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NOTES

1.0 INTRODUCTION

The procedures contained in this manual include all of the specifications, instructions, and graphics needed to diagnose W5J400 Electronic Automatic Transmission 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 information for the proper removal and repair procedure.

READ THIS MANUAL BEFORE TRYING TO DIAGNOSE A VEHICLE TROUBLE CODE.

Diagnostic procedures change every year. New diagnostic systems may be added and/or carryover systems may be enhanced. It is recommended that you review the entire manual to become familiar with all new and changed diagnostic procedures.

1.1 SYSTEM COVERAGE

This diagnostic procedures manual covers all 2002 MY Grand Cherokee equipped with a W5J400 Automatic Transmission.

1.2 SIX -STEP TROUBLESHOOTING PROCEDURE

Diagnosis of the W5J400 electronic transmission 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

The W5J400 Transmission family can be identified by the presence of a 13 pin electrical connector, with a bayonet lock on the right hand side of the transmission. The connector is oriented horizontally.

3.0 SYSTEM DESCRIPTION AND FUNCTIONAL OPERATION

3.1 GENERAL DESCRIPTION

The W5J400 electronic transmission is an electronically controlled five speed transmission with a controlled slip torque converter. The W5J400 electronic transmission is a conventional transmission 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.

The ratios for the gear stages are obtained by 3 planetary gear sets. Fifth Gear is designed as an Overdrive with a high speed ratio. The gears are actuated electronically/hydraulically. The electronic control system enables precise adaptation of pressures to the respective operating conditions and to the engine output during a shift phase, which results in a significant improvement in shift quality.

3.2 FUNCTIONAL OPERATION

The W5J400 electronic transmission has a fully adaptive control system. The system performs its functions based on continuous real-time sensor and switch feedback information. In addition the TCM receives information from the PCM/ECM (engine management) and ABS (chassis systems) controllers over the CAN bus. The CAN bus is a high speed communication bus that allows real time control capability between various controllers. Most messages are sent every 20 milliseconds, this means critical information can be shared between the Transmission, Engine and ABS controllers. The CAN bus is a two wire bus with a CAN C Bus (+) circuit and a CAN C Bus (-) circuit. The CAN bus uses a twisted pair of wires in the harness to reduce the potential of radio and noise interference. The CAN bus also uses a 120 ohm terminating resistor in both the TCM and ABS modules. The module terminating resistance is measured across both CAN bus circuits at the TCM or ABS module, with the PCM/ECM, TCM and ABS modules disconnected.

The control system automatically adapts to changes in engine performance, vehicle speed, and transmission temperature variations to provide consistent shift quality. The control system ensures that clutch operation during upshifting and downshifting is more responsive without increased harshness. The TCM controls the actuation of solenoid valves for modulating shift pressure and gear change. The required pressure level is calculated from the load condition, engine speed. Power for the transmission system is supplied through the Shifter Assembly (no transmission control relay). The TCM is located in the center console of the vehicle.

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 (DTC). Some of these codes cause the transmission to go into ″limp-in″ or ″default″ mode. The W5J400 will default in the current gear position if a DTC is detected, then after a key cycle or shift to park the transmission will go into Limp-in, which is mechanical 2nd gear. Some DTC's may allow the transmission to resume normal operation (recover) if the detected problem goes away. Permanent limp-in DTC will recover when the key is cycled, but if the same DTC is detected for three key cycles the system will not recover and the DTC must be cleared from the TCM with the DRBIII® scan tool.

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

3.2.1 CONTROLLER MODES OF OPERATION

Permanent limp-in mode

When the TCM determines there is a non-recoverable condition present that will not allow proper transmission operation, it will place the transmission in permanent limp-in mode. When the condition occurs the TCM will turn off all solenoids as well as the solenoid supply output circuit. If this occurs while the vehicle is moving, the transmission will remain in the current gear until the ignition is turned off or shifter is placed in the ″P″ position. Once the shifter has been placed in ″P″ the Transmission will only allow 2nd gear operation. . If the problem occurs while the vehicle is not moving the transmission will only allow 2nd gear operation.

Temporary limp-in mode

This mode is the same as the permanent limp-in mode except if the condition is no longer present the system will resume normal operation. (Recoverable DTC)

Undervoltage limp-in mode

When the TCM detects that system voltage has dropped below 8.5 volts it will disable voltage dependant diagnostics and place the transmission in the temporary limp-in mode. When the TCM senses that the voltage has risen above 9.0 volts, normal transmission operation will be resumed.

Hardware Error Mode

When the TCM detects a major internal error the transmission will be placed in the permanent limp-in mode and cease all communication over the CAN bus. Once the TCM has entered this mode normal transmission operation will not resume until all DTC's are cleared from the TCM.

Loss of Drive

If the TCM detects a situation that has resulted or may result in a catastrophic engine or transmission failure, the transmission will be placed in the neutral position. Improper Ratio, Input Sensor Overspeed, or Engine Overspeed DTC's will cause the loss of drive.

Controlled Limp-in Mode

When a failure condition does not require the TCM to shut down the solenoid supply, but the failure is of a degree where the TCM will place the transmission into a predefined gear, there will be several shift performance issues. Examples of this are, with the transmission slipping the controller will attempt to place the transmission into third gear and maintain third gear for all forward drive conditions. Another example is some of the CAN bus message issues if the TCM does not receive required information from the Engine Controller, then default values are used which may result in poor transmission shift performance.

3.2.2 MIL ILLUMINATION

For failures detected by the Transmission Controller that result in the controller placing the transmission into a limp-in mode, except for System Overvoltage and System Undervoltage DTCs, the MIL will be illuminated. The Transmission Controller will inform the PCM/ECM over the CAN bus that a failure has occurred. The PCM/ECM will store one of two DTC's P0700 or P0702 depending on which transmission DTC is present and will illuminate the MIL. If the condition is removed and the failure becomes Stored (Intermittent), the Transmission controller will stop reporting that the DTC is active and the PCM/ECM will extinguish the MIL.

Note: The MIL will light when the problem is first detected and it will not go off until the next ignition cycle, after all problem conditions have been checked for their presence. This normally takes several minutes of driving.

3.2.3 FREEZE FRAME

The TCM will record up to two freeze frames for each DTC. When a failure is initially detected the controller will store the information for that DTC in the first Freeze Frame. On the next occurrence of the same DTC the controller will save the same DTC information in a second Freeze Frame. If the DTC occurs for a third time the freeze frame information from the second occurrence will be over written with the third occurrence of the DTC. Therefore, the controller will store the freeze frame information for the first and last occurrence for each DTC stored in memory. The freeze frame also

allows higher priority DTCs to replace lower priority DTCs for diagnostic purposes.

The Freeze frame information is very useful in determining the conditions under which an intermittent DTC is setting. Use the reported Freeze Frame information to duplicate the DTC set conditions

Note: The turbine speed is calculated from the N2 and N3 input speed sensors. The N2 and N3 input speed sensors are both active in 2nd, 3rd, and 4th gears. The N3 input speed is not reported in1st and 5th gears and will not match the turbine speed.

Information provided in Freeze frame:

Time since ignition Cycle
Mileage (km)
Battery voltage
Trans oil temperature
Actual gear/ Target Gear
Output speed
Turbine speed
Shifter Position
Calculated Gear

3.2.4 SOLENOIDS

1-2/4-5 solenoid - The 1-2/4-5 solenoid is activated when the TCM determines that the transmission must shift into or out of 2nd gear or 5th gear. The solenoid is only activated during the shifting of the transmission. When the solenoid is activated, hydraulic pressure is applied to the proper shift elements in the transmission to allow the desired shift. Once the shift is completed, the solenoid is turned off.

2-3 solenoid - The 2-3 solenoid is activated when the TCM determines that the transmission must shift into or out of 3rd gear. The solenoid is only activated during the shifting of the transmission. When the solenoid is activated hydraulic pressure is applied to the proper shift elements in the transmission to allow the desired shift. Once the shift is completed, the solenoid is turned off.

3-4 solenoid - The 3-4 solenoid is activated when the TCM determines that the transmission must shift into or out of 4th gear. The solenoid is only activated during the shifting of the transmission. When the solenoid is activated, hydraulic pressure is applied to the proper shift elements in the transmission to allow the desired shift. Once the shift is completed, the solenoid is turned off.

TCC solenoid - The TCC solenoid is activated when the TCM determines that the Torque converter clutch should be activated. The TCC clutch is a variable slip torque clutch that allows control of torque converter slip from 5% to 95.5% of full TCC engagement. The clutch is controlled by the TCC solenoid which is pulse width modulated (PWM) to provide the desired amount of slip.

Shift Pressure Solenoid - The Shift Pressure Solenoid is activated when the TCM determines that a transmission shift is required. The solenoid is PWM controller to allow the proper amount of hydraulic pressure to the shift elements. The solenoid is only activated during the shifting of the transmission. When the solenoid is activated, hydraulic pressure is removed from the proper shift elements to allow the desired shift. Once the shift is completed, the solenoid is turned off.

Modulation pressure solenoid - The modulation pressure is always active. The solenoid is pulse width modulated (PWM) controlled and is used to modulate the hydraulic system pressure to the desired pressure.

3.2.5 TRANSMISSION COMPONENT DESCRIPTIONS

Shift Assembly

The Shift Selector is similar to the TRS found on other DaimlerChrysler products, but is located in the Shifter Assembly instead of the transmission. The Shift Selector switches transmit all selector lever positions to the TCM. Light Emitting Diodes (LED's) are used as a light source in order to display the current selector lever position and provide basic shifter lighting. The shifter also has a vehicle PCI bus circuit for communication with the cluster (electronic PRNDL display). The Reverse light switch is integrated into the shifter module and controls the reverse lights through a reverse lamp relay. The Brake Shift Interlock solenoid and Park lockout solenoid, are also part of the Shift Selector module and are controlled by the TCM. The shifter module also supplies all power to the transmission system.

Note: If there are no LEDS illuminated on the shifter and the vehicle will not start, the TCM has a no response check the shifter assembly power connections for loss of voltage or ground.

Park lockout

This feature prevents inadvertent selection of Park at speeds above approximately 10 km/h (6MPH). The Park lockout solenoid is part of the Shifter Assembly and is controlled by the TCM.

Reverse Lamp Relay

The Reverse Light Switch is integrated into the shifter module and controls the reverse lights through a reverse lamp relay. The reverse lamp relay is located in the engine compartment. The reverse light switch provides a ground, to the reverse lamp relay solenoid control circuit, which turns the reverse lights on.

Brake shift inter-lock

To prevent unauthorized shifting out of the park position, the Selector lever is locked in the Park position until the ignition key is turned to the run position and the brake pedal is pressed. This will allow the driver to shift out of the park position.

Trans temp sensor - P/N Switch circuit

The TCM will detect the selector lever in park and neutral positions. The TCM does this by monitoring the Transmission temperature sensor signal along with the shifter position signals. The P/N switch contact is operated by a cam located in the transmission which, opens a reed contact switch that is wired in series with the transmission temperature sensor. When the P/N contact switch is opened in park and neutral, the TCM senses a high transmission temperature. Confirming the P/N switch status. Note: In park or neutral, the TCM uses engine temperature (to avoid setting a DTC). The TCM sends a hardwired signal to the PCM/ECM that will allow the PCM/ECM controlled start circuit to engage in P or N only. The TCM also sends a P/N bus message to the PCM/ECM to confirm the P/N switch status.

NOTE: The Engine Controller will allow starting of the vehicle if either the bus or hardwired P/N signal is present.

Input Speed Sensors

The W5J400 transmission has two input speed sensors N2 and N3, both speed sensors are located on the valve body and report DTC's for the input speed sensors errors. The speed sensors are hall effect speed sensors that are used by the TCM to calculate the transmissions input speed. Since the input speed could not be measured directly, two of the drive elements are measured. Two input speed sensors were required because both drive elements are not active in all gears. The input sensors N2 and N3 will report the same input speed in gears 2nd, 3rd or 4th. If the N2 and N3 input speed signals are not the same in these gears then there is an issue with the transmission and the DTC Input Sensors Mismatch will be set.

The N3 input speed is not reported in 1st and 5th gears. The N2 sensor is not reported in Reverse. The Input Speed Sensor Overspeed is a rationality check that is intended to indicate a major transmission failure and will cause a loss of drive (place the transmission in Neutral)

Output Speed Sensor (ABS signal)

The W5J400 transmission does not have an output shaft speed sensor. The TCM uses the ABS (Antilock Brake System) Wheel Speed sensor information, it receives over the CAN bus, to calculate the transmissions output shaft speed. The TCM monitors the ABS system for functionality and reports ABS speed sensor and communication DTCs, which will affect proper transmission operation. The MIL will be requested if two or more wheel speed sensors are involved. If both rear wheel speeds are not valid, Temporary Limp-in mode is activated and backup value for wheel speeds will be used. The TCM also uses the Axle ratio and Transfer case position and Ratio when in 4 Low to calculate transmission output speed. The TCM knows what mode the T-Case is in at all times. This is accomplished by a sensor on the transfer case that is wired to the PCM/ECM. Some four-wheel drive applications require averaging all four wheel speed sensors to calculate an accurate output shaft speed. This is not required with the W5J400 transmission system, the front sensors are used for various other calculations (vehicle speed, transverse acceleration) etc.

3.2.6 TRANSMISSION OPERATION AND SHIFT SCHEDULING

The transmission covered in this manual has unique shift schedules depending on the temperature of the transmission oil. The transmission oil temperature has a decisive effect on the shift quality of the transmission. The shift schedule is modified to extend the life of the transmission while operating under extreme conditions and to improve driver comfort by modifying shift schedules.

The transmission oil temperature is measured with a Temperature Sensor on the W5J400 transmission. The Temperature Sensor is an integral component of the Transmission Solenoid assembly. If the Temperature Sensor is causing a problem, a DTC will be set in the TCM.

The transmission temperature sensor is wired in series with the Park /Neutral (P/N) switch. The P/N switch is also located in the transmission. The transmission temperature is only read by the TCM when the P/N switch closes while in the R, D, 4,3,2,1

position. When the shifter lever is in the park or neutral position, the P/N switch opens and the temperature being displayed is Engine temperature.

3.2.7 TRANSMISSION ADAPTIVES - INITIALIZE AND STORE

Initialize Adaptive - This TCM function should be used when a new transmission has been placed in the vehicle. This command will reset the TCM adaptive to the factory setting.

Store Adaptive - This command should be used after the vehicle has been test driven by the technician to store any learned adaptive changes that occurred during the test drive. During normal operation adaptive are updated every 10 minutes. Using this command the latest adaptive will be written to the TCM immediately.

3.3 DIAGNOSTIC TROUBLE CODES

Diagnostic trouble codes (DTC's) are codes stored by the Transmission Control Module (TCM) to help 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/ECM DTC's are present that could cause a transmission complaint.

If there is a communication SCI (K line) circuit 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 SCI (K line) circuit.
- internal failure of any module or component connected to the SCI (K line) circuit

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.

If the TCM records a DTC that will adversely affect the vehicles transmission, it will request (via the communication bus) that the PCM/ECM illuminate the Malfunction Indicator Lamp (MIL). All transmission DTC's will be stored in the TCM.

3.3.1 ACTIVE (HARD) CODE

Any Diagnostic Trouble Code (DTC) that is set whenever the system or component is monitored is an Active 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 to set the DTC. It must be determined if a code is Active (repeatable) or Stored (Intermittent) before attempting diagnosis.

3.3.2 STORED (INTERMITTENT) CODE

A diagnostic trouble code that is not there every time the TCM checks the circuit or function is a Stored (Intermittent) code. 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. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status. A DTC status can be ″Active″ or ″Stored″ (Intermittent). Active is when the DTC is present in the controller and the transmission is in the particular mode of operation for that DTC. Stored means that the DTC occurred at some point, but is not currently present, or the conditions have not been right to check for the presence of the problem, when a DTC is classified as Stored (Intermittent), no TCM reaction is required.

3.3.3 EMERGENCY RUNNING FUNCTION

If DTCs occur, safe-driving conditions must be retained but full functionality of the transmission will be limited to avoid damaging the automatic transmission. In the event of certain DTCs the TCM switches to emergency running. The TCM will store the appropriate DTC codes and solenoids will be de-energized (turned off)

The transmission effects will be:

- The last gear shifted remains in that position
- The modulating pressure and shift pressure increase to maximum value
- The torque converter clutch is disengaged (turned off)

Shifting manually after a DTC detection

Note: The vehicle can still be shifted manually to 2nd or reverse gear.

To accomplish these shifts you must
Stop the vehicle
Turn the ignition off
Start the engine

Place the selector lever into D for 2nd gear

Place the selector lever into R for reverse gear

The emergency running function is retained until the DTC is eliminated or the stored DTC code is erased.

Stored (Intermittent) DTCs can be reset by cycling the ignition switch

3.3.4 ERROR STATUS

DRBIII® will display: DTC (name)
DTC Status (Active or Stored)
DTC I.D. (Number of DTC)

The TCM stores information for each DTC stored in memory. This information defines the status of a particular DTC.

DTC I.D.	For each DTC a unique error number is defined. These DTC ID numbers count linear starting with 1. The unique number is used to identify DTC's in the TCM.	
Error Status	Active or Stored	Active: The DTC is present at the time of and is current error status in error memory. Stored (intermittent) : A DTC becomes Stored (Intermittent), if it was previously stored in memory and DTC set conditions are not satisfied.
Error Counter	The error counter shows how often a DTC was detected, which means a change of a DTC to 'active' status happened (the error counter will be incremented each time that a failure is detected independent of ignition cycles) The error counter is only incremented and allows to distinguish whether a DTC is a Active or an Stored (intermittent) DTC. The error counter is the number of times the TCM detects the DTC, the counter starts at 0 and counts to 255 (the maximum value is 255).	
Warm-up-Cycle Counter	The warm-up cycle counter is incremented (conditions for this problem detection have been met) if an error did not occur during the current driving cycle. and if a value of 255 is reached the error may be deleted from error memory. The counter starts at 0 and counts to 255 (the maximum value is 255). The counter will be reset to 0 if the problem occurs again.	
Driving Cycle Since First Set	The Driving Cycle First Set - will count the number of times the vehicle has completed a driving cycle since the DTC was first set. The counter will count up to 255 starts or until cleared.	

*Driving Cycle - A driving cycle is set when the engine speed is greater than 450 rpm. If one of the errors 28, 37, 39 or 82 is present the driving cycle is incremented immediately.

3.3.5 TROUBLE CODE ERASURE

Diagnostic Trouble Codes can be erased in two ways. The first is to erase the DTC with the DRBIII® or scan tool. The second is if the DTC is no longer present, the DTC is reset by the TCM (after an ignition cycle), which will place the DTC in an intermittent status (Stored DTC).

When there are no diagnostic trouble codes stored in memory, the DRBIII® will display "NO DTC's DETECTED"

3.3.6 LIST OF DIAGNOSTIC TROUBLE CODES

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

DTC ID	Name of Code	Limp-in	MIL
46,47,48,57, 58,59,60,61, 62,63,65, 66,67, 69	Internal Controller	YES[1]	ON
2 , 71	1-2/4-5 Solenoid Circuit	YES[1]	ON
3, 72	2-3 Solenoid Circuit	YES[1]	ON
4, 73	3-4 Solenoid Circuit	YES[1]	ON
5	TCC Solenoid Circuit	YES[1]	ON
6	Mod. Press Solenoid Circuit	YES[1]	ON
7	Shift Pressure Solenoid Circuit	YES[1]	ON
8	Park Lock Out Solenoid Circuit	NO	OFF
9	P/N Output Circuit	NO	OFF
10	Solenoid Supply Voltage	YES[1]	ON
11	Sensor Supply Voltage	YES[1]	ON
12	N2 Input Sensor Circuit	YES[2]	ON
13	N3 Input Sensor Circuit	YES[2]	ON
14	Input Sensors Mismatch	YES[2]	ON
15	Input Sensor Overspeed	LOSS of DRIVE	ON
17	Shifter Signal Invalid	YES[2]	ON
19	System Overvoltage	YES[2]	OFF
20	Trans Temp Sensor Shorted	NO	OFF
21	System Undervoltage	YES[3]	OFF
22	ABS RR Sensor Message	YES[2]	ON [4]
23	ABS LR Sensor Message	YES[2]	ON [4]
24	ABS RF Sensor Message	YES[2]	ON [4]
25	ABS LF Sensor Message	YES[2]	ON [4]
26	Engine APP/TPS Message	NO	OFF
27	Engine Torque Message Incorrect	NO	OFF
28	Engine RPM Message	NO	OFF
29	Engine Torque Message Incorrect	NO	OFF
31	Engine Torque Message Incorrect	NO	OFF
32	Engine Torque Message Incorrect	NO	OFF
33	ABS Brake Message	NO	OFF
35	Engine CAN Message Missing	NO	OFF
36	Engine CAN Message Missing	YES[2]	ON
37	CAN Bus Circuit	YES[2]	ON

DTC ID	Name of Code	Limp-in	MIL
38	ABS CAN Message Missing	YES[2]	ON
39	Engine CAN Message Missing	NO	OFF
43	Engine Temp Message	NO	OFF
44	Engine T-case Switch Message	YES[1]	ON
49	Engine Overspeed	LOSS of DRIVE	ON
50	Improper Ratio	LOSS of DRIVE	ON
51	Transmission Slipping	NO[5]	ON
52	TCC Stuck On	NO	OFF
53	TCC Over Temp	NO	OFF
54	Engine Torque Reduction	NO	OFF
55	Improper Gear	YES[2]	ON
56	Solenoid Supply/Watchdog	YES[6 then 1]	ON
74	Trans Temp Sensor-P/N switch circuit	NO	OFF
75	Trans Temp Sensor Erratic	NO	OFF
76	Internal Shifter failure	YES[2]	ON
81	ABS CAN Message Incorrect	YES[2]	ON
82	Engine CAN Message Missing	NO	OFF
83	Engine CAN Message Missing	YES[2]	ON
85	Engine CAN Message Incorrect	NO	OFF

Permanent Limp-in mode [1] Temporary Limp-in mode [2] Undervoltage Limp-in [3] MIL on if two or more sensors [4] Conditional limp-in [5] Hardware Error[6]

3.3.7 DTC DESCRIPTIONS

Name of code: Internal Controller (46,47,48,57,58,59,60,61,62,63,65,66,67,69)
When Monitored: Always monitored with system active at each ignition cycle.
Set Condition: This code is set whenever Transmission Control Module (TCM) senses an internal error.
Theory of Operation: The TCM is constantly monitoring it's internal processor. If an internal problem is detected, this DTC will be set. The TCM performs various internal tests to verify proper controller operation. When one of these tests fail the controller will enter Hardware Error mode and the controller should be replaced.
Transmission Effects: The MIL will illuminate and the transmission system will default to the Limp-in.
Possible causes:

- Solenoid DTC's will set the internal controller code (repair first before replacing TCM)
- TCM

Name of code: 1-2/4-5 Solenoid Circuit (2, 71)
When Monitored: Always monitored with system active at each ignition cycle, but only a short to ground will be detected without the engine running..
Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.
Theory of Operation: The 1-2/4-5 solenoid is activated when the TCM determines that the transmission must shift into or out of 2nd gear or 5th gear. The solenoid is only activated during the shifting of the transmission. When the solenoid is activated hydraulic pressure is applied to the proper shift elements in the transmission to allow the desired shift. Once the shift is completed the solenoid is turned off. Note: DTC ID 71 varies from DTC ID 2 in the manner that the DTC is detected. This detection method uses direct feed back to the microprocessor and not the diagnostic capabilities of the driver circuits. This detection method will

only detect open circuits, shorts to ground and shorted drivers when the output is off and the engine is running.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Permanent Limp-in until the ignition key is cycled. If three consecutive solenoid failures are detected by the TCM, the TCM will not retest the solenoid and place the transmission is Limp-in until the DTC is erased with the DRBIII®. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.
Possible causes:

- Solenoid circuit wiring
- Solenoid internal
- TCM

Name of code: 2-3 Solenoid Circuit (3, 72)
When Monitored: Always monitored with system active at each ignition cycle, but only a short to ground will be detected without the engine running.. Set condition:. If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.
Theory of Operation: The 2-3 solenoid is activated when the TCM determines that the transmission must shift into or out of 3rd gear. The solenoid is only activated during the shifting of the transmission. When the solenoid is activated hydraulic pressure is applied to the proper shift elements in the transmission to allow the desired shift. Once the shift is completed, the solenoid is turned off. Note: DTC ID 72 varies from DTC ID 3 in the manner that the DTC is detected. This detection method uses direct feed back to the microprocessor and not the diagnostic capabilities of the driver circuits. This detection method will only detect open circuits, shorts to ground and shorted drivers when the output is off and the engine is running.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Permanent Limp-in until the ignition key is cycled. If three consecutive solenoid failures are detected by the TCM, the TCM will not retest the solenoid and places the transmission in Limp-in until the DTC is erased with the DRBIII®. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.
Possible causes:

- Solenoid circuit wiring
- Solenoid internal
- TCM

Name of code: 3-4 Solenoid Circuit (4, 73)
When Monitored: Always monitored with system active at each ignition cycle, but only a short to ground will be detected without the engine running.
Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.
Theory of Operation: The 3-4 solenoid is activated when the TCM determines that the transmission must shift into or out of 4th gear. The solenoid is only activated during the shifting of the transmission. When the solenoid is activated, hydraulic pressure is applied to the proper shift elements in the transmission to allow the desired shift. Once the shift is completed, the solenoid is turned off. Note: DTC ID 73 varies from DTC ID 4 in the manner that the DTC is detected. This detection method uses direct feed back to the microprocessor and not the diagnostic capabilities of the driver circuits. This detection method will only detect open circuits, shorts to ground and shorted drivers when the output is off and the engine is running.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Permanent Limp-in until the ignition key is cycled. If three consecutive solenoid failures are detected by the TCM, the TCM will not retest the solenoid and places the transmission in Limp-in until the DTC is erased with the DRBIII®. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.
Possible causes:

- Solenoid circuit wiring
- Solenoid internal
- TCM

Name of code: TCC Solenoid Circuit (5)
When Monitored: Always monitored with system active at each ignition cycle. Solenoid inactive, Solenoid active and controlled above 25% duty cycle, Solenoid Supply Active.
Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.
Theory of Operation: The TCC solenoid is activated when the TCM determines that the Torque converter clutch should be activated. The TCC clutch is a variable slip torque clutch that allows control of torque converter slip from 5% to 95.5% of full TCC engagement. The clutch is controlled by the TCC solenoid which is pulse width modulated (PWM) to provide the desired amount of slip.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Permanent Limp-in until the ignition key is cycled. If three consecutive solenoid failures are detected by the TCM, the TCM will not retest the solenoid and places the transmission in Limp-in until the DTC is

erased with the DRBIII®. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.

