DESCRIPTION AND OPERATION

Communications Network

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

Vehicle communication utilizes the International Standards Organization (ISO) 9141 network, the medium speed controller area network (MS-CAN), and the high speed controller area network (HS-CAN). Information is sent to and from individual control modules that each control specific functions. All 3 networks are connected to the data link connector (DLC). The DLC can be found under the instrument panel between the steering column and the audio control module (ACM).

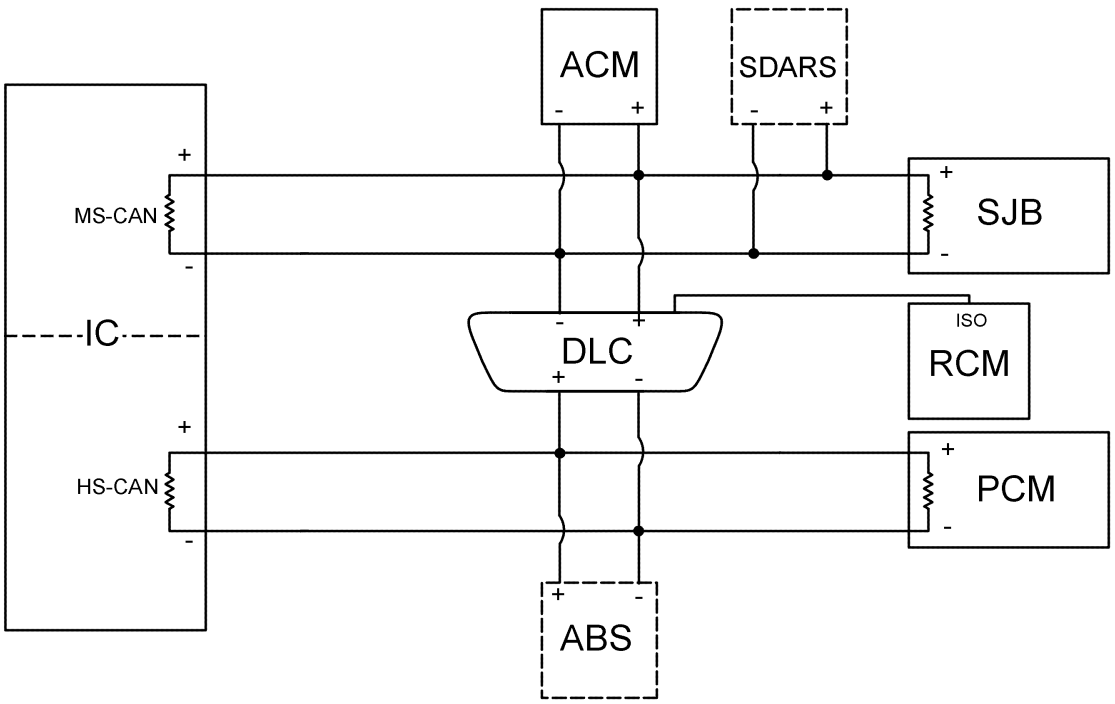
The 3 module communication networks are:

- ISO 9141
- Medium speed (MS) CAN
- High speed (HS) CAN

All 3 networks are connected to the DLC. This makes diagnosis and testing of these systems easier by allowing one scan tool to be able to diagnose and control any module on the 3 networks from one connector. The DLC can be found under the instrument panel between the steering column and the ACM.

DESCRIPTION AND OPERATION (Continued)

Network Topology



Module Name	Network Type	Termination Module
ABS module (if equipped)	HS-CAN	No
Audio control module (ACM)	MS-CAN	No
Instrument cluster (IC) (gateway module)	HS-CAN MS-CAN	Yes Yes
PCM	HS-CAN	Yes
Restraints control module (RCM)	ISO 9141	N/A
Satellite digital audio receiver system (SDARS) module (if equipped)	MS-CAN	No
Smart junction box (SJB)	MS-CAN	Yes

ISO 9141 Network Operation

The ISO 9141 communication network is a single wire network, used for diagnostic purposes only.

The ISO 9141 communication network is used for the following module:

- RCM

MS-CAN Network Operation

The MS-CAN network communicates using bussed messages. The MS-CAN has an unshielded twisted pair cable, data bus (+) and data bus (-) circuits. In addition to scan tool communication, this network allows sharing of information between all modules on the network.

DESCRIPTION AND OPERATION (Continued)

The MS-CAN is a medium speed communication network used for the following modules:

- IC
- Audio control module (ACM)
- SJB
- Satellite digital audio receiver system (SDARS) module (if equipped)

HS-CAN Operation

The HS-CAN uses an unshielded twisted pair cable, data bus (+) and data bus (-) circuits. In addition to scan tool communication, this network allows sharing of information between all modules on the network.

The HS-CAN is a high speed communication network used for the following modules:

- Instrument cluster (IC)
- PCM
- ABS module (if equipped)

Network Termination

The CAN uses a network termination circuit to improve communication reliability. The network termination of the CAN bus takes place inside the termination modules by termination resistors. Termination modules are located at either end of the bus network. As network messages are broadcast in the form of voltage signals, the network voltage signals are stabilized by the termination resistors. Each termination module has a 120 ohm resistor across the positive and negative bus connection in the termination module. With 2 termination modules on each network, and the 120 ohm resistors located in a parallel circuit configuration, the total network impedance (total resistance) is 60 ohms.

Network termination improves bus message reliability by:

- stabilizing bus voltage.
- eliminating electrical interference.

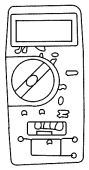
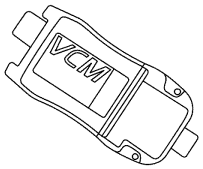
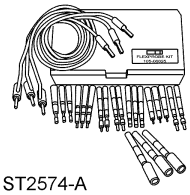
Gateway Module

The IC is the gateway module, translating HS-CAN to MS-CAN and vice versa. This information allows a message to be distributed throughout both networks. The IC is the only module on this vehicle that has this ability.

DIAGNOSIS AND TESTING

Communications Network

Special Tool(s)

 ST1137-A	73III Automotive Meter 105-R0057 or equivalent
 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool
 ST2574-A	Flex Probe Kit 105-R025C or equivalent

Principles of Operation

NOTE: The Smart Junction Box (SJB) is also known as the Generic Electronic Module (GEM).

Vehicle communication utilizes both International Standards Organization (ISO) 9141 and controller area network (CAN) communications. ISO 9141 is for diagnostic use only, and CAN is a method for transferring data among distributed electronic modules via a serial data bus.

The vehicle is equipped with 3 module communication networks:

- ISO 9141
- Medium Speed Controller Area Network (MS-CAN)
- High Speed Controller Area Network (HS-CAN)

International Standards Organization (ISO) 9141 Communications Network

The ISO 9141 communications network is a single wire network. The ISO 9141 communications network does not permit intermodule communication. The ISO 9141 is for the Restraints Control Module (RCM) and is for diagnostic use only. When the scan tool communicates to the RCM, the scan tool must request all information; the module cannot initiate communications.

The following fault chart describes the specific ISO 9141 network failures and their resulting symptom:

ISO 9141 Network Communication Fault Chart

Failure Description	Symptom
ISO circuit open	No communication
ISO circuit short to voltage	No communication
ISO circuit short to ground	No communication
Module loss of voltage or ground	No communication
Module internal failure	No communication

Medium Speed Controller Area Network (MS-CAN)

The MS-CAN uses an unshielded twisted pair cable of data (+) and data (-) circuits. The data (+) and the data (-) circuits are each regulated to approximately 2.5 volts during neutral or rested network traffic. As bus messages are sent on the data (+) circuit, voltage is increased by approximately 1.0 volt. Inversely, the data (-) circuit is reduced by approximately 1.0 volt when a bus message is sent. Multiple bus messages can be sent over the CAN circuits allowing multiple modules to communicate with each other. The MS-CAN is used for the Instrument Cluster (IC), the Audio Control Module (ACM), the Satellite Digital Audio Receiver System (SDARS) module (if equipped) and the Smart Junction Box (SJB) communications, and designed for general information transfer. The MS-CAN will not communicate while certain faults are present, but will operate with diminished performance with other faults present. The MS-CAN bus may remain operational when 1 of the 2 termination resistors are not present.

