

ABBREVIATION	DESCRIPTION
ABS	Antilock Brake System / Système de freinage antiblocage
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
ECM	Engine Control Module / Unité de commande électronique du moteur
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 / Échappement
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
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](http://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**

## APPENDIX B – Troubleshooting Multiplex 1

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)  Module A53 not powered or is defective  Engine ECM does not receive the ignition signal  Engine ECM is not powered	If the vehicle does not start from the rear:  1. Verify that module A53 is powered: 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.  2. Verify that the engine ECM is powered and get the ignition signal a) Check / reset circuit breaker CB8 Check / replace fuse F74 b) Check / reset circuit breaker CB2 Check / replace fuse F78
None of the Multiplexed functions are operating, including the basic limp-home functions (door opening, flashers, wipers in speed 1)  “FLIP REAR BREAKER TO INITIATE I/O MODULES PROGRAMMING” pop-up message appears in the DID  <i>Note: The sunshades are still functioning since these are not multiplexed</i>	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.  2. The DID indicates “MUX AUTOPROGRAMMING I/O MODULE PLEASE WAIT” until the reprogramming is complete.
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 <sup>th</sup> from the top on the right side column) Check / replace fuse F1

## 2 APPENDIX B – Troubleshooting Multiplex

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>

## APPENDIX B – Troubleshooting Multiplex 3

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"> <li>1. Check / reset circuit breaker CB7</li> <li>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.</li> </ol>
<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"> <li>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).</li> <li>2. Check / reset circuit breaker CB1</li> <li>3. Check / replace fuse F12</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>
<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"> <li>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).</li> <li>2. Check / reset circuit breaker CB2</li> <li>3. Check / replace fuse F33 and F34</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>
Low beam headlights and flasher on right side not functioning	Module A48 is not powered or is faulty	<ol style="list-style-type: none"> <li>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).</li> <li>2. Check / reset circuit breaker CB2</li> <li>3. Check / replace fuse F33 and F34</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>

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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"> <li>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).</li> <li>2. Check / reset circuit breaker CB2</li> <li>3. Check / replace fuse F80</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>
<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"> <li>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).</li> <li>2. Check / reset circuit breaker CB5</li> <li>3. Check / replace fuse F65</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>
<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"> <li>1. Check / reset circuit breaker CB3</li> <li>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).</li> <li>3. Check / reset circuit breaker CB5</li> <li>4. Check / replace fuse F67 , F68</li> <li>5. Probe gray connector on module to see if it is powered.</li> </ol>
<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"> <li>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).</li> <li>2. Check / reset circuit breaker CB5</li> </ol>



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Problem/Symptom	Probable Causes	Actions
		<ol style="list-style-type: none"> <li>3. Check / replace fuse F67 , F68</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>
Sound system not functioning	Circuit breaker CB4 or CB11 was manually tripped and not reset	<ol style="list-style-type: none"> <li>1. Check / reset circuit breaker CB4 or CB11</li> </ol>
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"> <li>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</li> </ol>
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"> <li>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</li> </ol>
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"> <li>1. Turn the ignition key to the OFF position and turn to the ON position again. This resets all "soft –fuses"</li> </ol>
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"> <li>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.</li> <li>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.</li> </ol> <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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### DIAGNOSTIC TROUBLESHOOTING CODES (DTC) — ALLISON 4<sup>TH</sup> GENERATION CONTROLS

#### DIAGNOSTIC TROUBLESHOOTING CODES (DTC) OVERVIEW

Diagnostic codes (DTC) are numerical indications relating to a malfunction in transmission operation. These codes are logged in a list in the TCM memory with the most severe or most recent code listed first. A maximum of five codes (numbered d1 to d5) may be listed in memory at one time. As codes are added, the oldest inactive code is dropped from the list. If all codes are active, the code with the lowest priority that is not included on the severity list is dropped from the list.

Diagnostic codes (DTC) and code information may be accessed through the pushbutton shift selector or using an Allison DOC™ diagnostic tool.

The TCM separately stores the active and inactive codes. An active code is any code that is current in the TCM decision-making process. Inactive codes are codes that are retained in the TCM memory and will not necessary affect the TCM decision-making process. Inactive codes are useful in determining if a problem is:

- Isolated ;
- Intermittent ;
- Result from a previous malfunction.

