TECHlink
GM
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Fuel Quality

A long time and many millions of miles ago, when gasoline had an octane rating of perhaps 80, about the only thing a driver had to know about fuel was how much was in the tank. Now, the choices are bewildering.

Regular, mid-range, or premium? With or without alcohol? What about detergents? Oxygenates?

And a visit to the local auto parts store will reveal more gasoline additives than you can count. Dry gas, fuel injector cleaners, top end cleaners, octane enhancers . . .

With so many choices, how are your customers supposed to decide what's right for them? And if they ask your advice, what are you prepared to tell them?

What is Gasoline, Anyway?

Freshly pumped from the ground, petroleum is a dark, smelly, thick stew of hydrocarbon compounds. It's the task of the refiner to separate crude oil into its component parts, then to remix them in various combinations to make useful products. The blending recipe for gasoline also calls for additives not found in crude oil.

The Octane Myth

Everyone seems to "know" that an engine will run better and perform better on high octane fuel (it used to be called 'ethyl,' for the tetraethyl lead used as an octane booster.) What's true and what's myth?

In normal combustion, the air/fuel

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Techline News

SI 2000 Roll-Out Update

Say Goodbye to ESI

Service Information 2000 (SI 2000) has arrived. Every GM dealership across the country has been shipped the four CD SI 2000 package along with an outline of system requirements, an SI 2000 quick reference guide and installation instructions. And with SI 2000 rolled out, the Electronic Service Information (ESI) software will quickly become a thing of the past.

With SI 2000 loaded to a personal computer (PC), technicians are able to access the latest service information and bulletins quickly and easily. Dealerships should now have the necessary equipment in place to run SI 2000.

Minimum System Requirements

The minimum specifications that a PC needs to run SI 2000 include:

- Pentium II processor
- 64MB RAM
- 6GB Hard Drive
- Internet Explorer 4.0 or Netscape Communicator 4.5
- Windows® 98 Second Edition

T-9 Computers

Based upon the minimum requirements to load SI 2000, some dealerships may need to upgrade the T-9's memory and/or hard drive.

T-7 and T-8 Computers

The T-7 and T-8 PCs do not meet the minimum specifications required to play SI 2000 and cannot be upgraded efficiently. However, these PCs can still be used as a TIS 2000 client PC off of the GM ACCESS server.

For more hardware information, contact the Techline Customer Support Center at 1-800-828-6860, prompt 2.

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GM Service Operations

mixture is burned very rapidly, but also very smoothly. In abnormal combustion when a quantity of mixture burns all at once, it literally explodes. The resulting shock wave can damage engine components and produces an audible sound we call knock.

Gasoline can be formulated to resist knock, and the result is expressed as the fuel's octane number. Here's how it works.

Of the hundreds of different hydrocarbons found in typical gasoline, we're interested in the two called heptane and isooctane. Heptane doesn't resist knock, and is assigned the number 0. Isooctane does resist knock and is assigned the number 100.

A gasoline blend resists knock in proportion to the percentage of isooctane it contains. So, the octane number of the fuel is a numeric representation of its ability to resist knock.

A gasoline may be blended with substances other than isooctane that affect the octane number. These fuels are assigned an octane number that matches the anti-knock characteristics of a standard fuel containing isooctane.

There are two different standards to describe a fuel's anti-knock capabilities. The Research Octane Number (RON) predicts a fuel's low speed performance, while the Motor Octane Number (MON) is related to high speed and high temperature. By law, US gas pumps are labeled with a yellow sticker containing an Antiknock Index (AKI) number, which is the average of the two:

$$\frac{\text{RON} + \text{MON}}{2} = \text{Antiknock Index (AKI)}$$

Your customers need to understand that every engine family has been carefully tested to determine its octane requirements under normal conditions. This requirement is listed in the owner's manual. ***Using an octane higher than required will bring no added benefits. The vehicle will not have better performance or better fuel economy -- it will simply cost more. If an engine doesn't knock on the recommended octane, that's the right fuel to use.***

Part of the octane myth comes from the fact that, traditionally, high performance engines have been designed with a high compression ratio, which calls for high octane fuel to control knock. In those cases, high octane is a *requirement* of the engine's performance, not a direct *cause* of it.

An engine's octane requirement is raised if the compression ratio is raised (from combustion chamber deposits as the engine ages, for instance), if the air/fuel ratio becomes less rich, spark is advanced, or if coolant temperature or ambient temperature are raised.

On the other hand, the octane requirement is lowered if absolute humidity is raised (cool, damp days) or if the vehicle is operated at high altitude (which has the effect of reducing the compression ratio).

The vehicle's powertrain control module adjusts for most of these variables. Customers can experiment with different brands or octanes to account for changes in humidity and ambient temperature.

All current GM products are manufactured with knock sensors to temporarily retard timing at the onset of knock. Performance may suffer slightly when timing is retarded. However, it's important to understand that the opposite is not true. If a higher-than-needed octane is used, a knock sensor will not advance timing beyond normal to provide an improvement in performance.

