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NOTES

1.0 INTRODUCTION

The procedures contained in this manual include specifications, instructions, and graphics needed to diagnose the AW4 AUTOMATIC TRANSMISSION. The diagnostics in this manual are based on the failure condition or symptom being present at the time of diagnosis.

Please follow the recommendations below when choosing your diagnostic path.

1. First make sure the DRBIII® is communicating with the appropriate modules; ie., if the DRBIII® displays a "No Response" condition, you must diagnose this first before proceeding.
2. Read DTC's (diagnostic trouble codes) with the DRBIII®.
3. If no DTC's are present, identify the customer complaint.
4. Once the DTC or customer complaint is identified, locate the matching test in the Table of Contents and begin to diagnose the symptom.

All component location views are in Section 8.0. All connector pinouts are in Section 9.0. All system schematics are in section 10.0.

An * placed before the symptom description indicates a customer complaint.

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

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

After using this book, if you have any comments or recommendations, please fill out the form at the back of the book and mail it back to us.

1.1 SIX-STEP TROUBLESHOOTING PROCEDURE

Diagnosis of the AW4 electronic transmission system is done in six basic steps:

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

2.0 IDENTIFICATION OF SYSTEM

All 2001 Jeep Cherokees (XJ) vehicles equipped with a 4.0 liter engine and automatic transmission have an AW4 electronic transmission.

3.0 SYSTEM DESCRIPTION AND FUNCTIONAL OPERATION

3.1 GENERAL DESCRIPTION

The AW4 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 AW4 transmission control system has improved significantly since it's introduction. The Park/Neutral switch was replaced by a Transmission Range Sensor (TRS). The Transmission Control Module (TCM) now has the ability to communicate with the Powertrain Control Module (PCM) via the CCD Bus. The TCM also has the ability to monitor transmission faults which could affect emissions. Any transmission fault which will adversely affect emissions will set a DTC in the PCM and will also illuminate the MIL.

An Input Speed Sensor (ISS) was added to the control system. This gives improved functional trouble detection. This results in a new Diagnostic Trouble Code (DTC) to detect ISS malfunctions. The "Solenoid A or TCC Solenoid Functional Fault" DTC was separated into two DTC's "Shift solenoid A functional fault" and "TCC solenoid C functional fault" and there was also a new DTC for internal TCM failures.

3.2 FUNCTIONAL OPERATION

The AW4 system performs it's functions based on continuous real-time sensor feedback information. The Transmission Control Module (TCM) continuously checks for electrical problems, some mechanical problems, and some hydraulic problems. When a problem is sensed, the TCM stores a diagnostic trouble code. Some of these codes cause the transmission to go into "limp-in" or "default" mode. While in this mode, the TCM may not energize some of the solenoids in the transmission.

The only transmission functions that may be available are:

- Park and Neutral
- Reverse

- Fourth Gear (Gear Selector OD Position)
- Third Gear (Gear Selector 3 Position)
- First Gear (Gear Selector 1-2 Position)

Depending on the DTC that is set, determines what gear(s) are allowed. If one or more of the transmission solenoids are shorted to voltage or stuck open (therefore appearing energized to the transmission), the transmission may be stuck in the gear that would normally be engaged when a particular solenoid is energized.

The following chart shows the solenoid status required for a particular gear to be engaged.

Sol #A	Sol #B	Gear
Off	On	1st
On	On	2nd
On	Off	3rd
Off	Off	4th

Although vehicle performance may be seriously degraded while in this mode (limp-in), it allows the owner to drive the vehicle in for service.

3.3 DIAGNOSTIC TROUBLE CODES (DTC'S)

Always begin diagnosis by performing a visual inspection,

- check the fluid level and condition and correct as necessary
- check and adjust manual linkage as necessary
- check the electrical connections at the PCM, TCM, TPS, TRS and Transmission solenoids for pushed out or corroded terminals. Make sure all connectors are seated properly.
- test drive the vehicle to verify the customer complaint
- read the DTC's, the DTC will direct you to the specific test(s) in the table of contents that must be performed. If more than one code exists, diagnostic priority should be given to the most recent code.

If there is a CCD bus or communication problem, trouble codes will not be accessible until the problem is repaired. The DRBIII® will display an appropiate diagnostic message.

The following is a possible list of causes for a bus problem:

- open in either or both CCD bus wires.
- short to ground on either or both CCD bus wires.
- short to battery on either or both CCD bus wires.
- internal failure of any module or component on the bus

NOTE: THE CCD BUS SHOULD HAVE APPROXIMATELY 2.5 VOLTS ON BOTH WIRES. FOR MORE DETAILED INFORMATION ABOUT DIAGNOSING CCD BUS PROBLEMS, REFER TO THE APPROPRIATE BODY DIAGNOSTIC SYMPTOM.

The P-code, P1698–No CCD messages from TCM has been added in 1997.

This is a powertrain symptom (PCM code) and is diagnosed in powertrain diagnostics symptoms.

Each diagnostic trouble code is diagnosed by following a 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. In certain test procedures within this book, codes are used as a diagnostic tool.

DTC's which affect vehicle emissions will illuminate the Malfunction Indicator Lamp (MIL). Three consecutive "Good" OBDII trips or clearing the DTC's with a diagnostic tool (DRBIII® or equivalent) is required to extinguish the MIL.

3.3.1 HARD CODE

Any Diagnostic trouble codes (or **One-Trip** failure or drive cycle) that comes back within one cycle of the ignition key is a "hard" code. This means that the problem is there every time the TCM checks that circuit or function.

NOTE: NOT ALL OBDII CODES WILL NOT SET WITH JUST THE IGNITION KEY ON. THEY MUST BE DRIVEN, IN THE VEHICLE START AND DRIVE CYCLE(S) SUCH THAT ALL DIAGNOSTIC MONITORS HAVE RUN.

3.3.2 INTERMITTENT CODE

A diagnostic trouble code that is not present every time the TCM checks the circuit or function is an **"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.

3.3.3 STARTS SINCE SET COUNTER

For the most recent code (Code 1), the starts since set counter count the number of times the vehicle has started since it was last set. The starts since set counter will count up to 255 starts. When there are no diagnostic trouble codes stored in memory, the DRBIII® will display "NO DTC's DETECTED".

If DTC's are detected, the DRBIII® will display the number of good trips. This is the number of good trips since the latest DTC was set. The number of

good trips helps determine if the diagnostic trouble code is hard or intermittent.

- If the Good Trip count is displayed and equal to 0, the code is a hard code.
  Note: Look at "One-Trip" codes as a Hard codes.
- If the code is in the Warm-Up Cycle counter, it is considered an intermittent code. This means that the vehicle (transmission) has been driven at least "3 Good Trips" without the code recurring.

3.3.4 TROUBLE CODE ERASURE

A Diagnostic trouble code will be cleared from TCM memory if 40 Warm-Up Cycles have occured. A warm-up cycle is defined by CARB as "sufficient vehicle operation such that the coolant temperature has risen by at least 40°F from engine starting and reaches a minimum temperature of 160°F".

The Malfunction Indicator Lamp (MIL) will turn off after 3 good trips. The MIL will also turn off if the DTC's are cleared from the TCM with the diagnostic scan tool or if the problem corrects itself.

3.3.5 LIST OF DIAGNOSTIC TROUBLE CODES

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

Scan	Name of Code
P0122	THROTTLE POSITION SENSOR SIGNAL CIRCUIT
P0562	TRANSMISSION VOLTAGE LOW
P0563	TRANSMISSION VOLTAGE HIGH
P0705	CHECK SHIFTER SIGNAL (RANGE SENSOR)
P0715	INPUT SPEED SENSOR
P0720	OUTPUT SPEED SENSOR
P0740	(TCC) SOLENOID C FUNCTIONAL FAULT
P0751	SOLENOID A FUNCTIONAL FAULT
P0756	SOLENOID B FUNCTIONAL FAULT
P1694	NO CCD MESSAGE FROM PCM
P1718	INTERNAL TCM (EEPROM)
P1742	INTERNAL TCM (ROM)
P1743	INTERNAL TCM (RAM)
P1744	SOLENOID A SHORTED TO GROUND
P1745	SOLENOID A SHORTED TO VOLTAGE OR OPEN
P1746	SOLENOID B SHORTED TO GROUND
P1747	SOLENOID B SHORTED TO VOLTAGE OR OPEN
P1748	(TCC) SOLENOID C SHORTED TO GROUND
P1749	(TCC) SOLENOID C SHORTED TO VOLTAGE OR OPEN

The P-codes, P1698-" No CCD messages from TCM" and P0700 "Transmission Fault Present" are Powertrain Symptoms (PCM codes) and are diagnosed under the powertrain diagnostic symptoms group.

DTC's for AW4 transmission controller are not permanent and will change the moment the reason for the code is corrected.

3.4 INPUT SPEED SENSOR

The TCM uses the Input Speed Sensor (ISS) to detect transmission solenoid functional faults (P0751 solenoid A functional fault, P0756 solenoid B functional fault, TCC solenoid C functional fault). The ISS is a variable reluctance sensor. Changes in the reluctance of a magnetic circuit caused by the passing of the rotor lobes on the overdrive clutch drum result in the ISS outputting an AC periodic voltage wave form. The frequency and voltage of the wave form are proportional to the transmission input speed.

NOTE: SINCE THE OD/CLUTCH DRUM IS STATIONARY IN 4TH GEAR OR WHEN THE VEHICLE IS IN GEAR, BUT NOT MOVING. THERE WILL BE NO ISS SENSOR SIGNAL.

3.5 OUTPUT SPEED SENSOR

The Transmission Control Module (TCM) uses the Output Speed Sensor (OSS) to determine shift points and TCC engagement points. The OSS is a variable reluctance sensor. Changes in the reluctance of a magnetic circuit caused by the passing of the rotor lobes on the output shaft result in the OSS outputting an AC periodic voltage wave form. The frequency and voltage of the wave form are proportional to the transmission output shaft speed.

3.6 TRANSMISSION RANGE SENSOR

The transmission range sensor (TRS) contacts are used to determine the position of the shift lever and also to control the reverse lamps. The TCM determines the shift lever position based on the table below.

Shift lever position	Range Switch states			
	R	D	D3	L
P	off	off	off	off
R	on	off	off	off
N	off	off	off	off
OD	off	on	off	off
3	off	off	on	off
1-2	off	off	off	on

There are five switches in the TRS, 1 each for the 1-2, 3, OD, Reverse and Park/Neutral. The Park/Neutral portion of the TRS is hard wired to the Powertrain Control Module (PCM). The Park/Neutral information is received by the TCM from the PCM over the CCD communication bus. 12 volts is supplied to the TRS through the fused ignition switch output circuit. The TCM senses this voltage when a switch is closed. When the reverse switch is closed, power is supplied to the reverse lamps.

3.7 THROTTLE POSITION SENSOR

The TCM uses the Throttle Position Sensor (TPS) signal to determine shift points. The TPS circuit is hard wired to the TCM. If Pcode **P0122 "Throttle Position Sensor circuit"** is present, there may be a TPS code stored in the PCM. Always repair the PCM throttle position sensor DTC's first.

3.8 TRANSMISSION CONTROL MODULE SYSTEM

3.8.1 COMMUNICATIONS TO PCM

The PCM is continuously sending Bus Messages to the TCM. The TCM requires inputs from the PCM primarily to determine the Vehicle speed, Engine RPM, and the Park/Neutral switch state. The PCM also monitors the CCD bus messages from the TCM. A Diagnostic code is set if the TCM does not receive any valid messages from the PCM for 20 seconds.

3.8.2 OPERATING VOLTAGE

The TCM can operate normally with a battery voltage input between 10.0 and 17.7 volts. If the battery voltage supply (Fused B+) voltage is out of range there is a possibility of abnormal operation and/or TCM failure. A "Transmission Voltage High" or "Transmission Voltage Low" DTC will be set.

NOTE: ALWAYS PERFORM DIAGNOSTICS WITH A FULLY CHARGED BATTERY TO AVOID DIAGNOSING FALSE SYMPTOMS.

3.8.3 SHIFT SOLENOIDS

Two solenoids are used to control shifting. Solenoid A is used to control the 1-2 shift and the 3-4 shift. Solenoid B is used to control the 2-3 shift. Solenoid C controls the operation of the Torque Converter Clutch (TCC). The TCC solenoid is controlled by the TCM. The TCC can be engaged in 2nd, 3rd and fourth gear. The TCC can not be engaged in 1st gear, because it is hydraulically locked out in 1st gear. If the TCM turns off the solenoids and a voltage is detected on the control circuit a DTC will be set.

3.8.4 FUNCTIONAL FAULTS

Functional faults are detected by the transmission control module. The TCM uses the output speed sensor and the input speed sensor to calculate the current gear ratio. If the gear ratio is not within tolerance (within 10%) for the correct gear detected, a DTC will be set. The TCC solenoid functional fault will set if the difference between engine RPM and transmission input RPM is not consistent with the requested TCC state.

3.9 USING THE DRBIII®

The TCM and other components have the ability to interface over the communications bus. The DRBIII® Scan Tool connects to the Data Link Connector located in the passenger compartment. This allows communication with the TCM.

