TECHlink
GM
November 2000
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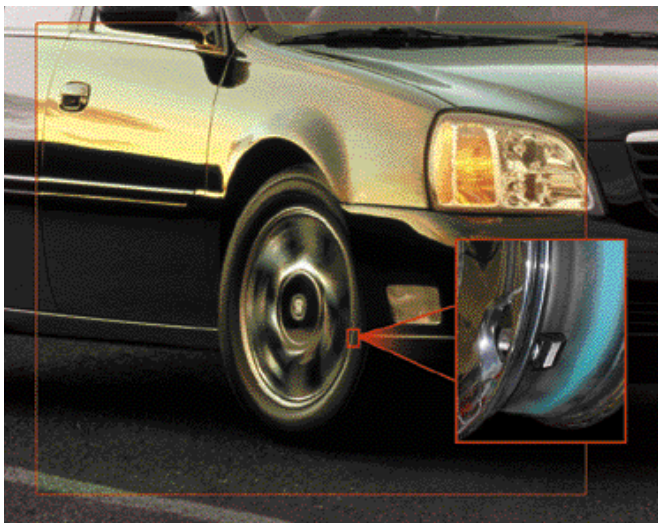
New Tire Pressure Monitor System for 2001

A new tire pressure monitor (TPM) system, UJ6, is now available on Cadillac DeVilles and Sevilles. Unlike other systems which report only underinflation, this system also reports overinflation, and permits viewing individual tire pressures.



Components

The TPM system consists of three components.

First, there's a battery powered sensor/radio frequency transmitter in each wheel. Second, the TPM system shares the Remote Control Door Lock Receiver (RCDLR) with the Keyless Entry system. And third, digital information is sent over the serial data line to the instrument panel cluster, where the readout is displayed on the Driver Information Center (DIC).

Sensors

The sensor assembly includes a nickel-plated valve stem and a battery. It's serviceable only as an assembly. The sensor installs from inside the wheel, with the valve stem protruding through a hole in the rim. A special grommet provides an air seal, and the retaining nut is installed from the outside. You must use a torque wrench to tighten the nut to 4 N•m (35 lb. in.) to avoid damage to the grommet.

Operation

The sensor begins transmitting only when the wheel is rotating above 20 mph. After the wheel has remained below 20 mph for 20 minutes, the sensor goes into a stationary mode and transmits only once per hour. This extends battery life.

At the start of production, the TPM system was calibrated to recognize 24 psi as the lower limit and 36 psi as the upper limit.

There has been a running change in pressure calibration. Beginning with VIN U115021, the upper limit was raised to 39 psi; the owner's manual continues to list the 36 psi specification.

If the pressure in a tire moves outside the specified limits, the "Check Tire Pressure" notification appears in the DIC. It can be cleared by adjusting the air in the affected tire to the proper pressure.

Each sensor is uniquely coded, so

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Techline News

Tech 2 Live Plot Feature Offers Live Data

The Tech 2 will soon have a new feature that allows data display parameters to be graphed in real time as it happens. The Tech 2 Live Plot function will be included in the upcoming TIS 2000 satellite update broadcast number 20 scheduled for December 10.

The Live Plot function will allow up to three parameters to be plotted on a graph at one time. The data of these parameters will be plotted as the information is received on the Tech 2 from the vehicle. This may aid in the diagnosis of an intermittent vehicle condition by enabling the user to view data from the vehicle graphically. Any spikes or drops on the graph can be analyzed immediately. Previously, it was required that data be captured before it could be plotted.

The Live Plot application is available from the Data Display, Quick Snapshot and Snapshot applications on the Tech 2.

From Data Display, select the MORE soft key twice to bring up the LIVE PLOT soft key. Once up to three parameters are selected, select ACCEPT and a graph will be displayed.

All of the features of the graph are available while Live Plot is functioning, such as SELECT ITEMS, DTC and QUICK SNAPSHOT. Pressing the MORE soft key leads to options that allow the user to zoom in and out on the plotted graph 50 frames at a time and change the min/max values of a highlighted data parameter.

The min/max values of a highlighted data parameter can be edited several ways. Selecting CHANGE MIN/MAX allows the minimum and maximum val-

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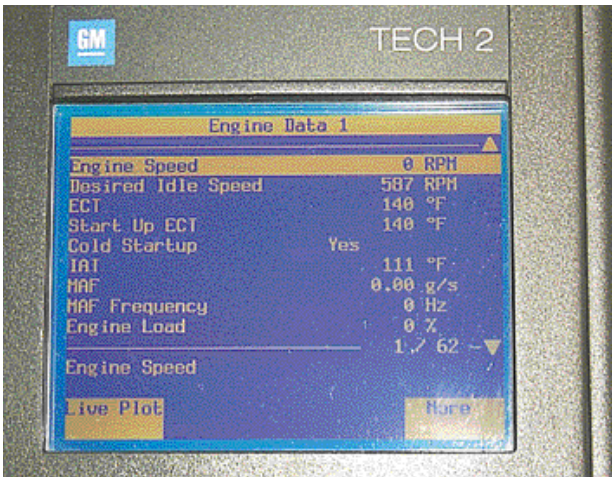


Select the Line Plot soft key...

ues of a data parameter to be changed. EDIT MIN and EDIT MAX enables the key pad to be used to set the minimum and maximum values, respectively. The value also can be assigned a positive or negative value. Selecting LEARN and LEARN ALL allows the Tech 2 to learn the min/max values of a highlighted parameter or of all selected parameters. Selecting RESTORE DEFAULT restores the default min/max values of the highlighted parameter.

