

## 2007 Dodge Nitro R/T

2007 AUTOMATIC TRANSMISSION NAG1 - Shifter Diagnostics - Nitro

### 2007 AUTOMATIC TRANSMISSION

#### NAG1 - Shifter Diagnostics - Nitro

## DIAGNOSTIC CODE INDEX

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DTC	Description
<u>P0562</u>	BATTERY VOLTAGE LOW - ESM
<u>P0563</u>	BATTERY VOLTAGE HIGH - ESM
<u>P0607</u>	ECU INTERNAL PERFORMANCE - ESM
<u>P0930</u>	BTSI CONTROL CIRCUIT LOW - ESM
<u>P0931</u>	BTSI CONTROL CIRCUIT HIGH - ESM
<u>P2775</u>	AUTOSTICK UPSHIFT SWITCH CIRCUIT PERFORMANCE - ESM
<u>P2779</u>	AUTOSTICK DOWNSHIFT SWITCH CIRCUIT PERFORMANCE - ESM
<u>U0002</u>	CAN C BUS OFF PERFORMANCE - ESM
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM - ESM
<u>U0121</u>	LOST COMMUNICATION WITH ANTI-LOCK BRAKE MODULE - ESM
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE - ESM

## NAG1 - SHIFTER DIAGNOSTICS

### DIAGNOSIS AND TESTING

#### P0562-BATTERY VOLTAGE LOW - ESM

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS article.

#### Theory of Operation

The Shift Lever Assembly (SLA) controller (Electronic Shift Module - ESM) monitors ignition voltage. The DTC will set if the monitored battery voltage drops below 6.0 volts and a temporary limp in will be activated. If the voltage rises above 9.0 volts, normal operations is resumed.

#### When Monitored:

Continuously with the ignition in the run position.

#### Set Condition:

When monitored battery voltage drops below 6.0 volts.

#### Possible Causes

VEHICLE CHARGING SYSTEM

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(F1) IGNITION UNLOCK RUN START CIRCUIT  
(Z910) GROUND CIRCUITS  
SHIFT LEVER ASSEMBLY

**Always perform the NAG1 Pre-Diagnostic Troubleshooting procedure before proceeding.**

### Diagnostic Test

#### 1) CHECK FOR ENGINE CHARGING SYSTEM DTCS

With the scan tool, read Engine DTCs.

**Are there any Engine Charging System DTCs present?**

**Yes**

Refer to appropriate Engine Electrical Diagnostics article and perform the appropriate symptom.  
Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

**No**

Go to 2).

#### 2) CHECK (F1) IGNITION UNLOCK RUN START CIRCUIT



**Yes**

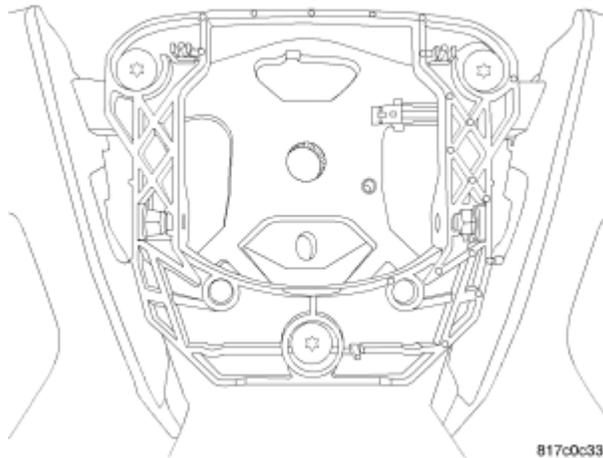
Go to 3).

**No**

Repair the (F1) Ignition Unlock Run Start circuit for high resistance.

Perform **NAG1 TRANSMISSION VERIFICATION TEST.**

**3) CHECK (Z910) GROUND CIRCUITS**



**Fig. 2: Using 12-Volt Test Light Connected To 12-Volts To Check (Z910) Ground Circuit In Shift Lever Assembly Harness Connector**  
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Using a 12-volt test light connected to 12-volts, check the (Z910) Ground circuit in the Shift Lever Assembly harness connector.

