

New 9T50 9-Speed Automatic Transmission

GM's all-new Hydra-Matic 9T50 9-speed automatic transmission (RPOs M3E, M3D, M3H) — currently available on the 2017 Malibu, 2017 Cruze Diesel, 2018 Equinox and upcoming 2018 Terrain — is designed to deliver excellent efficiency, performance and refinement. By the end of this year, it will be an option on 10 GM models.

When paired with the Malibu's 2.0L turbo engine, for example, the transmission helps the sedan deliver an estimated 33 mpg (7.1 L/100km) on the highway — a 3% increase over the 2016 Malibu with the 8-speed automatic transmission.

The transmission consists primarily of a 4-element torque converter, a compound planetary gear set, friction and mechanical clutch assemblies, and a hydraulic pressurization and control system. It employs a wider 7.6:1 overall ratio (compared to the 8-speed transmission) for better acceleration in first gear — 4.69 first gear — and lower engine speeds on the highway — 0.62 top gear — to enhance fuel economy and reduce noise.

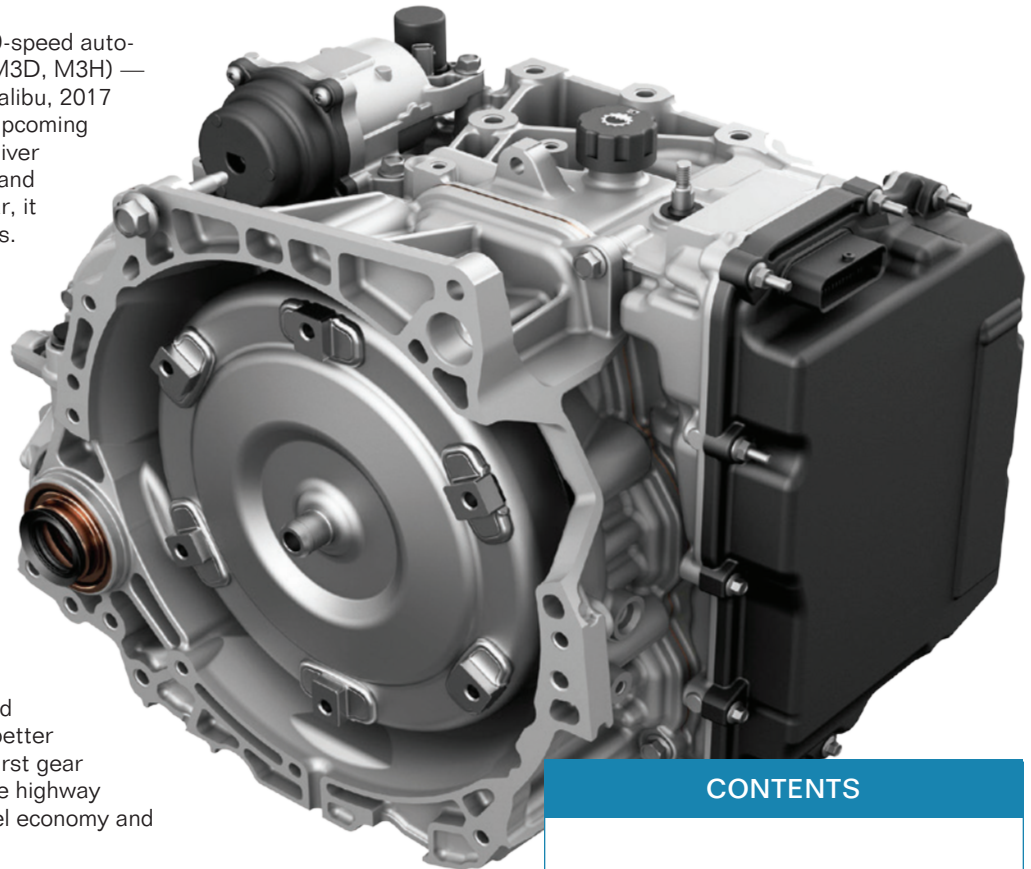
Design

Developed to meet the tight packaging requirements of transverse propulsion systems, the 9T50 features an on-axis layout that keeps the planetary gears in line with the engine crankshaft. It also has GM's first application of a selectable one-way clutch that can hold torque or freewheel, depending on the desired operating mode.