The TCM may automatically delete a code from memory if it has not recurred. If the condition which generated the code is active, the LED indicator on the selector will be illuminated simultaneously with the display of the code. If the condition which generated the code no longer exists, the LED is not illuminated and the code is maintained only as a historical record of the prior condition. An illuminated MODE INDICATOR (LED) during normal operation signifies secondary shift mode operation.



#### DIAGNOSTIC CODES – ALLISON 4<sup>TH</sup> GENERATION CONTROLS

When the diagnostic mode is entered, the first code (position d1) is displayed as follows:

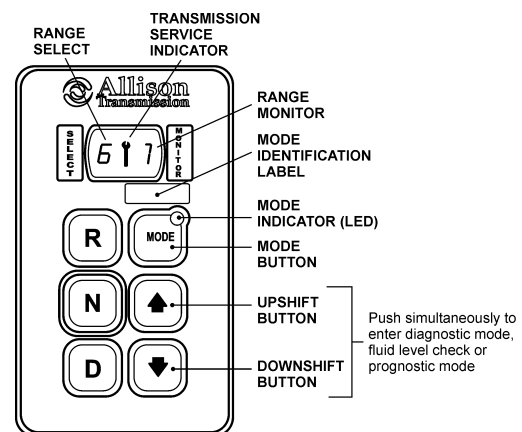
Exemple : Code P0722

Displayed as: **d1...P...07...22**

The code list position is the first item displayed, followed by the DTC. Each item is displayed for about one second. The display cycles continuously until the next code list position is accessed by pressing the **MODE** button. The following example shows how DTC P0722 is displayed on the pushbutton shift selector.

SELECT	d	1	MONITOR
		P	
	0	7	
	2	2	

- d1 (code list position) – The position which a code occupies in the list. Positions are displayed as « d1 » through « d5 » (code list position 1 through code list position 5).
- P0722 (DTC) – The diagnostic troubleshooting code number referring to the general condition or area of fault detected by the TCM.



**DIAGNOSTIC CODE DISPLAY AND CLEARING PROCEDURE – ALLISON 4<sup>TH</sup> GENERATION CONTROLS**

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:*

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

*To display stored codes:*

1. Simultaneously press the ▲ (Up) and ▼ (Down) arrow buttons five times to access the Diagnostic Display Mode.

***NOTE***

*To access the Oil Level Display Mode, simultaneously press the ▲ (Up) and ▼ (Down) arrow buttons once. Consult paragraph: « ALLISON TRANSMISSION OIL LEVEL CHECK USING THE PUSHBUTTON SHIFT SELECTOR » at the end of this section.*

2. Observe the digital display for code (d1).
3. Press the MODE button to see the next code (d2) – repeat for subsequent codes (d3, d4 & d5).

***NOTE***

*Be sure to record all codes displayed before they are cleared. This is essential for troubleshooting.*

***NOTE***

*The Diagnostic Display Mode can be entered for viewing codes at any speed. Codes can only be cleared when the output speed = 0 and no output speed sensor failure is active*

Active indicators (MODE INDICATOR LED) and inactive codes can be cleared manually, while in the diagnostic display mode, after the condition causing the code is identified.

*To clear active indicators and inactive codes:*

1. While in Diagnostic Display Mode, press and hold the MODE button for 10 seconds to clear both active indicators and inactive codes.
2. Begin operating as normal. Have the transmission checked at the earliest opportunity by an Allison Transmission distributor or dealer.

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### *NOTE*

All active indicators are cleared at TCM power down.

Some codes will clear their active indicator when the condition causing the code is no longer detected by the TCM.

The Diagnostic Display Mode can be exited by any of the following methods:

- Press simultaneously the ▲ (Up) and ▼ (Down) arrow buttons at the same time on the pushbutton shift selector.
- Press any range button «D», «N» or «R» on the pushbutton shift selector (the shift will be commanded if it is not inhibited by an active code).
- Wait until the calibrated time (approximately 10 minutes) has passed. The system will automatically return to the normal operating mode.
- Turn off power to the TCM (shut off the engine using the ignition key).

### *NOTE*

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.