Are All Fuels Alike That Are Labeled Alike?

No. The definitions of "regular" or "premium" vary according to the standards of the individual states. One state may allow 90 octane to be marketed as premium, while another may require a minimum of 92 octane.

Most commonly, regular fuel has an AKI of at least 87, mid-range is about 89, and premium is 91 or higher. To be sure what you're buying, always consult the yellow AKI label on the pump, not the marketing name.

What About Gasoline Containing Engine Cleaners?

Some refiners tout the detergent qualities of their fuels. Consumers need to know that it's not necessary to purchase high octane to obtain cleaning benefits. The Environmental Protection Agency requires all grades of gasoline, regardless of octane rating, to contain engine-cleaning detergents to guard against harmful deposit buildup during the life of the engine.

Winter and Summer Blends

There are differences between winter and summer blends of gasoline. Fuel must be vaporized before it will mix with air for proper combustion in the cylinders. Evaporation is low at colder temperatures, much higher when warm. For winter, gasoline is blended for high volatility or high vapor pressure. Warm weather fuel is blended just the opposite, with lower volatility and lower vapor pressure. Because fuel vapors must be controlled by the vehicle's emission con-

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Publisher:

Gracemary Allen
VSSM Communications

Executive Editor:

Mark Stesney
GM Service Operations

Internet E-mail:
Mark.Stesney@GM.com

Technical Editors:

Mark Spencer
Mark.Spencer@SandyCorp.com
1-248-816-3647

Jim Horner
Jim.Horner@SandyCorp.com
1-248-816-3641

FAX number:

1-248-649-5465

Write to:

Tech Link

PO Box 500

Troy, MI 48007-0500

Desktop Publishing:

Greg Szpaichler, MediaWurks-
spake@mediawurks.com

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trol system, excessive volatility in warm weather is a concern.

Admittedly, fuel injected engines with their in-tank electric fuel pumps are far less susceptible to vapor related problems than older carbureted engines were. Nevertheless, be aware that driveability conditions may be related to the wrong seasonal fuel blend.

If a customer has this problem, they may benefit from purchasing gasoline at a high-volume station, where the gasoline supply is renewed often.

Alcohol as a Fuel

Ethyl alcohol (ethanol) will mix with gasoline in any proportion, and it raises the fuel's octane.

However, alcohol has a lower heat content than gasoline, so fuel economy is lower. Because water mixes readily with alcohol, water in the fuel may be a concern. And alcohol may be more corrosive than gasoline to fuel system components.

Although the volatility of alcohol is lower than gasoline, a blend of alcohol and gasoline will have a higher volatility than gasoline alone. This phenomenon is greatest at a volume of 3% alcohol.

All of that being said, gasoline containing alcohol may be used in GM gasoline-powered vehicles if the following guidelines are followed.

- Gasoline may be blended with up to 10% ethanol (meeting the ASTM D4806 standard for fuel grade alcohol).
- GM recommends against use of methanol as a vehicle fuel.

NOTE: *The 2000 model year 2-wheel-drive S-Truck with the L43 4-cylinder engine has E85 flexible fuel capability (March 2000 TechLink). The L43 package will use 100% gasoline or a blend of up to 85% ethanol/15% gasoline. The fuel filler door on these trucks reminds the owner not to use any fuel additives along with alcohol-blended gasoline, to avoid buildup of sludge in the fuel tank.*

Fuel Additives and Fuel Injection Cleaners?

Stated simply, properly formulated fuel, stored in clean tanks, should not need supplemental additives. In general, GM does not recommend additives.

Additives may be useful to deal with specific fuel-related conditions, such as the periodic use of an injector cleaner to remove excessive deposits.

Gasoline Brands

Occasionally, anecdotes and rumors arise in certain regions that associate service problems with particular brands of gasoline. Usually these rumors are not factual. You can recommend trying a different brand, but should not recommend that a customer stop using a particular brand of fuel.

Where Can I Learn More?

The Federal Trade Commission in Washington, DC, publishes consumer information. You can obtain guidance by calling toll-free 1-877-382-4357 or by checking this web site:

<www.ftc.gov/bcp/conline/pubs/autos/octane.htm>.

CFR Engine

The Co-operative Fuel Research (CFR) committee was formed in the 1920s with the primary purpose of defining and measuring gasoline combustion characteristics. These fuel producers and engine manufacturers recognized the need to identify standards. Their efforts paid off on January 14, 1929, when the first CFR engine was displayed at the Society of Automotive Engineers annual meeting. The engine, developed by Waukesha Motor Company, featured a single cylinder and a variable compression ratio. It has been refined through the years, but to this day adheres to the original basic design principles.

The engine's manufacturer, today called Waukesha Engine Division, a Dresser Company, is the only company that has ever manufactured the CFR engine. There are now five variations, which are recognized and used worldwide in the testing of octane number for gasoline, supercharge rating of aviation gasoline, and cetane number for diesel fuels.

All CFR units are designed to correspond to test methods written by the American Society for Testing and Materials. CFR engines are used in basic research for engine emissions and alternative fuel suitability.