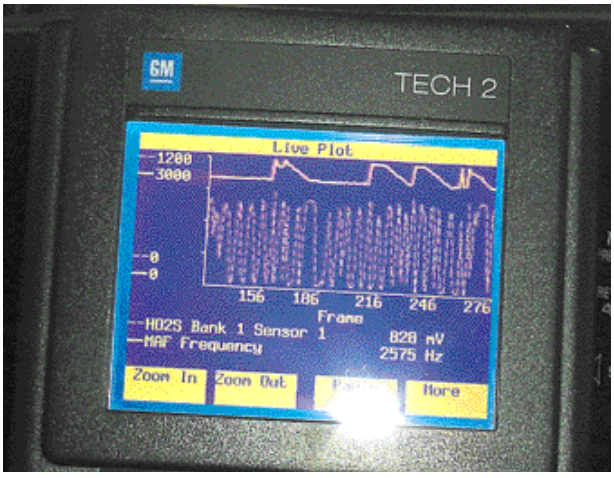
To stop the plot function for analysis, select PAUSE. RESUME will restart the live plot.

To switch the display mode from Live Plot display back to a text display, select the MORE soft key twice from the Live Plot graph and then select DATA LIST.

From the Snapshot standby mode, the Live Plot function also is available by selecting the MORE soft key. While viewing Live Plot, a snapshot also can be triggered the same way it is in the Snapshot mode.

Be sure to update your Tech 2 with the latest TIS 2000 software as soon as it is available to utilize the new Live Plot feature.

– Ken Sturdevant



...to graph up to three parameters.

Transfer Case Tech 2 Support

If you can't find transfer case data with the Tech 2 on a truck, does that mean there is a communication problem? Not always.

The control modules of some of the transfer cases that are currently available in GM trucks do not provide for communication with the Tech 2. Following is a list of available transfer cases along with which ones are supported by the Tech 2.

– Dana Swaney

Transfer Case	Switch Configuration	Applications	Tech 2 Support	Model Year
NVG-136	None	L, T (Bravada)	Yes	1998-2001
NVG-233	Rocker Switch	T	No	
NVG-243	3 Switches	K	No	
NVG-236	4 Switches	T	Yes	1998-2001
NVG-246	4 Switches	K	Yes	1998-2001
Borg 261	Automatic	K (Escalade), L	No	
NVG-263	3 Switches	K Heavy Duty	Yes	2001

TECHlink

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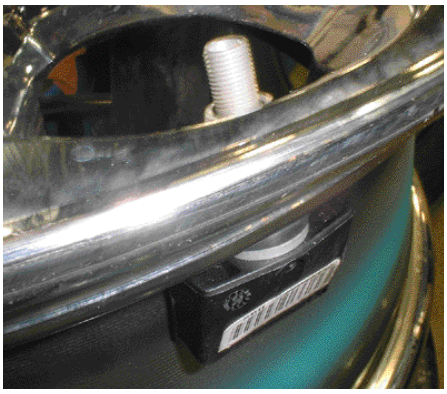


Tire Pressure Monitor sensor

the receiver can determine which pressure information is related to each tire.

The TPM system compensates for altitude, using baro information from the PCM. If this communication does not occur, the TPM system substitutes a default value.

Service Tips

Before delivering a new vehicle, check and adjust the tire pressure according to the specifications on the tire placard on the left rear door. These specifications are for a cold tire.

The tire pressure display in the DIC can be turned off using the Personalization feature. If a customer is concerned that the tire pressure monitor is not working, be sure the display is turned on.

The lightweight sensor adds only one ounce to the rim of the wheel. This will be accounted for when the tire is balanced using conventional methods.

The sensor is located within the "well" of the wheel below the safety hump, so it's not likely to be contacted by modern tire mounting equipment. But the sensor could be damaged by using tire irons.

If the reading obtained from a service station tire gauge does not agree with the TPM reading, diplomatically suggest using a known-accurate gauge. The precision of the TPM exceeds that of consumer-grade tire gauges.

At the factory, the receiver is programmed to recognize the sensor at each wheel location. If the tires are rotated, or a sensor is replaced, the TPM system must be reprogrammed. Otherwise, the system will continue to report the correct pressures but will assign them to

Valve stem nut

the wrong wheel locations. No data will be displayed for a new sensor until it is programmed.