**NOTE:**        **The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

**Does the test light illuminate brightly?**

**Yes**

Go to 4).

Perform **NAG1 TRANSMISSION VERIFICATION TEST.**

**No**

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Repair the (Z910) Ground circuit for high resistance.

#### 4) SHIFT LEVER ASSEMBLY

Reconnect all disconnected harness connectors.

With the scan tool, erase Shift Lever DTC's.

Start the engine and raise the engine speed to 2000 RPM.

With the scan tool, read Shift Lever DTC's.

**Did the DTC P0562-BATTERY VOLTAGE LOW DTC reset?**

**Yes**

Replace the Shift Lever Assembly per the Service Information  
Perform NAG1 TRANSMISSION VERIFICATION TEST.

**No**

Test Complete.

#### P0563-BATTERY VOLTAGE HIGH - ESM

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS article.

##### **When Monitored:**

Continuously with the ignition in the run position.

##### **Set Condition:**

When the monitored battery voltage rises above 16.0 volts.

#### Possible Causes

CHARGING SYSTEM DTCS  
VEHICLE WAS JUMP STARTED INCORRECTLY  
SHIFT LEVER ASSEMBLY

**Always perform the NAG1 Pre-Diagnostic Troubleshooting procedure before proceeding. See STANDARD PROCEDURE.**

The Shift Lever Assembly monitors ignition voltage. The DTC will set, if the monitored battery voltage rises above 16.0 volts.

**Diagnostic Test**

**1) CHECK FOR CHARGING SYSTEM DTCS**

With the scan tool, read Engine DTCs.

**NOTE: This includes any one trip faults.**

**Are there any Engine Charging System DTCs present?**

**Yes**

Refer to the appropriate Engine Electrical Diagnostics article and perform the appropriate symptom.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

**No**

Go to 2).

**2) VEHICLE WAS JUMP STARTED INCORRECTLY**

Verify if the vehicle was jump started by another vehicle using a 24-volt charging system or incorrectly jump started with the 12 volt battery in series.

**Was the vehicle jump started by another vehicle?**

**Yes**

This is the cause of the DTC. Erase the DTC and return the vehicle to the customer.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

**No**

Go to 3).

**3) SHIFT LEVER ASSEMBLY**

Reconnect all disconnected harness connectors.

With the scan tool, erase Shift Lever DTC's.

Start the engine and raise the engine speed to 2000 RPM.

With the scan tool, read Shift Lever DTC's.

**Did the P0563-BATTERY VOLTAGE HIGH DTC reset?**

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#### Yes

Replace the Shift Lever Assembly per the Service Information  
Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

#### No

Test Complete.

#### **P0607-ECU INTERNAL PERFORMANCE - ESM**

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** article.

#### **When Monitored:**

Continuously with the ignition in the run position.

#### **Set Condition:**

If the Shift Lever Assembly controller detects an invalid calibration (checksum value).

Possible Causes
SHIFTER LEVER ASSEMBLY

**Always perform the NAG1 Pre-Diagnostic Troubleshooting procedure before proceeding. See STANDARD PROCEDURE.**

The Shift Lever Assembly (SLA) Electronic Shift Module (ESM) performs various internal tests to verify proper controller operation. This DTC indicates that there is an issue with the Shifter's internal processor.

#### **Diagnostic Test**

##### **1) SHIFTER LEVER ASSEMBLY**

#### **View repair**

#### **Repair**

Using the schematics as a guide, check the Shift Lever Assembly Control Module terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the Shift Lever Assembly per the Service Information.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

#### **P0930-BTSI CONTROL CIRCUIT LOW - ESM**

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** article.

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### When Monitored:

Continuously with the ignition in the run position.

### Set Condition:

The DTC will set if the high side driver detects a short to ground for 10 seconds.

