

| ABBREVIATION | DESCRIPTION |
|--------------|--|
| A/C | Air Conditioning / Air climatisé |
| ACB | Adaptive Cruise Braking / Régulateur de vitesse et d'espacement avec freinage |
| ACM | Aftertreatment Control Module / Unité de commande électronique du système de post-traitement |
| AFSS | Automatic Fire Suppression System / Système automatique de détection et d'extinction des incendies |
| ATC | Automatic Traction Control (Bendix) / Système d'antidérapage automatique |
| CECM | Chassis Electronic Control Module |
| CVC | Chauffage, Ventilation et Climatisation / heating, ventilation and air conditioning HVAC |
| DCDL | Driver Controlled Differential Lock / Verrouillage du différentiel |
| DDR | Diagnostic Data Reader |
| DEF | Diesel Exhaust Fluid / Fluide d'échappement diesel FED |
| DEL | Diode Électroluminescente / Light Emitting Diode LED |
| DID | Driver Information Display / Écran d'affichage du panneau des instruments |
| D-MIC | Driver Microphone / Microphone du conducteur |
| DPF | Diesel Particulate Filter / Filtre à particules |
| DTC | Diagnostic Troubleshooting Code / Code d'anomalie |
| DUFS | Diesel Ultra Faible en Soufre / Ultra Low Sulfur Diesel ULSD |
| ECU | Electronic Control Unit / Unité de commande électronique |
| EECU | Engine Electronic Control Unit / Unité de commande électronique du moteur |
| EGR | Exhaust Gas Recirculation / Recirculation des gaz d'échappement |
| ESC | Electronic Stability Control / Dispositif de contrôle de la stabilité |
| ESC | Escape / Échap |
| ESP | Electronic Stability Program (Bendix) / Dispositif électronique de contrôle de la stabilité |
| E+ | Eco-Roll |
| FAP | Filtre À Particules / Diesel Particulate Filter DPF |
| FDA | Following Distance Alert / Alerte de distance |
| FED | Fluide d'Échappement Diesel / Diesel exhaust fluid DEF |
| GECU | Gear selector Electronic Control Unit / Unité de commande électronique du sélecteur de vitesses |
| G-MIC | Guide Microphone / Microphone du guide |
| HVAC | Heating, Ventilation and Air Conditioning / Chauffage, Ventilation et Climatisation CVC |
| IA | Impact Alert / Alerte de collision |
| IFS | Independent Front Suspension / suspension avant indépendante |
| LED | Light Emitting Diode / diode électroluminescente DEL |
| MCM | Master Chassis Module |
| MPH | Miles Per Hour / Milles à l'heure |
| PPT | Premium Tech Tool |
| PRIME | Power Recovery by Intelligent Management of Energy |
| PTO | Power Take Off / Prise de force |
| SCR | Selective Catalytic Reduction / Réduction catalytique sélective |
| TCM | Transmission Control Module / Module de commande de la transmission |
| TCS | Traction Control System / Dispositif d'antipatinage |
| TECU | Transmission Electronic Control Unit / Unité de commande électronique de la transmission |
| TPMS | Tire Pressure Monitoring System / Système de surveillance de la pression des pneus |
| TWS | Threshold Warning System / Système avertisseur du seuil de porte |
| ULSD | Ultra Low Sulfur Diesel / Diesel Ultra Faible en Soufre DUFS |
| VCADS | Outil informatisé de diagnostic |
| VEB | Volvo Engine Brake / Frein moteur Volvo |
| VECF | Vehicle Electrical Center Front |
| VECR | Vehicle Electrical Center Rear |
| VECU | Vehicle Electronic Control Unit / Unité de commande électronique du véhicule |
| VSS | Video and Sound Selector / Sélecteur audio-vidéo |
| WCL | Wheelchair Lift / Élévateur de fauteuils roulants |

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SERVICE LITERATURE

Visit our web sit at www.prevostcar.com for on-line product information and technical publications!

Additional copies of the following service literature are available on request and at low cost. These can be helpful to mechanics and drivers alike.

- **Maintenance Manual**
- **Operator's Manual**
- **Parts Manual**
- **Service Center Directory**

To order, call Prevost Parts toll free 1-800-463-8876 or write to:

PREVOST PARTS INC.

2955-A Watt Street
Sainte-Foy, (Quebec)
Canada G1X 3W1

Specify the complete vehicle serial number. Allow 30 days for delivery

NOTICE

DECLARATION OF THE MANUFACTURING DEFECTS TO THE GOVERNMENT OF THE UNITED STATES

If you believe that your vehicle has defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Prevest Car Inc.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign.

However, NHTSA cannot become involved in individual problems between you, your dealer, or Prevest Car Inc.

To contact NHTSA you may either call the Auto Safety Hotline toll-free at **1-800-424-9393** (or **366-0123** in Washington, D.C. area) or write to:

**NHTSA
U.S. Department of transportation
Washington, D.C. 20590.**

You can also obtain other information about motor vehicle safety from the Hotline.

DECLARATION OF THE MANUFACTURING DEFECTS TO THE CANADIAN GOVERNMENT

If you stay in Canada, and if you believe that your vehicle has a safety defect, you should immediately inform Transport Canada and Prevest Car Inc. You may write to:

**Transport Canada
Box 8880
Ottawa, Ontario, K1G 3J2**

DECLARATION OF THE MANUFACTURING DEFECTS TO PREVOST CAR INC.

In addition to notify the NHTSA (or Transport Canada), please contact Prevest Car at **1-418-831-2046**. Or you may write to :

