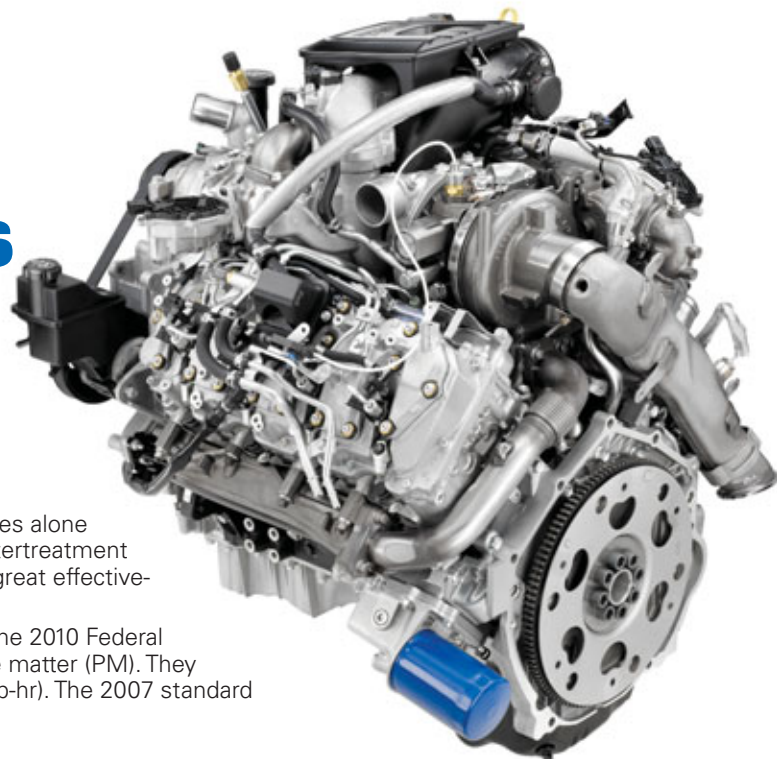


## New DURAMAX Diesel Engines



Compared with the emissions of gasoline engines, diesels have typically offered benefits, particularly in hydrocarbons and carbon monoxide. But controlling nitrogen oxides (NOx) and particulate mass (PM) have been challenging. New emission regulation changes in the U.S., Canada and Europe require substantial NOx reduction.

### The Emissions Challenge

Meeting these new requirements by engine hardware changes alone has proven to be extremely difficult. However, the advanced aftertreatment technologies of the new Duramax diesel engines have shown great effectiveness in dealing with these emissions.

Two new Duramax diesel engines were developed to meet the 2010 Federal emission standards for oxides of nitrogen (NOx) and particulate matter (PM). They reduce NOx to 0.2 grams per brake horsepower per hour (g/bhp-hr). The 2007 standard was 1.2 (g/bhp-hr).

### Engine Applications

The 6.6L Duramax diesel engine (RPO LGH, VIN code L) is used on 2010 interim and 2011 Express and Savana (GMT 610) vans and 2011 Silverado and Sierra (GMT 900) trucks with RPO ZW9 (chassis cabs or trucks with pickup box delete).

The 6.6L Duramax diesel engine (RPO LML, VIN code 8) is used on 2011 Silverado and Sierra pickup models.

### Mechanical Features

These engines use an iron block and aluminum cylinder heads. The bore and stroke are unchanged. The main bearing has been changed to enhance oil film thickness, and oil pump flow is increased.

In the cooling system, the thermostat is equipped with bleed holes to improve bleeding air from the system. The thermostat must be positioned with the bleed holes oriented toward the front of the engine.

An oval air filter is used on vans and a flat panel air filter is used on pickups. Also on pickups, the charge air cooler system has plastic lock rings on the inlet and outlet ducts. Use care when removing the lock ring to avoid damage. Twist the lock ring counterclockwise to release the tabs.

A single variable nozzle turbocharger (VNT) is used. The oil feed has been relocated from the number 4 cam bearing to a dedicated supply port at the left rear of the engine valley. The turbo mounting bosses have been revised. On the LGH engine, one boss was removed and another was added. On the LML engine, one boss was revised and another was added.

The EGR valve and stepper motor are contained in one unit. The position sensor now reflects the true position of the valve — the valve moves when the stepper motor extends or retracts.

