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Safe Multimeter Practices

Understanding Multimeter Protection When Used With Hybrids

You need to be careful when working on the electrical systems of Hybrid vehicles. In fact, you need to observe the same safety precautions as a commercial or industrial electrician. Working safely has two parts, and you are responsible for both parts: (1) having safe equipment and (2) using it in a safe manner.

Learn about the key safety features of the new Two-Mode Hybrid vehicles and the safety precautions you must use when servicing them. The GM Service Technical College is offering these training courses on-line at www.gmtraining.com. In Canada, these courses are available on the GM Pro Training website www.gmprocanada.com.

Course Title	Course Number
High Voltage System Safety *	18440.01W
Two-mode Introduction and Safety	18440.05W
Two-mode 300v Battery System	18441.01W

* Required for all service personnel (U.S.) (including service manager, service foreman, service advisor, technician, body shop)

MULTIMETER SAFETY STANDARDS

Safety must be built into your multimeter. The International Electrotechnical Commission (IEC) recently defined new safety standards for test equipment. Equipment designed to the new IEC61010 standard offers an even higher level of safety than equipment designed to the earlier IEC348.

IMPORTANT: See the sidebar on page 5 about the essential multimeter J-39200-A.

TIP: The IEC defines the standards, but is not responsible for enforcing them. Equipment manufacturers may self-certify their equipment, but you must look for the symbol of an independent testing laboratory to be sure that the equipment has been verified. Symbols of typical laboratories include UL, CSA and TUV.

continued on page 4

Transfer Case Actuator Motor

Some owners of a 2006-07 Hummer H2 may comment about a Service 4WD light on continuously or intermittently. A C0306 DTC may be hard set or in history.

This concern may be caused by high resistance through the actuator motor brushes.

TIP: The highest concentrations of concerns have occurred in geographic locations with low 4WD usage.

If the DTC C0306 is hard set or in history, clear the DTC, then cycle the actuator motor 25 times by shifting the transfer case between 4HI, 4HI LOCK and 4LO LOCK.

TIP: A revised interim software reflash is available in TIS2WEB. This software was released on 07/22/07 on version 7.5

Do not replace actuator P/N 89059688 for this concern.

If DTC C0306 resets and the system remains inoperative, follow published SI diagnostics for this repair. Check all wiring, connections, power and grounds. Replace the actuator only if necessary.

– *Thanks to Dan Oden*

TECHlink GM

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GM Service and Parts Operations

Using E85 Fuel in Older Vehicles

E85 compatibility is designated for vehicles that are certified to run on up to 85% ethanol and 15% gasoline. All other gasoline engines are designed to run on fuel that contains no more than 10% ethanol.

Some of your customers may inquire if they are able to use E85 fuel in non-E85 compatible vehicles. For answers, refer to bulletin 05-06-04-035C.

IMPORTANT: Only vehicles designated for use with E85 should use E85 blended fuel.

NOTICE: Use of fuel containing greater than 10% ethanol in non-E85 designated vehicles can cause driveability issues, Service Engine Soon indicators as well as increased fuel system corrosion.

TIP: Additional information is available at website www.livegreengoyellow.com.

Identifying E85 Capable Vehicles

TIP: Since model year 2007, GM's new E85 ethanol-capable vehicles come equipped with a yellow gas cap, which makes it easy to tell right away. If a vehicle was produced before the 2007 model year, its E85 capability is indicated by a label inside the fuel door and also by its VIN number. For information on what to look for in the VIN number, go to www.e85fuel.com.

