



Service Bulletin

Bulletin No.: 22-NA-122

Date: April, 2023

INFORMATION

Subject: Diagnostic Tip for DTCs Set at a Low Mileage for 8L45/90 Automatic Transmissions

| Brand: | Model: | Model Year: | | VIN: | | Engine: | Transmission: |
|---|--|-------------|------|------|----|---------|---------------|
| | | from | to | from | to | | |
| Cadillac | CT4 | 2022 | 2022 | | | | M5N |
| Chevrolet | Camaro | | | | | | M5T |
| | Colorado | | | | | | M5T |
| | Express | | | | | | M5U, MQD |
| | Silverado 1500 - LTD (RPO J21, VIN Digit 5 = W/Y) | | | | | | MQE |
| | Silverado 1500 - New (RPO J22, VIN Digit 5 = A/D) | | | | | | |
| | GMC | | | | | | Canyon |
| Savana | | | | | | | M5U, MQD |
| Sierra 1500 - Limited (RPO J21, VIN Digit 5 = 8/9) | | | | | | | MQE |
| Sierra 1500 - New (RPO J22, VIN Digit 5 = H/U) | | | | | | | |

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|-----------------------------------|--|
| Involved Region or Country | North America, Middle East |
| Condition | Some customers may comment that the MIL is illuminated. |
| Cause | This condition may be caused by manufacturing debris that clears itself from the valve body and then becomes captured by the filter. |
| Information | The purpose of this bulletin is to aid the service technician in diagnosing 8L45/90 automatic transmissions with low mileage and DTCs current or history related to the transmission control solenoids and valves. Intent is to assist in diagnosing the correct issue, minimize return customer visits for the same issue, and reduce unnecessary repairs in cases of transient or momentary issues that may happen during vehicle initial break-in period. Follow the Service Procedure steps below to determine repair strategy. |

Important: Service agents must comply with all International, Federal, State, Provincial, and/or Local laws applicable to the activities it performs under this bulletin, including but not limited to handling, deploying, preparing, classifying, packaging, marking, labeling, and shipping dangerous goods. In the event of a conflict between the procedures set forth in this bulletin and the laws that apply to your dealership, you must follow those applicable laws.

Important: Please refer to these service publications for resolutions to customer comments prior to proceeding with this bulletin:

- [21-NA-149: Engine Wire Harness Chafing](#)
- [20-NA-187: Delayed and/or Harsh Engagement of Transmission Shift After Vehicle Sitting with Engine Off](#)
- [19-NA-136: Howling, Whining/Whirring, Shudder/Vibration, and/or Grinding Noise While in 4HI, 4HI Auto and/or During Parking Lot Maneuvers in Auto Mode](#)

- 16-NA-361: Information on Transmission Harsh 1-2 Shift Upon First Start Up/Shift of the Day Under Light Throttle
- 16-NA-019: Information on Transmission Adaptive Functions and Correcting Low Mileage Harsh Shifts, Slips, or Flares
- 18-NA-285: Information on Slight Movement in Park at Ignition On and Vehicle Start Up and/or During a Remote Vehicle Start Event

Service Procedure

Step One — Check DTCs

Check all Modules for DTCs. Record all DTCs, Current or History, and which Module the codes are in on the work order.

Step Two — Road Test

Before the Road Test, Ensure the Following:

- The engine is performing properly. Often engine misfires or engine lack of power for any reason can cause erratic transmission shifting or vibrations that may seem like torque converter shudder concerns. Don't overlook issues like plugged or restricted exhaust.
- Don't overlook engine or chassis DTCs that may be related to the cause of the transmission shifting concerns.
- Tire pressure is correct, and tires are matching brand and of equal size. Different brand tires of the same size can have different circumference measurements.

Electrical Function Check:

Note: Perform this procedure first, in order to ensure the electronic transmission components are functioning properly. If these components are not checked, a simple electrical condition could be misdiagnosed.

1. Connect the scan tool.
2. Ensure the gear selector is in PARK and set the parking brake.
3. Start the engine.
4. Verify that the following scan tool data can be obtained and is functioning properly:
 - Engine Speed
 - Transmission ISS
 - Transmission OSS
 - Vehicle Speed
 - IMS
 - Commanded Gear
 - Gear Ratio
 - Brake Pedal Position
 - ECT (Included in GDS Engine Data List)
 - Trans. Fluid Temp.
 - Calc. Throttle Position
 - Ignition Voltage
 - Trans. Control Solenoid Valve 1-9
 - TCC Slip Speed

5. Check the garage shifts.
 - Apply the brake pedal and ensure the parking brake is set.
 - Move the gear selector through the following ranges:
 - ⇒ Park to Reverse
 - ⇒ Reverse to Neutral
 - ⇒ Neutral to Drive
 - ⇒ Drive to Reverse
 - ⇒ Reverse to Drive
 - Pause 2 to 3 seconds in each gear position.
 - Verify the gear engagements are immediate (less than 3 seconds to complete if trans fluid temperature is above 20°C) and not harsh. Note that these shifts may be almost imperceptible in some applications. Using the scan tool to monitor Transmission ISS achieving 0 rpm can be used to check delay in these cases.

