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TRANSMISSION

NOTES

1.0 INTRODUCTION

The procedures contained in this manual include all of the specifications, instructions, and graphics needed to diagnose 41TE/AE 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 RG equipped with a 41TE/AE transaxle.

1.2 SIX -STEP TROUBLESHOOTING PROCEDURE

Diagnosis of the 41TE/AE 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

RG series vehicles equipped with a 4 speed transmission.

3.0 SYSTEM DESCRIPTION AND FUNCTIONAL OPERATION

3.1 GENERAL DESCRIPTION

The 41TE/AE electronic transaxle 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/AE 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 mechanical 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

This feature allows the driver to manually shift the transaxle when the shift lever is pulled back into the AutoStick position. When in AutoStick mode, 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 Temperature Sensor on the 41TE/AE transmission. The Temperature Sensor is an integral component of the Transmission Range Sensor (TRS). If the Temperature Sensor is faulty, (DTC P1799(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, vehicle speed, gear, and engine coolant temperature to determine an estimated oil temperature during vehicle operation. Vehicles using a 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 -26.6C (-16°F)

> Goes to a Cold schedule above -24C (-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 -24C (-12°F) and below 2.2C (36°F)

> Goes to a Warm schedule above 4.4C (40°F) oil temperature

> Delayed 2-3 upshift approximately 35-50 Km/h (22-31 MPH)

> Delayed 3-4 upshift 72-85 Km/h (45-53 MPH)

> Early 4-3 coastdown shift approximately 48 Km/h (30 MPH)

> Early 3-2 coastdown shift approximately 27 Km/h (17 MPH)

> High speed 4-2, 3-2, 2-1 kickdown shifts are prevented

> No EMCC

Warm: Oil temperature at start up above 2.2C (36°F) and below 27C (80°F)

> Goes to a Hot schedule above 27C (80°F) oil temperature

> Normal operation (upshifts, kickdowns, and coastdowns)

> No EMCC

Hot: Oil temperature at start up above 27C (80°F)

> Goes to a Overheat schedule above 115C (240°F) oil temperature

> Normal operation (upshifts, kickdowns, and coastdowns)

> Full EMCC, No PEMCC except to engage FEMCC
(Except at closed throttle at speeds above 113-133 Km/h (70 - 83 MPH)

Overheat: Oil temperature above 115C (240°F) or engine coolant temperature above 118C (244°F)

> Goes to a Hot below 110C (230°F) oil temperature or a Super Overheat above 115C (240°F) oil temperature

> Delayed 2-3 upshift 40-51 Km/h (25-32 MPH)

> Delayed 3-4 upshift 66-77 Km/h (41-48 MPH)

> 3rd gear FEMCC from 48-77 Km/h (30-48 MPH)

> 3rd gear PEMCC from 43-50 Km/h (27-31 MPH)

Super Overheat: Oil temperature above 127C (260°F)

> Goes back to a Overheat below 115C (240°F) oil temperature

> All a Overheat shift schedules features apply

> 2nd gear PEMCC above 35 Km/h (22 MPH)

> Above 35 Km/h (22 MPH) the torque converter will not unlock unless the throttle is closed (i.e. at 80 Km/h (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:

> 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 110C (230°F)

> Engine coolant temperature stays low too long - If engine coolant temperature drops below 65C (150°F), the transmission will disengage EMCC. Extended operation with the EMCC disengaged will cause the transmission to overheat.

> A brake switch issue 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

> Transmission Temperature Sensor circuit

3.3 DIAGNOSTIC TROUBLE CODES

Diagnostic trouble codes (DTC's) are codes stored by the Transmission Control Module (TCM) that help 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 testing 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 OBDII (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 P0700(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 OBDII (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 a intermittent code. Some intermittent codes, such as codes P1792(12), P1767(14), P1768(15), P0725(18), P1716(19), P1781(21), P1782(22), P1724(24), P0705(28), P0120(29), P0750(41), P0755(42), P0760(43), P0765(44), P1793(48), P0715(56), P0720(57), P1794(58), P1796(70), P1799(74), P1739(76), P1717(77), and P0600(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 count 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 4.4C (40°F) from engine starting and reaches a minimum temperature of 71C (160°F).

The Malfunction Indicator Lamp (MIL) will turn off after 3 good trips 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	2-4 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 switch circuit	Yes	Yes
32	P1728	24 hydraulic pressure switch circuit	Yes	Yes
33	P1728	OD/24 hydraulic pressure switch circuit	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
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/Yes (3.3L-3.5L)
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

DTC	P-Code	Name of Code	Limp-in	MIL
71	P1797	Manual shift overheat	No	No
73	P1798	Worn out/burnt transmission fluid	No	No
74	P1799	Calculated Oil temperature 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.

3.3.7 DTC DESCRIPTIONS

Name of code: P1792(12) - Battery was Disconnected (Informational code Only)
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® 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 initialization 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
> Battery Disconnect by DRBIII® or MDS
> Bad TCM ground circuit.

Name of code: P1767(14) - Relay Output Always On
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 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 and 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: P1768(15) - Relay Output Always Off
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 a 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: P0725(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 either a EATX RPM signal (simulated Crank Sensor signal) or the TCM uses the Crank Postion Sensor signal to calculate engine RPM depending on the engine application. The signal supplied by the PCM and uses a dedicated circuit is called the EATX RPM Signal circuit. The Crank Position Sensor signal is a spliced circuit from the engine Crank Position Sensor. 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 transmission system defaults to Relay Open limp-in mode.

Possible causes:

> Open or short in EATX RPM Signal circuit. (3.5L)

> Open or short in Crank Position Sensor Signal circuit. (3.3L/3.8L)

> Open or short in Crank Position Sensor ground circuit. (3.3L/3.8L)

> TCM and/or PCM connector problems

> TCM

> PCM

Name of code: P0716(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

> TCM

> PCM

Name of code: P1765(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 a 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 a 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

> TCM

Name of code: P1781(21) - OD Pressure Switch Sense 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 codes are present. TCM will ignore the code. Limp-in condition will only occur if code P1781(21) is present with a code P0705(28).
Possible causes:

> If code P1791(35) is present, ignore code P1781(21) and perform code P1791 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
> Loose valve body bolts
> Plugged filter - internal transmission or torque converter failure
> TCM

Name of code: P1782(22) - 2-4 Pressure Switch Sense 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 P1782(22) and continues with normal operation. The transmission will only go into relay open limp-in mode if a code P0705(28) is also present. If no 2-4 clutch pressure is present a speed ratio code P0732(52) or P0734(54) will be set and cause the limp-in condition.
Possible causes:

> If code P1791(35) is present, ignore code P1782(22) and perform code P1791 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
> 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: P1784(24) - L/R Pressure Switch Sense 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 P1784(24) is accompanied by a code P0705(28).
Possible causes:

> If code P1791(35) is present, ignore code P1784(24) and perform code P1791(35) 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 P1775(37)
> Loose valve body bolts
> Plugged filter - internal transmission or torque converter failure
> TCM

Name of code: P0705(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 C1 through C4 (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

> C1 through C4 (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 C1 through C4 (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 C1 through C4 (T1, T3, T41 or T42) circuits. Check for corrosion, terminal push-outs or spread terminals at 60-way and/or TRS connector

> TRS

> TCM

> BCM

These same symptoms may occur without the code P0705(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: P0120(29) - Throttle Position Sensor 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 an intermittent (excessive signal changes).

Transmission Effects: Extremely erratic transmission shifting with an intermittent TPS signal just prior to setting the code. If the intermittent 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: P1787(31) - OD Hydraulic Pressure Test Failure
P1788(32) - 2-4 Hydraulic Pressure Test Failure
P1789(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 cor-

responding 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: P1791(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 for a given gear are open, a loss of prime test begins. All available elements (in 1st gear L-R, 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: P1790(36) - Fault Immediately After Shift

When monitored: After a gear ratio error is stored.

Set condition: This code is set if the associated gear ratio code 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 gear ratio code and primarily mechanical causes should be considered.

Transmission Effects: None

Possible causes:

> Mechanical causes as listed under associated gear ratio code.

Name of code: P1775(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: P0740(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 slip the TCC by more than 100 RPM (Engine speed - Input speed) for 10 seconds.

The code will be set if one of these event 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 transmission 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 code P0740(38) present
> Solenoid pack.

Name of code: P0750(41) - L-R Solenoid Circuit
P0755(42) - 2-4 Solenoid Circuit
P0760(43) - OD Solenoid Circuit
P0765(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 DTC 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 deenergized. 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 again to verify the failure. In addition to the periodic testing, the solenoid circuits 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 35 Km/h (22 MPH), limp-in mode when vehicle speed is below 35 Km/h (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: P1776(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 pressure 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 the 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 upshifted position and directs the fluid into the torque converter clutch (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 indicates 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 detection of L-R pressure results in setting the code.

Transmission Effects: At speeds above 72 Km/h (45 MPH), EMCC is inhibited. Once speed falls below 72 Km/h (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 P1784(24) only)

> TCM (with code P1784(24) only)

Name of Code: P1793(48) - Torque Reduction (TRD) Link Communication Error

Note: The MIL may set on some engines (3.3L, 3.8L, 3.5L)

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 Powertrain Control Module across the Torque Management Request Sense Circuit. The PCM will acknowledge the TCM 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 my 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: P0736(50) - Gear Ratio Error in Reverse
P0731(51) - Gear Ratio Error in 1st
P0732(52) - Gear Ratio Error in 2nd
P0733(53) - Gear Ratio Error in 3rd
P0734(54) - Gear Ratio Error in 4th
P0715(56) - Input Speed Sensor Error
P0720(57) - Output Speed Sensor Error
P1794(58) - Speed Sensor Ground Error

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

Set condition: This code is set if the gear 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 of 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 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 intermittent 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 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 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 72 Km/h (45 MPH) - The appropriate code is set, EMCC is aborted and current gear is maintained. If while still traveling above 72 Km/h (45 MPH), the gear ratio becomes valid again, EMCC will reengage and normal operation will resume. If the gear ratio becomes intermittent and recovers three times in a given 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 72 Km/h (45 MPH) or at 35 Km/h (22 MPH) with closed throttle.

– Codes 51, 52, 53, 54, 56, and 57 (at speeds between 35 and 72 Km/h (22 and 45 MPH) - If one of these codes is set between 35 and 72 Km/h (22 and 45 MPH), the current gear will be maintained until the gear ratio problem corrects itself. If throttle is applied, the trans will go to 2nd gear. If this happens and the gear ratio problem goes away, normal operation will resume. If three gear 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 35 and 72 Km/h (22 and 45 MPH).

– Codes 51, 52, 53, 54, 56, and 57 (at speeds below 35 Km/h (22 MPH) - If a gear ratio problem is identified below 35 Km/h (22 MPH), the transmission will immediately substitute second gear for the current gear. If the gear ratio problem goes away, normal operation will resume. If three gear ratio problems are identified in a given key start, the transmission will go into relay open limp-in mode.

Possible causes:

Code P0736(50) - Excludes geartrain failures which should be obvious upon disassembly

> If code P1791(35) is also set, follow diagnostic procedure for code P1791(35) first

> Valve body - #1 ball check or LR switch valve sticking - may also set code P0731(51)

> Speed sensor or associated wiring

– may also set codes P0731(51), P0715(56), or P0720(57)

> Failed or slipping LR clutch - may also set code P0731(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 P0731(51) - Excludes geartrain failures which should be obvious upon disassembly

> If code P1791(35) is also set, follow diagnostic procedure for code P1791(35) first

> Valve body - #1 ball check or LR switch valve sticking - may also set code P0736(56) or have no Reverse

> Speed sensor or associated wiring - may also set codes P0736(50), P0715(56), or P0720(57)

> Failed or intermittent slipping UD clutch - may also set P0732(52), or P0733(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)

– Solenoid pack (UD pressure in 4th gear)

> Failed or slipping LR clutch - may also set code P0736(56) or have no Reverse

– LR seal leakage (Intermittent)

– Sticky LR accumulator seals (Intermittent)

Code P0732(52) - Excludes geartrain failures which should be obvious upon disassembly

> If code P1791(35) is also set, follow diagnostic procedure for code P1791(35) first

> Failed or slipping 2-4 clutch - may also set code P0734(54)

– 2-4 seal leakage (intermittent)

– Sticky accumulator seals (intermittent)

> Failed or intermittent slipping UD clutch - may also set code P0731(51) and/or P0733(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)

– Solenoid pack (UD pressure in 4th gear)

Code P0733(53) - Excludes geartrain failures which should be obvious upon disassembly

> If code P1791(35) is also set, follow diagnostic procedure for code P1791(35) first

> Failed or slipping OD clutch - may also set code P0734(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 P0731(51) and/or P0732(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)

– Solenoid pack (UD pressure in 4th gear)

Code P0734(54) - Excludes geartrain failures which should be obvious upon disassembly

> If code P1791(35) is also set, follow diagnostic procedure for code P1791(35) first

> Failed or slipping OD clutch - may also set code P0733(53)

– 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 slipping 2-4 clutch - may also set code P0732(52)

– 2-4 seal leakage (intermittent)

– Sticky accumulator seals (intermittent)

Codes P0715(56) and P0720(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 P1794(58)

> Open or shorted speed sensor ground (speed sensor ground is different from chassis ground)

> Open or shorted Temperature Sensor wiring to TRS

> TRS - Will also set code P1799(74)

> TCM

Name of code: P1796(70) - Autostick Sensor Circuit (If equipped)

Note: RS is a MUXED Autostick system

When monitored: Whenever the engine is running.

Set condition:

1) The transmission shift lever is not in AutoStick and either the upshift or downshift switch is closed.

2) Upshift and downshift switches 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 MUXED 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:

> Wiring or connector problems

> AutoStick switch failure

> TCM

Name of code: P1797(71)- Manual Shift Overheat

When monitored: Whenever the engine is running.

Set condition: 1) If the engine temperature exceeds 124C (255 °F) while operating in AutoStick mode.

2) If the transmission temperature exceeds 135C (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 transmission 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 substituted 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: P1798 (73) - Deteriorated Transaxle Fluid

When monitored: At every Fully Electronically Modulated Converter Clutch (FEMCC) to Partial Electronically Modulated Converter Clutch (PEMCC) transition 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 to 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 (EURO STAGE III OBD) warm-up 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 disconnect 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 (EURO STAGE III OBD) warm up starts.

Possible causes:

> Degraded transmission fluid

> Wheels severely out of alignment

> Internal torque converter problem

Name of Code: P1799(74) - Calculated Oil Temperature in Use

When Monitored: When ever the Engine is running.

Set condition: The code is set if any of the following conditions exist for three consecutive key starts:

> The Temperature Sensor voltage is out of range (below 0.07 volts or greater than 4.94 volts)

> If continuous erratic Temperature Sensor voltage is sensed.

> The Temperature Sensor temperature stays below 27C (80°F) for an extended period of time.

Theory of Operation: The TCM uses a Temperature Sensor to monitor the transmission 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 in this diagnostic manual) If the Temperature Sensor circuit fails to operate properly the TCM will use the calculated oil temperature routine found in prior model year TCM. If this occurs for three consecutive key starts, the code will be set. The TCM will then test the Temperature Sensor circuit after every 35 OBDII (EURO STAGE III OBD) warm-up starts. If the Temperature Sensor circuit is OK, the Temperature Sensor data is used in place of the Calculated Oil Temperature data.

Transmission Effects: If the Temperature Sensor indicates a temperature below -18C (0° F) or above 115C (240° F) at start up, The TCM compares the calculated oil temperature to the indicated Temperature Sensor oil temperature. If the calculated oil temperature differs significantly from the 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.

> TRS

> TCM

Name of Code: P1738(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 115C (240°F), the overheat shift schedule is activated refer to Transmission Operation as a function of Transmission Oil Temperature and the code is set. The DTC is an information 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 115C (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 condition occurs. 2nd gear partial EMCC above 40 Km/h (25 MPH), 3rd gear EMCC from 45-69 Km/h (28-43 MPH), delayed 3-4 upshift at 69 Km/h (43 MPH), early 4-3 coastdown at 66 Km/h (41 MPH), EMCC operation under all conditions above 40 Km/h (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

Name Of Code: P1739(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 32 Km/h (20 MPH), the code is set.