A single EGR cooler is used on the LGH engine for Express and Savana van applications, and a dual cooler is used on the LGH engine for Silverado and Sierra truck

**Duramax Diesel 6.6L V-8 Turbo (RPO LML)**

## Contents

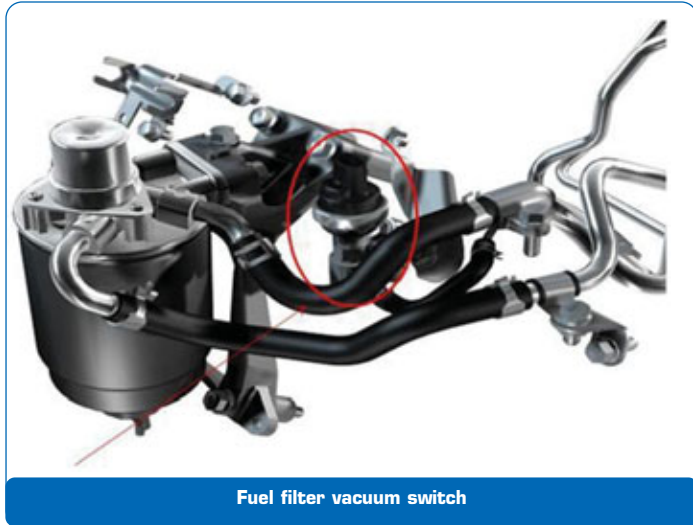
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applications. The LML engine for the pickups also uses a dual cooler with an EGR cooler bypass controlled by the ECM to prevent coking of the EGR cooler during light load and idling.

## Fuel System Features

The fuel system supply side is equipped with a fuel filter vacuum switch near the fuel filter. The switch opens if there is a restriction on the supply side, indicated by a vacuum of 13.6–15 Hg.



Fuel filter vacuum switch

The fuel system high pressure side uses a two-chamber pump that generates 200 megaPascals (mPa) of pressure (29,000 psi). Two high pressure lines feed the right fuel rail. A transfer tube carries fuel to the left fuel rail. A Fuel Rail Pressure sensor (FRP) is located on the rear of the left fuel rail.

The high pressure pump is timed so the peak pressure pulses match the injection events. Matching the pressure pulses results in a more constant pressure within the fuel rails. If the pump is removed, it must be retimed when it is installed. There are timing marks on the pump gear and camshaft gear that must be aligned, following SI procedures.

Two Fuel Rail Pressure Regulators (FRPR) are used. FRPR 1 is still located on the injection pump as on previous Duramax engines. FRPR 2 is located on the front of the left fuel rail. This solenoid is normally open. The ECM supplies pulse width modulation to change the duty cycle of FRPR2 to control the amount of fuel returned to the fuel tank.

The new Duramax engines are equipped with Bosch piezoelectric fuel injectors. These injectors operate a high voltage, indicated by the orange color of the injector harness.

**IMPORTANT:** Do not make contact with the fuel injector harness, ECM or fuel injectors while the ignition is in the On or Run position. Use certified insulated gloves EL-48286. These Class 0 gloves are rated at 1000 v. Check for functionality and check the expiration date of the gloves.

The ECM supplies high voltage and provides a ground. Voltage is supplied up to 160v at 20 amps, and can peak up to 240 v. This causes the injector to open. The capacitor discharges through an injector for initial opening and holds open with 12 v.

Injectors are grouped into four pairs: 1-4, 6-7, 2-5, and 3-8. If a condition is detected in a group, that group is disabled and a DTC is set.

On the fuel system return side, the return lines are now equipped with snap-in connections. The return side is under pressure.

A pressure retention valve maintains 0.4 to 1.1 mPa of

pressure within the return lines to provide proper fuel injector operation.

**TIP:** Improper injector return line pressure may cause a no-start or performance concern.

If the engine runs out of fuel, or if the fuel system is serviced, the system must be primed. After priming, a feed line from the low pressure side of the pump backfills the injector return lines. The feed line will also backfill if pressure falls below 0.3 mPa in the injector return lines.

## Electronic Control Features

The Bosch E86 ECM is larger and has three connectors instead of two. It also controls the HCI (Hydrocarbon Injector), FRPR 2, DEF pump, and DEF injector. The ECM has more than 160 new DTCs and you can use the Tech 2 to communicate with it.

**TIP:** This ECM will be on parts restriction for six months.

**TIP:** During programming, the download to the ECM should not be interrupted for the first 10% to 15% of the information transfer, or the ECM may not be recoverable for service.

The Glow Plug Control Module (GPCM) is located on the alternator bracket on the right side of the engine. The GPCM also provides regulated B+ for the NOx sensors and reductant heaters.

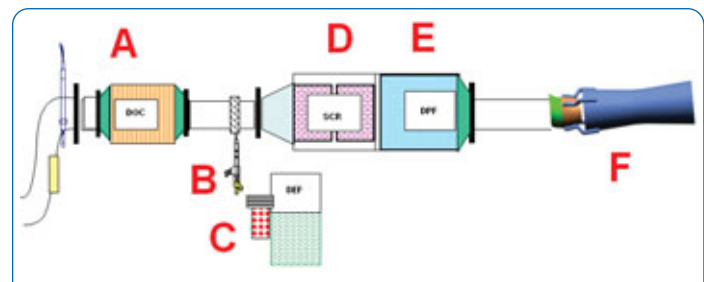
## Electrical Features

On the pickups, a mega fuse block is part of the battery positive cable assembly. It contains a 175 amp main fuse that protects the UBEC and generator, a 125 amp glow plug control module fuse, and a 175 amp intake air heater fuse.

