



# Service Bulletin

File in Section: -

Bulletin No.: 16-NA-230

Date: July, 2016

## INFORMATION

**Subject: 2017 Buick LaCrosse New Model Features**

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		From:	To:	From:	To:		
Buick	LaCrosse	2017	2017	All	All	Gasoline, 6 Cylinder, V6, 3.6L, DI, DOHC, VVT, AFM and Stop/Start — RPO LGX	Aisin AF50-8 Automatic 8-Speed Transaxle — RPO MRC

Region	North America
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### Overview

#### Bulletin Purpose

This is a special bulletin to introduce the 2017 Buick LaCrosse. The purpose of this bulletin is to help the Service Department Personnel become familiar with some of the vehicle's new features, available Training Courses, Special Tools and to describe some of the action they will need to take to service this vehicle.

#### Trim Levels (United States)

The LaCrosse is available in the following trim levels:

- LaCrosse 1SV (FWD)
- Preferred 1SD (FWD)
- Essence 1SL (FWD)
- Premium 1SN (FWD/AWD)

#### Trim Levels (Canada)

The LaCrosse is available in the following trim levels:

- LaCrosse 1SV (FWD)
- Preferred 1SB (FWD)
- Essence 1SL (FWD)
- Premium 1SP (FWD/AWD)

## Overview



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The all-new 2017 Buick LaCrosse introduces the new face of Buick and features a new grille design with a large opening distinguished by the return of a three color – red, silver and blue – Buick tri-shield insignia, accented by wing-shaped elements set against darkened waterfall grille bars. Longer, lower and wider than the current model, the 2017 LaCrosse is built on a stronger yet lighter structure. It is about 300 pounds (136 kg) lighter than the current LaCrosse due to the use of press-hardened, high-strength steels, which contribute to greater efficiency and more responsive handling.

### Vehicle Highlights

Some vehicle highlights include:

- Both FWD and AWD models are equipped with a standard V6 3.6L engine and 8-speed automatic transaxle transmission. To increase fuel efficiency, it utilizes Active Fuel Management (AFM) which deactivates two cylinders under certain conditions and advanced Stop/Start technology that also helps to conserve fuel by shutting OFF the engine under certain conditions when the vehicle is stopped.
- 8-way power driver seat with 2-way lumbar and 8-way power front passenger seat.
- 10-airbags.
- 12V auxiliary power outlets (2) and USB ports (2).
- 18-inch wheels are standard and 20-inch wheels are available.
- 60/40 split-fold rear seat helps to accommodate longer cargo, while overall trunk space has been maximized.
- Acoustic laminated windshield and front side windows.
- Acoustic wheelhouse liners.
- Active Grille Shutters which open and close automatically to control airflow, reducing aerodynamic drag and improving fuel efficiency.
- Active noise cancellation is standard on all models.
- Buick IntelliLink® displayed in a new, frameless 8-inch (203 mm) diagonal color touchscreen.
- Buick QuietTuning® technology.
- Capless fuel filler on all models.
- Configurable LED Driver Information Center (DIC) with 8-inch (203 mm) diagonal color display (Available).
- Cruise control.
- Dual-zone automatic climate control.
- Electric Power Steering (EPS) with Active Return Assist.
- Electronic parking brake.
- Head-Up Display (HUD) (Available).



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- High-Intensity Discharge (HID) headlamps, LED signature lighting and LED tail lamps are standard.
- OnStar® 4G LTE with available built-in Wi-Fi hotspot, transforms LaCrosse into a powerful internet connection for up to 7-devices (3-month/3GB data trial whichever comes first).  
4G LTE Wi-Fi requires compatible mobile device, active OnStar® service and data plan after trial.
- Power Tilt/Telescoping steering column (Available).
- Rear Parking Assist (RPA).
- Rear Vision Camera (RVC).
- Rear window electric defogger.
- Remote start.
- Safety Alert Seat.
- Teen Driver Technology. Lets owners program one or more key fobs with customizable preferences through the vehicle Settings menu, encouraging safer driving habits. (Available).
- Triple-sealed doors.
- Universal home remote.
- Windshield wipers that “park” below the hood line reducing wind noise.
- Wireless charging. A convenient storage pocket in the console allows the phone to be charged without connecting cables. (Available).

### Chassis and Driving Dynamics Features

Chassis and driving dynamics features include:

- AWD system with Active Twin Clutch (Available on Premium 1SN model in the United States and 1SP in Canada), optimizes traction for every condition encountered.
- Electric power steering system with Lead/Pull compensation.
- The driver selectable Electronic Precision Shift (EPS) eliminates the mechanical connection to the transmission, which allows for optimal placement

of the shifter. The shifter operates like a premium joystick and the paddle shift can be used for a more engaging driving experience. Because less space is used, EPS enables a console pass-through that provides increased storage.

- The Electronic Suspension Control (ESC) has driver-selectable selectable TOUR and SPORT modes, available on vehicles with 20-inch wheels and FWD or AWD.
- Four-wheel disc brakes with DURALIFE™ brake rotors.
- MacPherson strut front suspension and the available HiPer Strut front suspension is used on FWD models with 20-inch wheels and ESC.
- New five-link rear suspension.

### Brakes

This vehicle is equipped with a Bosch ABS 9.0 brake system and low-drag four-wheel disc brakes. The electronic brake control module (EBCM) and the brake pressure modulator valve are serviced separately. The brake pressure modulator valve uses a four circuit configuration to control hydraulic pressure to each wheel independently. Vehicles built with option RPO FX3 will feature stability enhancement.

Depending on the vehicle options, the following performance enhancement systems are provided:

- **Antilock Brake System:** When wheel slip is detected during a brake application, an Antilock Brake System (ABS) event occurs. During ABS braking, hydraulic pressure in the individual wheel circuits is controlled to prevent any wheel from slipping. A separate hydraulic line and specific solenoid valves are provided for each wheel. The ABS can decrease, hold, or increase hydraulic pressure to each wheel. The ABS does not, however, increase hydraulic pressure above the amount which is transmitted by the master cylinder during braking.
- **Automatic Vehicle Hold:** The Automatic Vehicle Hold (AVH) feature works with Hill Start Assist (HSA). This feature will activate when the vehicle is stopped on a moderate to steep grade to help prevent it from rolling in an unintended direction. After the brake pedal has been released and before the accelerator pedal has been pressed, AVH uses braking pressure to hold the vehicle stationary. If AVH is holding the vehicle, a DIC message displays. AVH will not activate in a forward drive gear when facing downhill, or in **R** (Reverse) when facing uphill. Select the duration of the AVH feature on the center stack touchscreen by choosing the submenu for Automatic Vehicle Hold. When Short and Auto Park Brake OFF is selected, the vehicle is held stationary for up to two seconds after the brake pedal is released. When Long and Auto Park Brake ON is selected, the vehicle is held stationary for up to five minutes after the brake pedal is released. In either case, override the hold feature by pressing the accelerator pedal and attempting to drive away.