Theory of Operation: If a vehicle loses power to the 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 32 Km/h (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 DTC can be set. Therefore it is critical that this DTC 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. The DTC is for information only when trying to diagnosis intermittent 2nd gear operation and subsequently a return to normal operation.

Possible Causes:

- No Problem if vehicle is started in ″neutral″ at speeds above 32 Km/h (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: P1717(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 PCI bus circuit from MIC
> MIC
> TCM (If other communications codes are stored in the TCM only)

Name of code: P0600(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 the 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: P1714(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 circuit (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 72 Km/h (45 MPH) the transmission system will default to neutral. Below 72 Km/h (45 MPH) the transmission system will default to relay open limp-in mode. Park, Reverse, and Neutral are still available.
Possible causes:

> Charging system problem
> Poor/High resistance connection between TCM and Battery/Alternator
> TCM pin 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 relearn the value by performing the appropriate driving maneuver. 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 15C (60° F), the transmission must be run at idle or driven in gear until it goes above 15C (60°F). If the temperature is above 93C (200°F), the transmission must cool to below 93C (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 volumes 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 15C (60°F) and 93C (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 21-49C (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 43C (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 43C (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 43C (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.

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

Note: After replacing the TCM, you must reprogram pinion factor

3.4 USING THE DRBIII®

Refer to the DRBIII® users 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 S.T.A.R.. Center. 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®.

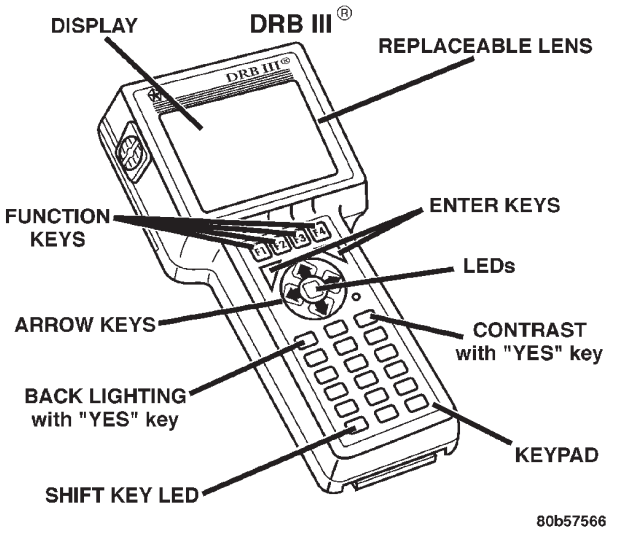
If all connections are proper between the DRBIII® and the vehicle or other devices, and the vehicle battery is fully charged, an inoperative DRBIII® may be the result of faulty cable or vehicle wiring. For a blank screen, refer to the appropriate Body Diagnostic manual.

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, 42LE, 45RFE, and 545RFE). 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 42LE 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 at the time of publication. The right is reserved to make changes at any time without notice.

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 DRB® 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 instructions should be serviced.

4.2.4 DRBIII® SAFETY INSTRUCTIONS

WARNING: EXCEEDING THE LIMITS OF THE DRB® 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 DRB® 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.

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 - 1100°F -50 - 600°C

*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 exceeds 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 attempting 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 DRB® 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”. Failure 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 DRBIII® 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 the 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 clutch 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
- Parking 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 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?

4.3.3 ELECTRONIC PINION FACTOR WARNINGS

The pinion factor must be set for all new transmission control modules. If the pinion factor is not set or if it is set incorrectly, any speedometer, speed control, rolling door locks, and other devices that are operated by the powertrain and body controllers will not function properly.

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) - Must be at latest release level.

- > Transmission Simulator (Miller # 8333)
- > Transmission Simulator (Miller # 8333-1) Adapter harness kit and panel overlay for FWD vehicles.
- > Jumper wires
- > Test Light (minimum of 25 ohms of resistance)
- > 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
DRBIII®	Diagnostic Readout Box
DTC	Diagnostic Trouble Code
EATX	Electronic Automatic Transaxle
EMCC	Electronically Modulated Converter Clutch
FCM	Front Control Module (part of the IPM system)
IOD	Ignition off-draw
IPM	Intelligent Power Module
IRT	Intelligent Recovery Timer
ISS	Input Speed Sensor
LED	Light Emitting Diode
LR	Low/reverse Clutch or Pressure Switch
LU	Lockup
MIC	Mechanical Instrument Cluster
MIL	Malfunction Indicator Lamp
OBDII	On Board Diagnostics
OD	Overdrive Clutch or Pressure Switch
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 or Pressure Switch

6.2 DEFINITIONS

OBDII (EURO STAGE III OBD) 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 71C (160°F) and must rise by at least 4.4C (40°F) from initial start up. To count as a warm-up cycle, no DTC may occur during the cycle.

NOTES

7.0

DIAGNOSTIC INFORMATION AND PROCEDURES

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

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check Powertrain Control Module DTC's. Are any of the following P-codes P0122, P0123, P0121 stored in the PCM? Yes → Refer to the Driveability category for the related symptom(s). Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0120-THROTTLE POSITION SENSOR SIGNAL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	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 4 No → Go To 7	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 41TE TRANSMISSION VERIFICATION TEST - VER 1.	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 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	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 wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. 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 → Test Complete. No → Replace the Throttle Position Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	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 DTC 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 AND CONNECTORS
TCM - INTERNAL ERROR

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 the Communication category for the related symptom(s). Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	Ignition on, engine not running. With the DRBIII®, select the following screens in order: ″BODY″ ″MIC″ ″MONITOR DISPLAY″ ″PCI BUS ENGINE INFO″. Does the DRBIII®, read ″NO RESPONSE″ from any of the listed PCM monitors? Yes → Refer to Communication Category for the related symptom(s). Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0600-SERIAL COMMUNICATION LINK MALFUNCTION — Continued

TEST	ACTION	APPLICABILITY
5	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

P0604-INTERNAL TCM

POSSIBLE CAUSES
TCM - INTERNAL ERROR

TEST	ACTION	APPLICABILITY
1	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

P0605-INTERNAL TCM

POSSIBLE CAUSES
TCM - INTERNAL ERROR

TEST	ACTION	APPLICABILITY
1	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

P0700-INTERNAL TCM

POSSIBLE CAUSES
TCM - INTERNAL ERROR

TEST	ACTION	APPLICABILITY
1	**NOTE: Make sure this DTC is set in the TCM before making repair.** **NOTE: The PCM also sets a P0700 but it only indicates that a DTC is set in the TCM and turns the MIL on.** If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. 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
CONDITION P0705 PRESENT
INTERMITTENT WIRING AND CONNECTORS
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
TRANSMISSION RANGE SENSOR
TCM - TRS T1 SENSE CIRCUIT
TCM - TRS T3 SENSE CIRCUIT
TCM - TRS T41 SENSE CIRCUIT
TCM - TRS T42 SENSE CIRCUIT

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Using the DRBIII®, perform the Shift Lever Position Test. Select the test outcome from the following: Test passes Go To 3 Test fails with DTC Go To 4 Test fails without DTC Adjust the shift linkage per the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. With the DRBIII®, perform the Shift Lever Position Test with the Transmission 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®. Did the test pass? Yes → Go To 5 No → Go To 6 **NOTE: Disconnect the Transmission Simulator and reconnect all the harness connectors.**	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Range Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Ignition on, engine not running. With the DRBIII® in Inputs/Outputs, read the TRS Sense circuits 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 the 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 harness connector to the TRS harness connector. Is the resistance above 5.0 ohms? Yes → Repair the TRS T1 Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
8	Turn the 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 the TRS T1 Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the TRS T1 Sense circuit at the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the TRS T1 Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	Turn the 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 harness connector to the TRS harness connector. Is the resistance above 5.0 ohms? Yes → Repair the TRS T3 Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 12	All
12	Turn the 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 ground and the TRS T3 Sense circuit in the TCM harness connector. Is the resistance below 5.0 ohms? Yes → Repair the TRS T3 Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 13	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
13	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the TRS T3 Sense circuit at the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the TRS T3 Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 14	All
14	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
15	Turn the 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 the TRS T41 Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 16	All
16	Turn the 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 ground and the TRS T41 Sense circuit in the TCM harness connector. Is the resistance below 5.0 ohms? Yes → Repair the TRS T41 Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 17	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
17	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the TRS T41 Sense circuit at the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the TRS T41 Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 18	All
18	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
19	Turn the 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 harness connector to the TRS harness connector. Is the resistance above 5.0 ohms? Yes → Repair the TRS T42 Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 20	All
20	Turn the 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 ground and the TRS T42 Sense circuit in the TCM harness connector. Is the resistance below 5.0 ohms? Yes → Repair the TRS T42 Sense circuit for a short to ground.. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 21	All

P0705-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
21	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the TRS T42 Sense circuit at the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the TRS T42 Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 22	All
22	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. 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 AND 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	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
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
3	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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 3000/1250 position. Turn the ″Input/Output″ switch to 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 +/-50 RPM? Yes → Go To 4 No → Go To 5 **NOTE: Disconnect the Transmission Simulator and reconnect all harness connectors.**	All
4	If there are no possible causes remaining, view repair. Repair Replace the Input Speed Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Input Speed Sensor Signal circuit from the TCM harness connector to the Input Speed Sensor harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Input Speed Sensor Signal circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Speed Sensor Ground circuit from the TCM harness connector to the Input Speed Sensor harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Speed Sensor Ground circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Speed Sensor circuit. Is the resistance Below 5.0 ohms? Yes → Repair the Input Speed Sensor Signal circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the Input Speed Sensor harness connector. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the Input Speed Sensor Signal circuit in the TCM harness connector. Is the voltage above 0.5 volts? Yes → Repair the Input Speed Sensor Signal circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the Speed Sensor Ground circuit in the TCM harness connector. Is the voltage above 0.5 volts? Yes → Repair the Speed Sensor Ground circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
11	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 AND 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	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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 3000/1250 position. Turn the ″Input/Output″ switch to ON. With the DRBIII®, read the Input RPM and Output RPM. Does the Input RPM read 3000 and the Output RPM read 1250 +/-50 RPM? Yes → Go To 4 No → Go To 5	All
4	If there are no possible causes remaining, view repair. Repair Replace the Output Speed Sensor. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Output Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Output Speed Sensor Signal circuit from the TCM harness connector to the Output Speed Sensor harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Output Speed Sensor Signal circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Output Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Speed Sensor Ground circuit from the TCM harness connector to the Output Speed Sensor harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Speed Sensor Ground circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0720-OUTPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Output Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Output Speed Sensor Signal circuit. Is the resistance Below 5.0 ohms? Yes → Repair the Output Speed Sensor Signal circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch harness connector Remove the Transmission Control Relay from the IPM. **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 the IPM. Ignition on, engine not running. Measure the voltage of the Output Speed Sensor Signal circuit in the TCM harness connector. Is the voltage above 0.5 volts? Yes → Repair the Output Speed Sensor Signal circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. Remove the Transmission Control Relay from the IPM. **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 the IPM. Ignition on, engine not running. Measure the voltage of the Speed Sensor Ground circuit in the TCM harness connector. Is the voltage above 0.5 volts? Yes → Repair the Speed Sensor Ground circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0720-OUTPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
11	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

P0725-ENGINE SPEED SENSOR CIRCUIT (3.3L/3.8L)

When Monitored and Set Condition:

P0725-ENGINE SPEED SENSOR CIRCUIT (3.3L/3.8L)

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
PCM TPS DTC'S PRESENT
INTERMITTENT WIRING & CONNECTORS
CRANK POSITION SENSOR GROUND CIRCUIT OPEN
CRANK POSITION SENSOR SIGNAL CIRCUIT OPEN
TCM - ENGINE SPEED SENSOR CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read PCM DTCs. Are there any PCM Throttle Position Sensor DTC's present? Yes → Repair all PCM Throttle Position Sensor DTCs before proceeding. Refer to the driveability category for the appropriate symptom. No → Go To 3	All

P0725-ENGINE SPEED SENSOR CIRCUIT (3.3L/3.8L) — 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 set at 0? Yes → Go To 4 No → Go To 7	All
4	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Crank Position Sensor harness connector. Measure the resistance of the Crank Position Sensor Ground circuit between the TCM harness connector and the CKP harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Crank Position Sensor Ground circuit for an open. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Crank Position Sensor harness connector. Measure the resistance of the Crank Position Sensor Signal circuit between the TCM harness connector and the CKP harness connector. Is the resistance above 5.0 ohms? Yes → Repair the open Crank Position Sensor Signal circuit. No → Go To 6	All
6	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR.	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. Check the power and ground circuits of the Transmission Control Module. Start the engine. With the DRBIII®, monitor the Engine RPM. Wiggle the wire harness between the TCM and CKP. Were any problems found and/or did the Engine RPM change while wiggling the harness? Yes → Repair wiring and/or connectors as necessary. No → Test Complete.	All

Symptom:

P0725-ENGINE SPEED SENSOR CIRCUIT (3.5L)

When Monitored and Set Condition:

P0725-ENGINE SPEED SENSOR CIRCUIT (3.5L)

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	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 set at 0? Yes → Go To 3 No → Go To 8	All

P0725-ENGINE SPEED SENSOR CIRCUIT (3.5L) — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off to the lock position. Disconnect the PCM harness connector(s). Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the EATX RPM signal circuit between the TCM harness connector and the PCM harness connector. Is the resistance above 5.0 ohms? Yes → Repair the EATX RPM Signal circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the PCM harness connector(s). Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the EATX RPM Signal circuit. 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 the ignition off to the lock position. Disconnect the 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 harness 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 the 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 and program the Powertrain Control Module in accordance with the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0725-ENGINE SPEED SENSOR CIRCUIT (3.5L) — 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
TRANSMISSION - INTERNAL

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission DTC's If any of these DTC's are present, perform their respective tests first. Are DTC's P1791, P0715, P0720, P1794, P1720, 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 P1791 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 per the service information.** With the DRBIII®, perform the 1st gear clutch test. Follow the instructions on the DRBIII®. Increase the throttle angle-TPS Degree to 30° for no more than a few seconds. **CAUTION: Do not overheat the transmission.** Did the clutch test pass - Input speed remains at 0? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not present at this time. 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. **NOTE: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Check the Speed Sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and the FWD Adapter Cable kit, Miller tool #8333-1. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	If there are no possible causes remaining, view repair. Repair Repair internal transmission problem. Check all components related to the Underdrive and L/R clutches and inspect the Oil Pump. 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
TRANSMISSION - INTERNAL

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0732-GEAR RATIO ERROR IN 2ND — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's If any of these DTC's are present, perform their respective tests first. Are DTC's P1791, P0715, P0720, P1794, P1720, 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 P1791 first if it is present. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	**NOTE: Low fluid level can be the cause of many transmission problems. Check and adjust the fluid level per the Service Information.** With the DRBIII®, perform the 2nd gear clutch test. Follow the instructions on the DRBIII®. Increase the throttle angle, TPS Degree, to 30° for no more than a few seconds. **CAUTION: Do not overheat the transmission.** Did the clutch test pass, Input speed remain at 0? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not present at this time. 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. **NOTE: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Check the Speed Sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and the FWD Adapter Cable kit, Miller tool #8333-1. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	With the DRBIII®, read Transmission DTC's. Is a DTC P1788 - 2/4 Hydraulic Pressure Switch and/or P1782 - 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	If there are no possible causes remaining, view repair. Repair Repair internal transmission problem. 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 information and repair as necessary. 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
TRANSMISSION - INTERNAL

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0733-GEAR RATIO ERROR IN 3RD — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's If any of these DTC's are present, perform their respective tests first. Are DTC's P1791, P0715, P0720, P1794, P1720, 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 P1791 first if it is present. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	**NOTE: Low fluid level can be the cause of many transmission problems. Check and adjust the fluid level per the Service Information.** With the DRBIII®, perform the 3rd gear clutch test. Follow the instructions on the DRBIII®. Increase the throttle angle, TPS Degree, to 30° for no more than a few seconds. **CAUTION: Do not overheat the transmission.** Did the clutch test pass, Input speed remain at 0? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not present at this time. 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 Rear Ratio DTC(s), check the Speed Sensors for proper operation. **NOTE: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Check the speed sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and the FWD Adapter Cable kit, Miller tool #8333-1. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	With the DRBIII®, read Transmission DTC's. Is a DTC P1787 - OD Hydraulic Pressure Switch and/or P1781 - 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	If there are no possible causes remaining, view repair. Repair Repair internal transmission problem. If the transmission is to be repaired, check all of the components related to the Underdrive and Overdrive clutches. Inspect the pump per service information and repair as necessary. 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
TRANSMISSION - INTERNAL