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

3.9.1 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 MDS Hotline, This is a **Sample** of such an error message display:

```
ver: 2.14
date: 26 Jul93
file: key_itf.cc
date: Jul 26 1998
line: 548
err: 0x1
User-Requested COLD Boot

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

3.9.2 DRBIII® DOES NOT POWER UP (BLANK SCREEN)

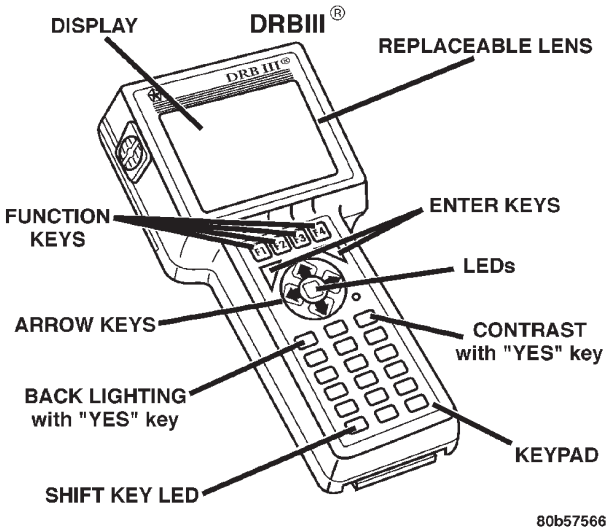
If the LED's do not light or no sound is emitted at start up, check for loose cable connections or a bad cable. Check the vehicle battery voltage. A minimum of 11 volts is required to adequately power the DRBIII®.

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 a faulty cable or vehicle wiring. For a blank screen, refer to the XJ Body Diagnostic symptoms.

3.9.3 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, WARNINGS

4.1 DISCLAIMERS

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

4.2 SAFETY

4.2.1 TECHNICIAN SAFETY INFORMATION

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

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

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

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

4.2.2 VEHICLE PREPARATION FOR TESTING

Make sure the vehicle being tested has a fully charged battery. If it does not, false diagnostic codes or error messages may occur. It is extremely important that accurate shift lever position data be available to the TCM. The accuracy of any diagnostic trouble code found in memory is doubtful unless the Shift Lever Test, performed on the DRBIII® Scan Tool, passes without fail.

4.2.3 SERVICING SUB-ASSEMBLIES

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

4.2.4 DRBIII® SAFETY INFORMATION

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

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

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

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

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

4.3 WARNINGS

4.3.1 VEHICLE DAMAGE WARNINGS

Before disconnecting any control module, make sure the ignition is “off”. Failure to do so could damage the module.

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

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

4.3.2 ROAD TEST COMPLAINT VEHICLE

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

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

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

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

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

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

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

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

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

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

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

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

4.3.3 BULLETINS AND RECALLS

The service procedures contained in this manual are correct, provided that all applicable Safety Recalls and Technical Service Bulletins have been performed. Perform a Dial Function 70 to retrieve a recall history for the vehicle being serviced.

5.0 REQUIRED TOOLS AND EQUIPMENT

> DRBIII® (diagnostic read-out box) - DRBIII® must use the most current software release level.

> Jumper wires

> Ohmmeter

> Voltmeter

6.0 GLOSSARY OF TERMS

6.1 ACRONYMS

BCM	Body Control Module
CARB	California Air Resource Board
CCD	Chrysler Collision Detection (communication bus)
CKT	Circuit
DLC	Data Link Connector
CVI	Clutch Volume Index
DLC	Data Link Connector
DRBIII®	Diagnostic Readout Box
DTC	Diagnostic Trouble Code
IOD	Ignition off-draw
ISS	Input Speed Sensor
LED	Light Emitting Diode
L-R	Low/reverse Clutch
LU	Lockup
MIL	Malfunction Indicator Lamp
OD	Overdrive
OSS	Output Speed Sensor
PCM	Powertrain Control Module
REV	Reverse
SW	Switch
TCC	Torque Converter Clutch
TCM	Transmission Control Module
TPS	Throttle Position Sensor
TRS	Transmission Range Sensor
UD	Underdrive
VSS	Vehicle Speed Sensor

6.2 DEFINITIONS

OBDII Trip - A vehicle start and drive cycle such that all once per trip diagnostic monitors have run.

Key Start - A vehicle start and run cycle of at least 20 seconds.

Warm-up Cycle - A vehicle start and run cycle such that the engine coolant must rise to at least 160°F and must rise by at least 40°F from initial start up. To count as a warm-up cycle, no faults may occur during the cycle.

NOTES

7.0

DIAGNOSTIC INFORMATION AND PROCEDURES

Symptom:

***NO RESPONSE FROM TRANSMISSION CONTROL MODULE**

POSSIBLE CAUSES
GROUND CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
CCD BUS (+) CIRCUIT OPEN
CCD BUS (-) CIRCUIT OPEN
TRANSMISSION CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure the DRB can establish communications with the PCM before beginning.** Turn the ignition off. Disconnect the TCM harness connector. Measure the resistance between ground and the ground circuit. Is the resistance below 5.0 ohms? Yes → Go To 2 No → Repair the Ground circuit for an open. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
2	**NOTE: Ensure the DRB can establish communications with the PCM before beginning.** Turn the ignition off. Disconnect the TCM harness connector. Turn the ignition on. Measure the voltage of the Fused Ignition Switch Output circuit. Is the voltage above 10.0 volts? Yes → Go To 3 No → Repair the Fused Ignition Switch Output circuit for an open. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
3	**NOTE: Ensure the DRB can establish communications with the PCM before beginning.** Turn the ignition off. Disconnect the TCM harness connector. Connect a jumper wire between the CCD Bus (+) circuit and ground. Turn the ignition on. With the DRB, enter SYSTEM MONITORS then CCD Bus Test. Does the DRB display: SHORT TO GROUND? Yes → Go To 4 No → Repair the CCD Bus (+) circuit for an open. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

*NO RESPONSE FROM TRANSMISSION CONTROL MODULE — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure the DRB can establish communications with the PCM before beginning.** Turn the ignition off. Disconnect the TCM harness connector. Connect a jumper wire between the CCD Bus (-) circuit and ground. Turn the ignition on. With the DRB, enter SYSTEM MONITORS then CCD Bus Test. Does the DRB display: SHORT TO GROUND? Yes → Go To 5 No → Repair the CCD Bus (-) circuit for an open. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:
P0122-THROTTLE POSITION SENSOR

When Monitored and Set Condition:

P0122-THROTTLE POSITION SENSOR

When Monitored: Continuously with the ignition key on.

Set Condition: The Throttle Position Sensor Signal circuit is out of range for 7 seconds or the Sensor Ground circuit is open or shorted to voltage for 7 seconds.

POSSIBLE CAUSES
TPS DTC'S PRESENT IN THE PCM
INTERMITTENT WIRING AND/OR CONNECTORS
TPS SIGNAL CIRCUIT OPEN
TPS SENSOR GROUND CIRCUIT OPEN TO TCM
TPS SIGNAL CIRCUIT SHORTED TO GROUND
TPS SENSOR GROUND CIRCUIT SHORTED TO VOLTAGE
TPS SIGNAL CIRCUIT SHORTED TO VOLTAGE
TCM-TPS CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P0122-THROTTLE POSITION SENSOR — Continued

TEST	ACTION	APPLICABILITY
2	When monitored: Continuously with the ignition key on. When set: The Throttle Position Sensor Signal circuit is out of range for 7 seconds or the Sensor Ground circuit is open or shorted to voltage for 7 seconds. This is the When monitored / When set conditions for DTC P0122. Continue Go To 3	All
3	With the DRBIII®, read PCM DTC's. Are there any TPS related DTC's stored in the PCM? Yes → Repair all Powertrain TPS codes before performing the Transmission diagnostics. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 4	All
4	Start the engine. Allow the engine to idle. With the DRBIII®, Check the Throttle Position Sensor Voltage under Transmission sensors. Is the Throttle Position Sensor voltage below 0.3 or above 1.0 volts? Yes → Go To 5 No → Go To 11	All
5	Ignition Off. Disconnect the Throttle Position Sensor (TPS). Disconnect the Transmission Control Module (TCM). **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the TPS Signal Circuit from the TCM connector to the TPS Connector. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open TPS Signal circuit. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
6	Ignition Off. Disconnect the TPS harness connector. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Sensor Ground Circuit between the TPS connector and the Transmission Control Module connector. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open TPS Sensor Ground circuit. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

P0122-THROTTLE POSITION SENSOR — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. Disconnect the Throttle Position Sensor harness connector. Disconnect the Transmission Control Module harness connector. **Note: Check connectors - Clean/repair as necessary.** With an Ohmmeter, measure the TP Sensor Signal Circuit to ground at the TCM connector. Is the resistance below 5.0 ohms? Yes → Repair the TPS Signal circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 8	All
8	Turn the igntion off. Disconnect the Throttle Position Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Turn the ignition on. With a Voltmeter, measure the TPS Sensor Ground Circuit. Is the voltage above 0.2 volts? Yes → Repair the TPS Sensor Ground circuit short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 9	All
9	Turn the igntion off. Disconnect the Throttle Position Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Turn the ignition on. With a Voltmeter, measure the Throttle Position Sensor Signal Circuit. Is the voltage above 5.0 volts? Yes → Repair the TPS Signal circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
11	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

Symptom:

P0562-TRANSMISSION VOLTAGE LOW

When Monitored and Set Condition:

P0562-TRANSMISSION VOLTAGE LOW

When Monitored: Continuously with the key on.

Set Condition: The voltage on the Fused B(+) circuit falls below 10.0 volts for 1 minute.

POSSIBLE CAUSES
CHARGING SYSTEM DTC'S PRESENT IN THE PCM
INTERMITTENT WIRING AND/OR CONNECTORS
TCM FUSED B+ CIRCUIT OPEN OR HIGH RESISTANCE
TCM GROUND CIRCUIT HAS OPEN OR HIGH RESISTANCE
TCM-FUSED B+ SUPPLY

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	When monitored: Continuously with the ignition key on. When set: The voltage on the Fused B(+) circuit falls below 10.0 volts for 1 minute. This is the When monitored / When set conditions for DTC P0562. Continue Go To 3	All

P0562-TRANSMISSION VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, read the PCM DTC's. **NOTE: Also check for Charging System no DTC's present symptom's.** Are there any Charging system DTC's, stored in the PCM. Yes → Refer to the Charging category and perform the appropriate symptom. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 4	All
4	With the DRBIII®, read the Battery Voltage under Transmission Sensors. Start the engine. Increase the Engine Speed to 1500 RPM. Is the Transmission Voltage above 9.9 volts? Yes → Go To 5 No → Go To 6	All
5	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All
6	Turn ignition off to the lock position. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Connect the ground clip of a test light to a known good 12 volt source on the vehicle such as the positive battery post. Probe the ground circuit in the TCM connector with the test light. **NOTE: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly at all ground circuits? Yes → Go To 7 No → Repair the open or high resistance Ground circuit. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

P0562-TRANSMISSION VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Connect the ground clip of a test light to a known good ground. Connect the other end to the Fused B(+) circuit in the TCM connector. **NOTE: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the test light illuminate brightly? Yes → Go To 8 No → Repair the open or high resistance Fused B(+) circuit. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
8	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:

P0563-TRANSMISSION VOLTAGE HIGH