**TIP:** On vehicles with two generators, there is a second 175 amp fuse for the additional generator.

## Aftertreatment System

The new Duramax diesel engines use an aftertreatment system to reduce oxides of nitrogen (NOx) by 90%. This system consists of a Selective Catalyst Reduction (SCR) system, a Diesel Exhaust Fluid (DEF) injection system, and two NOx sensor and smart module assemblies.



**After-treatment System**  
A. Diesel Oxidation Catalyst (DOC)  
B. DEF injection and mixer  
C. Diesel Exhaust Fluid (DEF)  
D. Selective Catalyst Reduction (SCR)  
E. Diesel Particulate Filter (DPF)  
F. Exhaust cooler

SCR technology permits NOx reduction to occur in an oxidizing atmosphere. It's called selective because it uses ammonia to reduce NOx levels as a reductant within a catalyst system. The reducing agent is automotive-grade urea — also known as Diesel Exhaust Fluid (DEF) or Emission Reduction Fluid (ERF) — that reacts with NOx to convert the pollutants into nitrogen, water and trace amounts of CO<sub>2</sub>. The urea is quickly hydrolyzed to produce oxidizing ammonia.

Two NOx sensors are used. Each sensor and its associated smart module are permanently connected and are serviced as a

continued on page 3

unit. Sensor 1 reads engine-out NOx. Sensor 2 reads SCR-out NOx. Sensor information is used by the ECM to adjust DEF dosing to the SCR. Sensor 2 allows the SCR system to detect poor DEF control and a damaged SCR catalyst.

The ECM controls the DEF delivery system. Based on engine NOx emissions level as communicated by calibration tables in the ECM or by the NOx sensor feedback, the ECM will send a command to the DEF injector to dose a given quantity of DEF. The injected DEF mixes with the exhaust gas with the help of a mixer before contacting the SCR. The SCR brick stores the ammonia, and by way of a chemical reaction with the NOx in the exhaust gas, produces nitrogen (N2) and water.

### Diesel Particulate Filter

The DPF operates the same as on previous engines to remove diesel particulate matter, or soot, from the exhaust. The regeneration parameters are still based on time, distance, fuel and soot loading, but the algorithms used to determine regeneration now allow more time between generation events.

## Diesel Exhaust Fluid

The Duramax diesel engine requires injection of Diesel Exhaust Fluid (DEF) as an integral part of the exhaust after-treatment process.

DEF is a colorless, clear solution of water and nitrogen-based urea product that has 32.5% of urea by weight. It may also be referred to by other names, such as AdBlue, ClearBlue, Urea, and Aus32 (Aqueous Urea Solution).

To prevent decomposition, avoid transporting or storing DEF at temperatures above 77° F (25° C). It's recommended that DEF be stored out of direct sunlight in temperatures between 23° F – 68° F (-5° C – 20° C). Minimum shelf life ranges from 36 months at a temperature of 50° F (10° C) to only 12 months at a temperature of 86° F (30° C). DEF will freeze at 12° F (-11° C). The fluid will not be damaged by freezing, and will remain fully usable when thawed. Before using DEF, check the fluid for potential evaporation.

DEF is naturally occurring and is biodegradable. However, it is slightly alkaline, which means it is corrosive to metals.

**TIP:** Although DEF is non-hazardous and non-flammable, use proper precautions to avoid contact with skin and eyes, which could cause irritation.

### Pre-Delivery Inspection

Each vehicle is shipped from the factory with two gallons of DEF and the fluid tank should be filled as part of the pre-delivery process (approximately an additional 3.3 gallons, 12.5 liters per vehicle).

DEF is available to customers in two sizes, complete with fill spout:

Size	Part Number
1 Gallon (3.78 L)	88862659 (U.S.) 88862660 (Canada)
2.5 Gallons (9.45 L)	88863523 (U.S.) 88863524 (Canada)

The DEF filler cap is blue. On pickups, the fill location is on the right rear side of the engine compartment and, on vans, the fill location is next to the diesel fuel filler. The DEF fill nozzle also is smaller than the diesel fuel nozzle to avoid confusion.

### DEF Tank

On pickups, the DEF tank is located outside the right frame rail under the cab. On vans, the tank is located outside the left frame rail on full-body models, and on the left frame rail or cross-member on cutaway versions. On all models, the tank capacity is 5.3 gallons (20 liters), which is designed to last approximately

A Hydrocarbon Injector (HCI) is located on the right side of the engine, with a nozzle located in the exhaust downpipe between the turbo and the Diesel Oxidation Catalyst (DOC). Diesel fuel is injected into the exhaust system ahead of the DOC to raise the temperature of the exhaust for DPF regeneration.