8th Character in VIN

Vehicle	Character 8
Buick Terraza	W
Chevrolet Avalanche	Prior to Model Year 2007: Z Model Year 2007: 3 or 0
Chevrolet Express	Z
Chevrolet Impala	K
Chevrolet Monte Carlo	K
Chevrolet S-10 Pickup	5
Chevrolet Silverado	Model Year 2006 and prior: Z Model Year 2007: 0 or 3 or Z
Chevrolet Suburban	Prior to Model Year 2007: Z Model Year 2007: 3 or 0
Chevrolet Tahoe	Prior to Model Year 2007: Z Model Year 2007: 3 or 0
Chevrolet Uplander	W
GMC Yukon & Yukon XL	Prior to Model Year 2007: Z Model Year 2007: 3 or 0
GMC Savana	Z
GMC Sierra	Model Year 2006 and prior: Z Model Year 2007: 0 or 3 or Z
GMC Sonoma	5
Pontiac Montana (available ONLY in Canada and Mexico)	W
Saturn RELAY	W

Aftermarket Conversions of Vehicles to Use E85 Fuels

General Motors has become aware of several companies that claim to be able to convert vehicles equipped with gasoline engines to be compatible with E85 fuels. Refer to bulletin 06-06-04-035 for details.

– *Thanks to Jack Woodward*

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SRX Ultraview (Sunroof) Service Tips

Here are some tips for correcting the causes of customer concerns with the Ultraview (sunroof) on the Cadillac SRX. There are several bulletins that you should refer to for details. Also refer to the Service Know-How/TECHAssist course number 50250.23T1 (US dealers).

Auto Reverse

The sunroof may stop and auto-reverse direction when the express open or closed feature is selected. The sunroof motor reverses when it experiences high current draw caused by excess friction in the guide tracks. Due to the size and design of the glass, the rear guide tracks may become dirty from exposure to environmental elements. Lack of proper maintenance, cleaning and lubrication may also be a cause.

Refer to bulletin 06-08-67-011D for several remedies. These procedures detail improvements that have been implemented in production.

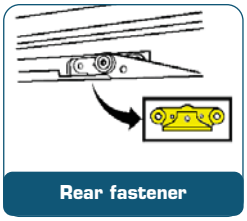
- Clean the guide rails with brake cleaner, then lubricate with Rheosil 500F (obtained from TAI Lubricants at 1.302.326.0200). Rheosil 500F is the only lubricant GM recommends for the rear tracks.
- When the sunroof glass is removed, operate the sunroof drive system to confirm that there are no concerns with the front drive tracks or drive cables.
- Install softer durometer rubber guide caps p/n 25880591 to the white plastic guide shoes.
- If other remedies are not successful, replace the motor with a high-current version, p/n 15932104. It is not necessary to replace the drive motor in every case

Guide shoe caps

Sunroof motor

TIP: These procedures require temporary removal of the glass panel. When installing the glass panel, be sure the rear retainers are placed as far rearward as possible. If the retainer threads should strip, the retainers are available as p/n 89045564.

TIP: Take care with the front sunroof fasteners – they are threaded into aluminum and can be stripped if cross-threaded or over-torqued (5 N.m, 44 lb in). Refer to bulletin 07-08-67-007 for instructions on installing a HeliCoil thread insert.



Rear fastener

Noises

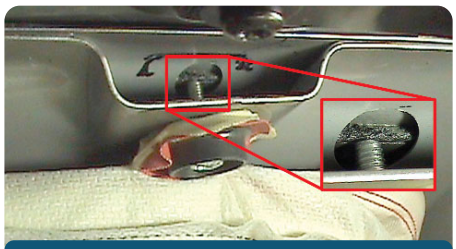
Customers may experience creaking or snapping noises from various parts of the roof. Noises typically occur when a torsional load is applied to the vehicle body (driving on rough roads, when turning, or when going up a driveway).

Some causes of sunroof noises:

- Sunroof module or glass panel fasteners may be loose. The specified clamp load is low and must be maintained. Also be careful not to overtorque. See the over-torque tip earlier.
- Sunroof frame alignment pins may contact the roof sheet metal. Refer to bulletin 06-08-67-012B for details.
- Rear roof rail airbag fastener may contact the side door ring sheet metal. Refer to PIC4359A for details of the condition and repairs.
- The sunroof module fasteners may contact the sunroof SMC frame, creating a noise. See PIC4359A for details.
- The copper drive cable tube may contact the SMC frame or a tie strap may contact the SMC. Isolate both contact areas with flocking tape.