Possible causes:

- Solenoid circuit wiring
- Solenoid internal
- TCM

Name of code: Mod. Press Solenoid Circuit (6)

When Monitored: Always monitored with system active at each ignition cycle. Solenoid off, Solenoid active with 25-75% duty cycle, Solenoid Supply Active

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.

Theory of Operation: The modulation pressure is always active. The solenoid is pulse width modulated (PWM) controlled and is used to modulate the hydraulic system pressure to the desired pressure.

Transmission Effects: The MIL will illuminate and the transmission will be placed in Permanent Limp-in until the ignition key is cycled. If three consecutive solenoid failures are detected by the TCM, the TCM will not retest the solenoid and places the transmission in Limp-in until the DTC is erased with the DRBIII®. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Solenoid circuit wiring
- Solenoid internal
- TCM

Name of code: Shift Pressure Solenoid Circuit (7)

When Monitored: When the solenoid is off, solenoid active with 25-75% duty cycle and/or the solenoid supply is active

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.

Theory of Operation: The Shift Pressure Solenoid is activated when the TCM determines that a transmission shift is required. The solenoid is PWM controller to allow the proper amount of hydraulic pressure to the shift elements. The solenoid is only activated during the shifting of the transmission. When the solenoid is activated, hydraulic pressure is applied to the proper shift elements through one of the shift solenoids in the transmission to allow the desired shift. Once the shift is completed the solenoid is turned off.

Transmission Effects: The MIL will illuminate and the transmission will be placed in Permanent Limp-in until the ignition key is cycled. If three consecutive solenoid failures are detected by the TCM, the TCM will not retest the solenoid and places the transmission in Limp-in until the DTC is erased with the DRBIII®. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Solenoid circuit wiring
- Solenoid internal
- TCM

Name of code: Park Lockout Solenoid Circuit (8)

When Monitored: When the solenoid is off and when the solenoid is active.

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.

Theory of Operation: The Park lockout Solenoid is activated when vehicle speed is greater then 6 MPH to protect the transmission from inadvertently being shifted into Park while moving. The Park lock out solenoid is located in the Shifter assembly.

Transmission Effects: Transmission may be able to be shifted into Park when vehicle speed is above 6 MPH. The DTC is evaluated with each ignition cycle if the DTC is detected the solenoid is switched off until the ignition is cycled. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Solenoid circuit wiring
- Solenoid
- TCM

Name of code: P/N Output Circuit (9)

When Monitored: Shifter is in park or neutral and the solenoid is active

Set Condition: Shifter is in park or neutral and the output is active

Theory of Operation: The Park/Neutral output is a hard wired connection to the Engine Controller. The TCM will activate this output when is detects that the Shifter is in the park or neutral position. The TCM will also send a P/N bus message to the PCM/ECM. The P/N switch is wired in series with the transmission temperature sensor and is open in park and neutral. This is a redundant signal as the PCM/ECM also receives a message over the CAN bus that provides the same information. The PCM/ECM will allow starting of the vehicle if either of these signals is present. NOTE: The Engine Controller will allow starting of the vehicle if either the bus or hardwired signal is present.

Transmission Effects: The vehicle may be able to be started in gear. Once set in the system, the output is switched off and the TCM will not re-evaluate DTC until the ignition key is cycled. If the

DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- P/N circuit wiring
- PCM/ECM
- TCM

Name of code: Solenoid Supply Voltage (10)

When Monitored: When the output is active and no under-voltage condition exists.

Set Condition: If the measured Solenoid Supply Voltage and measured battery voltage differ by 3.6 volts. (Watchdog DTC is set if short to B+)

Theory of Operation: The Solenoid Supply Voltage output of the TCM provides the voltage to the three shift solenoids, two pressure solenoids and TCC solenoids. The output is active whenever the system is in normal operation. If a major system DTC is detected this output is turned off to ensure that no solenoids are active.

Transmission Effects: The MIL will illuminate and the transmission will be placed in Permanent Limp-in until the ignition key is cycled. If three consecutive failures are detected by the TCM, the TCM will place the transmission is Limp-in until the DTC is erased with the DRBIII®. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Short to B+ on any solenoid circuit
- Solenoid supply circuit
- Solenoid internal
- TCM

Name of code: Sensor Supply Voltage (11)

When Monitored: Always monitored with system active at each ignition cycle and no under-voltage condition exists.

Set Condition: If measured sensor voltage is not within specified limits 4.8-7.2 volts or if a problem with the regulator, Sensor Supply Voltage shorted to ground, Sensor Supply Voltage shorted to battery is detected.

Theory of Operation: The Sensor Supply Voltage output provides the 6.0V supply voltage to both input speed sensors. The output is active whenever the system is in operation.

Transmission Effects: The MIL will illuminate and the transmission will be placed in Permanent Limp-in until the ignition key is cycled. If three consecutive failures are detected by the TCM, the TCM will place the transmission is Limp-in until the DTC is erased with the DRBIII®. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Sensor supply circuit
- Solenoid internal
- TCM

Name of code: N2 Input Sensor Circuit (12)

When Monitored: Engine speed greater than 450 rpm, no engine speed DTC's, no TCM under-voltage system operation, no output speed sensor DTC's (signal from the ABS system), all wheel speeds above 250 rpm (signal from the ABS system), no rear wheel speed DTC's (signal from the ABS system), and no wheel slip detected (signal from the ABS system).

Set Condition: If the N2 input speed sensor is equal to 0 rpm or a short to ground, short to battery open input speed sensor, input speed sensor, open sensor supply circuit.

Theory of Operation: The N2 Input Speed Sensor is one of two hall effect speed sensors that are used by the TCM to calculate the transmissions input speed. Since the input speed could not be measured directly two of the drive elements are measured. Two input speed sensors were required because both drive elements are not active in all gears.

Transmission Effects: The MIL will illuminate and the transmission will be placed in Temporary Limp-in until the ignition key is cycled. If three consecutive failures are detected by the TCM, the TCM places the transmission in Limp-in until the DTC is erased with the DRBIII®. The TCM will use a back up value for the N2 input speed sensor of 8000 rpm. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.

Possible causes:

- Sensor circuit wiring
- Open Sensor Supply Circuit
- Solenoid internal
- TCM

Name of code: N3 Input Sensor Circuit (13)

When Monitored: Engine speed greater than 450 rpm, no engine speed DTC's, no TCM under-voltage system operation, no output speed sensor DTC's (signal from the ABS system), all wheel speeds above 250 rpm (signal from the ABS system), no rear wheel speed DTC's (signal from the ABS system), and no wheel slip detected (signal from the ABS system), no shifting operation, detected gear is 3rd or 4th and the detected gear is the actual vehicle gear.

Set Condition: If the N3 input speed sensor is equal to 0 rpm or a short to ground, short to battery open input speed sensor, input speed sensor, open sensor supply circuit.

Theory of Operation: The N3 Input Speed Sensor is one of two Hall effect speed sensors that are used by the TCM to calculate the transmissions input speed. Since the input speed could not be measured directly two of the drive elements are measured. Two input speed sensors were required because both drive elements are not active in all gears.

Transmission Effects: The MIL will illuminate and the transmission will be placed in Temporary Limp-in until the ignition key is cycled. If three consecutive failures are detected by the TCM, the TCM places the transmission in Limp-in until the DTC is erased with the DRBIII®. The TCM will use a back up value for the N3 input speed sensor of 8000 rpm. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Sensor circuit wiring
- Open Sensor Supply Circuit
- Solenoid internal
- TCM

Name of code: Input Sensors Mismatch (14)

When Monitored: Engine speed greater than 450 rpm, no engine speed DTC's, no TCM under-voltage system operation, no output speed sensor DTC's (signal from the ABS system), all wheel speeds above 250 rpm (signal from the ABS system), no rear wheel speed DTC's (signal from the ABS system), and no wheel slip detected (signal from the ABS system), no shifting operation, N3 input speed sensor greater than 800 rpm and N2 input speed sensor greater than 0 rpm and the TCM not in reset.

Set Condition: If the speed difference between the N2 and N3 input speed sensors is greater than 150 rpm.

Theory of Operation: The N2 and N3 Input Speed Sensors will report the same speed in gears 2,3 or 4. If these signals are not the same in these gears then there is an issue with the transmission.

Transmission Effects: The MIL will illuminate and the transmission will be placed in Temporary Limp-in until the ignition key is cycled. If three consecutive failures are detected by the TCM, the TCM places the transmission in Limp-in until the DTC is erased with the DRBIII®. The TCM will use a back up value for the N2 and N3 input speed sensors of 8000 rpm. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Transmission internal
- Solenoid internal
- TCM

Name of code: Input Sensor Overspeed (15)

When Monitored: Whenever the N2 input speed sensor is greater than 0 rpm

Set Condition: If the rpm of the N2 or N3 input speed sensor is greater than 7700 rpm

Theory of Operation: The rationality check is intended to indicate a catastrophic transmission failure. The MIL will illuminate and the transmission will be placed in neutral until the ignition key is cycled. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Transmission Effects: Loss of drive and the transmission will shift to neutral

Possible causes:

- Transmission internal
- TCM

Name of code: Shifter Signal Invalid (17)

When Monitored: Always monitored with system active at each ignition cycle and no under-voltage condition exists

Set Condition: The Shifter detects an invalid code, shifter failure, TCM failure, Short to ground, open circuit or short to battery on one of the five circuits.

Theory of Operation: This transmission does not have a Range Sensor internally. The customer requested gear must be communicated by the shifter module to the TCM. This is accomplished by five circuits, which send a gray code to the transmission controller. If this gray code is incorrect, this DTC is set. The shifter sense circuits communicate the shift lever position to the TCM. Each circuit is terminated at the shifter. Each circuit can be either HI or LO, 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 circuits, which will be HI and LO, this is called a PRNDL code. There are five circuits, therefore: there are many possible combinations of HI and LO circuit (codes). The following chart shows the normal switch states for each shift lever position.

PRNDL SWITCH INPUTS FROM THE SHIFTER

Switch	Park	T1	Rev	T2	N	T3	D	4	3	2	1
C1	HI	LO	LO	LO	HI	HI	LO	LO	LO	HI	HI
C2	HI	HI	HI	LO	LO	LO	LO	LO	HI	LO	HI
C3	HI	HI	HI	HI	HI	LO	HI	LO	LO	LO	LO
C4	LO	LO	HI	HI	HI	HI	LO	HI	LO	LO	HI
C5	LO	HI	LO	HI	LO	HI	LO	LO	LO	LO	LO
HI = 12 volts LO = 0 volts											

DRBIII® error code list

ERROR CODE	SWITCH STUCK	POSITION
1.	C1 Stuck	Open
2.	C1 Stuck	Closed
3.	C2 Stuck	Open
4.	C2 Stuck	Closed
5.	C3 Stuck	Open
6.	C3 Stuck	Closed
7.	C4 Stuck	Open
8.	C4 Stuck	Closed
9.	C5 Stuck	Open
10.	C5 Stuck	Closed

Transmission Effects: The MIL will illuminate and the transmission will be placed in Temporary Limp-in until the ignition key is cycled. If three consecutive failures are detected by the TCM, the TCM will place the transmission in Limp-in until the DTC is erased with the DRBIII®. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Shifter circuit wiring
- Internal Shifter
- TCM

Name of code: System Overvoltage (19)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: Ignition voltage above 16.9 volts with the engine and transmission input speed sensors above 2000 rpm for 60 seconds

Theory of Operation: The TCM monitors the ignition voltage that it is supplied. This DTC is set when the monitored voltage raises above a threshold. Temporary limp-in mode will be activated when the voltage reaches the threshold, but the System Overvoltage DTC will not be saved unless the engine speed and transmission input speed is greater then 2000 RPM for 60 seconds. The system will recover if the ignition voltage drops below 16.4 volts.

Transmission Effects: The transmission will be placed in Temporary Limp-in. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Charging system
- 24-volt jump(jumpstart of vehicle with battery in series)
- TCM

Name of code: Transmission Temp Sensor Shorted (20)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: Temperature sensor input is below a threshold (.5V), failed temperature sensor, short to ground, TCM

Theory of Operation: The Solenoid Assembly in the transmission contains a sensor that monitors the oil temperature of the transmission. This sensor is wired in series with the P/N Switch. The transmission temperature sensors expected state is detected as OPEN when the transmission is in Park or Neutral. When in park or neutral, the temperature displayed will be engine temperature.

Transmission Effects: No Reaction, Engine temperature is substituted for transmission temperature. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Temp Sensor wiring
- Solenoid internal
- TCM

Name of code: System Undervoltage (21)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: Ignition voltage falls below 8.5 volts with engine rpm greater than 2000 RPM for 60 seconds.

Theory of Operation: The Transmission Controller monitors the ignition voltage that it is supplied. This DTC is set when the monitored voltage falls below a threshold. Undervoltage limp-in mode will be activated when the voltage reaches the threshold, but a DTC will not be saved unless the engine speed and transmission input speed is greater then 2000 RPM for 60 seconds. The system will recover if the ignition voltage rises above 9.0 volts.

Transmission Effects: The TCM will go into undervoltage limp-in. Diagnostic DTC detection for

other DTC's is turned off. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Charging system
- Fused Ignition wiring
- Low battery voltage
- TCM

Name of code: ABS RR Sensor Message (22)

When Monitored: Valid ABS CAN messages received at least once and the CAN Bus circuit, ABS CAN Message Missing, ABS CAN Message Incorrect DTCs are not active

Set Condition: ABS signal ″wheel speed rear right″ not valid or ABS has detected a sensor failure.

Theory of Operation: The W5J400 transmission does not have an output shaft speed sensor. The TCM uses the ABS Wheel Speed sensor information, it receives over the CAN bus, to calculate the output shaft speed. This calculation considers the Axle ratio and Transfer case position and gear ratio when in 4 Low.

Transmission Effects: MIL on if two or more wheel speed sensors are involved. The secondary system reaction is to use wheel speed rear left as backup value, if two wheel speeds are not valid Temporary Limp-in mode is activated and backup value for wheel speeds = 2000 rpm. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- ABS Wheel speed sensor
- ABS controller
- TCM

Name of code: ABS LR Sensor Message (23)

When Monitored: Valid ABS CAN messages received at least once and the CAN Bus circuit, ABS CAN Message Missing, ABS CAN Message Incorrect are not active

Set Condition: ABS signal ″wheel speed rear left″ not valid or ABS has detected a sensor failure.

Theory of Operation: The W5J400 transmission does not have an output shaft speed sensor. The TCM uses the ABS Wheel Speed sensor information, it receives over the CAN bus, to calculate the output shaft speed. This calculation considers the Axle ratio and Transfer case position and ratio when in 4 Low.

Transmission Effects: MIL on if two or more wheel speed sensors are involved. The secondary system reaction is to use wheel speed rear right as backup value, if two wheel speeds are not valid Temporary Limp-in mode is activated and backup value for wheel speeds = 2000 rpm. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- ABS Wheel speed sensor
- ABS controller
- TCM

Name of code: ABS RF Sensor Message (24)

When Monitored: Valid ABS CAN messages received at least once and the CAN Bus circuit, ABS CAN Message Missing, ABS CAN Message Incorrect are not active

Set Condition: ABS signal ″Wheel Speed Front Right″ not valid or ABS has detected a sensor failure.

Theory of Operation: The W5J400 transmission does not have an output shaft speed sensor. The TCM uses the ABS Wheel Speed sensor information, it receives over the CAN bus, to calculate the output shaft speed. This calculation considers the Axle ratio and Transfer case position and ratio when in 4 Low. For some 4 Wheel Drive applications, it is required to average all four sensors to calculate an accurate output shaft speed. This is not required with this system, the front sensors are used for various other calculations (vehicle speed, transverse acceleration) etc.

Transmission Effects: no reaction- front sensors used for other calculations, MIL on if two or more wheel speed sensors are involved. The secondary system reaction is if two wheel speeds are not valid Temporary Limp-in mode is activated and backup value for wheel speeds = 2000 rpm. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- ABS Wheel speed sensor
- ABS controller
- TCM

Name of code: ABS LF Sensor Message (25)

When Monitored: Valid ABS CAN messages received at least once and the CAN Bus circuit, ABS CAN Message Missing, ABS CAN Message Incorrect are not active

Set Condition: ABS signal ″Wheel Speed Front Left″ not valid or ABS has detected a sensor failure.

Theory of Operation: The W5J400 transmission does not have an output shaft speed sensor. The TCM uses the ABS Wheel Speed sensor information, it receives over the CAN bus, to calculate the output shaft speed. This calculation considers the Axle ratio and Transfer case position and ratio when in 4 Low. For some 4 WD applications it is required to average all four sensor to calculate an accurate output shaft speed. This is not required

with this system, front sensors are used for various other calculations (vehicle speed, transverse acceleration) etc.

Transmission Effects: No reaction- front sensors are used for other calculations, The MIL will be turned on if two or more wheel speed sensors are involved. The secondary system reaction is if two wheel speeds are not valid Temporary Limp-in mode is activated and backup value for wheel speeds = 2000 rpm. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- ABS Wheel speed sensor
- ABS controller
- TCM

Name of code: Engine APP/TPS Message (26)

When Monitored: - Valid APP/TPS CAN Message Received at least once and CAN Bus Circuit, Engine CAN Message Missing and Engine CAN Message Incorrect are not active.

Set Condition: - APP/TPS (accelerator pedal position) Message not valid or PCM/ECM engine sensor DTC detected. NOTE: The PCM/ECM can not detect a short to ground or an open circuit of the APP/TPS. The above DTC should only be indicated if the APP/TPS signal is shorted to Battery or Sensor supply.

Theory of Operation: The TCM does not have a direct interface with the APP/TPS (accelerator pedal position). It obtains this information over the CAN bus from the PCM/ECM.

Transmission Effects: No reaction - backup value for APP/TPS accelerator pedal position = 25 %. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status

Possible causes:

- APP/TPS (accelerator pedal position)
- PCM/ECM
- TCM

Name of code: Engine Torque Message Incorrect (27)

When Monitored: Valid Torque CAN messages received at least once and CAN Bus Circuit, Engine CAN Message Missing and Engine CAN Message Incorrect are not active.

Set Condition: - Engine torque message not valid or PCM/ECM controller error.

Theory of Operation: The TCM receives engine torque information over the CAN bus from the PCM/ECM. This information is used to determine what torque reduction will be required during a transmission shift. The TCM requests the torque reduction from the PCM/ECM over the CAN bus. This message indicates the level of torque that the engine is presently producing.

Transmission Effects: No reaction - Shifts performed with higher system pressures and a backup value for engine torque = 600 Nm (443 Ft/LBS). If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- PCM/ECM
- TCM

Name of code: Engine RPM Message (28)

When Monitored: - Valid RPM CAN message received at least once CAN Bus Circuit, Engine CAN Message Missing and Engine CAN Message Incorrect are not active.

Set Condition: Signal ″engine speed″ not valid or PCM/ECM error.

Theory of Operation: The TCM receives engine RPM information over the CAN bus from the PCM/ECM

Transmission Effects: No reaction - backup value for engine speed = 750 rpm. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status

Possible causes:

- Engine Speed Sensor
- PCM/ECM
- TCM

Name of code: Engine Torque Message Incorrect (29)

When Monitored: - Valid Torque CAN messages received at least once and CAN Bus Circuit, Engine CAN Message Missing and Engine CAN Message Incorrect are not active.

Set Condition: - Engine torque minimum message not valid or PCM/ECM error.

Theory of Operation: The TCM receives engine torque information over the CAN bus from the PCM/ECM. This information is used to determine what torque reduction will be required during a transmission shift. The TCM requests the torque reduction from the PCM/ECM over the CAN bus. This message is used to set the minimum level of torque that the TCM can request

Transmission Effects: No reaction - Shifts performed with higher system pressures and a backup value for minimum engine torque = 600 Nm (443 Ft/LBS) If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.

Possible causes:

- PCM/ECM
- TCM

Name of code: Engine Torque Message Incorrect (31)

When Monitored: - Valid Torque CAN messages received at least once and CAN Bus Circuit, Engine CAN Message Missing and Engine CAN Message Incorrect are not active.

Set Condition: - Engine torque Maximum message not valid or PCM/ECM error.
Theory of Operation: The TCM receives engine torque information over the CAN bus from the PCM/ECM. This information is used to determine what torque reduction will be required during a transmission shift. The TCM requests the torque reduction from the PCM/ECM over the CAN bus. This message is used to set the maximum level of torque that the TCM can request
Transmission Effects: No reaction - Shifts performed with higher system pressures and a backup value for engine torque = 600 Nm (443 Ft/LBS) If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.
Possible causes:

- PCM/ECM
- TCM

Name of code: Engine Torque Message Incorrect (32)
When Monitored: - Valid Torque CAN messages received at least once and CAN Bus Circuit, Engine CAN Message Missing and Engine CAN Message Incorrect are not active.
Set Condition: Signal ″torque demand ESP″ not valid or PCM/ECM error.
Theory of Operation: The TCM receives engine torque information over the CAN bus from the PCM/ECM. This information is used to determine what torque reduction will be required during a transmission shift. The TCM requests the torque reduction from the PCM/ECM over the CAN bus. This message indicates what the present torque of the engine would be without a TCM torque reduction request.
Transmission Effects: No reaction - Shifts performed with higher system pressures and a backup value for engine torque = 600 Nm (443 Ft/LBS) If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.
Possible causes:

- PCM/ECM
- TCM

Name of code: ABS Brake Message (33)
When Monitored: Valid Brake CAN message received at least once and CAN Bus Circuit, ABS CAN Message Missing, ABS CAN Message Incorrect are not active.
Set Condition: Signal ″brake-light switch″ not valid- ABS sending invalid value.
Theory of Operation: The TCM receives the brake switch status from the ABS controller over the CAN bus.
Transmission Effects: No reaction - brake light switch signal is set to a default value (not actuated). If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.
Possible causes:

- ABS
- TCM

Name of code: Engine CAN Message missing (35)
When Monitored: CAN Bus circuit error not present, 1 second after ignition on and not in Park or Neutral, no System Overvoltage or System Undervoltage conditions present, or transmission in Park or Neutral and engine RPM greater than 850 RPM.
Set Condition: This DTC is set if the Vehicle Mileage CAN message from the PCM/ECM was not received in the required time.
Theory of Operation: The TCM receives information from the Engine controller over the CAN bus.
Transmission Effects: No reaction, no Mileage reported in DTC History, if the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.
Possible causes:

- CAN Bus wiring
- Ignition to PCM/ECM
- PCM/ECM
- TCM

Name of code: Engine CAN Message Missing (36)
When Monitored: CAN Bus Circuit error not present, 1 sec after ignition on and the transmission is not in Park or Neutral, no System Overvoltage or System Undervoltage conditions present, transmission in Park or Neutral and engine RPM greater than 850 RPM
Set Condition: : This DTC is set if the Engine Coolant and T-Case Status CAN message from the PCM/ECM was not received in the required time. - PCM/ECM controller issue
Theory of Operation: The TCM receives information from the PCM/ECM over the CAN bus.
Transmission Effects: The transmission will be placed in Temporary Limp-in, a backup value for engine coolant temperature = 80 °C (176 °F) - transfer case 4H default value used. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.
Possible causes:

- CAN Bus
- Ignition to PCM/ECM
- PCM/ECM
- TCM

Name of code: CAN Bus Circuit (37)
When Monitored: Always monitored with system active at each ignition cycle.
Set Condition: Open circuit in the CAN C Bus (+) circuit or CAN C Bus (-) circuit, Short to ground of CAN C Bus (+) circuit or CAN C Bus (-) circuit, Short to Voltage of CAN C Bus (+) circuit or CAN C

Bus (-) circuit, CAN C Bus (+) circuit shorted to CAN C Bus (-) circuit, or a TCM Failure

Theory of Operation: The TCM receives information from the PCM/ECM and ABS controllers over the CAN bus. The CAN bus is a high speed communication bus that allows real time control capability between various controllers. Most messages are sent every 20 milliseconds, this means critical information can be shared between controllers. The CAN bus is a two wire bus with a CAN C Bus (+) circuit and a CAN C Bus (-) circuit. These circuits are twisted pairs in the harness to reduce the potential of radio and noise interference.

Transmission Effects: The transmission will be placed in Temporary Limp-in. All Secondary System Reactions for Missing messages will be activated. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.

Possible causes:

- CAN Bus wiring
- ABS
- PCM/ECM
- TCM

Name of code: ABS CAN Message missing (38)

When Monitored: CAN Bus Circuit error not present, 1 second after ignition on and not in Park or Neutral, no System Overvoltage or System Undervoltage conditions present, or transmission in Park or Neutral and engine RPM greater than 850 RPM

Set Condition: This DTC is set when a CAN ID was not received in the required time and are not being sent from the ABS Controller. NOTE: The ABS controller is powered by the run only ignition feed. This means that this DTC will be set if the key is placed in the start position with the transmission in gear or if in Park or Neutral and the engine RPM is greater than 850 RPM. Because of this, the presence of this DTC should be verified by turning the ignition on to the run position and placing the Shifter in the R position.

Theory of Operation: The TCM receives information from the ABS controller over the CAN bus.

Transmission Effects: The transmission will be placed in Temporary Limp-in. Backup values for wheel speed set to 2000 RPM. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.

Possible causes:

- CAN Bus wiring
- Ignition to PCM/ECM
- ABS
- TCM

Name of code: Engine CAN Message missing (39)

When Monitored: CAN Bus Circuit error not present, 1 second after ignition on and not in Park or Neutral, no System Overvoltage or System Undervoltage conditions present, or transmission in Park or Neutral and engine RPM greater than 850 RPM

Set Condition: This DTC is set when the Engine Torque, APP/TPS and RPM CAN messages from the PCM/.ECM was not received in the required time.

Theory of Operation: The TCM receives information from the Engine controller over the CAN bus.

Transmission Effects: Controlled Limp-in, backup value for accelerator pedal position is 25%, backup value for engine rpm is 750 rpm, TCM uses backup value for engine torque of 600 Nm, and other PCM/ECM signals are set to default. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.