### Possible Causes

ENGINE BRAKE DTCS PRESENT  
ABS DTCS PRESENT  
(L51) BRAKE SWITCH SIGNAL SHORT TO GROUND  
SHIFT LEVER ASSEMBLY

**Always perform the NAG1 Pre-Diagnostic Troubleshooting procedure before proceeding. See STANDARD PROCEDURE.**

The brake switch signal must be active before the shift lever can be moved out of the park position. The Shift Lever Assembly (SLA) Electronic Shift Module (ESM) receives two brake switch signals. The first signal is a CAN C Bus message sent to the shift lever assembly. The second signal is a hard wired brake switch signal to the shift lever assembly. The CAN C Bus message is the primary brake switch signal and the hard wired signal serves as the backup brake switch signal.

### Diagnostic Test

#### 1) ENGINE DTCS PRESENT

With the scan tool, read Engine DTCs.

**Are there any Engine brake DTCs present?**

**Yes**

Refer to appropriate Engine Electrical Diagnostics article and perform the appropriate diagnostic procedure.

Perform **NAG1 TRANSMISSION VERIFICATION TEST.**

**No**

Go to 2).

#### 2) ABS MODULE DTCS PRESENT

With the scan tool, read ABS Module DTCs.

**Are there any ABS DTCs present?**

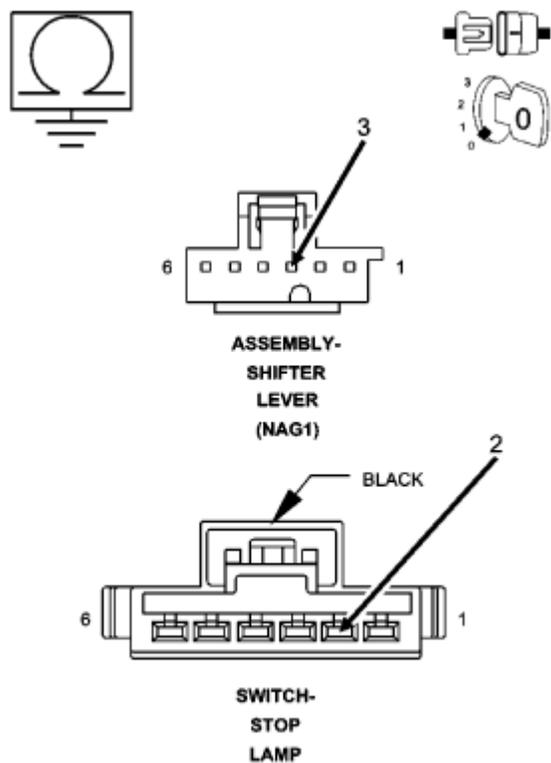
Yes

Refer to **ABS ELECTRICAL DIAGNOSTICS** and perform the appropriate diagnostic procedure.  
Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

No

Go to 3).

### 3) (L51) BRAKE SWITCH SIGNAL SHORT TO GROUND



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**Fig. 3: Measuring Resistance Between Ground And (L51) Brake Switch Signal Circuit**  
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Shift Lever Assembly harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

Measure the resistance between ground and the (L51) Brake Switch Signal circuit.

**Is the resistance below 5.0 ohms?**

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#### Yes

Repair the (L51) Brake Switch Signal for a short to ground.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

#### No

Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If no problems are found, replace the Shift Lever Assembly per the Service Information.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

#### **P0931-BTSI CONTROL CIRCUIT HIGH - ESM**

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** article.

#### **When Monitored:**

Continuously with the ignition in the run position.

#### **Set Condition:**

The DTC will set if the high side driver detects an open load for 10 seconds.

#### **Possible Causes**

ENGINE BRAKE DTC'S PRESENT  
ABS DTC'S PRESENT  
(L51) BRAKE SWITCH SIGNAL OPEN  
(L51) BRAKE SWITCH SIGNAL SHORT TO VOLTAGE  
SHIFT LEVER ASSEMBLY

**Always perform the NAG1 Pre-Diagnostic Troubleshooting procedure before proceeding.**

The brake switch signal must be active before the shift lever can be moved out of the park position. The Shift Lever Assembly (SLA) Electronic Shift Module (ESM) receives two brake switch signals. The first signal is a CAN C Bus message sent to the shifter lever assembly. The second signal is a hard wired brake switch signal to the shifter lever assembly. The CAN C Bus message is the primary brake switch signal and the hard wired signal serves as the backup brake switch signal. These two brake switch signals are compared against each other to verify proper brake switch operation.