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0734-GEAR RATIO ERROR IN 4TH — Continued

TEST	ACTION	APPLICABILITY
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 P1791, P0715, P0720, P1794, P1720, 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 P1791 first if it is present. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	**NOTE: Low fluid level can be the cause of many transmission problems. Check and adjust the fluid level per the Service Information. 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 DRBIII®. Increase the throttle angle, TPS Degree, to 30° for no more than a few seconds. **CAUTION: Do not overheat the transmission.** Did the clutch test pass, Input Speed remain at 0? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not present at this time. 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. **NOTE: Remove the Starter Relay from the PDC. This will prevent the vehicle from being started in gear.** Check the Speed Sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and the FWD Adapter Cable kit, Miller tool #8333-1. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	With the DRBIII®, read Transmission DTC's. Is a DTC P1788 - 2/4 Hydraulic Pressure Switch and/or P1782 - 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	If there are no possible causes remaining, view repair. Repair Repair internal transmission problem. 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 information and repair as necessary. 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
TRANSMISSION - INTERNAL

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Transmission DTC's If any of these DTC's are present, perform their respective tests first. Are DTC's P1791, P0715, P0720, P1794, P1720, 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 P1791 first if it is present. 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 per the Service Information. 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®. Increase the throttle angle, TPS Degree, to 30° for no more than a few seconds. **CAUTION: Do not overheat the Transmission.** Did the clutch test pass, Input Speed remain at 0? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not present at this time. 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. **NOTE: Remove the starter relay before installing the Transmission Simulator.** Check the speed sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and the FWD Adapter Cable 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. Were there any problems found? Yes → Repair as necessary. No → Test Complete.	All
5	If there are no possible causes remaining, view repair. Repair Repair internal transmission problem. 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 information and repair as necessary.	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	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0740-TORQUE CONVERTER CLUTCH CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTC's Are the DTCs P0750 and/or P1784 present also? Yes → Refer to symptom list for problems related to DTC P0750 and/or P1784. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, record and erase Transmission DTCs. Drive the vehicle until it is fully warmed up to at least 43.33° C or 110° F. Perform the following steps 3 times. With the DRBIII®, monitor TPS degree. Drive the vehicle to the speed of 83.45 Km/h or 50 MPH and allow 4th gear to engage for at least 10 seconds. Close the throttle, then tip back in until the throttle angle, TPS degrees, is between 25 and 29 degrees. **NOTE: If you go over 30 TPS 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. Verify if the problem is only experienced under extreme hot or cold conditions. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	Check the Transmission Fluid level per the Service Information. Is the Transmission Fluid level at the proper level? Yes → Go To 6 No → Adjust the Transmission fluid level per the Service Information. Repair the cause of the incorrect Transmission Fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	If there are no possible causes remaining, view repair. Repair Repair internal transmission problem. Inspect the Valve Body per service information and replace if necessary. If no problems are found in the Valve Body, replace the Solenoid/Pressure switch assembly. Replace the Torque Converter in either case Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	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 a test is run in response to a Gear Ratio or Pressure Switch error.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
INTERMITTENT WIRING AND CONNECTORS
TRANSMISSION CONTROL 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

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0750-LR SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission Control Module DTC's Are there any Transmission Control Relay related DTC's P1765, P1767, or P1768 present? Yes → Refer to symptom list and perform the appropriate symptom for Transmission Control Relay related 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 counter for P0750 set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. With the DRBIII®, actuate the L/R Solenoid. Monitor the L/R Solenoid LED on the Transmission Simulator #8333. Did the L/R Solenoid LED on the Transmission Simulator blink on and off during actuation? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Solenoid/Pressure switch assembly . Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0750-LR SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Measure the resistance of the L/R Solenoid Control circuit from the TCM harness connector to the Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the L/R Solenoid Control circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Measure the resistance between ground and the L/R Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the L/R Solenoid Control circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the L/R Solenoid Control circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the L/R Solenoid Control circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 AND CONNECTORS
TRANSMISSION CONTROL 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
TCM - 2-4 SOLENOID

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0755-2-4 SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission Control Module DTC's Are there any Transmission Control Relay related DTC's P1765, P1767, or P1768 present?. Yes → Refer to symptom list and perform the appropriate symptom for Transmission Control Relay related 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 counter for P0755 set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. With the DRBIII®, actuate the 2-4 Solenoid. Monitor the 2-4 Solenoid LED on the Transmission Simulator, Miller tool #8333 Did the 2-4 Solenoid LED on the Transmission Simulator blink on and off during actuation? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Solenoid/Pressure switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0755-2-4 SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 2-4 Solenoid Control circuit from the TCM harness connector to the Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the 2-4 Solenoid Control circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the 2-4 Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the 2-4 Solenoid Control circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the 2-4 Solenoid Control circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the 2-4 Solenoid Control circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module .WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 AND CONNECTORS
TRANSMISSION CONTROL 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
TCM - OD SOLENOID

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0760-OD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission Control Module DTC's Are there any Transmission Control Relay related DTC's P1765, P1767, or P1768 present? Yes → Refer to symptom list and perform the appropriate symptom for the Transmission Control Relay related 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 counter for P0760 set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. Monitor the OD Solenoid LED on the Transmission Simulator Miller tool #8333, With the DRBIII®, actuate the OD Solenoid. Did the OD Solenoid LED on the Transmission Simulator blink on and off during actuation? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Solenoid/Pressure Switch Assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0760-OD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the OD Solenoid Control circuit from the TCM harness connector to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the OD Solenoid Control circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the OD Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the OD Solenoid Control circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the OD Solenoid Control circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the OD Solenoid Control circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 AND CONNECTORS
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
TCM - UD SOLENOID

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0765-UD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission Control Module DTC's Are there any Transmission Control Relay related DTC's P1765, P1767, or P1768 present? Yes → Refer to symptom list and perform the appropriate symptom for Transmission Control Relay related 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 counter for P0765 set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. With the DRBIII®, actuate the UD Solenoid. Monitor the UD Solenoid LED on the Transmission Simulator, Miller tool #8333. Did the UD Solenoid LED on the Transmission Simulator blink on and off? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace Transmission Solenoid/Pressure Switch Assembly as required. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector in the IPM. Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P0765-UD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the UD Solenoid Control circuit from the TCM harness connector to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the UD Solenoid Control circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the UD Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the UD Solenoid Control circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector in the IPM. Ignition on, engine not running. **Note: Check connectors - Clean/repair as necessary.** Measure the voltage of the UD Solenoid Control circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the UD Solenoid Control circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

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 circuit is less than 10.0 volts for 15 seconds. *P-1714 generally indicates a gradually falling battery voltage or resistive connections to the TCM.

POSSIBLE CAUSES
RELATED CHARGING SYSTEM DTCS
INTERMITTENT WIRING AND CONNECTORS
FUSED IGNITION SWITCH OUTPUT (RUN/START) CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT (START) CIRCUIT OPEN
GROUND CIRCUIT OPEN
FUSED B+ CIRCUIT
TRANS CONTROL RELAY OUTPUT TO TCM HIGH RESISTANCE
TCM - LOW BATTERY VOLTAGE

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 System DTC's, before testing DTC P1714. 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 for P1714 set at 0? Yes → Go To 4 No → Go To 10	All
4	Turn the ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Fused Ignition Switch Output circuit in the TCM harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 5 No → Repair the Fused Ignition Switch Output (Run/Start) circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Remove the Starter Relay from the IPM. Turn the ignition switch to the start position. Using a 12-volt test light connected to ground, check the Fused Ignition Switch Output (Start) circuit in the TCM harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 6 No → Repair the Fused Ignition Switch Output (Start) circuit for an open or high resistance. If the fuse is open make sure to check for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. **Note: Reinstall the Starter Relay.**	All

P1714-LOW BATTERY VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Using a 12-volt test light connected to 12-volts, check the ground circuits in the TCM harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly at all ground circuits? Yes → Go To 7 No → Repair the Ground circuit(s) for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Fused B+ circuit in the TCM harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 8 No → Repair the Fused B+ circuit for an open or high resistance. If the fuse is open make sure to check for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Using a 12-volt test light connected to ground, check both Transmission Control Relay Output circuits in the TCM harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 9 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
9	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1714-LOW BATTERY VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
10	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 for 10 seconds.

POSSIBLE CAUSES
NO COMMUNICATION WITH PCM
OTHER BUS PROBLEMS PRESENT
INTERMITTENT WIRING AND CONNECTORS
TCM - BUS COMMUNICATION

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 the DTC, P1716, return? Yes → Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 AND CONNECTORS
MIC - NO COMMUNICATION
TCM - BUS COMMUNICATION

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 communication category and perform symptoms related 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 DTC, P1717- No Communication with the MIC, present? Yes → Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 Information Is the engine cooling system functioning properly? Yes → Go To 2 No → Repair cause of engine overheating. Refer to Service Information for additional repair information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
2	Check the Transmission Fluid level per the Service Information. Is the Transmission Fluid Level at the proper level? Yes → Go To 3 No → Repair any Transmission Fluid leak as necessary and adjust the Transmission Fluid Level in accordance with the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	Perform Cooler Flow Check per Service Information. Did the cooler flow test pass? Yes → Go To 4 No → Repair cause of plugged Transmission Oil Cooler. Flush or replace Transmission Oil Cooler(s) as necessary per Service Information. 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. Were any problems found? Yes → Repair cause of transmission overheating or if indicated install an additional Transmission Oil Cooler. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	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 DTC and the Output RPM is above 800 RPM (approximately 32 Km/h or 20 MPH) then the DTC will set.

POSSIBLE CAUSES
POWER UP AT SPEED

TEST	ACTION	APPLICABILITY
1	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. Were there any problems found? Yes → Repair wiring and/or connectors as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1765-SWITCHED BATTERY

When Monitored and Set Condition:

P1765-SWITCHED BATTERY

When Monitored: Ignition key is turned from the OFF position to RUN position and/or ignition key is turned from the CRANK position to RUN position.

Set Condition: This DTC is set if the Transmission Control Module senses voltage on any of the Pressure Switch Inputs prior to the TCM energizing the Transmission Control Relay.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
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 - SWITCHED BATTERY

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 for P1765 set at 0? Yes → Go To 3 No → Go To 7	All

P1765-SWITCHED BATTERY — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the 2-4 Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the 2-4 Pressure Switch Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the L/R Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the L/R Pressure Switch Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the OD Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the OD Pressure Switch Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1765-SWITCHED BATTERY — Continued

TEST	ACTION	APPLICABILITY
7	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 the OFF position to the RUN position and/or ignition is turned from the CRANK position to RUN position.

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

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
TRANSMISSION CONTROL RELAY STUCK CLOSED
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT SHORT TO VOLTAGE
TRANSMISSION RELAY CONTROL CIRCUIT SHORT TO VOLTAGE
TCM - TRANSMISSION RELAY ALWAYS ON

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1767-TRANSMISSION RELAY ALWAYS ON — 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 set to 0? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Remove the Transmission Control Relay from the IPM. **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. 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 the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Measure the voltage of the Transmission Control Relay Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the voltage above 0.5 volt? Yes → Repair the Transmission Control Relay Output circuit for a short to voltage Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Remove the Transmission Control Relay from the IPM. Ignition on, engine not running. **Note: Check connectors - Clean/repair as necessary.** Measure the voltage of the Transmission Relay Control circuit in the IPM connector. Is the voltage above 0.5 volt? Yes → Repair Transmission Relay Control Circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1767-TRANSMISSION RELAY ALWAYS ON — Continued

TEST	ACTION	APPLICABILITY
7	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 circuits at the Transmission Control Module when the TCM is energizing the relay.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
FUSED B+ CIRCUIT OPEN
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
TRANSMISSION RELAY CONTROL CIRCUIT OPEN
TRANSMISSION CONTROL RELAY GROUND CIRCUIT OPEN
TRANSMISSION CONTROL RELAY STUCK OPEN
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT SHORT TO GROUND
TRANSMISSION RELAY CONTROL CIRCUIT SHORT TO GROUND
TCM - TRANSMISSION CONTROL RELAY ALWAYS OFF

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 set at 0? Yes → Go To 3 No → Go To 10	All
3	Turn the ignition off to the lock position. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Fused B+ circuit in the Transmission Control Relay connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 4 No → Repair the Fused B+ circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition off to the lock position. Remove the Transmission Control Relay from the IPM. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Transmission Control Relay Control circuit between the Transmission Control Relay connector and the TCM harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Transmission Control Relay Control circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Using a 12-volt test light connected to 12-volts, check the Transmission Control Relay Ground circuit. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 6 No → Repair the Transmission Control Relay Ground circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1768-RELAY OUTPUT ALWAYS OFF — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit. Ignition on, engine not running. Using a 12-volt test light connected to ground, check the three Transmission Control Relay Output circuits. **NOTE: There are three Transmission Relay Output circuits. Two are located in the TCM harness connector and one located in the Transmission Solenoid/Pressure Switch Assembly harness connector** **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly on all three Transmission Control Relay Output circuits? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Transmission Control Relay Output circuit. Is the resistance below 5.0 ohms? Yes → Repair the Transmission Control Relay Output circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Transmission Relay Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Transmission Control Relay Control circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

P1768-RELAY OUTPUT ALWAYS OFF — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Install a substitute Relay in place of the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. With the DRBIII®, actuate the Transmission Control Relay. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit. Does the test light blink on and off? Yes → Test Complete. Replace the Transmission Control Relay. Perform 41TE TRANSMISSION VERIFICATION. No → Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
10	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 DTC is set if three unsuccessful attempts are made to shift into 1st gear in one given ignition start.

POSSIBLE CAUSES
INCORRECT FLUID LEVEL
RELATED DTC P1784 PRESENT
INTERMITTENT OPERATION
TRANSMISSION CONTROL 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 - SOLENOID SWITCH VALVE STUCK
TCM - SOLENOID SWITCH VALVE

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 DTC P1784 present also? Yes → Refer to symptom list and perform test for DTC P1784. 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 DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 12	All
4	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. On the Transmission Simulator select L/R on the Pressure Switch selector switch. With the DRBIII®, monitor the L/R Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Did the Pressure Switch state change from OPEN to CLOSED when the test button was pressed? Yes → Go To 5 No → Go To 7	All
5	Check the Transmission Fluid Level per the Service Information. Is the Transmission Fluid Level at the proper level? Yes → Go To 6 No → Adjust fluid level and repair cause of incorrect fluid level. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	If there are no possible causes remaining, view repair. Repair Inspect the Solenoid Switch Valve per service information and repair or replace as necessary. If no problems are found, replace the Transmission Solenoid/Pressure Switch assembly per Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between Fused B+ circuit and the Transmission Control Relay Output circuit in the IPM. Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 8 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the L/R Pressure Switch Sense circuit from the TCM harness connector to the Transmission Solenoid/Pressure Switch harness connector. Is the resistance above 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for an open. 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 Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the L/R Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION — Continued

TEST	ACTION	APPLICABILITY
10	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the L/R Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the L/R Pressure Switch Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All
11	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
12	The conditions necessary to set this DTC are not present at this time. Test drive the vehicle. Did you experience 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 Assembly. If excessive debris is Present in the pan or valve body, repair cause 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: This DTC will set if the TCM senses the L/R Pressure Switch closing while performing PEMCC or FEMCC or after two unsuccessful attempts to perform PEMCC or FEMCC.

POSSIBLE CAUSES
INCORRECT FLUID LEVEL
RELATED DTC P1784 PRESENT
INTERMITTENT OPERATION
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
INTERNAL TRANSMISSION - SOLENOID SWITCH VALVE STUCK
TCM - SOLENOID SWITCH VALVE

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 DTCs Is the DTC P1784 present also? Yes → Refer to symptom list and perform test for DTC P1784. 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 DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 12	All
4	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. On the Transmission Simulator select L/R on the Pressure Switch selector switch. With the DRBIII®, monitor the L/R Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Did the Pressure Switch state change from OPEN to CLOSED when the test button was pressed? Yes → Go To 5 No → Go To 7	All
5	Check the Transmission Fluid Level per the Service Information. Is the Transmission Fluid Level at the proper level? Yes → Go To 6 No → If the Transmission Fluid is low, repair any Transmission Fluid leak as necessary and adjust the Transmission Fluid Level in accordance with the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	If there are no possible causes remaining, view repair. Repair Inspect the Solenoid Switch Valve in the valve body per the Service Information and repair or replace as necessary. If no problems are found in valve body, replace the Transmission Solenoid/Pressure Switch Assembly per service information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 8 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the L/R Pressure Switch Sense circuit from the TCM harness connector to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the L/R Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION — Continued

TEST	ACTION	APPLICABILITY
10	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the L/R Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volts? Yes → Repair the L/R Pressure Switch Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All
11	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
12	The conditions necessary to set this DTC are not present at this time. Test drive the vehicle. Did you experience 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 Assembly. If excessive debris is present in the pan or valve body, repair cause 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 DTC is set if one of the Pressure Switches are open or closed at the wrong time in a given gear.