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Complete integrated PCs can be purchased from PC Source (1-800-233-0040) or GM Dealer Equipment (1-800-GMTOOLS).

A TIS 2000 Accessories kit that provides the necessary GM ACCESS software to properly set up a PC for TIS 2000 and SI 2000 may be needed.

ESI

With SI 2000 readily available in every GM dealership, GM Service Operations will automatically remove ESI from dealerships' GM ACCESS server this month. After this takes place, ESI will no longer be able to be used to search for service information. Instructions for removing the ESI application from the PC will be sent to dealerships soon.

With ESI no longer available, and if the dealership does not have the proper PC hardware for SI 2000, the service department will not have access to the most current service information.

Navigation

As you use SI 2000, you'll notice you're using the Internet Explorer or Netscape browser as a means of viewing the electronic service manual information. SI 2000 is not a link to an Internet site. The SI 2000 application is loaded from the CDs to the hard drive of your computer, and all the service information is on your PC. An Internet version of SI 2000 is being developed and will be available on the Web shortly.

Searching for information can be performed through a keyword search, a symptom search or by a bulletin number, campaign number or document ID. When searching for campaigns, it's necessary to enter the divisional campaign number, not the Campaign Information Product System (CIPS) number.

Preliminary Information (PI) titles also are available in SI 2000 by clicking the Preliminary Information button below the bulletin and campaign buttons. This presents the PI number and title, which can be provided to the Technical Assistance Center for complete details about that topic.

Updates

To receive the very latest service information, incremental updates to SI 2000 will be sent via a combination of satellite broadcasts to dealerships' GM ACCESS servers and new CD's. These updates will include the latest service bulletins, campaigns and service manual updates. With both delivery methods, the updates will need to be loaded to each individual PC running SI 2000.

Currently, all SI 2000 data is on four CDs. Occasionally, a new set of SI 2000 CDs will be sent to dealerships if a large amount of new information is available, such as when new model year vehicles are introduced.

– Lisa Scott, Mike Waszczenko

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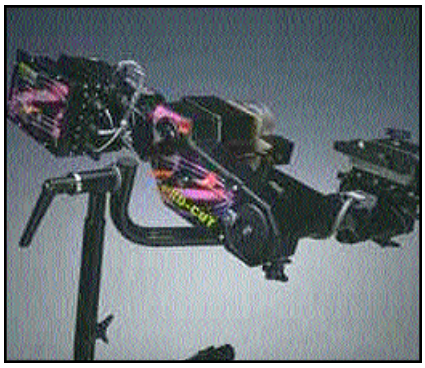
Dealing with Brake Pulsation

A customer may experience brake pulsation in several ways. It may be audible, it may be felt throughout the vehicle, or it may be felt primarily through the brake pedal.



Pro-Cut PFM900

Pulsation in a disc brake may be the result of the rotor not running true. A distorted rotor makes intermittent contact with the pads, leading to uneven rotor wear. The thickness variation resulting from intermittent contact is what causes brakes to pulsate and causes customers to make repeat visits to the dealer service department.

Measuring the Brake Rotor

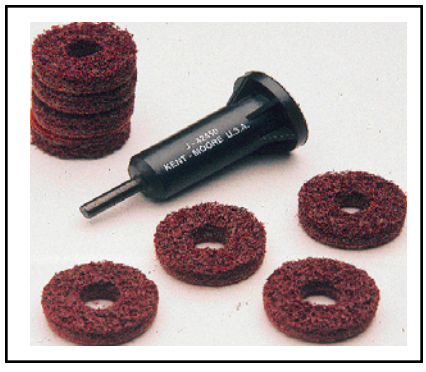
The amount of acceptable rotor runout, published in the appropriate service manual, is generally in the area of 0.003 inch. Runout can be measured by mounting a dial indicator perpendicular to the rotor surface and turning the rotor. Be sure the lugnuts are installed and torqued correctly when measuring.

Dial Indicator Set

Brake pulsation caused by thickness variation in the rotor can be checked by taking four micrometer readings spaced 90° apart, the same distance in from the edge of the rotor. A variation as little as 0.0005 inch can cause pedal pulsation.

Cleaning the Surfaces

The brake rotor is installed over the wheel studs and seats against the wheel bearing flange. Corrosion on the face of the flange or the backside of the rotor can cause excessive runout.



J-42450

You can use sanding discs and holder from the J-41013 Rotor Resurfacing Kit to clean the inside of the rotor hub and the wheel bearing flange. Then, use the J-42450 Wheel Hub Resurfacing Kit to clean the difficult-to-reach surface of the wheel bearing flange close to each wheel stud. Simply install the tools in the chuck of an electric drill.

In some cases, you can correct runout by indexing the rotor by rotating it by one or two studs on the hub.

Torquing the Lugnuts

Incorrect or uneven torque of the wheel lugnuts can distort the brake rotor. Loosening and correctly retorquing the lugnuts may or may not cure a distorted rotor condition. There are two acceptable ways to install lugnuts correctly:

- use a torque wrench
- use the correct Torq Stik and an impact wrench.