DIAGNOSIS AND TESTING (Continued)

In the event that one of the 2 network circuits (MS-CAN + or MS-CAN -) becomes open to a module on the network, unreliable network communication to all modules on the network may result. The module to which the network circuit is open may repeatedly send network messages indicating there has been partial data received. This type of message is referred to as a Negative-Acknowledge (NACK) message. Repeated NACK messages may ''load'' the network with too much activity causing intermittent no communication to other network modules and/or the scan tool.

The following fault chart describes the specific MS-CAN failures and their resulting symptom:

MS-CAN Communication Fault Chart

Failure Description	Symptom
MS-CAN (+) shorted to MS-CAN (-)	No communication
MS-CAN (+) short to voltage	No communication
MS-CAN (-) short to voltage	No communication
MS-CAN (+) short to ground	No communication
MS-CAN (-) short to ground	Unreliable communication possible in all network modules
MS-CAN (+) open	Unreliable communication possible in all network modules
MS-CAN (-) open	Unreliable communication possible in all network modules
Module loss of voltage or ground	No communication
Module internal failure	No communication

High Speed Controller Area Network (HS-CAN)

The HS-CAN uses an unshielded twisted pair cable of data (+) and data (-) circuits. The data (+) and the data (-) circuits are each regulated to approximately 2.5 volts during neutral or rested network traffic. As bus messages are sent on the data (+) circuit, voltage is increased by approximately 1.0 volt. Inversely, the data (-) circuit is reduced by approximately 1.0 volt when a bus message is sent. Multiple bus messages can be sent over the CAN circuits allowing multiple modules to communicate with each other. The HS-CAN is a high speed communication network used for the IC, the PCM and the ABS module (if equipped) communications, and designed for real time information transfer and control. The HS-CAN will not communicate while certain faults are present, but will operate with diminished performance with other faults present. The HS-CAN bus may remain operational when 1 of the 2 termination resistors are not present.

In the event that one of the 2 network circuits (HS-CAN + or HS-CAN -) becomes open to a module on the network, unreliable network communication to all modules on the network may result. The module to which the network circuit is open may repeatedly send network messages indicating there has been partial data received. This type of message is referred to as a Negative-Acknowledge (NACK) message. Repeated NACK messages may ''load'' the network with too much activity causing intermittent no communication to other network modules and/or the scan tool.

The following fault chart describes the specific HS-CAN failures and their resulting symptom:

HS-CAN Communication Fault Chart

Failure Description	Symptom
HS-CAN (+) shorted to HS-CAN (-)	No communication
HS-CAN (+) short to voltage	No communication
HS-CAN (-) short to voltage	No communication
HS-CAN (+) short to ground	No communication

DIAGNOSIS AND TESTING (Continued)

HS-CAN Communication Fault Chart (Continued)

Failure Description	Symptom
HS-CAN (-) short to ground	Unreliable communication possible in all network modules
HS-CAN (+) open	Unreliable communication possible in all network modules
HS-CAN (-) open	Unreliable communication possible in all network modules

HS-CAN Communication Fault Chart (Continued)

Failure Description	Symptom
Module loss of voltage or ground	No communication
Module internal failure	No communication

The following chart describes the specific CAN messages broadcast by each module, and the module(s) that receive the message:

CAN Module Communication Message Chart

Broadcast Message	Originating Module	Network Type	Receiving Module(s)
ABS indicator request	ABS module	HS-CAN	• IC
ABS/traction control system configuration	ABS module	HS-CAN	• IC
Accelerator pedal position	PCM	HS-CAN	• ABS module
Accessory delay status	SJB	MS-CAN	• ACM
A/C clutch request	SJB	MS-CAN	• IC
A/C clutch request (gateway)	IC	HS-CAN	• PCM
A/C clutch status	PCM	HS-CAN	• IC
Axle ratio	PCM	HS-CAN	• ABS module
Barometric pressure	PCM	HS-CAN	• ABS module • IC
Barometric pressure (gateway)	IC	MS-CAN	• SJB
Battery saver status	SJB	MS-CAN	• IC
Brake deactivator switch status	PCM	HS-CAN	• ABS module
Brake fluid level	SJB	MS-CAN	• IC
Brake fluid level (gateway)	IC	HS-CAN	• ABS module
Brake malfunction indicator request	ABS module	HS-CAN	• IC
Brake switch status	SJB	MS-CAN	• IC
Brake switch status (gateway)	IC	HS-CAN	• ABS module
Charging system warning indicator request	PCM	HS-CAN	• IC
Door ajar status (LF, RF, luggage compartment)	SJB	MS-CAN	• IC
Daytime Running Lamps (DRL) indicator request	SJB	MS-CAN	• IC
Engine coolant temperature	PCM	HS-CAN	• IC

DIAGNOSIS AND TESTING (Continued)

CAN Module Communication Message Chart (Continued)

Broadcast Message	Originating Module	Network Type	Receiving Module(s)
Engine fail-safe cooling mode	PCM	HS-CAN	• IC
Engine fail-safe (wrench) indicator request	PCM	HS-CAN	• IC
Engine fuel consumption data	PCM	HS-CAN	• IC
Engine Malfunction Indicator Lamp (MIL) request	PCM	HS-CAN	• IC
Engine oil pressure	SJB	MS-CAN	• IC
Engine RPM	PCM	HS-CAN	• ABS module • IC
Engine supercharger boost pressure	PCM	HS-CAN	• IC
Engine torque data	PCM	HS-CAN	• ABS module
Engine torque reduction request	ABS module	HS-CAN	• PCM
Engine vacuum	PCM	HS-CAN	• ABS module
Fuel cap off indicator request	PCM	HS-CAN	• IC
Fuel level input status, sender 1 and 2	SJB	MS-CAN	• IC
Fuel level input status, sender 1 and 2 (gateway)	IC	HS-CAN	• PCM
Headlamp high beam status	SJB	MS-CAN	• IC
Headlamp low beam status	SJB	MS-CAN	• IC
Headlamp on warning chime request	SJB	MS-CAN	• IC
Ignition switch position	SJB	MS-CAN	• ACM • IC
Ignition switch position (gateway)	IC	HS-CAN	• ABS module • PCM
Illumination dimmer level	SJB	MS-CAN	• ACM • IC
Key-in-ignition status	IC	MS-CAN	• SJB
Odometer count	PCM	HS-CAN	• IC
Parking brake status	SJB	MS-CAN	• IC
Parking brake status (gateway)	IC	HS-CAN	• ABS module • PCM
Parking lamp status	SJB	MS-CAN	• IC
Passive Anti-Theft System (PATS) indicator status	PCM	HS-CAN	• IC
Perimeter anti-theft status	SJB	MS-CAN	• IC
Speed control set indicator request	PCM	HS-CAN	• ABS module • IC

DIAGNOSIS AND TESTING (Continued)

CAN Module Communication Message Chart (Continued)

Broadcast Message	Originating Module	Network Type	Receiving Module(s)
Tire size information	ABS module	HS-CAN	• PCM
Tire Pressure Monitoring System (TPMS) system status	SJB	MS-CAN	• IC
TPMS sensor status (LF, RF, RR, LR, spare)	SJB	MS-CAN	• IC
Transmission clutch pedal position	PCM	HS-CAN	• ABS module
Traction control disable switch status	IC	HS-CAN	• ABS module
Traction control event in progress	ABS module	HS-CAN	• PCM
Traction control indicator request	ABS module	HS-CAN	• IC
Transmission overdrive indicator status	PCM	HS-CAN	• IC
Transmission selector (PRNDL) range	PCM	HS-CAN	• ABS module • IC
Transmission selector (PRNDL) range (gateway)	IC	MS-CAN	• SJB
Transmission shift in progress	PCM	HS-CAN	• ABS module
Transmission type	PCM	HS-CAN	• ABS module
Turn signal indicator request	SJB	MS-CAN	• IC
Vehicle speed	PCM	HS-CAN	• ABS module • IC
Vehicle speed (gateway)	IC	MS-CAN	• ACM • SJB
Vehicle Identification Number (VIN) information	PCM	HS-CAN	• ABS module • IC
Wheel speed output (RF, LF, RR, LR)	ABS module	HS-CAN	• PCM

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of electrical damage.
   - If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

DIAGNOSIS AND TESTING (Continued)

Visual Inspection Chart

Electrical
• Bussed Electrical Center (BEC) fuse(s): — 42 (15A) (no communication with PCM) — 45 (10A) (no communication with PCM) — 56 (20A) (no communication with Audio Control Module (ACM), Satellite Digital Audio Receiver System (SDARS) module) — 59 (30A) (no communication with SJB) — 63 (30A) (no communication with SJB) — 65 (30A) (no communication with ABS module) — 67 (30A) (no communication with SJB) • Smart Junction Box (SJB) fuse(s): — 8 (10A) (no communication with Instrument Cluster (IC), no power to scan tool) — 16 (5A) (no communication with IC) — 17 (10A) (no communication with Restraints Control Module (RCM)) — 18 (10A) (no communication with ABS module) — 19 (5A) (no communication with IC, PCM) • Data Link Connector (DLC) • Wiring harness • Wiring, terminals or connectors

3. Connect the scan tool to the DLC.
   - **NOTE:** Make sure to use the latest scan tool software release.

     NOTE: The Vehicle Communication Module (VCM) LED prove-out confirms power and ground from the DLC are provided to the VCM.

