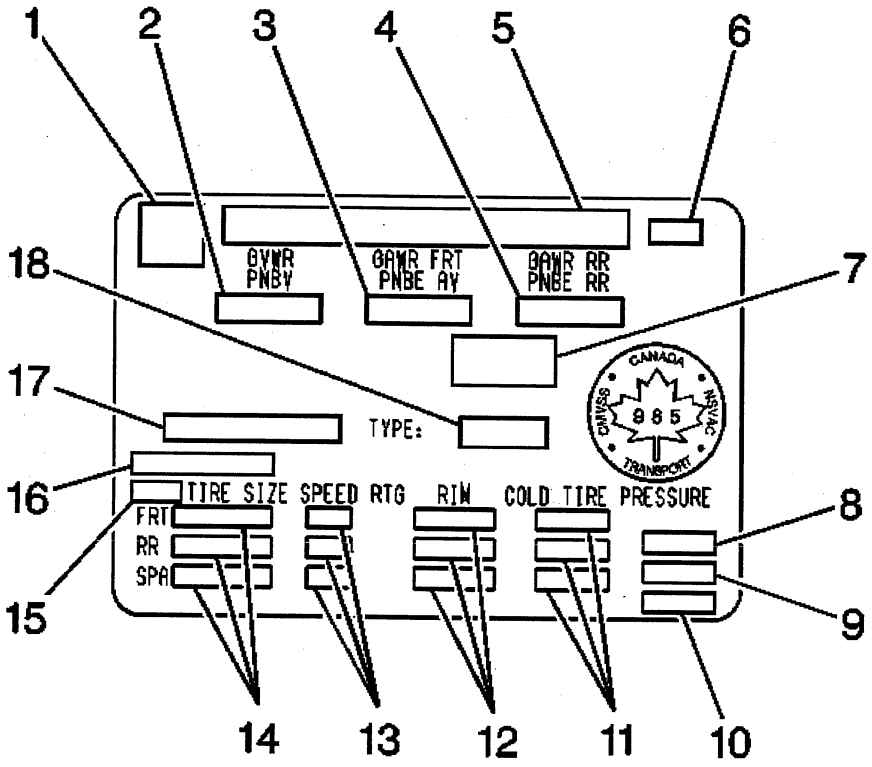

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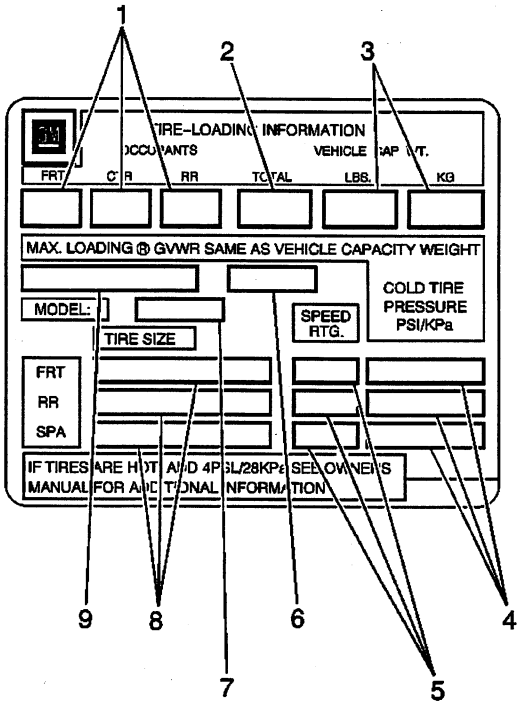
Tire Placard

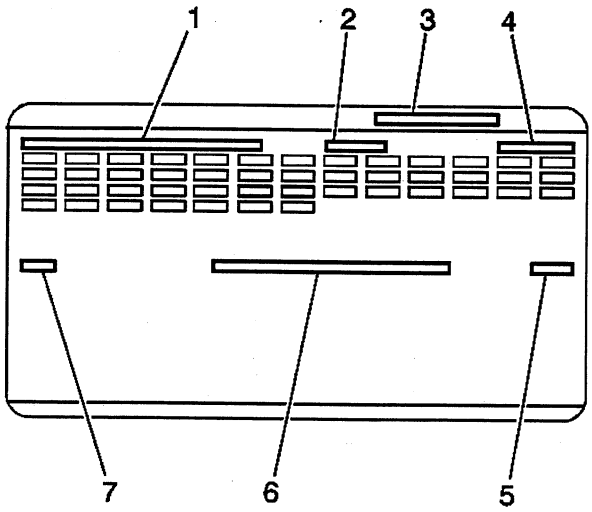


(1) Specified Occupant Seating Positions
(2) Total Occupant Seating
(3) Maximum Vehicle Capacity Weight
(4) Tire Pressures, Front, Rear, and Spare
(5) Tire Speed Rating, Front, Rear, and Spare
(6) Tire Label Code
(7) Engineering Model Minus First Character
(8) Tire Sizes, Front, Rear, and Spare
(9) Vehicle Identification Number

The Tire Placard is permanently located on the edge of the driver's door. Refer to the placard to obtain:

- The maximum vehicle capacity weight
- The cold tire inflation pressures
- The tire sizes (original equipment tires)
- The tire speed ratings (original equipment tires)

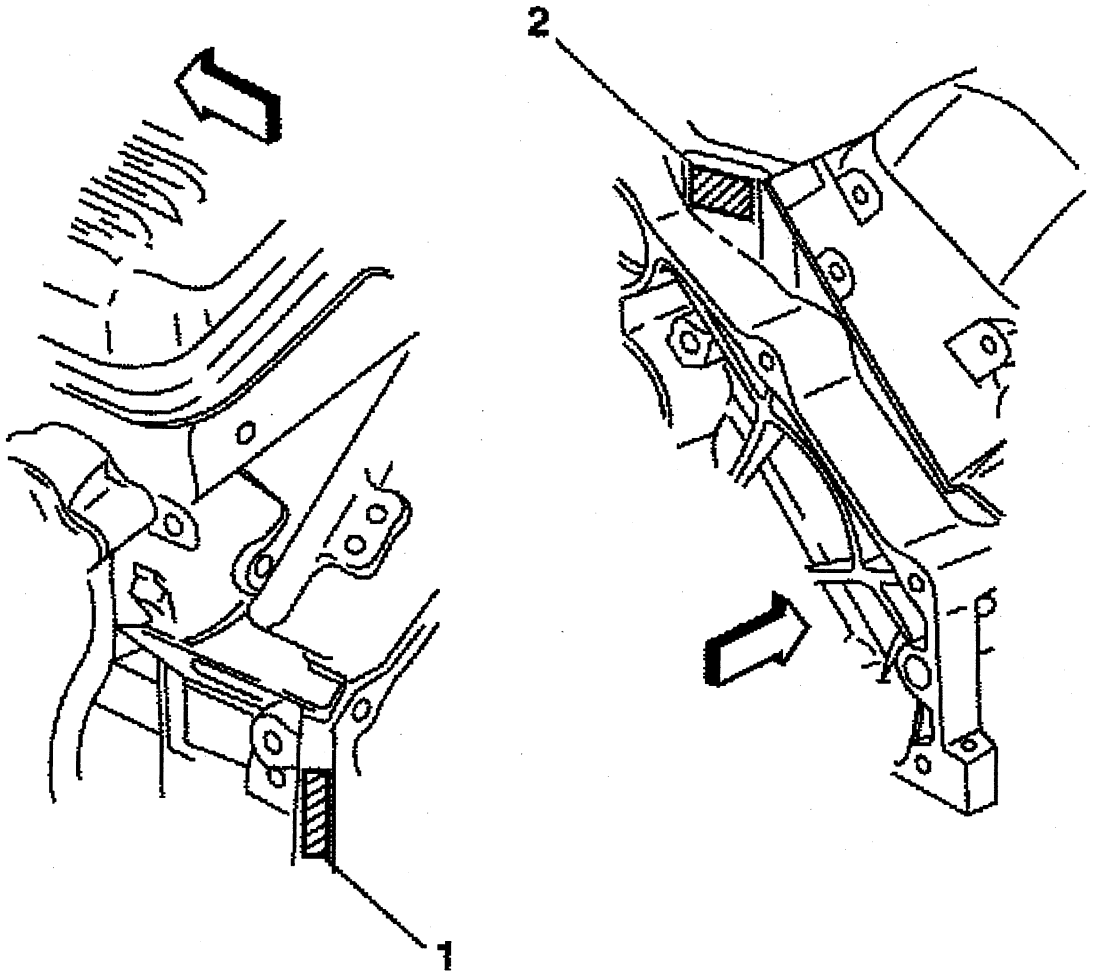
Service Parts Identification Label (SPID)



(1) Vehicle Identification Number
(2) Wheel Base
(3) Part Number Location
(4) Model Designation
(5) Order Number
(6) Exterior Color
(7) Paint Technology

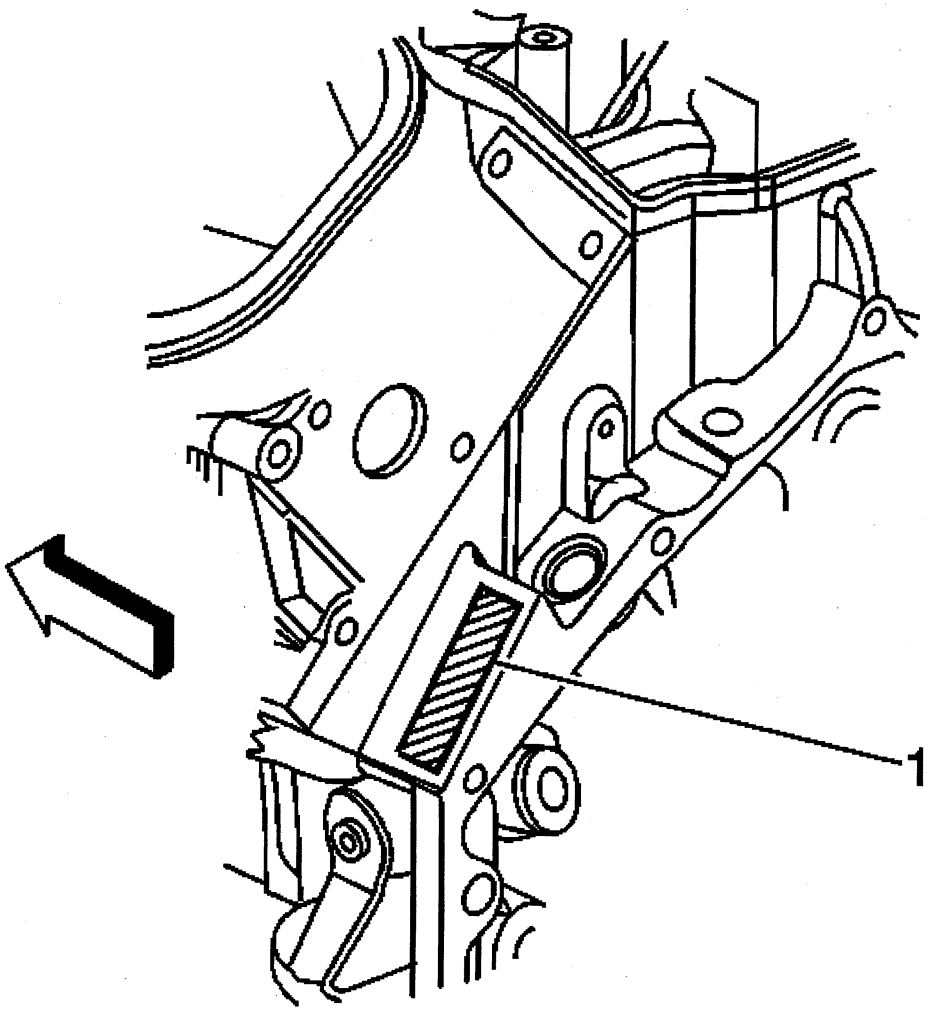
The service parts identification label is placed on the vehicle in order to help service and parts personnel identify the vehicle's original parts and the vehicle's original options.

Engine ID and VIN Derivative Location 5.3L & 6.0L



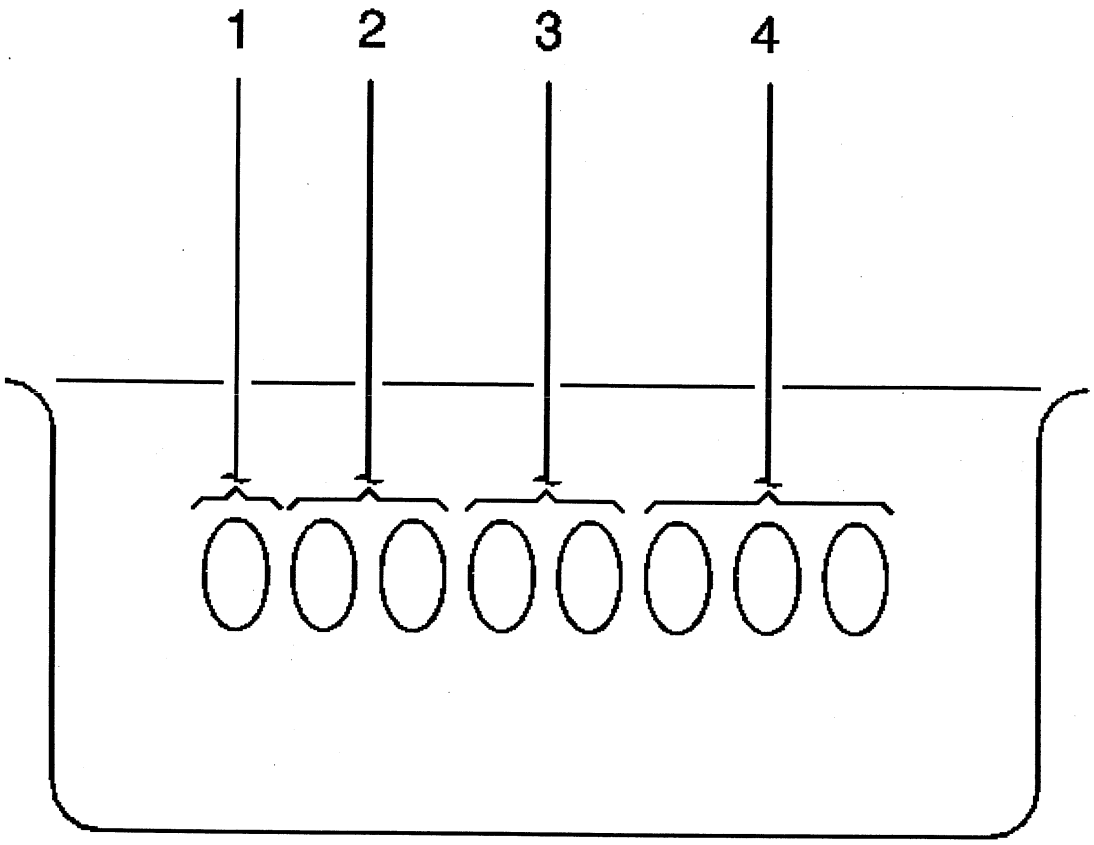
(1) Primary Engine Identification Number Location
(2) Secondary Engine Identification Number Location

Engine ID and VIN Derivative Location 8.1L



(1) Engine Identification Number Location

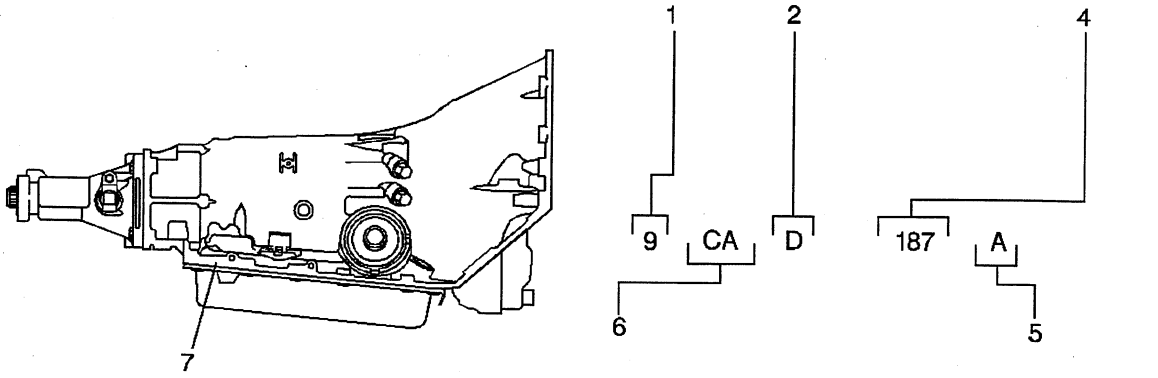
Engine ID Legend

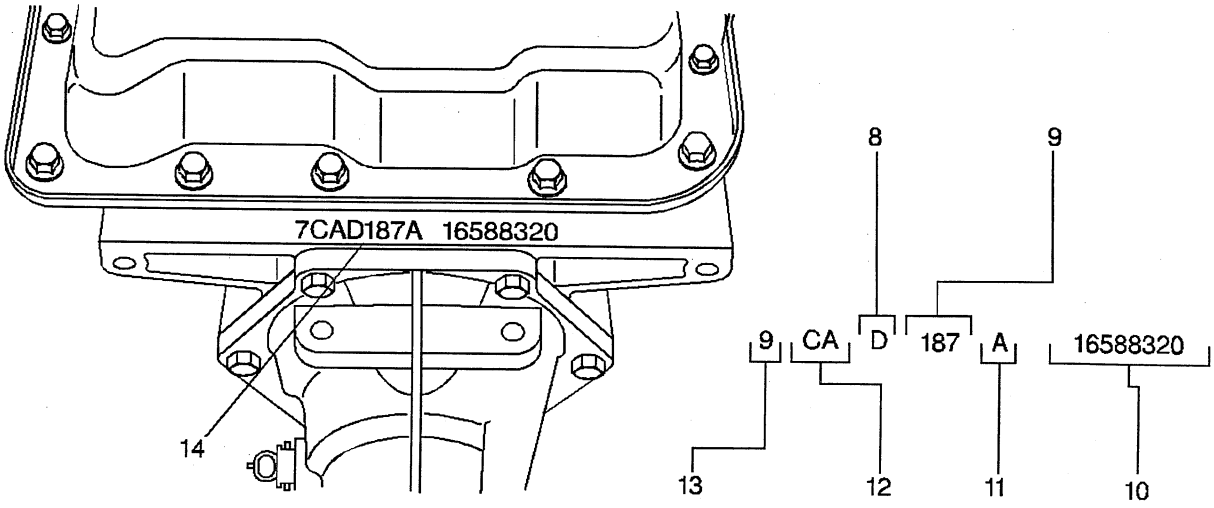


1. Source Code
2. Month of Build
3. Date of Build
4. Broadcast Code

Transmission ID and VIN Derivative Location

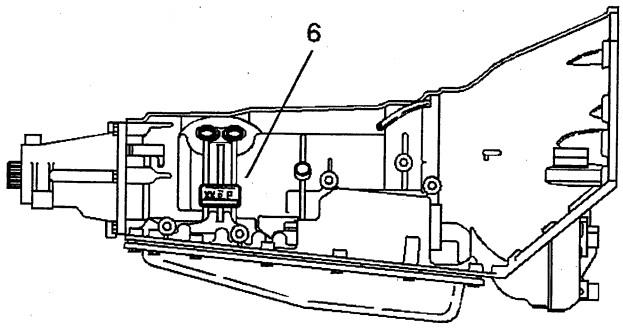
4L60-E Transmission ID Location

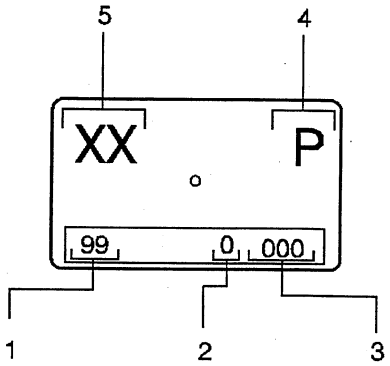




(1) Model Year
(2) Hydra-Matic 4L60-E
(4) Julian Date (or Day of the Year)
(5) Shift Built (A, B, J = First Shift; C, H, W = Second Shift)
(6) Model
(7) Transmission ID Location
(8) Hydra-Matic 4L60-E
(9) Julian Date (or Day of the Year)
(10) Serial No.
(11) Shift Built (A, B, J = First Shift; C, H, W = Second Shift)
(12) Model
(13) Model Year
(14) Transmission ID Location

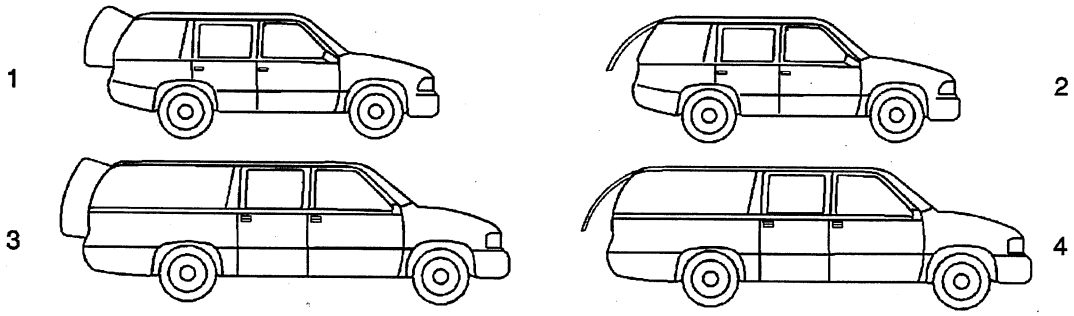
4L80-E Transmission ID Location





1. Calendar Year
2. Julian Date of the Year
3. Shift and Line Number
4. Plant
5. Model
6. Location on Transmission

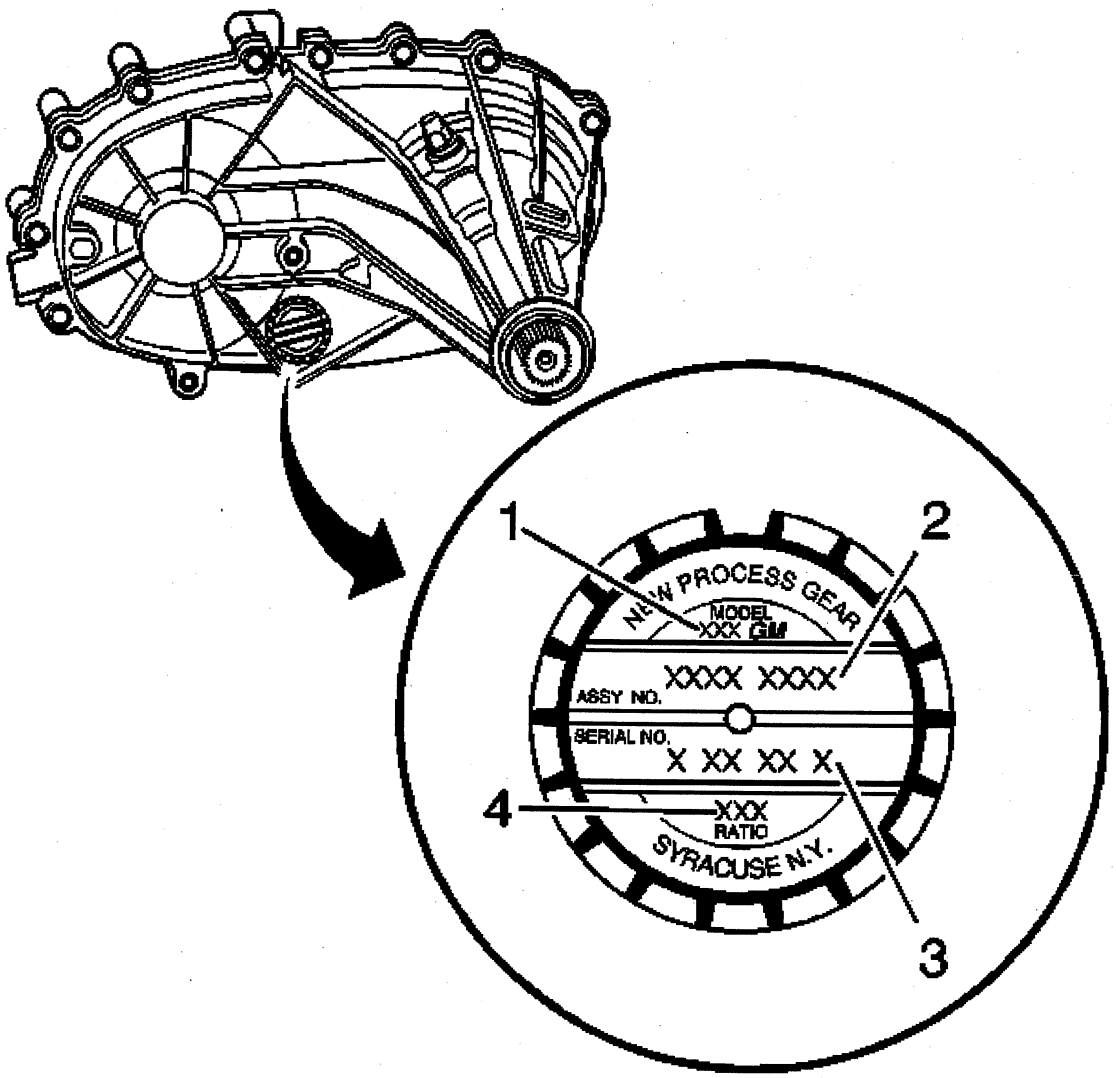
Engine and Transmission Usage



(1) 4-Door Utility Rear Cargo Doors
(2) 4-Door Utility Liftgate/Glass
(3) 4-Door Suburban with Rear Cargo Doors
(4) 4-Door Suburban Liftgate/Glass

Engine (RPO)	Transmission (RPO)
5.3L V8 (L59)	4L60E (M30)
5.3L V8 (LM7)	4L60E (M30)
6.0L V8 (LQ4)	4L60E HD (M32) 4L80E (MT1)
6.0L V8 (LQ9)	4L60E HD (M32)
8.1L V8 (L18)	4L80E HD (MN8)

Transfer Case Identification

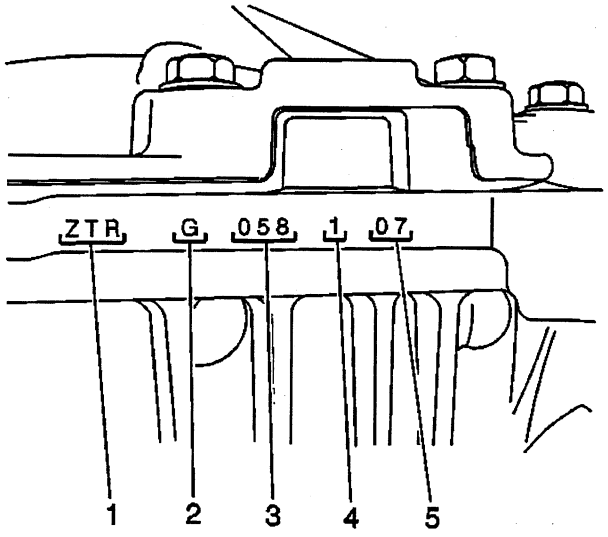


An identification tag is attached to the rear half of the transfer case. The tag provides the following information:

1 Model number (1)
   A First Digit-1 =Single Speed, 2=Two-Speed
   B Second Digit-2 = T Utility, 3 =T-Truck, L-Van, 4 or 6 = K Truck and Utility
   C Third Digit-1 = Manual, 3 = Electric Shift, 6 = Automatic, 9 = All Wheel Drive
2 Assembly number (2)
3 Serial number (Date and Shift Code) (3)
4 Low range reduction ratio (4)

The information on this tag is necessary for servicing the transfer case. If the tag is removed or becomes dislodged during service operations, keep the identification tag with the unit.

Axle Identification – Front



(1) Broadcast Code
(2) Supplier Code (G = American Axle)
(3) Julian Date (Day of Year)
(4) Shift Built (1 = First Shift; 2 = Second Shift) (Optional for 8.25" and 9.25" axles)
(5) Hour Built

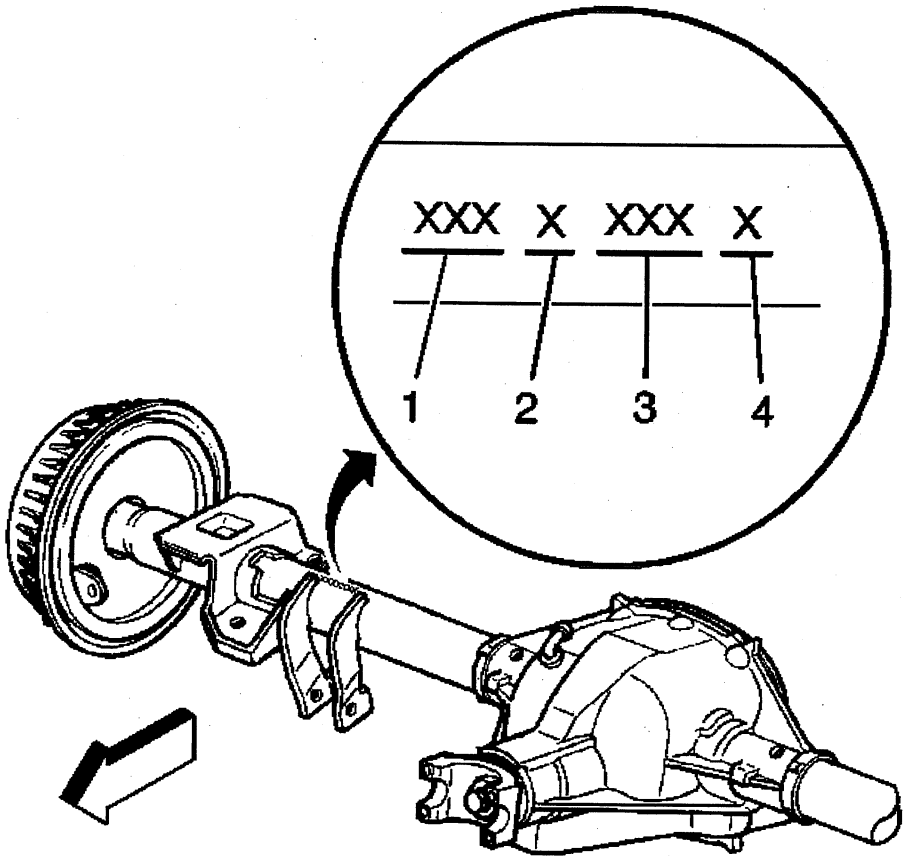
Front axle identification information is stamped on the top of the differential carrier assembly.

The following broadcast codes identifies the axle ratio:

Broadcast Code	Ratio
ZTM	3.08
ZTN, ZTU, ZTW, ZSY, ZA2, ZC2	3.42
ZTP, ZTR, ZTS, ZTX, ZSZ, ZB2,ZD2	3.73
ZTT,ZF2	4.10
ZH2	4.56

The information on the differential carrier assembly is necessary for servicing.

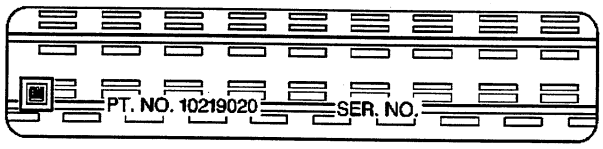
Axle Identification – Rear



(1) Rear Axle Ratio
(2) Build Source (C = Buffalo; K = Canada)
(3) Julian Date
(4) Shift Built (1 = First; 2 = Second)

All rear axles are identified by a broadcast code on the right axle tube near the carrier. The rear axle identification and manufacturer's codes must be known before attempting to adjust or to repair axle shafts or the rear axle case assembly. Rear axle ratio, differential type, manufacturer, and build date information is stamped on the right axle tube on the forward side.

Labeling - Anti-Theft



Notice

The anti-theft label found on some major body panels MUST be covered before performing any painting, rustproofing or undercoating procedures. The mask must also be removed following those procedures. Failure to follow these precautionary steps may result in liability for violation of the Federal Vehicle Theft Prevention Standard, and subject the vehicle owner to possible suspicion that the part was stolen.

Federal law requires General Motors (GM) to affix a label to certain parts on selected vehicles with the Vehicle Identification Number (VIN). The purpose of this law is to reduce the number of motor vehicle thefts by helping in the tracing and recovery of parts from stolen vehicles. The certification label on the driver's door qualifies as a theft deterrent label.

The theft deterrent label will be permanently affixed to an interior surface of the part and will contain the complete VIN. The label on replacement parts will contain the letter R, the manufacturer's logo, and the acronym for the Department of Transportation (DOT). DO NOT deface, or remove these labels.