Possible causes:

- CAN Bus wiring
- Ignition to PCM/ECM
- PCM/ECM
- TCM

Name of code: Engine Temp Message (43)

When Monitored: Valid Engine Temp CAN message received at least once and CAN Bus Circuit error, Engine CAN Message Missing and Engine CAN Messages Incorrect are not active.

Set Condition: Engine coolant temperature signal is not valid - indicates a possible coolant temperature sensor error.

Theory of Operation: The TCM receives engine temperature information over the CAN bus from the Diesel Controller. This information is used to modify transmission shifting based on engine temperature. It is also used as a backup if the transmission temperature sensor fails.

Transmission Effects: No reaction - backup value for engine coolant temperature = 80 °C

Possible causes:

- Engine Temperature Sensor Wiring
- Engine Temperature Sensor
- PCM/ECM
- TCM

Name of code: Engine T-case Switch Message (44)

When Monitored: Valid T-Case CAN message received at least once, the CAN Buss Circuit and Engine CAN Message Missing are not active.

Set Condition: Transfer Case Status signal not valid - indicates possible T-Case sensor error.

Theory of Operation: The W5J400 Transmission does not have an output speed sensor. The output shaft speed is calculated from the ABS wheel speed information received over the CAN bus. In order to calculate the output shaft speed the TCM uses the axle ratio and the transfer case ratio when in low gear. The TCM must know what mode the T-Case is

in at all times. This is accomplished by a sensor in the transfer case that is wired to the PCM/ECM.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Permanent Limp-in. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status
Possible causes:

- Transfer Case Sensor wiring
- Transfer Case Sensor
- Transfer Case - Mechanical
- PCM/ECM
- TCM

Name of code: Engine Overspeed (49)
When Monitored: Valid Engine RPM message received at least once, the CAN Bus Circuit and Engine CAN Message Missing are not active.
Set Condition: If the engine speed increases above 5100 RPM.
Theory of Operation: The TCM monitors the engine speed over the CAN bus. If the engine speed increases above a set value (5100 RPM) the TCM assumes that either the information from the Engine controller is incorrect or that a major mechanical problem exists. The TCM will then force the transmission into neutral to protect the transmission.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Neutral (LOSS of DRIVE) until the ignition key is cycled. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.
Possible causes:

- Engine - Mechanical
- Transmission - Mechanical
- PCM/ECM
- TCM

Name of code: Improper Ratio (50)
When Monitored: Engine rpm greater than 450 rpm, output speed greater than 180 rpm, no N2 - N3 input speed sensor errors present, no gear selector lever errors present, no ABS system errors, no transfer case errors present, and all wheel speeds above 450 rpm.
Set Condition: No shifting operation and detected gear is not the actual gear No shifting operation - detected (calculated) gear is less than actual(expected) gear or no plausible gear is calculated or Actual turbine speed - calculated turbine speed > 300 rpm or calculated transmission ration is above threshold. During an Upshift - detected (calculated) gear is less than actual(expected) gear-1. During Downshift - detected (calculated) gear is less than actual (expected) gear
Theory of Operation: The TCM constantly calculates the transmission ratio based on the N2-N3 input speed signals and the calculated output shaft speed (CAN message from the ABS). The TCM will detect if the transmission is trying to mechanically shift into a lower gear, then the TCM intends.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Neutral (LOSS of DRIVE) until the ignition key is cycled. If the DTC is reset (after an ignition cycle) the DTC will be set to Stored (Intermittent) status.
Possible causes:

- Solenoid wiring
- Transfer Case position sensor
- Transmission - mechanical
- TCM

Name of code: Transmission Slipping (51)
When Monitored: Engine rpm greater than 450 rpm, output speed greater than 180 rpm, no N2 - N3 input speed sensor errors present, no gear selector lever errors present, no ABS system errors, no transfer case errors present, and all wheel speeds between 70 - 380 rpm with no wheel slip detected.
Set Condition: Calculated ratio not within allowable range for the engaged gear. No shifting operation.
Theory of Operation: The TCM constantly calculates the transmission ratio based on the N2-N3 input speed signals and the calculated output shaft speed (CAN message from the ABS). The TCM will detect if the transmission is slipping or an invalid gear ratio is present
Transmission Effects: Controlled Limp-in and delayed engagement in reverse, modulating pressure is set to maximum value and a transmission shift into 3rd gear only, will be allowed, MIL will illuminate, DTC re-evaluated after ignition key is cycled. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.
Possible causes:

- Transfer Case position error
- Transfer case - mechanical
- Transfer Case - shift cable adjustment
- Transmission - mechanical
- Axle - mechanical
- Axle ratio incorrect
- TCM

Name of code: TCC Stuck On (52)
When Monitored: TCM not in initialization phase, No input speed sensor N2 - N3 codes present, no CAN bus code present, no PCM/ECM codes present, no CAN engine speed codes present, Engine speed Greater than 450 rpm, no CAN engine torque codes present, no shift in progress, must be in a forward gear (1, 2, 3, 4 or 5 engaged), TCM torque converter status = OPEN
Set Condition: Engine RPM-Turbine Speed 100NM for 1 second

Theory of Operation: The TCM constantly monitors the amount of torque converter slippage. When the torque converter is open the slippage is expected to be above a threshold. If the slippage is less then expected when the TCC is open then the TCM assumes that the TCC is stuck on.
Transmission Effects: No reaction, If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.
Possible causes:

- Solenoid
- Transmission - mechanical
- TCM

Name of code: TCC Over Temp (53)
When Monitored: TCM not in initialization phase, Solenoid supply active, No input speed sensor N2 - N3 codes present, no CAN bus code present, no PCM/ECM codes present, no CAN engine speed codes present, TCM torque converter clutch in slip mode.
Set Condition: Friction loss factor reaches threshold
Theory of Operation: The TCM monitors the friction losses of the torque converter clutch while it is in slipping mode. The friction losses are calculated using the CAN signals engine speed and engine torque as well as the torque converters turbine speed calculated by the TCM. Depending on the friction losses calculated in each program cycle, a corresponding value is added to a factor as long as the torque converter clutch is in slipping mode. The factor is set to 0 when the clutch is opened. If the factor reaches a specified value a DTC is detected.
Transmission Effects: No reaction, the desired value for the TCC slip is set to it's minimum value until the DTC is cleared by the DRBIII®. DTC's must be erased in order to return to normal operation.
Possible causes:

- Transmission - mechanical

Name of code: Engine Torque Reduction (54)
When Monitored: Engine intervention active for at least 20 ms, no engine torque errors, engine torque demand is greater than 0.
Set Condition: Torque Reduction acknowledge bit - not set, no shift aborts, the error flag ″torque reduction acknowledge″ is not set, Engine controller not supporting torque requests.
Theory of Operation: The TCM requests torque reductions, over the CAN bus, during a transmission shift to improve shift quality. The TCM verifies that the PCM/ECM has performed the requested torque reduction by monitoring the response to the request. If the response is not within a specified tolerance the TCM increments a counter. If this counter reaches a threshold then a failure is detected
Transmission Effects: No reaction, If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.
Possible causes:

- PCM/ECM
- TCM

Name of code: Improper Gear (55)
When Monitored: The conditions for gear detection: are, engine speed greater than 450 rpm, No input speed sensor failures are active, no selector lever error active, selector lever is not in intermediate position, selector lever position is not showing power-up value, no output speed error is active, no transfer case error is active, output speed (ABS system) greater than 180 rpm, no wheel speed (ABS system) overspeed detected.
Set Condition: If problem is present for the 3 consecutive ignition cycles then the system will be placed into Limp-in mode until the DTC is cleared by the DRBIII® diagnostic tool.
Theory of Operation: The TCM compares the calculated gear with the gear the transmission has actually engaged. The actual gear is identified by verifying the signals of the two speed sensors N2 and N3 as well as the transmission output speed (from the ABS system). If the actual gear differs from the gear calculated by the TCM, the TCM value is adjusted to the engaged gear and a counter is increased by 2 points. If after a shift the engaged gear and the calculated gear still match, the counter is decreased by 1 point. A DTC is detected as soon as the counter exceeds a threshold.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Temporary Limp-in until the ignition key is cycled. If three consecutive failures are detected by the TCM, the TCM will place the transmission is Limp-in until the DTC is erased with the DRBIII®. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.
Possible causes:

- Solenoid valve
- Internal Transmission
- TCM

Name of code: Solenoid Supply/Watchdog (56)
When Monitored: Always monitored with system active at each ignition cycle.
Set Condition: During the power up of the TCM, it tests the ability of the external watchdog to shut down the Solenoid Supply driver.
Theory of Operation: The TCM performs various internal tests to verify proper TCM operation. During the power up of the TCM it tests the ability of the external watchdog to shut down the Solenoid Supply driver. It does this by not servicing the external watchdog, this will cause a false triggering of the Watchdog and should result in the shut down

of the Solenoid Supply Driver. The controller monitors the A/D feedback on the Solenoid Supply driver output to ensure that 12 V is no longer present there. Note: You must eliminate a short to B+ on solenoids and/or wiring before replacing the TCM, a short to Battery on the solenoid supply output or one of the other solenoids will result in HI on the Solenoid Supply output and may set this DTC in error.

Transmission Effects: Hardware Error Mode - When the TCM detects a major internal error the transmission will be placed in the permanent limp-in mode and cease all communication over the CAN bus. Once the TCM has entered this mode normal transmission operation will not resume until all DTC's are cleared from the TCM. This DTC will not reset with ignition off. The DTC must be cleared with the DRBIII® diagnostic tool in order to return to normal operation

Possible causes:

- Short to Battery on Solenoid Supply line or one of the Solenoids
- TCM

Name of code: Transmission Temperature Sensor - P/N switch circuit (74)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: Temp sensor is open while in forward gears (1-5), temp sensor, open trans temp circuit, P/N Switch.

Theory of Operation: The Solenoid Assembly of the W5J400 transmission contains a temperature sensor to monitor the transmission oil temperature. This sensor is wired in series with the transmission Park/Neutral switch. The TCM expects to see a valid voltage level from the sensor when the shifter is in any forward gear position, and it expects to see an open circuit condition when the shifter is in the Park or Neutral position. When the TCM detects and open circuit when in a forward gear position the DTC is set.

Transmission Effects: No reaction, there will be a 500mSec delay in the starting of the engine and engine temperature is used for transmission temperature. Error is set to intermittent only after the DTC condition is removed. Error will remain active after reset by default until it has been verified that the error is no longer present.

Possible causes:

- Temp Sensor wiring
- Shifter Adjustment
- Solenoid
- Internal Shifter
- TCM

Name of code: Trans Temp Sensor Erratic (75)

When Monitored: When transmission temperature is below 170° C (338° F)

Set Condition: When there is a 10° C (18° F) variation between each transmission temperature sensor read. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.

Theory of Operation: The Solenoid Assembly of the W5J400 transmission contains a temperature sensor to monitor the transmission oil temperature. This sensor is wired in series with the transmission Park/Neutral switch. The TCM expects to see a valid voltage level from the sensor when the shifter is in any forward gear position, and it expects to see an open circuit condition when the shifter is in the Park or Neutral position. The TCM will set this DTC when it detects that the Temperature sensor input is changing to fast to be realistic

Transmission Effects: No reaction, If three consecutive failures are detected by the TCM the DTC will be set, the DTC will reset when there is less than a 2° C (36° F) variation between sensor reads for 5 seconds. Error is set to intermittent after a reset occurs. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status. Error is set to intermittent only after the DTC condition is removed. Error will remain active after reset by default until it has been verified that the error is no longer present.

Possible causes:

- Temp Sensor wiring (intermittent)
- Solenoid
- TCM

Name of code: Internal Shifter failure (76)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: Shifter sends an erroneous signal indicating the shifter detected an Internal shifter problem, shifter held in an intermediate position for more than 30 seconds.

Theory of Operation: The W5J400 transmission does not have a Range Sensor internally. The customer requested gear must be communicated by the shifter module to the TCM. This is accomplished by five circuits, which sends a gray code to the TCM. The Shifter module performs it's own internal checks for proper operation. When the Shifter detects an internal failure it sends a DTC to the TCM. Clear DTC if DTC returns replace shifter

Transmission Effects: The MIL will illuminate and the transmission will be placed in Temporary Limp-in until the ignition key is cycled. If the DTC is reset, the DTC will be set to Stored (Intermittent) status.

Possible causes:

- Shifter held in intermediate position for more then 30 seconds
- Shifter out of adjustment
- Shifter Module - internal

Name of code: ABS CAN Messages Incorrect (81)
When Monitored: ABS messages received at least once and CAN Bus Circuit (37) is not active
Set Condition: DTC Detected if the number of bytes incorrect for CAN ID.
Theory of Operation: The messages sent on the CAN bus are distinguished by an ID. Each CAN ID is defined to contain a certain number of bytes. The TCM verifies that it has received the proper number of bytes for each ID.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Temporary Limp-in until the ignition key is cycled. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status. The TCM will use a default wheel speed of 2000 RPM.
Possible causes:

- ABS
- TCM

Name of code: Engine CAN Messages Incorrect (82)
When Monitored: CAN-ID received at least once and CAN Bus Circuit (37) is not active
Set Condition: DTC Detected if the number of bytes incorrect for CAN ID.
Theory of Operation: The messages sent on the CAN Bus are distinguished by an ID. Each CAN ID is defined to contain a certain number of bytes. The TCM verifies that it has received the proper number of bytes for each ID.
Transmission Effects: No reaction, system recovery if the correct message sent, backup value for accelerator pedal position = 25 %, backup value for engine speed = 750 rpm, TCM uses a backup value for engine torque = 600 Nm (443 ft lbs), default values for engine signals. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.
Possible causes:

- PCM/ECM
- TCM

Name of code: Engine CAN Messages Incorrect (83)
When Monitored: CAN-ID received at least once and CAN Bus Circuit (37) is not active
Set Condition: DTC Detected if the number of bytes incorrect for CAN ID.
Theory of Operation: The messages sent on the CAN bus are distinguished by an ID. Each CAN ID is defined to contain a certain number of bytes. The TCM verifies that it has received the proper number of bytes for each ID.
Transmission Effects: The MIL will illuminate and the transmission will be placed in Temporary Limp-in until the ignition key is cycled. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status. The system will recover if the correct message sent. The TCM will use backup value for engine coolant temperature = 80° C (176° F), default values used for transfer case signals.
Possible causes:

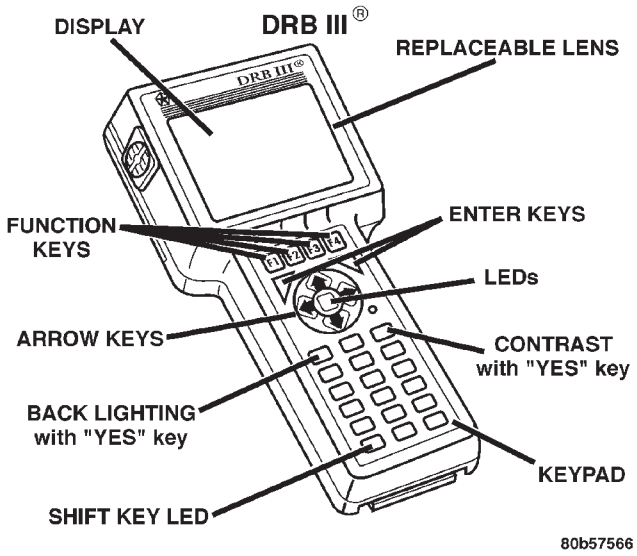
- PCM/ECM
- TCM

Name of code: Engine CAN Messages Incorrect (85)
When Monitored: CAN-ID received at least once and CAN Bus Circuit (37) is not active
Set Condition: DTC Detected if the number of bytes incorrect for CAN ID.
Theory of Operation: The messages sent on the CAN bus are distinguished by an ID. Each CAN ID is defined to contain a certain number of bytes. The TCM verifies that it has received the proper number of bytes for each ID.
Transmission Effects: No effect on the transmission system operation. No mileage information will be stored in Freeze Frame for transmission. The DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status. The system will recover if the correct message received from the engine controller.
Possible causes:

- PCM/ECM
- TCM

3.4 USING THE DRBIII®

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



3.5 DRBIII® ERROR MESSAGES

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

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

If the DRBIII® should display any other error message, record the entire display and call the S.T.A.R. Center.

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.

4.0 DISCLAIMERS, SAFETY, AND WARNINGS

4.1 DISCLAIMERS

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

4.2 SAFETY

4.2.1 TECHNICIAN SAFETY INFORMATION

WARNING: ENGINES PRODUCE CARBON MONOXIDE THAT IS ODORLESS, CAUSES SLOWER REACTION TIME, 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.

Set the parking brake and block the wheels before testing or repairing the vehicle. If is especially important to block the wheels on front-wheel drive vehicles: the parking brake does not hold the drive wheels.

Some operations in this manual require that hydraulic tubes, hoses, and fittings, disconnected for inspection or testing purposes. These systems, when fully charged, contain fluid at high pressure.

Before disconnecting any hydraulic tubes, hoses, and 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. These procedures can be found in the service information. 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 DTC's or error messages may occur. It is extremely important that accurate shift lever position data is available to the TCM. The accuracy of any DTC

found in memory is doubtful unless the Shift Lever Test, performed on the DRBIII® Scan Tool, passes without failure.

4.2.3 SERVICING SUB-ASSEMBLIES

Some components of the Transmission 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 information should be serviced.

4.2.4 DRBIII® SAFETY INFORMATION

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

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

FUNCTION	INPUT LIMIT	Volts
0-500 volts peak 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 DC or 500v peak AC.
- Use caution when measured voltage above 25v DC or 25v AC.
- The circuit being tested must be protected by a 10A fuse or circuit breaker.
- Use the low current shunt to measure circuits up to 10A. Use the high current clamp to measure circuits exceeding 10A.
- When testing for the presence of voltage or current, make sure the meter is functioning correctly. Take a reading of a known voltage or current before accepting a zero reading.
- When measuring current, connect the meter in series with the load.
- Disconnect the live test lead before disconnecting the common test lead.
- When using the meter function, keep the DRBIII® away from spark plug or coil wires to avoid measuring error from outside interference.

4.3 WARNINGS

4.3.1 VEHICLE DAMAGE WARNINGS

Before disconnecting any control module, make sure the ignition is ″lock″ position. 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 the wire and eventually cause the wire 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 DTC could be set, making diagnosis of the original problem more difficult.

When replacing a blown fuse, it is important to use only a fuse having the correct amperage rating. The use of a fuse with a rating other than indicated may result in a dangerous electrical system overload. If a properly rated fuse continues to blow, it indicates a problem in the circuit that must be corrected.

4.3.2 ROAD TESTING A 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 DTC 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 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 the diagnostic information obtained from the DRBIII® Scan Tool and the original customer concern, the road test helps verify the problem was current and any repairs performed, fixed the vehicle correctly. Always operate and observe the vehicle under actual driving conditions.

Just as important as the road test is, there are preliminary inspections that should be performed prior to the road test. Always check the fluid level and condition before taking the vehicle on a road test. Determine if the incorrect fluid is being used, improper fluid will result in erratic transmission operation.

Some of the conditions of incorrect fluid level are as follows:

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

The next step is to verify that the shift linkage is correctly adjusted. If the shift linkage is incorrectly adjusted, a number of complaints can result.

The TCM monitors the Shift Lever Position (SLP) continuously. If the linkage is incorrectly adjusted, the TCM will sense a shift lever position that is not correct for the gear chosen by the driver. This may cause a DTC to be set.

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

- Delayed clutch engagement
- Erratic shifts
- Vehicle will drive in neutral
- Engine will not crank in park or neutral
- Gear shift linkage will be able to be shifted without the key in the ignition
- Not able to remove the ignition key in park
- Parking pawl will not engage properly

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

Some questions to ask yourself when performing the road test are as follows:

- Is the complaint or concern what you think the problem is, based on the drivers description of the problem?
- Is the Transmission operating normally, or is there a real problem?
- When does the problem occur?
- Is the problem only in one gear range?
- What temperature does the problem occur?
- Does the vehicle have to sit over night for the problem to occur?
- Does the transmission go into Limp-in mode?

4.4 BULLETINS AND RECALLS

ALWAYS PERFORM ALL SAFETY RECALLS AND TECHNICAL SERVICE BULLETINS THAT ARE APPLICABLE TO THE PROBLEM.

5.0 REQUIRED TOOLS AND EQUIPMENT

- DRBIII® (diagnostic read-out box) - DRBIII® must use the latest release level.
- Jumper wires
- Test Light
- Ohmmeter
- Voltmeter

6.0 GLOSSARY OF TERMS

6.1 ACRONYMS

ABS	Antilock Braking system
A/C	Air conditioner
A/D	Analog to Digital conversion
APP	Accelerator Pedal Position
CAN	Controller Area Network (Inter-module Bus)
CKT	Circuit
DLC	Data Link Connector
DRBIII®	Diagnostic Readout Box
DTC	Diagnostic Trouble Code
EATX	Electronic Automatic Transmission
ECM	Diesel Engine Controller
EMCC	Electronically Modulated Converter Clutch
IOD	Ignition off-draw
ISS	Input Speed Sensor (N2 and N3)
LED	Light Emitting Diode
MIL	Malfunction Indicator Lamp
OSS	Output Speed Sensor (derived form the ABS controller)
PCI	Programmable Controller Interface (Vehicle bus system)
PCM/ ECM	Powertrain or Engine Control Module
PEMCC	Partial Electronically Modulated Converter Clutch
PWM	Pulse width modulated
SW	Switch
TCC	Torque Converter Clutch
TCM	Transmission Control Module
TP	Throttle Position
TRD	Torque Reduction
TTS	Transmission Temperature Sensor
1-2/4-5 solenoid	controls the shift into and out of 2nd gear or 5th gear.
2-3 solenoid	controls the shift into and out of 3rd gear
3-4 solenoid	controls the shift into and out of 4th gear
TCC solenoid	is pulse width modulated and controls the TCC clutch
Shift Pressure Solenoid	is a pulse width modulated solenoid and controls the hydraulic pressure to the shift elements.
Modulation pressure solenoid	is a pulse width modulated solenoid and controls the hydraulic system pressure

6.2 DEFINITIONS

Driving cycle counter - The starts since first set counter indicates the number of driving cycles since the first occurrence of an error.

NOTES

7.0

DIAGNOSTIC INFORMATION AND PROCEDURES

Symptom:

***NO RESPONSE FROM SHIFTER ASSEMBLY - DIESEL ONLY**

POSSIBLE CAUSES
ATTEMPT TO COMMUNICATE WITH THE BCM
OPEN GROUND CIRCUIT
OPEN FUSED IGNITION SWITCH OUTPUT CIRCUIT
OPEN PCI BUS CIRCUIT
SHIFTER ASSEMBLY

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, enter Body then Body Computer. Was the DRB able to I/D or communicate with the BCM? Yes → Go To 2 No → Refer to the symptom list for problems related to no communication with the BCM. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the Shifter Assembly C1 harness connector. Using a 12-volt test light connected to 12-volts, probe each ground circuit. Is the test light illuminated for each circuit? Yes → Go To 3 No → Repair the ground circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the Shifter Assembly C1 and C2 harness connectors. Turn the ignition on. Using a 12-volt test light connected to ground, probe each Fused Ignition Switch Output circuit. Is the test light illuminated for each circuit? Yes → Go To 4 No → Repair the Fused Ignition Switch Output circuit for an open or short. Refer to the wiring diagrams in the service information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM SHIFTER ASSEMBLY - DIESEL ONLY — Continued

TEST	ACTION	APPLICABILITY
4	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the Shifter Assembly C1 harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Set Probe to x10. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the Shifter Assembly connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Replace the Shifter Assembly in accordance with the service information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Repair the PCI Bus circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

*NO RESPONSE FROM TRANSMISSION CONTROL MODULE - DIESEL ONLY

POSSIBLE CAUSES
ATTEMPT TO COMMUNICATE WITH THE ECM
FUSED IGNITION SWITCH OUTPUT (RUN/ST) CIRCUIT OPEN
GROUND CIRCUIT OPEN
SCI TRANSMIT CIRCUIT OPEN
TRANSMISSION CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, attempt to communicate with the ECM. Was the DRB able to I/D or communicate with the ECM? Yes → Go To 2 No → Refer to the symptom list for problems related to no communication with the ECM (SCI Only). Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
2	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Fused Ignition Switch Output (Run/St) 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 3 No → Repair the Fused Ignition Switch Output (Run/St) circuit for an open. Refer to the wiring diagrams in the Service Information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
3	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Using a 12-volt test light connected to 12-volts, check the ground 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 Ground circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM TRANSMISSION CONTROL MODULE - DIESEL ONLY — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the TCM C1 harness connector. Disconnect the DRB from the DLC. Measure the resistance of the SCI Transmit circuit between the TCM connector and the DLC. Is the resistance below 5.0 ohms? Yes → Replace the Transmission Control Module in accordance with the service information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Repair the SCI Transmit circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

1-2/4-5 SOLENOID CIRCUIT (2, 71)

When Monitored and Set Condition:

1-2/4-5 SOLENOID CIRCUIT (2, 71)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
1-2/4-5 SOLENOID CONTROL CIRCUIT OPEN
1-2/4-5 SOLENOID CONTROL CIRCUIT SHORT TO GROUND
1-2/4-5 SOLENOID CONTROL CIRCUIT SHORT TO OTHER CIRCUITS
1-2/4-5 SOLENOID
TCM - 1-2/4-5 SOLENOID 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

1-2/4-5 SOLENOID CIRCUIT (2, 71) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, erase DTCs. With the DRBIII®, perform the Solenoid Test. With the DRBIII®, read DTCs. Did the DTC, 1-2/4-5 SOLENOID CIRCUIT, reset? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 1-2/4-5 Solenoid Control circuit from the TCM harness connector to the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the 1-2/4-5 Solenoid Control circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the 1-2/4-5 Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the 1-2/4-5 Solenoid Control circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 1-2/4-5 Solenoid Control circuit to all other circuits in the Transmission Solenoid Assembly harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the 1-2/4-5 Solenoid Control circuit for a short to other circuit-s. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

1-2/4-5 SOLENOID CIRCUIT (2, 71) — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the 1-2/4-5 Solenoid Control circuit and the Solenoid Supply Voltage Circuit in the Transmission Control Module C2 harness connector. Is the resistance between 2.5 and 6.5 ohms? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the 1-2/4-5 Solenoid per the Service Information. Perform W5J400 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. **NOTE: Check the Technical Service Bulletins.** Were there any problems found? Yes → Repair as necessary. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

2-3 SOLENOID CIRCUIT (3, 72)

When Monitored and Set Condition:

2-3 SOLENOID CIRCUIT (3, 72)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
2-3 SOLENOID CONTROL CIRCUIT OPEN
2-3 SOLENOID CONTROL CIRCUIT SHORT TO GROUND
2-3 SOLENOID CONTROL CIRCUIT SHORT TO OTHER CIRCUITS
2-3 SOLENOID
TCM - 2-3 SOLENOID 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

2-3 SOLENOID CIRCUIT (3, 72) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, erase DTCs. With the DRBIII®, perform the Solenoid Test. With the DRBIII®, read DTCs. Did the DTC, 2-3 SOLENOID CIRCUIT, reset? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 2-3 Solenoid Control circuit from the TCM C2 harness connector to the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the 2-3 Solenoid Control circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the 2-3 Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the 2-3 Solenoid Control circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 2-3 Solenoid Control circuit to all other circuits in the Transmission Solenoid Assembly harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the 2-3 Solenoid Control circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

2-3 SOLENOID CIRCUIT (3, 72) — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the 2-3 Solenoid Control circuit and the Solenoid Supply Voltage Circuit in the Transmission Control Module C2 harness connector. Is the resistance between 2.5 and 6.5 ohms? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the 2-3 Solenoid per the Service Information. Perform W5J400 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. **NOTE: Check the Technical Service Bulletins.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

3-4 SOLENOID CIRCUIT (4, 73)

When Monitored and Set Condition:

3-4 SOLENOID CIRCUIT (4, 73)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
3-4 SOLENOID CONTROL CIRCUIT OPEN
3-4 SOLENOID CONTROL CIRCUIT SHORT TO GROUND
3-4 SOLENOID CONTROL CIRCUIT SHORT TO OTHER CIRCUITS
3-4 SOLENOID
TCM - 3-4 SOLENOID 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

3-4 SOLENOID CIRCUIT (4, 73) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, erase DTCs. With the DRBIII®, perform the Solenoid Test. With the DRBIII®, read DTCs. Did the DTC, 3-4 SOLENOID CIRCUIT, reset? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 3-4 Solenoid Control circuit from the TCM C2 harness connector to the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the 3-4 Solenoid Control circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the 3-4 Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the 3-4 Solenoid Control circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the 3-4 Solenoid Control circuit between all other circuits in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the 3-4 Solenoid Control circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

3-4 SOLENOID CIRCUIT (4, 73) — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the 3-4 Solenoid Control circuit and the Solenoid Supply Voltage Circuit in the Transmission Control Module C2 harness connector. Is the resistance between 2.5 and 6.5 ohms? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the 3-4 Solenoid per the Service Information. Perform W5J400 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. **NOTE: Check the Technical Service Bulletins.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
ABS BRAKE MESSAGE (33)

When Monitored and Set Condition:

ABS BRAKE MESSAGE (33)

When Monitored: Valid Brake CAN message received at least once and CAN Bus Circuit, ABS CAN Message Missing, ABS CAN Message Incorrect are not active.