## DIAGNOSTIC CODE RESPONSE

The following responses are used in the "Diagnostic Troubleshooting Code List and Inhibited Operation Description" table to command safe operation when diagnostic codes are sent.

### **DNS - Do Not Shift Response**

- Release lock up clutch and inhibit lock up operation.
- Inhibit all shifts.
- Turn ON the CHECK TRANS light.
- Display the range attained.
- Ignore any range selection inputs from the shift selector.

### **DNA - Do Not Adapt Response**

The TCM stops adaptive shift control while the code is active.

### **SOL OFF - SOLenoid OFF Response**

All solenoids are commanded OFF (turning solenoids “A” and “B” off electrically cause them to be on hydraulically).

### **RPR - Return to Previous Range Response**

When the speed sensor ratio or C3 pressure switch test associated with a shift not successful, the TCM commands the same range as commanded before the shift.

### **NNC - Neutral No Clutches Response**

When certain speed sensor ratio or C3 pressure switch tests are not successful, the TCM commands a neutral condition with no clutches applied.

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**DIAGNOSTIC TROUBLESHOOTING CODES (DTC) LIST - ALLISON 4<sup>TH</sup> GENERATION CONTROLS**

<b>DTC</b>	<b>Description</b>	<b>CHECK TRANS Light</b>	<b>Inhibited Operation Description</b>
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 Low Voltage	No	Use default throttle values. Freezes shift adapts.
P0123	Pedal Position Sensor High Voltage	No	Use default throttle values. Freezes shift adapts.
P0218	Transmission Fluid Over Temperature	No	Use hot mode shift schedule. Holds fourth range. TCC is inhibited. Freezes shift adapts.
P0561	System Voltage Performance		
P0562	System Voltage Low		
P0563	System Voltage High		
P0602	TCM Not Programmed	Yes	Lock in Neutral
P0610	TCM Vehicle Options (Trans ID) Error	Yes	Use TID A calibration
P0613	TCM Processor	No	All solenoids off
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)
P063E	Auto Configuration Throttle Input Not Present	Yes	Use default throttle values
P063F	Auto Configuration Engine Coolant Temp Input Not Present	No	None
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)
P0667	TCM Internal Temperature Sensor Circuit Range / Perform		
P0668	TCM Internal Temperature Sensor Circuit Low		
P0669	TCM Internal Temperature Sensor Circuit High		
P0701	Transmission Control System Performance		
P0702	Transmission Control System Electrical (TransID)	Yes	Use TID A calibration
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
P070C	Transmission Fluid Level Sensor Circuit – Low Input	No	None
P070D	Transmission Fluid Level Sensor Circuit – High Input	No	None
P0711	Transmission Fluid Temperature Sensor Circuit Performance	Yes	Use default sump temp
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
P0716	Turbine Speed Sensor Circuit Performance	Yes	DNS, Lock in current range
P0717	Turbine 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

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DTC	Description	CHECK TRANS Light	Inhibited Operation Description
P0720	Output Speed Sensor Circuit		
P0721	Output Speed Sensor Circuit Performance	Yes	DNS, Lock in current range
P0722	Output Speed Sensor Circuit No Signal	Yes	DNS, Lock in current range
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 <sup>th</sup> Gear Ratio	Yes	DNS, Attempt 5 <sup>th</sup> , then 3 <sup>rd</sup>
P0730	Incorrect Neutral Gear ratio		
P0731	Incorrect 1 <sup>st</sup> Gear ratio	Yes	DNS, Attempt 2 <sup>nd</sup> , then 5 <sup>th</sup>
P0732	Incorrect 2 <sup>nd</sup> Gear ratio	Yes	DNS, Attempt 3 <sup>rd</sup> , then 5 <sup>th</sup>
P0733	Incorrect 3 <sup>rd</sup> Gear ratio	Yes	DNS, Attempt 4 <sup>th</sup> , then 6 <sup>th</sup>
P0734	Incorrect 4 <sup>th</sup> Gear ratio	Yes	DNS, Attempt 5 <sup>th</sup> , then 3 <sup>rd</sup>
P0735	Incorrect 5 <sup>th</sup> Gear ratio	Yes	DNS, Attempt 6 <sup>th</sup> , then 3 <sup>rd</sup> , then 2 <sup>nd</sup>
P0736	Incorrect Reverse Gear ratio	Yes	DNS, Lock in Neutral
P0741	Torque Converter Clutch System Stuck Off	Yes	None
P0776	Pressure Control Solenoid 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 Pressure Switch 1 Circuit Low	Yes	DNS, Lock in current range
P0843	Transmission Pressure Switch 1 Circuit High	Yes	DNS, Lock in current range
P0847	Transmission Pressure Switch 2 Circuit Low		
P0848	Transmission Pressure Switch 2 Circuit High		
P088A	Transmission Fluid Filter Deteriorated		
P088B	Transmission Fluid Filter Very Deteriorated		
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	Transmission Component Slipping	Yes	DNS, Lock in first
P0960	Pressure Control Solenoid Main Mod Control Circuit Open	Yes	None
P0961	Pressure Control Solenoid (PCS) MM System Performance		
P0962	Pressure Control Solenoid Main Mod Control Circuit Low	Yes	DNS, SOL OFF (hydraulic default)
P0963	Pressure Control Solenoid Main Mod Control Circuit High	Yes	None
P0964	Pressure Control Solenoid 2 (PCS2) Control Circuit Open	Yes	DNS, SOL OFF (hydraulic default)
P0965	Pressure Control Solenoid (PCS) 2 System Performance		
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)
P0969	Pressure Control Solenoid (PCS) 3 System Performance		
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)