The combination of an on-axis design and a one-way clutch, which eliminates the need for an additional clutch pack, helps reduce overall package dimensions, making the compact 9T50 transmission about the same size as a six-speed transmission.

The transmission uses five planetary gearsets, four stationary clutches and three rotating clutches. Gears change from 2nd- to 9th- ratios with precise clutch-to-clutch shifting, with the clutch engaging in one gear at exactly the same time that it's released from another.

The hydraulic system primarily consists of a chain-driven pump, a control valve body assembly and case. The pump maintains the working pressures



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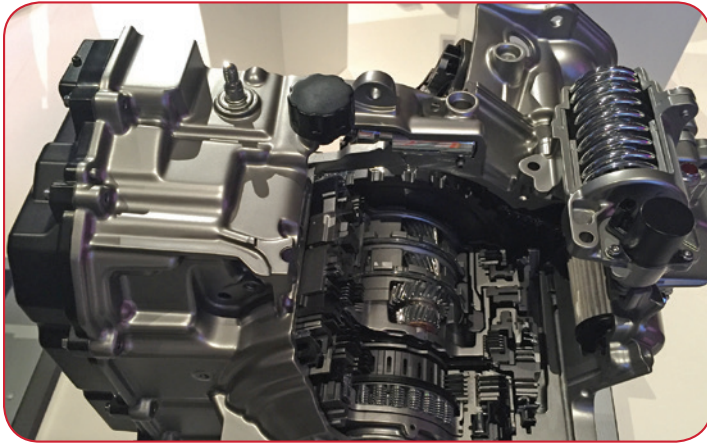


Customer Care and Aftersales

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needed to stroke the clutch pistons that apply or release the friction components.



The 9T50 employs five planetary gearsets.

The transmission's single-plate lockup clutch uses an electronically-controlled capacity clutch (ECCC) to dampen engine vibrations and ensure smooth operation.

Shift Controls

Commanding all of the shifting events is a 32-bit Transmission Control Module (TCM), which is located outside the transmission.

The TCM uses adaptive learning to compensate for new transmission variation and normal wear of the apply components. By adjusting the pressure commands to the various pressure control (PC) solenoids, it maintains the originally calibrated shift timing for consistent shift feel plus increased transmission durability.

TIP: Anytime internal repairs are performed or a revised calibration is installed, the Service Fast Learn Procedure should be performed using GDS2. This helps the transmission learn the clutch fill times initially prior to driving the vehicle. The vehicle should always be driven after the Service Fast Learn Procedure to ensure that the shift quality is acceptable.

To help maintain desired vehicle speed when coasting or braking on a hill, the transmission uses automatic grade braking that can select a lower gear to take advantage of engine braking. The control module receives inputs that monitor brake pedal usage, vehicle acceleration, throttle position, grade and whether a trailer is being towed.

The 9T50 transmission also supports auto engine stop/start operation. A unique accumulator within the transmission allows for refined stop/start transitions. The accumulator stores energy for engine restarts, while the software is calibrated for those smooth restarts.

The 9T50 transmission uses Dexron®-VI fluid. It does not require changing under normal driving conditions.