Set Condition: Signal ″brake-light switch″ not valid- ABS sending invalid value.

POSSIBLE CAUSES
CAN C BUS CIRCUIT 37 DTC PRESENT
ABS DTCS PRESENT
ABS - BRAKE MESSAGE ERROR
TCM - BRAKE MESSAGE ERROR

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

ABS BRAKE MESSAGE (33) — Continued

TEST	ACTION	APPLICABILITY
3	Ignition on, engine not running. With the DRBIII®, read ABS DTCs. Are there any ABS or bus related DTCs present? Yes → Repair all ABS DTCS before proceeding. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Replace and program the ABS Control Module. With the DRBIII®, erase Transmission DTCs. Start the engine. With the brakes firmly applied, shift the gear selector into drive. With the DRBIII®, read Transmission DTCs. Did the DTC, ABS BRAKE MESSAGE, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ABS CAN MESSAGE INCORRECT (81)

When Monitored and Set Condition:

ABS CAN MESSAGE INCORRECT (81)

When Monitored: ABS CAN messages received at least once and CAN Bus Circuit (37) is not active

Set Condition: DTC Detected if the number of bytes incorrect for CAN ID.

POSSIBLE CAUSES
ABS - INTERNAL
TCM - 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Turn the ignition off to the lock position. Replace the ABS Control Module per the Service Information. Ignition on, engine not running. With the DRBIII®, erase Transmission DTCs. Start the engine and with the brakes firmly applied place the gear selector into Drive. With the DRBIII®, read Transmission DTCs. Did the DTC, ABS CAN MESSAGES INCORRECT, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test complete. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ABS CAN MESSAGE MISSING (38)

When Monitored and Set Condition:

ABS CAN MESSAGE MISSING (38)

When Monitored: CAN Bus Circuit error not present, 1 second after ignition on and not in Park or Neutral, no System Overvoltage or System Undervoltage conditions present, or transmission in Park or Neutral and engine RPM greater than 850 RPM

Set Condition: This DTC is set when a CAN ID was not received in the required time are not being sent from the ABS Controller. NOTE: The ABS controller is powered by the run only ignition feed. This means that this DTC will be set if the key is placed in the start position with the transmission in gear or if in Park or Neutral and the engine RPM is greater than 850 RPM.

POSSIBLE CAUSES
ABS DTC SET IF ATTEMPT TO START VEHICLE IN GEAR
CAN BUS CIRCUIT 37 - DTC PRESENT
CAN C BUS +/- CIRCUIT OPEN
ABS DTCS PRESENT
ABS - CAN MESSAGE MISSING
TCM - CAN MESSAGE MISSING

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ABS CAN MESSAGE MISSING (38) — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: This DTC can be erroneously set if the vehicle was started in gear or with the engine running.** Was the vehicle started in gear or with the engine running? Yes → Note: If the ignition switch is moved to the run/start (crank) position with the shifter lever not in the Park or Neutral position, or if the run/start with the engine rpm >850 an ABS CAN Message Missing DTC will be set. Erase DTC and return to customer. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the ABS harness connector. Disconnect the TCM C2 harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the CAN C Bus + circuit between the ABS harness connector and the TCM C2 harness connector. Measure the resistance of the CAN C Bus - circuit between the ABS harness connector and the TCM C2 harness connector. Is the resistance above 5.0 ohms on either circuit? Yes → Repair the CAN C BUS + or - circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Ignition on, engine not running. With the DRBIII®, read ABS DTCs. Are there any performance or bus related ABS DTCs present? Yes → Repair all ABS DTCs before proceeding. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

ABS CAN MESSAGE MISSING (38) — Continued

TEST	ACTION	APPLICABILITY
6	Replace and program the ABS Control Module. With the DRBIII®, erase Transmission DTCs. Start the engine. With the brakes firmly applied, shift the gear selector into drive. With the DRBIII®, read Transmission DTCs. Did the DTC, ABS CAN MESSAGE MISSING, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test complete. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ABS LF SENSOR MESSAGE (25)

When Monitored and Set Condition:

ABS LF SENSOR MESSAGE (25)

When Monitored: Valid ABS CAN messages received at least once and the CAN Bus circuit, ABS CAN Message Missing, ABS CAN Message Incorrect are not active

Set Condition: ABS signal ″Wheel Speed Front Left″ not valid or ABS has detected a sensor failure.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 DTC PRESENT
ABS DTCS PRESENT
ABS CONTROL MODULE - ABS LF SENSOR MESSAGE
TCM - ABS LF SENSOR MESSAGE

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ABS LF SENSOR MESSAGE (25) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, read ABS DTCs. Are there any ABS DTCs present? Yes → Refer to the ABS category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Replace the ABS Control Module per the Service Information. With the DRBIII®, erase Transmission DTCs. Road test the Vehicle. With the DRBIII®, read Transmission DTCs. Does the DTC, ABS LF SENSOR MESSAGE, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test complete. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

ABS LR SENSOR MESSAGE (23)

When Monitored and Set Condition:

ABS LR SENSOR MESSAGE (23)

When Monitored: Valid ABS CAN messages received at least once and the CAN Bus circuit, ABS CAN Message Missing, ABS CAN Message Incorrect are not active

Set Condition: ABS signal ″wheel speed rear left″ not valid or ABS has detected a sensor failure.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 DTC PRESENT
ABS DTCS PRESENT
ABS CONTROL MODULE - ABS LR SENSOR MESSAGE
TCM - ABS LR SENSOR MESSAGE

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ABS LR SENSOR MESSAGE (23) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, read ABS DTCs. Are there any ABS DTCs present? Yes → Refer to the ABS category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Replace the ABS Control Module per the Service Information. With the DRBIII®, erase Transmission DTCs. Road test the Vehicle. With the DRBIII®, read Transmission DTCs. Does the DTC, ABS LR SENSOR MESSAGE, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test complete. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ABS RF SENSOR MESSAGE (24)

When Monitored and Set Condition:

ABS RF SENSOR MESSAGE (24)

When Monitored: Valid ABS CAN messages received at least once and the CAN Bus circuit, ABS CAN Message Missing, ABS CAN Message Incorrect are not active

Set Condition: ABS signal ″Wheel Speed Front Right″ not valid or ABS has detected a sensor failure.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 DTC PRESENT
ABS DTCS PRESENT
ABS CONTROL MODULE - ABS RF SENSOR MESSAGE
TCM - ABS RF SENSOR MESSAGE

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ABS RF SENSOR MESSAGE (24) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, read ABS DTCs. Are there any ABS DTCs present? Yes → Refer to the ABS category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Replace the ABS Control Module per the Service Information. With the DRBIII®, erase Transmission DTCs. Road test the Vehicle. With the DRBIII®, read Transmission DTCs. Does the DTC, ABS RF SENSOR MESSAGE, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test complete. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ABS RR SENSOR MESSAGE (22)

When Monitored and Set Condition:

ABS RR SENSOR MESSAGE (22)

When Monitored: Valid ABS CAN messages received at least once and the CAN Bus circuit, ABS CAN Message Missing, ABS CAN Message Incorrect are not active

Set Condition: ABS signal ″wheel speed rear right″ not valid or ABS has detected a sensor failure.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 DTC PRESENT
ABS DTCS PRESENT
ABS CONTROL MODULE - ABS RR SENSOR MESSAGE
TCM - ABS RR SENSOR MESSAGE

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ABS RR SENSOR MESSAGE (22) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, read ABS DTCs. Are there any ABS DTCs present? Yes → Refer to the ABS category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Replace the ABS Control Module per the Service Information. With the DRBIII®, erase Transmission DTCs. Road test the Vehicle. With the DRBIII®, read Transmission DTCs. Does the DTC, ABS RR SENSOR MESSAGE, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test complete. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
CAN BUS CIRCUIT (37)

When Monitored and Set Condition:

CAN BUS CIRCUIT (37)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: Open circuit in the CAN C Bus (+) circuit or CAN C Bus (-) circuit, Short to ground of CAN C Bus (+) circuit or CAN C Bus (-) circuit, Short to Voltage of CAN C Bus (+) circuit or CAN C Bus (-) circuit, CAN C Bus (+) circuit shorted to CAN C Bus (-) circuit, or a TCM failure. Note: All CAN message missing DTCS will also be present, which indicates a Bus Failure.

POSSIBLE CAUSES
CAN C BUS(+) SHORT TO CAN C BUS (-)
CAN C BUS (+) AND/OR CAN C BUS (-) CIRCUIT OPEN
CAN C BUS (+) AND/OR CAN C BUS (-) CIRCUIT SHORT TO GROUND
CAN C BUS (+) AND/OR CAN C BUS (-) CIRCUIT SHORT TO OTHER CIRCUITS
ABS - TERMINATING RESISTOR
PCM/ECM - CAN BUS CIRCUIT
TCM - TERMINATING RESISTOR

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

CAN BUS CIRCUIT (37) — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: If the CAN BUS CIRCUIT (37) DTC is present, all the CAN MESSAGE MISSING DTCs will be set also. Ignore the Missing Message DTCs and perform the CAN BUS CIRCUIT (37) DTC test.** Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the PCM/ECM harness connector. Disconnect the ABS harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of both the CAN C Bus (+) circuit and the CAN C Bus (-) circuit between the TCM C2 harness connector and both the PCM/ECM harness connector and the ABS harness connector. Is the resistance above 5.0 ohms on either Bus circuit? Yes → Repair the CAN C Bus (+) and/or CAN C Bus (-) circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Turn the ignition off to the lock position. Disconnect the ABS harness connector. Disconnect the PCM/ECM harness connector. Disconnect the TCM C2 harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between the CAN C Bus (+) circuit and the CAN C Bus (-) circuit. Is the resistance below 5.0 ohms? Yes → Repair the short between the CAN C Bus (+) circuit and the CAN C Bus (-) circuit. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the PCM/ECM harness connector. Disconnect the ABS harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and both the CAN C Bus (+) circuit and the CAN C Bus (-) circuit. Is the resistance below 5.0 ohms on either Bus circuit? Yes → Repair the CAN C Bus (+) and/or CAN C Bus (-) circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All

CAN BUS CIRCUIT (37) — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of both the CAN C Bus (+) circuit and the CAN C Bus (-) circuit to all other circuits in the TCM C2 harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the CAN C Bus (+) and/or CAN C Bus (-) circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Disconnect the PCM/ECM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** **NOTE: Make sure both the TCM and the ABS harness connectors are connected before taking this measurement.** Measure the resistance between the CAN C Bus (+) circuit and the CAN C Bus (-) circuit in the PCM/ECM harness connector. Is the resistance 60.0 ohms, ± 3.0 ohms? Yes → Replace the Powertrain/Engine Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the ABS harness connector. **NOTE: Make sure both the TCM and the ECM harness connectors are connected before taking this measurement.** Measure the resistance between the CAN C Bus (+) circuit and the CAN C Bus (-) circuit in the ABS harness connector. Is the resistance 120 ohms, ± 2.0 ohms? Yes → Replace the ABS Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

ENGINE APP/TPS MESSAGE (26)

When Monitored and Set Condition:

ENGINE APP/TPS MESSAGE (26)

When Monitored: When a valid Accelerator Pedal Position (APP) or Throttle Position Sensor (TPS) CAN Message Received at least once and the DTCs, CAN Bus Circuit, Engine CAN Message Missing and Engine CAN Message Incorrect are not active.

Set Condition: Accelerator Pedal Position (APP) or Throttle Position Sensor (TPS) Message not valid or a ECM or PCM Engine Sensor DTC detected.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 DTC PRESENT
ENGINE APP OR TPS DTCS PRESENT
ENGINE COMMUNICATION DTCS PRESENT
INTERMITTENT WIRING AND CONNECTORS
PCM/ECM - ENGINE APP/TPS MESSAGE

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ENGINE APP/TPS MESSAGE (26) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. Is the DTC ENGINE APPS/TPS MESSAGE displayed as ACTIVE? Yes → Go To 4 No → Go To 8	All
4	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any Engine bus related DTCs present? Yes → Refer to the Communication category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any APP or TPS DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Replace the Transmission Control Module. Perform W5A400 TRANSMISSION VER TEST-1 Did the DTC ″ENGINE TPS MESSAGE″ reset? Yes → Go To 7 No → Test Complete.	All
7	If there are no possible causes remaining, view repair. Repair Replace the Powertrain/Engine Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

ENGINE APP/TPS MESSAGE (26) — 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 wires while checking for shorts and open circuits. **NOTE: Check for any Technical Service Bulletins that may apply.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
ENGINE CAN MESSAGE INCORRECT (85)

When Monitored and Set Condition:

ENGINE CAN MESSAGE INCORRECT (85)

When Monitored: CAN-ID received at least once and CAN Bus Circuit (37) is not active.

Set Condition: DTC Detected if the number of bytes incorrect for CAN ID.

POSSIBLE CAUSES
ENGINE DTCS PRESENT
PCM/ECM - ENGINE CAN MESSAGE INCORRECT
TCM - ENGINE CAN MESSAGE INCORRECT

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any performance or bus related Engine DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

ENGINE CAN MESSAGE INCORRECT (85) — Continued

TEST	ACTION	APPLICABILITY
3	Replace and program the PCM/ECM per the Service Information. With the DRBIII®, erase Transmission DTCs. Start the engine. With the brakes firmly applied, shift the gear selector into drive. With the DRBIII®, read Transmission DTCs. Did the DTC, ENGINE CAN MESSAGE INCORRECT, reset? Yes → Go To 4 No → Test Complete Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
4	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

ENGINE CAN MESSAGE MISSING (35, 36, 39, 82, 83)

When Monitored and Set Condition:

ENGINE CAN MESSAGE MISSING (35, 36, 39, 82, 83)

When Monitored: CAN Bus circuit error not present, 1 second after ignition on and not in Park or Neutral, no System Overvoltage or System Undervoltage conditions present, or transmission in Park or Neutral and engine RPM greater than 850 RPM.

Set Condition: This DTC is set if a CAN ID was not received in the required time, being sent from the Engine Controller.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 - DTC PRESENT
CAN C BUS +/- CIRCUIT OPEN
ENGINE DTCS PRESENT
PCM/ECM - ENGINE CAN MESSAGE MISSING
TCM - ENGINE CAN MESSAGE MISSING

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ENGINE CAN MESSAGE MISSING (35, 36, 39, 82, 83) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Turn the ignition off to the lock position. Disconnect the PCM/ECM harness connector(s). Disconnect the TCM C2 harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the CAN C Bus + circuit between the PCM/ECM harness connector and the TCM C2 harness connector. Measure the resistance of the CAN C Bus - circuit between the PCM/ECM harness connector and the TCM C2 harness connector. Is the resistance above 5.0 ohms on either circuit? Yes → Repair the CAN C BUS + or - circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any performance or bus related Engine DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Replace and program the PCM/ECM per the Service Information. With the DRBIII®, erase Transmission DTCs. Start the engine. With the brakes firmly applied, shift the gear selector into drive. With the DRBIII®, read Transmission DTCs. Did the DTC, ENGINE CAN MESSAGE MISSING, reset? Yes → Go To 6 No → Test Complete Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
6	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ENGINE OVERSPEED (49)

When Monitored and Set Condition:

ENGINE OVERSPEED (49)

When Monitored: Valid Engine RPM message received at least once, the CAN Bus Circuit and Engine CAN Message Missing are not active.

Set Condition: If the engine speed increases above 5100 RPM.

POSSIBLE CAUSES
ENGINE - MECHANICAL PROBLEM
TRANSMISSION - MECHANICAL PROBLEM
PCM/ECM - ENGINE OVERSPEED
TCM - ENGINE OVERSPEED

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Determine if there are any Engine Mechanical problems present. Are there any Engine Mechanical problems present? Yes → Refer to the Service Information for the proper repair procedure. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

ENGINE OVERSPEED (49) — Continued

TEST	ACTION	APPLICABILITY
3	Determine if there are any Transmission Mechanical problems present. Remove the Transmission Oil Pan and inspect for debris or a plugged Transmission Oil Filter. Is there any debris, plugged Transmission Oil Filter, or signs of an Internal Transmission problem? Yes → Refer to the Service Information for the proper repair procedure. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	**NOTE: The Engine and Transmission must not have mechanical problems and be operating normally before proceeding with this test.** Turn the ignition off to the lock position. Replace and program the PCM/ECM Control Module per the Service Information. With the DRBIII®, erase Transmission DTCs. Road test the Vehicle. With the DRBIII®, read Transmission DTCs. Does the DTC, ENGINE OVERSPEED, reset? Yes → Go To 5 No → Replacing the PCM/ECM has corrected the problem. Perform the Powertrain Verification test. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
5	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ENGINE RPM MESSAGE (28)

When Monitored and Set Condition:

ENGINE RPM MESSAGE (28)

When Monitored: Valid TPS CAN message received at least once CAN Bus Circuit, Engine CAN Message Missing and Engine CAN Message Incorrect are not active.

Set Condition: Signal ″engine speed″ not valid or PCM/ECM error.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 DTC PRESENT
ENGINE DTCS PRESENT
PCM/ECM - ENGINE RPM MESSAGE
TCM - ENGINE RPM MESSAGE

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

ENGINE RPM MESSAGE (28) — Continued

TEST	ACTION	APPLICABILITY
3	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any performance or bus related Engine DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Replace and program the PCM/ECM per the Service Information. With the DRBIII®, erase Transmission DTCs. Start the engine. With the brakes firmly applied, shift the gear selector into drive. With the DRBIII®, read Transmission DTCs. Did the DTC, ENGINE RPM MESSAGE, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

ENGINE T-CASE SW MESSAGE (44)

When Monitored and Set Condition:

ENGINE T-CASE SW MESSAGE (44)

When Monitored: Valid T-Case CAN message received at least once, the CAN Buss Circuit and Engine CAN Message Missing are not active.

Set Condition: Transfer Case Status signal not valid - indicates possible T-Case sensor error.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 DTC PRESENT
ENGINE DTCS PRESENT
PCM/ECM - ENGINE T-CASE SWITCH MESSAGE
TCM - ENGINE T-CASE SWITCH MESSAGE

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ENGINE T-CASE SW MESSAGE (44) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any Transfer Case or Bus related Engine DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Replace and program the PCM/ECM per the Service Information. With the DRBIII®, erase Transmission DTCs. Start the engine. With the brakes firmly applied, shift the gear selector into drive. With the DRBIII®, read Transmission DTCs. Did the DTC, ENGINE T-CASE SWITCH MESSAGE, reset? Yes → Go To 5 No → Test Complete Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ENGINE TEMP MESSAGE (43)

When Monitored and Set Condition:

ENGINE TEMP MESSAGE (43)

When Monitored: Valid Engine Temp CAN message received at least once and CAN Bus Circuit error, Engine CAN Message Missing and Engine CAN Messages Incorrect are not active.

Set Condition: Engine coolant temperature signal is not valid - indicates possible coolant temperature sensor error.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 DTC PRESENT
ENGINE DTCS PRESENT
PCM/ECM- ENGINE TEMP MESSAGE
TCM - ENGINE TEMP MESSAGE

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ENGINE TEMP MESSAGE (43) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any Engine Temperature Sensor DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Replace and program the PCM/ECM per the Service Information. With the DRBIII®, erase Transmission DTCs. Start the engine. With the brakes firmly applied, shift the gear selector into drive. With the DRBIII®, read Transmission DTCs. Did the DTC, ENGINE TEMP MESSAGE, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test complete. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ENGINE TORQUE MESSAGE INCORRECT (27, 29, 31, 32)

When Monitored and Set Condition:

ENGINE TORQUE MESSAGE INCORRECT (27, 29, 31, 32)

When Monitored: Valid Torque CAN messages received at least once and CAN Bus Circuit, Engine CAN Message Missing and Engine CAN Message Incorrect are not active.

Set Condition: Engine torque message not valid or PCM/ECM controller error.

POSSIBLE CAUSES
ENGINE DTCS PRESENT
PCM/ECM - ENGINE TORQUE MESSAGE INCORRECT
TCM - TORQUE MESSAGE INCORRECT

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any performance or bus related Engine DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. No → Go To 3	All

ENGINE TORQUE MESSAGE INCORRECT (27, 29, 31, 32) — Continued

TEST	ACTION	APPLICABILITY
3	Replace and program the ECM/ECM per the Service Information. With the DRBIII®, erase Transmission DTCs. Drive the vehicle performing multiple aggressive upshifts and downshifts. With the DRBIII®, read Transmission DTCs. Did the DTC, ENGINE TORQUE MESSAGE INCORRECT, reset? Yes → Go To 4 No → Test Complete Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
4	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
ENGINE TORQUE REDUCTION (54)

When Monitored and Set Condition:

ENGINE TORQUE REDUCTION (54)

When Monitored: Engine intervention active for at least 20 ms, no engine torque errors, engine torque demand is greater than 0.

Set Condition: Torque Reduction acknowledge bit - not set, no shift aborts, the error flag ″torque reduction acknowledge″ is not set, Engine controller not supporting torque requests.

POSSIBLE CAUSES
CAN BUS CIRCUIT 37 - DTC PRESENT
CAN C BUS +/- CIRCUIT OPEN
ENGINE DTCS PRESENT
PCM/ECM - ENGINE CAN MESSAGE MISSING
TCM - ENGINE CAN MESSAGE MISSING

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

ENGINE TORQUE REDUCTION (54) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. **NOTE: If the DTC, CAN BUS CIRCUIT 37, is present, perform diagnostics on that symptom first.** Is the DTC, CAN BUS CIRCUIT 37, present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Turn the ignition off to the lock position. Disconnect the PCM/ECM harness connector(s). Disconnect the TCM C2 harness connector. Measure the resistance of the CAN C Bus + circuit between the PCM/ECM harness connector and the TCM C2 harness connector. Measure the resistance of the CAN C Bus - circuit between the PCM/ECM harness connector and the TCM C2 harness connector. Is the CAN C Bus + or - circuit open? Yes → Repair the CAN C BUS + or - circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any performance or bus related Engine DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Replace and program the PCM/ECM per the Service Information. With the DRBIII®, erase Transmission DTCs. Start the engine. With the brakes firmly applied, shift the gear selector into drive. With the DRBIII®, read Transmission DTCs. Did the DTC, ENGINE CAN MESSAGE MISSING, reset? Yes → Go To 6 No → Test Complete Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
6	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
IMPROPER GEAR (55)

When Monitored and Set Condition:

IMPROPER GEAR (55)

When Monitored: Engine RPM greater than 450 and output speed (ABS) greater than 180 RPM. No Input Speed sensor N2 - N3, Shift lever, Transfer Case, and/or ABS wheel speed DTCs present.

Set Condition: The TCM compares the calculated gear with the gear the transmission has actually engaged. If the actual gear differs from the gear calculated by the TCM, the TCM value is adjusted to the engaged gear and a counter is increased by 2. If after a shift the engaged gear and the calculated gear still match , the counter is decreased by 1 point. A DTC is detected as soon as the counter exceeds a threshold. If the fault is detected 3 consecutive ignition cycles the transmission will be placed in Limp-in and the MIL activated.