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
AC6	Window Tinted Deep, Rear, S/D
AE7	Seat FRT Split, Driver, PASS
AG1	Adjuster FRT ST Power, Multi-Directional, Driver
AG2	Adjuster PASS ST Power, Multi-Directional
AJ1	Windows Deep Tint, All Except W/S And DRS
AJ7	Restraint System Seat, Inflatable, Driver and Passenger, Front and Side
AL0	Sensor Indicator Inflatable Restraint, Front Passenger/Child Presence Detector
AL4	Seat RR BKT
AN3	Seat FRT, Individual (Non BKT)
ARL	Plant Code Arlington, TX USA
AS3	Seat RR
AT5	Seat Rear CTR, Folding
AU0	Remote Function Actuation - Keyless Entry - Domestic
AU3	Lock Control Side Door, Electric
AU8	Remote Function Actuation, Specific Frequency
A31	Window Power Operated, All Doors
A95	Seat FRT BKT, High Back, Driver and PASS RECL
BG9	Covering Floor Rubber
BPH	Appearance Package Chevrolet "Off Road"
BS1	Insulation Acoustical PKG
BVE	Side Steps Runningboard
BVF	Side Steps Runningboard, Color Keyed
BVQ	Side Steps Runningboard, Tubular Chrome
BW2	Molding B/S Deluxe
BX2	Molding B/S Lower, Extra Wide
B30	Floor Covering Carpet
B34	Covering Front Floor Mats, Carpet Insert
B37	Covering Floor IMat, Front and Rear, Auxiliary
B39	Covering Floor Carpet, Load Floor
B41	Covering Floor Mat, Load Floor
B58	Covering Floor MAT, FRT And RR, Carpeted Insert
B71	Wheel Opening Flares
B85	Molding - Body Side , Exterior, Bright
B96	Molding Wheel Opening
CF5	Roof Sun Glass, Sliding, Electric
CJ2	HVAC System Air Conditioner Front, Auto Temperature Control, Aux Temperature Control
CJ3	HVAC System Air Conditioner Front, Manual Temperature Control, Aux Temperature Control
C25	Wiper System, Rear Window, Intermittent
C36	Heater Auxiliary
C49	Defogger RR Window, Electric
C5F	GVW Rating 8, 500 LBS
C5H	GVW Rating 6,900 LBS
C5M	GVW Rating 6,100 LBS
C5S	GVW Rating 6,600 LBS
C5U	GVW Rating 6,800 LBS
C5W	GVW Rating 7,000 LBS
C5Z	GVW Rating 7,200 LBS

C6P	GVW Rating 8,600 LBS/3, 900KG
C69	HVAC System RearAir Conditioner
C7H	GVW Rating 6,400 LBS/2, 900 KG
DE2	Mirror, O/S LH And RH, Manual Control, Folding, Color
DF5	Mirror, I/S R/V LT Sensitive, Compass, O/S Temp Display
DG5	Mirror O/S LH & RH, Wide Load, Large
DH6	Mirror, I/S Front Van, LH And RH, Illumination with Sunshade
DK7	Console Roof Interior, Custom
DK8	Console Roof Interior, Deluxe
DL3	Mirror, O/S LH and RH, Remote Control, Electric, Heated, Power Folding, Turn Signal Indicator, Light Sensitive, Color
DL8	Mirror, O/S LH And RH, Remote Control, Electric, Heated
DNR	Equipment, Dealer Installed
DPF	Mirror, O/S LH and RH, Wide Load, Remote Control, Electric, Heated
DT3	Rear Box Compartment, Stowage
DT4	Ashtray, Cigarette Lighter
DUF	Equipment, Duffle Bag and Daypack
D07	Console Front Compartment, Floor, Custom
EN4	Cover, Rear Compartment Hard, Rear Compartment, Cargo
EVA	Test DVT, EVAP Emission Requirement
E52	Body Equipment One Piece Lift Gate With Lift Glass
FWI	Plant Code Ft Wayne, IN, USA
FW1	Ride and Handling Manual Electronic Controlled
F60	Spring Front Heavy Duty
GT4	Axle Rear 3.73 Ratio (DUP With 5 x 1)
GT5	Axle Rear 4.10 Ratio (DUP With GT8)
GU6	Axle Rear 3.42 Ratio
G65	Level Control Manual, Self-Adjusting
G69	Level Control Auto, Air, HD
G80	Axle Positraction Limited Slip
G86	Axle, Limited Slip
JAN	Plant Code Janesville, WI, USA
JF4	Power Adjustable Pedals
JH2	Brake Hyd Power, Disc/ Disc, 7,200 lb
JH6	Brake Hyd Power, 4-Wheel Disc, 9,900 lb
JL4	Control Active Brake
KC4	Heavy Duty Engine Oil Cooling
KG3	Generator 145 Amp
KNP	Cooling System Trans, HD
KUP	Throttle Control Electronic
K05	Heater Engine Block
K34	Cruise Control, Automatic, Electronic
K47	Air Cleaner High Capacity
K68	Generator 105 Amp
LM7	Engine Gas, 8 CYL, 5.3L, MFI, Iron, GM
LQ4	Engine Gas, 8 CYC, 6.0L, MFI, Iron, GM
LQ9	Engine Gas, 8 CYC, 6.0L, MFI, Iron, GM, HO
LR4	Engine Gas, 8 Cechy, 4.8L MFI, Iron, GM
L18	Engine Gas, 8 CYL, 8.1L, MFI
MN8	Transmission Auto 4-Speed, HMD, 4L80-E, Heavy Duty
MSL	Plant Code, Silao, Mexico
MT1	Transmission 4-Speed Auto W/Elect Controls H.D. - Hydra - Matic 4L80 - E
M30	Transmission Auto 4-Speed, HMD, 4L60-E, Electronic
M32	Transmission Auto 4-Speed Hydra-Matic Drive, 4L60-E Electronic, HD

M74	Transmission Auto 5-Speed Allison, LCT 1000, 3.10 1st, 1.00 4th, 0.71 5th, Overdrive, Conv. Clutch
M96	Transmission Manual 5-Speed Tremec, 109 mm, 5.81 1st, 0.77 5th
NC1	Emission System California, LEV
NC8	Emission System California, ULEV
NF2	Emission System Federal Tier 1
NF4	Emission System Clean Fuel Fleet
NF9	Emission System General Unleaded
NP3	New Venture Gear 149
NP8	New Venture Gear 246
NR3	Transfer Case - All Wheel Drive (AWD), Open Differential, Single Speed
NR4	Transfer Case - 4 Wheel Drive (4WD), Open Differential, 2 Speed
NT9	Emission System Federal, Tier 2 Phase-out
NW7	Traction Control - Electronic
NYS	Steering Four Wheel
NZZ	Skid Plate Off-Road
N30	Steering Wheel Deluxe
N88	Wheel - New - Aluminum - 17 x 7.5, Premium
N89	Wheel - New - Aluminum - 17 x 7.5, Sport
N93	Wheel - New - Aluminum - 17 x 7.5
N94	Wheel - New - Aluminum - 17 x 7.5, Chrome
PF4	Wheel - Cast - Aluminum- 16 X 7.0
PF9	Wheel - Cast - Aluminum- 16 X 7.0
PY0	Wheel - New - Aluminum - 16 X 6.5
P96	Equipment Mexican Modified, Mandatory Base Equipment
QAN	Tire All P265/70R 17 - 113S BW R/PE ST TL AL2
QAQ	Tire All P265/70R 17 - 113H BW R/PE ST TL AL2
QAS	Tire All P265/70R 17 - 113S WOL R/PE ST TL AL2
QBN	Tire All LT245/75R16/C BW R/PE ST TL 00R
QC3	Wheel 16 x 7, Aluminum, Special
QIW	Tire All LT245/75R16E R/PE ST TL OOR BL
QIX	Tire All LT265/75R16/C BW R/PE ST TL OOR 12OQ
QIZ	Tire All LT245/75R16/E BW R/PE ST TL OOR 12OQ
QJM	Tire All P265/70R17 - 113SWOL R/PE ST TL OOR
QJP	Tire All P265/70R17 - 113S BW R/PE ST TL OOR
QMJ	Tire All P265/70R16 - 111S BW R/PE ST TL AL2
QMK	Tire All P265/70R16 - 111S WOL R/PE ST TL AL2
SLT	Equipment Chevrolet 'LT' Sales Package
TL1	Grille Special
TRW	Provisions Lamp, Roof Mounted
TR6	Headlamps Control Leveling System, Manual
T74	Headlamps Control Automatic, Delay
T96	Fog Lamps - Front
UB0	Radio AM/FM Stereo, Seek/Scan, CD, Auto Tone, Data System, Clock, ETR
UB1	Radio AM/FM Stereo, Seek/Scan, Auto Reverse Music, Search Cassette, CD, Auto Tone, Data System, Clock, ETR
UC6	Radio AM/FM Stereo, Seek/Scan, RDS, Multiple Compact Disc, Auto Tone Control, Clock, ETR
UD7	Sensor Indicator Rear Parking Assist
UE1	Communication System Vehicle, G.P.S. 1
UG1	Garage Door Opened, Universal
UK3	Control Steering Wheel, Accessory
UK6	Radio Control RR Seat And Earphone Jacks
UM8	Radio - AM/FM Stereo, Seek/Scan CD, ETR, Navigation Clock

UQ3	Speaker System, Performance Enhanced Audio
UQ7	Speaker System Premium Performance, Enhanced Audio, Bose®
U01	Roof Marker Lamps
U1S	Player Multiple Compac Disc
U19	Speedometer INST, Kilo And Miles, Kilo Odometer
U2K	Digital Audio System S-Band
U2L	Digital Audio System L-Band
U34	Display Celsius Temperature
U42	Entertainment Package Rear Seat
VB5	Bumper Front, Color
VGC	Protector Film, Paint Etch Preventive
VG3	Bumper Front Impact Strip
VG8	Vehicle Label, Notice to Buyer
VK3	License Plate, Front Mounting Package
VR4	Trailer Hitch Weight Distributing Platform
VT4	Bumper Front Color Keyed
VT5	Bumper Rear Color Keyed
VXS	Vehicle Complete
V1K	Luggage Carrier Bar, Center Cross
V22	Grille Radiator, Chrome
V43	Rear Bumper Step, Color
V54	Roof Luggage Carrier, Painted
V73	Vehicle Statement, USA/Canada
V76	Front Towing Hook
V78	Vehicle Statement - Delete
XAN	Tire Front P265/70R17-113S BW R/PE ST TL AL2
XAS	Tire Front P265/70R17-113S WOL R/PE ST TL AL2
XGK	Tire Front LT245/75R16/E BW R/PE ST TL OOR 120Q
XHH	Tire Front LT245/75R16/E BW R/PE ST TL ALS 120Q
XJM	Tire Front P265/70R17-113S WOL R/PE ST TL OOR
XJP	Tire Front P265/70R17-113S BW R/PE ST TL OOR
XMJ	Tire Front P265/70R16-111S BW R/PE ST TL AL2
XMK	Tire Front P265/70R16-111S WOL R/PE ST TL AL2
X88	Conversion Name Plate Chevrolet
YAN	Tire Rear P265/70R17-113S BW R/PE ST TL AL2
YAS	Tire Rear P265/70R17-113S WOL R/PE ST TL AL2
YE9	Convenience Package Comfort and Decor Level #3
YGK	Tire Rear LT245/75R16/E BW R/PE ST TL OOR 120Q
YHH	Tire Rear LT245/75R16/E BW R/PE ST TL ALS 120Q
YJM	Tire Rear P265/70R17-113S WOL R/PE ST TL OOR
YJP	Tire Rear P265/70R17-113S BW R/PE ST TL OOR
YMJ	Tire Rear P265/70R16-111S BW R/PE ST TL AL2
YMK	Tire Rear P265/70R16-111S WOL R/PE ST TL AL2
Y91	Merchandised PKG Luxury Edition
Y92	Merchandised PKG Special Edition
ZGC	Tire Spare P265/75R16-114S BW R/PE ST TL AT
ZGK	Tire Spare LT245/75R16/E BW R/PE ST TL 00R 120Q
ZHH	Tire Spare LT245/75R16/E BW R/PE ST TL ALS 120Q
ZHS	Tire Spare P265/75R16-114H BW R/PE ST TL AT "A" Temp Rating
ZMJ	Tire Spare LT265/70R16-111S BW R/PE ST TL AL2
ZMK	Tire Spare LT265/70R16-111S WOL R/PE ST TL AL2
ZM9	Sales Package Comfort & Convenience
ZQ1	Chassis Package Smooth Ride

ZW7	Chassis Package Premium Smooth Ride
ZW9	Base Body or Chassis
ZY1	Color Combination, Solid
Z49	Export Canadian Modified, Mandatory Base Equipment
Z55	Chassis Package Bi-State, Real Time Damping
Z66	Appearance Package Premium Ride Suspension
Z71	Chassis Package "Off Road"
Z75	Conversion Name Plate Cadillac
Z82	Trailer Provisions Special Equipment, H. D.
Z85	Chassis Package Increased Capacity
Z88	Conversion Name PLT GMC
15I	Interior Trim Shale (I) (95)
152	Trim Combination Leather, Shale (2) (95)
50U	Primary Color Exterior, Olympic White (93)
52D	Trim Combinatioin Cloth, Medium Neutral II (D) (98)
52I	Interior Trim Medium Neutral II (I) (96)
522	Trim Combination Leather, Medium Neutral II (2) (98)
58U	Primary Color Exterior, Sandalwood Met (02)
62U	Primary Color Exterior, Dark Spiral Gray Met (03)
69D	Trim Combination Cloth, Very Dark Pewter (D) (03)
69I	Interior Trim, Very Dark Pewter (01)
692	Trim Combination Leather, Very Dark Pewter (03)
71U	Primary Color Exterior, Sunset Orange Met (01)
72U	Primary Color Exterior, Redfire Met (99)
74U	Primary Color Exterior, Victory Red (96)
91U	Primary Color Exterior, Arrival Blue (03)
92D	Trim Combination CLoth, Medium Dark Pewter (D) (97)
92I	Interior Trim Medium Dark Pewter (97)
922	Trim Combination Leather, Medium Dark Pewter (2) (97)
98IU	Primary Color Exterior, White Diamond (02)

Technical Information

Maintenance and Lubrication

Capacities - Approximate Fluid

Application	Specification	
	Metric	English
Axle Capacities		
• Front Drive Axle (8.25")	1.66 liters	1.75 quarts
• Front Drive Axle (9.25")	1.73 liters	1.83 quarts
• Rear Drive Axle (8.6")	2.03 liters	2.15 quarts
• Rear Drive Axle (9.5")	2.6 liters	2.75 quarts
• Rear Drive Axle (10.5")	2.6 liters	2.75 quarts
• Rear Drive Axle (11.5")	3.62 liters	3.83 quarts
Engine Cooling System		
• 5.3L (VIN T) Automatic Transmission with Front A/C	13.6 liters	14.4 quarts
• 5.3L (VIN T) Automatic Transmission with Front and Rear A/C	15.0 liters	15.8 quarts
• 6.0L (VIN V) Automatic Transmission	15.0 liters	15.8 quarts
• 6.0L (VIN V) Automatic Transmission with Optional Engine Oil Cooler	14.6 liters	15.4 quarts
• 8.1L (VIN G) Automatic Transmission	19.6 liters	20.7 quarts
Engine Crankcase		
• 5.3L (VIN T) with Filter	5.7 liters	6.0 quarts
• 6.0L (VIN U) with Filter	5.7 liters	6.0 quarts
• 8.1L (VIN G) with Filter	6.1 liters	6.5 quarts
Transmission		
• 4L60-E 4 Spd. HMD Auto (M30)	4.7 liters	5.0 quarts
• 4L60-E 4 Spd. HMD Auto (M30) After Complete Overhaul	10.6 liters	11.2 quarts
• 4L60-E 4 Spd HM Auto (M32)	4.7 liters	5.0 quarts
• 4L60-E 4 Spd HM Auto (M32) After Complete Overhaul	10.6 liters	11.2 quarts
• 4L80-E Auto (MT1)	7.3 liters	7.7 quarts
• 4L80-E Auto (MT1) After Complete Overhaul	12.8 liters	13.5 quarts
Fuel Tank		
• Suburban/Yukon XL (1500 Series)	117.3 liters	31.0 gallons
• Suburban/Yukon XL (2500 Series)	145.7 liters	37.0 gallons
Air Conditioning Refrigerant		
• Suburban/Yukon XL	1.36 kg	3.0 lbs
Power Steering Capacities - approximate	0.77-1.25 liters	0.81-1.32 quarts
Transfer Case		
Borg Warner 4481 (NR3)	1.4 Liters	1.5 Quarts
Borg Warner 4482 (NR4)	1.4 Liters	1.5 Quarts
New Venture Gear 149 (NP3)	2.1 Liters	2.22 Quarts
New Venture Gear 246 (NP8)	1.9 Liters	2.0 Quarts

Maintenance Items

Usage	Type
Air Cleaner	
• 4.8L (VIN V)	A1519C
• 5.3L (VIN T)	A1518C
• 6.0L (VIN U)	A1518C
• 8.1L (VIN G)	A1518C
Engine Oil Filter	
• 4.8L (VIN V)	PF46
• 5.3L (VIN T)	PF46
• 6.0L (VIN U)	PF46
• 6.6L (VIN 1)	P/N 97214983
• 8.1L (VIN G)	PF454
PCV Valve	
• 4.8L (VIN V)	CV948C
• 5.3L (VIN T)	CV948C
• 6.0L (VIN U)	CV948C
Spark Plugs and Gaps	
• 4.8L (VIN V)	PTJ16R15 (GAP 1.52 mm, 0.060 in)
• 5.3L (VIN T)	PTJ14R15 (GAP 1.52 mm, 0.060 in)
• 6.0L (VIN U)	PTJ16R15 (GAP 1.52 mm, 0.060 in)
• 8.1L (VIN G)	PTJ14R15 (GAP 1.52 mm, 0.060 in)
Fuel Filter	
• 4.8L (VIN V)	GF626
• 5.3L (VIN T)	GF626
• 6.0L (VIN U)	GF626
• 8.1L (VIN G)	GF626
Wiper Blades	P/N 15706394
Passenger Compartment Air Filter	P/N 52485513

Fluid and Lubricant Recommendations

Usage	Fluid/Lubricant
Automatic Transfer Case	Automatic transfer case fluid AUTO-TRAK II Fluid (GM P/N 12378508)
Automatic Transfer Case (Diesel Engine)	Automatic transfer case fluid (GM P/N 12378396)
Transfer Case (Pickup)	DEXRON®-III, Automatic Transmission Fluid
Automatic Transmission	DEXRON®-III, Automatic Transmission Fluid
Body Door Hinge Pins, Tailgate Hinge and Linkage, Folding Seat and Fuel Door Hinge	Multi-Purpose lubricant, Superlube® (GM P/N 12346241 or equivalent).
Chassis Lubrication	Chassis Lubricant (GM Part No. 12377985 or equivalent) or lubricant meeting requirements of NLGI # 2 Category LB or GC-LB.
Engine Coolant	50/50 mixture of clean drinkable water and use only GM Goodwrench® DEX-COOL® or Havoline® DEX-COOL® coolant.
Engine Oil	Engine oil with the American Petroleum Institute Certified For Gasoline Engines STARBURST symbol of the proper viscosity
Engine Oil (Diesel Engine)	Engine oil with the letters CH-4 or CG-4 is best for this vehicle. The CH-4 or CG-4 designation may appear either alone, or in combination with other API designations, such as API CH-4/SJ, CG-4/SH or CH-4/CG-4/SJ. These letters show American Petroleum Institute (API) level of quality.
Floor Shift Linkage	Lubriplate ® Lubricant Aerosol (GM Part No. 12346293 or equivalent) or lubricant meeting requirements of NLGI # 2 Category LB or GC-LB.
Front Axle (S4WD)	SAE 80W-90 Axle Lubricant (GM P/N 1052271 or equivalent).
Front Axle (F4WD)	SAE 75W-90 Synthetic Axle Lubricant (GM part No. 12378261) or equivalent meeting GM Specification 9986115.
Front Axle Propshaft Spline or One-Piece Propshaft Spline (Two-Wheel Drive with Auto. Trans.)	Spline Lubricant, Special Lubricant (GM Part No. 12345879) or lubricant meeting requirements of GM 9985830.
Hood Hinges	Multi-Purpose lubricant, Superlube ® (GM Part No. 12346241 or equivalent).
Hood Latch Assembly, Secondary Latch, Pivots, Spring Anchor and Release Pawl	Lubriplate ® Lubricant Aerosol (GM Part No. 12346293 or equivalent) or lubricant meeting requirements of NLGI # 2, Category LB or GC-LB.
Hydraulic Brake System	Delco Supreme 11® Brake Fluid (GM P/N 12377967 or equivalent DOT-3 brake fluid).
Hydraulic Clutch System	Hydraulic Clutch Fluid (GM Part No. 12345347 or equivalent DOT-3 brake fluid).
Key Lock Cylinders	Multi-Purpose Lubricant, Superlube® (GM P/N 12346241 or equivalent).
Manual Transfer Case	DEXRON®-III Automatic Transmission Fluid
Manual Transmission (5-Speed with Low Gear, RPO MW3	GM Goodwrench Synthetic Manual Transmission Fluid (GM Part No. 12346190-1 qt.) or equivalent SAE 75W-85 GL-4 gear oil.
Manual Transmission (5-Speed without Low Gear, RPO MG5)	Synchromesh Transmission Fluid (GM Part No. 12345349 or equivalent).
Manual Transmission (6-Speed)	TransSynd ™ Synthetic Automatic Transmission Fluid (GM Par No. 12378515).
Outer Tailgate Handle Pivot Points	Multi-Purpose lubricant, Superlube® (GM P/N 12346241 or equivalent).

Parking Brake Cable Guides	Chassis Lubricant (GM Part No. 12377985 or equivalent) or lubricant meeting requiremetns of NLGI # 2, Category LB or GC-LB.
Power Steering System	GM Power Steering Fluid (GM P/N 1052884 - 1 pint, 1050017 - 1 quart, or equivalent).
Weatherstrip Conditioning	Dielectric Silicone Grease (GM P/N 12345579 or equivalent).
Windshield Washer Solvent	GM Optikleen ® Washer Solvent (GM Part No. 1051515) or equivalent.
Weatherstrip Squeaks	Synthetic Grease with Teflon, Superlube ® (GM Part No. 12371287 or equivalent).
Tailgate Handle Pivot Points, Hinges, Latch Bolt and Linkage	Multi-Purpose lubricant, Superlube® (GM P/N 12346241 or equivalent).
Rear Axle	SAE 75W-90 Synthetic Axle Lubricant, GM Part No. 12378261 (in Canada use Part No. 10953455) or equivalent meeting GM Specification 9986115.
Rear Driveline Center Spline	Chassis Lubricant (GM Par No. 12377985 or equivalent) or lubricant meeting requirements of NLGI # 2, Category LB or GC-LB.

Descriptions and Operations

Power Steering System

The hydraulic power steering system consists of the following components:

- The pump
- The fluid reservoir
- The steering gear
- The pressure hose
- The return hose

The power steering pump is a vane-type pump. The pump houses the internal components inside the reservoir. The pump operates submerged in oil.

Two bore openings are located at the rear of the pump housing. The larger opening contains the following components:

- The cam ring
- The pressure plate
- The thrust plate
- The rotor and vane assembly
- The end plate

The smaller opening contains the following components:

- The pressure hose union
- The flow control valve
- The spring

The flow control orifice is part of the pressure control union. The pressure relief valve inside the flow control valve limits the pump pressure.

The power steering gear has a recirculating ball system. The system acts as a rolling thread between the worm shaft and the rack position. The lower end of the worm shaft is supported by a preloaded thrust bearing and two conical thrust races. The upper end of the worm shaft is supported by an adjusted plug. When you turn the worm shaft right, the rack piston moves up in the gear. When you turn the worm shaft left, the rack piston moves down in gear. The rack piston teeth mesh with the sector. The sector is part of the pitman shaft. The pitman shaft turns the wheels through the steering linkage.

The control valve in the steering gear directs the power steering fluid to either side of the rack piston. The rack piston converts the hydraulic pressure into a mechanical force. You can control the vehicle manually if the steering system becomes damaged and loses hydraulic pressure.

Steering Linkage

The steering linkage consists of the following components:

- A pitman arm
- An idler arm
- A relay rod
- 2 adjustable tie rods

When you turn the steering wheel, the steering gear rotates the pitman arm which forces the relay rod to one side. The tie rods connect to the relay rod with the ball studs. The tie rods transfer the steering force to the wheels. Use the tie rods in toe adjustments. The tie rods are adjustable. The pitman arm support the relay rod. The idler arm pivots on a support attached to the frame rail and the ball stud attaches to the relay rod.

The 2 tie rod are threaded into the tube and secured with jam nuts. Right and left hand threads are used in order to permit the adjustment of toe.

The condition of the steering linkage affects the steering performance. If parts are bent, damaged, worn, or poorly lubricated, potentially dangerous steering action will result.

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.

Rear Wheel Steering Description and Operation

Quadrasteer™ is a 4-wheel steering system that dramatically enhances low speed maneuverability, high speed stability, and towing capability. The system is an electrically powered rear wheel steering system comprised of the following components:

- A steerable, solid hypoid rear axle.
- A steering wheel position sensor located at the base of the steering column.
- A rear wheel position sensor located below the rear wheel steering motor on the rear steering gear.
- An electric motor driven actuator.
- A rear wheel steering control module.
- A combined yaw rate sensor/ lateral accelerometer sensor.
- Three hall effect switches in the motor assembly.

- A mode select switch on the dash.
- A heavy duty wiring harness and fuse .
- A Service 4 Wheel Steer indicator in the IPC.
- A shorting relay in the rear wheel steering gear motor .
- A power relay in the rear wheel steering control module.

Rear Wheel Steering Control Module

The rear wheel steering control module controls all functions of the rear wheel steering system . The module has a dedicated power feed line from the under hood fuse holder. The fuse is a 125 amp mega fuse . The wiring is routed to the rear of the vehicle. The rear wheel steering control module is located above the rear mounted spare tire. The rear wheel steering control module uses the inputs listed above to determine when and how far to turn the rear wheels. The rear wheel steering control module also uses the hall switches in the steering gear motor , shorting relay , and motor control relay to monitor and control the direction and speed the motor operates. The rear wheel control module also controls the duty cycle of the phase leads to the motor . The motor control relay is part of the rear wheel steering control module and is not serviceable . The rear wheel steering control module uses both a class 2 and a discrete vehicle speed sensor signal . The system will not function without a discrete vehicle speed sensor signal . The rear wheel steering control module uses the 2 vehicle speed sensor signals for comparison purposes. The rear wheel steering control module uses inputs from the steering wheel position sensor to determine steering wheel position and rate of change. The rear wheel position sensor signals provide the rear wheel steering control module with rear wheel position data. The rear wheel steering control module will send out a class 2 message to the IPC to turn on and off the amber Service 4-Wheel Steering System Indicator. The rear wheel steering control module controls the indicators in the mode switch on the dash .

The control module allows the vehicle's rear wheels to turn a maximum of 12 degrees left or right. When the vehicle is operated in reverse, the maximum rear wheel steering angle is 5 degrees left or right. When the vehicle is sitting still in the test mode the system will move a maximum of 5 degrees left or right.

Important

The rear wheel steering control module may shut down if the system is operated under very extreme conditions and becomes overheated. The Service 4-Wheel Steer indicator will not be illuminated. Once the temperature decreases back to operating range, the rear wheel steering system will resume normal operation upon the next ignition cycle.

Rear Wheel Steering Mode Switch

The mode switch located on the instrument panel allows the driver the option of selecting 2-wheel steering, 4-wheel steering, or 4-wheel steering tow operation. The mode switch also has indicators that show which mode the rear wheel steering system is in . When all indicators are lit the rear wheel steering control module has lost it's memory settings and the scan tool must be used to re-calibrate the rear wheel steering control module . When the indicators are flashing the rear wheel steering control module is waiting for the steering wheel to pass the center position before changing to the selected mode . The indicators on the mode switch are led's , the switch is also back lit .

The system operates in 3 principal modes, as follows:

2-Wheel Steer Mode

Normal steering operation; rear wheel steering is disabled while in this mode.

4-Wheel Steer Mode

The 4-wheel steering mode provides the 3 principal phases of steering: negative phase, neutral phase, and positive phase. In the negative phase the rear wheels turn opposite of the front wheels . In the neutral phase the rear wheels are centered and do not turn in or out . In the positive phase the rear wheels turn the same direction as the front wheels .

4-Wheel Steer Tow Mode

The 4-wheel steer tow mode provides more positive phase steering than the normal 4-wheel steering at high speed. At low speed driving, the 4-wheel steer tow mode provides similar negative phase steering as it does in the normal 4-wheel steering mode.

NOTE : There is also a cross-over speed. This is the speed that the control module transitions from a negative phase to a positive phase status. In 4-Wheel Steer mode, this transition occurs when the vehicle obtains a speed of 65 km/h (40 mph).

The cross over speed in the 4-Wheel Steer tow mode occurs at 40 km/h (25 mph).

Rear Wheel Steering Gear Motor

The rear steering gear motor is a 3 phase, 6 pole brushless, DC motor. The rear wheel steering gear motor is located on the top of the rear steering gear . The motor transmits it's power through a planetary gear set inside the rear steering gear . There are 3 hall switches inside the motor , hall A , hall B , and hall C . They are not serviceable . There is a motor phase shorting relay located inside the motor assembly , it is not serviceable . The motor leads are not to be spliced or damaged in any way . If there is damage to the wiring the motor must be replaced . If there is any damage to the wiring it is possible for water to get inside the rear steering gear. The rear wheel steering control module uses the hall switch inputs to monitor motor position, speed, and direction .

Steering Wheel Position Sensor

The steering wheel position sensor inputs to the rear wheel steering control module consists of 3 digital input circuits. The steering wheel position sensor supply voltage is between 4.9-5.1 volts. Phase A and phase B circuits are digital pulse signals whose output represents one degree of steering wheel rotation. When observing the phase A and phase B data parameters on the scan tool, the parameters will not have the same value at the same time. When the steering wheel is rotated, the phase A and phase B data parameters will be shown as high or low on the scan tool. The marker pulse is a digital pulse that is displayed as high on the scan tool for 20 ° only when the steering wheel angle is between -10 and +10 °. The steering wheel position sensor analog signal voltage is at or near 2.5 volts with the wheels at center. Voltage increases/decreases for less than 1 full turn (+/- 225°) then plateaus for remainder of wheel travel.

Rear Wheel Steering Position Sensor

The rear wheel position sensor has 2 signal circuits: position 1 and position 2. Position 1 is a linear measurement of voltage per degree. The voltage range for position 1 is from 0.25 to 4.75 volts, and the angular measurement range is from - 620° to + 620°. At 0.25 volts the steering wheel has been rotated - 600° past center. At 4.75 volts the steering wheel has been rotated + 600° past center. Position 2 circuit is a linear measurement of voltage per degree. The voltage for position 2 increases or decreases from 0.25 to 4.75 volts every 180°. When the steering wheel is 0° or at center, position 1 and position 2 output signals measure 2.5 volts respectively.

Combined Yaw Rate Sensor / Lateral Accelerometer Sensor

The combined yaw rate sensor / lateral accelerometer sensor is located under the passenger front seat . Yaw rate is a rotational force on a horizontal plane. Lateral acceleration is a measure of forward motion on a horizontal plane . The inputs to the rear wheel steering controller are bias compensated. This compensates for variations in manufacturing, temperature, and mounting. With the vehicle at rest the sensor should have a voltage output on both circuits of approximately 2.5 volts .

Steerable Rear Axle

The steerable rear axle has a rack and pinon mounted to the differential cover, and half shafts with upper and lower ball joints on movable hub and bearings assemblies . The rack is part of the differential cover. If a system malfunction occurs the rear wheels are moved back to center via an internal spring. The rack has redundant inner and outer tie rods ends . There are inner tie rod boots on the rack to prevent water and dirt from getting inside. Long term exposure to moisture due to a damaged boot or components can result in an internal malfunction. The rear wheel steering gear has the rear wheel steering gear motor

attached to the upper rack . There are shields and a skid plate type shield on the rear axle assembly to protect the steering gear. There are no internal adjustments to the rack . It is mandatory to preform a 4 wheel alignment if any hard parts , such as tie rods or ball joints or wheel bearings are serviced . The axle assembly is a heavier duty version of the standard rear axle on a non rear wheel steer truck . You must consult the owners manual and the trailer towing guide for specific towing capacities . The carrier contains 9.74 inch ring and pinon gear set. The quarter shafts are a special heavy duty design with up to 15 ° of movement and a special designed CV joint and boot at the wheel end of the axle .

Suspension Description and Operation

Front Suspension

The front suspension has 2 primary purposes:

- Isolate the driver from irregularities in the road surface.
- Define the ride and handling characteristics of the vehicle.

The front suspension absorbs the impact of the tires travelling over irregular road surfaces and dissipates this energy throughout the suspension system. This process isolates the vehicle occupants from the road surface. The rate at which the suspension dissipates the energy and the amount of energy that is absorbed is how the suspension defines the vehicle's ride characteristics. Ride characteristics are designed into the suspension system and are not adjustable. The ride characteristics are mentioned in this description in order to aid in the understanding of the functions of the suspension system. The suspension system must allow for the vertical movement of the tire and wheel assembly as the vehicle travels over irregular road surfaces while maintaining the tire's horizontal relationship to the road.

This requires that the steering knuckle be suspended between an upper and a lower control arm. The lower control arm attaches from the steering knuckle at the outermost point of the control arm. The attachment is through a ball and socket type joint. The innermost end of the control arm is attached at 2 points to the vehicle frame through semi-rigid bushings. The upper control arm attaches to the frame in the same fashion. Attached to the lower control arm is a torsion bar. Torsion bars are steel or steel composite shaft that connects from the lower control arm an adjustable mount at the torsion bar crossmember. The torsion bar functions as a spring in this suspension system. The torsion bar absorbs energy from irregular road surfaces by twisting force along the center axis. The torsion bar has a resistance to this twisting motion and will return to the original, at-rest position similar to that of a spring.

A shock absorber is used in conjunction with this system in order to dampen out the oscillations of the torsion bar. A shock absorber is a basic hydraulic cylinder. The shock is filled with oil and has a moveable shaft that connects to a piston inside the shock absorber. Valves inside the shock absorber offer resistance to oil flow and consequently offer resistance to rapid movement of the piston and shaft. Each end of the shock absorber is connected in such a fashion in order to utilize this recoil action of a torsion bar alone.

Front suspension systems utilize a stabilizer shaft. The stabilizer bar connects between the left and right lower control arm assemblies through the stabilizer link and stabilizer shaft insulators. This bar controls the amount of independent movement of the suspension when the vehicle turns. Limiting the independent movement defines the vehicle's handling characteristics on turns.

Rear Suspension

All pickup models and 25 series Suburban/Yukon XL models use a rear spring suspension system and a solid rear axle suspension system. The rear axle is attached to the multi-rear springs by U-bolts. The front of the spring ends are attached to the frame at the front hangers through rubber bushings. The rear of the spring ends are attached to the frame with shackles that allow the springs to change their length, due to the spring compressing, while the vehicle is in motion. The ride control is provided by 2 identical direct dual-action shock absorbers that are angle-mounted between the frame and the brackets which are attached to the axle tubes.

All 15 series utility vehicles use a 5-link rear suspension system. The rear axle is attached to the frame with the upper control arms, lower control arms, and a track bar. Two coil springs and a link mounted rear stabilizer shaft complete the system.

The ride control is provided by 2 identical direct dual-action shock absorbers that are angle-mounted between the frame and the brackets which are attached to the axle tubes. Also available are the Autoride™ and self adjusting level control shocks as well as the gas charged monotube shocks. For information about the Autoride™ components refer to Real Time Damping below. The self adjusting level control shock utilizes a hydraulic pump inside each shock and raises the rear of the vehicle to the proper height based on inputs from the road surface while the vehicle is being driven.

Real Time Damping Description

The RTD system is bi-state real time damping system. The Electronic Suspension Control (ESC) module controls the suspension damper solenoids and suspension position sensors, along with parts of the automatic level control (ALC) system and electronic variable orifice (EVO) power steering system.

The RTD system consists of the following:

- ESC Module
- Compressor/Leveling Module
  - Air Pressure Sensor
  - Exhaust Solenoid
- Compressor Motor Relay
- Steering Handwheel Speed/Position Sensor
- Electronic Variable Orifice (EVO) Solenoid
- Suspension Damper Solenoids
- Suspension Position Sensors

The objective of the ESC module is to provide ride and handling results that are superior to a passive damper system, both on and off road at all load conditions. The ESC module monitors body-to-wheel height, vehicle speed, handwheel position/speed, lift/dive status and a driver tow/haul input switch status in real time and instantly selects a "normal" or "firm" mode. This is done for each of the front and rear shock absorbers in order to adjust the vehicle for specific road and driving conditions.

The ESC module will use the rear body-to-wheel displacements and vehicle speed inputs to keep the rear trim height of the vehicle at its desired level.

The ESC module also uses the steering handwheel position/speed sensor and vehicle speed inputs to control a power steering effort control valve.

The suspension damper solenoid is driven ON and OFF by the ESC module. To activate the solenoid, it is initially subjected to full battery voltage for a short period of time. Once the solenoid is pulled-in, the supply voltage is pulse width modulated (PWM). The amount the suspension damper solenoid is activated is based on inputs from the driver Tow/Haul switch, road inputs, position sensor inputs and the PCM. The ESC module provides a common ground for all four of the suspension damper solenoids.

The ESC module provides a common regulated voltage of approximately 5 volts to all four of the body-to-wheel suspension position sensors, air pressure sensor and the steering handwheel position/speed sensor. The ESC module receives VSS discrete output from the PCM. The suspension position sensors provide an analog signal voltage between 0.5 and 4.5 volts to the ESC module. This signal voltage represents the wheel's position relative to the body. The ESC module provides a 5 volt reference and a low reference to the suspension position sensors.

Ignitión cycle counting is used by the ESC module to detect faults in the system. The objective is to eliminate false/intermittent codes while maintaining an acceptable level of system performance. The operation of the ignition cycle counting requires that a fault condition be present for four consecutive ignition cycles before it will set the fault code and display the "SERVICE RIDE CONTROL" message. If a fault code is present (without a fault being current), the system will go into one or more degraded modes without displaying a message. Resetting the ignition cycle counter is done by clearing codes with a scan tool. Clearing codes will override ignition cycle counting for one ignition cycle. Therefore, a fault condition will set the fault code immediately if it occurs on the first ignition cycle after the codes are cleared.

There are two different ESC modules being used in the 02 MY. They have the same Z55 RPO, except that one also has and additional ZK3 RPO. The module with the additional ZK3 RPO connects to the EVO solenoid.

Automatic Level Control Description

The RTD system is bi-state real time damping system. The Suspension Control module controls the suspension damper solenoids and suspension position sensors, along with parts of the automatic level control (ALC) system and electronic variable orifice (EVO) power steering system.

The Automatic Level Control system consists of the following:

- Suspension Control Module
- Compressor/Leveling Module
  - Air Pressure Sensor
  - Exhaust Solenoid
- Compressor Motor Relay

The objective of the Automatic Level Control System is to provide constant ride height at all load conditions. The Suspension Control module monitors body-to-wheel height, and vehicle speed.

