

## New Colorado ZR2 Takes Off-Roading to New Heights



The new 2017 Colorado ZR2 is designed to excel off-road, whether that's tackling out-of-the-way two-tracks, technical rock crawling, or desert running. At its introduction, the ZR2 boasts more off-road technology than any other mid-size pickup.

Compared to the standard Colorado, the ZR2 has a 3.5-inch (89 mm) wider track and a suspension lifted an additional two inches (50 mm). Its rugged off-road capability is enhanced with cast-iron control arms; functional steel-tube rocker protectors; aluminum skid shields protecting the radiator, engine oil pan and transfer case; front and rear electronic locking differentials; and the first application of Multimatic Dynamic Suspensions Spool Valve (DSSV) damper technology.

ZR2-specific components include:

- Suspension system
- Electronic locking differentials
- Rear axle
- Rear drive shaft
- Rear leaf springs
- Skid shields
- Control arms
- Front halfshafts
- Steering gear and knuckles
- Coil springs
- Stabilizer bar
- 17-inch wheels and all-terrain 31-inch tires (overall diameter)
- Side rocker protection
- An optional cargo bed-mounted, full-size spare tire carrier.

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**Customer Care and Aftersales**

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## Powertrains

The ZR2 is available with two powertrain choices:

- A 3.6L V6 gasoline engine (RPO LGZ) and 8L45 8-speed automatic transmission (RPO M5T)
- A 2.8L L4 turbocharged Duramax diesel engine (RPO LWN) and 6L50 6-speed automatic transmission (RPO MYB)

The DOHC gasoline 3.6L V6 engine generates 308 horsepower and 275 lb.-ft. of torque. It features variable valve timing (VVT), Active Fuel Management (AFM) and direct injection. The 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. Use ACDelco dexos1 5W-30 viscosity grade engine oil.

The DOHC, direct-injected, turbocharged 2.8L Duramax diesel engine produces 186 horsepower and 369 lb.-ft. of torque. Engine efficiency and performance is improved by the water-cooled variable geometry turbocharger (VGT) that uses an oiling circuit with a dedicated feed to provide increased pressure at the turbocharger and faster oil delivery. The engine uses an integrated engine oil filter and integrated engine oil cooler. The oil filter is a cartridge-style paper filter designed for easy accessibility in the vehicle. Use ACDelco dexos2 5W-30 viscosity grade engine oil.



2.8L L4 turbocharged Duramax Diesel engine

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## A Salute to TechLink Contributor Dave Nowak

Meticulous may be the best way to describe Dave Nowak. Everything he had a hand in was detailed, thoughtfully planned out, and developed with a keen understanding of how the results would affect others. This goes for his professional work at GM as well as his personal life with his family.

Sadly, Dave passed away recently after complications from surgery. He was a longtime TechLink contributor — close to 17 years — and a Senior Project Engineer for Diagnostic Strategy with the Diagnostic Strategies and Methods Team for GM Customer Care and Aftersales in Warren, Michigan.

Dave's involvement with TechLink over the years has been invaluable. His detailed knowledge of electrical diagnosis as well as his insight of the challenges dealership technicians face each day helped shape our mission, while doing so with candor, intelligence, and some humor too.

Dave began his career turning wrenches at an AMC dealership. After more than a decade in the service bay, with a quickly growing technical background and a keen understanding of how to share that information with others, he spent four years as an instructor teaching automotive electronics classes. From there, he worked helping GM and IBM with the testing of CAMS (Computerized Automotive Maintenance System) — the first machine of its type used in the industry for electrical diagnosis, albeit with a unique reputation in dealerships — before joining GM in the early



1990s as an Advance Electrical Service Engineer with the Service Technology Group (STG).

In his work developing electronic diagnostic procedures in the Service Information, Dave was truly hands-on. He created GM's global service manual authoring guidelines for electrical diagnostic procedures and became a GM global subject matter expert on how to diagnose electrical problems. Maybe what made Dave so good at what he did was in how he always looked out for technicians by searching for any real-world issues that would affect diagnostics and repairs, whether that was revising component testing, determining scan tool inputs, or how to use the results of a simple resistance test. Dave was recognized for his efforts with a U.S. patent for establishing a methodology for service manual consistency.