**TIP:** HCI replaces the late post injections used in previous engines, although late post injections can be used if there's a fault in the HCI system.

HCI is triggered when ECM data indicates that the conditions for regeneration have been met.

### Training

To learn more about the new Duramax diesel engines, refer to the new two-part Virtual Training Course (VCT) that covers engine and fuel system changes as well as the advanced aftertreatment system: 16440.15D1/D2 – Engines: New and Updates for RPOs LGH and LML (in Canada, 16051.01D1/D2 – Introduction to the new LML and LGH Diesel Engines).

– Thanks to Chris Graham, Kevin Larson and Bill Carnevale

5,000 miles (8,000 km) between refills. Actual DEF usage is dependent on drive cycles and vehicle use.

**TIP:** To avoid contamination, be sure all surfaces in direct contact with the fluid are free of foreign matter such as fuel, oil, grease, detergent, etc. If DEF is diluted with diesel fuel, it must be replaced.

**TIP:** DEF concentration can be checked with Refractometer J26568.

The fluid tank contains the DEF pump, pump heater, reservoir heater, line heater, level sensor and temperature sensor.

The DEF injector is located between the DOC and SCR. The injector is controlled by the ECM and dosing of DEF is dependent on NOx concentrations as determined by the NOx sensors.

An instrument panel warning light illuminates, a chime sounds and a Driver Information Center message appears when DEF level becomes low, is empty, or of poor quality.

To assist customers in understanding the meaning of the various messages, become familiar with the DIC displays:

- **Exhaust Fluid Range: XXX** – displays available mileage range when the DEF is getting low
- **Exhaust Fluid Low Speed Limited Soon** – displays when the DEF range falls below a specified range; speed will be limited when the DEF level becomes critical
- **Exhaust Fluid Empty Refill Now** – displays when the DEF is empty; speed will be limited and other messages will display that provide more information.

If these warning are ignored, additional warning messages will display and the vehicle speed will continue to be severely limited.

When adding DEF to an empty or very low tank, always add at least one gallon (3.78L) of fluid to release the vehicle from speed limitation.

– Thanks to Chris Graham, Kevin Larson and Bill Carnevale



DEF fill locations on vans (A) and pickups (B)



New DEF warning symbol

# Global Wire Repair Strategy

GM's wire harness repair strategy is to repair instead of replace. It is important to have the ability to repair large harnesses (i.e.: Body, Engine, Chassis, Forward Lamp, Instrument Panel, and Headliners) in the vehicle rather than having to replace them. There are several methods to achieve this strategy:

- Wire-to-wire repair
- Connector repair
- Terminal replacement

## WIRE-TO-WIRE REPAIR

Wire within the harness that has been either thermally damaged or broken should be repaired by splicing in a new section of wire.

**TIP:** Replace the damaged wire using the correct gage size wire. The new section of wire should maintain the original length.

Wire harness insulation that has been damaged, chafed or broken, showing the conductive portion of the wire without having any damage to the wire itself, should be repaired.

Determine the length of insulation that needs to be repaired.

For repairs less than 280 mm (11 in.):

1. Cut the wire within the damaged area
2. Cut a piece of appropriate heat shrink tubing that is one inch longer than damaged area
3. Slide the heat shrink tubing over the wire
4. Splice the cut wires together. Refer to Splicing Copper Wire Using Splice Sleeves in SI
5. Slide the heat shrink tubing over the damaged area and apply heat to seal the repaired wire



Wire spliced and sealed with heat shrink tubing

For repairs greater than 280 mm (11 in.):

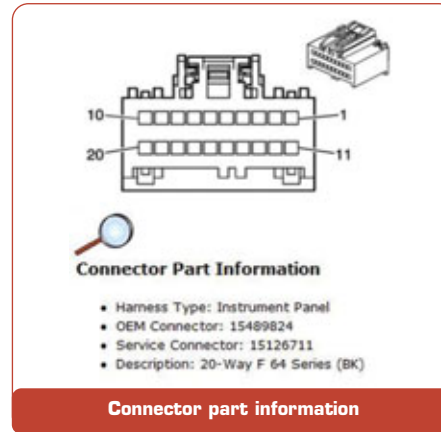
- Replace the damaged wire by splicing in a new section of wire.