     If the Integrated Diagnostic System (IDS) does not communicate with the VCM:
     - Check the VCM connection to the vehicle.
     - Check the scan tool connection to the VCM.
     - GO to Pinpoint Test L, to diagnose No Power To The Scan Tool.
4. Establish a scan tool session.
   - **NOTE:** The scan tool will first attempt to communicate with the PCM, after establishing communication with the PCM, the scan tool will then attempt to communicate with all other modules on the vehicle.

     If an IDS session cannot be established with the vehicle, (IDS may state ‘‘No communication can be established with the PCM’’):
     - Choose ‘‘NO’’ when the scan tool prompts whether or not to retry communication.
     - Enter either a PCM part number, tear tag or calibration number to identify the vehicle and start a session (the PCM part number and 4-character tear tag are printed on the PCM label).
     - GO to Pinpoint Test A, to diagnose The PCM Does Not Respond To The Scan Tool.
5. Carry out the network test.
   - If the network test passes, retrieve and record the continuous memory DTCs and proceed to Step 6.
   - If the network test fails, GO to Symptom Chart to diagnose the failed communication network.
   - If a module fails to communication during the network test, GO to Symptom Chart.
6. Retrieve and review the DTCs.
   - If the DTCs retrieved are related to the concern, go to DTC Charts. Follow the non-network DTC diagnostics (B-codes, C-codes, P-codes) prior to the network DTC diagnostics (U-codes). For all other DTCs, refer to the Diagnostic Trouble Code (DTC) Chart in Section 419-10.
   - If no DTCs related to the concern are retrieved, GO to Symptom Chart.

DIAGNOSIS AND TESTING (Continued)

DTC Charts

NOTE: Network DTCs (U-codes) are often a result of intermittent concerns such as faulty wiring or low battery voltage occurrences. Additionally, vehicle service procedures such as module reprogramming will often set network DTCs. Replacing a module to resolve a network DTC is unlikely to resolve the concern. To prevent repeat network DTC concerns, inspect all network wiring, especially connectors. Test the vehicle battery, refer to Section 414-01.

Communication Network DTC Chart

NOTE: DTC U1900 will set in a module that is reporting a communication fault from another module on the data bus. The module that reports the fault is not the problem module.

DTC	Description	Source	Action
U0073	Control Module Communication Bus A Off	ABS module	DTC U0073 indicates the module could not communicate on the network at a point in time. The fault is currently not present. CLEAR the DTC. REPEAT the network test with the scan tool.
U0073	Control Module Communication Bus A Off	Instrument Cluster (IC)	DTC U0073 indicates the module could not communicate on the network at a point in time. The fault is currently not present. CLEAR the DTC. REPEAT the network test with the scan tool.
U0073	Control Module Communication Bus A Off	Smart Junction Box (SJB)	DTC U0073 indicates the module could not communicate on the network at a point in time. The fault is currently not present. CLEAR the DTC. REPEAT the network test with the scan tool.
U0140	Lost Communication With Body Control Module (GEM)	Audio Control Module (ACM)	REFER to Section 415-00.
U0155	Lost Communication With Instrument Panel Cluster (IC) Control Module	ACM	REFER to Section 415-00.
U0159	Lost Communication With Parking Assist Control Module (PAM)	ACM	DISREGARD this DTC.
U0184	Lost Communication With Radio (ACM)	Satellite Digital Audio Receiver System (SDARS) module	REFER to Section 415-00.
U0193	Lost Communication With Digital Audio Control Module (SDARS)	ACM	REFER to Section 415-00.
U0196	Lost Communication With Entertainment Control Module - Rear (AUX)	ACM	DISREGARD this DTC. This vehicle is not equipped with an auxiliary ACM.
U0197	Lost Communication With Telephone Control Module	ACM	DISREGARD this DTC. This vehicle is not equipped with a telephone control module.

DIAGNOSIS AND TESTING (Continued)

Communication Network DTC Chart (Continued)

DTC	Description	Source	Action
U0197	Lost Communication With Telephone Control Module	SDARS module	DISREGARD this DTC. This vehicle is not equipped with a telephone control module.
U0238	Lost Communication With Digital Audio Control Module ‘‘D’’ (DSP)	ACM	DISREGARD this DTC. This vehicle is not equipped with a networked audio Digital Signal Processing (DSP) module.
U0249	Lost Communication With Entertainment Control Module - Rear ‘‘B’’ (RCU)	ACM	DISREGARD this DTC. This vehicle is not equipped with a Rear Entertainment Module (RETM).
U1900	CAN Communication Bus Fault-Receive Error	ABS module	GO to Symptom Chart for module that failed network test.
U1900	CAN Communication Bus Fault-Receive Error	IC	GO to Symptom Chart for module that failed network test.
U1900	CAN Communication Bus Fault-Receive Error	SJB	GO to Symptom Chart for module that failed network test.
U2011	Module Transmitted Invalid Data (Non-SCP)	ABS module	RETRIEVE and FOLLOW DTCs from the PCM.
U2023	Fault Received From External Node	IC	RETRIEVE AND FOLLOW non-network DTCs from module with non-network fault code present. REFER to Section 419-10.
U2033	VSM Communication Link Failure	SJB	The communication network to the overhead console is not accessible through the vehicle Data Link Connector (DLC). REFER to Section 419-01A.
U2473	Unexpected Vehicle Speed (VSS)	ACM	REFER to Section 415-00.

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
• The PCM does not respond to the scan tool	• Wiring, terminals or connectors • PCM	• REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual, Section 5, pinpoint test QA before proceeding to Pinpoint Test A. If pinpoint test QA has been completed, GO to Pinpoint Test A.
• The ABS module does not respond to the scan tool	• Fuse • Wiring, terminals or connectors • ABS module	• GO to Pinpoint Test B.
• The Instrument Cluster (IC) does not respond to the scan tool	• Fuse • Wiring, terminals or connectors • IC	• GO to Pinpoint Test C.

DIAGNOSIS AND TESTING (Continued)

Symptom Chart (Continued)

Condition	Possible Sources	Action
• The Smart Junction Box (SJB) does not respond to the scan tool	• Fuse • Wiring, terminals or connectors • SJB	• GO to Pinpoint Test D.
• The Audio Control Module (ACM) does not respond to the scan tool	• Fuse • Wiring, terminals or connectors • ACM	• GO to Pinpoint Test E.
• The Satellite Digital Audio Receiver System (SDARS) module does not respond to the scan tool	• Fuse • Wiring, terminals or connectors • SDARS module	• GO to Pinpoint Test F.
• The Restraints Control Module (RCM) does not respond to the scan tool or no ISO 9141 network communication	• Fuse • Wiring, terminals or connectors • RCM	• GO to Pinpoint Test G.
• Intermittent no Medium Speed Controller Area Network (MS-CAN) communication, communication can be intermittently established	• Wiring, terminals or connectors	• GO to Pinpoint Test H.
• No Medium Speed Controller Area Network (MS-CAN) communication, communication can be intermittently established	• Wiring, terminals or connectors • SJB • ACM • SDARS module (if equipped) • IC	• GO to Pinpoint Test I.
• Intermittent no High Speed Controller Area Network (HS-CAN) communication, communication can be intermittently established	• Wiring, terminals or connectors	• GO to Pinpoint Test J.
• No High Speed Controller Area Network (HS-CAN) communication, all modules are not responding	• Wiring, terminals or connectors • ABS module (if equipped) • IC • PCM	• GO to Pinpoint Test K.
• No power to the scan tool	• Fuse • Wiring, terminals or connectors • Scan tool • Data Link Connector (DLC)	• GO to Pinpoint Test L.