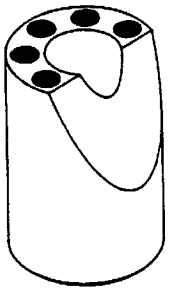
Programming

NOTE: There are two methods available for reprogramming, using the J-41760 magnet and using the Tech 2. You must use J-41760 if a new sensor is installed; both methods work when tires are rotated.

Using the J-41760 magnet -- Be sure you understand the procedure before starting. You have only one minute to perform each step; otherwise, you will have to begin again.

With the ignition on, engine not running, press both lock and unlock buttons simultaniously on the key fob to put the receiver in the programming mode. This is indicated by a horn chirp within 10 seconds.

At each wheel, hold the J-41760 magnet over the valve stem to force the sensor to transmit its ID code. Hold the magnet in place until the horn chirps, about 5 seconds. You must follow a specific order: LF, RF, RR, LR. After the fourth sensor, a double horn chirp indicates that the programming is successful. Scroll through the readouts on the DIC to be sure all four pressures are displayed.



J 41760 Magnet

Using the Tech 2 -- A new Tech 2 feature allows relearning new tire locations without using the reprogramming magnet. Using TPM Reprogramming on the Tech 2 menu, you can command the LF tire to the LR location, and likewise with the other three tires. Scroll through the readouts on the DIC to be sure all four pressures are displayed.

– Dave Smith and Alan Srodawa contributed to this article

TAC Tips

Cavalier and Sunfire Steering Clunk Noise During Turns

A steering clunk noise during turns in parking lot maneuvers may be heard on some 1997-2001 Pontiac Sunfire and Chevrolet Cavalier models. This condition may be caused by the intermediate shaft grease not being distributed evenly along the intermediate shaft of the steering column.

Before replacing any part, disconnect the intermediate shaft, either at the column or the gear, and cycle the shaft (pull it all the way out and then back again) to redistribute the grease. If the noise is gone, replace the shaft. Parts are available from GM SPO.

4T40E/4T45E Transaxles Removal of the TCC PWM Filter

The TCC Pulse Width Modulation (PWM) filter (#17), which snaps into the spacer plate, on 4T40E/4T45E transaxles was eliminated from production on May 8, 2000. The use of the filter in this location is redundant. The PWM has its own filter located on the solenoid. The PWM filter has been removed from SPO inventory and is no longer available.

Models equipped with 4T40E/4T45E transaxles affected by this change include 1998-2000 Chevrolet Cavalier, 1998-2000 Pontiac Sunfire, 1998-2000 Oldsmobile Cutlass, 1999-2000 Chevrolet Malibu, 1999-2000 Pontiac Grand Am and 1999-2000 Oldsmobile Alero.

Programming for Tire Size and Axle Ratio Changes

Customer's and/or Dealer's requests for changing tire sizes and axle ratios requires a calibration change so that the vehicle operates properly. Techline will support these changes on 1999-2001 cars and 1996-2001 light-trucks as long as it was an available combination for that model year.

A dealer can request a VCI number for a car or truck when they have changed differential gear ratios or tire sizes. It must be a combination that was available for that model and year. TCSC has a list of allowable combinations for a specific model year. If the combination is possible Techline will provide a VCI number that allows reprogramming.

Note: It's recommended to check on a planned change first to see if it's an allowable combination before doing the work.

Requests for a calibration change to upgrade a tire speed rating (install a faster speed rated tire) will not be approved.

Requests for cars also will take longer as additional approvals are required.

Call Techline at 1-800-828-6860. Select prompt 1, and then prompt 2 for a VCI number.

– GM Technical Assistance

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Remanufactured Engines and Transmissions

Putting the 'Good' in Goodwrench

In the August issue of *GM TechLink*, we brought you a look into the remanufacturing processes for electronic components. This month, we're putting the emphasis on the remanufactured engines and transmissions offered by GM Service

Parts Operations (GMSPO).

For an inside look, we visited with two representatives of Service Parts Operations: Chris Thomas, Remanufacturing Manager, and Mark Kevnick, Remanufacturing Group Leader.

What's the currently proper name for remanufactured engines and transmissions?

The first thing we learned is that two names used in the past -- SRTA (Service Replacement Transmission Assemblies) and Targetmaster engines -- are now replaced by the GM Goodwrench banner.

Where do Goodwrench engines and transmissions come from?

GM contracts with several independent remanufacturing facilities throughout the United States, four sites for engines and three for transmissions. These facilities are all QS

9000 certified, which carries the assurance of top-notch procedures and processes. Further, they're members of either the Auto Engine Rebuilders Association or the Aftermarket Transmission Rebuilders Association.

All of these suppliers are in constant contact with GM engineering who provide the latest information on current revisions and practices.

What determines whether you should install a factory-new unit or a Goodwrench remanufactured one? Is it somehow related to warranty vs. customer-pay?

For engines, while the vehicle is under warranty, only factory-new units will be provided. After production of an engine stops, remanufacturing starts. This means that customer pay units can be new or remanufactured.