**TIP:** GM now sells several different colors and sizes of TXL wire.

## Service Information (SI) – Connector End Views

To help with the repair of large harnesses, the connector end views in SI include the following connector and terminal information:

- Picture of the connector
- Type of harness
- Connector OEM part number
- Service Repair part number for connector kit or connector assembly
- Terminated lead part number (if available)
- Release tool to remove terminal from connector body
- Diagnostic tool to check for terminal damage
- Terminal and tray information
- Crimp specification



**Terminal Part Information**

- Terminated Lead: 13178807
- Release Tool: 2-26220-0004
- Diagnostic Test Probe: 2-26220-0004
- Terminal Tray: 5427-4027-0004-04
- Crimp/Insulation Strip: P17

**F38 Instrument Cluster**

Pin	Wire	Circuit	Function
1	0.20 (2-08)	5000	Low Speed DM-46 Sensor Data
2	—	—	Not Used
3	0.20 (2-08/10)	5100	Driver Information Center Switch Signal
4	0.20 (8)	817	Driver Information Center Switch Low Reference
5	0.20 (12)	81	Outside Ambient Temperature Sensor Low Reference
7	0.20 (2-08/10)	5100	Outside Ambient Air Temperature Sensor Signal
8-9	—	—	Not Used
10	0.20 (8)	6000	Ground
11-16	—	—	Not Used
18	0.20 (16)	100	Low Washer Fluid Indicator Control
19	0.20 (8)	811	Driver Information Center (Deter) Menu Switch Signal
17	0.20 (8/10/16)	419	Check Engine Indicator Control
16	—	—	Not Used
15	0.20 (8)	139	Start/Charge System 1 Voltage
20	0.1 (8/16)	2040	Battery Positive Voltage

## CONNECTOR REPAIR

Connector repair is divided into two different formats based on the number of cavities in the connector body:

- Connector assemblies (pigtailed) service: 8 or less cavities
- Connector kits/bodies and terminated leads service: 9 or more cavities

## “Pigtail”

A pigtail is fully populated connector body with machine crimp terminals on 450 mm TXL wire.

## Connector Kit

A connector kit is the connector plastic and all the TPAs and CPAs to assemble the connector.



Connector kit

## Connector Body

The plastic piece of a connector is the connector body.



Connector bodies

## TERMINAL REPLACEMENT

There are two service strategies for replacing bent or damaged terminals — using Terminal Repair Kit J38125 or using a terminated lead.

When performing wire repairs on all large harnesses with damaged terminals on current and past programs, the Terminal Repair Kit J38125 should be used, while on global platforms, terminated leads are available.

## Terminal Repair Kit J38125

The terminal repair kit contains most of the terminals used on North American vehicles. When using the kit, cut off the damaged terminal at its end and replace it with a Service Terminal. Refer to SI to locate Service Terminal (tray, compartment and tool) data.

continued on page 5

**TIP:** Follow the SI procedure on terminal crimping, using the right parts and tools, to reduce the repair cost and time.

Terminal Repair Kit J38125 for North American dealers will be maintained.



**Terminal Repair Kit J38125**

Replacement terminals can be purchased through SPX (contact SPX at 1-800-468-6657) or through your local Barnes contact. High volume terminals also may be purchased from GM.

All terminals that are offered in the terminal repair kit now have a GM part number. SI will identify the new number and tray and the terminal repair instruction manual will be updated. The trays will be labeled with the OEM number as well as the GM part number.

### Terminated Lead

A terminated lead is a length of 450 mm TXL gage size wire with a production terminal machine-crimped onto it. The package also includes the correct splice sleeve for the wire.



**Terminated lead**

**TIP:** If the gage size of the wire between the harness and terminated lead differ, review the folded-over wire procedures in SI. See the accompanying article on folded-over wire procedures.

SI connector end views will identify the terminated lead for each cavity and, if applicable, the correlating terminal in the Terminal Repair Kit J38125.

– Thanks to Rob Prough and Pamma Chana

## Folded-Over Wire Repair

The GM global wire repair strategy calls for using connector assemblies (pigtails) and terminated leads when repairing wiring harnesses.

To reduce and manage GM Service Parts proliferation, the service pigtailed and terminated leads will be designed with the largest wire gage size that can be held by either the terminal or the connector housing.

The folded-over wire repair technique, in which the copper wire strands are folded over before being installed into a splice sleeve, allows the service part to be used when repairing a wire of a smaller gage size in a vehicle. This technique has passed all GM testing standards.

### When to Use

- Splicing wires of 0.35mm or less (22, 24 & 26 gage sizes)

**TIP:** Increasing the amount of copper strands in the smaller gage size will allow for a better crimp

- Splicing wires of different gages

**TIP:** Vehicle side needs to be of same or less gage size (not greater than the service part's gage size)

Use Service Information (SI) connector end-views to determine:

- Gage size of wiring harness
- Recommended Repair: Terminated Lead or Pigtail

The following table lists the acceptable variance within the gage size.