Pinpoint Tests

Pinpoint Test A: The PCM Does Not Respond To The Scan Tool

Refer to Wiring Diagrams Cell 14, Module Communications Network for schematic and connector information.

Refer to Wiring Diagrams Cell 23, Electronic Engine Controls - 4.0L for schematic and connector information.

Refer to Wiring Diagrams Cell 24, Electronic Engine Controls - 4.6L for schematic and connector information.

DIAGNOSIS AND TESTING (Continued)

Refer to Wiring Diagrams Cell 25, Electronic Engine Controls - 5.4L for schematic and connector information.

Normal Operation

The PCM communicates with the scan tool through the High Speed Controller Area Network (HS-CAN). Circuits 1827 (WH/LG) (HS-CAN +) and 1828 (PK/LG) (HS-CAN -) provide the network connection to the PCM. The PCM shares the HS-CAN with the ABS module (if equipped), and the Instrument Cluster (IC).

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- PCM

PINPOINT TEST A: THE PCM DOES NOT RESPOND TO THE SCAN TOOL

NOTICE: **Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.**

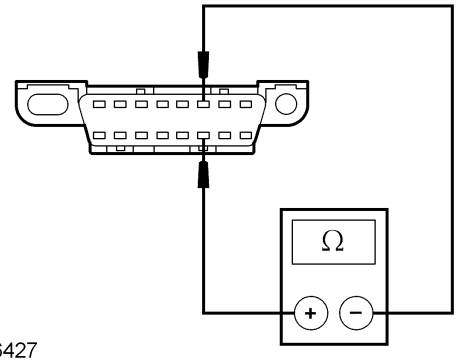
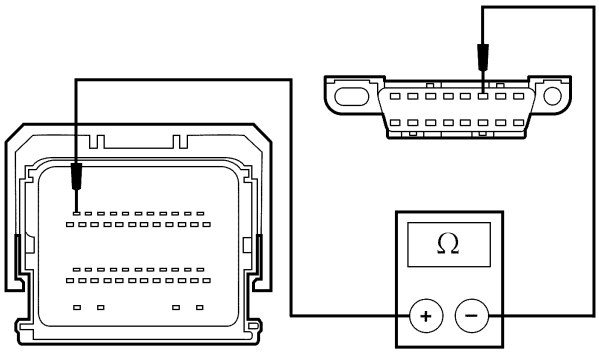
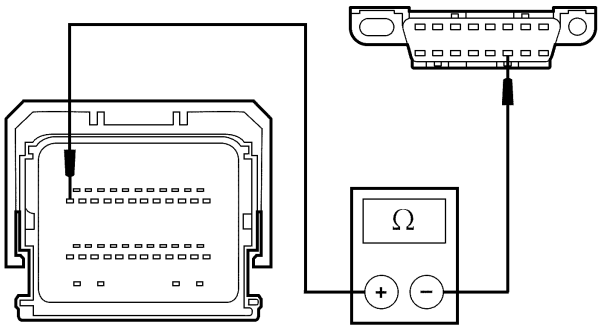
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
A1	**VERIFY WHETHER OTHER HS-CAN MODULES PASS THE NETWORK TEST**	
	• Enter the following diagnostic mode on the scan tool: Network Test. • In the left hand pane of the IDS network test display screen, verify whether any HS-CAN modules passed the network test. • **Is the text ''pass'' or a DTC listed next to any of the following modules: ABS module, Instrument Cluster (IC) or PCM?**	**Yes** If ''pass'' or a DTC was listed next to the PCM, a network fault is not currently present. GO to Pinpoint Test J to diagnose an intermittent HS-CAN fault condition. If ''pass'' or a DTC was listed next to one or more modules other than the PCM, GO to **A2**. **No** No modules are currently communicating on the HS-CAN. GO to Pinpoint Test K to diagnose no HS-CAN communication.
A2	**PC/ED MANUAL PINPOINT TEST QA VERIFICATION CHECK**	
	• Verify that the Powertrain Control/Emissions Diagnosis (PC/ED) pinpoint test QA has been performed. • **Has pinpoint test QA been performed?**	**Yes** GO to **A3**. **No** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual, Section 5, pinpoint test QA to diagnose no communication with the PCM.
A3	**CHECK THE HS-CAN TERMINATION RESISTANCE**	
	• Ignition OFF. • Disconnect: Negative Battery Cable.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST A: THE PCM DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
A3	CHECK THE HS-CAN TERMINATION RESISTANCE (Continued)	
	• Measure the resistance between the Data Link Connector (DLC) C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance between 54 and 66 ohms?**	**Yes** CONNECT the negative battery cable. GO to **A5**. **No** GO to **A4**.
A4	CHECK THE CAN CIRCUITS BETWEEN THE PCM AND THE DLC FOR AN OPEN	
	• Disconnect: PCM C175b. • Measure the resistance between the PCM C175b-11, circuit 1827 (WH/LG), harness side and the DLC C251-6, circuit 1827 (WH/LG), harness side.  N0002560 • Measure the resistance between the PCM C175b-23, circuit 1828 (PK/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0002561 • **Are the resistances less than 5 ohms?**	**Yes** CONNECT the negative battery cable. GO to **A5**. **No** REPAIR the circuit in question. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST A: THE PCM DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
A5	**CHECK FOR CORRECT PCM OPERATION**	
	• Disconnect all the PCM connectors. • Check for: — corrosion — damaged pins — pushed-out pins • Connect all the PCM connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new PCM. REFER to Section 303-14. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.

Pinpoint Test B: The ABS Module Does Not Respond To The Scan Tool

Refer to Wiring Diagrams Cell 14, Module Communications Network for schematic and connector information.

Refer to Wiring Diagrams Cell 42, Vehicle Dynamic Systems for schematic and connector information.

Normal Operation

The ABS module communicates with the scan tool through the High Speed Controller Area Network (HS-CAN). Circuits 1827 (WH/LG) (HS-CAN +) and 1828 (PK/LG) (HS-CAN -) provide the network connection to the ABS module. The ABS module shares the HS-CAN with the PCM and the Instrument Cluster (IC). Voltage for the ABS module is provided by circuits 601 (LB/PK) and 1844 (LG/RD). Both circuits 1205 (BK) provide ground.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- ABS module

PINPOINT TEST B: THE ABS MODULE DOES NOT RESPOND TO THE SCAN TOOL

NOTICE: **Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.**

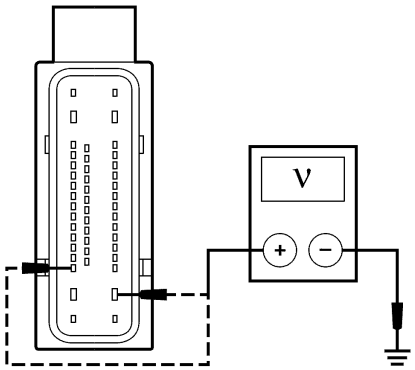
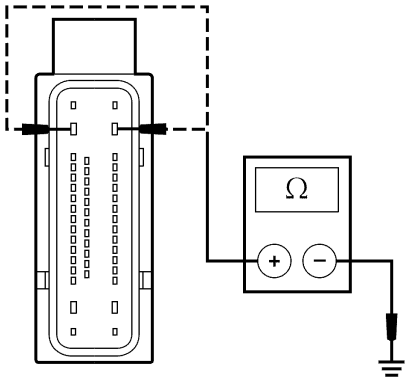
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
B1	**CHECK THE ABS MODULE VOLTAGE SUPPLY CIRCUITS FOR AN OPEN**	
	• Ignition OFF. • Disconnect: ABS Module C135. • Ignition ON.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