POSSIBLE CAUSES
TRANSMISSION RELAY DTCS PRESENT
INTERMITTENT WIRING AND CONNECTORS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
O/D PRESSURE SWITCH SENSE CIRCUIT OPEN
O/D PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
O/D PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
O/D PRESSURE SWITCH INOPERATIVE
TCM - O/D PRESSURE SWITCH

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1781-OD PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay related DTC's P1765, 1767, or 1768 present? Yes → Refer to symptom list and perform the appropriate test for Transmission Relay related 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 counter 2 or less for P1781? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. On the Transmission Simulator select OD on the Pressure Switch selector switch. With the DRBIII®, monitor the OD Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Did the Pressure Switch state change from OPEN to CLOSED when the test button was pressed? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1781-OD PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the O/D Pressure Switch Sense circuit from the TCM harness connector to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the O/D Pressure Switch Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the O/D Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the O/D Pressure Switch circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the O/D Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the O/D Pressure Switch Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 DTC is set if one of the Pressure Switches are open or closed at the wrong time in a given gear .

POSSIBLE CAUSES
TRANSMISSION RELAY DTC'S PRESENT
INTERMITTENT WIRING AND CONNECTORS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
2/4 PRESSURE SWITCH SENSE CIRCUIT OPEN
2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
2/4 PRESSURE SWITCH
TCM - 2/4 PRESSURE SWITCH CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1782 - 2-4 PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay related DTC's P1765, 1767, or 1768 present? Yes → Refer to symptom list and perform the appropriate test for Transmission Control Relay related 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 counter 2 or less for P1782? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. On the Transmission Simulator select 2/4 on the Pressure Switch selector switch. With the DRBIII®, monitor the 2/4 Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Did the Pressure Switch state change from OPEN to CLOSED when the test button was pressed? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1782 - 2-4 PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 2/4 Pressure Switch Sense circuit from the TCM harness connector to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the 2/4 Pressure Switch Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness 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 Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the 2/4 Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair 2/4 Pressure Switch Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 DTC 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 DTC P1791 PRESENT
TRANSMISSION CONTROL RELAY DTCS PRESENT
TCM AND WIRING - L/R PRESSURE SWITCH
INTERMITTENT WIRING AND CONNECTORS
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
TCM - L/R PRESSURE SWITCH CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1784-LR PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check for other Transmission DTC's. Is DTC P1791 present in addition to the DTC that you are diagnosing? Yes → Refer to DTC list and perform symptom for P1791 Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay related DTC's P1765, 1767, or 1768 present? Yes → Refer to symptom list and perform the appropriate test for Transmission 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 11	All
5	Turn the 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. On the Transmission Simulator select L/R on the Pressure Switch selector switch. With the DRBIII®, monitor the L/R Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Did the Pressure Switch state change from OPEN to CLOSED when the test button was pressed? Yes → Replace the Solenoid/Pressure Switch Assembly in accordance with the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

P1784-LR PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Transmission Control Relay Output circuit and the Fused B+ circuit in the IPM. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. If the fuse is open make sure to check for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the L/R Pressure Switch Sense circuit from the TCM harness connector to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the L/R Pressure Switch Sense circuit in the Transmission Solenoid/Pressure Switch harness connector. Is the resistance below 5.0 ohms? Yes → Repair the L/R Pressure Switch circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

P1784-LR PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 IPM. Ignition on, engine not running. Measure the voltage of the L/R Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the L/R Pressure Switch Sense circuit for a short to voltage.. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 DTC P1791 PRESENT
RELATED DTC'S PRESENT
INTERMITTENT WIRING AND CONNECTORS
TRANSMISSION CONTROL 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
TCM - O/D HYDRAULIC TEST FAILURE

P1787-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check for other Transmission DTCs. Is the DTC P1791 present also? Yes → Refer to symptom list and perform test for P1791. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read Transmission DTC's. Is the DTC P0733 and/or P1781 present also? Yes → Replace the Transmission or Solenoid/Pressure Switch Assembly. 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 13	All

P1787-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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.** On the Transmission Simulator select OD on the Pressure Switch selector switch. With the DRBIII®, monitor the OD Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Wiggle the wires leading to the TCM while pressing the button. Did the O/D 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 21° C or 70° 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, view repair. Repair 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 per the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch harness connector. Remove the Transmission Control Relay from the IPM **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 Transmission Control Relay connector in the IPM. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 9 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. If the fuse is open make sure to check for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1787-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the OD Pressure Switch Sense circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector.. Is the resistance above 5.0 ohms? Yes → Repair the O/D Pressure Switch Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the OD Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the OD Pressure Switch Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All
11	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the OD Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair OD Pressure Switch Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 12	All
12	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
13	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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
LOSS OF PRIME P1791 PRESENT
RELATED DTC'S PRESENT
TRANSMISSION FLUID LEVEL
INTERMITTENT WIRING AND CONNECTORS
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
2/4 PRESSURE SWITCH SENSE CIRCUIT OPEN
2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
INTERNAL TRANSMISSION
TCM - 2/4 HYDRAULIC PRESSURE

P1788-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check for other Transmission DTCs. Is the DTC P1791 present also? Yes → Refer to symptom list and perform test for P1791. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read Transmission DTC's. Is the DTC P0732, P0734 and/or P1782 present also? Yes → Replace the Transmission or Solenoid/Pressure switch assembly. 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 13	All

P1788-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. On the Transmission Simulator select 2/4 on the Pressure Switch selector switch. With the DRBIII®, monitor the 2/4 Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Wiggle the wiring 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 Transmission Fluid Level at the proper level? 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, view repair. Repair Disassemble and inspect the Valve Body per service information and repair or replace as necessary. If there are no problems found in the Valve Body, replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information, Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector in the IPM. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 9 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. If the fuse is open make sure to check for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1788-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 2/4 Pressure Switch Sense circuit from the TCM harness connector to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the 2/4 Pressure Switch Sense circuit or an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness 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 Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All
11	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the 2/4 Pressure Switch Sense circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair the 2/4 Pressure Switch Sense circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 12	All
12	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
13	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 P1789 PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	**NOTE: The vehicle must be driven to set this DTC, the transmission must be warm or hot with the Engine RPM above 1000 RPM.** This DTC is an indicator of 2/4 and/or O/D Hydraulic Pressure Switch DTC's present. Perform the tests for P1787 and/or P1788 determine which switch is failing. If there are no possible causes remaining, view repair. Repair Refer to symptom list for problems related to Transmission and perform tests for P1787 and/or P1788. 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
CONDITION P1790 PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	This DTC 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 DTC's current.** If there are no possible causes remaining, view repair. Repair Refer to Transmission symptom list for the 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
PLUGGED TRANSMISSION OIL FILTER
SHIFT LEVER POSITION
TRANSMISSION FLUID LEVEL
INTERMITTENT WIRING AND CONNECTORS
TRANSMISSION OIL PUMP

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1791-LOSS OF PRIME — Continued

TEST	ACTION	APPLICABILITY
2	The Transmission Fluid temperature must be above 21° C or 70° 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 Transmission Fluid Level at the proper level? Yes → Go To 3 No → If the Transmission Fluid is low, repair any Transmission Fluid leak as necessary and adjust the Transmission Fluid Level in accordance with the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
3	Place the gear selector in park. Start the engine. The Transmission must be at operating temperature prior to checking pressure. A cold Transmission 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 4 No → Go To 6	All
4	The conditions necessary to set this DTC are not present at this time. Test drive the vehicle. Allow the Transmission to shift through all gears and ranges. Did you experience any Delayed Engagement and/ or No Drive condition? Yes → Go To 6 No → Go To 5	All
5	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
6	Remove and inspect the Transmission Oil Pan and Transmission Oil Filter per the Service Information. Does the Transmission Oil Pan contain excessive debris and/or is the Oil Filter plugged? Yes → Repair the cause of plugged Transmission Oil Filter. Refer to the Service Information for repair procedures. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	With the DRBIII®, perform a Shift Lever Position test. Follow the instructions on the DRBIII®. Did the Shift Lever Position Test pass? Yes → Go To 8 No → Refer to symptom list and perform test for DTC P0705. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1791-LOSS OF PRIME — Continued

TEST	ACTION	APPLICABILITY
8	If there are no possible causes remaining, view repair. 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
QUICK LEARN WAS PERFORMED
RECENT BATTERY DISCONNECTION
TCM WAS REPLACED OR DISCONNECTED
INTERMITTENT WIRING AND CONNECTORS
FUSED B+ CIRCUIT TO TCM OPEN
GROUND CIRCUIT OPEN

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1792-BATTERY WAS DISCONNECTED — Continued

TEST	ACTION	APPLICABILITY
2	Turn ignition off to the lock position. Disconnect the TCM harness connector. Ignition on, engine not running. Measure the voltage of the Fused B+ circuit in the TCM harness connector. Is the voltage below 10.0 volts? Yes → Go To 3 No → Go To 5	All
3	Turn the ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Fused B+ circuit in the TCM harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 4 No → Repair the Fused B+ circuit for a open or high resistance. If the fuse is open make sure to check for a short to ground. 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.** Using a 12-volt test light connected to 12-volts, check all the ground circuits in the TCM harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection 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 Quick Learn procedure been performed? Yes → This is the cause of the DTC. Erase the DTC and return vehicle to customer. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Has the battery been disconnected, lost it's charge, or been replaced recently? Yes → This is the cause of the DTC. Erase the 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 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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 AND CONNECTORS
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	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 DTCs P1716, P0731, P0732, P0733, P0734, P1736 present also? Yes → If any of these codes are present, disregard the P1793 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 0? Yes → Go To 4 No → Go To 9	All
4	Turn the 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 harness connector to the PCM harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Torque Management Request Sense circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the 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 ground and the Torque Management Request Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair Torque Management Request Sense circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the 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 harness 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 the 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 harness connector. Is the voltage above 7.0 volts? Yes → Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module. Replace and program the PCM Module in accordance with the Service Information. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair 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 AND CONNECTORS
SPEED SENSOR GROUND CIRCUIT OPEN
TCM - SPEED SENSOR GROUND

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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

P1794-SPEED SENSOR GROUND ERROR — Continued

TEST	ACTION	APPLICABILITY
3	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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 selector switch to the 3000/1250 position. Turn the Input/Output switch to ON. With the DRBIII®, read the Input and Output Speed Sensor RPM. Does the Input Speed read 3000 RPM and the Output Speed read 1250 RPM within 50 RPM? Yes → Go To 5 No → Go To 5	All
5	Turn the 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 Ground circuit from the TCM harness connector to the Speed Sensor harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Speed Sensor Ground circuit for an open or high resistance.. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

P1795-INTERNAL TCM

POSSIBLE CAUSES
TCM - INTERNAL ERROR

TEST	ACTION	APPLICABILITY
1	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1796-AUTOSTICK SENSOR CIRCUIT

POSSIBLE CAUSES
VERIFY AUTOSTICK OPERATION WITH SWITCH IN THE DOWN POSITION
VERIFY AUTOSTICK OPERATION WITH SWITCH IN THE UP POSITION
VERIFY OD OFF SWITCH OPERATION
INTERMITTENT OPERATION
AUTOSTICK/OD OFF MUX INPUT CIRCUIT OPEN
AUTOSTICK/OD OFF SWITCH ASSEMBLY GROUND CIRCUIT OPEN
AUTOSTICK/OD OFF MUX INPUT CIRCUIT SHORT TO GROUND
AUTOSTICK/OD OFF MUX INPUT CIRCUIT SHORT TO VOLTAGE
TCM - AUTOSTICK INPUT 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 for P1796 set at 0? Yes → Go To 2 No → Go To 11	All
2	Turn the ignition on. Select the Autostick position with the gear selector. With the DRBIII®, observe the Autostick switch voltage. **NOTE: Do not press any Autostick switches while reading the voltage.** Is the voltage between 3.8 - 4.8 volts? Yes → Go To 3 No → Go To 6	All
3	Turn the ignition on. Select the Autostick position with the gear selector. With the DRBIII®, observe the Autostick switch voltage. Push the Autostick down switch. Is the voltage between 0.3 - 1.6 volts? Yes → Go To 4 No → Replace the Autostick/OD OFF switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition on. Select the Autostick position with the gear selector. With the DRBIII®, observe the Autostick switch voltage. Push the Autostick up switch. Is the voltage between 1.6 - 2.8 volts? Yes → Go To 5 No → Replace the Autostick/OD OFF switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1796-AUTOSTICK SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition on. Select the Drive position with the gear selector. With the DRBIII®, observe the Autostick switch voltage. Push the O/D OFF switch. Is the voltage between 2.8 - 3.8 volts? Yes → Test Complete. No → Replace the Autostick/OD OFF switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Autostick/OD switch harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Autostick/OD Off Mux Input circuit between the Autostick/OD switch harness connector and the TCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open Autostick/OD Off Mux Input circuit. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Autostick/OD switch harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the ground circuit between the Autostick/OD switch harness connector and ground. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the open Autostick/OD Off Switch ground circuit, if an open in the ground wire is not found, replace the Autostick/OD Off Switch assembly. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
8	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Autostick/OD switch harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Autostick/OD Off Mux Input circuit to Ground. Is the resistance below 5.0 ohms? Yes → Repair the Autostick/OD Off Mux Input circuit for a short to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

P1796-AUTOSTICK SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Autostick/OD switch harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Autostick/OD Off Mux Input circuit. Is the voltage above 5.5 volts? Yes → Repair the Autostick/OD Off Mux Input circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set this DTC are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Test drive the vehicle through all Autostick gears. Were any problems found or did the DTC return? Yes → Repair any wiring/connector problems as necessary. If the DTC set, return to the symptom P1796 and perform the diagnostics. 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	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	This is an informational DTC only. Check the Engine and Transmission Cooling Systems for proper operation. Check the Radiator Cooling Fan operation. Check the Transmission Cooling 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 DTC.** Were there any problems found? 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 TRANSMISSION FLUID

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 Oil Pan and Oil Filter per the Service Information. Install a new Transmission Oil Filter per Service Information. Reinstall Transmission Oil Pan, and refill with new Transmission Fluid per the Service Information. **Note: The Transmission Cooler must be flushed before prodceeding.** Start the engine, check and adjust the Transmission Fluid Level per Service Information. Allow the engine to idle for 10 minutes, in Park. Flush the Transmission Oil Cooler per the Service Information. Turn the ignition off. Drain and refill the Transmission Fluid. Flush the Transmission Oil Cooler again. Start the engine, check and adjust the Transmission Fluid Level per Service Information. 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 DTC 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 Convertor per the Service Information. Note: After replacing the Torque Convertor, use the DRBIII to perform the TCC Break In procedure. This will prevent possible shudder conditions. 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 AND CONNECTORS
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
TCM - HI TRANSMISSION TEMPERATURE SENSOR
TCM - LO TRANSMISSION TEMPERATURE SENSOR

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many Transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read the engine DTC's. Check and repair all engine DTC's prior to performing Transmission Symptom Diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0705 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.** **NOTE: Check for applicable TSB's related to the symptom.** 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 the ignition off to the lock position. **CAUTION: Remove the Starter Relay from the IPM. 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. With the DRBIII®, monitor the Trans Temp Volts. On the Transmission Simulator place the Thermistor Voltage Selector Switch to all three positions. Compare the DRBIII® reading with the numbers on the Transmission Simulator. Pick one that best matches your readings. 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 the 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 harness connector to the TRS harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Speed Sensor Ground circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the 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 Transmission Temperature Sensor Signal circuit from the TCM harness connector to the TRS harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Transmission Temperature Sensor Signal circuit for an open. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

