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NOTES

1.0 INTRODUCTION

The procedures contained in this manual include all of the specifications, instructions, and graphics needed to diagnose 41TE Electronic Automatic Transaxle (EATX) problems. The diagnostics in this manual are based on the failure condition or symptom being present at the time of diagnosis.

When repairs are required, refer to the appropriate volume of the service manual for the proper removal and repair procedure.

Diagnostic procedures change every year. New diagnostic systems may be added and/or carryover systems may be enhanced. READ THIS MANUAL BEFORE TRYING TO DIAGNOSE A VEHICLE TROUBLE CODE. It is recommended that you review the entire manual to become familiar with all new and changed diagnostic procedures.

This book reflects many suggested changes from readers of past issues. After using this book, if you have any comments or recommendations, please fill out the form at the back of the book and mail it back to us.

1.1 SYSTEM COVERAGE

This diagnostic procedures manual covers all 2001 MY PT series vehicles.

1.2 SIX-STEP TROUBLESHOOTING PROCEDURE

Diagnosis of the 41TE electronic transaxle is done in six basic steps:

- verification of complaint
- verification of any related symptoms
- symptom analysis
- problem isolation
- repair of isolated problem
- verification of proper operation

2.0 IDENTIFICATION OF SYSTEM

All 2001 MY PT Cruiser series vehicles are equipped with a 41TE Automatic Transaxle.

3.0 SYSTEM DESCRIPTION AND FUNCTIONAL OPERATION

3.1 GENERAL DESCRIPTION

The 41TE electronic transaxles is a conventional transaxle in that it uses hydraulically applied clutches to shift a planetary gear train. However, the electronic control system replaces many of the mechanical and hydraulic components used in conventional transmission valve bodies.

3.2 FUNCTIONAL OPERATION

The 41TE electronic transaxle has a fully adaptive control system. The system performs it's functions based on continuous real-time sensor feedback information. The control system automatically adapts to changes in engine performance and friction element variations to provide consistent shift quality. The control system ensures that clutch operation during upshifting and downshifting is more responsive without increased harshness.

The Transmission Control Module (TCM) continuously checks for electrical problems, mechanical problems, and some hydraulic problems. When a problem is sensed, the TCM stores a diagnostic trouble code. Some of these codes cause the transaxle to go into "limp-in" or "default" mode. While in this mode, electrical power is taken away from the transaxle via the TCM, de-energizing the transmission control relay, and taking power from the solenoid pack. When this happens, the only transaxle functions are:

- Park and Neutral
- Reverse
- Second Gear

No upshifts or downshifts are possible. The position of the manual valve alone allows the three ranges that are available. Although vehicle performance is seriously degraded while in this mode, it allows the owner to drive the vehicle in for service.

Once the DRBIII® is in the "EATX" portion of the diagnostic program, it constantly monitors the TCM to see if the system is in limp-in mode. If the transaxle is in limp-in mode, the DRBIII® will flash the red LED.

3.2.1 AUTOSTICK FEATURE

The feature allows the driver to manually shift the transaxle when the shift lever is pulled back into the AutoStick position. When in AutoStick, the instrument cluster displays the current gear.

3.2.2 TRANSMISSION OPERATION AND SHIFT SCHEDULING AT VARIOUS OIL TEMPERATURES

The transmission covered in this manual has unique shift schedules depending on the temperature of the transmission oil. The shift schedule is modified to extend the life of the transmission while operating under extreme conditions.

The oil temperature is measured with a Transmission Temperature Sensor on the 41TE transmission. The Transmission Temperature Sensor is an integral component of the Transmission Range Sensor (TRS). If the Transmission Temperature Sensor is faulty, (DTC P-1799(74)) the transmission will default to a "calculated" oil temperature. Oil temperature will then be calculated through a complex heat transfer equation which uses engine coolant temperature, battery/ambient temperature, and engine off time from the Body Control Module (BCM). These inputs are received from the PCI bus periodically and used to initialize the oil temperature at start up. Once the engine is started, the TCM updates the transmission oil temperature based on torque converter slip speed, at vehicle speed, gear, and engine coolant temperature to determine an estimated oil temperature during vehicle operation. Vehicles using "calculated oil temperature" track oil temperature reasonably accurate during normal operation. However, if a transmission is overfilled, a transmission oil cooler becomes restricted, or if a customer drives aggressively in low gear, the calculated oil temperature will be inaccurate. Consequently the shift schedule selected may be inappropriate for the current conditions. The key highlights of the various shift schedules are as follows:

Extreme Cold: Oil temperature at start up below -16°F

- Goes to "Cold" schedule above -12°F oil temperature
- Park, Reverse, Neutral and 2nd gear only (prevents shifting which may fail a clutch with frequent shifts)

Cold: Oil temperature at start up above -12°F and below 36°F

- Goes to "Warm" schedule above 40°F oil temperature
- Delayed 2-3 upshift (approximately 22 -31 MPH)
- Delayed 3-4 upshift (45-53 MPH)
- Early 4-3 coastdown shift (approximately 30 MPH)
- Early 3-2 coastdown shift (approximately 17 MPH)
- High speed 4-2, 3-2, 2-1 kickdown shifts are prevented
- No EMCC

Warm: Oil temperature at start up above 36°F and below 80°F

- Goes to "Hot" schedule above 80°F oil temperature
- Normal operation (upshifts, kickdowns, and coastdowns)
- No EMCC

Hot: Oil temperature at start up above 80°F

- Goes to "Overheat" schedule above 240°F oil temperature
- Normal operation (upshifts, kickdowns, and coastdowns)
- Full EMCC, No PEMCC except to engage FEMCC (Except at closed throttle speeds above 70 -83 MPH)

Overheat: Oil temperature at above 240°F or engine coolant temperature above 244°F

- Goes to "Hot" below 230°F oil temperature or "Super Overheat" above 240°F oil temperature
- Delayed 2-3 upshift (25-32 MPH)
- Delayed 3-4 upshift (41-48 MPH)
- 3rd gear FEMCC from 30-48 MPH
- 3rd gear PEMCC from 27-31 MPH

Super Overheat: Oil temperature above 260°F

- Goes to "Overheat" below 240°F oil temperature
- All "Overheat" shift schedules features apply
- 2nd gear PEMCC above 22 MPH
- Above 22 MPH the torque converter will not unlock unless the throttle is closed (i.e. at 50 MPH a 4th FEMCC to 3rd FEMCC shift will be made during a part throttle kickdown or a 4th FEMCC to 2nd PEMCC shift will be made at wide open throttle) or if a wide open throttle 2nd PEMCC to 1 kickdown is made.

Causes for operation in the wrong temperature shift schedule:

Extreme Cold or Cold shift schedule at start up:

- Defective Transmission Temperature Sensor circuit.

Overheat or Super Overheat shift schedule after extended operation:

- Operation in city traffic or stop and go traffic
- Engine idle speed too high
- Aggressive driving in low gear
- Trailer towing in OD gear position (use "3" position (or A/S 3rd) if frequent shifting occurs)
- Cooling system failure causing engine to operate over 230°F
- Engine coolant temperature stays too long - If engine coolant temperature drops below 150°F, the transmission will disengage EMCC. Extended operation with the EMCC disengaged will cause the transmission to overheat.
- A defective brake switch will cause the EMCC to disengage. Extended operation with the EMCC disengaged will cause the transmission to overheat.
- Transmission fluid overfilled
- Transmission cooler or cooler lines restricted
- Defective Transmission Temperature Sensor circuit.

3.3 DIAGNOSTIC TROUBLE CODES

Diagnostic trouble code (DTC's) are codes stored by the Transmission Control Module (TCM) that helps us diagnose Transmission problems. They are viewed using the DRBIII® scan tool.

Always begin by performing a visual inspection of the wiring, connectors, cooler lines and the transmission. Any obvious wiring problems or leaks should be repaired prior to performing any diagnostic test procedures. Some engine driveability problems can be misinterpreted as a transmission problem. Ensure that the engine is running properly and that no PCM DTC's are present that could cause a transmission complaint.

If there is a communication bus problem, trouble codes will not be accessible until the problem is fixed. The DRBIII® will display an appropriate message. The following is a possible list of causes for a bus problem:

- open or short to ground/battery in PCI bus circuit (pin 43).
- internal failure of any module or component on the bus.

Each diagnostic trouble code is diagnosed by following a specific test sequence. The diagnostic test procedures contain step-by-step instructions for determining the cause of a transmission diagnostic trouble code. Possible sources of the code are checked and eliminated one by one. It is not necessary to perform all of the tests in this book to diagnose an individual code. These tests are based on the problem being present at the time that the test is run. **All testing should be done with a fully charged battery.**

If the TCM records a DTC that will adversely affect vehicle emissions, it will request (via the communication bus) that the PCM illuminate the Malfunction Indicator Lamp (MIL). Although these DTC's will be stored in the TCM immediately as a 1 trip failure, it may take up to five minutes of accumulated trouble confirmation set the DTC and illuminate the MIL. Three consecutive successful EURO STAGE III OBD trips or clearing the DTC's with a diagnostic tool (DRBIII® or equivalent) is required to extinguish the MIL. When the TCM requests that the PCM illuminate the MIL, the PCM sets a DTC ($89) to alert the technician that there are DTC's in the TCM. This must also be erased in the PCM in order to extinguish the MIL.

3.3.1 HARD CODE

Any Diagnostic Trouble Code (DTC) that is set whenever the system or component is monitored is a "hard" code. This means that the problem is there every time the TCM checks that system or component. Some codes will set immediately at start up and others will require a road test under specific conditions. It must be determined if a code is repeatable (Hard) or intermittent before attempting diagnosis.

3.3.2 ONE TRIP FAILURES

A One Trip Failure, when read from the TCM, is a hard EURO STAGE III OBD code that has not matured for the full 5 minutes. This applies to codes that will only set after 5 minutes of substituted gear operation.

3.3.3 INTERMITTENT CODE

A diagnostic trouble code that is not there every time the TCM checks the circuit or function is an "intermittent" code. Some intermittent codes, such as codes: P-1792(12), P-1767(14), P-1768(15), P-0725(18), P-1716(19), P-1781(21), P-1782(22), P-1724(24), P-0705(28), P-0120(29), P-0750(41), P-0755(42), P-0760(43), P-0765(44), P-1793(48), P-0715(56), P-0720(57), P-1794(58), P-1796(70), P-1799(74), P-1739(76), P-1717(77), P-0600(78) are caused by wiring or connector problems. However intermittent codes 50-54 are usually caused by intermittent hydraulic seal leakage in the clutch and/or accumulator circuits. Problems that come and go like this are the most difficult to diagnose, they must be looked for under the specific conditions that cause them.

3.3.4 STARTS SINCE SET COUNTER

For the most recent code (Code 1), the Starts Since Set counter counts the number of times the vehicle has started since it was last set. The counter will count up to 255 starts.

Note: that this code only applies to the last code set.

When there are no diagnostic trouble codes stored in memory, the DRBIII® will display "NO DTC'S PRESENT" and the reset counter will show "STARTS SINCE CLEAR = XXX".

The number of starts helps determine if the diagnostic trouble code is hard or intermittent.

- If the count is less than 3, the code is usually a hard code.
- If the counter is greater than 3, it is considered an intermittent code. This means that the engine has been started most of the time without the code recurring.

3.3.5 TROUBLE CODE ERASURE

A Diagnostic trouble code will be cleared from TCM memory if it has not reset for 40 warm-up cycles.

A warm-up cycle is defined as "sufficient vehicle operation such that the coolant temperature has risen by at least 40°F from engine starting and reaches a minimum temperature of 160°F".

The Malfunction Indicator Lamp (MIL) will turn off after 3 good trips (see section 12.3) or when the DTC's are cleared from the TCM.

3.3.6 LIST OF DIAGNOSTIC TROUBLE CODES

(Detailed descriptions follow list)

The TCM may report any of the following DTC's.

DTC	P-Code	Name of Code	Limp-in	MIL
11	P0700	Internal TCM	Yes	Yes
12	P1792	Battery was disconnected	No	No
13	P0700	Internal TCM	Yes	Yes
14	P1767	Relay output always on	Yes	Yes
15	P1768	Relay output always off	Yes	Yes
16	P0605	Internal TCM	Yes	Yes
17	P0604	Internal TCM	Yes	Yes
18	P0725	Engine Speed input circuit	Yes	Yes
19	P1716	Bus communication with engine module	No	No
20	P1765	Switched battery (Trans Relay Output)	Yes	Yes
21	P1781	OD pressure switch sense circuit	Yes*	Yes
22	P1782	24 pressure switch sense circuit	Yes	Yes
24	P1784	L-R pressure switch sense circuit	Yes	Yes
28	P0705	Check shifter signal	No	No
29	P0120	Throttle position sensor signal circuit	No	No
31	P1787	OD hydraulic pressure test failure	Yes	Yes
32	P1788	24 hydraulic pressure test failure	Yes	Yes
33	P1789	OD/24 hydraulic pressure test falure	Yes	Yes
35	P1791	Loss of prime	No	No
36	P1790	Fault immediately after shift	No	No
37	P1775	Solenoid switch valve latched in TCC position	No	Yes
38	P0740	Torque converter clutch control circuit	No	Yes
41	P0750	L-R Solenoid Circuit	Yes	Yes
42	P0755	2-4 Solenoid Circuit	Yes	Yes
43	P0760	OD Solenoid Circuit	Yes	Yes
44	P0765	UD Solenoid Circuit	Yes	Yes
45	P1795	Internal TCM	No	No
47	P1776	Solenoid switch valve latched in L-R position	Yes	Yes
48	P1793	TRD link communication error	No	No
50	P0736	Gear ratio error in reverse	Yes	Yes
51	P0731	Gear ratio error in 1st	Yes	Yes
52	P0732	Gear ratio error in 2nd	Yes	Yes
53	P0733	Gear ratio error in 3rd	Yes	Yes
54	P0734	Gear ratio error in 4th	Yes	Yes
56	P0715	Input speed sensor error	Yes	Yes
57	P0720	Output speed sensor error	Yes	Yes
58	P1794	Speed sensor ground error	Yes	Yes
70	P1796	Autostick sensor circuit	No	No
71	P1797	Manual shift overheat	No	No
73	P1798	Worn out/burnt transmission fluid	No	No
74	P1799	Calculated oil temperatue in use	No	No
75	P1738	High temperature operation activated	No	No
76	P1739	Power up at speed	No	No
77	P1717	No communication with the MIC	No	No
78	P0600	Serial communication link malfunction	No	No
79	P1714	Low battery voltage	Yes	Yes

Yes (underlined) indicates that this DTC can take up to five minutes of problem identification before illuminating the MIL.

*Only with code 28 set.

3.3.7 DTC DESCRIPTIONS

Name of code: P-0700(12) — Battery was Disconnected

When monitored: Whenever the key is in the Run/Start position.

Set condition: This code is set whenever the Transmission Control Module (TCM) is disconnected from battery power (B+) or ground. It will also be set during the DRBIII® Quick Battery Disconnect procedure.

Theory of operation: A battery backed RAM (Random Access Memory) is used to maintain some learned values. When the battery B(+) is disconnected, the memory is lost. When the B(+) is restored, this memory loss is detected by the TCM. The code is set and the learned values are initialized to known constants or previously learned values from EEPROM (Electronic Erasable Programmable Read Only Memory). This results in the reinitialization of some parameters.

Transmission Effects: Loss of trouble code data. Immediate limp-in mode if power is lost while operating the vehicle. Normal operation is resumed if the power is restored during the same key start.

Possible causes:

> Battery voltage removed from TCM

> TCM disconnected

> Dead Battery

> Low battery voltage during cranking

> Quick Battery Disconnect by DRBIII® or MDS

> Bad TCM ground circuit

Name of code: P-1767(14) — Relay Always On

When monitored: Ignition key is turned from "off" to "run" position and/or ignition key is turned from "crank" position to "run" position.

Set condition: This code is if the Transmission Control Module (TCM) senses greater than 3 volts at the Trans Relay Output (switched battery) terminal of the TCM prior to the TCM energizing the relay.

Theory of operation: The transmission control relay is used to supply power to the solenoid pack when the transmission is in normal operating mode. When the relay is off, no power is supplied to the solenoid pack and the transmission is in "limp-in" mode. The relay output is fed back to the TCM through pins 16 and 17. It is referred to as the Trans Relay Output circuit or "switched battery".

Transmission Effects: The MIL will illuminate the transmission system defaults to Logical limp-in mode. Logical Limp-in mode results in the same modes of operation as Relay Open Limp-in. Since the relay is stuck "on", the TCM can not open the relay, and the TCM shifts to 2nd gear.

Possible causes:

> Relay failure (welded contacts)

> Short to battery in 12-volt supply and/or transmission control relay output circuit(s)

> Short to voltage

> TCM connector problems

> TCM

Name of code: P-1768(15) — Trans Control Relay Circuit

When monitored: Continuously

Set condition: This code is set when less than 3 volts are present at the Trans Relay Output (switched battery) terminals at the Transmission Control Module (TCM) when the TCM is energizing the relay.

Theory of operation: The transmission control relay is used to supply power to the solenoid pack when the transmission is in normal operating mode. When the relay is off, no power is supplied to the solenoid pack and the transmission is in "limp-in" mode. The relay output is fed back to the TCM through pins 16 and 17. It is referred to as the Trans Relay Output circuit or "switched battery".

After a controller reset (ignition key turned to the "run" position or after cranking engine), the controller energizes the relay. Prior to this the TCM verifies that the contacts are open by checking for no voltage at the switched battery terminals. After the relay is energized, the TCM monitors the terminals to verify that the voltage is greater than 3 volts.

Transmission Effects: The MIL illuminates and the transmission system defaults to Relay Open limp-in mode.

Possible causes:

> Relay failure (intermittent relay function caused by oxidized or contaminated relay contacts)

> Short to ground or open circuit in the transmission control relay circuit(s)

> TCM connector problem

> TCM

Name of code: P-0725(18) — Engine Speed Sensor Circuit

When monitored: Whenever the engine is running

Set condition: This code is set when the engine speed sensed by the Transmission Control Module (TCM) is less than 390 RPM or greater than 8000 RPM for more that 2.0 seconds.

Theory of operation: The TCM uses a simulated Crank Sensor signal to calculate engine RPM. This signal is supplied by the PCM and uses a dedicated circuit called the EATX RPM Signal circuit. If the TCM interprets this signal to be out of range when the engine is running (as reported by the PCM over the bus) the code is set.

Transmission Effects: The MIL illuminates and the transmissions system defaults to Relay Open limp-in mode.

Possible causes:

> Open or short in EATX RPM Signal circuit.

> TCM and/or PCM connector problems

> TCM

> PCM

Name of code: P-0716(19) — Bus Communication with Engine Module

When monitored: Continuously with key on.

Set condition: If no PCI bus messages are received from the Powertrain Control Module (PCM) for 10 seconds.

Theory of operation: The TCM communicates with the PCM using the PCI bus. It relies on certain information to function properly. The TCM continuously monitors the PCI bus to check for messages broadcast from the PCM.

Transmission Effects: Delayed 3-4 shifts. No EMCC and early 3-4 shifts for a few minutes after engine is started.

Possible causes:

> Open or shorted PCI bus circuit

> Bus bias problem

> TCM

> PCM

Name of code: P-1765(20) — Switched Battery

When monitored: Ignition key is turned from "off" position to "run" position and/or ignition key is turned from "crank" position to "run" position.

Set condition: This code is set if the Transmission Control Module (TCM) senses voltage on any of the pressure switch inputs prior to the TCM energizing the relay.

Theory of operation: The transmission control relay is used to supply power to the solenoid pack when the transmission is in normal operating mode. When the relay is off, no power is supplied to the solenoid pack and the transmission is in "limp-in" mode. The relay output is fed back to the TCM through pins 16 and 17. It is referred to as the Trans Relay Output circuit or "switched battery".

Immediately after a controller reset (ignition key turned to the "run" position or after cranking engine), the TCM verifies that the relay contacts are open by checking for no voltage at the switched battery terminals. After this is verified, the voltage

at the solenoid pack pressure switches is checked. There should be no voltage on the pressure switches at this time. The TCM will then activate the relay.
Transmission Effects: The MIL illuminates and the transmission system defaults to Relay Open limp-in mode.
Possible causes:

> Short to battery on one or more pressure switch sense circuits
> TCM connector problems
> Defective TCM

Name of code: P-1781(21) — OD Pressure Switch Circuit
When monitored: Whenever the engine is running.
Set condition: This code is set if the OD pressure switch is open or closed at the wrong time in a given gear (see chart below).
Theory of operation: The Transmission system uses three pressure switches to monitor the fluid pressure in the L-R, 2-4, and OD clutch circuits. The pressure switches are continuously monitored for the correct states in each gear as shown below.

Normal Pressure Switch States

Gear	L-R	2-4	OD
R	OP	OP	OP
N	CL	OP	OP
1st	CL	OP	OP
2nd	OP	CL	OP
3rd	OP	OP	CL
4th	OP	CL	CL

OP = switch is open
CL = switch is closed

Transmission Effects: Normal operation will be experienced if no other fault codes are present. TCM will ignore the code. Limp-in condition will only occur if code P-1781(21) is present with a code P-0705(28).
Possible causes:

> If code P-1791(35) is present, ignore code P-1781(21) and perform code P-1791 diagnostic procedures
> OD pressure switch sense circuit open or shorted to ground between TCM and solenoid pack
> OD pressure switch sense circuit shorted to battery
> Solenoid pack defectiv
> Loose valve body bolts
> Plugged filter - internal transmission or torque converter failure
> TCM

Name of code: P-1782(22) — 2-4 Pressure Switch Circuit
When monitored: Whenever the engine is running.
Set condition: This code is set if the 2-4 pressure switch is open or closed at the wrong time in a given gear (see chart below).
Theory of operation: The Transmission system uses three pressure switches to monitor the fluid pressure in the L-R, 2-4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear as shown below.

Normal Pressure Switch States

Gear	L-R	2-4	OD
R	OP	OP	OP
N	CL	OP	OP
1st	CL	OP	OP
2nd	OP	CL	OP
3rd	OP	OP	CL
4th	OP	CL	CL

OP = switch is open
CL = switch is closed

Transmission Effects: If the 2-4 pressure switch is identified as closed in P or N, the code will immediately be set and normal operation will be allowed for that given key start. If the problem is identified for 3 successive key starts, the transmission will go into relay open limp-in mode.

If the 2-4 pressure switch is identified as being closed in 1st or 3rd gear and was not identified as being closed in P or N, then 2nd gear or 4th gear will be substituted for 1st or 3rd gear depending on throttle angle and vehicle speed. A short period of time after the gear substitution, the transmission will return to normal operating mode. If the transmission is shifted back into 1st or 3rd gear through normal operation, and the 2-4 pressure switch remains closed, 2nd or 4th gear will be substituted briefly and then resume normal operation. If four gear substitutions occur in a given key start, the transmission will go into relay open limp-in mode.

If the 2-4 pressure switch is open (indicating no 2-4 clutch pressure) in 2nd or 4th gear, the TCM sets code P-1782(22) and continues with normal operation. The transmission will only go into relay open limp-in mode if a code P-0705(28) is also present. If no 2-4 clutch pressure is present a speed ratio code P-0732(52) or P-0734(54) will be set and cause the limp-in condition.
Possible causes:

> If code P-1791(35) is present, ignore code P-1782(22) and perform code P-1791 diagnostic procedures
> 2-4 pressure switch sense circuit open or shorted to ground between TCM and solenoid pack
> 2-4 pressure switch sense circuit shorted to battery

> Solenoid pack defective>

> Transmission overheated - Excessive regulator valve leakage in valve body causing high line pressure which results in 2-4 solenoid blow-off in 1st or 3rd gear. May require new valve body if it happens only when hot.

> Loose valve body bolts

> Plugged filter - internal transmission or torque converter failure

> TCM

Name of code: P-1784(24) — L-R Pressure Switch Circuit

When monitored: Whenever the engine is running.

Set condition: This code is set if the L-R pressure switch is either open or closed at the wrong time in a given gear.

Theory of operation: The Transmission system uses three pressure switches to monitor the fluid pressure in the L-R, 2-4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear as shown below.

Normal Pressure Switch States

Gear	L-R	2-4	OD
R	OP	OP	OP
N	CL	OP	OP
1st	CL	OP	OP
2nd	OP	CL	OP
3rd	OP	OP	CL
4th	OP	CL	CL

OP = switch is open
CL = switch is closed

Transmission Effects: If a set condition is identified, 1st gear and torque converter lock-up (EMCC) will be inhibited. The vehicle will launch in 2nd gear and shift normally through the gears without allowing EMCC. If during the same key start, the set condition is no longer valid, the transmission will return to normal operation (1st and EMCC available). A relay open limp-in will not occur unless code P-1784(24) is accompanied by a code P-0705(28).

Possible causes:

> If code P-1791(35) is present, ignore code P-1784(24) and perform code P-1791 diagnostic procedures

> L-R pressure switch sense circuit open or shorted to ground between TCM and solenoid pack

> L-R pressure switch sense circuit shorted to battery

> Solenoid pack

> Valve body- solenoid switch valve stuck in LU position. (May be accompanied by a code 37)

> Loose valve body bolts

> Plugged filter - internal transmission or torque converter failure

> TCM

Name of code: P-0705(28) — Check Shifter Signal

When monitored: Continuously with the key on

Set condition: 3 occurrences in one key start of an invalid PRNDL code which lasts for more than 0.1 second.

Theory of operation: The T1, T3, T41, and T42 sense circuits communicate the shift lever position to the TCM. Each circuit is terminated at the transmission with a switch. Each switch can be either open or closed, depending on the shift lever position. The TCM can decode this information and determine the shift lever position. Each shift lever position has a certain combination of switches which will be open and closed, this is called a PRNDL code. There are 4 switches, therefore: there are many possible combinations of open and closed switches (codes). However, there are only 9 valid codes (8 for Autostick), one for each gear position and three recognized between gear codes. The remainder of the codes should **never occur**, these are called invalid codes. The following chart shows the normal switch states for each shift lever position.

TRS	Park	T1	Rev	T2	N	T2	OD	T3	3/AS	T3	L
T1 (C4) OP	OP	OP	CL	CL	CL	CL	CL	OP	CL	CL	
T3 (C3) CL	CL	OP	OP	OP	OP	OP	CL	CL	CL	CL	
T41 (C1)	CL	OP	OP	OP	CL	OP	OP	OP	OP	OP	OP
T42 (C2)	CL	CL	CL	CL	CL	CL	OP	OP	OP	OP	CL

Transmission Effects: and possible causes:

Scenario 1) - All PRNDL lights stay illuminated indefinitely in Park following a Key start.

> Wrong Part Number TCM for application

> TRS connector not plugged in

> T1, T3, T41, or T42 circuits are either open, shorted to ground, or shorted to 12 volts.

> PCI bus failure (Open or shorted resulting in no communication to BCM or Cluster)

> TRS

> TCM

> BCM

Scenario 2) - "P" is indicated following a key start but all PRNDL lights illuminate in "N" following a shift from "R" to "N". If PRNDL lights illuminate in "N" and shifter is moved directly into "3" or "L" position without pausing in "OD", then the "OD" position shift schedule and electronic display will indicate "OD" until the shifter is shifted into the "OD" position and held for at least 3 seconds.

> Worn Manual Lever (Rooster Comb). Check for heavy wearing by TRS switch contacts

> Intermittent T1, T3, T41 or T42 circuits. Check for corrosion, terminal push-outs or spread terminals at 60-way and/or TRS switch 10-way connector
> TRS
> TCM
> BCM

Scenario 3) - If the invalid code happened while operating in the "3" or "L" position, then the "3" or "L" shift schedule and electronic display will be frozen (regardless of whether "OD", "3" or "L" is selected) until the shifter is moved to the "N" position (all PRNDL lights will illuminate) and then back to the "OD" position and held there for at least 3 seconds in order to resume the normal "OD" shift schedule and electronic display.

> Intermittent T1, T3, T41 or T42 circuits. Check for corrosion, terminal push-outs or spread terminals at 60-way and/or TRS, MVLPS, P/N, or PRNDL switch 10-way connector
> TRS
> TCM
> BCM

These same symptoms may occur without the fault code P-0705(28) getting set. It is possible that the invalid code that was sensed by the TCM only occurred once or twice during the given ignition key start and/or did not last for longer than 0.1 second.