Note: Harsh engagement may be caused by any of the following conditions:

- High engine idle speed—Compare engine idle speed to desired idle speed.
- Incorrect line pressure—Investigate Transmission Control Solenoid Valve 6 Cmd.
- A default condition caused by certain DTCs that result in maximum line pressure to prevent clutch slippage.
- Incomplete adapting or incorrect adapting—Repeat maneuver multiple times to see if shift quality improves. If it does not, refer to service procedures and field bulletins for Harsh Garage Shift.

Note: Delayed engagement may be caused by any of the following conditions:

- Low idle speed—Compare engine idle speed to desired idle speed.
 - Low fluid level.
 - Incorrect line pressure—Investigate Transmission Control Solenoid Valve 6 Cmd.
 - Cold transmission fluid temperature (TFT)—Use the scan tool to determine TFT.
 - Selector linkage—Inspect and adjust as necessary.
 - Incomplete adapting or incorrect adapting—Repeat maneuver multiple times to see if delay improves. If it does not, refer to service procedures and field bulletins for Harsh, Soft, Delayed or Slipping First, Second, Seventh, Eighth, or Reverse Shift.
6. Monitor transmission range on the scan tool, transmission data list.
 - Apply the brake pedal and ensure the parking brake is set.
 - Move the gear selector through all ranges.
 - Pause 2 to 3 seconds in each range.

- Return gear selector to PARK.
 - Verify that all selector positions match the scan tool display.
7. Check throttle position input.
- Apply the brake pedal and ensure the parking brake is set.
 - Ensure the gear selector is in PARK.
 - Monitor the scan tool Calc. Throttle Position while increasing and decreasing engine speed with the throttle pedal. The scan tool Calc. Throttle Position percentage should increase and decrease with engine speed.

If any of the above checks do not perform properly, record the result for reference after completion of the road test.

During the Road Test:

- Perform the test only when traffic conditions permit.
- Operate the vehicle in a controlled, safe manner.
- Observe all traffic regulations.
- Take along qualified help in order to operate the vehicle safely and view the scan tool data while conducting this test. **Do not attempt to view data while operating the vehicle yourself.**
- Observe any unusual sounds or smells.
- Abort test if DTC/MIL resets at any point and follow Service Information.

Upshift Control and Torque Converter Clutch (TCC) Apply:

The TCM calculates the upshift points based primarily on 2 inputs: throttle position and vehicle speed. When the TCM determines that conditions are met for a shift to occur, the TCM commands the shift by varying current to the appropriate transmission control solenoids to control oncoming and offgoing clutch pressures.

1. Monitor the following scan tool parameters:
 - Calc. Throttle Position
 - Vehicle Speed
 - Engine Speed
 - Transmission ISS
 - Transmission OSS
 - Commanded Gear
 - Transmission Control Solenoid Valve 1-9
 - TCC Slip Speed
2. Place the gear selector in the DRIVE position.
3. Accelerate the vehicle using a steady throttle position between 15 and 20 percent. Hold the throttle steady.
4. As the transmission upshifts, there should be a noticeable shift feel or engine speed change within 1 to 2 seconds of the commanded gear change. The transmission control solenoid valve pressure command should change to “ON” for the oncoming clutch and “OFF” for the offgoing clutch.
5. Note any harsh, soft or delayed shifts or slipping. Note any noise or vibration.

6. The TCC feel may not be noticeable. In many applications the TCC will apply after the 1-2 shift and TCC events will not be easily detected using engine speed.

Note: This transmission is equipped with an electronically controlled capacity clutch (ECCC), which allows operation of the clutch without fully locking to the torque converter cover. The clutch maintains a small amount of slippage, approximately 0-50 RPM, depending on the vehicle application. TCC may apply in 1st through 8th gear. ECCC was developed to reduce the possibility of noise, vibration or chuggle caused by TCC apply. Full lockup is available at highway speeds on some applications.

7. Monitor Transmission Control Solenoid Valve 7 current while driving and check TCC slip speed when the pressure command indicates that the TCC is commanded to apply.

