



Service Bulletin

File in Section: -
 Bulletin No.: 16-NA-149
 Date: August, 2016

INFORMATION

Subject: 2016 Buick Envision New Model Features

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		From:	To:	From:	To:		
Buick	Envision	2016	2016	All	All	GASOLINE, 4 CYL, I4, 2.0L, DI, DOHC, VVT, DCVCP, TURBO — RPO LTG with STOP/START — RPO KL9	Hydra-Matic™ 6T50 6-Speed Automatic Transaxle — RPO M2D

Region — Countries	United States and Canada
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Overview



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Bulletin Purpose

This is a special bulletin to introduce the 2016 Buick Envision. The purpose of this bulletin is to help the Service Department Personnel become familiar with some of the vehicle's new features and to describe some of the action they will need to take to service this vehicle.

About the Car

The Buick Envision was designed, engineered and tested in the United States and is a world-class luxury crossover vehicle. It targets customers shopping between the Encore, the best-selling Buick in eight years, and the Enclave. It is a four door, five passenger compact crossover with steel body frame (unibody) with front and rear crumple zones; galvanized steel front fenders, roof, door panels and one piece body side outer panel. Efficiency enhancing features include electric power steering, upper grille shutters that open and close to enhance aerodynamics on the highway and a body structure incorporating mass reducing high-strength and ultra-high-strength steels and a lightweight aluminum hood. The Envision is equipped with a 2.0L turbocharged engine with Stop/Start technology and produces 252 horsepower (188 kW), matched with Buick's first crossover vehicle application of HiPer Strut front suspension with a Hydra-Matic™ 6T50 6-speed automatic transaxle and Buick's first Active Twin Clutch all-wheel-drive (AWD) system.

Vehicle Highlights

Some of the vehicle highlights are:

- Active noise cancellation.
- Available Adaptive Cruise Control.
- Available Automatic Parking Assist.
- Available cooled front seats.
- Available Front Automatic Braking.
- Available Head-Up Display (HUD).
- Available OnStar® with 4G LTE and built-in Wi-Fi hotspot.



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- Available panoramic moonroof.
- Available Surround Vision. Provides the driver with a view of the scene around the vehicle on the centerstack display.
- Buick IntelliLink® with 8-inch (203 mm) diagonal color touch screen.
- LED daytime running lamps and rear LED accent lights.

- Passive entry and push-button start with standard remote start.
- Programmable power liftgate with hands-free operation.



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- Sliding 60/40 split rear seat offering more legroom for the second row passengers.
- When folded the second row seat offers a flat load floor.
- Standard 8-way power-adjustable front seats and four-way-adjustable lumbar, including available adjustable thigh support on some models that enhances comfort for taller passengers.
- Standard 19-inch aluminum wheels.
- Standard Bose® premium sound system.
- Standard heated front seats, heated rear outboard seats and heated steering wheel.
- Standard Safety Alert Seat and Lane Keep Assist, as well as available Automatic Park Assist, and Surround Vision 360-degree camera system.
- Standard tri-zone climate control with rear-seat controls and console-mounted rear vents.
- QuietTuning® technologies.

Airbag System

Airbag Readiness Light

This light shows 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**, have it repaired immediately.

All vehicle airbags have the word AIRBAG on the trim or on a label near the deployment opening. The 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 the passenger seated directly behind the driver.
- A roof-rail airbag for the front outboard passenger and the passenger seated directly behind the front outboard passenger.

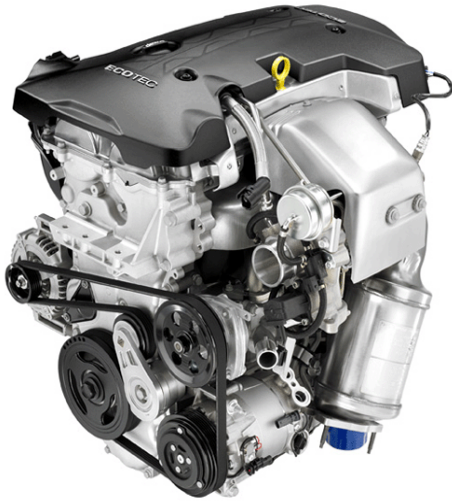
Brakes

This vehicle is equipped with a Continental Teves Mk100 ABS, traction control, electronic stability control and a hydraulic brake system with diagonal brake circuit split. The electronic brake control module (EBCM) and the brake pressure modulator is serviced separately. The brake pressure modulator uses a four circuit configuration to control hydraulic pressure to each wheel independently.