The Suspension Control module will use the rear body-to-wheel displacements and vehicle speed inputs to keep the rear trim height of the vehicle at its desired level.

Wheels and Tires

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Hoist to Crossmember Nut	40 N·m	30 lb ft
Wheel Nut Stud	190 N·m	140 lb ft

General Description

The factory installed tires are designed to operate satisfactorily with loads up to and including the full rated load capacity when these tires are inflated to the recommended pressures.

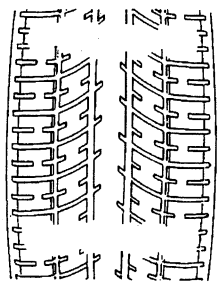
The following factors have an important influence on tire life:

- Correct tire pressures
- Correct wheel alignment
- Proper driving techniques
- Tire rotation

The following factors increase tire wear:

- Heavy cornering
- Excessively rapid acceleration
- Heavy braking

Tread Wear Indicators Description



The original equipment tires have tread wear indicators that show when you should replace the tires.

The location of these indicators are at 72 degree intervals around the outer diameter of the tire. The indicators appear as a 6 mm (0.25 in) wide band when the tire tread depth becomes 1.6 mm (2/32 in).

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

Tire Description

Caution

Do not mix different types of tires on the same vehicle such as radial, bias, and bias-belted tires except in emergencies because vehicle handling may be seriously affected and may result in loss of control and possible serious injury.

This vehicle is equipped with speed rated tires. Listed below are the common speed rating symbols and the corresponding maximum speeds:

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

A Tire Performance Criteria (TPC) specification number is molded in the sidewall near the tire size of all original equipment tires. Usually, a specific TPC number is assigned to each tire size. The TPC specification number assures that the tire meets the following GM's performance standards.

- Meets the standards for traction.
- Meets the standards for endurance.
- Meets the standards for dimension.
- Meets the standards for noise.
- Meets the standards for handling.
- Meets the standards for rolling resistance, and others.

The following is required of replacement tires:

- Replacement tires must be of the same size as the original tires.
- Replacement tires must be of the same speed rating as the original tires.
- Replacement tires must be of the same load index as the original tires.
- Replacement tires must be of the same construction as the original tires.
- Replacement tires must have the same TPC specification number as the original tires.

The following may seriously be affected by the use of any other tire size, tire speed rating or tire type:

- May seriously affect the ride.
- May seriously affect the handling.

- May seriously affect the speedometer/odometer calibration.
- May seriously affect the antilock brake system.
- May seriously affect the vehicle ground clearance.
- May seriously affect the trailering capacity.
- May seriously affect the tire clearance to the body.
- May seriously affect the tire clearance to the chassis.

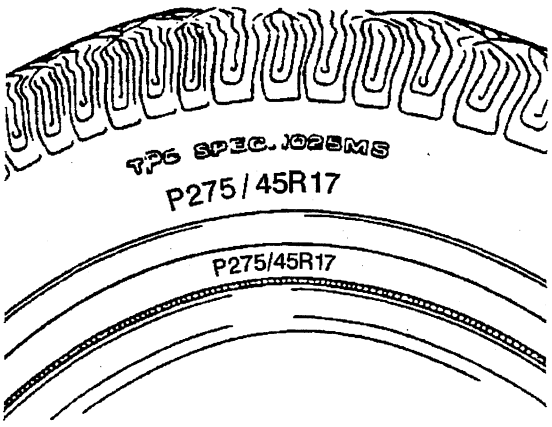
Conditions for Tire Replacement

Replace the tires when one and/or all of the following conditions are evident:

- When the tire(s) is worn to a point where 1.6 mm (2/32 in) or less of tread remains. The tires have built in tread wear indicators that appear between the tread grooves when the tread is worn to 1.6 mm (2/32 in) or less to help in the detection of this condition. Replace the tire when the indicators appear in two or more adjacent grooves at three spots around the tire.
- When the following conditions are evident on the tread:
  - When the tread is cracked.
  - When the tread is cut.
  - When the tread is snagged deeply enough to expose the cord.
  - When the tread is snagged deeply enough to expose the fabric.
  - When the sidewall is snagged deeply enough to expose the cord.
  - When the sidewall is snagged deeply enough to expose the fabric.
- When the following conditions are evident on the tire:
  - When the tire has a bump.
  - When the tire has a bulge (protrusion).
  - When the tire is split.
  - Please note that slight sidewall indentations are normal in radial tires.
- When the following damage is evident on the tire and the damage cannot be correctly repaired because of the size or the location of the damage:
  - When the tire has a puncture.
  - When the tire is cut, or other damage.

Always install new tires in pairs on the same axle. In the event that only one tire is replaced, then pair with the tire having the most tread.

All Seasons Tires Description

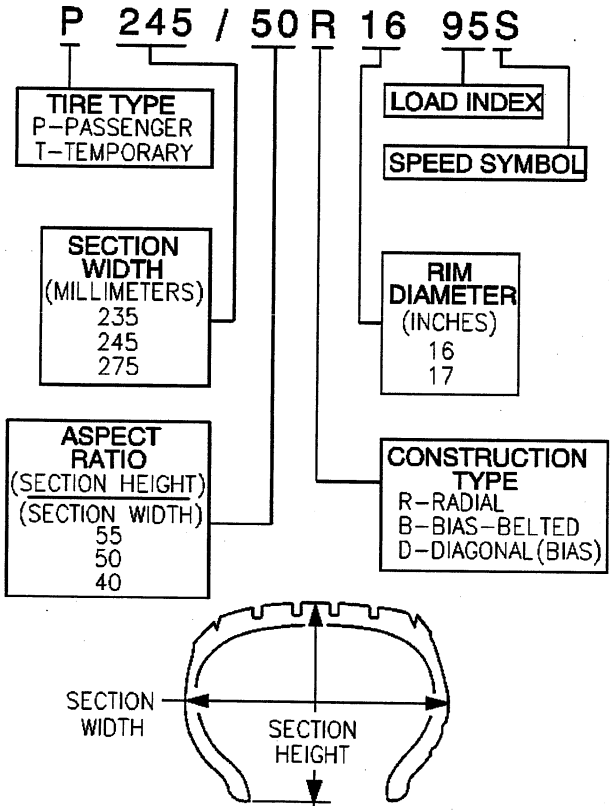


Most GM vehicles are equipped with steel belted all-season radial tires as standard equipment. These tires qualify as snow tires, with a higher than average rating for snow traction than the non-all season

radial tires previously used. Other performance areas, such as wet traction, rolling resistance, tread life, and air retention, are also improved. This is done by improvements in both tread design and tread compounds. These tires are identified by an M + S molded in the tire side wall after the tire size. The suffix MS is also molded in the tire side wall after the TPC specification number.

The optional handling tires used on some vehicles now also have the MS marking after the tire size and the TPC specification number.

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

The propeller shaft is a tube with universal joints at both ends which do not require periodic maintenance, that transmit power from the transfer case or transmission output shaft to the differential.

Front Propeller Shaft Description

The front propeller shaft transmits rotating force from the transfer case to the front differential when the transfer case is engaged. The front propeller shaft connects to the transfer case using a splined slip joint.

One Piece Propeller Shaft Description

A 1 piece propeller shaft uses a splined slip joint to connect the driveline to the transmission or transfer case.

Two Piece Propeller Shaft Description

There are 3 universal joints used on the two piece propeller shaft, A center bearing assembly is used to support the propeller shaft connection point, and help isolate the vehicle from vibration.

Propeller Shaft Phasing Description

The propeller shaft is designed and built with the yoke lugs (ears) in line with each other. This produces the smoothest running shaft possible. A propeller shaft designed with built in yoke lugs in line is known as in - phase. An out of phase propeller shaft often causes vibration. The propeller shaft generates vibration from speeding up and slowing down each time the universal joint goes around. The vibration is the same as a person snapping a rope and watching the wave reaction flow to the end. An in phase propeller shaft is similar to 2 persons snapping a rope at the same time and watching the waves meet and cancel each other out. A total cancellation of vibration produces a smooth flow of power in the drive line. All splined shaft slip yokes are keyed in order to ensure proper phasing.

Universal Joint Description

The universal joint is connected to the propeller shaft. The universal consist of 4 caps with needle bearings and grease seals mounted on the trunnions of a cross or spider. These bearings and caps are greased at the factory and no periodic maintenance is required. There are 2 universal joints used in a one piece propeller shaft and 3 used in two piece propeller shaft. The bearings and caps are pressed into the yokes and held in place with snap rings, except for 2 bearings on some models witch are strapped onto the pinion flange of the differential. Universal joints are designed to handle the effects of various loads and rear axle windup conditions during acceleration and braking. The universal joint operates efficiently and safely within the designed angle variations. when the design angles are exceeded, the operational life of the joint decreases.

Center Bearing Description

Center bearings support the driveline when using 2 or more propeller shafts. The center bearing is a ball bearing mounted in a rubber cushion that attaches to a frame crossmember. The manufacturer prelubricates and seals the bearing. The cushion allows vertical motion at the driveline and helps isolate the vehicle from vibration.

Wheel Drive Shafts Description and Operation

Front Wheel Drive Shafts are flexible assemblies which consist of the following components:

- Front wheel drive shaft constant velocity joint outer joint.
- Front wheel drive shaft tri-pot joint inner joint.
- The front wheel drive shaft connects the front wheel drive shaft tri-pot joint and the front wheel drive shaft constant velocity joint.
- Wheel Drive Shaft Seal Cover 15 Series

- The front wheel drive shaft tri-pot joint is completely flexible, and moves with an in and out motion.
- The front wheel drive shaft constant velocity joint is flexible but can not move in and out.

The Wheel Drive Shaft is a balanced shaft that transmits rotational force from the front differential to the front wheels when the transfer case is engaged. The wheel drive shaft is mounted to the front differential by bolting the flange of the wheel drive shaft to the flange on the inner output shaft of the front differential. The other end of the wheel drive shaft is splined to fit into and drive the hub assembly when the transfer case is engaged. The tri-pot joint and constant velocity joint on the wheel drive shaft allows the shaft to be flexible to move with the suspension travel of the vehicle.

Front Drive Axle Description and Operation

Selectable Four Wheel Drive (S4WD) Front Axle Description and Operation

The Selectable Four Wheel Drive (S4WD) Front Axle consist of the following components:

- Differential Carrier Housing
- Differential Assembly
- Output Shafts (Left and Right Side)
- Inner Axle Shaft Housing
- Inner Axle Shaft (Right Side)
- Clutch Fork
- Clutch Fork Sleeve
- Electric Motor Actuator

The front axle on Selectable Four Wheel Drive model vehicles uses a central disconnect feature in order to engage and disengage the front axle. When the driver engages the 4WD system, the Transfer Case Control Module sends a signal to the electric motor actuator to energize and extend the plunger inside. The extended plunger moves the clutch fork and clutch fork sleeve across the inner axle shaft and the clutch fork shaft and locks the two shafts together. The locking of the two shafts allows the axle to operate in the same manner as a semi-floating rear axle. A propeller shaft connects the transfer case to the front axle. The differential carrier assembly uses a conventional ring and pinion gear set to transmit the driving force of the engine to the wheels. The open differential allows the wheels to turn at different rates of speed while the axle continues to transmit the driving force. This prevents tire scuffing when going around corners and premature wear on internal axle parts. The ring and pinion set and the differential are contained within the carrier. The axle identification number is located on top of the differential carrier assembly or on a label on the bottom of the right half of differential carrier assembly. The drive axles are completely flexible assemblies consisting of inner and outer constant velocity CV joints protected by thermoplastic boots and connected by a wheel drive shaft.

Full-Time Four Wheel Drive (F4WD) Front Axle Description and Operation

The Full-Time Four Wheel Drive (F4WD) Front Axle consist of the following components:

- Differential Carrier Housing
- Differential Assembly
- Output Shaft (Left Side)
- Inner Axle Shaft Housing
- Inner Axle Shaft (Right Side)

The front axle on Full-Time Four Wheel Drive model vehicles does not have a central disconnect feature in order to engage and disengage the front axle. The left and right axle shafts are connected directly to the differential case assembly. This allows the axle shafts and the propeller shaft to spin continuously. The transfer case controls the amount of torque applied to the front axle. The remaining components are the same as the selectable four wheel drive axle.

Rear Drive Axle Description and Operation

Rear axles for this vehicle consist of the following components:

- Differential axle housing
- Differential carrier
- Right and left axle tubes
- Right and left axle shafts

These axles are either full-floating or semi-floating. These axles can be identified as follows: the semi-floating axle has axle shafts with C-clips inside the differential carrier on the inner ends of the axle shafts. The full-floating axle has bolts at the hub retaining the axle shafts to the hub assembly. The axles can be identified by the stamping on the right side axle tube and may also be identified by the ring gear size. The ring gear sizes include 8.60, 9.50, and 10.50 inch axles. The locking differential information for these rear axles can be located in the locking differential section.

The driveline components in this vehicle have been system balanced at the factory. System balance provides for a smoother running driveline. These components include the propeller shafts, drive axles, pinion shafts and output shafts. Affixed to the rear axle is a system balanced driveline notice indicating that the driveline components have been factory tested. All components must be referenced marked before disassembly and reassembly in the exact relationship to each other the components had before removal.

An open differential has a set of four gears. Two are side gears and two are pinion gears. Some differentials have more than two pinion gears. Each side gear is splined to an axle shaft which turns when it's side gear rotates. The pinion gears are mounted on a differential pinion shaft, and the gears are free to rotate on this shaft. The pinion shaft is fitted into a bore in the differential case and is at right angles to the axle shafts. Power is transmitted through the differential as follows: the drive pinion rotates the ring gear. The ring gear, which is bolted to the differential case, rotates the case. The differential pinion, as it rotates the case, forces the pinion gears against the side gears. When both wheels have equal traction, the pinion gears do not rotate on the pinion shaft because the input force on the pinion gear is equally divided between the two side gears. Therefore, the pinion gears revolve with the pinion shaft, but do not rotate around the shaft itself. The side gears, being splined to the axle shafts and in mesh with the pinion gears rotate the axle shafts. If a vehicle were always driven in a straight line, the ring and pinion gears would be sufficient. The axle shaft could be solidly attached to the ring gear and both driving wheels would turn at equal speed. However, if it became necessary to turn a corner, the tires would scuff and slide because the differential allows the axle shafts to rotate at different speeds. When the vehicle turns a corner, the inner wheel turns slower than the outer wheel and slows it's rear axle side gear because the shaft is splined to the side gear. The rear axle pinion gears will roll around the slowed rear axle side gear, driving the rear axle side gear wheel faster.

Locking/Limited Slip Rear Axle Description and Operation

The locking differential consists of the following components:

- Differential case - 1 or 2 piece
- Locking differential spider - 2 piece case only
- Pinion gear shaft - 1 piece case only
- Differential pinion gear shaft lock bolt - 1 piece case only
- 2 clutch discs sets
- Locking differential side gear
- Thrust block
- Locking differential clutch disc guides
- Differential side gear shim
- Locking differential clutch disc thrust washer
- Locking differential governor
- Latching bracket
- Cam plate assembly

- Differential pinion gears
- Differential pinion gear thrust washers

The optional locking differential (RPO G80) enhances the traction capability of the rear axle by combining the characteristics of a limited-slip differential and the ability of the axle shafts to "lock" together when uneven traction surfaces exist. The differential accomplishes this in 2 ways. First by having a series of clutch plates at each side of the differential case to limit the amount of slippage between each wheel. Second, by using a mechanical locking mechanism to stop the rotation of the right differential side gear, or the left differential side gear on the 10.5 inch axle, in order to transfer the rotating torque of the wheel without traction to the wheel with traction. Each of these functions occur under different conditions.

Limited-Slip Function

Under normal conditions, when the differential is not locked, a small amount of limited-slip action occurs. The gear separating force developed in the right-hand (left-hand side on 10.5 inch axle) clutch pack is primarily responsible for this.

The operation of how the limited-slip function of the unit works can be explained when the vehicle makes a right-hand turn. Since the left wheel travels farther than the right wheel, it must rotate faster than the ring gear and differential case assembly. This results in the left axle and left side gear rotating faster than the differential case. The faster rotation of the left-side gear causes the pinion gears to rotate on the pinion shaft. This causes the right-side gear to rotate slower than the differential case.

Although the side gear spreading force produced by the pinion gears compresses the clutch packs, primarily the right side, the friction between the tires and the road surface is sufficient to overcome the friction of the clutch packs. This prevents the side gears from being held to the differential case.

Locking Function

Locking action occurs through the use of some special parts:

- A governor mechanism with 2 flyweights
- A latching bracket
- The left side cam plate and cam side gear

When the wheel-to-wheel speed difference is 100 RPM or more, the flyweights of the governor will fling out and one of them will contact an edge of the latching bracket. This happens because the left cam side gear and cam plate are rotating at a speed different, either slower or faster, than that of the ring gear and differential case assembly. The cam plate has teeth on its outer diameter surface in mesh with teeth on the shaft of the governor.

As the side gear rotates at a speed different than that of the differential case, the shaft of the governor rotates with enough speed to force the flyweights outward against spring tension. One of the flyweights catches its edge on the closest edge of the latching bracket, which is stationary in the differential case. This latching process triggers a chain of events.

When the governor latches, it stops rotating. A small friction clutch inside the governor allows rotation, with resistance, of the governor shaft while one flyweight is held to the differential case through the latching bracket. The purpose of the governor's latching action is to slow the rotation of the cam plate as compared to the cam side gear. This will cause the cam plate to move out of its detent position.

The cam plate normally is held in its detent position by a small wave spring and detent humps resting in matching notches of the cam side gear. At this point, the ramps of the cam plate ride up on the ramps of the cam side gear, and the cam plate compresses the left clutch pack with a self-energizing action.

As the left clutch pack is compressed, it pushes the cam plate and cam side gear slightly toward the right side of the differential case. This movement of the cam side gear pushes the thrust block which compresses the right-hand side gear clutch pack.

At this point, the force of the self-energizing clutches and the side gear separating force combine to hold the side gears to the differential case in the locking stage.

The entire locking process occurs in less than 1 second. The process works with either the left or right wheel spinning, due to the design of the governor and cam mechanism. A torque reversal of any kind will unlatch the governor, causing the cam plate to ride back down to its detent position. Cornering or deceleration during a transmission shift will cause a torque reversal of this type. The differential unit returns to its limited-slip function.

The self-energizing process would not occur if it were not for the action of one of the left clutch discs. This energizing disc provides the holding force of the ramping action to occur. It is the only disc which is splined to the cam plate itself. The other splined discs fit on the cam side gear.

If the rotating speed of the ring gear and differential case assembly is high enough, the latching bracket will pivot due to centrifugal force. This will move the flyweights so that no locking is permitted. During vehicle driving, this happens at approximately 32 km/h (20 mph) and continues at faster speeds.

When comparing the effectiveness of the locking differential, in terms of percent-of-grade capability to open and limited-slip units, the locking differential has nearly 3 times the potential of the limited-slip unit under the same conditions.

Locking Differential Torque-Limiting Disc

The locking differential design was modified in mid-1986 to include a load-limiting feature to reduce the chance of breaking an axle shaft under abusive driving conditions. The number of tangs on the energizing disc in the left-hand clutch pack was reduced allowing these tangs to shear in the event of a high-torque engagement of the differential locking mechanism.

At the time of failure of the load-limiting disc, there will be a loud bang in the rear axle and the differential will operate as a standard differential with some limited-slip action of the clutch packs at low torques.

The service procedure, when the disc tangs shear, involves replacing the left-hand clutch plates and the wave spring. It is also necessary to examine the axle shafts for twisting because at high torques it is possible to not only shear the load-limiting disc, but to also twist the axle shafts.

Transfer Case - NVG 246-NP8 (Two Speed Automatic)

The New Venture Gear model NVG 246 RPO NP8 transfer case is a two speed automatic, active, transfer case. The NVG 246 transfer case has many changes from prior years. The NVG 246 is now classified as an Electronic Architect Upgrade (EAU). The upgrades to the NVG 246 EAU include some of the following internal changes:

- A new encoder motor for faster operation in the AWD mode.
- The control actuator lever (3) is a new design with different cam angles.
- The shift detent plunger and spring is no longer used.
- The clutch assembly (1) uses a new style return spring and clutch washer.
- A new rear output shaft (2) no longer uses a retaining ring by the oil pump.
- The range shift fork (4) is a newer design.

The NVG 246 EAU provides 5 modes, Auto 4WD, 4HI, 4LO, 2HI and Neutral. The Auto 4WD position allows the capability of an active transfer case, which provides the benefits of on-demand torque biasing wet clutch and easy vehicle tuning through software calibrations. The software calibrations allow more features such as flexible adapt ready position and clutch preload torque levels. The technology allows for vehicle speed dependent clutch torque levels to enhance the performance of the system. For example, the system is calibrated to provide 0-5 ft lb of clutch torque during low speed, low engine torque operation, and predetermined higher torque for 40 km/h (25 mph) and greater. This prevents crow-hop and binding at low speeds and provides higher torque biases at higher vehicle speeds, in order to enhance stability.

The NVG 246 EAU transfer case features a 4 button shift control switch located on the instrument panel. When the ignition key is in the RUN position, the transfer case shift control module monitors the transfer case shift control switch to determine if the driver desires a new mode/range position. At a single press of the transfer case shift control switch, the lamp of the new desired position will begin flashing to inform the driver that the transfer case shift control module has received the request for a new mode/range position.

The lamp will continue to flash until all shifting criteria has been met and the new mode/range position has been reached, or has been engaged. Once the new mode/range position is fully active, the switch indicator lamp for the new position will remain ON constantly.

During normal driving situations, the transfer case can operate in the Auto 4WD mode. In the Auto 4WD mode, the transfer case shift control module monitors rear wheel slip speed, based on the inputs from both the front and rear propshaft speed sensors. When the vehicle experiences a rear wheel slip condition, the transfer case shift control module sends a pulse width modulated (PWM) signal to an electronic motor, which is the transfer case encoder motor. This motor rotates the transfer case control actuator lever shaft, applying a clutch pack. This clutch pack is designed to deliver a variable amount of torque, normally delivered to the rear wheels, and transfers it to the front wheels. Torque is ramped up to the front wheels until the front propshaft speed sensor matches that of the rear propshaft speed sensor. Torque is ramped down to the front wheels. The process would repeat if rear wheel slip is detected again.

The NVG 246 EAU transfer case has the added feature of also providing the driver with 3 manual mode/range positions:

- 4HI - 4 Wheel Drive high range
- 2HI - 2 Wheel Drive high range
- 4LO - 4 Wheel Drive low range

The driver may choose to select any of these mode/range positions while driving the vehicle. However, the transfer case will not allow a shift into or out of 4LO unless the following criteria has been met:

- The engine is running.
- The automatic transmission is in Neutral.
- The vehicle speed is below 5 km/h (3 mph).

This transfer case also has a Neutral position. A shift to the Neutral position allows the vehicle to be towed without rotating the transmission output shaft. Neutral position may be obtained only if the following criteria has been met:

- The engine is running.
- The automatic transmission is in Neutral.
- The vehicle speed is below 5 km/h (3 mph).
- The transfer case is in 2HI mode.

Once these conditions have been met, press and hold both the 2HI and 4LO buttons for 10 seconds. When the system completes the shift to neutral, the red neutral lamp will illuminate.

The NVG 246 EAU case halves are high-pressure die-cast magnesium. Ball bearings support the input shaft, the front output shaft, and the rear output shaft. A thrust bearing is located inside of the input shaft gear to support the front of the rear output shaft. The transfer case requires Auto Trac® II Fluid GM P/N 12378508 (Canadian P/N 10953626) which is blue in color. The fluid is designed for smooth clutch application. An oil pump, driven by the rear output shaft, pumps the fluid through the rear output shaft oil gallery to the clutch and bearings.

There are two versions of the NVG 246 EAU, which depend on the transmission applications and vehicle applications. If the vehicle is equipped with a transmission RPO M30, the transmission splines in the input gear will have 27 teeth. With this application the planetary carrier assembly will have 4 pinion gears. If the vehicle is equipped with transmission RPO MT1 or MN8, the transmission splines in the input gear will have 32 teeth. The planetary carrier assembly on this application will have 6 pinion gears.

Transfer Case - BW 4482-NR4

The Borg Warner (BW) model 4482 NR4 transfer case is a two-speed, full time 4WD, transfer case. The transfer case has an external planetary type differential, which has two different sets of pinion gears. The planetary differential provides a 40/60 torque split front/rear full time. This means the front and rear propeller shafts are constantly being driven for maximum traction in all conditions.

While in the 4HI mode, the transfer case external type planetary differential functions the same as a typical rear axle differential. The transfer case differential pinion gears function as the spider gears, and the sun gears function as the side gears.

The following actions occur because of the planetary differential:

- If the vehicle is on a hoist, and in the 4HI mode, the front propeller shaft can be rotated by hand.
- The vehicle cannot be driven in the 4HI mode if one propeller shaft is removed.
- Operating the vehicle on the hoist, in the 4HI mode, can damage the differential pinion gears, by over-spinning.
- Operating the vehicle with one propeller shaft removed, in the 4HI mode, causes over-spinning of the differential pinion gears.

The BW 4482 design of the planetary differential allows use with the Vehicle Stability Enhancement System (VSES) vehicles. The VSES takes use of the planetary differential, by applying braking to a tire that has less traction and dividing the engine torque to the other axle. A high/low planetary carrier assembly provides the high and low ranges, which is a 4-pinion gear, sun gear, and annulus gear arrangement, giving a 2.64 low range reduction ratio.

The BW 4482 case halves are high-pressure die-cast magnesium. Ball bearings support the input shaft, the front output shaft, and the rear output shaft. A needle roller bearing is located inside of the input shaft gear to support the front of the mainshaft. The rear of the mainshaft is supported by a bronze bearing inside the rear output shaft. The transfer case requires DEXRON®III ATF Fluid GM P/N 12346143 (Canadian P/N 10952622), which is red in color. An oil pump pumps the fluid through the mainshaft oil gallery to the gears and bearings.

Transfer Case Shift Control Switch

The BW 4482 transfer case features a 3-button shift control switch located on the instrument panel. When the vehicle has the ignition key in the RUN position, the transfer case shift control module starts monitoring the transfer case shift control switch to determine if the driver desires a new mode/range position. At a single press of the transfer case shift control switch, the lamp of the new desired position will begin flashing to inform the driver that the transfer case shift control module has received the request for a new mode/range position. The lamp will continue to flash until all shifting criteria have been met and the new mode/range position has been reached, or has been engaged. Once the new mode/range position is fully active, the switch indicator lamp for the new position will remain ON constantly. In addition, the switch includes a VSES request button which sends a voltage signal to the transfer case shift control module. The transfer case shift control module in turn sends a request via the class 2 data bus to the ABS control module which controls the VSES system.

During normal driving situations, the transfer case operates in the 4HI mode. When the 4HI mode is selected, the transfer case shift control module sends 12 volts to an electrical motor, which is the transfer case encoder motor. This motor rotates the transfer case shift detent lever shaft which moves the shift forks and range sleeve to obtain different modes/ranges.

The BW 4482 transfer case has the added feature of also providing the driver with 2 selectable mode/range positions and a VSES request button:

- 4HI - Full Time 4 Wheel Drive
- 4LO - 4 Wheel Drive Low Locked
- VSES - Vehicle Stability Enhancement System

The transfer case will not allow a shift into or out of 4LO unless the following criteria has been met:

- The engine is running.
- The automatic transmission is in Neutral.
- The vehicle speed is below 5 km/h (3 mph).

This transfer case also has a Neutral position. A shift to the Neutral position allows the vehicle to be towed without the transmission output shaft rotating. Refer to the Owners Manual for instructions for proper towing of the vehicle.

Neutral position may be obtained only if the following criteria have been met:

- The ignition switch is ON.
- The automatic transmission is in Neutral.
- The vehicle speed is below 5 km/h (3 mph).

- The transfer case is in the 4HI mode.

Once these conditions have been met, press and hold both the 4HI and 4LO Lock buttons for 10 seconds. When the system completes the shift to neutral, the red neutral indicator will illuminate.

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

The park brake system is applied by depressing the park brake pedal. Applying the park brake pedal places tension on the park brake cables, which actuates the rear park brake mechanism. The system mechanically forces the parking brake shoes against the drum of the rotor, locking the rear brakes.

All vehicles are equipped with a four-wheel disc braking system. The park brake system uses brake shoes which are inside a brake drum that is part of a one-piece drum/rotor casting. The brake shoes are mechanically applied to lock the rear brakes.

This section covers park brake component replacement and adjustment. The park brake must be adjusted any time the park brake cables have been replaced or disconnected, or if the park brake holding ability is inadequate. The lever on the disc brakes must also be properly seated when this procedure is performed.

The park brake is not designed for use in the place of service brakes and should be applied only after the vehicle is brought to a complete stop, except in an emergency. Before working on the park brake system, make sure the service brakes are in good working order and adjusted properly.

Park Brake Lever

The park brake lever is located on the left side of the driver's compartment and is activated by foot pressure. The park brake lever incorporates a cable self adjusting mechanism. The park brake release handle under the instrument panel allows the driver to release the park brake and control the foot lever release velocity. The park brake lever requires minimal pedal effort to engage the park brake.

Cable System

The park brake uses a cable system that includes a front cable, an intermediate cable with a threaded rod and an equalizer, and two rear cables. The front cable connects to the park brake lever on one end and to the intermediate cable at the other end. The rear cables attach to the equalizer on one end and to the lever on the disc brakes at the other end.

This vehicle is equipped with coated park brake cable assemblies. The wire strand is coated with a nylon material that slides over plastic seals inside the conduit end fittings. This is for corrosion protection and reduced park brake effort.

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.

Engine Description and Operation

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.

Engine Mechanical –5.3, 6.0L

General Specifications 5.3L (LM7 VIN T)

Application	Specification	
	Metric	English
General		
• Engine Type	V8	
• Displacement	5.3L	325 CID
• RPO	LM7	
• VIN	T	
• Bore	96.0-96.018 mm	3.779-3.78 in
• Stroke	92.0 mm	3.622 in
• Compression Ratio	9.49:1	
• Firing Order	1-8-7-2-6-5-4-3	
• Spark Plug Gap	1.524 mm	0.06 in
Block		
• Camshaft Bearing Bore 1 and 5 Diameter	59.12-59.17 mm	2.327-2.329 in
• Camshaft Bearing Bore 2 and 4 Diameter	58.87-58.92 mm	2.317-2.319 in
• Camshaft Bearing Bore 3 Diameter	58.62-58.67 mm	2.307-2.309 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	96.0-96.018 mm	3.779-3.78 in
• Cylinder Bore Taper - Thrust Side	0.018 mm	0.0007 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 - Exhaust	6.96 mm	0.274 in
• Camshaft Lobe Lift - Intake	6.82 mm	0.268 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
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	64.993-65.007 mm	2.558-2.559 in
• Crankshaft Main Journal Diameter - Service	64.993 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	5.68 Liters	6.0 Quarts
• Oil Capacity - without Filter	4.73 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
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	0.23-0.44 mm	0.009-0.017 in
• Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Service	0.23-0.5 mm	0.009-0.0196 in
• Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Production	0.44-0.7 mm	0.017-0.027 in
• Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Service	0.44-0.76 mm	0.0173-0.03 in
• Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Production	0.18-0.75 mm	0.007-0.029 in
• Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Service	0.18-0.81 mm	0.007-0.032 in
• Piston Ring to Groove Clearance - First Compression Ring - Production	0.04-0.085 mm	0.00157-0.00335 in
• Piston Ring to Groove Clearance - First Compression Ring - Service	0.04-0.085 mm	0.00157-0.00335 in
• Piston Ring to Groove Clearance - Second Compression Ring - Production	0.04-0.078 mm	0.00157-0.0031 in
• Piston Ring to Groove Clearance - Second Compression Ring - Service	0.04-0.078 mm	0.00157-0.0031 in
• Piston Ring to Groove Clearance - Oil Control Ring - Production	0.012-0.2 mm	0.0005-0.0078 in
• Piston Ring to Groove Clearance - Oil Control Ring - Service	0.012-0.2 mm	0.0005-0.0078 in
Pistons and Pins		
• Piston - Piston Diameter - Measured Over Skirt Coating	96.002-96.036 mm	3.779-3.78 in
• Piston - Piston to Bore Clearance - Production	-0.036 to +0.016 mm	-0.0014 to +0.0006 in
• Piston - Piston to Bore Clearance - Service Limit with Skirt Coating Worn Off	0.07 mm	0.0028 in
• Pin - Piston Pin Fit in Connecting Rod Bore	0.02-0.043 mm - interference	0.00078-0.00169 in - interference
• Pin - Piston Pin Clearance to Piston Pin Bore - Production	0.007-0.02 mm	0.00027-0.00078 in
• Pin - Piston Pin Clearance to Piston Pin Bore - Service	0.007-0.021 mm	0.00027-0.00082 in
• Pin - Piston Pin Diameter	23.997-24.0 mm	0.9447-0.9448 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	11.6 mm	0.457 in
• Valves - Valve Lift - Exhaust	11.85 mm	0.466 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
• 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

General Specifications 5.3L (L59 VIN Z)

Application	Specification	
	Metric	English
General		
• Engine Type	V8	
• Displacement	5.3L	325 CID
• RPO	L59	
• VIN	Z	
• Bore	96.0-96.018 mm	3.779-3.78 in
• Stroke	92.0 mm	3.622 in
• Compression Ratio	9.49:1	
• Firing Order	1-8-7-2-6-5-4-3	
• Spark Plug Gap	1.524 mm	0.06 in
Block		
• Camshaft Bearing Bore 1 and 5 Diameter	59.12-59.17 mm	2.327-2.329 in
• Camshaft Bearing Bore 2 and 4 Diameter	58.87-58.92 mm	2.317-2.319 in
• Camshaft Bearing Bore 3 Diameter	58.62-58.67 mm	2.307-2.309 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	96.0-96.018 mm	3.779-3.78 in
• Cylinder Bore Taper - Thrust Side	0.018 mm	0.0007 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 - Exhaust	6.96 mm	0.274 in
• Camshaft Lobe Lift - Intake	6.82 mm	0.268 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
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	64.993-65.007 mm	2.558-2.559 in
• Crankshaft Main Journal Diameter - Service	64.993 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	5.68 Liters	6.0 Quarts
• Oil Capacity - without Filter	4.73 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
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	0.23-0.44 mm	0.009-0.017 in
• Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Service	0.23-0.5 mm	0.009-0.0196 in
• Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Production	0.44-0.7 mm	0.017-0.027 in
• Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Service	0.44-0.76 mm	0.0173-0.03 in
• Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Production	0.18-0.75 mm	0.007-0.029 in
• Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Service	0.18-0.81 mm	0.007-0.032 in
• Piston Ring to Groove Clearance - First Compression Ring - Production	0.04-0.085 mm	0.00157-0.00335 in
• Piston Ring to Groove Clearance - First Compression Ring - Service	0.04-0.085 mm	0.00157-0.00335 in
• Piston Ring to Groove Clearance - Second Compression Ring - Production	0.04-0.078 mm	0.00157-0.0031 in
• Piston Ring to Groove Clearance - Second Compression Ring - Service	0.04-0.078 mm	0.00157-0.0031 in
• Piston Ring to Groove Clearance - Oil Control Ring - Production	0.012-0.2 mm	0.0005-0.0078 in
• Piston Ring to Groove Clearance - Oil Control Ring - Service	0.012-0.2 mm	0.0005-0.0078 in
Pistons and Pins		
• Piston - Piston Diameter - Measured Over Skirt Coating	96.002-96.036 mm	3.779-3.78 in
• Piston - Piston to Bore Clearance - Production	-0.036 to +0.016 mm	-0.0014 to +0.0006 in
• Piston - Piston to Bore Clearance - Service Limit with Skirt Coating Worn Off	0.071 mm	0.0028 in
• Pin - Piston Pin Fit in Connecting Rod Bore	0.02-0.043 mm - interference	0.00078-0.00169 in - interference
• Pin - Piston Pin Clearance to Piston Pin Bore - Production	0.007-0.02 mm	0.00027-0.00078 in
• Pin - Piston Pin Clearance to Piston Pin Bore - Service	0.007-0.021 mm	0.00027-0.00082 in
• Pin - Piston Pin Diameter	23.997-24.0 mm	0.9447-0.9448 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	11.6 mm	0.457 in
• Valves - Valve Lift - Exhaust	11.85 mm	0.466 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
• 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	0.025-0.066 mm	0.001-0.0026 in

