Bulletin No.: 17-NA-061

Date: Mar-2017

Service Bulletin

INFORMATION

Subject: 2017 Chevrolet Colorado ZR2 New Model Features

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		From:	To:	From:	To:		
Chevrolet	Colorado ZR2	2017	2017	All	All	2.8L, 4 Cylinder, L4, DOHC, DI, Turbocharged, Duramax® Diesel — RPO LWN — 3.6L, 6 Cylinder, V6, DOHC, DI, VVT, VAR 2, GEN 2, Gasoline — RPO LGZ	Hydra-Matic™ 6L50 6-Speed Automatic Transmission — RPO MYB — Hydra-Matic™ 8L45 8-Speed Automatic Transmission — RPO M5T

Involved Countries	United States and Canada

Overview

Chevrolet Colorado ZR2 4-Wheel Drive (4WD)

Bulletin Purpose

This is a special bulletin to introduce the 2017 Chevrolet Colorado ZR2 4WD mid-size truck. The purpose of this bulletin is to help the Service Department Personnel become familiar with some of the vehicle's new dedicated features and its off-road capabilities and to describe some of the action they will need to take to service this vehicle.

Overview

The 2017 ZR2 is the new performance variant of the Chevrolet Colorado and the exterior design was shaped by the desire to improve its driving capabilities over mud, sand and rock. Compared to a standard Colorado Z71, the ZR2 has a more aggressive side profile, features a much wider track, with the suspension lifted an additional 2 inches (50 mm) to provide greater ground clearance. The front and rear track has been widened by 3.5 inches (89 mm) and has new cast-iron control arms for strength and increased durability in off-road situations. The ZR2 excels in tight two-tracks, technical rock-crawling, fast desert running and on pavement. The ZR2 is poised to reset expectations for off-road trucks and will feature more off-road technology than any other mid-size pickup in its segment when it is initially launched. Functional steel-tube rocker protectors are standard equipment and are strong enough to protect the body side while dragging the truck against a rock face. The front and rear bumpers have been modified for additional off-road ground clearance. Compared to full-size off-road trucks, the ZR2 is about a foot narrower and 500 pounds (227 kg) lighter, enabling greater agility over obstacles and getting it through tighter spots resulting in better access to an increased variety of demanding trails. Class-exclusive features include front and rear electronic locking differentials, an available 2.8L Duramax® diesel engine, and the first off-road application of Multimatic Dynamic Suspensions Spool Valve (DSSV™) damper technology. The ZR2 can go rock crawling on Saturday, desert running on Sunday, and be comfortably driven to work on Monday.

The following parts and systems are specific to the ZR2:

- 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.

Bumper — Skid Shield

The front bumper of the ZR2 has tapered ends, to increase tire clearance when approaching obstacles. The bumper also integrates a thick, aluminum skid shield protecting the radiator and engine oil pan, while the transfer case is protected by an additional skid shield. The rear bumper has also been modified to provide better off-road clearance.

Grille and Hood

The ZR2 displays its Chevrolet golden bowtie right in the middle of its aggressively restyled black grille, which complements the swooping hood design that has an integrated black insert.

Trailering — Load Capacity — Gross Combination Weight Rating

Notice: Refer to Vehicle Load Limits for more information about the vehicle's maximum load capacity and to Trailer Towing in the Owner Manual or in SI.

- Even with all of the off-roading upgrades over the base Colorado truck, the ZR2 can still tow up to 5,000 pounds (2,268 kg) which is the Maximum Trailering Weight as indicated in the Owner Manual. This is enough capacity to pull a camper, a trailer with dirt bikes, jet skis, snow mobiles, camping equipment and/or other toys, or carry 1,100 pounds (499 kg) of payload.
- The ZR2 when equipped with the V6 gasoline engine has a Gross Combination Weight Rating (GCWR) of 10,300 pounds (4,672 kg) which is the total allowable weight of the completely loaded vehicle and trailer including any passengers, cargo, equipment, and conversions. When equipped with the L4 diesel engine the GCWR is 10,700 pounds (4,853 kg). The GCWR for the ZR2 should not be exceeded.

Wheels and Tires

The ZR2 also features 17 x 8 inch aluminum wheels, in a pattern exclusive to the ZR2, which are wrapped in 31-inch Goodyear Duratrac off-road tires providing exceptional traction.

Spare Tire

An optional cargo bed mounted, full-size spare tire carrier is available as an accessory. The bed-mounted spare tire adds a rugged look to ZR2, and serves a functional purpose. By relocating the spare tire to the bed, ZR2's departure angle is improved and also prevents any damage to the spare tire when crawling over obstacles.