- **Antilock Brake System (ABS):** When wheel slip is detected during a brake application, an 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.
- **Hydraulic Brake Assist:** The hydraulic 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 hydraulic brake pressure to a specific maximum by turning the pump motor **ON**.
- **Intelligent Brake Assist:** The intelligent brake assist function is designed to provide limited braking to help prevent front and rear low speed collisions. The EBCM receives inputs from the brake pedal position sensor, wheel speed sensors, short range radar and ultrasonic sensors to detect a collision. When the EBCM senses a possible collision, it will actively increase the hydraulic brake pressure to apply the brakes.
- **Optimized Hydraulic Brake System:** With the 2.0L engine, the EBCM monitors the vacuum in the brake booster with a vacuum sensor and controls a brake booster vacuum pump depending on vacuum sensor input. It also has a hydraulic brake boost feature which supplements the brake system to maintain consistent brake performance under conditions of low brake booster vacuum. Low brake booster vacuum conditions can include initial start up after the vehicle has been parked for several hours, very frequent brake stops, or high altitude driving. The hydraulic brake boost system activates only during a brake apply under low vacuum conditions. In this case the electronic brake control module will actively increase and control the hydraulic brake pressure by turning the pump motor **ON** and the appropriate solenoid valves **ON** and **OFF**. When hydraulic brake boost is active, a series of rapid pulsations is felt in the brake pedal.
- **Electronic Stability Control:** Electronic stability control provides added stability during aggressive maneuvers. Yaw rate is the rate of rotation about the vehicle's vertical axis. The stability control is activated when the electronic brake control module 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. When a yaw rate error is detected, the electronic brake control module attempts to correct the vehicle's yaw motion by applying brake pressure to one or more of the wheels. The amount of brake pressure which is applied varies, depending on the correction required.
- **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. If the engine torque reduction does not reduce drive wheel slip, the EBCM will actively apply the brakes on the slipping drive wheel. During traction control braking, hydraulic pressure in each drive wheel circuit is controlled to prevent the drive wheels from slipping. The EBCM commands the pump motor and appropriate solenoid valves **ON** and **OFF** to apply brake pressure to the slipping wheel.
- **Hill Hold Start Assist:** The hill hold start assist allows the driver to launch the vehicle without a roll back while moving the foot from the brake pedal to the accelerator pedal. The EBCM calculates the brake pressure, which is needed to hold the vehicle on an incline and locks that pressure for a certain time by commanding the appropriate solenoid valves **ON** and **OFF** when the brake pedal is released. Hill hold start assist is activated when the EBCM determines that the driver wishes to move the vehicle up-hill, either backwards or forwards.

Engine

Engine Components Description and Operation



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Shown is a typical view of a 2.0L Turbocharged Engine — RPO LTG

Overview

Performance from GM's Ecotec family of engines continues to advance with the 2.0L Turbo — RPO LTG, which is based on a generation of large displacement four cylinder engines which are designed for greater efficiency. The turbocharger generates up to 20 pounds (138 kPa) of boost and its twin-scroll design helps optimize the usable power from the engine, virtually eliminating turbo lag and helping deliver a broad power band. It also gives the engine the rapid throttle responsiveness associated with a higher displacement naturally aspirated high performance engine. Electronically controlled turbocharger supporting components including the wastegate and bypass valve, help optimize performance and efficiency.

- Engine Block:** The sand-cast aluminum 319T7 cylinder block is a superior refinement of previous Ecotec engine block castings. It is dimensionally similar with previous Ecotec turbo block variants, while providing improved structural support, as well as enabling greater control of noise, vibration and harshness. The main bearing bulkheads, which support the crank bearings, as well as the cylinder bore walls have been significantly strengthened to support increased engine loads. Refinements to the oil distribution system enable improved oil flow throughout the engine and an expansion of the coolant jacket, along with the use of cast-in-place bore liners, allows more precise bore roundness and improves the block's ability to dissipate heat.
- Rotating Assembly:** The crankshaft is made of drop forged steel with induction heat-treated fillets and cross-drilled chamfered oil passages for racing grade lubrication characteristics. Forged powdered metal connecting rods incorporate a larger, forged I-beam cross section for added strength in this turbocharged application. The pistons in the 2.0L turbo are lightweight cast aluminum, which reduces reciprocating mass inside the engine. This enhances efficiency and the feeling of performance as the rpm increases. The tops of the pistons have a dish shape that deflects injected fuel. Each piston has its own directed jet that sprays oil toward its skirt, coating its underside and the cylinder wall with an additional layer of lubricant. The extra lubrication cools the pistons, reduces both friction and operational noise and bolsters engine durability.
- Rotocast Aluminum Cylinder Head with Sodium Filled Exhaust Valves:** The Ecotec 2.0L turbo's A356T6 aluminum cylinder head is cast using a Rotocast process for high strength, reduced machining and improved port flow. The head is also designed specifically for direct injection. The 2.0L turbo head has unique injector mounting locations below the ports. Apart from injector installation, the head has conventional port and combustion chamber designs, both are optimized for direct injection and high boost pressure. The head uses stainless steel intake valves that are nitrided for improved durability and undercut to improve flow and reduce weight. The exhaust valves have sodium-filled stems that promote valve cooling. At normal engine operating temperatures, the sodium inside the valve stem fuses and becomes liquid. The liquid sodium improves conductivity, promoting heat transfer away from the valve face and valve guide to the cooler end of the stem, where it more readily dissipates. This helps maintain a lower, more uniform valve temperature, reducing wear on the valve guide for better alignment and a consistent seal between the valve seat and valve face over the life of the engine. The exhaust manifold is mounted to the cylinder head and is made of cast stainless steel. It is extremely durable and delivers exceptional airflow qualities.