- **Pressure Hold:** The EBCM closes the inlet valve and keeps the outlet valve closed in order to isolate the system when wheel slip occurs. This holds the pressure steady on the brake so that the hydraulic pressure does not increase or decrease.
- **Pressure Decrease:** The EBCM decreases the pressure to individual wheels during a deceleration when wheel slip occurs. The inlet valve is closed and the outlet valve is opened. The excess fluid is stored in the accumulator until the return pump can return the fluid to the master cylinder. The EBCM decreases the pressure to individual wheels during a deceleration when wheel slip occurs. The inlet valve is closed and the outlet valve is opened. The excess fluid is stored in the accumulator until the return pump can return the fluid to the master cylinder.
- **Pressure Increase:** The EBCM increases the pressure to individual wheels during a deceleration in order to reduce the speed of the wheel. The inlet valve is opened and the outlet valve is closed. The increased pressure is delivered from the master cylinder.
- **Brake Assist:** The Brake Assist function is designed to support the driver in emergency braking situations. The EBCM receives inputs from the brake pressure sensor. When the EBCM senses an emergency braking situation, it will actively increase the brake pressure to a specific maximum.
- **Electronic Brake Distribution:** The electronic brake distribution function is designed to support the driver in emergency braking situations. The electronic brake distribution is a control system that enhances the hydraulic proportioning function of the mechanical proportioning valve in the base brake system. The electronic brake distribution control system is part of the operation software in the EBCM. The electronic brake distribution uses active control with existing ABS in order to regulate the vehicle's rear brake pressure.
- **Electronic Stability Control — RPO FX3:** The Electronic Stability Control (ESC) adds an additional level of vehicle control to the EBCM. Yaw rate is the rate of rotation about the vehicles vertical axis. The electronic stability control is activated when the EBCM determines that the desired yaw rate does not match the actual yaw rate as measured by the yaw rate sensor. The difference between the desired yaw rate and the actual yaw rate is the yaw rate error, which is a measurement of over steer or under steer. If the yaw error becomes too large, the EBCM attempts to correct the vehicles yaw rate motion by applying differential braking to the appropriate wheel. The amount of differential braking applied to the left or right front wheel is based on both the yaw rate error and side slip rate error.
- **Hill Start Assist:** When stopped on a hill, the Hill Start Assist (HSA) feature prevents the vehicle from rolling before driving off, whether facing uphill or downhill by holding the brake pressure during the transition between when the driver releases the brake pedal and starts to accelerate. The

EBCM calculates the brake pressure, which is needed to hold the vehicle on an incline or grade greater than 5% and locks that pressure for up to two seconds by commanding the appropriate solenoid valves ON and OFF when the brake pedal is released. The stop lamps will stay illuminated during the HSA operation even though the brake pedal is released. This is considered normal operation.

- **Traction Control:** When drive wheel slip is noted, the EBCM will enter traction control mode. First, the EBCM requests the engine control module (ECM) to reduce the amount of torque to the drive wheels via a serial data message. The ECM reduces torque to the drive wheels and reports the amount of delivered torque. The ECM reduces torque to the drive wheels by retarding spark timing and turning OFF fuel injectors.

### DURALIFE™ Ferritic Nitro-Carburized Rotors

The vehicle is equipped with DURALIFE™ ferritic nitro-carburized (FNC) brake rotors. Application of the FNC technology involves an additional manufacturing process that heats the rotors at 1,040°F (560°C) for up to 24 hours in a giant oven. Inside the nitrogen-rich atmosphere, nitrogen atoms bond to the surface of the steel rotor, hardening and strengthening the rotor. This process creates a unique surface treatment equivalent to one-tenth the width of a human hair. FNC creates sufficient friction and allows for effective braking performance while providing corrosion protection. This hardened layer allows the rotor to wear slower and reduces rotor corrosion. With FNC, GM vehicles are free of brake pedal or steering wheel shudder caused by an uneven buildup of rust on the rotor that occurs over time. FNC rotors also create less brake dust than non-FNC rotors. Vehicles with large open-architecture wheels that show off wheel and brake hardware, FNC helps keep rotors and wheels looking clean and rust-free longer.

## Engine

### Engine Component Description and Operation

#### 3.6L V6 Engine — RPO LGX

The all-new 3.6L V-6 engine debuts in the 2016 model year, ushering in new benchmarks for efficiency, refinement and durability. The clean-sheet engine redesign represents the fourth generation of GM's acclaimed DOHC V6 engine family and incorporates new features, including Active Fuel Management and Stop/Start technology to enhance fuel economy. The 3.6L also advances performance and fuel economy optimizing technologies introduced on previous generations, including Direct Injection (DI) and Continuously Variable Valve Timing (VVT).



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Shown are typical views of the 3.6L V6 Engine.

### Engine Component Description and Operation

- **Active Fuel Management System:** The AFM system consists of the camshafts, valves, the switching roller finger followers (SRFF), also known as the valve switching rocker arm, the dual feed hydraulic lash adjusters and the oil control valve (OCV) which is also known as the valve rocker arm oil control valve.

Depending on engine RPM, the ECM sends a signal to the OCV commanding it either **ON** or **OFF**.

With the AFM system **ON**, the OCV directs oil to the dual feed hydraulic lash adjuster unlatching the switching roller finger followers creating zero lift and not allowing the valves to open on cylinders two and five. AFM is active at this time.

With the AFM system **OFF**, the OCV is not active and no oil is directed to the dual feed hydraulic lash adjuster. The switching roller finger followers operate as normal rocker arms. AFM is inactive at this time.

- **Camshaft Drive System:** The camshaft drive system consists of two timing drive chains driven by the crankshaft which drives the respective cylinder head's intake and exhaust camshaft position actuators. Cushioned actuator chain sprockets have been added contributing to quieter engine operation. The timing drive chains use moveable timing drive chain guides and a hydraulic-actuated tensioner. The tensioner minimizes timing drive chain noise and provides accurate valve action by keeping slack out of the timing drive chains and continuously adjusting for timing drive chain wear. The tensioner incorporates a plunger that adjusts out with wear allowing only a minimal amount of backlash. The tensioners are sealed to the head or block using a rubber coated steel gasket. The gasket traps an adequate oil reserve to ensure quiet start-up.
- **Camshaft Position Actuator System:** The engine incorporates a camshaft position actuator for each intake and exhaust camshaft. Camshaft phasing changes valve timing as engine operating conditions vary. Dual camshaft phasing allows the further optimization of performance, fuel economy and emissions without compromising overall engine response and driveability. Variable valve timing also contributes to a reduction in exhaust emissions. It optimizes exhaust and inlet valve overlap and eliminates the need for an exhaust gas recirculation (EGR) system.