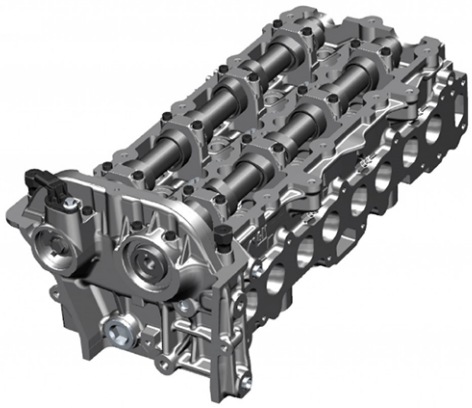
2.8L Duramax® Turbocharged Diesel Engine — RPO LWN

The 2017 ZR2 is the only off-road pickup in the segment that offers an optional diesel engine, specifically the 2.8L Duramax® diesel engine.

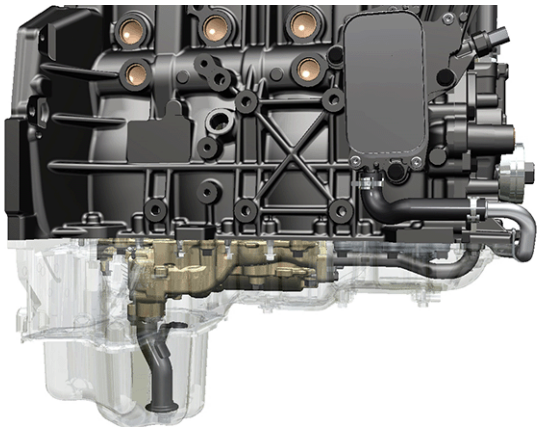
Engine Specifications and Components

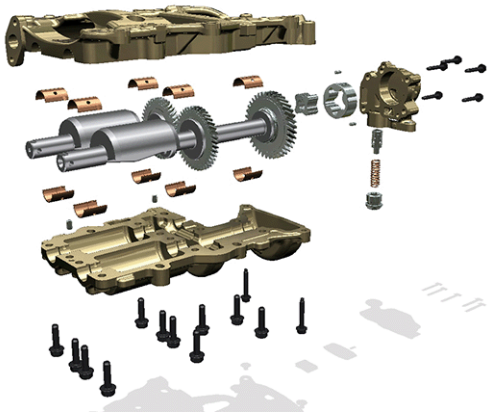
The following include engine specifications and components:

- **Engine Type:** 2.8L Duramax® inline 4 cylinder turbocharged diesel.
- **Displacement:** 2.8 liters, 170 cubic inches.
- **Peak Horsepower:** SAE certified at 186 horsepower (139 kW) at 3,400 rpm.
- **Peak Torque:** SAE certified at 369 lb-ft (500 Nm) of torque at 2,000 rpm. A broad torque band makes it very powerful at low rpm while the turbocharged performance provides immediate and smooth horsepower on demand.
- **Engine Block Material:** Cast iron cylinder block, machined in-house at GM's plant in Rayong, Thailand.
- **Cylinder Head Material:** Cast aluminum alloy with newly enlarged exhaust ports, bigger water passages and an improved oil distribution channel for in-head lubrication.
- **Compression Ratio:** 16.5:1
- **Bore:** 3.70 inches (94 mm).
- **Stroke:** 3.94 inches (100 mm)
- **Fuel Injection:** Direct injection, high pressure, solenoid operated injectors at 29,000 psi (2000 bar) with a common rail. High pressures improve engine efficiency and performance and reduce CO2 and fuel consumption.



- **Valvetrain:** Dual overhead camshafts (DOHC), 16 valves (4 valves per cylinder) with a roller finger follower actuator system. Valve springs are standard and the seats are sintered metal pressed in, then later machined.
- **Camshafts:** The camshafts are tubular, utilizing cast steel sintered lobes that are pressed onto the camshaft and then machined to profile.
- **Crankshaft:** Forged steel crankshaft, machined in-house at GM's plant in Thailand. The crankshaft is fully balanced.
- **Connecting Rods:** Forged steel connecting rods.
- **Pistons, Rings and Cooling:** Traditional deep-dish design cast aluminum pistons with floating piston pin, cored oil cooling gallery with oil cooling jets and three ring design — a top, middle and oil ring.