		Connector Assembly (Pigtail) or Terminated Lead Wire Gage Size				
		Metric	SAE	0.35mm	0.5–1.0mm	1.5–2.5mm
Harness Wire Gage Size	0.13mm	26	Fold Wire Over	Fold Wire Over	Fold Wire Over	Not Acceptable
	0.22mm	24	Wire to Wire	Fold Wire Over	Fold Wire Over	Not Acceptable
	0.35mm	22	Wire to Wire	Fold Wire Over	Fold Wire Over	Not Acceptable
	0.5mm	20	Not Acceptable	Wire to Wire	Fold Wire Over	Not Acceptable
	0.75mm		Not Acceptable	Wire to Wire	Fold Wire Over	Not Acceptable
	0.8mm	18	Not Acceptable	Wire to Wire	Fold Wire Over	Not Acceptable
	1.0mm	16	Not Acceptable	Wire to Wire	Fold Wire Over	Not Acceptable
	1.5mm		Not Acceptable	Not Acceptable	Wire to Wire	Fold Wire Over
	2.0mm	14	Not Acceptable	Not Acceptable	Wire to Wire	Fold Wire Over
	2.5mm		Not Acceptable	Not Acceptable	Wire to Wire	Fold Wire Over
	3.0–5.0mm	12–10	Not Acceptable	Not Acceptable	Not Acceptable	Wire to Wire

### Example

For an IP Harness of 0.22 mm (22 gage) wire size, SI recommends a pigtail with leads of 18 (0.8 mm) with a salmon colored DuraSeal splice sleeve of 0.5 to 1.0mm (20 -16).

Follow these steps to use the folded-over wire technique on an IP Harness.

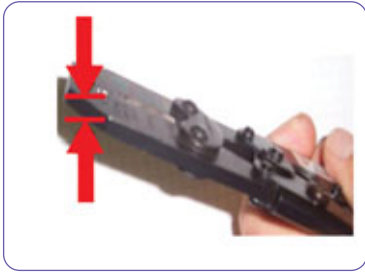
1. Strip twice the amount of insulation on the smaller wire (IP Harness is the red wire) than normally required.



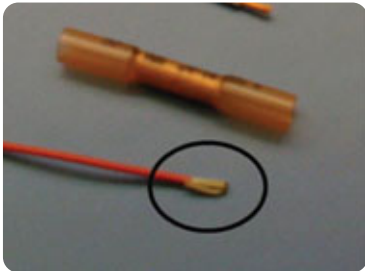
## Folded-Over Wire Repair - continued from page 5

**TIP:** Use crimp tool J-38125-8.

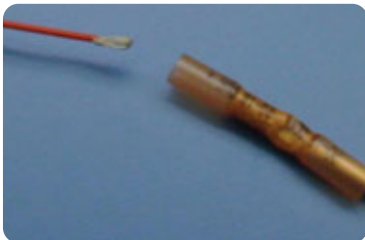
2. Fold over the copper wire strands of the smaller gage wire so that it is the same length as the non-folded wire.



3. Insert folded-over wire into the splice sleeve.



4. Use the proper crimp tool to crimp the splice sleeve to the smaller wire (harness side of repair). Complete the crimp as usual (using heat tool to shrink the tube).

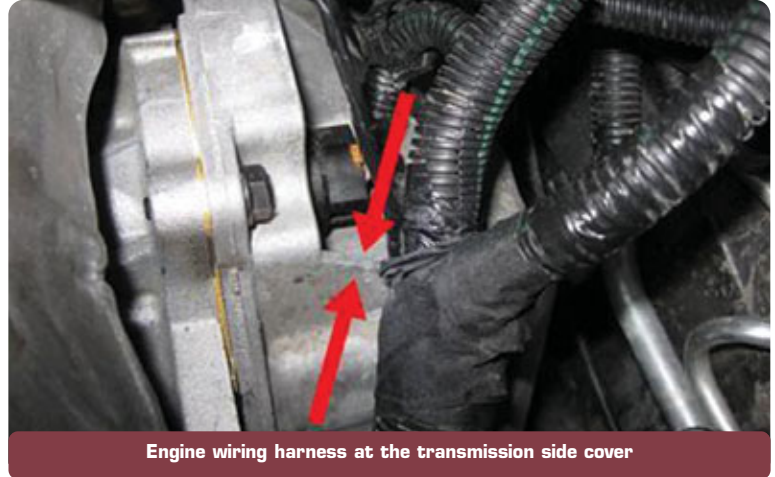


- Thanks to Rob Prough and Pamma Chana

## Accelerator Pedal Position Circuits Terminal Tension and Engine Wiring Harness Routing

The 2009-2010 Impala may have the SES (Service Engine Soon) light illuminated and/or the vehicle may be operating under reduced engine power. The following DTCs may be set: P2120, P2122, P2123, P2125, P2127, P2128, or P2138.

Prior to replacing the Accelerator Pedal Position (APP) sensor or the Engine Control Module (ECM), check the following:



Engine wiring harness at the transmission side cover

- Check terminal tension for the APP circuits (circuits 1164, 1161, 1271, 1274, 1162, 1272) at the APP sensor, X111, and ECM using the appropriate test probe per the Service Information.
- Check for proper routing of the engine wiring harness. A common location where a chafe can occur in the engine wiring harness is at the transmission side cover. Also visually check the engine wiring harness outside of the APP circuits for any signs of chafing or other issues.
- Be aware that other engine sensors that have a 5 volt reference may share the 5 volt feed internally to the ECM. The sharing of this reference voltage could cause DTC misdiagnosis.