- **DOHC with Continuously Variable Valve Timing:** Overhead cams are the most direct, efficient means of operating the valves, while four valves per cylinder increase airflow in and out of the engine. This arrangement is integrated on the lightweight aluminum cylinder head. Continuously variable valve timing optimizes the engine's turbocharging system by adjusting valve timing at lower rpm for improved turbo response and greater torque delivery. Both the intake and exhaust cams have hydraulically operated vane-type phasers that are managed by a solenoid and directed by the engine control module (ECM). The phasers turn the camshaft relative to the drive sprocket, allowing intake and exhaust valve timing to be adjusted independently. Cam phasing changes the timing of valve operation as conditions such as rpm and engine load vary. This provides an outstanding balance of smooth torque delivery over a broad rpm range, high specific output and improves fuel consumption.
- **Direct Injection:** Direct injection moves the point where fuel feeds into an engine closer to the point where it ignites, enabling greater combustion efficiency. It fosters a more complete burn of the fuel in the air-fuel mixture, and operates at a lower temperature than conventional port injection. This allows the mixture to be leaner (less fuel and more air), so less fuel is required to produce the equivalent horsepower of a conventional, port-injection fuel system. Direct injection also delivers reduced emissions, particularly cold-start emissions, by about 25 percent. The higher compression ratio with direct injection is possible because of a cooling effect as the injected fuel vaporizes in the combustion chamber, which reduces the charge temperature to lessen the likelihood of spark knock. The direct injection fuel injectors have been developed to withstand the greater heat and pressure inside the combustion chamber, and feature multiple outlets for best injection control.
- **Cam-Driven High Pressure Fuel Pump:** A high pressure, cam-driven fuel pump provides the higher fuel pressure required by the direct injection system. The engine mounted fuel pump is augmented by a conventional electrically operated supply pump in the fuel tank. The fuel delivery system features a high-pressure stainless steel feed line and a pressure regulated fuel rail without a conventional fuel return line from the engine to the tank. Fuel pressure varies from about 750 psi (5,171 kPa) at idle to 2,250 psi (15,513 kPa) at wide open throttle.
- **Two Stage Variable Displacement Oil Pump:** The variable flow oiling system helps maximize fuel efficiency. Rather than the linear operation of a conventional fixed flow pump, it is accomplished with a crankshaft driven oil pump that matches the oil supply to the engine load. The engine's variable flow pump changes its capacity based on the engine's demand for oil. This prevents using energy to pump oil that is not required for proper engine operation. An engine oil cooler helps maintain optimum oil temperatures. It has a heat exchanger incorporated into the oil filter housing. Coolant to the heat exchanger is provided by the engine's coolant circuit. The design optimizes oil cooling with a minimal pressure loss. During the cold starting, the system also enables faster heating of the engine oil for an earlier reduction of internal engine friction.
- **Twin-Scroll Turbocharger:** An advanced, electronically controlled turbocharger with a unique twin-scroll design is used to increase power in the engine. Each of two scrolls on the turbine is fed by a separate exhaust passage, one from cylinders one and four, the other from cylinders two and three and virtually eliminates turbo lag at low engine speeds, giving the engine immediate throttle response associated with a naturally aspirated high-performance engine. The turbocharger generates maximum boost of about 20 psi (138 kPa). Because direct injection cools the intake process it allows the Ecotec 2.0L turbo to safely operate at higher boost and a relatively higher compression (9.5:1) than a conventional turbo engine, increasing both output and efficiency.
- **Turbocharger - Air-to-Air Intercooler:** An intake charge air cooler enhances the power increasing benefits of the turbocharging system. The air-to-air intercooler draws fresh air through a heat exchanger, much like a radiator, to reduce the temperature of compressed air that's forced through the intake system by the turbocharger. Inlet temperature is reduced by as much as 212°F (118°C). Cooler air is denser, which means more oxygen is packed in the cylinders for optimal combustion and consequently greater power.
- **Cam-Driven Vacuum Pump:** A cam-driven vacuum pump ensures the availability of vacuum under all conditions, especially under boost, when the engine produces the opposite of vacuum. The pump is mounted at the rear of the cylinder head and is driven by the exhaust camshaft via a flexible coupling.