Dave's penchant for details was evident outside of the office too. He was an avid woodworker and built his own furniture. One year, his grandkids each got a home-made miniature log cabin, with individual, hand-stained logs, as a Christmas gift. Dave even printed directions and diagrams on how to build the cabin using all of the different logs.

Of course, everything in his garage was in excellent condition, including his Cavalier convertible (maybe the last in Michigan!) and his 2002 Suburban. After all, this was a man who took apart his refrigerator to modify the fan so it would run cooler. A testament to Dave's passion for making things better, his daily-driver Suburban was included as part of the truck's 75th anniversary celebration in 2011. It turned out that GM had Suburban models in its collection to represent every major model year except 2002. When a call went out to GM employees looking for a 2002 model, Dave offered up his Suburban, which was in pristine condition and fit right in with the historical collection.

Dave will be missed by all of us at GM Customer Care and Aftersales. His mantra was to stick to the basics but do it well. He felt everything needed a solid foundation first before you could begin to build upon it. Our foundation here at TechLink is now a little weaker, but we wouldn't be where we are without him. Thanks Dave.

🙏 Thanks to the many friends and colleagues of Dave Nowak



# New Colorado ZR2 Takes Off-Roading to New Heights

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## Transfer Case

The 2-speed automatic, active transfer case (ATC) offers five modes: Auto 4WD, 4HI, 4LO, 2HI and Neutral. The automatic transfer case shift control knob is located on the instrument panel. The indicator mark on the switch must line up with the indicator light before a shift can be commanded. To command a shift, rotate the shift control knob to the desired position. The light will blink when the shift is in progress. When the shift is completed, the new position will be illuminated. If the transfer case cannot complete a shift command, it will go back to the last chosen setting.



Transfer case knob with Off-Road Driving Mode control.

The transfer case knob also features an Off-Road Driving Mode that maximizes performance on terrain with limited traction.

Off-Road Mode:

- Interacts with the axle locking system, allowing the vehicle to travel at higher speeds with a locked rear axle.
- Modifies the sensitivity of the accelerator pedal for fine linear control of torque on uneven terrain.
- Modifies the transmission shift map to hold gears for a longer period of time, providing limited slip while driving over obstacles.
- Optimizes the chassis control calibrations.
- Optimizes the performance of the ABS, traction control, and StabiliTrak systems on slippery surfaces.

## ELocker Differentials

The ZR2 is equipped with an Eaton ELocker differential on the front and rear axles. The ELocker is an electronically-controlled, selectable On-Off locking differential that provides 100 percent axle lock on demand. The differential can operate in an open position, where it channels torque to the low traction wheel, or a fully locked position.



Front and rear axle locking switches

The lockers are activated using the switches on the instrument panel. LED lights on the switches indicate when the switches are on and the status will appear on the off-roading screen on the Driver Information Center (DIC). :

To lock the rear axle, press the rear axle locking switch with the vehicle moving less than 25 mph (40 km/h). The rear axle is locked when the light on the switch remains illuminated.

The locking rear axle will disengage when vehicle speed exceeds 25 mph (40 km/h). The Off-Road Mode allows the axle lock to remain engaged at higher vehicle speeds.

To give the vehicle additional traction when driving through mud or snow and over steep hills or uneven terrain, the front axle also can be locked.

**TIP:** Before the front axle can be locked, the rear axle must be locked and the transfer case must be in 4WD Low.

Press the front axle locking switch with the vehicle stopped or moving less than 25 mph (40 km/h). The front axle is locked when the light on the switch remains illuminated. Locking the front axle will disable Hill Descent Control and the anti-lock brakes (ABS), illuminating the ABS light.

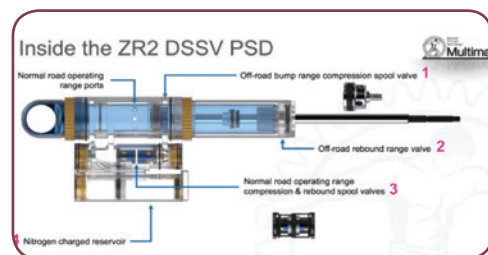
The locking front axle will disengage when vehicle speed exceeds 25 mph (40 km/h) or the transfer case is shifted out of 4WD Low.

## Multimatic DSSV Suspension

The ZR2's standard Multimatic DSSV™ (Dynamic Suspensions Spool Valve) Position-Sensitive Damping (PSD) system is tuned to handle a wide range of terrain, such as rugged trails, deep sand and mud. In these types of extreme wheel travel conditions that are often encountered while driving off-road, the PSD system uniquely optimizes damping response with the precision of spool valves, yet it also provides refined on-road driving dynamics.