Refer to the chart accompanying the Torq Stiks, J-39544, to select the stick with the correct lugnut size and torque calibration for the vehicle being serviced. The sticks are color-coded for quick identification.

When a Torq Stik is used with an impact wrench, it absorbs any torque in excess of the stick's rating, so it prevents overtorquing the lugnut. Be sure not to defeat the benefits of correct lugnut torque by tightening the lugnuts in the wrong order. Always follow a star pattern, and tighten the lugnuts in three steps: snug, half torque, and full torque.

Dealing With Rotor Conditions

If you find excessive lateral runout or a thickness variation, and if there is sufficient material remaining, indicated by the machining limits cast into the rotor, you can turn the rotor using a rotor lathe. GM highly recommends the use of on-car brake rotor turning as a method of eliminating the stack-up of lateral runout which is a potential source of brake pulsation.

The Pro-Cut PFM900 rotor turning machine can be used with the rotor remaining on the car. On-car turning has proven to significantly reduce the repeat occurrences of brake pulsation.

Regardless of how you perform your service repair, always check your work. Using a dial indicator after machining will ensure the repair has been performed properly and is within recommended guidelines.

A precision dial indicator may be obtained by calling GM Dealer Equipment at 1-800-GM-TOOLS. You will need:

378-6624 Dial Indicator Set

378-4213 Roller Contact

Be sure to check bulletin 00-05-22-002 for standard procedures and guidelines, and bulletin 00-05-23-002 for additional technical information.

–Tim Dobbs and Russ Dobson contributed to this article.

Some Torq Stik safety tips:

- Always wear safety goggles when using Torq Stiks.
- Limit line pressure to 90-100 psi.
- Do not use Torq Stiks to remove lug nuts.
- Remove dirt and corrosion from studs and mounting faces.
- Use Torq Stiks with a 1/2-inch impact gun. Do not use with ratchet or breaker bar.
- Do not hold Torq Stik with hand; this may affect torque.
- Spin nuts until snug, then apply impact until nut ceases to turn.
- Follow wheel nut tightening sequence.

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Fluid Flushing vs. Exchanging

Using the Right Tool for Transmission Service

As you know, deteriorated or contaminated fluid can result in some ill effects for a transmission. Two transmission service tools are readily available for transmission service in the dealership: the Kent-Moore Transmission Cooling System Flusher and the Wynn's TranServe® II+ Fluid Exchanger. Each tool serves a special purpose, so which one you use depends on the situation.

Wynn's TranServe II+ Fluid Exchanger

If your service involves scheduled fluid replacement, use the Wynn's TranServe II+ Fluid Exchanger, P/N 211-08601-GMPKG-E4. It is available from GM Dealer Equipment. The TranServe II+ is a more efficient and effective alternative to conventional pan-drop transmission service.

The Fluid Exchanger performs a more complete service by replacing virtually all of the old fluid from the entire system, including the torque converter, cooler and all transmission lines. It operates a "closed loop" with the vehicle running and utilizes the transmission's pressure to move fluid through the system. Since the Fluid Exchanger uses the transmission pump to move the fluid and is not a high-pressure system, it will not effectively clear blocked or restricted cooler lines. Always check the manufacturer's filter change intervals to determine if a complete service is necessary.

When your service involves a transmission failure, use the Kent-Moore Transmission Cooling System Flusher, J-35944-A. The Cooling System Flusher is the only tool approved by GM to remove contaminants and debris from the transmission cooler and cooling lines. With the aid of compressed air, it effectively clears passages by delivering a high-pressure burst of flushing detergent (use GM approved fluid) that encapsulates fine particles found in the transmission cooler and lines. And because the Cooling System Flusher performs a high-pressure flush of the transmission cooling system in an "open loop" with the cooler and lines disconnected, any debris or contaminants are flushed out and not allowed to remain in the transmission.

A fluid exchanger cannot perform the same service because it operates with much lower pressure and does not use a detergent to remove fine particles. The flushing detergent, when used properly, can be disposed of without special handling. Check your state and local requirements for more information.

Kent-Moore Transmission Cooling System Flusher

For more details about using these tools and transmission flushing, check service bulletins 99-07-30-017 and 99-07-30-020.

Contact GM Dealer Equipment at 1-800-GM-TOOLS or on the Web at <www.gmde.com>. Kent-Moore can be reached at 1-800-345-2233 or <www.spxkentmoore.com>.

– Russ Dobson

Get Ready for the A/C Season

It's that time, again. Customers will soon be bringing their vehicles in for the spring check-up of their A/C systems. In some cases, it's just a precautionary check. In other cases, they will turn the A/C on for the first time in the season and find that it doesn't cool the way it should. In either case, you need to be ready.

NOTE: *Always wear eye protection when working on an A/C system.*

An important part of servicing a malfunctioning A/C system is checking for leaks. There are two recognized leak detection methods, and the preferred one depends on conditions.