**Prevest Car Inc.
After-sales service department
850 ch. Olivier,
Saint-Nicolas (Quebec)
Canada, G7A 2N1**

| Problem/Symptom | Probable Causes | Actions |
|--|---|---|
| Vehicle does not Start | Rear Start selector switch is not at the NORMAL position | 1. Check that the rear start selector switch is flipped up to NORMAL start position and battery master switch is flipped up to ON and retry cranking |
| | Battery master switch in the battery compartment is at the OFF position (down) | 2. Flip the rear start selector switch to “Rear Start” and start the vehicle from the rear |
| | CAN network problem (Multiplex) | If the vehicle does not start from the rear: |
| | Module A53 not powered or is defective | 1. Verify that module A53 is powered: <ul style="list-style-type: none"> a) Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA53, Active” indicates a power problem on the module or a CAN network problem. b) Check / reset circuit breaker CB5 c) Check / replace fuse F65 d) Probe gray connector on module to see if it is powered. |
| | Engine ECM does not receive the ignition signal | 2. Verify that the engine ECM is powered and get the ignition signal <ul style="list-style-type: none"> a) Check / reset circuit breaker CB8 Check / replace fuse F74 b) Check / reset circuit breaker CB2 Check / replace fuse F78 |
| | Engine ECM is not powered | |
| None of the Multiplexed functions are operating, including the basic limp-home functions (door opening, flashers, wipers in speed 1) | The program version in the MCM is different than the program in the I/O modules and the MCM is forcing all I/O modules to stay inactive | 1. Engage the auto-programming of the I/O modules: Turn the ignition key to the ON position, trip and reset circuit breaker CB6. |
| “FLIP REAR BREAKER TO INITIATE I/O MODULES PROGRAMMING” pop-up message appears in the DID | | 2. The DID indicates “MUX AUTOPROGRAMMING I/O MODULE PLEASE WAIT” until the reprogramming is complete. |
| <i>Note: The sunshades are still functioning since these are not multiplexed</i> | | |
| Many secondary functions (not essential for driving) not functioning (interior | The MCM module does not receive 24 V power | 1. Check / reset circuit breaker CB6 (4 th from the top on the right side column) Check / replace fuse F1 |

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| Problem/Symptom | Probable Causes | Actions |
|---|---|---|
| <p>lighting, driver's area lighting, wiper speed 2 and intermittent)</p> <p>Marker lights and clearance lights are turned ON when setting ignition to the ON position</p> | <p>The CAN network is not working. It could be caused by a short on the network, an open circuit, a problem with the MCM or the MCM being disconnected from the network</p> | <p>2. Operate in limp-home mode by starting the vehicle from the engine compartment (REAR START). All functions essential to drive are available</p> <p>To close and lock the door, pull the door manually up to its closed position and it will lock by itself. The door opening button is still functioning</p> |
| <p>No temperature control in the passenger area</p> <p>Passenger temperature display indicates two dashes "--"</p> | <p>Problem with the temperature sensor located in the evaporator compartment air intake or the sensor wiring</p> | <p>1. Instruct the driver to manually control the temperature by playing with the passenger set point. Set above 22°C (72°F) to heat and below 22° C (72°F) to cool</p> |
| <p>Entrance door does not open nor close using the control buttons</p> <p>Defroster fan not functioning</p> <p>Lower windshield wipers not functioning in speed 1 or intermittent</p> | <p>Module A47 is not powered or is faulty</p> | <p>1. Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message "No Response ModA47, Active" indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce these symptoms).</p> <p>2. Check / reset circuit breaker CB6</p> <p>3. Check / replace fuse F5</p> <p>4. Probe gray connector on module to see if it is powered.</p> <p>5. Use the air release valves near the entrance door and in the front service compartment to lock / unlock the door</p> |
| <p>Lower windshield wipers not functioning in speed 1 or intermittent</p> | <p>No power on R23</p> | <p>1. Check / replace fuse F18</p> |
| <p>HVAC condenser fans not functioning in speed 1</p> | <p>Circuit breaker CB7 was manually tripped and not reset</p> <p>Module A53 is defective</p> | <p>1. Check / reset circuit breaker CB7</p> <p>2. Verify that module A53 is powered: Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message "No Response ModA53, Active" indicates a power problem on the module or a CAN network problem.</p> |

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| Problem/Symptom | Probable Causes | Actions |
|--|---|--|
| HVAC condenser fans not functioning in speed 2 | <p>Circuit breaker CB7 was manually tripped and not reset</p> <p>Module A53 not powered or is defective</p> | <ol style="list-style-type: none"> 1. Check / reset circuit breaker CB7 2. Verify that module A53 is powered: Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA53, Active” indicates a power problem on the module or a CAN network problem. |
| <p>Lower and upper windshield washer not functioning</p> <p>Upper windshield wiper not functioning</p> <p>Defroster fan is functioning but no heat or cooling available in the driver area</p> | Module A46 is not powered or is faulty | <ol style="list-style-type: none"> 1. Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA46, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce these symptoms). 2. Check / reset circuit breaker CB1 3. Check / replace fuse F12 4. Probe gray connector on module to see if it is powered. |
| <p>Low beam headlights and front flasher on left side not functioning</p> <p>Electric horn not functioning</p> | Module A45 is not powered or is faulty | <ol style="list-style-type: none"> 1. Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA45, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce these symptoms). 2. Check / reset circuit breaker CB2 3. Check / replace fuse F33 and F34 4. Probe gray connector on module to see if it is powered. |
| Low beam headlights and flasher on right side not functioning | Module A48 is not powered or is faulty | <ol style="list-style-type: none"> 1. Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA48, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom). 2. Check / reset circuit breaker CB2 3. Check / replace fuse F33 and F34 4. Probe gray connector on module to see if it is powered. |

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| Problem/Symptom | Probable Causes | Actions |
|---|--|--|
| <p>Rear flashers not functioning</p> <p>Stoplights and high-mounted stoplight not functioning</p> | <p>Module A51 is not powered or is faulty</p> | <ol style="list-style-type: none"> 1. Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA51, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom). 2. Check / reset circuit breaker CB2 3. Check / replace fuse F80 4. Probe gray connector on module to see if it is powered. |
| <p>Engine is overheating and radiator fan clutch does not engage</p> <p>The A/C compressor clutch does not engage</p> | <p>Module A52 is not powered or is faulty</p> | <ol style="list-style-type: none"> 1. Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA52, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom). 2. Check / reset circuit breaker CB5 3. Check / replace fuse F65 4. Probe gray connector on module to see if it is powered. |
| <p>Evaporator fan not functioning</p> | <p>Circuit breaker CB3 tripped</p> <p>Module A54 is not powered or is faulty</p> | <ol style="list-style-type: none"> 1. Check / reset circuit breaker CB3 2. Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA54, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom). 3. Check / reset circuit breaker CB5 4. Check / replace fuse F67 , F68 5. Probe gray connector on module to see if it is powered. |
| <p>HVAC condenser fans not functioning in speed 1</p> | <p>Module A54 is not powered or is faulty</p> | <ol style="list-style-type: none"> 1. Check DIAGNOSTIC menu of the DID. Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA54, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom). 2. Check / reset circuit breaker CB5 |