- Thanks to Dave Eplin

## New Torque Specifications for A/C Lines

The torque specifications for the air conditioning lines on 2010 Colorado, Canyon, H3 and H3T have been updated in order to avoid A/C refrigerant leaking due to relaxation of the joint during tightening.

When replacing A/C lines:

- Use lint free gloves
- Hand-start all fasteners. The strip-out of threads is caused by trying to drive the fasteners without hand-starting the threads
- Do not use any kind of lubrication on seal washers or fasteners
- Leave A/C line shipping caps on parts until ready for installation to minimize potential contamination

- Thanks to Alfredo Torres Mateos

### 2010 Colorado, Canyon, H3 and H3T A/C Line Torque Specifications

	Fastener	Application	Torque
A/C lines to TXV	M8 nut	All models	22 +/- 3 Nm
Suction hose to compressor	M8 bolt	V-8 engine (LH9)	16 +/- 2 Nm
		I-4 engine (LLV) I-5 engine (LLR)	22 +/- 3 Nm
Discharge hose to compressor	M8 bolt	V-8 engine (LH9)	16 +/- 2 Nm
		I-4 engine (LLV) I-5 engine (LLR)	22 +/- 3 Nm
Discharge line to condenser inlet	M8 nut	V-8 engine (LH9) All H3, H3T	22 +/- 3 Nm
	M8 bolt	I-4 engine (LLV) I-5 engine (LLR)	22 +/- 3 Nm
Liquid line to condenser outlet	M8 nut	V-8 engine (LH9) All H3, H3T	22 +/- 3 Nm
	M6 bolt	I-4 engine (LLV) I-5 engine (LLR)	9 +/- 2 Nm

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## Inoperative Rear Defogger

On some 2010 LaCrosse, SRX, Equinox and Terrain models, the rear defogger may be inoperative, but the rear defroster button LED is operating properly.

With this condition, the rear defogger LED lights up when requested and the rear defogger can be commanded on with GDS, but it doesn't work normally. The switch status in the HVAC data list will not change from Off to On. It will remain Off while pressing the button as the controller is in a lock-out status.

This condition could be caused by a low Running State of Charge reported on the GMLAN. This data value is viewable in GDS through either BCM > Charging Data, or BCM > Electric Power Management Data

**TIP:** The engine must be running for the rear defogger to operate.

The BCM calculates and reports the battery Running State of Charge to other modules in the vehicle via GMLAN. The HVAC control module calibration is set up to disable the rear defogger output if the battery Running State of Charge is reported below 70%.

Follow these diagnostic procedures for the vehicle being serviced.

### 2010 LaCrosse, Equinox, Terrain

1. View the State of Charge parameter in GDS. If the value is 70% or greater, follow SI diagnostic procedures; otherwise continue to the next step.
2. Command the rear defogger On with GDS and verify rear defogger operation at the grid.

3. Performance test the battery using the Midtronics tester. If it passes the Midtronics test, perform a battery disconnect for 30 seconds and then reconnect the cables.
4. If the rear defogger is now functional, no further repairs are necessary. If the condition is still occurring, follow published diagnostic procedures in SI.

### 2010 SRX

1. View the State of Charge parameter in GDS. If the value is 70% or greater, follow SI diagnostic procedures; otherwise continue to the next step.
2. Command the rear defogger On with GDS and verify rear defogger operation at the grid.
3. Performance test the battery using the Midtronics tester. If it passes the Midtronics test, cycling the ignition Off and On should restore operation of the rear defogger.
4. If the rear defogger is now functional, no further repairs are necessary. If the condition is still occurring, follow published diagnostic procedures in SI.

**TIP:** Because the SRX resets the Start-Up State of Charge each ignition cycle, the customer may experience this condition intermittently or it may be difficult to verify the condition. Determine from the customer when the condition occurs to aid diagnosis.

– Thanks to Jeremy Richardson

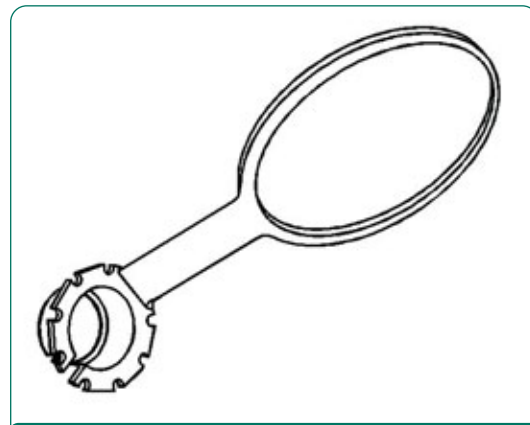
## Transmission Axle Oil Seal

If the front drive axle assembly is removed during service on any 2008 to present vehicle equipped with the GF-6 (6T30/6T40/6T45/ and 6T50) transmission or 6T70/6T75 transmission, the transmission axle oil seal should be replaced.