Name of code: P-0120(29) — Throttle Position Signal
When monitored: Whenever the engine is running.
Set condition: This code is set if the throttle angle goes out of range or if throttle angle changes abruptly (ie: faster than the throttle body motion could occur)
Theory of operation: The Transmission Control Module (TCM) receives the throttle position signal from the Throttle Position Sensor (TPS) through a wire spliced into the TPS circuit to the PCM. The TPS has a 5-volt pull up supplied from the Powertrain Control Module (PCM). The signal is checked for out-of-range as well as intermittent (excessive signal changes).
Transmission Effects: Extremely erratic transmission shifting with an intermittent TPS signal just prior to setting the code. If the intermittency does not last long enough to set the code, the customer will say that the transmission violently hunts between gears. The TCM will use a "calculated throttle angle" supplied by the PCM over the PCI bus. If the PCI bus is unavailable, the TCM will use a default throttle angle of 24 degrees for the key start in which the code was set. The TCM will try to use the TPS signal again on the next key start.
Possible causes:

> Open or shorted TPS signal and/or ground circuits
> TCM connector problems
> TPS or TPS connector (Check PCM DTC's)
> PCM
> TCM

Name of code: P-1787(31) — OD Hydraulic Pressure Test Failure
P-1788(32) — 2-4 Hydraulic Pressure Test Failure
P-1789(33) — OD/2-4 Hydraulic Pressure Test Failure
When monitored: In 1st, 2nd, or 3rd gear with engine speed above 1000 RPM shortly after a shift and every minute thereafter.
Set condition: Immediately after a shift into 1st, 2nd, or 3rd gear, with engine speed above 1000 RPM, the TCM momentarily turns on element pressure to the 2-4 and/or OD clutch circuits to identify that the appropriate pressure switch closes. If the pressure switch does not close it is tested again. If the switch does not close the second time, the appropriate code is set.
Theory of operation: The Transmission Control Module (TCM) tests the OD and 2-4 pressure switches when they are off (OD and 2-4 are tested in 1st gear, OD in 2nd gear, and 2-4 in 3rd gear). The test verifies that the switches are operational. The TCM verifies that the switch closes when the corresponding element is applied. If a switch fails to close, it is retested. If it fails the second test, the code is set.
Transmission Effects: The MIL illuminates and the transmission system defaults to Relay Open limp-in mode.
Possible causes:

> Pressure switch sense circuit shorted to battery between TCM and solenoid pack.
> Low line pressure
> Solenoid Pack

Name of code: P-1791(35) — Loss of Prime
When monitored: If the transmission is slipping in any forward gear and the pressure switches are not indicating pressure, a loss of prime test is run.
Set condition: If the transmission begins to slip in any forward gear, and the pressure switch or switches that should be closed a given gear are open, a loss of prime test begins. All available elements (in 1st gear L-4, 2-4 and OD, in 2nd, 3rd, and 4th gear 2-4 and OD) are turned on by the Transmission Control Module (TCM) to see if pump prime exists. The code is set if none of the pressure switches respond. The TCM will continue to run the loss of prime test until pump pressure returns.
Theory of operation: The loss of prime test is used to prevent transmission defaults which can be

caused by a lack of pump prime.

Transmission Effects: Vehicle will not move or transmission slips. Normal operation will continue if pump prime returns.

Possible causes:

> Low transmission fluid level

> PRNDL indicates a valid OD code in the hydraulic reverse position

> Transmission fluid filter clogged or damaged

> Transmission fluid filter improperly installed (Bolts loose or O-ring missing)

> Oil pump - If a customer has a problem when the transmission is cold whereby he shifts to reverse, gets reverse, and then shifts to OD and does not get OD (gets a neutral condition), and then can not get reverse or OD for between 3-20 seconds, replace the oil pump. High side clearance in the oil pump will set a code 35. The pump will prime upon start-up, but as the torque converter purges air (drain down) the air will leak across the inner rotor into the pump suction port and cause a loss of prime right after the shift into OD. After 3-20 seconds, pump prime will return and normal operation will continue. The pump should be replaced only after all other possible causes above have been checked and verified.

Name of code: P-1790(36) — Fault Immediately Afer Shift

When monitored: After a speed ratio error is stored.

Set condition: This code is set if the associated speed ratio is stored within 1.3 seconds after a shift.

Theory of operation: This code will only be stored along with a 50 series code. If this code is set, it indicates the problem is mechanical in nature. When this code exists, diagnosing the transmission should be based on the associated speed ratio code and primarily mechanical causes should be considered.

Transmission Effects: None

Possible causes:

> Mechanical causes as listed under associated speed ratio code.

Name of code: P-1775(37) — Solenoid Switch Valve Latched in TCC Position

When monitored: During an attempted shift into 1st gear.

Set condition: This code is set if three unsuccessful attempts are made to get into 1st gear in one given key start.

Theory of operation: The solenoid switch valve (SSV) controls the direction of the transmission fluid when the L-R/TCC solenoid is energized. The SSV will be in the downshifted position in 1st gear, thus directing the fluid to the L-R clutch circuit. In 2nd, 3rd, and 4th, it will be in the upshifted position and directs the fluid into the torque converter clutch (TCC).

When shifting into 1st gear, a special hydraulic sequence is performed to ensure SSV movement into the downshifted position. The L-R pressure switch is monitored to confirm SSV movement. If movement is not confirmed (the L-R pressure switch does not close), 2nd gear is substituted for 1st.

Transmission Effects: Transmission will have no 1st gear (2nd gear will be substituted), and no EMCC operation.

Possible causes:

> PRNDL indicates a valid OD code in the hydraulic reverse position

> Valve body - Solenoid valve stuck in TCC position

> High idle speed

> Solenoid malfunction - L-R pressure switch will not close

> L-R Pressure Switch Sense circuit shorted to battery

Name of code: P-0740(38) — Torque Converter Clutch Control Circuit

When monitored: During Electronically Modulated Converter Clutch (EMCC)

Set condition:

a) The transmission must be in EMCC, with the input speed greater than 1750 RPM. The TCC/L-R solenoid must achieve it's maximum duty cycle and still not be able to pull the engine speed within 60 RPM of input speed.

b) If the transmission is in FEMCC and the engine can clip the TCC by more then 100 RPM (Engine speed - Input speed) for 10 seconds.

The code will be set if one of these events happens three times at a throttle angle less than 30 degrees.

Theory of operation: When in 2nd, 3rd, or 4th gear, the torque converter clutch (TCC) can be locked when certain conditions are met. The TCC piston is electronically modulated by increasing the duty cycle of the L/R/TCC solenoid until the torque converter slip difference (difference between engine and turbine speed) is within 60 RPM. Then the L-R/TCC solenoid is fully energized (FEMCC/100% duty cycle). Torque converter slip is monitored in FEMCC to ensure adequate clutch capacity.

Transmission Effects: EMCC will still be available after code is set. MIL will illuminate after 5 minutes of accumulated slip in FEMCC. The trans will attempt normal operation (no limp-in) even after the MIL is illuminated.

Possible causes:

> Worn pump bushing and/or failed torque converter - both should be replaced during a rebuild with P-0740(38) present

> Solenoid pack

Name of code: P-0750(41) — L-R Solenoid Circuit
P-0755(42) — 2-4 Solenoid Circuit
P-0760(43) — OD Solenoid Circuit
P-0765(44) — UD Solenoid Circuit

When monitored: Ignition key is turned from "off" position to "run" position and/or ignition key is turned from "crank" position to "run" position, then every 10 seconds thereafter, or when a speed ratio or pressure switch error fault is detected.

Set condition: All four solenoids are tested for continuity continuously immediately upon start up and during vehicle operation. For solenoids that are currently energized, power is momentarily interrupted, then reenergized. For solenoids that are not currently energized, the solenoid is momentarily energized, then de-energized. Under both situations, if an inductive spike is not sensed by the Transmission Control Module (TCM) during the continuity check, it is retested twice. IF it fails the test the third time, the appropriate code is set.

Gear	UD	OD	REV	2-4	L-R
Park					X
Reverse		X		X	
Neutral					X
1st	X				X
2nd	X			X	
3rd	X	X			
4th		X		X	

Theory of operation: Four solenoids are used to control the friction elements (clutches). The continuity of the solenoids circuits are periodically tested. Each solenoid is turned on or off depending on it's current state. An inductive spike should be detected by the TCM during this test. If no spike is detected, the circuit is tested agin to verify the failure. In addition to the periodic testing, the solenoid circuts are tested if a speed ratio or pressure switch error occurs. In this case, one failure will result in the appropriate code being set.

Transmission Effects: The MIL will illuminate and the transmission goes into neutral if code is set above 22 MPH, limp-in mode when vehicle speed is below 22 MPH.

Possible causes:

> Open or shorted solenoid circuit(s) between TCM and solenoid pack.
> Open ground circuit.
> TCM connector problems
> Solenoid pack connector problem.
> Solenoid Pack
> TCM

Name of code: P-1776(47) — Solenoid Switch Valve (SSV) Latched in L-R Position

When monitored: Continuously when doing partial or full EMCC (PEMCC or FEMCC)

Set condition: If the transmission senses the L-R prssure switch closing while performing PEMCC or FEMCC. This code will be set after two unsuccessful attempts to perform PEMCC or FEMCC.

Theory of operation: The solenoid switch valve (SSV) controls the direction of th transmission fluid when the L-R/TCC solenoid is energized. SSV will be in the downshifted position in 1st gear, thus directing the fluid to the L-R clutch circuits. In 2nd, 3rd, and 4th, the SSV will be in the downshifted position and directs the fluid into the torque converter cluch (TCC).

When doing PEMCC or FEMCC, the L-R pressure switch should indicate no pressure if the SSV is in the TCC position. If the L-R pressure switch indicats pressure while in PEMCC or FEMCC, EMCC operation is aborted and inhibited to avoid inadvertent application of the L-R clutch. Partial EMCC will be attempted if the L-R pressure switch does not indicate pressure. A second direction of L-R pressure results in setting the code.

Transmission Effects: At speeds above 45 MPH, EMCC is inhibited. Once speed falls below 45 MPH, the transmission will go into relay open limp-in mode and the MIL will illuminate.

Possible causes:

> Valve body - Solenoid valve stuck in L-R position
> Intermittent short to ground or open circuit in L-R Pressure Switch Sense circuit (with code 24 only)
> Solenoid pack (with code P-1784(24) only)
> TCM (with code P-1784(24) only)

Name of code: P-1793(48) — Torque Reduction (TRD) Link Communication Error

When monitored: Whenever the engine is running.

Set condition: This code is set when the TCM sends multiple torque reduction messages to the PCM and the TCM does not receive a response from the PCM.

Theory of operation: During high torque shifts the TCM will send a message requesting that the PCM reduce engine power until the shift is completed. This message is sent from the TCM to the Powetrain Control Module across the Torque Management Request Sense Circuit. The PCM will acknowledge the TCM's request by sending a message across the PCI bus within a specific amount of time. The TRD Link communication is also tested periodically for operation whenever the engine is running and the vehicle is not moving with zero degrees throttle.

Transmission Effects: Maximum throttle angle used by TCM will be 54 degrees. As a result a customer may complain about loss of performance or of short shifting when driving aggressively.

Possible causes:

> Sticky Throttle Position Sensor (TPS)

> Wiring or Connector problems in the Torque Management Request Sense Circuit

> PCM

> TCM

Name of code: P-0736(50) — Speed Radio Error in Reverse
P-0731(51) — Speed Ratio Error in 1st
P-0732(52) — Speed Ratio Error in 2nd
P-0733(53) — Speed Ratio Error in 3rd
P-0734(54) — Speed Ratio Error in 4th
P-0715(56) — Input Speed Sensor Error
P-0720(57) — Output Speed Sensor Error
P-1794(58) — Speed Sensor Ground Error

When monitored: The transmission gear/speed ratio is monitored continuously while the transmission is in gear.

Set condition: This code is set if the gear/speed ratio is not correct for a period of time.

– Codes 50 through 54 sets if the ratio of the input RPM (Nt) to the output RPM (No) does not match the given gear ratio.

– Code 56 sets if there is an excessive change in input RPM in any gear

– Code 57 sets if there is an excessive change in output RPM in any gear

– Code 58 sets after a TCM reset in neutral and Nt/No equals a ratio of input to output 2.50

A hard code sets within 3 seconds, an intermittent code sets within 15 seconds.

Theory of operation: The transmission system uses two speed sensors, one to measure input RPM and one to measure output RPM. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through the following checks:

1. When in gear, if the gear/speed ratio does not compare to a known gear ratio, the corresponding in-gear trouble code is set (codes 50 through 54).
2. An excessive change in input or output speeds indicating signal intermittency will result in codes 56 and/or 57 being set.
3. After a TCM reset in neutral, observing erratic output and input speed sensor signals indicates a loss of the common speed sensors ground. This sets a code 58.

Transmission Effects: The transmission will not go into relay open limp-in mode until three gear/speed ratio error events occur in a given key start. This allows for intermittent problems to correct themselves without opening the relay. However, if a gear/speed ratio error develops, a code is always set, but if the condition corrects itself the transmission will continue without requiring the ignition key to be cycled on and off. Many different events could occur given the range of failures possible for codes 50 through 58. The following are a few examples:

– Codes 51, 52, 53, 54, 56, and 57 (at speeds above 45 MPH) - The appropriate code is set, EMCC is aborted and current gear is maintained. If while still traveling above 45, the gear ratio becomes valid again, EMCC will re-engage and normal operation will resume. If the gear ratio becomes intermittent and recovers three times in a give key start, the current gear will be maintained and EMCC inhibited, then the transmission will go into relay open limp-in mode if throttle is applied below 45 MPH or at 22 MPH with closed throttle.

– Codes 51, 52, 53, 54, 56, and 57 (at speeds between 22 and 45 MPH) - If one of these codes is set between 22 and 45 MPH, the current gear will be maintained until the gear/speed ratio problem corrects itself. If throttle is applied, the trans will go to 2nd gear. If this happens and the gear/speed ratio problem goes away, normal operation will resume. If three gear/speed ratio problems are identified in a given key start, the current gear will be frozen until throttle is applied. The transmission will then go into relay open limp-in mode with throttle applied at speeds between 22 and 45 MPH.

– Codes 51, 52, 53, 54, 56, and 57 (at speeds below 22 MPH) - If a gear/speed ratio problem is identified below 22 MPH, the transmission will immediately substitute second gear for the current gear. If the gear/speed ratio problem goes away, normal operation will resume. If three gear/speed ratio problems are identified in a given key start, the transmission will go into relay open limp-in mode.

Possible causes:

Code P-0736(50) - Excludes geartrain failures which should be obvious upon disassembly.

> If code P-1791(35) is also set, follow diagnostic procedure for code P-1791(35) first

> Valve body - #1 ball check or LR switch valve sticking - may also set code P-0731(51)

> Speed sensor or associated wiring - may also set codes P-0731(51), P-0715(56), or P-0720(57)

> Failed or slipping LR clutch - may also set code P-0731(51)

– LR seal leakage (Intermittent no drive or reverse)

– Sticky LR accumulator seals (Intermittent no drive or reverse)

> Failed reverse clutch (hard code)
  – OD/Rev lip seal leakage
  – Worn reaction shaft support seal rings
  – Snap ring out of position

Code P-0731(51) - Excludes geartrain failures which should be obvious upon disassembly

> If code P-1791(35) is also set, follow diagnostic procedure for code P-1791(35) first
> Valve body - #1 ball check for LR switch valve sticking - may also set code P-9736(56) or have no Reverse
> Speed sensor or associated wiring may also set codes P-0736(50), P-0715(56), or P-0720(57)
> Failed or intermittent slipping UD clutch - may also set P-0732(52), or P-0733(53)
  – UD seal leakage (intermittent)
  – Worn input clutch hub bushing (hard code at heavy throttle)
  – Sticky UD accumulator seals (intermittent)
  – Worn reaction shaft support seal rings (hard code at heavy throttle)
  – Defective solenoid pack (UD pressure in 4th gear)
> Failed or slipping LR clutch - may also set code P-0736(56) or have no Reverse
  – LR seal leakage (intermittent)
  – Sticky LR accumulator seals (intermittent)

Code P-0732(52) - Excludes geartrain failures which should be obvious upon disassembly

> If code P-1791(35) is also set, follow diagnostic procedure for code P-1791(35) first
> Failed or slipping 2-4 clutch - may also set code P-0734(54)
  – 2-4 seal leakage (intermittent)
  – Sticky accumulator seals (intermittent)
> Failed or intermittent slipping UD clutch - may also set code P-0731(51) and/or P-0733(53)
  – UD seal leakage (intermittent)
  – Worn input clutch hub bushing (hard code at heavy throttle)
  – Sticky UD accumulator seals (intermittent)
  – Worn reaction shaft support seal rings (hard code at heavy throttle)
  – Defective solenoid pack (UD pressure in 4th gear)

Code P-0733(53) - Excludes geartrain failurs which should be obvious upon disassembly

> If code P-1791(35) is also set, follow diagnostic procedure for code P-1791(35) first
> Failed or slipping OD clutch - may also set code P-0734(54)
  – OD and Reverse inner and outer lip seal leakage (usually hard code)
  – Sticky OD accumulator seals (intermittent)
  – Worn reaction shaft support seal rings (hard code at heavy throttle)
  – Broken OD/UD tapered snap ring (hard code at heavy throttle)>
> Failed or intermittent slipping UD clutch - may also set code P-0731(51) and/or P-0732(52)
  – UD seal leakage (intermittent)
  – Worn input clutch hub bushing (hard code at heavy throttle)
  – Sticky UD accumulator seals (intermittent)
  – Worn reaction shaft support seal rings (hard code at heavy throttle)
  – Defective solenoid pack (UD pressure in 4th gear)

Code P-0734(54) - Excludes geartrain failurs which should be obvious upon disassembly

> If code P-1791(35) is also set, follow diagnostic procedure for code P-1791(35) first
> Failed or slipping OD clutch - may also set code P-0733(53)
  – OD and Reverse inner and outer lip seal leakage (usually hard code)
  – Sticky OD accumulator seals (intermittent)
  – Worn reaction support seal rings (hard code at heavy throttle)
  – Broken OD/UD tapered snap ring (hard code at heavy throttle)
> Failed or slipping 2-4 clutch - may also set code P-0732(52)
  – 2-4 seal leakage (intermittent)
  – Sticky accumulator seals (intermittent)

Codes P-0715(56) and P-0720(57)

> Failed input or output speed sensor (intermittent or hard code)
> Shorted or open wiring between TCM and speed sensor(s) (intermittent)
> Connector problems at 60 TCM connector and/or speed sensor connector

Code P-58

> Open or shorted speed sensor ground (speed sensor ground is different from chassis ground)
> Open or shorted Transmision Temperature Sensor wiring to TRS
> TRS - will also set code P-1799(74)
> TCM

Name of code: 70 - Autostick Input Circuit
When monitored: Whenever the engine is running.
Set condition:

1. The transmission shift lever is not in AutoStick and either the upshift or downshift switches are closed.
2. Both the upshift and downshift switches are closed at the same time.

Theory of operation: In the AutoStick Mode (manual shift mode), upshifts and downshifts are actuated manually. Shift requests are detected by monitoring the upshift and downshift switches. The Transmission Control Module (TCM) monitors the above set conditions. A set condition will be tolerated for up to 15 seconds before setting a code.
Transmission Effects: The "OD" position shift schedule is substituted while operating in the autostick gear selector position. No limp-in mode occurs.
Possible causes:

> Wirng or connector problems
> AutoStick switch failure
> Defective TCM

Name of code: P-1797(71) — Manual Shift Overheat
When monitored: Whenever the engine is running.
Set condition:

1. If the engine temperatures exceeds 255°F while operating in AutoStick mode.
2. If the transmission temperature exceeds 275°F while in AutoStick mode

Theory of operation: Transmission and engine temperatures are monitored during vehicle operation. If conditions occur causing the engine or transmision to overheat, the AutoStick mode will be canceled, and a code will be set.
Transmission Effects: The "3" position shift schedule that is used in non-AutoStick applications is substitued while operating in the AutoStick gear selector position. No limp-in mode occurs.
Possible causes:

> Engine overheat - refer to service manual for diagnosis and repair
> Transmission Overheat
  – Restricted transmission cooling system
  – Transmission fluid overfilled
  – Radiator fan not functioning properly.
  – Extended driving in low gear

Note: Strenuous driving conditions may cause the vehicle to overheat. If the driver operates in or initiates AutoStick with an overheated vehicle, the code will be set.

Name of code: P-1798(73) — Deteriorated Transaxle Fluid
When monitored: At every Fully Electronically Modulated Converter Clutch (FEMCC) to Partial Electronically Modulated Converter Clutch (PEMCC) transmission miles when A/C compressor clutch is being cycled.
Set condition: The code will be set if vehicle shudder is detected 20 times when the A/C clutch is cycled.
Theory of operation: While in 3rd or 4th gear FEMCC and just before the A/C clutch engages, the Powertrain Control Module (PCM) requests the Transmission Control Module (TCM) to momentarily establish PEMCC operation. If vehicle shudder is detected during the FEMCC or PEMCC transition, a counter is incremented. If the count reaches 20, the trouble code is set. The driver may then notice harsh bumps when the A/C clutch is being cycled, but vehicle shudder will be eliminated. After 35 OBDII warm-ups starts or if the code is cleared, PEMCC will be reactivated to see if shudder is still present. If one shudder event occurs, the code will be reset. Clearing the code and running battery with the DRBIII® is the only way to reset the shudder counter from 20 back to zero.
Transmission Effects: This code does not cause the transmission to go into limp-in mode. However, once the code is set, FEMCC to PEMCC operation before the A/C clutch engagement will be disabled for 35 OBDII warm up starts.
Possible causes:

> Degraded transmission fluid
> Wheels severely out of alignment
> Internal torque converter problem

Name of code: P-1799(74) — Calculated Oil Temperature in Use
When monitored: Whenever the engine is running.
Set condition: The code is set if any of the following conditions exist for three consecutive key starts:

> The Transmission Temperature Sensor voltage is out of range (below 0.07 volts or greater than 4.94 volts)
> If continuous erratic Transmission Temperature Sensor voltage is sensed.
> The Transmission Temperature Sensor temperature stays below 80°F for an extended period of time.

Theory of operation: The TCM uses a Transmission Temperature Sensor to monitor the transmission's sump temperature. This temperature is used to determine which shift schedule the TCM is to use. (See "Transmission Operation and Shift Scheduling at Various Sump Temperatures" section 3.2.2 of this diagnostic manual.) If Transmission Temper-

ature Sensor circuit fails to operate properly the TCM will use the calculated oil temperature routine found in prior module year TCM's. If this occurs for three consecutive key starts, the code will be set. The TCM will then test the Transmission Temperature Sensor circuit after every 35 OBDII warm-up starts. If the Transmission Temperatures Sensor circuit is OK, the Transmission Temperature Sensor data is used in place of the Calculated Oil Temperature data.

Transmission Effects: If the Transmission Temperature Sensor indicates a temperature below 0°F or above 240°F at start up, the TCM compares the calculated oil temperature to the indicated Transmission Temperature Sensor oil temperature. If the calculated oil temperature differs significantly from the Transmission Temperature Sensor value, the calculated oil temperature will be used for that key start.

Possible causes:

> Wiring or Connector problems in the transmission temperature sensor signal circuit.

> Defective TRS

> Defective TCM

Name of code: P-1738(75) — High Temperature Operation Activated

When monitored: Whenever the engine is running.

Set condition: Immediately once the Overheat Shift Schedule is activated.

Theory of operation: If the transmission oil temperature rises above 240°F, the overheat shift schedule is activated (see Transmission Operation as a function of Transmission Oil Temperature Section 3.3.2) and the fault code is set. The code is an information fault code only and is being set to aid the technician in determining root cause of a customer driveability issue. The code is also intended to alert the technician to determine if a cooling system malfunction has occurred or if an additional transmission air to oil cooler should be added to the vehicle if the customer regularly drives in a manner that overheats the transmission. Extended operation above 240°F will reduce the durability of the transmission and should be avoided. Correcting the cooling system malfunction or installing an additional transmission oil cooler will improve transmission durability especially for customers who operate in city/construction stop and go traffic, tow trailers regularly, drive aggressively in low gear or drive regularly in mountainous areas.

Transmission Effects: Information only code. Overheat shift schedule was activated, no limp-in conditions occurs. 2nd gear partial EMCC above 25 MPH, 3rd gear EMCC from 28-43 MPH, delayed 3-4 upshift at 43 MPH, early 4-3 coastdown at 41 MPH, EMCC operation under all conditions above 25 MPH except at closed throttle or 1st gear.

Possible causes:

> Transmission Overfilled with Oil

> Engine cooling fan failure

> Engine thermostat stuck closed

> Radiator corroded or packed with dirt

> Transmission Oil Cooler Plugged

> Customer driving pattern requires additional transmission cooling (See Theory of Operation for typical driving patterns that cause overheating)

Name of code: P-1739(76) — Power-Up at Speed

When monitored: When TCM (transmission control module) initially powers up.

Set condition: If the TCM powers up while in the "Drive" position and the vehicle is going above 20 MPH, the code is set.

Theory of operation: If a vehicle loses power to TCM, the vehicle will go to the 2nd gear mode since there is no power available to control the transmission solenoids. However, if power is restored, the TCM will power up and normal operation will be restored. This DTC identifies that power to the TCM was restored, when the gear selector was in a "Drive" position while the vehicle was moving at speeds above 20 MPH. If a person shifts to Neutral and cycles the ignition key and quickly shifts to "Drive" while moving before the TCM comes out of its START ROUTINE, the fault can be set. Therefore it is critical that this faulty diagnosis repair procedure should only be used if the vehicle is experiencing intermittent 2nd gear operation and subsequently a return to normal operation during normal driving.

Transmission Effects: No limp-in condition. Fault code is for information only when trying to diagnose intermittent 2nd gear operation and subsequently a return to normal operation.

Possible causes:

– No problem is vehicle is started in "neutral" at speeds above 20 MPH and shifted quickly to "Drive" before TCM comes out of the START ROUTINE.

FOR INTERMITTENT 2ND GEAR OPERATION AND THEN A SUBSEQUENT RETURN TO NORMAL OPERATION WITHOUT CYCLING THE IGNITION KEY.

– Intermittent Direct Battery connection between TCM (60-way pin 56) and battery.

– Intermittent Fused Ignition Switch Output between TCM (60-way pin 11) and ignition switch.

– Intermittent Ground to TCM (60-way pins 53 and 57).

Name of code: P-0717(77) — No Communication with Mechanical Instrument Cluster (MIC)
When monitored: Continuously with key on.
Set condition: If no PCI bus messages are received from the Mechanical Instrument Cluster (MIC) for 25 seconds.
Theory of operation: The TCM communicates with the MIC using the PCI bus. It relies on certain information to function properly. The TCM continuously monitors the PCI bus to check for messages broadcast from the PCM.
Transmission Effects: Possible improper TCM AutoStick configuration.
Possible causes:

> Open or shorted to PCI bus circuit from MIC
> MIC
> TCM (If other communication codes are stored in TCM only)

Name of code: P-0600(78) — Serial Communication Link Malfunction
When monitored: Continuously with key on.
Set condition: If no PCI bus messages are received by the Transmission Control Module (TCM) for 10 seconds.
Theory of operation: The TCM communicates with the other modules in the vehicle using the PCI bus. It relies on certain information to function properly. The TCM continuously monitors the PCI bus to check for messages broadcast from certain modules.
Transmission Effects: Possible improper TCM AutoStick configuration and delayed 3-4 shifts. No EMCC and early 3-4 shifts for a few minutes after engine is started.
Possible causes:

> Open or shorted PCI bus circuit from BCM
> TCM

Name of code: P-1714(79) — Low Battery Voltage
When monitored: Continuously with engine running and Transmission Relay energized.
Set condition: If the voltage sensed at the Transmission Control Relay Output circuits (pins 16 and 17 at TCM) for 15 seconds.
Theory of operation: The transmission system requires sufficient battery voltage in order to energize the transmission solenoids. The TCM continuously monitors the voltage available to the solenoids.
Transmission Effects: At speeds above 45 MPH, the transmission system will default to neutral. Below 45 MPH, the transmission system will default to relay open limp-in mode. Park, Reverse, Neutral are still available.
Possible causes:

> Charging system problem
> Poor/High resistance connection between TCM and Battery/Alternator
> TCM pins 16 and 17 high resistance or poor connection
> TCM ground pins 53 and 57 high resistance or poor connection
> High resistance in Transmission Control Relay contacts
> TCM

3.3.8 QUICK LEARN

The Quick Learn function customizes adaptive parameters of the TCM to the transmission characteristics of a vehicle. This gives the customer improved "as received" shift quality compared to the initial parameters stored in the TCM.