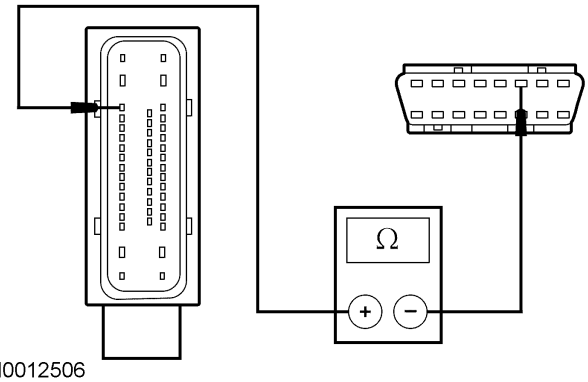
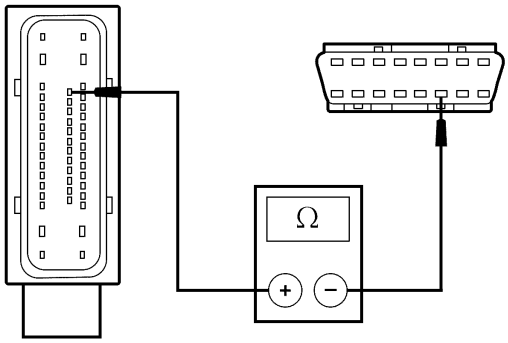
PINPOINT TEST B: THE ABS MODULE DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
B1	**CHECK THE ABS MODULE VOLTAGE SUPPLY CIRCUITS FOR AN OPEN (Continued)**	
	• Measure the voltage between the ABS module C135-2, circuit 601 (LB/PK), harness side and ground; and between the ABS module C135-32, circuit 1844 (LG/RD), harness side and ground.  N0012329 • **Are the voltages greater than 10 volts?**	**Yes** GO to **B2**. **No** VERIFY the SJB fuse 18 (10A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the Wiring Diagrams Manual to IDENTIFY the possible causes of the short circuit. VERIFY the Bussed Electrical Center (BEC) fuse 65 (30A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the Wiring Diagrams Manual to IDENTIFY the possible causes of the short circuit. CLEAR the DTCs. REPEAT the network test with the scan tool.
B2	**CHECK THE ABS MODULE GROUND CIRCUITS FOR AN OPEN**	
	• Ignition OFF. • Disconnect: Negative Battery Cable. • Measure the resistance between the ABS module C135-16, circuit 1205 (BK), harness side and ground; and between the ABS module C135-45, circuit 1205 (BK), harness side and ground.  N0009314 • **Are the resistances less than 5 ohms?**	**Yes** GO to **B3**. **No** REPAIR the circuit in question. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST B: THE ABS MODULE DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
B3	**CHECK THE HS-CAN CIRCUITS BETWEEN THE ABS MODULE AND THE DLC FOR AN OPEN**	
	• Measure the resistance between the ABS module C135-3, circuit 1827 (WH/LG), harness side and the Data Link Connector (DLC) C251-6, circuit 1827 (WH/LG), harness side.  N0012506 • Measure the resistance between the ABS module C135-18, circuit 1828 (PK/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0012507 • **Are the resistances less than 5 ohms?**	**Yes** CONNECT the negative battery cable. GO to **B4**. **No** REPAIR the circuit in question. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
B4	**CHECK FOR CORRECT ABS MODULE OPERATION**	
	• Disconnect the ABS module connector. • Check for: — corrosion — damaged pins — pushed-out pins • Connect the ABS module connector and make sure it seats correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new ABS module. REFER to Section 206-09. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.

Pinpoint Test C: The Instrument Cluster (IC) Does Not Respond To The Scan Tool

Refer to Wiring Diagrams Cell 14, Module Communications Network for schematic and connector information.

Refer to Wiring Diagrams Cell 60, Instrument Cluster for schematic and connector information.

DIAGNOSIS AND TESTING (Continued)

Normal Operation

The Instrument Cluster (IC) communicates with the scan tool through the High Speed Controller Area Network (HS-CAN). Circuits 1827 (WH/LG) (HS-CAN +) and 1828 (PK/LG) (HS-CAN -) provide the HS-CAN connection to the IC and circuits 1847 (WH/OG) (MS-CAN +) and 1848 (PK/OG) (MS-CAN -) provide the MS-CAN connection to the IC. The IC shares the HS-CAN with the PCM, and the ABS module (if equipped). Voltage for the IC is provided by circuits 489 (PK/BK), 1001 (LG/RD) and 1266 (RD/YE). Circuit 1205 (BK) provides ground.

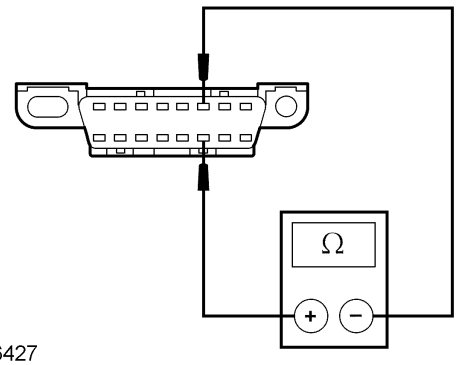
This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- IC

PINPOINT TEST C: THE IC DOES NOT RESPOND TO THE SCAN TOOL

NOTICE: **Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.**

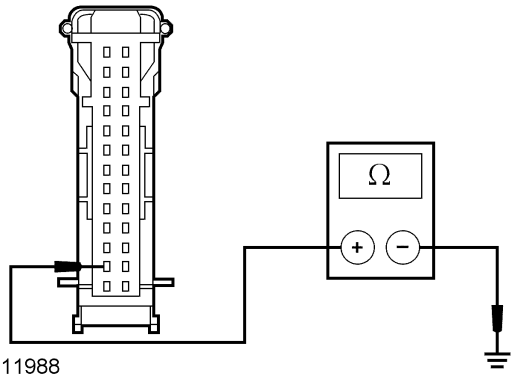
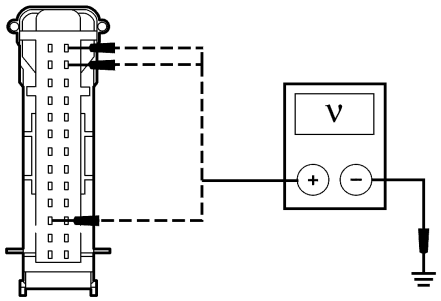
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
C1	**CHECK THE HS-CAN TERMINATION RESISTANCE**	
	• Ignition OFF. • Disconnect: Negative Battery Cable. • Disconnect the scan tool cable from the Data Link Connector (DLC). • Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance between 54 and 66 ohms?**	**Yes** GO to **C2**. **No** GO to **C4**.

(Continued)

DIAGNOSIS AND TESTING (Continued)

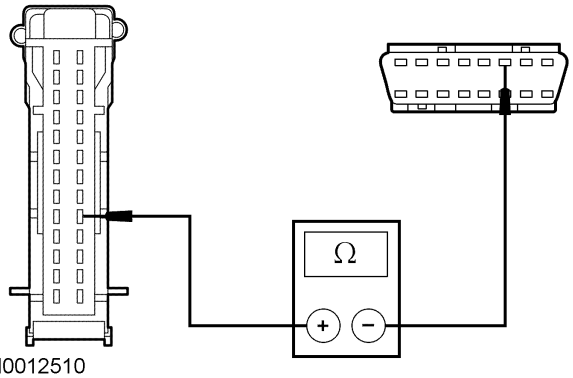
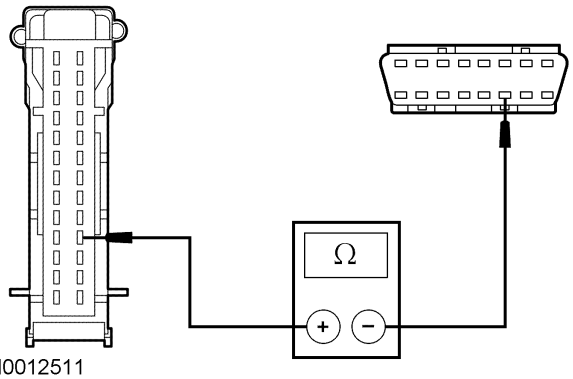
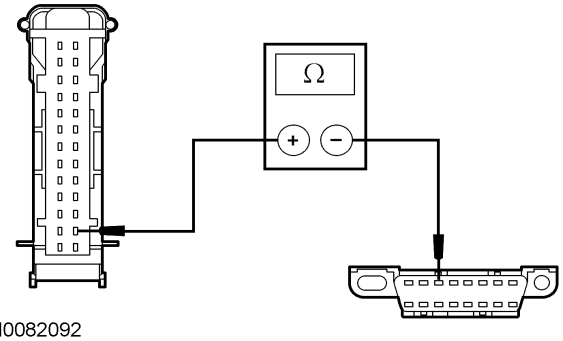
PINPOINT TEST C: THE IC DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step	Result / Action to Take
C2 CHECK THE IC GROUND CIRCUIT FOR AN OPEN • Measure the resistance between the IC C220-2, circuit 1205 (BK) harness side and ground.  N0011988 • **Is the resistance less than 5 ohms?**	**Yes** CONNECT the negative battery cable. GO to **C3**. **No** REPAIR the circuit. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
C3 CHECK THE IC VOLTAGE SUPPLY CIRCUITS FOR AN OPEN • Disconnect: IC C220. • Ignition ON. • Measure the voltage between the IC, harness side and ground as follows: C220-3 — 1001 (LG/RD) C220-25 — 1266 (RD/YE) C220-26 — 489 (PK/BK)  N0084256 • **Are the voltages greater than 10 volts?**	**Yes** GO to **C3**. **No** VERIFY the SJB fuses 8 (10A), 16 (5A), and 19 (5A) are OK. If OK, REPAIR the circuit in question. If not OK, REFER to the Wiring Diagrams Manual to IDENTIFY the possible causes of the short circuit. CLEAR the DTCs. REPEAT the network test with the scan tool.