P1799-CALCULATED OIL TEMP IN USE — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the TRS harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the Speed Sensor Ground circuit in the TCM harness connector. Is the voltage above 0.5 volt? Yes → Repair Speed Sensor Ground circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Remove the Transmission Control Relay from the IPM. **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 Transmission Control Relay connector in the IPM. Ignition on, engine not running. Measure the voltage of the Transmission Temperature Sensor Signal circuit in the TCM harness connector. Is the voltage above 8.0 volts? Yes → Repair Transmission Temperature Sensor Signal circuit for a short to voltage. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
9	If there are no possible causes remaining, view repair. Repair If the temperature readings are correct with the simulator installed, the problem must be internal.Replace TRS assembly as required. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All

P1799-CALCULATED OIL TEMP IN USE — Continued

TEST	ACTION	APPLICABILITY
10	Turn the 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 ground and the Transmission Temperature Sensor Signal circuit. Is the resistance below 5.0 ohms? Yes → Repair Transmission Temperature Sensor Signal circuit shorted to ground. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All
11	If there are no possible causes remaining, view repair. Repair Replace the TCM. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1.	All
12	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
*BRAKE SHIFT INTERLOCK OUTPUT OPEN

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
BRAKE SHIFT INTERLOCK CONTROL CIRCUIT OPEN
BRAKE SHIFT INTERLOCK FEED CIRCUIT OPEN
BRAKE SHIFT INTERLOCK SOLENOID
FRONT CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, record and erase DTC's. Turn the ignition off to the lock position. Turn the ignition on. With the DRBIII®, read DTCs. Does the DRBIII® display BRAKE SHIFT INTERLOCK OUTPUT OPEN? Yes → Go To 2 No → Go To 8	All
2	Turn the ignition off to the lock position. Disconnect the Brake Shift Interlock harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Using a 12-volt test light connected to B+, check the Brake Shift Interlock Control circuit in the Brake Shift Interlock harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 3 No → Go To 6	All
3	Turn the ignition off to the lock position. Disconnect the Brake Shift Interlock harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Brake Shift Interlock Feed circuit in the Brake Shift Interlock harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 4 No → Go To 5	All
4	If there are no possible causes remaining, view repair. Repair Replace the Brake Shift Interlock Solenoid in accordance with the Service Information.	All

*BRAKE SHIFT INTERLOCK OUTPUT OPEN — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Disconnect the Front Control Module harness connector. Disconnect the Brake Shift Interlock harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Brake Shift Interlock Feed Circuit from the Front Control Module connector to the Brake Shift Interlock harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Brake Shift Interlock Feed Circuit for an open. No → Go To 7	All
6	Turn the ignition off to the lock position. Disconnect the Front Control Module harness connector. Disconnect the Brake Shift Interlock harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Brake Shift Interlock Control Circuit from the Front Control Module connector to the Brake Shift Interlock harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Brake Shift Interlock Control Circuit for an open. No → Go To 7	All
7	If there are no possible causes remaining, view repair. Repair Replace the Front Control Module in accordance with the Service Information.	All
8	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 wiring while checking for shorts and open circuits. Were there any problems found? Yes → Repair as necessary. No → Test Complete.	All

Symptom:
*CHECKING PARK/NEUTRAL SWITCH OPERATION

POSSIBLE CAUSES
P/N POSITION SWITCH SENSE CIRCUIT OPEN
P/N POSITION SWITCH SENSE CIRCUIT SHORTED TO GROUND
TRANSMISSION RANGE SENSOR
PCM - P/N POSITION SWITCH

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, 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 DRBIII® display. Did the DRBIII® 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.	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 100k ohms? Yes → Go To 4 No → Repair the P/N Position Switch Sense circuit for a short to ground.	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.	All

*CHECKING PARK/NEUTRAL SWITCH OPERATION — Continued

TEST	ACTION	APPLICABILITY
5	If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 2.	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.	All

Symptom:

*NO BACK UP LAMP OPERATION

POSSIBLE CAUSES
BCM - BACK UP LAMP DRIVER OPEN DTC PRESENT
BCM - BACK UP LAMP DRIVER SHORTED DTC PRESENT
BCM - BUS PROBLEM
IPM - BUS PROBLEM
LEFT REVERSE LAMP GROUND CIRCUIT OPEN
LEFT REVERSE LAMP OPEN
RIGHT REVERSE LAMP GROUND CIRCUIT OPEN
RIGHT REVERSE LAMP OPEN
TRS GROUND CIRCUIT OPEN
TRS REVERSE SENSE CIRCUIT OPEN TO IPM

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, read the BCM DTCs. Is the Back Up Lamp Driver Open DTC Present? Yes → Refer to the Body category and perform the appropriate symptom diagnosis. No → Go To 2	All
2	With the DRBIII®, read the BCM DTCs. Is the Back Up Lamp Driver Shorted DTC Present? Yes → Refer to the Body category and perform the appropriate symptom diagnosis. No → Go To 3	All
3	With the DRBIII®, attempt to communicate with the BCM. Can the DRBIII® communicate with the BCM? Yes → Go To 4 No → Refer to the Communication category and perform the appropriate symptom diagnosis.	All
4	With the DRBIII®, attempt to communicate with the IPM. Can the DRBIII® communicate with the IPM? Yes → Go To 5 No → Refer to the Communication category and perform the appropriate symptom diagnosis.	All

*NO BACK UP LAMP OPERATION — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Disconnect the Left Reverse Lamp harness connector per the service information. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Reverse Lamp Ground circuit. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the Reverse Lamp Ground circuit for an open.	All
6	Turn the ignition off to the lock position. Disconnect the Left Reverse Lamp harness connector per the service information. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance across the Reverse Lamp contacts. Is the resistance above 5.0 ohms? Yes → Replace the Reverse Lamp. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the Right Reverse Lamp harness connector per the service information. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Reverse Lamp Ground circuit. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the Reverse Lamp Ground circuit for an open.	All
8	Turn the ignition off to the lock position. Disconnect the Right Reverse Lamp harness connector per the service information. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance across the Reverse Lamp contacts. Is the resistance above 5.0 ohms? Yes → Replace the Reverse Lamp. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TRS harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the TRS Ground circuit. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair the TRS Ground circuit for an open.	All
10	Turn the ignition off to the lock position. Disconnect the IPM harness connector. Disconnect the TRS harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the TRS Reverse Sense circuit between the IPM connector and the TRS connector. Is the resistance below 5.0 ohms? Yes → Test Complete. No → Repair the TRS Reverse Sense circuit for an open.	All

Symptom:

*NO SPEEDOMETER OPERATION

POSSIBLE CAUSES
NO SPEEDOMETER OPERATION

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, check the pinion factor setting in the TCM. Is the pinion factor missing or set incorrectly? Yes → One possible cause is the pinion factor is not set or is set incorrectly in the TCM. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

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 the Transmission Fluid Level per the Service Information. Is the fluid level OK? Yes → Go To 2 No → Adjust fluid level and repair cause of incorrect fluid level.	All
2	Place vehicle on hoist. **WARNING: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** Run vehicle on hoist under conditions necessary to duplicate the noise. **NOTE: It may be necessary to test drive the vehicle to duplicate the noise.** Using Chassis Ears or other suitable listening device, verify the source of the noise. Is the noise coming from the transmission? Yes → Go To 3 No → Test Complete.	All
3	With the shift lever in neutral, raise the engine speed and listen to the noise. **NOTE: THE RADIO MUST BE 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.** 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, view repair. Repair Repair internal transmission problem as necessary. Inspect all of the transmission components for signs of wear. If no problems found, replace the Transmission oil pump..	All
5	If there are no possible causes remaining, view repair. Repair Repair internal transmission problem as necessary. Inspect all of the transmission components for signs of wear. Pay particular attention to bearings, pinion gears, etc. Repair or replace as necessary.	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	**NOTE: 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. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. 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. 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 wiring and/or connector as necessary. Perform 41TE TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
*TRANSMISSION SIMULATOR 8333 WILL NOT POWER UP

TEST	ACTION	APPLICABILITY
1	**NOTE: If the Transmission Simulator Miller 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 Transmission Simulator not installed correctly on the vehicle.** **NOTE: Check the Simulator ground cable connection.** **NOTE: Check all Transmission Simulator harness connections.** Repair these symptoms before having the Transmission Simulator Miller Tool #8333 repaired. Continue Test Complete.	All

Verification Tests

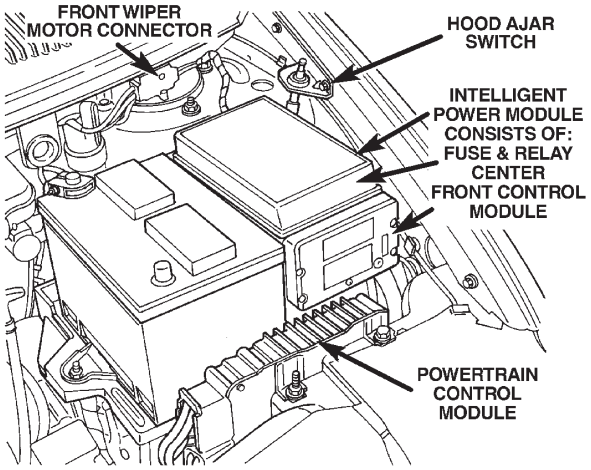
41TE TRANSMISSION VERIFICATION TEST - VER 1	APPLICABILITY
1. Connect the DRBIII® to the Data Link Connector (DLC). 2. Reconnect any disconnected components. 3. With the DRBIII®, erase all Transmission DTC's, also erase the PCM DTC's. **4. NOTE: Erase DTC P0700 in the PCM to turn the Malfunction Indicator Lamp (MIL) off after making Transmission repairs.** 5. With the DRBIII®, display Transmission Temperature. Start and run the engine until the Transmission Temperature is HOT - above 43.33° C or 110° F. 6. Check the Transmission Fluid and adjust if necessary. Refer to the Service information for the Fluid Fill procedure. **7. 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″** **8. NOTE: If the Torque Converter is replaced, or if a TCM is replaced on a vehicle whose Torque Converter has less than 3750 miles and less than 360 minutes of PEMCC, then with the DRBIII® restart the TCC Break-In. This is in order to avoid possible shudder.** 9. 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. 10. 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. 11. For a specific DTC, drive the vehicle to the Symptom's When Monitored/When Set conditions to verify the DTC repair. **12. NOTE: Use the EATX OBDII Task Manager to run Good Trip time in each gear, this will confirm the repair and to ensure that the DTC has not re-matured.** 13. 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 perform the appropriate Symptom. Were there any Diagnostic Trouble Codes (DTCs) set during the road test? Yes → Refer to the Symptom List for appropriate Symptom(s). No → Repair is complete.	All

Verification Tests — Continued

POWERTRAIN VERIFICATION TEST VER - 2	APPLICABILITY
1. NOTE: If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will be set in the ABS Module, Airbag Module and the SKIM. **2. NOTE: If the vehicle is equipped with a Sentry Key Immobilizer System, Secret Key data must be updated. Refer to the Service Information for the PCM, SKIM and the Transponder (ignition key) for programming information.** 3. Inspect the vehicle to ensure that all components related to the repair are connected properly. 4. With the DRBIII®, clear DTCs and Reset Memory all engine values. 5. Run the engine for one warm-up cycle to verify proper operation. 6. Road test the vehicle. Use all accessories that may be related to this repair. 7. With the DRBIII®, confirm that no DTC's or Secondary Indicators are present and that all components are functioning properly. 8. If this test is being performed after a No Trouble Code test, verify the symptom is no longer present. 9. If the symptom is still present, or any other symptom or DTC is present refer to the appropriate category and perform the corresponding symptom. 10. Refer to any Technical Service Bulletins that may apply. 11. If there are no DTCs present and all components are functional properly, the repair is complete. Are any DTCs present? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

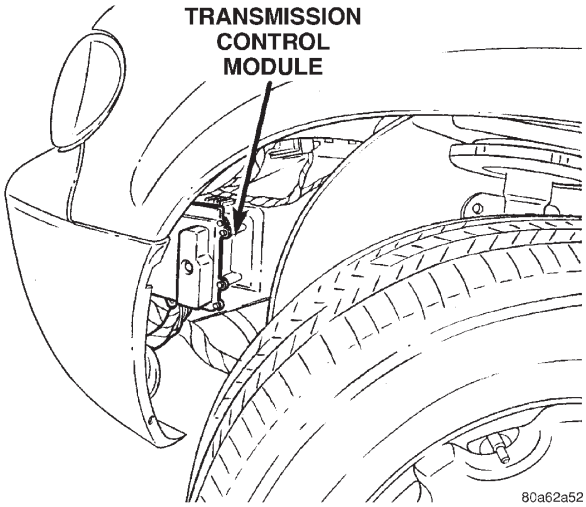
8.0 COMPONENT LOCATIONS

8.1 POWERTRAIN CONTROL MODULE



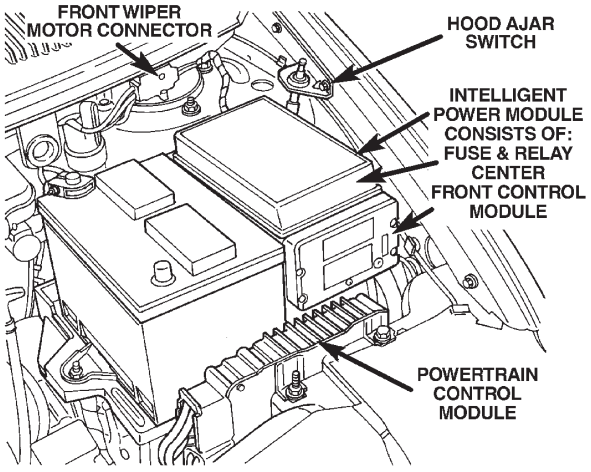
80964236

8.2 TRANSMISSION CONTROL MODULE



80a62a52

8.3 INTELLIGENT POWER MODULE



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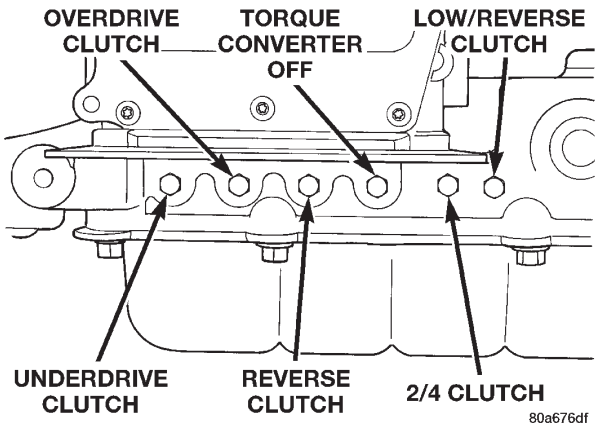
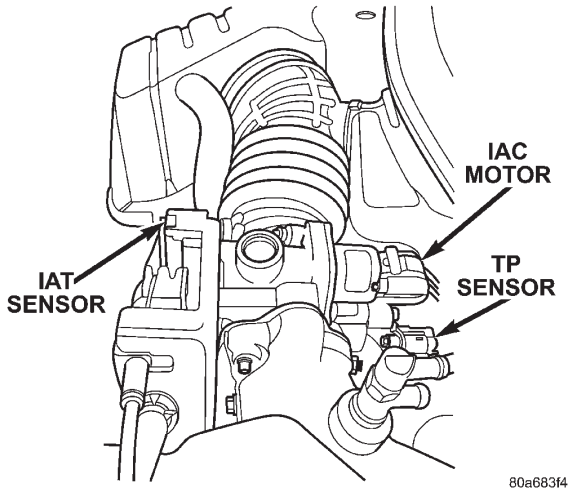
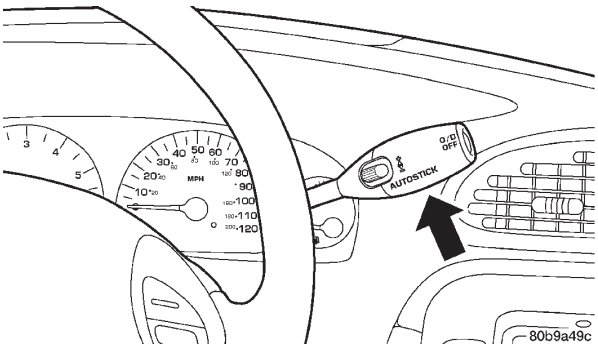
8.4 PRESSURE PORT LOCATIONS