For transmissions, during the first model year, only factory-new units (seed units) will be provided. After the first year, remanufacturing starts. At that time, both warranty and customer pay units will be remanufactured.

Engines and transmissions are available in various levels of completeness. Define them.

Engine, 1/2 (Short-Block)

- Includes block, pistons, crank shaft

Engine, 3/4 (Long Block)

- Includes Short Block plus heads, camshaft and lifters, front cover, associated dress items

Engine, Drop-In

- Includes 3/4 Block plus sensors, intake manifold and flywheel

Transmission, Drop-In

- Includes transmission, valve body, torque converter, and sensors

NOTE: Transmission torque converters and valve bodies are also available individually.

What is the retail technician's role in the remanufacturing process?

First, a steady supply of good cores (remanufacturable engines and transmissions) is needed to keep the remanufacturers supplied with product. An uninterrupted supply going out depends on a good incoming supply.

When you return a core for remanufacturing, you must follow several important guidelines, including these:

- "Reason for Failure" This critical item is part of the Core Credit and Return form and is important for several reasons. First, it gives the remanufacturer a clue what to be on the lookout for when the unit is disassembled. Second, the information is added to a data base where it is

used for continuous product improvement.

- Be sure to identify the core properly. And be sure the core is complete. Removing small items that you consider incidental may prevent the facility from accepting the core.

- Be sure to drain all fluids (transmission fluid, engine oil, and coolant) before packaging the core.

What does the engine remanufacturing process involve?

During the initial disassembly, mandatory-replacement items are discarded. The remaining components are baked in an oven for a prescribed length of time and temperature up to 14 hours at 700° F to remove grime, then they are washed and inspected.

Small components such as rocker arms, pushrods and valve springs are sonically cleaned.

Aluminum parts are shot blasted.

All parts are inspected to determine if they can be remanufactured. Inspectors look for evidence of damage and measure critical dimensions to determine if there is sufficient material left to permit machining.

Most cast iron blocks contain enough material to permit overboring. Generally, cylinders are bored to 0.020-inch overbore, with a maximum of 0.040-inch. All cylinders in an engine are overbored the same amount. Bearing bores are line-honed. Aluminum blocks may contain sleeves, which can be replaced.

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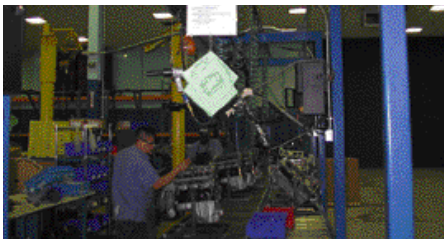
Crankshaft journals are typically ground to 0.010 undersize, with a maximum of 0.020-inch. This applies to both main journals and rod journals.

Connecting rods are reconditioned. Valve seats are reground to factory specifications; inserts are installed if necessary.

Valve guides are reamed to 0.015-inch oversize. New valves, lifters and camshaft are installed. Valve springs, rocker arms and pushrods may be reused.



When an engine is assembled, all of the following are mandatory-replacement items: seals, gaskets, plugs for fluid passages, pistons and rings, camshaft and lifters, valves, torque-to-yield bolts, timing gear and chain or belt.

Because some engines are no longer manufactured as new units, the remanufactured engines are built to the most recent content level in effect before production was discontinued.

How is a remanufactured engine tested?

Each engine is subjected to a low rpm cold-roll test. The engine is driven by an electric motor to permit checking oil pressure and flow, compression, and the required torque-to-turn. This last test determines whether bearing clearances and ring clearances are within specification. A vacuum decay test determines whether there are any leaks in the coolant or oil cavities.

On a percentage basis, a certain number of engines are pulled at random from the shipping dock for further testing for sediment content, which determines cleanliness, and a teardown audit determines machining precision and assembly torques.

What does the transmission remanufacturing process involve?

After complete disassembly, aluminum parts and cast iron parts are pressure washed in separate cleaners. Because transmission parts do not get as grimy as engines, they do not have to be baked.

A visual inspection determines which components are suitable for further processing.

The pump and body are machined if necessary.

Each torque converter is cut open, inspected and renewed with new bearings and friction material.

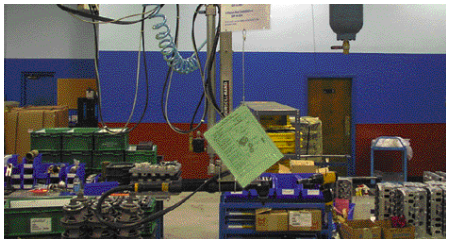
Valve bodies are completely torn down, inspected and tested. In some cases valve bores are sleeved if they are oversize. Serviceable valves are reused.

When the transmission is assembled, all of the following are mandatory-replacement items: seals, gaskets, bands, friction surfaces, most bearings and bushings.

Because updated parts are installed in every transmission, the finished unit may be thought of better than it was when it was new.

How is a remanufactured transmission tested?