(Continued)

DIAGNOSIS AND TESTING (Continued)

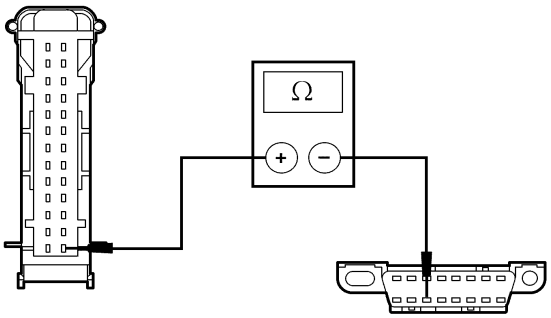
PINPOINT TEST C: THE IC DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
C4	**CHECK THE HS-CAN CIRCUITS BETWEEN IC AND THE DLC FOR AN OPEN**	
	• Measure the resistance between the IC C220-18, circuit 1827 (WH/LG), harness side and the Data Link Connector (DLC) C251-6, circuit 1827 (WH/LG), harness side.  N0012510 • Measure the resistance between the IC C220-17, circuit 1828 (PK/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0012511 • **Are the resistances less than 5 ohms?**	**Yes** GO to **C5**. **No** REPAIR the circuit in question. CLEAR the DTCs. REPEAT the network test with the scan tool.
C5	**CHECK THE MS-CAN CIRCUITS BETWEEN THE IC AND THE DLC FOR AN OPEN**	
	• Measure the resistance between the IC C220-15, circuit 1847 (WH/OG), harness side and the DLC C251-3, circuit 1847 (WH/OG), harness side.  N0082092	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST C: THE IC DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
C5	**CHECK THE MS-CAN CIRCUITS BETWEEN THE IC AND THE DLC FOR AN OPEN (Continued)**	
	• Measure the resistance between the IC C220-14, circuit 1848 (PK/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0082093 • **Are the resistances less than 5 ohms?**	**Yes** CONNECT the negative battery cable. GO to **C6**. **No** REPAIR the circuit in question. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
C6	**CHECK FOR CORRECT IC OPERATION**	
	• Disconnect the IC connector. • Check for: — corrosion — damaged pins — pushed-out pins • Connect the IC connector and make sure it seats correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new IC. REFER to Section 413-01. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.

Pinpoint Test D: The Smart Junction Box (SJB) Does Not Respond To The Scan Tool

Refer to Wiring Diagrams Cell 10, Grounds for schematic and connector information.

Refer to Wiring Diagrams Cell 13, Power Distribution/SJB for schematic and connector information.

Refer to Wiring Diagrams Cell 14, Module Communications Network for schematic and connector information.

Normal Operation

The Smart Junction Box (SJB) communicates with the scan tool through the Medium Speed Controller Area Network (MS-CAN). Circuits 1847 (WH/OG) (MS-CAN +) and 1848 (PK/OG) (MS-CAN -) provide the network connection to the SJB. The SJB shares the MS-CAN with the Audio Control Module (ACM), the Satellite Digital Audio Receiver System (SDARS) module (if equipped) and the Instrument Cluster (IC). Voltage for the SJB is provided by circuits 905 (GY/LB), 1052 (TN/BK) and 1523 (DG). Both circuits 1205 (BK) provide ground.

This pinpoint test is intended to diagnose the following:

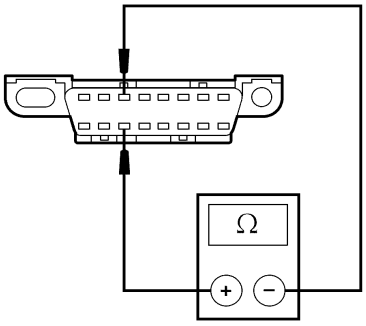
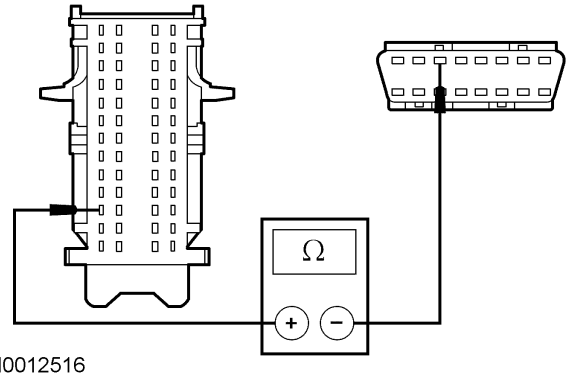
- Fuse
- Wiring, terminals or connectors
- SJB

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST D: THE SJB DOES NOT RESPOND TO THE SCAN TOOL

NOTICE: **Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.**

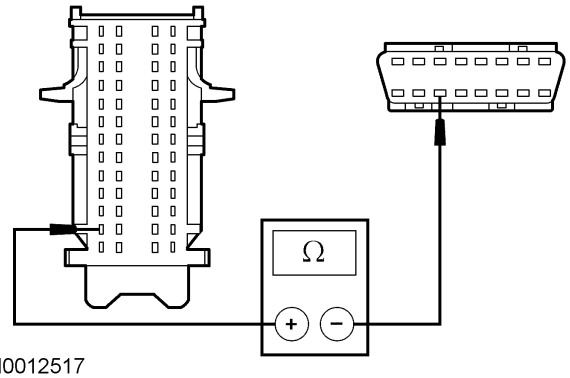
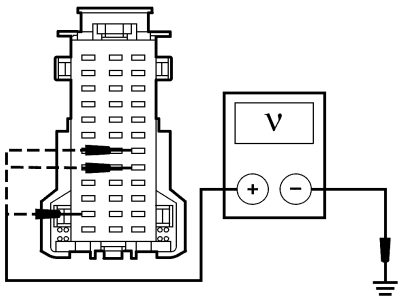
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
D1	**CHECK THE MS-CAN TERMINATION RESISTANCE**	
	• Ignition OFF. • Disconnect: Negative Battery Cable. • Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance between 54 and 66 ohms?**	**Yes** GO to **D3**. **No** GO to **D2**.
D2	**CHECK THE MS-CAN CIRCUITS BETWEEN THE SJB AND THE DLC FOR AN OPEN**	
	• Disconnect: SJB C2280b. • Measure the resistance between the SJB C2280b-50, circuit 1847 (WH/OG), harness side and the Data Link Connector (DLC) C251-3, circuit 1847 (WH/OG), harness side.  N0012516	

(Continued)

DIAGNOSIS AND TESTING (Continued)