🙏 Thanks to Mark Kevnick

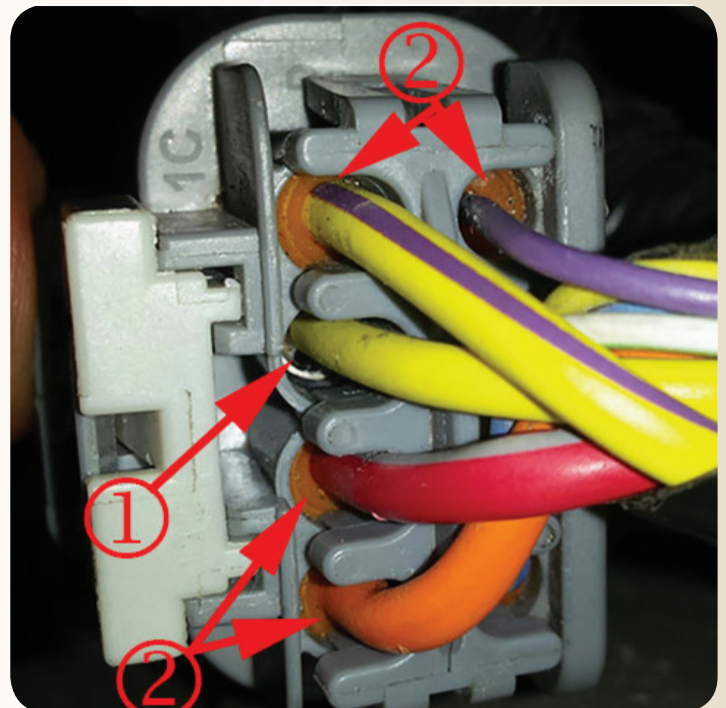
Missing Connector Seals

Some 2015-2017 Silverado, Tahoe, Suburban, Colorado, Sierra, Yukon, Canyon, and Escalade models equipped with 4WD (RPOs NQF, NQH, NQ6, NPO, NG7) may have an intermittent Service 4 Wheel Drive message displayed on the Driver Information Center (DIC). There may be several wiring terminal issues caused by missing seals.

When diagnosing intermittent Transfer Case Control Module DTCs related to signal or circuit integrity, including DTCs C0321, C0392, C0396, C0398, C0306, C039E, and C038D, inspect the associated connectors to ensure that the seals are properly installed in the connectors. Missing seals allow moisture inside the connector and will cause repeat conditions or other intermittent conditions.

Some connectors are serviced as a connector, while some have terminated leads and others are available as a harness only. If there is corrosion in the connector and it has to be replaced, the mating side of the connector should also be replaced regardless if it is another connector or an electrical component. For example, if the connector at the transfer case actuator is replaced due to a missing seal and corrosion is present, the transfer case actuator should also be replaced.

🙏 Thanks to Steve Schipansky



1. Missing seal
2. Proper seals

Sensor Locations of Hands-Free Power Liftgates

A growing number of GM models now offer an available hands-free power liftgate or trunk, which uses a sensor under the rear bumper of the vehicle that, when activated, opens or closes the liftgate or trunk. Depending on the model, the sensor is positioned at different locations under the rear bumper.

Models that offer the hands-free power liftgate (RPO TC2) include the 2015-2018 Tahoe, Suburban, Yukon, Escalade; 2016-2018 CT6, Envision; 2017-2018 XT5, Acadia; 2018 Enclave, Equinox, Traverse and Terrain.

The liftgate operates when the sensor detects a kicking motion. The hands-free liftgate sensor control module sends a serial data message to the liftgate control module, which activates the liftgate motor in the liftgate power assist actuator. The tail lamps flash when the command has been received.

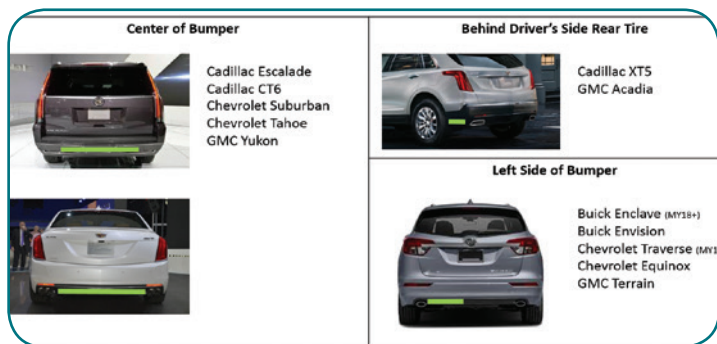


The sensor is located at different locations under the rear bumper.