- **Balance Shaft:** The balance shaft is more centered in the engine, which contributes to increased smoothness. The balance shaft assembly is bolted to the bottom of the cylinder block. It is driven from a gear at the rear of the crankshaft. The balance shaft also drives the oil pump gear-to-gear.
- **Oil Pan:** The laminated steel oil pan is assembled with an upper aluminum section that contributes to engine rigidity and quietness.
- **Ceramic Glow Plugs:** Ceramic glow plugs provide shorter heat-up times and higher glow temperatures than metallic glow plugs.
- **Cooled EGR:** The cooled EGR contributes to lower emissions by diverting some of the engine-out exhaust gas and mixing it back into the fresh intake air stream, which is drawn into the cylinder head for combustion. That process lowers combustion temperatures and rates, improving emissions performance by reducing the formation of NOx.
- **Variable Geometry Turbocharger (VGT):** A water-cooled VGT provides optimal power across the engine RPM band. It uses an oiling circuit that includes a dedicated feed for the VGT to provide increased pressure at the turbocharger and faster oil delivery. The compressor wheel was retooled to optimize high-altitude capability and to meet emissions standards at the higher altitudes that may be encountered in certain areas of North America.
- **Composite Intake Manifold:** A composite intake manifold is used on this engine for weight reduction and to reduce the transfer of engine noise.
- **Biodiesel Fuel:** The engine is B20 biodiesel fuel capable.
- **Soft Timing Belt:** The engine uses a soft timing belt that's good for a 150,000 mile (240,000 km) service interval. It was selected for packaging, lower noise production and serviceability to −40°F (−40°C).
- **Optional Block Heater:** The optional block heater is a wet heater through the side of the engine block for those extreme below −20°F (−29°C) temperatures. The heater is attached through a cast-in port and it can be retrofitted through the block plug if a used vehicle is bought but didn't ship with one originally.
- **Integrated Engine Oil Filter and Integrated Engine Oil Cooler:** The engine uses an integrated engine oil filter and an integrated engine oil cooler. The

oil filter is a cartridge-style paper filter designed for ease of service and accessibility in the vehicle.

Engine Oil — dexos2® — Diesel Engine

Specification and Viscosity Grade

Ask for and use engine oils that meet the dexos® specification. Engine oils that have been approved by GM as meeting the dexos2® specification are marked with an approved logo as shown. For additional information, visit this General Motors website: **http://www.gmdexos.com** In the Duramax® diesel engine, use ACDelco® dexos2® SAE 5W-30 viscosity grade engine oil. In an area of extreme cold, where the temperature is less than −20°F (−29°C), use ACDelco® dexos2® SAE 0W-40 viscosity grade engine oil. An oil of this viscosity grade will provide easier cold starting for the engine at these colder temperatures.

3.6L Gasoline Engine — RPO LGZ

The 3.6L V6 — RPO LGZ is based on GM's 3.6L V6 — RPO LGX engine, which launched GM's second-generation double-overhead-cam engine architecture, but it is tuned for truck use. It has improved variable valve timing (VVT), active fuel management (AFM) and direct injection (DI). The DI system on this engine

places the high pressure fuel injectors in the cylinder heads. This engine incorporates 2 intake and 2 exhaust valves per cylinder, and uses a dual overhead cam design with individual intake and exhaust camshafts. A camshaft position actuator is mounted on each camshaft. The cylinders are arranged in 2 banks of 3 at a 60 degree angle. The right bank of cylinders are number 1-3-5 and the left bank of cylinders are 2-4-6, viewed from the flywheel end of the engine.

Engine Specifications and Components

The following include engine specifications and components:

- **Firing Order:** The engine firing order is 1-2-3-4-5-6
- **Horsepower:** 308 hp (230 kW) @ 6,800 rpm (SAE-certified).
- **Torque:** 275 lb-ft (373 Nm) @ 4,000 rpm (SAE-certified).
- **Active Fuel Management:** Active Fuel Management (AFM) 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.
- **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. All 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 ActuatorSystem:** The engine incorporates a camshaft position actuator for each intake and exhaust camshaft. The camshaft position actuator is a hydraulic vane-type actuator that changes the camshaft lobe timing relative to the camshaft drive sprocket. 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.
- **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 LGZ both for compression ratio and combustion efficiency. The piston uses two low tension compression rings and one multi-piece oil control ring.
- **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.
- **Crankcase:** The cylinder block is constructed of aluminum alloy by precision sand-casting with cast in place iron cylinder liners. Each nodular main bearing cap incorporates 6 bolts bolting the cap into the engine block. Along with 2 outer and 2 inner bolts, 2 side bolts are used in the deep skirt block. To prevent aeration, oil return from the valve train and cylinder heads is channeled away from the rotating and reciprocating components through oil drain back passages incorporated into the cylinder heads and engine block. Pressure-actuated piston oil cooling jets are mounted between opposing cylinders. Twin knock sensors are located in the valley of the block between the cylinder heads. The knock sensors have an acoustic foam noise barrier that surrounds them in the valley.
- **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 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 LGZ 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 LGZ 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 LGZ 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 LGZ 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 LGZ 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 LGZ 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 LGZ 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 through 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).

Engine Oil — dexos1® — Gasoline Engine

Specification and Viscosity Grade

Ask for and use engine oils that meet the dexos® specification. Engine oils that have been approved by GM as meeting the dexos1® specification are marked with an approved logo as shown. For additional information, visit this General Motors website: **http://www.gmdexos.com** In the 3.6L, V6 gasoline engine, use ACDelco® dexos1® SAE 5W-30 viscosity grade engine oil. In an area of extreme cold, where the temperature is less than −20°F (−29°C), use ACDelco® dexos1® SAE 0W-30 viscosity grade engine oil. An oil of this viscosity grade will provide easier cold starting for the engine at these colder temperatures.