When Monitored and Set Condition:

P0563-TRANSMISSION VOLTAGE HIGH

When Monitored: Continuously with the key on.

Set Condition: The voltage on the Fused B(+) circuit goes above 17.5 volts for 1 minute.

POSSIBLE CAUSES
CHARGING SYSTEM DTC'S PRESENT IN THE PCM
INTERMITTENT WIRING AND/OR CONNECTORS
CHARGING SYSTEM NO CODE
TCM-FUSED B+ SUPPLY

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	When monitored: Continuously with the ignition key on. When set: The voltage on the Fused B(+) circuit goes above 17.5 volts for 1 minute. This is the When monitored / When set conditions for DTC P0563 Continue Go To 3	All

P0563-TRANSMISSION VOLTAGE HIGH — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, read the PCM DTC's. **NOTE: Also check for Charging System no DTC's present symptom's.** Are there any Charging system DTC's, stored in the PCM. Yes → Refer to the Charging category and perform the appropriate symptom. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 4	All
4	With the DRBIII®, read the Battery Voltage under Transmission Sensors. Start the engine. Increase the Engine Speed to 1500 RPM. Is the Transmission Voltage below 17.7 volts? Yes → Go To 5 No → Go To 6	All
5	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All
6	Start the engine. Increase the Engine Speed to 1500 RPM. While backprobing, measure the voltage of the Fused B(+) circuit in the TCM harness connector. Is the voltage below 17.7 volts? Yes → Go To 7 No → Refer to the Charging category and perform the Charging System No Code. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
7	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:

P0705-RANGE SENSOR

When Monitored and Set Condition:

P0705-RANGE SENSOR

When Monitored: Continuously with the key on.

Set Condition: No Transmission Range Sensor signals are received or two conflicting signals are received from the Transmission Range Sensor at the same time by the TCM.

POSSIBLE CAUSES
PCM PARK/NEUTRAL DTC'S PRESENT
INTERMITTENT WIRING AND/OR CONNECTORS
FUSED IGNITION SWITCH OUTPUT OPEN OR HIGH RESISTANCE
TRS 1-2 SENSE CIRCUIT OPEN
TRS 3 SENSE CIRCUIT OPEN
TRS OVERDRIVE SENSE CIRCUIT OPEN
TRS REVERSE SENSE CIRCUIT OPEN
TRS 1-2 SENSE CIRCUIT SHORTED TO GROUND
TRS 3 SENSE CIRCUIT SHORTED TO GROUND
TRS OVERDRIVE SENSE CIRCUIT SHORTED TO GROUND
TRS REVERSE SENSE CIRCUIT SHORTED TO GROUND
TRS 1-2 SENSE CIRCUIT SHORTED TO VOLTAGE
TRS 3 SENSE CIRCUIT SHORTED TO VOLTAGE
TRS OVERDRIVE SENSE CIRCUIT SHORTED TO VOLTAGE
TRS REVERSE SENSE CIRCUIT SHORTED TO VOLTAGE
TRANS RANGE SENSOR-SENSE CIRCUIT
TCM-TRS SENSE CIRCUIT INPUTS

P0705-RANGE SENSOR — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	When monitored: Continuously with the ignition key on. When set: No Transmission Range Sensor signals are received or two conflicting signals are received from the Transmission Range Sensor at the same time by the TCM. This is the When monitored / When set conditions for DTC P0705. Continue Go To 3	All
3	With the DRBIII®, read the PCM DTC's. Is there a Park/Neutral DTC present? Yes → Refer to symptom P1899 P/N STUCK IN PARK OR IN GEAR in the DRIVEABILITY category. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 4	All
4	While monitoring the INPUT/OUTPUT (SLP) with the DRBIII®, place the gear selector in each gear position. Does the DRBIII® display the current gear position selected? Yes → Go To 5 No → Go To 6	All
5	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

P0705-RANGE SENSOR — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition switch to the lock position. Disconnect the TRS harness connector. Turn the ignition on. Using a 12-volt Test Light connected to ground, check the Fused Ignition Switch Output circuit. **NOTE: The light must illuminate brightly, if it does not light, or lights dimly, the circuit must be repaired. If there is any doubt, compare the brightness when testing the circuit, to the brightness when connected directly to the battery.** Does the light illuminate brightly? Yes → Go To 7 No → Repair the open or high resistance Fused Ignition Switch Output circuit. Check the fuse and replace, if necessary diagnose and repair cause of open fuse. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
7	With the DRBIII®, observe the TRS sense circuits on the Input/Output screen. Move the shift lever from P to 1-2, pausing momentarily in each gear position. Watch for one of the circuits to not change state. SHIFT LEVER POSITION RANGE SWITCH STATES R D D3 L P OFF OFF OFF OFF R ON OFF OFF OFF N OFF OFF OFF OFF OD OFF ON OFF OFF 3 OFF OFF ON OFF 1-2 OFF OFF OFF ON Choose the TRS sense circuit that did not change states. TRS Reverse Sense circuit Go To 8 TRS Overdrive Sense circuit Go To 11 TRS 3 Sense circuit Go To 14 TRS 1-2 Sense circuit Go To 17	All
8	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the TRS Reverse Sense circuit between the TCM connector and the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair the open TRS Reverse Sense circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 9	All

P0705-RANGE SENSOR — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the TRS Reverse Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the TRS Reverse Sense circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 10	All
10	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the TRS Reverse Sense circuit in the TCM connector. Is there any voltage present? Yes → Repair the TRS Reverse Sense circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 20	All
11	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the TRS O/D Sense circuit between the TCM connector and the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair the open TRS OD Sense circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 12	All
12	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the TRS Overdrive Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the TRS O/D Sense circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 13	All
13	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the TRS Overdrive Sense circuit in the TCM connector. Is there any voltage present? Yes → Repair the TRS Overdrive Sense circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 20	All

P0705-RANGE SENSOR — Continued

TEST	ACTION	APPLICABILITY
14	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the TRS 3 Sense circuit between the TCM connector and the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair the open TRS 3 Sense circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 15	All
15	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the TRS 3 Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the TRS 3 Sense circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 16	All
16	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the TRS 3 Sense circuit in the TCM connector. Is there any voltage present? Yes → Repair the TRS 3 Sense circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 20	All
17	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the TRS 1-2 Sense circuit between the TCM connector and the TRS connector. Is the resistance above 5.0 ohms? Yes → Repair the open TRS 1-2 Sense circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 18	All
18	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the TRS 1-2 Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the TRS 1-2 Sense circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 19	All

P0705-RANGE SENSOR — Continued

TEST	ACTION	APPLICABILITY
19	Turn the ignition off. Disconnect the TRS harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the TRS 1-2 Sense circuit in the TCM connector. Is there any voltage present? Yes → Repair the TRS 1-2 Sense circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 20	All
20	Turn the ignition off. Disconnect the TRS harness connector. **NOTE: Check connectors - Clean/repair as necessary.** With the DRBIII® in Inputs/Outputs, read the TRS state. Connect a jumper wire to B(+). Momentarily connect the other end of the jumper wire to each of the TRS Sense circuit's. **NOTE: The TRS switch state should display ON with the voltage applied.** Did all the TRS switch states indicate ON while 12 volts was applied? Yes → Go To 21 No → Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
21	If there are no possible causes remaining, view repair. Repair Replace the Transmission Range Sensor. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:

P0715-INPUT SPEED SENSOR ERROR

When Monitored and Set Condition:

P0715-INPUT SPEED SENSOR ERROR

When Monitored: Continuously while in 1st, 2nd, and 3rd gears with an Output Speed Sensor signal present and vehicle speed is over 8 MPH.

Set Condition: No signal from the Input Speed Sensor (ISS) with an Output Speed Sensor signal present. The DTC will be set when the TCM verifies that there is no ISS for 1 second in 2nd gear.

POSSIBLE CAUSES
INTERMITTENT WIRING AND/OR CONNECTORS
INPUT SPEED SENSOR GROUND CIRCUIT OPEN
INPUT SPEED SENSOR SIGNAL CIRCUIT OPEN
INPUT SPEED SENSOR GROUND CIRCUIT SHORT TO GROUND
INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND
ISS SIGNAL CIRCUIT SHORTED TO ISS GROUND CIRCUIT
INPUT SPEED SENSOR GROUND CIRCUIT SHORT TO VOLTAGE
INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
INPUT SPEED SENSOR - OUT OF RANGE
TCM-INPUT SPEED SENSOR

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	When monitored: Continuously while in 1st, 2nd, and 3rd gears with an Output Speed Sensor signal present and vehicle speed is over 8 MPH. When set: No signal from the Input Speed Sensor (ISS) with an Output Speed Sensor signal present. The DTC will be set when the TCM verifies that there is no ISS for 1 second in 2nd gear. This is the When monitored / When set conditions for DTC P0715. Continue Go To 3	All
3	Raise the Drive wheels off the ground. **CAUTION: Properly support the vehicle.** **WARNING: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** With the DRBIII® in Inputs/Outputs, read the Input Speed Sensor state. Place the gear selector in the 1-2 position and let the wheels spin. Is the Input Shaft speed above 0 RPM? Yes → Go To 4 No → Go To 5	All
4	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
5	Turn ignition switch to the lock position Disconnect the TCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Input Speed Sensor Ground circuit from the TCM harness connector to the Input Speed Sensor harness connector. Is the resistance above 5.0 ohms? Yes → Repair the open Input Speed Sensor Ground circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	Turn ignition switch to the lock position Disconnect the TCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Input Speed Sensor Signal circuit from the TCM connector to the Input Speed Sensor connector. Is the resistance above 5.0 ohms? Yes → Repair open Input Speed Sensor Signal circuit Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 7	All
7	Turn ignition switch to the lock position. Disconnect the TCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Speed Sensor Ground circuit and ground. Is the resistance Below 5.0 ohms? Yes → Repair Input Speed Sensor Ground circuit short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 8	All
8	Turn ignition switch to the lock position. Disconnect the TCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Input Speed Sensor Signal circuit and ground. Is the resistance Below 5.0 ohms? Yes → Repair Input Speed Sensor Signal circuit short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 9	All
9	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Input Speed Sensor harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between Input Speed Sensor Ground circuit and the Input Speed Sensor Signal circuit. Is the resistance below 5.0 ohms? Yes → Repair the ISS Signal circuit shorted to the ISS Ground Circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 10	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
10	Turn the ignition switch to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Turn ignition on. Measure the voltage of the Speed Sensor Ground circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair Input Speed Sensor Ground circuit short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 11	All