- Intake		
• 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

General Specifications 6.0L (LQ4 VIN U)

Application	Specification	
	Metric	English
General		
• Engine Type	V8	
• Displacement	6.0L	364 CID
• RPO	LQ4	
• VIN	U	
• Bore	101.618-101.636 mm	4.0007-4.0014 in
• Stroke	92.0 mm	3.622 in
• Compression Ratio	9.41:1	
• Firing Order	1-8-7-2-6-5-4-3	
• Spark Plug Gap	1.524 mm	0.06 in
Block		
• Camshaft Bearing Bore 1 and 5 Diameter - First Design	59.12-59.17 mm	2.327-2.329 in
• Camshaft Bearing Bore 2 and 4 Diameter - First Design	58.87-58.92 mm	2.317-2.319 in
• Camshaft Bearing Bore 3 Diameter - First Design	58.62-58.67 mm	2.307-2.309 in
• Camshaft Bearing Bore 1 and 5 Diameter - Second Design	59.62-59.67 mm	2.347-2.349 in
• Camshaft Bearing Bore 2 and 4 Diameter - Second Design	59.12-59.17 mm	2.327-2.329 in
• Camshaft Bearing Bore 3 Diameter - Second Design	58.62-58.67 mm	2.307-2.309 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 Bore Taper - Thrust Side	0.018 mm	0.0007 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 - Exhaust	7.13 mm	0.281 in
• Camshaft Lobe Lift - Intake	6.96 mm	0.274 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	0.006 mm	0.0002 in
• Connecting Rod Bore Out-of-Round - Bearing End - Service	0.006 mm	0.0002 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
• 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	64.993-65.007 mm	2.558-2.559 in
• Crankshaft Main Journal Diameter - Service	64.993 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	5.68 Liters	6.0 Quarts
• Oil Capacity - without Filter	4.73 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
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	0.31-0.52 mm	0.012-0.02 in
• Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Service	0.31-0.59 mm	0.0122-0.023 in
• Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Production	0.51-0.77 mm	0.02-0.03 in
• Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Service	0.51-0.84 mm	0.02-0.033 in
• Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Production	0.31-0.87 mm	0.0122-0.034 in
• Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Service	0.31-0.94 mm	0.0122-0.037 in
• Piston Ring to Groove Clearance - First Compression Ring - Production	0.04-0.08 mm	0.00157-0.0031 in
• Piston Ring to Groove Clearance - First Compression Ring - Service	0.04-0.08 mm	0.00157-0.0031 in
• Piston Ring to Groove Clearance - Second Compression Ring - Production	0.039-0.079 mm	0.0015-0.0031 in
• Piston Ring to Groove Clearance - Second Compression Ring - Service	0.039-0.079 mm	0.0015-0.0031 in
• Piston Ring to Groove Clearance - Oil Control Ring - Production	0.015-0.199 mm	0.0006-0.0078 in
• Piston Ring to Groove Clearance - Oil Control Ring - Service	0.015-0.199 mm	0.0006-0.0078 in
Pistons and Pins		
• Piston - Piston Diameter - Measured Over Skirt Coating	101.606-101.640 mm	4.0002-4.0016 in
• Piston - Piston to Bore Clearance - Production	-0.022 to +0.03 mm	-0.0009 to +0.0012 in
• Piston - Piston to Bore Clearance - Service Limit with Skirt Coating Worn Off	0.07 mm	0.0028 in
• Pin - Piston Pin Fit in Connecting Rod Bore	0.02-0.043 mm - interference	0.00078-0.00169 in - interference
• Pin - Piston Pin Clearance to Piston Pin Bore - Production	0.011-0.018 mm	0.0004-0.0007 in
• Pin - Piston Pin Clearance to Piston Pin Bore - Service	0.011-0.02 mm	0.0004-0.0008 in
• Pin - Piston Pin Diameter	23.997-24.0 mm	0.9447-0.9448 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	11.79 mm	0.464 in
• Valves - Valve Lift - Exhaust	12.16 mm	0.479 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
• Valves - Valve 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

General Specifications 6.0L (LQ9 VIN N)

Application	Specification	
	Metric	English
General		
• Engine Type	V8	
• Displacement	6.0L	364 CID
• RPO	LQ9	
• VIN	N	
• Bore	101.618-101.636 mm	4.0007-4.0014 in
• Stroke	92.0 mm	3.622 in
• Compression Ratio	10.08:1	
• Firing Order	1-8-7-2-6-5-4-3	
• Spark Plug Gap	1.524 mm	0.06 in
Block		
• Camshaft Bearing Bore 1 and 5 Diameter	59.12-59.17 mm	2.327-2.329 in
• Camshaft Bearing Bore 2 and 4 Diameter	58.87-58.92 mm	2.317-2.319 in
• Camshaft Bearing Bore 3 Diameter	58.62-58.67 mm	2.307-2.309 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 Bore Taper - Thrust Side	0.018 mm	0.0007 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 - Exhaust	7.13 mm	0.281 in
• Camshaft Lobe Lift - Intake	6.96 mm	0.274 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	0.006 mm	0.00023 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
• 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	64.993-65.007 mm	2.558-2.559 in
• Crankshaft Main Journal Diameter - Service	64.993 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	5.68 Liters	6.0 Quarts
• Oil Capacity - without Filter	4.73 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

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	0.31-0.52 mm	0.012-0.02 in
• Piston Ring End Gap - First Compression Ring - Measured in Cylinder Bore - Service	0.31-0.59 mm	0.0122-0.023 in
• Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Production	0.51-0.77 mm	0.02-0.03 in
• Piston Ring End Gap - Second Compression Ring - Measured in Cylinder Bore - Service	0.51-0.84 mm	0.02-0.033 in
• Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Production	0.31-0.87 mm	0.0122-0.034 in
• Piston Ring End Gap - Oil Control Ring - Measured in Cylinder Bore - Service	0.31-0.94 mm	0.0122-0.037 in
• Piston Ring to Groove Clearance - First Compression Ring - Production	0.035-0.08 mm	0.0014-0.0031 in
• Piston Ring to Groove Clearance - First Compression Ring - Service	0.035-0.08 mm	0.0014-0.0031 in
• Piston Ring to Groove Clearance - Second Compression Ring - Production	0.034-0.079 mm	0.0013-0.003 in
• Piston Ring to Groove Clearance - Second Compression Ring - Service	0.034-0.079 mm	0.0013-0.003 in
• Piston Ring to Groove Clearance - Oil Control Ring - Production	0.012-0.2 mm	0.00047-0.00078 in
• Piston Ring to Groove Clearance - Oil Control Ring - Service	0.012-0.2 mm	0.00047-0.00078 in
Pistons and Pins		
• 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 to +0.030 mm	-0.009 to +0.0012 in
• Piston - Piston to Bore Clearance - Service Limit with Skirt Coating Worn Off -	0.08 mm	0.0031 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	0.007-0.022 mm	0.00027-0.00086 in
• Pin - Piston Pin Clearance to Piston Pin Bore - Production	0.002-0.01 mm	0.00008-0.0004 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
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	11.79 mm	0.464 in
• Valves - Valve Lift - Exhaust	12.16 mm	0.479 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
• Valves - Valve 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

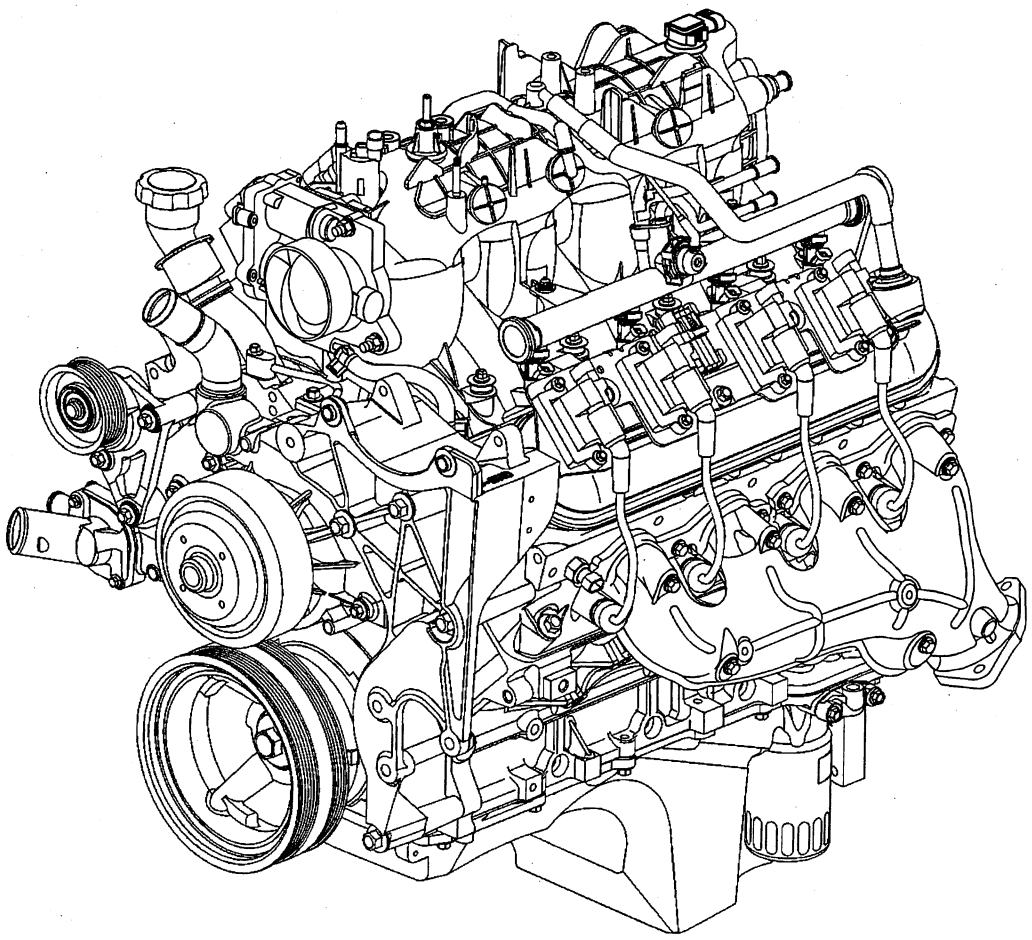
Application	Specification	
	Metric	English
Air Cleaner Outlet Duct Clamp	7 N·m	62 lb in
Air Conditioning Belt Tensioner Bolt	50 N·m	37 lb ft
Battery Cable Channel Bolt	12 N·m	106 lb in
Camshaft Retainer Bolts	25 N·m	18 lb ft
Camshaft Sensor Bolt	25 N·m	18 lb ft
Camshaft Sprocket Bolts	35 N·m	26 lb ft
Connecting Rod Bolts - First Pass	20 N·m	15 lb ft
Connecting Rod Bolts - Final Pass	75 degrees	
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 Bolts - First Pass in Sequence	20 N·m	15 lb ft
Crankshaft Bearing Cap Bolts - Outer Bolts - 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 Sensor Bolt	25 N·m	18 lb ft
Crossbar Bolt	100 N·m	74 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	90 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
Differential Carrier Lower Mounting Bolt/Nut	100 N·m	74 lb ft
Drive Belt Idler Pulley Bolt	50 N·m	37 lb ft
Drive Belt Tensioner Bolt	50 N·m	37 lb ft
Engine Block Coolant Drain Plugs	60 N·m	44 lb ft
Engine Block Heater	40 N·m	30 lb ft
Engine Block Oil Gallery Plugs	60 N·m	44 lb ft
Engine Coolant Air Bleed Pipe and Cover Bolts	12 N·m	106 lb in
Engine Flywheel Bolts - First Pass	20 N·m	15 lb ft
Engine Flywheel Bolts - Second Pass	50 N·m	37 lb ft
Engine Flywheel Bolts - Final Pass	100 N·m	74 lb ft
Engine Front Cover Bolts	25 N·m	18 lb ft
Engine Harness Ground Bolt - Right Rear	16 N·m	12 lb ft
Engine Harness Ground Bolt-to-Block	25 N·m	18 lb ft
Engine Mount Bolt-to-Engine Bracket	50 N·m	37 lb ft
Engine Mount Frame Bracket Through Bolt	75 N·m	55 lb ft
Engine Mount Frame Side Mount Bolt	65 N·m	50 lb ft
Engine Mount-to-Engine Bracket Bolt	50 N·m	37 lb ft
Engine Rear Cover Bolts	25 N·m	18 lb ft
Engine Service Lift Bracket M10 Bolts	50 N·m	37 lb ft
Engine Service Lift Bracket M8 Bolt	25 N·m	18 lb ft
Engine Shield Bolt	20 N·m	15 lb ft
Engine Valley Cover Bolts	25 N·m	18 lb ft
Engine Wiring Harness Bracket Nut	5 N·m	44 lb in

Evaporative Emission (EVAP) Purge Solenoid Bolt	10 N·m	89 lb in
Exhaust Manifold Bolts - First Pass	15 N·m	11 lb ft
Exhaust Manifold Bolts - Final Pass	25 N·m	18 lb ft
Exhaust Manifold Heat Shield Bolts	9 N·m	80 lb in
Fuel Rail Bolts	10 N·m	89 lb in
Fuel Rail Cover Bolt	9 N·m	80 lb in
Fuel Rail Crossover Tube Bolts	3.8 N·m	34 lb in
Fuel Rail Stop Bracket Bolt	50 N·m	37 lb ft
Generator Bracket Bolt	50 N·m	37 lb ft
Generator Cable Nut	9 N·m	80 lb in
Heater Hose Bracket Nut	9 N·m	80 lb in
Hood Hinge Bolt	25 N·m	18 lb ft
Ignition Coil-to-Bracket Bolts	10 N·m	89 lb in
Ignition Coil Bracket-to-Valve Rocker Arm Cover Bolts	12 N·m	106 lb in
Inner Axle Housing Nut	100 N·m	74 lb ft
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
Intake Manifold Sight Shield Bolts	10 N·m	89 lb in
Intake Manifold Sight Shield Bracket Bolts	5 N·m	45 lb in
Intake Manifold Sight Shield Retainer Bolt	5 N·m	44 lb in
Intake Manifold Wiring Harness Stud	10 N·m	89 lb in
Knock Sensors	20 N·m	15 lb ft
Mass Airflow/Intake Air Temperature (MAF/IAT) Sensor Clamp	7 N·m	62 lb in
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	13 N·m	115 lb in
Oil Pan Baffle Bolts	12 N·m	106 lb in
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 M8 Bolts - Oil Pan-to-Engine Block and Oil Pan-to-Front Cover	25 N·m	18 lb ft
Oil Pan M6 Bolts - Oil Pan-to-Rear Cover	12 N·m	106 lb in
Oil Pan Skid Plate Bolt	20 N·m	15 lb ft
Oil Pressure Sensor	20 N·m	15 lb ft
Oil Pump-to-Engine Block Bolts	25 N·m	18 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
Positive Battery Cable Clip Bolt	9 N·m	80 lb in
Power Steering Pump Rear Bolt	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 Nuts	10 N·m	89 lb in
Throttle Body Studs	6 N·m	53 lb in
Torque Converter Bolt - 4L60-E/4L65-E Transmissions	63 N·m	47 lb ft
Torque Converter Bolt - 4L80-E/4L85-E Transmissions	60 N·m	44 lb ft
Transmission Bolt/Stud	50 N·m	37 lb ft
Transmission Cover Bolt	12 N·m	106 lb in
Transmission Oil Level Indicator Tube Nut	18 N·m	13 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
Water Pump Cover Bolts	15 N·m	11 lb ft

Engine Component Description

The 5.3, and 6.0 Liter V8 Engines



The 5.3, and 6.0 Liter V8 engines are identified as RPO LM7 VIN T (5.3L), RPO L59 VIN Z (5.3L), RPO LQ4 VIN U (6.0L), and RPO LQ9 VIN N (6.0L).

Camshaft and Drive System

A billet steel one piece camshaft is supported by five bearings pressed into the engine block. The camshaft has a machined camshaft sensor reluctor ring incorporated between the fourth and fifth bearing journals. 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 splined crankshaft sprocket is positioned to the crankshaft by a key and keyway. The crankshaft sprocket splines drive the oil pump driven 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. All crankshafts will have a short rear flange, at the crankshaft rear oil seal area. Certain 4.8L manual transmissions and 6.0L applications require a spacer between the rear of the crankshaft and the flywheel for proper flywheel positioning. Longer bolts are required in applications using the spacer.

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 head 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 iron. 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 cable bracket, throttle body, evaporative emission (EVAP) solenoid, wire harness stud, engine sight shield and sight shield bracket. Each side of the intake manifold is sealed to the cylinder head by a nonreusable silicone sealing gasket and nylon carrier assembly. 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 of the left cylinder head by a mounting bolt. The manifold absolute pressure (MAP) sensor is installed and retained to the top rear of the intake manifold and sealed by an O-ring seal. The EVAP solenoid is mounted to the top front of the intake manifold and retained by one bolt. 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, oil level sensor mounting bore, and oil pan baffle. The oil pan transfer cover and oil level sensor mount to the sides of the oil pan. 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, have floating fit in the piston, and are retained by a press fit in the connecting rod. 6.0L LQ9 applications will have full-floating pistons/pins retained by internal clips. The connecting rods are powdered metal. The connecting rods are fractured at the connecting rod journal and then machined for the proper clearance. 2003 applications use a piston with a graphite coated skirt. The piston, pin, and connecting rod are to be serviced as an assembly.

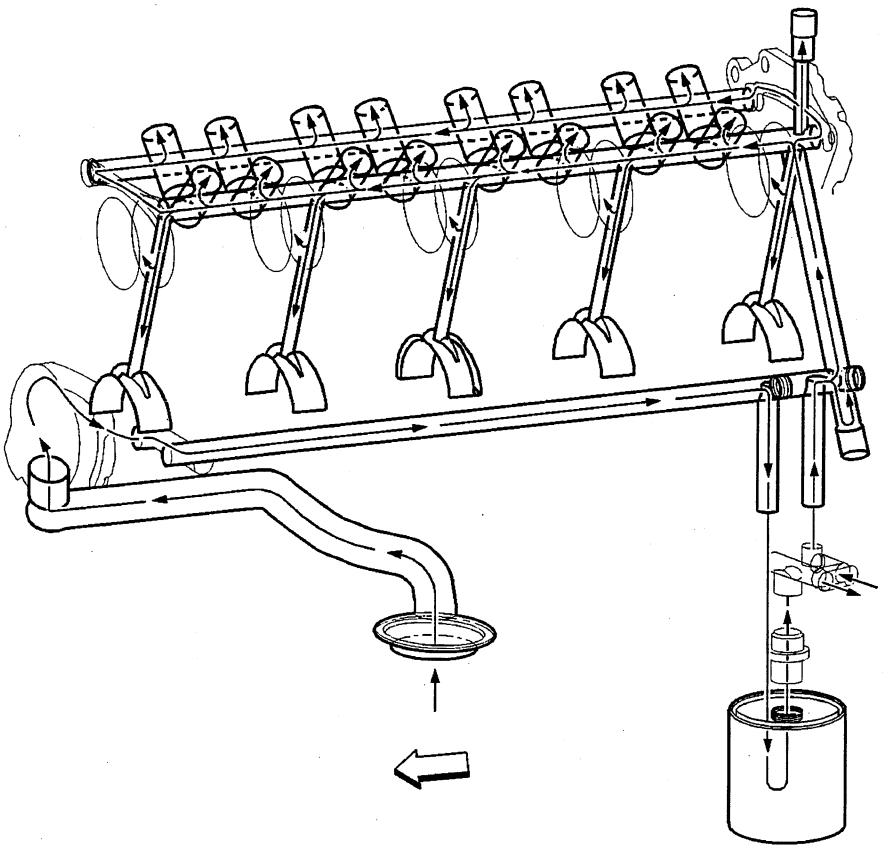
Valve Rocker Arm Cover Assemblies

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 covers are the oil fill tube, the positive crankcase ventilation (PCV) system passages, and the engine fresh air passages.

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, pivot supports. Each rocker arm is retained on the pivot support and cylinder head by a bolt. Valve lash is net build.

Lubrication Description



Engine lubrication is supplied by a gerotor type oil pump assembly. 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 oil galleries. Contained within the oil pump assembly is a pressure relief valve that maintains oil pressure within a specified range. Pressurized oil is directed through the lower gallery to the full flow oil filter where harmful contaminants are removed. A bypass valve is incorporated into the oil pan, at the oil filter boss, which will permit oil flow in the event the filter becomes restricted. At the rear of the block, oil is then directed to the upper main oil galleries which are drilled just above the camshaft assembly. From there oil is then directed to the crankshaft and camshaft bearings. Oil that has entered the upper main oil galleries also pressurizes the valve lifter assemblies 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. Oil pressure and crankcase level are each monitored by individual sensors.

An external oil cooler is available on certain applications, all 6.0L. Oil is directed from the oil pump, through the lower main oil gallery to the full flow oil filter. Oil is then directed through the oil pan outlet oil gallery, located in the left rear of the oil pan, and to the external oil cooler via a hose assembly. Oil flows through the oil cooler and returns to the engine at the oil pan inlet oil gallery, located in the left rear of the oil pan. Oil is then directed to the upper main oil galleries and the remainder of the engine assembly.

Drive Belt System Description

See Drive Belt System Description above.

Crankcase Ventilation System Description

A closed crankcase ventilation system is used in order to provide a more complete scavenging of the crankcase vapors. Fresh air from the throttle body is supplied to the crankcase, mixed with blow-by gases, and then passed through a crankcase ventilation valve into the intake manifold.

The primary control is through the crankcase ventilation valve which meters the flow at a rate depending on manifold vacuum. To maintain idle quality, the crankcase ventilation valve restricts the flow when intake manifold vacuum is high. If abnormal operating conditions arise, the system is designed to allow excessive amounts of blow-by gases to back flow through the crankcase vent tube into the engine air inlet to be consumed by normal combustion.

Filtered fresh air is routed from up-stream of the throttle blade to the front of the right rocker arm cover via a formed rubber hose. To reduce the potential of oil pullover into the throttle bore area due to back flow of the ventilation system, the fitting in the right rocker arm cover is shielded from the rocker arms. From there fresh air and gases are routed through the crankcase and up to the opposite rocker arm cover where the positive crankcase ventilation (PCV) valve is located. Gases are then routed through a hose to the intake manifold.

Engine Mechanical – 8.1L (RPO L18 VIN G)

General Specifications

Application	Specification	
	Metric	English
General		
• Engine Type	V-8	
• Displacement	8.1L	496 CID
• RPO	L18	
• VIN	G	
• Bore	107.950 mm	4.250 in
• Stroke	111.00 mm	4.370 in
• Compression Ratio	9.1:1	
• Firing Order	1-8-7-2-6-5-4-3	
• Spark Plug Gap	1.52 mm	0.060 in
Block		
• Crankshaft Main Bearing Bore Diameter	74.6060-74.6220 mm	2.9372-2.9379 in
• Cylinder Bore Diameter - Production	107.950-107.968 mm	4.2500-4.2507 in
• Cylinder Bore Diameter - Service	107.940-107.990 mm	4.2496-4.2516 in
• Cylinder Bore Out-of-Round - Production, Maximum Minus Minimum Bore Diameter	0.0180 mm	0.0007 in
• Cylinder Bore Out-of-Round - Service, Maximum Minus Minimum Bore Diameter	0.050 mm	0.002 in
• Cylinder Bore Taper - Production	0.0180 mm	0.0007 in
• Cylinder Bore Taper - Service Thrust Axis	0.050 mm	0.002 in
• Cylinder Bore Taper - Service Pin Axis	0.050 mm	0.002 in
• Cylinder Head Deck Height - from Centerline of Crankshaft	259.875-260.125 mm	10.231-10.241 in
• Cylinder Head Deck Surface Flatness - Entire Face	0.100 mm	0.004 in
• Cylinder Head Deck Surface Flatness - Within 150 mm (6 in)	0.050 mm	0.002 in
• Valve Lifter Bore Diameter	21.417-21.443 mm	0.843-0.844 in
Camshaft		
• Camshaft Bearing Inside Diameter	49.5480-49.5730 mm	1.9507-1.9517 in
• Camshaft Journal Diameter	49.4720-49.5220 mm	1.9477-1.9497 in
• Camshaft Lobe Lift - Exhaust	6.973-7.075 mm	0.2745-0.2785 in
• Camshaft Lobe Lift - Intake	6.924-7.026 mm	0.2726-0.2766 in
• Camshaft Runout - Production	0.051 mm	0.002 in
• Camshaft Runout - Service	0.076 mm	0.003 in
Connecting Rod		
• Connecting Rod Bearing Clearance - Production	0.021-0.064 mm	0.0008-0.0025 in
• Connecting Rod Bearing Clearance - Service	0.021-0.081 mm	0.0008-0.0032 in
• Connecting Rod Side Clearance	0.384-0.686 mm	0.0151-0.0270 in

Crankshaft		
• Connecting Rod Journal Diameter	55.854-55.870 mm	2.1990-2.1996 in
• Connecting Rod Journal Out-of-Round - Production	0.0102 mm	0.0004 in
• Connecting Rod Journal Taper - Production	0.0102 mm	0.0004 in
• Crankshaft End Play	0.127-0.279 mm	0.0050-0.0110 in
• Crankshaft Main Bearing Clearance - #1, #2, #3, #4 Production	0.022-0.052 mm	0.0008-0.0020 in
• Crankshaft Main Bearing Clearance - #5 Production	0.035-0.067 mm	0.0014-0.0026 in
• Crankshaft Main Bearing Clearance - #1, #2, #3, #4 Service	0.022-0.089 mm	0.0008-0.0035 in
• Crankshaft Main Bearing Clearance - #5 Service Limit	0.035-0.102 mm	0.0014-0.0040 in
• Crankshaft Main Journal Diameter	69.805-69.822 mm	2.7482-2.7489 in
• Crankshaft Main Journal Out-of-Round - Production	0.0102 mm	0.0004 in
• Crankshaft Main Journal Taper - Production	0.0102 mm	0.0004 in
• Crankshaft Runout - Production	0.0380 mm	0.0015 in
• Crankshaft Runout - Service	0.0510 mm	0.0020 in
Cylinder Head		
• Cylinder Head Height/Thickness	259.875-260.125 mm	10.231-10.241 in
• Surface Flatness - Block Deck	0.050 mm	0.002 in
• Surface Flatness - Exhaust Manifold Deck	0.102 mm	0.004 in
• Surface Flatness - Intake Manifold Deck	0.080 mm	0.003 in
Exhaust Manifold		
• Surface Flatness	0.254 mm	0.010 in
Lubrication System		
• Oil Capacity - Without Filter	5.7L	6 Qts
• Oil Pressure - Minimum	34 kPa @ 1,000 RPM	5 psi @ 1,000 RPM
• Oil Pressure - Minimum	69 kPa @ 2,000 RPM	10 psi @ 2,000 RPM
Piston Rings		
Piston Ring End Gap		
• First Compression Ring - Production	0.300-0.450 mm	0.012-0.018 in
• First Compression Ring - Service	0.450-0.675 mm	0.018-0.027 in
• Second Compression Ring - Production	0.450-0.650 mm	0.017-0.025 in
• Second Compression Ring - Service	0.675-0.975 mm	0.026-0.039 in
• Oil Control Ring - Production	0.249-0.759 mm	0.0098-0.0299 in
• Oil Control Ring - Service	0.373-1.138 mm	0.015-0.045 in
Piston Ring to Groove Clearance		
• First Compression Ring	0.031-0.074 mm	0.0012-0.0029 in
• Second Compression Ring	0.031-0.074 mm	0.0012-0.0029 in
• Oil Control Ring	0.051-0.203 mm	0.002-0.008 in
Piston and Pins		
Piston		
• Piston Diameter	Not Measurable	Not Measurable
• Piston to Bore Clearance	Interference Fit	Interference Fit

Pin		
• Piston Pin Clearance to Connecting Rod Bore	0.049-0.020 mm Interference	0.00019-0.0007 in Interference
• Piston Pin Diameter	26.416-26.419 mm	1.0400-1.0401 in
Valve System		
Valves		
• Valve Face Angle - Exhaust	45 degrees	
• Valve Face Angle - Intake	45 degrees	
• Valve Head Diameter - Exhaust	43.69 mm	1.72 in
• Valve Head Diameter - Intake	55.63 mm	2.19 in
• Valve Lash - Exhaust	Net Lash	Net Lash
• Valve Lash - Intake	Net Lash	Net Lash
• Valve Seat Angle - Exhaust	46 degrees	
• Valve Seat Angle - Intake	46 degrees	
• Valve Seat Runout - Exhaust	0.0500 mm	0.002 in
• Valve Seat Runout - Intake	0.0500 mm	0.002 in
• Valve Seat Width - Exhaust	1.651-2.159 mm	0.060-0.095 in
• Valve Seat Width - Intake	0.800-1.200 mm	0.030-0.060 in
• Valve Stem Diameter - Exhaust	9.431-9.449 mm	0.3713-0.3720 in
• Valve Stem Diameter - Intake	9.436-9.454 mm	0.3715-0.3722 in
• Valve Stem-to-Guide Clearance - Production Exhaust	0.030-0.079 mm	0.0012-0.0031 in
• Valve Stem-to-Guide Clearance - Production Intake	0.025-0.074 mm	0.0010-0.0029 in
• Valve Stem-to-Guide Clearance - Service Exhaust	0.030-0.091 mm	0.0012-0.0036 in
• Valve Stem-to-Guide Clearance - Service Intake	0.025-0.088 mm	0.0010-0.0034 in
Rocker Arms		
• Valve Rocker Arm Ratio	1.70:1	
Valve Springs		
• Valve Spring Free Length	56.35 mm	2.218 in
• Valve Spring Installed Height	45.923-46.685 mm	1.808-1.838 in
• Valve Spring Load - Closed	381-419 N·m @ 45.923 mm	86-94 lb @ 1.808 in
• Valve Spring Load - Open	962-1058 N·m @ 33.985 mm	216-236 lb @ 1.338 in

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Accessory Drive Belt Tensioner Bolt	50 N·m	37 lb ft
Air Cleaner Outlet Duct Clamp	4 N·m	35 lb in
Air Conditioning (A/C) Belt Tensioner Bolt	50 N·m	37 lb ft
Battery Cable Channel Bolt	9 N·m	80 lb in
Camshaft Position Sensor Bolt	12 N·m	106 lb in
Camshaft Retainer Bolt	12 N·m	106 lb in
Camshaft Sprocket Bolt	30 N·m	22 lb ft
Connecting Rod Nut	30 N·m + 90 Degrees	22 lb ft + 90 Degrees
Coolant Crossover Pipe Bolt	50 N·m	37 lb ft
Coolant Drain Hole Plug		
• Left Front	60 N·m	44 lb ft
• Sides	30 N·m	22 lb ft
Crankshaft Balancer Bolt	255 N·m	189 lb ft
Crankshaft Bearing Cap Inner Bolts		
• First Pass	30 N·m	22 lb ft
• Final Pass	90 Degrees	
Crankshaft Bearing Cap Outer Studs		
• First Pass	30 N·m	22 lb ft
• Final Pass	80 Degrees	
Crankshaft Oil Deflector Nut	50 N·m	37 lb ft
Crankshaft Position Sensor Bolt	12 N·m	106 lb in
Crossbar Bolt	100 N·m	74 lb ft
Cylinder Head Bolt - In Sequence		
• First Pass	30 N·m	22 lb ft
• Second Pass	30 N·m + 120 Degrees	22 lb ft + 120 Degrees
• Final Pass - Long Bolts #1, 2, 3, 6, 7, 8, 9, 10, 11, 14, 16, 17	60 Degrees	
• Final Pass - Medium Bolts #15, 18	45 Degrees	
• Final Pass - Short Bolts #4, 5, 12, 13	30 Degrees	
Cylinder Head Coolant Hole Plug	35 N·m	26 lb ft
Drive Belt Idler Pulley Bolt	50 N·m	37 lb ft
EGR Adapter Nut	22 N·m	16 lb ft
EGR Valve Nut	22 N·m	16 lb ft
EGR Valve Pipe Bolt	25 N·m	18 lb ft
EGR Valve Pipe Bracket Bolt	50 N·m	37 lb ft
EGR Valve Pipe Nut	25 N·m	18 lb ft
EGR Valve Pipe Stud in Exhaust Manifold	12 N·m	106 lb in
Engine Block Heater	50 N·m	37 lb ft
Engine Coolant Temperature (ECT) Sensor	35 N·m	26 lb ft
Engine Coolant Temperature (ECT) Sensor Bracket Bolt	50 N·m	37 lb ft
Engine Harness Bolt	5 N·m	44 lb in
Engine Harness Ground Bolt	16 N·m	12 lb ft
Engine Harness Stud	10 N·m	89 lb in
Engine Mount Bolt-to-Engine Bracket	50 N·m	37 lb ft
Engine Mount-to-Engine Bracket Bolt	50 N·m	37 lb ft
Engine Mount Frame Bracket Thru Bolt	75 N·m	55 lb ft
Engine Mount Frame Side Mount Bolt	65 N·m	50 lb ft
Engine Sight Shield Bracket Nut	5 N·m	44 lb in

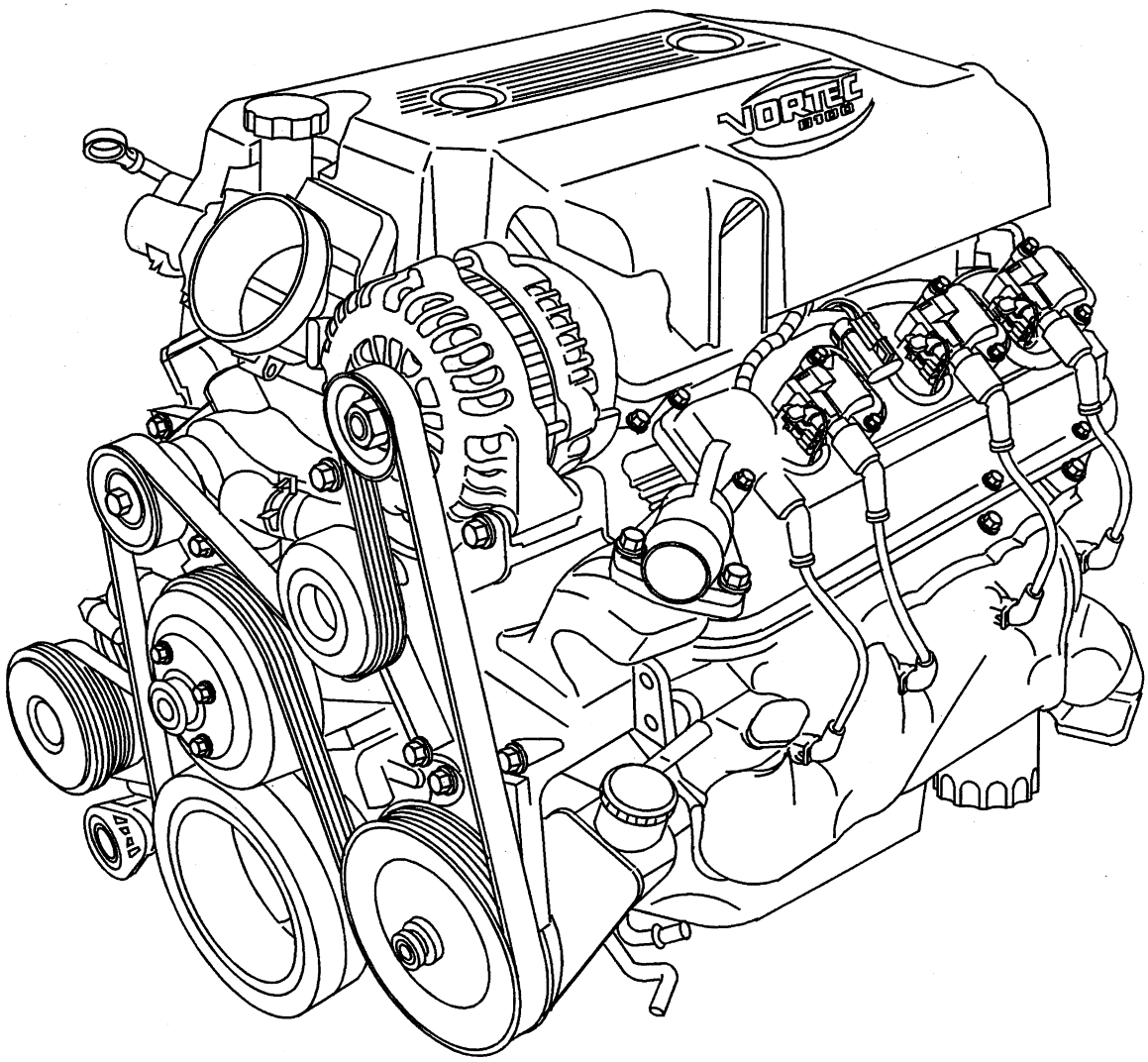
Engine Wiring Harness Bolt	16 N·m	12 lb ft
Exhaust Manifold		
• Center Bolt	35 N·m	26 lb ft
• Nut	16 N·m	12 lb ft
• Stud	20 N·m	15 lb ft
Exhaust Manifold Heat Shield		
• Bolt	25 N·m	18 lb ft
• Nut	25 N·m	18 lb ft
Flywheel Bolt		
• First Pass	40 N·m	30 lb ft
• Second Pass	80 N·m	59 lb ft
• Final Pass	100 N·m	74 lb ft
Front Cover Bolt		
• First Pass	6 N·m	53 lb in
• Final Pass	12 N·m	106 lb in
Fuel Rail Stud	12 N·m	106 lb in
Heater Hose Bracket Bolt	50 N·m	37 lb ft
Hood Hinge Bolt	25 N·m	18 lb ft
Ignition Coil Bolt	12 N·m	106 lb in
Ignition Coil Wiring Harness Bolt	12 N·m	106 lb in
Intake Manifold Bolt - In Sequence		
• First Pass	5 N·m	44 lb in
• Second Pass	8 N·m	71 lb in
• Third Pass	12 N·m	106 lb in
• Final Pass	15 N·m	12 lb ft
J 42847 Flywheel Holding Tool Bolt	50 N·m	37 lb ft
Knock Sensor	20 N·m	15 lb ft
Knock Sensor Heat Shield Bolt	12 N·m	106 lb in
Lift Bracket Bolt	40 N·m	30 lb ft
MAP Sensor Bolt	12 N·m	106 lb in
Oil Cooler Hose Fittings	23 N·m	17 lb ft
Oil Fill Tube Bolt	12 N·m	106 lb in
Oil Filter	38 N·m	28 lb ft
Oil Filter Fitting	66 N·m	49 lb ft
Oil Gallery Plug		
• Front	20 N·m	15 lb ft
• Left	30 N·m	22 lb ft
• Rear	30 N·m	22 lb ft
• Top	20 N·m	15 lb ft
Oil Level Indicator Tube Bracket Bolt	25 N·m	18 lb ft
Oil Level Sensor	20 N·m	15 lb ft
Oil Pan Bolt		
• First Pass	10 N·m	89 lb in
• Final Pass	25 N·m	18 lb ft
Oil Pan Drain Plug	28 N·m	21 lb ft
Oil Pan Skid Plate Bolt	20 N·m	15 lb ft
Oil Pressure Gage Sensor	30 N·m	22 lb ft
Oil Pump Bolt	75 N·m	56 lb ft
Oil Pump Cover Bolt	12 N·m	106 lb in
Oil Pump Drive Bolt	25 N·m	18 lb ft
Power Steering Pump Bracket Bolt/Nut	50 N·m	37 lb ft
Power Steering Pump Bracket Stud	20 N·m	15 lb ft

Purge Solenoid Bolt	8 N·m	71 lb in
Spark Plug	30 N·m	22 lb ft
Thermostat Housing Bolt	30 N·m	22 lb ft
Throttle Body		
• Nut	10 N·m	89 lb in
• Stud	12 N·m	106 lb in
Valve Lifter Guide Retainer Bolt	25 N·m	18 lb ft
Valve Rocker Arm Cover Bolt		
• First Pass	6 N·m	53 lb in
• Final Pass	12 N·m	106 lb in
Valve Rocker Arm Nut	35 N·m	26 lb ft
Valve Rocker Arm Stud	50 N·m	37 lb ft
Water Pump Bolt		
• First Pass	25 N·m	18 lb ft
• Final Pass	50 N·m	37 lb ft
Water Pump Pulley Bolt	25 N·m	18 lb ft

Drive Belt System Description

See Drive Belt System Description above.