Notes about Quick Learn Features

The nature of the Quick Learn function requires that certain features must be taken into consideration.

> Quick Learn should generally not be used as a repair procedure unless directed by a repair or diagnostic procedure. If the transmission system is exhibiting a problem that you think is caused by an invalid CVI, you should try to re-learn the value by performing the appropriate maneuver as described in section 3.3.9. In most cases, if a quick learn makes a vehicle shift better, the vehicle will return with the same problem.
> Before performing Quick Learn, it is imperative that the vehicle be shifted into OD with the engine running and the oil level set to the correct level. This step will purge air from the clutch circuits to prevent erroneous clutch volume values which could cause poor initial shift quality.
> If an unused TCM is installed on a vehicle with a HOT engine, Quick Learn will cause the TCM to report a cold calculated oil temperature. This requires monitoring the calculated oil temperature using the DRBIII®. If the temperature is below 60°F, the transmission must be at idle or driven in gear until it goes above 60°F. If the temperature is above 200°F, the transmission must cool to below 200°F.
> First gear is engaged in overdrive after Quick Learn is completed. Place the vehicle in park after performing Quick Learn.

The Quick Learn function should be performed:

– Upon installation of a new service TCM

– After replacement or rebuild of internal transmission components or the torque converter.
– If one or more of the clutch volume indexes (CVI's) contain skewed readings because of abnormal conditions.

To perform the Quick Learn procedure, the following conditions must be met.

– It is imperative that the vehicle be shifted into OD with the engine running and the oil level set to the correct level. This step will purge the air in the clutch circuits to prevent erroneous clutch volume values, which could cause poor initial shift quality.
– The brakes must be applied.
– The engine must be idling.
– The throttle angle (TP sensor) must be less than 3 degrees.
– The shift lever position must stay in neutral until prompted to shift into OD.
– The shift lever must stay in OD after the "Shift to Overdrive" prompt until the DRBIII® indicates the procedure is complete.
– The oil temperature must be between 60-200°F.

NOTE: THE ABOVE CONDITIONS MUST BE MAINTAINED DURING THE PROCEDURE TO KEEP THE PROCEDURE FROM BEING ABORTED.

The Quick Learn procedure is performed with the DRBIII® by selecting "Transmission" system then "Miscellaneous" functions, then "Quick Learn". Follow the procedure instructions displayed on the DRBIII®.

3.3.9 CLUTCH VOLUMES

The L-R clutch volume is updated when doing a 2-1 or 3-1 coast down shift. The transmission temperature must be between 70-120°F. The clutch volume should be between 35 and 83.

The 2-4 clutch volume is updated when doing a 1-2 shift. The transmission temperature must be above 110°F. The clutch volume should be between 20 and 77.

The OD clutch volume is updated when doing a 2-3 shift. The transmission temperature must be above 110°F. The clutch volume should be between 40 and 150.

The UD clutch volume is updated when doing a 4-3 or 4-2 shift. The transmission temperature must be above 110°F. The clutch volume should be between 24 and 70.

3.3.10 ELECTRONIC PINION FACTOR

The transmission output speed signal supplies distance pulses to the powertrain control module (PCM), which are used to calculate speed and mileage. A pinion factor is stored in the transmission control module (TCM) in order to provide the appropriate distance pulses for the vehicle. The pinion factor is programmed into the TCM at the assembly plant.

Using the following steps, the pinion factor can be checked and/or reset using the DRBIII®:

1. Select "Transmission" system, then "Miscellaneous" functions, then "Pinion Factor". The DRBIII® will display the current tire size.
2. If the tire size is incorrect, depress the Enter key and then select the correct size.
3. Depress the Page Back key to exit the reset procedure.

Notes about Electronic Pinion Factor Features

The nature of the electronic pinion factor requires that certain features must be taken into consideration.

> If no pinion factor is stored in an installed TCM, the vehicle speedometer will not operate, engine speed will be limited to 2300 RPM, and catalyst damage may occur.

> If a TCM is removed from one vehicle and placed in another, the pinion factor must be reprogrammed according to the new vehicle's final drive ratio (FDR) and tire size.
Note: Swapping of production TCM's is not a recommended procedure.

> Selecting a wrong FDR or tire size will cause the speedometer to be inaccurate and will also cause any speed related features to operate improperly.

3.4 USING THE DRBIII®

Refer to the DRBIII® user's guide for instructions and assistance with reading trouble codes, erasing trouble codes, and other DRBIII® functions.

3.5 DRBIII® ERROR MESSAGES

Under normal operation, the DRBIII® will display one of only two error messages:

– User-Requested WARM Boot
– User-Requested COLD Boot

If the DRBIII® should display any other error message, record the entire display and call the MDS2 Hotline. This is a sample of such an error message display:

```
ver: 2.14
date: 26 Jul93
file: key_itf.cc
date: Jul 26 1993
line: 548
err: 0x1
User-Requested COLD Boot

Press MORE to switch between this
display and the application screen.
Press F4 when done noting information.
```

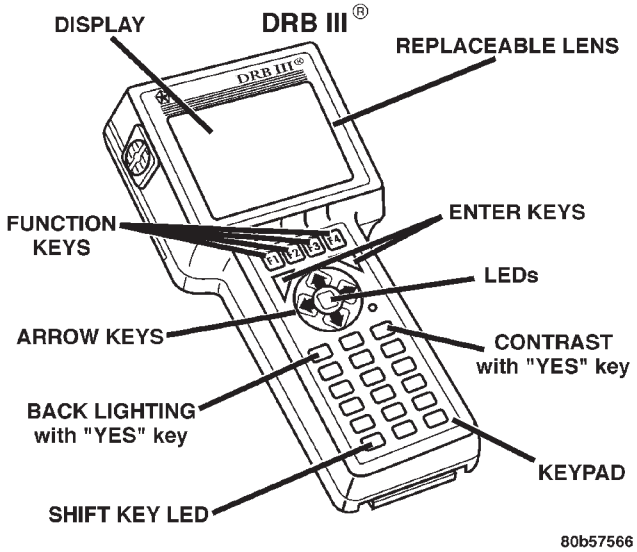
3.5.1 DRBIII® DOES NOT POWER UP (BLANK SCREEN)

If the LED's do not light or no sound is emitted at start up, check for loose cable connections or a bad cable. Check the vehicle battery voltage. A minimum of 11 volts is required to adequately power the DRBIII®.

If all connections are proper between the DRBIII® and the vehicle or other devices, and the vehicle battery is fully charged, an inoperative DRBIII® may be the result of faulty cable or vehicle wiring. For a blank screen, refer to the appropriate Body Diagnostic manual.

3.5.2 DISPLAY IS NOT VISIBLE

Low temperatures will affect the visibility of the display. Adjust the contrast to compensate for this condition.



3.6 TRANSMISSION SIMULATOR (MILLER TOOL #8333) AND FWD ADAPTER (MILLER TOOL #8333-1)

The transmission simulator, simply put, is an electronic device that simulates the electronic functions of any EATX controlled transmission (41TE, 41TE, and 45RFE). It's basic function is to aid the technician in determining if an internal transmission problem exists or if the problem resides in the vehicle wiring or Transmission Control Module (TCM). It is only useful for electrical problems. It will not aid in the diagnosis of a failed mechanical component, but it can tell you that the TCM and wiring are working properly and that the problem is internal.

The ignition switch should be in the lock position before attempting to install the simulator. Follow all instructions included with the simulator. If the feedback from the simulator is in doubt, you can verify it's operation by installing it on a known good vehicle. A "known good vehicle" would be defined as a vehicle that does not set any DTC's and drives and shifts as expected.

One important point to remember is that the Simulator receives it's power from the Trans Relay Output circuit. If the transmission system is in Limp−in (Relay open), the simulator will not operate. This is not really an indication of a problem, but an additional symptom. If the simulator does not power up ("P" led lit), this is an indication that the problem is still present with the simulator hooked up. This indicates that the problem is in the wiring or TCM and not the transmission.

Miller Tool #8333-1 consists of the adapter cables and overlay necessary to adapt the simulator to 41TE and 41TE transmissions.

4.0 DISCLAIMERS, SAFETY, AND WARNINGS

4.1 DISCLAIMERS

All information, illustrations, and specifications contained in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

4.2 SAFETY

4.2.1 TECHNICIAN SAFETY INFORMATION

WARNING: ENGINES PRODUCE CARBON MONOXIDE THAT IS ODORLESS, CAUSES SLOWER REACTION TIMES, AND CAN LEAD TO SERIOUS INJURY. WHEN THE ENGINE IS OPERATING, KEEP SERVICE AREAS WELL VENTILATED OR ATTACH THE VEHICLE EXHAUST SYSTEM TO THE SHOP EXHAUST REMOVAL SYSTEM.

Some operations in this manual require that hydraulic tubes, hoses, and fittings, disconnected for inspection or testing purposes. These systems, when fully charged contains fluid at high pressure. Before disconnecting any hydraulic tubes, hoses or fittings, be sure that the system is fully depressurized.

When servicing a vehicle, always wear eye protection, and remove any metal jewelry such as watchbands or bracelets that might make an inadvertent electrical contact.

When diagnosing a transmission system problem, it is important to follow approved procedures where applicable. Following these procedures is very important to the safety of individuals performing diagnostic tests.

4.2.2 VEHICLE PREPARATION FOR TESTING

Make sure the vehicle being tested has a fully charged battery. If it does not, false diagnostic codes or error messages may occur. It is extremely important that accurate shift lever position data be available to the TCM. The accuracy of any diagnostic trouble code found in memory is doubtful unless the Shift Lever Test performed on the DRBIII® Scan Tool, passes.

4.2.3 SERVICING SUB-ASSEMBLIES

Some components of the powertrain system are intended to be serviced in assembly only. Attempting to remove or repair certain system subcomponents may result in personal injury and/or improper system operation. Only those components with approved repair and installation procedures in the service manual should be serviced.

4.2.4 DRBIII® SAFETY INFORMATION

WARNING: EXCEEDING THE LIMITS OF THE DRBIII® MULTIMETER IS DANGEROUS. IT CAN EXPOSE YOU TO SERIOUS OR POSSIBLY FATAL INJURY. CAREFULLY READ AND UNDERSTAND THE CAUTIONS AND THE SPECIFICATION LIMITS.

Follow the vehicle manufacturer's service specifications at all times.

- Do not use the DRBIII® if it has been damaged.
- Do not use the test leads if the insulation is damaged or if metal is exposed.
- To avoid electrical shock, do not touch the test leads, tips, or the circuit being tested.
- Choose the proper range and function for the measurement. Do not try voltage or current measurements that may exceed the rated capacity.
- Do not exceed the limits shown in the table below:

FUNCTION	INPUT LIMIT
Volts	0 - 500 peak volts AC 0 - 500 volts DC
Ohms (resistance)*	0 - 1.12 megohms
Frequency Measured Frequency Generated	0 - 10 kHz
Temperature	-58 - 1100F -50 - 600C

* Ohms cannot be measured if voltage is present. Ohms can be measured only in a non-powered circuit.

- Voltage between any terminal and ground must not exceed 500v peak AC.
- Use caution when measuring voltage above 25v DC or 25v AC.
- The circuit being tested must be protected by a 10A fuse or circuit breaker.
- Use the low current shunt to measure circuits up to 10A. Use the high current clamp to measure circuits exceeding 10A.
- When testing for the presence of voltage or current, make sure the meter is functioning correctly. Take a reading of a known voltage or current before accepting a zero reading.
- When measuring current, connect the meter in series with the load.
- Disconnect the live test lead before disconnecting the common test lead.
- When using the meter function, keep the DRBIII® away from spark plug or coil wires to avoid measuring error from outside interference.

4.3 WARNINGS

4.3.1 VEHICLE DAMAGE WARNINGS

Before disconnecting any control module, make sure the ignition is "off". Failures to do so could damage the module.

When testing voltage or continuity at any control module, use the terminal side (not the wire end) of the connector. Do not probe a wire through the insulation; this will damage it and eventually cause it to fail because of corrosion.

Be careful when performing electrical tests so as to prevent accidental shorting of terminals. Such mistakes can damage fuses or components. Also, a second code could be set, making diagnosis of the original problem more difficult.

4.3.2 ROAD TEST COMPLAINT VEHICLE

Some complaints will require a test drive as part of the repair verification procedure. The purpose of the test drive is to try to duplicate the diagnostic code or symptom condition.

CAUTION: BEFORE ROAD TESTING A VEHICLE, BE SURE THAT ALL COMPONENTS ARE REASSEMBLED. DURING THE TEST DRIVE, DO NOT TRY TO READ THE DRBIII® SCREEN WHILE IN MOTION. DO NOT HANG THE DRBIII® FROM THE REAR VIEW MIRROR OR OPERATE IT YOURSELF. HAVE AN ASSISTANT AVAILABLE TO OPERATE THE DRBIII®.

Road testing is an essential step in the diagnostic process that must not be overlooked. Along with diagnostic information obtained from the DRB® Scan Tool and the original customer concern, the road test helps to verify the problem and observe operation under actual vehicle driving conditions.

Just as important as road test is, there are preliminary inspections that should be carried out prior to the road test. Always check the fluid level and condition before going on a road test or performing other tests. Also try to determine the type of fluid being used. Improper fluid can result in problems. Additionally, a variety of complaints can be caused by incorrect fluid level. Some of the conditions caused by incorrect fluid level are as follows:

- Delayed engagement
- Poor shifting or erratic shifts
- Excessive noise
- Overheating

The next step is to verify that the shift linkage is correctly adjusted. If the gearshift linkage is incorrectly adjusted because of wear or incorrect adjustment, a number of complaints can result.

The TCM monitors the Shift Lever Position (SLP) Sensor at all times. If the linkage is incorrectly adjusted, the TCM may sense a shift lever position that is not correct for the gear range chosen by the driver. This may cause diagnostic trouble codes to be set and a possible limp-in situation.

The following complaints may also be the result of an incorrectly adjusted or worn linkage.

- Delayed engagement or erratic shifts
- Vehicle able to drive in Neutral
- Engine not able to crank in Park or Neutral
- Gearshift linkage able to be shifted without the key in the ignition
- Not able to remove the ignition key in Reverse
- Park pawl not engaging

The shift linkage should also be adjusted when replacing the transaxle, repairing the valve body or repairing any component between the shift lever and the transaxle.

Some questions to ask yourself when considering the road test are listed below:

- Is the complaint or concern what you think it is, based on the driver's description of the problem?
- Is the transaxle operating normally, or is there a real problem?
- When does the malfunction occur?
- Is the problem in only one gear range?
- What temperature does the complaint occur?
- Is the transaxle in limp-in mode?

4.3.4 BULLETINS AND RECALLS

The service procedures contained in this manual are correct, provided that all applicable Safety Recalls and Technical Service Bulletins have been performed.

5.0 REQUIRED TOOLS AND EQUIPMENT

> DRBIII® (diagnostic read-out box) — DRBIII® must use most current program cartridge

> Transmission Simulator (Miller #8333) and FWD adapter kit (Miller #8333-1)

> Jumper Wires

> Test Light

> Ohmmeter

> Voltmeter

> Pressure gauge (0-300 PSI)

6.0 GLOSSARY OF TERMS

6.1 ACRONYMS

BCM	Body Control Module
CKT	Circuit
CVI	Clutch Volume Index
DLC	Data Link Connector
DRB	Diagnostic Readout Box
DTC	Diagnostic Trouble Code
EATX	Electronic Automatic Transaxle
EMCC	Electronically Modulated Converter Clutch
IOD	Ignition off-draw
IRT	Intelligent Recovery Timer
ISS	Input Speed Sensor
LED	Light Emitting Diode
LR	Low/reverse Clutch
LU	Lockup
MIC	Mechanical Instrument Cluster
MIL	Malfunction Indicator Lamp
OD	Overdrive Clutch
OSS	Output Speed Sensor
PCM	Powertrain Control Module
PEMCC	Partial Electronically Modulated Converter Clutch
PLU	Partial Lockup
REV	Reverse Clutch
SLPK	Solenoid Pack
SSV	Solenoid Switch Valve
SW	Switch
TCC	Torque Converter Clutch
TCM	Transmission Control Module
TP	Throttle Position
TRD	Torque Reduction
TRS	Transmission Range Sensor
UD	Underdrive Clutch
2-4	2nd and 4th gear clutch

6.2 DEFINITIONS

OBDII Trip - A vehicle start and drive cycle such that all once per trip diagnostic monitors have run.
Key Start - A vehicle start and run cycle of at least 20 seconds.
Warm-up Cycle - A vehicle start and run cycle such that the engine coolant must rise to at least 160°F and must rise by at least 40°F from initial start up. To count as a warm-up cycle, no faults may occur during the cycle.

7.0

DIAGNOSTIC INFORMATION AND PROCEDURES

Symptom:

***NO RESPONSE FROM TCM**

POSSIBLE CAUSES
ATTEMPT TO COMMUNICATE WITH THE PCM
FUSED B(+) CIRCUIT TO TCM OPEN
FUSED IGNITION SWITCH OUTPUT (RUN/ST) CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT (START) CIRCUIT OPEN
GROUND CIRCUIT OPEN
PCI BUS CIRCUIT OPEN
OTHER BUS PROBLEMS PRESENT
SCI TRANSMIT CIRCUIT OPEN
TCM (PCI BUS CIRCUIT)

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, attempt to communicate with the PCM. Was the DRB able to communicate with the PCM? Yes → Go To 2 No → Refer to symptom No Response From PCM (SCI Only) in the Communication category. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
2	With the DRBIII®, attempt to read Transmission DTC's. Does the DRBIII® show ″NO RESPONSE to TCM″? Yes → Go To 3 No → Test Complete.	All
3	With the DRBIII®, check all of the other modules on the vehicle for evidence of a vehicle bus problem. Bus related DTC's in other modules point to an overall vehicle bus problem. Other symptoms such as a customer complaint of intermittent operation of bus controlled features also indicate a bus problem. Does the PRNDL display indicate ″No Bus″ or is there any evidence of an overall vehicle bus problem? Yes → Diagnose and repair other bus problems as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All

*NO RESPONSE FROM TCM — Continued

TEST	ACTION	APPLICABILITY
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Connect the ground clip of a test light to a known good ground. Connect the other end to the Fused B(+) circuit in the TCM connector. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 5 No → Repair Fused B(+) Circuit wiring and / or connectors. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Connect the ground clip of a test light to a known good ground. Probe the Fused Ignition Switch Output circuit in the TCM connector with the test light. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 6 No → Repair cause of not lit or dim test light in Fused Ignition Switch Output (Run/St) circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the starter relay from the PDC. Connect the ground clip of a test light to a known good ground. Probe the Fused Ignition Switch Output(Start) circuit in the TCM connector with the test light. Turn the ignition switch to the start position. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair cause of unlit or dim test light in Fused Ignition Switch Output (Start) circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. **Note: Reinstall the Starter Relay.**	All

*NO RESPONSE FROM TCM — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Connect the ground clip of a test light to a known good 12 volt source on the vehicle such as the positive battery post. Probe all ground circuit(s) in the TCM connector with the test light. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly at all ground circuits? Yes → Go To 8 No → Repair the Ground circuit(s) as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	**NOTE: Ensure there is PCI bus communication with other modules. If not, refer to the PCI Bus Communication Failure symptom and repair as necessary.** Turn ignition off to the lock position. Disconnect the TCM harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. Select DRB Standalone. Select lab scope. Select Live. Select 12 volt square wave. Select F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to chassis ground. Connect the Red lead to the PCI Bus circuit in the TCM connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. What is the voltage display on the scope? Pulse from 0 to approximately 7.5 volts Go To 9 Steady 0 volts Repair the PCI Bus circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
9	Turn the ignition off. Disconnect the Transmission Control Module harness connector. Disconnect the DRB from the Data Link Connector. Measure the resistance of the SCI Transmit circuit between the TCM connector and the Data Link Connector. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair the SCI Transmit circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM TCM — Continued

TEST	ACTION	APPLICABILITY
10	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0120-THROTTLE POSITION SENSOR SIGNAL CIRCUIT

When Monitored and Set Condition:

P0120-THROTTLE POSITION SENSOR SIGNAL CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: This code is set if the throttle angle goes out of range or if throttle angle changes abruptly (i.e.: faster than the throttle body motion could occur).

POSSIBLE CAUSES
INTERMITTENT WIRING & CONNECTORS CONDITIONS
RELATED PCM DTC'S PRESENT
TPS VOLTAGE CHANGE NOT SMOOTH
TCM P-0120
SENSOR GROUND CIRCUIT OPEN TO TCM
TPS SIGNAL CIRCUIT OPEN TO TCM

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	Start the engine. Allow the engine to idle. With the DRBIII®, Check the Throttle Position Sensor Voltage under Transmission sensors. Is the Throttle Position Sensor voltage below 0.3 or above 1.0 volts? Yes → Go To 3 No → Go To 7	All

P0120-THROTTLE POSITION SENSOR SIGNAL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRB, check Powertrain Control Module DTC's. Are any of the following P-codes stored in the PCM? P-0122 Refer to the Driveability category for the related symptom(s). Perform POWERTRAIN VERIFICATION TEST VER - 5. P-0123 Refer to the Driveability category for the related symptom(s). Perform POWERTRAIN VERIFICATION TEST VER - 5. P-0121 Refer to the Driveability category for the related symptom(s). Perform POWERTRAIN VERIFICATION TEST VER - 5. No → Go To 4	All
4	Turn the ignition off. Disconnect the TPS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Ground circuit between the TPS harness connector and the Transmission Control Module harness connector. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the Sensor Ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5.	All
5	Turn the ignition off. Disconnect the Throttle Position Sensor harness connector. Disconnect the Transmission Control Module harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TPS Signal Circuit from the TCM harness connector to the TPS harness connector. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the TPS signal circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5.	All
6	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform POWERTRAIN VERIFICATION TEST VER - 5.	All

P0120-THROTTLE POSITION SENSOR SIGNAL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	With the DRB, check Powertrain Control Module DTC's. Are any of the following P-codes stored in the PCM? P-0122 Refer to the Driveability category for the related symptom(s). Perform POWERTRAIN VERIFICATION TEST VER - 5. P-0123 Refer to the Driveability category for the related symptom(s). Perform POWERTRAIN VERIFICATION TEST VER - 5. P-0121 Refer to the Driveability category for the related symptom(s). Perform POWERTRAIN VERIFICATION TEST VER - 5. No → Go To 8	All
8	Turn the ignition on. With the DRBIII®, read TPS VOLTS. While monitoring the DRBIII®, slowly open and close the Throttle. Is the voltage change smooth? Yes → Go To 9 No → Replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5.	All
9	The conditions necessary to set this DTC are not present at this time.Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Pay particular attention to the the point where the TPS signal and sensor ground circuits splice off from the engine circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5. No → Test Complete.	All

Symptom:
P0600-SERIAL COMMUNICATION LINK MALFUNCTION

When Monitored and Set Condition:

P0600-SERIAL COMMUNICATION LINK MALFUNCTION

When Monitored: Continuously with engine running.

Set Condition: The code sets in approximately 20 seconds if no BUS messages are received by the TCM.

POSSIBLE CAUSES
NO COMMUNICATION WITH MIC
NO COMMUNICATION WITH PCM
INTERMITTENT WIRING & CONNECTORS CONDITIONS
TCM ERROR (P-0600)

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase TCM DTC's. **Note: Erase P0700 DTC in the PCM to turn the MIL light off after making transmission repairs.** Start the engine in park. Did the DTC reset after the engine was started? Yes → Go To 2 No → Go To 5	All
2	Ignition on, engine not running. With the DRBIII®, attempt communication with the MIC Can you communicate with the MIC? Yes → Go To 3 No → Refer to symptom category communication for problems related to No Response From MIC Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	Ignition on, engine not running. With the DRBIII®, attempt to communicate with the Powertrain Control Module (PCM). Can the DRBIII® communicate with the PCM? Yes → Go To 4 No → Refer to symptom list for problems related to No Response From PCM Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0600-SERIAL COMMUNICATION LINK MALFUNCTION — Continued

TEST	ACTION	APPLICABILITY
4	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom List:

P0604-INTERNAL TCM
P0605-INTERNAL TCM
P1795-INTERNAL TCM

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0604-INTERNAL TCM.

POSSIBLE CAUSES
TCM (INTERNAL ERROR)

TEST	ACTION	APPLICABILITY
1	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

P0700-INTERNAL TCM

POSSIBLE CAUSES
TCM ERROR (P-0700)

TEST	ACTION	APPLICABILITY
1	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

P0705-CHECK SHIFTER SIGNAL

When Monitored and Set Condition:

P0705-CHECK SHIFTER SIGNAL

When Monitored: Continuously with the ignition key on.

Set Condition: 3 occurrences in one key start of an invalid PRNDL code which lasts for more than 0.1 second.

POSSIBLE CAUSES
INTERMITTENT WIRING & CONNECTORS
SHIFT LINKAGE OUT OF ADJUSTMENT.
TRS T1 SENSE CIRCUIT OPEN
TRS T3 SENSE CIRCUIT OPEN
TRS T41 SENSE CIRCUIT OPEN
TRS T42 SENSE CIRCUIT OPEN
TRS T1 SENSE CIRCUIT SHORTED TO GROUND
TRS T3 SENSE CIRCUIT SHORTED TO GROUND
TRS T41 SENSE CIRCUIT SHORTED TO GROUND
TRS T42 SENSE CIRCUIT SHORTED TO GROUND
TRS T1 SENSE CIRCUIT SHORTED TO VOLTAGE
TRS T3 SENSE CIRCUIT SHORTED TO VOLTAGE
TRS T41 SENSE CIRCUIT SHORTED TO VOLTAGE
TRS T42 SENSE CIRCUIT SHORTED TO VOLTAGE
TCM (TRS T1 SENSE CIRCUIT)
TCM (TRS T3 SENSE CIRCUIT)
TCM (TRS T41 SENSE CIRCUIT)
TCM (TRS T42 SENSE CIRCUIT)
TRANSMISSION RANGE SENSOR (P-0705)

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	Using the DRB, perform the Shift Lever Position Test. Select the test outcome from the following: Test passes Go To 3 Test fails with error code Go To 4 Test fails without error code Go To 23	All
3	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Perform the DRB Shift Lever Position Test with the simulator installed. When the DRBIII ® instructs you to put the Gear Selector in a particular position, you must do so using the simulator tool. The LED for the gear position in question must be illuminated prior to hitting ″enter″ on the DRBIII®. **NOTE: Disconnect the Transmission Simulator and reconnect the vehicle harness.** Did the test pass? Yes → Go To 5 No → Go To 6	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
5	If there are no possible causes remaining, replace the TRS. View repair options. Repair Replace the Transmission Range Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Ignition on, engine not running. With the DRB, observe the TRS sense circuits on the Input/Output screen. (C1 thru C4) Move the shift lever thru all gear positions, pausing momentarily in each gear position. Watch for one of the circuits to not change state. Pick the one that did not change state. TRS T1 sense (C4) Go To 7 TRS T3 sense (C3) Go To 11 TRS T41 sense (C1) Go To 15 TRS T42 sense (C2) Go To 19	All
7	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TRS T1 Sense circuit from the TCM connector to the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair the open TRS T1 Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the TRS T1 Sense circuit at the TCM connector and ground. Is the resistance below 5.0 ohms? Yes → Repair TRS T1 Sense circuit shorted to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
9	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) circuit and the Trans Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the TRS T1 Sense circuit at the TCM connector. Is the voltage above 1.0 volt? Yes → Repair the TRS T1 Sense circuit shorted to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, replace the TCM. **NOTE: Reprogram Pinion Factor and Perform Quick learn.** View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TRS T3 Sense circuit from the TCM connector to the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair the open TRS T3 Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 12	All
12	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the TRS T3 Sense circuit at the TCM connector and ground. Is the resistance below 5.0 ohms? Yes → Repair TRS T3 Sense circuit shorted to ground Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 13	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
13	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) circuit and the Trans Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the TRS T3 Sense circuit at the TCM connector. Is the voltage above 1 volt? Yes → Repair TRS T3 Sense circuit shorted to voltage Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 14	All
14	If there are no possible causes remaining, replace the TCM. **NOTE: Reprogram Pinion Factor and Perform Quick learn.** View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
15	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TRS T41 Sense circuit from the TCM connector to the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair open TRS T41 Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 16	All
16	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the TRS T41 Sense circuit at the TCM connector and ground. Is the resistance below 5.0 ohms? Yes → Repair the TRS T41 Sense circuit shorted to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 17	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
17	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) circuit and the Trans Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the TRS T41 Sense circuit at the TCM connector. Is the voltage above 1 volt? Yes → Repair the TRS T1 Sense circuit shorted to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 18	All
18	If there are no possible causes remaining, replace the TCM. **NOTE: Reprogram Pinion Factor and Perform Quick learn.** View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
19	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TRS T42 Sense circuit from the TCM connector to the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair the open TRS T42 Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 20	All
20	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the TRS T42 Sense circuit at the TCM connector and ground. Is the resistance below 5.0 ohms? Yes → Repair the TRS T42 Sense circuit shorted to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 21	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
21	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) circuit and the Trans Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the TRS T42 Sense circuit at the TCM connector. Is the voltage above 1 volt? Yes → Repair the TRS T42 Sense circuit shorted to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 22	All
22	If there are no possible causes remaining, replace the TCM. **NOTE: Reprogram Pinion Factor and Perform Quick learn.** View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
23	Check and adjust the shift linkage per the service instructions. View repair options. Repair Adjust the shift linkage per the service instructions. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

P0715-INPUT SPEED SENSOR ERROR

When Monitored and Set Condition:

P0715-INPUT SPEED SENSOR ERROR

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If there is an excessive change in input RPM in any gear.