Transfer Case

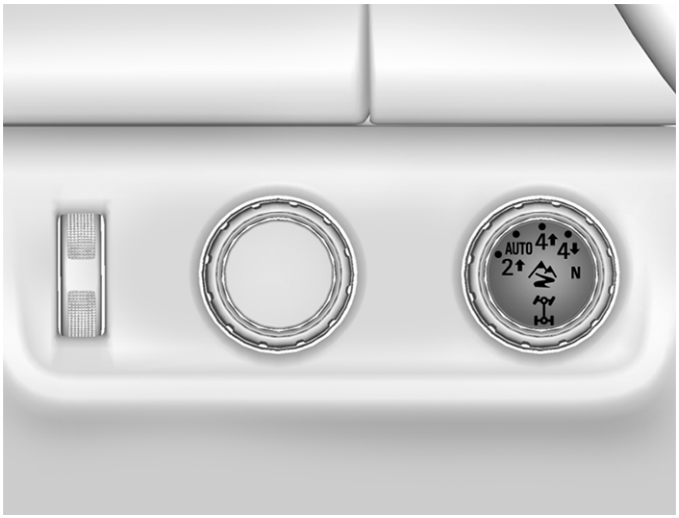
Transfer Case — RPO NQ6

The Magna Powertrain (MP) model MP-3025G RPO-NQ6 transfer case is a 2 speed automatic, active transfer case (ATC). The MP 3025G RPO-NQ6 ATC provides 5 modes, Auto 4WD, 4HI, 4LO, 2HI and NEUTRAL. The Auto 4WD position allows the capability of an active transfer case, which provides the benefits of on-demand torque biasing wet clutch and easy vehicle tuning through software calibrations. The software calibrations allow more features such as flexible adapt ready position and clutch preload torque levels. The technology allows for vehicle speed dependent clutch torque levels to enhance the performance of the system.

Automatic Transfer Case Shift Control Knob with Off-Road Mode

The automatic transfer case shift control knob is located on the instrument panel. Use it to shift ***into*** and ***out*** of 4WD. All of the lights will blink ON then OFF momentarily when the ignition is moved to the ON/RUN position. The light that remains ON will indicate the state of the Transfer Case. If the indicator mark on the switch does not match up with the light then that likely means the switch was moved when the ignition was OFF. 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 new desired position. The light will blink meaning that the shift is in progress. When the shift is completed the new position will be illuminated. If the transfer case can not complete a shift command, it will go back to its last chosen setting.

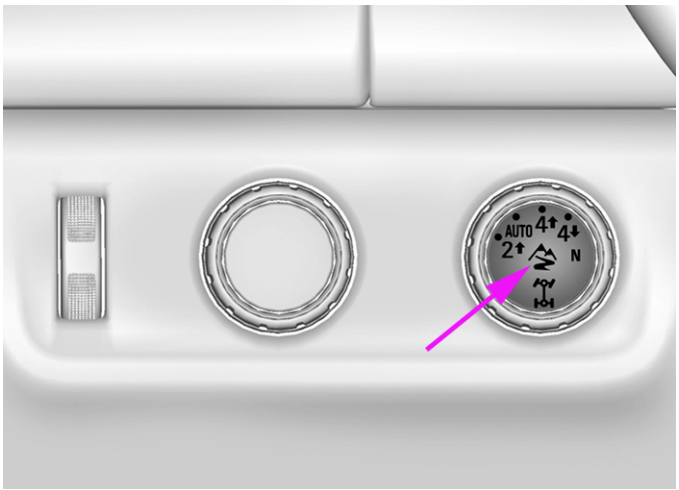
Shift Control Knob



The shift control knob settings operate as follows:

- **N (Neutral):** Use only when the vehicle needs to be towed.
- **2 (with upward arrow) Two-Wheel Drive High:** Use 2WD High for driving on most streets and highways. The front axle is not engaged. This setting provides the best fuel economy.
- **AUTO (Automatic Four-Wheel Drive):** Use AUTO when road surface traction conditions are variable. When driving in AUTO, the front axle is engaged, and the vehicle's power is sent to the front and rear wheels automatically based on driving conditions.
- **4 (with upward arrow) Four-Wheel Drive High:** This setting engages the front axle. Use 4WD High when extra traction is needed, such as when driving on snowy or icy roads, or when off-roading.
- **4 (with downward arrow) Four-Wheel Drive Low:** This setting engages the front axle and delivers extra torque. Use 4WD Low when driving off-road in deep sand, deep mud, or deep snow, and while climbing or descending steep hills. 4WD Low will turn Traction Control and StabiliTrak® OFF. When the vehicle is in 4WD Low and the front axle is locked, the ABS warning light will turn ON because ABS is disabled. When the switch is pressed again to unlock the front axle the ABS warning light will turn OFF.
- **Off-Road Driving Mode:** The Off-Road Driving Mode attempts to maximize vehicle performance on terrain with limited traction. Refer to the subsection titled: Driver Mode Control (Off-Road Driving Mode).