POSSIBLE CAUSES
ABS DTCS PRESENT
SOLENOID DTCS PRESENT
INTERNAL TRANSMISSION
TCM - IMPROPER GEAR

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

IMPROPER GEAR (55) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. Are there any Transmission Solenoid DTCs present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read ABS DTCs. Are there any ABS DTCs present? Yes → Refer to the Antilock Brake category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Remove and inspect the Transmission Valve Body and Solenoid Assembly per the Service Information. **NOTE: This DTC is usually set due to a internal transmission problem such as but not limited to: stuck solenoid or valve and/or contamination in the valve body, broken springs, leaking clutch seals, dislodged or broken snap ring.** Inspect internal transmission per the Service Information. Where there any problems found? Yes → Repair internal transmission as necessary. Refer to the Service Information for the proper repair procedure. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
IMPROPER RATIO (50)

When Monitored and Set Condition:

IMPROPER RATIO (50)

When Monitored: Engine rpm greater than 450 rpm, output speed greater than 180 rpm, no N2 - N3 input speed sensor errors present, no gear selector lever errors present, no ABS system errors, no transfer case errors present, and all wheel speeds above 450 rpm.

Set Condition: No shifting operation and detected gear is not the actual gear No shifting operation - detected (calculated) gear is less than actual(expected) gear or no plausible gear is calculated or Actual turbine speed - calculated turbine speed > 300 rpm or calculated transmission ration is above threshold. During an Upshift - detected (calculated) gear is less than actual(expected) gear-1. During Downshift - detected (calculated) gear is less than actual (expected) gear

POSSIBLE CAUSES
TRANSMISSION MECHANICAL PROBLEM
TCM - IMPROPER RATIO

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

IMPROPER RATIO (50) — Continued

TEST	ACTION	APPLICABILITY
2	Determine if there are any Transmission Mechanical problems present. Remove the Transmission Oil Pan and inspect for debris or a plugged Transmission Oil Filter. Refer to the Service Information for proper removal and inspection procedures. Is there any Debris, plugged Transmission Oil filter, or signs of an Internal Transmission problem? Yes → Refer to the Service Information for the proper repair procedure. Pay particular attention to the Valve body components and stuck solenoids. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
INPUT SENSOR OVERSPEED (15)

When Monitored and Set Condition:

INPUT SENSOR OVERSPEED (15)

When Monitored: Whenever the N2 input speed sensor is greater than 0 rpm

Set Condition: If the rpm of the N2 or N3 input speed sensor is greater than 7700 rpm

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
INTERNAL TRANSMISSION
TCM - INPUT SENSOR OVERSPEED

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

INPUT SENSOR OVERSPEED (15) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, erase Transmission DTCs. Raise the vehicle on the hoist. Start the engine. **NOTE: This condition indicates a catastrophic transmission failure.** With the DRBIII® in Sensors, monitor the N2 and N3 Speed Sensors. Firmly apply the brakes and place the gear selector in Drive (D). Release the brakes and raise the engine RPM to allow the Transmission to upshift to the 2-3 and 3-4 shift schedule. **CAUTION: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** Did either the N2 or N3 Speed Sensors display a RPM above 7700? Yes → Go To 3 No → Go To 5	All
3	Remove the Transmission Oil Pan and inspect for debris or a plugged Transmission Oil Filter. Is there any debris, plugged Transmission Oil Filter, or signs of an Internal Transmission problem? Yes → Repair Internal Transmission as necessary. Refer to the Service Information for proper repair procedures. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	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 wires while checking for shorts and open circuits. **NOTE: Check for any Technical Service Bulletins that may apply.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
INPUT SENSORS MISMATCH (14)

When Monitored and Set Condition:

INPUT SENSORS MISMATCH (14)

When Monitored: Engine speed greater than 450 rpm, no engine speed DTC's, no TCM under-voltage system operation, no output speed sensor DTC's (signal from the ABS system), all wheel speeds above 250 rpm (signal from the ABS system), no rear wheel speed DTC's (signal from the ABS system), and no wheel slip detected (signal from the ABS system), no shifting operation, N3 input speed sensor greater than 800 rpm and N2 input speed sensor greater than 0 rpm and the TCM not in reset.

Set Condition: If the speed difference between the N2 and N3 input speed sensors is greater than 150 rpm.

POSSIBLE CAUSES
SPEED SENSOR DTCS PRESENT
INTERMITTENT WIRING AND CONNECTORS
INTERNAL TRANSMISSION
TCM - INPUT SPEED SENSOR MISMATCH

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

INPUT SENSORS MISMATCH (14) — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read DTCs. Are any Speed Sensor or Sensor Supply DTCs present? Yes → Repair any Speed Sensor and/or Sensor Supply DTCs before proceeding with test. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, erase Transmission DTCs. Start the engine. Drive the vehicle to speeds to allow multiple 2-3 and 3-4 upshifts. Does the DTC ″INPUT SENSOR MISMATCH″ reset and displayed as ″ACTIVE″? Yes → Go To 4 No → Go To 6	All
4	Remove the Transmission Oil Pan and inspect for debris or a plugged Transmission Oil Filter. Is there any debris, plugged Transmission Oil Filter, or signs of an Internal Transmission problem? Yes → Repair Internal Transmission as necessary. Refer to the Service Information for proper repair procedures. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
6	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. **NOTE: Check for any Technical Service Bulletins that may apply.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
INTERNAL CONTROLLER

When Monitored and Set Condition:

INTERNAL CONTROLLER

When Monitored: Always monitored with system active at each ignition cycle

Set Condition: This code is set whenever Transmission Control Module (TCM) senses an internal error. If this Internal Controller DTC is set with any Solenoid DTC's repair the Solenoid DTC's first, erase all DTC's, then verify the Internal Controller DTC sets before replacing the TCM.

POSSIBLE CAUSES
TCM - INTERNAL ERROR

TEST	ACTION	APPLICABILITY
1	If there are no possible causes remaining, view repair. Repair The Transmission Control Module is reporting internal errors and must be replaced. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
INTERNAL SHIFTER FAILURE (76)

When Monitored and Set Condition:

INTERNAL SHIFTER FAILURE (76)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: Shifter sends an erroneous signal indicating the shifter detected a fault. Internal shifter fault, shifter held in an intermediate position for more than 30 seconds.

POSSIBLE CAUSES
SHIFTER OUT OF ADJUSTMENT
SHIFTER HELD INTERMEDIATE POSITION
SHIFTER ASSEMBLY - INTERNAL

TEST	ACTION	APPLICABILITY
1	Check the shifter adjustment per the Service Information. **NOTE: Verify the proper LED is illuminated and matches the selected gear position.** Was the shifter properly adjusted and LEDs illuminated correctly? Yes → Go To 2 No → Adjust the Shifter Assembly per the Service Information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
2	**NOTE: This DTC can be set, if the driver rests their hand on the shifter while driving.** With the DRBIII®, erase DTCs. Place the shifter in each gear position for 30 seconds each. **NOTE: Remember to remove your hand from the shifter after selecting each of the gear positions.** Did the INTERNAL SHIFTER FAILURE DTC set? Yes → Go To 3 No → Advise the customer that resting your hand on the shifter or moving the shifter while driving can set this DTC. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
3	If there are no possible causes remaining, view repair. Repair Yes → Replace the Shifter Assembly. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

MOD. PRESS SOLENOID CIRCUIT (6)

When Monitored and Set Condition:

MOD. PRESS SOLENOID CIRCUIT (6)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
MOD. PRESS SOLENOID CONTROL CIRCUIT OPEN
MOD. PRESS SOLENOID CONTROL CIRCUIT SHORT TO GROUND
MOD. PRESS SOLENOID CONTROL CIRCUIT SHORT TO OTHER CIRCUITS
MOD PRESS SOLENOID
TCM - MOD. PRESS SOLENOID 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

MOD. PRESS SOLENOID CIRCUIT (6) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, erase DTCs. With the DRBIII®, perform the Solenoid Test With the DRBIII®, read DTCs. Did the DTC, Mod Press SOLENOID CIRCUIT, reset? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Mod. Press Solenoid Control circuit from the TCM C2 harness connector to the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Mod. Press Solenoid Control circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Mod. Press Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Mod. Press Solenoid Control circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Mod Press Solenoid Control circuit to all other circuits in the Transmission Solenoid Assembly harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the Mod. Press Solenoid Control circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

MOD. PRESS SOLENOID CIRCUIT (6) — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Mod Press Solenoid Control circuit and the Solenoid Supply Voltage Circuit in the Transmission Control Module C2 harness connector. Is the resistance between 4.0 and 8.0 ohms? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Mod Press Solenoid per the Service Information. Perform W5J400 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. **NOTE: Check the Technical Service Bulletins.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

N2 INPUT SPEED SENSOR CIRCUIT (12)

When Monitored and Set Condition:

N2 INPUT SPEED SENSOR CIRCUIT (12)

When Monitored: Engine speed greater than 450 rpm, no engine speed DTC's, no TCM under-voltage system operation, no output speed sensor DTC's (signal from the ABS system), all wheel speeds above 250 rpm (signal from the ABS system), no rear wheel speed DTC's (signal from the ABS system), and no wheel slip detected (signal from the ABS system).

Set Condition: If the N2 input speed sensor is equal to 0 rpm or a short to ground, short to battery, open input speed sensor, faulty input speed sensor, open sensor supply circuit.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
SENSOR SUPPLY VOLTAGE CIRCUIT OPEN
N2 INPUT SPEED SENSOR SIGNAL CIRCUIT OPEN
N2 SPEED SENSOR SIGNAL CIRCUIT SHORT TO OTHER CIRCUIT
SENSOR GROUND CIRCUIT OPEN
SENSOR GROUND CIRCUIT SHORT TO OTHER CIRCUIT
N2 INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND
SENSOR GROUND CIRCUIT SHORT TO GROUND
N2 INPUT SPEED SENSOR
TCM - N2 INPUT SPEED SENSOR

N2 INPUT SPEED SENSOR CIRCUIT (12) — 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Supply Voltage circuit between the TCM connector and the Transmission Solenoid Assembly connector Is the resistance above 5.0 ohms? Yes → Repair the Sensor Supply Voltage circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read DTCs. **NOTE: The vehicle must be driven to at least 32 Km/h (20 MPH) for this DTC to be displayed as active.** Is the Warm up counter displayed and equal to 0? Yes → Go To 4 No → Go To 12	All
4	Turn the ignition switch to the lock position Disconnect the TCM harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the N2 Input Speed Sensor Signal circuit from the TCM connector to the Transmission Solenoid Assembly connector. Is the resistance above 5.0 ohms? Yes → Repair the N2 Input Speed Sensor Signal circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All

N2 INPUT SPEED SENSOR CIRCUIT (12) — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connectors. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Ground circuit from the TCM C2 harness connector to the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Sensor Ground circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the N2 Speed Sensor Signal circuit to all other circuits in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the N2 Speed Sensor Signal circuit for a short to other circuit-s. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the N2 Input Speed Sensor Signal circuit. Is the resistance Below 5.0 ohms? Yes → Repair the N2 Input Speed Sensor Signal circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Ground circuit to all other circuits in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the Sensor Ground circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

N2 INPUT SPEED SENSOR CIRCUIT (12) — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connectors. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Sensor Ground circuit. Is the resistance Below 5.0 ohms? Yes → Repair the Sensor Ground circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn the ignition off to the lock position. With the DRBIII®/PEP Module being used as a Dual Channel Lab Scope with Miller Special tool #6801. Backprobe N2 Input Speed Sensor Signal circuit using Channel 1 at the TCM harness connector. Raise all drive wheels off the ground. **CAUTION: Properly support vehicle** Start the engine. Place gear selector in drive and increase vehicle speed to engage 2nd gear **CAUTION: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** Compare the Scope Pattern on the DRBIII® with a typical 5 volt square wave pattern. Does the scope pattern match a typical 5 volt square wave Signal Scope Pattern? Yes → Go To 11 No → Replace the N2 Input Speed Sensor. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
11	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 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 wires while checking for shorts and open circuits. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair as necessary. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

N3 INPUT SPEED SENSOR CIRCUIT (13)

When Monitored and Set Condition:

N3 INPUT SPEED SENSOR CIRCUIT (13)

When Monitored: Engine speed greater than 450 rpm, no engine speed DTC's, no TCM under-voltage system operation, no output speed sensor DTC's (signal from the ABS system), all wheel speeds above 250 rpm (signal from the ABS system), no rear wheel speed DTC's (signal from the ABS system), and no wheel slip detected (signal from the ABS system), no shifting operation, detected gear is 3rd or 4th and the detected gear is the actual vehicle gear.

Set Condition: If the N3 input speed sensor is equal to 0 rpm or a short to ground, short to battery open input speed sensor, faulty input speed sensor, open sensor supply circuit.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
SENSOR SUPPLY VOLTAGE CIRCUIT OPEN
N3 INPUT SPEED SENSOR SIGNAL CIRCUIT OPEN
N3 SPEED SENSOR SIGNAL CIRCUIT SHORT TO OTHER CIRCUIT
SENSOR GROUND CIRCUIT OPEN
SENSOR GROUND CIRCUIT SHORT TO OTHER CIRCUIT
N3 INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND
SENSOR GROUND CIRCUIT SHORT TO GROUND
N3 INPUT SPEED SENSOR
TCM - N3 INPUT SPEED SENSOR

N3 INPUT SPEED SENSOR CIRCUIT (13) — 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Supply Voltage circuit between the TCM connector and the Transmission Solenoid Assembly connector Is the resistance above 5.0 ohms? Yes → Repair the Sensor Supply Voltage circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read DTCs. **NOTE: The vehicle must be driven to at least 32 Km/h (20 MPH) for this DTC to be displayed as active.** Is the Warm up counter displayed and equal to 0? Yes → Go To 4 No → Go To 12	All
4	Turn the ignition switch to the lock position Disconnect the TCM harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the N3 Input Speed Sensor Signal circuit from the TCM connector to the Transmission Solenoid Assembly connector. Is the resistance above 5.0 ohms? Yes → Repair the N3 Input Speed Sensor Signal circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All

N3 INPUT SPEED SENSOR CIRCUIT (13) — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Ground circuit from the TCM C2 harness connector to the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Sensor Ground circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the N3 Speed Sensor Signal circuit to all other circuits in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the N3 Speed Sensor Signal circuit for a short to other circuit-s. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the N3 Input Speed Sensor Signal circuit. Is the resistance Below 5.0 ohms? Yes → Repair the N3 Input Speed Sensor Signal circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Ground circuit to all other circuits in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the Sensor Ground circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

N3 INPUT SPEED SENSOR CIRCUIT (13) — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connectors. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Sensor Ground circuit. Is the resistance Below 5.0 ohms? Yes → Repair the Sensor Ground circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn the ignition off to the lock position. With the DRBIII®/PEP Module being used as a Dual Channel Lab Scope with Miller Special tool #6801. Backprobe N3 Input Speed Sensor Signal circuit using Channel 1 at the TCM harness connector. Raise all drive wheels off the ground. **CAUTION: Properly support vehicle** Start the engine. Place gear selector in drive and increase vehicle speed to engage 2nd gear **CAUTION: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** Compare the Scope Pattern on the DRBIII® with a typical 5 volt square wave pattern. Does the scope pattern match a typical 5 volt square wave Signal Scope Pattern? Yes → Go To 11 No → Replace the N3 Input Speed Sensor. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
11	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 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 wires while checking for shorts and open circuits. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair as necessary. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P/N OUTPUT CIRCUIT (9)

When Monitored and Set Condition:

P/N OUTPUT CIRCUIT (9)

When Monitored: Shifter is in park or neutral and the solenoid is active

Set Condition: Shifter is in park or neutral and the output is active. NOTE: The P/N Ouput signal is duplicated over the CAN bus and the vehicle will start if either the hard wired P/N signal or the CAN bus P/N signal is present.

POSSIBLE CAUSES
ENGINE PARK/NEUTRAL DTC PRESENT
TRANS TEMP SENSOR SHORTED DTC PRESENT
INTERMITTENT WIRING AND CONNECTORS
PARK/NEUTRAL POSITION SWITCH SENSE CIRCUIT OPEN
PARK/NEUTRAL POSITION SWITCH SENSE CIRCUIT SHORT TO GROUND
PARK/NEUTRAL POSITION SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
SHIFTER SENSE VOLTAGE C1 AND C3 OUT OF TOLERANCE
TCM - P/N OUTPUT CIRCUIT
PCM/ECM - P/N OUTPUT

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P/N OUTPUT CIRCUIT (9) — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check for Engine DTCs. Are there any Park/Neutral DTCs present? Yes → Repair all PCM/ECM P/N DTCS before diagnosing the P/N Output circuit. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, check for Trans Temp Sensor Shorted Circuit DTC. Is the Trans Temp Sensor Shorted DTC present? Yes → Repair the Trans Temp Sensor Shorted DTC before proceeding with diagnostics. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Engine Running. Shift lever in park. With the DRBIII®, read DTCs. Is the DTC status displayed as Active? Yes → Go To 5 No → Go To 11	All
5	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Disconnect the PCM/ECM harness connector **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Park/Neutral Position Switch Sense circuit from the TCM C1 harness connector to the PCM/ECM harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Park/Neutral Position Switch Sense circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Disconnect the PCM/ECM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Park/Neutral Position Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the Park/Neutral Position Switch Sense circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P/N OUTPUT CIRCUIT (9) — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Disconnect the PCM/ECM harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Measure the voltage of the Park/Neutral Position Switch Sense circuit in the TCM C1 harness connector. Is the voltage above 0.5 volt? Yes → Repair the Park/Neutral Position Switch Sense circuit for a short to voltage. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Place the Shifter in Park. Ignition on, engine not running. Measure the voltage between Shifter C1 Sense circuit and ground. Measure the voltage between Shifter C3 Sense circuit and ground. **NOTE: The voltage measured will be approximately 12.0 volts** Did the voltage differ by more than 2.0 volts between both Shifter Sense circuits? Yes → Replace the Shifter Assembly. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between P/N Output circuit and ground. Crank the engine. Did the starter engage? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the PCM/ECM. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

P/N OUTPUT CIRCUIT (9) — 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 wires while checking for shorts and open circuits. **NOTE: Check the Technical Service Bulletins.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

PARK LOCK OUT SOLENOID CIRCUIT (8)

When Monitored and Set Condition:

PARK LOCK OUT SOLENOID CIRCUIT (8)

When Monitored: When the solenoid is off and when the solenoid is active.

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM. Note: You must drive the vehicle above 6 MPH to activate the Park Lockout Solenoid.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
FUSED IGNITION SWITCH OUTPUT (RUN/START) CIRCUIT OPEN
PARK LOCKOUT SOLENOID CONTROL CIRCUIT OPEN
PARK LOCKOUT SOLENOID CONTROL CIRCUIT SHORT TO GROUND
PARK LOCK OUT SOLENOID
TCM - PARK LOCKOUT SOLENOID 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

PARK LOCK OUT SOLENOID CIRCUIT (8) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, erase DTCs. With the DRBIII®, perform the Park Solenoid Test. With the DRBIII®, read DTCs. Did the DTC, PARK LOCKOUT SOLENOID, reset? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Disconnect the Shifter Assembly C2 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 (Run/Start) circuit in the Shifter Assembly C2 harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 4 No → Repair the Fused Ignition Switch Output (run/start) circuit for an open. If the fuse is open make sure to check for a short to ground or excessive resistance in the Fused Ignition Switch Output (run/start) circuit and repair as necessary. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C1 harness connector. Disconnect the Shifter Assembly C2 harness connector **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Park Lockout Solenoid Control circuit from the TCM C1 harness connector to the Shifter Assembly C2 harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Park Lockout Solenoid Control circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C1 harness connector. Disconnect the Shifter Assembly C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Park Lockout Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Park Lockout Solenoid Control circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

PARK LOCK OUT SOLENOID CIRCUIT (8) — Continued

TEST	ACTION	APPLICABILITY
6	With the DRBIII® actuate the Park Lock Out Solenoid. Does the Park Lock Out Solenoid actuate? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Park Lock Out Solenoid. Perform W5J400 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. **NOTE: Check the Technical Service Bulletins.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
SENSOR SUPPLY VOLTAGE (11)

When Monitored and Set Condition:

SENSOR SUPPLY VOLTAGE (11)

When Monitored: Always monitored with system active at each ignition cycle and no under-voltage condition exists.

Set Condition: If measured sensor voltage is not within specified limits 4.8-7.2 volts or if a Faulty regulator, Sensor Supply Voltage shorted to ground, Sensor Supply Voltage shorted to battery is detected.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
SENSOR SUPPLY CIRCUIT SHORT TO OTHER CIRCUIT
SENSOR SUPPLY VOLTAGE CIRCUIT SHORT TO GROUND
TCM - SENSOR SUPPLY 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. Is the DTC Sensor Supply Voltage displayed as ACTIVE? Yes → Go To 3 No → Go To 5	All

SENSOR SUPPLY VOLTAGE (11) — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Supply circuit to all other circuits in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the Sensor Supply circuit for a short to other circuit-s. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Supply circuit to chassis ground in the Transmission Solenoid Assembly harness connector. Is the resistance below 5.0 ohms? Yes → Repair the Sensor Supply Voltage circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	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 wires while checking for shorts and open circuits. **NOTE: Check for any Technical Service Bulletins that may apply.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

SHIFT PRESS SOLENOID CIRCUIT (7)

When Monitored and Set Condition:

SHIFT PRESS SOLENOID CIRCUIT (7)

When Monitored: When the solenoid is off, solenoid active with 25-75% duty cycle and/or the solenoid supply is active

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
SHIFT PRESSURE SOLENOID CONTROL CIRCUIT OPEN
SHIFT PRESSURE SOLENOID CONTROL CIRCUIT SHORT TO GROUND
SHIFT PRESSURE SOLENOID CONTROL CIRCUIT SHORT TO OTHER CIRCUITS
SHIFT PRESSURE SOLENOID ASSEMBLY
TCM - SHIFT PRESSURE SOLENOID 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

SHIFT PRESS SOLENOID CIRCUIT (7) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, erase DTCs. With the DRBIII®, perform the Solenoid Test. With the DRBIII®, read DTCs. Did the DTC, SHIFT PRESSURE SOLENOID CIRCUIT, reset? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Shift Pressure Solenoid Control circuit from the TCM C2 harness connector to the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Shift Pressure Solenoid Control circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Shift Pressure Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Shift Pressure Solenoid Control circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Shift Pressure Solenoid Control circuit to all other circuits in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the Shift Pressure Solenoid Control circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

SHIFT PRESS SOLENOID CIRCUIT (7) — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Shift Pressure Solenoid Control circuit and the Solenoid Supply Voltage Circuit in the Transmission Control Module C2 harness connector. Is the resistance between 4.0 and 8.0 ohms? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Shift Pressure Solenoid. Perform W5J400 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. **NOTE: Check the Technical Service Bulletins.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
SHIFTER SIGNAL INVALID (17)

When Monitored and Set Condition:

SHIFTER SIGNAL INVALID (17)

When Monitored: Always monitored with system active at each ignition cycle and no under-voltage condition exists

Set Condition: The Shifter detects an invalid code, shifter failure, TCM failure, Short to ground, open circuit or short to battery on one of the five circuits.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
C1 - C5 SHIFTER SENSE CIRCUITS OPEN
C1- C5 SHIFTER SENSE CIRCUITS SHORT TO GROUND
C1 - C5 SHIFTER SENSE CIRCUITS SHORT TO OTHER CIRCUITS
SHIFTER ASSEMBLY - SHIFTER SIGNAL INVALID
TCM - SHIFTER SIGNAL INVALID

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, perform the Shift Lever Position Test. Did the Shift Lever Test pass? Yes → Go To 3 No → Go To 4	All

SHIFTER SIGNAL INVALID (17) — 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 wires while checking for shorts and open circuits. **NOTE: Check for any Technical Service Bulletins that may apply.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
4	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Disconnect the Shifter Assembly C1 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Shifter Sense circuit (C1 -C5) between the Shifter Assembly C1 and TCM C1 harness connectors. Is the resistance above 5.0 ohms on any of the C1 - C5 circuits? Yes → Repair the C1 - C5 Shifter Sense circuits for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Disconnect the Shifter Assembly C1 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the C1- C5 Shifter Sense circuits. Is the resistance below 5.0 ohms on any circuit? Yes → Repair the C1 - C5 Shifter Sense Circuits for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Disconnect the Shifter Assembly C1 harness connector. Disconnect the Shifter Assembly C201 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the C1- C5 Shifter Sense circuits to all other circuits in the Shifter Assembly C1 and C201 harness connectors. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the C1 - C5 Shifter Sense circuits for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

SHIFTER SIGNAL INVALID (17) — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector(s). **NOTE: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Step #1 Place the shifter in the Park position. Measure the voltage of the Shifter Sense circuits C1 thru C5 at the TCM C1 harness connector. The voltages on C1, C2, and C3 should have greater than 5.2 volts. The voltage on C4 and C5 should be below 1.5 volts. Step #2 Place and hold the shifter in an intermediate position - between Park and Reverse. Measure only the voltage of the C5 Shifter Sense circuit at the TCM C1 harness connector. The voltage on C5 should be greater than 5.2 volts. Step #3 Place the shifter in 4th gear. Measure the voltage of the Shifter Sense circuits C1 thru C5 at the TCM C1 harness connector. The voltage on C4 should be greater than 5.2 volts. The voltages on C1, C2, C3, C5 should all be below 1.5 volts. Were all measured Shifter Sense voltages correct? Yes → Go To 8 No → Replace the Shifter Assembly. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
8	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
SOLENOID SUPPLY VOLTAGE (10)

When Monitored and Set Condition:

SOLENOID SUPPLY VOLTAGE (10)

When Monitored: When the solenoid is active or not active and no under-voltage condition exists.

Set Condition: If voltage is present when the output is off or the measured supply voltage and measured battery voltage differ by 3.6 volts.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
SOLENOID SUPPLY CIRCUIT SHORT TO OTHER CIRCUIT
SOLENOID SUPPLY VOLTAGE CIRCUIT SHORT TO GROUND
SOLENOID ASSEMBLY
TCM - SOLENOID SUPPLY VOLTAGE 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. Is the DTC, Solenoid Supply Voltage, displayed as ACTIVE? Yes → Go To 3 No → Go To 6	All

SOLENOID SUPPLY VOLTAGE (10) — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Solenoid Supply circuit to all other circuits in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the Solenoid Supply circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Solenoid Supply circuit to chassis ground in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms? Yes → Repair the Solenoid Supply Voltage circuit for a short to ground or high resistance. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between all Solenoid Control circuits and chassis ground in the Transmission Control Module C2 harness connector. Is the resistance below 5.0 ohms? Yes → Replace the Solenoid that is shorted to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
6	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. **NOTE: Check for any Technical Service Bulletins that may apply.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
SOLENOID SUPPLY/WATCHDOG (56)

When Monitored and Set Condition:

SOLENOID SUPPLY/WATCHDOG (56)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: During the power up of the TCM, it tests the ability of the external watchdog to shut down the Solenoid Supply driver.