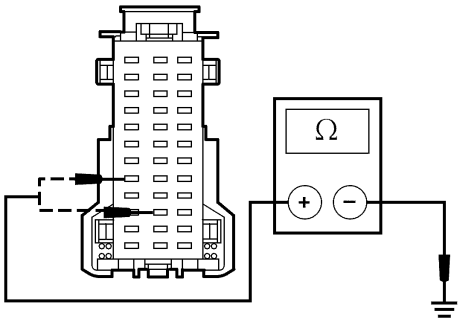
PINPOINT TEST D: THE SJB DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
D2	**CHECK THE MS-CAN CIRCUITS BETWEEN THE SJB AND THE DLC FOR AN OPEN (Continued)**	
	• Measure the resistance between the SJB C2280b-51, circuit 1848 (PK/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0012517 • **Are the resistances less than 5 ohms?**	**Yes** GO to D3. **No** REPAIR the circuit in question. CLEAR the DTCs. REPEAT the network test with the scan tool.
D3	**CHECK THE SJB VOLTAGE SUPPLY CIRCUITS FOR AN OPEN**	
	• Ignition OFF. • Disconnect: SJB C2280h. • Connect: Negative Battery Cable. • Ignition ON. • Measure the voltage between the SJB, harness side and ground as follows: Connector-Pin / Circuit: C2280h-11 — 1523 (DG) C2280h-31 — 905 (GY/LB) C2280h-32 — 1052 (TN/BK)  N0094211 • **Are the voltages greater than 10 volts?**	**Yes** GO to D4. **No** VERIFY the Bussed Electrical Center (BEC) fuse(s) 59 (30A), 63 (30A) and 67 (30A) are OK. If OK, REPAIR the circuit in question. If not OK, REFER to the Wiring Diagrams Manual to IDENTIFY the possible causes of the short circuit. CLEAR the DTCs. REPEAT the network test with the scan tool.
D4	**CHECK THE SJB GROUND CIRCUITS FOR AN OPEN**	
	• Ignition OFF.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST D: THE SJB DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
D4	**CHECK THE SJB GROUND CIRCUITS FOR AN OPEN (Continued)**	
• Measure the resistance between the SJB C2280h-8, circuit 1205 (BK), harness side and ground; and between the SJB C2280h-22, circuit 1205 (BK), harness side and ground.  N0026852 • **Are the resistances less than 5 ohms?**		**Yes** CONNECT the negative battery cable. GO to **D5**. **No** REPAIR the circuit in question. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
D5	**CHECK FOR CORRECT SJB OPERATION**	
• Disconnect all the SJB connectors. • Check for: — corrosion — damaged pins — pushed-out pins • Connect all the SJB connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**		**Yes** INSTALL a new SJB. REFER to Section 419-10. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.

Pinpoint Test E: The Audio Control Module (ACM) Does Not Respond To The Scan Tool

Refer to Wiring Diagrams Cell 14, Module Communications Network for schematic and connector information.

Refer to Wiring Diagrams Cell 130, Audio System/Navigation for schematic and connector information.

Normal Operation

The Audio Control Module (ACM) communicates with the scan tool through the Medium Speed Controller Area Network (MS-CAN). Circuits 1847 (WH/OG) (MS-CAN +) and 1848 (PK/OG) (MS-CAN -) provide the network connection to the ACM. The ACM shares the MS-CAN with the Smart Junction Box (SJB), the SDARS module (if equipped), and the Instrument Cluster (IC). Voltage for the ACM is provided by circuits 687 (GY/YE) and 729 (RD/WH). Circuit 1204 (BK/OG) provides ground.

This pinpoint test is intended to diagnose the following:

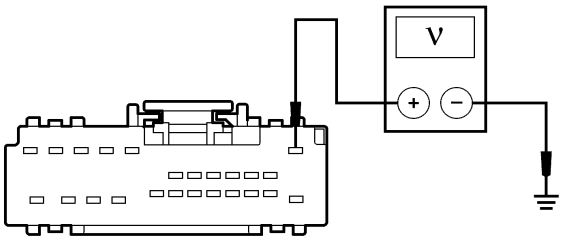
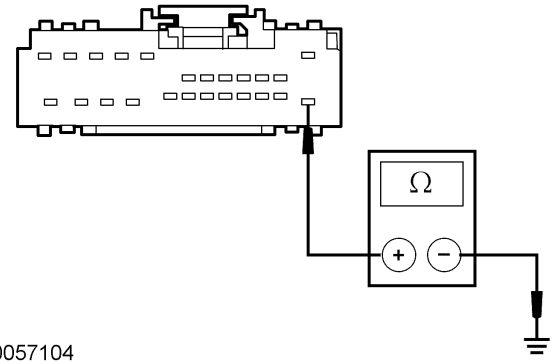
- Fuse
- Wiring, terminals or connectors
- ACM

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST E: THE ACM DOES NOT RESPOND TO THE SCAN TOOL

NOTICE: **Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.**

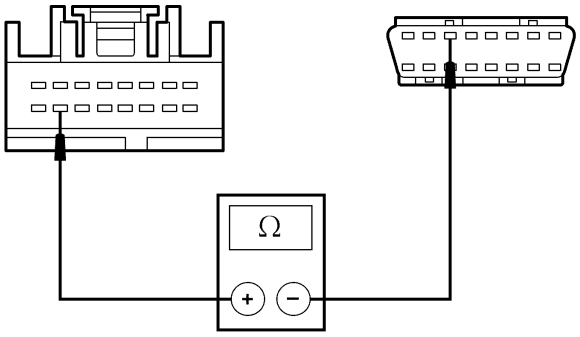
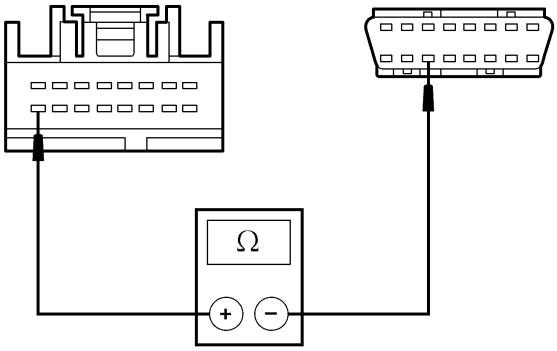
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
E1	**CHECK THE ACM VOLTAGE SUPPLY CIRCUITS FOR AN OPEN**	
	• Ignition OFF. • Disconnect: ACM C290d. • Ignition ON. • Measure the voltage between the ACM C290d-1, circuit 729 (RD/WH), harness side and ground.  N0062412 • **Are the voltages greater than 10 volts?**	**Yes** GO to **E2**. **No** VERIFY the Bussed Electrical Center (BEC) fuse 56 (20A) is OK. If OK, REPAIR the circuit in question. If not OK, REFER to the Wiring Diagrams Manual to IDENTIFY the possible causes of the short circuit. CLEAR the DTCs. REPEAT the network test with the scan tool.
E2	**CHECK THE ACM GROUND CIRCUIT FOR AN OPEN**	
	• Ignition OFF. • Disconnect: Negative Battery Cable. • Measure the resistance between the ACM C290d-13, circuit 1204 (BK/OG), harness side and ground.  A0057104 • **Is the resistance less than 5 ohms?**	**Yes** GO to **E3**. **No** REPAIR the circuit. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
E3	**CHECK THE MS-CAN CIRCUITS BETWEEN THE ACM AND THE DLC FOR AN OPEN**	
	• Disconnect: ACM C290a.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST E: THE ACM DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
E3	**CHECK THE MS-CAN CIRCUITS BETWEEN THE ACM AND THE DLC FOR AN OPEN (Continued)**	
	• Measure the resistance between the ACM C290a-15, circuit 1847 (WH/OG), harness side and the Data Link Connector (DLC) C251-3, circuit 1847 (WH/OG), harness side.  N0012514 • Measure the resistance between the ACM C290a-16, circuit 1848 (PK/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0012515 • **Are the resistances less than 5 ohms?**	**Yes** CONNECT the negative battery cable. GO to **E4**. **No** REPAIR the circuit in question. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
E4	**CHECK FOR CORRECT ACM OPERATION**	
	• Disconnect all the ACM connectors. • Check for: — corrosion — damaged pins — pushed-out pins • Connect all the ACM connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new ACM. REFER to Section 415-00. TEST the system for normal operation. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.

DIAGNOSIS AND TESTING (Continued)

Pinpoint Test F: The Satellite Digital Audio Receiver System (SDARS) Module Does Not Respond To The Scan Tool

Normal Operation

The Satellite Digital Audio Receiver System (SDARS) module communicates with the scan tool through the Medium Speed Controller Area Network (MS-CAN). Circuits 1847 (WH/OG) (MS-CAN +) and 1848 (PK/OG) (MS-CAN -) provide the network connection to the SDARS module. The SDARS module shares the MS-CAN with the Smart Junction Box (SJB), the Audio Control Module (ACM) and the Instrument Cluster (IC). Voltage for the SDARS module is provided by circuit 729 (RD/WH). Ground is provided by circuit 1204 (BK/OG).