#### **Diagnostic Test**

##### **1) ENGINE DTCs PRESENT**

With the scan tool, read Engine DTCs.

**Are there any Engine brake DTCs present?**

**Yes**

Refer to appropriate Engine Electrical Diagnostics article and perform the appropriate diagnostic procedure.

Perform **NAG1 TRANSMISSION VERIFICATION TEST.**

**No**

Go to 2).

**2) ABS MODULE DTCs PRESENT**

With the scan tool, read ABS Module DTCs.

**Are there any ABS DTCs present?**

**Yes**

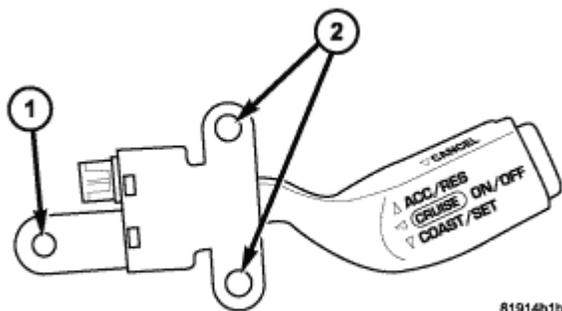
Refer to **ABS - ELECTRICAL DIAGNOSTICS** and perform the appropriate diagnostic procedure.

Perform **NAG1 TRANSMISSION VERIFICATION TEST.**

**No**

Go to 3).

**3) (L51) BRAKE SWITCH SIGNAL OPEN**



**Fig. 4: Measuring Resistance Of (L51) Brake Switch Signal Circuit Between Shift Lever Assembly Harness Connector And Stop Lamp Switch**  
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Shift Lever Assembly harness connector.

Disconnect the Stop Lamp Switch harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

Measure the resistance of the (L51) Brake Switch Signal circuit between the Shift Lever Assembly harness connector and the Stop Lamp Switch.

**Is the resistance above 5.0 ohms?**

**Yes**

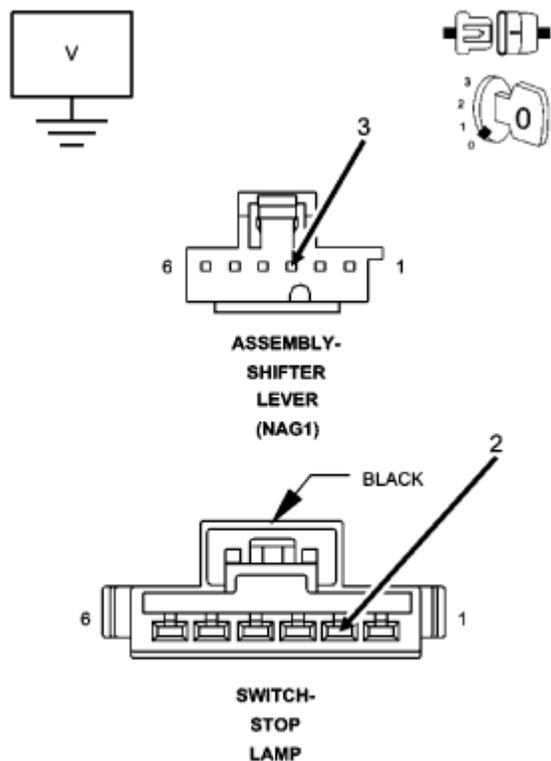
Repair the (L51) Brake Switch Signal for an open.

Perform **NAG1 TRANSMISSION VERIFICATION TEST.**

**No**

Go to 4).

#### 4) (L51) BRAKE SWITCH SIGNAL SHORT TO VOLTAGE



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**Fig. 5: Measuring Voltage Of (L51) Brake Switch Signal Circuit**

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#### Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Shift Lever Assembly harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

Turn the ignition on.

Measure the voltage of the (L51) Brake Switch Signal circuit.