POSSIBLE CAUSES
INTERMITTENT WIRING & CONNECTORS
INPUT SPEED SENSOR SIGNAL CIRCUIT OPEN
SPEED SENSOR GROUND CIRCUIT OPEN
INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND
INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
SPEED SENSOR GROUND CIRCUIT SHORT TO VOLTAGE
INPUT SPEED SENSOR ERROR
TCM (INPUT SPEED SENSOR)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	Start the engine in park. With the DRBIII®, observe the Input Speed Sensor RPM. Is the Input Speed Sensor Reading below 400 RPM? Yes → Go To 3 No → Go To 11	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
3	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Using the Transmission Simulator, set the rotary knob to the middle (1000/3000) position. Turn the ″Input/Output″ switch on. With the DRBIII®, observe the Input RPM and Output RPM. Does the Input speed read 3000 RPM and the Output speed read 1250 RPM (within 50 RPM)? Yes → Go To 4 No → Go To 5	All
4	Replace the Input Speed Sensor in accordance with the Service Information. View repair options. Repair Replace the Input Speed Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Input Speed Sensor Signal circuit from the TCM connector to the Input Speed Sensor connector. Is the resistance above 5.0 ohms? Yes → Repair open Input Speed Sensor Signal circuit Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Speed Sensor Ground circuit from the TCM connector to the Input Speed Sensor connector. Is the resistance above 5.0 ohms? Yes → Repair the open Speed Sensor Ground circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Input Speed Sensor Signal circuit and ground. Is the resistance Below 5.0 ohms? Yes → Repair Input Speed Sensor Signal circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) circuit and the Trans Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the Input Speed Sensor Signal circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair Input Speed Sensor Signal circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the Speed Sensor Ground circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair Speed Sensor Ground circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

P0720-OUTPUT SPEED SENSOR ERROR

When Monitored and Set Condition:

P0720-OUTPUT SPEED SENSOR ERROR

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If there is an excessive change in output RPM in any gear.

POSSIBLE CAUSES
INTERMITTENT WIRING & CONNECTORS
OUTPUT SPEED SENSOR SIGNAL CIRCUIT OPEN
SPEED SENSOR GROUND CIRCUIT OPEN
OUTPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND
OUTPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
SPEED SENSOR GROUND CIRCUIT SHORT TO VOLTAGE
OUTPUT SPEED SENSOR ERROR
TCM (OUTPUT SPEED SENSOR)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P0720-OUTPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
2	Start the engine in park. Raise the drive wheels off of the ground. **WARNING: PROPERLY SUPPORT THE VEHICLE.** Place transmission in drive, release foot from brake. **WARNING: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** **Note: The drive wheels must be turning at this point.** With the DRBIII®, observe the Output RPM Is the Output RPM below 100? Yes → Go To 3 No → Go To 11	All
3	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Using the Transmission Simulator, set the rotary knob to the middle (1000/3000) position. Turn the ″Input/Output″ switch on. With the DRBIII®, observe the Input RPM and Output RPM. Does the Input RPM read 3000 and the Output RPM read 1250 (within 50 RPM)? Yes → Go To 4 No → Go To 5	All
4	Replace the Output Speed Sensor in accordance with the Service Information. View repair options. Repair Replace the Output Speed Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Output Speed Sensor Signal circuit from the TCM connector to the Output Speed Sensor connector. Is the resistance above 5.0 ohms? Yes → Repair open Output Speed Sensor Signal circuit Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Speed Sensor Ground circuit from the TCM connector to the Output Speed Sensor connector. Is the resistance above 5.0 ohms? Yes → Repair open Speed Sensor Ground circuit Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0720-OUTPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Output Speed Sensor Signal circuit and ground. Is the resistance Below 5.0 ohms? Yes → Repair Output Speed Sensor Signal circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Simulator. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the Output Speed Sensor Signal circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair Output Speed Sensor Signal circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the Speed Sensor Ground circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair Speed Sensor Ground circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0725-ENGINE SPEED SENSOR CIRCUIT

When Monitored and Set Condition:

P0725-ENGINE SPEED SENSOR CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: Engine RPM less than 390 or greater than 8000 for more than 2 seconds while the engine is running.

POSSIBLE CAUSES
INTERMITTENT WIRING & CONNECTORS CONDITIONS
EATX RPM SIGNAL CIRCUIT OPEN
EATX RPM SIGNAL CIRCUIT SHORTED TO GROUND
EATX RPM SIGNAL CIRCUIT SHORTED TO VOLTAGE
PCM-INTERNAL CONTROLLER
TCM-INTERNAL CONTROLLER

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	Start the engine. With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter set at 0? Yes → Go To 3 No → Go To 8	All

P0725-ENGINE SPEED SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn ignition off to the lock position. Disconnect the Powertrain Control Module (PCM) harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the EATX RPM signal circuit between the TCM connector and the PCM connector. Is the resistance above 5.0 ohms? Yes → Repair the open EATX RPM Signal circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn ignition off to the lock position. Disconnect the Powertrain Control Module (PCM) harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the EATX RPM Signal circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair the EATX RPM Signal circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the Powertrain Control Module (PCM) harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Measure the voltage of the EATX RPM Signal circuit in the PCM connector. Is the voltage above 10.0 volts? Yes → Repair the EATX RPM Signal circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn ignition off to the lock position. Disconnect the Powertrain Control Module (PCM) harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Measure the voltage between the Eatx RPM Signal circuit and ground at the PCM harness connector. Is the voltage between 4.5 and 5.5 volts? Yes → Replace the PCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0725-ENGINE SPEED SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
8	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Check the power and ground circuits of the Transmission Control Module. Check the vehicles battery condition. Were any problems found? Yes → Repair wiring and/or connectors as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0731-GEAR RATIO ERROR IN 1ST

When Monitored and Set Condition:

P0731-GEAR RATIO ERROR IN 1ST

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If the ratio of the input RPM to the output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
INTERMITTENT GEAR RATIO ERRORS
REPAIR TRANSMISSION

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's If any of these DTC's are present, perform their respective tests first. Are DTC's P-1791, P-0715, P-0720, P-1794, P-1720, present also? Yes → Refer to appropriate symptom in the Transmission category. If any of these DTC's are present, they will cause a gear ratio error. Go to test for P-1791 first if it is present. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0731-GEAR RATIO ERROR IN 1ST — Continued

TEST	ACTION	APPLICABILITY
3	**Note: Low fluid level can be the cause of many transmission problems. Check and adjust the fluid level before continuing. If the fluid level is low, locate and repair the leak before returning the vehicle to the customer.** With the DRBIII®, perform the 1st gear clutch test. Follow the instructions on the DRBIII®. Did the clutch test pass (Input speed remains at zero)? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not currently present. Check the gearshift linkage adjustment. Gear ratio DTC's can be set by problems in the input and output speed sensor circuits. If the vehicle passes the clutch test and still sets gear ratio DTC('s), check the Speed Sensors for proper operation. Check the speed sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator (Miller tool # 8333) and FWD adapter kit (Miller tool # 8333-1). This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Ask the customer if the problem is only experienced under extreme hot or cold conditions. View repair options. Repair Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Repair internal transmission problem as necessary per current warranty policy. If the transmission is to be repaired, check all of the components related to the Underdrive and L/R clutches. Inspect the pump per service manual procedures and repair as necessary. View repair options. Repair Repair internal transmission problem per current warranty policy. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0732-GEAR RATIO ERROR IN 2ND

When Monitored and Set Condition:

P0732-GEAR RATIO ERROR IN 2ND

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If the ratio of the input RPM to the output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
RELATED PRESSURE SWITCH DTC'S PRESENT
INTERMITTENT GEAR RATIO ERRORS
REPAIR TRANSMISSION

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's If any of these DTC's are present, perform their respective tests first. Are DTC's P-1791, P-0715, P-0720, P-1794, P-1720, present also? Yes → Refer to appropriate symptom in the Transmission category. If any of these DTC's are present, they will cause a gear ratio error. Go to test for P-1791 first if it is present. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0732-GEAR RATIO ERROR IN 2ND — Continued

TEST	ACTION	APPLICABILITY
3	**Note: Low fluid level can be the cause of many transmission problems. Check and adjust the fluid level before continuing. If the fluid level is low, locate and repair the leak before returning the vehicle to the customer.** With the DRBIII, perform the 2nd gear clutch test. Follow the instructions on the DRB. Did the clutch test pass (Input speed remains at zero)? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not currently present. Check the gearshift linkage adjustment. Gear ratio DTC's can be set by problems in the input and output speed sensor circuits. If the vehicle passes the clutch test and still sets gear ratio DTC('s), check the Speed Sensors for proper operation. Check the speed sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator (Miller tool # 8333) and FWD adapter kit (Miller tool # 8333-1). This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Ask the customer if the problem is only experienced under extreme hot or cold conditions. View repair options. Repair Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	With the DRBIII®, read Transmission DTC's. Is a DTC P-1788 (2-4 Hydraulic Pressure Switch) and/or P-1782 (2-4 Pressure Switch) present also? Yes → Replace the Solenoid/Pressure switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Repair internal transmission problem as necessary per current warranty policy. If the transmission is to be repaired, check all of the components related to the Underdrive and 2/4 clutches. Inspect the pump per service manual procedures and repair as necessary. View repair options. Repair Repair internal transmission problem per current warranty policy. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

P0733-GEAR RATIO ERROR IN 3RD

When Monitored and Set Condition:

P0733-GEAR RATIO ERROR IN 3RD

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If the ratio of the input RPM to the output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
RELATED PRESSURE SWITCH DTC'S PRESENT
INTERMITTENT GEAR RATIO ERRORS
REPAIR TRANSMISSION

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's If any of these DTC's are present, perform their respective tests first. Are DTC's P-1791, P-0715, P-0720, P-1794, P-1720, present also? Yes → Refer to appropriate symptom in the Transmission category. If any of these DTC's are present, they will cause a gear ratio error. Go to test for P-1791 first if it is present. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0733-GEAR RATIO ERROR IN 3RD — Continued

TEST	ACTION	APPLICABILITY
3	**Note: Low fluid level can be the cause of many transmission problems. Check and adjust the fluid level before continuing. If the fluid level is low, locate and repair the leak before returning the vehicle to the customer.** With the DRBIII, perform the 3rd gear clutch test. Follow the instructions on the DRB. Did the clutch test pass (Input speed remains at zero)? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not currently present. Check the gearshift linkage adjustment. Gear ratio DTC's can be set by problems in the input and output speed sensor circuits. If the vehicle passes the clutch test and still sets gear ratio DTC('s), check the Speed Sensors for proper operation. Check the speed sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator (Miller tool # 8333) and FWD adapter kit (Miller tool # 8333-1). This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Ask the customer if the problem is only experienced under extreme hot or cold conditions. View repair options. Repair Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	With the DRBIII®, read Transmission DTC's. Is a DTC P-1787 (OD Hydraulic Pressure Switch) and/or P-1781 (OD Pressure Switch) present also? Yes → Replace the Solenoid/Pressure switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Repair internal transmission problem as necessary per current warranty policy. If the transmission is to be repaired, check all of the components related to the Underdrive and Overdrive clutches. Inspect the pump per service manual procedures and repair as necessary. View repair options. Repair Repair internal transmission problem per current warranty policy. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0734-GEAR RATIO ERROR IN 4TH

When Monitored and Set Condition:

P0734-GEAR RATIO ERROR IN 4TH

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If the ratio of the input RPM to the output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
RELATED PRESSURE SWITCH DTC'S PRESENT
INTERMITTENT GEAR RATIO ERRORS
REPAIR TRANSMISSION

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's If any of these DTC's are present, perform their respective tests first. Are DTC's P-1791, P-0715, P-0720, P-1794, P-1720, present also? Yes → Refer to appropriate symptom in the Transmission category. If any of these DTC's are present, they will cause a gear ratio error. Go to test for P-1791 first if it is present. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0734-GEAR RATIO ERROR IN 4TH — Continued

TEST	ACTION	APPLICABILITY
3	**Note: Low fluid level can be the cause of many transmission problems. Check and adjust the fluid level before continuing. If the fluid level is low, locate and repair the leak before returning the vehicle to the customer.** With the DRBIII, perform the 4th gear clutch test. Follow the instructions on the DRB. Did the clutch test pass (Input speed remains at zero)? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not currently present. Check the gearshift linkage adjustment. Gear ratio DTC's can be set by problems in the input and output speed sensor circuits. If the vehicle passes the clutch test and still sets gear ratio DTC('s), check the Speed Sensors for proper operation. Check the speed sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator (Miller tool # 8333) and FWD adapter kit (Miller tool # 8333-1). This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Ask the customer if the problem is only experienced under extreme hot or cold conditions. View repair options. Repair Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	With the DRBIII®, read Transmission DTC's. Is a DTC P-1788 (2-4 Hydraulic Pressure Switch) and/or P-1782 (2-4 Pressure Switch) present also? Yes → Replace the Solenoid/Pressure switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Repair internal transmission problem as necessary per current warranty policy. If the transmission is to be repaired, check all of the components related to the Overdrive and 2/4 clutches. Inspect the pump per service manual procedures and repair as necessary. View repair options. Repair Repair internal transmission problem per current warranty policy. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0736-GEAR RATIO ERROR IN REVERSE

When Monitored and Set Condition:

P0736-GEAR RATIO ERROR IN REVERSE

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If the ratio of the input RPM to the output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
INTERMITTENT GEAR RATIO ERRORS
REPAIR TRANSMISSION

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's If any of these DTC's are present, perform their respective tests first. Are DTC's P-1791, P-0715, P-0720, P-1794, P-1720, present also? Yes → Refer to appropriate symptom in the Transmission category. If any of these DTC's are present, they will cause a gear ratio error. Go to test for P-1791 first if it is present. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0736-GEAR RATIO ERROR IN REVERSE — Continued

TEST	ACTION	APPLICABILITY
3	**Note: Low fluid level can be the cause of many transmission problems. Check and adjust the fluid level before continuing. If the fluid level is low, locate and repair the leak before returning the vehicle to the customer.** With the DRBIII, perform the Reverse gear clutch test. Follow the instructions on the DRBIII®. Did the clutch test pass (Input speed remains at zero)? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not currently present. Check the gearshift linkage adjustment. Gear ratio DTC's can be set by problems in the input and output speed sensor circuits. If the vehicle passes the clutch test and still sets gear ratio DTC('s), check the Speed Sensors for proper operation. Check the speed sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator (Miller tool # 8333) and FWD adapter kit (Miller tool # 8333-1). This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Ask the customer if the problem is only experienced under extreme hot or cold conditions. View repair options. Repair Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Repair internal transmission problem as necessary per current warranty policy. If the transmission is to be repaired, check all of the components related to the Reverse and L/R clutches. Inspect the pump per service manual procedures and repair as necessary. View repair options. Repair Replace the Transmission or repair internal transmission problem per current warranty policy. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0740-TORQ CONV CLU, NO RPM DROP AT LOCKUP

When Monitored and Set Condition:

P0740-TORQ CONV CLU, NO RPM DROP AT LOCKUP

When Monitored: Run in third with converter unlocked for 10 seconds, apply throttle until it locks then run for 5 seconds. No DTCs set for: TCC solenoids, any cam/crank conditions, VSS, TPS signal, TPS voltage too high or too low.

Set Condition: Torque converter malfunctions are detected when it does not lock or unlock properly. Two consecutive trips that fail will store the code. Mountainous terrain may cause this trouble code.

POSSIBLE CAUSES
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
INTERMITTENT TORQUE CONVERTER CLUTCH SOLENOID
CHECK FOR OTHER DTC'S
TCC OPERATION
TORQUE CONVERTER ASSEMBLY OR TCC SOL STUCK
TRANSMISSION FLUID LEVEL AND CONDITION
VEHICLE CONFIGURATION NON-STANDARD
TCC SOLENOID

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Turn the ignition on. With the DRB, read PCM DTCs. With the DRB, read PCM DTCs. Turn the ignition on. Turn the ignition on. With the DRB, read PCM DTCs. With the DRB, read PCM DTCs. Is the Good Trip counter for P-0740 displayed and equal to 0? Yes → Go To 2 No → Go To 9	All
2	Turn the ignition on. With the DRB, read PCM DTCs. Is P-0122, P-0123, P-0320, P-0743 or are any misfire codes present? Yes → Refer to the symptom list for problems related to any of these DTCs before proceeding. Perform TRANSMISSION DTC VERIFICATION TEST. No → Go To 3	All

P0740-TORQ CONV CLU, NO RPM DROP AT LOCKUP — Continued

TEST	ACTION	APPLICABILITY
3	Check the transmission fluid level and condition. Is fluid level OK and free of contamination? Yes → Go To 4 No → Repair the fluid level and condition as necessary. Perform TRANSMISSION DTC VERIFICATION TEST.	All
4	Turn the ignition off. Disconnect the TCC Solenoid harness connector. **Note: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Fused Ignition Switch Output circuit in the TCC Solenoid harness connector. Is the voltage above 10.0 volts? Yes → Go To 5 No → Repair the Fused Ignition Switch Output circuit for an open. Perform TRANSMISSION DTC VERIFICATION TEST.	All
5	Turn the ignition off. Disconnect the TCC Solenoid harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TCC Solenoid. Is resistance between 30.0 and 50.0 ohms? Yes → Go To 6 No → Replace TCC Solenoid. Perform TRANSMISSION DTC VERIFICATION TEST.	All
6	Turn the ignition off. Remove the Vehicle Speed Sensor. **Note: Check connectors - Clean/repair as necessary.** Look for any damage and for proper Speedo location. Check for standard front wheels. Were any problems found? Yes → Repair as necessary. Perform TRANSMISSION DTC VERIFICATION TEST. No → Go To 7	All
7	Turn the ignition off. At the COOLER IN port, install a 0 to 2070 KPa (300 PSI) gauge using a ″T″. Ensure the gauge hose is long enough to reach in driver's side of vehicle so gauge can be monitored while driving. Road test vehicle. Gear select in drive. While monitoring DRB, achieve 80 km/h (50 MPH). Note: The gauge will read around 103 KPa (15 PSI) until lockup is achieved in 3rd gear. If the TCC Solenoid is operating properly, the gauge pressure will jump when lockup is achieved. Did gauge pressure jump? Yes → Go To 8 No → Refer to pertinent Service Information for proper service procedure on Torque Converter Assembly or stuck TCC Solenoid and repair as necessary. Perform TRANSMISSION DTC VERIFICATION TEST.	All

P0740-TORQ CONV CLU, NO RPM DROP AT LOCKUP — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. At the COOLER IN port, install a 0 to 2070 KPa (300 PSI) gauge using a ″T″. Ensure the gauge hose is long enough to reach in driver's side of vehicle so gauge can be monitored while driving. Road test vehicle. Gear select in drive. While monitoring DRB, achieve 80 km/h (50 MPH). Note: The gauge will read around 103 KPa (15 PSI) until lockup is achieved in 3rd gear. If the TCC Solenoid is operating properly, the gauge pressure will jump when lockup is achieved. Maintain 80 km/h (50 MPH) per DRB. Wait 10 seconds in lockup. Record engine RPM. Was engine RPM 2200 RPM + /- 50 RPM? Yes → Test Complete. No → Problem appears to be in the Differential, Output Shaft, or Gear Box. See pertinent Service Information. Perform TRANSMISSION DTC VERIFICATION TEST.	All
9	At this time, the conditions required to set the DTC are not present. **Note: Use the Freeze Frame Data to help duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as, VSS, MAP, ECT, and Load.** **Note: Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.** **Note: Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **Note: Refer to any technical service bulletins that may apply.** Were any problems found? Yes → Repair as necessary in accordance with the Service Information. Perform TRANSMISSION DTC VERIFICATION TEST. No → Test Complete.	All

Symptom:
P0740-TORQUE CONVERTER CLUTCH CONTROL CIRCUIT

When Monitored and Set Condition:

P0740-TORQUE CONVERTER CLUTCH CONTROL CIRCUIT

When Monitored: During Electronically Modulated Converter Clutch (EMCC) Operation.

Set Condition: A) Transmission must be in EMCC, with input speed > than 1750 RPM. TCC/L-R sol achieves the maximum duty cycle & can't pull engine RPM within 60 RPM of input speed. B) Transmissions is in FEMCC & engine slips TCC > than 100 RPM for 10 seconds.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
INTERMITTENT OPERATION
INCORRECT FLUID LEVEL
INTERNAL TRANSMISSION PROBLEM - TCC OUT OF RANGE

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's Is DTC P-0750 and or P-1784 present also? Yes → Refer to symptom list for problems related to DTC P-0750 and/or P-1784. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0740-TORQUE CONVERTER CLUTCH CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Ignition on, engine not running. With the DRB, Read and record Transmission DTC's. After recording DTC's, erase DTC's. Drive the vehicle until it is fully warmed up. (At least 110 degrees) Perform the following step 3 times. Drive the vehicle at 50 MPH and allow 4th gear to engage for at least 10 seconds. Close the throttle, then tip back in until the throttle angle is between 25 and 29 degrees. Note that if you go over 30 degrees, you must back off of the throttle and retry. Did the TCC engage during any of the attempts? Yes → Go To 4 No → Go To 5	All
4	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Ask the customer if the problem is only experienced under extreme hot or cold conditions. Were any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	The transmission must be hot to accurately check the oil level. Check the transmission fluid level per the service instructions. Is the fluid level OK? Yes → Go To 6 No → Adjust fluid level. Repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	If there are no possible causes remaining, repair the transmission. Inspect the Valve Body per service manual instructions and replace if necessary. If no problems are found in the Valve Body, replace the Solenoid/Presssure switch assembly. Replace the Torque Converter in either case. View repair options. Repair Repair internal transmission problem as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

P0743-TORQUE CONVERTER CLUTCH SOLENOID/TRANS RELAY CIRCUITS

When Monitored and Set Condition:

P0743-TORQUE CONVERTER CLUTCH SOLENOID/TRANS RELAY CIRCUITS

When Monitored: Continuously with the key on.

Set Condition: An open or shorted condition is detected in the torque converter clutch solenoid control circuit.

POSSIBLE CAUSES
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
INTERMITTENT TORQUE CONVERTER CLUTCH SOLENOID
TCC SOLENOID CONTROL CIRCUIT OPEN
TCC SOLENOID CONTROL CIRCUIT SHORT TO GROUND
TORQUE CONVERTER CLUTCH SOLENOID
POWERTRAIN CONTROL MODULE (TCC SOLENOID CONTROL CIRCUIT)

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, read PCM DTCs. Is the Good Trip counter for P-0743 displayed and equal to 0? Yes → Go To 2 No → Go To 7	All
2	Turn the ignition off. Disconnect the TCC Solenoid harness connector. **Note: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Fused Ignition Switch Output circuit in the TCC Solenoid harness connector. Is the voltage above 10.0 volts? Yes → Go To 3 No → Repair the Fused Ignition Switch Output circuit for an open. Perform TRANSMISSION DTC VERIFICATION TEST.	All

P0743-TORQUE CONVERTER CLUTCH SOLENOID/TRANS RELAY CIRCUITS — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the TCC Solenoid harness connector. Disconnect the PCM harness connectors. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TCC Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the TCC Solenoid Control circuit for an open. Perform TRANSMISSION DTC VERIFICATION TEST.	All
4	Turn the ignition off. Disconnect the TCC Solenoid harness connector. **Note: Check connectors - Clean/repair as necessary.** Turn the ignition on. Using the DRB, actuate the TCC Solenoid. Using a 12 Volt Test Light, check for voltage between the TCC Solenoid harness connector cavities. Does the test light cycle on and off? Yes → Replace the TCC Solenoid. Perform TRANSMISSION DTC VERIFICATION TEST. No → Go To 5	All
5	Turn the ignition off. Disconnect the TCC Solenoid harness connector. Disconnect the PCM harness connectors. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the TCC Solenoid Control circuit. Is the resistance above 100k ohms? Yes → Go To 6 No → Repair the TCC Solenoid Control circuit for a short to ground. Perform TRANSMISSION DTC VERIFICATION TEST.	All
6	If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module. Perform TRANSMISSION DTC VERIFICATION TEST.	All
7	At this time, the conditions required to set the DTC are not present. **Note: Use the Freeze Frame Data to help duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as, VSS, MAP, ECT, and Load.** **Note: Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.** **Note: Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **Note: Refer to any technical service bulletins that may apply.** Were any problems found? Yes → Repair as necessary in accordance with the Service Information. Perform TRANSMISSION DTC VERIFICATION TEST. No → Test Complete.	All

Symptom:
P0750-LR SOLENOID CIRCUIT

When Monitored and Set Condition:

P0750-LR SOLENOID CIRCUIT

When Monitored: Initially at power-up, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio or pressure switch error is detected.

Set Condition: Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
INTERMITTENT WIRING & CONNECTORS CONDITIONS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
L/R SOLENOID CONTROL CIRCUIT OPEN
L/R SOLENOID CONTROL CIRCUIT SHORT TO GROUND
L/R SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE
L/R SOLENOID INOPERATIVE
TCM - L/R SOLENOID CIRCUIT

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's Are any Transmission Control Relay related DTC's present? (P-1765, 1767, or 1768) Yes → Refer to symptom list and perform the appropriate test for Trans Relay related DTC's. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0750-LR SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter for P-0750 set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Watch the L/R solenoid LED on the simulator while actuating the L/R solenoid with the DRBIII®. Did the L/R Solenoid LED on the simulator blink on and off during actuation? Yes → Go To 5 No → Go To 6	All
5	View repair options. Repair Replace the Transmission Solenoid/Pressure switch assembly . Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 7 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. Measure the resistance of the L/R Solenoid Control circuit from the TCM connector to the solenoid/pressure switch assembly connector. Is the resistance above 5.0 ohms? Yes → Repair the open L/R Solenoid Control circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

P0750-LR SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. Measure the resistance between the L/R Solenoid Control circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair L/R Solenoid Control circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the L/R Solenoid Control circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → RepairL/R Solenoid Control circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0755-2-4 SOLENOID CIRCUIT

When Monitored and Set Condition:

P0755-2-4 SOLENOID CIRCUIT

When Monitored: Initially at power-up, then every 10 seconds thereafter. They will also be tested immediately after a gear ratio or pressure switch error is detected.

Set Condition: Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
INTERMITTENT WIRING & CONNECTORS CONDITIONS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
2-4 SOLENOID CONTROL CIRCUIT OPEN
2-4 SOLENOID CONTROL CIRCUIT SHORT TO GROUND
2-4 SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE
2-4 SOLENOID INOPERATIVE
TCM (2-4 SOLENOID CIRCUIT)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's Are any Transmission Control Relay related DTC's present? (P-1765, 1767, or 1768) Yes → Refer to symptom list and perform the appropriate test for Trans Relay related DTC's. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0755-2-4 SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter for P-0755 set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Watch the solenoid LED on the simulator while actuating the 2-4 solenoid with the DRBIII®. Did the 2-4 Solenoid LED on the simulator blink on and off during actuation? Yes → Go To 5 No → Go To 6	All
5	View repair options. Repair Replace the Transmission Solenoid/Pressure switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 7 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 2-4 Solenoid Control circuit from the TCM connector to the Solenoid/Pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open 2-4 Solenoid Control circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

P0755-2-4 SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the 2-4 Solenoid Control circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair 2-4 Solenoid Control circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the 2-4 Solenoid Control circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair 2-4 Solenoid Control circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0760-OD SOLENOID CIRCUIT

When Monitored and Set Condition:

P0760-OD SOLENOID CIRCUIT

When Monitored: Initially at power-up, then every 10 seconds thereafter. They will also be tested immediately after a gear ratio or pressure switch error is detected.