Engine Component Description



The engine block is made of cast iron and it has eight cylinders arranged in a V shape with four cylinders in each bank. The engine block is a one piece casting with the cylinders encircled by coolant jackets.

Cylinder Head

The cylinder heads are made of cast iron and have parent metal intake valve guides and intake valve seats. The cast iron exhaust valve guides and powdered metal valve seats are pressed into the exhaust ports. A spark plug is located between the valves in the side of the cylinder head. The water crossover pipe attaches to the front of each cylinder head.

Camshaft

A steel camshaft is supported by five bearings pressed into the engine block. The camshaft sprocket is mounted to the front of the camshaft and is driven by the crankshaft sprocket through a camshaft timing chain.

Motion from the camshaft is transmitted to the valves by hydraulic roller valve lifters, valve push rods, and ball-pivot type rocker arms. A spiral gear machined into the camshaft near the rear journal drives a shaft assembly which operates the oil pump driveshaft assembly. Ignition synchronization with the camshaft is provided by a physical feature integral with the camshaft sprocket.

Crankshaft

The crankshaft is made of cast nodular iron. The crankshaft is supported by five crankshaft bearings. The crankshaft bearings are retained by the crankshaft bearing caps. The crankshaft bearing caps are machined with the engine block for proper alignment and clearance. The crankshaft bearing caps are retained by two bolts and two studs each. The number five crankshaft bearing at the rear of the engine block is the end thrust bearing. The four connecting rod journals (two rods per journal) are spaced 90 degrees apart. The crankshaft position sensor reluctor ring is pushed onto the rear of the crankshaft. The crankshaft position sensor reluctor is constructed of powdered metal. The reluctor ring has an interference fit onto the crankshaft and an internal keyway for correct positioning.

Pistons and Connecting Rods

The pistons are cast aluminum alloy that use two compression rings and one oil control ring assembly. The piston pins are a floating fit in the pistons and the piston pins are retained by a press fit in the connecting rod assembly. The pistons are coated in order to create an interference fit into the cylinder. The connecting rods are forged steel and have precision insert type crankpin bearings. The piston and connecting rod is only serviced as an assembly.

Valve Train

The valve train is a ball pivot type. Motion is transmitted from the camshaft through the hydraulic roller valve lifters and tubular valve push rods to the valve rocker arms. The valve rocker arm pivots on a ball in order to open the valve. The hydraulic roller valve lifters keep all parts of the valve train in constant contact. Each valve lifter acts as an automatic adjuster and maintains zero lash in the valve train. This eliminates the need for periodic valve adjustment. The valve rocker arm stud and nut retains the valve rocker arm and ball seat. The valve rocker arm stud is threaded into the cylinder head. The valve stem seal is pressed over the valve guide of the cylinder head.

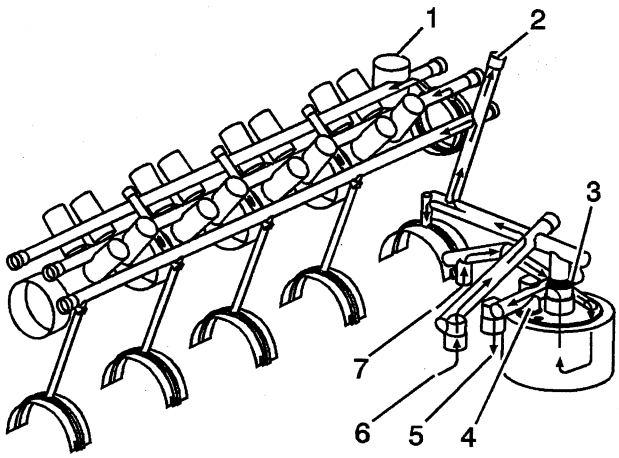
Intake Manifold

The intake manifold is a one-piece design. The intake manifold is made of cast aluminum. The throttle body is attached to the front of the intake manifold. A linear exhaust gas recirculation (EGR) port is cast into the manifold for exhaust gas recirculation mixture. The EGR valve bolts onto the rear of the intake manifold. The fuel rail assembly with eight separate fuel injectors is retained to the intake manifold by four studs. The fuel injectors are seated in their individual manifold bores with O-ring seals to provide sealing. A Manifold Absolute Pressure (MAP) sensor is mounted on the top of the intake manifold and sealed by an O-ring seal. The MAP sensor is held in place with a retainer bolt. The evaporative emission canister solenoid is located in the front of the intake manifold. The positive crankcase ventilation (PCV) system is internally cast into the intake manifold. There is not a PCV valve. A splash shield is installed under the intake manifold. The shield prevents hot oil from contacting the bottom of the intake manifold, maintaining air inlet charge density.

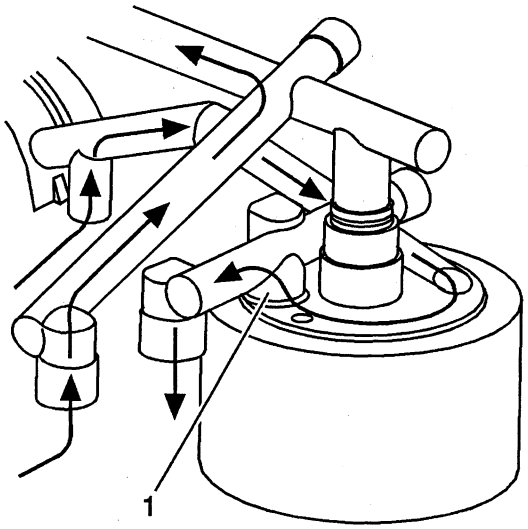
Exhaust Manifold

The two exhaust manifolds are constructed of cast stainless steel. The exhaust manifolds direct exhaust gases from the combustion chambers to the exhaust system. The right exhaust manifold has a flange for the EGR pipe.

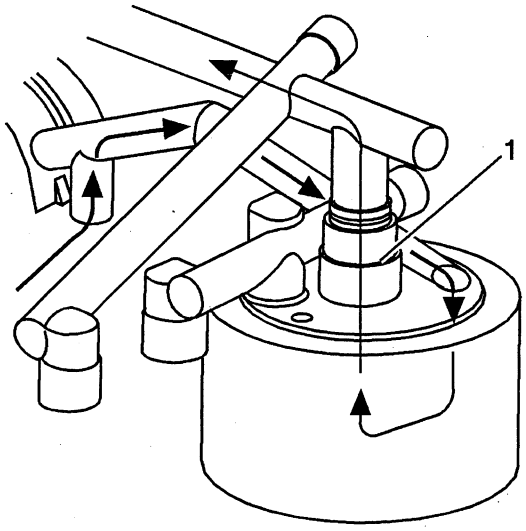
Lubrication Description



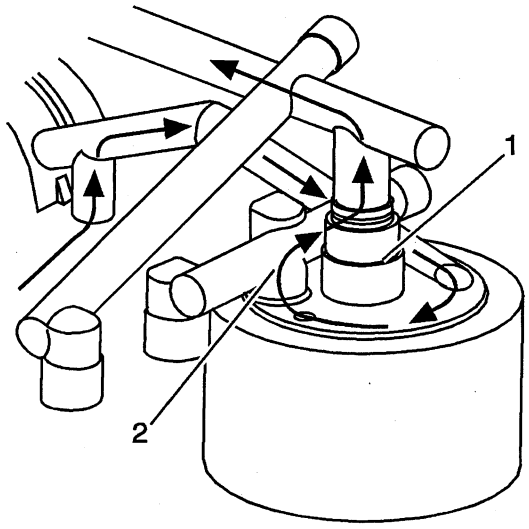
The gear-type oil pump is driven through an extension driveshaft. The extension driveshaft is driven by the oil pump drive, which is gear driven by the camshaft. The oil is drawn from the oil pan through a pickup screen and tube, into the oil pump (7). Pressurized oil flows through the oil filter, into the oil cooler (5), back into the engine (6), up to the oil pressure gage port (2) and rear crankshaft bearing, and is then distributed to the upper oil galleries. Oil must flow around the oil pump drive (1) in order to reach the right side valve lifters properly. The oil is delivered through internal passages in order to lubricate camshaft and crankshaft bearings and to provide lash control in the hydraulic valve lifters. Oil is metered from the valve lifters through the valve push rods in order to lubricate the valve rocker arms and ball pivots. Oil returning to the oil pan from the cylinder heads and the front camshaft bearing, lubricates the camshaft timing chain and the crankshaft and the camshaft sprockets. There are two bypass valves located in the engine block, above the oil filter. The oil filter bypass valve (4) and the oil cooler bypass valve (3).



If the oil filter becomes plugged, the pressurized oil is diverted around the top of the oil filter. The oil filter bypass valve (1) is forced open, allowing the oil to continue on to the oil cooler and engine oil passages. No oil filtration occurs because the oil is not allowed into the oil filter.



If the oil cooler flow becomes blocked, either from a plugged oil cooler or blocked or kinked oil cooler line, the oil cooler bypass valve (1) is forced open, allowing oil to flow directly into the engine oil passages. Oil does not flow into or out of the engine oil cooler.



If both the oil filter and the oil cooler are plugged, the pressurized oil is routed around the top of the oil filter, through the oil filter bypass valve (2), through the oil cooler bypass valve (1) and directly into the engine oil passages. Lubrication still occurs, but the oil is not filtered or directed through the oil cooler.

Engine Cooling

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Air Cleaner Outlet Duct Clamp Screw (5.3L, and 6.0L)	7 N·m	62 lb in
Coolant Air Bleed Pipe Stud/Bolt (5.3L, and 6.0L)	12 N·m	106 lb in
Coolant Crossover Bolt (8.1L)	50 N·m	37 lb ft
Coolant Heater Cord Bolt	8 N·m	71 lb in
Coolant Heater (5.3L, and 6.0L)	50 N·m	37 lb ft
Coolant Heater (8.1L)	60 N·m	47 lb ft
Engine Block Coolant Drain Plug (5.3L, 6.0L, and 8.1L)	60 N·m	44 lb ft
Engine Shield Bolt	20 N·m	15 lb ft
Exhaust Manifold Pipe Nut (5.3L, and 6.0L)	50 N·m	37 lb ft
Fan Clutch Bolt	23 N·m	17 lb ft
Fan Clutch Nut	56 N·m	41 lb ft
Fan Shroud Bolt	9 N·m	80 lb in
Generator Bracket Stud (8.1L)	20 N·m	15 lb ft
Oil Cooler Hose Adapter Bolt (6.0L)	12 N·m	106 lb in
Oil Cooler Hose Bracket Bolt (6.0L)	25 N·m	18 lb ft
Oil Cooler Hose Bracket Bolt (8.1L)	50 N·m	37 lb ft
Radiator Bolt	25 N·m	18 lb ft
Surge Tank Bolt/Nut	9 N·m	80 lb in
Thermostat Housing Bolt (5.3L, and 6.0L)	15 N·m	11 lb ft
Thermostat Housing Bolt (8.1L)	37 N·m	27 lb ft
Transmission Control Module (TCM) Cover Bolt	9 N·m	80 lb in
Transmission Control Module (TCM) Electrical Connector Bolt	8 N·m	71 lb in
Water Outlet Bolt (8.1L)	30 N·m	22 lb ft
Water Pump Bolt (First Pass) (5.3L, and 6.0L)	15 N·m	11 lb ft
Water Pump Bolt (Final Pass) (5.3L, and 6.0L)	30 N·m	22 lb ft
Water Pump Bolt (8.1L)	50 N·m	37 lb ft

Cooling System Description and Operation

Coolant Heater

The optional engine coolant heater (RPO K05) operates using 110-volt AC external power and is designed to warm the coolant in the engine block area for improved starting in very cold weather -29°C (-20°F). The coolant heater helps reduce fuel consumption when a cold engine is warming up. The unit is equipped with a detachable AC power cord. A weather shield on the cord is provided to protect the plug when not in use.

Cooling System

The cooling system's function is to maintain an efficient engine operating temperature during all engine speeds and operating conditions. The cooling system is designed to remove approximately one-third of the heat produced by the burning of the air-fuel mixture. When the engine is cold, the coolant does not flow to the radiator until the thermostat opens. This allows the engine to warm quickly.

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 Cable Bracket Bolt	25 N·m	18 lb ft
Battery Cable Channel Bolt	12 N·m	106 lb in
Battery Cable Junction Block Bracket Bolt	9 N·m	80 lb in
Battery Hold Down Retainer Bolt	25 N·m	18 lb ft
Battery Tray Bolt	9 N·m	80 lb in
Battery Tray Nut	25 N·m	18 lb ft
Engine Wiring Harness Ground Bolt	16 N·m	12 lb ft
Engine Wiring Harness Ground/Negative Cable Bolt	25 N·m	18 lb ft
Front Axle Mounting Bracket Nut	95 N·m	70 lb ft
Forward Lamp Wiring Harness Ground/Negative Cable Bolt	9 N·m	80 lb in
Front End Diagonal Brace Bolt	9 N·m	80 lb in
Generator Bracket Bolt - 4.8L, 5.3L, and 6.0L Engines	50 N·m	37 lb ft
Generator Bracket Bolt/Nut - 8.1L	50 N·m	37 lb ft
Generator Bracket Stud	20 N·m	15 lb ft
Generator Bolt	50 N·m	37 lb ft
Generator Cable Nut	9 N·m	80 lb in
Ground Strap Nut	9 N·m	80 lb in
Negative Battery Cable Bolt	17 N·m	13 lb ft
Positive Battery Cable Bolt	17 N·m	13 lb ft
Positive Cable Clip Bolt - 8.1L Engine	8 N·m	71 lb in
Positive Cable Nut	9 N·m	80 lb in
Positive Cable at Underhood Bussed Electrical Center (UBEC) Bolt	9 N·m	80 lb in
Starter Bolt	50 N·m	37 lb ft
Starter Heat Shield Bolt - 8.1L Engine	3 N·m	35 lb in
Starter Heat Shield Nut - 8.1L Engine	5 N·m	44 lb in
Starter Lead Nut	3.4 N·m	30 lb in
Transmission Cover Bolt	9 N·m	80 lb in

Battery Usage

Base	
GM Part Number	19001810
Cold Cranking Amperage (CCA)	600 A
Reserve Capacity Rating	115 Minutes
Replacement Battery Number	78-6YR
Optional (Dual)	
GM Part Number	19001814
Cold Cranking Amperage (CCA)	770 A
Reserve Capacity Rating	115 Minutes
Replacement Battery Number	78-7YR

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

Starter Motor Usage

Applications	Starter Model
5.3L (LM7)	PG-260F2
6.0L (LQ4) 8.1L (L18)	PG-260M

Generator Usage

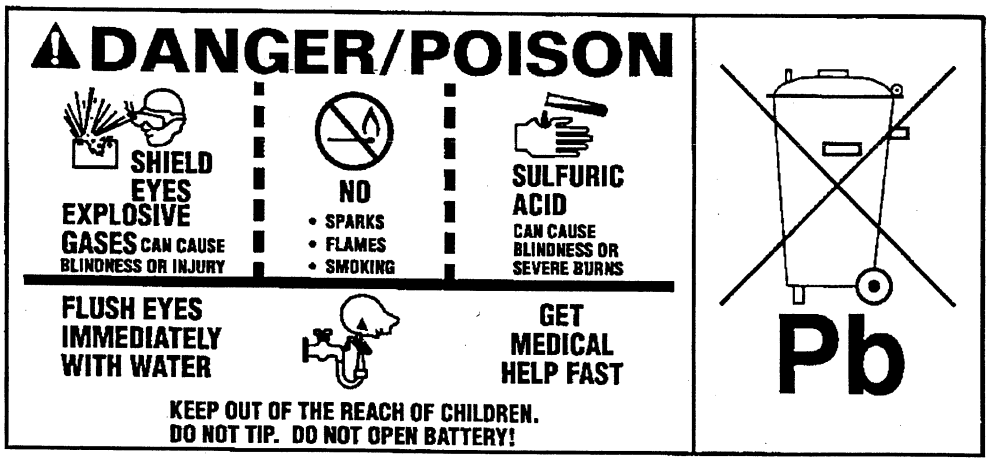
Base	
Generator Model	Delphi AD230
Rated Output	102 A
Load Test Output	71 A
Optional (Dual)	
Generator Model	Delphi AD244
Rated Output	130 A
Load Test Output	91 A
Bosch® Generator	
Generator Model	Bosch® 15755900
Rated Output	130 A
Load Test Output	91 A

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.**



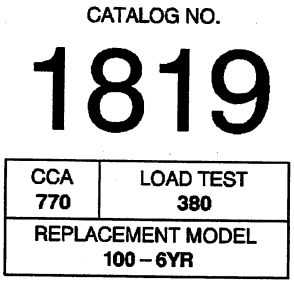
The maintenance free battery is standard. There are no vent plugs in the cover. The battery is completely sealed except for two small vent holes in the side. These vent holes allow the small amount of gas that is produced in the battery to escape.

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-260M and Hitachi-S14-100B are non-repairable starter motors. It has 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 sprag protects the armature from excessive speed until the switch is opened.

When the ignition switch is released from the CRANK position, 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 AD-230 and AD-244 generators are non-repairable. They are electrically similar to earlier models. The generators feature the following major components:

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

The pulley and the fan cool the slip ring and the frame.

The AD stands for Air-cooled Dual internal fan; the 2 is an electrical design designator; the 30/44 denotes the outside diameter of the stator laminations in millimeters, over 100 millimeters. The generators is rated at 102 and 130 amperes respectively.

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

Regulator

The voltage regulator controls the field current of the rotor in order to limit system voltage. 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.

Auxiliary Battery Charging

The auxiliary battery is charged in the same manner as the primary battery with the ignition switch in the run position and the engine running. The system contains the following components:

- Auxiliary battery.
- Auxiliary battery relay.
- Mega fuse.
- Junction block battery cable.
- Associated wiring.

The auxiliary battery relay coil is energized with the engine running through the fuse block and wiring, thus closing the relay contacts which allow the battery to be charged from the vehicle's generator via the

battery junction block. The auxiliary battery relay is permanently grounded so any time the ignition switch is in the run position the relay will be energized.

The auxiliary battery is only used for accessories and is not part of the vehicle starting system. However if the primary battery fails and in need of an jump start, follow the service information for Jump Starting In Case Of Emergency using appropriate battery jumper cables.

Engine Controls

Engine Controls – 5.3 & 6.0L

Ignition System Specifications

Application	Specification	
	Metric	English
Firing Order	1-8-7-2-6-5-4-3	
Spark Plug Wire Resistance	1000 ohms per ft	
Spark Plug Torque	15 N·m	11 lb ft
Spark Plug Gap	1.52 mm	0.060 in
Spark Plug Type	25171803 [AC plug type] 12567759 [NGK plug type]	

Fastener Tightening Specifications

Application	Specifications	
	Metric	English
Accelerator Pedal Nut	20 N·m	15 lb ft
Air Cleaner Outlet Duct Clamp	7 N·m	62 lb in
Brake Pipe Fittings to Electronic Brake Control Module (EBCM)	25 N·m	18 lb ft
Camshaft Position (CMP) Sensor Bolt	29 N·m	21 lb ft
Crankshaft Position (CKP) Sensor Bolt	25 N·m	18 lb ft
Crossover Fuel Pipe Retainer Clip Attaching Screw	3.8 N·m	34 lb in
Electro-Hydraulic Control Unit (EHCU) Bolts	25 N·m	18 lb ft
Engine Coolant Temperature (ECT) Sensor	20 N·m	15 lb ft
Engine Wiring Harness Bracket Nut	5 N·m	44 lb in
EVAP Canister Bracket Bolt	25 N·m	18 lb ft
EVAP Canister Nuts	10 N·m	89 lb in
EVAP Canister Purge Solenoid Bolt	10.5 N·m	93 lb in
EVAP Vent Valve Bracket Bolt	12 N·m	106 lb in
Fuel Composition Sensor Nut	17 N·m	13 lb ft
Fuel Composition Sensor to Bracket Bolt	10 N·m	89 lb in
Fuel Feed, EVAP, and Return Pipe Assembly Nut	12 N·m	106 lb in
Fuel Fill and Vent Hose Clamp	2.5 N·m	22 lb in
Fuel Tank Ground Strap Bolt	9 N·m	80 lb in
Fuel Tank Fill Pipe Clamp	2.5 N·m	22 lb in
Fuel Tank Filler Housing to Body Screw	2.3 N·m	20 lb in
Fuel Tank Filler Pipe Housing to Fuel Tank Fill Pipe Screw	2.3 N·m	20 lb in
Fuel Tank Fill Pipe Clamp	2.5 N·m	22 lb in
Fuel Line Fitting	25 N·m	18 lb ft
Fuel Pipe Bracket Bolt	12 N·m	106 lb in
Fuel Rail Bolts	10 N·m	89 lb in
Fuel Return Pipe Attaching Screw	5 N·m	44 lb in
Fuel Tank Shield Bolt	18 N·m	13 lb ft
Fuel Tank Strap Bolt	40 N·m	30 lb ft
Heated Oxygen Sensor (HO2S)	42 N·m	31 lb ft
Ignition Coil Bolt	8 N·m	71 lb in
Knock Sensor	20 N·m	15 lb ft
Mass Airflow/Intake Air Temperature (MAF/IAT) Sensor Clamp	7 N·m	62 lb in
Powertrain Control Module (PCM) Electrical Connector Bolt	8 N·m	71 lb in
Spark Plug		
• Used Head	15 N·m	11 lb ft
• New Head	20 N·m	15 lb ft
Throttle Body Nut	10 N·m	89 lb in

Fuel System Specifications

Use regular unleaded gasoline rated at 87 octane or higher. It is recommended that the gasoline meet specifications which have been developed by the American Automobile Manufacturers Association (AAMA) and endorsed by the Canadian Motor Vehicle Manufacturers Association for better vehicle performance and engine protection. Gasoline meeting the AAMA specification could provide improved driveability and emission control system performance compared to other gasoline. For more information, write to: American Automobile Manufacturer's Association, 7430 Second Ave, Suite 300, Detroit MI 48202.

Be sure the posted octane is at least 87. If the octane is less than 87, you may get a heavy knocking noise when you drive. If it is bad enough, it can damage your engine.

If you're using fuel rated at 87 octane or higher and you hear heavy knocking, your engine needs service. Don't worry if you hear a little pinging noise when you're accelerating or driving up a hill. That is normal and you don't have to buy a higher octane fuel to get rid of pinging. It is 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 California Emission Standards, indicated on the under hood emission control label, your vehicle 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 there is a determination 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.

Engine Controls – 8.1L

Ignition System Specifications

Application	Specification	
	Metric	English
Firing Order	1-8-7-2-6-5-4-3	
Spark Plug Wire Resistance	1,000 ohms per ft	
Spark Plug Torque	20 N·m	15 lb ft
Spark Plug Gap	1.52 mm	0.060 in
Spark Plug Type	TJ14R-P15 Denso plug type	

Fastener Tightening Specifications

Application	Specifications	
	Metric	English
Accelerator Pedal Nut	20 N·m	15 lb ft
Air Cleaner Resonator Outlet Duct Clamp	4 N·m	35 lb in
Camshaft Position (CMP) Sensor Bolt	12 N·m	106 lb in
Crankshaft Position (CKP) Sensor Bolt	12 N·m	106 lb in
Engine Coolant Temperature (ECT) Sensor	50 N·m	37 lb ft
Engine Wire Harness Bolt/Stud	10 N·m	89 lb in
Exhaust Gas Recirculation (EGR) Valve Adapter Nut	22 N·m	16 lb ft
Exhaust Gas Recirculation (EGR) Valve Nut	22 N·m	16 lb ft
Exhaust Gas Recirculation (EGR) Valve Pipe-to-Adapter Bolt	25 N·m	18 lb ft
Exhaust Gas Recirculation (EGR) Valve Pipe-to-Cylinder Head Bolts	50 N·m	37 lb ft
Exhaust Gas Recirculation (EGR) Valve Pipe-to-Exhaust Manifold Nuts	25 N·m	18 lb ft
Evaporative Emission (EVAP) Canister Bracket Bolt	25 N·m	18 lb ft
Evaporative Emission (EVAP) Canister Purge Valve Bolt	10 N·m	89 lb in
Evaporative Emission (EVAP) Canister Nut	10 N·m	89 lb in
Evaporative Emission (EVAP) Canister Vent Valve Bracket Bolt	12 N·m	106 lb in
Evaporative Emission (EVAP) Canister Vent Valve Bolt	12 N·m	106 lb in
Fuel Feed, EVAP, and Return Pipe Nut	12 N·m	106 lb in
Fuel Fill and Vent Hose Clamp	2.5 N·m	22 lb in
Fuel Fill Pipe Clamp	2.5 N·m	22 lb in
Fuel Filter Fitting	25 N·m	18 lb ft
Fuel Pipe Bracket Nut	10 N·m	89 lb in
Fuel Rail Stud	12 N·m	106 lb in
Fuel Tank Filler Housing to Body Screw	2.3 N·m	20 lb in
Fuel Tank Filler Pipe Housing to Fuel Tank Fill Pipe Screw	2.3 N·m	20 lb in
Fuel Tank Ground Strap Bolt	9 N·m	80 lb in
Fuel Tank Shield Bolt	18 N·m	13 lb ft
Fuel Tank Strap Bolt	40 N·m	30 lb ft
Heated Oxygen Sensor (HO2S)	42 N·m	31 lb ft
Ignition Coil Bolt	12 N·m	106 lb in
Knock Sensor	20 N·m	15 lb ft
Manifold Absolute Pressure (MAP) Sensor Bolt	12 N·m	106 lb in
Powertrain Control Module (PCM) Electrical Connector Bolt	8 N·m	71 lb in
Spark Plug (Existing Head)	20 N·m	15 lb ft
Spark Plug (New Head)	30 N·m	22 lb ft
Throttle Actuator Control Module Bracket Nut	9 N·m	80 lb in
Throttle Actuator Control Module Nut	9 N·m	80 lb in
Throttle Body Nut	10 N·m	89 lb in

Exhaust System

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Engine Shield Bolt	20 N·m	15 lb ft
Engine Coolant Temperature (ECT) Sensor	20 N·m	15 lb ft
EGR Pipe Bracket Bolt - 8.1L Engine	50 N·m	37 lb ft
EGR Pipe Nut - 8.1L Engine	30 N·m	22 lb ft
Exhaust Heat Shield Bolt	9 N·m	80 lb in
Exhaust Heat Shield Nut (Body Panel)	9 N·m	80 lb in
Exhaust Manifold Bolts - 4.8L, 5.3L, and 6.0L Engines		
• First Pass in Sequence	15 N·m	11 lb ft
• Final Pass in Sequence	25 N·m	18 lb ft
Exhaust Manifold Center Bolt - 8.1L Engine	35 N·m	26 lb ft
Exhaust Manifold Heat Shield Bolt - 4.8L, 5.3L, and 6.0L Engines	9 N·m	80 lb in
Exhaust Manifold Heat Shield Bolt/Nut - 8.1L Engine	25 N·m	18 lb ft
Exhaust Manifold Nut - 8.1L Engine	16 N·m	12 lb ft
Exhaust Pipe Hanger Bracket Bolt	12 N·m	106 lb in
Exhaust Manifold Pipe Nut	50 N·m	37 lb ft
Exhaust Muffler Hanger Nut	50 N·m	39 lb ft
Exhaust Muffler Nut	40 N·m	30 lb ft
Exhaust Pipe Clamp	40 N·m	30 lb ft
Oil Pan Skid Plate Bolt	20 N·m	15 lb ft
Oxygen Sensor	42 N·m	31 lb ft
Rear Shock Absorber Lower Bolt	95 N·m	70 lb ft
Transmission Mount Nut	40 N·m	30 lb ft
Transmission Support Crossmember Bolt	70 N·m	52 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

Automatic Transmission – 4L60E

Transmission General Specifications

Name	Hydra-matic 4L60-E
RPO Codes	M30
Production Location	Toledo, Ohio Romulus, MI Ramos Arizpe, Mexico
Vehicle Platform (Engine/Transmission) Usage	C/K 800
Transmission Drive	Longitudinally-Mounted Rear Wheel Drive
1st Gear Ratio	3.059:1
2nd Gear Ratio	1.625:1
3rd Gear Ratio	1.000:1
4th Gear Ratio	0.696:1
Reverse	2.294:1
Torque Converter Size (Diameter of Torque Converter Turbine)	300 mm
Pressure Taps	Line Pressure
Transmission Fluid Type	DEXRON® III
Transmission Fluid Capacity (Approximate)	300 mm Converter Dry: 11.50 l (12.1 qt)
Transmission Type: 4	Four Forward Gears
Transmission Type: L	Longitudinal Mount
Transmission Type: 60	Product Series
Transmission Type: E	Electronic Controls
Position Quadrant	P, R, N, Overdrive, D, 2, 1 P, R, N, Overdrive, 3, 2, 1
Case Material	Die Cast Aluminum
Transmission Weight Dry (Approximate)	300 mm Converter 86.17 kg (190.5 lb)
Transmission Weight Wet (Approximate)	300 mm Converter 98.4 kg (218.0 lb)
Maximum Trailer Towing Capacity	6 130 kg (13,500 lb)
Maximum Gross Vehicle Weight (GVW)	3 900 kg (8,600 lb)

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Accumulator Cover to Case Bolt	8.0-14.0 N·m	6-10 lb ft
Case Extension to Case Bolt	42.0-48.0 N·m	31-35 lb ft
Case Extension to Case Bolt (4WD Shipping)	11.2-22.6 N·m	8.3-16.7 lb ft
Converter Cover Bolt	10 N·m	89 lb in
Converter Housing to Case Screw	65.0-75.0 N·m	48-55 lb ft
Cooler Pipe Connector	35.0-41.0 N·m	26-30 lb ft
Detent Spring to Valve Body Bolt	20.0-27.0 N·m	15-20 lb ft
Floorshift Control Bolt	10 N·m	89 lb in
Flywheel to Torque Converter Bolt	63 N·m	46 lb ft
Forward Accumulator Cover to Valve Body Bolt	8.0-14.0 N·m	6-10 lb ft
Heat Shield to Transmission Bolt	17 N·m	13 lb ft
Line Pressure Plug	8.0-14.0 N·m	6-10 lb ft
Manual Shaft to Inside Detent Lever Nut	27.0-34.0 N·m	20-25 lb ft
Negative Battery Cable Bolt	15 N·m	11 lb ft

Oil Level Indicator Bolt	47 N·m	35 lb ft
Oil Pan to Transmission Case Bolt	11 N·m	97 lb in
Oil Passage Cover to Case Bolt	8-14.0 N·m	6-10 lb ft
Park Brake Bracket to Case Bolt	27.0-34.0 N·m	20-25 lb ft
Park/Neutral Position Switch Screw	3 N·m	27 lb in
Plate to Case Bolt (Shipping)	27.0-34.0 N·m	20-25 lb ft
Plate to Converter Bolt (Shipping)	27.0-34.0 N·m	20-25 lb ft
Plug Assembly, Automatic Transmission Oil Pan (C/K)	30-40 N·m	22.1-29.5 lb ft
Plug Assembly, Automatic Transmission Oil Pan (Y)	28-32 N·m	20.7-23.6 lb ft
Pressure Control Solenoid Bracket to Valve Body Bolt	8.0-14.0 N·m	6-10 lb ft
Pump Assembly to Case Bolt	26.0-32.0 N·m	19-24 lb ft
Pump Cover to Pump Body Bolt	20.0-27.0 N·m	15-20 lb ft
Shift Cable Grommet Screw	1.7 N·m	15 lb in
Shift Control Cable Attachment	20 N·m	15 lb ft
Speed Sensor Retainer Bolt	10.5-13.5 N·m	7.7-10 lb ft
Stud, Automatic Transmission Case Extension (Y-car)	18.0-22.0 N·m	13-16 lb ft
TCC Solenoid Assembly to Case Bolt	8.0-14.0 N·m	6-10 lb ft
Trans Mount to Transmission Bolt	25 N·m	18 lb ft
Transmission Fluid Pressure Manual Valve Position Switch to Valve Body Bolt	8.0-14.0 N·m	6-10 lb ft
Transmission Oil Cooler Pipe Fitting	35.0-41.0 N·m	26-30 lb ft
Transmission Oil Pan to Case Bolt	9.5-13.8 N·m	7-10 lb ft
Transmission to Engine Bolt	47 N·m	35 lb ft
Valve Body to Case Bolt	8.0-14.0 N·m	6-10 lb ft

Fluid Capacity Specifications

Application	Specification	
	Metric	English
Bottom Pan Removal	4.7 liters	5 quarts
Complete Overhaul	10.6 liters	11 quarts
(measurements are approximate)		

Transmission Component and System Description

The 4L60E transmission consists primarily of the following components:

- Torque converter assembly
- Servo assembly and 2-4 band assembly
- Reverse input clutch and housing
- Overrun clutch
- Forward clutch
- 3-4 clutch
- Forward sprag clutch assembly
- Lo and reverse roller clutch assembly
- Lo and reverse clutch assembly
- Two planetary gear sets: Input and Reaction
- Oil pump assembly
- Control valve body assembly

The electrical components of the 4L60-E are as follows:

- 1-2 and 2-3 shift solenoid valves
- 3-2 shift solenoid valve assembly
- Transmission pressure control (PC) solenoid

- Torque converter clutch (TCC) solenoid valve
- TCC pulse width modulation (PWM) solenoid valve
- Automatic transmission fluid pressure (TFP) manual valve position switch
- Automatic transmission fluid temperature (TFT) sensor
- Vehicle speed sensor assembly

Adapt Function

Transmission Adapt Function

The 4L60-E transmission uses a line pressure control system, which has the ability to continuously adapt the system's line pressure. This compensates for normal wear of the following parts:

- The clutch fiber plates
- The seals
- The springs

The PCM maintains the Upshift Adapt parameters for the transmission The PCM monitors the AT ISS sensor and the AT OSS during commanded shifts in order to determine if a shift is occurring too fast or too slow. The PCM adjusts the signal from the transmission pressure control solenoid in order to maintain a set shift feel.