11	Turn the ignition switch to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Input Speed Sensor Signal circuit in the TCM harness connector. Is the voltage above 3.0 volts? Yes → Repair Input Speed Sensor Signal circuit short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 12	All
12	Turn ignition off to the lock position. Disconnect the Input Speed Sensor harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance across the Input Speed Sensor terminals. **NOTE: The Input Speed Sensor resistance will vary depending on temperature.** **NOTE: The resistance specification is 620.0 ohms at 20°Celsius 68°Fahrenheit.** Is the resistance between 500.0 and 700.0 ohms? Yes → Go To 13 No → Replace the Input Speed Sensor. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
13	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:
P0720-OUTPUT SHAFT SPEED SENSOR ERROR

When Monitored and Set Condition:

P0720-OUTPUT SHAFT SPEED SENSOR ERROR

When Monitored: Continuously with the vehicle speed over 6 MPH (over the CCD bus) and the transmission is in a forward gear (1st, 2nd , 3rd or OD).

Set Condition: No signal from the Output Speed Sensor for 100 seconds.

POSSIBLE CAUSES
INTERMITTENT WIRING AND/OR CONNECTORS
OUTPUT SPEED SENSOR GROUND CIRCUIT OPEN
OUTPUT SPEED SENSOR SIGNAL CIRCUIT OPEN
OSS SIGNAL CIRCUIT SHORTED TO OSS GROUND CIRCUIT
OUTPUT SPEED SENSOR GROUND CIRCUIT SHORT TO GND
OUTPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND
OUTPUT SPEED SENSOR GROUND CIRCUIT SHORT TO VOLTAGE
OUTPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
OUTPUT SPEED SENSOR (OUT OF RANGE)
TCM-OUTPUT SPEED SENSOR

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P0720-OUTPUT SHAFT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
2	When monitored: Continuously with the vehicle speed over 6 MPH (over the CCD bus) and the transmission is in a forward gear (1st, 2nd , 3rd or OD). When set: No signal from the Output Speed Sensor for 100 seconds. This is the When monitored / When set conditions for DTC P0720. Continue Go To 3	All
3	Raise the Drive wheels off the ground. **CAUTION: Properly support the vehicle.** **WARNING: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** With the DRBIII® in Inputs/Outputs, read the Output Speed Sensor state. Place the gear selector in the 1-2 position and let the wheels spin. Is the Output Shaft Speed above 0 RPM? Yes → Go To 4 No → Go To 5	All
4	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All
5	Turn ignition switch to the lock position Disconnect the TCM harness connector. Disconnect the Output Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Speed Sensor Ground circuit from the TCM connector to the Output Speed Sensor connector. Is the resistance above 5.0 ohms? Yes → Repair open Output Speed Sensor Ground circuit Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	Turn ignition switch to the lock position Disconnect the TCM harness connector. Disconnect the Output Speed Sensor connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance of the Output Speed Sensor Signal circuit from the TCM connector to the Output Speed Sensor connector. Is the resistance above 5.0 ohms? Yes → Repair open Output Speed Sensor Signal circuit Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 7	All

P0720-OUTPUT SHAFT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
7	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Output Speed Sensor harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between Output Speed Sensor Ground circuit and the Output Speed Sensor Signal circuit. Is the resistance below 5.0 ohms? Yes → Repair the OSS Signal circuit shorted to the OSS Ground Circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 8	All
8	Turn ignition switch to the lock position. Disconnect the TCM harness connector. Disconnect the Output Speed Sensor connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Speed Sensor Ground circuit and ground. Is the resistance Below 5.0 ohms? Yes → Repair Output Speed Sensor Ground circuit short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 9	All
9	Turn ignition switch to the lock position. Disconnect the TCM harness connector. Disconnect the Output Speed Sensor connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Output Speed Sensor Signal circuit and ground. Is the resistance Below 5.0 ohms? Yes → Repair Output Speed Sensor Signal circuit short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 10	All
10	Turn ignition off to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Output Speed Sensor Ground circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair Output Speed Sensor Ground circuit short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 11	All
11	Turn the ignition switch to the lock position. Disconnect the TCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Turn ignition on. Measure the voltage of the Output Speed Sensor Signal circuit in the TCM connector. Is the voltage above 3.0 volts? Yes → Repair Output Speed Sensor Signal circuit short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 12	All

P0720-OUTPUT SHAFT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
12	Turn ignition off to the lock position. Disconnect the Output Speed Sensor harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance across the Output Speed Sensor terminals. **NOTE: The Input Speed Sensor resistance will vary depending on temperature.** **NOTE: The resistance specification is 620.0 ohms at 20°Celsius 68°Fahrenheit.** Is the resistance between 500.0 and 700.0 ohms? Yes → Go To 13 No → Replace the Output Speed Sensor. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
13	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:
P0740-SOLENOID C FUNCTIONAL FAULT

When Monitored and Set Condition:

P0740-SOLENOID C FUNCTIONAL FAULT

When Monitored: Continuously with Solenoid C (TCC) energized.

Set Condition: When the solenoid is energized and the Engine RPM does not equal the Transmission's Input Speed RPM or when the solenoid is deenergized and the Engine RPM equals Transmission input RPM.

POSSIBLE CAUSES
TPS DTC P0122 PRESENT IN THE TCM
TPS DTC'S PRESENT IN THE PCM
TCM DTC'S P1748 AND/OR P1749 PRESENT
INTERMITTENT WIRING AND/OR CONNECTORS
TRANSMISSION OIL BURNT AND/OR CONTAINS EXCESSIVE DEBRIS
INTERNAL TRANSMISSION

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P0740-SOLENOID C FUNCTIONAL FAULT — Continued

TEST	ACTION	APPLICABILITY
2	When monitored: Continuously with the Torque Convertor Clutch Solenoid (Solenoid C) energized. When set: When the solenoid is energized and the Engine RPM does not equal the Transmission's Input Speed RPM or when the solenoid is deenergized and the Engine RPM equals Transmission input RPM. This is the When monitored / When set conditions for DTC P0740. Continue Go To 3	All
3	With the DRBIII®, erase DTC's. Test drive the vehicle. Maintain a steady speed of 55 MPH for 30 seconds. Bring the vehicle slowly to a complete stop. **NOTE: Check shift patterns while the vehicle is upshifting and downshifting.** Did Solenoid C (TCC) engage properly during the test drive? Yes → Go To 4 No → Go To 5	All
4	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All
5	With the DRBIII®, read Transmission DTC's. Is P-0122 Throttle Position Sensor DTC present? Yes → Refer to the Transmission category and perform the appropriate TCM Throttle Position DTC diagnostic before continuing. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	With the DRBIII®, read the PCM DTC's. Is there a TPS DTC present? Yes → Refer to the Driveability category and perform all the appropriate PCM Throttle Position DTC's diagnostic's before continuing. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 7	All
7	With the DRBIII®, read TCM DTC's. Is there a DTC P1748 and/or P1749 present? Yes → If P1748 or P1749 are present refer to the transmission category and perform the appropriate symptom. If both DTC's are present perform test P1749 first. If the problem is still present, perform the diagnostic test P1748. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 8	All

P0740-SOLENOID C FUNCTIONAL FAULT — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Remove the transmission oil pan per the service information. Inspect the pan and fluid for excessive debris or friction material. Is the oil burnt and/or does the pan contain excessive debris or friction material. Yes → Repair internal transmission problem. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 9	All
9	Turn ignition off to the lock position. Replace Solenoid C. With the DRBIII®, erase DTC's. Test drive the vehicle, maintain a steady speed of 55 MPH for at least 30 seconds. Slowly come to a complete stop. **NOTE: Check the shift patterns while the vehicle is upshifting and downshifting.** Is the problem repaired? Yes → Test Complete. No → Repair internal transmission problem as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:
P0751-SOLENOID A FUNCTION FAULT

When Monitored and Set Condition:

P0751-SOLENOID A FUNCTION FAULT

When Monitored: Continually while the vehicle is at high vehicle speeds and higher engine load conditions.

Set Condition: The gear ratio is incorrect for the current gear requested. The vehicle must be driven on the road to set the DTC. NOTE: This code will not set on the hoist.

POSSIBLE CAUSES
TPS DTC P0122 PRESENT IN THE TCM
TPS DTC'S PRESENT IN THE PCM
TCM DTC'S P1744 AND/OR P1745 PRESENT
INTERMITTENT WIRING AND/OR CONNECTORS
TRANSMISSION OIL BURNT AND/OR CONTAINS EXCESSIVE DEBRIS
INTERNAL TRANSMISSION

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P0751-SOLENOID A FUNCTION FAULT — Continued

TEST	ACTION	APPLICABILITY
2	When monitored: Continually while the vehicle is at high vehicle speeds and higher engine load conditions. When set: The gear ratio is incorrect for the current gear requested. The vehicle must be driven on the road to set the DTC. This DTC will not set on the hoist. This is the When monitored / When set conditions for DTC P0751. Continue Go To 3	All
3	With the DRBIII®, erase DTC's. Test drive the vehicle. Maintain a steady speed of 55 MPH for 30 seconds. Bring the vehicle slowly to a complete stop. **NOTE: Check shift patterns while the vehicle is upshifting and downshifting.** Did the vehicle shift normally through all forward gears (1st-4th) during the test drive? Yes → Go To 4 No → Go To 5	All
4	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All
5	With the DRBIII®, read TCM DTC's. Is the P0122 TCM TPS DTC present? Yes → Refer to the Transmission category and perform the appropriate TCM Throttle Position DTC diagnostic before continuing. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	With the DRBIII®, read PCM DTC's. Are there any PCM TPS DTC's present? Yes → Refer to the Driveability category and perform all the appropriate PCM Throttle Position DTC's diagnostic's before continuing. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 7	All
7	With the DRBIII®, read TCM DTC's. Is the DTC P1744 and/or P1745 present? Yes → If P1744 or P1745 are present refer to the transmission category and perform the appropriate symptom. If both DTC's are present perform test P1745 first. If the problem is still present, perform the diagnostic test P1744. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 8	All

P0751-SOLENOID A FUNCTION FAULT — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Remove the transmission oil pan per the service information. Inspect the pan and fluid for excessive debris or friction material. Is the oil burnt and/or does the pan contain excessive debris or friction material. Yes → Repair internal transmission problem. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 9	All
9	Turn ignition off to the lock position. Replace Solenoid A. With the DRBIII®, erase DTC's. Test drive the vehicle, maintain a steady speed of 55 MPH for at least 30 seconds. Slowly come to a complete stop. **NOTE: Check the shift patterns while the vehicle is upshifting and downshifting.** Is the problem repaired? Yes → Test Complete. No → Repair internal transmission problem as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:
P0756-SOLENOID B FUNCTIONAL FAULT

When Monitored and Set Condition:

P0756-SOLENOID B FUNCTIONAL FAULT

When Monitored: Continually while the vehicle is at high vehicle speeds and higher engine load conditions.