Set Condition: Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
INTERMITTENT WIRING & CONNECTORS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
OD SOLENOID CONTROL CIRCUIT OPEN
OD SOLENOID CONTROL CIRCUIT SHORT TO GROUND
OD SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE
OD SOLENOID INOPERATIVE
TCM (O/D SOLENOID CIRCUIT)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's Are any Transmission Control Relay related DTC's present? (P-1765, 1767, or 1768) Yes → Refer to symptom list and perform the appropriate test for Trans Relay related DTC's. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0760-OD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter for P-0760 set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Watch the OD solenoid LED on the simulator while actuating the OD solenoid with the DRBIII. Did the OD Solenoid LED on the simulator blink on and off during actuation? Yes → Go To 5 No → Go To 6	All
5	View repair options. Repair Replace theTransmission Solenoid/Pressure switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 7 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the OD Solenoid Control circuit from the TCM connector to the Transmission Solenoid/Pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open OD Solenoid Control circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

P0760-OD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the OD Solenoid circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair OD Solenoid Control circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the OD Solenoid Control circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair OD Solenoid Control circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0765-UD SOLENOID CIRCUIT

When Monitored and Set Condition:

P0765-UD SOLENOID CIRCUIT

When Monitored: Initially at power-up, then every 10 seconds thereafter. They will also be tested immediately after a gear ratio or pressure switch error is detected.

Set Condition: Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
INTERMITTENT WIRING & CONNECTORS CONDITIONS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
UD SOLENOID CONTROL CIRCUIT OPEN
UD SOLENOID CONTROL CIRCUIT SHORT TO GROUND
UD SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE
UD SOLENOID INOPERATIVE
TCM (UD SOLENOID CIRCUIT)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's Are any Transmission Control Relay related DTC's present? (P-1765, 1767, or 1768) Yes → Refer to symptom list and perform the appropriate test for Trans Relay related DTC's. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0765-UD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter for P-0765 set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Watch the UD solenoid LED on the simulator while actuating theUD solenoid with the DRBIII. Did the UD Solenoid LED on the simulator blink on and off? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, replace the Transmission Solenoid/Pressure switch assembly. View repair options. Repair Replace Transmission Solenoid/Pressure switch assembly as required. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 7 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0765-UD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the UD solenoid control circuit from the TCM connector to the transmission solenoid/pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open UD Solenoid Control circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the UD Solenoid Control circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair UD Solenoid Control circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. **Note: Check connectors - Clean/repair as necessary.** Measure the voltage of the UD Solenoid Control circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair UD Solenoid Control circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0833-CLUTCH RELEASED SWITCH CIRCUIT

When Monitored and Set Condition:

P0833-CLUTCH RELEASED SWITCH CIRCUIT

When Monitored: During crank or when engine speed is between 1500-2880 RPM and vehicle speed is greater than 40 km/h (25 MPH).

Set Condition: A short to ground is detected during startup. An open circuit is detected when engine speed is between 1500-2880 RPM, vehicle speed is >40 km/h (25 MPH), and delta throttle is >1.1 volts for 4 seconds. This cycle must repeat 5 times per trip for 2 trips.

POSSIBLE CAUSES
WIRING HARNESS INTERMITTENT
GROUND CIRCUIT OPEN
CLUTCH INTERLOCK/UPSTOP SWITCH
CLUTCH UPSTOP SIGNAL CIRCUIT OPEN
CLUTCH UPSTOP SIGNAL SHORTED TO GROUND
POWERTRAIN CONTROL MODULE (UPSTOP SWITCH)

TEST	ACTION	APPLICABILITY
1	Using the DRB, monitor the Clutch Upstop Switch status in Input/Outputs. Depress the Clutch Pedal completely to the floor and release all the way up several times. Did the Clutch Upstop Switch state change from Closed when released to Open when fully depressed? Yes → Go To 2 No → Go To 3	5SPD MANUAL TRANS
2	Turn the ignition off. **NOTE: Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.** **NOTE: Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **NOTE: Refer to any Technical Service Bulletins (TSB) that may apply.** Were any problems found? Yes → Repair wiring harness/connectors as necessary. Perform TRANSMISSION DTC VERIFICATION TEST. No → Test Complete.	5SPD MANUAL TRANS

P0833-CLUTCH RELEASED SWITCH CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Clutch Interlock/Upstop Switch harness connector. Using a 12-volt Test Light connected to 12-volts, check the Clutch Interlock/Upstop Switch Ground circuit. Did the test light illuminate brightly? Yes → Go To 4 No → Repair the Clutch Interlock/Upstop Switch Ground circuit for an open or high resistance. Perform TRANSMISSION DTC VERIFICATION TEST.	5SPD MANUAL TRANS
4	Turn the ignition off. Disconnect the Clutch Interlock/Upstop Switch harness connector. Disconnect the PCM harness connectors. Measure the resistance of the Clutch Upstop Signal circuit. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open Clutch Upstop Signal Circuit. Perform TRANSMISSION DTC VERIFICATION TEST.	5SPD MANUAL TRANS
5	Turn the ignition off. Disconnect the Clutch Interlock/Upstop Switch harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the Clutch Upstop Switch Signal circuit. Is the resistance above 100k ohms? Yes → Go To 6 No → Repair the Clutch Upstop Switch Signal circuit for a short to ground. Perform TRANSMISSION DTC VERIFICATION TEST.	5SPD MANUAL TRANS
6	Disconnect the Clutch Interlock/Upstop Switch harness connector. Connect a jumper wire between the Clutch Interlock/Upstop Switch Ground circuit and the Clutch Upstop Switch Signal circuit in the Clutch Interlock/Upstop Switch harness connector. Using the DRB, monitor the Clutch Upstop Switch status in Input/Outputs. Did the Clutch Upstop Switch status change from Open (jumper disconnected) to Closed? Yes → Replace the Clutch Interlock/Upstop Switch. Perform TRANSMISSION DTC VERIFICATION TEST. No → Go To 7	5SPD MANUAL TRANS
7	If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module. Perform TRANSMISSION DTC VERIFICATION TEST.	5SPD MANUAL TRANS

Symptom:
P1714-LOW BATTERY VOLTAGE

When Monitored and Set Condition:

P1714-LOW BATTERY VOLTAGE

When Monitored: With the engine running and the TCM has closed the Transmission Control Relay.

Set Condition: If battery voltage at TCM Transmission Control Relay Output sense circuits is less than 10 volts for 15 seconds. *P-1714 generally indicates a gradually falling battery voltage or resistive connections to the TCM.

POSSIBLE CAUSES
RELATED CHARGING SYSTEM CODES
INTERMITTENT WIRING & CONNECTORS CONDITIONS
FUSED IGNITION SWITCH OUTPUT (RUN/ST) CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT (START) CIRCUIT OPEN
GROUND CIRCUIT OPEN
FUSED B(+) CIRCUIT TO TCM HIGH RESISTANCE
TRANS CONTROL RELAY OUTPUT TO TCM HIGH RESISTANCE
REPLACE THE TCM

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1714-LOW BATTERY VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read the PCM DTC's. Are any Charging System related DTC's stored in the PCM? Yes → Refer to the Charging System category and repair any PCM charging DTC's, before testing DTC P-1714. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read Transmission DTC's. With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last DTC set.** Is the starts since set counter 0? Yes → Go To 4 No → Go To 10	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Connect the ground clip of a test light to a known good ground. Probe the Fused Ignition Switch Output circuit in the TCM connector with the test light. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 5 No → Repair cause of not lit or dim test light in Fused Ignition Switch Output (Run/St) circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the starter relay from the PDC. Connect the ground clip of a test light to a known good ground. Probe the Fused Ignition Switch Output(Start) circuit in the TCM connector with the test light. Turn the ignition switch to the start position. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 6 No → Repair cause of unlit or dim test light in Fused Ignition Switch Output (Start) circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. **Note: Reinstall the Starter Relay.**	All

P1714-LOW BATTERY VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
6	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Connect the ground clip of a test light to a known good 12 volt source on the vehicle such as the positive battery post. Probe all ground circuit(s) in the TCM connector with the test light. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly at all ground circuits? Yes → Go To 7 No → Repair the Ground circuit(s) as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Connect the ground clip of a test light to a known good ground. Connect the other end to the Fused B(+) circuit in the TCM connector. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 8 No → Repair Fused B(+) Circuit wiring and / or connectors. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Connect the ground clip of a test light to a known good ground. Probe both Trans Control Relay Output circuits (pin 16 and 17) in the TCM connector with the other end of the test light. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 9 No → Repair Trans control relay ouput circuit wiring and / or connectors. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
9	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1714-LOW BATTERY VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
10	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring, connector and/or charging system as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1716-BUS COMMUNICATION WITH PCM

When Monitored and Set Condition:

P1716-BUS COMMUNICATION WITH PCM

When Monitored: Continuously with ignition key on.

Set Condition: If no bus messages are received from the Powertrain Control Module (PCM) for 10 seconds.

POSSIBLE CAUSES
NO COMMUNICATION WITH PCM
OTHER BUS PROBLEMS PRESENT
INTERMITTENT WIRING & CONNECTORS CONDITIONS
TCM ERROR (BUS PROBLEM)

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter equal to zero? Yes → Go To 2 No → Go To 5	All
2	Ignition on, engine not running. With the DRBIII®, attempt to communicate with the Powertrain Control Module (PCM). Can the DRBIII® communicate with the PCM? Yes → Go To 3 No → Refer to symptom list for problems related to No Response From PCM Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	With the DRBIII®, check all of the other modules on the vehicle for evidence of a vehicle bus problem. Bus related DTC's in other modules point to an overall vehicle bus problem. Other symptoms such as a customer complaint of intermittent operation of bus controlled features also indicate a bus problem. Does the PRNDL display indicate ″No Bus″ or is there any evidence of an overall vehicle bus problem? Yes → Refer to the Communications category for the related symptom(s). Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All

P1716-BUS COMMUNICATION WITH PCM — Continued

TEST	ACTION	APPLICABILITY
4	Ignition on, engine not running. With the DRBIII®, erase TCM DTC's. Start the engine in park. With the DRBIII®, read Transmission DTC's. Did code P-1716 return? Yes → Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
5	With the DRBIII®, check all of the other modules on the vehicle for evidence of a vehicle bus problem. Bus related DTC's in other modules point to an overall vehicle bus problem. Other symptoms such as a customer complaint of intermittent operation of bus controlled features also indicate a bus problem. Does the PRNDL display indicate ″No Bus″ or is there any evidence of an overall vehicle bus problem? Yes → Refer to the Communications category for the related symptom(s). Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1717-NO COMMUNICATION WITH THE MIC

When Monitored and Set Condition:

P1717-NO COMMUNICATION WITH THE MIC

When Monitored: Continuously with engine running.

Set Condition: The code sets in approximately 25 seconds if no BUS messages are received form the MIC.

POSSIBLE CAUSES
OTHER BUS PROBLEMS PRESENT
INTERMITTENT WIRING & CONNECTORS CONDITIONS
MIC (NO COMMUNCATION)
TCM (BUS CIRCUIT)

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter equal to zero? Yes → Go To 2 No → Go To 5	All
2	With the DRBIII®, check all of the other modules on the vehicle for evidence of a vehicle bus problem. Bus related DTC's in other modules point to an overall vehicle bus problem. Other symptoms such as a customer complaint of intermittent operation of bus controlled features also indicate a bus problem. Does the PRNDL display indicate ″No Bus″ or is there any evidence of an overall vehicle bus problem? Yes → Refer to the Communications category for the related symptom(s). Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, clear all DTC's. Start the engine in park. With the DRBIII®, read the MIC DTC's. Can the DRBIII® communicate with the MIC? Yes → Go To 4 No → Refer to the symptom category Communications for no response to MIC. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1717-NO COMMUNICATION WITH THE MIC — Continued

TEST	ACTION	APPLICABILITY
4	Ignition on, engine not running. With the DRBIII®, erase TCM DTC's. Start the engine in park. With the DRBIII®, read Transmission DTC's. Is the No Communication with the MIC DTC P-1717 present? Yes → Replace the TCM Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1738-HIGH TEMPERATURE OPERATION ACTIVATED

When Monitored and Set Condition:

P1738-HIGH TEMPERATURE OPERATION ACTIVATED

When Monitored: Whenever the engine is running.

Set Condition: Immediately when the Overheat shift schedule is activated (240 degrees trans oil temp).

POSSIBLE CAUSES
ENGINE COOLING SYSTEM MALFUNCTION
INCORRECT FLUID LEVEL
TRANSMISSION OIL COOLER PLUGGED
HIGH TEMPERATURE OPERATIONS ACTIVATED

TEST	ACTION	APPLICABILITY
1	Perform engine cooling system diagnostics per service instructions. Is the engine cooling system functioning properly? Yes → Go To 2 No → Repair cause of engine overheating. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
2	The transmission must be above 70 degree F. prior to checking fluid level. Adjusting fluid level on a cold transmission will result in an overfilled transmission. Check the transmission fluid level per the service information. Is the fluid level OK? Yes → Go To 3 No → Adjust fluid level. Repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	Perform cooler flow check per service manual information. Did the cooler flow test pass? Yes → Go To 4 No → Repair cause of plugged transmission oil cooler. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1738-HIGH TEMPERATURE OPERATION ACTIVATED — Continued

TEST	ACTION	APPLICABILITY
4	This DTC is an informational DTC designed to aid the Technician in diagnosing shift quality complaints. This DTC indicates that the transmission has been operating in the ″Overheat″ shift schedule which may generate a customer complaint. The customer driving patterns may indicate the need for an additional transmission oil cooler. View repair options.. Repair Repair cause of transmission overheating. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1739-POWER UP AT SPEED

When Monitored and Set Condition:

P1739-POWER UP AT SPEED

When Monitored: When TCM (Transmission Control Module) initially powers-up.

Set Condition: If the TCM powers up and senses a valid forward gear PRNDL code and the output RPM is above 800 RPM (approx. 20 MPH) the DTC will be set.

POSSIBLE CAUSES
POWER UP AT SPEED

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	This DTC is set when the TCM is initialized while the vehicle is moving down the road in a valid forward gear. Check all of the Fused B(+), Fused ignition switch output, and ground circuits to the TCM for an intermittent open or short to ground. View repair options. Repair Repair wiring and/or connectors as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1765-SWITCHED BATTERY

When Monitored and Set Condition:

P1765-SWITCHED BATTERY

When Monitored: Ignition key is turned from ″off″ position to ″run″ position and/or ignition key is turned from ″crank″ position to ″run″ position.

Set Condition: This code is set if the Transmission Control Module (TCM) senses voltage on any of the pressure switch inputs prior to the TCM energizing the relay.

POSSIBLE CAUSES
INTERMITTENT WIRING & CONNECTORS CONDITIONS
2-4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
TCM ERROR P-1765

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last DTC set.** Is the ″Starts Since Set″ counter equal to zero? Yes → Go To 3 No → Go To 7	All

P1765-SWITCHED BATTERY — Continued

TEST	ACTION	APPLICABILITY
3	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the 2-4 Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair 2-4 Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the L/R Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair L/R Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the OD Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair OD Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1767-TRANSMISSION RELAY ALWAYS ON

When Monitored and Set Condition:

P1767-TRANSMISSION RELAY ALWAYS ON

When Monitored: When ignition key is turned from ″off″ position to ″run″ position and/or ignition key is turned from ″crank″ position to ″run″ position.

Set Condition: This code is set if the Transmission Control Module (TCM) senses greater than 3 volts at the Trans Control Relay Output terminal(s) of the TCM prior to the TCM energizing the relay.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS CONDITIONS
TRANSMISSION CONTROL RELAY STUCK CLOSED
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT SHORT TO VOLTAGE
TRANSMISSION RELAY CONTROL CIRCUIT SHORT TO VOLTAGE
TCM ERROR - P1767

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter equal to 0? Yes → Go To 3 No → Go To 7	All

P1767-TRANSMISSION RELAY ALWAYS ON — Continued

TEST	ACTION	APPLICABILITY
3	Turn ignition off to the lock position. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Fused B(+) circuit and the Transmission Control Relay Output Circuit in the relay. (Pins 30 and 87) Is the resistance above 5.0 ohms? Yes → Go To 4 No → Replace the Transmission Control Relay Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn ignition off to the lock position. Remove the Transmission Control Relay from the PDC. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Measure the voltage at the Transmission Control Relay Output circuit in the relay PDC connector. Is the voltage above 3.0 volts? Yes → Repair the Transmission Control Relay Output circuit shorted to voltage Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn ignition off to the lock position. Remove the Transmission Control Relay from the PDC. Ignition on, engine not running. **Note: Check connectors - Clean/repair as necessary.** Measure the voltage at the Transmission Relay Control circuit in the relay PDC connector. Is the voltage above 3.0 volts? Yes → Repair Transmission Relay Control Circuit shorted to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

P1768-RELAY OUTPUT ALWAYS OFF

When Monitored and Set Condition:

P1768-RELAY OUTPUT ALWAYS OFF

When Monitored: Continuously

Set Condition: This code is set when less than 3 volts are present at the transmission control relay output (pins 16,17 and 36) circuits at the Transmission Control Module (TCM) when the TCM is energizing the relay.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS CONDITIONS
FUSED B(+) CIRCUIT OPEN
GROUND CIRCUIT OPEN
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
TRANSMISSION RELAY CONTROL CIRCUIT OPEN
TRANSMISSION CONTROL RELAY STUCK OPEN
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT SHORTED TO GROUND
TRANSMISSION RELAY CONTROL CIRCUIT SHORTED TO GROUND
TCM ERROR - P1768

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1768-RELAY OUTPUT ALWAYS OFF — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter equal to 0? Yes → Go To 3 No → Go To 11	All
3	Turn ignition off to the lock position. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Measure the voltage at the Fused B(+) circuit in the relay connector. Is the voltage below 10.0 volts? Yes → Repair the open Fused B(+) circuit Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn ignition off to the lock position. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Ground circuit in the relay connector and ground. Is the resistance above 5.0 ohms? Yes → Repair the open Ground circuit Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Transmission Control Relay Output circuits between the relay and the TCM connector. Measure at all three TCM terminals. Is the resistance above 5.0 ohms on any circuit? Yes → Repair the open Transmission Control Relay Output circuit Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn ignition off to the lock position. Remove the Transmission Control Relay from the PDC. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Transmission Relay Control circuit between the relay and the TCM connector. Is the resistance above 5.0 ohms? Yes → Repair the open Transmission Relay Control circuit Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P1768-RELAY OUTPUT ALWAYS OFF — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Transmission Control Relay Output circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair the Transmission Relay Output shorted to ground Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Transmission Relay Control circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair the Transmission Relay Control shorted to ground Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) circuit and the Transmission Control Relay Output circuit in the relay connector. Measure the voltage of the Transmission Control Relay Output circuit in the TCM connector. Is the voltage above 10.0 volts? Yes → Replace the Transmission Control Relay Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION

When Monitored and Set Condition:

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION

When Monitored: During an attempted shift into 1st gear.

Set Condition: This code is set if three unsuccessful attempts are made to get into 1st gear in one given key start.

POSSIBLE CAUSES
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
INCORRECT FLUID LEVEL
RELATED DTC P-1784 PRESENT
INTERMITTENT OPERATION
L/R PRESSURE SWITCH SENSE CIRCUIT OPEN
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
L/R PRESSURE SWITCH CIRCUIT SHORT TO GROUND
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
INTERNAL TRANSMISSION PROBLEM - SSV STUCK
TCM (L-R PRESSURE SWITCH)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check for other transmission DTC's Is P-code 1784 Present also? Yes → Refer to symptom list and perform test for DTC P-1784. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Perform a visual inspection of all connectors, wiring, and cooler connections before proceeding. Repair as necessary. With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last code set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 13	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Using the Transmission Simulator, set the pressure switch selector knob to the L/R position. While observing the LR pressure switch state with the DRBIII®, depress the Pressure Switch Test button. Did the pressure switch state on the DRB change from open to closed when the switch was depressed? Yes → Go To 5 No → Go To 7	All
5	The transmission must be above 70 degree F. prior to checking fluid level. Adjusting fluid level on a cold transmission will result in an overfilled transmission. Check the transmission fluid level per the service information. Is the fluid level OK? Yes → Go To 6 No → Adjust fluid level. Repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	The transmission has an internal problem and must be repaired. Inspect the Solenoid Switch Valve per service manual instructions and repair or replace as necessary. If no problems are found, replace the transmission solenoid/ pressure sw assembly. View repair options. Repair Repair internal transmission problem as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the L/R Pressure Switch Sense circuit from the TCM connector to the transmission solenoid/pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open L/R Pressure Switch Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Transmission Control Relay Output circuits between the relay and the TCM connector. Measure at all three TCM terminals. Is the resistance above 5.0 ohms on any circuit? Yes → Repair the open Transmission Control Relay Output circuit Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the L/R Pressure Switch Sense circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair L/R Pressure Switch circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the L/R Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair L/R Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION — Continued

TEST	ACTION	APPLICABILITY
11	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 12 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
12	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
13	The conditions necessary to set this DTC are not present at this time. Ask the customer if they have experienced 2nd gear launches and/or no TCC engagement. If the answer is ″No″ erase the code and return the vehicle to the customer. Has the customer experienced any 2nd gear launches or no TCC engagement? Yes → Inspect the valve body for signs of a stuck valve or other problem in the SSV area. If no problems are found, replace the Solenoid/ Pressure switch assy. If excessive debris is present in the pan or valve body, repair cuase of debris as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION

When Monitored and Set Condition:

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION

When Monitored: Continuously when doing partial or full EMCC (PEMCC or FEMCC).

Set Condition: If the transmission senses the L-R pressure switch closing while performing PEMCC or FEMCC. This code will be set after two unsuccessful attempts to perform PEMCC or FEMCC.

POSSIBLE CAUSES
INCORRECT FLUID LEVEL
RELATED DTC P-1784 PRESENT
INTERMITTENT OPERATION
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT OPEN
L/R PRESSURE SWITCH CIRCUIT SHORT TO GROUND
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
INTERNAL TRANSMISSION PROBLEM - SSV STUCK
TCM (P-1776)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check for other transmission DTC's Is P-code 1784 Present also? Yes → Refer to symptom list and perform test for DTC P-1784. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Perform a visual inspection of all connectors, wiring, and cooler connections before proceeding. Repair as necessary. With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last code set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 12	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Using the Transmission Simulator, set the pressure switch selector knob to the L/R position. While observing the L/R pressure switch state with the DRBIII®, depress the Pressure Switch Test button. Did the pressure switch state on the DRB change from open to closed when the switch was depressed? Yes → Go To 5 No → Go To 7	All
5	The transmission must be above 70 degree F. prior to checking fluid level. Adjusting fluid level on a cold transmission will result in an overfilled transmission. Check the transmission fluid level per the service information. Is the fluid level OK? Yes → Go To 6 No → Adjust fluid level. Repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	The transmission has an internal problem and must be repaired. If the trans is to be repaired, inspect the Solenoid Switch Valve in the valve body per the service manual instructions and repair or replace as necessary. If no problems are found in valve body, replace the transmission solenoid/pressure sw assembly. **Note: The Solenoid Switch Valve should move back and forth freely.** View repair options. Repair Repair internal transmission problem as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 8 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the L/R Pressure Switch Sense circuit from the TCM connector to the transmission solenoid/pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open L/R Pressure Switch Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the L/R Pressure Switch Sense circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair L/R Pressure Switch circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the L/R Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair L/R Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION — Continued

TEST	ACTION	APPLICABILITY
11	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
12	The conditions necessary to set this DTC are not present at this time. Ask the customer if they have experienced 2nd gear launches and/or no TCC engagement. If the answer is ″No″ erase the code and return the vehicle to the customer. Has the customer experienced any 2nd gear launches or no TCC engagement? Yes → Inspect the valve body for signs of a stuck valve or other problem in the SSV area. If no problems are found, replace the Solenoid/ Pressure switch assy. If excessive debris is present in the pan or valve body, repair cuase of debris as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1781-OD PRESSURE SWITCH SENSE CIRCUIT

When Monitored and Set Condition:

P1781-OD PRESSURE SWITCH SENSE CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: The appropriate code is set if one of the pressure switches are open or closed at the wrong time in a given gear.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
INTERMITTENT WIRING & CONNECTORS CONDITIONS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
OD PRESSURE SWITCH SENSE CIRCUIT OPEN
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
PRESSURE SWITCH INOPERATIVE
TCM- (OD PRESSURE SWITCH)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's Are any Transmission Control Relay related DTC's present? (P-1765, 1767, or 1768) Yes → Refer to symptom list and perform the appropriate test for Trans Relay related DTC's. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P1781-OD PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 11	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Place pressure switch selector on OD. Observe the OD Pressure Switch state on the DRBIII®, while pressing pressure switch test button. Did the state of the OD Pressure Switch change while pushing the button? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, replace the Solenoid/Pressure switch assembly. View repair options. Repair Replace Transmission Solenoid/Pressure switch assembly as required. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 7 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1781-OD PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the OD Pressure Switch Sense circuit from the TCM connector to the transmission solenoid/pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open OD Pressure Switch Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the OD Pressure Switch Sense circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair OD Pressure Switch circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the OD Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair OD Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

P1782 - 2-4 PRESSURE SWITCH SENSE CIRCUIT

When Monitored and Set Condition:

P1782 - 2-4 PRESSURE SWITCH SENSE CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: The appropriate code is set if one of the pressure switches are open or closed at the wrong time in a given gear .

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
INTERMITTENT WIRING & CONNECTORS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
2-4 PRESSURE SWITCH SENSE CIRCUIT OPEN
2-4 PRESSURE SWITCH CIRCUIT SHORT TO GROUND
2-4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
PRESSURE SWITCH INOPERATIVE
TCM (2-4 PRESSURE SWITCH SENSE)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission Control module DTC's Are any Transmission Control Relay related DTC's present? (P-1765, 1767, or 1768) Yes → Refer to symptom list and perform the appropriate test for Trans Relay related DTC's. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P1782 - 2-4 PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 15	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Place pressure switch selector on 2/4. Observe the 2/4 Pressure Switch state on the DRBIII®, while pressing pressure switch test button. Did the state of the 2/4 Pressure Switch change while pushing the button? Yes → Go To 5 No → Go To 10	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the 2-4 Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the 2-4 Pressure Switch circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 2-4 Pressure Switch Sense circuit from the TCM connector to the transmission solenoid/pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open 2-4 Pressure Switch Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P1782 - 2-4 PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the 2-4 Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair 2-4 Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 9 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
9	If there are no possible causes remaining, replace the Solenoid/Pressure switch assembly. View repair options. Repair Replace Transmission Solenoid/Pressure switch assembly as required. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1782 - 2-4 PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
10	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 11 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 2-4 Pressure Switch Sense circuit from the TCM connector to the transmission solenoid/pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open 2-4 Pressure Switch Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 12	All
12	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the 2-4 Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the 2-4 Pressure Switch circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 13	All
13	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the 2-4 Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair 2-4 Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 14	All

P1782 - 2-4 PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
14	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
15	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1784-LR PRESSURE SWITCH SENSE CIRCUIT

When Monitored and Set Condition:

P1784-LR PRESSURE SWITCH SENSE CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: The appropriate code is set if one of the pressure switches are open or closed at the wrong time in a given gear .