The camshaft position actuator is a hydraulic vane-type actuator that changes the camshaft lobe timing relative to the camshaft drive sprocket. Engine oil is directed by a camshaft position actuator oil control valve to the appropriate passages in the camshaft position actuator. Oil acting on the vane in the camshaft position actuator rotates the camshaft relative to the sprocket. At idle, both camshafts are at the default or "home" position. At this position, the exhaust camshaft is fully advanced and the intake is fully retarded to minimize valve overlap for smooth idle. In addition, this engine has intermediate park technology, which incorporates an intermediate-lock intake variable valve timing cam phaser, allowing the cams to be parked at the most favorable position for cold starting. Under other engine operating conditions, the camshaft position actuator is controlled by the engine control module (ECM) to deliver optimal intake and exhaust valve timing for performance, driveability and fuel economy. The camshaft position actuator incorporates an integral trigger wheel, which is sensed by the camshaft position sensor mounted in the front cover, to accurately determine the position of each camshaft. The exhaust camshaft position actuator has a different internal configuration than the intake camshaft position

actuator since the exhaust camshaft position actuator phases in the opposite direction relative to the inlet camshaft position actuator.

The camshaft position actuator oil control valve (OCV) directs oil from the oil feed in the head to the appropriate camshaft position actuator oil passages. There is one OCV for each camshaft position actuator. The OCV is sealed and mounted to the front cover. The ported end of the OCV is inserted into the cylinder head with a sliding fit. A filter screen protects each OCV oil port from any contamination in the oil supply.

- **Cooling System:** This engine has a targeted cooling system which sends coolant simultaneously to each water jacket in the heads and block. This new, parallel-flow design maximizes heat extraction in the area of the upper deck, intake and exhaust valve bridges in the heads and integrated exhaust manifold with a minimal amount of coolant. The result is more even and consistent cooling, which enhances performance, and faster engine warm up, which improves cold-start efficiency and reduces emissions.
- **Connecting Rods and Pistons:** The connecting rods are sinter-forged with a high copper content and have press-in-place piston pin bushings. The connecting rods and rod cap are aligned by dowel pins retained in the cap. The cast aluminum pistons incorporate a polymer-coated skirt to reduce friction. The pistons are unique to the LGX both for compression ratio and combustion efficiency. The piston uses two low tension compression rings and one multi-piece oil control ring.
- **Crankshaft:** The crankshaft is a hardened, forged steel design with 4 main bearings. Crankshaft thrust is controlled by the upper portion of the number 3 main bearing. The crankshaft position reluctor wheel is pressed onto the rear of the crankshaft in front of the rear main journal. A micro encapsulated adhesive is used on the reluctor wheel to aid retention. This crankshaft is internally balanced.
- **Cylinder Block:** Sand cast aluminum (319) with cast in iron bore liners. The stronger, stiffer aluminum block has increased structure in the bulkheads for superior rigidity.
- **Cylinder Heads:** The cylinder heads are a two piece design consisting of a head and a camshaft carrier which are cast aluminum with powdered metal valve seat inserts and valve guides. The two piece design allows for the Active Fuel Management (AFM) System. The cylinder heads also feature integrated exhaust manifolds; the exhaust manifolds are incorporated into the head casting. Two intake valves and two exhaust valves are actuated by roller finger followers pivoting on a stationary hydraulic lash adjuster (SHLA). In the LGX engine, the valves and seats are constructed with specialized materials and coatings, and the exhaust valves are sodium filled for robustness. The cylinder heads also feature a “high-tumble”

port design, and are sealed with LGX specific head gaskets. The head gaskets are also specific to the LH and RH sides.

Separate exhaust and intake camshafts are supported by bearings machined into the camshaft carrier. The front camshaft bearing cap is used as a thrust control surface for each camshaft. Each spark plug is shielded by a tube that is pressed into the cylinder head. Each spark plug ignition coil is also mounted through the spark plug tube. The LGX engine uses specific spark plugs and a different spark plug gap from other HFV6 engines. The engine coolant temperature (ECT) sensor is mounted in the thermostat housing near the flywheel end of the engine. With direct injection, the high pressure injectors are located in machined bores below the intake ports. A stainless steel, high pressure fuel rail is attached to the intake side of the head. The LGX engine has unique higher-flow injectors and fuel pump. The cylinder head has a larger bore for the new larger diameter fuel pump follower that operates the higher-flow pump. The fuel injectors are retained to the fuel rail in a new “twist-lock” retention scheme that does not require special tools for service.

- **Oiling System:** The LGX engine contains a dual-pressure control and variable-displacement vane pump that enhances efficiency by optimizing oil pressure as a function of engine speed. The oil pump is located beneath the cylinder block inside the oil pan, contributing to the engines smoother and quieter operation. The oiling system components differ depending on the engine being in a transverse or longitudinal orientation. The LGX has unique oil pans depending on orientation, with the pans being separated into an upper (traditional aluminum) and lower (stamped steel) pan. This configuration helps with noise and mass concerns. It also affords some serviceability improvements through not needing to remove the entire upper pan for some service procedures; the procedures can be performed through removing the lower pan. The LGX oil pans contain oil level switches as do nearly all HFV6 applications. The oil level switch is normally open and closes at oil levels above minimum requirements.
- **Right and Left Bank Designation:** Right hand (RH) and left hand (LH) designation throughout the engine mechanical section are viewed from the rear, flywheel side, of the engine or from inside the vehicle. These banks are also referred to as Bank 1 (RH) and Bank 2 (LH).
- **Vacuum Pump:** The engine utilizes a mechanical vacuum pump to provide a vacuum source for the braking system. The vacuum pump is integrated into the oil pump assembly located in the oil pan. Both vacuum pump and oil pump are part of a common assembly, referred to as a tandem pump. Neither pump is serviceable individually. If either the oil pump or vacuum pump are defective, replace the entire tandem pump assembly.

## Engine Specifications

- **Displacement:** 3.6 L (222 cubic inches)
- **Bore x Stroke :** 3.74 inches (95 mm) x 3.377 inches (85.8 mm)
- **Compression Ratio:** 11.5:1
- **Horsepower:** 305 horsepower (227 kW) @ 6,800 RPM (Estimate)
- **Maximum Engine Speed:** 7,200 RPM
- **Torque:** 268 lb-ft (363 Nm) @ 5,200 RPM (Estimate)
- **Valves:** 2 intake and 2 exhaust valves per cylinder
- **Recommended Fuel:** Regular unleaded

## Engine Oil — dexos®

Ask for and use engine oils that meet the dexos® specification. Engine oils that have been approved by GM as meeting the dexos® specification are marked with either of the dexos1® approved logos that are shown. For additional information, visit this General Motors website: <http://www.gmdexos.com>

### Viscosity Grade

Use ACDelco® dexos1® SAE 5W-30 viscosity grade engine oil. In an area of extreme cold, where the temperature falls below -20°F (-29°C) use SAE 0W-30 viscosity grade engine oil. An oil of this viscosity grade will provide easier cold starting for the engine at extremely low temperatures.

### Engine Oil Life System

The vehicle features GM's engine oil life system, which better protects engines by recommending oil changes based on a computer software algorithm using actual engine operating conditions and can save the vehicle owner money by avoiding unnecessary oil changes.



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## Engine — Stop/Start System — RPO KL9

### Stop/Start System Overview



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**Notice:** The Stop/Start System is automatically activated each time the ignition is turned ON.

A fuel-saving Stop/Start system has been integrated with the 3.6L engine. While driving, when the brake pedal is applied and the vehicle is at a complete stop, the Stop/Start system may turn the engine **OFF**, depending on operating conditions. When the engine is **OFF**, the tachometer will read **AUTO STOP (2)** with the needle resting at **500 RPM** indicating the engine has been shut down by the Stop/Start System. Once the engine is restarted, the tachometer will function normally.