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<b>DTC</b>	<b>Description</b>	<b>CHECK TRANS Light</b>	<b>Inhibited Operation Description</b>
P0974	Shift Solenoid 1 (SS1) Control Circuit High	Yes	DNS, SOL OFF (hydraulic default)
P0975	Shift Solenoid 2 (SS2) Control Circuit Open	Yes	7-speed: Allow 2 through 6, N, R
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
P0989	Retarder Pressure Sensor Failed Low	No	None
P0990	Retarder Pressure Sensor Failed High	No	None
P1739	Incorrect Low Gear Ratio	Yes	Command 2 <sup>nd</sup> and allow shifts 2 through 6, N, R
P1891	Throttle Position Sensor PWM Signal Low Input	No	Use default throttle values
P1892	Throttle Position Sensor PWM Signal High Input	No	Use default throttle values
P2184	Engine Coolant Temperature Sensor Circuit Low Input	No	Use default engine coolant values
P2185	Engine Coolant Temperature Sensor Circuit High Input	No	Use default engine coolant values
P2637	Torque Management Feedback Signal (SEM)	Yes	Inhibit SEM
P2641	Torque Management Feedback Signal (LRTP)	Yes	Inhibit LRTP
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)
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)
P2719	Pressure Control Solenoid (PCS) 4 System Performance		
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)
P2728	Pressure Control Solenoid (PCS) 1 System Performance		
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
P2737	Pressure Control Solenoid (PCS) 5 System Performance		
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
P2740	Retarder Oil Temperature Hot	No	None
P2742	Retarder Oil Temperature Sensor Circuit – Low Input	No	Use default retarder temp values
P2743	Retarder Oil Temperature Sensor Circuit – High Input	No	Use default retarder temp values
P2761	TCC PCS Control Circuit Open	Yes	Inhibit TCC operation
P2762	TCC PCS Control Circuit Range / Performance		
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
P2772	Four Wheel Drive Low Switch Circuit Performance		



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DTC	Description	CHECK TRANS Light	Inhibited Operation Description
P278A	Kickdown Input Failed ON	No	Inhibit kickdown operation
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)
P2813	Pressure Control Solenoid (PCS) 6 System Performance		
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)
U0001	Hi Speed CAN Bus Reset Counter Overrun (IESCAN)	No	Use default values, inhibit SEM
U0010	CAN BUS Reset Counter Overrun	No	Use default values, inhibit SEM
U0100	Lost Communications with ECM/PCM (J1587)	Yes	Use default values
U0103	Lost Communication with Gear Shift Module (Shift Selector) 1	Yes	Maintain range selected, observe gear shift direction circuit
U0115	Lost Communication with ECM	Yes	Use default values
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) ID	Yes	Ignore shift selector inputs
U0333	Incompatible Gear Shift Module 2 (Shift Selector) ID	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