POSSIBLE CAUSES
SOLENOID SUPPLY CIRCUIT SHORT TO OTHER CIRCUITS
SOLENOID DTCS PRESENT
TCM - SOLENOID SUPPLY WATCHDOG

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read DTCs. Are any Solenoid DTCs present? Yes → Repair all Solenoid DTCs before proceeding with test. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

SOLENOID SUPPLY/WATCHDOG (56) — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off to the lock position. Remove the TCM harness connector. Disconnect the Solenoid harness connector. Check the resistance between the Solenoid Supply circuit and all other circuits in the TCM harness connector. Is the resistance below 5.0 ohms between Solenoid Supply and any other circuit? Yes → Repair the Solenoid Supply circuit short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → The TCM has an internal error. Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
SYSTEM OVERVOLTAGE (19)

When Monitored and Set Condition:

SYSTEM OVERVOLTAGE (19)

When Monitored: Always monitored with system active at each ignition cycle

Set Condition: Ignition voltage above 16.9 volts with the engine and transmission input speed sensors above 2000 rpm for 60 seconds

POSSIBLE CAUSES
VEHICLE JUMP STARTED IMPROPERLY
ENGINE CHARGING SYSTEM DTC'S PRESENT
FUSED IGNITION SWITCH OUTPUT (RUN-START) HIGH AT TCM
TCM - SYSTEM OVERVOLTAGE

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Determine is the vehicle was jump started improperly. **NOTE: If the battery was jump started with the batteries in series, the System Overvoltage DTC will be set.** Was the vehicle jump started improperly? Yes → Erase the DTC , if the vehicle was jump started improperly. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

SYSTEM OVERVOLTAGE (19) — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, read the Engine DTC's. Are there any Engine Charging System DTC's present? Yes → Refer to the Charging category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Check connectors - Clean/repair as necessary. Start the engine. Increase the Engine Speed to 1500 RPM. Measure the voltage of the Fused Ignition Switch Output (Run-Start) circuit in the TCM C1 harness connector. Is the voltage below 16.9 volts? Yes → Go To 5 No → Refer the Charging category and perform the symptom, Charging System with No DTCs present. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
5	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
SYSTEM UNDERVOLTAGE (21)

When Monitored and Set Condition:

SYSTEM UNDERVOLTAGE (21)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: Ignition voltage falls below 8.5 volts with the engine rpm greater than 2000 rpm for 60 seconds.

POSSIBLE CAUSES
ENGINE CHARGING SYSTEM DTC'S PRESENT
FUSED IGNITION SWITCH OUTPUT (RUN-START) LO AT TCM
TCM - SYSTEM UNDER 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, read Engine DTC's. Are there any Engine Charging System DTC's present? Yes → Refer to the Charging category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

SYSTEM UNDERVOLTAGE (21) — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Start the engine. Increase the Engine Speed to 1500 RPM. Measure the voltage of the Fused Ignition Switch Output (run-start) circuit in the TCM C1 harness connector. Is the voltage below 9.0 volts? Yes → Repair the Fused Ignition Output (Run-Start) circuit for an open or high resistance. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
TCC OVER TEMP (53)

When Monitored and Set Condition:

TCC OVER TEMP (53)

When Monitored: Solenoid supply active. No Input Speed Sensor N2 - N3, CAN C Bus, PCM/ECM, CAN Engine, CAN Engine Speed DTCs present. Torque Converter Clutch in slip mode.

Set Condition: Friction loss factor reaches threshold.

POSSIBLE CAUSES
INTERNAL TRANSMISSION

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	This DTC is an informational DTC. Check for any TSBs or Controller updates that may apply. This is usually a sign of TCC failure or internal transmission problems. Check the Engine and Transmission Cooling Systems for proper operation. View repair. Repair Repair internal Transmission as necessary. Refer to the Service Information for proper repair procedure. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
TCC SOLENOID CIRCUIT (5)

When Monitored and Set Condition:

TCC SOLENOID CIRCUIT (5)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: If the TCM detects a short to ground or battery on the solenoid control circuit, shorted solenoid, open solenoid, or an open or shorted solenoid control circuit driver in the TCM.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
TCC SOLENOID CONTROL CIRCUIT OPEN
TCC SOLENOID CONTROL CIRCUIT SHORT TO GROUND
TCC SOLENOID CONTROL CIRCUIT SHORT TO OTHER CIRCUITS
TCC SOLENOID
TCM - TCC SOLENOID 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

TCC SOLENOID CIRCUIT (5) — Continued

TEST	ACTION	APPLICABILITY
2	Ignition on, engine not running. With the DRBIII®, erase DTCs. With the DRBIII®, perform the Solenoid Test. With the DRBIII®, read DTCs. Did the DTC, TCC SOLENOID CIRCUIT, reset? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TCC Solenoid Control circuit from the TCM C2 harness connector to the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the TCC Solenoid Control circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the TCC Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the TCC Solenoid Control circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TCC Solenoid Control circuit to all other circuits in the Transmission Solenoid Assembly harness connector. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the TCC Solenoid Control circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

TCC SOLENOID CIRCUIT (5) — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the Transmission Control Module C2 harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the TCC Solenoid Control circuit and the Solenoid Supply Voltage Circuit in the Transmission Control Module C2 harness connector. Is the resistance between 2.0 and 4.0 ohms? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the TCC Solenoid per the Service Information. Perform W5J400 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. **NOTE: Check the Technical Service Bulletins.** Were there any problems found? Yes → Repair as necessary Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:

TCC STUCK ON (52)

When Monitored and Set Condition:

TCC STUCK ON (52)

When Monitored: No Input Speed Sensor N2 - N3, CAN C Bus, PCM/ECM, CAN Engine, No CAN Engine Torque and/or Shift in progress DTCs present. Must be in a valid forward gear.

Set Condition: Engine RPM - Turbine Speed is greater than 30 RPM when the Engine torque is less than 100 NM for 1.0 second

POSSIBLE CAUSES
TCC SOLENOID CONTROL CIRCUIT SHORT TO GROUND
TCC SOLENOID CONTROL CIRCUIT SHORT TO OTHER CIRCUITS
INTERNAL TRANSMISSION
TCM - TCC STUCK 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

TCC STUCK ON (52) — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid Assembly harness connector. Start the engine. With the brakes firmly applied, shift the gear selector into Drive. Did the engine stall or stumble? Yes → Repair the internal transmission. Pay particular attention to the components related to the TCC. Refer to the Service Information for the proper repair procedure. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. Measure the resistance between ground and the TCC Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the TCC Solenoid Control circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid harness connector. Measure the resistance of the TCC Solenoid Control circuit to all other circuits in the Transmission Solenoid harness connector. Is the resistance below 5.0 ohms on any circuit? Yes → Repair the TCC Solenoid Control circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
TRANS TEMP SENSOR - P/N SWITCH CIRCUIT (74)

When Monitored and Set Condition:

TRANS TEMP SENSOR - P/N SWITCH CIRCUIT (74)

When Monitored: Always monitored with system active at each ignition cycle.

Set Condition: Temp sensor is open while in forward gears (1-5), temp sensor, open Trans temp circuit, P/N Switch.

POSSIBLE CAUSES
SHIFTER ADJUSTMENT
SHIFT LEVER POSITION TEST
SENSOR GROUND CIRCUIT OPEN
TEMP SENSOR - P/N SWITCH CIRCUIT OPEN
TEMP SENSOR - P/N SWITCH CIRCUIT SHORT TO GROUND
SENSOR GROUND CIRCUIT SHORT TO OTHER CIRCUITS
TEMP SENSOR- P/N SWITCH CIRCUIT SHORT TO OTHER CIRCUITS
TEMP SENSOR - P/N SWITCH
TCM - TEMP SENSOR - P/N 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

TRANS TEMP SENSOR - P/N SWITCH CIRCUIT (74) — Continued

TEST	ACTION	APPLICABILITY
2	Check the Shifter Assembly adjustment per the Service Information. Was the Shifter Assembly adjusted correctly? Yes → Go To 3 No → Adjust the Shifter Assembly per the Service Information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
3	With the DRBIII®, perform the Shift Lever Position Test. Follow the instructions on the DRBIII®. Did the Shift Lever Position Test pass? Yes → Go To 4 No → Refer to the Transmission Category and perform Symptom *SHIFTER ERROR (1-10) Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. Measure the resistance of the Sensor Ground circuit between the TCM C2 harness connector and the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Sensor Ground circuit for an open or high resistance. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. Measure the resistance of the Transmission Temp Sensor - P/N Switch circuit between the TCM C2 harness connector and the Transmission Solenoid Assembly harness connector. Is the resistance above 5.0 ohms. Yes → Repair the Transmission Temp Sensor - P/N Switch circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. Measure the resistance between ground and the Transmission Temp Sensor - P/N Switch circuit. Is the resistance below 5.0 ohms? Yes → Repair the Transmission Temp Sensor - P/N Switch circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

TRANS TEMP SENSOR - P/N SWITCH CIRCUIT (74) — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TCM C1 and C2 harness connectors. Disconnect the Transmission Solenoid Assembly harness connector. Measure the resistance between the Sensor Ground circuit and all other circuits in the TCM C1 and C2 harness connectors. Is the resistance below 5.0 ohms on any of the circuits? Yes → Repair the Sensor Ground circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TCM C1 and C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. Measure the resistance between the Temp Sensor - P/N Switch circuit and all other circuits in the TCM C1 and C2 harness connector. Is the resistance below 5.0 ohms on any circuit? Yes → Repair the Transmission Temp Sensor - P/N Switch circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. **NOTE: Make sure the Transmission Solenoid Assembly harness connector is connected or the results of the test will be invalid.** With the brakes firmly applied, place the gear selector in Drive. Measure the resistance between the Temp Sensor - P/N Switch circuit and the Sensor Ground circuit in the TCM C2 harness connector. Is the resistance between 500 and 2500 ohms? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Temp Sensor - P/N Switch Assembly per the Service Information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
TRANS TEMP SENSOR ERRATIC (75)

When Monitored and Set Condition:

TRANS TEMP SENSOR ERRATIC (75)

When Monitored: When transmission temperature is below 170° C (338° F)

Set Condition: When there is a 10° C (18° F) variation between each transmission temperature sensor read. If the DTC is reset (after an ignition cycle), the DTC will be set to Stored (Intermittent) status.

POSSIBLE CAUSES
TRANSMISSION TEMP SENSOR WIRING
TCM - TRANS TEMP SENSOR ERRATIC

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Ignition on, engine not running. With the DRBIII® , monitor the Transmission Temperature. With the brakes firmly applied, place the gear selector in Drive. While monitoring the DRBIII®, wiggle the wires and connectors from the TCM to the Transmission Solenoid Assembly. Did the Transmission Temperature fluctuate while wiggling the wires? Yes → Repair the wiring and/or connectors as necessary. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

TRANS TEMP SENSOR ERRATIC (75) — Continued

TEST	ACTION	APPLICABILITY
3	Replace the Transmission Temp Sensor - P/N Switch Assembly per the Service Information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. Did the DTC, TRANS TEMP SENSOR ERRATIC, reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
TRANS TEMP SENSOR SHORTED (20)

When Monitored and Set Condition:

TRANS TEMP SENSOR SHORTED (20)

When Monitored: Always monitored with system active

Set Condition: Temperature sensor input below a threshold, failed temperature sensor, short to ground, TCM

POSSIBLE CAUSES
TEMP SENSOR - P/N SWITCH CIRCUIT SHORT TO GROUND
TEMP SENSOR - P/N SWITCH CIRCUIT SHORT TO OTHER CIRCUITS
TCM - P/N SWITCH CIRCUIT
TRANSMISSION TEMPERATURE SENSOR
TCM - TRANS TEMP SENSOR SHORTED
TRANSMISSION TEMP SENSOR - P/N 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Attempt to start the vehicle in Park and Neutral. Does the engine start in either position, Park or Neutral? Yes → Go To 3 No → Go To 5	All

TRANS TEMP SENSOR SHORTED (20) — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Place the gear selector to Drive (D). Measure the resistance of the Transmission Temperature Sensor between the Temp Sensor - P/N Switch circuit and the Sensor Ground circuit in the TCM C2 harness connector. Is the resistance between 500 ohms and 2500 ohms. Yes → Go To 4 No → Check for a poor terminal to pin connections at the Solenoid Assembly harness connector and repair as necessary. If no problems are found in the connector, replace the Transmission Temperature Sensor - P/N Switch Assembly per the Service Information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
4	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid harness connector. **NOTE: This procedure may set several DTCs in both the ECM and TCM. Disregard and erase DTCs after this procedure.** With the gear selector in park, attempt to start the vehicle. Does the vehicle start? Yes → Replace the Transmission Temperature Sensor - P/N Switch Assembly per the Service Information. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Disconnect the Transmission Solenoid Assembly harness connector. Measure the resistance between ground and the Temp Sensor - P/N Switch circuit. Is the resistance below 5.0 ohms? Yes → Repair the Temp Sensor - P/N Switch circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

TRANS TEMP SENSOR SHORTED (20) — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** Disconnect the TCM C1 and C2 harness connectors. Measure the resistance of the Temp Sensor - P/N Switch circuit to all other circuits in the TCM C1 and C2 harness connectors. Is the resistance below 5.0 ohms between any other circuit? Yes → Repair the Temp Sensor - P/N Switch circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
TRANSMISSION SLIPPING (51)

When Monitored and Set Condition:

TRANSMISSION SLIPPING (51)

When Monitored: Engine rpm greater than 450 rpm, output speed greater than 180 rpm, no N2 - N3 input speed sensor errors present, no gear selector lever errors present, no ABS system errors, no transfer case errors present, and all wheel speeds between 70 - 380 rpm with no wheel slip detected. Set Condition: Calculated ratio not within allowable range for the engaged gear. No shifting operation.

Set Condition: The TCM constantly calculates the transmission ratio based on the N2 - N3 input speed signals and the calculated output shaft speed (CAN message from the ABS). The TCM will detect if the transmission is slipping or an invalid gear ratio is present

POSSIBLE CAUSES
OTHER DTCS PRESENT
TRANSFER CASE DTCS PRESENT
TRANSFER CASE SHIFT CABLE OUT OF ADJUSTMENT
AXLE - MECHANICAL - GEAR RATIO
INTERNAL TRANSMISSION
TCM - TRANSMISSION SLIPPING

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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

TRANSMISSION SLIPPING (51) — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTCs. Are there any Improper Gear and/or Improper Ratio DTCs present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, read Engine DTCs. Are there any Transfer Case related DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Check to Transfer Case Shift cable for proper adjustment per the Service Information. Is the Transfer Case cable properly adjusted? Yes → Go To 5 No → Adjust Transfer Case cable as necessary. Refer to the Service Information for proper adjustment procedure. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Verify the correct axle gear ratio and make sure there are no mechanical problems. Refer to the Service Information for the proper procedures. Were there any problems found? Yes → Refer to the Service Information for proper repair procedures. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Determine if the Transmission is mechanically slipping. Is the transmission slipping? Yes → Repair internal transmission as necessary. Refer to the Service Information for the proper repair procedure. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:

***ABS DTC SET WHEN ATTEMPTING TO START VEHICLE IN GEAR OTHER THAN PARK OR NEUTRAL**

POSSIBLE CAUSES
ABS DTC 38 SET WHEN ATTEMPTING TO START VEHICLE IN GEAR OTHER THAN P/N

Repair Instructions:

ABS DTC 38 SET WHEN ATTEMPTING TO START VEHICLE IN GEAR OTHER THAN P/N

Note: If the ignition switch is moved to the run/start (crank) position with the shifter lever not in the Park or Neutral position, or if the run/start with the engine rpm >850 an ABS

CAN Message Missing DTC will be set. Erase DTC and return to customer.

Symptom:
*ADAPTION PROCEDURE

POSSIBLE CAUSES
ADAPTION PROCEDURE

TEST	ACTION	APPLICABILITY
1	This procedure should be performed whenever the TCM has been replaced, the Transmission has been replaced, or major Transmission repairs have been performed. With the DRBIII®, reset the Transmission adaptives. Resetting the adaptives will set the adaptives to factory settings. **NOTE: Perform the Coast Down Adaptations first. The Transmission Temperature must be greater than 60°C (140°F) and less than 70°C (158°F). Failure to stay within these temperature ranges will void the procedure.** Drive the Vehicle until the Transmission Temperature is in the specified range. Perform 4 to 5 Coast Downs from 5th to 4th gear and then 4th to 3rd gear. **NOTE: For Upshift adaption, the Transmission temperature must be greater than 60°C (140°F) and less than 100°C (212°F). Failure to stay within these temperature ranges will void this procedure.** From a stop, moderately accelerate the vehicle and obtain all forward gear ranges while keeping the Engine RPM below 1800 RPM. Repeat this procedure 4 to 5 times. Obtaining 5th gear may be difficult at 1800 RPM. Allow the transmission to shift into 5th gear at a higher RPM then lower the RPM to 1800 and perform manual shifts between 4th and 5th gears using the shift lever. The TCM will store the adaptives every 10 minutes. After completion of the Adaption Procedure make sure the vehicle stays running for at least 10 minutes. It is possible to manually store the adaptives under the 10 minute time frame using the DRBIII® Store Adaptives procedure. Is the Shift quality acceptable after performing this procedure? Yes → Test Complete. No → Repeat the Adaption Procedure. Note: If internal repairs were performed and the shift quality is still poor after repeating the Adaption Procedure, it may be necessary to check the internal repair. Also check for any TSBs or Controller Flash updates.	All

Symptom:

***NO START CONDITION WITH NO DTCS PRESENT**

POSSIBLE CAUSES
CAN C BUS + OR - CIRCUIT SHORT TO GROUND
TRANS TEMP SENSOR - P/N SWITCH STUCK CLOSED

TEST	ACTION	APPLICABILITY
1	Turn the ignition off to the lock position. Disconnect the PCM/ECM harness connector. Measure the resistance between ground and the CAN C BUS (+) circuit in the PCM/ECM harness connector. Measure the resistance between ground and the CAN C BUS (-) circuit in the PCM/ECM harness connector. Is the CAN C BUS (+) and/or (-) below 5.0 ohms? Yes → Repair the CAN C Bus + and/or - circuit for a short to ground. No → Go To 2	All
2	Turn the ignition off to the lock position. Disconnect the TCM C2 harness connector. Place the gear selector in Park. Measure the resistance between the Temp Sensor - P/N Switch circuit and the Sensor Ground circuit in the TCM C2 harness connector. Is the resistance between 500 ohms and 2500 ohms. Yes → Replace the Transmission Temperature Sensor - P/N Switch Assembly per the Service Information. No → Test Complete.	All

Symptom:
*SHIFTER ERROR (1-10)

POSSIBLE CAUSES
SHIFTER C1 - C5 SENSE CIRCUIT STUCK OPEN
SHIFTER C1 - C5 SENSE CIRCUIT SHORT TO GROUND
SHIFTER C1 - C5 SENSE CIRCUIT SHORT TO OTHER CIRCUITS
SHIFTER ASSEMBLY - SHIFT SENSE CIRCUIT
TCM - SHIFT SENSE 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 DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostics. With the DRBIII®, read and record all Transmission DTCs. **NOTE: Check connectors - Clean/repair as necessary. Poor pin to terminal connections can set DTCs.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Most DTCs 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 controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSBs related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	This test is intended to help in the diagnosis of the Shift Lever Test reported error code. Select the error code reported by the DRBIII®. Shifter error code 1,3,5,7,9 Go To 3 Shifter error code 2,4,6,8,10 Go To 4	All
3	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Disconnect the Shifter Assembly C1 harness connector. Measure the resistance of the C1 - C5 Sense circuit between the Shifter Assembly C1 harness connector and the TCM C1 harness connector. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the reported Shifter C1- C5 Sense circuit for an open. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

*SHIFTER ERROR (1-10) — Continued

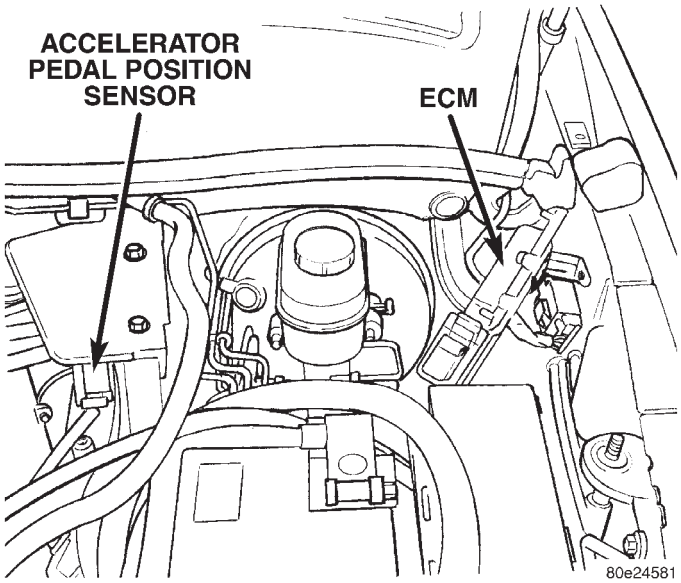
TEST	ACTION	APPLICABILITY
4	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Disconnect the Shifter Assembly C1 harness connector. Measure the resistance between ground and the reported Shifter C1- C5 Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the reported Shifter C1- C5 Sense circuit for a short to ground. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the TCM C1 harness connector. Disconnect the Shifter Assembly C1 harness connector. Measure the resistance between the C1 - C5 Shifter Sense circuit and all other circuits in the Shifter Assembly C1 harness connector. Is the resistance below 5.0 ohms on any circuit? Yes → Repair the reported Shifter C1 - C5 Sense circuit for a short to other circuits. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Replace the Shifter Assembly per the Service Information. With the DRBIII®, erase any Transmission DTCs. With the DRBIII®, perform the Shift Lever Position Test. Follow the instructions on the DRBIII®. Did the Shift Lever error code reset? Yes → Replace the Transmission Control Module. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete. Perform W5J400 TRANSMISSION VERIFICATION TEST - VER 1.	All

Verification Tests

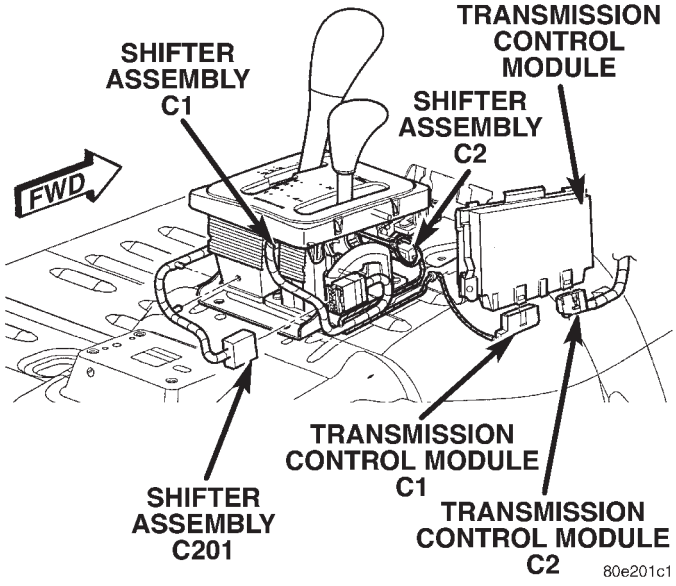
W5J400 TRANSMISSION VERIFICATION TEST - VER 1	APPLICABILITY
1. NOTE: If the TCM was replaced, use the DRBIII® to program the VIN information into the TCM 2. Reconnect any disconnected components. 3. Connect the DRBIII® to the Data Link Connector. 4. With the DRBIII®, erase ABS DTC's. 5. With the DRBIII®, erase PCM/ECM DTC's. 6. With the DRBIII®, erase Transmission DTC's. 7. With the DRBIII®, display Transmission Temperature. Start and run the engine until the Transmission Temperature is HOT, above 43° C (110° F). 8. Check the Transmission fluid and adjust if necessary. Refer to the Service Information for the proper Fluid Fill procedure. 9. Perform the ADAPTION PROCEDURE whenever the TCM and/or the Transmission has been replaced or major Transmission repairs have been performed. If none of these apply, proceed to ROAD TEST PROCEDURE. 10. ADAPTION PROCEDURE 11. With the DRBIII®, reset the Transmission adaptives. Resetting the adaptives will set the adaptives to factory settings. 12. Drive the Vehicle until the Transmission Temperature is in the specified range. **13. NOTE: Perform the Coast Down Adaptations first. The Transmission Temperature must be greater than 60° C (140° F) and less than 70° C (158° F). Failure to stay within these temperature ranges will void the procedure.** 14. Perform 4 to 5 Coast Downs from 5th to 4th gear and then 4th to 3rd gear. **15. NOTE: For Upshift adaption, the Transmission temperature must be greater than 60° C (140° F) and less than 100° C (212° F). Failure to stay within these temperature ranges will void this procedure.** 16. From a stop, moderately accelerate the vehicle and obtain all forward gear ranges while keeping the Engine RPM below 1800 RPM. Repeat this procedure 4 to 5 times. 17. Obtaining 5th gear may be difficult at 1800 RPM. Allow the transmission to shift into 5th gear at a higher RPM then lower the RPM to 1800 and perform manual shifts between 4th and 5th gears using the shift lever. 18. The TCM will store the adaptives every 10 minutes. After completion of the Adaption Procedure make sure the vehicle stays running for at least 10 minutes. To manually store the adaptives under 10 minutes, use the DRBIII® Store Adaptives procedure. 19. If the Shift Quality is not acceptable after performing the Adaption Procedure, repeat the Adaption Procedure. **20. NOTE: If internal repairs were performed and the shift quality is still poor after repeating the Adaption Procedure, it may be necessary to check the internal repair. Also check for any TSBs and/or Controller Flash updates that may apply.** 21. ROAD TEST PROCEDURE 22. Road test the vehicle. Make fifteen to twenty 1-2, 2-3, 3-4 and 4-5 upshifts. 23. Perform these shifts from a standing start to 72 Km/h or 45 MPH with a constant throttle opening of 20 to 25 degrees. 24. With speeds below 40 Km/h or 25 MPH, make five to eight wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown. 25. With the DRBIII®, perform the Transmission Solenoid Test. 26. With the DRBIII®, read Transmission DTCs. Were there any Diagnostic Trouble Codes set? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