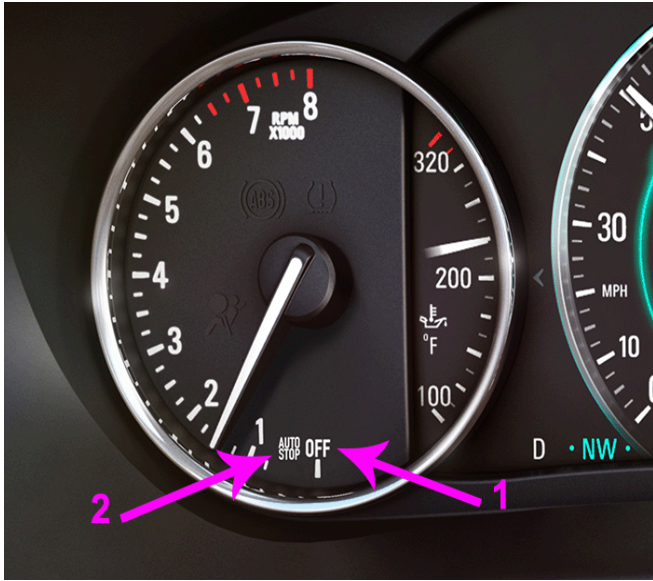
Engine Specifications

- **Displacement:** 2.0 L (1998 cc) — (122 cubic inches)
- **Bore x Stroke:** 86 mm (3.39 inches) x 86 mm (3.39 inches)
- **Compression Ratio:** 9.5:1
- **Horsepower:** 252 horsepower (188 kW) @ 5,500 rpm — (Estimate)
- **Torque:** 260 lb ft (353 Nm) @ 2000 rpm — SAE Certified
- **Maximum Engine Speed:** 7,000 rpm
- **Valves:** There are 2 intake and 2 exhaust valves per cylinder
- **Valve Lifters:** Hydraulic roller finger follower

- **Recommended Fuel:** Premium unleaded
- **Emissions controls:** Evaporative system, Catalytic converters (close coupled and underfloor) and Positive Crankcase Ventilation (PCV)

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 2.0L engine. When driving and bringing the vehicle to a complete stop and firmly applying the brake pedal, the Stop/Start system may turn the engine **OFF**, depending on operating conditions. When the Stop/Start system turns the engine **OFF**, the tachometer needle will point at **AUTO STOP (2)** 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.

AutoStop Inhibiting Conditions

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

- The ambient (outside) temperature and the engine coolant temperature (ECT) correlation do not meet the 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.
- Driver seat belt is not fastened and the driver door is not fully closed. (Not applicable to vehicles in North America).

AutoStop Enabling Conditions

The engine **will 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.

AutoStart Enabling Conditions

The engine **will AutoStart** 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.
- Driver door is opened and the driver seat belt is unbuckled. (Not applicable to vehicles in North America).

Engine Oil — dexos®



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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® synthetic blend 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 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.

Head-Up Display

If equipped with Head-Up Display (HUD), some information concerning the operation of the vehicle is projected onto the windshield. The image is projected through the HUD lens on top of the instrument panel. The information appears as an image focused out toward the front of the vehicle.

The HUD may display some of the following vehicle information and vehicle messages or alerts:

- Speed
- Tachometer
- Audio
- Phone
- Navigation
- Collision Alert
- Cruise Control

- Lane Departure
- Low Fuel

IntelliLink®



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The Envision comes standard with Buick IntelliLink® with an 8-inch (203 mm) diagonal color-touch radio that keeps customers connected to the important things in life with the latest system enhancements and is designed to mimic the functionality of a smartphone so it will be simple for customers to use. Buick IntelliLink® uses a Bluetooth® or USB connection to link to a compatible device, such as a smartphone, cell phone, USB flash drive or portable audio player such as an Apple® iPod®.

IntelliLink® in the Envision offers:

1. Text Message Alerts. Requires a compatible smartphone with Bluetooth profile (M.A.P.) and applicable text messaging features.
2. Siri® Eyes Free. Requires Buick IntelliLink® and compatible iPhone® running iOS 6 or later.
3. Gesture recognition.
4. App Tray customization.
5. Customizable Favorites.
6. Natural Language Voice Recognition.
7. Cluster/centerstack integration.
8. 8-inch (203 mm) diagonal multi-color reconfigurable Driver Information Center (DIC) with cluster display.
9. Available Navigation. Map coverage available in the United States and Canada.