Driver Mode Control (Off-Road Driving Mode)



The Off-Road Driving Mode attempts to maximize performance on terrain with limited traction. It is turned ON by ***pressing and releasing the center of the shift control knob***. The Off-Road Mode is accessible in all transfer case modes and is turned OFF automatically when the vehicle ignition is turned OFF.

Off-Road Mode facilitates limited traction driving by:

- Off-Road Driving Mode interacts with the axle locking system. It allows the vehicle to travel at higher speeds with a locked rear axle.
- Modifying the sensitivity of the accelerator pedal for fine linear control of torque on uneven terrain.
- Modifying the transmission shift map to hold gears for a longer period of time, in order to limit slip while driving over obstacles.

- Optimizing the chassis control calibrations.
- Optimizing the performance of the anti-lock brake (ABS), Traction Control System (TCS) and StabiliTrak systems on slippery surfaces.

Eaton ELocker® Differential

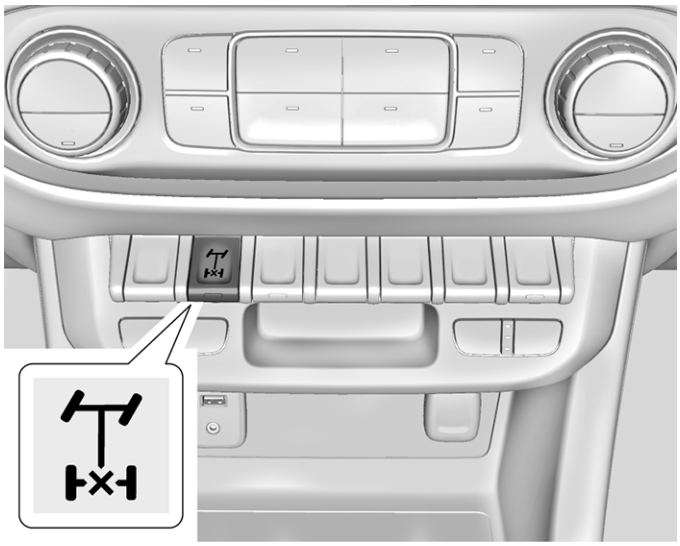
ELocker® Operation

The ZR2 is equipped with the Eaton ELocker differential on the front and rear axles. It is an electronically controlled, selectable ON-OFF locking differential that will provide 100 percent axle lock ***on demand***. ELocker® differentials operate in either ***open*** or ***fully locked*** position. The differential normally operates in an ***open*** position meaning it will channel torque to the low traction wheel. When the driver determines there is a need for maximum traction, such as driving over ar obstacle or when on rough terrain, they can activate one or both of the lockers using the switches on the instrument panel. The driver ***must*** activate the front ELocker in 4WD Low range and ***only*** with the rear ELocker engaged **first**. LED lights near the switches indicate when the switches are ON, and the status will appear on the driver information center (DIC) on the off-roading screen. The ELockers operate in forward or reverse and utilize the same 3.42 axle gear ratio as the baseline Colorado.

Locking the Rear Axle

The locking rear axle will give the vehicle additional traction from the rear wheels when traveling in off-road situations such as mud, snow, steep hills, and uneven terrain. Before the front axle can be locked, the rear axle must be locked and the transfer case must in 4WD Low.

To lock the rear axle:



1. Press the rear axle locking switch with the vehicle moving less than 40 km/h (25 mph).
2. Wait for the light in the switch to stop flashing and remain illuminated to show that the rear axle is locked.

The locking rear axle will be disengaged when the vehicle speed exceeds 25 mph (40 km/h). The Off-Road Mode allows the axle lock to remain engaged at higher vehicle speeds. After pressing the switch to unlock the axle, it may remain locked due to torque in the driveline. The axle is more easily unlocked by turning the steering wheel to the right and to the left while traveling at a low speed.

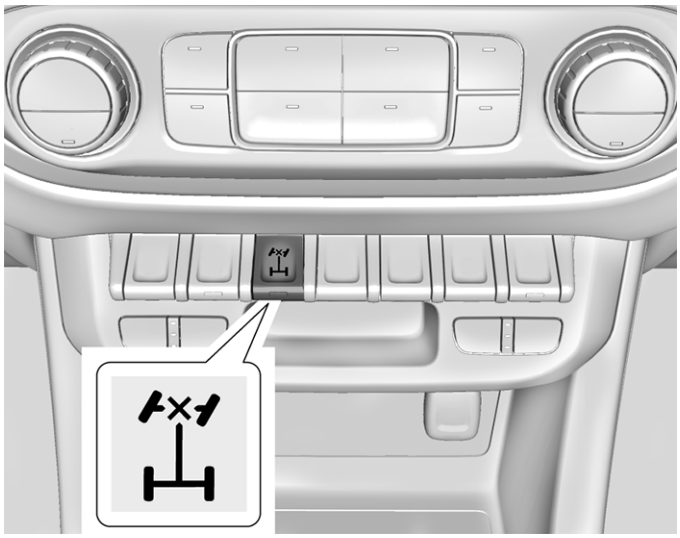
Locking the Front Axle

The locking front axle can give the vehicle additional traction when traveling in off-road situations such as mud, snow, steep hills, and uneven terrain.