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| Problem/Symptom | Probable Causes | Actions |
|--|---|---|
| | | <ol style="list-style-type: none"> 3. Check / replace fuse F67 , F68 4. Probe gray connector on module to see if it is powered. |
| Sound system not functioning | Circuit breaker CB4 or CB11 was manually tripped and not reset | <ol style="list-style-type: none"> 1. Check / reset circuit breaker CB4 or CB11 |
| Fire alarm telltale light and audible alarm always ON and there is no fire or high temperature in the engine compartment | Short-circuited fire sensor or defective sensor | <ol style="list-style-type: none"> 1. Prior to start the vehicle, cycle the ignition key to the ON position, OFF position and then ON position again and then start the vehicle. This will deactivate the fire alarm function. This has to be repeated each time the vehicle is re-started |
| The vehicle is parked and the electrical horn is activated to indicate a fire in the engine compartment but there is no fire | Short-circuited fire sensor or defective sensor | <ol style="list-style-type: none"> 1. Cycle the ignition key between the ON and OFF position twice within 3 seconds. This will deactivate the fire alarm function. This has to be repeated each time the vehicle is parked |
| A single light, a group of LED lights or another function of the vehicle is not functioning | The multiplex outputs are protected in current by an internal "soft-fuse". When an output is shorted, it turns OFF and stays OFF until the "soft-fuse" is reset | <ol style="list-style-type: none"> 1. Turn the ignition key to the OFF position and turn to the ON position again. This resets all "soft –fuses" |
| No backlighting in the instrument cluster | Circuit breaker CB10 is tripped or fuse F29 blown | <p>Check / reset circuit breaker CB10</p> <p>Check / replace fuse F20</p> |
| The radiator fan clutch does not function and the engine is overheating | | <p>You can manually engage the radiator fan clutch speed 1 or speed 2.</p> <ol style="list-style-type: none"> 1. On the Driver Information Display, select DIAGNOSTICS menu. Select VEHICLE TESTS submenu and then ACTIVATE RADIATOR FAN SPEED 1 or ACTIVATE RADIATOR FAN SPEED 2. 2. The DID status line will show TEST to confirm the forced activation of the radiator fan clutch. To cancel, turn the ignition switch to the OFF position or press ESCAPE button, select STOP TEST submenu and then press ENTER button twice. TEST will disappear from the DID status line. <p>If the fan clutch does not engage using this procedure then the clutch is faulty or the wiring between the multiplex module and the clutch is faulty. Mechanically lock the fan clutch as described in section 05: COOLING SYSTEM of the maintenance manual.</p> |

APPENDIX C

| | |
|--|----------|
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ALLISON TRANSMISSION 5th GENERATION OIL LEVEL CHECK USING THE PUSHBUTTON SHIFT SELECTOR

The oil level sensor (OLS) is standard in your transmission. With the OLS and Allison 5th generation shift selector, you can get a more accurate electronic fluid level check than with a dipstick.

Oil level codes are obtained as follows:

1. Park vehicle on a level surface, select «N» (neutral) on the pushbutton shift selector and apply parking brake.
2. Wait for at least 2 minutes to allow the oil to settle;
3. Press simultaneously the ▲ (Upshift) and ▼ (Downshift) arrow buttons once.
4. Oil level codes are displayed once the following parameters are met :
 - **The vehicle has been stationary for approximately 2 minutes to allow the oil to settle;**
 - **Engine at idle;**
 - **Oil at normal operating temperature, between 104°F (40°C) and 220°F (104°C);**
 - **Transmission in «N» (Neutral);**
 - **Transmission output shaft stopped;**
 - **Oil level sensor present and working.**

5. Correct fluid level is displayed as shown.



6. Low fluid level is displayed as shown. The number indicates the number of quarts of fluid the transmission requires.



7. High fluid level condition with the number of quarts in excess is displayed as shown.



NOTE

Confirm a low fluid level condition by making a manual fluid level check.

8. To exit the Oil Level Display Mode, press any range button «R», «N» or «D» at any time.

NOTE

Note that the quantities LO 4 and HI 3 are the largest values displayed and that the actual variation in oil level may exceed these numbers.

If the fluid level check cannot be completed, an Invalid for Display fault is reported. Refer to table below to review the codes and conditions.

| CODE | CAUSE OF FAULT CODE |
|-------------------|---------------------------------|
| SETTLING OX | Settling time too short |
| ENG RPM TOO LOW | Engine speed (rpm) too low |
| ENG RPM TOO HIGH | Engine speed (rpm) too high |
| MUST BE IN NEU | N (Neutral) must be selected |
| OIL TEMP TOO LOW | Sump fluid temperature too low |
| OIL TEMP TOO HIGH | Sump fluid temperature too high |
| VEH SPD TOO HI | Output shaft speed |
| SENSOR FAILED | Sensor failure |

CONTROL SYSTEM PROGNOSTICS

The transmission control system includes the provision for the user to monitor various transmission operating parameters. Transmission operating parameters monitored by the prognostics feature are:


- Oil Life Monitor
- Filter Life Monitor
- Transmission Health Monitor



NOTE

*The prognostics package requires the use of **TranSynd™** or an Allison approved **TES295 or TES389 licensed fluid** in the transmission and **Allison High Capacity filters**. If any other fluids or filters are used, Prognostic mode **must be disabled**. Prognostic information will not be accurate with any other fluids or filters and could result in missed maintenance activities resulting in transmission damage.*



Refer to TES 295 or TES389 Approved Fluids list, found under the Service/Fluids heading on the home page of the Allison Transmission web site.


www.allisontransmission.com

When a specified threshold is detected for any of the serviceable conditions, the TRANSMISSION SERVICE indicator  is illuminated to alert the operator. Failure to attend to the service condition and reset the TRANSMISSION SERVICE indicator within a defined operating period will result in illumination of the CHECK light with associated message in the DID, indicating the increased probability that the service condition will develop into a more serious condition.

To access the Prognostic Mode functions, simultaneously press the  (Upshift) and  (Downshift) arrow buttons repeatedly. See the reference table at the end of this section.

NORMAL PROGNOSTICS INDICATION AT ENGINE START

- A system bulb check illuminates the TRANSMISSION SERVICE indicator  approximately 0.5 seconds.
- If Prognostics features are enabled, the TRANSMISSION SERVICE indicator  illuminates again for 3 seconds after the bulb check. If Prognostics features are


disabled, the TRANSMISSION SERVICE indicator  does not illuminate again after the bulb check.