OnStar® with 4G LTE and Wi-Fi

With OnStar® 4G LTE and Wi-Fi®, up to seven devices (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 Absorber

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

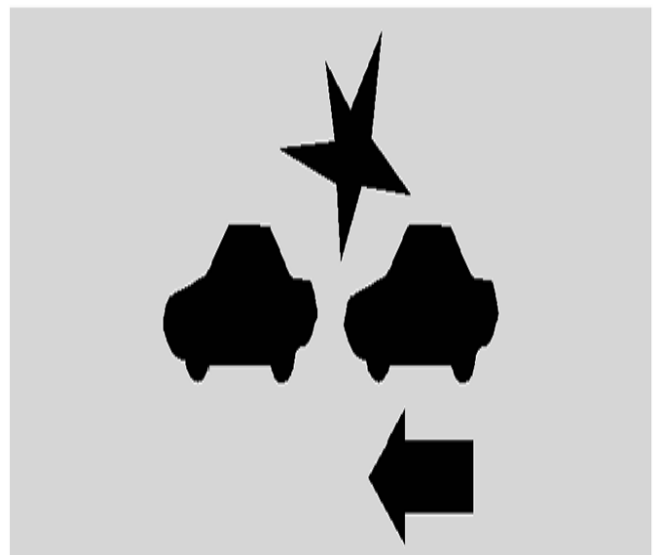
1. **ABSORB:** These technologies absorb sound.
 - 1.1. Engine Compartment Acoustic Absorbers
 - 1.2. Interior Trim Acoustic Absorbers
 - 1.3. High Performance Dissipative Acoustic System (Active Noise Cancellation — RPO NKC)
 - 1.4. Door System Acoustic Absorber
2. **Block:** These technologies block 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

Safety — Driving/Parking Assistance Systems

- **Adaptive Cruise Control:** If equipped, this feature helps to maintain a safe following distance with the vehicle ahead.
- **Automatic Parking Assist:** If equipped, the Automatic Parking Assist (APA) system helps to search for and maneuver the vehicle into parallel or perpendicular parking spots using automatic

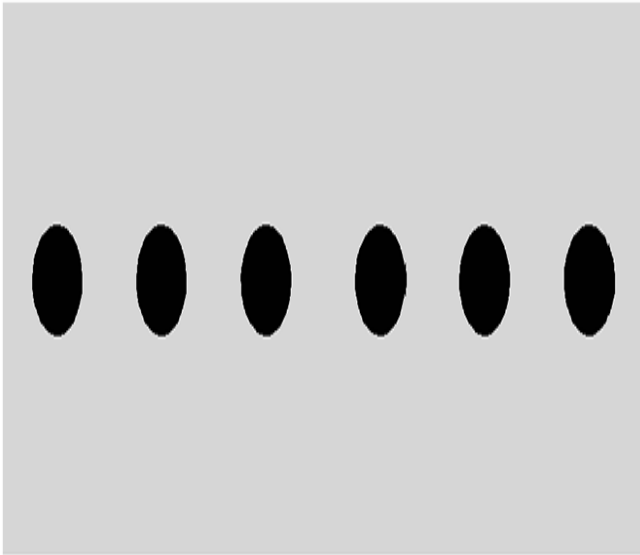
steering, DIC displays, and beeps while the driver follows text commands, selects the gear and brakes/accelerates.

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- With Head-Up Display

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Without Head-Up Display

Notice: On vehicles equipped with Head-Up Display (HUD), the icons display on the windshield. On vehicles that are not equipped with HUD, the icons display in the center of the IP cluster.

Forward Collision Alert: Forward Collision Alert (FCA) warnings will not occur unless the FCA system detects a vehicle ahead. When a vehicle is detected, the vehicle ahead indicator will display green. When your vehicle approaches another detected vehicle too rapidly, the red FCA display will flash. Also, eight rapid high-pitched beeps will sound from the front, or both sides of the Safety Alert Seat will pulse five times.

- **Front Automatic Braking:** If equipped, and a front-end collision is determined to be imminent while following a vehicle ahead, the system can automatically apply the brakes to help reduce the collision's severity.
- **Lane Change Alert with Side Blind Zone Alert:** Lane Change Alert (LCA) provides 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.
- **Lane Keep Assist with Lane Departure Warning:** Lane Keep Assist (LKA) provides gentle steering wheel turns and Lane Departure Warning (LDW) alerts, if necessary to help drivers avoid crashes due to unintentionally drifting out of their lane when they are not actively steering and their turn signal is not activated.
- **Rear Cross Traffic Alert:** When in reverse, Rear Cross Traffic Alert (RCTA) provides alerts to help the driver avoid crashing into approaching detected left or right cross traffic, for example, when backing out of a crowded parking space or driveway with side obstructions.