Set Condition: The gear ratio is incorrect for the current gear requested. The vehicle must be driven on the road to set the DTC. NOTE: This code will not set on the hoist.

POSSIBLE CAUSES
TPS DTC P0122 PRESENT IN THE TCM
TPS DTC'S PRESENT IN THE PCM
TCM DTC'S P1746 AND/OR P1747 PRESENT
INTERMITTENT WIRING AND/OR CONNECTORS
TRANSMISSION OIL BURNT AND/OR CONTAINS EXCESSIVE DEBRIS
INTERNAL TRANSMISSION

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P0756-SOLENOID B FUNCTIONAL FAULT — Continued

TEST	ACTION	APPLICABILITY
2	When monitored: Continually while the vehicle is at high vehicle speeds and higher engine load conditions. When set: The gear ratio is incorrect for the current gear requested. The vehicle must be driven on the road to set the DTC. This DTC will not set on the hoist. This is the When monitored / When set conditions for DTC P0756. Continue Go To 3	All
3	With the DRBIII®, erase DTC's. Test drive the vehicle. Maintain a steady speed of 55 MPH for 30 seconds. Bring the vehicle slowly to a complete stop. **NOTE: Check shift patterns while the vehicle is upshifting and downshifting.** Did the transmission hang in 1st gear or launch in 4th gear during the test drive? Yes → Go To 4 No → Go To 9	All
4	With the DRBIII®, read TCM DTC's. Is the P0122 TCM TPS DTC present? Yes → Refer to the Transmission category and perform the appropriate TCM Throttle Position DTC diagnostic before continuing. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 5	All
5	With the DRBIII®, read PCM DTC's. Are there any PCM TPS DTC's present? Yes → Refer to the Driveability category and perform all the appropriate PCM Throttle Position DTC's diagnostic's before continuing. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	With the DRBIII®, read TCM DTC's. Is the DTC P1746 and/or P1747 present? Yes → If P1746 or P1747 are present refer to the transmission category and perform the appropriate symptom. If both DTC's are present perform test P1747 first. If the problem is still present, perform the diagnostic test P1746. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 7	All
7	Turn ignition off to the lock position. Remove the transmission oil pan per the service information. Inspect the pan and fluid for excessive debris or friction material. Is the oil burnt and/or does the pan contain excessive debris or friction material. Yes → Repair internal transmission problem. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 8	All

P0756-SOLENOID B FUNCTIONAL FAULT — Continued

TEST	ACTION	APPLICABILITY
8	Turn ignition off to the lock position. Replace Solenoid B. With the DRBIII®, erase DTC's. Test drive the vehicle, maintain a steady speed of 55 MPH for at least 30 seconds. Slowly come to a complete stop. **NOTE: Check the shift patterns while the vehicle is upshifting and downshifting.** Is the problem repaired? Yes → Test Complete. No → Repair internal transmission problem as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
9	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

Symptom:

P1694-CCD MESSAGE FROM JTEC FAILURE

When Monitored and Set Condition:

P1694-CCD MESSAGE FROM JTEC FAILURE

When Monitored: Continuously with the key on.

Set Condition: No CCD bus messages or invalid CCD bus messages are received from the PCM for 20 seconds.

POSSIBLE CAUSES
INTERMITTENT WIRING AND/OR CONNECTORS
CCD BUS (+) CIRCUIT OPEN TO PCM
CCD BUS (-) CIRCUIT OPEN TO PCM
TCM - CCD BUS OPEN

TEST	ACTION	APPLICABILITY
1	When monitored: Continuously with the ignition key on. When set: No CCD bus messages or invalid CCD bus messages are received from the PCM for 20 seconds. This is the When monitored / When set conditions for DTC P1694. Continue Go To 2	All
2	With the DRBIII®, erase DTC's. Start the engine. Allow the engine to idle for 2 minutes. With the DRBIII®, read DTC's. Did the DTC P1694 NO CCD MESSAGE FROM PCM return? Yes → Go To 3 No → Go To 6	All
3	Turn ignition off to the lock position. Disconnect the PCM harness connector(s). Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the CCD Bus (+) circuit between the PCM harness connector and the TCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the CCD Bus (+) circuit for an open. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

P1694-CCD MESSAGE FROM JTEC FAILURE — Continued

TEST	ACTION	APPLICABILITY
4	Turn ignition off to the lock position. Disconnect the PCM harness connector(s). Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the CCD Bus (-) circuit between the PCM harness connector and the TCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the CCD Bus (-) circuit for an open. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
5	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
6	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

Symptom:

P1718-EEPROM FAILURE

POSSIBLE CAUSES
INTERNAL TCM PROBLEM CAUSES DTC P1718

Repair Instructions:

INTERNAL TCM PROBLEM CAUSES DTC P1718

Replace the TCM.

Perform AW4 TRANS VERIFICATION TEST-VER1.

Symptom:

P1742-ROM CHECKSUM ERROR

POSSIBLE CAUSES
INTERNAL TCM PROBLEM CAUSES DTC P1742

Repair Instructions:

INTERNAL TCM PROBLEM CAUSES DTC P1742

Repalce the TCM.

Perform AW4 TRANS VERIFICATION TEST-VER1.

Symptom:

P1743-RAM TEST FAILURE

POSSIBLE CAUSES
INTERNAL TCM PROBLEM CAUSES DTC P1743

Repair Instructions:

INTERNAL TCM PROBLEM CAUSES DTC P1743

Replace the TCM.

Perform AW4 TRANS VERIFICATION TEST-VER1.

Symptom:
P1744-SOLENOID A SHORTED TO GROUND

When Monitored and Set Condition:

P1744-SOLENOID A SHORTED TO GROUND

When Monitored: Continuously while in 2nd and 3rd gear.

Set Condition: Solenoid A is turned on and a low voltage is detected on the Solenoid A Control circuit.

POSSIBLE CAUSES
INTERMITTENT WIRING AND/OR CONNECTORS
SHORT TO GROUND BETWEEN THE 8-WAY CONNECTOR AND THE TCM CONNECTOR
SHORT TO GROUND BETWEEN THE 8-WAY CONNECTOR AND THE SOLENOID A CONNECTOR
SOLENOID A - RESISTANCE OUT OF RANGE
TCM - SOLENOID A CONTROL CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	When monitored: Continuously while in 2nd and 3rd gear. When set: Solenoid A is turned on and a low voltage is detected on the Solenoid A Control circuit. This is the When monitored / When set conditions for DTC P1744. Continue Go To 3	All

P1744-SOLENOID A SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, erase DTC's. **NOTE: The vehicle must be driven on the road for the next step.** Place the gear selector in the 3 range. Accelerate the vehicle to 40 MPH and hold for 30 seconds. Did the DTC P1744 reset? Yes → Go To 4 No → Go To 8	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid 8-way harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Solenoid A Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Solenoid A Control circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the Transmission Solenoid 8-Way harness connector. Remove the Transmission Oil Pan, refer to the Service Information. Disconnect the Solenoid A harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Solenoid A Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Solenoid A Control circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	Turn ignition off to the lock position. Remove the Transmission Oil Pan, refer to the service information. Disconnect the Solenoid A harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of Solenoid A from the solenoid mounting bracket to the solenoid wire terminal. Is the resistance between 11.0 and 15.0 ohms? Yes → Go To 7 No → Replace Solenoid A. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
7	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

P1744-SOLENOID A SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
8	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

Symptom:
P1745 SOLENOID A SHORTED TO VOLTAGE OR OPEN

When Monitored and Set Condition:

P1745 SOLENOID A SHORTED TO VOLTAGE OR OPEN

When Monitored: Continuously while in 1st and 4th gear.

Set Condition: When Solenoid A is turned off and voltage is detected on the Solenoid A Control circuit.

POSSIBLE CAUSES
INTERMITTENT WIRING AND/OR CONNECTORS
OPEN BETWEEN THE 8-WAY CONNECTOR AND TCM CONNECTOR
SHORT TO VOLTAGE BETWEEN THE 8-WAY CONNECTOR AND THE TCM CONNECTOR
OPEN BETWEEN THE 8-WAY CONNECTOR AND SOLENOID A CONNECTOR
OPEN OR HIGH RESISTANCE TRANSMISSION CASE GROUND
SHORT TO VOLTAGE BETWEEN THE 8-WAY CONNECTOR AND THE SOLENOID A CONNECTOR
SOLENOID A - RESISTANCE OUT OF RANGE
TCM - SOLENOID A CONTROL CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1745 SOLENOID A SHORTED TO VOLTAGE OR OPEN — Continued

TEST	ACTION	APPLICABILITY
2	When monitored: Continuously while in 1st and 4th gear. When set: When Solenoid A is turned off and voltage is detected on the Solenoid A Control circuit. This is the When monitored / When set conditions for DTC P1745. Continue Go To 3	All
3	With the DRBIII®, erase DTC's. **NOTE: The vehicle must be driven on the road for the next step.** Place the gear selector in the D range. Accelerate the vehicle to 40 MPH and hold for 30 seconds. Did the DTC P1745 reset? Yes → Go To 4 No → Go To 11	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the 8-way harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Solenoid A Control circuit between the 8-WAY connector and the TCM connector. Is the resistance above 5.0 ohms? Yes → Repair the open Solenoid A Control circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the Transmission Solenoid 8-Way harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Solenoid A Control circuit in the 8-way connector. Is there any voltage present? Yes → Repair the Solenoid A Control circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	Turn ignition off to the lock position. Disconnect the Transmission Solenoid 8-way harness connector. Remove the Transmission Pan, per the Service Information. Disconnect the Solenoid A harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Solenoid A Control circuit between the 8-WAY connector and the Solenoid A connector. Is the resistance above 5.0 ohms? Yes → Repair the open Solenoid A Control circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 7	All

P1745 SOLENOID A SHORTED TO VOLTAGE OR OPEN — Continued

TEST	ACTION	APPLICABILITY
7	With the DRBIII®, read TCM DTC's. Are DTC's P1747 and P1749 present in addition to the P1745 DTC? Yes → Repair the open or high resistance Transmission Case Ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 8	All
8	Turn ignition off to the lock position. Remove the Transmission Oil Pan, refer to the Service Information. Disconnect the Solenoid A harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Solenoid A Control circuit in the Solenoid A connector. Is there any voltage present? Yes → Repair the Solenoid A Control circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 9	All
9	Turn ignition off to the lock position. Remove the Transmission Oil Pan, refer to the service information. Disconnect the Solenoid A harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of Solenoid A from the solenoid mounting bracket to the solenoid wire terminal. Is the resistance between 11.0 and 15.0 ohms? Yes → Go To 10 No → Replace Solenoid A. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
11	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

Symptom:
P1746-SOLENOID B SHORTED TO GROUND

When Monitored and Set Condition:

P1746-SOLENOID B SHORTED TO GROUND

When Monitored: Continuously while in 1st or 2nd gear.

Set Condition: Solenoid B is turned on and a low voltage is detected on the Solenoid B Control circuit.

POSSIBLE CAUSES
INTERMITTENT WIRING AND/OR CONNECTORS
SHORT TO GROUND BETWEEN THE 8-WAY CONNECTOR AND THE TCM CONNECTOR
SHORT TO GROUND BETWEEN THE 8-WAY CONNECTOR AND THE SOLENOID B CONNECTOR
SOLENOID B - RESISTANCE OUT OF RANGE
TCM - SOLENOID B CONTROL CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	When monitored: Continuously while in 1st or 2nd gear. When set: Solenoid B is turned on and a low voltage is detected on the Solenoid B Control circuit. This is the When monitored / When set conditions for DTC P1746. Continue Go To 3	All