The remanufactured transmission is subjected to the exact tests used in the new transmission factory. The shift points are checked, as well as shift duration (computerized test,



checked in milliseconds). Safety items are checked. And a pressure decay test looks for leaks.

On a percentage basis, a certain number of transmissions are pulled at random from the shipping dock for further testing for sediment content, which determines cleanliness, and a teardown audit determines machining precision and assembly torques.

And as a further check, a certain number of transmissions are selected at random and actually installed into vehicles for a drive audit.

With all of this remanufacturing care, what is the warranty on Goodwrench engines and transmissions?

The standard warranty is 36 months or 50,000 miles.

Are there any installation tips to ensure customer satisfaction with the remanufactured Goodwrench engine?

Mark Kevnick emphasized the following points.

First, you must flush the oil lines and cooler, if equipped. The old engine may have left debris in them. Likewise, flush the cooling system. And finally, if you're installing a short-block or 3/4-engine, don't install the old intake or exhaust manifold, without first removing debris from it. There's no point contaminating the new engine with any debris from the original one.

Second, be sure to pre-lube the engine before starting it. Once the crankcase is filled with oil, this may be accomplished in several ways. On engines with a distributor, you can drive the oil pump through the distributor shaft opening to circulate oil to all parts of the engine. You can install an external pressurized engine oiler, generally using an oil sender hole. Or you can disable the fuel and ignition systems and operate the engine on the starter until operating oil pressure is achieved. (NOTICE: the starter motor should not be operated for more than 15 seconds at a time without pausing. Overheating caused by too much cranking will damage the motor.)

Are there any installation tips to ensure customer satisfaction with the remanufactured Goodwrench transmission?

Chris Thomas emphasized the following points.

Many times when a transmission fails, it leaves metal or fiber particles in the oil cooler system. You must flush the oil cooler and lines before running the oil through the new transmission. A metal particle or fiber can cause a valve to hang or a passage to plug, with disastrous results.

Second, you must follow service manual procedures to check flow rate through the cooler. It must be at least 2 quarts in 30 seconds to be acceptable.

– Chris Thomas and Mark Kevnick contributed to this article.

Some terms are used so often, so interchangeably and often incorrectly, that they lose their intended meaning. Here's how the following terms should be used:

REPAIR: replace the part that failed

REBUILD: return the device to original specifications using OEM parts

REMANUFACTURE: rebuild, incorporating updates to the current level of practices

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Let's Talk

Service Clubs Open Lines of Communication

In this world of digital communication – e-mail, voice-mail, cell phones, fax machines – interactive communication with each other and its value may sometimes get lost in the shuffle.

Interactive communication is one of the benefits for service managers who attend a local service club meeting. The idea of service managers getting together to discuss local business issues is not a new one, but it is still an effective one.

Service clubs enable members to develop a rapport with other service managers from neighboring dealerships. In most cases, those managers are dealing with many of the same issues. The clubs allow for the development of cooperation and assistance between dealerships and also provide a way to deliver information to many dealerships from a wide array of sources.

George Gabor, service manager at Farabaugh Chevrolet-Oldsmobile in Ligionier, PA, is the president of the Western Pennsylvania GM Service Club. The bimonthly club meetings provide an opportunity for service managers to get together with representatives from GM, including local AVMs and regional field engineers, as well as local businesses. Past meeting guests have included representatives from OnStar, GM platform engineers and GM SPO.

"The meetings are a great communication tool with guest speakers from the different areas of the automotive business," says Gabor.

"We discuss product concerns and any on-going problems, warranty concerns, policies and procedures, and any issues that the AVMs may be able to help with."

Gabor suggests inviting your AVM to help support the club. They can provide a great deal of information that can help dealerships. And the clubs also provide a chance to further develop relationships with AVMs.

The clubs aren't all business though, says Gabor. The Western Pennsylvania GM Service Club recently toured the GM assembly plant in Baltimore and also holds an annual technician outing for the dealerships technicians and their families.

Following is a list of some of the GM service clubs that are organized around the country. If there is a service club in your area, it may prove beneficial to attend. If there is not one in your area, you may want to think about starting one. GM supports local service clubs and many GM representatives are eager to attend.

For more information about GM service clubs, contact any of the clubs listed here.

NORTH CENTRAL REGION

Central Illinois GM Service Club
Contact: George Williams
Sullivan-Parkhill Chevrolet, Champaign, IL
217-352-4275

GM Mid-Illinois Service Managers Club
Contact: Mark Grimm
Bob Grimm Chevrolet, Morton, IL
309-263-2241

GM Parts & Service Club of Chicago
Contact: Pat Leschkies
New Rogers Motors, Chicago, IL
312-225-4300

Metro Chicago-Indiana Chevrolet Dealers Retail Service Club
Contact: Roy Miller
Apple Chevrolet, Inc., Tinley Park, IL
708-429-3000

Ft. Wayne, IN Area
Contact: Steve Heck
Pace Chevrolet-Oldsmobile, Huntington, IN
219-356-2334