**ALLISON TRANSMISSION OIL LEVEL CHECK USING THE PUSHBUTTON SHIFT SELECTOR**

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. Press simultaneously the ▲ (Up) and ▼ (Down) arrow buttons once.
3. Oil level codes are displayed in 2 minutes (e.g. display will flash and 8, 7, 6, 5, ...; countdown will occur during the 2 minutes) once the following parameters are met :
  - **Waiting time, vehicle must be stationary for at least 2 minutes to allow the oil to settle;**
  - **Engine at idle;**
  - **Oil at normal operating temperature, between 140°F (60°C) and 220°F (104°C);**
  - **Transmission in «N» (Neutral);**
  - **Transmission output shaft stopped;**
  - **Oil level sensor present and working.**

After 2 minutes, the display will flash one of the codes shown below :

DISPLAY	INTERPRETATION
O L...O K	Oil level is correct
O L...L O... 1	Oil Level is LOw 1 quart
O L...L O... 2	Oil Level is LOw 2 quart
O L...L O... 3	Oil Level is LOw 3 quarts
O L...L O... 4	Oil Level is LOw 4 or more quarts
O L...H I... 1	Oil Level is Hlgh 1 quart
O L...H I... 2	Oil Level is Hlgh 2 quarts
O L...H I... 3	Oil Level is Hlgh 3 or more quarts
O L... – (fc)	Oil Level is invalid. Source of invalid reading is defined by a two-character fault code (fc)

**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.*

**NOTE**

*Failure to meet one of the above parameters will stop the two minute countdown. One of the codes shown hereafter will indicate the cause of the countdown interruption. Once all parameters are met, the countdown will continue from where it left off.*

If the fluid level check cannot be completed, an Invalid for Display fault is reported. This condition is reflected by the display of "OL", followed by "–", followed by one or two additional characters. The displayed characters define the cause of the fault, which may be either a system malfunction or an improper condition for conducting the check.

CODE	CAUSE OF FAULT CODE
OL...-...OX	Waiting period is not complete
OL...-...EL	Engine speed (rpm) too low
OL...-...EH	Engine speed (rpm) too high
OL...-...SN	N (neutral) must be selected
OL...-...TL	Sump oil temperature too low
OL...-...TH	Sump oil temperature too high
OL...-...SH	Output shaft rotation
OL...-...FL	Sensor failure

**Exiting the Fluid Level Display Mode**

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

### 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 TES-295 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 Approved Fluids list, found under the Service/Fluids heading on the home page of the Allison Transmission web site.*

**[www.allisontransmission.com](http://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 TRANS light on the dashboard telltale panel, indicating the increased probability that the service condition will develop into a more serious condition.

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

#### • 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 1–2 %. The indicator will be lit steadily upon each initialization of the TCM, and will remain on steady for approximately 1–2 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 TRANS light on the dashboard telltale panel and diagnostic code P0897 Transmission Fluid at Limit will be set.


**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.

 **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 month (five years) have passed, it will be necessary to change the fluid and filters per calendar requirements and reset the system.

#### • FILTER LIFE MONITOR

The display message denotes operating status of the transmission main fluid filter, based on the measured pressure drop across the filter. The feature is not functional at transmission sump temperatures below 40 °C (105 °F). Both the main and lube filters **must be** changed when the TRANSMISSION SERVICE indicator  shows the main filter should be changed.

**Display:** An acceptable filter life status is displayed as "OK". An unacceptable filter life status is displayed as "LO".

Once the programmed threshold for maximum filter pressure drop has been observed and verified, the diagnostic code P088A Transmission Filter At/Over Limit 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 approximately 1–2 minutes after the first selection of "D" (drive) range. Thereafter, the indicator will illuminate and flash upon each TCM initialization, continuing to flash for 1–2 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 TRANS light on the dashboard telltale panel and diagnostic code P088B will be recorded to indicate a highly deteriorated filter.

**Reset:** 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.

#### • TRANSMISSION HEALTH MONITOR

The display message denotes clutch life status, as determined by monitored changes and the calculated running clearance of the transmission clutches C1, C2, C3, C4 & C5.