**Is the voltage above 0.5 volts?**

**Yes**

Repair the (L51) Brake Switch Signal for a short to voltage.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

**No**

Replace the Shift Lever Assembly per the Service Information.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

#### **P2775-AUTOSTICK UPSHIFT SWITCH CIRCUIT PERFORMANCE - ESM**

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** article.

#### **When Monitored:**

Continuously with the ignition in the run position and the shift lever in AutoStick mode.

#### **Set Condition:**

When the expected switch state is not correctly sensed by the Shift Lever Assembly. If the upshift switch signal is detected as active in gear position other than drive or both upshift and downshift signals are active at the same time.

#### **Possible Causes**

**SHIFT LEVER ASSEMBLY**

**Always perform the NAG1 Pre-Diagnostic Troubleshooting procedure before proceeding. See STANDARD PROCEDURE.**

The AutoStick Switch is integrated into the Shift Lever Assembly. The gear requested by the AutoStick

selection is then sent over the CAN C bus to the TCM to engage the requested gear.

**Diagnostic Test****1) SHIFT LEVER ASSEMBLY****View repair****Repair**

Using the schematics as a guide, check the Shift Lever Assembly (SLA) Electronic Shift Module (ESM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the Shift Lever Assembly per the Service Information. Refer to Shift Mechanism for the appropriate service procedures.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

**P2779-AUTOSTICK DOWNSHIFT SWITCH CIRCUIT PERFORMANCE - ESM**

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** article.

**When Monitored:**

Continuously with the ignition in the run position and with the shift lever in AutoStick mode.

**Set Condition:**

When the expected switch state is not correctly sensed by the Shift Lever Assembly (SLA) Electronic Shift Module (ESM). If the upshift switch signal is detected as active in gear position other than drive or both upshift and downshift signals are active at the same time.

Possible Causes
SHIFT LEVER ASSEMBLY

**Always perform the NAG1 Pre-Diagnostic Troubleshooting procedure before proceeding. See STANDARD PROCEDURE.**

The AutoStick Switch is integrated into the Shift Lever Assembly. The gear requested by the AutoStick selection is then sent over the CAN C bus from the Electronic Shift Module (ESM) to the TCM to engage the requested gear.

**Diagnostic Test****1) SHIFT LEVER ASSEMBLY****View repair**

**Repair**

Using the schematics as a guide, check the Shift Lever Assembly (SLA) Electronic Shift Module (ESM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the Shift Lever Assembly per the Service Information.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

**U0002-CAN C BUS OFF PERFORMANCE - ESM**

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** article.

Some controllers communicate with other controllers over the CAN C BUS. The Electronic Shift Module (ESM) continuously monitors BUS activity and reads the messages it needs. The CAN C BUS is also used to communicate the MIL status to the Engine Controller.

For CAN BUS diagnostic procedures. Refer to **DIAGNOSIS AND TESTING** .

**U0100-LOST COMMUNICATION WITH ECM/PCM - ESM**

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** article.

Some controllers communicate with other controllers over the CAN C BUS. The Electronic Shift Module (ESM) continuously monitors BUS activity and reads the messages it needs. The CAN C BUS is also used to communicate the MIL status to the Engine Controller.

For CAN BUS diagnostic procedures. Refer to **DIAGNOSIS AND TESTING** .

**U0121-LOST COMMUNICATION WITH ANTI-LOCK BRAKE MODULE - ESM**

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** article.

Some controllers communicate with other controllers over the CAN C BUS. The Electronic Shift Module (ESM) continuously monitors BUS activity and reads the messages it needs. The CAN C BUS is also used to communicate the MIL status to the Engine Controller.

For CAN BUS diagnostic procedures. Refer to **DIAGNOSIS AND TESTING** .

**U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE - ESM**

For a complete wiring diagram refer to appropriate Wiring Diagram article.

Some controllers communicate with other controllers over the CAN C BUS. The Electronic Shift Module (ESM) continuously monitors BUS activity and reads the messages it needs. The CAN C BUS is also used to communicate the MIL status to the Engine Controller.