The transmission axle oil seal can be easily damaged by the drive axle end splines if the splines make contact with the seal during drive axle removal. This may lead to a transmission oil leak after a drive axle has been removed for service.

**TIP:** Use the oil seal protector tool (J44394-A) when the drive axle is reinstalled to prevent the new seal from being damaged.

– Thanks to Paul Lukasik



Oil seal protector tool J44394-A



## Car Issues – Fix It Right the First Time

Model Year(s)	Vehicle Line(s)/ Condition	Do This	Don't Do This	Reference Information/ Bulletin
2010	CTS, SRX – Power liftgate inoperative	Reprogram the liftgate control module if adheres to VIN breakpoints in bulletin	Do not reprogram vehicles beyond the listed VIN breakpoint	09-08-66-010B
2005-2010	Avalanche, Canyon, Cobalt, Colorado, DTS, Escalade/ESV/EXT, G5, H3, HHR, Impala, Lucerne, Montana SV6, Monte Carlo, RELAY, Sierra, Silverado, Suburban, Tahoe, Terraza, Uplander, VUE, Yukon/XL/Denali – Airbag Light On, DTC B0071 and B0081 Set	Diagnose the right front seatbelt buckle	Do not replace the Passenger Presence System or the Sensing and Diagnostic Module.	07-09-41-010C
2008-2010	CTS, SRX, STS – No forward or reverse at launch	Replace the transmission output shaft and the transfer case input shaft	Do not replace only the transmission output shaft	10-07-30-005
2009	Aveo – E109070 – MIL/Check engine light on, reduced power mode, DTCs P2101, P2135 Set	Replace the engine wiring harness for P2135 and P2101	Reprogram or replace the ECM for P2135	09-06-04-016A
2003-2010	CTS/CTS-V/Sport Wagon, SRX, STS – Rear axle clunk noise on turns	Service the limited-slip axles with DEXRON® LS fluid, P/N 88862624	Do not use P/Ns 89021677 or 1052358	10-04-20-001B
2010	Camaro – Side window glass not clearing molding when indexing down during door opening	Follow the revised window adjustment procedure in SI	Do not replace the window regulator or motor	09-08-64-014A
2005-2008	Corvette, XLR – Rear axle noise or vibration when making turns or under hard acceleration	Drain and refill the rear axle fluid. If the vehicle returns for the same issue, replace the posi-traction plates	Do not replace the rear axle	07-04-20-002B
2010 and Prior	All Vehicles – Passenger Presence Sensing System concerns with customer upholstery, accessory seat heaters	Electronic equipment placed on the passenger's seat may cause intermittent issues with the system	Do not replace the Passenger Presence System for intermittent interaction with electronic devices	06-08-50-009E
2004-2011	All Vehicles – Driver or passenger head restraint concerns	Use the head restraints designed for the vehicle	Do not modify the vehicle's head restraint, add comfort devices or replace with aftermarket head restraints	10-08-50-003



## Truck Issues – Fix It Right the First Time

Model Year(s)	Vehicle Line(s)/ Condition	Do This	Don't Do This	Reference Information/ Bulletin
2006-2010	Canyon, Colorado – Vehicle leans left, front sits low on one side	Verify the Z height is lower on the left side. If so, replace the left front spring	Do not shim the body to frame fastening locations	07-03-06-001C
2009-2010	Acadia, Enclave, Equinox, Escalade, Lucerne, OUTLOOK, Torrent, Traverse, VUE – Intermittent blank screen, radio reset, map screen freezes, voice recognition inoperative, dead battery	Perform software update	Do not replace the radio	09-08-44-002E
2007-2010	Acadia, Enclave, OUTLOOK, Traverse – Clunk noise when turning	Replace the steering gear bushings	Do not replace the steering gear	10-02-32-001
2010	SRX – MIL on, fuel gauge inoperative, hard/no start, water on driver's front floor	Inspect connector X350 for evidence of water leaks and repair	Do not replace the fuel pump module	10-08-45-002
2007-2010	Avalanche, Escalade/ESV/EXT, Sierra, Silverado, Suburban, Tahoe, Yukon/XL/Denali – E109081 – Side door body-mounted primary weatherstrip replacement	Follow proper diagnostics and perform primary door opening seal repairs	Do not replace the primary door opening seals	09-08-64-012B
2010	Express, Savana – Leak from rear of transmission or propeller shaft slip yoke	If the welch plug is missing, replace the propeller shaft front slip yoke and the universal joint only	Do not replace the slip yoke oil seal	10-04-17-001
2007-2010	Sierra, Silverado – Excessive wind noise from rear interior	Check for missing sealer in the rear acoustic panel	Do not change the tires or add any exterior cab isolator	10-08-58-001

### Service Know-How

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