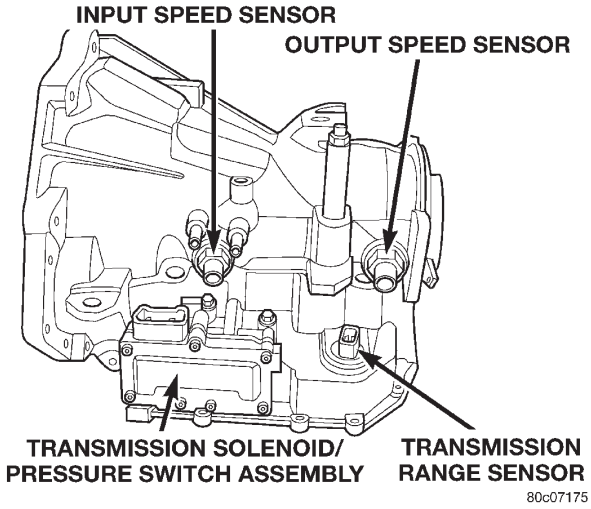
8.5 THROTTLE POSITION SENSOR (2.4L)



8.6 AUTOSTICK/OD OFF

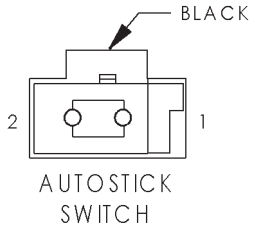


8.7 TRANSMISSION COMPONENT LOCATIONS



NOTES

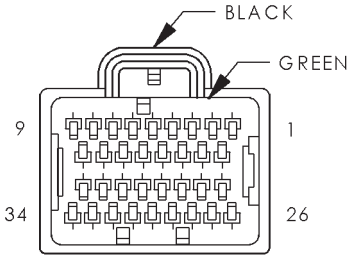
9.0 CONNECTOR PINOUTS



AUTOSTICK SWITCH

AUTOSTICK SWITCH - BLACK 2 WAY

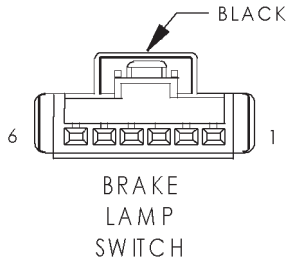
CAV	CIRCUIT	FUNCTION
1	T55 20YL/VT	AUTOSTICK/OVERDRIVE OFF MUX INPUT
2	Z65 20BK/YL	GROUND



BODY CONTROL MODULE C2

BODY CONTROL MODULE C2 - BLACK/GREEN 34 WAY

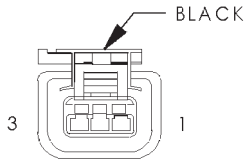
CAV	CIRCUIT	FUNCTION
1	L61 18WT/LG	LEFT FRONT TURN SIGNAL DRIVER
2	L63 18WT/DG	LEFT REAR TURN SIGNAL DRIVER
3	L60 18WT/TN	RIGHT FRONT TURN SIGNAL DRIVER
4	L62 18WT/BR	RIGHT REAR TURN SIGNAL DRIVER
5	F20 20PK/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
6	G25 20VT/TN (EXCEPT LOWLINE)	LIFTGATE SWITCH MUX
7	A114 20GY/RD	FUSED B(+) (I.O.D.)
8	-	-
9	L1 18WT/LG	BACK-UP LAMP DRIVER
10	P3 20TN/WT	LEFT FRONT DOOR LOCK DRIVER
11	P2 20TN/GY	RIGHT FRONT DOOR LOCK DRIVER
12	P38 20TN/DB	RIGHT SLIDING DOOR LOCK DRIVER
13	-	-
14	-	-
15	Z15 18BK/TN	GROUND
16	G920 20VT/YL (MEMORY)	MEMORY SELECT SWITCH RETURN
17	G153 20VT/YL (POWER LIFTGATE)	LIFTGATE MODULE WAKE UP SIGNAL
18	P32 20TN/VT	LEFT SLIDING DOOR LOCK DRIVER
19	Z10 18BK/TN	GROUND
20	P5 20TN/OR	LEFT SLIDING DOOR UNLOCK DRIVER
21	-	-
22	P30 20TN/DG	LIFTGATE HANDLE SWITCH SENSE
23	-	-
24	G200 20VT/BR (MEMORY)	MEMORY SELECT SWITCH MUX
25	M22 20YL/OR	COURTESY LAMPS DRIVER
26	P4 20TN/BR	RIGHT FRONT DOOR UNLOCK DRIVER
27	P34 20TN/LB	RIGHT SLIDING DOOR UNLOCK DRIVER
28	P1 20TN/LG	LEFT FRONT DOOR UNLOCK DRIVER
29	-	-
30	-	-
31	-	-
32	W13 18BR/LG	REAR WIPER MOTOR CONTROL
33	M24 20YL/WT	COURTESY LAMPS DRIVER
34	-	-



BRAKE
LAMP
SWITCH

BRAKE LAMP SWITCH - BLACK 6 WAY

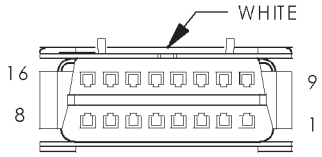
CAV	CIRCUIT	FUNCTION
1	A103 18GY/RD	FUSED B(+)
2	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT
3	V30 20VT/WT	SPEED CONTROL BRAKE SWITCH OUTPUT
4	V32 20VT/YL	SPEED CONTROL ON/OFF SWITCH SENSE
5	Z429 20BK/OR	GROUND
6	B29 20DG/WT	BRAKE SWITCH SENSE



CRANKSHAFT
POSITION
SENSOR

CRANKSHAFT POSITION SENSOR - BLACK 3 WAY

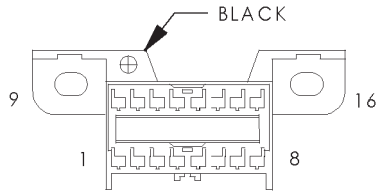
CAV	CIRCUIT	FUNCTION
1	F888 18BR/PK	8 VOLT SUPPLY
2	K900 18DB/DG	SENSOR GROUND
3	K24 18BR/LB	CRANKSHAFT POSITION SENSOR SIGNAL



DATA LINK
CONNECTOR

DATA LINK CONNECTOR - WHITE 16 WAY

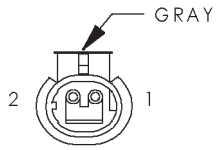
CAV	CIRCUIT	FUNCTION
1	-	-
2	D25 20WT/VT	PCI BUS
3	-	-
4	Z11 18BK/LG	GROUND
5	Z111 18BK/WT	GROUND
6	D20 20WT/LG	SCI RECEIVE
7	D21 20WT/BR	SCI TRANSMIT
8	-	-
9	D23 20WT/BR	FLASH PROGRAM ENABLE
10	-	-
11	-	-
12	-	-
13	-	-
14	D16 20WT/OR	SCI RECEIVE
15	-	-
16	A105 20DB/RD	FUSED B(+)



DIAGNOSTIC JUNCTION PORT

DIAGNOSTIC JUNCTION PORT - BLACK 16 WAY

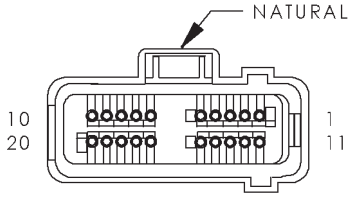
CAV	CIRCUIT	FUNCTION
1	D25 20WT/VT	PCI BUS (PCM/SKIM)
2	D25 20WT/VT	PCI BUS (HVAC)
3	D25 20WT/VT	PCI BUS (RADIO)
4	D25 20WT/VT	PCI BUS (ORC)
5	D25 20WT/VT	PCI BUS (CLUSTER)
6	D25 20WT/VT	PCI BUS (BCM)
7	D25 20WT/VT	PCI BUS (DLC)
8	D25 20WT/VT	PCI BUS (OVERHEAD CONSOLE)
9	D25 20WT/VT	PCI BUS (IPM)
10	D25 20WT/VT	PCI BUS (LSIACM)
11	D25 20WT/VT	PCI BUS (MEMORY SEAT/MIRROR)
12	D25 20WT/VT	PCI BUS (PWR DOOR/ LT, RT LIFTGATE)
13	D25 20WT/VT	PCI BUS (RSIACM)
14	-	-
15	-	-
16	-	-



INPUT SPEED SENSOR (3.3/3.8L)

INPUT SPEED SENSOR (3.3L/3.8L) - GRAY 2 WAY

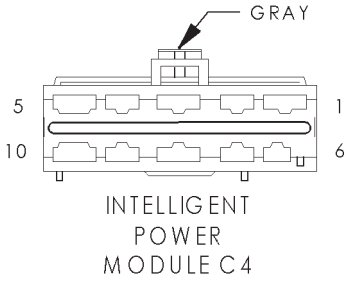
CAV	CIRCUIT	FUNCTION
1	T13 18DG/VT	SPEED SENSOR GROUND
2	T52 18DG/WT	INPUT SPEED SENSOR SIGNAL



INTELLIGENT POWER MODULE C3

INTELLIGENT POWER MODULE C3 - NATURAL 20 WAY

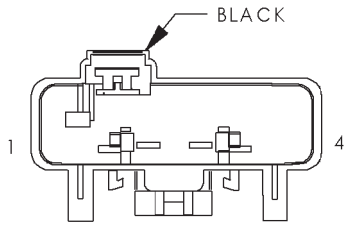
CAV	CIRCUIT	FUNCTION
1	Z115 20BK/OR (3.3L/3.8L)	GROUND
2	F1 18PK/WT (3.3L/3.8L)	FCM OUTPUT (UNLOCK-RUN-START)
3	T751 18YL (3.3L/3.8L)	FUSED IGNITION SWITCH OUTPUT (START)
4	T2 18DG/WT	TRS REVERSE SENSE
5	T16 18YL/OR (3.3L/3.8L)	TRANSMISSION SAFETY SHUTDOWN RELAY OUTPUT
6	T15 18YL/BR (3.3L/3.8L)	TRANSMISSION CONTROL RELAY CONTROL
7	C3 18DB/YL	A/C COMPRESSOR CLUTCH RELAY OUTPUT
8	K31 18BR	FUEL PUMP RELAY CONTROL
9	C13 18LB/OR	A/C COMPRESSOR CLUTCH RELAY CONTROL
10	A104 18YL/RD (3.3L/3.8L)	FUSE B(+)
11	-	-
12	-	-
13	D25 18WT/VT (3.3L/3.8L)	PCI BUS (EATX)
14	T752 18DG/OR	ENGINE STARTER MOTOR RELAY CONTROL
15	Z116 18BK/VT	GROUND
16	K51 18BR/WT	AUTOMATIC SHUTDOWN RELAY CONTROL
17	F202 18PK/GY	IGNITION SWITCH OUTPUT (RUN-START)
18	K173 18BR/VT	RADIATOR FAN RELAY CONTROL
19	F202 18PK/GY	IGNITION SWITCH OUTPUT (RUN-START)
20	A109 18OR/RD	FUSED B(+)



INTELLIGENT POWER MODULE C4

INTELLIGENT POWER MODULE C4 - GRAY 10 WAY

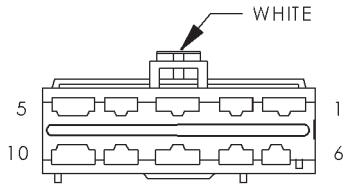
CAV	CIRCUIT	FUNCTION
1	Z127 12BK/DG	GROUND
2	T750 12YL/GY	ENGINE STARTER MOTOR RELAY OUTPUT
3	K342 16BR/WT	AUTOMATIC SHUTDOWN RELAY OUTPUT
4	F500 18DG/PK (ANTILOCK BRAKES)	FUSED IGNITION SWITCH RELAY OUTPUT (RUN)
5	-	-
6	D25 16WT/VT (ANTILOCK BRAKES)	PCI BUS
7	A107 12TN/RD (ANTILOCK BRAKES)	FUSED B(+)
8	A111 12DG/RD (ANTILOCK BRAKES)	FUSED B(+)
9	A701 14BR/RD	FUSED B(+)
10	-	-



INTELLIGENT POWER MODULE C5

INTELLIGENT POWER MODULE C5 - BLACK 4 WAY

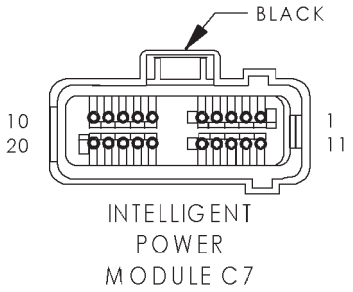
CAV	CIRCUIT	FUNCTION
1	A1 04RD	B(+)
2	-	-
3	-	-
4	-	-



INTELLIGENT POWER MODULE C6

INTELLIGENT POWER MODULE C6 - WHITE 10 WAY

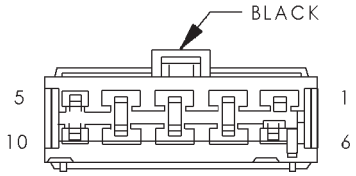
CAV	CIRCUIT	FUNCTION
1	A101 12VT/RD	FUSED B(+)
2	Z117 16BK/WT	GROUND
3	Z118 16BK/YL	GROUND
4	A110 12OR/RD (POWER SEAT)	FUSED B(+)
5	-	-
6	-	-
7	C7 12DB	FUSED FRONT BLOWER MOTOR RELAY OUTPUT
8	F307 16LB/PK (ACCESSORY RELAY POSITION)	FUSED ACCESSORY RELAY OUTPUT
8	F307 16LB/PK (BATTERY POSITION)	FUSED B(+)
9	A113 12WT/RD (POWER SLIDING DOOR)	FUSED B(+)
10	-	-



INTELLIGENT POWER MODULE C7

INTELLIGENT POWER MODULE C7 - BLACK 20 WAY

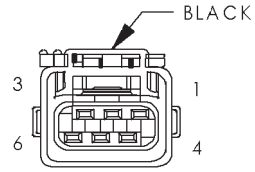
CAV	CIRCUIT	FUNCTION
1	C16 20DB/GY	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
2	T751 20YL	FUSED IGNITION SWITCH OUTPUT (START)
3	D25 20WT/VT	PCI BUS
4	-	-
5	K32 18DB/YL	BRAKE TRANSMISSION SHIFT INTERLOCK SOLENOID CONTROL
6	-	-
7	W7 20BR/GY	FRONT WIPER PARK SWITCH SENSE
8	B20 20DG/OR	BRAKE FLUID LEVEL SWITCH SENSE
9	F201 18PK/OR	FCM OUTPUT (RUN-START)
10	F214 20PK/LG	FCM OUTPUT (RUN-START)
11	A106 20LB/RD	FUSED B(+)
12	-	-
13	F2 18PK/WT	FCM OUTPUT (UNLOCK RUN-START)
14	-	-
15	A114 16GY/RD	FUSED B(+) (I.O.D.)
16	D23 20WT/BR	FLASH PROGRAM ENABLE
17	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT
18	X1 16DG/BR (PREMIUM 8 SPEAKER)	NAME BRAND SPEAKER RELAY OUTPUT
19	X3 20DG/VT	HORN SWITCH SENSE
20	F100 18PK/VT	FCM OUTPUT (RUN)



INTELLIGENT POWER MODULE C9

INTELLIGENT POWER MODULE C9 - BLACK 10 WAY

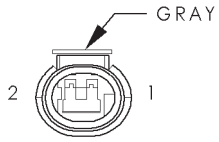
CAV	CIRCUIT	FUNCTION
1	A102 12WT/RD	FUSED B(+)
2	F20 18PK/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
3	C15 12DB/WT	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
4	A105 18DB/RD	FUSED B(+)
5	L61 18WT/LG	LEFT FRONT TURN SIGNAL OUTPUT
6	A701 16BR/RD	FUSED B(+) (HAZARD)
6	A701 16BR/RD	FUSED B(+) (HAZARD)
7	F306 16DB/PK	FUSED ACCESSORY RELAY OUTPUT (RUN-ACC)
8	F30 12PK/YL (POWER WINDOWS)	FUSED ACCESSORY RELAY OUTPUT (RUN-ACC)
9	A115 12YL/RD (POWER LIFTGATE)	FUSED B(+)
10	F302 18GY/PK	FUSED ACCESSORY RELAY OUTPUT (RUN-ACC)