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

To lock the front and rear axles, perform the following:

1. Place the transfer case in 4WD Low. This is the only mode that allows the front axle to lock.
2. Press the rear axle locking switch with the vehicle stopped or moving less than 25 mph (40 km/h).
3. Wait for the light in the switch to stop flashing and remain illuminated to show that the rear axle is locked.



4. Press the front axle locking switch with the vehicle stopped or moving less than 25 mph (40 km/h).
5. Wait for the light in the switch to stop flashing and remain illuminated to show that the front axle is locked.
   Locking the front axle will disable ABS, illuminate the ABS light and disable Hill Descent Control (HDC).

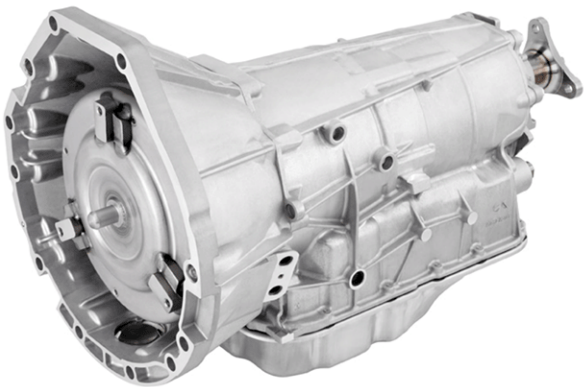
The locking front axle will disengage when the vehicle speed exceeds 25 mph (40 km/h) or the transfer case is shifted out of 4WD Low.

After pressing the switch to unlock the axle, it may remain locked due to torque in the driveline. The axle is more easily unlocked by turning the steering wheel t the right and to the left while traveling at a slow speed.

ABS will be automatically enabled and the ABS warning light will turn OFF when the locking front axle is disengaged.

If HDC was enabled prior to axle lock, it will be automatically enabled when the locking front axle is disengaged.