OIL LIFE MONITOR

The display message denotes the calculated remaining life of the transmission fluid. This value is based on the established life for the required baseline fluid, and then is continuously adjusted for cumulative effects of such operating parameters as operating time, retarder operation, output shaft revolutions and shift frequency.

Display

The display is a two-digit number, denoting percentage of the fluid life which remains. New fluid is displayed as 99%.

The TRANSMISSION SERVICE indicator  will be illuminated, denoting a required change of transmission fluid, when the remaining fluid life reaches approximately 1 %. The indicator will be lit steadily upon each initialization of the TCM, and will remain on steady for approximately 2 minutes after the first selection of “D” (drive) range each time, until service is performed and the indicator is reset.

Failure to perform maintenance and reset the TRANSMISSION SERVICE indicator within a defined period will result in the illumination of the CHECK light with associated message in the DID and diagnostic code P0897 Transmission Fluid Deteriorated.

Reset

The TRANSMISSION SERVICE indicator can be reset by a message over the SAE J1939 communication interface, with the Allison DOC™ for PC diagnostic program, or by depressing and holding the MODE button for ten (10) seconds while the Oil Life Monitor function is displayed. It may also be reset by selecting N-D-N-D-N-R-N on the shift selector, pausing briefly (less than 3 seconds) between each selector movement, with the ignition on and the engine not running. The TRANSMISSION SERVICE indicator illuminates briefly following a reset to acknowledge the reset was successful.

Setting Fluid Type for Prognostics

The fluid type can be programmed if the specific calibration allows it. The operator can do the following:

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With the engine off and the ignition on, perform the following sequence on the selector, N-R-N-D-N-R-N-D-N-R-N-D-N.

The TRANSMISSION SERVICE indicator flashes if TES389 is the current setting and illuminates solidly if TES295 is the current setting. To change the transmission fluid type, wait 5 seconds after entering transmission fluid type mode and perform the following sequences to select the proper transmission type:

N-R-N to select TES295

N-D-N to select TES389

The selector exits 30 seconds after entering transmission fluid type mode or the ignition may be turned off to exit earlier. Only one transmission fluid type selection may be made after entering transmission fluid type mode. All other attempt will be ignored. Transmission fluid type mode needs to be entered again if the wrong type of fluid is selected.



CAUTION

Verify prognostics fluid type setting matches transmission fluid type. Oil Life Monitor notifications will be inaccurate when mismatched. This could result in transmission damage from running a TES389 fluid too long or cause shortened TES295 fluid changes to occur.




CAUTION

Required calendar-based oil & filter change intervals (based on month) still apply because Oil Life Monitor function cannot measure time while ignition power is OFF.


If the Oil Life Monitor function has not indicated the need for a fluid change before 60 months have passed when using TES295 fluid type or before 24 months have passed when using TES389 fluid type, it will be necessary to change the fluid and filters per calendar requirements and reset the system.

FILTER LIFE MONITOR

This feature provides an alert when the transmission’s fluid filters need to be replaced. It helps extend filter change intervals to reduce routine maintenance downtime while providing maximum protection for the transmission.



The filter life indicator pressure switch signals the transmission control module when fluid exiting the main filter drops below a predetermined pressure. Both the main and lube filters **must be** changed when the TRANSMISSION SERVICE indicator  shows the main filter should be changed.


Filter Change Notification

Once the programmed threshold for maximum filter pressure drop has been observed and verified, the diagnostic code P088A Transmission Filter Maintenance Alert will be recorded to indicate that the filter has reached the end of its designed life. At the next initialization of the TCM, the TRANSMISSION SERVICE indicator  will flash for 2 minutes after the first selection of “D” (drive) range. Thereafter, the indicator will illuminate and flash upon each TCM initialization, continuing to flash for 2 minutes after the first selection of a drive range each time, until service is performed and the indicator is reset.

Failure to perform maintenance and reset the monitor after a calibration-defined number of warnings will result in the illumination of the CHECK light with associated message in the DID and diagnostic code P088B will be recorded to indicate a highly deteriorated filter.

Read and Reset Filter Life Monitor from Selector

To **enter** the filter life monitor, press simultaneously the  (Upshift) and  (Downshift) arrows three times. An acceptable filter life status is displayed as "OIL FILTER OK". An unacceptable filter life status is displayed as "REPLACE FILTERS".

The feature will **reset** automatically when the main fluid filter has been changed and the pressure drop across the filter no longer exceeds the threshold value. A manual reset can be performed by depressing and holding the MODE button for ten (10) seconds while the Filter Life Monitor function is displayed. It may also be reset by selecting N-R-N-R-N-D-N on the shift selector, pausing briefly (less than 3 seconds) between each selector movement, with the ignition on and the engine not running. The TRANSMISSION SERVICE indicator  illuminates briefly following a reset to acknowledge the reset was successful.

TRANSMISSION HEALTH MONITOR

This prognostic feature determines clutch life status of the transmission’s clutches and alerts you when clutch maintenance is required. The clutch life status is determined by monitoring changes and the calculated running clearance of the transmission clutches.

Clutch Maintenance Notification



The transmission health monitor feature determines when clutch maintenance is needed. If any of the clutches (except lockup) reaches a remaining life of approximately 10% or if any of the clutch running clearances exceeds a maximum value, then the TRANSMISSION SERVICE indicator is steadily illuminated from just after ignition on until ignition is turned off. Thereafter, the indicator will be lit upon each initialization of the TCM, and will remain on steady during all vehicle operation until service is performed and the indicator is reset. If the transmission health monitor mode has been accessed via the shift selector, a “TRANS HEALTH OK” or “TRANS HEALTH LO” is displayed. An acceptable clutch life status is displayed as “TRANS HEALTH OK”. An unacceptable clutch life status is displayed as “TRANS HEALTH LO”.

Read and Reset Transmission Health Monitor from Selector

To enter the transmission health monitor, press simultaneously the ▲ (Upshift) and ▼ (Downshift) arrows four times. An acceptable clutch life status is displayed as “TRANS HEALTH OK”. An unacceptable clutch life status is displayed as “TRANS HEALTH LO”.

The feature will **reset** automatically upon elimination of the clutch clearance condition which initiated it. The indicator can also be manually reset using the Allison DOC™ for PC diagnostics program if necessary.