P1746-SOLENOID B SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, erase DTC's. **NOTE: The vehicle must be driven on the road for the next step.** Place the gear selector in the 3 range. Accelerate the vehicle to 40 MPH and hold for 30 seconds. Did the DTC P1746 reset? Yes → Go To 4 No → Go To 8	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid 8-Way harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Solenoid B Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Solenoid B Control circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the Transmission Solenoid 8-Way harness connector. Remove the Transmission Oil Pan, refer to the Service Information. Disconnect the Solenoid B harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Solenoid B Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Solenoid B Control circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	Turn ignition off to the lock position. Remove the Transmission Oil Pan, refer to the service information. Disconnect the Solenoid B harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of Solenoid B from the solenoid mounting bracket to the solenoid wire terminal. Is the resistance between 11.0 and 15.0 ohms? Yes → Go To 7 No → Replace Solenoid B. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
7	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

P1746-SOLENOID B SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
8	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

Symptom:
P1747-SOLENOID B SHORTED TO VOLTAGE OR OPEN

When Monitored and Set Condition:

P1747-SOLENOID B SHORTED TO VOLTAGE OR OPEN

When Monitored: Continuously while in 3rd or 4th gear.

Set Condition: Solenoid B is turned off and voltage is detected on the Solenoid B Control circuit.

POSSIBLE CAUSES
INTERMITTENT WIRING AND/OR CONNECTORS
OPEN BETWEEN THE 8-WAY CONNECTOR AND TCM CONNECTOR
SHORT TO VOLTAGE BETWEEN THE 8-WAY CONNECTOR AND THE TCM CONNECTOR
OPEN BETWEEN THE 8-WAY CONNECTOR AND SOLENOID B CONNECTOR
OPEN OR HIGH RESISTANCE TRANSMISSION CASE GROUND
SHORT TO VOLTAGE BETWEEN THE 8-WAY CONNECTOR AND THE SOLENOID B CONNECTOR
SOLENOID B - RESISTANCE OUT OF RANGE
TCM - SOLENOID B CONTROL CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1747-SOLENOID B SHORTED TO VOLTAGE OR OPEN — Continued

TEST	ACTION	APPLICABILITY
2	When monitored: Continuously while in 3rd or 4th gear. When set: Solenoid B is turned off and voltage is detected on the Solenoid B Control circuit. This is the When monitored / When set conditions for DTC P1747. Continue Go To 3	All
3	With the DRBIII®, erase DTC's. **NOTE: The vehicle must be driven on the road for the next step.** Place the gear selector in the 3 range. Accelerate the vehicle to 40 MPH and hold for 30 seconds. Did the DTC P1747 reset? Yes → Go To 4 No → Go To 11	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the 8-way harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Solenoid B Control circuit between the 8-WAY connector and the TCM connector. Is the resistance above 5.0 ohms? Yes → Repair the open Solenoid B Control circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the Transmission Solenoid 8-Way harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Solenoid B Control circuit in the 8-way connector. Is there any voltage present? Yes → Repair the Solenoid B Control circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	Turn ignition off to the lock position. Disconnect the Transmission Solenoid 8-way harness connector. Remove the Transmission Oil Pan, per the Service Information. Disconnect the Transmission Solenoid B harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Solenoid B Control circuit between the 8-WAY connector and the Solenoid B connector. Is the resistance above 5.0 ohms? Yes → Repair the open Solenoid B Control circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 7	All

P1747-SOLENOID B SHORTED TO VOLTAGE OR OPEN — Continued

TEST	ACTION	APPLICABILITY
7	With the DRBIII®, read DTC's. Are DTC's P1745 and P1749 present in addition to the P1747 DTC? Yes → Repair the open or high resistance Transmission Case Ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 8	All
8	Turn ignition off to the lock position. Remove the Transmission Oil Pan, refer to the Service Information. Disconnect the Solenoid B harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Solenoid B Control circuit in the Solenoid B connector. Is there any voltage present? Yes → Repair the Solenoid B Control circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 9	All
9	Turn ignition off to the lock position. Remove the Transmission Oil Pan, refer to the service information. Disconnect the Solenoid B harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of Solenoid B from the solenoid mounting bracket to the solenoid wire terminal. Is the resistance between 11.0 and 15.0 ohms? Yes → Go To 10 No → Replace Solenoid B. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
11	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

Symptom:
P1748-SOLENOID C SHORTED TO GROUND

When Monitored and Set Condition:

P1748-SOLENOID C SHORTED TO GROUND

When Monitored: Continuously while Solenoid C (TCC) is energized.

Set Condition: Solenoid C (TCC) is turned off and low voltage is detected on the Solenoid C Control circuit for 12.5 seconds.

POSSIBLE CAUSES
INTERMITTENT WIRING AND/OR CONNECTORS
SHORT TO GROUND BETWEEN THE 8-WAY CONNECTOR AND THE TCM CONNECTOR
SHORT TO GROUND BETWEEN THE 8-WAY CONNECTOR AND THE SOLENOID C CONNECTOR
SOLENOID C - RESISTANCE OUT OF RANGE
TCM - SOLENOID C CONTROL CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All
2	When monitored: Continuously while Solenoid C is energized. When set: Solenoid C is turned off and low voltage is detected on the Solenoid C Control circuit for 12.5 seconds. This is the When monitored / When set conditions for DTC P1748. Continue Go To 3	All

P1748-SOLENOID C SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, erase DTC's. **NOTE: The vehicle must be driven on the road for the next step.** Place the gear selector in the 3 range. Accelerate the vehicle to 40 MPH and hold for 30 seconds. Did the DTC P1748 reset? Yes → Go To 4 No → Go To 8	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the Transmission Solenoid 8-Way harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Solenoid C Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Solenoid C Control circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the Transmission Solenoid 8-Way harness connector. Remove the Transmission Oil Pan, refer to the Service Information. Disconnect the Solenoid C harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Solenoid C Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Solenoid C Control circuit for a short to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	Turn ignition off to the lock position. Remove the Transmission Oil Pan, refer to the service information. Disconnect the Solenoid C harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of Solenoid C from the solenoid mounting bracket to the solenoid wire terminal. Is the resistance between 11.0 and 15.0 ohms? Yes → Go To 7 No → Replace Solenoid C. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
7	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

P1748-SOLENOID C SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
8	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

Symptom:
P1749-TCC SOLENOID C SHORTED TO VOLTAGE OR OPEN

When Monitored and Set Condition:

P1749-TCC SOLENOID C SHORTED TO VOLTAGE OR OPEN

When Monitored: Continuously while Solenoid C is deenergized.

Set Condition: Solenoid C is turned off and voltage is detected on the Solenoid C Control circuit for 12.5 seconds.

POSSIBLE CAUSES
INTERMITTENT WIRING AND/OR CONNECTORS
OPEN BETWEEN THE 8-WAY CONNECTOR AND TCM CONNECTOR
SHORT TO VOLTAGE BETWEEN THE 8-WAY CONNECTOR AND THE TCM CONNECTOR
OPEN BETWEEN THE 8-WAY CONNECTOR AND SOLENOID C CONNECTOR
OPEN OR HIGH RESISTANCE TRANSMISSION CASE GROUND
SHORT TO VOLTAGE BETWEEN THE 8-WAY CONNECTOR AND THE SOLENOID C CONNECTOR
SOLENOID C - RESISTANCE OUT OF RANGE
TCM - SOLENOID C CONTROL CIRCUIT

TEST	ACTION	APPLICABILITY
1	**NOTE: Always perform diagnostics with a fully charged battery to avoid diagnosing false symptoms.** **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.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Verify the brake switch input to the TCM is working correctly. Perform the shift lever position test and adjust the linkage if necessary. Test drive vehicle to verify customer complaint. With the DRBIII®, read the PCM DTC's. Check and repair all PCM DTC's before performing transmission diagnostics. With the DRBIII®, read the TCM DTC's. **Note: Check 1 trip failures and diagnose them as DTC's (Hard codes)** Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **Note: Verify flash level of transmission controller. Some problems are corrected by software upgrades to the transmission controller.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to symptom diagnosis. Continue Go To 2	All

P1749-TCC SOLENOID C SHORTED TO VOLTAGE OR OPEN — Continued

TEST	ACTION	APPLICABILITY
2	When monitored: Continuously while Solenoid C is deenergized. When set: Solenoid C is turned off and voltage is detected on the Solenoid C Control circuit for 12.5 seconds. This is the When monitored / When set conditions for DTC P1749. Continue Go To 3	All
3	With the DRBIII®, erase DTC's. **NOTE: Place the vehilce in park for 60 seconds.** Did the DTC P1749 reset? Yes → Go To 4 No → Go To 11	All
4	Turn ignition off to the lock position. Disconnect the TCM harness connector. Disconnect the 8-way harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Solenoid C Control circuit between the 8-WAY connector and the TCM connector. Is the resistance above 5.0 ohms? Yes → Repair the open Solenoid C Control circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 5	All
5	Turn ignition off to the lock position. Disconnect the Transmission Solenoid 8-Way harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Solenoid C Control circuit in the 8-way connector. Is there any voltage present? Yes → Repair the Solenoid C Control circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 6	All
6	Turn ignition off to the lock position. Disconnect the Transmission Solenoid 8-way harness connector. Remove the Transmission Oil Pan, per the Service Information. Disconnect the Transmission Solenoid C harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Solenoid C Control circuit between the 8-WAY connector and the Solenoid C connector. Is the resistance above 5.0 ohms? Yes → Repair the open Solenoid C Control circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 7	All

P1749-TCC SOLENOID C SHORTED TO VOLTAGE OR OPEN — Continued

TEST	ACTION	APPLICABILITY
7	With the DRBIII®, read DTC's. Are DTC's P1745 and P1747 present in addition to the P1749 DTC? Yes → Repair the open or high resistance Transmission Case Ground also check and repair the solenoid case ground inside the transmission. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 8	All
8	Turn ignition off to the lock position. Remove the Transmission Oil Pan, refer to the Service Information. Disconnect the Solenoid C harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Turn the ignition on. Measure the voltage of the Solenoid C Control circuit in the Solenoid C connector. Is there any voltage present? Yes → Repair the Solenoid C Control circuit for a short to voltage. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 9	All
9	Turn ignition off to the lock position. Remove the Transmission Oil Pan, refer to the service information. Disconnect the Solenoid C harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of Solenoid C from the solenoid mounting bracket to the solenoid wire terminal. Is the resistance between 11.0 and 15.0 ohms? Yes → Go To 10 No → Replace Solenoid C. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
10	If there are no possible causes remaining, view repair. Repair Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
11	Using the when monitored / when set conditions, attempt to reset the DTC. If the DTC can be reset return to the symptom list and perform the appropriate diagnostic test. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. **NOTE: Check the Technical Service Bulletins.** Were any problems found? Yes → Repair the wiring and/or connectors as necessary. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Test Complete.	All