Siouxland Service Managers Club
Contact: John Ryan
Hesse Chevrolet, Marcus, IA
712-376-2515

Metro Detroit Area
Contact: Bob Campbell
Suburban Olds-Cadillac, Troy, MI
248-643-0070

Contact: Lynn York
Dalgleish Cadillac, Detroit, MI
313-875-0300

Metro Detroit Area
Contact: Tim Crain
Matthews-Hargreaves Chevrolet, Madison Heights, MI
248-336-1421

Lansing, MI Area
Contact: Gary Gossick
Riverside Pontiac, Lansing, MI
517-725-8106

Mid-Michigan Area
Contact: Gene Brewer
Mike Young Pontiac-Oldsmobile-GMC, Frankenmuth, MI
517-652-3271

Contact: Cliff Hacker
Cook Chevrolet, Vassar, MI
517-823-8523

Contact: Dave Snyder
Ross Moody Chevrolet, Lapeer, MI
810-664-4571

Southeast Michigan Area
Contact: Gene Winzeler
Knapp Motors, Blissfield, MI
517-486-4311

Metro Chevrolet Service Managers Club
Contact: Gene Lynch
Friendly Chevrolet, Fridely, MN
763-786-6100

Northland Parts and Service Club
Contact: Tony Strong
Kolar Buick-GMC, Duluth, MN
218-733-0100

Fargo, ND Area
Contact: Todd Anvinson
Dalstrom Motors, Oslo, MN
218-695-2721

Canton, OH Area
Contact: Mike Luke
Lavery Chevrolet-Buick, Inc., Alliance, OH
330-823-1100

Cleveland, OH Area
Contact: Dan Nemec
Spitzer Chevrolet, Inc., Northfield, OH
330-467-4141

Columbus, OH Area
Contact: Rich Wallace
Roby Chevrolet-Oldsmobile, Inc., Marysville, OH
937-644-9000

Dayton, OH Area
Contact: David Reed
Troutwine Auto Sales, Inc., Arcanum, OH
937-692-8373

Youngstown, OH Area
Contact: Jim Lambert
Woolam Chevrolet, Inc., Cortland, OH
330-638-2710

Best of the Best Club
Contact: Ken Marquart
Boucher Chevrolet, Inc., Waukesha, WI
262-549-1000

Bow Ties Best Service Club
Contact: Dan Stenbroten
Voegeli Chevrolet-Buick, Monticello, WI
608-938-4191

Central Wisconsin Service Managers Club
Contact: Rich Shepard
Parsons of Eagle River, Eagle River, WI
715-479-4461

SOUTHEAST REGION

Atlanta Parts & Service Managers Guild Club
Contact: Jeff Burns
Jerry Brown Chevrolet, Buford, GA
770-945-4981

Savannah, GA Area Service Club
Contact: Gary Jones
Woody Folsom Chevrolet-Olds, Inc., Hazlehurst, GA
912-375-2503

Gulf Coast Service Manager Association
Contact: Peggy Saranthus
Turan Foley Oldsmobile-Cadillac, Gulfport MS
228-863-4104

Mid-South Managers Club
Contact: Clay Cook
Cunningham Motors, Inc., Lebanon, TN
615-444-8370

T.A.G. Service & Parts Mangers Club
Contact: Mike Rittenhouse
Herb Adcox Chevrolet Company, Chattanooga, TN
423-892-8310

NORTHEAST REGION

49er's Service Club
Contact: Gary Kreiner
Faulkner Chevrolet, Harrisburg, PA
717-397-0601

Tri-State Service Club
Contact: Dave Pedersen
Bryner Chevrolet, Philadelphia, PA
215-572-1712

Western Pennsylvania GM Service Club
Contact: George Gabor
Farabaugh Chevrolet-Oldsmobile, Ligionier, PA
724-238-5606

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New Duramax Diesel Produces Power to the Max

If a customer comes into the dealership looking for a vehicle that delivers off-the-line performance and acceleration with 300 horsepower, would you recommend a truck? Add the need of 520 lb.-ft. of torque and heavy-duty trailering capability and the right vehicle is a 2001 Chevrolet Silverado or GMC Sierra with the new Duramax Diesel 6600 engine.

The Duramax Diesel 6600 (RPO LB7) is optional on 2001 Chevrolet Silverado and GMC Sierra 2500HD/3500 Series pickups, including Crew Cab, Big Dooley and Chassis-Cab models. It's the most powerful diesel ever produced for a heavy-duty pickup or chassis cab.

The new 6.6L, 90-degree, OHV 32-valve turbocharged V8 diesel engine is the product of the DMAX, Ltd. joint venture between GM and Isuzu Motors.

The engine has a number of innovative features that enhance efficiency and durability. It weighs only 836 lbs. due to the extensive use of aluminum in components such as the cylinder heads, upper oil pan, intake manifold and flywheel bell housing. The deep-skirt design increases structural rigidity for smoother operation. The nitrided crankshaft and an induction hardened block also add to the engine's durability.