Front alignment pin

Rear alignment pin



Airbag fastener

A - Flocking tape at drive tube
B - Flocking tape at tie strap

- Conditions of wind noise at the leading edge of the glass may be corrected by following the procedures in bulletin 07-08-58-002.

– *Thanks to Jeff Strausser*

Transfer Case Shift Condition

The owner of a 2008 Silverado, Suburban, Tahoe, Sierra, or Yukon equipped with a Magna transfer case NQF or NQH may comment that the Service 4x4 light is on currently or intermittently and/or the transfer case cannot shift into certain modes. There may be DTCs related to the encoder circuits, actuator circuits, brake circuits, rotational sensor or incremental sensor circuits.

Inspect for water intrusion and corrosion at the encoder/actuator connector near the transfer case. If water intrusion or corrosion is found, replace the encoder/actuator assembly and repair or replace the vehicle side connector and terminals as necessary.

– *Thanks to Chuck Krepp*

Safe Multimeter Practices – *continued from page 1*

Testing laboratory symbols

VOLTAGE SPIKES – THE INVISIBLE HAZARD

Hybrid vehicles produce electrical loads more complex and powerful than traditional automotive systems, creating greater possibilities of transient over-voltages (spikes). Motors, capacitors and power conversion equipment, all commonly used in hybrid vehicles, can be prime generators of voltage spikes.

When taking measurements on electrical systems, you can be exposed to the hazard of voltage spikes, which are invisible and largely unavoidable. They occur regularly on low voltage power circuits, and can reach peak values in the many thousands of volts.

Being affected by a voltage spike has nothing to do with misuse of the multimeter, because spikes can occur without warning. Your protection is dependent on the safety margin built into your meter. The voltage rating alone will not tell you how well that meter was designed to survive high voltage spikes.

Protection against voltage transients (spikes) is critical. It involves not just the maximum steady state voltage of the circuit, but the combination of steady state voltage and transient overvoltage capability.

OVERVOLTAGE INSTALLATION CATEGORIES

The most important single concept to understand about the new IEC standards is the Overvoltage Installation Category. The new standard defines Categories I through IV, often abbreviated as CAT I, CAT II, etc.

The categories are based on the fact that a dangerous high-energy transient will be dampened as it travels through the impedance (AC resistance) of the system.

Overvoltage Category	Description
CAT IV	Three-phase at utility connection
CAT III	Three-phase distribution, single-phase commercial lighting
CAT II	Single-phase receptacle loads
CAT I	Electronic

A higher CAT number refers to an electrical environment with higher power available and higher-energy transients. For instance, a multimeter designed to a CAT III standard is resistant to much higher-energy transients than one designed to CAT II standards.

Within a category, a higher voltage rating denotes a higher transient withstand rating. For instance, a CAT III-1000 V meter has superior protection compared with a CAT III-600 V rated meter. The real misunderstanding occurs if someone selects a CAT II-1000 V rated meter thinking that it is superior to a CAT III-600 V meter.

WHEN IS 600 V MORE THAN 1000 V?

Within a category, a higher working voltage (steady state voltage) is associated with a higher transient, as would be expected. For example, a CAT III-600 V meter is tested with 6000 V transients while a CAT III-1000 V meter is tested with 8000 V transients.

What is not as obvious is the difference between the 6000 V transient for CAT III- 600 V and the 6000 V transient for CAT II-1000 V. They are not the same. This is where the source impedance comes in.

Ohm's Law (Amps = Volts/Ohms) tells us that the 2 ohm test source for CAT III has six times the current of the 12 ohm test source for CAT II. The CAT III-600 V meter clearly offers superior transient protection compared to the CAT II-1000 V meter, even though its so-called voltage rating could be perceived as being lower. It is the combination of the steady-state voltage (called the working voltage), and the category that determines the total voltage withstand rating of the test instrument; including the all-important transient voltage withstand rating.

TIPS FOR UNDERSTANDING CATEGORIES

Here are some quick ways to apply the concept of categories to your every day work.