LEFT REAR LAMP ASSEMBLY

LEFT REAR LAMP ASSEMBLY - BLACK 6 WAY

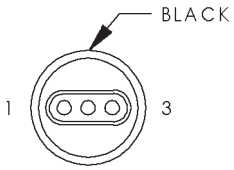
CAV	CIRCUIT	FUNCTION
1	L63 18WT/DG	LEFT REAR TURN SIGNAL DRIVER
2	L62 18WT/BR	RIGHT REAR TURN SIGNAL DRIVER
3	L77 18WT/BR	FUSED LEFT PARK LAMP RELAY OUTPUT
4	L1 18WT/LG	BACK-UP LAMP DRIVER
5	Z363 18BK/DG	GROUND
6	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT



OUTPUT SPEED SENSOR (3.3L/3.8L)

OUTPUT SPEED SENSOR (3.3L/3.8L) - GRAY 2 WAY

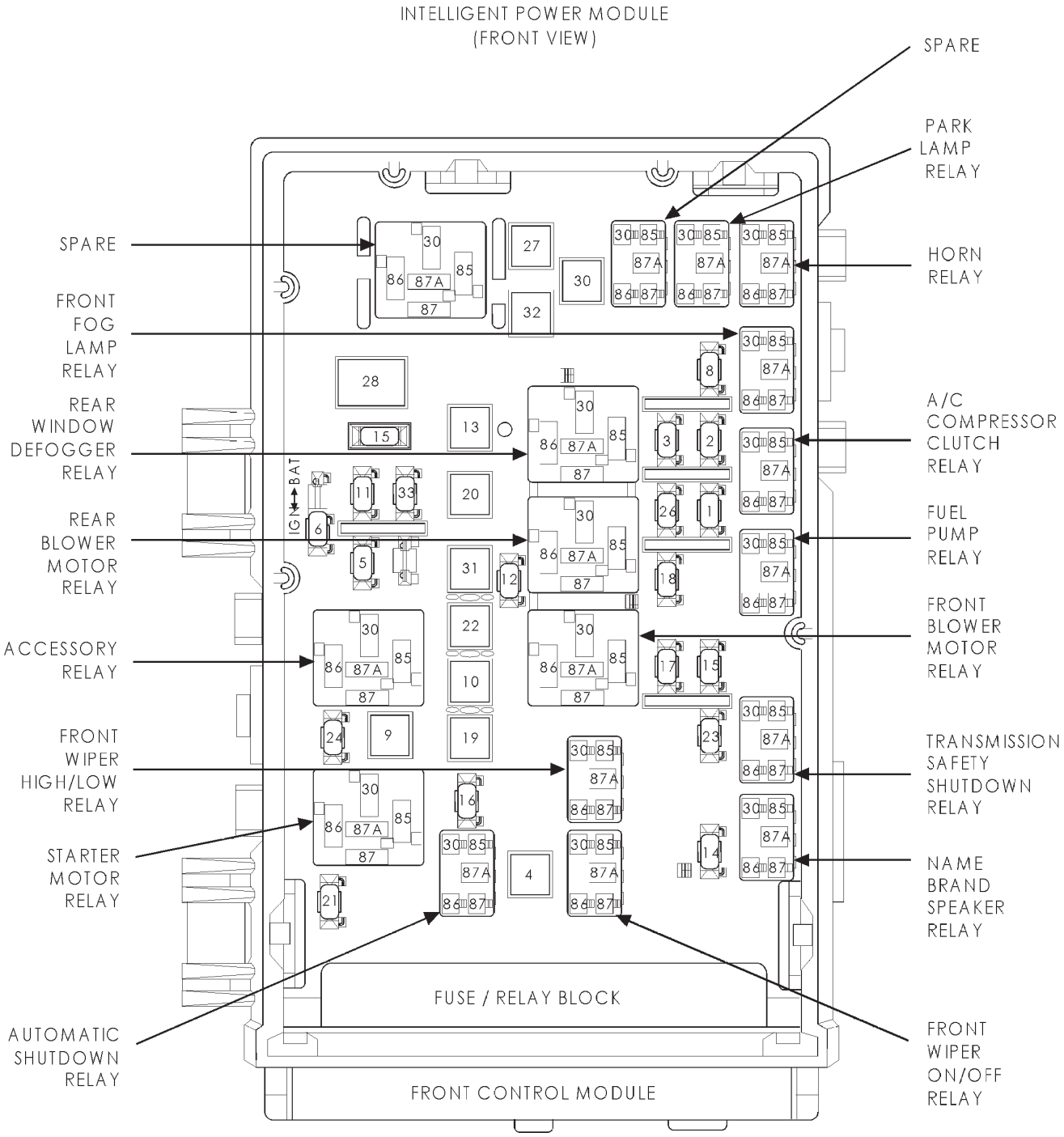
CAV	CIRCUIT	FUNCTION
1	T13 18DG/VT	SPEED SENSOR GROUND
2	T14 18DG/BR	OUTPUT SPEED SENSOR SIGNAL



PARK/NEUTRAL POSITION SWITCH (2.4L)

PARK/NEUTRAL POSITION SWITCH (2.4L) - BLACK 3 WAY

CAV	CIRCUIT	FUNCTION
1	Z252 18BK/WT	GROUND
2	T41 18YL/DB	PARK/NEUTRAL POSITION SWITCH (TRS T41)
3	T2 18DG/WT	TRS REVERSE SENSE

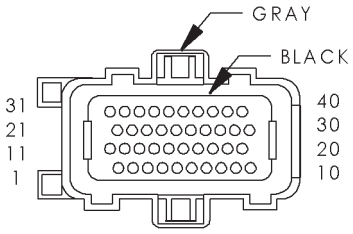

INTELLIGENT POWER MODULE
(FRONT VIEW)
SPARE
PARK LAMP RELAY
SPARE
HORN RELAY
FRONT FOG LAMP RELAY
A/C COMPRESSOR CLUTCH RELAY
REAR WINDOW DEFOGGER RELAY
FUEL PUMP RELAY
REAR BLOWER MOTOR RELAY
FRONT BLOWER MOTOR RELAY
ACCESSORY RELAY
TRANSMISSION SAFETY SHUTDOWN RELAY
FRONT WIPER HIGH/LOW RELAY
NAME BRAND SPEAKER RELAY
STARTER MOTOR RELAY
FRONT WIPER ON/OFF RELAY
AUTOMATIC SHUTDOWN RELAY
IGN BAT
FUSE / RELAY BLOCK
FRONT CONTROL MODULE

FUSES (IPM)

FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	20A	INTERNAL	FUSED B(+)
2	15A	INTERNAL	FUSED PARK LAMP RELAY OUTPUT
3	15A	INTERNAL	FUSED PARK LAMP RELAY OUTPUT
4	30A	INTERNAL	FUSED B(+)
5	20A	F306 16DB/PK	FUSED ACCESSORY RELAY OUTPUT
6	20A	F307 16LB/PK (BATTERY POSITION)	FUSED B(+)
6	20A	F307 16LB/PK (ACCESSORY RELAY POSITION)	FUSED ACCESSORY RELAY OUTPUT
8	20A	INTERNAL	FUSED B(+)
9	40A	INTERNAL	FUSED B(+)
10	40A	C7 12DB	FUSED FRONT BLOWER MOTOR RELAY OUTPUT
11	20A	F302 18GY/PK	FUSED ACCESSORY RELAY OUTPUT
12	25A	C51 12LB/BR	FUSED REAR BLOWER MOTOR RELAY OUTPUT
13	40A	C15 12DB/WT	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
14	15A	INTERNAL	FUSED B(+) (I.O.D.)
15	20A	INTERNAL	FUSED B(+)
16	25A	INTERNAL	FUSED B(+)
17	20A	INTERNAL	FUSED B(+)
18	15A	INTERNAL	FUSED B(+)
19	40A	A101 12VT/RD	FUSED B(+)
20	40A	A102 12WT/RD	FUSED B(+)
21	25A	A111 12DG/RD	FUSED B(+)
22	40A	A110 12OR/RD	FUSED B(+)
23	10A	A106 20LB/RD	FUSED B(+)
24	20A	A701 16BR/RD	FUSED B(+) (HAZARD)
26	20A	A103 18GY/RD	FUSED B(+)
27	40A	A112 12OR/RD	FUSED B(+)
28	40A	F30 12PK/YL	FUSED ACCESSORY RELAY OUTPUT
30	40A	SPARE	SPARE
31	40A	A113 12WT/RD	FUSED B(+)
32	40A	A115 12YL/RD	FUSED B(+)
33	15A	INTERNAL	FUSED ACCESSORY RELAY OUTPUT

TRANSMISSION SAFETY SHUTDOWN RELAY

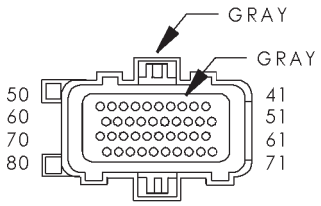
CAV	CIRCUIT	FUNCTION
30	INTERNAL	FUSED B(+)
85	Z115 20BK/OR	GROUND
86	T15 18YL/BR	TRANSMISSION CONTROL RELAY CONTROL
87	T16 18YL/OR	TRANSMISSION CONTROL RELAY OUTPUT
87A	-	-



POWERTRAIN CONTROL MODULE C1

POWERTRAIN CONTROL MODULE C1 - GRAY/BLACK 40 WAY

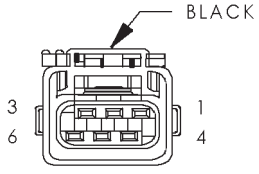
CAV	CIRCUIT	FUNCTION
1	-	-
2	K18 16DB/OR (3.3L/3.8L)	IGNITION COIL NO. 3 DRIVER
3	K17 16DB/TN	IGNITION COIL NO. 2 DRIVER
4	-	-
5	V32 18VT/YL	SPEED CONTROL ON/OFF SWITCH SENSE
6	K342 16BR/WT	AUTOMATIC SHUTDOWN RELAY OUTPUT
7	K13 16BR/LB	FUEL INJECTOR NO. 3 DRIVER
8	K20 18BR/GY	GENERATOR FIELD DRIVER (+)
9	-	-
10	Z130 18BK/BR	GROUND
11	K19 16DB/DG	IGNITION COIL NO. 1 DRIVER
12	G6 16VT/GY	ENGINE OIL PRESSURE SWITCH SENSE
13	K11 16BR/YL	FUEL INJECTOR NO. 1 DRIVER
14	K58 16BR/VT (3.3L/3.8L)	FUEL INJECTOR NO. 6 DRIVER
15	K38 16BR/OR (3.3L/3.8L)	FUEL INJECTOR NO. 5 DRIVER
16	K14 16BR/TN	FUEL INJECTOR NO. 4 DRIVER
17	K12 16BR/DB	FUEL INJECTOR NO. 2 DRIVER
18	K99 18BR/LG	OXYGEN SENSOR 1/1 HEATER CONTROL
19	-	-
20	F202 18PK/GY	FUSED IGNITION SWITCH OUTPUT (RUN-START)
21	-	-
22	-	-
23	-	-
24	-	-
25	K42 18DB/YL	KNOCK SENSOR SIGNAL
26	K2 18VT/OR	ENGINE COOLANT TEMPERATURE SENSOR SIGNAL
27	K902 18BR/DG	OXYGEN SENSOR GROUND
28	-	-
29	-	-
30	K41 18DB/LB	OXYGEN SENSOR 1/1 SIGNAL
31	T752 18DG/OR	DOUBLE START OVERRIDE
32	K24 18BR/LB	CRANKSHAFT POSITION SENSOR SIGNAL
33	K44 18DB/GY	CAMSHAFT POSITION SENSOR SIGNAL
34	-	-
35	K22 18BR/OR	THROTTLE POSITION SENSOR SIGNAL
36	K1 18VT/BR	MANIFOLD ABSOLUTE PRESSURE SENSOR SIGNAL
37	K21 18DB/LG	INTAKE AIR TEMPERATURE SIGNAL
38	-	-
39	-	-
40	K35 18DB/VT	EGR SOLENOID CONTROL



POWERTRAIN CONTROL MODULE C2

POWERTRAIN CONTROL MODULE C2 - GRAY/GRAY 40 WAY

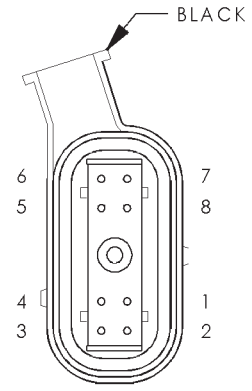
CAV	CIRCUIT	FUNCTION
41	V37 18VT	SPEED CONTROL SWITCH SIGNAL
42	C18 18LB/BR	A/C PRESSURE SIGNAL
43	K900 18DB/DG	SENSOR GROUND
44	F888 18BR/PK	8 VOLT SUPPLY
45	-	-
46	A109 18OR/RD	FUSED B(+)
47	-	-
48	K40 18BR/LG (2.4L)	IDLE AIR CONTROL NO. 3 DRIVER
49	K39 18VT/DG (3.3L/3.8L)	IDLE AIR CONTROL NO. 1 DRIVER
49	K60 18VT/LG (2.4L)	IDLE AIR CONTROL NO. 2 DRIVER
50	Z131 18BK/DG	GROUND
51	K141 18DB/YL	OXYGEN SENSOR 1/2 SIGNAL
52	-	-
53	-	-
54	-	-
55	-	-
56	V36 18VT/YL	SPEED CONTROL VACUUM SOLENOID CONTROL
57	K39 18VT/DG (2.4L)	IDLE AIR CONTROL NO. 1 DRIVER
57	K60 18VT/LG (3.3L/3.8L)	IDLE AIR CONTROL NO. 2 DRIVER
58	K59 18BR/DG (2.4L)	IDLE AIR CONTROL NO. 4 DRIVER
59	D25 18WT/VT	PCI BUS
60	-	-
61	F855 18PK/YL	5 VOLT SUPPLY
62	B29 18DG/WT	BRAKE SWITCH SENSE
63	T10 18DG/LG (3.3L/3.8L)	TORQUE MANAGEMENT REQUEST SENSE
64	C13 18LB/OR	A/C COMPRESSOR CLUTCH RELAY CONTROL
65	D21 18WT/BR	SCI TRANSMIT
66	N7 18DB/OR	VEHICLE SPEED SENSOR OUTPUT
67	K51 18BR/WT	AUTOMATIC SHUTDOWN RELAY CONTROL
68	K52 18DB/WT	EVAPORATIVE EMISSION SOLENOID CONTROL
69	-	-
70	K70 18DB/BR	EVAPORATIVE EMISSION SOLENOID SENSE
71	-	-
72	K107 18VT/WT	LEAK DETECTION PUMP SWITCH SENSE
73	K173 18BR/VT	RADIATOR FAN RELAY CONTROL
74	K31 18BR	FUEL PUMP RELAY CONTROL
75	D20 18WT/LG	SCI RECEIVE
76	T41 18YL/DB	PARK/NEUTRAL POSITION SWITCH SENSE (TRS T41)
77	K106 18VT/LB	LEAK DETECTION PUMP SOLENOID CONTROL
78	K54 18DB/WT (2.4L)	TORQUE CONVERTER CLUTCH SOLENOID CONTROL
79	-	-
80	V35 18VT/OR	SPEED CONTROL VENT SOLENOID CONTROL



RIGHT REAR LAMP ASSEMBLY

RIGHT REAR LAMP ASSEMBLY - BLACK 6 WAY

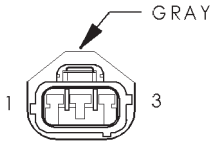
CAV	CIRCUIT	FUNCTION
1	L62 18WT/BR	RIGHT REAR TURN SIGNAL DRIVER
2	-	-
3	L78 18WT/OR	FUSED RIGHT PARK LAMP RELAY OUTPUT
4	L1 18WT/LG	BACK-UP LAMP DRIVER
5	Z362 18BK/BR	GROUND
6	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT



SOLENOID/ PRESSURE SWITCH ASSEMBLY (3.3/3.8L)