Sensor Locations

The sensor is located in different positions on the various models that offer the hands-free power liftgate.

- Full-size SUVs — Tahoe, Suburban, Yukon and Escalade — and Cadillac CT6: sensor is located under the center of the rear bumper.
- XT5 and Acadia: sensor is located behind the driver's side rear tire on the side of the rear bumper.
- Envision, Equinox, and the upcoming Terrain, Traverse, and Enclave: sensor is located under the left side of the rear bumper, between the left exhaust pipe and the center of the bumper.



Hands-free liftgate sensor locations

Operating the Liftgate

To open or close the power liftgate hands-free, swing your foot in a direct in-and-out motion (your foot should be under the rear bumper for less than one second) in the proximity of the sensor. The motion must be within five inches of the sensor. Do not swing your leg in a sweeping or side-to-side motion.

To activate the power liftgate, the Remote Keyless Entry transmitter (key fob) must be within 3 feet (1 meter) of the liftgate.

The hands-free feature will not work while the liftgate is moving. Use one of the liftgate switches to stop the liftgate while in motion.

The hands-free feature also may be temporarily disabled under some conditions. If the liftgate does not respond to the kicking motion, open or close the liftgate by another method or start the vehicle. The feature will be re-enabled.



With the key fob within 3 ft. (1 m) of the liftgate, swing your foot in and out to activate the liftgate.

Projected Logo

Some 2018 models feature a vehicle logo that is projected onto the ground under the rear bumper sensor that indicates where the kicking motion should take place. The logo is projected when the key fob is detected within 6 feet (2 meters) of the liftgate.

Under normal conditions, the logo will be projected for one minute. If the logo is not projected, check for the following operating conditions:

- The projected logo is only available for the currently used key fob after it has been out of range for at least 20 seconds.
- If a key fob is again detected within approximately 6 feet (2 meters) of the liftgate, or another hands-free operation has been detected, the one-minute timer is reset. If it is reset five times in 10 minutes, the logo will not turn back on for one hour. This provides the battery with a "cool-down period" to preserve its charge.
- If the vehicle remains parked for an extended period of time with no key fob use or Keyless Access operation, the projected vehicle logo will be disabled. The projected logo will be re-enabled when any key fob button is pressed, any vehicle door is opened and closed, or the liftgate is closed when all doors are opened.
- The projected logo will not work for a single key fob when a key fob has been left within approximately 15 feet (5 meters) of the liftgate for several minutes, has been left inside the vehicle and all vehicle doors are closed, or has approached the area outside of the liftgate several times in a short period of time.

Users can customize hands-free operation. The kick function can be turned off, only open the liftgate, or open and close the liftgate. To change the kick function:

- Select the Hands-free Liftgate Control menu on the infotainment screen under Settings > Vehicle > Comfort and Convenience.
- Select Off, On-Open Only, or On-Open and Close.

Selecting Off will disable hands-free control of the liftgate and keep the logo lamp off.

🙏 Thanks to Gary McAdam

New Service Information Subsections for 2018 Model Year

For the 2018 model year, there are a number of new subsections that have been added to the Service Information. In addition, several subsections have been moved to different service categories. As a result, if you're searching for the service procedures on a particular system or component, it might not be where you were used to finding it. The new subsections include additional information and are categorized by the functions of each system.