POSSIBLE CAUSES
LOSS OF PRIME (P-1791) PRESENT
RELATED RELAY DTC'S PRESENT
INTERMITTENT WIRING & CONNECTORS CONDITIONS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT OPEN
L/R PRESSURE SWITCH CIRCUIT SHORT TO GROUND
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
L/R PRESSURE SWITCH
TCM (L-R PRESSURE SWITCH)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check for other Transmission DTC's. Is DTC P-1791 present in addition to the code that you are diagnosing? Yes → Refer to symptom list and perform test for P-1791. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P1784-LR PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, read Transmission Control module DTC's Are any Transmission Control Relay related DTC's present? (P-1765, 1767, or 1768) Yes → Refer to symptom list and perform the appropriate test for Trans Relay related DTC's. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 5 No → Go To 12	All
5	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Place pressure switch selector on L/R and observe DRBIII screen, while pressing pressure switch test button. Did the L/R Pressure Switch change state on the DRBIII® ? Yes → Go To 6 No → Go To 7	All
6	If there are no possible causes remaining, replace the Solenoid/Pressure switch assembly. View repair options Repair Replace the Solenoid/Pressure switch assembly refer to the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 8 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1784-LR PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the L/R Pressure Switch Sense circuit from the TCM connector to the transmission solenoid/pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open L/R Pressure Switch Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the L/R Pressure Switch Sense circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair L/R Pressure Switch circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the L/R Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair L/R Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All
11	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
12	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1787-OD HYDRAULIC PRESSURE TEST FAILURE

When Monitored and Set Condition:

P1787-OD HYDRAULIC PRESSURE TEST FAILURE

When Monitored: In any forward gear with engine speed above 1000 RPM shortly after a shift and every minute thereafter.

Set Condition: After a shift into a forward gear, with engine speed > 1000 RPM, the TCM momentarily turns on element pressure to the clutch ckts that don't have pressure to identify the correct pressure sw closes. If the pressure sw does not close 2 times the code sets

POSSIBLE CAUSES
INCORRECT FLUID LEVEL
LOSS OF PRIME (P-1791) PRESENT
RELATED GEAR RATIO AND/OR PRESSURE SWITCH DTC'SS PRESENT
INTERMITTENT WIRING & CONNECTORS CONDITIONS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
OD PRESSURE SWITCH SENSE CIRCUIT OPEN
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
INTERNAL TRANSMISSION PROBLEM - OD PRESSURE TEST
TCM- (OD PRESSURE SWITCH)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1787-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check for other Transmission DTC's. Is DTC P-1791 present in addition to the code that you are diagnosing? Yes → Refer to symptom list and perform test for P-1791. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read Transmission DTC's. Is a DTC P-0733 and/or P-1781 present also? Yes → Replace the Transmission or Solenoid/Pressure switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Check the transmission fluid level per service instructions. Adjust if necessary. With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 5 No → Go To 13	All
5	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). **Note: Check connectors - Clean/repair as necessary.** Place pressure switch selector on OD and observe DRB screen while pressing pressure switch test button. Wiggle the wires leading to the TCM while pressing the button. Did the OD pressure switch state change to closed and remain closed while wiggling the wires? Yes → Go To 6 No → Go To 8	All
6	The transmission must be above 70 degree F. prior to checking fluid level. Adjusting fluid level on a cold transmission will result in an overfilled transmission. Check the transmission fluid level per the service information. Is the fluid level OK? Yes → Go To 7 No → Adjust fluid level. Repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	If there are no possible causes remaining, repair the transmission. Disassemble and inspect the Valve Body per service instructions and repair or replace as necessary. If no problems are found in the valve body, replace the transmission solenoid/pressure switch assembly. View repair options. Repair Repair internal transmission problem as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1787-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 9 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the OD Pressure Switch Sense circuit from the TCM connector to the transmission solenoid/pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open OD Pressure Switch Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the OD Pressure Switch Sense circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair OD Pressure Switch circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All
11	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the OD Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair OD Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 12	All

P1787-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
12	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
13	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1788-2/4 HYDRAULIC PRESSURE TEST FAILURE

When Monitored and Set Condition:

P1788-2/4 HYDRAULIC PRESSURE TEST FAILURE

When Monitored: In any forward gear with engine speed above 1000 RPM shortly after a shift and every minute thereafter.

Set Condition: After a shift into a forward gear, with engine speed > 1000 RPM, the TCM momentarily turns on element pressure to the clutch ckts that don't have pressure to identify the correct pressure sw closes. If the pressure sw does not close 2 times the code sets.

POSSIBLE CAUSES
INCORRECT FLUID LEVEL
LOSS OF PRIME (P-1791) PRESENT
RELATED GEAR RATIO AND/OR PRESSURE SWITCH DTC'SS PRESENT
INTERMITTENT WIRING & CONNECTORS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
2-4 PRESSURE SWITCH SENSE CIRCUIT OPEN
2-4 PRESSURE SWITCH CIRCUIT SHORT TO GROUND
2-4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
INTERNAL TRANSMISSION PROBLEM - 2-4 PRESSURE TEST
TCM (2-4 PRESSURE SWITCH SENSE)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1788-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check for other Transmission DTC's. Is DTC P-1791 present in addition to the code that you are diagnosing? Yes → Refer to symptom list and perform test for P-1791. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read Transmission DTC's. Is a DTC P-0732, P-0734 and/or P-1782 present also? Yes → Replace the Transmission or Solenoid/Pressure switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Check the transmission fluid level per service instructions. Adjust if necessary. With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 5 No → Go To 13	All
5	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Place pressure switch selector on 2-4. Observe the 2/4 Pressure Switch state on the DRBIII®, while pressing pressure switch test button. Wiggle the wires leading to the TCM while pressing the button. Did the 2-4 pressure switch state change to closed and remain closed while wiggling the wires? Yes → Go To 6 No → Go To 8	All
6	The transmission must be above 70 degree F. prior to checking fluid level. Adjusting fluid level on a cold transmission will result in an overfilled transmission. Check the transmission fluid level per the service information. Is the fluid level OK? Yes → Go To 7 No → Adjust fluid level. Repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	If there are no possible causes remaining, repair the transmission. Disassemble and inspect the Valve Body per service instructions and repair or replace as necessary. If no problems are found in the valve body, replace the transmission solenoid/pressure switch assembly. View repair options. Repair Repair internal transmission problem as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1788-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Connect the ground clip of a test light to a known good ground. Probe the Transmission Relay Output circuit in the Solenoid/PS connector with the test light **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 9 No → Repair cause of unlit or dim test light. (Open circuit or high resistance in Trans Relay Output circuit) Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 2-4 Pressure Switch Sense circuit from the TCM connector to the transmission solenoid/pressure switch connector. Is the resistance above 5.0 ohms? Yes → Repair the open 2-4 Pressure Switch Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the 2-4 Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the 2-4 Pressure Switch circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All
11	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the 2-4 Pressure Switch Sense circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair 2-4 Pressure Switch Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 12	All

P1788-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
12	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
13	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1789-2-4/OD HYDRAULIC PRESSURE TEST FAILURE

When Monitored and Set Condition:

P1789-2-4/OD HYDRAULIC PRESSURE TEST FAILURE

When Monitored: In any forward gear with engine speed above 1000 RPM shortly after a shift and every minute thereafter.

Set Condition: After a shift into a forward gear, with engine speed > 1000 RPM, the TCM momentarily turns on element pressure to the clutch ckts that don't have pressure to identify the correct pressure sw closes. If the pressure sw does not close 2 times the code sets.

POSSIBLE CAUSES
CONDITION P-1789 PRESENT

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	**Note: The vehicle must be driven to set this code, the transmission must be warm or hot with the Engine RPM above 1000 RPM.** This code is an indicator of both a 2-4 and/or O/D hydraulic pressure switch DTC present, (perform both tests P-1787 and P-1788) to determine which switch is failing. View repair options. Repair Refer to symptom list for problems related to Transmission and perform tests for P-1787 and P-1788. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1790-FAULT IMMEDIATELY AFTER SHIFT

When Monitored and Set Condition:

P1790-FAULT IMMEDIATELY AFTER SHIFT

When Monitored: After a speed ratio error is stored.

Set Condition: This code is set if the associated speed ratio code is stored within 1.3 seconds after a shift.

POSSIBLE CAUSES
FAULT AFTER SHIFT

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	This test is set along with a gear ratio DTC. Perform the appropriate test for the Gear Ratio DTC stored. **Note: Check 1 trip failures if there are no gear ratio codes current.** View repair options. Repair Perform appropriate gear ratio DTC test. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1791-LOSS OF PRIME

When Monitored and Set Condition:

P1791-LOSS OF PRIME

When Monitored: If the transmission is slipping in any forward gear and the pressure switches are not indicating pressure, a loss of prime test is run.

Set Condition: If the trans. begins to slip in a forward gear & the press. switch(s) that should be closed are open a loss of prime test begins. Available elements are turned on by the TCM to see if pump prime exists.The code sets if no pressure switches respond.

POSSIBLE CAUSES
INCORRECT FLUID LEVEL
INVALID PRNDL CODE
PLUGGED FILTER
INTERMITTENT OPERATION
REPLACE OIL PUMP

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	Place the gear selector in park Start the engine. The transmission must be at operating temperature prior to checking pressure. A cold trans will give higher readings. Place the transmission in Reverse. With the DRBIII®, observe the transmission pressure switch states. Are any of the pressure switches closed? Yes → Go To 3 No → Go To 4	All

P1791-LOSS OF PRIME — Continued

TEST	ACTION	APPLICABILITY
3	The conditions necessary to set this DTC are not present at this time. Ask the customer if they have experienced delayed engagement or an intermittent ″no Drive″ condition. If the answer is ″No″ erase the code and return the vehicle to the customer. Has the customer experienced any delayed engagement or ″no drive″ conditions? Yes → Go To 4 No → The conditions necessary to set this code are not present at this time. Inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
4	The transmission must be above 70 degree F. prior to checking fluid level. Adjusting fluid level on a cold transmission will result in an overfilled transmission. Check the transmission fluid level per the service information. Is the fluid level OK? Yes → Go To 5 No → Adjust fluid level. Repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Using the DRBIII, perform a shift lever position test. Follow the instructions on the DRB. Did the Shift Lever Position Test pass? Yes → Go To 6 No → Refer to symptom list and perform test for DTC P-0705. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Remove and inspect the transmission oil pan per service manual instructions. Remove and inspect oil filter per service manual instructions. Does the oil pan contain excessive debris and/or is the oil filter plugged? Yes → Repair cause of plugged transmission oil filter. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	View repair options. Repair Replace the Transmission Oil Pump per the service information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1792-BATTERY WAS DISCONNECTED

When Monitored and Set Condition:

P1792-BATTERY WAS DISCONNECTED

When Monitored: Whenever the key is in the Run/Start position.

Set Condition: This code is set whenever Transmission Control Module (TCM) is disconnected from battery power (B+) or ground. It will also be set during the DRBIII® Quick Battery Disconnect procedure.

POSSIBLE CAUSES
BATTERY WAS DISCONNECTED
QUICK LEARN WAS PERFORMED
TCM WAS REPLACED OR DISCONNECTED
INTERMITTENT WIRING & CONNECTORS CONDITIONS
FUSED B(+) CIRCUIT TO TCM OPEN
GROUND CIRCUIT OPEN

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	Turn ignition off to the lock position. Disconnect the TCM harness connector. Measure the voltage of the Fused B(+) circuit in the TCM connector. Is the Voltage below 10 volts? Yes → Go To 3 No → Go To 5	All

P1792-BATTERY WAS DISCONNECTED — Continued

TEST	ACTION	APPLICABILITY
3	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Connect the ground clip of a test light to a known good ground. Connect the other end to the Fused B(+) circuit in the TCM connector. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 4 No → Repair Fused B(+) Circuit wiring and / or connectors. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Connect the ground clip of a test light to a known good 12 volt source on the vehicle such as the positive battery post. Probe all ground circuit(s) in the TCM connector with the test light. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly at all ground circuits? Yes → Test Complete. No → Repair the Ground circuit(s) as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Has the battery been disconnected, lost it's charge, or been replaced recently? Yes → This is the cause of the code. Erase DTC and return vehicle to customer. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Has a quick learn been performed? Yes → This is the cause of the code. Erase DTC and return vehicle to customer. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Has the TCM been replaced or disconnected? Yes → Replacing or disconnecting the TCM will set this DTC. Erase the DTC and return the vehicle to the customer. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

P1792-BATTERY WAS DISCONNECTED — Continued

TEST	ACTION	APPLICABILITY
8	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1793-TRD LINK COMMUNICATION ERROR

When Monitored and Set Condition:

P1793-TRD LINK COMMUNICATION ERROR

When Monitored: The transmission controller pulses the 12 volt TRD signal from the PCM to ground, during torque managed shifts with the throttle angle above 54 degrees. The TRD system is also tested whenever the vehicle is stopped and the engine speed is at idle.

Set Condition: This code is set when the Transmission Control Module (TCM) sends two subsequent torque reduction messages to the Powertrain Control Module (PCM) via the TRD link circuit and does not receive a confirmation from the PCM over the communication bus.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
INTERMITTENT WIRING & CONNECTORS CONDITIONS
TORQUE MANAGEMENT REQUEST SENSE CIRCUIT OPEN
TORQUE MANAGEMENT REQUEST SENSE SHORT TO GROUND
TORQUE MANAGEMENT REQUEST SENSE CIRCUIT SHORT TO VOLTAGE
PCM (TRD LINK)
TCM (TRD LINK)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1793-TRD LINK COMMUNICATION ERROR — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's. Are any of the following codes present also? P-1716, P-0731, P-0732, P-0733, P-0734, P-1736. Yes → If any of these codes are present, disregard the P-1793 DTC and refer to the symptom list for the other DTC'(s). Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last DTC set.** Is the STARTS SINCE SET equal to zero? Yes → Go To 4 No → Go To 9	All
4	Turn ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Torque Management Request Sense circuit from the TCM connector to the PCM connector. Is the resistance above 5.0 ohms? Yes → Repair the open Torque Management Request Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Torque Management Request Sense circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair Torque Management Request Sense circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn ignition off to the lock position. Disconnect the TCM harness connector. Ignition on, engine not running. Measure the voltage of the Torque Management Request Sense circuit in the TCM connector. Is the voltage above 10.5 volts? Yes → Repair Torque Management Request Sense circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P1793-TRD LINK COMMUNICATION ERROR — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Ignition on, engine not running. Measure the voltage of the Torque Management Request Sense circuit in the TCM connector. Is the voltage above 7.0 volts? Yes → Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	If there are no possible causes remaining, replace the PCM. View repair options. Repair Replace the Powertrain Control Module Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
9	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1794-SPEED SENSOR GROUND ERROR

When Monitored and Set Condition:

P1794-SPEED SENSOR GROUND ERROR

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: After a TCM reset in neutral and Input/Output equals a ratio of input to output of 2.50

POSSIBLE CAUSES
INTERMITTENT WIRING & CONNECTORS
SPEED SENSOR GROUND CIRCUIT OPEN
TCM (SPEED SENSOR GROUND)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	Start the engine in park. With the DRBIII®, observe the Input and Output Speed Sensor readings. Is the Output Speed Sensor reading twice the Input Speed Sensor reading? Yes → Go To 4 No → Go To 3	All
3	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All

P1794-SPEED SENSOR GROUND ERROR — Continued

TEST	ACTION	APPLICABILITY
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Using the Transmission Simulator, set the rotary knob to the middle (3000/1250) position. Turn the ″Input/Output″ switch on. With the DRBIII®, observe the input and output speed sensor readings. Does the input speed read 3000 RPM and the Output speed read 1250 RPM (within 50 RPM)? Yes → Test Complete. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Speed Sensor Ground circuit from the TCM connector to the Input Speed Sensor connector. Is the resistance above 5.0 ohms? Yes → Repair the open Speed Sensor Ground circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1796-AUTOSTICK SENSOR CIRCUIT

When Monitored and Set Condition:

P1796-AUTOSTICK SENSOR CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: The transmission shift lever is not in the AutoStick Position and either the Upshift or Downshift switch is closed. This code will also set if both switches are closed at the same time.

POSSIBLE CAUSES
INTERMITTENT WIRING & CONNECTORS
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
GROUND CIRCUIT OPEN
DOWNSHIFT SENSE CIRCUIT OPEN
DOWNSHIFT SENSE CIRCUIT SHORTED TO GROUND
UPSHIFT SENSE CIRCUIT OPEN
UPSHIFT SENSE CIRCUIT SHORTED TO GROUND
AUTOSTICK SWITCH STUCK OPEN OR CLOSED
TCM-AUTOSTICK

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, Check the STARTS SINCE SET counter. **Note: This counter only applies to the last DTC set.** Is the Starts Since Set counter equal to 0? Yes → Go To 2 No → Go To 10	All
2	Turn ignition off to the lock position. Disconnect the AutoStick switch connector. **Note: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of both AutoStick Upshift and Downshift sense circuits. Is the voltage above 10.0 volts on both circuits? Yes → Replace the Autostick Switch. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P1796-AUTOSTICK SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn ignition off to the lock position. Disconnect the AutoStick harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Measure the voltage of the Fused Ignition Switch Output circuit in the AutoStick connector. Is the voltage above 10.0 volts? Yes → Go To 4 No → Repair the open Fused Ignition Switch Output circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn ignition off to the lock position. Disconnect the AutoStick harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Autostick Ground circuit at the AutoStick connector. Is the resistance above 5.0 ohms? Yes → Repair the open Ground circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the AutoStick harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Downshift Sense circuit between the TCM connector and the Autostick connector. Is the resistance above 5.0 ohms? Yes → Repair the open Downshift Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the AutoStick harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Downshift Sense circuit in the TCM connector to ground. Is the resistance below 5.0 ohms? Yes → Repair the Downshift Sense circuit shorted to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P1796-AUTOSTICK SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the AutoStick harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Upshift Sense circuit between the TCM connector and the Autostick connector. Is the resistance above 5.0 ohms? Yes → Repair the open Upshift Sense circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the AutoStick harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Upshift Sense circuit in the TCM connector to ground. Is the resistance below 5.0 ohms? Yes → Repair the Upshift Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Ignition on, engine not running. With the DRBIII® display the AutoStick switch status? Shift into AutoStick Push the shift lever to the right several times to actuate the Upshift switch and then to the left several times to actuate the Downshift switch. Do both Upshift and Downshift switch states toggle? Yes → Test Complete. No → Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
10	Check for low battery voltage or charging system problems. Check TCM power and ground circuits for intermittent shorts or high resistance. Perform the 42LE Transmission Verification Test - Ver 1. The conditions necessary to set this DTC are not present at this time.Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1797-MANUAL SHIFT OVERHEAT

When Monitored and Set Condition:

P1797-MANUAL SHIFT OVERHEAT

When Monitored: Whenever engine is running and transmission is in the AutoStick mode.

Set Condition: If the engine temperature exceeds 255 deg. F or the transmission temperature exceeds 275 deg. F while in AutoStick mode. note: Aggressive driving or driving in low for extended periods of time in AutoStick mode will set this code.

POSSIBLE CAUSES
MANUAL SHIFT OVERHEAT

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	This is an informational code only. Check the engine and transmission cooling system for proper operation. Check the radiator fan operation. Check the Transmission fan operation if equipped. Check the transmission fluid level. Make sure it is not overfilled. **Note: Aggressive driving or driving in low for extended periods of time in AutoStick mode will set this code.** Repair as necessary. Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1798-WORN OUT/BURNT TRANSAXLE FLUID

When Monitored and Set Condition:

P1798-WORN OUT/BURNT TRANSAXLE FLUID

When Monitored: With each transition from full Torque Convertor to partial Torque Convertor engagement for A/C bump prevention.

Set Condition: When vehicle shudder is detected during partial engagement (PEMCC).

POSSIBLE CAUSES
WORN OUT/ BURNT TRANS FLUID

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1798-WORN OUT/BURNT TRANSAXLE FLUID — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. Remove the transmission pan and filter per the service information. Install new filter. Reinstall Oil Pan, and refill with new fluid per the service instructions. **Note: The Transmission Cooler must be flushed before prodceeding.** Start the engine, check and adjust fluid level per service instructions. Allow the engine to idle for 10 minutes, in Park. Turn the ignition off. Drain and refill the transmission oil. Flush the Transmision Cooler again. Start the engine, check and adjust fluid level per service instructions. With the DRBIII®, perform a Battery Disconnect. **Note: This must be done to re enable EMCC during an A/C Clutch engagement.** The vehicle may exhibit intermittent shudder during the first few hundred miles. **Note: The oil will gradually penetrate the TCC friction material and the shudder should disappear.** Erase the code and return the vehicle to the customer. Did the Code reset or does the vehicle still shudder after a few thousand miles? Yes → Replace the Torque Converter. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

P1799-CALCULATED OIL TEMP IN USE

When Monitored and Set Condition:

P1799-CALCULATED OIL TEMP IN USE

When Monitored: Whenever the engine is running. The code is set if any of the following conditions exist for three consecutive key starts: The thermistor voltage is out of range (below 0.70 volts or greater than 4.94 volts)

Set Condition: If continuos erratic thermistor voltage is sensed. The thermistor temperature stays below 80 degree's Fahrenheit for an extended period time.

POSSIBLE CAUSES
INTERMITTENT WIRING & CONNECTORS CONDITIONS
SPEED SENSOR GROUND CIRCUIT OPEN
TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT OPEN
TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO GROUND
SPEED SENSOR GROUND CIRCUIT SHORT TO VOLTAGE
TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
TRANSMISSION TEMPERATURE SENSOR INOPERATIVE
REPLACE TCM HI (TTS)
REPLACE TCM LO (TTS)

TEST	ACTION	APPLICABILITY
1	Check fluid level and condition and adjust as necessary Visually inspect connectors and wiring harness. Repair as necessary. Check for leaks or other visible damage. Repair as necessary. Perform the shift lever position test and adjust the linkage as necessary. Connect a battery charger to the vehicle. Ensure the battery is fully charged. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** If you have a Gear Ratio DTC, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1799-CALCULATED OIL TEMP IN USE — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 3 No → Go To 12	All
3	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. While observing thermistor voltage on the DRBIII, place the Sensor Value rotary knob in all three positions. Compare the DRBIII reading with the numbers on the simulator. Pick one of the following. DRBIII readings always high. Go To 4 DRBIII readings = simulator +/- 0.25 V Go To 9 DRBIII readings always low Go To 10 DRBIII readings erratic. Go To 12	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Speed Sensor Ground circuit from the TCM connector to the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair open Speed Sensor Ground circuit Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Trans Temp Sensor Signal circuit from the TCM connector to the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair the open Transmission Temperature Sensor Signal circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

P1799-CALCULATED OIL TEMP IN USE — Continued

TEST	ACTION	APPLICABILITY
6	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the Speed Sensor Ground circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair Speed Sensor Ground circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B(+) and Transmission Control Relay Output circuits in the Transmission Control Relay connector (In PDC). Ignition on, engine not running. Measure the voltage of the Trans Temp Sensor Signal circuit in the TCM connector. Is the voltage above 8.0 volts? Yes → Repair Trans Temp Sensor Signal circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
9	If the temperature readings are correct with the simulator installed, the problem must be internal. Replace the TRS assembly. View repair options. Repair Replace TRS assembly as required. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
10	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Trans Temp Sensor Signal circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair Transmission Temperature Sensor Signal circuit short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All

P1799-CALCULATED OIL TEMP IN USE — Continued

TEST	ACTION	APPLICABILITY
11	If there are no possible causes remaining, replace the TCM. View repair options. Repair Replace the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
12	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1899-P/N SWITCH STUCK IN PARK OR IN GEAR

When Monitored and Set Condition:

P1899-P/N SWITCH STUCK IN PARK OR IN GEAR

When Monitored: Continuously with the transmission in Park, Neutral, or Drive and NOT in Limp-in mode.

Set Condition: This code will set if the PCM detects an incorrect Park/Neutral switch state for a given mode of vehicle operation.

POSSIBLE CAUSES
INTERMITTENT PARK/NEUTRAL SWITCH
TRANSMISSION RANGE SENSOR
P/N POSITION SWITCH SENSE CIRCUIT OPEN
P/N POSITION SWITCH SENSE CIRCUIT SHORTED TO GROUND
POWERTRAIN CONTROL MODULE (P/N POSITION SWITCH)

TEST	ACTION	APPLICABILITY
1	With the DRB, read PCM DTCs. Is the Good Trip Counter for P-1899 displayed and equal to 0? Yes → Go To 2 No → Go To 7	All
2	Turn the ignition on. With the DRB, read the Park/Neutral Position Switch input state. While moving the gear selector through all gear positions (Park to 1 and back to Park), watch the DRB display. Did the DRB display show P/N and D/R in the correct gear positions? Yes → Test Complete. No → Go To 3	All
3	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the Transmission Range Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the P/N Position Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the P/N Position Switch Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1899-P/N SWITCH STUCK IN PARK OR IN GEAR — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the Transmission Range Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the P/N Position Switch Sense circuit. Is the resistance above 100 kohms? Yes → Go To 5 No → Repair the P/N Position Switch Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn the ignition off. Disconnect the PCM harness connectors. Move the Gear selector through all gear positions, from Park to 1st and back. While moving the gear selector through each gear, measure the resistance between ground and the P/N Position Switch Sense circuit. Did the resistance change from above 10.0 ohms to below 10.0 ohms? Yes → Go To 6 No → Replace the Transmission Range Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	At this time, the conditions required to set the DTC are not present. **NOTE: Use the Freeze Frame Data to help duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as, VSS, MAP, ECT, and Load.** **NOTE: Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.** **NOTE: Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **NOTE: Refer to any technical service bulletins (TSB) that may apply.** Were any problems found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5. No → Test Complete.	All

Symptom:

* TRANSMISSION SIMULATOR 8333 WILL NOT POWER UP

TEST	ACTION	APPLICABILITY
1	**Note: If the transmission simulator tool 8333 will not power up, this is a symptom of the transmission relay being open (such as Limp-in) and/or this also could be a indication of the trans simulator not installed correctly on the vehicle.** **Note: Check the simulator ground cable connection.** Repair these symptoms before having the transmission simulator 8333 repaired. Test Complete.	All

Symptom:

*BACKUP LAMPS COME ON WHILE SHIFTER IS NOT IN REVERSE POSITION

POSSIBLE CAUSES
BACK-UP LAMP SUPPLY CIRCUIT SHORT TO VOLTAGE
TRANSMISSION RANGE SENSOR (BACKUP LIGHTS ALWAYS ON)
TRANSMISSION RANGE SENSOR (INT BU LTS)

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. Firmly apply brakes. Place the shift lever in the position which causes the Backup Lamps to come on at the wrong time. Do the Backup Lamps come while the shifter is not in Reverse? Yes → Go To 2 No → Go To 4	All
2	Ignition on, engine not running. Place the shift lever in the position (not reverse) that causes the Backup Lamps to come on when they should NOT be on. Disconnect the transmission TRS connector. **Note: This will cause a DTC P-0705 and possibly other DTC's to be stored in the TCM. They must be erased before returning the vehicle to the customer.** Did the Backup Lamps go out when the connector was disconnected? Yes → Go To 3 No → Repair Back-up Lamp Supply circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	If there are no possible causes remaining, replace the TRS. View repair options. Repair Replace Transmission Range Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. **Note: Check connectors - Clean/repair as necessary.** Wiggle the wire harness while observing the back-up lamps. Did the backup lamps come on while the wires were being wiggled? Yes → Repair Back-up Lamp Supply circuit short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All

*BACKUP LAMPS COME ON WHILE SHIFTER IS NOT IN REVERSE POSITION — Continued

TEST	ACTION	APPLICABILITY
5	If there are no possible causes remaining, replace the TRS. View repair options. Repair Replace the Transmission Range Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

***BACKUP LAMPS INOPERATIVE**

POSSIBLE CAUSES
OPEN LEFT BACK-UP LAMP BULB
OPEN RIGHT BACK-UP LAMP BULB
INTERMITTENT BACKUP LIGHTS
BACK-UP LAMP GROUND CIRCUIT OPEN
BACK-UP LAMP SUPPLY CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
BACK-UP LAMP SUPPLY CIRCUIT SHORT TO GROUND
TRANSMISSION RANGE SENSOR - NO BACKUP LIGHTS

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. Place foot firmly on brake pedal. Place the shift lever in the reverse position. Do either of the back-up lamps work? Yes → Go To 2 No → Go To 3	All
2	If one backup lamp works, the problem must be in the bulb or the wiring to the one that doesn't work. Check the bulb, Backup Lamp Supply circuit and the Ground circuit to the one that does not work. The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. If the Backup Lamps work now, and the wiring has been carefully inspected, but the customer is reporting Backup Lamp problems, replace the TRS assembly. View repair options. Repair Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	Remove the left Back-up Lamp bulb. Measure the resistance of the Back-up Lamp bulb. Is the resistance above 5.0 ohms? Yes → Replace the Back-up Lamp bulb. No → Go To 4	All
4	Remove the right Back-up Lamp bulb. Measure the resistance of the Back-up Lamp bulb. Is the resistance above 5.0 ohms? Yes → Replace the Back-up Lamp bulb. No → Go To 5	All

*BACKUP LAMPS INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
5	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Install Transmission simulator (Miller tool #8333) and the FWD Adapter Cable kit.(Miller tool #8333-1). Ignition on, engine not running. Press the ″Reverse Light Test″ button on the simulator while observing the back-up lamps. Do either of the back-up lamps come on? Yes → Go To 6 No → Go To 7	All
6	If there are no possible causes remaining, replace the TRS. View repair options. Repair Replace Transmission Range Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Remove the back-up lamp bulb. Connect the ground clip of a test light to a known good 12 volt source on the vehicle such as the positive battery post. Probe the ground circuit in the Back-up Lamp bulb socket with the other end of the test light. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 8 No → Repair the bad ground circuit to the Back-up Lamp bulb socket. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	Turn ignition off to the lock position. Remove the back-up lamp bulb. Disconnect the transmission TRS connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Back-up lamp supply circuit from the lamp socket to the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair the open Back-up lamp supply circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

*BACKUP LAMPS INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
9	Turn ignition off to the lock position. Disconnect the transmission TRS connector. Ignition on, engine not running. Connect the ground clip of a test light to a known good ground. Probe the Fused Ignition Switch Output circuit in the solenoid/TRS connector with the other end of the test light. **Note: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 10 No → Repair the open Fused Ignition Switch Output circuit. Check fuse and replace if necessary. Investigate and repair cause of blown fuse if replaced. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
10	Turn ignition off to the lock position. Remove the back-up lamp bulb. (See TRANSMISSION CONTROL MODULE COMPONENT LOCATION) Disconnect the transmission TRS connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Back-up lamp supply circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair Back-up lamp supply circuit short to ground. Check fuse and replace if necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
*CHECKING PARK/NEUTRAL SWITCH OPERATION

POSSIBLE CAUSES
TRANSMISSION RANGE SENSOR
P/N POSITION SWITCH SENSE CIRCUIT OPEN
P/N POSITION SWITCH SENSE CIRCUIT SHORTED TO GROUND
POWERTRAIN CONTROL MODULE (P/N POSITION SWITCH)

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, read the Park/Neutral Position Switch input state. While moving the gear selector through all gear positions (Park to 1 and back to Park), watch the DRB display. Did the DRB display show P/N and D/R in the correct gear positions? Yes → Test Complete. No → Go To 2	All
2	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the Transmission Range Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the P/N Position Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the P/N Position Switch Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the Transmission Range Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the P/N Position Switch Sense circuit. Is the resistance above 100 kohms? Yes → Go To 4 No → Repair the P/N Position Switch Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the PCM harness connectors. Move the Gear selector through all gear positions, from Park to 1st and back. While moving the gear selector through each gear, measure the resistance between ground and the P/N Position Switch Sense circuit. Did the resistance change from above 10.0 ohms to below 10.0 ohms? Yes → Go To 5 No → Replace the Transmission Range Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

*CHECKING PARK/NEUTRAL SWITCH OPERATION — Continued

TEST	ACTION	APPLICABILITY
5	If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

*INCORRECT TRANSMISSION FLUID LEVEL

POSSIBLE CAUSES
INCORRECT FLUID LEVEL

TEST	ACTION	APPLICABILITY
1	The transmission must be above 70 degree F. prior to checking fluid level. Adjusting fluid level on a cold transmission will result in an overfilled transmission. Check the transmission fluid level per the service information. Is the fluid level OK? Yes → Test Complete. No → Adjust fluid level. Repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

***NO MANUAL AUTOSTICK OPERATION**

POSSIBLE CAUSES
NO AUTOSTICK OPERATION WITH NO DTC'S

TEST	ACTION	APPLICABILITY
1	This is a list of possible causes. Upshift or Downshift Sense circuits open. Damaged connector(s). Damaged terminals. Bad ground at AutoStick switch. No ignition feed to AutoStick switch. Transmission Control Module. View repair options. Repair Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

***NO SPEEDOMETER OPERATION**

POSSIBLE CAUSES
NO SPEEDOMETER

Repair Instructions:

NO SPEEDOMETER

Check the pinion factor setting in the TCM.

Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.

Symptom:
*TRANSMISSION NOISY WITH NO DTC'S PRESENT

POSSIBLE CAUSES
INCORRECT FLUID LEVEL
INTERNAL TRANSMISSION PROBLEM - NOISY
INTERNAL TRANSMISSION PROBLEM - NOISY WHILE STANDING STILL

TEST	ACTION	APPLICABILITY
1	Check and adjust the oil level before continuing. Place vehicle on hoist. Run vehicle on hoist under conditions necessary to duplicate the noise. Using Chassis Ears or other suitable device, verify that the noise is coming from the transmission. Is the noise coming from the transmission? Yes → Go To 2 No → Test Complete.	All
2	The transmission must be above 70 degree F. prior to checking fluid level. Adjusting fluid level on a cold transmission will result in an overfilled transmission. Check the transmission fluid level per the service information. Is the fluid level OK? Yes → Go To 3 No → Adjust fluid level. Repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	With the shift lever in neutral, raise the engine speed and listen to the noise. **Note: Make sure the radio is turned OFF. Alternator noise can come through the speakers and be misinterpreted as Transmission Pump Whine. This can happen even with the volume turned down, THE RADIO MUST BE TURNED OFF.** Does the noise get louder or change pitch while the engine speed is changing? Yes → Go To 4 No → Go To 5	All
4	If there are no possible causes remaining, repair the transmission. Inspect all of the transmission components for signs of wear. If no problems found, replace oil pump.. View repair options. Repair Repair internal transmission problem as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	If there are no possible causes remaining, repair the transmission. Inspect all of the transmission components for signs of wear. Pay particular attention to bearings, pinion gears, etc. Repair or replace as necessary. View repair options. Repair Repair internal transmission problem as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
*TRANSMISSION SHIFTS EARLY WITH NO DTC'S

POSSIBLE CAUSES
BUS PROBLEMS
CHECK FOR INTERMITTENT WIRING & CONNECTORS
COLD TRANSMISSION

TEST	ACTION	APPLICABILITY
1	Using the DRBIII®, check all other Modules for signs of a PCI bus problem such as bus related DTC's and/or communication problems. Check and diagnose all 1 trip failures as a hard code. Although it takes two occurences of a missed TRD link message to set the DTC P1793, one missed message will cause the transmission to short shift until the next start up. If the vehicle has any indications of a bus problem, the bus must be repaired first Do any of the other modules show signs of a bus problem? Yes → Repair the PCI bus problem. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 2	All
2	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Although it takes two occurences of a missed TRD link message to set the DTC P1793, one missed message will cause the transmission to short shift until the next start up. If the vehicle has any indications of a bus problem, the bus must be repaired first Were any problems found? Yes → Repair defective wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	If the transmission shifts too early when the transmission is cold, this is a normal condition. The software is designed to protect the transmission from high torque and/or high RPM shifts during cold operation. Did the problem occur when the transmission temperature was cold? Yes → This is a normal condition. The software is designed to protect the transmission from high torque and/or high RPM shifts during cold operation. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Verification Tests

41TE TRANSMISSION VERIFICATION TEST - VER 1	APPLICABILITY
1. Connect the DRBIII® to the Data Link Connector (DLC). 2. Reconnect any disconnected components. 3. With the DRBIII®, erase all Transmission DTC's, also erase the PCM DTC's. 4. With the DRBIII®, display transmission temperature. Start and run the engine until the transmission temperature is HOT (above 110 deg. F). 5. Check the transmission fluid and adjust if necessary. Refer to the service information for the fluid fill procedure. **6. NOTE: If the Transmission Control Module or torque converter has been replaced or if the transmission has been repaired or replaced it is necessary to perform the DRBIII® Quick Learn Procedure and reset the "Pinion Factor"** 7. Road test the vehicle. With the DRBIII®, monitor the engine RPM. Make 15 to 20 1-2, 2-3, 3-4 upshifts. Perform these shifts from a standing start to 45 MPH with a constant throttle opening of 20 to 25 degrees. 8. Below 25 MPH, make 5 to 8 wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown. 9. For a specific DTC, drive the vehicle to the Symptom's When Monitored/When Set conditions to verify the DTC repair. 10. Check for Diagnostic Trouble Codes (DTC's) during the road test. If a DTC sets during the road test , return to the Symptom list and follow the path. **11. NOTE: Erase P0700 DTC in the PCM to turn the MIL light off after making transmission repairs. This will turn the MIL off.** Were any Trouble Codes set during the road test? Yes → Refer to the Symptom List for appropriate diagnostic tests. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Repair is complete.	All

Verification Tests — Continued

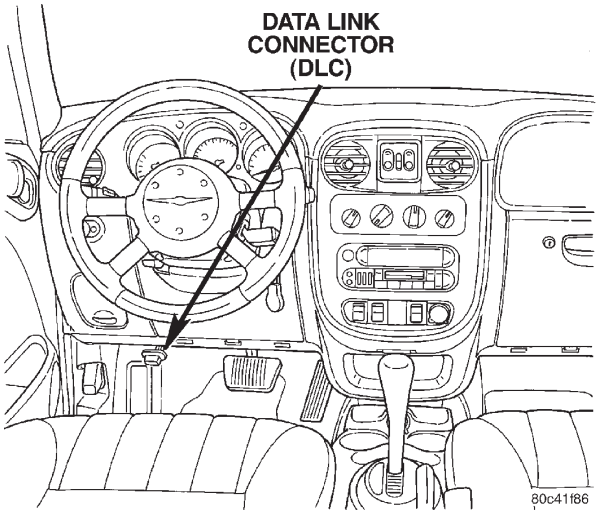
POWERTRAIN VERIFICATION TEST VER - 5	APPLICABILITY
1. Inspect the vehicle to ensure that all engine components are properly installed and connected. Reassemble and reconnect components as necessary. 2. If any existing diagnostic trouble codes have not been repaired, go to Symptom List and follow path specified. 3. Connect the DRBIII® to the data link connector. 4. Ensure the fuel tank has at least a quarter tank of fuel. Turn off all accessories. 5. Perform steps 6 through 8 if the PCM has been replaced. Then proceed with the verification. If the PCM has not been replaced skip those steps and continue verification. 6. If PCM has been changed and correct VIN and mileage have not been programmed, a DTC will be set in ABS and Air bag modules. In addition, if vehicle is equipped with a Sentry Key Immobilizer Module (SKIM), Secret Key data must be updated to enable start. 7. For ABS and Air Bag systems: Enter correct VIN and Mileage in PCM. Erase codes in ABS and Air Bag modules. 8. For SKIM theft alarm: Connect DRBIII® to data link conn. Go to Theft Alarm, SKIM, Misc. and place SKIM in secured access mode by using the appropriate PIN code for this vehicle. Select Update the Secret Key data. Data will be transferred from SKIM to PCM. 9. If a Comprehensive Component DTC was repaired, perform steps 10-13. If a Major OBDII Monitor DTC was repaired skip those steps and continue verification. 10. After the ignition has been off for at least 10 seconds, restart the vehicle and run 2 minutes. 11. If the Good Trip counter changed to one or more and there are no new DTC's, the repair was successful and is now complete. Erase DTC's and disconnect the DRBIII®. 12. If the repaired DTC has reset, the repair is not complete. Check for any related TSB's or flash updates and return to the Symptom list. 13. If another DTC has set, return to the Symptom List and follow the path specified for that DTC. 14. With the DRBIII®, monitor the appropriate pre-test enabling conditions until all conditions have been met. Once the conditions have been met, switch screen to the appropriate OBDII monitor, (Audible beeps when the monitor is running). 15. If the monitor ran, and the Good Trip counter changed to one or more, the repair was successful and is now complete. Erase DTC's and disconnect the DRBIII®. 16. If the repaired OBDII trouble code has reset or was seen in the monitor while on the road test, the repair is not complete. Check for any related technical service bulletins or flash updates and return to Symptom List. 17. If another DTC has set, return to the Symptom List and follow the path specified for that DTC.	All

Verification Tests — Continued

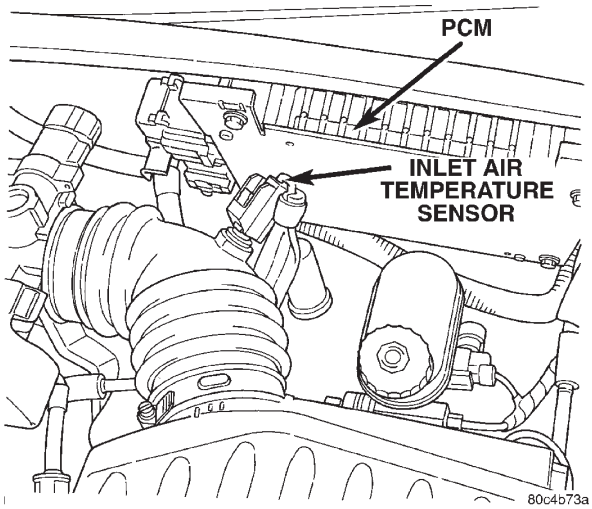
TRANSMISSION DTC VERIFICATION TEST	APPLICABILITY
1. Inspect the vehicle to ensure that all engine components are properly installed and connected. Reassemble and reconnect components as necessary. 2. If any existing diagnostic trouble codes have not been repaired, go to Symptom List and follow path specified. 3. Connect the DRBIII® to the data link connector. 4. Ensure the fuel tank has at least a quarter tank of fuel. Turn off all accessories. 5. Perform steps 6 through 8 if the PCM has been replaced. Then proceed with the verification. If the PCM has not been replaced skip those steps and continue verification. 6. If PCM has been changed and correct VIN and mileage have not been programmed, a DTC will be set in ABS and Air bag modules. In addition, if vehicle is equipped with a Sentry Key Immobilizer Module (SKIM), Secret Key data must be updated to enable start. 7. For ABS and Air Bag systems: Enter correct VIN and Mileage in PCM. Erase codes in ABS and Air Bag modules. 8. For SKIM theft alarm: Connect DRBIII® to data link conn. Go to Theft Alarm, SKIM, Misc. and place SKIM in secured access mode by using the appropriate PIN code for this vehicle. Select Update the Secret Key data. Data will be transferred from SKIM to PCM. 9. Start and run the engine until the transmission temperature is above 43°C (110°F). 10. Check the transmission fluid level. Adjust if necessary. 11. Road test the vehicle. Make 15 to 20 1-2, 2-3 and 3-4 up shifts. Perform these shifts from a standing start to 72 kmh (45 mph) with a constant throttle opening of 20-25%. 12. Below 40 kmh (25 mph), make 5 to 8 wide open throttle kick downs to 1st gear. Allow at least 5 seconds each in 2nd and 3rd between each kick down. 13. For a specific DTC drive the vehicle to the Symptom's When Monitored/When Set conditions to verify the DTC repair. 14. If a DTC sets during the road test, return to symptom list and follow the path. If no DTC is set the repair is complete.	All

8.0 COMPONENT LOCATIONS

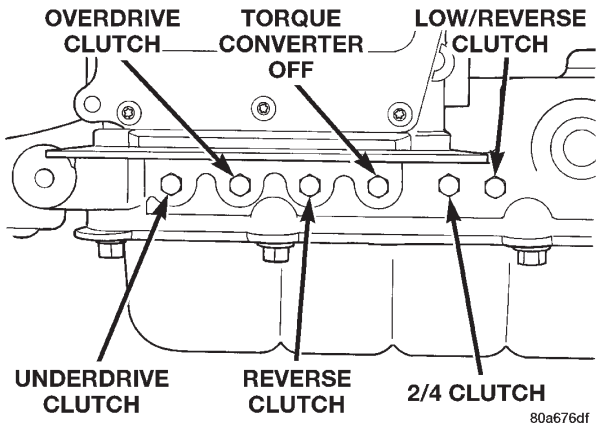
8.1 DATALINK



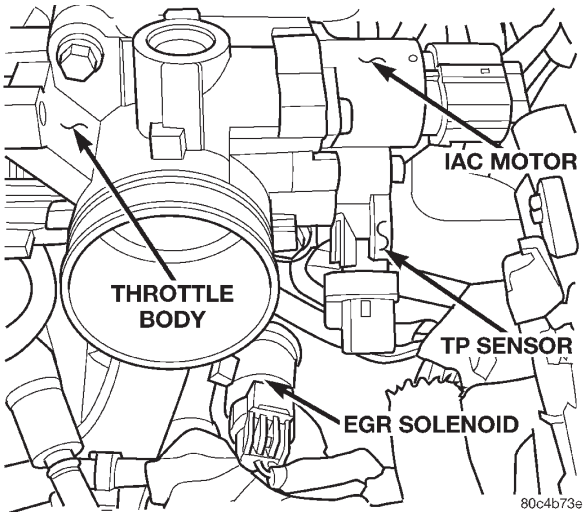
8.2 PCM



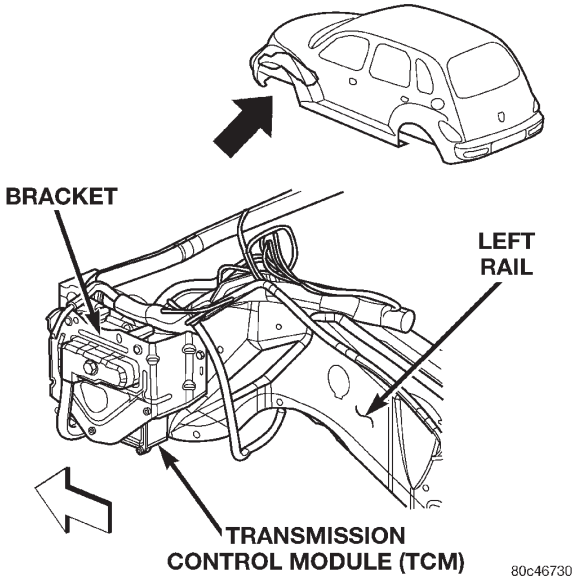
8.3 PRESSURE PORT



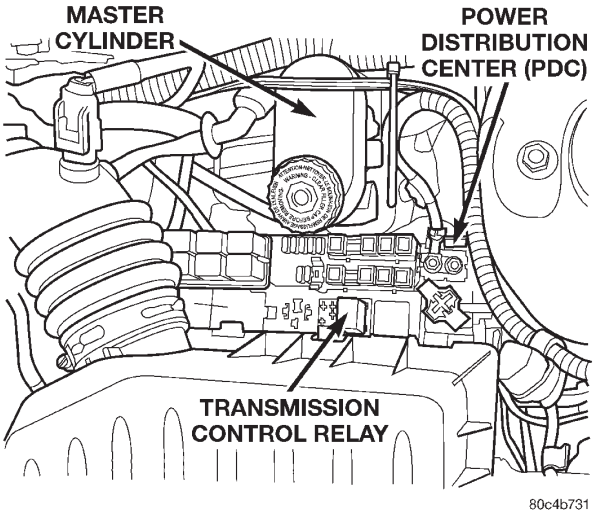
8.4 THROTTLE POSITION SENSOR



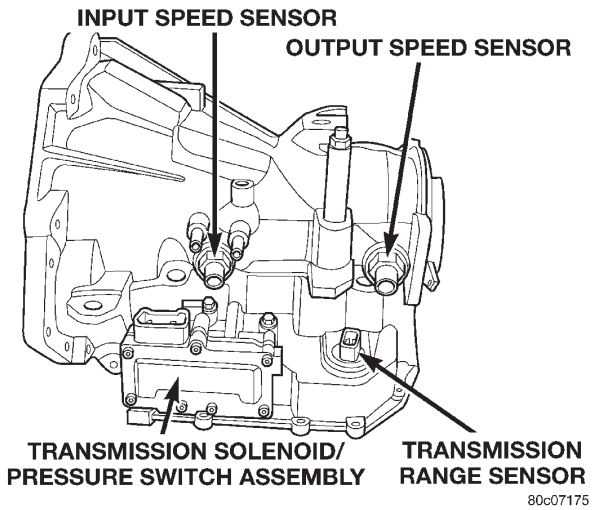
8.5 TRANSMISSION CONTROL MODULE



8.6 TRANSMISSION CONTROL RELAY

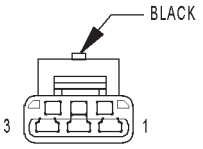


8.7 TRANSMISSION COMPONENT LOCATION



NOTES

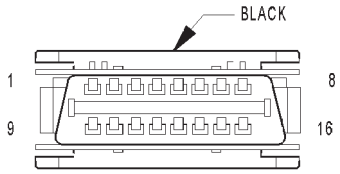
9.0 CONNECTOR PINOUTS



CRANKSHAFT
POSITION
SENSOR

CRANKSHAFT POSITION SENSOR - BLACK 3 WAY

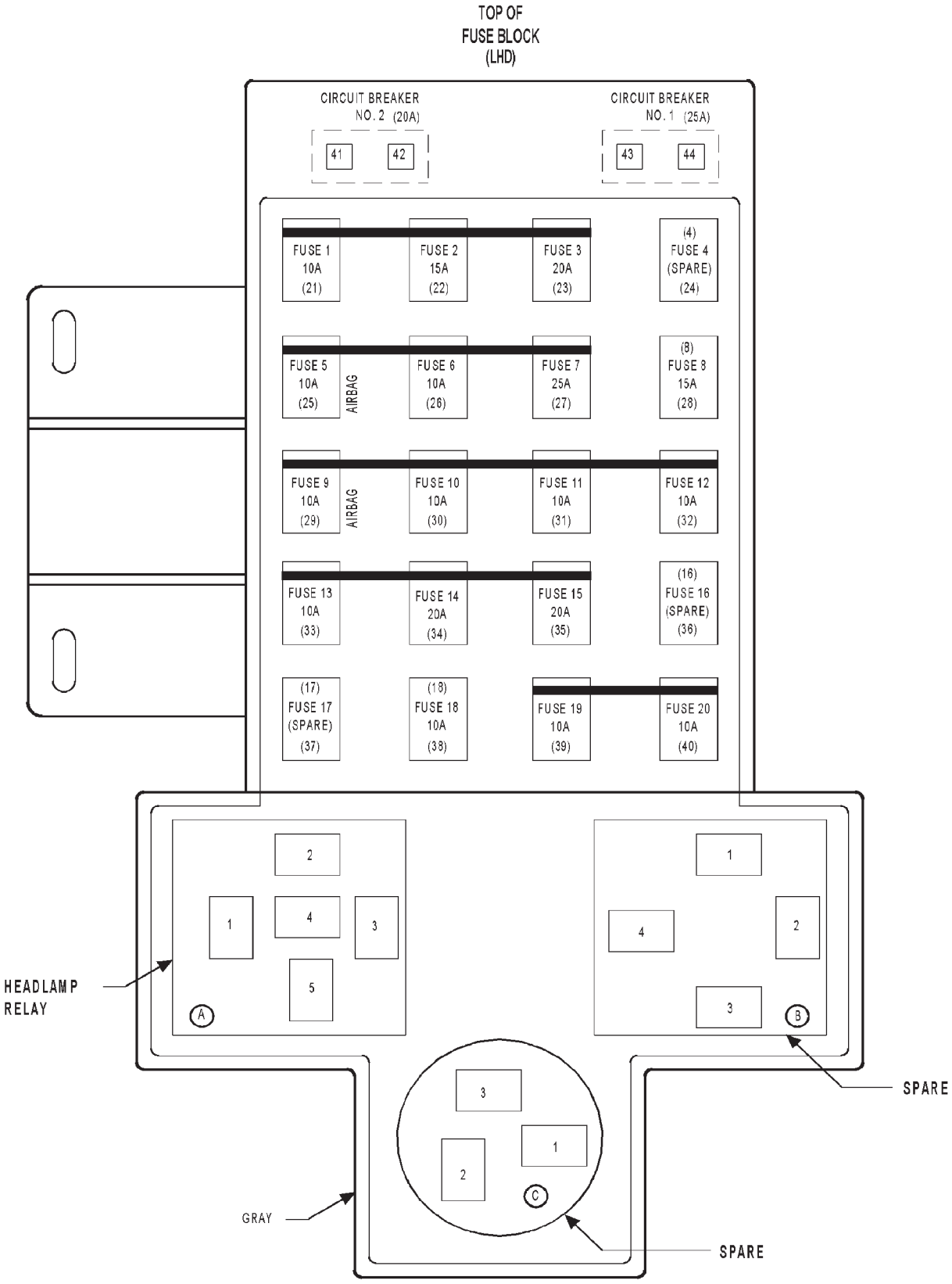
CAV	CIRCUIT	FUNCTION
1	K7 20OR	8V SUPPLY
2	K4 20BK/LB	SENSOR GROUND
3	K24 20GY/BK	CRANKSHAFT POSITION SENSOR SIGNAL



DATA LINK
CONNECTOR

DATA LINK CONNECTOR - BLACK 16 WAY

CAV	CIRCUIT	FUNCTION
1	-	-
2	D25 20VT/YL	PCI BUS
3	-	-
4	Z12 20BK/TN	GROUND
5	Z11 20BK/WT	GROUND
6	D20 20LG	SCI RECEIVE
7	D21 20PK	SCI TRANSMIT
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	D6 20PK/LB	SCI RECEIVE (EATX)
15	-	-
16	A14 18RD/WT	FUSED B(+)


TOP OF
FUSE BLOCK
(LHD)
CIRCUIT BREAKER
NO. 2 (20A)
CIRCUIT BREAKER
NO. 1 (25A)
41
42
43
44
FUSE 1
10A
(21)
FUSE 2
15A
(22)
FUSE 3
20A
(23)
(4)
FUSE 4
(SPARE)
(24)
FUSE 5
10A
(25)
AIRBAG
FUSE 6
10A
(26)
FUSE 7
25A
(27)
(8)
FUSE 8
15A
(28)
FUSE 9
10A
(29)
AIRBAG
FUSE 10
10A
(30)
FUSE 11
10A
(31)
FUSE 12
10A
(32)
FUSE 13
10A
(33)
FUSE 14
20A
(34)
FUSE 15
20A
(35)
(16)
FUSE 16
(SPARE)
(36)
(17)
FUSE 17
(SPARE)
(37)
(18)
FUSE 18
10A
(38)
FUSE 19
10A
(39)
FUSE 20
10A
(40)
HEADLAMP
RELAY
A
B
C
SPARE
GRAY
SPARE