Symptom:

* ENGINE STALLS WITH TRANSMISSION IN GEAR

POSSIBLE CAUSES
*ENGINE STALLS WITH TRANS IN GEAR

TEST	ACTION	APPLICABILITY
1	This is just one possible cause of the engine stalling while in gear. **NOTE: With the DRBIII®, check and repair any PCM DTC's first.** If no PCM DTC's are present, check the TCC circuit for proper operation. Yes → Check for Transmission Torque Convertor Clutch DTC's and proper Torque Convertor Clutch operation. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:

*NO BRAKE SWITCH INPUT TO TCM

POSSIBLE CAUSES
BRAKE SWITCH GROUND CIRCUIT OPEN
BRAKE SWITCH SENSE CKT OPEN
BRAKE SWITCH SENSE CIRCUIT SHORTED TO GROUND
BRAKE SWITCH
TCM - BRAKE SWITCH

TEST	ACTION	APPLICABILITY
1	With the DRBIII® in Inputs/Outputs, read the Brake Switch state. Press the Brake Pedal while monitoring the Brake Switch status. Does the Brake Switch status switch from OFF to ON? Yes → Test Complete. No → Go To 2	All
2	Turn ignition off to the lock position. Disconnect the Brake Switch harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Ground circuit. Is the resistance above 5.0 ohms? Yes → Repair the open Brake Switch ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 3	All
3	Turn ignition off to the lock position. Disconnect the Brake Switch harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance of the Brake Switch Sense circuit between the TCM harness connector and the Brake Switch harness connector. Is the resistance above 5.0 ohms? Yes → Repair the open Brake Switch Sense circuit. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 4	All
4	Turn ignition off to the lock position. Disconnect the Brake Switch harness connector. Disconnect the TCM harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Brake Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the Brake Switch Sense circuit shorted to ground. Perform AW4 TRANS VERIFICATION TEST-VER1. No → Go To 5	All

*NO BRAKE SWITCH INPUT TO TCM — Continued

TEST	ACTION	APPLICABILITY
5	Turn ignition off to the lock position. Disconnect the Brake Switch harness connector. **NOTE: Check connectors - Clean/repair as necessary.** Connect a jumper wire between Brake Switch Sense circuit and ground. Turn the ignition on. With the DRBIII® in Inputs/Outputs, read the Brake Switch state. While monitoring the DRBIII® Brake Switch State. Slowly and repeatedly tap the jumper wire to ground. Does the Brake Switch status switch from OFF to ON? Yes → Go To 6 No → Replace the TCM. Perform AW4 TRANS VERIFICATION TEST-VER1.	All
6	If there are no possible causes remaining, view repair. Repair Replace the brake switch. Perform AW4 TRANS VERIFICATION TEST-VER1.	All

Symptom:

***POOR SHIFT QUALITY**

POSSIBLE CAUSES
*POOR SHIFT QUALITY

Repair Instructions:

***POOR SHIFT QUALITY**

Check the Transmission fluid level per the service information, check for TSB's, and check TCM Flash Version Level for latest release. Note: These are just some of the possible issues of poor shift quality that are sometimes overlooked.

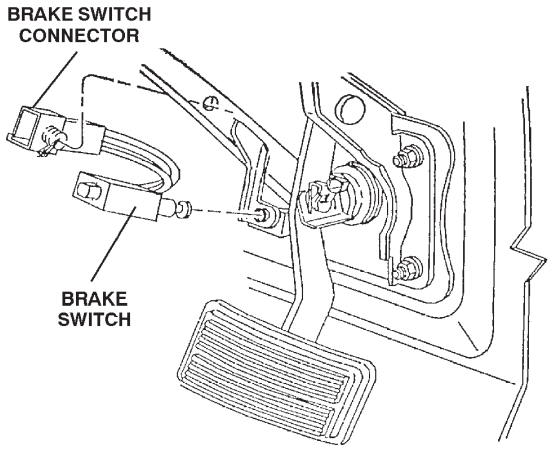
Perform AW4 TRANS VERIFICATION TEST-VER1.

Verification Tests

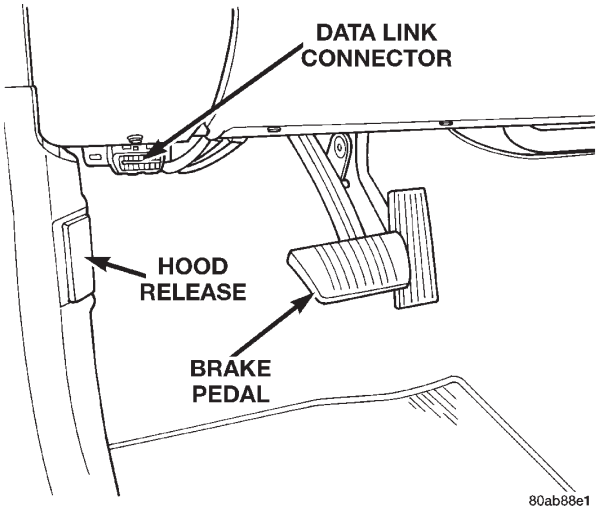
AW4 TRANS VERIFICATION TEST-VER1	APPLICABILITY
1. Connect the DRBIII® to the Data Link Connector (DLC). 2. Reconnect any disconnected components. 3. With the DRBIII®, erase all Transmission DTC's, also erase the PCM DTC's. 4. Check the transmission fluid and adjust if necessary. Refer to the Service Information for the Fluid Fill procedure. 5. Road test the vehicle. With the DRBIII®, monitor the engine RPM. Make 15 to 20 1-2, 2-3, 3-4 upshifts. Perform these shifts from a standing start to 45 MPH with a constant throttle opening of 20 to 25 degrees. 6. Below 25 MPH, make 5 to 8 wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown. 7. Attempt to reset the specific DTC, drive the vehicle to the When Monitored/When Set conditions for the DTC to verify the DTC is repaired.. 8. Check for Diagnostic Trouble Codes (DTC's) during the road test. If a DTC sets during the road test , return to the Symptom list and perform the diagnostics. **9. NOTE: Erase P0700 DTC in the PCM after making transmission repairs. This will turn the MIL off.** Were any DTC's set during the road test? Yes refer to the symptom list Repair is not complete, refer to appropriate symptom. No Test Complete Repair is complete.	All

8.0 COMPONENT LOCATIONS

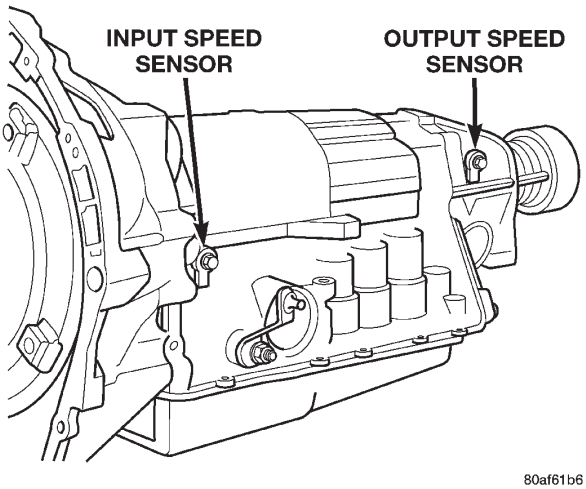
8.1 BRAKE SWITCH



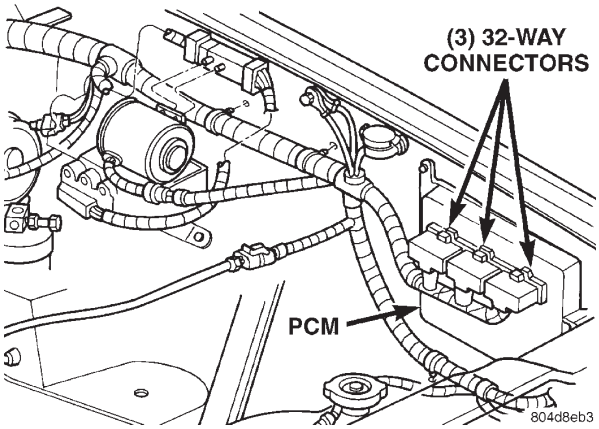
8.2 DATA LINK



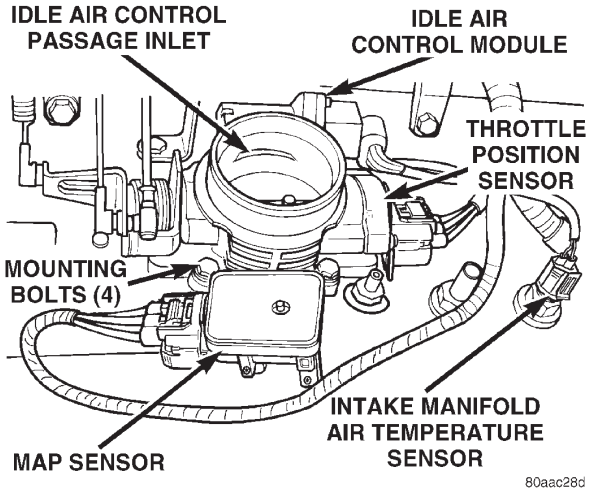
8.3 INPUT AND OUTPUT SPEED SENSORS



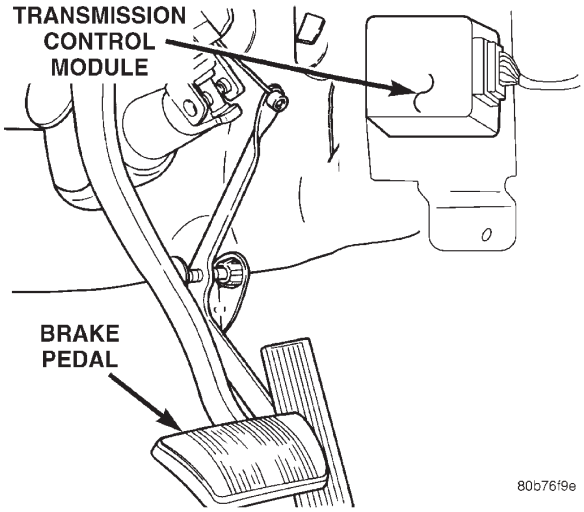
8.4 POWERTRAIN CONTROL MODULE



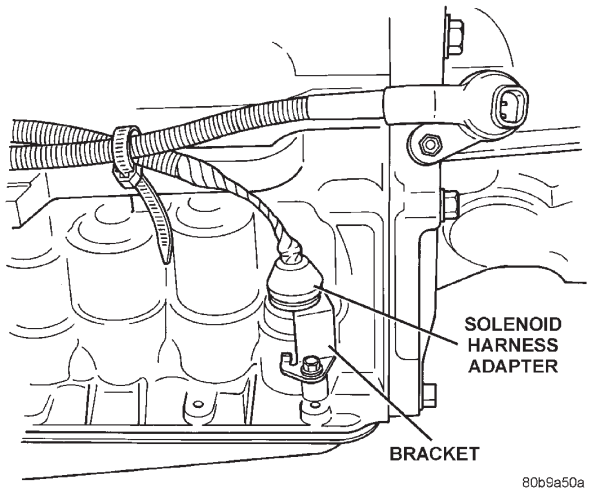
8.5 THROTTLE POSITION SENSOR



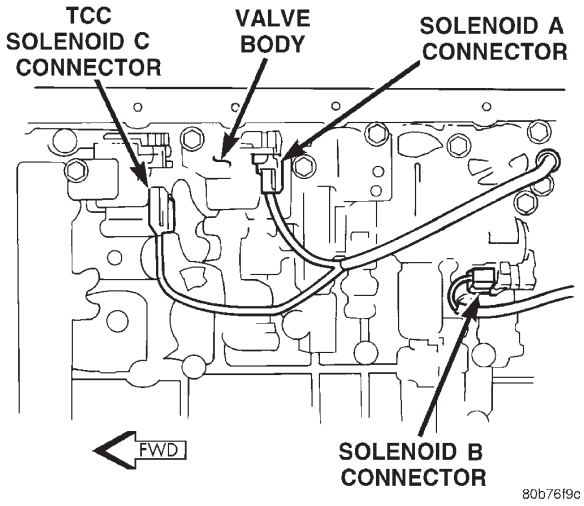
8.6 TRANSMISSION CONTROL MODULE



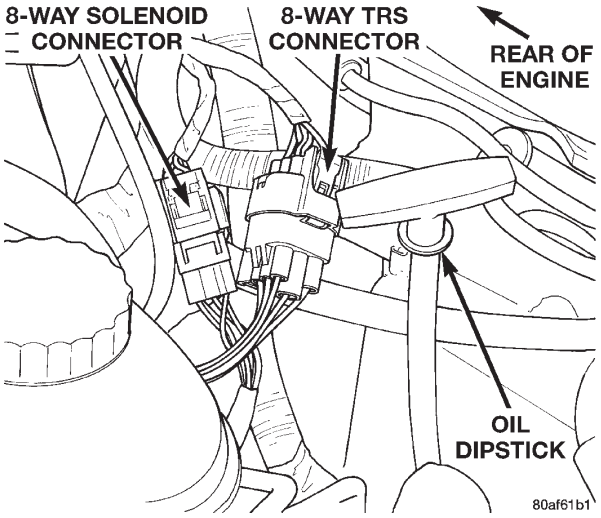
8.7 SOLENOID HARNESS ADAPTER



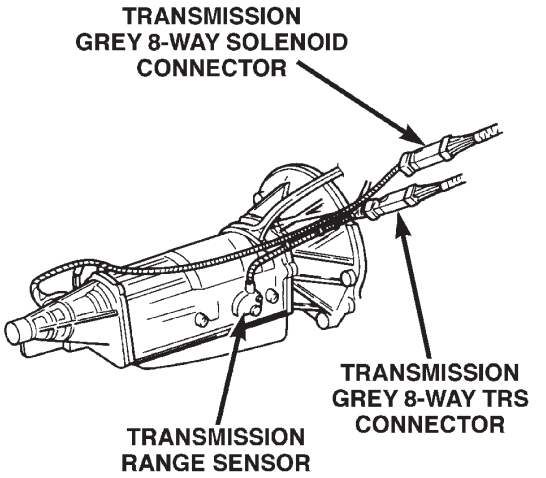
8.8 SOLENOIDS A, B, C



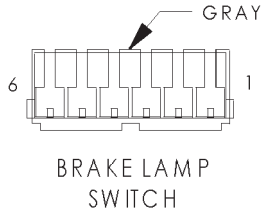
8.9 8-WAY SOLENOID CONNECTOR/8-WAY TRANSMISSION RANGE SENSOR CONNECTOR



8.10 TRANSMISSION RANGE SENSOR/8-WAY HARNESS LOCATION



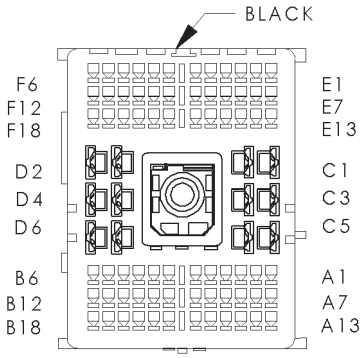
9.0 CONNECTOR PINOUTS



BRAKE LAMP
SWITCH

BRAKE LAMP SWITCH - GRAY 6 WAY

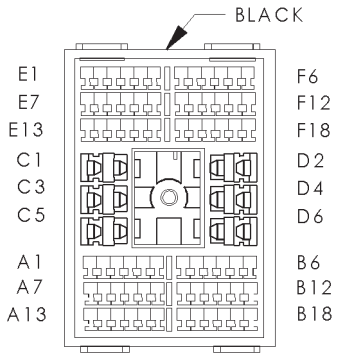
CAV	CIRCUIT	FUNCTION
1	K29 18WT/PK (GAS)	BRAKE LAMP SWITCH SENSE
1	K29 18WT/PK (DIESEL)	SECONDARY BRAKE SWITCH SIGNAL
2	Z1 18BK	GROUND
2	Z1 20BK (LHD BUILT UP EXPORT)	GROUND
3	V32 20YL/RD	SPEED CONTROL SUPPLY
4	V30 20DB/RD	SPEED CONTROL BRAKE SWITCH OUTPUT
5	L50 20WT/TN (LHD GAS)	BRAKE LAMP SWITCH OUTPUT
5	L50 20WT/TN (GAS)	BRAKE LAMP SWITCH OUTPUT
5	L50 20WT/TN (DIESEL)	PRIMARY BRAKE SWITCH SIGNAL
6	F32 20PK/DB	FUSED B(+)



C100
(LHD)

C100 (LHD) - BLACK (HEADLAMP AND DASH SIDE)

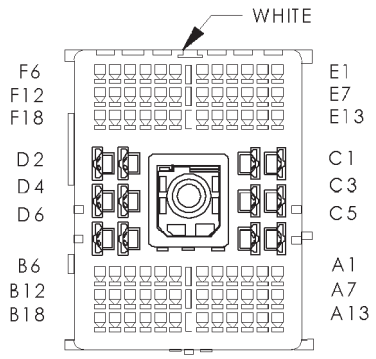
CAV	CIRCUIT
A1	Z1 18BK
A2	G106 20BK/WT (A/T)
A3	G107 20BK/RD
A4	L92 20PK (FOG LAMPS)
A5	L139 20VT (FOG LAMPS)
A5	L77 20BR/YL (DIESEL)
A6	C90 18LG (DIESEL)
A6	C90 20LG (GAS)
A7	-
A8	-
A9	-
A10	-
A11	-
A12	-
A13	-
A14	-
A15	-
A16	-
A17	-
A18	-
B1	-
B2	-
B3	-
B4	-
B5	-
B6	-
B7	-
B8	-
B9	-
B10	-
B11	-
B12	-
B13	-
B14	-
B15	-
B16	-
B17	-
B18	-
C1	V3 16BR/WT
C2	A1 12RD
C3	V4 16BR/VT
C4	F75 16VT (POWER AMPLIFIER)
C5	V5 16DG/YL
C6	A2 12PK/BK
D1	A3 14RD/WT
D2	A141 14DG/WT
D3	G34 16RD/GY (EXCEPT DRL)
D4	G34 16RD/GY
D5	A111 12RD/LG
D6	-
E1	L50 20WT/TN (DIESEL)
E1	L50 18WT/TN (GAS)
E2	G9 20GY/BK
E3	L10 18BR/LG
E4	V10 18BR
E5	V20 18BK/WT
E6	F34 18TN/BK
E7	Z12 20BK/TN (DIESEL)
E7	Z12 18BK/TN (GAS)
E8	G29 20BK/LB
E9	F20 18WT
E10	F1 20DB/GY (SENTRY KEY IMMOBILIZER MODULE)
E11	D1 20VT/BR (A/T)
E11	D1 18VT/BR (M/T)
E12	D2 20WT/BK (A/T)
E12	D2 18WT/BK (M/T)
E13	-
E14	G99 20GY/WT
E15	K185 20OR/LB
E16	G86 18TN/OR
E17	G154 18VT/LG
E18	L13 20BR/YL (GAS)
E18	L13 18BR/YL (DIESEL)
F1	D20 18LG/BK
F2	D21 20PK
F3	L60 20TN
F4	L61 20LG/WT
F5	L9 20BK/PK
F6	L44 20VT/RD
F7	V30 20DB/RD
F8	F32 20PK/DB
F9	V32 18YL/RD
F10	K29 18WT/PK (M/T EXCEPT DIESEL)
F10	K29 20WT/PK (A/T)
F11	K226 18DB/LG
F12	K167 20BR/YL
F13	G19 20LG/OR (ABS)
F14	G31 20VT/LG
F15	G32 20BK/LB
F16	K78 20GY
F17	V37 20RD/LG (DIESEL)
F17	V37 18RD/LG (GAS)
F18	K4 20BK/LB (DIESEL)
F18	K167 20BR/YL (GAS)
D3	L3 16RD (DAYTIME RUNNING LAMPS)



C100
(LHD)

C100 (LHD) - BLACK (INSTRUMENT PANEL SIDE)

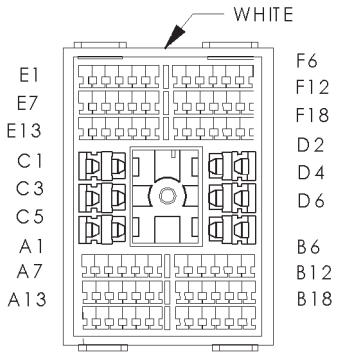
CAV	CIRCUIT
A1	Z1 18BK
A2	G106 20BK/WT (A/T)
A3	G107 20BK/RD
A4	L92 20LB (FOG LAMPS)
A5	L139 20VT (FOG LAMPS)
A6	C90 20LG
A7	-
A8	-
A9	-
A10	-
A11	-
A12	-
A13	-
A14	-
A15	-
A16	-
A17	-
A18	-
B1	-
B2	-
B3	-
B4	-
B5	-
B6	-
B7	-
B8	-
B9	-
B10	-
B11	-
B12	-
B13	-
B14	-
B15	-
B16	-
B17	-
B18	-
C1	V3 16BR/WT
C2	A1 12RD
C3	V4 16BR/VT
C4	F75 16VT (POWER AMPLIFIER)
C5	V5 16DG/YL
C6	A2 12PK/BK
D1	A3 14RD/WT
D2	A141 16DG/WT
D3	L3 16RD/OR
D4	G34 16RD/GY
D5	A111 12RD/LG
D6	-
E1	L50 20WT/TN
E2	G9 20GY/BK
E3	L10 18BR/LG
E4	V10 18BR
E5	V20 18BK/WT
E6	F34 18TN/BK
E7	Z12 18BK/TN
E8	G29 20BK/LB
E9	F20 18WT
E10	F1 20DB/GY (SENTRY KEY IMMOBILIZER MODULE)
E11	D1 20VT/BR
E12	D2 20WT/BK
E13	-
E14	G99 20GY/WT
E15	K185 20OR/LB
E16	G86 20TN/OR
E17	G154 20VT/LG
E18	L13 20BR/YL (HEADLAMP LEVELING)
F1	D20 20LG/BK
F2	D21 18PK
F3	L60 20TN
F4	L61 20LG/WT
F5	L9 20BK/PK
F6	L44 20VT/RD (HEADLAMP LEVELING)
F7	V30 20DB/RD
F8	F32 20PK/DB
F9	V32 20YL/RD
F10	K29 20WT/PK
F11	K226 20DB/LG
F12	K167 20BR/YL
F13	G19 20LG/OR (ABS)
F14	G31 20VT/LG
F15	G32 20BK/LB
F16	K78 20GY
F17	V37 20RD/LG
F18	K4 20BK/RD



C100
(RHD)

C100 (RHD) - WHITE (HEADLAMP AND DASH SIDE)

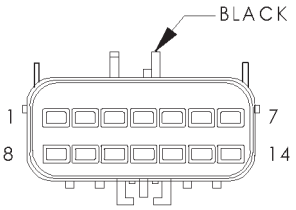
CAV	CIRCUIT
A1	Z1 18BK
A2	G106 20BK/WT (A/T)
A3	G107 20BK/RD
A4	L92 20PK (FOG LAMPS)
A5	L77 20BR/YL (DIESEL FOGLAMPS)
A5	L139 20VT (GAS FOG LAMPS)
A6	C90 18LG (DIESEL)
A6	C90 20LG (GAS)
A7	Z12 18BK/TN (GAS)
A7	Z12 20BK/TN (DIESEL)
A8	G29 20BK/LB
A9	F20 18WT
A10	G99 20GY/WT
A11	D1 18VT/BR (M/T)
A11	D1 20VT/BR (A/T)
A12	D2 18WT/BK (M/T)
A12	D2 20WT/BK (A/T)
A13	-
A14	G9 20GY/BK
A15	L10 18BR/LG
A16	V10 18BR
A17	V20 18BK/WT
A18	F34 18TN/BK
B1	K29 20WT/PK
B2	K226 18DB/LG
B3	K167 20BR/YL
B4	L50 18WT/TN (GAS ABS)
B4	L50 18WT/TN (DIESEL)
B5	V37 18RD/LG (GAS)
B5	V37 20RD/LG (DIESEL)
B6	K4 20BK/LB (DIESEL)
B6	K167 20BR/YL (GAS)
B7	D20 18LG/BK
B8	D21 20PK
B9	L60 20TN
B10	L61 20LG/WT
B11	L9 20BK/PK
B12	L44 20VT/RD
B13	-
B14	-
B15	-
B16	-
B17	-
B18	-
C1	V3 16BR/WT
C2	A1 12RD
C3	V4 16BR/VT
C4	F75 16VT (POWER AMPLIFIER)
C5	V5 16DG/YL
C6	A2 12PK/BK
D1	A3 14RD/WT
D2	A141 14DG/WT
D3	L3 16RD
D4	-
D5	A111 12RD/LG
D6	-
E1	-
E2	-
E3	-
E4	-
E5	-
E6	-
E7	F45 20YL/RD
E8	T141 20YL
E9	-
E10	F1 20DB/GY (SENTRY KEY IMMOBILIZER MODULE)
E11	-
E12	-
E13	-
E14	-
E15	K185 20OR/LB (MESSAGE CENTER)
E16	G86 18TN/OR (MESSAGE CENTER)
E17	G154 18VT/LG (MESSAGE CENTER)
E18	L13 20BR/YL (GAS HEADLAMP LEVELING)
E18	L13 18BR/YL (DIESEL)
F1	D20 18LG/BK
F2	-
F3	-
F4	-
F5	-
F6	-
F7	V30 20DB/RD
F8	F32 20PK/DB
F9	V32 18YL/RD
F10	-
F11	-
F12	-
F13	G19 20LG/OR (ABS)
F14	G31 20VT/LG
F15	G32 20BK/LB
F16	-
F17	-
F18	-



C100
(RHD)

C100 (RHD) - WHITE (INSTRUMENT PANEL SIDE)

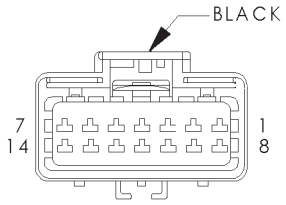
CAV	CIRCUIT
A1	Z1 18BK
A2	G106 20BK/WT (A/T)
A3	G107 20BK/RD
A4	L92 20LB (FOG LAMPS)
A5	L139 20VT (FOG LAMPS)
A6	C90 20LG
A7	Z12 18BK/TN
A8	G29 20BK/LB
A9	F20 18WT
A10	G99 20GY/WT
A11	D1 20VT/BR
A12	D2 20WT/BK
A13	-
A14	G9 20GY/BK
A15	L10 18BR/LG
A16	V10 18BR
A17	V20 18BK/WT
A18	F34 18TN/BK
B1	K29 18WT/PK
B2	K226 18DB/LG
B3	K167 20BR/YL
B4	L50 20WT/TN
B5	V37 20RD/LG
B6	K4 20BK/RD
B7	D20 20LG/BK
B8	D21 20PK
B9	L60 20TN
B10	L61 20LG/WT
B11	L9 20BK/PK
B12	L44 20VT/RD (HEADLAMP LEVELING)
B13	-
B14	-
B15	-
B16	-
B17	-
B18	-
C1	V3 16BR/WT
C2	A1 12RD
C3	V4 16BR/VT
C4	F75 16VT (POWER AMPLIFIER)
C5	V5 16DG/YL
C6	A2 12PK/BK
D1	A3 14RD/WT
D2	A141 16DG/WT
D3	-
D4	-
D5	A111 12RD/LG
D6	-
E1	-
E2	-
E3	-
E4	-
E5	-
E6	-
E7	F45 20YL/RD
E8	T141 20YL
E9	-
E10	F1 20DB/GY (SENTRY KEY IMMOBILIZER MODULE)
E11	-
E12	-
E13	-
E14	-
E15	K185 20OR/LB (MESSAGE CENTER)
E16	G86 20TN/OR (MESSAGE CENTER)
E17	G154 20VT/LG (MESSAGE CENTER)
E18	L13 20BR/YL (HEADLAMP LEVELING)
F1	-
F2	-
F3	-
F4	-
F5	-
F6	-
F7	V30 20DB/RD
F8	F32 20PK/DB
F9	V32 20YL/RD
F10	-
F11	-
F12	-
F13	G19 20LG/OR
F14	G31 20VT/LG
F15	G32 20BK/LB
F16	-
F17	-
F18	-



C107
(LHD GAS)

C107 (LHD GAS) - BLACK (ENGINE SIDE)

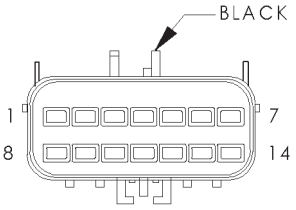
CAV	CIRCUIT
1	A142 18DG/OR
2	K20 18DG
3	K167 20BR/YL
4	G7 18WT/OR (DRL)
5	T41 18BK/WT
6	K22 20OR/DB (A/T)
7	A42 20DG
8	G107 20BK/RD (4WD)
9	Z12 16BK/TN (A/T)
10	F12 18DB/WT
11	K78 18GY (A/T)
12	G106 20BK/WT (4WD A/T)
13	A242 20VT/OR
14	A61 16DG/BK



C107
(LHD GAS)

C107 (LHD GAS) - BLACK (HEADLAMP AND DASH SIDE)

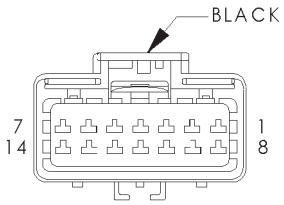
CAV	CIRCUIT
1	A142 18DG/OR
2	K20 18DG
3	K167 20BR/YL
4	G7 20WT/OR (DRL)
5	T41 20BK/WT (A/T)
5	Z1 18K (M/T)
6	K22 20OR/DB (A/T)
7	A42 18DG
8	G107 20BK/RD (4WD)
9	Z12 18BK/TN (A/T)
10	F12 18DB/WT
11	K78 20GY (EXTENDED IDLE)
12	G106 20BK/WT (4WD)
13	A242 18VT/OR
14	A61 16DG/BK



C107
(RHD GAS)

C107 (RHD GAS) - BLACK (ENGINE SIDE)

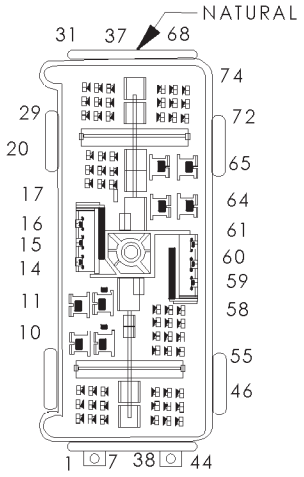
CAV	CIRCUIT
1	A142 18DG/OR
2	K20 18DG
3	K167 20BR/YL
4	G7 20WT/OR
5	T41 18BK/WT
6	K22 20OR/DB (A/T)
7	A42 20DG
8	G107 20BK/RD (4WD)
9	Z12 16BK/TN (A/T)
10	F12 18DB/WT
11	-
12	G106 20BK/WT (4WD A/T)
13	A242 20VT/OR
14	A61 14DG/BK



C107
(RHD GAS)