Upon releasing the brake pedal or applying the accelerator pedal, the engine will restart. After parking the vehicle and turning the engine **OFF**, the tachometer will read **OFF (1)**.

An upgraded starter motor and advanced battery technology support the increased number of engine starts. The starter motor has a high performance electric motor and stronger pinion engagement mechanism. The starter motor has also been re-designed to reduce the noise on startup. Advanced battery technology ensures it can handle frequent charge and discharge cycles. An intelligent battery sensor module monitors the state of charge and health of the battery. Battery state of charge and health are

used by the ECM to determine if the Stop/Start function may be performed. It only takes the Stop/Start system around 0.3 seconds to start the engine.

#### Engine Will Not Enter AutoStop if These Conditions Are Met

In order to ensure neither the needs of the driver or the vehicle are compromised, the engine **will not enter AutoStop** if the following conditions are met:

- The ambient (outside) temperature and the engine coolant temperature (ECT) correlation do not meet specified values.
- The ambient temperature is colder than 14°F (-10°C).
- The battery temperature is colder than 32°F (0°C) or warmer than 131°F (55°C).
- The HVAC system demand is high.
- The HVAC system has been set to Defrost.
- The 12V battery state of charge is low.
- The Battery Sensor Module Learn procedure has not been completed. Refer to Battery Sensor Module Learn in SI.



### Engine Will Automatically Restart if These Conditions are Met

The engine **will automatically restart** if the following conditions are met:

- Driver removes pressure from the brake pedal or depresses the accelerator pedal while the vehicle is in **D** (Drive).
- Hood Position changes to OPENED. Hood Position CLOSED, AJAR or OPENED is a viewable scan tool parameter.
- The battery state of charge is less than 73%. This varies with state of health.
- The battery voltage is less than 11V.
- An A/C compressor request from the HVAC system. (A/C or Defrost mode request).
- The vehicle speed increases.
- Brake booster vacuum is less than 6 psi (40 kPa).
- The ECT is warmer than 257°F (125°C).
- The HVAC system Economy mode has been turned OFF by the driver.

**Notice:** If the AutoStart crank time exceeds 2 seconds a manual ignition switch restart will be necessary.

- The AutoStop time has exceeded 2 minutes.

### Engine Will Enter AutoStop if These Conditions are Met

The engine **will enter AutoStop** if ALL of the following conditions are met:

- The initial minimum vehicle speed during the drive cycle must be 12 mph (19 km/h) or more. Subsequent AutoStop minimum speed may vary from 1 to 6 mph (2 to 10 km/h), depending on the vehicle.
- The ambient temperature and the ECT correlation meets the specified values.
- The ambient temperature and transmission fluid temperature (TFT) correlation meets the specified values.
- Hood Position is CLOSED. Hood Position CLOSED is a viewable scan tool parameter.
- The brake pedal is depressed more than a specified value, which is approximately 27%.
- The accelerator pedal is in the learned minimum throttle position.
- Brake booster vacuum is more than 7 psi (45 kPa).
- The transmission range selector is in **D** (Drive).
- Vehicle speed is less than 3 mph (5 km/h).
- Engine speed is less than 1,500 rpm.
- The ECT is less than 248°F (120°C).
- The HVAC system does not receive any A/C compressor requests. (No A/C or Defrost mode requests).
- The battery voltage is more than 12V.
- The battery state of charge is more than 75%. This varies with state of health.

### Instrument Cluster and Driver Information Center



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Typical view of one of the LaCrosse's IC & DIC.

#### Instrument Cluster (RPO UDC)

The instrument cluster (IC) is a multifunction module that provides the vehicle operator with information that is critical to vehicle operation, such as vehicle speed, engine RPM, oil pressure, battery voltage, fuel level, and coolant temperature, using analog gauges. The IC also provides the operator with operational warnings and message through various indicators and the Driver Information Center (DIC). With this RPO, the DIC is a one color multifunction display that is located in the IC. The DIC has several screens that can be scrolled through by twisting the trip reset stem.

#### Instrument Cluster (RPO UDD)

The IC is a multifunction module that provides the vehicle operator with information that is critical to vehicle operation, such as vehicle speed, engine RPM, oil pressure, battery voltage, fuel level, and coolant temperature, using analog gauges. The IC also provides the operator with operational warnings and message through various indicators and the DIC. With this RPO, the DIC is a full color multifunction display that is located in the IC. The DIC is also tightly integrated with the vehicle's infotainment system and is highly reconfigurable.

### Instrument Cluster (RPO UHS)

The IC is a multifunction module that provides the vehicle operator with information such as vehicle speed and engine RPM using analog gauges. Oil pressure, battery voltage, fuel level, and coolant temperature can also be displayed using an interactive LCD display. The IC is highly reconfigurable, with four different themes available for selection. The IC also provides the operator with operational warnings and message through various indicators and the DIC. Because the IC is an LCD display, DIC elements are located in various zones of the display, depending on how the IC is configured.

### Driver Information Center

The DIC displays information about the vehicle and allows the operator to access applications. It also displays warning messages if a system problem is detected. The DIC is made up of three distinct display zones. In the middle is an interactive application display zone. The application display zone allows access to the info application, navigation application, audio application, phone application, or settings application. To the left is the application selection menu and to the right are interactive information display zones. The information display zone contains multiple pages that display traditional vehicle information. Depending on the instrument cluster RPO, each of the displays zones can be selected and their associated pages scrolled through by using the steering wheel mounted driver information display switch or by twisting the trip reset stem.

### OnStar® with 4G LTE with Wi-Fi Hotspot Integration

**Notice: OnStar® services cannot work unless the vehicle is in a location where OnStar® has an agreement with a wireless service provider for service in that area. The wireless service provider must also have coverage, network capacity, reception, and technology compatible with OnStar® services.**