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|  (Upshift) &  (Downshift) arrow buttons pressed simultaneously * | Description | Message | |
|--|--|-------------------------|-------------------------|
| 1 st press | Allison transmission oil level check | | |
| 2 nd press | Oil Life Monitor | " O " | " M " |
| | Oil life remaining will range from 99% down to 00% | Some number from 9 to 0 | Some number from 9 to 0 |
| 3 rd press | Filter Life Monitor | " F " | " M " |
| | Present life of filter is acceptable | OIL FILTER OK | |
| | Present life of filter is unacceptable | REPLACE FILTERS | |
| 4 th press | Transmission Health Monitor | " T " | " M " |
| | An acceptable clutch life status is displayed as "TRANS HEALTH OK" | TRANS HEALTH OK | |
| | An unacceptable clutch life status is displayed as "TRANS HEALTH LO" | TRANS HEALTH LO | |
| 5 th press | Display of diagnostic codes | | |

DIAGNOSTIC TROUBLESHOOTING CODES (DTC) — ALLISON 5TH GENERATION CONTROLS

DIAGNOSTIC TROUBLESHOOTING CODES (DTC) OVERVIEW

Diagnostic features are provided with the transmission control system to assist in troubleshooting of malfunctions and/or the monitoring of specific operating parameters. When a control system malfunction is detected, a series of Diagnostic Trouble Codes (DTCs) are used to identify and clarify the nature of the malfunction. These DTCs are each named by a 5 character alphanumeric string that refers to a diagnostic algorithm running pass/fail tests to help identify a malfunction in the transmission or vehicle operation. Most DTCs have some kind of diagnostic response that the operator notices, such as an illuminated CHECK light, selector display change, lock in range, or inhibit shifts condition.

DTCs are logged in the Transmission Control Module (TCM) memory by severity and by their active/inactive status with the most severe and active codes listed first. A maximum of five DTCs (numbered d1- d5) from most recent to oldest may be read from the shift selector. As DTCs are added, the oldest inactive DTC (historic) is dropped from the list. If all DTCs are active, the DTC with the lowest priority is dropped from the list.

An active code is any code that is current in the TCM decision-making process and has failed the DTC test(s) associated with that specific diagnostic algorithm. Historical codes, which are by definition inactive, are codes that are no longer failing their algorithm but are retained in the TCM in order to help the technician analyze possible causes and provide them direction if the vehicle is brought in before they are cleared from the queue.

DTCs can be cleared manually by the operator or they clear automatically from last (d5) to first (d1) in the queue after a number of engine starts, without becoming active again.

USING SHIFT SELECTOR FOR ACCESSING DIAGNOSTICS INFORMATION

DTCs can be displayed on the display portion of the shift selector. A DTC is either active or historic. An active DTC is a DTC that is current in the TCM decision-making process. Historic DTCs are retained in the TCM memory and do not necessarily affect the TCM decision-making process.

Display Sequence

Up to five DTCs may be displayed one at a time from the selector once the diagnostic display mode has been initiated by the operator. Each DTC is 5 characters in length. The DTC status active or inactive is shown below the DTC.



Shows active DTC P0730

The operator presses the MODE button to read the next DTC in the queue (if any) or requests to exit diagnostics mode. The diagnostics mode times out and returns the selector to normal operating mode after approximately 10 minutes of operator inactivity.

Diagnostic Code Display and Clearing Procedure

Diagnostic codes can be read and cleared by two methods:

- Using an Allison DOC™ diagnostic tool. For specific instructions on how to use an Allison DOC™ diagnostic tool, refer to the User Guide.
- Using the pushbutton shift selector.

To begin the diagnostic process:

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1. Bring the vehicle to a stop at a safe location.
2. Apply the parking brake.

To display stored codes:

1. Simultaneously press the ▲ (Upshift) and ▼ (Downshift) arrow buttons five times (Prognostics enabled) to access the Diagnostic Display Mode. With Prognostics disabled, press the ▲ (Upshift) and ▼ (Downshift) arrow buttons twice.
2. Press the MODE button to read the next code in the queue, if any.

To clear all active stored codes:

While in Diagnostic Mode, clear all active codes by pressing and holding the MODE button for approximately three seconds until the MODE message flashes. Release the MODE button. The MODE message should not remain illuminated if the active DTC shown in the display has cleared.

While in Diagnostic Mode, press and hold the MODE button for 10 seconds to clear both active codes and inactive codes. The MODE message flashes a second time indicating all codes are cleared from the queue.

Exiting Diagnostic Mode

Exit the diagnostic mode by one of the following methods:

1. Press simultaneously the ▲ (Upshift) and ▼ (Downshift) arrow buttons at the same time on the pushbutton shift selector.
2. Press any range button «D», «N» or «R» on the pushbutton shift selector.
3. After approximately 10 minutes of inactivity at the pushbutton shift selector, the diagnostic mode automatically exits and returns to normal operating mode.
4. Turn off power to the TCM (shut off the engine using the ignition key).

| |
|--|
| NOTE |
| <i>Be sure to record all codes displayed before they are cleared. This is essential for troubleshooting.</i> |

| |
|--|
| NOTE |
| <i>If clearing a code while locked in a «D» (Drive) or «R» (Reverse) position (fail-to-range), the transmission will still be in «D» (Drive) or «R» (Reverse) when the clearing procedure is completed. «N» (Neutral) must be manually selected.</i> |

DIAGNOSTIC TROUBLE CODE RESPONSE

The electronic control system is programmed to inform the operator of a problem with the transmission system via the CHECK light and shift selector display while it automatically takes action to protect the operator, vehicle, and transmission. When the Transmission Control Module (TCM) flags a Diagnostic Trouble Code (DTC) as active, the TCM may take a combination of diagnostic responses as listed in the table below.