Current Subsections

Subsections from earlier model years that have been updated or replaced are:

- Horns (Service Category Type: Body Systems)
- Object Detection and Pedestrian Protection (Service Category Type: Safety and Security)

New Subsections for 2018

For the 2018 model year, the new subsections are:

- Horns and Pedestrian Alerts (Service Category Type: Body Systems)
- Image Display Cameras (Service Category Type: Driver Information and Entertainment)
- Parking Assistance Systems (Service Category Type: Safety and Security)
- Pedestrian Protection (Service Category Type: Safety and Security)
- Driver Monitoring (Service Category Type: Safety and Security)
- Driver Assistance Systems (Service Category Type: Safety and Security)

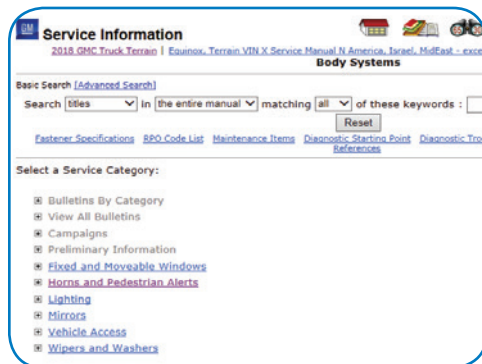
Here's a summary of the information covered in each of the new subsections.

Horns and Pedestrian Alerts – Systems that alert pedestrians. Located in Service Category Type: Body Systems.

- Horn
- Pedestrian Alert Sound Control Module

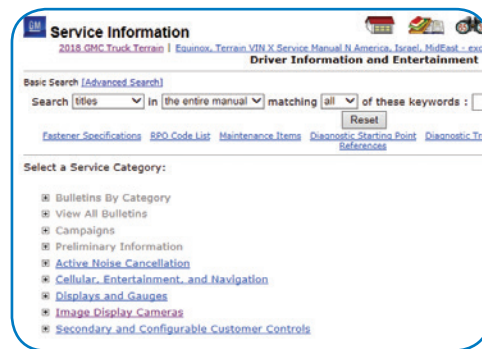
Image Display Cameras – Systems that provide the driver a visual display. Located in Service Category Type: Driver Information and Entertainment.

- Night Vision – Night Vision Control Module
- Rear Vision Camera – No Module
- Curbview – Video Processing Control Module
- Surround Vision (360 Camera) – Video Processing Control Module
- Performance Data Recorder (currently in Displays and Gauges) – Vehicle Performance Data Recorder



New Body Systems subsection

- Full Display Mirror (currently in Mirrors) – No Module
- Video By-pass Module – Sometimes used in conjunction with the rearview camera and HMI module



New Driver Information and Entertainment subsection

Parking Assistance Systems

– Systems that assist the driver primarily for parking, without providing the driver a visual display. Located in Service Category Type: Safety and Security.

- Parking Assist – Parking Assist Control Module

Pedestrian Protection – Systems that protect pedestrians in the event of a vehicle-to-pedestrian collision. This is a passive safety system similar to the Supplemental Inflatable Restraint System (SIR). Located in Service Category Type: Safety and Security.

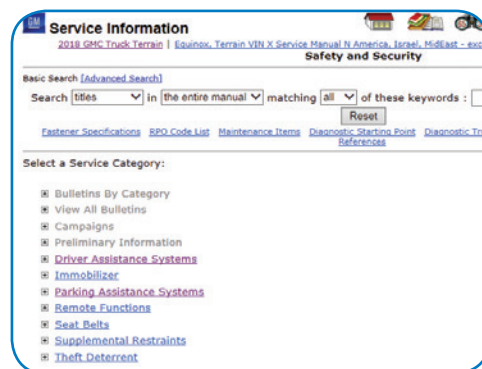
- Inflatable Restraint Sensing and Diagnostic Module

Driver Monitoring – Systems that have a camera facing the driver verifying the driver is focused on the road ahead and participating in safe driving. Located in Service Category Type: Safety and Security.

- Driver Monitoring System Control Module

Driver Assistance Systems – Systems that assist the driver during normal driving without providing the driver a visual display. Located in Service Category Type: Safety and Security.