- The general rule-of-thumb is that the closer you are to the power source, the higher the category number, and the greater the potential danger from transients.
- It also follows that the greater the short-circuit current available at a particular point, the higher the CAT number.
- The greater the source impedance, the lower the CAT number. Source impedance is simply the total impedance, including the impedance of the wiring, between the point where you are measuring and the power source. This impedance is what dampens transients.

MULTIPLE CATEGORIES

There's one scenario that sometimes confuses people trying to apply categories to real world applications. In a single piece of equipment, there is often more than one category. For example, in automotive accessory equipment, from the 12 V side of the power supply back to the battery is CAT II. The electronic circuitry (inside the PCM) is CAT I. In engine control systems, such as ignition controls, it is common to find electronic circuits (CAT I) and power circuits (CAT III) existing close together.

What do you do in these situations?

As in all real-world situations, use common sense. In this case, that means using a meter with the higher category rating. It's not realistic to expect people to be going through the category-defining process all the time. What is realistic, and highly recommended, is to select a multimeter rated to the highest category in which it could possibly be used. In other words, err on the side of safety.

OVERLOAD PROTECTION

Amp Inputs – Use only a multimeter with amps inputs protected by high energy fuses. Never replace a blown fuse with the wrong fuse. Use only the high-energy fuses specified by the manufacturer. These fuses are rated at a voltage and with a short circuit interrupting capacity designed for your safety. Overload protection fuses protect against overcurrent.

Volt/Ohm Inputs – The high input impedance of the volts/ohms terminals ensures that an overcurrent condition is unlikely, so fuses aren't necessary.

Overvoltage protection, on the other hand, is required. It is provided by a protection circuit that clamps high voltages to an acceptable level. In addition, a thermal protection circuit detects an overvoltage condition, protects the meter until the condition is removed, and then automatically returns to normal operation. The most common benefit is to protect the multimeter from overloads when it is in ohms mode. In this way, overload protection with automatic recovery is provided for all measurement functions as long as the leads are in the voltage input terminals.

WHAT TO LOOK FOR IN A MULTIMETER

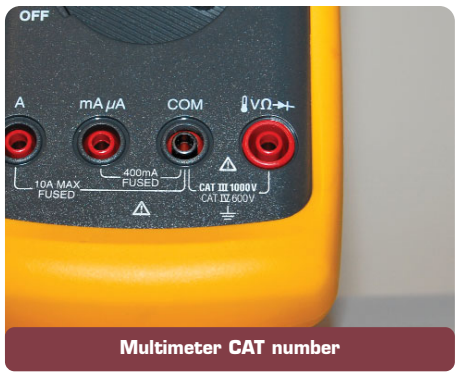
If you are faced with the task of replacing your multimeter, do one simple task before you start shopping: analyze the worst

case scenario of your job and determine what category (CAT number) your use or application fits into.

Choose a meter rated for the highest category you could be working in. Then, look for a multimeter with a voltage rating for that category matching your needs.

TIP: For Two-Mode Hybrid trucks, a multimeter with at least a CAT III number is necessary.

TIP: Test leads should be certified to a category and voltage as high as or higher than the meter. When it comes to your personal protection, don't let test leads be the weak link.

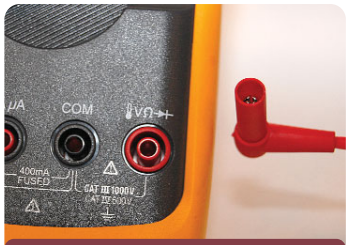


Multimeter CAT number

In addition to the appropriate CAT number, look for:

- Meters and test leads with double insulation.
- Meters with recessed input jacks and test leads with shrouded input connectors.
- Test leads with finger guards and a non-slip surface.
- Meter and test leads made of high-quality, durable, non-conductive materials.


Test lead CAT number



Recessed jack


Finger guard and non-slip surface

WORK SAFELY

Safety is everyone's responsibility, but ultimately it's in your hands. No tool by itself can guarantee your safety. It's the combination of the right tools and safe work practices that gives you maximum protection. Here are a few tips to help you in your work.