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- **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 center stack display. A warning triangle may display on the RVC screen to show that it has detected an object. This triangle changes from amber to red and increases in size the closer the object becomes. The previous screen displays when the vehicle is shifted out of R after a short delay.
- **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 Collision/Detection Systems under Vehicle Personalization in the Owner Manual.

Surround Vision 360-Degree Camera System

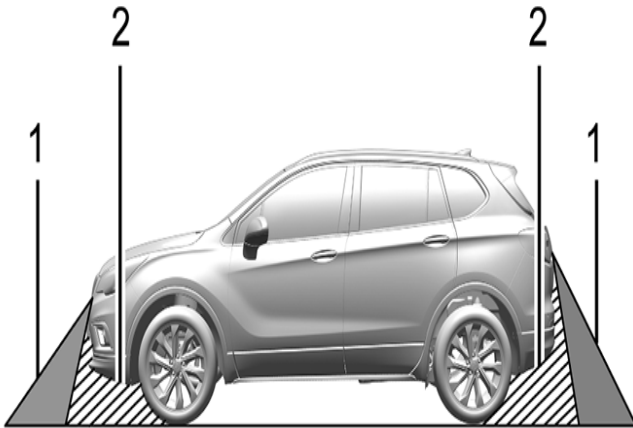


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Surround Vision

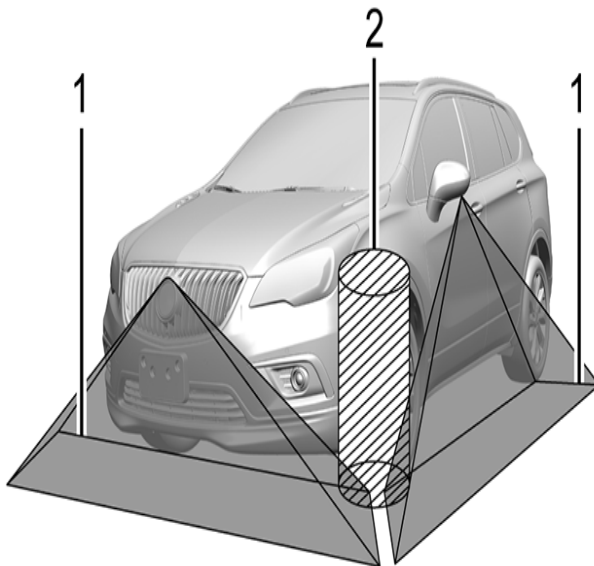
Notice: The Surround Vision cameras have blind spots and will not display all objects near the corners of the vehicle. Folding side mirrors that are out of position will not display the surround view correctly.

If equipped, Surround Vision displays an image of the area surrounding the vehicle, along with the front or rear camera views in the center stack. The front camera is in the grille or near the front emblem, the side cameras are on the bottom of the outside rearview mirrors (1), and the rear camera is above the license plate.



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1 = Views displayed by the Surround Vision cameras.



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2 = Area not displayed by the Surround Vision cameras.

Suspension/Electric Power Steering

Suspension

Front Suspension: Specifically tuned coil springs, direct-acting stabilizer bar (hollow); hydraulic ride bushings; HiPer Strut suspension.

Rear Suspension: Four-link independent rear with hollow stabilizer bar.

Electric Power Steering

Steering consists of an electric rack-and-pinion, power assisted with cross-wind stabilization and road-shake stabilization.

Traction Control and StabiliTrak®

The vehicle has a Traction Control System (TCS) and StabiliTrak®, an electronic stability control system. These systems help limit wheel slip and assist the driver in maintaining control, especially on slippery road conditions. Both systems come **ON** automatically when the vehicle is started and begins to move. The systems may be heard or felt while they are operating or while performing diagnostic checks. This is normal and does not mean there is a problem with the vehicle.

TCS activates if it senses that any of the drive wheels are spinning or beginning to lose traction. When this happens, TCS applies the brakes to the spinning wheels and reduces engine power to limit wheel spin.

StabiliTrak® activates when the vehicle senses a difference between the intended path and the direction the vehicle is actually traveling. StabiliTrak® selectively applies braking pressure to any one of the vehicle wheel brakes to assist the driver in keeping the vehicle on the intended path.

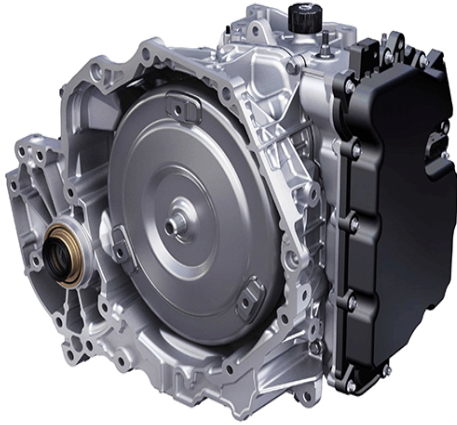
Indicator Light Operation

The indicator light for both systems is in the instrument cluster. This light will:

- Flash when TCS is limiting wheel spin.
- Flash when StabiliTrak is activated.
- Turn **ON** and stay **ON** when either system is not working.