Transmission adapts must be reset whenever the transmission is overhauled or replaced.

Automatic Transmission Shift Lock Control Description

The automatic transmission shift lock control is a safety device that prevents an inadvertent shift out of PARK when the ignition is ON. The driver must press the brake pedal before moving the shift lever out of the PARK position. The system consist of the following components:

- The automatic transmission shift lock control solenoid.
- The automatic transmission shift lock control switch.
- The park/neutral position switch.

With the ignition in the ON position battery positive voltage is supplied to the park/neutral position switch. With the transmission in the PARK position the contacts in the park/neutral position switch are closed. This allows current to flow through the switch to the automatic transmission shift lock control switch. The circuit continues through the normally-closed switch to the automatic transmission shift lock control solenoid. The automatic transmssion shift lock control soleniod is permanently grounded. This energizes the automatic transmission shift lock control solenoid, locking the shift linkage in the PARK position. When the driver presses the brake pedal the contacts in the automatic transmission shift lock control switch open, causing the automatic transmission shift lock control solenoid to release. This allows the shift lever to move from the PARK position.

Automatic Transmission – 4L80E

Transmission General Specifications

Name	Hydra-matic 4L80-E
RPO Codes	MT1
Production Location	Ypsilanti, MI
Vehicle Platform (Engine/Transmission) Usage	C/K, C/K 800, G, P32/42
Transmission Drive	Longitudinally Mounted Rear Wheel Drive
1st Gear Ratio	2.482:1
2nd Gear Ratio	1.482:1
3rd Gear Ratio	1.000:1
4th Gear Ratio	0.750:1
Reverse	2.077:1
Torque Converter Size (Diameter of Torque Converter Turbine)	310 mm
Pressure Taps	Line Pressure
Transmission Fluid Type	DEXRON® III
Transmission Fluid Capacity (Approximate)	Bottom Pan Removal: 7.3L (7.7 qts) Dry: 12.8L (13.5 qts)
Transmission Type: 4	Four Forward Gears
Transmission Type: L	Longitudinal Mount
Transmission Type: 80	Product Series
Transmission Type: E	Electronic Controls
Position Quadrant	P, R, N, Overdrive, D, 2, 1
Case Material	Die Cast Aluminum
Transmission Weight Dry	107 kg (236 lbs)
Transmission Weight Wet	118 kg (260 lbs)
Maximum Trailer Towing Capacity	9,525 kg (21,000 lbs)
Maximum Gross Vehicle Weight (GVW)	7,258 kg (16,000 lbs)

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Accumulator Housing to Valve Body	11 N·m	97 lb in
Case Center Support	44 N·m	32 lb ft
Control Valve Assembly to Case	11 N·m	97 lb in
Cooler Pipe Connector Nut at Case and Radiator	38 N·m	28 lb ft
Engine Rear Mount to Transmission Bolt	44 N·m	32 lb ft
Engine Rear Support Bracket to Frame Nut	44 N·m	32 lb ft
Extension Housing to Case	34 N·m	25 lb ft
Flywheel Housing Cover to Transmission	7 N·m	62 lb in
Flywheel to Converter	44 N·m	32 lb ft
Fourth Clutch	23 N·m	17 lb ft
Manual Shaft to Detent Lever Nut	24 N·m	18 lb ft
Oil Pan Drain Plug	34 N·m	25 lb ft
Oil Pan to Case	24 N·m	18 lb ft
Oil Test Hole Plug	11 N·m	97 lb in
Parking Pawl Bracket to Case	24 N·m	18 lb ft
Pressure Control Solenoid Bracket to Valve Body	8 N·m	71 lb in
Pump Assembly to Case	24 N·m	18 lb ft
Pump Body to Cover	24 N·m	18 lb ft
Rear Servo Cover to Case	24 N·m	18 lb ft
Solenoid to Valve Body	8 N·m	71 lb in

Speed Sensor and Bracket Assembly to Case	11 N·m	97 lb in
Transmission Case to Engine	44 N·m	32 lb ft
Valve Body to Case/Lube Pipe	11 N·m	97 lb in
Valve Body to Case/PSM	11 N·m	97 lb in

Fluid Capacity Specifications Overhaul

Application	Specification	
	Metric	English
Oil Pan Removal	7.3 liters	7.7 quarts
Overhaul	12.8 liters	13.5 quarts

Transmission General Description

The 4L80-E is a fully automatic rear wheel drive electronically controlled transmission. The 4L80-E provides four forward ranges including overdrive and reverse. A gear type of oil pump controls shift points. The VCM/PCM and the pressure control (PC) solenoid (force motor) regulate these shift points. The VCM/PCM also controls shift schedules and TCC apply rates. Transmission temperature also influences shift schedules and TCC apply rates.

You can operate the transmission in any one of the following seven modes:

- P - PARK position prevents the vehicle from rolling either forward or backward on vehicles less than 15,000 G.V.W. For safety reasons, use the parking brake in addition to the park position.
- R - REVERSE allows the vehicle to be operated in a rearward direction.
- N - NEUTRAL 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.
- OD - OVERDRIVE is used for all normal driving conditions. Overdrive provides four gear ratios plus a converter clutch operation. Depress the accelerator in order to downshift for safe passing.
- D - DRIVE position is used for city traffic, and hilly terrain. Drive provides three gear ranges. Depress the accelerator in order to downshift.
- 2 - Manual SECOND provides acceleration and engine braking or greater traction from a stop. When you choose manual SECOND, the vehicle will start out in first gear and upshift to second gear. You may select this gear at a vehicle speed of up to 22 km/h (35 mph).
- 1 - Manual LOW provides maximum engine braking. You may select this gear at a vehicle speed of up to 13 km/h (20 mph).

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

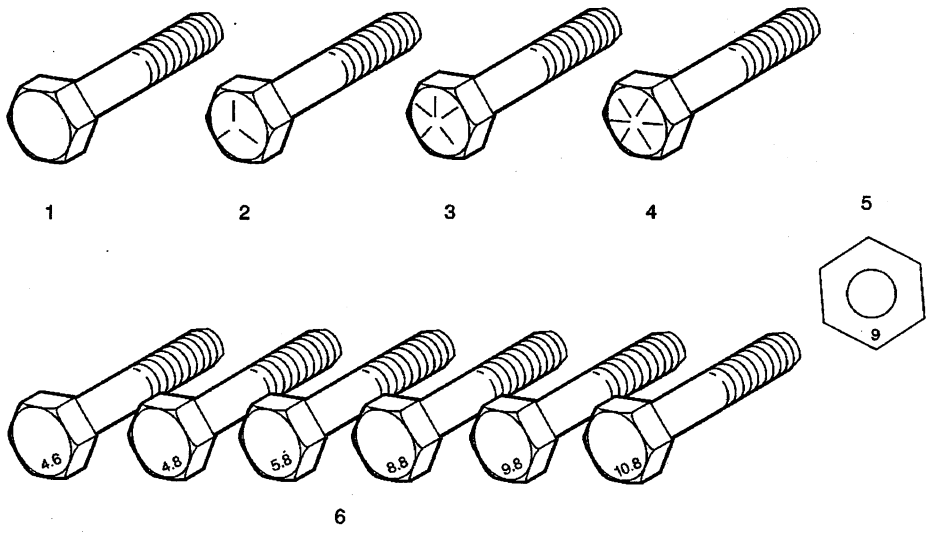
Metric Fasteners

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

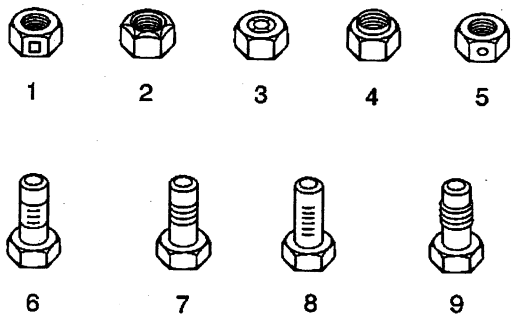
These fasteners accomplish the thread interface by a designed distortion or deformation in the fastener.

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

S = Standard Equipment A = Available n/a = Not Available
I = Included with another feature ■ = Included in Equipment Group □ = Included in Equipment Group but upgradeable

*Indicates availability of feature on multiple models. For example, it indicates feature availability on 2WD and 4WD Models or Rear wheel drive and All-wheel drive Models.

Options listed in the shaded column titled Ref. Only RPO Code are either included in a package or are 'base' equipment and cannot be ordered as a free flow option.

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
		Air bags, frontal, driver and right front passenger, includes Passenger Sensing System (front passenger air bag status display on inside rearview mirror)	S	S	S	S
	CJ3	NEW! **Air conditioning,** tri-zone, manual, individual climate settings for driver, right front passenger and rear passengers, includes front and rear HVAC systems	■	S	S	n/a
		Assist handles, front passenger and outboard 2nd row seats	S	S	S	S
	DK7	**Console,** overhead mini, includes map lights and rear seat HVAC controls	S	S	S	S
	K34	**Cruise control**, electronic with set and resume speed, includes telltale in instrument panel cluster	S	S	S	S
	C49	**Defogger,** rear-window, electric	S	S	S	S
	AU3	**Door locks,** power programmable, includes lockout protection	S	S	S	S
		Driver Message Center, monitors vehicle systems including low fuel, transmission temperature, engine coolant, security, oil level, oil pressure and oil change	S	S	S	S
		NEW! **Driver Information Center**, monitors numerous systems depending on vehicle equipment **1 - Full functionality included when the (PDH) Driver Convenience Package or (UE1) OnStar is ordered.** **2 - Full functionality included when the (PDH) Driver Convenience Package or (PDQ) Personal Security Package is ordered.**	I[1]	I[1]	S	I[2]
		Headliner, Shale-colored cloth	S	S	S	S
		Instrumentation, analog, includes speedometer, odometer with trip odometer, fuel level, voltmeter, engine temperature, oil pressure and tachometer	S	S	S	S
		Key, single, 2-sided	S	S	S	S
	AU0	**Keyless entry,** remote, includes 2 transmitters, panic button and content theft alarm	S	S	S	S
		Lighting, dome lamp, driver and passenger side door switch with delayed entry feature, cargo lamps, door handle or keyless remote-activated illuminated entry and map lights in front and 2nd seat positions	S	S	S	S

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	DF5	**Mirror,** inside rearview, electrochromic (light-sensitive auto-dimming), 8-point compass, outside temperature indicator and right front passenger air bag status	S	S	S	S
UE1		**OnStar**, 1-year Safe & Sound Service, includes Emergency Assistance Services, Air Bag Deployment Notification, Accident Assist, Roadside Assistance, Stolen Vehicle Tracking, Remote Diagnostics, Remote Door Lock and Unlock, Remote Vehicle Alert: horn and lights activation, online concierge services, Virtual Advisor and Personal Calling access **1 - Includes (UK3) Steering wheel, mounted controls.** **2 - Included with (PDQ) Personal Security Package.**	A[1]	A[1]	I[2]	S
		Power outlets, auxiliary, 2 on instrument panel, 1 in cargo area, 12-volt	S	S	S	S
		Safety belts, 3-point, driver and front passenger, in all seating positions except center seating position in 1st and 3rd row which are lap only	S	S	S	S
	DT4	**Smoker's Package**, includes ashtray and lighter	S	S	S	S
	UQ3	**Sound system feature,** 8-speakers	S	n/a	n/a	n/a
	UQ7	NEW! **Sound system feature,** Bose Premium speaker system, 9 speakers, includes subwoofer in center console **1 - Included when (A95) Seats, front Custom Cloth reclining buckets is ordered.**	I[1]	S	S	S
	UK6	**Sound system feature,** rear audio controls, includes dual headphone jacks (headphones not included), power outlet and controls for volume, station selection and media **1 - Included when (A95) Seats, front Custom Cloth reclining buckets is ordered.**	I[1]	S	S	S
		Steering column, Tilt-Wheel, adjustable, includes brake/transmission shift interlock	S	S	S	S
	NP5	**Steering wheel,** leather-wrapped rim, Black	S	S	S	S
	UK3	**Steering wheel,** mounted controls, includes audio and driver information center controls **1 - Included when (PDH) Driver Convenience Package or (UE1) OnStar is ordered.** **2 - Included when the (PDH) Driver Convenience Package or (PDQ) Personal Security Package is ordered.**	I[1]	I[1]	I[2]	S
		Theft-deterrent system, PASSlock II	S	S	S	S
	DH6	**Visors,** padded, Shale-colored, driver and passenger side with cloth trim, extenders, illuminated vanity mirrors and corner storage pockets on back of visors	S	S	S	S
		Warning tones, headlamp on, key-in-ignition, driver safety belt unfasten, turn signal on	S	S	S	S
	A31	**Windows,** power, includes driver express-down and lockout features	S	S	S	S

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
		Air dam, Gray	S	S	n/a	S
		Air dam, Dark Gray, unique	n/a	n/a	S	n/a
	VG3	**Bumper,** front, chrome **1 - Refer to Color Compatibility chart for Matte Black vs. color-keyed top pad.**	S[1]	S[1]	n/a	S[1]
	VB3	**Bumper,** rear, chrome step, includes pad	S	S	n/a	S
	VB5	**Bumper,** front, painted	n/a	n/a	S	n/a
	V43	**Bumper,** rear, painted step, includes pad	n/a	n/a	S	n/a
		Daytime running lamps, includes automatic exterior lamp control	S	S	S	S
		Door handles, Matte Black	S	S	n/a	n/a
		Door handles, color-keyed	n/a	n/a	S	S
	AJ1	**Glass,** Solar-Ray deep tinted (all windows except light tinted glass on windshield, driver and front passenger)	S	S	S	S
	V22	**Grille,** chrome surround	S	S	n/a	S
		Grille, color-keyed	n/a	n/a	S	n/a
		Headlamps, dual halogen composite, includes flash-to-pass feature and automatic lamp control	S	S	S	S
	V54	**Luggage rack,** roof-mounted, Black, side rails only **1 - Center rails available in (PDC) Cargo Package.**	S[1]	S[1]	n/a	S[1]
	G63	**Luggage rack,** roof-mounted, Black, includes cross rail, integral roller and rear auxiliary lamps to assist in loading items when in park	n/a	n/a	S	n/a
	B85	**Moldings,** bodyside **1 - Refer to Color Compatibility chart for Matte Black vs. color-keyed moldings.**	S[1]	S[1]	n/a	S[1]
		Moldings, Dark Gray, lower rocker	n/a	n/a	S	n/a
	V76	**Recovery hooks,** 2 front, frame-mounted **1 - Requires 4WD Models.**	S[1]	S[1]	S[1]	S[1]
		Tire carrier, outside spare, winch-type mounted under frame at rear, with tire	S	S	S	S
	SAF	**Tire carrier,** outside spare, lockable	S	S	S	S
	PF4	**Wheels,** 4 - 16" x 7" (40.6 cm x 17.8 cm) 6-lug bright machined aluminum, includes steel spare **1 - Requires 1/2 ton Models.**	S[1]	S[1]	n/a	S[1]
	PY0	**Wheels,** 4 - 16" x 6.5" (40.6 cm x 16.5 cm) 8-lug polished forged aluminum, includes chrome center caps and steel spare **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
	N88	**Wheels,** 4 - 17" x 7" (43.2 cm x 17.8 cm) cast aluminum, machined, includes 16" (40.6 cm) steel spare	n/a	n/a	S	n/a

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
		Wipers, intermittent, front, wet-arm with pulse washers	S	S	S	S
	K47	**Air cleaner,** high-capacity	n/a	n/a	S	n/a
	KG3	**Alternator,** 145 amps	S	S	S	S
		Battery, heavy-duty, 600 cold-cranking amps, includes rundown protection and retained accessory power	S	S	S	S
	JC4	**Brakes,** 4-wheel antilock, 4-wheel disc	S	S	S	S
	KC4	**Cooling,** external engine oil cooler, heavy-duty air-to-oil, integral to driver side of radiator **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
	KNP	**Cooling,** external transmission oil cooler, heavy-duty air-to-oil **1 - Included with (PDZ) Trailering equipment, heavy-duty on 1/2 ton Models - Standard on 3/4 ton Models.**	I[1]	I[1]	S	I[1]
	L59	**Engine,** Vortec 5300 V8 SFI Bi-Fuel, capable of running on unleaded or up to 85% ethanol (285 HP [212.6 kW] @ 5200 rpm, 325 lb.-ft. [438.7 N-m] @ 4000 rpm) **1 - Requires (FE9) Emissions, Federal requirements or (NG1) Emissions, New York or Vermont state requirements. Requires 1/2 ton Models.**	S[1]	S[1]	S[1]	S[1]
	LM7	**Engine,** Vortec 5300 V8 SFI (295 HP [220.1 kW] @ 5200 rpm, 325 lb.-ft. [445.5 N-m] @ 4000 rpm) **1 - Requires (NE1) Emissions, Massachusetts or Maine state requirements or (YF5) Emissions, California state requirements - Requires 1/2 ton Models.**	S[1]	S[1]	S[1]	S[1]
	LQ4	**Engine,** Vortec 6000 V8 SFI (320 HP [238.7 kW] @ 5000 rpm, 360 lb.-ft. [486.6 N-m] @ 4000 rpm) **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
	C5W	**GVWR,** 7000 lbs. (3175 kg) **1 - Requires 2WD 1/2 ton Models.**	S[1]	S[1]	n/a	S[1]
	C5Z	**GVWR,** 7200 lbs. (3266 kg) **1 - Requires 4WD 1/2 ton Models.**	S[1]	S[1]	S[1]	S[1]
	C6P	**GVWR,** 8600 lbs. (3901 kg) **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
	NZZ	**Skid Plate Package**, includes aluminum front underbody shield starting behind front bumper and running to 1st cross-member, protecting front underbody, oil pan, differential case and transfer case, frame-mounted shields **1 - Requires 4WD 3/4 ton Models. - 1/2 ton Models refer to (PDM) Skid Plates and Wheel Flares Package.**	S[1]	S[1]	n/a	S[1]
		Steering, power	S	S	S	S
		Suspension, front, independent torsion bar, and stabilizer bar	S	S	S	S
		Suspension, rear, multi-link with coil springs **1 - Requires 1/2 ton Models.**	S[1]	S[1]	S[1]	S[1]

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
		Suspension, rear, multi-stage leaf springs **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
		Trailering wiring harness, 7-wire	S	S	S	S
	NP8	**Transfer case,** electronic Autotrac, includes push-button controls **1 - Requires 4WD Models - Not available with (JL4) StabiliTrak, vehicle stability enhancement system.**	S[1]	S[1]	S[1]	S[1]
	M30	**Transmission,** 4-speed automatic, electronically controlled with overdrive and tow/haul mode **1 - Requires 1/2 ton Models.**	S[1]	S[1]	S[1]	S[1]
	MT1	**Transmission,** 4-speed automatic, heavy-duty, electronically controlled with overdrive, tow/haul mode and (KNP) Cooling, external transmission oil cooler **1 - Requires 3/4 ton Models and (LQ4) Engine, Vortec 6000 V8 SFI.**	S[1]	S[1]	n/a	S[1]

S = Standard Equipment A = Available n/a = Not Available
I = Included with another feature ■ = Included in Equipment Group □ = Included in Equipment Group but upgradeable

No deletions allowed to Equipment Groups. Additional options may be added; check ordering information section for compatibility.

*Indicates availability of feature on multiple models. For example, it indicates feature availability on 2WD and 4WD Models or Rear wheel drive and All-wheel drive Models.

Options listed in the shaded column titled Ref. Only RPO Code are either included in a package or are 'base' equipment and cannot be ordered as a free flow option.

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	CJ3	NEW! **Air conditioning,** tri-zone, manual, individual climate settings for driver, right front passenger and rear passengers, includes front and rear HVAC systems	■	S	S	n/a
	CJ2	NEW! **Air conditioning,** tri-zone, automatic, individual climate settings for driver, right front passenger and rear passengers, includes front and rear HVAC systems **1 - Included when (CF5) Sunroof, power or (U42) Entertainment system, rear seat is ordered.**	n/a	I[1]	I[1]	■
PDC		NEW! **Cargo Package**, includes (RYJ) cargo shade, (AP9) cargo net, (B39) cargo mat and (V1K) luggage rack center rails	A	A	■	A
	B30	**Floor covering,** color-keyed carpeting	■	■	■	■
	B58	**Floormats,** color-keyed, carpeted front and 2nd row, removable	■	■	■	■
	AE7	**Seats,** front Custom Cloth 40/20/40 split-bench, 3-passenger, driver and passenger manual reclining, outboard head restraints, center fold-down storage armrest, 6-way power adjustable driver seat and rear storage pockets **1 - Upgradeable to (A95) Seats, front Custom Cloth reclining buckets.**	□[1]	n/a	n/a	n/a
A95		**Seats,** front Custom Cloth reclining buckets, includes adjustable head restraints, inboard armrests, 6-way power adjustable driver seat, floor console and rear storage pockets **1 - Upgradeable to (A95) Seats, front leather seating surfaces reclining buckets.**	A	□[1]	n/a	n/a
A95		**Seats,** front leather seating surfaces reclining buckets, includes adjustable head restraints, inboard armrests, 6-way power adjustable driver seat, floor console and rear storage pockets **1 - Upgradeable to (AN3) Seats, front leather seating surfaces, power reclining full-feature buckets.**	n/a	A	□[1]	n/a

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
AN3		**Seats,** front leather seating surfaces power reclining full-feature buckets, includes adjustable head restraints, floor console, power lumbar, driver and passenger 8-way power adjustable, inboard armrests, heated driver and passenger seat cushion and seatbacks, power bolsters, 2-position driver-side memory and storage pockets and (JF4) Pedals, power adjustable **1 - Includes Pedals, power adjustable.**	n/a	n/a	A[1]	■[1]
	AT5	**Seats,** middle Custom Cloth 60/40 split-folding bench, 3-passenger with center armrest and rear passenger easy entry **1 - Upgradeable to (AT5) Seats, middle leather seating surfaces 60/40 split-folding bench or (AL4) Seats, middle leather seating surfaces buckets when leather interior is ordered.**	■	□[1]	n/a	n/a
	AT5	**Seats,** middle leather seating surfaces 60/40 split-folding bench, 3-passenger with center armrest and rear passenger easy entry **1 - Included with (A95) Seats, front leather seating surfaces reclining buckets.** **2 - Upgradeable to (AL4) Seats, middle leather seating surfaces buckets.**	n/a	I[1]	□[2]	□[2]
	AS3	**Seats,** rear 3rd row Custom Cloth bench, 3-passenger, 1-piece removable **1 - Upgradeable to Seats, rear vinyl 3rd row bench, when leather interior is ordered.**	■	□[1]	n/a	n/a
	AS3	**Seats,** rear 3rd row vinyl bench, 3-passenger, all-belts-to-seat, removable **1 - Included with (A95) Seats, front leather seating surfaces reclining buckets - 3rd row is vinyl when leather is ordered.** **2 - 3rd row is vinyl when leather is ordered.**	n/a	I[1]	■[2]	■[2]
	UB1	NEW! **Sound system,** ETR AM/FM stereo with CD and cassette player, includes seek-and-scan, digital clock, auto-tone control, speed-compensated volume, TheftLock, random select, auto-reverse cassette and Radio Data System (RDS)	■	n/a	n/a	n/a
	UC6	NEW! **Sound system,** ETR AM/FM stereo with in-dash 6-disc CD changer, includes seek-and-scan, digital clock, auto-tone control, speed-compensated volume, TheftLock and Radio Data System (RDS)	n/a	■	■	■
	BVE	**Assist steps**, Black, mounted between front and rear wheels at bottom of rocker panel	■	■	n/a	■
		Assist steps, tubular, mounted between front and rear wheels at bottom of rocker panel	n/a	n/a	■	n/a
	ZW9	**Body,** rear cargo panel doors **1 - Upgradeable to (E52) Body, liftgate with liftglass.**	□[1]	□[1]	□[1]	□[1]
	T96	**Fog lamps,** front, rectangular, halogen	■	■	n/a	■

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	T96	**Fog lamps,** front, round, halogen	n/a	n/a	■	n/a
	DL8	**Mirrors,** outside rearview, foldaway, power adjustable, heated **1 - May be substituted with (DPF) Mirrors, outside rearview, power, heated, camper-style on 3/4 ton Models.**	□[1]	□[1]	n/a	n/a
	DL3	NEW! **Mirrors,** outside rearview, power folding, power adjustable, heated, color-keyed, driver side electrochromic (light-sensitive auto dimming), turn signal in glass, with ground illumination and curb-tilt **1 - May be substituted with (DPF) Mirrors, outside rearview, power, heated, camper-style on 3/4 ton Models.**	n/a	n/a	■	□[1]
	QMJ	**Tires,** P265/70R16, all-season touring, blackwall **1 - Requires 1/2 ton Models. Upgradeable to (QMK) Tires, P265/70R16, all-season touring, White outlined-letter.**	□[1]	□[1]	n/a	□[1]
	QJP	**Tires,** P265/70R17, on-/off-road, blackwall	n/a	n/a	■	n/a
	QIZ	**Tires,** LT245/75R16E, all-season, blackwall **1 - Requires 3/4 ton Models. Upgradeable to (QIW) Tires, LT245/75R16E, on-/off-road, blackwall on 4WD Models.**	□[1]	□[1]	n/a	□[1]
G80		**Differential,** locking, heavy-duty, rear **1 - Not available with (JL4) StabiliTrak, vehicle stability enhancement system.**	A[1]	A[1]	■	A[1]
	GT4	**Rear axle,** 3.73 ratio **1 - Upgradeable to (GT5) Rear axle, 4.10 ratio.**	□[1]	□[1]	□[1]	□[1]
PDM		NEW! **Skid Plates and Wheel Flares Package**, off-road, with aluminum front underbody shield starting behind front bumper and running to 1st cross-member protecting front underbody, oil pan, differential case and steel transfer case frame-mounted shields (refer to Color Compatibility chart for Matte Black vs. color-keyed wheel flares) **1 - Requires 1/2 ton 4WD Models.**	A[1]	A[1]	■	A[1]
	ZW7	**Suspension Package,** Premium Smooth Ride **1 - Requires 1/2 ton Models.** **2 - Requires 1/2 ton Models. Upgradeable to (Z55) Suspension Package, Autoride.**	■[1]	■[1]	n/a	□[2]
	Z71	**Suspension Package,** Off-Road, includes 1.81" (46 mm) gas shocks, off-road jounce bumpers, (NZZ) Skid Plate Package, (K47) Air cleaner, high capacity and Z71 badge	n/a	n/a	■	n/a
	Z85	**Suspension Package,** Handling/Trailering, heavy-duty **1 - Requires 3/4 ton Models. Must be upgraded to (Z55) Suspension Package, Autoride when the (L18) Engine, Vortec 8100 V8 SFI is ordered.** **2 - Requires 3/4 ton Models. Upgradeable to (Z55) Suspension Package, Autoride when the (LQ4) Engine, Vortec 6000 V8 SFI is ordered. Must be upgraded to (Z55) Suspension Package, Autoride when the (L18) Engine, Vortec 8100 V8 SFI is ordered.**	□[1]	□[1]	n/a	□[2]
PDZ		**Trailering equipment,** heavy-duty, includes trailering hitch platform, 7-lead wiring connector and (KNP) Cooling external transmission oil cooler	A	A	■	A

S = Standard Equipment A = Available n/a = Not Available
I = Included with another feature ■ = Included in Equipment Group □ = Included in Equipment Group but upgradeable

No deletions allowed to Equipment Groups. Additional options may be added; check ordering information section for compatibility.

*Indicates availability of feature on multiple models. For example, it indicates feature availability on 2WD and 4WD Models or Rear wheel drive and All-wheel drive Models.

Options listed in the shaded column titled Ref. Only RPO Code are either included in a package or are 'base' equipment and cannot be ordered as a free flow option.