When the TCC applies, slip speed should be controlled to below 100 RPM when the transmission is not shifting, and the throttle is held steady. If the TCC slip exceeds this value for more than 6 seconds after the Transmission Control Solenoid Valve 7 current indicates that the TCC is commanded on:

- Check for DTCs.
- Refer to *Torque Converter Diagnosis* in SI.

Part Throttle Step-In Downshifts:

1. Place the gear selector in the DRIVE position
2. Accelerate the vehicle at light throttle (5–15 percent) until 3rd gear is just achieved.
3. Quickly increase throttle angle until commanded gear indicates that a downshift to 2nd gear is commanded.
4. Verify that the transmission downshifts within 2 seconds of the throttle movement.
5. Repeat steps 2 to 4 at higher speed to achieve 4th gear and then step in to command a 4th gear to 3rd gear downshift.
6. Repeat steps 2 to 4 at higher speed to achieve 5th gear and then step in to command a 5th to 4th gear downshift.
7. Repeat steps 2 to 4 at higher speed to achieve 6th gear and then step in to command a 6th gear to 5th gear downshift.
8. Repeat steps 2 to 4 at higher speed to achieve 7th gear and then step in to command to a 7th to 6th gear downshift.
9. Repeat steps 2 to 4 at a higher speed to achieve 8th gear and then step in to command an 8th to 7th gear downshift.
10. Note any harsh, soft or delayed shifts or slipping. Note any noise or vibration.

Manual Downshifts:

Manual downshift testing is not required since all vehicles equipped with the 8L90 are also equipped with some form of Driver Control Mode (DCM). The TCM will automatically override DCM downshifts to protect the transmission from damage.

- **Coasting Downshifts:**

1. Place the gear selector in the DRIVE position.
2. Accelerate the vehicle to 8th gear with the TCC applied.
3. Release the throttle and apply the brakes.
4. Verify that the downshifts occur as commanded by monitoring gear ratio, which should change after commanded gear changes.

Manual Gear Range Selection:

Perform the following test using a 10–15 percent throttle position.

- **Reverse:**

1. With the vehicle stopped, move the gear selector to REVERSE.
2. Slowly accelerate the vehicle.
3. Verify that there is no noticeable slip, noise or vibration.

Note: Complete the test in the sequence given. Incomplete testing cannot guarantee an accurate evaluation.

Note: If the vehicle you are testing is a Hybrid/Electric Vehicle and is equipped with an E-Assist or BAS propulsion system, please refer to the applicable vehicle Owner Manual/Supplement for a complete description and an explanation of operating conditions for the automatic stop/start feature. When performing this Road Test, the auto stop/start must be verified to ensure the shifting characteristics of this feature are operating as designed.

Driver Control Mode (DCM):

Refer to the owner's manual for specific instructions on the type of DCM available in this application. Utilize the DCM to ensure that the transmission responds

appropriately to driver's commands. The TCM will upshift automatically when maximum engine speed is achieved and will protect from any downshift which may cause excessive engine RPMs.

Tow/Haul Mode:

Tow/Haul Mode Grade Braking is only enabled while the Tow/Haul Mode is selected, and the vehicle is not in the Range Selection Mode. See Manual Mode. Tow/Haul Mode Grade Braking assists in maintaining desired vehicle speeds when driving on downhill grades by using the engine and transmission to slow the vehicle.

See Towing Equipment.

After the Road Test, Check the Following:

- ⇒ Inspect for any diagnostic trouble codes (DTCs) that may have set during the testing. Refer to the applicable DTC information in Service Information for diagnosis.
- ⇒ Monitor the scan tool data for any abnormal readings or data.
- ⇒ Inspect for fluid leaks. Refer to *Fluid Leak Diagnosis* in SI.
 - If the codes could not be duplicated during the road test, please return the vehicle to the customer without attempting any repairs.
 - If any DTCs reset, please follow Service Information for the appropriate diagnostics.

Parts Information

No parts are required for this repair.

Warranty Information

For vehicles repaired under the Powertrain coverage, use the following labor operation. Reference the Applicable Warranties section of Investigate Vehicle History (IVH) for coverage information.

| Labor Operation | Description | Labor Time |
|--|--|------------|
| 8486178* | Diagnosing and Testing 8L45/90 Automatic Transmissions | 0.8 hr |
| *This is a unique Labor Operation for Bulletin use only. | | |

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| Version | 2 |
| Modified | Released June 17, 2022 Revised April 17, 2023 - Removed 21-NA-275 Information. |

GM bulletins are intended for use by professional technicians, NOT a "do-it-yourselfer". They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the bulletin applies to your vehicle, or that your vehicle will have that condition. See your GM dealer for information on whether your vehicle may benefit from the information.



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