8.0 COMPONENT LOCATIONS

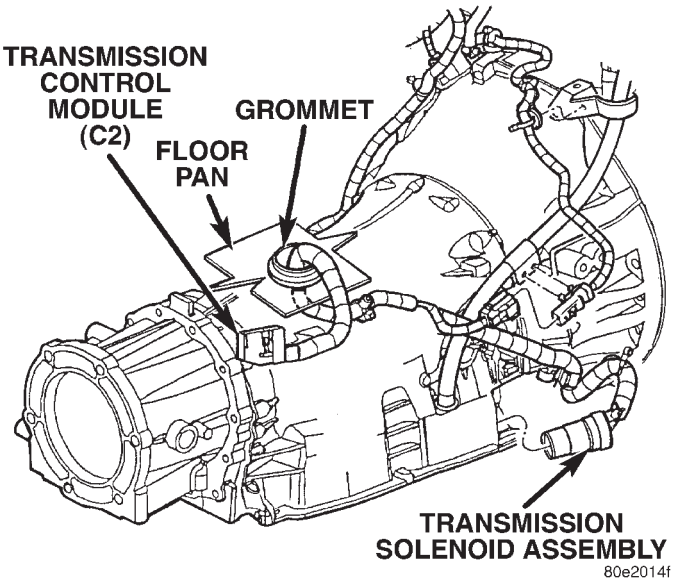
8.1 ENGINE CONTROL MODULE



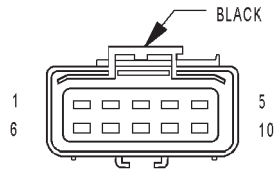
8.2 SHIFTER ASSEMBLY/TRANSMISSION CONTROL MODULE



8.3 TRANSMISSION SOLENOID ASSEMBLY



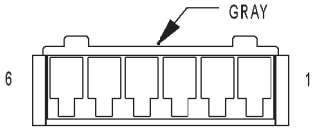
9.0 CONNECTOR PINOUTS



ACCELERATOR PEDAL POSITION SENSOR (DIESEL)

ACCELERATOR PEDAL POSITION SENSOR (DIESEL) - BLACK 10 WAY

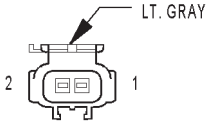
CAV	CIRCUIT	FUNCTION
1	-	-
2	F855 18BR/YL	SENSOR REFERENCE VOLTAGE A
3	K22 14RD/DB	ACCELERATOR PEDAL POSITION SENSOR 2 SIGNAL
4	-	-
5	-	-
6	K225 18BK	ACCELERATOR PEDAL POSITION SENSOR 2 GROUND
7	K81 20DB/DG	ACCELERATOR PEDAL POSITION SENSOR 1 SIGNAL
8	K255 20WT/DG	ACCELERATOR PEDAL POSITION SENSOR 1 GROUND
9	-	-
10	Y43 20WT/VT	ACCELERATOR PEDAL POSITION SENSOR 1 5-VOLT SUPPLY



BRAKE LAMP SWITCH

BRAKE LAMP SWITCH - GRAY 6 WAY

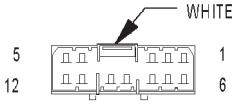
CAV	CIRCUIT	FUNCTION
1	K29 18WT/PK	SECONDARY BRAKE SWITCH SIGNAL
2	Z238 18BK (LHD)	GROUND
2	Z243 18BK (RHD)	GROUND
3	V32 22OR/DG (GAS)	SPEED CONTROL POWER SUPPLY
4	V30 22DB/RD (GAS)	SPEED CONTROL BRAKE SWITCH OUTPUT
5	L50 20VT/TN (LHD)	PRIMARY BRAKE SWITCH SIGNAL
5	L50 20WT/TN (RHD)	PRIMARY BRAKE SWITCH SIGNAL
6	F32 20PK/DB	FUSED B(+)



C113 (DIESEL)

C113 (DIESEL) - LT. GRAY (TRANSMISSION SIDE)

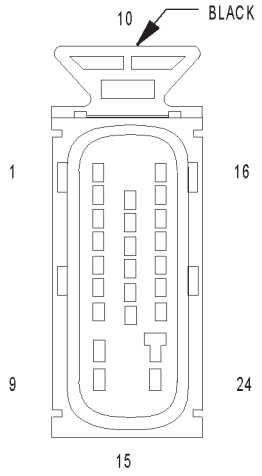
CAV	CIRCUIT
1	D52 18LG/WT
2	D51 18DG/WT



C201 (DIESEL)

C201 (DIESEL) - WHITE (SHIFTER ASSEMBLY SIDE)

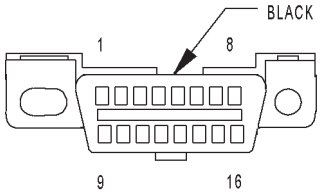
CAV	CIRCUIT
1	-
2	-
3	-
4	K2 20WT/PK
5	D25 20RD
6	-
7	D21 20PK
8	F12 20DB/WT
9	T2 20TN/BK
10	Z234 20WT
11	T41 20BK/WT
12	F991 20OR/DB



CONTROLLER ANTILOCK BRAKE

CONTROLLER ANTILOCK BRAKE - BLACK 24 WAY

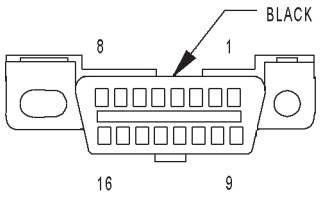
CAV	CIRCUIT	FUNCTION
1	Z101 12BK/OR	GROUND
2	B1 18YL/DB	RIGHT REAR WHEEL SPEED SENSOR SIGNAL
3	B2 18YL	RIGHT REAR WHEEL SPEED SENSOR 12 VOLT SUPPLY
4	-	-
5	D25 18VT/YL	PCI BUS
6	B6 18WT/DB	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL
7	B7 18WT	RIGHT FRONT WHEEL SPEED SENSOR 12 VOLT SUPPLY
8	-	-
9	A20 12RD/DB	FUSED B(+)
10	F20 18DB/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
11	D52 18LG/WT (DIESEL)	CAN C BUS(+)
12	-	-
13	B22 18DG/YL	VEHICLE SPEED SIGNAL
14	D51 18DG/YL (DIESEL)	CAN C BUS(-)
15	-	-
16	Z102 12BK/OR	GROUND
17	G9 18GY/BK	BRAKE FLUID LEVEL SWITCH SENSE
18	L50 18WT/TN	PRIMARY BRAKE SWITCH SIGNAL
19	B3 18LG/DB	LEFT REAR WHEEL SPEED SENSOR SIGNAL
20	B4 18LG	LEFT REAR WHEEL SPEED SENSOR 12 VOLT SUPPLY
21	Z231 18BK	GROUND
22	B8 18RD/DB	LEFT FRONT WHEEL SPEED SENSOR SIGNAL
23	B9 18RD	LEFT FRONT WHEEL SPEED SENSOR 12 VOLT SUPPLY
24	A10 12RD/DG	FUSED B(+)



DATA LINK CONNECTOR

DATA LINK CONNECTOR - BLACK 16 WAY

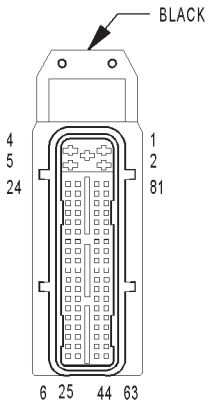
CAV	CIRCUIT	FUNCTION
1	-	-
2	D25 20YL/VT	PCI BUS
3	-	-
4	Z305 20BK/OR	GROUND
5	Z306 20BK/LG	GROUND
6	D32 20LG/DG	SCI RECEIVE
7	D21 20PK	SCI TRANSMIT
8	-	-
9	D19 20VT/OR	BODY CONTROL MODULE FLASH ENABLE
10	-	-
11	-	-
12	-	-
13	-	-
14	D20 20LG	SCI RECEIVE
15	-	-
16	F33 20PK/RD	FUSED B(+)



DIAGNOSTIC
JUNCTION PORT

DIAGNOSTIC JUNCTION PORT - BLACK 16 WAY

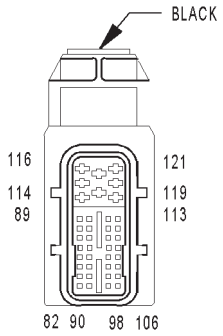
CAV	CIRCUIT	FUNCTION
1	D25 20YL/VT/BR	PCI BUS (PCM/ECM TCM PDM CD SKIM)
2	D25 20YL/VT/DG (AZC)	PCI BUS (AZC)
3	D25 20YL/VT/DB	PCI BUS (RADIO)
4	D25 20YL/VT/OR	PCI BUS (ACM)
5	D25 20YL/VT/RD	PCI BUS (MIC)
6	D25 20YL/VT/WT	PCI BUS (BCM)
7	D25 20YL/VT	PCI BUS (DLC)
8	D25 20YL/VT/GY	PCI BUS (DDM ABS MEM EVIC APM ITM RAIN SENSOR)
9	-	-
10	-	-
11	D25 20YL/VT (DIESEL)	PCI BUS (SHIFTER ASSEMBLY)
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-



ENGINE CONTROL MODULE C1 (DIESEL)

ENGINE CONTROL MODULE C1 (DIESEL) - BLACK 81 WAY

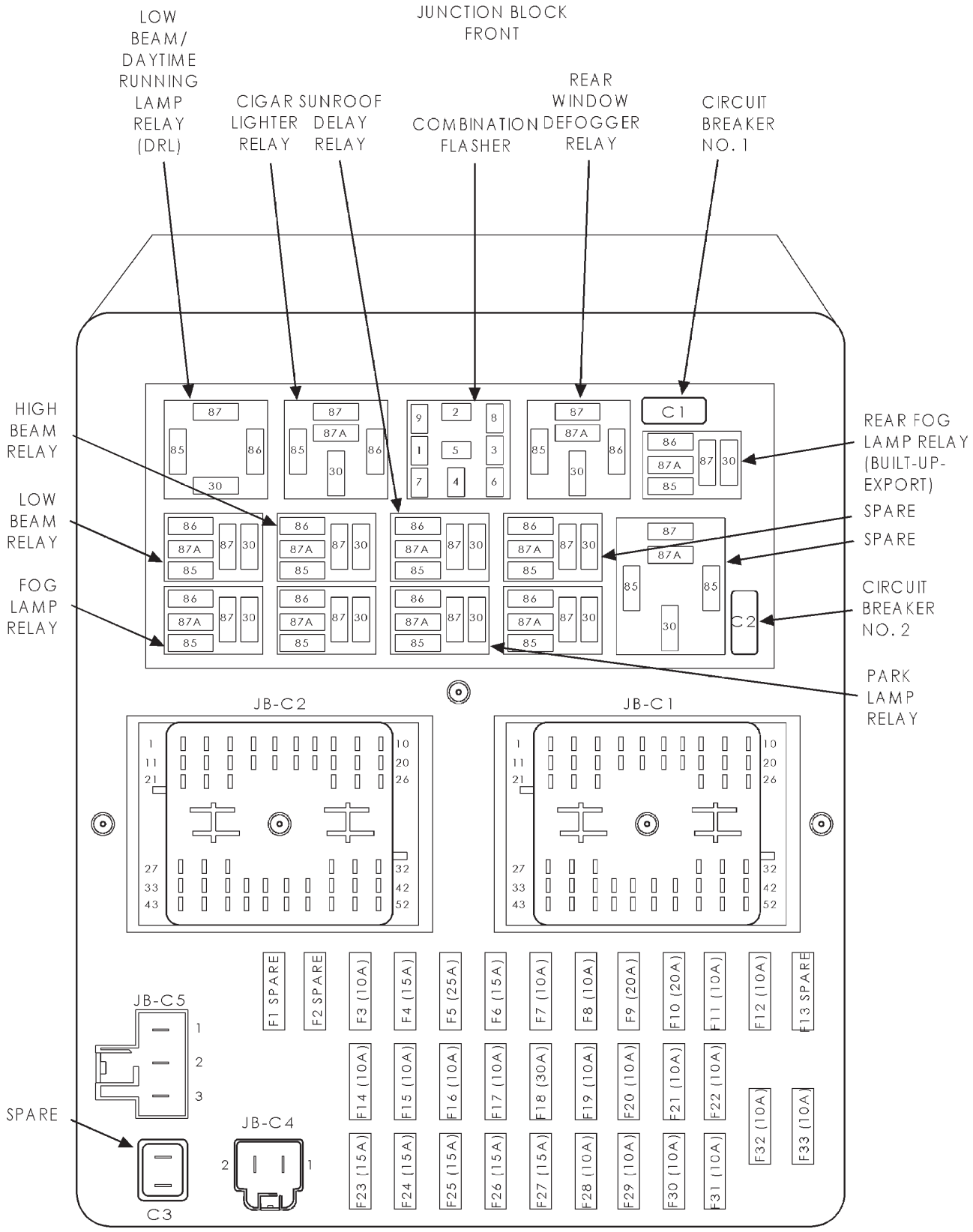
CAV	CIRCUIT	FUNCTION
1	Z108 14BK/DG	GROUND
2	Z108 14BK/DG	GROUND
3	K20 14DB	GENERATOR FIELD CONTROL
4	F142 14RD/DG	FUSED AUTO SHUT DOWN RELAY OUTPUT
5	F142 14RD/DG	FUSED AUTO SHUT DOWN RELAY OUTPUT
6	D52 18DG/WT	CAN C BUS(+)
7	D25 20VT/YL	PCI BUS
8	K944 20BR/DG	CAMSHAFT POSITION SENSOR GROUND
9	K44 20YL/GY	CAMSHAFT POSITION SENSOR SIGNAL
10	-	-
11	Y53 20BK/YL	BOOST PRESSURE SENSOR SIGNAL
12	K155 20YL/WT	MASS AIR FLOW SENSOR SIGNAL
13	Y40 20DG/VT	FUEL PRESSURE SENSOR SIGNAL
14	K22 20RD/DB	ACCELERATOR PEDAL POSITION SENSOR 2 SIGNAL
15	K81 20DB/DG	ACCELERATOR PEDAL POSITION SENSOR 1 SIGNAL
16	Y100 20BR/GY	FUEL PRESSURE SENSOR GROUND
17	-	-
18	-	-
19	F300 20RD/BK	BATTERY SENSE (+)
20	Z11 20BK/WT	BATTERY SENSE (-)
21	K4 18BK/LB	SENSOR GROUND
22	F991 20RD/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)
23	K6 18VT/WT	SENSOR REFERENCE VOLTAGE B
24	K3 20BK	CRANKSHAFT POSITION SENSOR SIGNAL 1
25	D51 18WT	CAN C BUS(-)
26	-	-
27	-	-
28	-	-
29	K77 20BR/WT	TRANSFER CASE POSITION SENSOR SIGNAL
30	G60 20BR/DB	ENGINE OIL PRESSURE SENSOR SIGNAL
31	-	-
32	K25 20VT/DG	BATTERY TEMPERATURE SENSOR SIGNAL
33	-	-
34	K255 20WT/DG	ACCELERATOR PEDAL POSITION SENSOR 1 GROUND
35	Y43 20WT/VT	ACCELERATOR PEDAL POSITION SENSOR 1 5-VOLT SUPPLY
36	C18 20DB	A/C PRESSURE SENSOR SIGNAL
37	-	-
38	V37 20RD/DG	SPEED CONTROL SWITCH SIGNAL
39	K226 20DB/WT	FUEL LEVEL SENSOR SIGNAL
40	K2 20DG/RD	ENGINE COOLANT TEMPERATURE SENSOR SIGNAL
41	K21 20DG/WT	INTAKE AIR TEMPERATURE SENSOR SIGNAL
42	Y101 20	CRANKSHAFT POSITION SENSOR SHIELD
43	K924 20YL	CRANKSHAFT POSITION SENSOR SIGNAL 2
44	-	-
45	-	-
46	-	-
47	L50 20WT/DB	PRIMARY BRAKE SWITCH SIGNAL
48	K29 20WT/PK	SECONDARY BRAKE SWITCH SIGNAL
49	-	-
50	F855 18BR/YL	SENSOR REFERENCE VOLTAGE A
51	-	-
52	-	-
53	-	-
54	Z189 20BR	MASS AIR FLOW SENSOR GROUND
55	B22 20DG/YL	VEHICLE SPEED SENSOR SIGNAL
56	K225 18BK	ACCELERATOR PEDAL POSITION SENSOR 2 GROUND
57	-	-
58	K4 20BK/LB	WATER IN FUEL SENSOR GROUND
59	K900 18GY	INTAKE PORT SWIRL ACTUATOR SIGNAL
60	K7 20RD/WT	FUEL PRESSURE SENSOR 5 VOLT SUPPLY
61	K51 20DB/YL	AUTO SHUT DOWN RELAY CONTROL
62	-	-
63	-	-
64	-	-
65	-	-
66	-	-
67	K173 20GY	HYDRAULIC RADIATOR FAN SOLENOID CONTROL
68	-	-
69	C13 20DB/RD	A/C COMPRESSOR CLUTCH RELAY CONTROL
70	-	-
71	-	-
72	K236 20GY/PK	GLOW PLUG RELAY NO. 2 CONTROL
73	-	-
74	T752 20DG/RD	ENGINE STARTER MOTOR RELAY CONTROL
75	K132 20BR/BK	VISCOUS/CABIN HEATER RELAY CONTROL
76	Y42 20BR/BK	WASTEGATE SOLENOID CONTROL
77	K152 20WT	GLOW PLUG RELAY NO. 1 CONTROL
78	-	-
79	-	-
80	K46 20DB/BK	FUEL PRESSURE SOLENOID CONTROL
81	K46 20DB/BK	FUEL PRESSURE SOLENOID CONTROL



ENGINE CONTROL MODULE C2 (DIESEL)

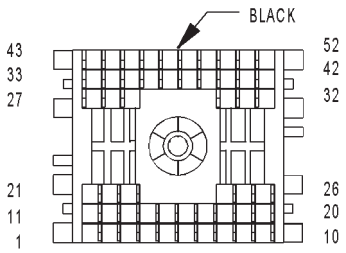
ENGINE CONTROL MODULE C2 (DIESEL) - BLACK 40 WAY

CAV	CIRCUIT	FUNCTION
82	D21 20PK	SCI TRANSMIT
83	-	-
84	-	-
85	-	-
86	-	-
87	-	-
88	-	-
89	K35 20GY/YL	EGR SOLENOID CONTROL
90	-	-
91	-	-
92	-	-
93	-	-
94	G123 20DG/WT	WATER IN FUEL SIGNAL
95	-	-
96	-	-
97	-	-
98	-	-
99	-	-
100	-	-
101	-	-
102	-	-
103	-	-
104	-	-
105	-	-
106	-	-
107	-	-
108	-	-
109	-	-
110	-	-
111	-	-
112	T41 20BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE
113	-	-
114	-	-
115	K14 14BK/YL	FUEL INJECTOR NO. 4 CONTROL
116	K63 14BK	COMMON INJECTOR DRIVER
117	-	-
118	K11 14BK/DB	FUEL INJECTOR NO. 1 CONTROL
119	K38 14BK/DG	FUEL INJECTOR NO. 5 CONTROL
120	K12 14BK/VT	FUEL INJECTOR NO. 2 CONTROL
121	K13 14BK/RD	FUEL INJECTOR NO. 3 CONTROL


JUNCTION BLOCK FRONT
LOW BEAM/ DAYTIME RUNNING LAMP RELAY (DRL)
CIGAR LIGHTER RELAY
SUNROOF DELAY RELAY
COMBINATION FLASHER
REAR WINDOW DEFOGGER RELAY
CIRCUIT BREAKER NO. 1
HIGH BEAM RELAY
LOW BEAM RELAY
FOG LAMP RELAY
REAR FOG LAMP RELAY (BUILT-UP-EXPORT)
SPARE
SPARE
CIRCUIT BREAKER NO. 2
PARK LAMP RELAY
JB-C2
JB-C1
JB-C5
JB-C4
C3
SPARE
F1 SPARE
F2 SPARE
F3 (10A)
F4 (15A)
F5 (25A)
F6 (15A)
F7 (10A)
F8 (10A)
F9 (20A)
F10 (20A)
F11 (10A)
F12 (10A)
F13 SPARE
F14 (10A)
F15 (10A)
F16 (10A)
F17 (10A)
F18 (30A)
F19 (10A)
F20 (10A)
F21 (10A)
F22 (10A)
F32 (10A)
F33 (10A)
F23 (15A)
F24 (15A)
F25 (15A)
F26 (15A)
F27 (15A)
F28 (10A)
F29 (10A)
F30 (10A)
F31 (10A)

FUSES (JB)

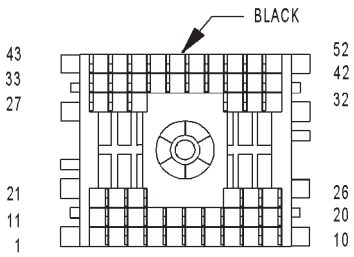
FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	-	-	-
2	-	-	-
3	10A	L33 18RD	FUSED HIGH BEAM RELAY OUTPUT
4	15A	INTERNAL	FUSED B(+)
5	25A	INTERNAL	FUSED B(+)
6	15A	INTERNAL	FUSED B(+)
7	10A	INTERNAL	FUSED B(+)
8	15A	INTERNAL	FUSED B(+)
9	20A	INTERNAL	FUSED B(+)
10	20A	F72 16RD/YL (EXCEPT BUILT-UP-EXPORT)	FUSED B(+)
11	10A	C15 20BK/WT	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
12	10A	F991 20OR/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)
13	-	-	-
14	10A	L43 18VT	FUSED LOW BEAM RELAY OUTPUT
15	10A	L44 18VT/RD	FUSED LOW BEAM RELAY OUTPUT
16	10A	L34 18RD/OR	FUSED HIGH BEAM RELAY OUTPUT
17	10A	INTERNAL	FUSED B(+)
18	30A	F9 20RD/BK	FUSED B(+)
19	10A	F20 18DB/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
20	10A	INTERNAL	FUSED IGNITION SWITCH OUTPUT (RUN)
21	10A	INTERNAL	FUSED IGNITION SWITCH OUTPUT (RUN-START)
22	10A	INTERNAL	FUSED IGNITION SWITCH OUTPUT (RUN-START)
23	15A	F32 20PK/DB	FUSED B(+)
24	15A	INTERNAL	FUSED B(+)
25	15A	INTERNAL	FUSED B(+)
26	15A	F30 18RD	FUSED CIGAR LIGHTER RELAY OUTPUT
27	15A	INTERNAL (BUILT-UP-EXPORT)	FUSED B(+)
28	10A	INTERNAL	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
29	10A	INTERNAL	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
30	10A	X12 18RD/WT (RHD)	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
30	10A	X12 16WT/RD (LHD)	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
31	10A	F45 20YL/RD	FUSED IGNITION SWITCH OUTPUT (START)
32	10A	F14 18LG/YL	FUSED IGNITION SWITCH OUTPUT (RUN-START)
33	10A	F23 18DB/YL	FUSED IGNITION SWITCH OUTPUT (RUN)



JUNCTION BLOCK C2 (LHD)

JUNCTION BLOCK C2 (LHD) - BLACK 52 WAY

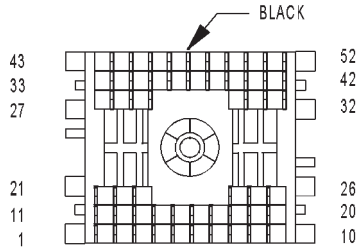
CAV	CIRCUIT	FUNCTION
1	X3 22GY/OR	HORN RELAY CONTROL
2	-	-
3	L39 20LB	FOG LAMP RELAY OUTPUT
4	-	-
5	L61 20TN/LG	LEFT TURN SIGNAL
6	-	-
7	-	-
8	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
9	V6 16DB (GAS)	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
10	L62 18BR/RD	RIGHT TURN SIGNAL
11	F991 20OR/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	L39 20LB	FOG LAMP RELAY OUTPUT
13	-	-
14	-	-
15	V16 22VT	WIPER HIGH/LOW RELAY CONTROL
16	-	-
17	-	-
18	-	-
19	-	-
20	L7 20BK/YL	PARK LAMP RELAY OUTPUT
21	L7 20BK/YL	PARK LAMP RELAY OUTPUT
22	-	-
23	-	-
24	F37 16RD/LB (EXCEPT BASE)	FUSED B(+)
25	F22 20WT/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
26	L60 20TN	RIGHT TURN SIGNAL
27	F45 20YL/RD	FUSED IGNITION SWITCH OUTPUT (START)
28	V55 16TN/RD	WIPER PARK SWITCH SENSE
29	-	-
30	-	-
31	F72 16RD/YL	FUSED B(+)
32	M1 20PK/RD	FUSED B(+)
33	V55 16TN/RD (GAS)	WIPER PARK SWITCH SENSE
34	-	-
35	-	-
36	A146 12OR/WT	FUSED B(+)
37	-	-
38	L34 18RD/OR	FUSED RIGHT HIGH BEAM OUTPUT
39	L43 18VT	FUSED LEFT LOW BEAM OUTPUT
40	-	-
41	-	-
42	F20 18DB/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
43	F12 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
44	-	-
45	A146 12OR/WT	FUSED B(+)
46	-	-
47	F32 20PK/DB	FUSED B(+)
48	-	-
49	L44 18VT/RD	FUSED RIGHT LOW BEAM OUTPUT
50	L33 18RD	FUSED LEFT HIGH BEAM OUTPUT
51	-	-
52	F60 14RD/WT (EXCEPT BASE)	FUSED B(+)



JUNCTION
BLOCK C2
(RHD)