SOLENOID/PRESSURE SWITCH ASSEMBLY (3.3L/3.8L) - BLACK 8 WAY

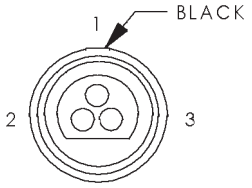
CAV	CIRCUIT	FUNCTION
1	T47 18YL/DG	2-4 PRESSURE SWITCH SENSE
2	T50 18YL/TN	LOW/REVERSE PRESSURE SWITCH SENSE
3	T9 18DG/TN	OVERDRIVE PRESSURE SWITCH SENSE
4	T16 18YL/OR	TRANSMISSION SAFETY SHUTDOWN RELAY OUTPUT
5	T59 18YL/LB	UNDERDRIVE SOLENOID CONTROL
6	T60 18YL/GY	OVERDRIVE SOLENOID CONTROL
7	T20 18DG/WT	LOW/REVERSE SOLENOID CONTROL
8	T19 18YL/DB	2-4 SOLENOID CONTROL



THROTTLE POSITION SENSOR

THROTTLE POSITION SENSOR - GRAY 3 WAY

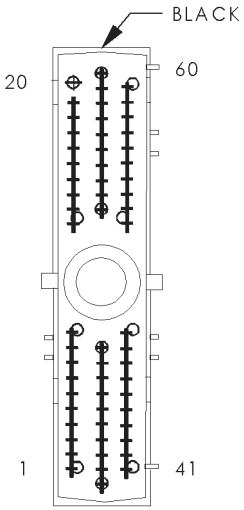
CAV	CIRCUIT	FUNCTION
1	K900 18DB/DG	SENSOR GROUND
2	K22 18BR/OR	THROTTLE POSITION SENSOR SIGNAL
3	F855 18PK/YL	5 VOLT SUPPLY



TORQUE CONVERTER CLUTCH SOLENOID (2.4L)

TORQUE CONVERTER CLUTCH SOLENOID (2.4L) - BLACK 3 WAY

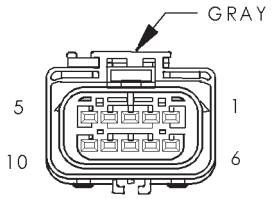
CAV	CIRCUIT	FUNCTION
1	-	-
2	F202 18PK/GY	FUSED IGNITION SWITCH OUTPUT (RUN-START)
3	K54 18DB/WT	TORQUE CONVERTER CLUTCH SOLENOID CONTROL



TRANSMISSION CONTROL MODULE (3.3/3.8L)

TRANSMISSION CONTROL MODULE (3.3L/3.8L) - BLACK 60 WAY

CAV	CIRCUIT	FUNCTION
1	T1 18DG/LB	TRS T1 SENSE
2	-	-
3	T3 18DG/DB	TRS T3 SENSE
4	-	-
5	-	-
6	K24 18BR/LB	CRANKSHAFT POSITION SENSOR SIGNAL
7	D21 18WT/BR	SCI TRANSMIT
8	T751 18YL	IGNITION SWITCH OUTPUT (START)
9	T9 18DG/TN	OVERDRIVE PRESSURE SWITCH SENSE
10	T10 18DG/LG	TORQUE MANAGEMENT REQUEST SENSE
11	F1 18PK/WT	FCM OUTPUT (UNLOCK-RUN-START)
12	K22 18BR/OR	THROTTLE POSITION SENSOR SIGNAL
13	T13 18DG/VT	SPEED SENSOR GROUND
14	T14 18DG/BR	OUTPUT SPEED SENSOR SIGNAL
15	T15 18YL/BR	TRANSMISSION SAFETY SHUTDOWN RELAY CONTROL
16	T16 18YL/OR	TRANSMISSION SAFETY SHUTDOWN RELAY OUTPUT
17	T16 18YL/OR	TRANSMISSION SAFETY SHUTDOWN RELAY OUTPUT
18	-	-
19	T19 18YL/DB	2-4 SOLENOID CONTROL
20	T20 18DG/WT	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 18DG/GY	TRS T41 SENSE
42	T42 18DG/YL	TRS T42 SENSE
43	D25 18WT/VT	PCI BUS
44	-	-
45	-	-
46	D16 18WT/OR	SCI RECEIVE
47	T47 18YL/DG	2-4 PRESSURE SWITCH SENSE
48	-	-
49	-	-
50	T50 18YL/TN	LOW/REVERSE PRESSURE SWITCH SENSE
51	K900 18DB/DG	SENSOR GROUND
52	T52 18DG/WT	INPUT SPEED SENSOR SIGNAL
53	Z132 16BK/YL	GROUND
54	T54 18DG/OR	TRANSMISSION TEMPERATURE SENSOR SIGNAL
55	T55 18YL/VT (AUTOSTICK)	AUTOSTICK/OVERDRIVE OFF MUX INPUT
56	A104 18YL/RD	FUSED B(+)
57	Z133 16BK/LG	GROUND
58	N7 18DB/OR	VEHICLE SPEED SENSOR SIGNAL
59	T59 18YL/LB	UNDERDRIVE SOLENOID CONTROL
60	T60 18YL/GY	OVERDRIVE SOLENOID CONTROL



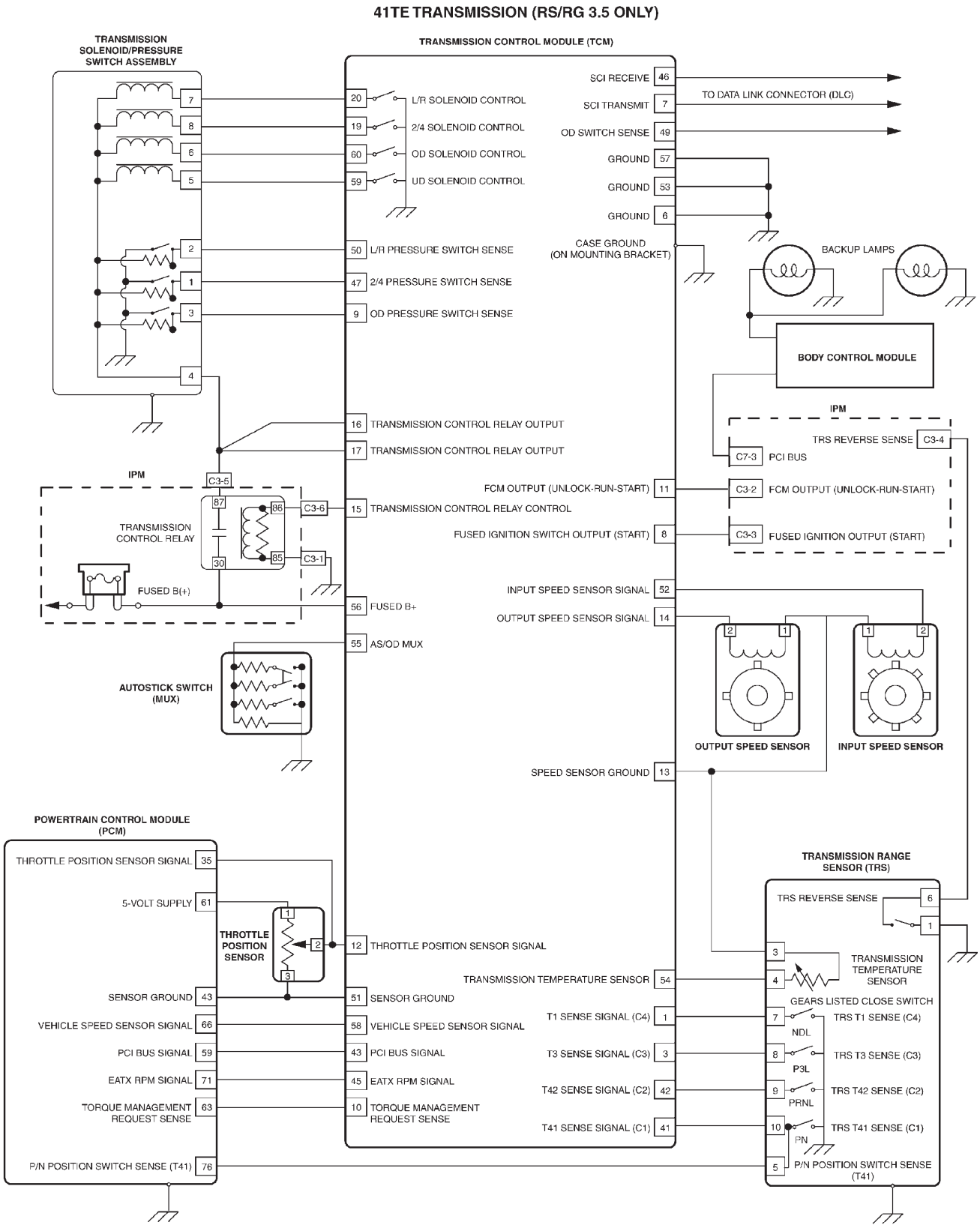
TRANSMISSION
RANGE
SENSOR
(3.3L/3.8L)

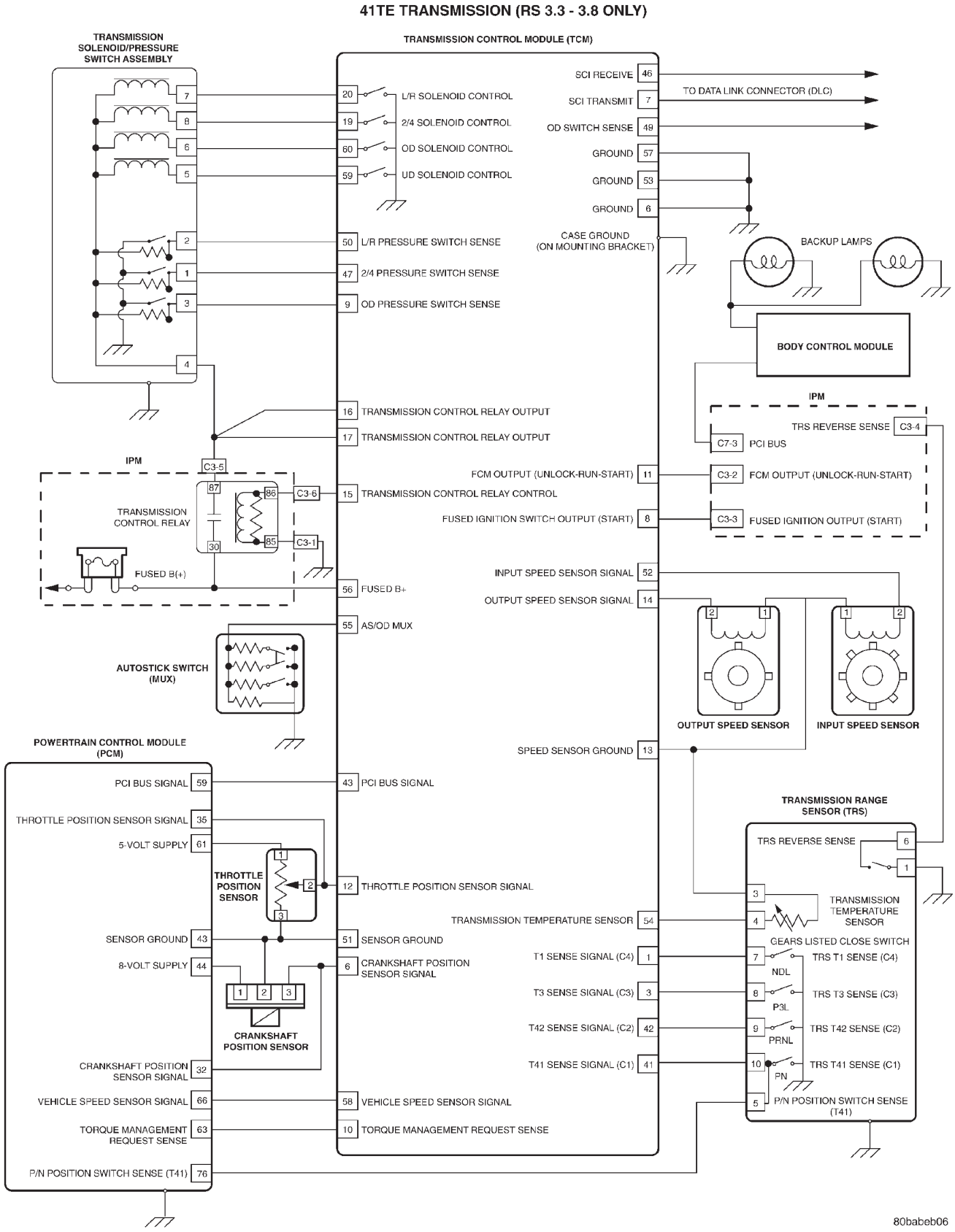
TRANSMISSION RANGE SENSOR (3.3L/3.8L) - GRAY 10 WAY

CAV	CIRCUIT	FUNCTION
1	T2 18DG/WT	TRS REVERSE SENSE
2	-	-
3	T13 18DG/VT	SPEED SENSOR GROUND
4	T54 18DG/OR	TRANSMISSION TEMPERATURE SENSOR SIGNAL
5	T41 18DG/GY	TRS T41 SENSE
6	Z252 18BK/WT	GROUND
7	T1 18DG/LB	TRS T1 SENSE
8	T3 18DG/DB	TRS T3 SENSE
9	T42 18DG/YL	TRS T42 SENSE
10	T41 18YL/DB	PARK/NEUTRAL POSITION SWITCH SENSE (TRS T41)

NOTES

10.0 SCHEMATIC DIAGRAMS




41TE TRANSMISSION (RS 3.3 - 3.8 ONLY)
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
TRANSMISSION CONTROL MODULE (TCM)
L/R SOLENOID CONTROL
2/4 SOLENOID CONTROL
OD SOLENOID CONTROL
UD SOLENOID CONTROL
L/R PRESSURE SWITCH SENSE
2/4 PRESSURE SWITCH SENSE
OD PRESSURE SWITCH SENSE
SCI RECEIVE
SCI TRANSMIT
TO DATA LINK CONNECTOR (DLC)
OD SWITCH SENSE
GROUND
GROUND
GROUND
CASE GROUND (ON MOUNTING BRACKET)
BACKUP LAMPS
BODY CONTROL MODULE
IPM
TRS REVERSE SENSE
PCI BUS
TRANSMISSION CONTROL RELAY OUTPUT
TRANSMISSION CONTROL RELAY OUTPUT
IPM
TRANSMISSION CONTROL RELAY
TRANSMISSION CONTROL RELAY CONTROL
FCM OUTPUT (UNLOCK-RUN-START)
FUSED IGNITION SWITCH OUTPUT (START)
FUSED B(+)
FUSED B+
INPUT SPEED SENSOR SIGNAL
OUTPUT SPEED SENSOR SIGNAL
AS/OD MUX
AUTOSTICK SWITCH (MUX)
OUTPUT SPEED SENSOR
INPUT SPEED SENSOR
POWERTRAIN CONTROL MODULE (PCM)
SPEED SENSOR GROUND
PCI BUS SIGNAL
PCI BUS SIGNAL
TRANSMISSION RANGE SENSOR (TRS)
THROTTLE POSITION SENSOR SIGNAL
5-VOLT SUPPLY
THROTTLE POSITION SENSOR
THROTTLE POSITION SENSOR SIGNAL
TRS REVERSE SENSE
TRANSMISSION TEMPERATURE SENSOR
TRANSMISSION TEMPERATURE SENSOR
SENSOR GROUND
SENSOR GROUND
GEARS LISTED CLOSE SWITCH
T1 SENSE SIGNAL (C4)
TRS T1 SENSE (C4)
8-VOLT SUPPLY
CRANKSHAFT POSITION SENSOR SIGNAL
NDL
T3 SENSE SIGNAL (C3)
TRS T3 SENSE (C3)
P3L
T42 SENSE SIGNAL (C2)
TRS T42 SENSE (C2)
PRNL
CRANKSHAFT POSITION SENSOR
T41 SENSE SIGNAL (C1)
TRS T41 SENSE (C1)
PN
CRANKSHAFT POSITION SENSOR SIGNAL
P/N POSITION SWITCH SENSE (T41)
VEHICLE SPEED SENSOR SIGNAL
VEHICLE SPEED SENSOR SIGNAL
TORQUE MANAGEMENT REQUEST SENSE
TORQUE MANAGEMENT REQUEST SENSE
P/N POSITION SWITCH SENSE (T41)
80babeb06

NOTES

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