The Dynamic Suspensions Spool Valve (DSSV) damping system is tuned for a wide range of terrain.



There are three spool valves in the each damper.

There are three spool valves in the ZR2-specific dampers. Each valve has laser-cut ports precisely controlling oil flow in response to the damper's internal pressure for ultimate performance.

PSD system components include:

1. Off-road bump range compression spool valve
2. Off-road rebound range valve
3. Normal road operating range compression and rebound spool valves
4. Nitrogen-charged reservoir
5. Normal road operating range ports

For additional information on the new 2017 Colorado ZR2, refer to Bulletin #17-NA-061.

☎ Thanks to Charles Hensley and Sherman Dixon

# UPDATE: Quick Learn Procedures for Programming 2017MY Keys and Key Fobs

New for 2017 model year vehicles, two keys that are already programmed or two previously learned Remote Keyless Entry (RKE) transmitters (key fobs) need to be present in order to use the quick learn procedure for adding keys or key fobs to all GM models excluding 2017 Acadia Limited, Enclave, Traverse, Express and Savana.

On 2016 and earlier models, only one learned key or key fob is needed to perform the quick learn procedure.

## Programming Additional Keys

**TIP:** If only one learned key is present, SPS must be used to add additional keys. The quick learn procedure will not complete with only one learned key. Using only one key for the quick learn procedure will cause the theft security light to illuminate when attempting to start the vehicle.

To program a new key for keyed vehicles:

1. Insert the original, already programmed key in the ignition and turn the key to ON/RUN.
2. Turn the key to LOCK/OFF, and remove the key.
3. Within five seconds, insert the second already programmed key in the ignition and turn it to ON/RUN.
4. Turn to the key to LOCK/OFF, and remove the key.
5. Within five seconds, insert the new key to be programmed and turn it to ON/RUN. The theft security light will turn off once the key has been programmed.
6. Repeat these steps to program additional keys.

The adding keys procedure does not erase any keys prior to programming. The procedure will simply program the key into the

next available slot. Use this procedure when adding an additional key to the vehicle.

If all keys are lost, the 30 minute learn procedure should be used. Once a key is learned with 30 minute learn procedure, all previously known keys will no longer work with the vehicle.

## Programming Additional RKE Transmitters

**TIP:** If only one transmitter is present, the quick learn procedure will not complete and a Remote Learn Pending message will display on the vehicle's Driver Information Center (DIC). The new transmitter will not be learned and cannot be reprogrammed. Use SPS to add a new transmitter to the vehicle instead of the quick learn procedure.

The Adding Transmitters, also referred to as Adding Keys, programming does not erase any keys. The programming simply adds a key into the next available slot. If a new transmitter is being learned to replace a damaged, inoperative, or stolen transmitter, follow the Replacing Transmitters procedure to ensure that an old transmitter cannot be used.

Before performing the quick learn procedure to add a transmitter, verify all mechanical keys operate correctly.

To program a new transmitter, the vehicle must be off and all transmitters, both currently recognized and new, must be present.

1. Place the two recognized transmitters in the cupholder.
2. Remove the key lock cylinder cap on the driver's door handle. Insert the vehicle key from the transmitter into the key lock cylinder on the driver's door and turn the key counterclockwise, to the

unlock position, five times within 10 seconds. The DIC will display READY FOR REMOTE #2, 3, 4, etc.

3. Place the new transmitter into the transmitter pocket. The transmitter pocket is inside the center console storage compartment between the driver's seat and front passenger's seat. (Fig. 3) The storage compartment will need to be opened and the storage tray (if equipped) must be lifted up to access the transmitter pocket.
4. Press Engine Start/Stop. When the transmitter is learned, the DIC will display that it is ready to program the next transmitter.
5. Remove the transmitter from the transmitter pocket and press the transmitter Lock or Unlock button.

To program additional transmitters, repeat Steps 3–5.

When all additional transmitters are programmed, press and hold Engine Start/Stop for 12 seconds to exit programming mode.

6. Place the vehicle key back into the transmitter.

Refer to #PIC6208 for additional information on the quick learn procedure for 2017 models.