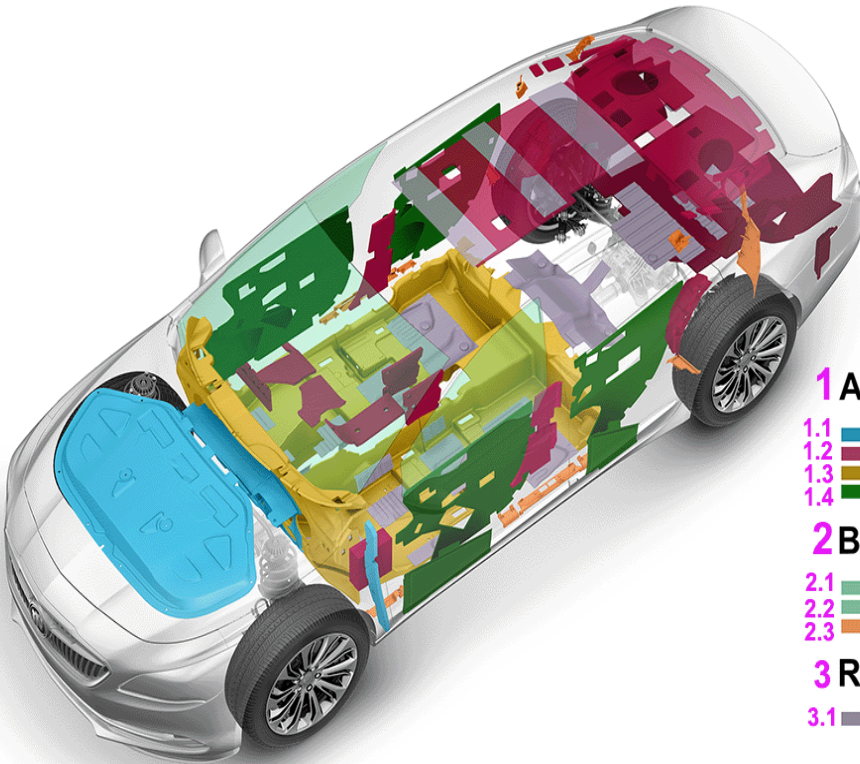
With OnStar® 4G LTE and the available Wi-Fi Hotspot, up to seven devices such as smartphones, tablets and laptops can be connected to high-speed Internet through the vehicle's built-in Wi-Fi hotspot.

To retrieve the SSID and password for the hotspot, press the OnStar® Voice Command button on the overhead console or rearview mirror, wait for the prompt, and then say "Wi-Fi Settings." The information will be displayed on the screen.

The powerful OnStar® connection also enables improved access to existing OnStar® safety and security services, including the ability to transmit voice and data simultaneously. That means OnStar® advisors can run a diagnostic check without ever leaving the call, making customer interactions quicker and more seamless. It's the most comprehensive in-vehicle safety and connectivity system available.

For assistance, press the blue OnStar® button or call 1-888-4-ONSTAR (1-888-466-7827).

## QuietTuning™ Technologies



### 1 ABSORB

- 1.1 Engine Compartment Acoustic Absorbers
- 1.2 Interior Trim Acoustic Absorbers
- 1.3 High Performance Dissipative Acoustic System
- 1.4 Door System Acoustic Absorbers

### 2 BLOCK

- 2.1 Acoustic Laminated Windshield
- 2.2 Acoustic Laminated Front Side Glass
- 2.3 Body Cavity Sealing Baffles

### 3 REDUCE

- 3.1 Liquid Apply Sound Deadener

QuietTuning® is a Buick pioneered process to reduce, block and absorb noise and vibration to create a quiet cabin. Buick QuietTuning® features enhancements with ultradissipative materials and Active Noise Cancellation as follows:

1. **ABSORB:** These technologies absorb sound.
  - 1.1. Engine Compartment Acoustic Absorbers
  - 1.2. Interior Trim Acoustic Absorbers
  - 1.3. High Performance Dissipative Acoustic System (Active Noise Cancellation — RPO NKC)
  - 1.4. Door System Acoustic Absorber
2. **Block:** These technologies block sound.
  - 2.1. Acoustic Laminated Windshield
  - 2.2. Acoustic Laminated Front Side Glass
  - 2.3. Body Cavity Sealing Baffles
3. **Reduce:** This technology reduces sound.
  - 3.1. Liquid Apply Sound Deadener

## Radio with Buick IntelliLink®

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### Frameless 8-Inch Diagonal Color Touchscreen Radio with Buick IntelliLink®



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The central technology in the LaCrosse is the latest edition of Buick IntelliLink® which is displayed in a new, frameless 8-inch (203 mm) diagonal color touchscreen located at the center of an ergonomically optimized instrument panel. It was designed with fewer buttons and controls for more intuitive use. IntelliLink® allows you to play your favorite music, access smartphone contacts, get directions, and more just by using your voice. Phone integration with IntelliLink® is via Apple® CarPlay™ and Android™ Auto using a compatible smartphone. The features allow occupants to use select smartphone apps through the touchscreen interface. Many features can be controlled via voice commands through a button on the steering wheel, helping the driver to keep their eyes on the road and hands on the wheel.

### Bluetooth® System

The Bluetooth® capable system can interact with many smartphones, allowing:

- Placement and receipt of calls in a hands-free mode.
- Sharing of the cell phone's address book or contact list with the vehicle.

When using the Bluetooth® system, sound comes through the vehicle's front audio system speakers and overrides the audio system. Before using a Bluetooth® enabled device in the vehicle, it must be paired with the in-vehicle Bluetooth® system. The pairing process is disabled when the vehicle is moving. Not all devices will support all functions.

### Portable Audio Devices

This vehicle is equipped with two USB ports in the center console. These ports are for data and charging. The system is optimized to support two connected devices with a total of 15,000 songs. An Apple® iPod®, iPhone®, MP3 Player, a USB flash drive or a USB mass storage device can be connected to the USB port. Compatible devices connected to the USB port can be controlled by the audio system. Not all devices may be supported. Use the audio controls and audio steering wheel controls to access the various functions.

## Safety — Airbag System

### Airbag Readiness Light

This light illuminates and stays **ON** if there is an electrical problem with the airbag system. The system check includes the airbag sensors, passenger sensing system, the pretensioners, the airbag modules, the wiring, and the crash sensing and diagnostic module (SDM). The airbag readiness light turns **ON** for several seconds when the vehicle is started. If the light does not turn **ON** and then **OFF**, have it repaired immediately.

### Airbag Locations

All vehicle airbags have the word AIRBAG on the trim or on a label near the deployment opening. The 10 airbags are located in the following positions:

- A frontal airbag for the driver.
- A frontal airbag for the front outboard passenger.

- A knee airbag for the driver.
- A knee airbag for the front outboard passenger.
- Seat-mounted side impact airbag for the driver.
- Seat-mounted side impact airbag for the front outboard passenger.
- Seat-mounted side impact airbags for the second row outboard passengers.
- A roof-rail airbag for the driver and for the second and third row passengers seated directly behind the driver.
- A roof-rail airbag for the front outboard passenger and the second and third row passengers seated directly behind the front outboard passenger.

## Safety — Driving/Parking Assistance Systems

If equipped, when driving the vehicle in a forward gear, Forward Collision Alert (FCA), Lane Departure Warning (LDW), Lane Keep Assist (LKA), Side Blind Zone Alert (SBZA), Lane Change Alert (LCA), Front Pedestrian Braking (FPB) and/or Forward Automatic Braking (FAB) can help to avoid a crash or reduce crash damage.

- **Adaptive Cruise Control:** Adaptive Cruise Control (ACC) allows the driver to select the cruise control set speed and following gap. The following gap is the following time between your vehicle and a vehicle detected directly ahead in your path, moving in the same direction. If a vehicle is detected in your path, ACC can speed up the vehicle or apply limited, moderate braking to maintain the selected following gap. If the Traction Control System (TCS) or StabiliTrak® electronic stability control system activates while ACC is engaged, ACC may automatically disengage. If the driver wants to disengage ACC, apply the brake. If no vehicle is detected in your path, ACC works like regular cruise control. Turning **OFF** the TCS or StabiliTrak® system will disengage the cruise control.