Electronic leak detectors, such as the J-39400, are extremely sensitive to small amounts of refrigerant. Before using the electronic leak detector, you need to check its calibration using the supplied calibration bottle. Service parts are included in kit J-39400-TUNEUP. To use the detector properly, hold the probe below the area of the suspected leak -- refrigerant is heavier than air and tends to fall from the leak site. Of course, a leak must be present at the time of the test in order to locate it with a leak detector.

Sporadic leaks may result from expansion due to temperature or pressure changes, or to vibration while the system is operating. Leaks of this kind are probably located better using leak detection dye, because the telltale stain will remain even when the site is not leaking. However, if dye remains from a past leak, you may get a false report. So, before performing a new test on the system, use J-43872 Fluorescent Dye Cleaner to remove dye residue.

You can obtain leak detection dye, a dye injector, and a black-light leak detector from Kent-Moore.

Dye must be formulated for the type of refrigerant in the system. And the amount of dye you use is important. The packages in the chart below consist of pre-measured bottles containing 1/4 ounce of dye, just the right amout for one application. To add dye to the A/C system without discharging the refrigerant, use the specified dye injector, and run the compressor to distribute the dye throughout the system. Be sure to install a supplied yellow label underhood for the reference of future service technicians.

R-12	R-134a
Tracer Dye J-39745	Tracer Dye J-41447
Dye Injector J-41709	Dye Injector J-41459

For both systems, use black light J-42220. It features a durable housing to withstand normal shop usage, and perhaps equally important, requires no warm-up time. Simply plug it in, turn it on, and it's ready to use. When the black light shines on a leak area, the fluorescent dye shines brightly.

– Jim Resutek contributed to this article.

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TAC Tips

Cadillac Electronic Level Control Systems

There are several possible methods used in the Electronic Level Control (ELC) system(s) to provide input for rear curb height and control of the compressor. These methods are based on vehicle content and design differences.

Scenario #1: 1997-2000 Cadillac models with Continuously Variable Road Sensing Suspension (CVRSS), F45 option, use existing CVRSS components to control the Electronic Level Control (ELC) compressor. The inputs are the rear body height position sensors already in use for the CVRSS system. The output controls (two separate transistor drivers) for the ELC relay and exhaust solenoid are located in the CVRSS module.

Since the inputs and outputs are in the CVRSS module, the input data can be viewed with the Tech2 and the compressor can be energized and exhausted from the output tests menu.

Cadillac models that have CVRSS are:

1997-2000 Seville SLS

1997-2000 Seville STS

1997-2000 Eldorado ETC

1997-1999 DeVille Concours

2000 DeVille DTS

Scenario #2: 1997-1999 Cadillac models without Continuously Variable Road Sensing Suspension (CVRSS) use an integrated rear height sensor that also has output control over the ELC relay and exhaust solenoid. Unlike CVRSS-equipped vehicles, this height sensor senses rear curb height only at one point on the vehicle.

This height sensor is a solid state device but is not on the data list for access with the Tech2.

Cadillac models that have this system are:

1997-1999 Eldorado

1997-1999 DeVille

1997-1999 DeVille De' Elegance

This information also applies to:

1997-1999 Buick LeSabre

1997-2000 Buick Park Avenue

1997-1999 Pontiac Bonneville

1997-1999 Oldsmobile Aurora

1997-1999 Oldsmobile 88

Scenario #3: Some 2000 model year vehicles now have the ELC in the Rear Integration Module (RIM). This system uses one three-wire height sensor (a potentiometer that produces an a/c signal input) that is a direct input to the RIM.

The RIM then controls the ELC pump on the output side. The output controls in the RIM are similar to the CVRSS description above. There are two dedicated transistor drivers; one driver controls the ELC relay to energize the compressor and the other driver controls the exhaust solenoid valve.

Since the inputs and outputs are in the RIM, the input data can be viewed with the Tech2 and the compressor can be energized and exhausted from the output tests menu.

The models that use this arrangement are:

2000 Cadillac DeVille

2000 Cadillac DeVille DHS

2000 Buick LeSabre

2000 Pontiac Bonneville

2001 Oldsmobile Aurora

Diagnosis of ABS Activation Events For Delphi Bosch 5.0/5.3 Systems

An "ABS," "TCS," "DRP" or a "Stabilitrack/Precision Control" event may be reported based on hearing the pump motor run and/or feeling the brake pedal pulsate on vehicles equipped with the Delphi Bosch 5.0 and 5.3 Systems. Due to the four possible events listed below, there is not a way to truly verify which event has occurred. The pump motor and hydraulic valves are used for multiple systems that have different inputs and different software requirements.

The Delphi Bosch 5.0 and 5.3 Systems place the controller (EBTCM) and hydraulic unit (BPMV) in one location on the following models:

1997-2000 Cadillac Seville SLS and STS

1997-2000 Cadillac Eldorado and ETC

1997-1999 Cadillac DeVille, De' Elegance and Concours

2000 Cadillac DeVille, DHS and DTS

2000 Buick LeSabre Custom and Limited

2000 Buick Park Avenue and Ultra

2000 Pontiac Bonneville SE, SLE and SSEi

2001 Oldsmobile Aurora

The systems have the capability of operating:

1.) ABS (Anti-Lock Brake System)

2.) TCS (Traction Control System)

3.) DRP (Dynamic Rear Proportioning--used only on 5.3 systems)

4.) Stabilitrak/Precision Control System.