Free Flow RPO Code	Ref. Only RPO Code	Description **1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models.** **2 - Equipment group 1SL available on CK15906 Models.**	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	CJ3	NEW! **Air conditioning,** tri-zone, manual, individual climate settings for driver, right front passenger and rear passengers, includes front and rear HVAC systems	■	S	S	n/a
	CJ2	NEW! **Air conditioning,** tri-zone, automatic, individual climate settings for driver, right front passenger and rear passengers, includes front and rear HVAC systems **1 - Included when (CF5) Sunroof, power or (U42) Entertainment system, rear seat is ordered.**	n/a	I[1]	I[1]	■
PDC		NEW! **Cargo Package**, includes (RYJ) cargo shade, (AP9) cargo net, (B39) cargo mat and (V1K) luggage rack center rails	A	A	■	A
	B30	**Floor covering,** color-keyed carpeting	■	■	■	■
	B58	**Floormats,** color-keyed, carpeted front and 2nd row, removable	■	■	■	■
	AE7	**Seats,** front Custom Cloth 40/20/40 split-bench, 3-passenger, driver and passenger manual reclining, outboard head restraints, center fold-down storage armrest, 6-way power adjustable driver seat and rear storage pockets **1 - Upgradeable to (A95) Seats, front Custom Cloth reclining buckets.**	□[1]	n/a	n/a	n/a
A95		**Seats,** front Custom Cloth reclining buckets, includes adjustable head restraints, inboard armrests, 6-way power adjustable driver seat, floor console and rear storage pockets **1 - Upgradeable to (A95) Seats, front leather seating surfaces reclining buckets.**	A	□[1]	n/a	n/a
A95		**Seats,** front leather seating surfaces reclining buckets, includes adjustable head restraints, inboard armrests, 6-way power adjustable driver seat, floor console and rear storage pockets **1 - Upgradeable to (AN3) Seats, front leather seating surfaces, power reclining full-feature buckets.**	n/a	A	□[1]	n/a

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
AN3		**Seats,** front leather seating surfaces power reclining full-feature buckets, includes adjustable head restraints, floor console, power lumbar, driver and passenger 8-way power adjustable, inboard armrests, heated driver and passenger seat cushion and seatbacks, power bolsters, 2-position driver-side memory and storage pockets and (JF4) Pedals, power adjustable **1 - Includes Pedals, power adjustable.**	n/a	n/a	A[1]	■[1]
	AT5	**Seats,** middle Custom Cloth 60/40 split-folding bench, 3-passenger with center armrest and rear passenger easy entry **1 - Upgradeable to (AT5) Seats, middle leather seating surfaces 60/40 split-folding bench or (AL4) Seats, middle leather seating surfaces buckets when leather interior is ordered.**	■	□[1]	n/a	n/a
	AT5	**Seats,** middle leather seating surfaces 60/40 split-folding bench, 3-passenger with center armrest and rear passenger easy entry **1 - Included with (A95) Seats, front leather seating surfaces reclining buckets.** **2 - Upgradeable to (AL4) Seats, middle leather seating surfaces buckets.**	n/a	I[1]	□[2]	□[2]
	AS3	**Seats,** rear 3rd row Custom Cloth bench, 3-passenger, 1-piece removable **1 - Upgradeable to Seats, rear vinyl 3rd row bench, when leather interior is ordered.**	■	□[1]	n/a	n/a
	AS3	**Seats,** rear 3rd row vinyl bench, 3-passenger, all-belts-to-seat, removable **1 - Included with (A95) Seats, front leather seating surfaces reclining buckets - 3rd row is vinyl when leather is ordered.** **2 - 3rd row is vinyl when leather is ordered.**	n/a	I[1]	■[2]	■[2]
	UB1	NEW! **Sound system,** ETR AM/FM stereo with CD and cassette player, includes seek-and-scan, digital clock, auto-tone control, speed-compensated volume, TheftLock, random select, auto-reverse cassette and Radio Data System (RDS)	■	n/a	n/a	n/a
	UC6	NEW! **Sound system,** ETR AM/FM stereo with in-dash 6-disc CD changer, includes seek-and-scan, digital clock, auto-tone control, speed-compensated volume, TheftLock and Radio Data System (RDS)	n/a	■	■	■
	BVE	**Assist steps**, Black, mounted between front and rear wheels at bottom of rocker panel	■	■	n/a	■
		Assist steps, tubular, mounted between front and rear wheels at bottom of rocker panel	n/a	n/a	■	n/a
	ZW9	**Body,** rear cargo panel doors **1 - Upgradeable to (E52) Body, liftgate with liftglass.**	□[1]	□[1]	□[1]	□[1]
	T96	**Fog lamps,** front, rectangular, halogen	■	■	n/a	■

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	T96	**Fog lamps,** front, round, halogen	n/a	n/a	■	n/a
	DL8	**Mirrors,** outside rearview, foldaway, power adjustable, heated **1 - May be substituted with (DPF) Mirrors, outside rearview, power, heated, camper-style on 3/4 ton Models.**	□[1]	□[1]	n/a	n/a
	DL3	NEW! **Mirrors,** outside rearview, power folding, power adjustable, heated, color-keyed, driver side electrochromic (light-sensitive auto dimming), turn signal in glass, with ground illumination and curb-tilt **1 - May be substituted with (DPF) Mirrors, outside rearview, power, heated, camper-style on 3/4 ton Models.**	n/a	n/a	■	□[1]
	QMJ	**Tires,** P265/70R16, all-season touring, blackwall **1 - Requires 1/2 ton Models. Upgradeable to (QMK) Tires, P265/70R16, all-season touring, White outlined-letter.**	□[1]	□[1]	n/a	□[1]
	QJP	**Tires,** P265/70R17, on-/off-road, blackwall	n/a	n/a	■	n/a
	QIZ	**Tires,** LT245/75R16E, all-season, blackwall **1 - Requires 3/4 ton Models. Upgradeable to (QIW) Tires, LT245/75R16E, on-/off-road, blackwall on 4WD Models.**	□[1]	□[1]	n/a	□[1]
G80		**Differential,** locking, heavy-duty, rear **1 - Not available with (JL4) StabiliTrak, vehicle stability enhancement system.**	A[1]	A[1]	■	A[1]
	GT4	**Rear axle,** 3.73 ratio **1 - Upgradeable to (GT5) Rear axle, 4.10 ratio.**	□[1]	□[1]	□[1]	□[1]
PDM		NEW! **Skid Plates and Wheel Flares Package,** off-road, with aluminum front underbody shield starting behind front bumper and running to 1st cross-member protecting front underbody, oil pan, differential case and steel transfer case frame-mounted shields (refer to Color Compatibility chart for Matte Black vs. color-keyed wheel flares) **1 - Requires 1/2 ton 4WD Models.**	A[1]	A[1]	■	A[1]
	ZW7	**Suspension Package,** Premium Smooth Ride **1 - Requires 1/2 ton Models.** **2 - Requires 1/2 ton Models. Upgradeable to (Z55) Suspension Package, Autoride.**	■[1]	■[1]	n/a	□[2]
	Z71	**Suspension Package,** Off-Road, includes 1.81" (46 mm) gas shocks, off-road jounce bumpers, (NZZ) Skid Plate Package, (K47) Air cleaner, high capacity and Z71 badge	n/a	n/a	■	n/a
	Z85	**Suspension Package,** Handling/Trailering, heavy-duty **1 - Requires 3/4 ton Models. Must be upgraded to (Z55) Suspension Package, Autoride when the (L18) Engine, Vortec 8100 V8 SFI is ordered.** **2 - Requires 3/4 ton Models. Upgradeable to (Z55) Suspension Package, Autoride when the (LQ4) Engine, Vortec 6000 V8 SFI is ordered. Must be upgraded to (Z55) Suspension Package, Autoride when the (L18) Engine, Vortec 8100 V8 SFI is ordered.**	□[1]	□[1]	n/a	□[2]
PDZ		**Trailering equipment,** heavy-duty, includes trailering hitch platform, 7-lead wiring connector and (KNP) Cooling external transmission oil cooler	A	A	■	A

ADDITIONAL OPTIONS						
Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
AJ7		**Air bags,** side-impact, driver and right front passenger 1 - Included with (PDQ) Personal Security Package.	A	A	I[1]	A
PDC		NEW! **Cargo Package**, includes (RYJ) cargo shade, (AP9) cargo net, (B39) cargo mat and (V1K) luggage rack center rails	A	A	■	A
PDH		NEW! **Driver Convenience Package**, includes Universal transmitter, Power adjustable pedals and (UK3) Steering wheel mounted controls for audio and driver information center	A	A	A	A
U42		NEW! **Entertainment system,** rear seat, includes DVD player with remote control, overhead display, 2 sets of wireless infrared headphones, auxiliary audio/video jacks, remote game plug-in and mute button in overhead console 1 - Includes (CJ2) Air conditioning, tri-zone, automatic. Not available with (CF5) Sunroof, power. 2 - Not available with (CF5) Sunroof, power.	n/a	A[1]	A[1]	A[2]
UE1		**OnStar**, 1-year Safe & Sound Service, includes Emergency Assistance Services, Air Bag Deployment Notification, Accident Assist, Roadside Assistance, Stolen Vehicle Tracking, Remote Diagnostics, Remote Door Lock and Unlock, Remote Vehicle Alert: horn and lights activation, online concierge services, Virtual Advisor and Personal Calling access 1 - Includes (UK3) Steering wheel, mounted controls. 2 - Included with (PDQ) Personal Security Package.	A[1]	A[1]	I[2]	S
PDQ		NEW! **Personal Security Package**, includes (AJ7) Side impact air bags, driver and right front passenger, (UE1) OnStar and (UK3) Steering wheel mounted controls for audio and driver information center	n/a	n/a	A	n/a
A95		**Seats,** front Custom Cloth reclining buckets, includes adjustable head restraints, inboard armrests, 6-way power adjustable driver seat, floor console and rear storage pockets 1 - Upgradeable to (A95) Seats, front leather seating surfaces reclining buckets.	A	□[1]	n/a	n/a
A95		**Seats,** front leather seating surfaces reclining buckets, includes adjustable head restraints, inboard armrests, 6-way power adjustable driver seat, floor console and rear storage pockets 1 - Upgradeable to (AN3) Seats, front leather seating surfaces, power reclining full-feature buckets.	n/a	A	□[1]	n/a

ADDITIONAL OPTIONS						
Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
AN3		**Seats,** front leather seating surfaces power reclining full-feature buckets, includes adjustable head restraints, floor console, power lumbar, driver and passenger 8-way power adjustable, inboard armrests, heated driver and passenger seat cushion and seatbacks, power bolsters, 2-position driver-side memory and storage pockets and (JF4) Pedals, power adjustable **1 - Includes Pedals, power adjustable.**	n/a	n/a	A[1]	■[1]
AL4		**Seats,** middle leather seating surfaces buckets, reclining	n/a	A	A	A
U2K		NEW! **Sound system feature,** XM Satellite Radio is 100 channels of digital quality sound that goes wherever you go - coast to coast. GM maintains exclusivity for factory installed satellite radio for 2003 Model year. **1 - Subscripton fees apply. Available only in the 48 contiguous U.S.**	A[1]	A[1]	A[1]	A[1]
CF5		**Sunroof,** power, tilt-sliding, electric with express-open and wind deflector **1 - Includes (CJ2) Air conditioning, tri-zone, automatic. Not available with (U42) Entertainment system, rear seat or (NYS) 4-wheel steering.** **2 - Includes (CJ2) Air conditioning, tri-zone, automatic. Not available with (U42) Entertainment system, rear seat.** **3 - Not available with (U42) Entertainment system, rear seat or (NYS) 4-wheel steering.**	n/a	A[1]	A[2]	A[3]
E52		**Body,** liftgate with liftglass, rear door system, includes rear-window wiper/washer	A	A	A	A
V20		**Grille brush guard,** Black **1 - Not available to order at this time.**	n/a	n/a	A[1]	n/a
U01		**Lamps,** 5 amber roof marker **1 - Required and only available with (NYS) 4-wheel steering.**	A[1]	A[1]	n/a	A[1]
DPF		NEW! **Mirrors,** outside rearview, power adjustable, heated, camper-style, includes power extending arms and turn signal indicators **1 - Requires 3/4 ton Models.**	A[1]	A[1]	n/a	A[1]
QMK		**Tires,** P265/70R16, all-season touring, White outlined-letter **1 - Requires 1/2 ton Models.**	A[1]	A[1]	n/a	A[1]
QIW		**Tires,** LT245/75R16E, on-/off-road, blackwall **1 - Requires 4WD 3/4 ton Models.**	A[1]	A[1]	n/a	A[1]

ADDITIONAL OPTIONS						
Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
B71		**Wheel flares**, front and rear (2WD 1/2 ton Models and all 3/4 ton Models) (for 4WD 1/2 ton Models, refer to [PDM] Skid Plates and Wheel Flares Package) (refer to Color Compatibility chart for Matte Black vs. color-keyed wheel flares) **1 - Available on 2WD 1/2 ton Models. Standard on all 3/4 ton models.**	A[1]	A[1]	n/a	A[1]
NYS		NEW! **4-wheel steering**, QUADRASTEER, includes 4WS mode selector switch on the instrument panel **1 - Requires 3/4 ton Models, (LQ4) Engine, Vortec 6000 V8 SFI and (E52) Body, liftgate with liftglass. Requires 11U, 47U, 50U, 58U or 72U exterior color. Not available with (CF5) Sunroof, power, (VYU) Snow Plow Prep Package, (JL4) StabiliTrak, vehicle stability enhancement system or (Z85) Suspension Package, Handling/Trailering - Requires (U01) Lamps, 5 amber roof marker, unique rear flared fenders, (G86) Differential, limited slip, heavy-duty, rear, (PDZ) Trailering equipment, heavy-duty, and (Z55) Suspension Package, Autoride. 2WD Models require (NW7) Traction assist system, electronic.**	A[1]	A[1]	n/a	A[1]
G86		**Differential,** limited slip, heavy-duty, rear **1 - Required and only available with (NYS) 4-wheel steering.**	A[1]	A[1]	n/a	A[1]
G80		**Differential,** locking, heavy-duty, rear **1 - Not available with (JL4) StabiliTrak, vehicle stability enhancement system.**	A[1]	A[1]	■	A[1]
FE9		**Emissions,** Federal requirements	A	A	A	A
YF5		**Emissions,** California state requirements	A	A	A	A
NE1		**Emissions,** Maine or Massachusetts state requirements	A	A	A	A
NG1		**Emissions,** New York or Vermont state requirements	A	A	A	A
VCL		**Emissions Certification,** CFF (Clean Fuel Fleet) LEV (Low Emission Vehicle). Option (VCL) should ONLY be ordered to receive the CFF LEV certification. If VCL is not ordered, the vehicle will be produced with your normally selected emission system and may not be CFF LEV certified. Products ordered with the VCL option may not be certified to California emission requirements. Therefore, they may not be legal for registration in California, New York, Massachusetts, Maine and Vermont. Option YF5 should be ordered for all vehicles ordered in California **1 - Requires 3/4 ton Models and (LQ4) Engine, Vortec 6000 V8 SFI.**	A[1]	A[1]	n/a	A[1]
NB8		**Emissions override,** California, Maine, Massachusetts, New York or Vermont (for vehicles ordered by dealers in states of California, New York, Vermont, Massachusetts or Maine with Federal emissions) **1 - Requires (FE9) Emissions, Federal requirements.**	A[1]	A[1]	A[1]	A[1]

ADDITIONAL OPTIONS						
Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[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, (NE1) Emissions, Massachusetts or Maine state requirements or (NG1) Emissions, New York or Vermont state requirements.**	A[1]	A[1]	A[1]	A[1]
L18		**Engine,** Vortec 8100 V8 SFI (340 HP [253.6 kW] @ 4200 rpm, 455 lb.-ft. [616.9 N-m] @ 3200 rpm} **1 - Requires (Z55) Suspension Package, Autoride. - Requires 3/4 ton Models.**	A[1]	A[1]	n/a	A[1]
K05		**Engine block heater**	A	A	A	A
GT5		**Rear axle,** 4.10 ratio	A	A	A	A
PDM		NEW! **Skid Plates and Wheel Flares Package**, off-road, with aluminum front underbody shield starting behind front bumper and running to 1st cross-member protecting front underbody, oil pan, differential case and steel transfer case frame-mounted shields (refer to Color Compatibility chart for Matte Black vs. color-keyed wheel flares) **1 - Requires 1/2 ton 4WD Models.**	A[1]	A[1]	■	A[1]
VYU		**Snow Plow Prep Package**, includes instrument panel switch, roof beacon wiring, forward lamp wiring and torsion bar **1 - Requires 4WD 3/4 ton Models, (LQ4) Engine, Vortec 6000 V8 SFI, (MT1) Transmission, 4-speed automatic, heavy-duty and (Z85) Suspension Package, Handling/Trailering. Not available with (NYS) 4-wheel steering or (CF5) Sunroof, power.**	A[1]	A[1]	n/a	A[1]
JL4		NEW! **StabiliTrak,** vehicle stability enhancement system, includes threshold switch **1 - Requires 1/2 ton Models. Not available with (G80) Differential, locking, heavy-duty, rear.**	A[1]	A[1]	n/a	A[1]
Z55		**Suspension Package,** Autoride, bi-state variable shock dampening and rear air-assisted load-leveling on 1/2 ton models **1 - Required when (L18) Engine, Vortec 8100 V8 SFI is specified. Not available on LS Models unless (L18) Engine, Vortec 8100 V8 SFI or (NYS) 4-wheel steering is specified.** **2 - Required when (L18) Engine, Vortec 8100 V8 SFI is specified - Available with (LQ4) Engine, Vortec 6000 V8 SFI.**	A[1]	A[1]	n/a	A[2]
NW7		**Traction assist system,** electronic **1 - Required and only available with (NYS) 4-wheel steering on 2WD Models.**	A[1]	A[1]	n/a	A[1]

ADDITIONAL OPTIONS						
Free Flow RPO Code	Ref. Only RPO Code	**Description** **1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models.** **2 - Equipment group 1SL available on CK15906 Models.**	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
PDZ		**Trailering equipment,** heavy-duty, includes trailering hitch platform, 7-lead wiring connector and (KNP) Cooling external transmission oil cooler	A	A	■	A
MN8		**Transmission,** 4-speed automatic, heavy-duty, electronically controlled with overdrive, tow/haul mode and (KNP) Cooling, external transmission oil cooler **1 - Requires 3/4 ton Models and (L18) Engine, Vortec 8100 V8 SFI.**	A[1]	A[1]	n/a	A[1]

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No deletions allowed to Equipment Groups. Additional options may be added; check ordering information section for compatibility.

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Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	ZW9	**Body,** rear cargo panel doors 1 - Upgradeable to (E52) Body, liftgate with liftglass.	□[1]	□[1]	□[1]	□[1]
	B30	**Floor covering,** color-keyed carpeting	■	■	■	■
	B58	**Floormats,** color-keyed, carpeted front and 2nd row	■	■	■	■
	GT4	**Rear axle,** 3.73 ratio 1 - Upgradeable to (GT5) Rear axle, 4.10 ratio.	□[1]	□[1]	□[1]	□[1]
	BVE	**Assist steps**	■	■		■
	T96	**Fog lamps,** front, rectangular	■	■		■
	ZW7	**Suspension Package,** Premium Smooth Ride 1 - Requires 1/2 ton Models. Upgradeable to (Z55) Suspension Package, Autoride.	■	■		□[1]
	Z85	**Suspension Package,** Handling/Trailering 1 - Requires 3/4 ton Models. Must be upgraded to (Z55) Suspension Package, Autoride when the (L18) Engine, Vortec 8100 V8 SFI is ordered. 2 - Requires 3/4 ton Models. Upgradeable to (Z55) Suspension Package, Autoride when the (LQ4) Engine, Vortec 6000 V8 SFI is ordered. Must be upgraded to (Z55) Suspension Package, Autoride when the (L18) Engine, Vortec 8100 V8 SFI is ordered.	□[1]	□[1]		□[2]
	QMJ	**Tires,** P265/70R16, all-season touring, blackwall 1 - Requires 1/2 ton Models. Upgradeable to (QMK) Tires, P265/70R16, all-season touring, White outlined-letter.	□[1]	□[1]		□[1]
	QIZ	**Tires,** LT245/75R16E, all-season, blackwall 1 - Requires 3/4 ton Models. Upgradeable to (QIW) Tires, LT245/75R16E, on-/off-road, blackwall on 4WD Models.	□[1]	□[1]		□[1]
	DL8	**Mirrors,** outside rearview, foldaway, power adjustable, heated 1 - May be substituted with (DPF) Mirrors, outside rearview, power, heated, camper-style on 3/4 ton Models.	□[1]	□[1]		
	AT5	**Seats,** middle Custom Cloth 60/40 split-folding bench 1 - Upgradeable to (AT5) Seats, middle leather seating surfaces 60/40 split-folding bench or (AL4) Seats, middle leather seating surfaces buckets when leather interior is ordered.	■	□[1]		
	AS3	**Seats,** rear 3rd row Custom Cloth bench 1 - Upgradeable to Seats, rear vinyl 3rd row bench, when leather interior is ordered.	■	□[1]		
	CJ3	NEW! **Air conditioning,** tri-zone, manual	■			

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	AE7	**Seats,** front Custom Cloth 40/20/40 split-bench **1 - Upgradeable to (A95) Seats, front Custom Cloth reclining buckets.**	□[1]			
	UB1	NEW! **Sound system,** ETR AM/FM stereo with CD and cassette player	■			
	UC6	NEW! **Sound system,** ETR AM/FM stereo with in-dash 6-disc CD changer		■	■	■
A95		**Seats,** front Custom Cloth reclining buckets **1 - Upgradeable to (A95) Seats, front leather seating surfaces reclining buckets.**		□[1]		
	DL3	NEW! **Mirrors,** outside rearview **1 - May be substituted with (DPF) Mirrors, outside rearview, power, heated, camper-style on 3/4 ton Models.**			■	□[1]
	AT5	**Seats,** middle leather seating surfaces 60/40 split-folding bench **1 - Upgradeable to (AL4) Seats, middle leather seating surfaces buckets.**			□[1]	□[1]
	AS3	**Seats,** rear 3rd row vinyl bench			■	■
		Assist steps, tubular			■	
PDC		NEW! **Cargo Package**			■	
G80		**Differential,** locking, heavy-duty, rear			■	
	T96	**Fog lamps,** front, round			■	
A95		**Seats,** front leather seating surfaces reclining buckets **1 - Upgradeable to (AN3) Seats, front leather seating surfaces, power reclining full-feature buckets.**			□[1]	
PDM		NEW! **Skid Plates and Wheel Flares Package**			■	
	Z71	**Suspension Package,** Off-Road			■	
	QJP	**Tires,** P265/70R17, on-/off-road, blackwall			■	
PDZ		**Trailering equipment,** heavy-duty			■	
	CJ2	NEW! **Air conditioning,** tri-zone, automatic				■
AN3		**Seats,** front leather seating surfaces power reclining full-feature buckets				■

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
		Air bags, frontal, driver and right front passenger, includes Passenger Sensing System (front passenger air bag status display on inside rearview mirror)	S	S	S	S
AJ7		**Air bags,** side-impact, driver and right front passenger **1 - Included with (PDQ) Personal Security Package.**	A	A	I[1]	A
	CJ3	NEW! **Air conditioning,** tri-zone, manual, individual climate settings for driver, right front passenger and rear passengers, includes front and rear HVAC systems	■	S	S	n/a
	CJ2	NEW! **Air conditioning,** tri-zone, automatic, individual climate settings for driver, right front passenger and rear passengers, includes front and rear HVAC systems **1 - Included when (CF5) Sunroof, power or (U42) Entertainment system, rear seat is ordered.**	n/a	I[1]	I[1]	■
		Assist handles, front passenger and outboard 2nd row seats	S	S	S	S
PDC		NEW! **Cargo Package**, includes (RYJ) cargo shade, (AP9) cargo net, (B39) cargo mat and (V1K) luggage rack center rails	A	A	■	A
	D07	NEW! **Console,** floor, includes storage area, map pocket, coin holder, cupholders and integrated 2nd row audio controls **1 - Included when (A95) Seats, front Custom Cloth reclining buckets is ordered.** **2 - Included with (A95) Seats, front reclining buckets or (AN3) Seats, front leather seating surfaces power reclining full-feature buckets.**	I[1]	I[2]	I[2]	I[2]
	DK7	**Console,** overhead mini, includes map lights and rear seat HVAC controls	S	S	S	S
	K34	**Cruise control**, electronic with set and resume speed, includes telltale in instrument panel cluster	S	S	S	S
	C49	**Defogger,** rear-window, electric	S	S	S	S
	AU3	**Door locks,** power programmable, includes lockout protection	S	S	S	S
PDH		NEW! **Driver Convenience Package**, includes Universal transmitter, Power adjustable pedals and (UK3) Steering wheel mounted controls for audio and driver information center	A	A	A	A

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
		Driver Message Center, monitors vehicle systems including low fuel, transmission temperature, engine coolant, security, oil level, oil pressure and oil change	S	S	S	S
		NEW! **Driver Information Center**, monitors numerous systems depending on vehicle equipment **1 - Full functionality included when the (PDH) Driver Convenience Package or (UE1) OnStar is ordered.** **2 - Full functionality included when the (PDH) Driver Convenience Package or (PDQ) Personal Security Package is ordered.**	I[1]	I[1]	S	I[2]
U42		NEW! **Entertainment system,** rear seat, includes DVD player with remote control, overhead display, 2 sets of wireless infrared headphones, auxiliary audio/video jacks, remote game plug-in and mute button in overhead console **1 - Includes (CJ2) Air conditioning, tri-zone, automatic. Not available with (CF5) Sunroof, power.** **2 - Not available with (CF5) Sunroof, power.**	n/a	A[1]	A[1]	A[2]
	B30	**Floor covering,** color-keyed carpeting	■	■	■	■
	B58	**Floormats,** color-keyed, carpeted front and 2nd row, removable	■	■	■	■
		Headliner, Shale-colored cloth	S	S	S	S
		Instrumentation, analog, includes speedometer, odometer with trip odometer, fuel level, voltmeter, engine temperature, oil pressure and tachometer	S	S	S	S
		Key, single, 2-sided	S	S	S	S
	AU0	**Keyless entry,** remote, includes 2 transmitters, panic button and content theft alarm	S	S	S	S
		Lighting, dome lamp, driver and passenger side door switch with delayed entry feature, cargo lamps, door handle or keyless remote-activated illuminated entry and map lights in front and 2nd seat positions	S	S	S	S
	DF5	**Mirror,** inside rearview, electrochromic (light-sensitive auto-dimming), 8-point compass, outside temperature indicator and right front passenger air bag status	S	S	S	S
UE1		**OnStar**, 1-year Safe & Sound Service, includes Emergency Assistance Services, Air Bag Deployment Notification, Accident Assist, Roadside Assistance, Stolen Vehicle Tracking, Remote Diagnostics, Remote Door Lock and Unlock, Remote Vehicle Alert: horn and lights activation, online concierge services, Virtual Advisor and Personal Calling access **1 - Includes (UK3) Steering wheel, mounted controls.** **2 - Included with (PDQ) Personal Security Package.**	A[1]	A[1]	I[2]	S

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
PDQ		NEW! **Personal Security Package**, includes (AJ7) Side impact air bags, driver and right front passenger, (UE1) OnStar and (UK3) Steering wheel mounted controls for audio and driver information center	n/a	n/a	A	n/a
		Power outlets, auxiliary, 2 on instrument panel, 1 in cargo area, 12-volt	S	S	S	S
		Safety belts, 3-point, driver and front passenger, in all seating positions except center seating position in 1st and 3rd row which are lap only	S	S	S	S
	AE7	**Seats,** front Custom Cloth 40/20/40 split-bench, 3-passenger, driver and passenger manual reclining, outboard head restraints, center fold-down storage armrest, 6-way power adjustable driver seat and rear storage pockets **1 - Upgradeable to (A95) Seats, front Custom Cloth reclining buckets.**	□[1]	n/a	n/a	n/a
A95		**Seats,** front Custom Cloth reclining buckets, includes adjustable head restraints, inboard armrests, 6-way power adjustable driver seat, floor console and rear storage pockets **1 - Upgradeable to (A95) Seats, front leather seating surfaces reclining buckets.**	A	□[1]	n/a	n/a
A95		**Seats,** front leather seating surfaces reclining buckets, includes adjustable head restraints, inboard armrests, 6-way power adjustable driver seat, floor console and rear storage pockets **1 - Upgradeable to (AN3) Seats, front leather seating surfaces, power reclining full-feature buckets.**	n/a	A	□[1]	n/a
AN3		**Seats,** front leather seating surfaces power reclining full-feature buckets, includes adjustable head restraints, floor console, power lumbar, driver and passenger 8-way power adjustable, inboard armrests, heated driver and passenger seat cushion and seatbacks, power bolsters, 2-position driver-side memory and storage pockets and (JF4) Pedals, power adjustable **1 - Includes Pedals, power adjustable.**	n/a	n/a	A[1]	■[1]
	AT5	**Seats,** middle Custom Cloth 60/40 split-folding bench, 3-passenger with center armrest and rear passenger easy entry **1 - Upgradeable to (AT5) Seats, middle leather seating surfaces 60/40 split-folding bench or (AL4) Seats, middle leather seating surfaces buckets when leather interior is ordered.**	■	□[1]	n/a	n/a

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	AT5	**Seats,** middle leather seating surfaces 60/40 split-folding bench, 3-passenger with center armrest and rear passenger easy entry **1 - Included with (A95) Seats, front leather seating surfaces reclining buckets.** **2 - Upgradeable to (AL4) Seats, middle leather seating surfaces buckets.**	n/a	I[1]	□[2]	□[2]
AL4		**Seats,** middle leather seating surfaces buckets, reclining	n/a	A	A	A
	AS3	**Seats,** rear 3rd row Custom Cloth bench, 3-passenger, 1-piece removable **1 - Upgradeable to Seats, rear vinyl 3rd row bench, when leather interior is ordered.**	■	□[1]	n/a	n/a
	AS3	**Seats,** rear 3rd row vinyl bench, 3-passenger, all-belts-to-seat, removable **1 - Included with (A95) Seats, front leather seating surfaces reclining buckets - 3rd row is vinyl when leather is ordered.** **2 - 3rd row is vinyl when leather is ordered.**	n/a	I[1]	■[2]	■[2]
	DT4	**Smoker's Package**, includes ashtray and lighter	S	S	S	S
	UB1	NEW! **Sound system,** ETR AM/FM stereo with CD and cassette player, includes seek-and-scan, digital clock, auto-tone control, speed-compensated volume, TheftLock, random select, auto-reverse cassette and Radio Data System (RDS)	■	n/a	n/a	n/a
	UQ3	**Sound system feature,** 8-speakers	S	n/a	n/a	n/a
	UC6	NEW! **Sound system,** ETR AM/FM stereo with in-dash 6-disc CD changer, includes seek-and-scan, digital clock, auto-tone control, speed-compensated volume, TheftLock and Radio Data System (RDS)	n/a	■	■	■
	UQ7	NEW! **Sound system feature,** Bose Premium speaker system, 9 speakers, includes subwoofer in center console **1 - Included when (A95) Seats, front Custom Cloth reclining buckets is ordered.**	I[1]	S	S	S
	UK6	**Sound system feature,** rear audio controls, includes dual headphone jacks (headphones not included), power outlet and controls for volume, station selection and media **1 - Included when (A95) Seats, front Custom Cloth reclining buckets is ordered.**	I[1]	S	S	S
U2K		NEW! **Sound system feature,** XM Satellite Radio is 100 channels of digital quality sound that goes wherever you go - coast to coast. GM maintains exclusivity for factory installed satellite radio for 2003 Model year. **1 - Subscripton fees apply. Available only in the 48 contiguous U.S.**	A[1]	A[1]	A[1]	A[1]
		Steering column, Tilt-Wheel, adjustable, includes brake/transmission shift interlock	S	S	S	S
	NP5	**Steering wheel,** leather-wrapped rim, Black	S	S	S	S

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	UK3	**Steering wheel,** mounted controls, includes audio and driver information center controls **1 - Included when (PDH) Driver Convenience Package or (UE1) OnStar is ordered.** **2 - Included when the (PDH) Driver Convenience Package or (PDQ) Personal Security Package is ordered.**	I[1]	I[1]	I[2]	S
CF5		**Sunroof,** power, tilt-sliding, electric with express-open and wind deflector **1 - Includes (CJ2) Air conditioning, tri-zone, automatic. Not available with (U42) Entertainment system, rear seat or (NYS) 4-wheel steering.** **2 - Includes (CJ2) Air conditioning, tri-zone, automatic. Not available with (U42) Entertainment system, rear seat.** **3 - Not available with (U42) Entertainment system, rear seat or (NYS) 4-wheel steering.**	n/a	A[1]	A[2]	A[3]
		Theft-deterrent system, PASSlock II	S	S	S	S
	DH6	**Visors,** padded, Shale-colored, driver and passenger side with cloth trim, extenders, illuminated vanity mirrors and corner storage pockets on back of visors	S	S	S	S
		Warning tones, headlamp on, key-in-ignition, driver safety belt unfasten, turn signal on	S	S	S	S
	A31	**Windows,** power, includes driver express-down and lockout features	S	S	S	S

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
		Air dam, Gray	S	S	n/a	S
		Air dam, Dark Gray, unique	n/a	n/a	S	n/a
	BVE	**Assist steps**, Black, mounted between front and rear wheels at bottom of rocker panel	■	■	n/a	■
		Assist steps, tubular, mounted between front and rear wheels at bottom of rocker panel	n/a	n/a	■	n/a
	ZW9	**Body,** rear cargo panel doors 1 - Upgradeable to (E52) Body, liftgate with liftglass.	□[1]	□[1]	□[1]	□[1]
E52		**Body,** liftgate with liftglass, rear door system, includes rear-window wiper/washer	A	A	A	A
	VG3	**Bumper,** front, chrome 1 - Refer to Color Compatibility chart for Matte Black vs. color-keyed top pad.	S[1]	S[1]	n/a	S[1]
	VB3	**Bumper,** rear, chrome step, includes pad	S	S	n/a	S
	VB5	**Bumper,** front, painted	n/a	n/a	S	n/a
	V43	**Bumper,** rear, painted step, includes pad	n/a	n/a	S	n/a
		Daytime running lamps, includes automatic exterior lamp control	S	S	S	S
		Door handles, Matte Black	S	S	n/a	n/a
		Door handles, color-keyed	n/a	n/a	S	S
	T96	**Fog lamps,** front, rectangular, halogen	■	■	n/a	■
	T96	**Fog lamps,** front, round, halogen	n/a	n/a	■	n/a
	AJ1	**Glass,** Solar-Ray deep tinted (all windows except light tinted glass on windshield, driver and front passenger)	S	S	S	S
	V22	**Grille,** chrome surround	S	S	n/a	S
		Grille, color-keyed	n/a	n/a	S	n/a
V20		**Grille brush guard,** Black 1 - Not available to order at this time.	n/a	n/a	A[1]	n/a
		Headlamps, dual halogen composite, includes flash-to-pass feature and automatic lamp control	S	S	S	S
U01		**Lamps,** 5 amber roof marker 1 - Required and only available with (NYS) 4-wheel steering.	A[1]	A[1]	n/a	A[1]

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	V54	**Luggage rack,** roof-mounted, Black, side rails only **1 - Center rails available in (PDC) Cargo Package.**	S[1]	S[1]	n/a	S[1]
	G63	**Luggage rack,** roof-mounted, Black, includes cross rail, integral roller and rear auxiliary lamps to assist in loading items when in park	n/a	n/a	S	n/a
	DL8	**Mirrors,** outside rearview, foldaway, power adjustable, heated **1 - May be substituted with (DPF) Mirrors, outside rearview, power, heated, camper-style on 3/4 ton Models.**	□[1]	□[1]	n/a	n/a
	DL3	NEW! **Mirrors,** outside rearview, power folding, power adjustable, heated, color-keyed, driver side electrochromic (light-sensitive auto dimming), turn signal in glass, with ground illumination and curb-tilt **1 - May be substituted with (DPF) Mirrors, outside rearview, power, heated, camper-style on 3/4 ton Models.**	n/a	n/a	■	□[1]
DPF		NEW! **Mirrors,** outside rearview, power adjustable, heated, camper-style, includes power extending arms and turn signal indicators **1 - Requires 3/4 ton Models.**	A[1]	A[1]	n/a	A[1]
	B85	**Moldings,** bodyside **1 - Refer to Color Compatibility chart for Matte Black vs. color-keyed moldings.**	S[1]	S[1]	n/a	S[1]
		Moldings, Dark Gray, lower rocker	n/a	n/a	S	n/a
	V76	**Recovery hooks,** 2 front, frame-mounted **1 - Requires 4WD Models.**	S[1]	S[1]	S[1]	S[1]
		Tire carrier, outside spare, winch-type mounted under frame at rear, with tire	S	S	S	S
	SAF	**Tire carrier,** outside spare, lockable	S	S	S	S
	QMJ	**Tires,** P265/70R16, all-season touring, blackwall **1 - Requires 1/2 ton Models. Upgradeable to (QMK) Tires, P265/70R16, all-season touring, White outlined-letter.**	□[1]	□[1]	n/a	□[1]
QMK		**Tires,** P265/70R16, all-season touring, White outlined-letter **1 - Requires 1/2 ton Models.**	A[1]	A[1]	n/a	A[1]
	QJP	**Tires,** P265/70R17, on-/off-road, blackwall	n/a	n/a	■	n/a
	QIZ	**Tires,** LT245/75R16E, all-season, blackwall **1 - Requires 3/4 ton Models. Upgradeable to (QIW) Tires, LT245/75R16E, on-/off-road, blackwall on 4WD Models.**	□[1]	□[1]	n/a	□[1]
QIW		**Tires,** LT245/75R16E, on-/off-road, blackwall **1 - Requires 4WD 3/4 ton Models.**	A[1]	A[1]	n/a	A[1]

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
B71		**Wheel flares**, front and rear (2WD 1/2 ton Models and all 3/4 ton Models) (for 4WD 1/2 ton Models, refer to [PDM] Skid Plates and Wheel Flares Package) (refer to Color Compatibility chart for Matte Black vs. color-keyed wheel flares) **1 - Available on 2WD 1/2 ton Models. Standard on all 3/4 ton models.**	A[1]	A[1]	n/a	A[1]
	PF4	**Wheels,** 4 - 16" x 7" (40.6 cm x 17.8 cm) 6-lug bright machined aluminum, includes steel spare **1 - Requires 1/2 ton Models.**	S[1]	S[1]	n/a	S[1]
	PY0	**Wheels,** 4 - 16" x 6.5" (40.6 cm x 16.5 cm) 8-lug polished forged aluminum, includes chrome center caps and steel spare **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
	N88	**Wheels,** 4 - 17" x 7" (43.2 cm x 17.8 cm) cast aluminum, machined, includes 16" (40.6 cm) steel spare	n/a	n/a	S	n/a
		Wipers, intermittent, front, wet-arm with pulse washers	S	S	S	S

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			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
NYS		NEW! **4-wheel steering**, QUADRASTEER, includes 4WS mode selector switch on the instrument panel **1 - Requires 3/4 ton Models, (LQ4) Engine, Vortec 6000 V8 SFI and (E52) Body, liftgate with liftglass. Requires 11U, 47U, 50U, 58U or 72U exterior color. Not available with (CF5) Sunroof, power, (VYU) Snow Plow Prep Package, (JL4) StabiliTrak, vehicle stability enhancement system or (Z85) Suspension Package, Handling/Trailering - Requires (U01) Lamps, 5 amber roof marker, unique rear flared fenders, (G86) Differential, limited slip, heavy-duty, rear, (PDZ) Trailering equipment, heavy-duty, and (Z55) Suspension Package, Autoride. 2WD Models require (NW7) Traction assist system, electronic.**	A[1]	A[1]	n/a	A[1]
	K47	**Air cleaner,** high-capacity	n/a	n/a	S	n/a
	KG3	**Alternator,** 145 amps	S	S	S	S
		Battery, heavy-duty, 600 cold-cranking amps, includes rundown protection and retained accessory power	S	S	S	S
	JC4	**Brakes,** 4-wheel antilock, 4-wheel disc	S	S	S	S
	KC4	**Cooling,** external engine oil cooler, heavy-duty air-to-oil, integral to driver side of radiator **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
	KNP	**Cooling,** external transmission oil cooler, heavy-duty air-to-oil **1 - Included with (PDZ) Trailering equipment, heavy-duty on 1/2 ton Models - Standard on 3/4 ton Models.**	I[1]	I[1]	S	I[1]
G86		**Differential,** limited slip, heavy-duty, rear **1 - Required and only available with (NYS) 4-wheel steering.**	A[1]	A[1]	n/a	A[1]
G80		**Differential,** locking, heavy-duty, rear **1 - Not available with (JL4) StabiliTrak, vehicle stability enhancement system.**	A[1]	A[1]	■	A[1]
FE9		**Emissions,** Federal requirements	A	A	A	A
YF5		**Emissions,** California state requirements	A	A	A	A
NE1		**Emissions,** Maine or Massachusetts state requirements	A	A	A	A
NG1		**Emissions,** New York or Vermont state requirements	A	A	A	A