**Display:** An acceptable clutch life status is displayed as "OK". An unacceptable clutch life status is displayed as "LO". The specific clutch(es) for which the function indicates "LO" cannot be identified with the shift selector. Allison DOC™ for PC-Service Tool displays clutch condition as OK or NOT OK for each clutch, C1 through C5.

The TRANSMISSION SERVICE indicator will be illuminated, indicating the need for clutch maintenance, when the remaining clutch life reaches approximately 10%, or if the running clearance exceeds a maximum value which may

indicate a non-wear-related issue. 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.

Failure to perform maintenance and reset the monitor after a number of warnings will result in the illumination of the CHECK TRANS light on the dashboard telltale panel and diagnostic code P2789 Clutch Adaptive learning at Limit will be set.

**Reset:** 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.

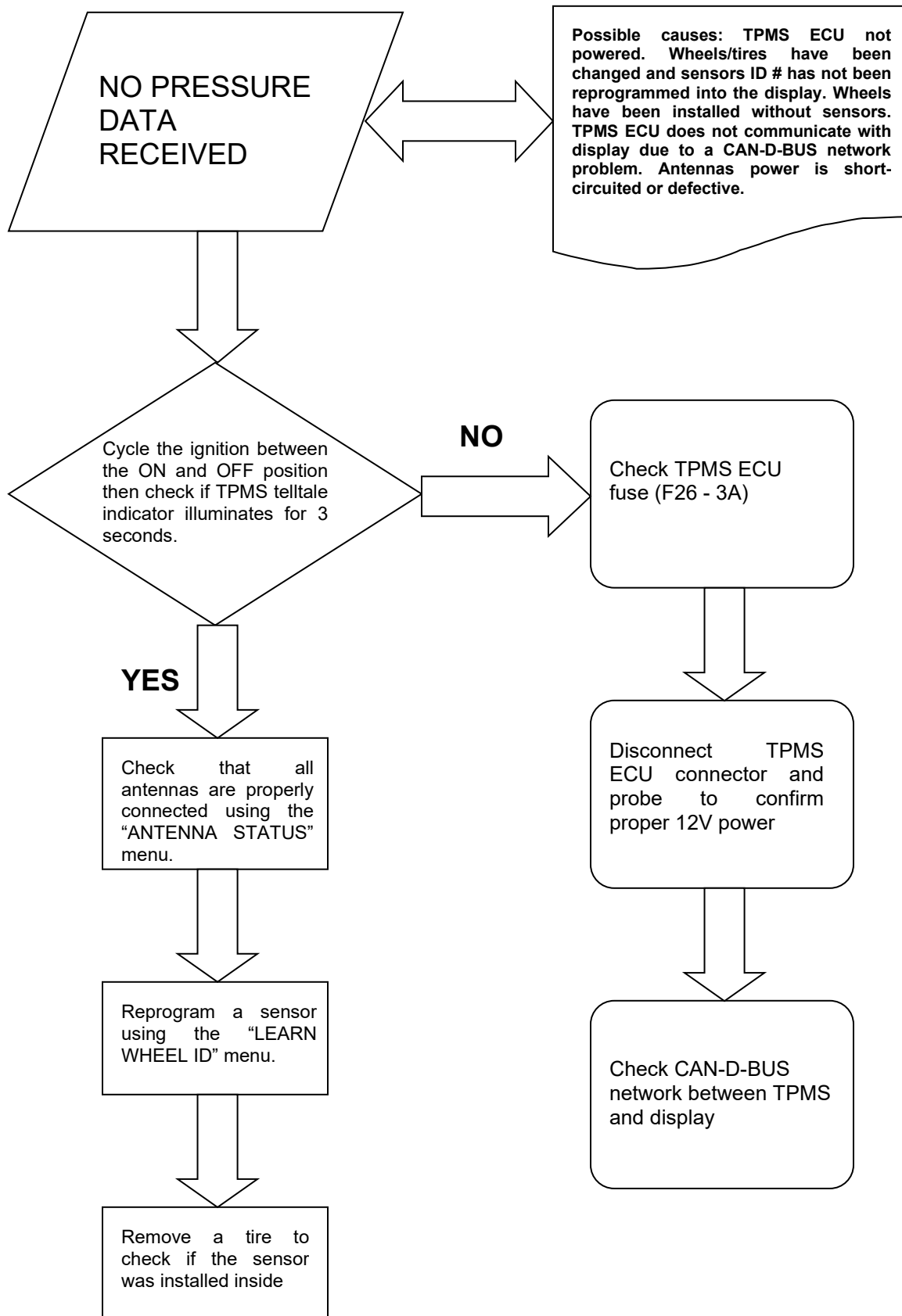
## 12 APPENDIX C – Allison Transmission’s Other Features