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| CATEGORY OF RESPONSE | ACTIONS TAKEN |
|--------------------------------|---|
| DNS - <u>Do Not Shift</u> | <p>Release lock up (LU) clutch and inhibit lock up operation.</p> <p>Inhibit shifts from the current attained range.</p> <p>Turn on the CHECK light.</p> <p>Display the current attained range in the MONITOR window of the shift selector.</p> <p>Blank the SELECT window of the shift selector.</p> <p>Ignore any range selection inputs from the shift selector.</p> |
| SOL OFF - <u>SOLenoid OFF</u> | All solenoids are commanded off, resulting in hydraulic default operation of the transmission – PCS1 & PCS2 are on hydraulically when off electrically. |
| RPR - Return to Previous Range | When the speed sensor ratio or PS1 tests do not pass, the TCM commands the same range as commanded before the shift. |
| NNC - Neutral No Clutches | When certain speed sensor ratio or PS1 tests do not pass, the TCM commands a neutral condition with no clutches applied. |
| DNA - <u>Do Not Adapt</u> | The TCM stops adaptive shift control while the code is active. |

DIAGNOSTIC TROUBLESHOOTING CODES (DTC) LIST - ALLISON 5TH GENERATION CONTROLS

| DTC | Description | CHECK Light | Inhibited Operation Description |
|-------|--|-------------|---|
| C1312 | Retarder Request Sensor Failed Low | No | May inhibit retarder operation if not using J1939 datalink |
| C1313 | Retarder Request Sensor Failed High | No | May inhibit retarder operation if not using J1939 datalink |
| P0122 | Pedal Position Sensor Circuit Low Voltage | No | Use default throttle values. Freezes shift adapts. |
| P0123 | Pedal Position Sensor Circuit High Voltage | No | Use default throttle values. Freezes shift adapts. |
| P0218 | Transmission Fluid Over Temperature | Yes | Use default sump temp |
| P0562 | System Voltage Low | No | Inhibit TCC Operation, DNA |
| P0602 | TCM Not Programmed | Yes | Lock in Neutral |
| P0604 | Control module random access memory (RAM) | Yes | Lock in Neutral |
| P0614 | Torque Control Data Mismatch - ECM/TCM | Yes | Allows operation only in reverse and second range. |
| P0634 | TCM Internal Temperature Too High | Yes | SOL OFF (hydraulic default) |
| P0642 | Sensor Reference Voltage "A" Circuit Low | Yes | Default sensor data used |
| P0643 | Sensor Reference Voltage "A" Circuit High | Yes | Default sensor data used |
| P0657 | Actuator Supply Circuit Voltage 1 Open (HSD 1) | Yes | SOL OFF, DNA, Inhibit TCC operation, Inhibit main modulation |
| P0658 | Actuator Supply Voltage 1 (HSD1) Low | Yes | DNS, SOL OFF (hydraulic default) |
| P0659 | Actuator Supply Voltage 1 (HSD1) High | Yes | DNS, SOL OFF (hydraulic default) |
| P0703 | Brake Switch Circuit Malfunction | No | No Neutral to Drive shifts for refuse packer. TCM inhibits retarder operation if a TPS code is also active. |
| P0708 | Transmission Range Sensor Circuit High Input | Yes | Ignore defective strip selector inputs |

