



# Service Bulletin

## PRELIMINARY INFORMATION

**Subject:** Chevrolet Cruze Clean Turbo Diesel New Model Features and Service Guide

**Models:** 2014 Chevrolet Cruze

Equipped with 2.0L Clean Turbo Diesel Engine — RPO LUZ

Equipped with Electronic 6 Speed Automatic Aisin-Warner, A6-AF40 Gen2 Transmission — RPO MDK



The purpose of this bulletin is to introduce the new features of the 2014 Cruze Clean Turbo Diesel, and describe the actions the Service Department will need to take to ensure that they are able to fully service this exciting new model.

### Pre-Delivery Inspection (PDI) and Preparation

Performing a quality pre-delivery inspection (PDI) is one of the most important functions the Service Agent (Dealer) can do for the customer. Most customers consider the condition of their new vehicle during delivery as a direct reflection of the Retailer and their service department.

A quality PDI is essential to improving a customer's perception of your facility and increasing his/her satisfaction with their new vehicle.

The 2014 Cruze Clean Turbo Diesel forms are available via Global Connect > Pre-Delivery Inspection Forms > 2014 Chevrolet Pre-Delivery Inspection Forms > 2014 Cruze and Cruze Diesel. These forms contain the same generic PDI steps as before, but also include a section for Special Inspection Items. This section is updated frequently and contains special items to look for during the PDI process.

### Customer Education

It is imperative that the customer be well informed about the unique features and operational characteristics of their 2014 Cruze Clean Turbo Diesel. For the sales team to be fully prepared, they should thoroughly review this New Model Features and Service Guide and use the Getting to Know Your Vehicle (GTK) guide (U.S. Only) as an outline when presenting the 2014 Cruze Clean Turbo Diesel to the customer. Additionally, Service and Parts leadership, Service Writers and Service Technicians should familiarize themselves with these materials to avoid attempting repair of normal operating characteristics.

### Available Product Training

The majority of the systems found on the Cruze Clean Turbo Diesel are taught in GM's core curriculum from a conceptual theory and operation perspective.

To access **all** of the available training courses visit the following website:

- In the United States go to > [www.centerlearning.com](http://www.centerlearning.com)
- In Canada go to > [www.gmprocanada.com](http://www.gmprocanada.com)

### ***Training Course Name and RPO - Course Number and Description***

Course Name - System RPO	Course Number and Description
<p style="text-align: center;"><b>UNITED STATES</b></p> <p><b>ENGINE – DIESEL, 2.0L, CRI, L4, DOHC, VGT — RPO LUZ</b></p>	<p><b>16440.18D Engines: New and Updates for RPOs LT1, LV3, LUZ, LKW, LF3, L83, L86 (Will be broadcast on June 17, 2013)</b></p>
<p style="text-align: center;"><b>CANADA</b></p> <p><b>ENGINE – DIESEL, 2.0L, CRI, L4, DOHC, VGT — RPO LUZ</b></p>	<p><b>50545.09W Cruze Diesel New Model Features (Available Late July 2013)</b></p>

## About the Vehicle

The purpose of this preliminary information (PI) is to familiarize you with some of the technical aspects of the 2014 Cruze Clean Turbo Diesel and introduce the **major diesel specific components and their functions.**

## Clean Turbo Diesel Engine



The 2.0L turbo-diesel engine provides greater fuel economy than a comparably sized gasoline engine through greater thermal efficiency, a higher compression ratio and an unthrottled combustion process. It features an iron cylinder block and a forged steel crankshaft, each designed to stand up to the greater cylinder pressures commensurate with a turbo-diesel engine.

The engine produces an estimated 148 hp (110 kW) with an estimated torque of 258 lb-ft (350 Nm) and can go from 0-60 mph (0-97 km/h) in about 8.6 seconds. The engine has an advanced overboost feature capable of increasing torque to an estimated 280 lb-ft (380 Nm) for short bursts of acceleration of about 10 seconds when needed, such as entering freeway traffic.