- **Automatic Parking Assist:** Automatic Parking Assist (APA) searches for and steers the vehicle into parallel and perpendicular parking spots. When using APA, you must still shift gears, and control the brakes and accelerator. The Driver Information Center (DIC) and audible beeps help to guide parking maneuvers. Press the APA button (1) on the center stack to enable the system to search for a parking space that is large enough and within 1.5 m (5 ft) of the vehicle. The vehicle speed must be less than 18 mph (30 km/h).

APA will instruct the vehicle to stop once a large enough space is found. Follow the instructions in the DIC. When instructed to drive in **R** (Reverse), shift to **R** to engage the automatic steering. The steering wheel will briefly vibrate as a reminder to remove hands from the steering wheel. Check surroundings and continue braking or accelerating as needed, and be prepared to stop to avoid vehicles, pedestrians, or objects.

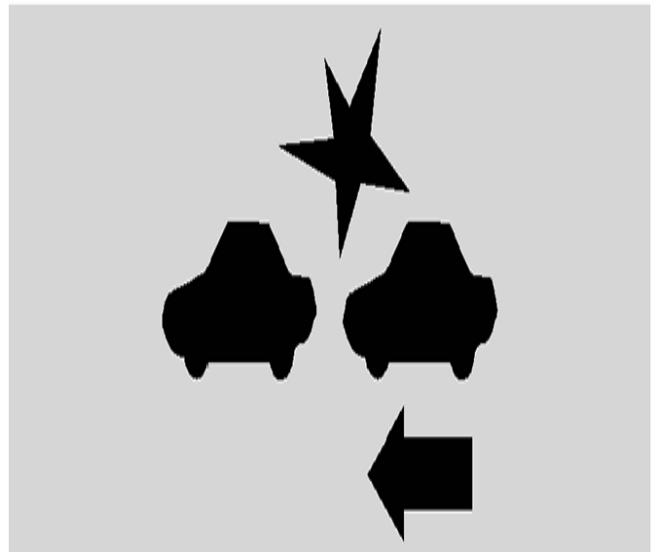
If the vehicle is in **R**, but does not steer into the expected space, this may be because the system is maneuvering the vehicle into a previously detected space. The APA system does not need service. If the vehicle exceeds 6 mph (10 km/h), APA is automatically disengaged and automatic steering will turn off. A DIC progress arrow displays the status of the parking maneuver. Depending on the space size, additional maneuvers may be required, and there will be additional instructions. When changing gears, allow the automatic steering to complete before continuing the parking maneuver. Upon successful completion of a maneuver, APA will beep and display a PARKING COMPLETE message. Place the vehicle in **P** (Park).

- **Forward Automatic Braking:** If the vehicle has FCA, it also has FAB, which includes IBA. When the system detects a vehicle ahead in your path that is traveling in the same direction that you may be about to crash into, it can provide a boost to braking or automatically brake the vehicle. This can help avoid or lessen the severity of crashes when driving in a forward gear. Depending on the situation, the vehicle may automatically brake moderately or hard. This forward automatic braking can only occur if a vehicle is detected. This is shown by the FCA vehicle ahead indicator being illuminated.
- **Forward Collision Alert:** The FCA system may help to avoid or reduce the harm caused by front-end crashes. When approaching a vehicle ahead too quickly, FCA provides a red flashing alert on the windshield and rapidly beeps or pulses the driver Safety Alert Seat. FCA also provides a visual alert if following another vehicle much too closely. FCA detects vehicles within a distance of approximately 197 ft (60 m) and operates at speeds above 25 mph (40 km/h). If the vehicle has Adaptive Cruise Control (ACC), it can detect vehicles to distances of approximately 360 ft (110 m) and operates at all speeds. FCA warnings will not occur unless the FCA system detects a vehicle ahead.



4526947

When a vehicle is detected, the vehicle ahead indicator will display green. Vehicles may not be detected on curves, highway exit ramps, or hills, due to poor visibility; or if a vehicle ahead is partially blocked by pedestrians or other objects. FCA will not detect another vehicle ahead until it is completely in the driving lane.



4526981

When your vehicle approaches another vehicle too rapidly, the red collision alert symbol will flash on the windshield. Either eight beeps will sound from the front, or both sides of the Safety Alert Seat will pulse five times. When this Collision Alert occurs, the brake system may prepare for driver braking to occur more rapidly which can cause a brief, mild deceleration. Continue to apply the brake pedal as needed.



4490977

- Front Pedestrian Braking:** If equipped, the FPB system may help avoid or reduce the harm caused by front-end crashes with nearby pedestrians when driving in a forward gear. FPB displays an amber indicator, ~, when a nearby pedestrian is detected directly ahead. When approaching a detected pedestrian too quickly, FPB provides a red flashing alert on the windshield and rapidly beeps or pulses the driver seat. FPB can provide a boost to braking or automatically brake the vehicle. This system includes Intelligent Brake Assist (IBA), and the Forward Automatic Braking (FAB) system may also respond to pedestrians. The FPB system can detect and alert to pedestrians in a forward gear at speeds between 5 mph (8 km/h) and 50 mph (80 km/h). During daytime driving, the system detects pedestrians up to a distance of approximately 131 ft (40 m). ***During nighttime driving, system performance is very limited.***
- Lane Change Alert:** The LCA system provides outside side mirror alerts to help the driver avoid crashing into a moving vehicle detected in their side blind spot (or zone) or a vehicle that is rapidly approaching their blind spot during a lane change maneuver. The LCA warning display will light up in the corresponding outside side mirror and will flash if the turn signal is **ON**.
- Lane Departure Warning:** Lane Departure Warning (LDW) may help avoid crashes due to unintentional lane departures. It may provide a warning if the vehicle is crossing a detected lane marking without using a turn signal in the lane departure direction. This system is part of the Lane Keep Assist (LKA) system.
- Lane Keep Assist:** Lane Keep Assist (LKA) may help avoid crashes due to unintentional lane departures. It may assist by gently turning the steering wheel if the vehicle approaches a detected lane marking without using a turn signal in that direction. It may also provide an LDW system alert as the lane marking is crossed. The

LKA system will not assist or provide an LDW alert if it detects that you are actively steering. Override LKA by turning the steering wheel. LKA uses a camera to detect lane markings between 37 mph (60 km/h) and 112 mph (180 km/h).