Hydra-Matic™ 6L50 6-Speed Automatic Transmission — RPO MYB



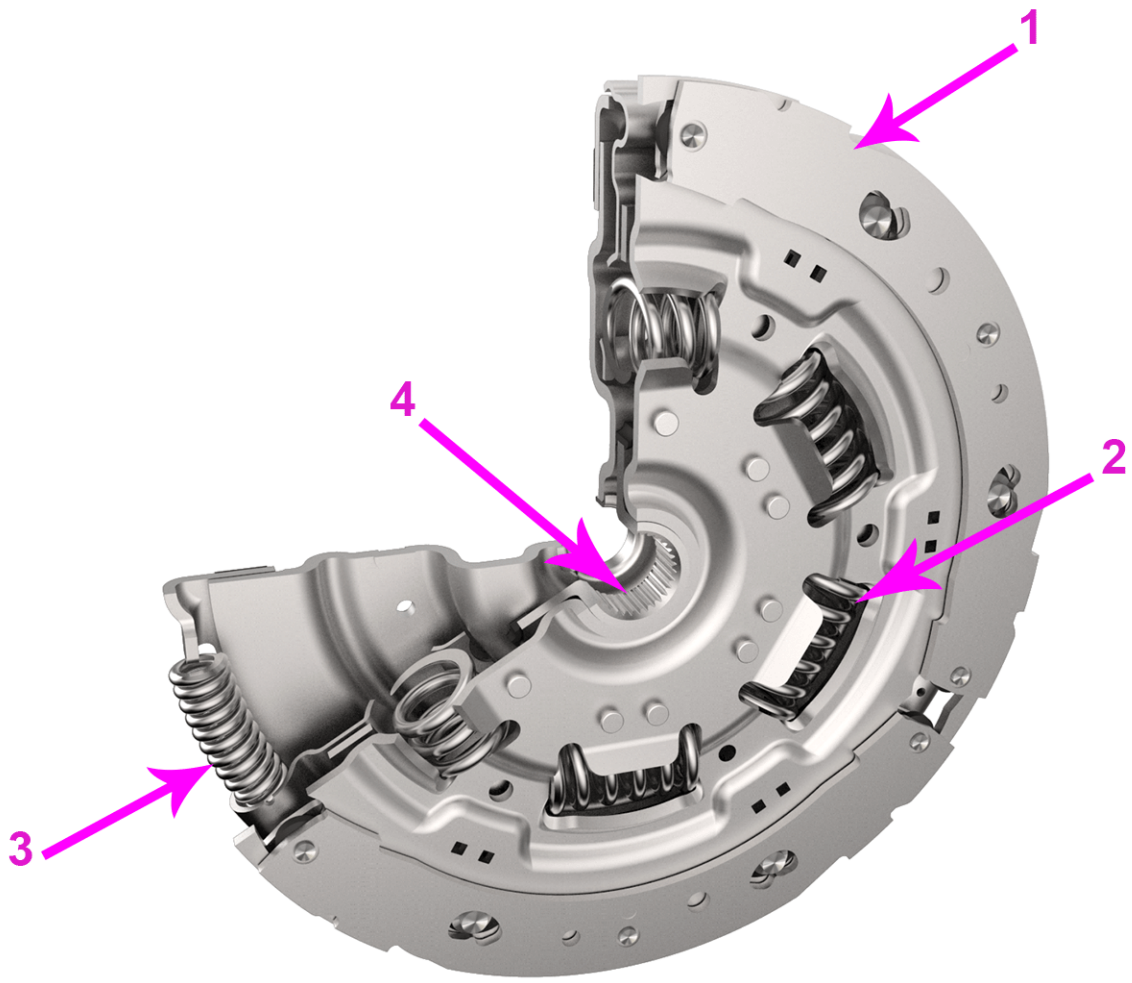
Transmission General Description

The Hydra-Matic™ 6L50 is a fully automatic, 6-speed, rear-wheel drive, electronic-controlled transmission. It consists primarily of a 4 element torque converter, an integral fluid pump and converter housing, a single and double planetary gear set, friction and mechanical clutch assemblies, and a hydraulic pressurization and control system. There are four variants of the transmission, all based on torque capacity. Architecture is common between the variants, and component differences are primarily related to size. The 4 element torque converter contains a pump, a turbine, a pressure plate splined to the turbine, and a stator assembly. 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. The

planetary gear sets provide the 6 forward gear ratios and reverse. Changing gear ratios is fully automatic and is accomplished through the use of a transmission control module (TCM) located inside the transmission. The TCM receives and monitors various electronic sensor inputs and uses this information to shift the transmission at the optimum time.

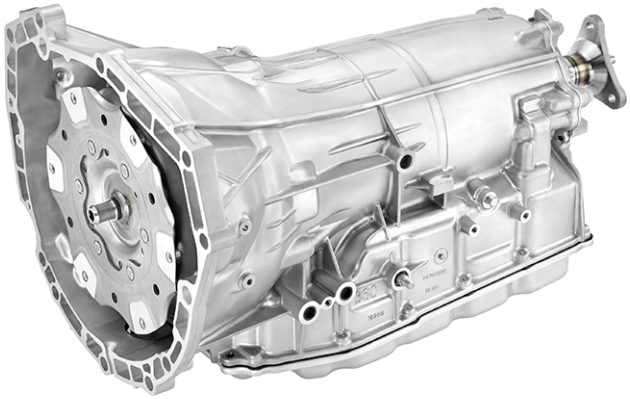
Centrifugal Pendulum Vibration Absorber

To control vibration and noise inside the Colorado, GM engineers **integrated** a device called a centrifugal pendulum vibration absorber (CPVA) in the torque converter that is used with the standard Hydra-Matic™ 6L50 6-speed automatic transmission. The CPVA is an absorbing damper with a set of secondary spring masses, that when energized cancels out the engine's torsional vibrations so the driver and passengers can't feel them. In this unique design the spring masses vibrate in the opposite direction of the torsional vibrations of the engine balancing out undesirable torsional vibrations.