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
VCL		**Emissions Certification,** CFF (Clean Fuel Fleet) LEV (Low Emission Vehicle). Option (VCL) should ONLY be ordered to receive the CFF LEV certification. If VCL is not ordered, the vehicle will be produced with your normally selected emission system and may not be CFF LEV certified. Products ordered with the VCL option may not be certified to California emission requirements. Therefore, they may not be legal for registration in California, New York, Massachusetts, Maine and Vermont. Option YF5 should be ordered for all vehicles ordered in California **1 - Requires 3/4 ton Models and (LQ4) Engine, Vortec 6000 V8 SFI.**	A[1]	A[1]	n/a	A[1]
NB8		**Emissions override,** California, Maine, Massachusetts, New York or Vermont (for vehicles ordered by dealers in states of California, New York, Vermont, Massachusetts or Maine with Federal emissions) **1 - Requires (FE9) Emissions, Federal requirements.**	A[1]	A[1]	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, (NE1) Emissions, Massachusetts or Maine state requirements or (NG1) Emissions, New York or Vermont state requirements.**	A[1]	A[1]	A[1]	A[1]
	L59	**Engine,** Vortec 5300 V8 SFI Bi-Fuel, capable of running on unleaded or up to 85% ethanol (285 HP [212.6 kW] @ 5200 rpm, 325 lb.-ft. [438.7 N-m] @ 4000 rpm) **1 - Requires (FE9) Emissions, Federal requirements or (NG1) Emissions, New York or Vermont state requirements. Requires 1/2 ton Models.**	S[1]	S[1]	S[1]	S[1]
	LM7	**Engine,** Vortec 5300 V8 SFI (295 HP [220.1 kW] @ 5200 rpm, 325 lb.-ft. [445.5 N-m] @ 4000 rpm) **1 - Requires (NE1) Emissions, Massachusetts or Maine state requirements or (YF5) Emissions, California state requirements - Requires 1/2 ton Models.**	S[1]	S[1]	S[1]	S[1]
	LQ4	**Engine,** Vortec 6000 V8 SFI (320 HP [238.7 kW] @ 5000 rpm, 360 lb.-ft. [486.6 N-m] @ 4000 rpm) **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
L18		**Engine,** Vortec 8100 V8 SFI (340 HP [253.6 kW] @ 4200 rpm, 455 lb.-ft. [616.9 N-m] @ 3200 rpm} **1 - Requires (Z55) Suspension Package, Autoride. - Requires 3/4 ton Models.**	A[1]	A[1]	n/a	A[1]
K05		**Engine block heater**	A	A	A	A
	C5W	**GVWR,** 7000 lbs. (3175 kg) **1 - Requires 2WD 1/2 ton Models.**	S[1]	S[1]	n/a	S[1]

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	C5Z	**GVWR,** 7200 lbs. (3266 kg) **1 - Requires 4WD 1/2 ton Models.**	S[1]	S[1]	S[1]	S[1]
	C6P	**GVWR,** 8600 lbs. (3901 kg) **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
	GT4	**Rear axle,** 3.73 ratio **1 - Upgradeable to (GT5) Rear axle, 4.10 ratio.**	□[1]	□[1]	□[1]	□[1]
GT5		**Rear axle,** 4.10 ratio	A	A	A	A
	NZZ	**Skid Plate Package**, includes aluminum front underbody shield starting behind front bumper and running to 1st cross-member, protecting front underbody, oil pan, differential case and transfer case, frame-mounted shields **1 - Requires 4WD 3/4 ton Models. - 1/2 ton Models refer to (PDM) Skid Plates and Wheel Flares Package.**	S[1]	S[1]	n/a	S[1]
PDM		NEW! **Skid Plates and Wheel Flares Package**, off-road, with aluminum front underbody shield starting behind front bumper and running to 1st cross-member protecting front underbody, oil pan, differential case and steel transfer case frame-mounted shields (refer to Color Compatibility chart for Matte Black vs. color-keyed wheel flares) **1 - Requires 1/2 ton 4WD Models.**	A[1]	A[1]	■	A[1]
VYU		**Snow Plow Prep Package**, includes instrument panel switch, roof beacon wiring, forward lamp wiring and torsion bar **1 - Requires 4WD 3/4 ton Models, (LQ4) Engine, Vortec 6000 V8 SFI, (MT1) Transmission, 4-speed automatic, heavy-duty and (Z85) Suspension Package, Handling/Trailering. Not available with (NYS) 4-wheel steering or (CF5) Sunroof, power.**	A[1]	A[1]	n/a	A[1]
JL4		NEW! **StabiliTrak,** vehicle stability enhancement system, includes threshold switch **1 - Requires 1/2 ton Models. Not available with (G80) Differential, locking, heavy-duty, rear.**	A[1]	A[1]	n/a	A[1]
		Steering, power	S	S	S	S
		Suspension, front, independent torsion bar, and stabilizer bar	S	S	S	S
		Suspension, rear, multi-link with coil springs **1 - Requires 1/2 ton Models.**	S[1]	S[1]	S[1]	S[1]
		Suspension, rear, multi-stage leaf springs **1 - Requires 3/4 ton Models.**	S[1]	S[1]	n/a	S[1]
	ZW7	**Suspension Package,** Premium Smooth Ride **1 - Requires 1/2 ton Models.** **2 - Requires 1/2 ton Models. Upgradeable to (Z55) Suspension Package, Autoride.**	■[1]	■[1]	n/a	□[2]
	Z71	**Suspension Package,** Off-Road, includes 1.81" (46 mm) gas shocks, off-road jounce bumpers, (NZZ) Skid Plate Package, (K47) Air cleaner, high capacity and Z71 badge	n/a	n/a	■	n/a

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
	Z85	**Suspension Package,** Handling/Trailering, heavy-duty 1 - Requires 3/4 ton Models. Must be upgraded to (Z55) Suspension Package, Autoride when the (L18) Engine, Vortec 8100 V8 SFI is ordered. 2 - Requires 3/4 ton Models. Upgradeable to (Z55) Suspension Package, Autoride when the (LQ4) Engine, Vortec 6000 V8 SFI is ordered. Must be upgraded to (Z55) Suspension Package, Autoride when the (L18) Engine, Vortec 8100 V8 SFI is ordered.	□[1]	□[1]	n/a	□[2]
Z55		**Suspension Package,** Autoride, bi-state variable shock dampening and rear air-assisted load-leveling on 1/2 ton models 1 - Required when (L18) Engine, Vortec 8100 V8 SFI is specified. Not available on LS Models unless (L18) Engine, Vortec 8100 V8 SFI or (NYS) 4-wheel steering is specified. 2 - Required when (L18) Engine, Vortec 8100 V8 SFI is specified - Available with (LQ4) Engine, Vortec 6000 V8 SFI.	A[1]	A[1]	n/a	A[2]
NW7		**Traction assist system,** electronic 1 - Required and only available with (NYS) 4-wheel steering on 2WD Models.	A[1]	A[1]	n/a	A[1]
PDZ		**Trailering equipment,** heavy-duty, includes trailering hitch platform, 7-lead wiring connector and (KNP) Cooling external transmission oil cooler	A	A	■	A
		Trailering wiring harness, 7-wire	S	S	S	S
	NP8	**Transfer case,** electronic Autotrac, includes push-button controls 1 - Requires 4WD Models - Not available with (JL4) StabiliTrak, vehicle stability enhancement system.	S[1]	S[1]	S[1]	S[1]
	NR4	**Transfer case,** open differential, 2-speed 1 - Included with (JL4) Stabilitrak, vehicle stability enhancement system. Requires 4WD Models.	I[1]	I[1]	n/a	I[1]
	M30	**Transmission,** 4-speed automatic, electronically controlled with overdrive and tow/haul mode 1 - Requires 1/2 ton Models.	S[1]	S[1]	S[1]	S[1]
	MT1	**Transmission,** 4-speed automatic, heavy-duty, electronically controlled with overdrive, tow/haul mode and (KNP) Cooling, external transmission oil cooler 1 - Requires 3/4 ton Models and (LQ4) Engine, Vortec 6000 V8 SFI.	S[1]	S[1]	n/a	S[1]
MN8		**Transmission,** 4-speed automatic, heavy-duty, electronically controlled with overdrive, tow/haul mode and (KNP) Cooling, external transmission oil cooler 1 - Requires 3/4 ton Models and (L18) Engine, Vortec 8100 V8 SFI.	A[1]	A[1]	n/a	A[1]

S = Standard Equipment A = Available n/a = Not Available

I = Included with another feature ■ = Included in Equipment Group □ = Included in Equipment Group but upgradeable

*Indicates availability of feature on multiple models. For example, it indicates feature availability on 2WD and 4WD Models or Rear wheel drive and All-wheel drive Models.

		Transmissions			Axles		GVWR lbs. (kg)		
Model	**Engine**	**M30 4-Speed Automatic**	**MT1 4-Speed Automatic**	**MN8 4-Speed Automatic**	**GT4 3.73**	**GT5 4.10**	**C5W 7000 (3175)**	**C5Z 7200 (3266)**	**C6P 8600 (3901)**
1/2 Ton									
CC15906	L59 Vortec 5300 V8 SFI[1]	S	n/a	n/a	S	A	S	n/a	n/a
	LM7 Vortec 5300 V8 SFI[2]	S	n/a	n/a	S	A	S	n/a	n/a
CK15906	L59 Vortec 5300 V8 SFI[1]	S	n/a	n/a	S	A	n/a	S	n/a
	LM7 Vortec 5300 V8 SFI[2]	S	n/a	n/a	S	A	n/a	S	n/a
3/4 Ton									
C*25906	LQ4 Vortec 6000 V8 SFI	n/a	S	n/a	S	A	n/a	n/a	S
	L18 Vortec 8100 V8 SFI	n/a	n/a	A	S	A	n/a	n/a	A

1 - Requires (FE9) Emissions, Federal requirements or (NG1) Emissions, New York or Vermont state requirements.

2 - Requires (NE1) Emissions, Massachusetts or Maine state requirements or (YF5) Emissions, California state requirements.

S = Standard Equipment A = Available n/a = Not Available
I = Included with another feature ■ = Included in Equipment Group □ = Included in Equipment Group but upgradeable

*Indicates availability of feature on multiple models. For example, it indicates feature availability on 2WD and 4WD Models or Rear wheel drive and All-wheel drive Models.

Decor Level	Seat Type	Seat Code	Seat Trim	Interior	
				Tan/ Neutral[1]	Gray/ Dark Charcoal[1]
LS	Front 40/20/40 reclining split-bench	AE7	Custom Cloth	52D[1]	92D[1]
LS	Front high-back reclining bucket	A95	Custom Cloth	52D	92D
LS/Z71	Front high-back reclining bucket	A95	Custom Leather seating surfaces	522	922
Z71/LT	Front full-feature reclining bucket	AN3	Custom Leather seating surfaces	522	922

Exterior Solid Paint	Color Code	WA-Number	Interior		LS Wheel Flares[2]	LT Wheel Flares, Bodyside Molding and Front Bumper Pad	LT Door Handles and Outside Rearview Mirrors
			Tan/ Neutral[1]	Gray/ Dark Charcoal[1]			
Light Pewter Metallic[3]	11U	WA-382E	A	A	Light Pewter	Light Pewter	Light Pewter
Indigo Blue Metallic[4]	39U	WA-9792	A	A	Matte Black	Matte Black	Indigo Blue
Black[5]	41U	WA-8555	A	A	Matte Black	Matte Black	Black
Dark Green Metallic[3]	47U	WA-9539	A	A	Dark Green	Dark Green	Dark Green
Summit White[3]	50U	WA-8624	A	A	Summit White	Summit White	Summit White
NEW! Sandalwood Metallic[6]	58U	WA-711J	A	n/a	Sandalwood	Sandalwood	Sandalwood
NEW! Dark Gray Metallic	62U	WA-805K	n/a	A	Matte Black	Matte Black	Dark Gray
Redfire Metallic[6]	72U	WA-526F	A	A	Redfire	Redfire	Redfire

1 - Interior color has lighter/darker two-tone effect.
2 - On LS Models, bodyside molding, front bumper pad and door handles are Matte Black.
3 - Only colors available on 1SL/Z71. Only colors available with (NYS) 4-wheel steering.
4 - Not available on 3/4 ton Models.
5 - Only colors available on 1SL/Z71.
6 - Only available on 3/4 ton Models when (NYS) 4-wheel steering is ordered.

S = Standard Equipment A = Available n/a = Not Available

I = Included with another feature ■ = Included in Equipment Group □ = Included in Equipment Group but upgradeable

*Indicates availability of feature on multiple models. For example, it indicates feature availability on 2WD and 4WD Models or Rear wheel drive and All-wheel drive Models.

Decor Level	Seat Type	Seat Code	Seat Trim	Interior	
				Tan/ Neutral[1]	Gray/ Dark Charcoal[1]
LS	Front 40/20/40 reclining split-bench	AE7	Custom Cloth	52D	92D
LS	Front high-back reclining bucket	A95	Custom Cloth	52D	92D
LS	Front high-back reclining bucket	A95	Custom Leather seating surfaces	522	922
LT	Front full-feature reclining bucket	AN3	Custom Leather seating surfaces	522	922

Exterior Solid Paint	Color Code	WA-Number	Interior	
			Tan/ Neutral[1]	Gray/ Dark Charcoal[1]
Blue	none	WA-7901	A	A
Green	none	WA-7941	A	A
Green, Woodland	9V5	WA-9015	A	A
Victory Red	none	WA-9260	A	A
Doeskin Tan	9V9	WA-9403	A	A
Yellow	none	WA-9414	A	A
Tangier Orange	9W4	WA-9417	A	A
Orange	none	WA-9419	A	A
Wheatland Yellow	9W3	WA-253A	A	A

All wheel flares, bodyside moldings, front bumper pads, OSRV mirror backs and door handles are Black.

1 - Interior color has lighter/darker two-tone effect.

S = Standard Equipment A = Available n/a = Not Available
I = Included with another feature ■ = Included in Equipment Group □ = Included in Equipment Group but upgradeable

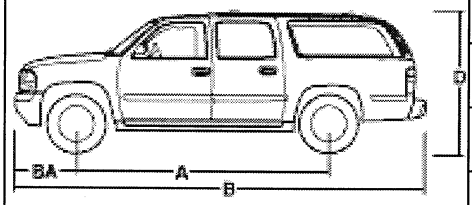
*Indicates availability of feature on multiple models. For example, it indicates feature availability on 2WD and 4WD Models or Rear wheel drive and All-wheel drive Models.

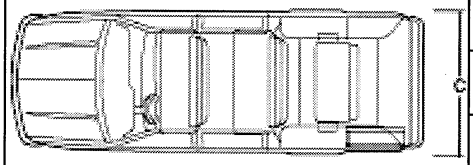
Options listed in the shaded column titled Ref. Only RPO Code are either included in a package or are 'base' equipment and cannot be ordered as a free flow option.

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
		Interior				
9R0 (SEO)		**Sound system, AM/FM stereo with cassette (MSRP = $150.00)** fleet option, AM/FM radio with cassette and clock **1 - Requires (AE7) Seats, front Custom Cloth 40/20/40 split-bench and a Fleet or Government order.**	A[1]	n/a	n/a	n/a
		Exterior				
8X1		**Label, fasten safety belts (MSRP = $2.00)** "Fasten Safety Belts" reminder label on side door window glass.	A	A	A	A
9V5		**Paints, solid (MSRP = No Charge),** Woodland Green **1 - Requires SEO (TGK) Special Paint One Color. - All wheel flares, bodyside moldings, front bumper pads, OSRV mirror backs and door handles are black.**	A[1]	A[1]	n/a	A[1]
9V9		**Paints, solid (MSRP = No Charge),** Doeskin Tan **1 - Requires SEO (TGK) Special Paint One Color. - All wheel flares, bodyside moldings, front bumper pads, OSRV mirror backs and door handles are black.**	A[1]	A[1]	n/a	A[1]
9W3		**Paints, solid (MSRP = No Charge),** Wheatland Yellow **1 - Requires SEO (TGK) Special Paint One Color. - All wheel flares, bodyside moldings, front bumper pads, OSRV mirror backs and door handles are black.**	A[1]	A[1]	n/a	A[1]
9W4		**Paints, solid (MSRP = No Charge),** Tangier Orange **1 - Requires SEO (TGK) Special Paint One Color. - All wheel flares, bodyside moldings, front bumper pads, OSRV mirror backs and door handles are black.**	A[1]	A[1]	n/a	A[1]
		Mechanical				
7Y9		**Battery, Main 770 CCA (MSRP = $56.00)** Provides a 770 CCA HD cranking battery. **1 - Not available with dual battery options or RPO (NYS) 4-wheel steering, QUADRASTEER.**	A[1]	A[1]	A[1]	A[1]

Free Flow RPO Code	Ref. Only RPO Code	Description 1 - Equipment groups 1SJ, 1SK and 1SM available on C*15906 and C*25906 Models. 2 - Equipment group 1SL available on CK15906 Models.	LS		Z71	LT
			1SJ[1]	1SK[1]	1SL[2]	1SM[1]
8T7		**Half shaft boot for 4x4 (MSRP = $150.00)** Front-wheel drive with a ballistic nylon (Cordura) protective cover on 4-wheel drive vehicles. Should be restricted to vehicles used in severe off-highway service. **1 - Requires Model K15906.**	A[1]	A[1]	A[1]	A[1]

All dimensions in inches (mm) unless otherwise stated.





	Specifications	2WD CC15906	2WD CC25906	4WD CK15906	4WD CK25906
A	**Wheelbase**	130.00 (3302)	130.00 (3302)	130.00 (3302)	130.00 (3302)
B	**Overall length**	219.30 (5570)	219.30 (5570)	219.30 (5570)	219.30 (5570)
C	**Body width**	78.90 (2004)	79.80 (2027)	78.90 (2004)	79.80 (2027)
D	**Overall height,** with luggage rack	73.60 (1869)	76.40 (1941)	75.40 (1915)	76.50 (1943)
	Head room, front	40.70 (1034)	40.70 (1034)	40.70 (1034)	40.70 (1034)
	Head room, center	39.00 (991)	39.00 (991)	39.00 (991)	39.00 (991)
	Head room, rear	38.60 (980)	38.60 (980)	38.60 (980)	38.60 (980)
	Shoulder room, front	65.20 (1656)	65.20 (1656)	65.20 (1656)	65.20 (1656)
	Shoulder room, center	65.10 (1654)	65.10 (1654)	65.10 (1654)	65.10 (1654)
	Shoulder room, rear	64.40 (1636)	64.40 (1636)	64.40 (1636)	64.40 (1636)
	Hip room, front	61.40 (1560)	61.40 (1560)	61.40 (1560)	61.40 (1560)
	Hip room, center	61.30 (1557)	61.30 (1557)	61.30 (1557)	61.30 (1557)
	Hip room, rear	49.20 (1250)	49.20 (1250)	49.20 (1250)	49.20 (1250)
	Leg room, front	41.30 (1049)	41.30 (1049)	41.30 (1049)	41.30 (1049)
	Leg room, center	39.10 (993)	39.10 (993)	39.10 (993)	39.10 (993)
	Leg room, rear	36.10 (917)	36.10 (917)	36.10 (917)	36.10 (917)
BA	**Front bumper to axle**	37.00 (940)	37.00 (940)	37.00 (940)	37.00 (940)
	Ground to top of rear load floor	31.20 (792)	32.50 (826)	31.00 (787)	33.20 (843)
	Load floor length, to front seat, at floor	104.60 (2657)	104.60 (2657)	104.60 (2657)	104.60 (2657)
	Load floor length, to center seat, at floor	69.60 (1768)	69.60 (1768)	69.60 (1768)	69.60 (1768)
	Load floor length, to rear seat, at floor	36.10 (917)	36.10 (917)	36.10 (917)	36.10 (917)
	Inside width, at floor	49.20	49.20	49.20	49.20

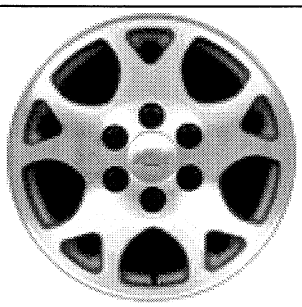
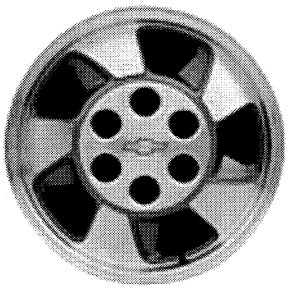
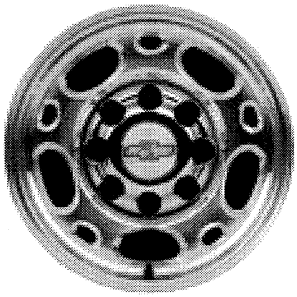
All dimensions in inches (mm) unless otherwise stated.

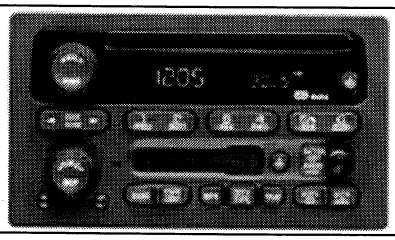
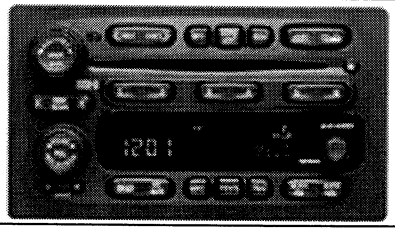
	Specifications		2WD CC15906	2WD CC25906	4WD CK15906	4WD CK25906
			(1250)	(1250)	(1250)	(1250)
		Inside width, between wheelhousing	49.10 (1247)	49.10 (1247)	49.10 (1247)	49.10 (1247)
		Cargo area height	40.50 (1029)	40.50 (1029)	40.50 (1029)	40.50 (1029)
		Ground clearance, front	9.80 (249)	8.10 (206)	9.80 (249)	8.40 (213)
		Ground clearance, rear	8.40 (213)	7.10 (180)	8.40 (213)	7.10 (180)

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.

	2WD CC15906	2WD CC25906	4WD CK15906	4WD CK25906
Specifications				
Front shock absorber diameter, in. (mm)	1.81 (46)	1.81 (46)	1.81 (46)	1.81 (46)
Front stabilizer bar diameter, in. (mm)	1.26 (32)	1.25 (32)	1.18 (30)	1.18 (30)
Rear shock absorber diameter, in. (mm)	1.81 (46)	1.81 (46)	1.81 (46)	1.81 (46)
Rear stabilizer bar diameter, in. (mm)	1.18 (30)	n/a	1.18 (30)	n/a
Turning diameter, curb-to-curb, ft. (m)	43.0 (13.1)	44.5 (13.6)	43.0 (13.1)	44.3 (13.5)
Turning diameter, curb-to-curb, with (NYS) 4-wheel steering, ft. (m)	n/a	36.5 (11.1)	n/a	36.5 (11.1)
Capacities				
Front axle, lbs. (kg)	3400 (1542)	4100 (1860)	3925 (1780)	4500 (2041)
Front spring capacity, lbs. (kg)	3150 (1429)	3800 (1724)	3600 (1633)	4180 (1896)
Rear axle, lbs. (kg)	4000 (1814)	6000 (2722)	4000 (1814)	6000 (2722)
Rear spring capacity, lbs. (kg)	4000 (1814)	6000 (2722)	4000 (1814)	6000 (2722)
Curb weight, lbs. (kg)	4947 (2244)	5520 (2504)	5219 (2367)	5796 (2629)
Cargo volume, cu. ft. (liters)	131.6 (3726.9)	131.6 (3726.9)	131.6 (3726.9)	131.6 (3726.9)
Payload[1], lbs. (kg)	2086 (946)	3153 (1430)	2077 (942)	2840 (1288)
Gross Vehicle Weight Rating (GVWR), lbs. (kg)	7000 (3175)	8600 (3901)	7200 (3266)	8600 (3901)
Front Gross Axle Weight Rating (GAWR), lbs. (kg)	3150 (1429)	3800 (1724)	3600 (1633)	4180 (1896)
Rear Gross Axle Weight Rating (GAWR), lbs. (kg)	4000 (1814)	6000 (2722)	4000 (1814)	6000 (2722)
Fuel capacity, approximate, gallon (liters)	31 (117)	37 (140)	31 (117)	37 (140)
Seating capacity (front/center/rear)	3/3/3	3/3/3	3/3/3	3/3/3

1. Maximum payload capacity includes weight of driver, passengers, optional equipment and cargo.

	N88 **Wheels,** 4 - 17" x 7" (43.2 cm x 17.8 cm) cast aluminum, machined, includes 16" (40.6 cm) steel spare
	PF4 **Wheels,** 4 - 16" x 7" (40.6 cm x 17.8 cm) 6-lug bright machined aluminum, includes steel spare
	PY0 **Wheels,** 4 - 16" x 6.5" (40.6 cm x 16.5 cm) 8-lug polished forged aluminum, includes chrome center caps and steel spare

	UB1 **Sound system,** ETR AM/FM stereo with CD and cassette player, includes seek-and-scan, digital clock, auto-tone control, speed-compensated volume, TheftLock, random select, auto-reverse cassette and Radio Data System (RDS)
	UC6 **Sound system,** ETR AM/FM stereo with in-dash 6-disc CD changer, includes seek-and-scan, digital clock, auto-tone control, speed-compensated volume, TheftLock and Radio Data System (RDS)

Deletions

- Exterior color Medium Charcoal Gray Metallic (14U)
- Exterior color Victory Red (74U)
- Interior cloth color Graphite (12I)
- Speed sensitive steering (4WD only)
- LT 1SN Package
- Trailering 7-way to 4-way adapter and electric trailer brake harness
- Pollen filter
- Auxiliary power door lock switch in cargo area
- Manual lumbar on AE7 bench seat and A95 bucket seats
- Power passenger seat on AE7 bench seat and A95 bucket seats
- Articulating headrest on AN3 bucket seats (1st and 2nd rows)
- Secondary shade on visors
- Roof rub strips
- Underhood lamp
- 3rd row floormats
- (39U) Indigo Blue Metallic not available on 3/4 ton Models
- (K47) High capacity air cleaner not available except on Z71 1SL

New Features

- Exterior Colors: Sandalwood Metallic (58U)
- Exterior Color: Dark Gray Metallic (62U)
- Enhanced driver information center
- Tri-zone climate control with manual controls for LS and Z71, and electronic controls for LT
- Rear electronic climate controls are now available with a sunroof
- New center console with integrated audio and HVAC controls for 2nd row
- New family of radios with Radio Data System (RDS)
- XM satellite radio (U2K)
- Rear Entertainment System (U42) with DVD player
- Bose speaker system with front bucket seats
- 2nd row bench seat now has middle seat 3-point safety belt restraint
- Passenger Sensing System (Right front passenger)
- Power adjustable pedals
- Power exterior mirrors with power folding, turn signal in glass, heat, ground illumination and driver-side self-dimming (DL3)
- Power camper mirrors including power adjust, power extend and heat (DPF)
- Redesigned 16" aluminum wheel (PF4)
- StabiliTrak (JL4)
- 4-Wheel steering (NYS) QUADRASTEER (3/4 ton only)
- Alternator amps increased to 145 amps
- Skid Plate and Wheel Flares Package (PDM)
- Smoker's Package includes cigarette lighter and ashtray
- (PDH) Driver's Convenience Package includes HomeLink universal transmitter, Power adjustable pedals and Steering wheel mounted controls for audio and driver information center
- (PDC) Cargo Package includes cargo net, cargo shade, cargo mat and luggage rack center rails
- (PDQ) Personal Security Package includes Side-impact air bags, OnStar and Steering wheel mounted controls for audio and driver information center

- Revised Instrument Panel with 2 power outlets
- (72U) Redfire Metallic now available on 3/4 ton Models with (NYS) 4-wheel steering, QUADRASTEER

Option Code	Description
7Y9	Battery, Main 770 CCA (MSRP = $56.00)
8T7	Half shaft boot for 4x4 (MSRP = $150.00)
8X1	Label, fasten safety belts (MSRP = $2.00)
9R0 (SEO)	Sound system, AM/FM stereo with cassette (MSRP = $150.00) fleet option
9V5	Paints, solid (MSRP = No Charge), Woodland Green
9V9	Paints, solid (MSRP = No Charge), Doeskin Tan
9W3	Paints, solid (MSRP = No Charge), Wheatland Yellow
9W4	Paints, solid (MSRP = No Charge), Tangier Orange
A31	Windows, power
A95	Seats, front Custom Cloth reclining buckets
A95	Seats, front leather seating surfaces reclining buckets
AE7	Seats, front Custom Cloth 40/20/40 split-bench
AJ1	Glass, Solar-Ray deep tinted
AJ7	Air bags, side-impact, driver and right front passenger
AL4	Seats, middle leather seating surfaces buckets
AN3	Seats, front leather seating surfaces power reclining full-feature buckets
AS3	Seats, rear 3rd row Custom Cloth bench
AS3	Seats, rear 3rd row vinyl bench
AT5	Seats, middle Custom Cloth 60/40 split-folding bench
AT5	Seats, middle leather seating surfaces 60/40 split-folding bench
AU0	Keyless entry, remote
AU3	Door locks, power programmable
B30	Floor covering, color-keyed carpeting
B58	Floormats, color-keyed, carpeted front and 2nd row
B71	Wheel flares
B85	Moldings, bodyside
BVE	Assist steps
C49	Defogger, rear-window, electric
C5W	GVWR, 7000 lbs. (3175 kg)
C5Z	GVWR, 7200 lbs. (3266 kg)
C6P	GVWR, 8600 lbs. (3901 kg)
CF5	Sunroof, power
CJ2	Air conditioning, tri-zone, automatic
CJ3	Air conditioning, tri-zone, manual
D07	Console, floor
DF5	Mirror, inside rearview, electrochromic
DH6	Visors, padded, Shale-colored
DK7	Console, overhead mini
DL3	Mirrors, outside rearview
DL8	Mirrors, outside rearview, foldaway, power adjustable, heated
DPF	Mirrors, outside rearview
DT4	Smoker's Package
E52	Body, liftgate with liftglass
FE9	Emissions, Federal requirements
G63	Luggage rack, roof-mounted, Black
G80	Differential, locking, heavy-duty, rear
G86	Differential, limited slip, heavy-duty, rear
GT4	Rear axle, 3.73 ratio
GT5	Rear axle, 4.10 ratio

Option Code	Description
JC4	Brakes, 4-wheel antilock, 4-wheel disc
JL4	StabiliTrak, vehicle stability enhancement system
K05	Engine block heater
K34	Cruise control
K47	Air cleaner, high-capacity
KC4	Cooling, external engine oil cooler
KG3	Alternator, 145 amps
KNP	Cooling, external transmission oil cooler
L18	Engine, Vortec 8100 V8 SFI
L59	Engine, Vortec 5300 V8 SFI Bi-Fuel
LM7	Engine, Vortec 5300 V8 SFI
LQ4	Engine, Vortec 6000 V8 SFI
M30	Transmission, 4-speed automatic
MN8	Transmission, 4-speed automatic, heavy-duty
MT1	Transmission, 4-speed automatic, heavy-duty
N88	Wheels, 4 - 17" x 7" (43.2 cm x 17.8 cm) cast aluminum, machined
NB8	Emissions override, California, Maine, Massachusetts, New York or Vermont
NC7	Emissions override, Federal
NE1	Emissions, Maine or Massachusetts state requirements
NG1	Emissions, New York or Vermont state requirements
NP5	Steering wheel, leather-wrapped rim
NP8	Transfer case, electronic Autotrac
NR4	Transfer case, open differential, 2-speed
NW7	Traction assist system, electronic
NYS	4-wheel steering
NZZ	Skid Plate Package
PDC	Cargo Package
PDH	Driver Convenience Package
PDM	Skid Plates and Wheel Flares Package
PDQ	Personal Security Package
PDZ	Trailering equipment, heavy-duty
PF4	Wheels, 4 - 16" x 7" (40.6 cm x 17.8 cm) 6-lug bright machined aluminum
PY0	Wheels, 4 - 16" x 6.5" (40.6 cm x 16.5 cm) 8-lug polished forged aluminum
QIW	Tires, LT245/75R16E, on-/off-road, blackwall
QIZ	Tires, LT245/75R16E, all-season, blackwall
QJP	Tires, P265/70R17, on-/off-road, blackwall
QMJ	Tires, P265/70R16, all-season touring, blackwall
QMK	Tires, P265/70R16, all-season touring, White outlined-letter
SAF	Tire carrier, outside spare, lockable
T96	Fog lamps, front, rectangular
T96	Fog lamps, front, round
U01	Lamps, 5 amber roof marker
U2K	Sound system feature, XM Satellite Radio
U42	Entertainment system, rear seat
UB1	Sound system, ETR AM/FM stereo with CD and cassette player
UC6	Sound system, ETR AM/FM stereo with in-dash 6-disc CD changer
UE1	OnStar
UK3	Steering wheel, mounted controls
UK6	Sound system feature, rear audio controls

Option Code	Description
UQ3	Sound system feature, 8-speakers
UQ7	Sound system feature, Bose Premium speaker system
V20	Grille brush guard, Black
V22	Grille, chrome surround
V43	Bumper, rear, painted step
V54	Luggage rack, roof-mounted, Black
V76	Recovery hooks, 2 front, frame-mounted
VB3	Bumper, rear, chrome step
VB5	Bumper, front, painted
VCL	Emissions Certification, CFF (Clean Fuel Fleet) LEV (Low Emission Vehicle).
VG3	Bumper, front, chrome
VYU	Snow Plow Prep Package
YF5	Emissions, California state requirements
Z55	Suspension Package, Autoride
Z71	Suspension Package, Off-Road
Z85	Suspension Package, Handling/Trailering
ZW7	Suspension Package, Premium Smooth Ride
ZW9	Body, rear cargo panel doors

Maximum trailer ratings are calculated assuming standard equipped vehicle, driver and required trailering equipment. The weight of optional equipment, passengers and cargo will reduce the maximum trailer weight your vehicle can tow. 10 to 15% of the trailer weight is the recommended trailer tongue load.

Automatic Transmission Ratings with Ball Hitch

Model	1/2 Ton (L59/LM7) Vortec 5300 V8 SFI		3/4 Ton (LQ4) Vortec 6000 V8 SFI		3/4 Ton (L18) Vortec 8100 V8 SFI	
	Axle Ratio	Maximum Trailer Weight lbs. (kg)	Axle Ratio	Maximum Trailer Weight lbs. (kg)	Axle Ratio	Maximum Trailer Weight lbs. (kg)
2WD	3.73	7400 (3357)	3.73	7600 (3447)	3.73	10400 (4717)
	4.10	8400 (3810)	3.73	7900 (3583)	4.10	12000 (5443)
			4.10	9600 (4355)		
			4.10	9900 (4491)		
4WD	3.73	7100 (3221)	3.73	7300 (3311)	3.73	10100 (4581)
	4.10	8100 (3674)	3.73	7600 (3447)	4.10	12000 (5443)
			4.10	9300 (4218)		
			4.10	9600 (4355)		

C/K25906 models with Z83 Suspension Package and either 3.73 or 4.10 axle ratio are limited to the 3.73 ratings shown above.

Trailering capacity may be limited by tow vehicle ability to carry trailer tongue weight.

Addition of trailer tongue weight cannot cause vehicle weights to exceed Rear Gross Axle Weight Rating (RGAWR) or Gross Vehicle Weight Rating (GVWR).

GCWR For Engine/Rear Axle Ratio Combination with Automatic Transmission

Engine	(GCWR) Gross Combination Weight Ratings lbs. (kg)					
	12000 (5443)	13000 (5897)	14000 (6350)	16000 (7258)	17000 (7711)	19000 (8618)
(L59/LM7) Vortec 5300 V8 SFI	3.42	3.73	4.10			
(LQ4) Vortec 6000 V8 SFI			3.73	4.10		
(L18) Vortec 8100 V8 SFI					3.73	4.10