4521517

- Parking Assist:** With Rear Park Assist (RPA), and if equipped with Front Park Assist (FPA), as the vehicle moves at speeds of less than 5 mph (8 km/h) the sensors on the bumpers may detect objects up to 6 ft (1.8 m) behind the vehicle and 4 ft (1.2 m) in front of the vehicle within a zone 10 in (25 cm) high off the ground and below bumper level. The Parking Assist system does not detect children, pedestrians, bicyclists, animals, or objects located below the bumper or that are too close or too far from the vehicle. The instrument cluster (IC) may have a parking assist display with bars that show "distance to object" and object location information for the Parking Assist system. As the object gets closer, more bars light up and the bars change color from yellow to amber to red. When an object is first detected in the rear, one beep will be heard from the rear. When an object is very close, which is less than 2 ft (0.6 m) in the vehicle rear, or less than 1 ft (0.3 m) in the vehicle front, five beeps will sound from the front or rear depending on object location. Beeps for FPA are higher pitched than for RPA.
- Rear Cross Traffic Alert:** Rear Cross Traffic Alert (RCTA) displays a red warning triangle with a left or right pointing arrow on the RVC screen to warn of traffic coming from the left or right. This system detects objects coming from up to 65 ft (20 m) from the left or right side of the vehicle. When an object is detected, either three beeps sound from the left or right or three Safety Alert Seat pulses occur on the left or right side, depending on the direction of the detected vehicle.
- Rear Vision Camera:** When the vehicle is shifted into **R** (Reverse), the Rear Vision Camera (RVC) displays an image of the area behind the vehicle in the infotainment display. The previous screen

displays when the vehicle is shifted out of **R** after a short delay. To return to the previous screen sooner, press a button on the infotainment display, shift into **P** (Park), or reach a vehicle speed of 5 mph (8 km/h).

- **Safety Alert Seat:** The Safety Alert Seat provides the driver the option of getting haptic seat-bottom vibration crash avoidance alerts or beeping. To change from one to the other, see “Comfort and Convenience” under Vehicle Personalization in the Owner Manual.
- **Side Blind Zone Alert:** The Side Blind Zone Alert (SBZA) system is a lane changing aid that assists drivers with avoiding crashes that occur with moving vehicles in the SBZA (or spot) areas. When the vehicle is in a forward gear, the left or right side mirror display will light up if a moving vehicle is detected in that blind zone. If the turn signal is activated and a vehicle is also detected on the same side, the display will flash as an extra warning not to change lanes. This system is part of the LCA system.

## Steering

The vehicle is equipped with a rack and dual pinion electric power steering (EPS) system which reduces the amount of effort needed to steer the vehicle utilizing the power steering control module to control the power steering motor to maneuver the steering gear. The power steering control module also uses a combination of the torque sensor, motor rotational sensor, battery voltage circuit and GMLAN serial data circuit to perform the system functions. The power steering control module monitors vehicle speed and engine speed from the engine control module via the GMLAN serial data circuit to determine the amount of steering assist needed to steer the vehicle. At low speeds more assist is provided for easy turning during parking maneuvers. At higher speeds less assist is provided for improved road feel and directional stability.

The power steering system consists of the following components:

- Power steering control module.
- Power steering motor.
- Power steering motor rotational sensor.
- Torque sensor.
- Steering gear (rack and dual pinion).

## Suspension

### Front Suspension — RPO GNA

The McPherson strut front suspension absorbs the impact of the tires travelling over irregular road surfaces and dissipates this energy throughout the suspension system. This process isolates the vehicle occupants from the road surface. The rate at which the suspension dissipates the energy and the amount of energy that is absorbed is how the suspension defines the vehicles ride characteristics. Ride characteristics are designed into the suspension system and are not adjustable. The ride characteristics are mentioned in

this description in order to aid in the understanding of the functions of the suspension system. The suspension system must allow for the vertical movement of the tire and wheel assembly as the vehicle travels over irregular road surfaces while maintaining the tire's horizontal relationship to the road. The front suspension uses a stabilizer shaft. The stabilizer shaft connects the left and right lower control arm assemblies through the stabilizer link and stabilizer shaft insulators. This shaft controls the amount of independent movement of the suspension when the vehicle turns. Limiting the independent movement defines the vehicle's handling characteristics when turning.

The front suspension has two primary purposes:

- Isolate the driver from irregularities in the road surface.
- Define the ride and handling characteristics of the vehicle.

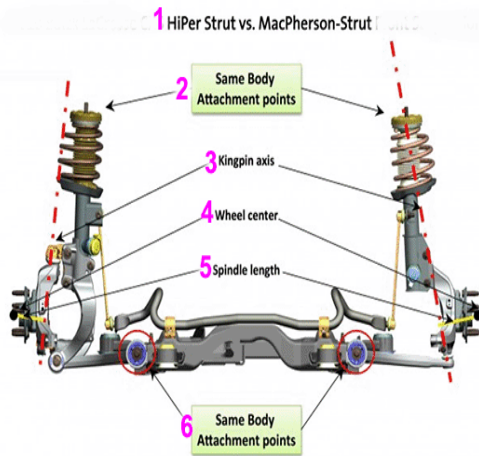
### Front Suspension — RPO GNB

The HiPer Strut front suspension absorbs the impact of the tires travelling over irregular road surfaces and dissipates this energy throughout the suspension system. This process isolates the vehicle occupants from the road surface. The rate at which the suspension dissipates the energy and the amount of energy that is absorbed is how the suspension defines the vehicles ride characteristics. Ride characteristics are controlled by the Electronic Suspension Control system. The Electronic Suspension Control system individually controls the damping force of each of the four shock absorbers. The suspension system must allow for the vertical movement of the tire and wheel assembly as the vehicle travels over irregular road surfaces while maintaining the tire's horizontal relationship to the road. The front suspension uses a stabilizer shaft. The stabilizer shaft connects the left and right strut assemblies through the stabilizer link and stabilizer shaft insulators. This shaft controls the amount of independent movement of the suspension when the vehicle turns. Limiting the independent movement defines the vehicle's handling characteristics when turning.

The front suspension has two primary purposes:

- Isolate the driver from irregularities in the road surface.
- Define the ride and handling characteristics of the vehicle.

## HiPer Strut Advantages



4551041

1. HiPer Strut vs. McPherson Strut
2. Same body attachment points
3. Kingpin axis
4. Wheel center
5. Spindle length
6. Same body attachment points

The HiPer Strut front suspension is designed with less spindle length than the McPherson Strut front suspension, resulting in the following benefits:

- Less torque steer.
- Reduced smooth road shake.
- Increased cornering power with no camber loss during cornering maneuvers.
- Robustness against wheel imbalance.
- Improved ride and handling performance with a premium steering feel.
- The design enables using larger wheels.

## Rear Suspension

The rear suspension is an independent link type. Rear suspension adjustment is achieved through adjustable toe links and lower control arms. The rear coil springs are retained between the body and the lower control arm. Rubber insulators isolate the coil spring at both top and bottom. The rear suspension consists of two shock absorbers attached to the lower control arms and the reinforced body areas.

The rear suspension system performs the following functions:

- Maintains the relationship of the rear axle to the body.
- Controls the torque reaction on acceleration and braking.

## Electronic Suspension Control System

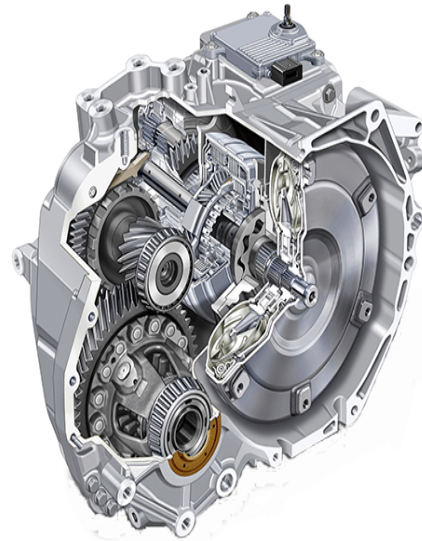
The electronic suspension control system uses the suspension control module to separately control each shock absorber actuator in order to control the damping force of each of the four shock absorbers, keeping the vehicle body as calm as possible. Changes of the damping forces can be accomplished within milliseconds. Suspension characteristics can be changed at any time by activating the Sport mode or Tour mode. The system provides an enhanced ride and comfort level over the widest possible range of operating conditions.