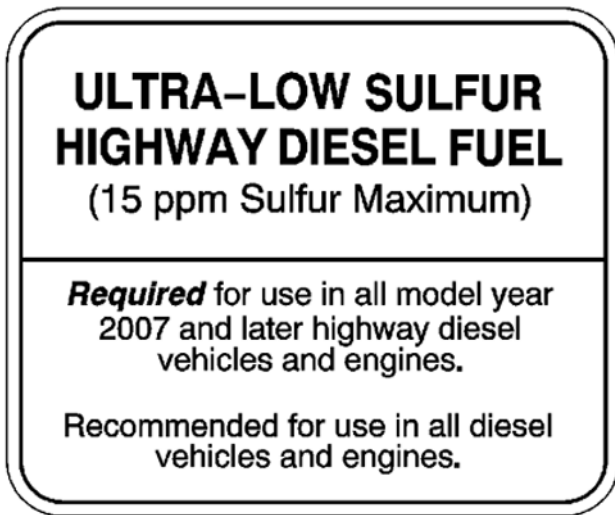
A lightweight aluminum cylinder head and aluminum intake manifold contribute to the engine's comparatively low weight of 408lbs (185 kg), helping the Cruze Clean Turbo Diesel deliver a balanced ride with outstanding handling characteristics. Additional highlights include:

- Dual overhead camshafts with four valves per cylinder and maintenance-free hydraulic lifters with low-friction roller-finger followers.
- Quiet belt-driven cams/valvetrain with high-strength belt material and tensioner rated for 97,500 miles (156,000 km).
- High-strength aluminum pistons with reinforced top ring and integral combustion bowl design.
- Central direct injection, with the injector positioned in the middle of the cylinder, with the bowl in the piston serving as the combustion chamber. This enables a high 16.5:1 compression ratio that enhances power and combustion efficiency.
- Variable-swirl intake manifold design, which optimizes air charge mixture motion in the cylinders for a more-efficient combustion that enhances performance and reduces emissions.
- Common-rail fuel system with Piezo fuel injectors that create multiple injections per combustion for greater performance, combustion efficiency and quietness.
- Variable-nozzle turbocharger that broadens the engine's torque curve, particularly at low rpm, and supports greater high-rpm horsepower. It is mounted close to the exhaust outlet of the engine for quicker "spool up" of the turbine and faster "light off" of the exhaust catalyst.
- Intercooling system produces a cooler, denser air charge for greater power.

- Piston oil jets that help reduce friction and optimize piston temperature for greater performance and efficiency.
- Turbocharger bearings are oil-lubricated and cooled via an oil cooler.
- Variable-displacement oil pump helps save fuel by optimizing the oil pressure, which reduces friction.
- Vacuum pump designed for lower engine friction.
- Ceramic glow plugs, which provide greater cold-start performance over conventional metal glow plugs (an engine oil heater is offered for cold climates).
- B20 bio-diesel compatibility.

Quiet, smooth performance is enabled by a number of features on and around the engine. There are also sound-absorbing features added to the Cruze, specific to the diesel model, including a unique dash mat, hood blanket and more.

## Use Only Ultra-Low Sulfur Highway Diesel Fuel



**Caution:** Use of diesel fuel other than Ultra Low Sulfur Diesel (15 ppm sulfur maximum) will cause damage to the exhaust after-treatment system. This damage would not be covered by the vehicle warranty. **DO NOT** use marine, locomotive, or boiler distillate fuel since it may contain higher sulfur levels.

The Cruze Clean Turbo Diesel uses Ultra Low Sulfur Highway Diesel Fuel (15 ppm sulfur maximum) **ONLY**. Diesel fuel dispensing pumps that display the Ultra Low Sulfur Highway Diesel Fuel **label** should always be used.

**NEVER** use regular unleaded gasoline in place of Ultra Low Sulfur Highway Diesel Fuel.

### Diesel Fuel ASTM Specification D975 — United States

At a minimum, the diesel fuel being used should meet the latest version of ASTM specification D975 (Grades number 2-D or number 1-D S15, commonly known as Ultra Low Sulfur Diesel) in the United States.

### Diesel Fuel Grades — United States

For best results use number 2-D diesel fuel year-round (above and below freezing conditions) as oil companies blend number 2-D fuel to address climate differences. Number 1-D diesel fuel can be used in very cold temperatures (when it stays below 0°F (-18°C)). However, it will produce a loss in power and fuel economy. **Avoid** the use of number 1-D diesel fuel in warm or hot climates. It can result in stalling, poor starting when the engine is hot, and damage to the fuel injection system.