▲ (up) & ▼ (down) arrow buttons pressed simultaneously	Description	SELECT	MONITOR
1 <sup>st</sup> press	<b>Allison transmission oil level check</b> Other codes will be displayed	" _ "	" _ "
2 <sup>nd</sup> press	<b>Oil Life Monitor</b> Oil life remaining will range from 99% down to 00%	" O "	" M "
3 <sup>rd</sup> press	<b>Filter Life Monitor</b> Present life of filter is OK Present life of filter is low	" F " " O " " L "	" M " " K " " O "
4 <sup>th</sup> press	<b>Transmission Health Monitor</b> Shows "OK" until remaining life of one or more of the clutch(es) wear enough so that the programming changes One or more of the clutches C1 through C5 have worn enough to change the program	" O " " O " " L "	" K " " K " " O "
5 <sup>th</sup> press	<b>Display of diagnostic codes</b> Other codes will be displayed	" d "	" 1 "

**Preheater Operational Failure Symptoms via Fault/Flash code**

The following table lists the possible faults which can be read by flashing code off of an appropriate timer, the equipment-on indicator /operation indicator flashes.

<b>Failure Symptom</b>	<b>Probable Cause</b>	<b>Check and Correct</b>
<b>1X Flash (F 01)</b> No combustion after completion of start up sequence.	- Fuel system  - Combustion air - Electronic ignition	- Fuel level - Type of fuel being used - Fuel filter - Fuel line connections (air bubbles in fuel lines) - Fuel nozzle plugged - Air intake or exhaust, restricted or plugged - Incorrect electrode gap
<b>2X Flashes (F 02)</b> Flame out during burner operation no restart possible	- Fuel supply (shortage of fuel)	- Restriction in the fuel system - Fuel filter - Fuel line connections (air bubbles in fuel lines) - Type of fuel being used
<b>3X Flashes (F 03)</b> Low voltage for more than 20 seconds	- Electrical system	- Load test batteries - Corrosion at connections - Loose connections
<b>4X Flashes (F 04)</b> Flame detector recognizes false flame signal during pre-start or shut-down cycle	- Defective flame detector	- Replace flame detector
<b>5X Flashes (F 05)</b> Flame detector	- Wiring - Defective flame detector	- Damaged wiring, open or short circuit - Replace flame detector
<b>6X Flashes (F 06)</b> Temperature sensor	- Wiring - Defective temperature sensor	- Damaged wiring, open or short circuit - Replace temperature sensor
<b>7X Flashes (F 07)</b> Fuel solenoid valve	- Wiring  - Defective solenoid valve	- Damaged or corroded wiring, open or short circuit - Replace solenoid valve
<b>8X Flashes (F 08)</b> Combustion air fan motor	- Wiring - Wrong RPM - Defective combustion air fan motor	- Damaged wiring, open or short circuit - Replace combustion air fan - Replace combustion air fan
<b>9X Flashes (F 09)</b> Circulation pump motor	- Wiring - Defective circulation pump motor	- Damaged wiring, open or short circuit - Replace circulation pump motor
<b>10X Flashes (F 10)</b> Temperature limiter	- Overheat condition - Coolant flow  - Wiring  - Defective temperature limiter	- Reset temperature limiter - Coolant level or flow restriction - Air trapped in coolant circuit - Damaged or corroded wiring, open or short circuit - Replace temperature limiter
<b>11X Flashes (F 11)</b> Electronic ignition coil	- Wiring - Defective electronic ignition coil	- Damaged wiring, open or short circuit - Replace electronic ignition coil
<b>12X Flashes (F 12)</b> Heater lock out	- 3 repeated faults/flame-outs or 5 repeated start attempts	- Reinitialize control unit by switching heater on and disconnecting power.



## 2 APPENDIX E – TPMS TROUBLESHOOTING GUIDE

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