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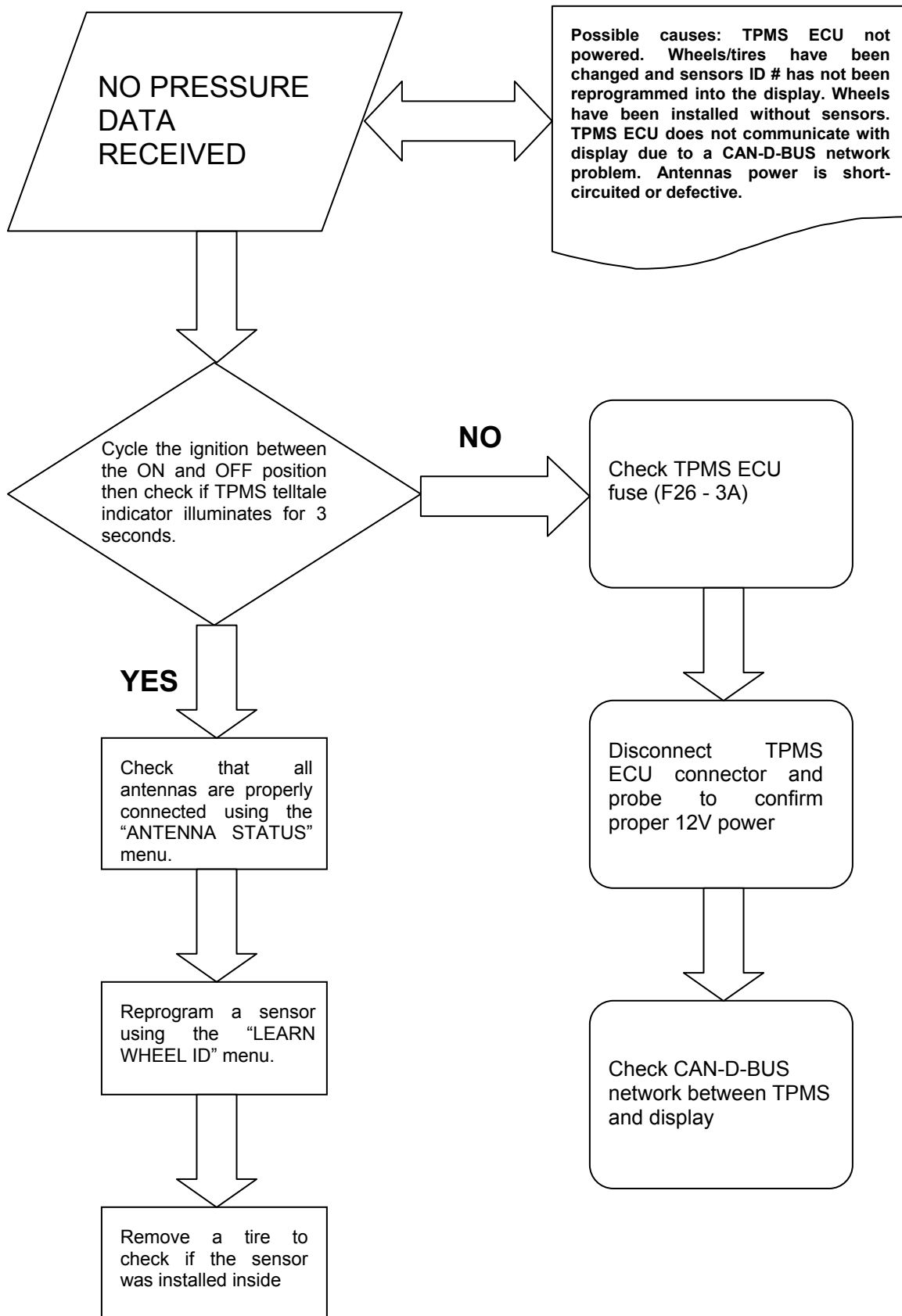
| DTC | Description | CHECK Light | Inhibited Operation Description |
|-------|--|-------------|--|
| P070C | Transmission Fluid Level Sensor Circuit – Low Input | No | None |
| P070D | Transmission Fluid Level Sensor Circuit – High Input | No | None |
| P0712 | Transmission Fluid Temperature Sensor Circuit Low Input | Yes | Use default sump temp |
| P0713 | Transmission Fluid Temperature Sensor Circuit High Input | Yes | Use default sump temp |
| P0715 | Turbine Shaft Speed Sensor Circuit | Yes | DNS, Lock in current range |
| P0716 | Turbine Shaft Speed Sensor Circuit Performance | Yes | DNS, Lock in current range |
| P0717 | Turbine Shaft Speed Sensor Circuit No Signal | Yes | DNS, Lock in current range |
| P071A | RELS Input Failed On | Yes | Inhibit RELS operation |
| P071D | General Purpose Input Fault | Yes | None |
| P0720 | Output Shaft Speed Sensor Circuit | Yes | DNS, Lock in current range |
| P0721 | Output Shaft Speed Sensor Circuit Performance | Yes | DNS, Lock in current range |
| P0722 | Output Speed Sensor Circuit No Signal | Yes | DNS, Lock in current range |
| P0725 | Engine Speed Sensor Circuit | No | Default to turbine speed |
| P0726 | Engine Speed Sensor Circuit Performance | No | Default to turbine speed |
| P0727 | Engine Speed Sensor Circuit No Signal | No | Default to turbine speed |
| P0729 | Incorrect 6 th Gear Ratio | Yes | DNS, Attempt 5 th , then 3 rd |
| P0731 | Incorrect 1 st Gear ratio | Yes | DNS, Attempt 2 nd , then 5 th |
| P0732 | Incorrect 2 nd Gear ratio | Yes | DNS, Attempt 3 rd , then 5 th |
| P0733 | Incorrect 3 rd Gear ratio | Yes | DNS, Attempt 4 th , then 6 th |
| P0734 | Incorrect 4 th Gear ratio | Yes | DNS, Attempt 5 th , then 3 rd |
| P0735 | Incorrect 5 th Gear ratio | Yes | DNS, Attempt 6 th , then 3 rd , then 2 nd |
| P0736 | Incorrect Reverse Gear ratio | Yes | DNS, Lock in Neutral |
| P0741 | Torque Converter Clutch System Stuck Off | Yes | None |
| P0752 | Shift Solenoid 1 Valve Performance-Stuck On | Yes | DNS |
| P0776 | Pressure Control Solenoid (PCS) 2 Stuck Off | Yes | DNS, RPR |
| P0777 | Pressure Control Solenoid 2 Stuck On | Yes | DNS, RPR |
| P0796 | Pressure Control Solenoid 3 Stuck Off | Yes | DNS, RPR |
| P0797 | Pressure Control Solenoid 3 Stuck On | Yes | DNS, RPR |
| P0842 | Transmission Fluid Pressure Switch 1 Circuit Low | Yes | DNS, Lock in current range |
| P0843 | Transmission Fluid Pressure Switch 1 Circuit High | Yes | DNS, Lock in current range |
| P0847 | Transmission Fluid Pressure Switch 2 Circuit Low | Yes | None |
| P0848 | Transmission Fluid Pressure Switch 2 Circuit High | Yes | None |
| P088A | Transmission Fluid Filter Maintenance Alert | No | None |
| P088B | Transmission Fluid Filter Maintenance Required | No | None |
| P0880 | TCM Power Input Signal | No | None |
| P0881 | TCM Power Input Signal Performance | No | None |
| P0882 | TCM Power Input Signal Low | Yes | DNS, SOL OFF (hydraulic default) |
| P0883 | TCM Power Input Signal High | No | None |
| P0894 | Unexpected Mechanical Gear Disengagement | Yes | DNS, Lock in first |
| P0897 | Transmission Fluid Deteriorated | No | None |
| P0960 | Main Pressure Modulator Solenoid Control Circuit Open | Yes | None |
| P0962 | Main Pressure Modulator Solenoid Control Circuit Low | Yes | DNS, SOL OFF (hydraulic default) |
| P0963 | Main Pressure Modulator Solenoid Control Circuit High | Yes | None |
| P0964 | Pressure Control Solenoid 2 (PCS2) Control Circuit Open | Yes | DNS, SOL OFF (hydraulic default) |