### Biodiesel — United States

**Caution:** **DO NOT** use home-made biodiesel or home test kits because the quality cannot be verified by approved scientific methods. **Do not use raw vegetable oil or other unmodified bio-oils, fats, or blends of vegetable oil with diesel. They could damage the fuel system and engine, and damages would not be covered by the vehicle warranty.**

Biodiesel is a fuel produced from vegetable oils or animal fats that have been chemically modified to reduce the possibility of damage to the fuel system and engine. It is acceptable to use diesel fuel containing up to 20% biodiesel (B20). The diesel fuel portion of the blend must meet the same specification, ASTM D975 (Grades number 2-D or number 1-D S15 commonly known as Ultra Low Sulfur Diesel), as other fuels used in your vehicle, and the biodiesel used for making this fuel must meet the latest version of ASTM specification D6751.

Retail pumps dispensing more than 5% and up to 20% biodiesel are required to be labeled with the concentration of biodiesel. When refueling with a biodiesel blend above B5, ensure one of the following two labels appears on the dispenser:

<b>B-20 Biodiesel Blend</b>
contains biomass-based diesel or biodiesel in quantities between 5 percent and 20 percent

<b>20% Biomass-Based Diesel Blend</b>
contains biomass-based diesel or biodiesel in quantities between 5 percent and 20 percent

For more information on the use of B20 Biodiesel blends, advise the customer to refer to their Owner Manual.

### Diesel Fuel Specification — Canada

**Caution:** Use of diesel fuel other than Ultra Low Sulfur Diesel (15 ppm sulfur maximum) will cause damage to the exhaust after-treatment system. This damage would not be covered by the vehicle warranty.

At a minimum, the diesel fuel that is used should meet the latest version of specification CAN/CGSB-3.517 (ULS).

### Diesel Fuel Types — Canada

Canadian fuels are blended for seasonal changes. Diesel Type “A” fuel is blended for better cold weather starting in extreme conditions; however, you might notice some power and fuel economy loss. If Type “A” fuel is used in warmer temperatures, stalling and hard starting may occur. Diesel Type “B” fuel is blended for higher temperatures experienced during most of the year.

### Biodiesel Blends — Canada

It is acceptable to use diesel fuel containing up to 20% biodiesel (B20). For low level, under 5%, biodiesel blends (B1 to B5), the fuel you use should meet the latest version of specification CAN/CGSB-3.520 (ULS). For biodiesel blends between B6 and B20, the fuel you use should meet the latest version of specification CAN/CGSB-3.522. If there are questions about the biodiesel-containing fuels you are using, contact your fuel supplier.

### Fuel Economy

The Cruze Clean Turbo Diesel achieves an Environmental Protection Agency rated 46 miles per gallon on the highway, making it the best highway fuel economy of any non-hybrid car in the United States.

The Cruze Clean Turbo Diesel receives a fuel consumption rating of 4.2 L/100 km highway, making it the best highway fuel efficiency of any non-hybrid car in Canada.

### dexos 2™ Diesel Engine Oil





## Specification

**Notice:** Failure to use the recommended engine oil and correct viscosity or its equivalent can result in engine damage not covered by the vehicle warranty.

Use and ask for engine oils with the dexos2™ certification mark (shown above). Oils meeting the requirements of the vehicle will have the dexos 2™ certification mark on the container. This certification mark indicates that the oil has been approved to the dexos 2™ specification. If you are unsure that the oil has been approved to the dexos 2™ specification, check with your service provider or use the website address provided below to determine if the oil is approved to the dexos 2™ specification.

Refer to this General Motors website for dexos 2™ information about the different licensed brands that are currently available:  
<http://www.gmdexos.com>

In the event that dexos 2™ approved engine oil is not available at an oil change or for maintaining proper oil level, you may use substitute engine oil that meets ACEA C3 of the appropriate viscosity grade.

## Viscosity Grade

SAE 5W-30 is the required viscosity grade for the vehicle's diesel engine. \* **DO NOT** use other viscosity grade oils such as SAE 10W-30, 10W-40, or 20W-50.

**Notice:** \* Cold Temperature Operation: In an area of extreme cold, where the temperature falls below -20°F (-29°C), an SAE 0W-30 oil may be used. An oil of this viscosity grade will provide easier cold starting for the engine at extremely low temperatures.

## Transmission

An A6-AF40 (RPO MDK) Transmission is used in the Cruze clean turbo diesel. It is an electronic 6-speed automatic transmission with TCC lock-up.