Refer to the appropriate Service Information for complete details on RKE transmitter programming for each specific GM model.

If keys/fobs of vehicles with under 100 miles are lost or damaged in transit/transportation to the dealership, use labor code 0500010.

🙏 Thanks to Lori Brohl

## Spin-On Oil Filter Replacement

The correct match of oil filter to engine application is more important now than ever with the tight tolerances, two stage oil pumps and high flow lubrication requirements of today's modern engines.

Beginning in 2012, oil pumps began to regulate main gallery feedback instead of pump out pressure, which means that the oil pump does not begin to regulate until pressure is built up to the main gallery. This change reduces the amount of time it takes to provide oil to the engine bearing and lifters during extreme cold start conditions.

To meet these new engine operating requirements, the oil filter specifications of

production oil filters and service oil filters have been improved. If a replacement oil filter with an internal bypass valve opening pressure specification of 15 PSI (100 kPa) or less is used, debris could circulate in the engine and cause damage to bearings and other tight tolerances areas, and eventually lead to premature engine failure.

### PF64 and PF63 Filters

The PF64 and PF63 filters are commonly confused as an ACDelco PF48 and/or PF48E filter because both oil filters have the same appearance and oil can size. However, these oil filters are not the same and have different internal bypass valve

opening pressure specifications. The PF48/PF48E has a pressure specification of 15 PSI (100 kPa) while the PF64/PF63E has a pressure specification of 22 PSI (150 kPa).

Refer to the Electronic Parts Catalog (EPC) to determine the proper part numbers for a replacement oil filter. If an aftermarket filter is used, it must have an internal bypass valve opening pressure specification, element integrity, filtration performance, media particle trap specification and burst strength that is equivalent to the original production oil filter.

🙏 Thanks to Tracy Lucas

# Passenger Presence System Service Kit

When diagnosing a failed Passenger Presence System (PPS) pressure sensor on current models of the Buick Cascada, Envision, LaCrosse; Chevrolet Bolt, Camaro, Colorado, Corvette, Cruze, Malibu, Silverado, Spark, Suburban, Tahoe; Cadillac CT6, Escalade, XT5; GMC Acadia, Canyon, Sierra, and Yukon, the new sensor will come with a seat cushion as part of a service kit. Do not install the new pressure sensor without the new seat cushion. These two parts are part of a calibrated set.

**TIP:** Replace the Passenger Presence System as a complete assembly. Do not mix any of the old parts with the new parts.

Recently, parts returned under warranty show that the sensor is being replaced while the seat cushion is not. If only the new sensor is installed, the repair is incomplete and the PPS may not operate properly. As a general rule, install all of the parts included in a service kit.

Each of the foam seat cushions are stamped with the date and time of production. If the sensor is replaced without the seat cushion and GM calls for the parts, it will be evident that the repairs were not completed properly.

## PPS Operation

The Passenger Presence System is used to monitor the type of occupant that is sitting in the front passenger seat and communicates the status to the inflatable restraint sensing and diagnostic module. The inflatable restraint sensing and diagnostic module uses this information to determine whether to enable or suppress the deployment of the passenger instrument panel air bag. The Passenger Presence Module consists of an electronic control module, a pressure sensor mat in the seat, a harness, and passenger air bag on/off indicators.

The Passenger Presence Module transmits and receives a low-level electric field. The measured capacitance value of this field is used to determine the type of occupant sitting in the front passenger seat. If the measured capacitance is less than a calibrated value, the passenger instrument panel air bag is disabled. If the measured capacitance is greater than a calibrated value, the passenger instrument panel air bag is enabled.

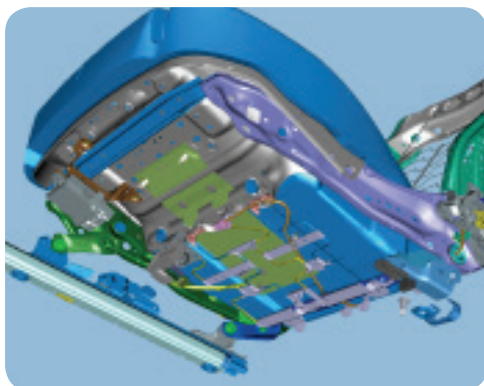
Previous PPS systems had the pressure sensor located on top of the seat cushion. On the current PPS system, the pressure sensor is located under the seat cushion foam.