- Work on de-energized circuits whenever possible.
- On live circuits, use protective gear:
  - Use insulated tools.
  - Wear safety glasses or a face shield.
  - Wear insulated gloves
  - Remove watches or other jewelry.
  - Stand on an insulated mat.
  - Wear flame resistant clothing, not ordinary work clothes.
- When making measurements on live circuits:
  - Hook on the ground clip first, then make contact with the hot lead. Remove the hot lead first, the ground lead last.
  - Hang or rest the meter if possible. Try to avoid holding it in your hands, to minimize personal exposure to the effects of transients.
  - Use the three-point test method, especially when checking to see if a circuit is dead. First, test a known live circuit. Second, test the target circuit. Third, test the live circuit again. This verifies that your meter worked properly before and after the measurement.
  - Use the old electricians' trick of keeping one hand in your pocket. This lessens the chance of a closed circuit across your chest and through your heart.

– *Thanks to Will Godfrey and Corey Glassman, Fluke Corporation*

ESSENTIAL TOOL J-39200-A

Note the distinction between tool numbers. The original number was J-39200 and the present number is J-39200-A.

The J-39200 has been an essential tool since 1992. The original tool was built to the IEC348 standard, not the present IEC61010 standard, which had not been established at that time

The J-39200-A presently being offered is built to the stringent IEC61010 standard, and is CAT III rated.

The original J-39200 is not category rated. It does not have the overvoltage protection of a CAT III instrument, but is rated for use up to 1000 V.

Of great concern, though, is whether existing J-39200 multimeters, after years of hard service, are still in good repair. Do they have high energy fuses? Are the test leads damaged, with exposed conductors? Are strain reliefs damaged, causing intermittent readings? Many – probably most – of these instruments have not been calibrated or serviced since new.

This goes back to the earlier statement – working safely has two parts, and you are responsible for both parts: (1) having safe equipment and (2) using it in a safe manner.

If your old J-39200 is in doubtful condition, and you decide that working safely requires you to replace it, follow the guidelines presented above, and obtain a new instrument that is CAT III rated. The new J-39200-A, available from Dealer Equipment, is such an instrument.

Canceling a Turn-by-Turn Route

The owner of an OnStar® Gen 7 equipped vehicle may be unable to cancel an OnStar Turn-by-Turn route. The customer can request a route, the route will download, and directions will play normally. But, if the customer tries voice commands using the white phone button either to cancel or to update the route, there will be no response from OnStar.

Be sure the OnStar white phone button demo message has been cancelled. If the demo message plays when the white phone button is pressed, the Turn-by-Turn will not be able to accept commands.

Delete the demo message by pressing the white phone button and letting the demo message play until the end of the message. When asked if you want to delete the message, respond "yes" and the message will be deleted.

– *Thanks to Brian Holcombe*

Diesel Particulate Filter (DPF) Regeneration

2007-08 vehicles with the LMM Duramax diesel engine are equipped with a Diesel Particulate Filter (DPF) in the exhaust system to help meet US EPA diesel emissions regulations (*TechLink* December 2006). The DPF traps the particulate matter in the exhaust. To prevent the DPF from clogging, the particulate matter is periodically oxidized while the vehicle is being driven. This self-cleaning process is called particulate filter regeneration.

Normally, regeneration is controlled by the ECM, according to miles driven, fuel consumed, engine run time, exhaust differential pressure and a calculated soot model. However, there are times when it is necessary to intervene and manually trigger a regeneration event. There are two different methods available, Regeneration Enable and Service Regeneration. Both methods are activated with the Tech 2.

There are several documents in SI that explain each of these regenerations, and when to use them. Vehicle setup, Tech 2 setup and safety procedures are explained in detail in SI and on the scan tool. Here are some highlights and background. Refer to the documents listed for full details.