The electronic suspension control system consists of the following major components:

- The suspension control module.
- Three body vertical acceleration sensors.
- Two front wheel vertical acceleration sensors.
- Four shock absorber actuators, which are integrated within the shock absorbers.

## Transmission — AWD with Active Twin Clutch — Selective Ride Control

### Aisin AF50-8 Automatic 8-Speed Transaxle



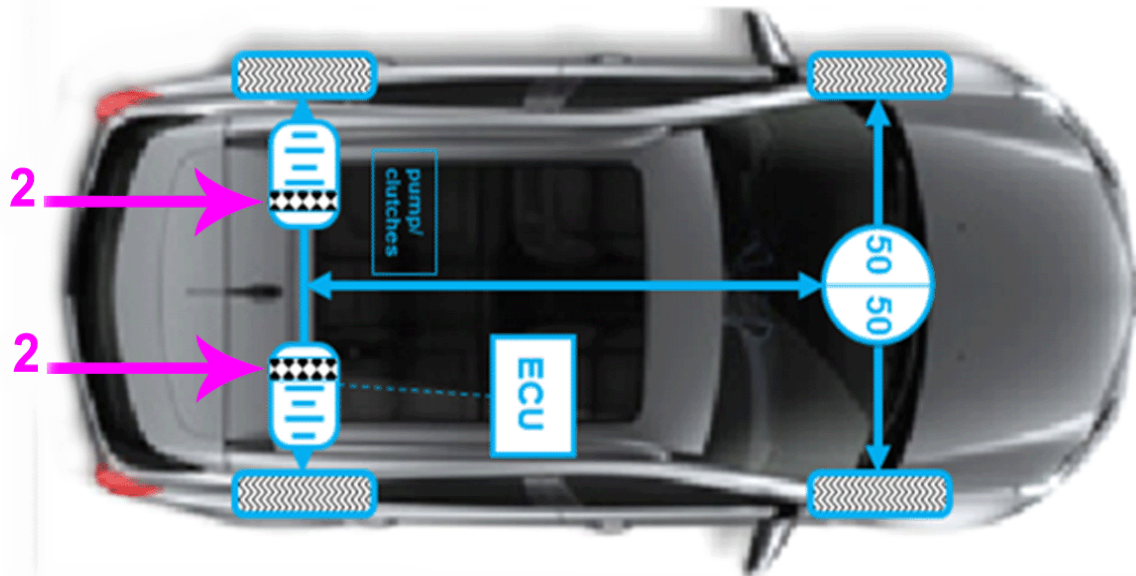
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The Aisin AF50-8 is a compact, lightweight, next-generation electronically controlled 8-speed automatic transaxle that employs a ravigneaux-type planetary gear. It employs a high-precision clutch hydraulic control system for smooth, highly responsive gear shift feel.



## AWD with Active Twin Clutch

# 1 Active Twin Clutch



4549898

The AWD system with Active Twin Clutch (1) delivers greater handling, stability and driver confidence by preemptively and **electronically** splitting the torque as needed between the rear wheels using twin clutches (2) to provide additional traction, stability and control versus a 50/50 split in a single clutch system.

It provides the following benefits:

- Enhanced traction, stability and performance during vehicle acceleration and cornering during dry normal conditions.
- Optimal handling and improved traction in wet/snowy/icy conditions.
- Improved vehicle response when road traction is not uniform, such as when the right side of the vehicle is on ice and the left side is on dry pavement.
- Active Twin Clutch with active torque bias has increased capability to add stability across all driving conditions.
- A fuel economy benefit is realized by not pushing torque when it is not needed.

## Selective Ride Control

The vehicle may be equipped with Selective Ride Control. The SPORT button is on the center stack.

Selective Ride Control adapts to the preference of the driver with one of two driving modes. The modes function as follows:

- **TOUR:** This is the default mode and is used for normal and long-distance highway driving. This setting provides a smooth, soft ride. Selective Ride Control automatically turns ON in the Tour Mode when the vehicle is started.
- **SPORT:** Use this mode when road conditions or personal preference demand more control. This setting provides responsive, controlled steering and handling to road conditions through increased steering effort and suspension tuning. Press and release SPORT and the light on the button illuminates. Press and release the SPORT button again and the system returns to the Tour Mode. The Selective Ride Control modes can be changed at any time. Based on road conditions, steering wheel angle, and vehicle speed, the system automatically adjusts to provide the best handling while providing a smooth ride. The Tour and Sport Modes will feel similar on a smooth road.

## Special Tools

The following new tools were released for the 2017 LaCrosse:

### Special Tools — Tool Number and Description

Tool Number	Description
DT-51329-A	Driveshaft Remover
DT-51466	Seal Installer, LH Input & IDS Cassette
DT-51467-A	Seal Installer, PTU
EN-42385-70	Head Bolt Thread Repair Torque Plate
EN-44226-5	Crankshaft Protector Button
EN-46335-A	Valve Spring Compressor (On-vehicle)
EN-49941	Piston Pin Retainer Remover
EN-51333	Timing Chain Retainer Set
EN-51766	Rear Seal Installation Pilot
DT-51918	Bearing Cup Installer
DT-51919	Bearing Race Puller
DT-51920	Installer, 1st / Rev Clutch Piston Spring

## Training Courses

The majority of the systems found on this vehicle are taught in GM's core curriculum from a conceptual theory and operation perspective. The North American technical training core curriculum structure is system based.

To access all of the available training courses in the United States, visit the following website:

[www.centerlearning.com](http://www.centerlearning.com)

In Canada, Go to **GM GlobalConnect** and select **Centre of Learning**

### Training Course Name or System — Course Number and Description

Course Name or System	Course Number and Description
<b>New Model Feature</b> 2017 Buick LaCrosse New Model Features	Not Available
<b>Engine</b> Gasoline, 6 Cylinder, V6, 3.6L, DI, DOHC, VVT — RPO LGX Engine Auto Stop/Start Technology	#16440.20D — Engines: New and Updates for RPOs LF4, LGX, LGW, L3A, LV7, LE2 and LWN (United States Only) #16040.31W — 12V Stop/Start (United States) (Canada Availability Mid-July 2016)
<b>Transmission</b> Aisin AF50-8 8-Speed Automatic Transaxle — RPO MRC	#17440.16D (VCT) — Transmissions: New and Updates for Aisin AF50-8, 8L45/8L90 Automatic Transmissions (United States Only)
<b>Safety Systems</b> Forward Collision Alert / Lane Departure Warning and Rear Vision Camera	#22048.42W1-W3 GM Safety Systems 1-3 (United States and Canada)

**Version Information**

Version	1
Modified	—

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