The transmission requires AW-1 Transmission Fluid, United States P/N 19256039 and in Canada P/N 19256040. **DO NOT** use DEXRON™ - VI Automatic Transmission fluid as it is not compatible.

It is not necessary to check the transmission fluid level. A transmission fluid leak is the only reason for fluid loss. If a leak occurs, take the vehicle to your Service Agent.



**Notice:** Because the procedure for checking and changing transmission fluid is difficult, this should be performed by the Service Agent.

The transmission does not have an oil dipstick. The drain plug has an extra, central check plug for checking the level that is connected to a rising tube that reaches up to the correct level in the box. Fill the oil through the conventional oil filler plug until the level is correct and oil runs out of the check plug hole in the rising tube.

## Emissions — Overview

A precise exhaust gas recirculation control system features a high-capacity cooler and bypass feature that enable the engine to meet the stringent diesel emissions regulations of the United States and Canada.

There is also an exhaust aftertreatment system that is similar to what is used on Chevrolet's heavy-duty trucks and vans equipped with the Duramax™ diesel, including a diesel particulate filter and urea injection. This exhaust aftertreatment system helps to make the Cruze's 2.0L engine the cleanest diesel passenger car ever from GM.

## Some Unique Characteristics of Cruze Clean Turbo Diesel

There are some unique characteristics of diesel powered vehicles that you should become familiar with in the event of customer questions or concerns.

### Auxiliary Electric Heater for the Cabin

A unique feature of the Cruze Turbo Diesel HVAC controls is the addition of an auxiliary electric heater that can be enabled by turning the temperature setting to full heat. This will improve the cabin heating in cold weather.

### 2.0 TD Badging



The appearance of the Cruze Clean Turbo Diesel is consistent with that of the standard Cruze and Cruze ECO models, with the minor exception of the 2.0 TD badging.

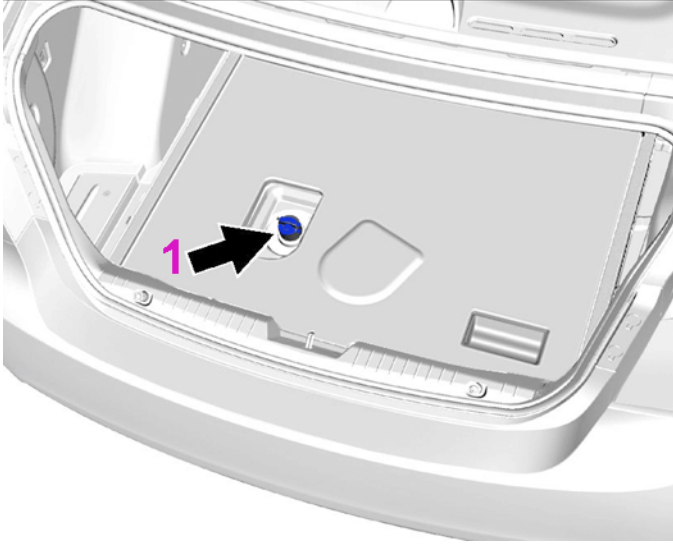
### Diesel Exhaust Fluid (DEF)



**Warning:** Diesel Exhaust Fluid (DEF) is corrosive. Do not allow it to come in contact with your skin, eyes, or the finished surfaces of the vehicle. If exposed, it may cause skin and eye irritation. Wear skin and eye protection when handling. Inhalation may cause irritation to the upper respiratory tract. Store in a cool, well-ventilated area. For more safety and storage information, see the label of the Diesel Exhaust Fluid container.

DEF is used with diesel engines to reduce the amount of regulated emissions produced. The fluid level in the DEF tank must be maintained for the vehicle to run.

correctly.



In the rear compartment of the vehicle, under the load floor is the DEF tank (1). The capacity of the tank is 4.9 gallons (18.5 L). This is enough DEF to provide a range of at least 10,000 miles (16,000 km) of driving between refills. The system is also designed for servicing to coincide with oil changes, for greater convenience.

The DEF level indicator is displayed in the Driver Information Center (DIC). When the DEF tank is approaching empty, a Driver Information Center message will be displayed to refill the DEF tank. If the tank is not refilled, the engine computer will begin to limit the vehicle to a maximum speed, starting at 65mph (105 km/h), and over time and mileage will reduce the maximum speed to less than 10mph (16 km/h).