C107 (RHD GAS) - BLACK (HEADLAMP AND DASH SIDE)

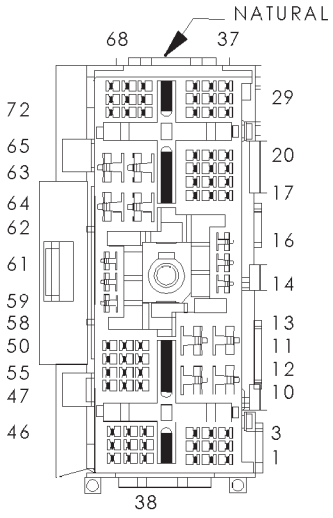
CAV	CIRCUIT
1	A142 18DG/OR
2	K20 18DG
3	K167 20BR/YL
4	G7 20WT/OR (DRL)
5	T41 20BK/WT (A/T)
5	Z1 18BK (M/T)
6	K22 20OR/DB (A/T)
7	A42 18DG
8	G107 20BK/RD (4WD)
9	Z12 18BK/TN (A/T)
10	F12 18DB/WT
11	-
12	G106 20BK/WT (4WD A/T)
13	A242 18VT/OR
14	A61 16DG/BK



C201
(LHD)

C201 (LHD) - NATURAL (INSTRUMENT PANEL SIDE)

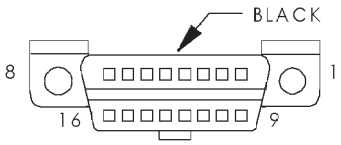
CAV	CIRCUIT
1	F20 18WT
2	C16 20LB/YL
3	L5 20BK
4	C36 20RD/WT
5	F87 20WT/BK
6	M1 20PK
7	Z1 20BK
8	V6 16DB
9	P36 20PK/VT
10	A31 12BK/WT
11	A111 12RD/LG
12	C7 12BK/TN
13	F81 12TN
14	Z1 14BK
15	-
16	L3 16RD/OR
17	C81 20LB/WT
18	-
19	-
20	P72 20YL/BK
21	-
22	L4 16VT/WT
23	P35 20OR/VT
24	P74 20DB
25	Z8 16BK/VT
26	X3 20BK/RD
27	-
28	P76 20OR/YL
29	G26 20LB
30	-
31	-
32	G31 20VT/LG
33	-
34	-
35	G32 20BK/LB
36	-
37	-
38	-
39	V23 18BR/PK
40	F15 20DB/WT
41	-
42	E1 20TN
43	E2 20OR
44	F83 18YL/DG
45	L7 18BK/YL
46	M2 20YL
47	-
48	-
49	-
50	F30 16RD
51	D1 20VT/BR
52	D2 20WT/BK
53	-
54	X12 16RD/WT
55	D1 20VT
56	D2 20WT
57	-
58	Z2 20BK/LG
59	C4 14TN
60	C5 14LG
61	C6 14LB
62	A22 12BK/OR
63	A41 14YL
64	A21 12DB
65	F38 16RD/LB
66	G9 20GY/BK
67	P91 20WT/BK
68	-
69	G10 20LG/RD
70	-
71	-
72	-
73	-
74	-



C201
(LHD)

C201 (LHD) - NATURAL (LOWER INSTRUMENT PANEL SIDE)

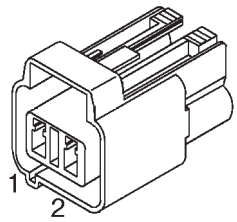
CAV	CIRCUIT
1	F20 18WT
2	C16 20LB/YL
3	L5 20BK
4	C36 20RD/WT
5	F87 20WT/BK
6	M1 20PK
7	Z1 20BK
8	V6 16DB
9	P36 20PK/VT
10	A31 12BK/WT
11	A111 12RD/LG
12	C7 12BK/TN
13	F81 12TN
14	Z1 14BK
15	-
16	L3 16RD/OR
17	C81 20LB/WT
18	-
19	-
20	P72 20YL/BK
21	-
22	L4 16VT/WT
23	P35 20OR/VT
24	P74 20DB
25	Z8 20BK/VT
26	X3 20BK/RD
27	-
28	P76 20OR/YL
29	G26 20LB
30	-
31	-
32	G31 20VT/LG
33	-
34	-
35	G32 20BK/LB
36	-
37	-
38	-
39	V23 18BR/PK
40	F15 20DB/WT
41	-
42	E1 20TN
43	E2 20OR
44	F83 18YL/DG
45	L7 18BK/YL
46	M2 20YL
47	-
48	-
49	-
50	F30 16RD
51	D1 18VT/BR
52	D2 18WT/BK
53	-
54	X12 16RD/WT
55	D1 20VT/BR
56	D2 20WT/BK
57	-
58	Z2 20BK/LG
59	C4 14TN
60	C5 14LG
61	C6 14LB
62	A22 12BK/OR
63	A41 14YL
64	A21 12DB
65	F38 16RD/LB
66	G9 20GY/BK
67	P91 20WT/BK
68	-
69	G10 20LG/RD
70	-
71	-
72	-
73	-
74	-



DATA LINK CONNECTOR

DATA LINK CONNECTOR - BLACK 16 WAY

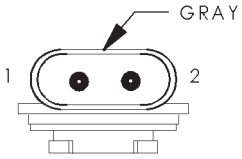
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	D1 18VT/BR	CCD BUS (+)
4	Z1 18BK	GROUND
5	Z12 18BK/TN	GROUND
6	D20 20LG/BK	SCI RECEIVE
7	D21 20PK	SCI TRANSMIT
8	-	-
9	-	-
10	-	-
11	D2 18WT/BK	CCD BUS (-)
12	-	-
13	-	-
14	-	-
15	-	-
16	F34 18TN/BK	FUSED B(+)



INPUT SPEED SENSOR CONNECTOR

INPUT SPEED SENSOR CONNECTOR - 2 WAY

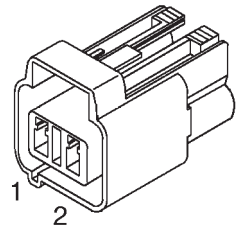
CAV	CIRCUIT	FUNCTION
1	VT/BK	INPUT SPEED SENSOR GROUND
2	BK/RD	INPUT SPEED SENSOR SIGNAL



LEFT BACK-UP LAMP

LEFT BACK-UP LAMP - GRAY 2 WAY

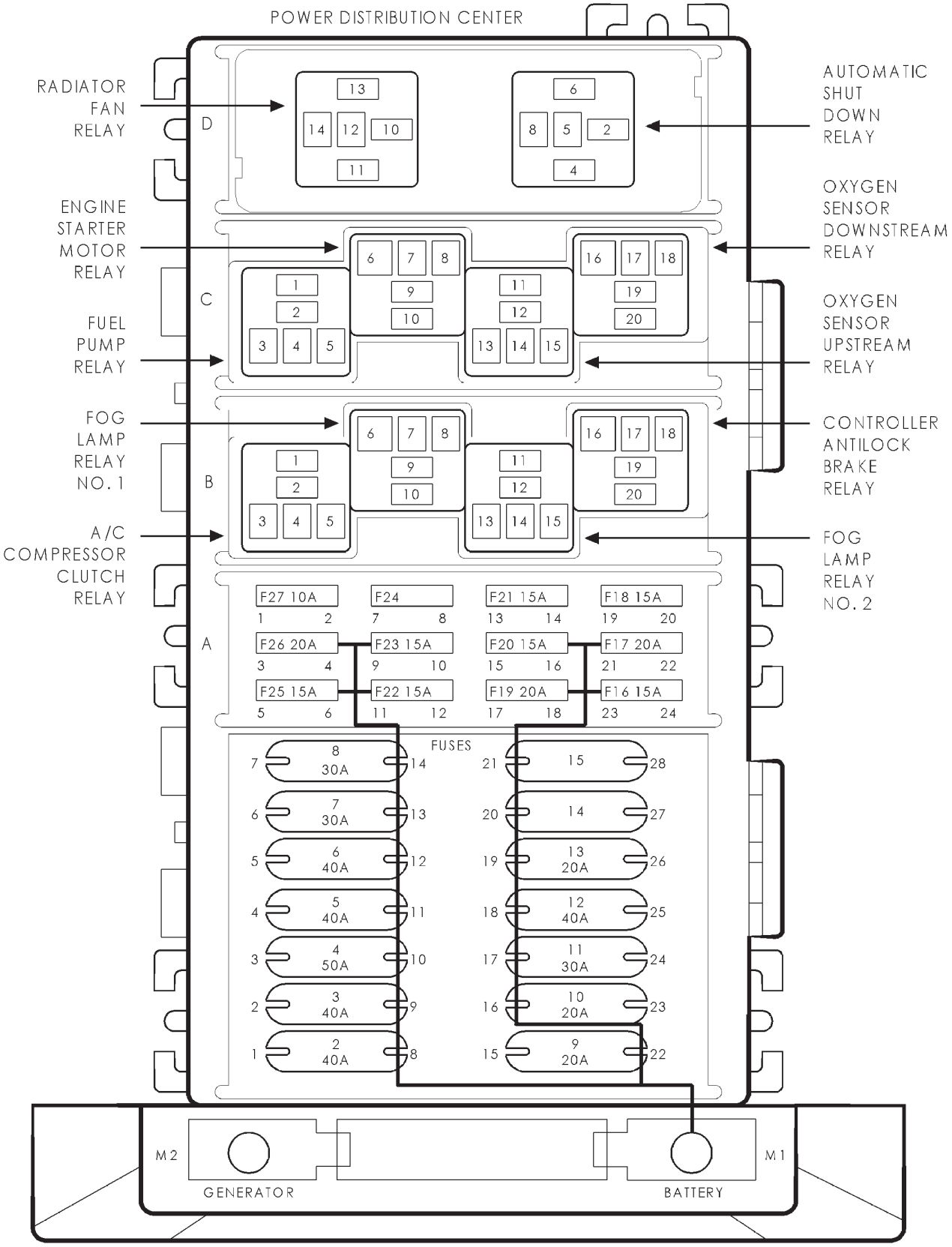
CAV	CIRCUIT	FUNCTION
1	Z1 18BK	GROUND
2	L10 18BR/LG	BACK-UP LAMP FEED



OUTPUT SPEED SENSOR CONNECTOR

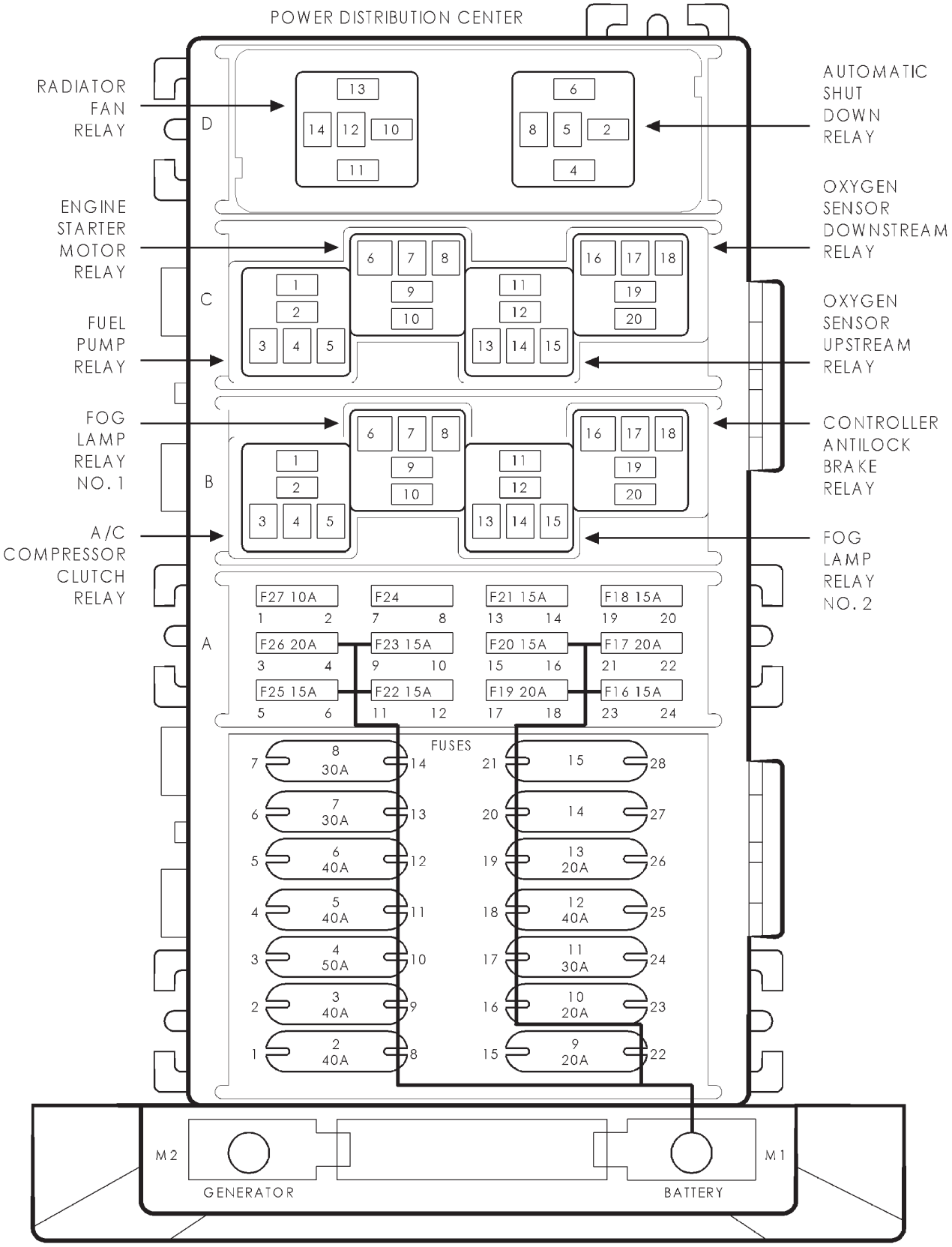
OUTPUT SPEED SENSOR CONNECTOR - 2 WAY

CAV	CIRCUIT	FUNCTION
1	VT/BK	OUTPUT SPEED SENSOR GROUND
2	BK/RD	OUTPUT SPEED SENSOR SIGNAL


POWER DISTRIBUTION CENTER
RADIATOR FAN RELAY
ENGINE STARTER MOTOR RELAY
FUEL PUMP RELAY
FOG LAMP RELAY NO. 1
A/C COMPRESSOR CLUTCH RELAY
AUTOMATIC SHUT DOWN RELAY
OXYGEN SENSOR DOWNSTREAM RELAY
OXYGEN SENSOR UPSTREAM RELAY
CONTROLLER ANTILOCK BRAKE RELAY
FOG LAMP RELAY NO. 2
D
C
B
A
F27 10A
F24
F21 15A
F18 15A
F26 20A
F23 15A
F20 15A
F17 20A
F25 15A
F22 15A
F19 20A
F16 15A
FUSES
8 30A
7 30A
6 40A
5 40A
4 50A
3 40A
2 40A
15
14
13 20A
12 40A
11 30A
10 20A
9 20A
M2
GENERATOR
BATTERY
M1

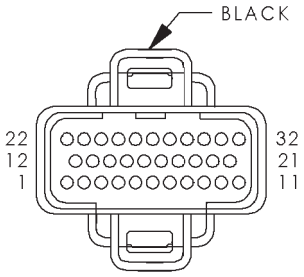
FUSES (DIESEL)

FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	-	-	-
2	50A	A54 12RD/GY	FUSED B(+)
3	50A	A54 12RD/GY	FUSED B(+)
4	30A	A16 12RD/LG	FUSED B(+)
5	40A	A1 12RD	FUSED B(+)
6	30A	A61 14LG/RD	FUSED B(+)
7	20A	A41 16YL	FUSED B(+)
8	30A	A3 14RD/WT	FUSED B(+)
9	50A	A7 10RD/BK	FUSED B(+)
10	40A	A2 12PK/BK	FUSED B(+)
11	40A	A111 12RD/LG	FUSED B(+)
12	40A	F141 12LG/RD	FUSED B(+)
13	40A	F141 12LG/RD	FUSED B(+)
14	20A	A20 12RD/DB	FUSED B(+)
15	30A	A4 12BK/PK	FUSED B(+)
16	15A	M1 20PK	FUSED B(+)
16	15A	M1 20PK	FUSED B(+)
17	-	-	-
18	-	-	-
19	15A	F32 20PK/DB	FUSED B(+)
20	20A	A17 18RD/BK	FUSED B(+)
20	20A	A17 16RD/BK	FUSED B(+)
21	20A	F142 16DG/OR	FUSED AUTOMATIC SHUT DOWN RELAY OUTPUT
22	20A	F75 16VT	FUSED B(+)
23	15A	L9 20BK/PK	FUSED B(+)
24	10A	F16 16RD/LG	FUSED B(+)
25	15A	F61 20WT/OR	FUSED B(+)
26	20A	F34 18TN/BK	FUSED B(+)
27	10A	F1 20DB/GY	FUSED B(+)


POWER DISTRIBUTION CENTER
RADIATOR FAN RELAY
ENGINE STARTER MOTOR RELAY
FUEL PUMP RELAY
FOG LAMP RELAY NO. 1
A/C COMPRESSOR CLUTCH RELAY
AUTOMATIC SHUT DOWN RELAY
OXYGEN SENSOR DOWNSTREAM RELAY
OXYGEN SENSOR UPSTREAM RELAY
CONTROLLER ANTILOCK BRAKE RELAY
FOG LAMP RELAY NO. 2
D
C
B
A
F27 10A
F24
F21 15A
F18 15A
F26 20A
F23 15A
F20 15A
F17 20A
F25 15A
F22 15A
F19 20A
F16 15A
FUSES
8 30A
7 30A
6 40A
5 40A
4 50A
3 40A
2 40A
15
14
13 20A
12 40A
11 30A
10 20A
9 20A
M2
GENERATOR
BATTERY
M1

FUSES (PDC)

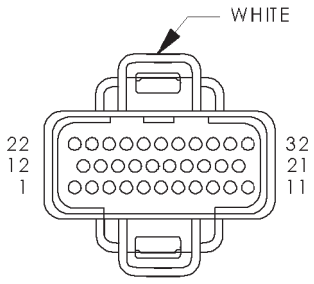
FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	-	-	-
2	40A	A1 12RD	FUSED B(+)
3	40A	A2 12PK/BK	FUSED B(+)
4	50A	A7 10RD/BK	FUSED B(+)
5	40A	F141 12LG/RD	FUSED B(+)
6	40A	A111 12RD/LG	FUSED B(+)
7	30A	A3 14RD/WT	FUSED B(+)
7	30A	A3 14RD/WT (DRL)	FUSED B(+)
8	30A	A16 14RD/LG	FUSED B(+)
9	20A	A17 16RD/BK	FUSED B(+)
9	20A	A17 16RD/BK	FUSED B(+)
10	20A	A41 16YL	FUSED B(+)
11	30A	A4 12BK/PK	FUSED B(+)
12 (ABS)	40A	A10 12RD/DG	FUSED B(+)
13 (ABS)	20A	A20 12RD/DB	FUSED B(+)
14	-	-	FUSED B(+)
15	-	-	FUSED B(+)
16	15A	M1 20PK	FUSED B(+)
17	20A	F99 18RD	FUSED B(+)
18	15A	A142 18DG/OR	FUSED AUTOMATIC SHUT DOWN RELAY OUTPUT
19	20A	F34 18TN/BK	FUSED B(+)
20	15A	L9 20BK/PK	FUSED B(+)
21	15A	F142 18DG/WT	FUSED AUTOMATIC SHUT DOWN RELAY OUTPUT
22	15A	A61 14DG/BK	FUSED B(+)
23	15A	F32 20PK/DB	FUSED B(+)
24	-	-	-
25	15A	F61 20WT/OR	FUSED B(+)
26	20A	F75 16VT	FUSED B(+)
27 (ABS)	10A	F1 20DB/GY	A17 16RD/BK



POWERTRAIN CONTROL MODULE - C1 (GAS)

POWERTRAIN CONTROL MODULE C1 (GAS) - BLACK 32 WAY

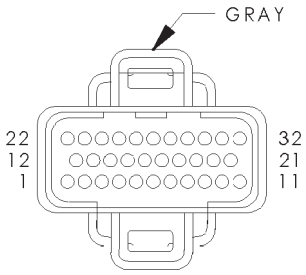
CAV	CIRCUIT	FUNCTION
1	K18 18RD/YL	IGNITION COIL NO. 3 DRIVER
2	F12 18DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
3	-	-
4	K167 18BR/YL	SENSOR GROUND
5	-	-
6	T41 18BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE
7	K19 18GY	IGNITION COIL NO. 1 DRIVER
8	K24 18GY/BK	CRANKSHAFT POSITION SENSOR SIGNAL
9	-	-
10	K60 18YL/BK	IDLE AIR CONTROL NO. 2 DRIVER
11	K40 18BR/WT	IDLE AIR CONTROL NO. 3 DRIVER
12	K78 18GY (A/T)	IDLE ACTUATOR
13	-	-
14	-	-
15	K21 18BK/RD	INTAKE AIR TEMPERATURE SENSOR SIGNAL
16	K2 18TN/BK	ENGINE COOLANT TEMPERATURE SENSOR SIGNAL
17	K7 18OR	5V SUPPLY
18	K44 18TN/YL	CAMSHAFT POSITION SENSOR SIGNAL
19	K39 18GY/RD	IDLE AIR CONTROL NO. 1 DRIVER
20	K59 18VT/BK	IDLE AIR CONTROL NO. 4 DRIVER
21	-	-
22	A61 14DG/BK	FUSED B(+)
23	K22 18OR/DB	THROTTLE POSITION SENSOR SIGNAL
24	K41 18BK/DG	OXYGEN SENSOR 1/1 SIGNAL
25	K141 18TN/WT	OXYGEN SENSOR 1/2 SIGNAL
26	K241 18LG/RD (CALIFORNIA/BUILT UP EXPORT)	OXYGEN SENSOR 2/1 SIGNAL
27	K1 18DG/RD	MANIFOLD ABSOLUTE PRESSURE SENSOR SIGNAL
28	-	-
29	K341 18TN (CALIFORNIA/ BUILT UP EXPORT)	OXYGEN SENSOR 2/2 SIGNAL
30	-	-
31	Z12 14BK/TN	GROUND
32	Z12 14BK/TN	GROUND



POWERTRAIN
CONTROL MODULE - C2
(GAS)

POWERTRAIN CONTROL MODULE C2 (GAS) - WHITE 32 WAY

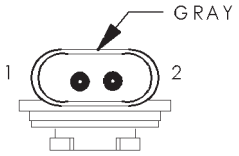
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	K11 18WT/DB	FUEL INJECTOR NO. 1 DRIVER
5	K13 18YL/WT	FUEL INJECTOR NO. 3 DRIVER
6	K15 18PK/BK	FUEL INJECTOR NO. 5 DRIVER
7	-	-
8	-	-
9	K17 18DB/TN	IGNITION COIL NO. 2 DRIVER
10	K20 18DG	GENERATOR FIELD
11	-	-
12	K16 18LG/BK	FUEL INJECTOR NO. 6 DRIVER
13	-	-
14	-	-
15	K12 18TN	FUEL INJECTOR NO. 2 DRIVER
16	K14 18LB/BR	FUEL INJECTOR NO. 4 DRIVER
17	-	-
18	-	-
19	-	-
20	-	-
21	-	-
22	-	-
23	G60 18GY/YL	ENGINE OIL PRESSURE SENSOR SIGNAL
24	-	-
25	-	-
26	-	-
27	G7 18WT/OR	VEHICLE SPEED SENSOR SIGNAL
28	-	-
29	-	-
30	-	-
31	K6 18VT/OR	5V SUPPLY
32	-	-



POWERTRAIN CONTROL MODULE - C3 (GAS)

POWERTRAIN CONTROL MODULE C3 (GAS) - GRAY 32 WAY

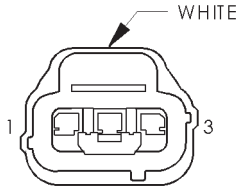
CAV	CIRCUIT	FUNCTION
1	C13 18DB/OR	A/C COMPRESSOR CLUTCH RELAY CONTROL
2	C27 18DB/PK	RADIATOR FAN RELAY CONTROL
3	K51 18DB/YL	AUTOMATIC SHUT DOWN RELAY CONTROL
4	V36 18TN/RD	SPEED CONTROL VACUUM SOLENOID CONTROL
5	V35 18LG/RD	SPEED CONTROL VENT SOLENOID CONTROL
6	-	-
7	-	-
8	K73 18BR/OR	OXYGEN SENSOR UPSTREAM RELAY CONTROL
9	K74 18BR/VT	OXYGEN SENSOR DOWNSTREAM RELAY CONTROL
10	K106 18WT/DG (LEAK DETECTION)	LEAK DETECTION PUMP SOLENOID CONTROL
11	V32 18YL/RD	SPEED CONTROL SUPPLY
12	F142 18DG/WT	FUSED AUTOMATIC SHUT DOWN RELAY OUTPUT
13	C48 18TN	RADIATOR FAN REQUEST
14	K105 18WT/OR (LEAK DETECTION)	LEAK DETECTION PUMP SWITCH SENSE
15	K118 18PK/YL	BATTERY TEMPERATURE SENSOR SIGNAL
16	-	-
17	-	-
18	-	-
19	K31 18BR	FUEL PUMP RELAY CONTROL
20	K52 18PK/BK	DUTY CYCLE EVAP/PURGE SOLENOID CONTROL
21	-	-
22	C22 18DB/WT	A/C SWITCH SENSE
23	C90 18LG	A/C SELECT INPUT
24	K29 18WT/PK	BRAKE LAMP SWITCH SENSE
25	K72 18DG/OR	GENERATOR SOURCE
26	K226 18DB/LG	FUEL LEVEL SENSOR SIGNAL
27	D21 18PK	SCI TRANSMIT
28	D2 18WT/BK	CCD BUS(-)
29	D20 18LG/BK	SCI RECEIVE
30	D1 18VT/BR	CCD BUS(+)
31	-	-
32	V37 18RD/LG	SPEED CONTROL SWITCH SIGNAL



RIGHT BACK-UP LAMP

RIGHT BACK-UP LAMP - GRAY 2 WAY

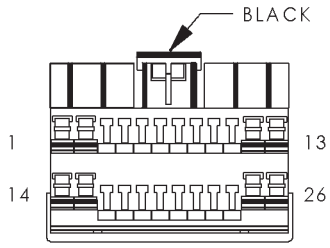
CAV	CIRCUIT	FUNCTION
1	Z1 18BK	GROUND
2	L10 18BR/LG	BACK-UP LAMP FEED



THROTTLE POSITION SENSOR

THROTTLE POSITION SENSOR - WHITE 3 WAY

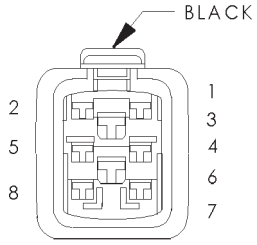
CAV	CIRCUIT	FUNCTION
1	K167 20BR/YL	SENSOR GROUND
2	K22 18OR/DB (M/T)	THROTTLE POSITION SENSOR SIGNAL
2	K22 20OR/DB (A/T)	THROTTLE POSITION SENSOR SIGNAL
3	K7 20OR	5V SUPPLY



TRANSMISSION CONTROL MODULE

TRANSMISSION CONTROL MODULE - BLACK 26 WAY

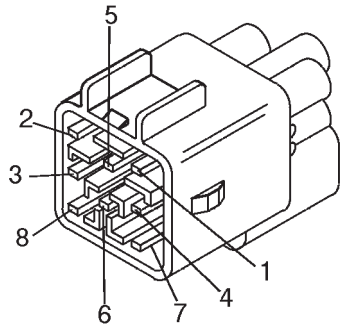
CAV	CIRCUIT	FUNCTION
1	T31 20VT/LG	INPUT SPEED SENSOR GROUND
2	T52 20RD/BK	INPUT SPEED SENSOR SIGNAL
3	T13 20DB/BK	OUTPUT SPEED SENSOR GROUND
4	T14 20LG/WT	OUTPUT SPEED SENSOR SIGNAL
5	-	-
6	D2 20WT/BK	CCD BUS(-)
7	D1 20VT/BR	CCD BUS(+)
8	-	-
9	T3 18VT	TRS 3 SENSE
10	-	-
11	T22 20DB/WT	SOLENOID C CONTROL
12	T19 20WT	SOLENOID A CONTROL
13	T60 20OR/WT	SOLENOID B CONTROL
14	D21 20PK	SCI TRANSMIT
15	-	-
16	K167 20BR/YL	SENSOR GROUND
17	K22 20OR/DB	THROTTLE POSITION SENSOR SIGNAL
18	L10 18BR/LG	TRS REVERSE SENSE
19	-	-
20	-	-
21	T42 18VT/WT	TRS 1-2 SENSE
22	T1 18LG/BK	TRS OVERDRIVE SENSE
23	K29 20WT/PK	BRAKE LAMP SWITCH SENSE
24	Z12 18BK/TN	GROUND
25	M1 20PK	FUSED B(+)
26	F12 18DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)



TRANSMISSION RANGE SENSOR (A/T)

TRANSMISSION RANGE SENSOR (A/T) - BLACK 8 WAY

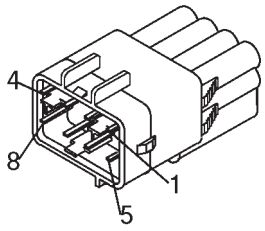
CAV	CIRCUIT	FUNCTION
1	T42 18VT/WT	TRS 1-2 SENSE
2	T3 18VT	TRS 3 SENSE
3	F20 18WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
4	T1 18LG/BK	TRS OVERDRIVE SENSE
5	-	-
6	L10 18BR/LG	TRS REVERSE SENSE
7	T41 20BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE
8	Z1 18BK	GROUND



TRANSMISSION
RANGE SENSOR
CONNECTOR
(TRANS HARNESS SIDE)

TRANSMISSION RANGE SENSOR CONNECTOR - 8 WAY (TRANS HARNESS SIDE)

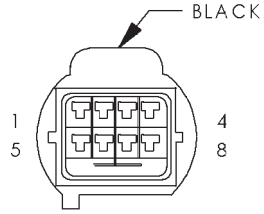
CAV	CIRCUIT	FUNCTION
1	VT/WT	TRS 1-2 SENSE
2	VT	TRS 3 SENSE
3	WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
4	LG/BK	TRS OVERDRIVE SENSE
5	-	-
6	BR/LG	TRS REVERSE SENSE
7	BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE
8	BK	GROUND



TRANSMISSION
SOLENOID
(TRANS SIDE)

TRANSMISSION SOLENOID - 8 WAY (TRANS SIDE)

CAV	CIRCUIT	FUNCTION
1	RD/BK	INPUT SPEED SENSOR SIGNAL
2	OR/WT	TRANSMISSION SOLENOID A
3	WT	TRANSMISSION SOLENOID B
4	DB/WT	TRANSMISSION SOLENOID C
5	VT/LG	INPUT SPEED SENSOR GROUND
6	DB/BK	OUTPUT SPEED SENSOR GROUND
7	LG/WT	OUTPUT SPEED SENSOR SIGNAL
8	-	-



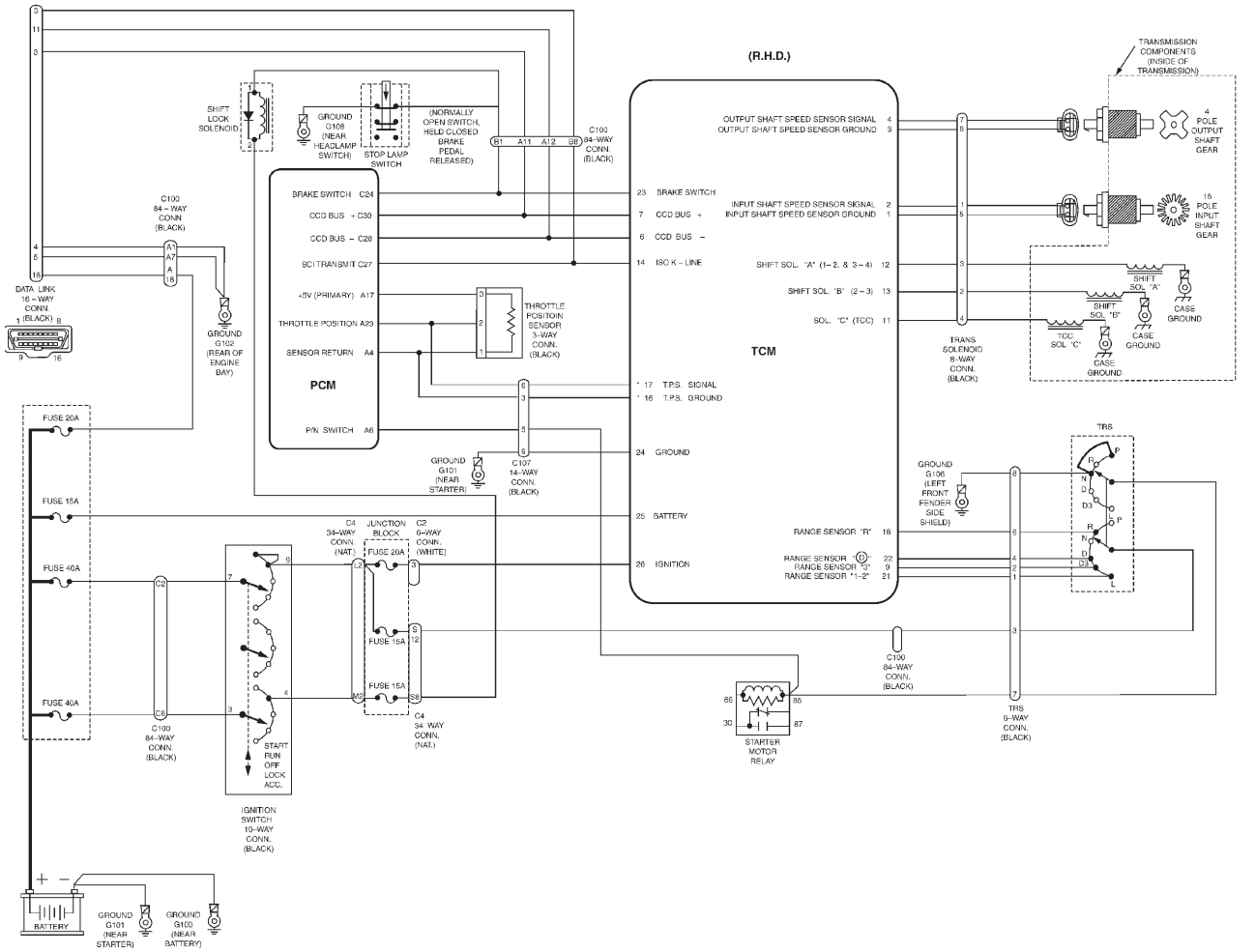
TRANSMISSION
SOLENOID

TRANSMISSION SOLENOID - BLACK 8 WAY

CAV	CIRCUIT	FUNCTION
1	T52 20RD/BK	INPUT SPEED SENSOR SIGNAL
2	T60 20OR/WT	SOLENOID B CONTROL
3	T19 20WT	SOLENOID A CONTROL
4	T22 20DB/WT	SOLENOID C CONTROL
5	T31 20VT/LG	INPUT SPEED SENSOR GROUND
6	T13 20DB/BK	OUTPUT SPEED SENSOR GROUND
7	T14 20LG/WT	OUTPUT SPEED SENSOR SIGNAL
8	-	-

NOTES

10.0 SCHEMATICS



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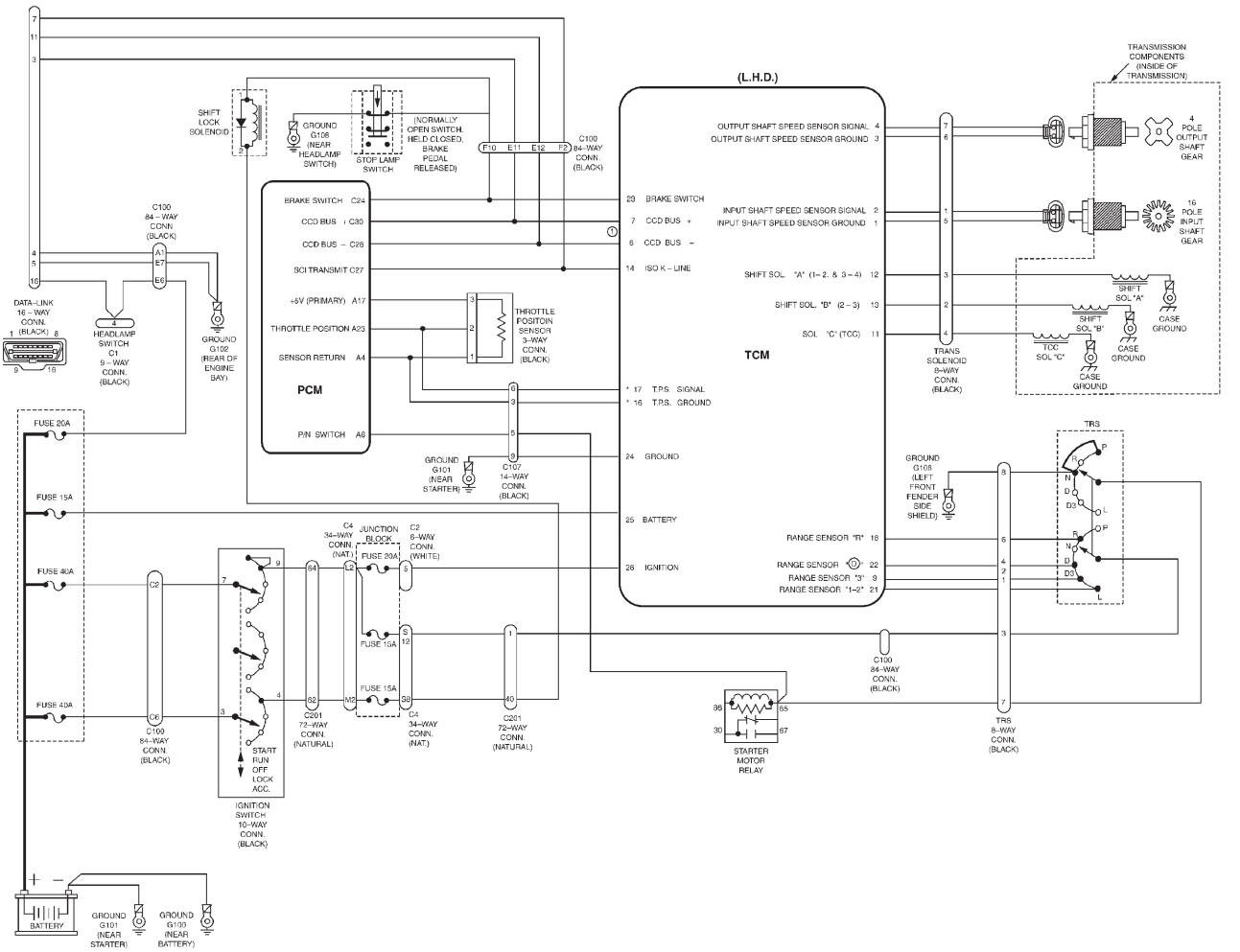
10.1 SCHEMATICS



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NOTES

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