Diesel Particulate Filter (DPF) Regeneration Enable

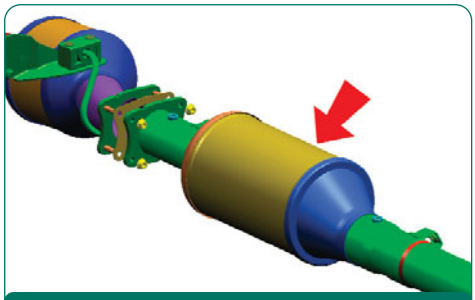
TIP: For details about this regeneration mode, refer to Diesel Particulate Filter (DPF) Regeneration Enable, in SI.

If an engine control condition causes the ECM to illuminate the MIL and command reduced engine power, the ECM may not be able to adequately warm the exhaust system to effectively clean the DPF. These conditions will require a DPF Regeneration Enable.

Filter element

The specific diagnostics that require the Regeneration Enable procedure will be specified in the Repair Verification section.

TIP: To avoid possible damage to the DPF, do not perform a DPF Regeneration Enable unless instructed to in the Repair Verification section of the service procedure. After completing the system repair, perform the following.



Diesel Particulate Filter (DPF)

1. Ignition ON, clear all DTCs with a scan tool.
2. Select DPF Regeneration Enable within the Special Function menu.
3. Select ON.

TIP: The selection can be confirmed by the DPF Regeneration Reason parameter indicating Device Control.

4. Exit the Special Function Menu. The scan tool can now be removed.

Once this is done, the vehicle will perform an Active Regeneration as soon as the engine running conditions are met. These conditions include the vehicle being operated continuously for approximately 18 minutes at speeds greater than 30 mph (50 km/h).

Diesel Particulate Filter (DPF) Service Regeneration

TIP: For details about this regeneration mode, refer to Diesel Particulate Filter (DPF) Service Regeneration in SI.

If normal driving conditions for regeneration do not occur, the ECM displays the CLEAN EXHAUST FILTER message in the Driver Information Center. If the driver ignores this message, the ECM eventually turns on the MIL, the Reduced Power lamp or the DIC message. When this occurs, the owner must bring the vehicle to the dealership for DPF Service Regeneration.

As mentioned in Regeneration Enable, certain engine control conditions that bring the vehicle into the dealership may have caused an excessive amount of soot accumulation in the DPF. Due to the MIL and Reduce Engine Power as a result of these conditions, the ECM may not command an active regeneration at the time it is needed. This could cause the vehicle to return to the dealership with an overloaded DPF. The specific diagnostics that require the Service Regeneration procedure are specified in the Repair Verification section.

Follow everything labeled Caution, Notice and Important in the service procedure to complete a Service Regeneration safely.

CAUTION: Tailpipe outlet exhaust temperature will be greater than 300°C (572°F) during service regeneration. To help prevent personal injury or property damage from fire or burns, you must take the precautions listed in Diesel Particulate Filter (DPF) Service Regeneration in SI. These include performing the procedure outdoors without a shop exhaust hose, in an isolated spot, remaining with the vehicle during the procedure, removing debris from the exhaust system, and ensuring proper airflow across the radiator.

Follow the SI procedure to initiate the Service Regeneration, the detailed instructions for establishing the correct conditions for the Service Regeneration to run, how to connect the scan tool, and how to observe and interpret the results of the Regeneration.

There are two tables provided, Service Regeneration Successful and Service Regeneration Unsuccessful. These tables explain how to recognize a successful regeneration, and what to do if it is unsuccessful.

TIP: An important and useful part of the Service Regeneration Unsuccessful table is a list of eight reasons the procedure may have not succeeded. These are referred to as the DPF Regeneration Inhibit Reasons, which can be displayed on the Tech 2. The table provides extensive information on interpreting, diagnosing and remedying each of the reasons.