**Caution: Use only diesel exhaust fluid that is GM approved, or fluid containing the API certified or ISO 22241 label. The use of other fluids could damage the system, requiring costly repairs that will not be covered by the vehicle warranty.**

When adding DEF to an empty or very low tank, always add at least 2 gallons (7.6 L) of fluid to release the vehicle from speed limitation. To prevent damage to the system, **DO NOT** overfill the DEF tank. When the fluid reaches the top of the fill pipe, stop filling. **DO NOT** top off the DEF tank. If you spill DEF during filling of the tank, wipe any affected surface with a damp cloth.

DEF can be purchased at a Chevrolet Service Agent. Additionally, many diesel fueling stations and auto parts retailers have DEF for purchase. For vehicles with an active OnStar® subscription, OnStar® can help to locate a DEF retailer.

### **Diesel Particulate Filter (DPF)**

The diesel particulate filter (DPF) features a porous material that allows exhaust gas to pass through while trapping or filtering solid matter from the exhaust. Occasionally, depending on a number of inputs monitored by the engine control module (ECM), the DPF will need to be cleaned of accumulated solids. The ECM will initiate the cleaning process by warming the exhaust gas temperature. The accumulated particulate matter in the DPF will be safely converted to harmless gases, and the DPF will then be clean and ready again to trap or filter additional particulate matter. This feature is designed to operate automatically, with limited driver involvement or awareness.

### **Cleaning the DPF — DPF Service Regeneration**

The DPF cleaning cycle (DPF Service Regeneration) is automatically controlled by the ECM and should normally be maintenance free for the driver. If the vehicle is used for numerous short trips or extended slow speed operation, the ECM may not be able to adequately heat up the exhaust system to clean the DPF effectively. When the ECM detects that the DPF is nearly full of particulates and that the vehicle is not being operated in a manner that would allow an effective automatic DPF cleaning, the driver information center (DIC) will display one of the following messages:

- **DIESEL PARTIC FILTER IS FULL CONTINUE DRIVING**
- **DIESEL PARTIC FILTER IS FULL CONTINUED DRIVING IS MANDATORY**

The **DIESEL PARTIC FILTER IS FULL CONTINUE DRIVING** or the **DIESEL PARTIC FILTER IS FULL CONTINUED DRIVING IS MANDATORY** DIC message **MUST** be followed to prevent damage to the engine. The vehicle may need to operate continuously for up to 20minutes and at speeds greater than 30 mph (48 km/h) in order to clean the DPF effectively.

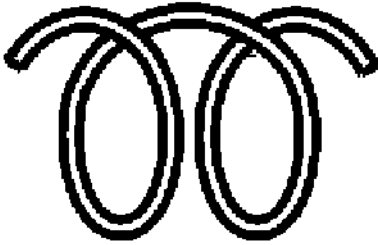
### **Diesel Fuel Filter**

The Cruze Clean Turbo Diesel is equipped with a fuel filter to protect the engine from water and other contaminants that can be found in diesel fuel. Water should be drained from the fuel filter when the DIC displays **WATER IN FUEL CONTACT SERVICE**. If water is not drained, there is a chance this water could enter the fuel injectors and result in corrosion. Fuel filter cartridges must be replaced every 30,000 miles (48,000 km), or two years whichever comes first or as indicated on the DIC. The fuel filter is located under the vehicle on the passenger side.

### **Starting the Cruze Clean Turbo Diesel — Wait to Start Light**

The ignition process for a diesel engine is different than that of a gasoline engine. The driver will need to follow these steps to properly start the engine:

1. Turn the ignition key to **ON/RUN**.



2. Observe the wait-to-start light on the Driver Information Center. This light may not turn **ON** if the engine is warm.

**Notice:** The engine has a fast warm-up glow plug system. The wait-to-start light will illuminate for a much shorter time than most diesel engines, due to the rapid heating of the glow plug system.

3. As soon as the wait-to-start light turns **OFF**, immediately turn the ignition key to **START**. When the engine starts, let go of the key.
  - ⇒ If the engine does not start after 15 seconds of cranking, turn the ignition switch to **LOCK/OFF**. Wait one minute for the starter to cool, then try the same steps again.