If cruise control is being used and traction control or StabiliTrak begins to limit wheel spin, the cruise control will disengage. Cruise control may be turned back **ON** when road conditions allow.

Transmission — Hydra-Matic™ 6T50 6-Speed Automatic Transaxle — RPO M2D



4424529

Hydra-Matic™ 6T50 6-Speed Automatic Transaxle

Shown is a typical view of the Hydra-Matic™ 6T50 6-speed front-wheel-drive, electronically controlled, automatic overdrive transaxle with an electronically controlled torque converter clutch and a surge accumulator for the start/stop system.

This transmission features Gen 3 upgrades implemented to enhance efficiency. The pump has been moved off-axis, which allows better sealing of the torque converter, reducing pump flow demands and enhancing fuel economy. Additionally, the pump is now a binary vane-type, which allows lower power consumption during times of lower flow demands and at higher engine speeds.

- The transmission case material is made from die cast aluminum.
- Clutch-to-clutch shift operation.
- Adaptive shift controls.
- IX Gear Pump.
- Ground and honed gears.
- Stop/start technology supported by a unique oil storage accumulator.

Torque Converter

The 3-element torque converter contains a pump, a turbine, a stator assembly and a pressure plate splined to the turbine. The torque converter acts as a fluid coupling to smoothly transmit power from the engine to the transmission. It also hydraulically provides additional torque multiplication when required. The pressure plate, when applied, provides a mechanical direct drive coupling of the engine to the transmission.

Transmission Gear Ratios

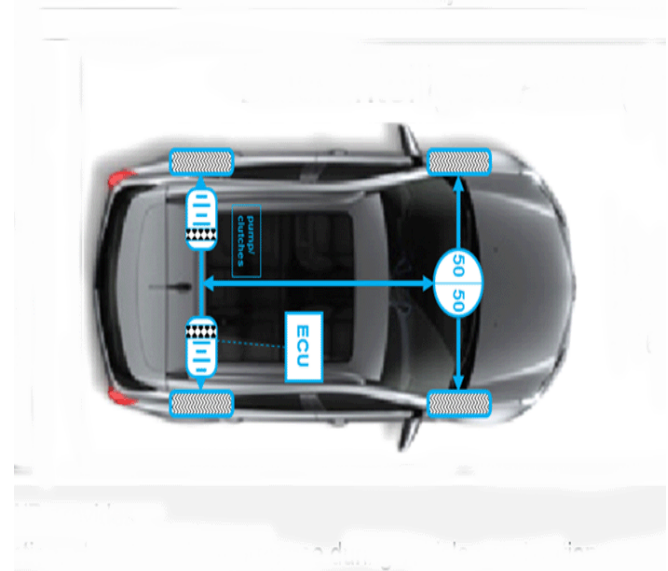
The transmission has the following gear ratios:

- **First:** 4.584
- **Second:** 2.964
- **Third:** 1.912
- **Fourth:** 1.446
- **Fifth:** 1.000
- **Sixth:** 0.746
- **Reverse:** 2.940
- **Final Drive Ratio:** 3.230

Transmission Fluid Level and Condition Check

The transmission uses DEXRON® VI transmission fluid. When performing fluid checks, always refer to SI for the Transmission Fluid Level and Condition Check procedure.

Buick Intelligent AWD (Active Twin Clutch)



4424641

Notice: When using a compact spare tire on an AWD vehicle, the system automatically detects the compact spare and reduces AWD performance to protect the system. An AWD message may be displayed. To restore full AWD operation and prevent excessive wear on the system, replace the compact spare with a full-size tire as soon as possible.

Buick Intelligent AWD (Active Twin Clutch) delivers greater handling, stability and driver confidence by preemptively and electronically splitting torque between the rear wheels to provide additional control versus a 50/50 split in a single clutch system.

It provides:

- 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.

Towing the Vehicle — Recreational Vehicle Towing

Towing the Vehicle

DO NOT use a wheel lift tow truck to tow the vehicle. **DO NOT** dolly tow the vehicle. Only use a flatbed car carrier. Do not lash or hook to suspension components. Use the proper straps around the tires to secure the vehicle.

Recreational Vehicle Towing — Dinghy Towing

Recreational vehicle towing means towing the vehicle behind another vehicle, such as behind a motor home. Dinghy towing is towing the vehicle with all four wheels on the ground.