Fuel Delivery

The fuel delivery system of the new Duramax diesel is a Bosch Common Rail Fuel System utilizing High Pressure Direct Injection. The sophisticated system was specially designed and calibrated to meet the engine's high performance standards.

The system employs a process known as "pilot injection." Pilot injection involves injecting a small amount of fuel in the cylinder prior to the main injection event. This allows combustion to start on a smaller scale and build subtly but rapidly for reduced noise and knock, less vibration and quieter, smoother warm-ups.

The electronic common rail system provides constant injection pressure to the injector, which opens, stays open and closes as directed by the Engine Control Module (ECM) and the Fuel Injection Control Module (FICM).

A mechanical fuel injection pump draws fuel through the FICM. The fuel is used as a coolant for the module. The FICM controls the solenoid valves in each injector and the pressure in the fuel rails.

Before the fuel reaches the Bosch high-pressure pump, it passes through an engine mounted fuel filter that features a water sensor, a water separator and a fuel heater. The high-pressure pump sends the fuel to the fuel rails and on to the injectors at each cylinder. The pump can operate at up to 23,000 psi. The engine normally idles at 5,000-6,000 psi.

Engine Cooling

The Duramax Diesel 6600 engine uses a center-mounted turbocharger that pulls fresh air in through the air cleaner and into its compressor, and then it is channeled through the charge air cooler (located in front of the water radiator). The cooler air is denser, reducing combustion chamber temperatures and amounts of NOx (nitrous oxide).

Adding to the engine's durability is the piston spray cooling system. Since the pistons absorb the full shock of thermal loads and high combustion pressures, an oil gallery provides additional engine cooling by allowing oil to circulate through the pistion and spraying oil directly onto the backside of each piston bowl.

Duramax Diesel 6600 Specifications

Engine description	**OHV – valve-V8**
Bore x stroke (in.)	**4.06 x 3.89**
Displacement (liters)	**6.6**
Bore pitch (in.)	**4.6**
Maximum power	**300 hp @ 3100 rpm**
Torque	**520 lb-ft @ 1800 rpm**
Combustion system	**DI diesel**
Air intake system	**TC air-cooled**
Timing train	**Gear**
Injection system	**Bosch common rail**
Piston cooling system	**Oil spray**
Oil cooler	**Integral to engine**

Serviceability

At 34.5 inches long, the engine is very compact, which provides more room for added serviceability. It is shorter and narrower than competitive diesel engines. Packaging efficiency also can be found in the placement of the turbocharger, which is in the "V" space at the top of the engine.

The locations of other items also offer easier service, including the timing gear train at the front of the engine, the oil filter at the lower left rear corner of the engine, and the fuel filter at the upper right rear of the engine.

The oil filter was designed specifically for use on the Duramax 6600 engine and incorporates improved filtering capabilities as well as an integral oil pressure relief valve.

Do not use a PF1218 oil filter on the Duramax 6600 engine. The PF1218 will physically fit onto the engine, but it does not have an integral oil pressure relief valve, which could result in severe engine damage. A bulletin is being developed with more details about correct oil filter usage.

Training

The new design features and components of the Duramax Diesel 6600 engine are highlighted in the Duramax Diesel 6600 Know How video (#16340.10B) that was released in August.

An Interactive Distance Learning (IDL) course also will be broadcast beginning in November. The two-session course (#16340.15D/E) covers the Duramax Diesel 6600 fuel and electronic engine management systems. Session one reviews component identification, location and operation. Session two focuses on diagnostic scenarios of the various engine systems.

The Know How video and the IDL course are utilized as part of the Diesel Engine Performance 2001 course (#16045.21) of the GM Service Technical College.

– Bill Carnavale

Impala and Monte Carlo Intermittent Airbag Lamp Flicker

Some 2001 Chevrolet Impala and Monte Carlo models may have an intermittent and random flicker of the red airbag lamp, commonly accompanied by DTC U1088.

This is caused by SDM software creating a Class II communication error.

The condition has been corrected in production. A field correction is under development and a Dealer Technical Bulletin will explain the repair procedure. This condition will not affect the operation of the airbag system, and you should not attempt repairs until the bulletin is released.

– Gary McAdam

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Bulletins – October 2000

This review of service bulletins released through mid-October lists the bulletin number, superseded bulletin number (if applicable), subject and models.