1. Pendulum masses.
2. Output isolator spring.
3. Input isolator spring.
4. Output hub.

Hydra-Matic™ 8L45 8-Speed Automatic Transmission — RPO M5T



Transmission General Description

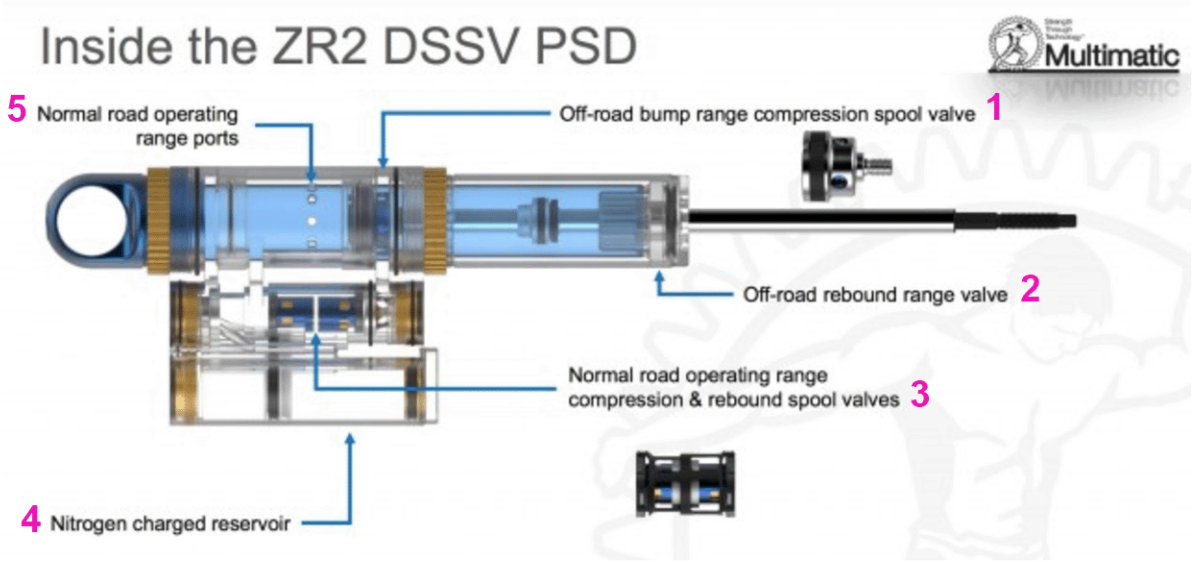
The Hydra-Matic™ 8L45 is a fully automatic, 8-speed, rear-wheel drive, electronic-controlled transmission. The eight speed ratios are generated using four simple planetary gearsets, two brake clutches, and three rotating clutches. The resultant on-axis transmission architecture utilizes a squashed torque converter, an off-axis pump and four close coupled gearsets. The three rotating clutches have been located forward of the gearsets to minimize the length of oil feeds which provides for enhanced shift response. There are different variants of the transmission, all based on torque capacity. Architecture is common between the variants, and component differences are primarily related to size. The transmission architecture features a case with integral bell housing for enhanced powertrain stiffness. A unique pump drive design allows for off-axis packaging very low in the transmission. The pump is a binary vane type which effectively allows for two pumps in the packaging size of one. This design and packaging strategy not only enables low parasitic losses and optimum priming capability but also provides for ideal oil routing to the controls system, with the pump located in the valve body itself. The transmission control module (TCM) is externally mounted, enabling packaging and powertrain integration flexibility. The controller makes use of three speed sensors which provide for enhanced shift response and accuracy. The 4-element torque converter contains a pump, a turbine, a pressure plate splined to the turbine, and a stator assembly. 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. The planetary gear sets provide the 8 forward gear ratios and reverse. Changing gear ratios is fully automatic and is accomplished through the use of a transmission control module (TCM). The TCM receives and monitors various electronic sensor inputs and uses this information to shift the transmission at the optimum time.

Suspension

Multimatic DSSV™ Position-Sensitive Damping

The centerpiece of the 2017 Colorado ZR2 is its standard Multimatic DSSV™ (Dynamic Suspensions Spool Valve) Position-Sensitive Damping (PSD) system. Multimatic's PSD technology that is used on the ZR2 is tuned to cover a wide spectrum of driving needs such as on rugged trails, in deep sand and in mud and yet still provide a comfortable controlled ride on paved roads. PSD uniquely alters and optimizes damping response with the***precision of spool valves*** in the extreme wheel travel conditions encountered off-road while simultaneously enhancing on-road driving dynamics and refinement. There are 3 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.

Inside the ZR2 DSSV PSD



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

Special Tools

No new Special Tools were released for the 2017 Chevrolet Colorado ZR2.

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
2018 Global Mid-Size Truck New Model Launch	**#10318.11W — 2018 Global Mid-Size Truck New Model Launch (Includes 2017 Colorado ZR2) (United States)**
Engines	**#16440.21D — Engines: New and Updates for L5P, LH7 and LGZ (United States)** **#16410.10W — 2.8L Duramax Engine RPO LWN (United States)** **—** **#50547.09W — Colorado/Canyon Diesel Features - 2.8L Duramax RPO LWN (Canada)**

Transmissions	**#17440.13D-R2 Transmissions: New & Updates: 6T70/6T75, 6L50/6L80/6L90, 4L60/4L65/4L70 (United States)** **#17440.16D Transmissions: New and Updates for Aisin AF50 and Hydra-Matic™ 8L45/8L90 Automatic Transmissions (United States)** **—** **#17038.05D1 & D2 — 8L90 Operation & Diagnosis - VCT Sessions 1 & 2 (Canada)** **#17038.06V Transmissions: 8L90 Unit Repair Video (Canada)**
Suspension with DSSV™ ZR2 Chassis Package **AND** **Transfer Case — RPO NQ6**	**#10318.11W — 2018 Global Mid-Size Truck New Model Launch (Includes 2017 Colorado ZR2) (United States)**
Propshafts and Rear Axle	**#14041.18W4 — Propshafts and Rear Axle Operation, Diagnosis and Service 4 (United States)**

Version Information

Version	1
Modified	—

Trademark Footnotes