## Driver Information Center (DIC) — Diesel Specific Messages and Lights

### Wait to Start Light

See the section in this PI titled: Starting the Cruze Clean Turbo Diesel — Wait to Start Light

### Diesel Exhaust Fluid Warning Light



The **DIESEL EXHAUST FLUID WARNING LIGHT** will turn **ON**, a DIC Message will display and a chime will also come **ON**, if there is an issue with the Diesel Exhaust Fluid. If the fluid issue is not corrected, the light will continue to flash when the vehicle is started. While driving, the vehicle's speed may be limited.

Advise the customer to refer to the various **Diesel Exhaust Fluid Messages** in their Owner Manual for information on the specific message displaying with the light.

### DIESEL EXHAUST FLUID LEVEL

Displays the current **Diesel Exhaust Fluid Level**



## REMAINING FUEL FILTER

Displays an estimate of the remaining fuel filter service life. If **REMAINING FUEL FILTER 50%** is displayed, that means 50% of the current fuel filter service life remains.

## WATER IN FUEL CONTACT SERVICE

The **WATER IN FUEL CONTACT SERVICE** message displays when the water level in the diesel fuel filter exceeds a specified level. Residual water in the diesel fuel filter must be drained.

## EXHAUST FLUID RANGE: XXXX KM (MI)

When the DEF level is getting low, the range will be displayed in miles or kilometers. It is normal for the **EXHAUST FLUID RANGE** value to vary based on vehicle and environmental driving conditions.

When this message first displays at approximately 1,000 miles (1,600 km) of fluid range remaining, it is approximately 3 gallons (11 L) low.

## EXHAUST FLUID LOW SPEED LIMITED SOON

When the exhaust fluid range is less than 120 km (75 mi) the **EXHAUST FLUID LOW SPEED LIMITED SOON** message will be displayed.

## EXHAUST FLUID EMPTY REFILL NOW

When the exhaust fluid is empty, the **EXHAUST FLUID EMPTY REFILL NOW** message will be displayed. This message may be accompanied by other messages.

## EXHAUST FLUID QUALITY POOR SEE OWNER MANUAL NOW

When the **EXHAUST FLUID QUALITY POOR SEE OWNER MANUAL NOW** message displays, the exhaust fluid is of poor quality or the wrong fluid was added. This message may be accompanied by other messages.

## DIESEL PARTICULATE (PARTIC) FILTER MESSAGE

When the soot particles in the diesel particulate filter reach a certain amount, the **DIESEL PARTIC FILTER IS FULL CONTINUE DRIVING** message displays. At this time continued driving is **mandatory** to prevent the filter from clogging.

## Available Special Tools

The following new available special tools have been released for the 2014 Cruze Clean Turbo Diesel:

Tool #	Tool Description
DT-29077-A	Transmission Seal Installer
DT-50298	Transmission Seal Installer
EN-46788	Crankshaft Locking Tool
EN-46789	Fixing Tool (Locking Tool)
EN-46790	Fuel Injection Pump Sprocket Remover
EN-46792	Flywheel Holder
EN-46793	Oil Pump Seal Installer
EN-47630	Crankshaft Sprocket Holder
EN-47633	Compression Gauge Adapter
EN-47634	Camshaft Sprocket Holding Tool
EN-51256*	Injector Remover Adapter Set
EN-6347	Fuel Injection Pump Sprocket Holder

\*Shipped as an essential tool to Chevrolet Service Agents (Dealers) in Canada.

⇒ If a Service Agent (Dealer) needs a tool(s), call 1-800-GM-TOOLS to place an order.

## Submitting Field Product Reports

As with any new vehicle, or vehicle technology, prompt detailed feedback on owner concerns and/or vehicle conditions in the field is of great value to the manufacturer.

- United States Dealers should report any product issues via a Field Product Report (FPR). Refer to the latest version of Corporate Bulletin Number 02-00-89-002 Information for Dealers on How to Submit a Field Product Report.
- Canadian Dealers should report any product issues via a Product Information Report (PIR). Refer to the latest version of Corporate Bulletin Number 10-00-89-006 Information for Dealers on How to Submit a Product Information Report.

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GM bulletins are intended for use by professional technicians, NOT a "do-it-yourselfer". They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the bulletin applies to your vehicle, or that your vehicle will have that condition. See your GM dealer for information on whether your vehicle may benefit from the information.



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