On vehicles equipped with any of these features, the EBTCM looks at different inputs in different ways for each one of these systems. Once the proper set of conditions is met, the EBTCM will initiate one of the events listed above.

From a hydraulic point of view, the BPMV uses a pump motor, a TCS isolation valve, TCS prime valve, and ABS inlet and outlet valves to modulate hydraulic pressure. The operation of the TCS and ABS valves are explained in the service manual. The BPMV may use some or all of the hydraulic components in any of the four events listed above.

To gather more information for proper diagnosis, determine what inputs the EBTCM uses for each type of event.

1. Set up the Tech2 for a snapshot of the condition. Scroll the data list prior to setting up for the snapshot. Many times, the parameters that are needed are on data list 2. However, since the scan tool menus regularly change, technicians need to verify this prior to duplicating the condition.

2. Since there may not be any DTCs, the Tech2 may need to be set up for a manual trigger snapshot.

3. Duplicate the condition.

4. Once the snapshot is obtained, review the data list parameters:

ABS active: (Yes or No?)

TCS active: (Yes or No?)

DRP active: (Yes or No?)

Stabilitrak active/VSES active: (Yes or No?)

Note: *Prior to the 2000 model year, the Tech2 lists "Stabilitrak active: Yes or No?" For 2000 models the name of the parameter has changed to "VSES active: Yes or No?" VSES is the Vehicle Stability Enhancement System and is used as a common scan tool term for vehicles equipped with systems marketed under the name Stabilitrak, Precision Control System, or Active Handling (on Corvette models).*

5. Find the system that is in the "active Yes" status and perform further diagnosis.

Section 5 of the service manual explains in further detail what inputs the EBTCM uses for each type of event.

– GM Technical Assistance

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New 2000 Silverado/Sierra Features and Components

The 2000 Chevrolet Silverado and GMC Sierra trucks offer several new features that operate differently than the 1999 models. Here's a quick review of several of them.

Automatic Door Locks

One of the new features for 2000 is the driver-programmable automatic door locks. This feature automatically locks the doors of the vehicle.

If owners do not want the doors to lock automatically, this function can be disabled. Follow the instructions in the owner's manual. The disable procedure involves choosing one of several programming options once the door locks are in the programming mode. This reprogramming procedure can be performed by the owner and is not covered under warranty.

On 1999 Silverado and Sierra models, the automatic door locks can be disabled by recalibrating the Body Control Module (BCM) using the Tech 2. The door lock feature may be turned off under warranty only once.

Refer to bulletin 99-08-64-003A for more details about disabling the automatic door locks.

DRL Disable Procedure

If owners prefer, the DRLs and the automatic headlamp system can be disabled on the 2000 models by following the procedure outlined in the owner's manual supplement. The procedure also is included in service bulletin 99-08-42-007. This disable procedure must be performed after every ignition cycle if the driver wishes to maintain this feature, otherwise the DRLs and headlamps will operate automatically. This driver-programmable feature was not available on the 1999 models.

Passenger Compartment Air Filter

A widely unknown feature on Silverado and Sierra models is the passenger compartment air filter. It is standard on all GMT800 vehicles with air conditioning.

This air filter is located under the instrument panel below the glove compartment. The filter has a recommended change interval of 30,000 miles and can be replaced according to the instructions listed in the owner's manual under the service and appearance care section.

Intermediate Shaft Clunk

On 1999-2000 Silverado and Sierra models, a noise or clunk may be noticed coming from the steering column. Diagnosis may point to the intermediate shaft as the cause of the noise.

Replace the I-shaft, P/N 26083324, if necessary. A pressurized greasing process has been recently added to the I-shaft.

To address this condition over the long term, a new I-shaft with an improved spline material is scheduled to be available shortly. The new I-shaft spline material is composed of carbon, silicone and PPS and remains intact better over time and produces less wear. The I-shaft with the new spline material will have a new part number. A bulletin also will be released covering this new component when it is available.