**TIP:** The PPS is a calibrated system that requires rezeroing anytime the seat cushion trim attachments have been removed or the PPS has been replaced. Refer to the appropriate Service Information during any seat repairs.

🙏 Thanks to Bill Taylor



PPS service kit, including the pressure sensor and seat cushion.



PPS sensor (light green color) on the Cruze front passenger seat

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# Top Questions on 2018 Equinox

The Chevrolet Equinox is an all-new model for 2018 with a variety of new features that may be unfamiliar to some customers. As a result, customers may bring their vehicle into the dealership for service when a system is actually operating as designed. Here are a few of the top customer questions seen in dealerships recently on the 2018 Equinox.

## Why is Lane Keep Assist not functioning?

The customer may be expecting a warning chime when the Lane Keep Assist with Lane Departure Warning system is active. However, there is not a warning chime if the system determines the driver is actively steering. The Lane Keep Assist system can be turned on/off using the button on the steering wheel.



Lane Keep Assist button

Lane Keep Assist will provide steering input to gently turn the steering wheel to help center the vehicle in the traffic lane if the vehicle approaches a detected lane marking without using a turn signal in that direction. The Lane Keep Assist icon is green on the instrument cluster if the system is available to assist. The Lane Keep Assist icon will turn amber when the system is providing steering input. As the driver actively steers the vehicle, the steering input and amber indicator may not be noticed.

If the driver does not actively steer the vehicle and crosses the lane marking without using a turn signal in that direction, the Lane Departure Warning will then provide a warning by flashing the amber icon and pulse the Safety Alert Seat or sound a chime/beeps (if selected in the Settings menu).

More information about the operation of the Lane Keep Assist system can be found at [my.chevrolet.com/learn](http://my.chevrolet.com/learn).



The Lane Keep Assist icon is amber when the system is providing steering input.

**TIP:** The Safety Alert Seat settings can be changed using the infotainment system by going to Settings > Vehicle > Collision/Detection Systems > Alert Type. Audible beeps or seat pulsing alerts may be selected.

## Why does the engine turn off at a stop?

The 2018 Equinox features Auto Engine Stop/Start to help conserve fuel and provide better fuel economy. The Auto Engine Stop//Start system shuts down the engine when the vehicle comes to a complete stop, referred to as an Auto Stop, if operating conditions are met. To indicate an Auto Stop, the tachometer will read AUTO STOP. The audio system, climate controls and other accessories will continue to operate. The engine will restart upon releasing the brake pedal or applying the accelerator pedal. The tachometer will read OFF when the engine is turned off using the ignition pushbutton.

The engine may not turn off at a stop or



AUTO STOP and OFF markings on the tachometer

may restart if any of the following conditions apply:

- A minimum vehicle speed is not reached.
- The engine or transmission is not at the required operating temperature.

- The outside temperature is not in the required operating range.
- The shift lever is in any gear other than Drive (D).
- The battery charge is low.
- The climate control system requires the engine to run based on the climate control or defog setting.
- The Auto Stop time is greater than two minutes.

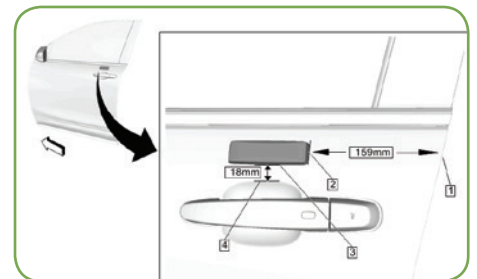
## Are there new OnStar voice commands?

The OnStar system has been updated for the 2018 model year with a number of new voice commands designed to make the system easier to use. The new commands are shorter and more direct, so users can quickly instruct the system without identifying a menu or topic. Here are some of the most commonly used updated voice commands.

For additional information on the operation of various features of the 2018 Equinox, refer to the Owner's Manual.

## Keyless Keypad Instructions

In addition to customer questions, there may be some questions on the part of technicians as well. One question is how to install the keyless keypad accessory.



Keyless keypad instructions

The wireless keypad instructions can be found in the Accessories manual in the Service Information. Look for document ID #4694211. Contact the Techline Customer Support Center for additional support if needed during installation.

**TIP:** Do not install the keypad on the vehicle until it has been programmed and verified that it is working correctly with the vehicle.

🙏 Thanks to Tyler Greenhill