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| DTC | Description | CHECK Light | Inhibited Operation Description |
|-------|---|-------------|---|
| P0966 | Pressure Control Solenoid 2 (PCS2) Control Circuit Low | Yes | DNS, SOL OFF (hydraulic default) |
| P0967 | Pressure Control Solenoid 2 (PCS2) Control Circuit High | Yes | DNS, SOL OFF (hydraulic default) |
| P0968 | Pressure Control Solenoid 3 (PCS3) Control Circuit Open | Yes | DNS, SOL OFF (hydraulic default) |
| P0970 | Pressure Control Solenoid 3 (PCS3) Control Circuit Low | Yes | DNS, SOL OFF (hydraulic default) |
| P0971 | Pressure Control Solenoid 3 (PCS3) Control Circuit High | Yes | DNS, SOL OFF (hydraulic default) |
| P0973 | Shift Solenoid 1 (SS1) Control Circuit Low | Yes | DNS, SOL OFF (hydraulic default) |
| P0974 | Shift Solenoid 1 (SS1) Control Circuit High | Yes | DNS, SOL OFF (hydraulic default) |
| P0976 | Shift Solenoid 2 (SS2) Control Circuit Low | Yes | 7-speed: Allow 2 through 6, N, R Inhibit TCC operation |
| P0977 | Shift Solenoid 2 (SS2) Control Circuit High | Yes | 7-speed: Allow 2 through 6, N, R |
| P097A | Shift Solenoid 1 (SS1) Control Circuit Open | Yes | Lock in range |
| P097B | Shift Solenoid 2 (SS2) Control Circuit Open | Yes | 7-speed: Allow 2 through 6, N, R |
| P0989 | Retarder Pressure Sensor Circuit Low | No | None |
| P0990 | Retarder Pressure Sensor Circuit High | No | None |
| P1739 | Incorrect Low Gear Ratio | Yes | Command 2 nd and allow shifts 2 through 6, N, R |
| P1790 | Gear Shift Module 1 Calibrated Invalid | Yes | Shift selector language or units incorrect |
| P1791 | Gear Shift Module 2 Calibrated Invalid | Yes | Shift selector language or units incorrect |
| P1891 | Throttle Position Sensor PWM Signal Low | No | Use default throttle values |
| P1892 | Throttle Position Sensor PWM Signal High | No | Use default throttle values |
| P2184 | Engine Coolant Temperature Sensor 2 Circuit Low Input | No | Use default engine coolant values |
| P2185 | Engine Coolant Temperature Sensor 2 Circuit High Input | No | Use default engine coolant values |
| P2637 | Torque Management Feedback Signal (A) | Yes | Inhibit SEM |
| P2641 | Torque Management Feedback Signal (B) | Yes | Inhibit LRTP |
| P2669 | Actuator Supply Circuit Voltage 2 Open (HSD2) | Yes | SOL OFF, Inhibit TCC operation, Inhibit Main modulation, ONA |
| P2670 | Actuator Supply Voltage 2 (HSD2) Low | Yes | DNS, SOL OFF (hydraulic default) |
| P2671 | Actuator Supply Voltage 2 (HSD2) High | Yes | DNS, SOL OFF (hydraulic default) |
| P2684 | Actuator Supply Circuit Voltage 3 Open (HSD3) | Yes | SOL OFF, Inhibit TCC operation, Inhibit Main modulation, ONA |
| P2685 | Actuator Supply Voltage 3 (HSD3) Low | Yes | DNS, SOL OFF (hydraulic default) |
| P2686 | Actuator Supply Voltage 3 (HSD3) High | Yes | DNS, SOL OFF (hydraulic default) |
| P2714 | Pressure Control Solenoid 4 (PCS4) Stuck Off | Yes | DNS, RPR |
| P2715 | Pressure Control Solenoid 4 (PCS4) Stuck On | Yes | DNS, SOL OFF (hydraulic default) |
| P2718 | Pressure Control Solenoid 4 (PCS4) Control Circuit Open | Yes | DNS, SOL OFF (hydraulic default) |
| P2720 | Pressure Control Solenoid 4 (PCS4) Control Circuit Low | Yes | DNS, SOL OFF (hydraulic default) |
| P2721 | Pressure Control Solenoid 4 (PCS4) Control Circuit High | Yes | DNS, SOL OFF (hydraulic default) |
| P2723 | Pressure Control Solenoid 1 (PCS1) Stuck Off | Yes | DNS, RPR |
| P2724 | Pressure Control Solenoid 1 (PCS1) Stuck On | Yes | DNS, RPR |
| P2727 | Pressure Control Solenoid 1 (PCS1) Control Circuit Open | Yes | DNS, SOL OFF (hydraulic default) |
| P2729 | Pressure Control Solenoid 1 (PCS1) Control Circuit Low | Yes | DNS, SOL OFF (hydraulic default) |
| P2730 | Pressure Control Solenoid 1 (PCS1) Control Circuit High | Yes | DNS, SOL OFF (hydraulic default) |
| P2736 | Pressure Control Solenoid 5 (PCS5) Control Circuit Open | Yes | Inhibit retarder operation |

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| DTC | Description | CHECK Light | Inhibited Operation Description |
|-------|--|-------------|---|
| P2738 | Pressure Control Solenoid 5 (PCS5) Control Circuit Low | Yes | Allow 2 through 6, N, R. Inhibit retarder and TCC operation |
| P2739 | Pressure Control Solenoid 5 (PCS5) Control Circuit High | Yes | Inhibit retarder operation |
| P273F | Retarder Oil Temperature Sensor Over Temperature Condition | No | None |
| P2742 | Retarder Oil Temperature Sensor Circuit – Low | No | Use default retarder temp values |
| P2743 | Retarder Oil Temperature Sensor Circuit – High | No | Use default retarder temp values |
| P2761 | TCC PCS Control Circuit Open | Yes | Inhibit TCC operation |
| P2763 | TCC PCS Control Circuit High | Yes | Inhibit TCC operation |
| P2764 | TCC PCS Control Circuit Low | Yes | 7-speed: Allow 2 through 6, N, R. Inhibit TCC operation |
| P2789 | Transmission Clutch Life Expired (Clutch Adaptive Learning at Limit) | No | None |
| P2793 | Gear Shift Direction Circuit | Yes | Ignores PWM input from shift selector |
| P2808 | Pressure Control Solenoid 6 (PCS6) Stuck Off | Yes | DNS, RPR |
| P2809 | Pressure Control Solenoid 6 (PCS6) Stuck On | Yes | DNS, RPR |
| P2812 | Pressure Control Solenoid 6 (PCS6) Control Circuit Open | Yes | DNS, SOL OFF (hydraulic default) |
| P2814 | Pressure Control Solenoid 6 (PCS6) Control Circuit Low | Yes | DNS, SOL OFF (hydraulic default) |
| P2815 | Pressure Control Solenoid 6 (PCS6) Control Circuit High | Yes | DNS, SOL OFF (hydraulic default) |
| U0073 | CAN Communication Bus 1 Off | No | Use default values |
| U0074 | CAN Communication Bus 2 Off | No | Use default values |
| U0100 | Lost Communications with ECM A | Yes | Use default values |
| U0103 | Lost Communication with Gear Shift Module (Shift Selector) 1 | Yes | Maintain range selected, observe gear shift direction circuit |
| U0291 | Lost Communication with Gear Shift Module (Shift Selector) 2 | Yes | Maintain range selected, observe gear shift direction circuit |
| U0304 | Incompatible Gear Shift Module 1 (Shift Selector) | Yes | Ignore shift selector inputs |
| U0333 | Incompatible Gear Shift Module 2 (Shift Selector) | Yes | Ignore shift selector inputs |
| U0404 | Invalid Data Received From Gear Shift Module (Shift Selector) 1 | Yes | Maintain range selected, observe gear shift direction circuit |
| U0592 | Invalid Data Received From Gear Shift Module (Shift Selector) 2 | Yes | Maintain range selected, observe gear shift direction circuit |



2 APPENDIX D – TPMS TROUBLESHOOTING GUIDE