– Steve Love, Doug Ritter

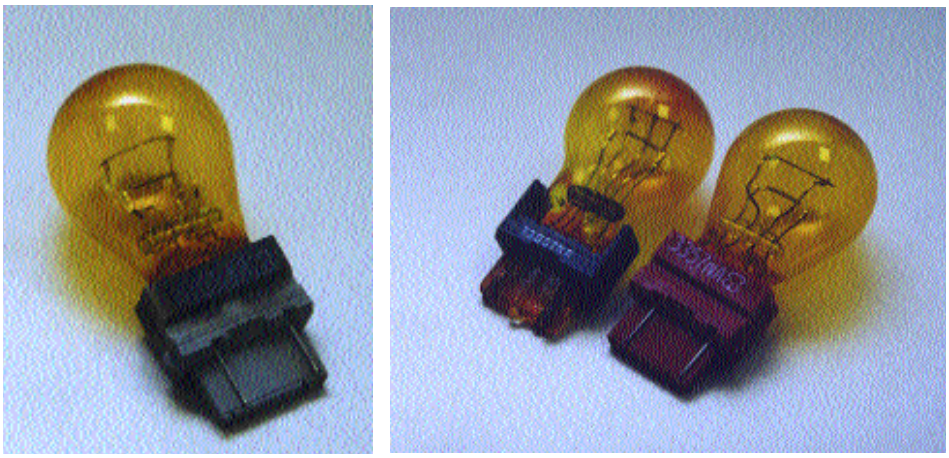
A Little Illumination on DRL Light Bulbs

Some vehicles use the turn signal portion of the turn/park lamp for the Daytime Running Lamp (DRL) function. These include the Oldsmobile Intrigue and the Buick Regal and Century.

The base of this lamp contains four contacts and resembles the base of conventional turn/park lamp bulbs. However, the bulb used in DRL applications is manufactured of heat-resistant materials. Although a conventional lamp will fit in place of the special DRL lamp, it will have a short operating life.

When replacing the DRL, be sure to use the heavy duty bulb, which is Sylvania 4175KNA.

– Gary McAdam



Don't go by appearance alone. The discoloration of the proper heat-resistant lamp, shown on the left, is acceptable. Both of the lamps on the right would fit the lamp socket, but neither one is the correct one.

2000 J-Body Instrument Cluster Lockup

The instrument cluster on some 2000 Cavalier and Sunfire models may appear to be dead, with no movement from the gauges and a nonfunctional odometer. This condition may occur when the battery has been disconnected, or if the vehicle has a dead battery and is jump-started. Do not replace the instrument cluster to correct this condition.

The cluster's microprocessor resets before the crystal stabilizes, causing the processor to lockup, when there is a loss of power.

This lockup condition can be corrected by removing the fuse marked "CLSTR" (circuit 1440), waiting approximately one second, then reinstalling the fuse. The fuse panel access door is on the left side of the instrument panel. Once the fuse is installed, the cluster should reset with the gauge needles vibrating at their zero positions for about two seconds. The body computer also will reset. For the 2001 model year, a power-on-reset chip will be added to the instrument cluster.

– Jeff Strausser

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Bulletins – March 2000

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

GENERAL INFORMATION:

00-00-89-002; March 2000 Labor Time Guide Updates; 1994-2000 Passenger Cars and Trucks

00-00-89-003; January 2000 Bulletin Summary; 2001 and Prior Passenger Cars and Trucks

00-00-89-004; Warranty Administration – April 2000 Labor Time Guide Updates; 1996-2000 Passenger Cars and Trucks

HVAC:

99-01-39-007A; Replaces 99-01-39-007; Automatic Air Conditioning Control Operation; 1997-2000 Passenger Cars and Trucks with Automatic Air Conditioning

00-01-38-003; Popping Sound Heard Underneath Instrument Panel When Switching from Defrost to Heat or from A/C to Defrost (Replace Defrost Valve Actuator); 2000 Chevrolet Impala, Monte Carlo

STEERING:

99-02-35-002; Revised Steering Column Lock Relay Schematics; 1998 Chevrolet Corvette

00-02-32-001; Release of New Power Steering Fluid Reservoir; 1990-2000 Chevrolet and GMC C6-7 Series Medium Duty Conventional Models, 1997-2000 Chevrolet and GMC F6-7 T-Series Medium Duty Tilt Cab Models with Gasoline Engines and 3116/3126 Caterpillar® Diesel Engines, 1999-2000 Chevrolet and GMC F6-7 T-Series Medium Duty Tilt Cab Models with Isuzu Duramax 7800 Diesel Engines

SUSPENSION:

00-03-07-002A; Replaces 00-03-07-002; Revised Wheel Alignment Specifications; 1999-2000 Chevrolet and GMC C/K Pickup Models (Silverado and Sierra)

00-03-09-002; Rear Suspension Spring Squeak/Creak (Lubricate Lower Spring Seat); 2000 Chevrolet Malibu, 2000 Oldsmobile Alero, 2000 Pontiac Grand Am

DRIVELINE AXLE:

00-04-21-001; Revised Transfer Case Front Output Shaft Seal; 1999 Cadillac Escalade with NVG246 Transfer Case (RPO NP8), 1998-99 Chevrolet and GMC C/K Utility Models with NVG246 Transfer Case (RPO NP8), 1999-2000 Chevrolet and GMC Pickup Models (Silverado and Sierra) with NVG246 (RPO NP8) or NVG261 (RPO NP2) Transfer Case, 1999-2000 Chevrolet and GMC Utility Models (Suburban, Tahoe, Yukon/Yukon XL) with NVG246 Transfer Case (RPO NP8)

BRAKES:

00-05-23-002; Front Disc Brake Pulsation (Install New Brake Rotors and Pads); 1997-2000 Chevrolet Malibu, 1997-2000 Oldsmobile Cutlass, 1999-2000 Oldsmobile Alero, 1999-2000 Pontiac Grand Am

ENGINE/PROPULSION SYSTEM:

99-06-04-047A; Replaces 99-06-04-047; Metal Contamination in Vehicle Fuel System (Clean Fuel System); 1994-2000 Chevrolet and GMC C/K Models with 6.5L Diesel Engine (VINs P, S, F – RPOs L49, L56, L65)

00-06-01-002; Revised Timing Chain, Sprockets, Tensioner Installation Procedure; 1998-1999 Chevrolet Malibu, 1998-2000 Chevrolet Cavalier, 1998 Oldsmobile Achieva, 1999-2000 Oldsmobile Alero, 1998-2000 Pontiac Grand Am, Sunfire, with 2.4L Engine (VIN T – RPO LD9)

00-06-04-007; Increased Accelerator Pedal Effort (Replace Throttle Body); 1999-2000 Chevrolet and GMC C/K Pickup Models (Silverado and Sierra) with 4.8L, 5.3L or 6.0L V8 Engine (VINs V, T, U – RPOs LR4, LM7, LQ4)

00-06-04-009; Rough Engine Idle, Misfire, Possible DTC P0300 (Replace Spark Plug Boot Assembly); 1999 Chevrolet Malibu, 1999-2000 Chevrolet Cavalier, 1999-2000 Oldsmobile Alero, 1999-2000 Pontiac Grand Am, Sunfire, with 2.4L Engine (VIN T – RPO LD9)

00-06-04-010; New Product Information – Oxygen Sensor Usage and Diagnostics; 2000 Chevrolet and GMC C/K Models with 7.4L Engine (VIN J – RPO L29)

00-06-04-011; Evaporative Emission Testing on Vehicles; 1996-2001 Passenger Cars and Trucks with Enhanced Evaporative Emissions

TRANSMISSION/TRANSAXLE:

99-07-29-004A; Replaces 99-07-29-004; High Shift Effort or Hard Shifting (Install Revised Shift Cables and New Bias Spring; 1997-99 Chevrolet and GMC F6-7 T-Series Models with Eaton® Manual Transmissions

BODY AND ACCESSORIES:

00-08-63-001A; Replaces 00-08-63-001; Cab Assist Step Cracking (Replace Step and Install Rubber Insulators); 1995-2000 Chevrolet and GMC C6-7 Conventional Models With Single Fuel Tank

00-08-63-002; Improper Fit/Appearance Between Cab and Front Fender Extensions (Replace Front Fender Extensions); 1997-99 Chevrolet and GMC F6-7 T-Series Medium Duty Tilt Models

RESTRAINTS:

00-09-40-001; Replaces 83-16-07; Excessive Lateral Movement of Some Aftermarket Child Seats (Replace Rear Seat Buckle); 1997-2000 Chevrolet Venture, 1997-2000 Oldsmobile Silhouette, 1997-99 Pontiac Trans Sport, 1999-2000 Pontiac Montana

Rear Axle Lubricant Compatibility

Synthetic axle lube and non-synthetic axle lube are both used in the rear axles of GM full-size truck and van models, but it's recommended that synthetic lubricant be used when changing rear axle lubricant. This applies to rear axles only, not front axles.

Synthetic lubricant offers the benefits of a potential increase in fuel economy and lower operating temperature under severe usage conditions. It is now part of the current production of C/K vehicles.

Bulletin 99-04-20-001 tells you which lubricants should be used in various applications. Affected models include 1988-99 Chevrolet and GMC C/K, G Van and P1-3 Series models and the 1999 Cadillac Escalade. Check the bulletin for VIN Breakpoint information.

American Axle and Manufacturing has approved the use of the new Fuel Efficient SAE 75W-90 Synthetic Axle Lubricant, P/N 12378261, for the following rear axles:

8.6 Inch Axles – synthetic lubricant can be used in all 8.6 inch axles as originally built.

9.5 Inch Axles – the synthetic lubricant is not compatible with 9.5 inch axles on vehicles built prior to mid-February 1998. Testing has shown that Fuel Efficient SAE 75W-90 Synthetic Axle Lubricant will chemically attack the Room Temperature Vulcanizing (RTV) sealant. This is why only non-synthetic axle lubricant, P/N 1052271, should be used in axles using RTV sealant. The 9.5 inch axle uses RTV sealant on the cover pan. On vehicles with 9.5 inch rear axles built after mid-February 1998, the synthetic lubricant can be used because the RTV sealant was replaced with a gasket.

10.5 Inch Axles – the synthetic lubricant can be used on all 10.5 inch axles built prior to March 1999 if the axle shaft hub seal, which uses RTV sealant, is replaced with a gasket, P/N 327739.

You do not need to wash/rinse any non-synthetic lubricant from the axle cavity when changing over to a synthetic lubricant. However, you should remove any debris from the magnet and the bottom of the axle cavity.

– Tim Dobbs

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