GENERAL INFORMATION:

00-00-89-022; Information – August, 2000 Bulletin Summary; 2001 and Prior Passenger Cars and Trucks

00-00-89-023; October, 2000 Labor Time Guide Updates; 1996-2001 Passenger Cars and Trucks

HVAC:

00-01-38-007; Replaces 73-12-12A; Correct Diagnostic Procedure When Reviewing A/C Performance Concern and A/C Refrigerant Leak is Suspected; 1997-2001 Passenger Cars and Light Duty Trucks

BRAKES:

00-05-23-006; Rear Disc Brake Groan/Squeal (Install New Rear Brake Pads); 2000-01 Chevrolet Impala and Monte Carlo Built Prior to VIN Breakpoint 19117621

00-05-26-001; Release of Revised Park Brake Pump/Reservoir Assembly; 1990-2000 Chevrolet and GMC C6-7 Series Conventional Medium Duty Models, 1997-2000 Chevrolet and GMC F6-7 T Series Medium Duty Tilt Models, With Power Operated Parking Brake (RPO J71) Built Prior to October 7, 1999 and VIN Breakpoints

ENGINE/PROPULSION SYSTEM:

99-06-01-002D; Replaces 99-06-01-002C; Exchange Program for 2001 Model Year; 2001 Chevrolet and GMC C/K and G Light Duty Models, 2001 Chevrolet and GMC B7, C6, C7 Medium Duty Models, With 8.1L Engine (VINs E, G – RPO L18)

99-06-04-041A; Replaces 87-63-07; Fuel Injection Pump Exchange Program; 1994-2001 Chevrolet and GMC C/K, P, G, B Models With 6.5L Diesel Engine (VINs F, P, S, Y – RPOs L65, L49, L56, L57)

00-06-01-019; High Oil Consumption After Installation of Goodwrench Remanufactured Engine (Diagnostic Checks); 1985 Chevrolet Impala, 1985-88 Chevrolet Caprice and Monte Carlo, 1985-86 Pontiac Parisienne, 1987 Pontiac Grand Prix, 1985-87 Chevrolet El Camino, 1985-87 GMC Caballero, 1985-86 Chevrolet and GMC C/K Models, 1985-95 Chevrolet and GMC G and M Vans, 1987 Chevrolet and GMC R/V Models, 1988-95 Chevrolet and GMC C/K and S/T Models, 1990-95 Chevrolet and GMC L Van, 1991-94 Oldsmobile Bravada, With 4.3L V6 Engine (VINs N, W, Z – RPOs LB1, L35, LB4)

00-06-04-039; SES Light Illuminated, DTC P1441 – (Reprogram VCM); 1996 Chevrolet and GMC S/T Models, 1996 Oldsmobile Bravada, With Enhanced EVAP and 4.3L V6 Engine (VINs W, X – RPOs L35, LF6)

TRANSMISSION/TRANSAXLE:

00-07-29-002; ZF 6-Speed Manual Transmission Exchange Program (RPO ML6); 2001 Chevrolet and GMC C/K 2500/3500 Pickup Models With ZF 6-Speed Manual Transmission (RPO ML6)

BODY AND ACCESSORIES:

00-08-46-002; OnStar® System Cellular Antenna Replacement Parts Availability; 1996-2000 Passenger Cars and Trucks

00-08-46-003; Global Position Sensor (GPS) Performance Degradation; 1996-2001 Passenger Cars and Trucks With Navigation Systems and/or OnStar®

00-08-47-002; Service Vehicle Soon (SVS) Message, DTC B2647 and/or B2648 Set (Replace Body Control Module); 2000 Chevrolet Impala and Monte Carlo Built Prior to VIN Breakpoint Y9255551

00-08-64-010; High Opening/Closing Effort or Misalignment of Sliding Side Door (Replace Center Roller Bracket and Bumper); 1996-2000 Chevrolet and GMC G-Van (Plant Code 1)

00-08-67-004; Revised/Added Sunroof Specifications and Procedures; 2000 Chevrolet and GMC C/K Utility Models with Sunroof

W-Car Waterleak from HVAC Module

Some 1999 and 2000 W-Cars may have a waterleak from the HVAC module, onto the passenger side floor.

Moisture from the evaporator may back up into the evaporator case and overflow onto the floor on the passenger side if the drain tube elbow becomes plugged. A white greasy/sticky substance or white crusty sediment may build up in the elbow and may also accumulate inside the case.

Sediment from a drain tube.

When cleaning the elbow, be sure to also clean out the evaporator drain tube built into the evaporator case in the event the inlet side of the tube is also plugged.

Use a plastic tie strap, piece of solder, or other suitable tool that is flexible enough and long enough, about 4 inches, to clean the input end of the drain tube. If the drain tube plugs again, remove the evaporator and clean out the bottom half of the case. A service bulletin on this condition is being developed.

– Fred Tebbets

2000 Grand Prix Intermittent SES/ABS Light

The SES or ABS light may intermittently set on some 2000 Pontiac Grand Prix models. When the SES light is set, numerous engine or transmission DTCs also may be stored.

If you do not diagnose any conditions with any of the DTC related components, look for a short to ground from the main PCM harness to the accumulator bracket below the air cleaner/PCM housing. The harness may be chafed through where it is taped for protection between the two sections of plastic conduit.

Repair the affected wire(s) per the service manual procedures to prevent moisture intrusion, then retape using Mylar tape or anti-chafe tape and reposition the wire harness away from the A/C accumulator bracket.

– Fred Tebbets

PCM harness at the accumulator bracket.

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