– *Thanks to Frank Tornambe and Bill Carnevale*

Strut Compressor

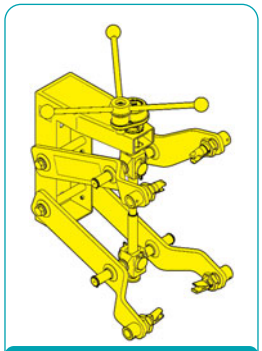
Kent-Moore has released the CH-48845 Strut Compressor as an essential tool for Chevrolet, GMC and Cadillac dealers. 2007-08 full-size pickups and utilities have coil-over shock modules (struts) that utilize coil springs requiring higher forces to compress.

The load capacity of the CH-48845 provides an extra margin of safety when servicing these modules compared with the current J-45400 and J-45400-A. Spring rates on future GM truck programs are going to continue to increase, requiring the need for this tool.

CAUTION: Use only the CH-48845 Spring Compressor when servicing suspension components on these vehicles. Attempts to service these strut/spring assemblies without using CH-48845 may result in damage to the strut, strut compressor and/or personal injury.

The Strut Compressor may be mounted to a wall. However, to save wall space and enhance shop efficiency, a portable Strut Compressor Stand 6582 is available. Because the stand has two wheels, it can be tilted and brought to the vehicle for use. Four no-slip rubber pads keep the stand in place during operation. For more information, contact Kent-Moore at 1.800.GMTools (1.800.468.6657).

– *Thanks to Kevin Willcock*



Spring Compressor CH-48845

Strut Compressor Stand 6582

Clutch Pedal Doesn't Return

The clutch pedal on some 2008 Z06 Corvettes may stay on the floor when depressed and released

Before any parts are replaced, follow these steps:

1. The engine should be off, transmission placed in neutral and the parking brake applied.
2. Verify the clutch reservoir is filled to the fill line. Inspect the fluid level from the side of the reservoir. Do not remove the cover to inspect. If additional fluid is required, use only DOT 4 fluid from an unopened container.

Do not substitute any other fluid for DOT 4.

3. If the pedal is on the floor, pull the pedal back to the full-up stop and hold for one second. The fill port in the master cylinder is at the very top of the stroke. If the pedal is not fully returned to the top of the stroke, new fluid cannot enter the master cylinder from the reservoir.
4. Repeat the above step three times. If the clutch pedal does not freely return, repeat steps three and four.
5. Check the reservoir to insure the fluid is still full
6. Drive the vehicle to insure proper clutch engagement.

TIP: The Corvette uses a self adjusting clutch and some change in pedal feel or pressure are normal as the clutch adjusts.

– *Thanks to Chuck Krepp*

DOT 4 Brake Fluid Note

DOT 4 brake fluid must be changed at 24 month intervals.

Steering Wheel Hard to Turn

Some owners of a 2007-08 AURA or Malibu (Classic) may comment that the steering wheel is hard to turn in one or both directions. The steering wheel may not return to the on-center position without assistance after making a turn.

The condition is created when the intermediate shaft is installed too far down on the pinion shaft of the steering rack. This causes the bottom housing of the intermediate shaft to contact the upper surface of the pinion casting.

Loosen but do not remove the intermediate shaft bolt and raise the intermediate shaft up on the pinion shaft.

With the intermediate shaft raised, tighten the shaft bolt.

- For electronic power steering, tighten the bolt to 49 N·m (36 lb ft)
- For hydraulic power steering, tighten the bolt to 62 N·m (46 lb ft).

Verify that the concern is eliminated.

– *Thanks to John Mason*

Transmission Slip

A 2007 Avalanche, Silverado, Suburban or Sierra equipped with 4L60E or 4L70E (RPO M30 or M70) automatic transmission may slip or no 2nd, 3rd or 4th gear. Inspection of the transmission may show distress of the 3-4 clutch or the 2-4 band. The front or rear stator support bushings and the turbine shaft oil seal rings may be worn or damaged. Also the turbine shaft may be worn or damaged where the sealing rings are located.

IMPORTANT: This applies only to vehicles built in January, February or March, 2007 with a Ramos-built transmission.

These conditions may be caused by rough surface finish on the turbine shaft stator shaft support bushing journals. Inspect the stator support bushings and the inner sleeve of the pump cover for wear and replace as required. When making repairs to a transmission from this population with these symptoms, the input housing with turbine shaft should also be replaced.