For CAN BUS diagnostic procedures. Refer to **DIAGNOSIS AND TESTING** .

**STANDARD PROCEDURE****NAG1 TRANSMISSION VERIFICATION TEST**

To validate that the repair(s) fixed the vehicle, perform the following steps.

1. Reconnect any disconnected components.
2. Connect the scan tool to the Data Link Connector.
3. With the scan tool, erase ABS DTCs.
4. With the scan tool, erase PCM DTCs.
5. With the scan tool, erase TCM DTCs.

**CAUTION: Apply the parking brake.**

**NOTE: The Transmission Temperature can only be read while in Reverse or Drive.**

6. With the scan tool, display the Transmission temperature. Start and run the engine until the Transmission temperature is above 43°C (110°F).
7. If internal transmission components were repaired or replaced check the Transmission fluid and adjust if necessary. Refer to the Service Information for the proper Fluid Fill procedure. Refer to **STANDARD PROCEDURE** .
8. If the TCM (EGS) is flashed or replaced, with the scan tool, perform an EGS initialization to relearn variant coding.
9. If internal transmission repairs are performed or replacement of the Transmission Control Module, perform a TCM ADAPTATION procedure. Refer to **STANDARD PROCEDURE** .
10. After performing the above procedures, perform the **Road Test Procedure**.

**ROAD TEST PROCEDURE**

1. Road test the vehicle. Make fifteen to twenty 1-2, 2-3, 3-4, and 4-5 upshifts.
2. Perform these shifts from a standing start to 72 Km/h (45 mph) with a constant throttle opening of 20 to 25 degrees.
3. With speeds below 40 Km/h (25 mph), make five to eight wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown.
4. With the scan tool, read DTCs.

**Did any DTCs set?**

**Yes**

Refer to the identified category and perform the appropriate symptom(s).

No

Testing is complete.

#### NAG1 PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS article.

**Perform the following pre-diagnostic troubleshooting procedures prior to performing any diagnostic test.**

**NOTE:** Due to different power control configurations, the Transmission Control Relay (if equipped) may be referred to as a PCM relay.

**NOTE:** Incorrect fluid level, and/or poor fluid condition can be the cause of many transmission problems. Visually inspect the transmission and cooler lines for leakage and repair as necessary and adjust the fluid level per the Service Information.

**Always perform diagnostics with a fully charged battery to avoid false symptoms.**

1. With the scan tool, read the engine DTCs. Check and repair all engine DTCs prior to performing transmission symptom diagnostic procedures.
2. With the scan tool, read and record all Transmission DTCs. Record the controller software version and variant ID (configuration or level).

**NOTE:** Check for any Service Information Tune-ups or Technical Service Bulletins (TSB) that may apply.

**NOTE:** If the TCM detects and stores a DTC, the TCM also stores the vehicles operating conditions under which the DTC originally set. This information is located using a scan tool under Environmental Data. Before erasing any stored DTCs, it is recommended to record all available data to assist in troubleshooting and duplicating the conditions and in which the DTC originally set.

3. Verify the current software level of transmission controller. Various problems are corrected by software upgrades (flash) to the transmission controller.

**NOTE:** If a TCM software update is performed, all DTC information (Environmental Data) will be lost.

4. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors to all components related to the transmission and shift lever assembly. Clean and repair as necessary.
5. Most DTCs set on start up but some may only set by driving the vehicle. Note the when monitored and set conditions of the reported DTC. If variant DTCs are present, perform their respective test first.

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6. Verify the axle ratio and transfer case ratio.

**NOTE:** The Transfer case ratio must be programmed using the scan tool under the appropriate gateway module (FCM, FDCM, and/or TIPM) even if equipped with AWD or NO transfer case. Validate that the left to right tire sizes on each axle are the same. Do not perform diagnostics using a space-saver spare tire. Invalid tire sizes (right to left) may cause erroneous DTCs to set.

**Did any of the above procedures repair the vehicle?**

**Yes**

Testing is complete.

Perform **NAG1 TRANSMISSION VERIFICATION TEST**.

**No**

Refer to the identified category and perform the appropriate symptom(s).