To dinghy tow the vehicle from the front, with all four wheels on the ground, perform the following:

Notice: Use of a shield mounted in front of the vehicle grille could restrict airflow and cause damage to the transmission.

1. Position the vehicle to tow and then secure it to the towing vehicle.
2. Turn the ignition **ON**, and shift the transmission to N (Neutral).
3. With the transmission in N (Neutral), turn the ignition **OFF**.
4. To prevent the battery from draining while the vehicle is being towed, remove fuses 29 and 32 (Body Control Module) from the instrument panel fuse block. Reinstall the fuses upon reaching the destination.

The instrument panel fuse block is in the glove box. To access the fuses, open the fuse panel door from the passenger side by pulling it out. To reinstall the door, insert the tabs on the top of the door first, then push the door back into its original location.

Front and Rear Tow Eye

The tow eye should not be used to recover a vehicle from an off-road situation. The tow eye is stored in the spare tire compartment area.

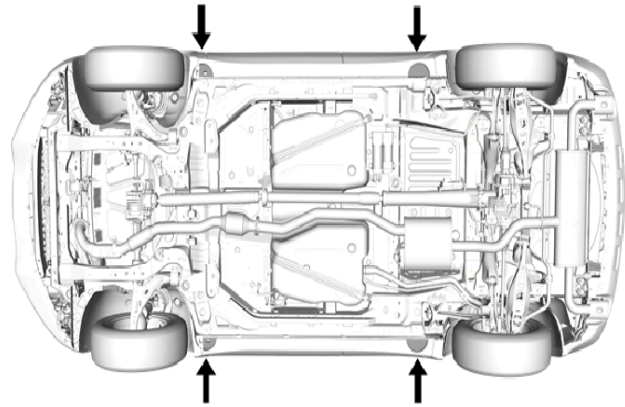
To use the tow eye:

1. Carefully open the cover by using the small notch that conceals the front or rear tow eye socket.
2. Install the tow eye into the socket by turning it clockwise until it stops in a horizontal position. When the tow eye is removed, reinstall the cover with the notch in the original position.

Vehicle Lifting and Jacking

Note: The use of a **LOW PROFILE LIFT ARMS SYSTEM** may be required to avoid unwanted contact with the vehicle's body and structure depending on lifting equipment used. Refer to the manufacturer's recommendation for their applications of low profile lift arms system for their lifting equipment.

Vehicle Lifting - Frame Contact Lift



4424064

- **Front Lift Pads:** When lifting the vehicle with a frame-contact lift, place the front lift pads on the rocker outer panel weld flange, as shown.
- **Rear Lift Pads:** When lifting the vehicle with a frame-contact lift, place the rear lift pads on the rocker outer panel weld flange, as shown.

Vehicle Jacking

When using a service jack under the front or rear of the vehicle, use the same location that is shown for the front and rear lift pads.

Special Tools

The following new tools were released for the 2016 Envision:

Special Tools — Tool Number and Description

Tool Number	Description
DT-50087	Remover/Installer, Differential Bearing, 4 Pinion
DT-51329-A	Driveshaft Remover
DT-51466	Seal Installer, LH Input and IDS
DT-51467-A	Seal Installer, L Cover and Pinion

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

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
New Model Feature 2016 Buick Envision New Model Feature	#10316.81W 2016 Buick Envision New Model Feature (U.S. & Canada)
Engine 2.0L Turbocharged — RPO LTG	#16440.17D VCT and #16440.17D-V Video — Engines: New and Updates for RPO LCV, LTG and LL0 (U.S. only) #16043.16H — Ecotec Gen. 2 Overhaul & Repair Certification (Canada only)
Engine - 12V Starting and Charging	#16040.31W — 12V Stop / Start
Transmission Hydra-Matic™ 6T50 6-Speed Automatic Transaxle — RPO M2D	#17041.52V 6-Speed Auto Video — Video On Demand (VOD) (U.S. only) #17036.01V — 6T40/45 Unit Repair Video (Canada only) #17041.56W1-W3 Automatic Transmission Operation, Diagnosis and Service 1-3 WBT (U.S. & Canada) #17041.56H Automatic Transmission Operation, Diagnosis and Service ILT (U.S. only) #17041.65H-R2 6-Speed Automatic Transmission Mechanical Service ILT (U.S. only)
Safety Systems Forward Collision Alert / Lane Departure Warning and Rear Vision Camera	#22048.42W1-W3 GM Safety Systems 1-3 (U.S. & Canada)

Version Information

Version	2
Modified	July 20, 2016 – Changes made to create 16-NA-149 Version 2: Add a Section for: Engine — Stop/Start System — RPO KL9, with a graphic and system operation information. Remove the Attention statement and replace that information with a Table for: Region — Countries — United States and Canada

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