– *Thanks to Don Langer*

Door Handle Release Button

Some owners of a 2004-08 XLR or Corvette may comment that the inside door handle release button switch will not release either the driver or passenger door. Verify that the door lock is not on. Further investigation will show that the door will function from the release handle/cable on the floor next to the inside rocker panel. This may be the result of a stuck Exterior Door Handle Switch (touch pad) on the outside of the vehicle's door.

Monitor the status of the Exterior Driver or Passenger Door Handle Switch. This data can be viewed using the Tech 2 in the Driver and/or Passenger door module. If the status displays Active when the switch is NOT being depressed, inspect and repair any associated wiring. If no trouble is found with the wiring, replace the Exterior Door Handle Switch as necessary.

– *Thanks to Dino Poulos*

Car Issues – Fix It Right the First Time

Model Year(s)	Vehicle Line(s) /Condition	Do This	Don't Do This	Reference Information / Bulletin
2005-07	XLR, Corvette – Dead battery, no crank/ no start	Reprogram RCDLR	Don't replace RCDLR	07-06-03-001B
2006-07	HHR – Front and rear carpet wet, water/blower motor inoperative	Install new butyl patch	Don't reinstall old butyl patch using RTV	07-08-57-001A
2006-07	G6 Coupe – Interior water leak	Re-route both rear drain hoses, re-connect and tie strap	Don't reconnect hoses without properly rerouting and securing with tie strap	07015
2006-07	Lucerne – Poor headliner fit in rear	Repair headliner	Don't replace headliner	PIC4189
2006-07	Lucerne – Front or rear door trim panel, map pocket squeaks	Install new retainers	Don't replace door trim	06-08-64-034
2005-07	STS – Cushion moves sideways when turning	Put tape on sides of hook on seat cushion frame	Don't replace seat adjuster	06-08-50-010
2004-07	SRX – Turn signals flash fast, front turn signal inoperative	Bulb and socket for turn signal are available separately	Don't replace complete fog lamp assembly	Parts Catalog
2006-07	Lucerne – Noise when making turns at slow speeds	Align I-shaft to steering column	Don't replace intermediate shaft or steering gear	06-02-35-009E

Truck Issues – Fix It Right the First Time

Model Year(s)	Vehicle Line(s) /Condition	Do This	Don't Do This	Reference Information / Bulletin
2007	Acadia, Enclave, OUTLOOK – Power driver seat jerks when moved	Burnish track by moving seat forward and rearward 30 times with heavy load	Don't replace seat track	07-08-50-016
2003-07	Kodiak, TopKick, HTR, HVR, HXR – Armrest being pulled off door panel	Replace armrest and install improved fasteners	Don't replace door panel assembly or reuse old fasteners	07-08-64-016
2007-08	Fullsize utilities – Apparent steering rack leak may be excess fluid	Determine source of leak	Don't replace power steering rack	07-02-32-002C
2001-04	LB7 Duramax Diesel – Injector high pressure lines corroded	Clean connection area of line and nut	Don't replace lines	03-06-04-036A
2007-08	Silverado, Sierra – Service 4WD message, DTC B2725	Replace IP switch	Don't replace transfer case module	PIP4101
2007	Silverado, Sierra – Fuel gauge erratic, DTC P0463	Replace fuel level sensor	Don't replace PCM, fuel sender, instrument cluster, fuel tank, wiring or fuel system relay	PIT4294C
2007	Fullsize utilities – Passenger airbag door not flush with IP	Reposition locking tabs	Don't replace passenger airbag	06-09-41-004B

Know-How Broadcasts for February

10208.02D Emerging Issues	February 14, 2008	9:30 AM and 12:30 PM Eastern Time
New Model Features	For Web NMF courses, log on to the GM Training Website (www.gmtraining.com). Select Service Know-How/TechAssists from the menu, then choose New Model Features for a selection of courses.	

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– Thanks to John Miller