JUNCTION BLOCK C2 (RHD) - BLACK 52 WAY

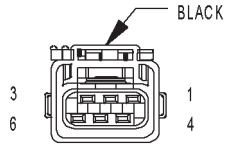
CAV	CIRCUIT	FUNCTION
1	X3 22BK/RD	HORN RELAY CONTROL
2	-	-
3	L39 20LB	FOG LAMP RELAY OUTPUT
4	-	-
5	L61 20TN/LG	LEFT TURN SIGNAL
6	-	-
7	-	-
8	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
9	V6 16DB (GAS)	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
10	L62 20BR/RD	RIGHT TURN SIGNAL
11	F991 20OR/DB (GAS)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	L39 20LB	FOG LAMP RELAY OUTPUT
13	-	-
14	-	-
15	V16 22VT	-
16	-	-
17	-	-
18	-	-
19	-	-
20	L7 20BK/YL	PARK LAMP RELAY OUTPUT
21	L7 18BK/YL	PARK LAMP RELAY OUTPUT
22	-	-
23	-	-
24	F37 16RD/LB	FUSED B(+)
25	F22 18WT/TN	FUSED IGNITION SWITCH OUTPUT (RUN)
26	L60 20TN	RIGHT TURN SIGNAL
27	F45 20YL/RD	FUSED IGNITION SWITCH OUTPUT (START)
28	V55 16TN/RD	WIPER PARK SWITCH SENSE
29	-	-
30	-	-
31	-	-
32	M1 20PK/RD	FUSED B(+)
33	V55 16TN/RD (GAS)	WIPER PARK SWITCH SENSE
34	-	-
35	-	-
36	A146 12OR/WT	FUSED B(+)
37	-	-
38	L34 18RD/OR	FUSED RIGHT HIGH BEAM OUTPUT
39	L43 18VT	FUSED LEFT LOW BEAM OUTPUT
40	-	-
41	-	-
42	F20 18DB/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
43	F12 20DB/WT (GAS)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
44	-	-
45	A146 12OR/WT	FUSED B(+)
46	-	-
47	F32 20PK/DB	FUSED B(+)
48	-	-
49	L44 18VT/RD	FUSED RIGHT LOW BEAM OUTPUT
50	L33 18RD	FUSED LEFT HIGH BEAM OUTPUT
51	-	-
52	F60 16RD/WT	FUSED B(+)



JUNCTION
BLOCK C3

JUNCTION BLOCK C3 - BLACK 52 WAY

CAV	CIRCUIT	FUNCTION
1	F22 20WT/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
2	-	-
3	L60 20TN	RIGHT TURN SIGNAL
4	L302 20LB/YL	RIGHT TURN SWITCH SENSE
5	L61 20TN/LG	LEFT TURN SIGNAL
6	L91 20DB/PK	HAZARD SWITCH SENSE
7	-	-
8	L305 20LB/WT	LEFT TURN SWITCH SENSE
9	-	-
10	L309 20PK/LG	HIGH BEAM RELAY CONTROL
11	F23 18DB/YL	FUSED IGNITION SWITCH OUTPUT (RUN)
12	F22 20WT/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
13	-	-
14	F85 16VT/WT	FUSED B(+)
15	C79 20BK/WT	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
16	-	-
17	-	-
18	-	-
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	A31 12RD/BK	IGNITION SWITCH OUTPUT (RUN-ACC)
25	F60 16RD/WT	FUSED B(+)
26	-	-
27	A41 12YL	IGNITION SWITCH OUTPUT (START)
28	F14 20LG/YL	FUSED IGNITION SWITCH OUTPUT (RUN-START)
29	A22 12BK/OR	IGNITION SWITCH OUTPUT (RUN)
30	F991 18OR/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)
31	Z234 20BK	GROUND
32	F33 20PK/RD	FUSED B(+)
33	X12 16WT/RD	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
34	M1 20PK	FUSED B(+)
35	M1 20PK (AZC)	FUSED B(+)
36	A21 12DB	IGNITION SWITCH OUTPUT (RUN-START)
37	-	-
38	F70 20PK/BK	FUSED B(+)
39	X3 20GY/OR	HORN RELAY CONTROL
40	F30 16RD	FUSED CIGAR LIGHTER RELAY OUTPUT
41	F33 20PK/RD	FUSED B(+)
42	-	-
43	V23 20BR/PK	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
44	M1 20PK	FUSED B(+)
45	Z132 20BK/OR	GROUND
46	-	-
47	-	-
48	F70 20PK/BK	FUSED B(+)
49	-	-
50	G5 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
51	G5 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
52	F12 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)

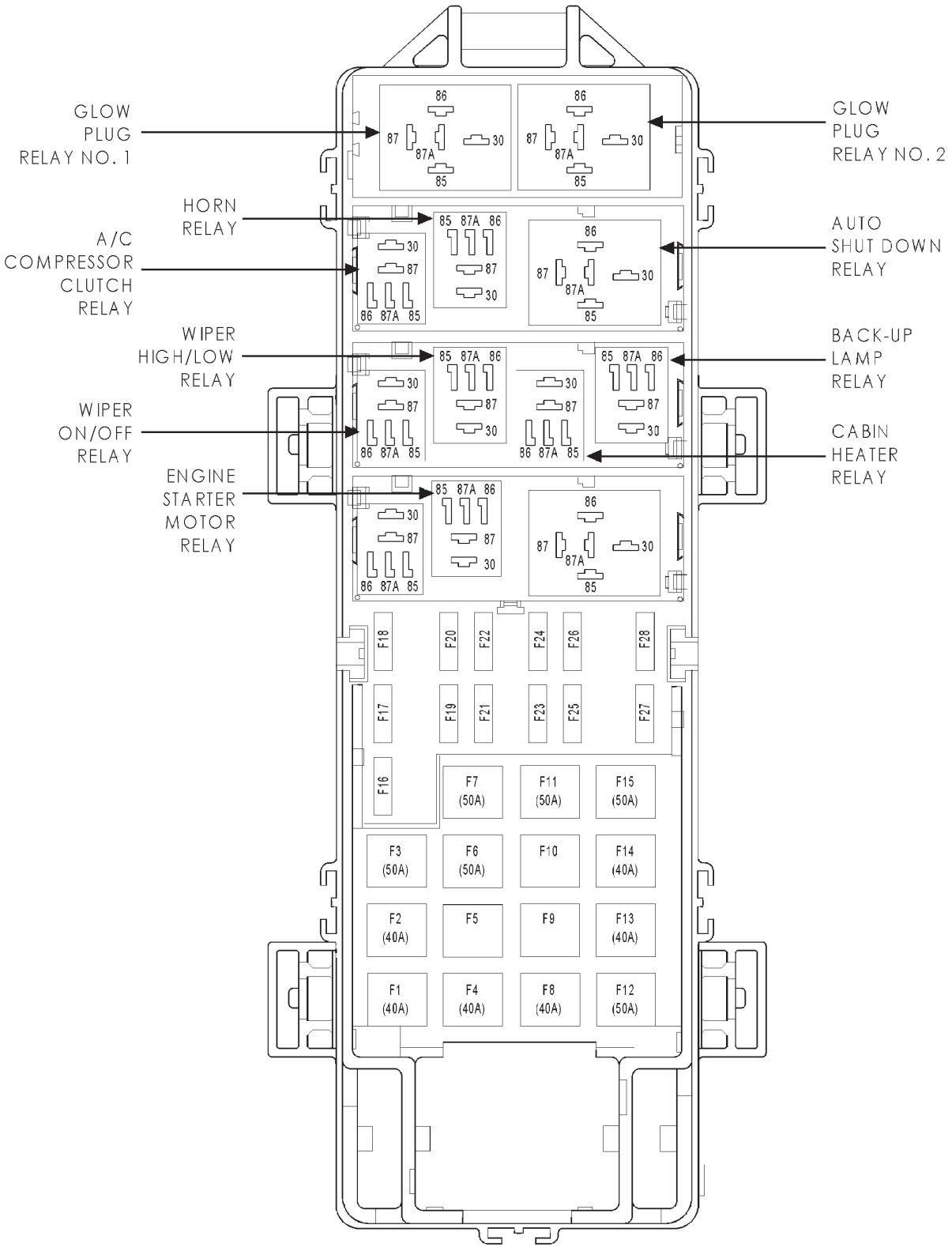


LEFT REAR
LAMP ASSEMBLY

LEFT REAR LAMP ASSEMBLY - BLACK 6 WAY

CAV	CIRCUIT	FUNCTION
1	L1 18VT/BK	BACK-UP LAMP FEED
2	L95 18DG/YL (BUILT-UP-EXPORT)	REAR FOG LAMP RELAY OUTPUT
3	L7 18BK/YL	PARK LAMP RELAY OUTPUT
4	L63 18DG/RD	LEFT TURN SIGNAL
5	Z150 18BK	GROUND
6	L50 18WT/TN	PRIMARY BRAKE SWITCH SIGNAL

POWER DISTRIBUTION CENTER (DIESEL)

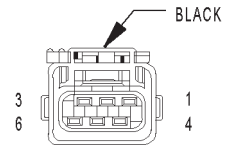


FUSES (DIESEL)

FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	40A	C1 12DG	FUSED B(+)
2	40A	A149 12RD/TN	FUSED B(+)
3	50A	A145 10WT/RD	FUSED B(+)
4	40A	A10 12RD/DG	FUSED B(+)
5	-	-	-
6	50A	A105 10DB/RD	FUSED B(+)
7	50A	A147 10RD/GY	FUSED B(+)
8	40A	A1 12RD	FUSED B(+)
9	-	-	-
10	-	-	-
11	50A	A110 10VT/RD	FUSED B(+)
12	50A	A146 10OR/WT	FUSED B(+)
13	40A	A14 14RD/WT	FUSED B(+)
14	40A	A2 12PK/BK	FUSED B(+)
15	50A	A148 10PK/WT	FUSED B(+)
16	20A	F15 18DB/WT	FUSED AUTO SHUT DOWN RELAY OUTPUT
16	20A	F15 18 DB/WT	FUSED AUTO SHUT DOWN RELAY OUTPUT
17	-	-	-
18	15A	F62 18RD	FUSED B(+)
18	15A	F62 18RD	FUSED B(+)
19	-	-	-
20	-	-	-
21	15A	A17 14RD/BK	FUSED B(+)
22	10A	F300 18RD/BK	FUSED B(+)
23	15A	A80 18RD/LG	FUSED B(+)
24	-	-	-
25	20A	A20 12RD/DB	FUSED B(+)
26	20A	F142 14OR/DG	FUSED AUTO SHUT DOWN RELAY OUTPUT
27	20A	A148 16LG/RD	FUSED B(+)
28	-	-	-

BACK-UP LAMP RELAY (DIESEL)

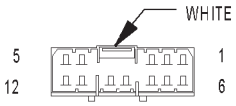
CAV	CIRCUIT	FUNCTION
30	F22 18WT/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
85	F22 18WT/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
85	F22 18WT/PK	FUSED IGNITION SWITCH OUTPUT (RUN)
86	T2 18TN/BK	BACK-UP LAMP RELAY CONTROL
87	L1 18VT/BK	BACK-UP LAMP FEED
87A	-	-



RIGHT REAR
LAMP ASSEMBLY

RIGHT REAR LAMP ASSEMBLY - BLACK 6 WAY

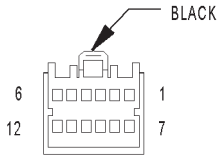
CAV	CIRCUIT	FUNCTION
1	L1 18VT/BK	BACK-UP LAMP FEED
2	L95 18DG/YL (BUILT-UP-EXPORT)	REAR FOG LAMP RELAY OUTPUT
3	L7 18BK/YL	PARK LAMP RELAY OUTPUT
4	L62 18BR/RD	RIGHT TURN SIGNAL
5	Z151 18BK	GROUND
6	L50 18WT/TN	PRIMARY BRAKE SWITCH SIGNAL



SHIFTER
ASSEMBLY
(C201 DIESEL)

SHIFTER ASSEMBLY (C201 DIESEL) - WHITE 12 WAY

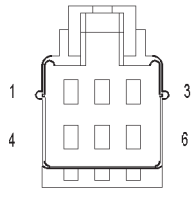
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	K2 20WT/PK	SECONDARY BRAKE SWITCH SIGNAL
5	D25 20RD	PCI BUS
6	-	-
7	D21 20PK	SCI TRANSMIT
8	F12 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
9	T2 20TN/BK	BACK-UP LAMP RELAY CONTROL
10	Z234 20WT	GROUND
11	T41 20BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE
12	F991 20OR/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)



SHIFTER
ASSEMBLY C1
(DIESEL)

SHIFTER ASSEMBLY C1 (DIESEL) - BLACK 12 WAY

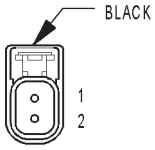
CAV	CIRCUIT	FUNCTION
1	F991 20OR/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)
2	F991 20OR/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)
3	F991 20OR/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)
4	T2 20TN/BK	BACK-UP LAMP RELAY CONTROL
5	D25 20OR	PCI BUS
6	W0 20DB/WT	SHIFTER C1 SENSE
7	W1 20VT/WT	SHIFTER C2 SENSE
8	W2 20VT	SHIFTER C3 SENSE
9	W3 20BK	SHIFTER C4 SENSE
10	W4 20PK/OR	SHIFTER C5 SENSE
11	Z234 20WT	GROUND
12	Z234 20WT	GROUND



SHIFTER
ASSEMBLY C2
(DIESEL)

SHIFTER ASSEMBLY C2 (DIESEL) - 6 WAY

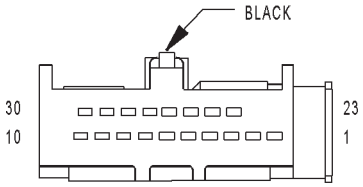
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	F12 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
4	K2 20WT/PK	SECONDARY BRAKE SWITCH SIGNAL
5	F991 20OR/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)
6	Y1 20DB/PK	PARK LOCKOUT SOLENOID CONTROL



TRANSFER CASE POSITION SENSOR

TRANSFER CASE POSITION SENSOR - BLACK 2 WAY

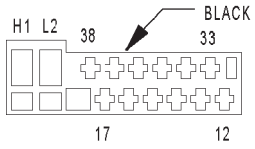
CAV	CIRCUIT	FUNCTION
1	K77 20BR/WT (DIESEL)	TRANSFER CASE POSITION SENSOR SIGNAL
1	K77 18LG/BK (GAS)	TRANSFER CASE POSITION SENSOR SIGNAL
2	K4 20BK/LB (DIESEL)	SENSOR GROUND
2	K4 18BK/LB (GAS)	SENSOR GROUND



TRANSMISSION CONTROL MODULE C1 (DIESEL)

TRANSMISSION CONTROL MODULE C1 (DIESEL) - BLACK 18 WAY

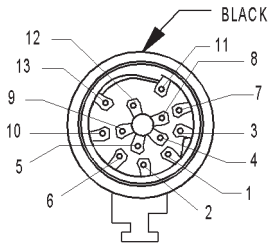
CAV	CIRCUIT	FUNCTION
1	D21 20PK	SCI TRANSMIT
2	-	-
3	W4 20PK/OR	SHIFTER C5 SENSE
4	Y1 20DB/PK	PARK LOCKOUT SOLENOID CONTROL
5	-	-
6	-	-
7	T41 20BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE
8	-	-
9	-	-
10	-	-
23	-	-
24	-	-
25	W0 20DB/WT	SHIFTER C1 SENSE
26	W1 20VT/WT	SHIFTER C2 SENSE
27	W2 20VT	SHIFTER C3 SENSE
28	W3 20BK	SHIFTER C4 SENSE
29	F991 20OR/DB	FUSED IGNITION SWITCH OUTPUT (RUN-START)
30	Z234 20WT	GROUND



TRANSMISSION CONTROL MODULE C2 (DIESEL)

TRANSMISSION CONTROL MODULE C2 (DIESEL) - BLACK 14 WAY

CAV	CIRCUIT	FUNCTION
12	T52 18RD/BK	N2 INPUT SPEED SENSOR
13	T39 18GY/LB	SENSOR SUPPLY VOLTAGE
14	T60 18BR	1-2/4-5 SOLENOID CONTROL
15	T159 18DG/WT	3-4 SOLENOID CONTROL
16	T119 18WT/DB	2-3 SOLENOID CONTROL
17	T120 18LG	TCC SOLENOID CONTROL
33	T13 18DB/BK	SENSOR GROUND
34	T54 18VT	TEMP SENSOR - P/N SWITCH
35	T14 18LG/WT	N3 INPUT SPEED SENSOR
36	T591 18YL/DB	MODULATION PRESSURE SOLENOID CONTROL
37	T118 18YL/DB	SHIFT PRESSURE SOLENOID CONTROL
38	T16 18RD	SOLENOID SUPPLY VOLTAGE
H1	D52 18LG/WT	CAN C BUS(+)
L2	D51 18DG/WT	CAN C BUS(-)

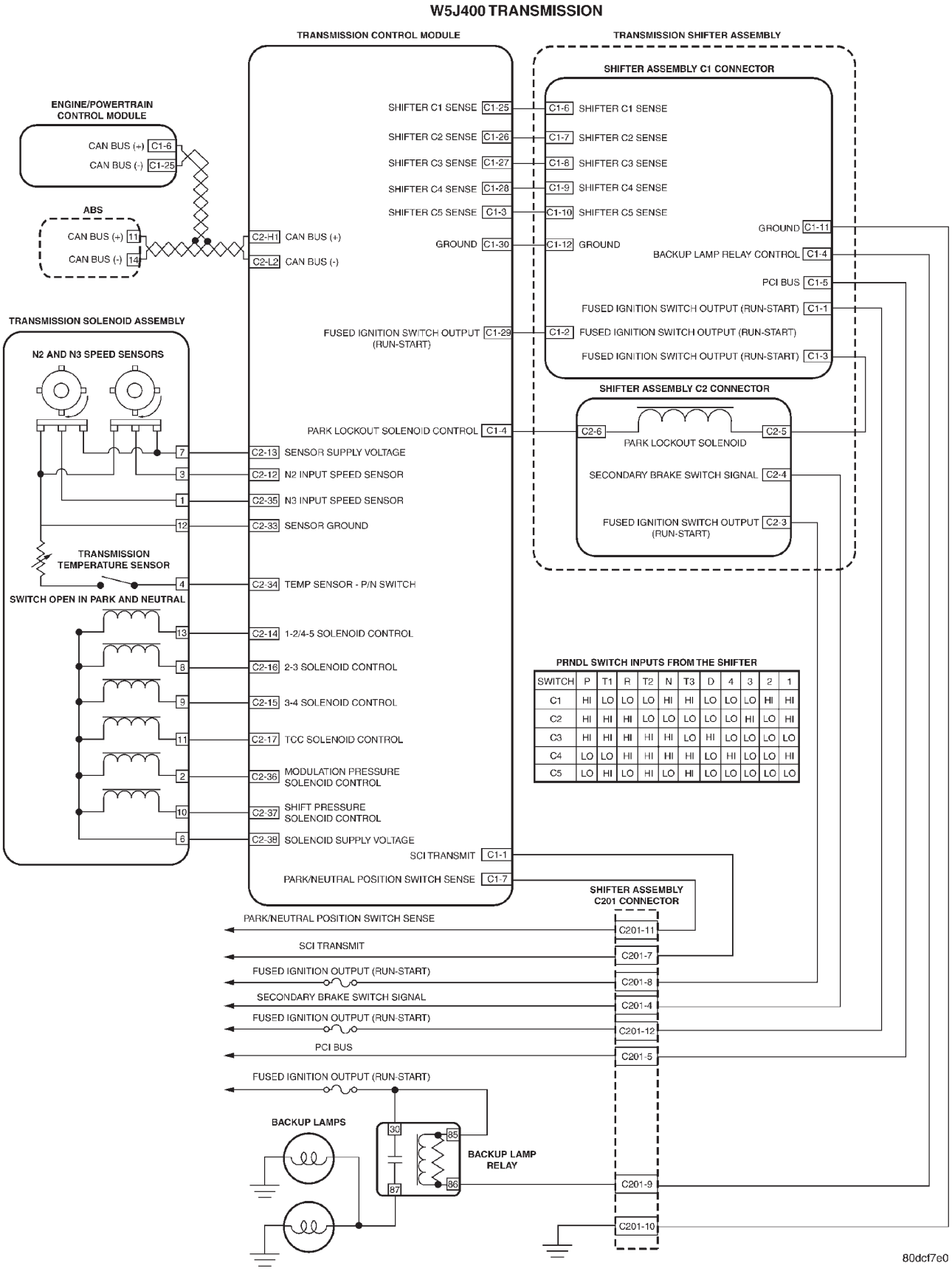


TRANSMISSION SOLENOID ASSEMBLY (DIESEL)

TRANSMISSION SOLENOID ASSEMBLY (DIESEL) - BLACK 13 WAY

CAV	CIRCUIT	FUNCTION
1	T14 18LG/WT	N3 INPUT SPEED SENSOR
2	T591 18YL/DB	MODULATION PRESSURE SOLENOID CONTROL
3	T52 18RD/BK	N2 INPUT SPEED SENSOR SIGNAL
4	T54 18VT	TEMP SENSOR - P/N SWITCH
5	-	-
6	T16 18RD	SOLENOID SUPPLY VOLTAGE
7	T39 18GY/LB	SENSOR SUPPLY VOLTAGE
8	T119 18WT/DB	2-3 SOLENOID CONTROL
9	T159 18DG/WT	3-4 SOLENOID CONTROL
10	T118 18YL/DB	SHIFT PRESSURE SOLENOID CONTROL
11	T120 18LG	TCC SOLENOID CONTROL
12	T13 18DB/BK	SENSOR GROUND
13	T60 18BR	1-2/4-5 SOLENOID CONTROL

10.0 SCHEMATIC DIAGRAMS



NOTES

11.0 CHARTS AND GRAPHS

11.1 SHIFT LEVER ERROR CODES

DRBIII ERROR CODE LIST

ERROR CODE	SWITCH STUCK	POSITION
1.	C1 Stuck	OPEN
2.	C1 Stuck	CLOSED
3.	C2 Stuck	OPEN
4.	C2 Stuck	CLOSED
5.	C3 Stuck	OPEN
6.	C3 Stuck	CLOSED
7.	C4 Stuck	OPEN
8.	C4 Stuck	CLOSED
9.	C5 Stuck	OPEN
10.	C5 Stuck	CLOSED

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11.2 SHIFTER SWITCH STATES

PRNDL SWITCH INPUTS FROM THE SHIFTER

SWITCH	PARK	T1	REV	T2	N	T3	D	4	3	2	1
C1	HI	LO	LO	LO	HI	HI	LO	LO	LO	HI	HI
C2	HI	HI	HI	LO	LO	LO	LO	LO	HI	LO	HI
C3	HI	HI	HI	HI	HI	LO	HI	LO	LO	LO	LO
C4	LO	LO	HI	HI	HI	HI	LO	HI	LO	LO	HI
C5	LO	HI	LO	HI	LO	HI	LO	LO	LO	LO	LO

HI = 12 VOLTS LO = 0 VOLTS

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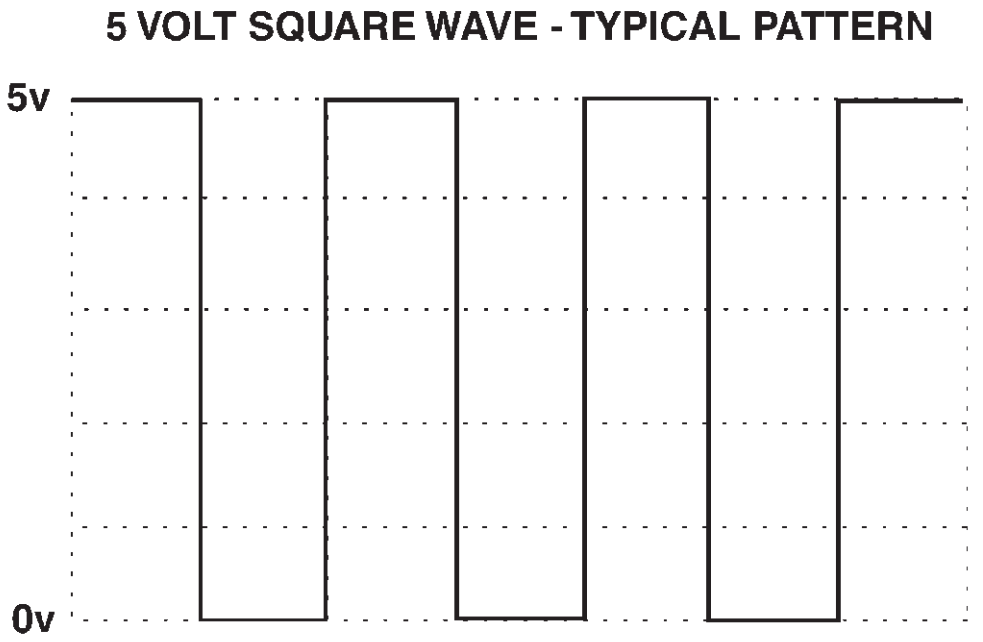
11.3 5 VOLT SQUARE WAVE - TYPICAL PATTERN



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11.4 TRANMISSION TEMP SENSOR

TRANSMISSION TEMP SENSOR SPECIFICATIONS

TEMPERATURE/VOLTAGE/RESISTANCE CHART

TEMPERATURE (C)	TEMPERATURE (F)	VOLTAGE	RESISTANCE
-50	-58	0.73	506.0
-45	-49	0.77	534.0
-40	-40	0.80	564.0
-35	-31	0.84	593.0
-30	-22	0.88	624.0
-25	-13	0.91	654.0
-20	-4	0.95	686.0
-15	5	0.98	718.0
-10	14	1.02	750.0
-5	23	1.05	783.0
0	32	1.09	817.0
5	41	1.12	851.0
10	50	1.16	886.0
15	59	1.19	921.0
20	68	1.23	957.0
25	77	1.26	994.0
30	86	1.30	1032.0
35	95	1.33	1070.0
40	104	1.37	1109.0
45	113	1.40	1149.0
50	122	1.44	1189.0
55	131	1.48	1231.0
60	140	1.51	1273.0
65	149	1.55	1316.0
70	158	1.58	1360.0
75	167	1.62	1405.0
80	176	1.65	1450.0
85	185	1.69	1497.0
90	194	1.72	1545.0
95	203	1.76	1594.0
100	212	1.79	1644.0
105	221	1.83	1695.0
110	230	1.86	1747.0
115	239	1.90	1800.0
120	248	1.93	1855.0
125	257	1.97	1911.0
130	266	2.00	1968.0
135	275	2.04	2027.0
140	284	2.08	2087.0
145	293	2.11	2148.0
150	302	2.15	2211.0
155	311	2.18	2276.0
160	320	2.22	2342.0
165	329	2.25	2410.0
170	338	2.29	2479.0
175	347	2.32	2551.0

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NOTES