- Lane Departure Warning – Frontview Camera Module
- Lane Keep Assist – Frontview Camera Module
- Forward Collision Alert – Frontview Camera Module
- Side Blind Zone Alert – Rear Short Range Radar(s)



New Safety and Security subsections

- Rear Cross Traffic Alert – Rear Short Range Radar(s)
- Integrated Brake Assist, Automatic Collision Preparation, Rear Emergency Braking, and Adaptive Cruise Control – Active Safety Control Module

🙏 Thanks to Brett Holsworth

Fuel Line Pulsation Sound

A rattle or ticking sound may be heard coming from the back of the left valve cover on some 2014-2017 Corvette, Silverado, Sierra; 2015-2017 Tahoe, Suburban, Yukon, Escalade; 2016-2017 CTS-V, and Camaro models equipped with the following engines: 6.2L (RPO LT4, LT1, L86); 5.3L (RPO L83); or 4.3L (RPO LV3) It may sound similar to a lifter ticking and may be louder inside the vehicle.

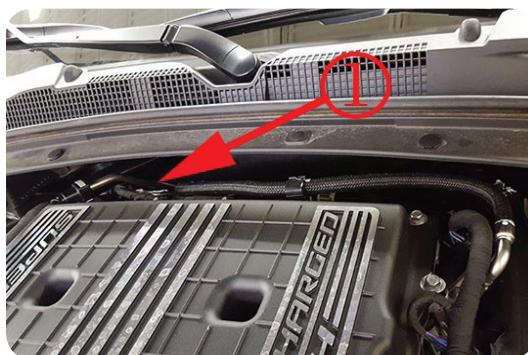
Listen to the fuel line connection at the left side of the engine. The fuel feed line between the high pressure fuel pump and chassis fuel line may be allowing high pressure pulsation back to the low side of the fuel system. If the sound is heard, the line will need to be replaced. On some trucks and SUVs, a vibration also may be observed in the fuel line at the fuel tank.

There are two different types of fuel lines that contain a check valve. The lines vary by model. Only one line should be used on Corvette, truck and SUV models. The line connects the chassis fuel line to the high pressure fuel pump.

🙏 Thanks to David Rutkowski



Fuel line for Corvette, truck and SUV models.

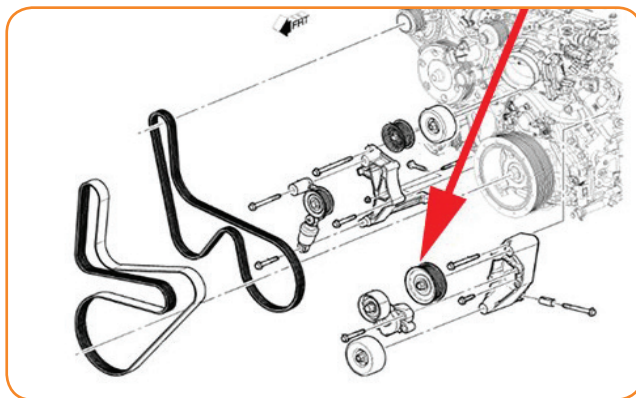


Line connecting the chassis fuel line to the high pressure fuel pump.

Supercharger Idler Pulley Sounds

A scraping or moaning sound may be heard from the supercharger idler pulley on some 2017 CTS-V, Corvette; and 2017-2018 Camaro models equipped with the supercharged 6.2L V8 engine (RPO LT4). The sound will be most noticeable when the engine is idling.

This condition has the following VIN break-points:



idler pulley

Model	From VIN	To VIN
2017 CTS-V	H0194673	H0196684
2017 Corvette	H5605159	H5605593
2017 Camaro	H0197262	H0196702
2018 Camaro	J0100002	J0100018

If the pulley sound is found, replace the idler pulley assembly.

🙏 Thanks to Richard Renshaw

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