FUSES

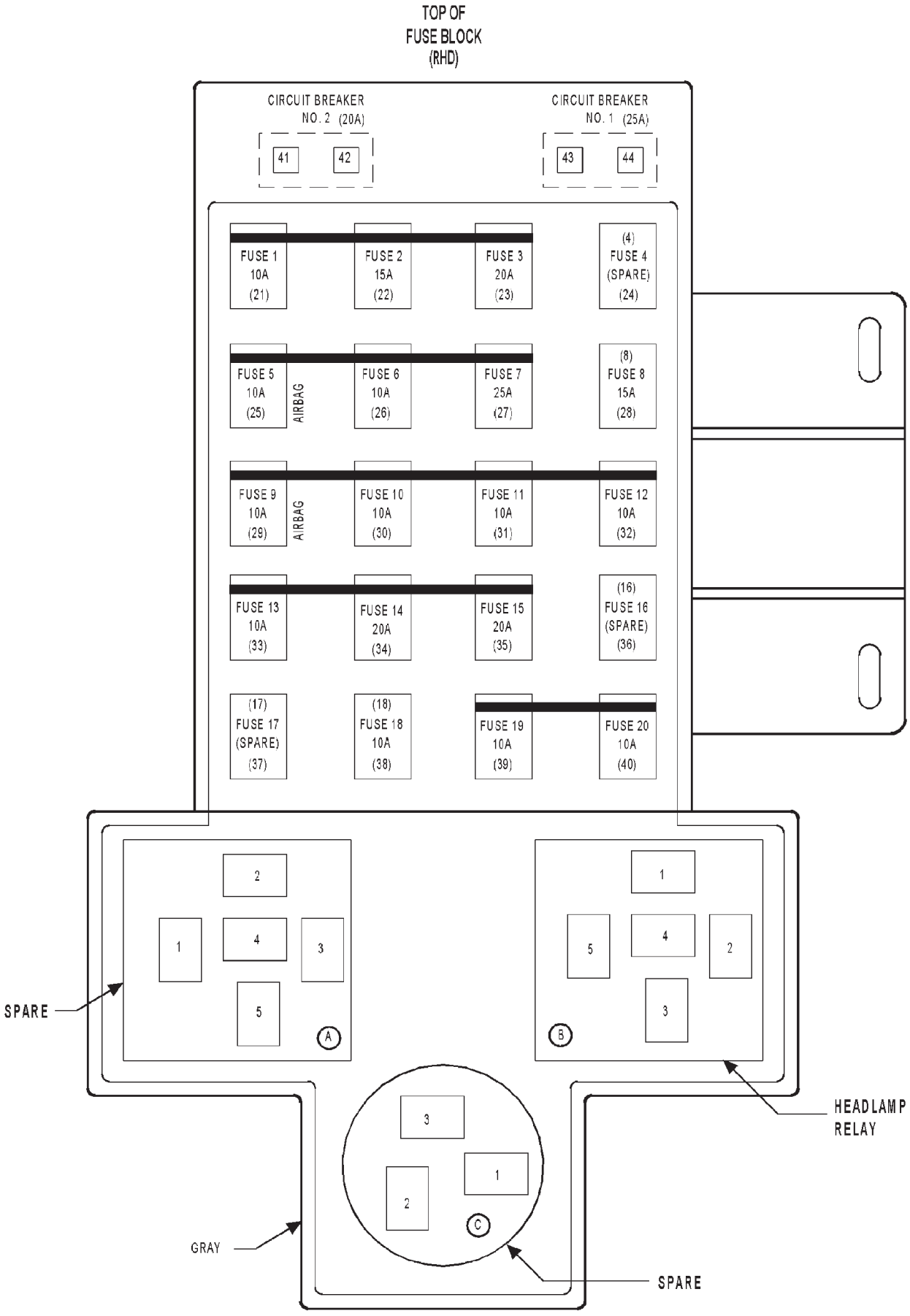
CAV	CIRCUIT	FUNCTION
1	F9 20RD/BK	FUSED B(+)
2	F33 18PK/RD	FUSED B(+)
3	F35 18RD	FUSED B(+)
4	-	-
5	F25 18TN/LG	FUSED IGNITION SWITCH OUTPUT (RUN)
6	F20 18WT	FUSED IGNITION SWITCH OUTPUT (RUN)
7	C1 14DG	FUSED IGNITION SWITCH OUTPUT (RUN)
8	F39 18PK/LG	HEADLAMP RELAY OUTPUT
9	F15 18DG/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
10	G5 20DB/BK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	F12 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	F18 20LG/BK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	F18 20LG/BK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
13	X12 18RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
14	F10 18YL/RD	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
15	F13 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
16	-	-
17	-	-
18	C16 20LB/YL	FUSED REAR WINDOW DEFOGGER SWITCH OUTPUT
19	L44 16VT/RD	FUSED RIGHT LOW BEAM OUTPUT
20	L43 18VT	FUSED LEFT LOW BEAM OUTPUT
20	L43 16VT	FUSED LEFT LOW BEAM OUTPUT

CIRCUIT BREAKERS

CAV	CIRCUIT	FUNCTION
C.B. NO. 1	F3 16LB/OR	FUSED B(+)
C.B. NO. 2	F21 14TN	FUSED IGNITION SWITCH OUTPUT (RUN)

HEADLAMP RELAY (LHD)

CAV	CIRCUIT	FUNCTION
A1	Z1 20BK	GROUND
A2	L4 16VT/WT	HEADLAMP RELAY OUTPUT
A3	L3 16RD/OR	HEADLAMP RELAY CONTROL
A4	F34 18TN/BK	HEADLAMP RELAY OUTPUT
A5	F3 16LB/OR	FUSED B(+)


TOP OF
FUSE BLOCK
(RHD)
CIRCUIT BREAKER
NO. 2 (20A)
41
42
CIRCUIT BREAKER
NO. 1 (25A)
43
44
FUSE 1
10A
(21)
FUSE 2
15A
(22)
FUSE 3
20A
(23)
(4)
FUSE 4
(SPARE)
(24)
FUSE 5
10A
(25)
AIRBAG
FUSE 6
10A
(26)
FUSE 7
25A
(27)
(8)
FUSE 8
15A
(28)
FUSE 9
10A
(29)
AIRBAG
FUSE 10
10A
(30)
FUSE 11
10A
(31)
FUSE 12
10A
(32)
FUSE 13
10A
(33)
FUSE 14
20A
(34)
FUSE 15
20A
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FUSE 16
(SPARE)
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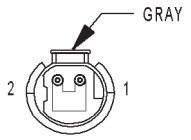
(17)
FUSE 17
(SPARE)
(37)
(18)
FUSE 18
10A
(38)
FUSE 19
10A
(39)
FUSE 20
10A
(40)
SPARE
A
B
C
HEADLAMP
RELAY
GRAY
SPARE

HEADLAMP RELAY (RHD)

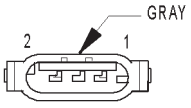
CAV	CIRCUIT	FUNCTION
B1	Z1 20BK	GROUND
B2	L4 16VT/WT	HEADLAMP RELAY OUTPUT
B3	L3 16RD/OR	HEADLAMP RELAY CONTROL
B4	-	-
B5	F3 16LB/OR	FUSED B(+)



INPUT SPEED SENSOR

INPUT SPEED SENSOR - GRAY 2 WAY

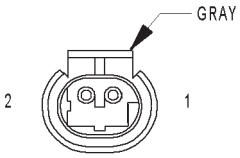
CAV	CIRCUIT	FUNCTION
1	T13 20DB/BK	SPEED SENSOR GROUND
2	T52 20RD/BK	INPUT SPEED SENSOR SIGNAL



LEFT BACK-UP LAMP

LEFT BACK-UP LAMP - GRAY 2 WAY

CAV	CIRCUIT	FUNCTION
1	L1 18VT/BK	BACK-UP LAMP FEED
2	Z1 18BK	GROUND

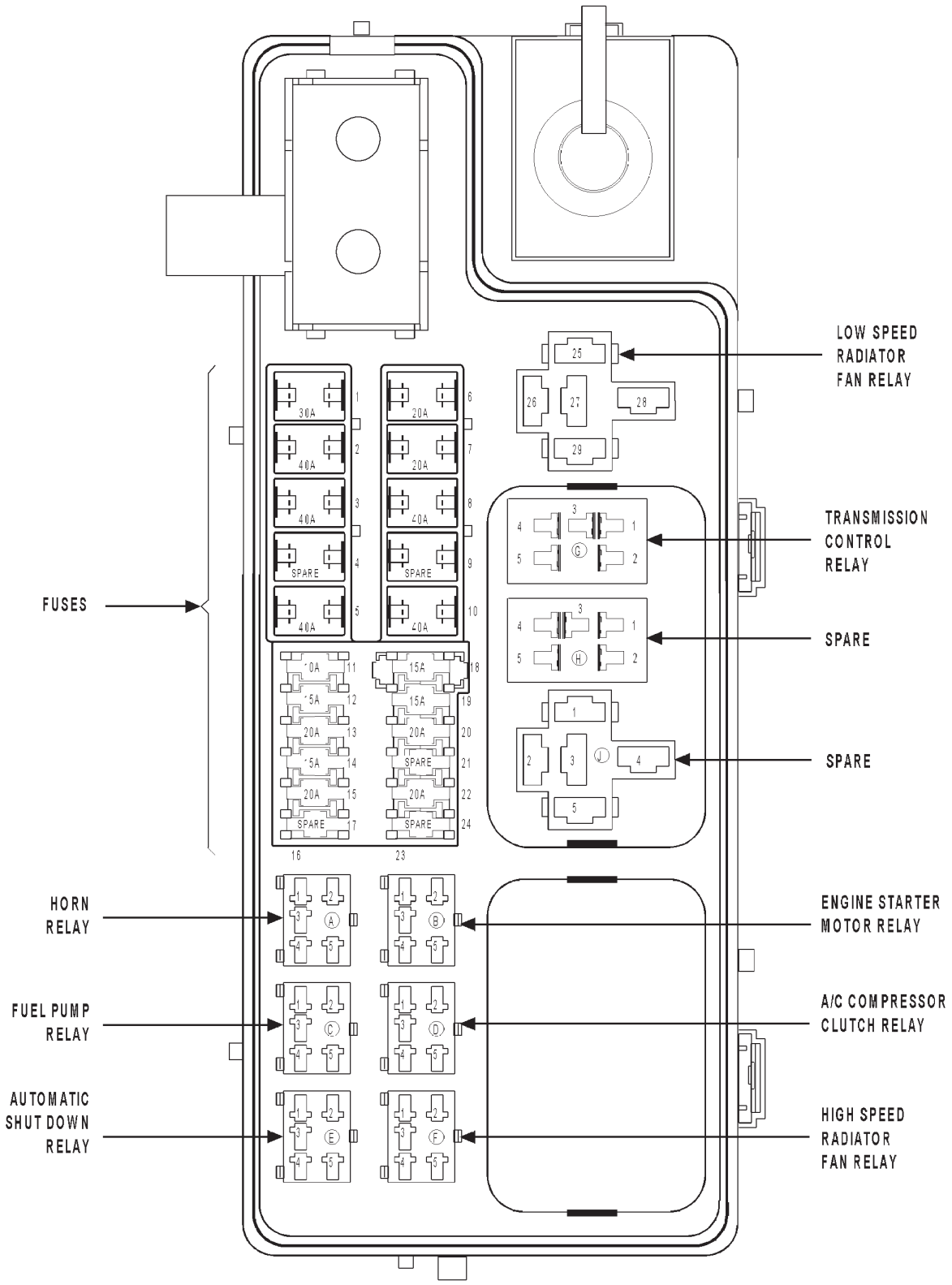


OUTPUT SPEED SENSOR

OUTPUT SPEED SENSOR - GRAY 2 WAY

CAV	CIRCUIT	FUNCTION
1	T13 20DB/BK	SPEED SENSOR GROUND
2	T14 20LG/WT	OUTPUT SPEED SENSOR SIGNAL

POWER DISTRIBUTION CENTER



FUSES

CAV	CIRCUIT	FUNCTION
1	A1 14RD	FUSED B(+)
2	A10 12RD/DG	FUSED B(+)
3	A2 12PK/BK	FUSED B(+)
4	-	-
5	A16 12GY	FUSED B(+)
6	A120 16RD/LB	FUSED B(+)
7	A20 12RD/DB	FUSED B(+)
8	A4 12BK/PK	FUSED B(+)
9	-	-
10	A3 12RD/WT	FUSED B(+)
11	A17 20RD/BK	FUSED B(+)
12	F32 18PK/DB	FUSED B(+)
13	A14 18RD/WT	FUSED B(+)
14	F62 20RD	FUSED B(+)
15	A30 16RD/WT	FUSED B(+)
16	-	-
17	-	-
18	M1 20PK	FUSED B(+)
19	A15 18PK/DG	FUSED B(+)
20	F1 16DB/BK	FUSED B(+)
21	-	-
22	F39 18PK/LG	FUSED B(+)
23	-	-
24	-	-

A/C COMPRESSOR CLUTCH RELAY

CAV	CIRCUIT	FUNCTION
D1	C3 20DB/BK	A/C COMPRESSOR CLUTCH RELAY OUTPUT
D2	C28 20DB/OR	A/C COMPRESSOR CLUTCH RELAY CONTROL
D3	-	-
D4	F18 20LG/BK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
D5	A17 20RD/BK	FUSED B(+)

AUTOMATIC SHUT DOWN RELAY

CAV	CIRCUIT	FUNCTION
E1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
E2	K51 20DB/YL	AUTOMATIC SHUT DOWN RELAY CONTROL
E3	-	-
E4	A14 18RD/WT	FUSED B(+)
E5	A14 18RD/WT	FUSED B(+)

ENGINE STARTER MOTOR RELAY

CAV	CIRCUIT	FUNCTION
B1	T40 14BR	ENGINE STARTER MOTOR RELAY OUTPUT
B2	K90 20TN	ENGINE STARTER MOTOR RELAY CONTROL
B3	-	-
B4	A41 14YL	FUSED IGNITION SWITCH OUTPUT (START)
B5	A1 14RD	FUSED B(+)

FUEL PUMP RELAY

CAV	CIRCUIT	FUNCTION
C1	A141 16DG/WT	FUEL PUMP RELAY OUTPUT
C2	K31 20BR	FUEL PUMP RELAY CONTROL
C3	-	-
C4	F12 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
C5	A14 18RD/WT	FUSED B(+)

HIGH SPEED RADIATOR FAN RELAY

CAV	CIRCUIT	FUNCTION
F1	C25 12YL	HIGH SPEED RADIATOR FAN RELAY OUTPUT
F2	C27 20DB/PK	HIGH SPEED RADIATOR FAN RELAY CONTROL
F3	-	-
F4	F18 20LG/BK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
F5	A16 12GY	FUSED B(+)

HORN RELAY

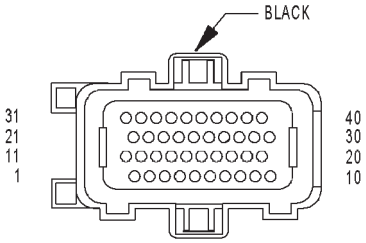
CAV	CIRCUIT	FUNCTION
A1	X2 20DG/RD	HORN RELAY OUTPUT
A2	X3 20BK/RD	HORN RELAY CONTROL
A3	-	-
A4	F62 20RD	FUSED B(+)
A5	F62 20RD	FUSED B(+)

LOW SPEED RADIATOR FAN RELAY

CAV	CIRCUIT	FUNCTION
25	F18 20LG/BK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
26	C23 12DG	LOW SPEED RADIATOR FAN RELAY OUTPUT
27	-	-
28	A16 12GY	FUSED B(+)
29	C24 20YL/RD	LOW SPEED RADIATOR FAN RELAY CONTROL

TRANSMISSION CONTROL RELAY

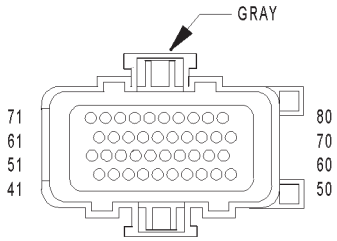
CAV	CIRCUIT	FUNCTION
G1	T16 16RD	TRANSMISSION CONTROL RELAY OUTPUT
G2	Z1 20BK	GROUND
G3	-	-
G4	T15 20LG	TRANSMISSION CONTROL RELAY CONTROL
G5	A30 16RD/WT	FUSED B(+)



POWERTRAIN CONTROL MODULE - C1

POWERTRAIN CONTROL MODULE C1 - BLACK 40 WAY

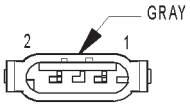
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	K17 18DB/TN	IGNITION COIL NO. 2 DRIVER
4	-	-
5	V32 20YL/RD	SPEED CONTROL POWER SUPPLY
6	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
7	K13 18YL/WT	FUEL INJECTOR NO. 3 DRIVER
8	K20 18DG	GENERATOR FIELD
9	-	-
10	Z12 18BK/TN	GROUND
11	K19 18BK/GY	IGNITION COIL NO. 1 DRIVER
12	G6 20GY	ENGINE OIL PRESSURE SWITCH SENSE
13	K11 18WT/DB	FUEL INJECTOR NO. 1 DRIVER
14	-	-
15	-	-
16	K14 18LB/BR	FUEL INJECTOR NO. 4 DRIVER
17	K12 18TN	FUEL INJECTOR NO. 2 DRIVER
18	K79 20OR/RD	OXYGEN SENSOR 1/1 CONTROL
19	-	-
20	F12 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
21	-	-
22	-	-
23	K119 20LG/BK	CLUTCH UPSTOP SWITCH SIGNAL
24	-	-
25	K42 20DB/LG	KNOCK SENSOR SIGNAL
26	K2 20TN/BK	ENGINE COOLANT TEMPERATURE SENSOR SIGNAL
27	K127 20BK/OR	OXYGEN SENSOR GROUND
28	-	-
29	-	-
30	K41 20BK/DG	OXYGEN SENSOR 1/1 SIGNAL
31	K90 20TN	ENGINE STARTER MOTOR RELAY CONTROL
32	K24 20GY/BK	CRANKSHAFT POSITION SENSOR SIGNAL
33	K44 20TN/YL	CAMSHAFT POSITION SENSOR SIGNAL
34	-	-
35	K22 20OR/DB	THROTTLE POSITION SENSOR SIGNAL
36	K1 20DG/RD	MAP SENSOR SIGNAL
37	-	-
38	C20 20BR	A/C SWITCH SENSE
39	-	-
40	K35 20GY/YL	EGR SOLENOID CONTROL



POWERTRAIN CONTROL MODULE - C2

POWERTRAIN CONTROL MODULE C2 - GRAY 40 WAY

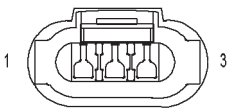
CAV	CIRCUIT	FUNCTION
41	V37 20RD/LG	SPEED CONTROL SWITCH SIGNAL
42	-	-
43	K4 20BK/LB	SENSOR GROUND
44	K7 20OR	8V SUPPLY
45	K10 20DB/OR	POWER STEERING PRESSURE SWITCH SENSE
46	A14 18RD/WT	FUSED B(+)
47	Z11 18BK/WT	GROUND
48	K40 20BR/WT	IDLE AIR CONTROL NO. 3 DRIVER
49	K60 20YL/BK	IDLE AIR CONTROL NO. 2 DRIVER
50	Z12 18BK/TN	GROUND
51	K141 20TN/WT	OXYGEN SENSOR 1/2 SIGNAL
52	K21 20BK/RD	INLET AIR TEMPERATURE SENSOR SIGNAL
53	-	-
54	-	-
55	C24 20YL/RD	LOW SPEED RADIATOR FAN RELAY CONTROL
56	V36 20TN/RD	SPEED CONTROL VACUUM SOLENOID CONTROL
57	K39 20GY/RD	IDLE AIR CONTROL NO. 1 DRIVER
58	K59 20VT/BK	IDLE AIR CONTROL NO. 4 DRIVER
59	D25 20VT/YL	PCI BUS
60	-	-
61	K6 20VT/WT	5V SUPPLY
62	K29 20WT/PK	BRAKE LAMP SWITCH SENSE
63	T10 20YL/DG	TORQUE MANAGEMENT REQUEST SENSE
64	C28 20DB/OR	A/C COMPRESSOR CLUTCH RELAY CONTROL
65	D21 20PK	SCI TRANSMIT
66	G7 20WT/OR	VEHICLE SPEED SENSOR SIGNAL
67	K51 20DB/YL	AUTOMATIC SHUT DOWN RELAY CONTROL
68	K52 20PK/BK	EVAP PURGE SOLENOID CONTROL
69	C27 20DB/PK	HIGH SPEED RADIATOR FAN RELAY CONTROL
70	K108 20VT/RD	EVAP PURGE SOLENOID SENSE
71	G9 20GY/BK	RED BRAKE WARNING INDICATOR DRIVER
72	K107 20OR/YL	LEAK DETECTION PUMP SWITCH SENSE
73	-	-
74	K31 20BR	FUEL PUMP RELAY CONTROL
75	D20 20LG	SCI RECEIVE
76	T41 20BK/WT	CLUTCH INTERLOCK SWITCH SIGNAL
76	T41 20BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE (TRS T41)
77	K106 20WT/DG	LEAK DETECTION PUMP SOLENOID CONTROL
78	K54 20OR/BK	TORQUE CONVERTER CLUTCH SOLENOID CONTROL
79	-	-
80	V35 20LG/RD	SPEED CONTROL VENT SOLENOID CONTROL



RIGHT BACK-UP LAMP

RIGHT BACK-UP LAMP - GRAY 2 WAY

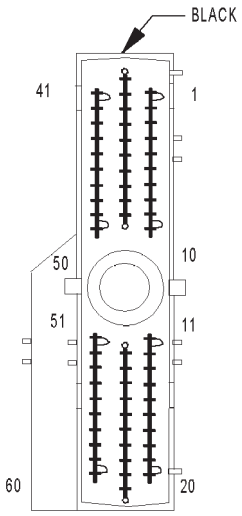
CAV	CIRCUIT	FUNCTION
1	L1 18VT/BK	BACK-UP LAMP FEED
2	Z1 18BK	GROUND



THROTTLE POSITION SENSOR

THROTTLE POSITION SENSOR - 3 WAY

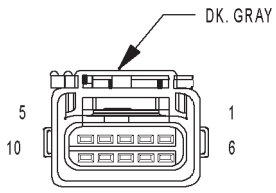
CAV	CIRCUIT	FUNCTION
1	K6 20VT/WT	5V SUPPLY
2	K22 20OR/DB	THROTTLE POSITION SENSOR SIGNAL
3	K4 20BK/LB	SENSOR GROUND



TRANSMISSION CONTROL MODULE

TRANSMISSION CONTROL MODULE - BLACK 60 WAY

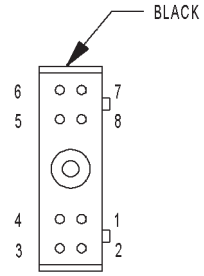
CAV	CIRCUIT	FUNCTION
1	T1 20LG/BK	TRS T1 SENSE
2	-	-
3	T3 20VT	TRS T3 SENSE
4	-	-
5	-	-
6	K24 20GY/BK	CRANKSHAFT POSITION SENSOR SIGNAL
7	D21 20PK	SCI TRANSMIT
8	A41 16YL	FUSED IGNITION SWITCH OUTPUT (START)
9	T9 18OR/BK	OVERDRIVE PRESSURE SWITCH SENSE
10	T10 20YL/DG	TORQUE MANAGEMENT REQUEST SENSE
11	F18 20LG/BK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	K22 20OR/DB	THROTTLE POSITION SENSOR SIGNAL
13	T13 20DB/BK	SPEED SENSOR GROUND
14	T14 20LG/WT	OUTPUT SPEED SENSOR SIGNAL
15	T15 20LG	TRANSMISSION CONTROL RELAY CONTROL
16	T16 16RD	TRANSMISSION CONTROL RELAY OUTPUT
17	T16 16RD	TRANSMISSION CONTROL RELAY OUTPUT
18	-	-
19	T19 18WT	2-4 SOLENOID CONTROL
20	T20 18LB	LOW/REVERSE SOLENOID CONTROL
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-
37	-	-
38	-	-
39	-	-
40	-	-
41	T41 20BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE (TRS T41)
42	T42 20VT/WT	TRS T42 SENSE
43	D25 20VT/YL	PCI BUS
44	-	-
45	-	-
46	D6 20PK/LB	SCI RECEIVE (EATX)
47	T47 18YL/BK	2-4 PRESSURE SWITCH SENSE
48	-	-
49	-	-
50	T50 18DG	LOW/REVERSE PRESSURE SWITCH SENSE
51	K4 20BK/LB	SENSOR GROUND
52	T52 20RD/BK	INPUT SPEED SENSOR SIGNAL
53	Z14 16BK/YL	GROUND
54	T54 20VT/PK	TRANSMISSION TEMPERATURE SENSOR SIGNAL
55	-	-
56	A30 16RD/WT	FUSED B(+)
57	Z13 16BK/RD	GROUND
58	G7 20WT/OR	VEHICLE SPEED SENSOR SIGNAL
59	T59 18PK	UNDERDRIVE SOLENOID CONTROL
60	T60 18BR	OVERDRIVE SOLENOID CONTROL



TRANSMISSION
RANGE SENSOR
(ATX)

TRANSMISSION RANGE SENSOR (ATX) - DK. GRAY 10 WAY

CAV	CIRCUIT	FUNCTION
1	F20 18WT	FUSED IGNITION SWITCH OUTPUT (RUN)
2	-	-
3	T13 20DB/BK	SPEED SENSOR GROUND
4	T54 18VT/PK	TRANSMISSION TEMPERATURE SENSOR SIGNAL
5	T41 20BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE (TRS T41)
6	L1 18VT/BK	BACK-UP LAMP FEED
7	T1 20LG/BK	TRS T1 SENSE
8	T3 20VT	TRS T3 SENSE
9	T42 20VT/WT	TRS T42 SENSE
10	-	-

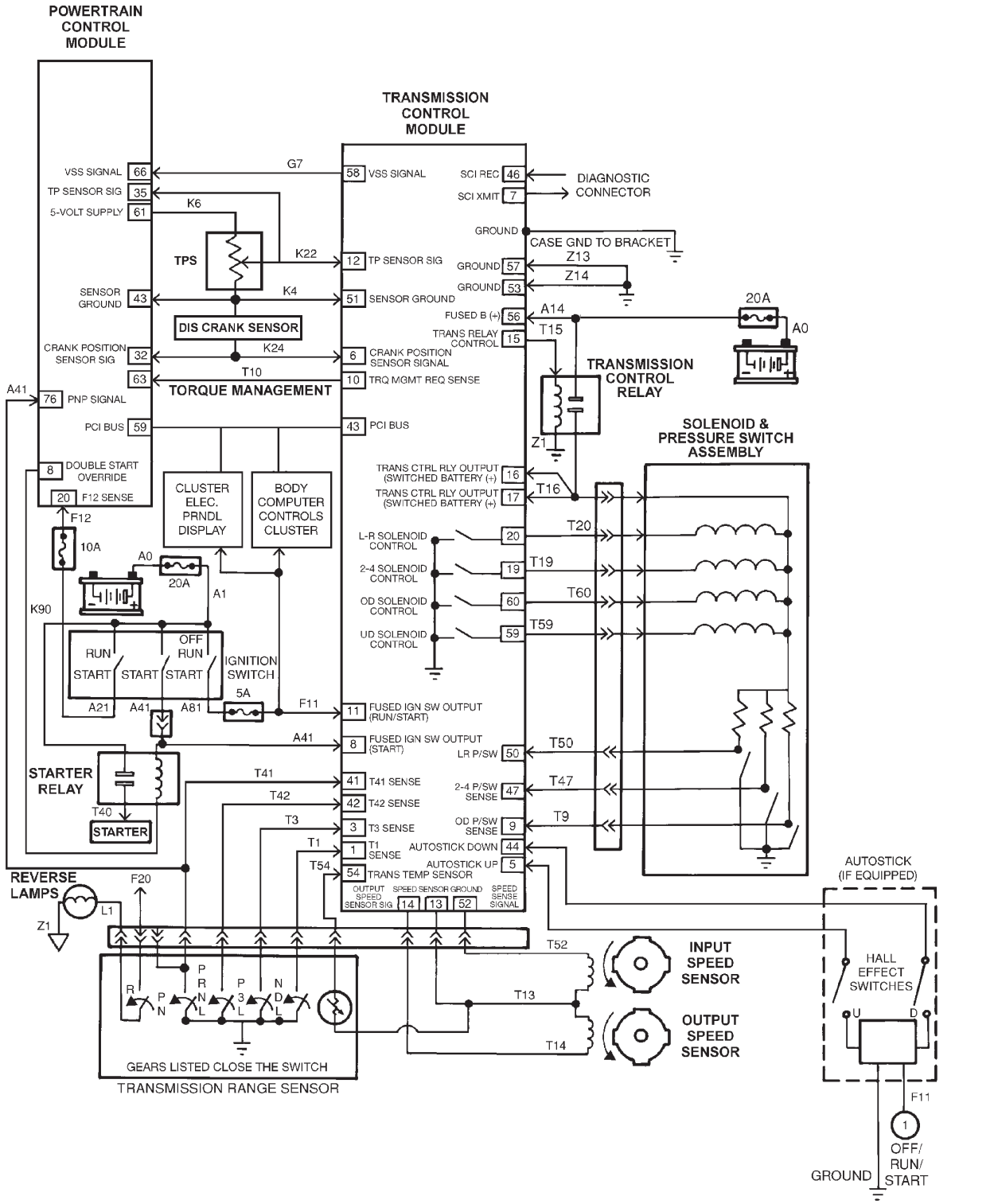


TRANSMISSION
SOLENOID/PRESSURE
SWITCH ASSEMBLY

TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY - BLACK 8 WAY

CAV	CIRCUIT	FUNCTION
1	T47 18YL/BK	2-4 PRESSURE SWITCH SENSE
2	T50 18DG	LOW/REVERSE PRESSURE SWITCH SENSE
3	T9 18OR/BK	OVERDRIVE PRESSURE SWITCH SENSE
4	T16 16RD	TRANSMISSION CONTROL RELAY OUTPUT
5	T59 18PK	UNDERDRIVE SOLENOID CONTROL
6	T60 18BR	OVERDRIVE SOLENOID CONTROL
7	T20 18LB	LOW/REVERSE SOLENOID CONTROL
8	T19 18WT	2-4 SOLENOID CONTROL

10.0 SCHEMATIC DIAGRAMS



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