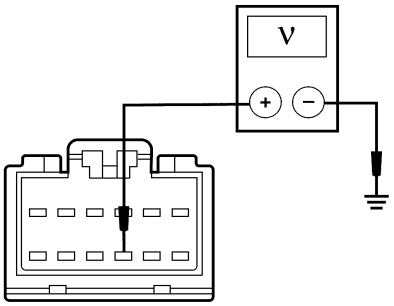
This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals and connectors
- SDARS module

PINPOINT TEST F: THE SDARS MODULE DOES NOT RESPOND TO THE SCAN TOOL

NOTICE: **Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.**

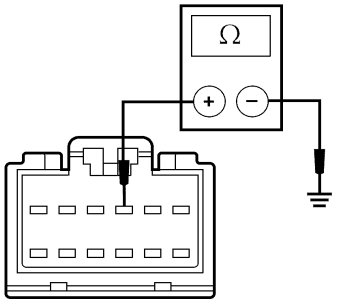
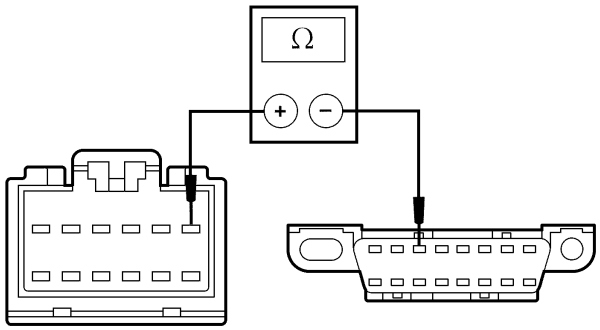
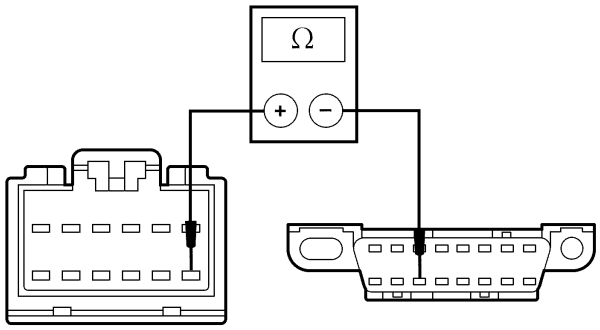
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
F1	**CHECK THE SDARS MODULE VOLTAGE SUPPLY CIRCUIT FOR AN OPEN**	
	• Ignition OFF. • Disconnect: SDARS Module C4344. • Ignition ON. • Measure the voltage between the SDARS module C4344-9, circuit 729 (RD/WH), harness side and ground.  N0053245 • **Is the voltage greater than 10 volts?**	**Yes** GO to F2. **No** VERIFY the Bussed Electrical Center (BEC) fuse 56 (20A) is OK. If OK, REPAIR the circuit in question. If not OK, REFER to the Wiring Diagrams Manual to IDENTIFY the possible causes of the short circuit. CLEAR the DTCs. REPEAT the network test with the scan tool.
F2	**CHECK THE SDARS MODULE GROUND CIRCUIT FOR AN OPEN**	
	• Ignition OFF. • Disconnect: Negative Battery Cable.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST F: THE SDARS MODULE DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
F2	**CHECK THE SDARS MODULE GROUND CIRCUIT FOR AN OPEN (Continued)**	
	• Measure the resistance between the SDARS module C4344-3, circuit 1204 (BK/OG), harness side and ground.  N0053246 • **Is the resistance less than 5 ohms?**	**Yes** GO to **F3**. **No** REPAIR the circuit. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
F3	**CHECK THE MS-CAN CIRCUITS BETWEEN THE SDARS MODULE AND THE DLC FOR AN OPEN**	
	• Measure the resistance between the SDARS module C4344-1, circuit 1847 (WH/OG), harness side and the Data Link Connector (DLC) C251-3, circuit 1847 (WH/OG), harness side.  N0026834 • Measure the resistance between the SDARS module C4344-7, circuit 1848 (PK/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0026835 • **Are the resistances less than 5 ohms?**	**Yes** CONNECT the negative battery cable. GO to **F4**. **No** REPAIR the circuit. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST F: THE SDARS MODULE DOES NOT RESPOND TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
F4	CHECK FOR CORRECT SDARS MODULE OPERATION	
	• Disconnect the SDARS module connector. • Check for: — corrosion — damaged pins — pushed-out pins • Connect the SDARS module connector and make sure it seats correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new SDARS module. REFER to Section 415-00. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.

Pinpoint Test G: The Restraints Control Module (RCM) Does Not Respond To The Scan Tool Or No ISO 9141 Network Communication

Refer to Wiring Diagrams Cell 14, Module Communications Network for schematic and connector information.

Refer to Wiring Diagrams Cell 46, Supplemental Restraint System for schematic and connector information.

Normal Operation

The Restraints Control Module (RCM) communicates with the scan tool through the ISO 9141 communications network, circuit 70 (LB/WH). The RCM is the only module on the ISO 9141 network. Voltage for the RCM is provided by circuit 937 (RD/WH). Ground is provided by circuit 1203 (BK/LB).

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- RCM

PINPOINT TEST G: PINPOINT TEST G: THE RCM DOES NOT RESPOND TO THE SCAN TOOL OR NO ISO 9141 NETWORK COMMUNICATION

⚠ WARNING: Never probe the electrical connectors on air bag, safety canopy or side air curtain modules. Failure to follow this instruction may result in the accidental deployment of these modules, which increases the risk of serious personal injury or death.

⚠ WARNING: Never probe the electrical connectors on safety belt buckle/retractor pretensioners or adaptive load limiting retractors. Failure to follow this instruction may result in the accidental deployment of the safety belt pretensioners or adaptive load limiting retractors, which increases the risk of serious personal injury or death.

NOTE: The Supplemental Restraint System (SRS) must be fully operational and free of faults before releasing the vehicle to the customer.

NOTE: Most faults are due to connector and/or wiring concerns. Carry out a thorough inspection and verification before proceeding with the pinpoint test.

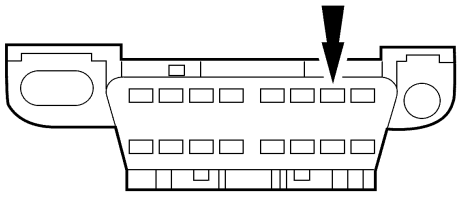
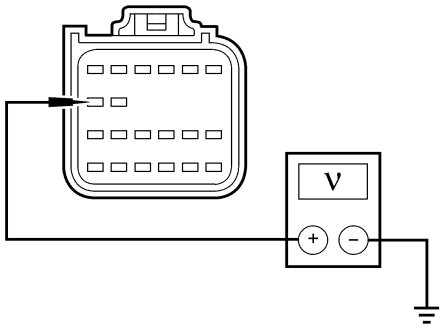
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
G1	CHECK THE Data Link Connector (DLC) PINS FOR DAMAGE	
	• Ignition OFF. • Disconnect the scan tool cable from the DLC.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

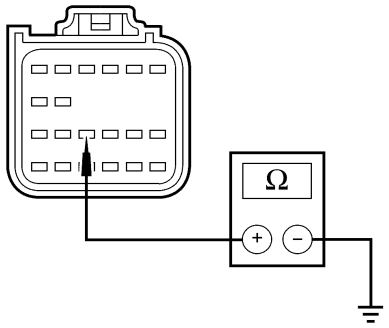
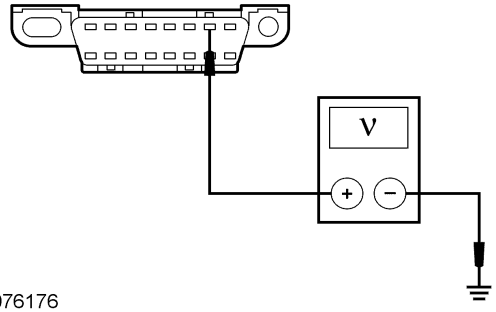
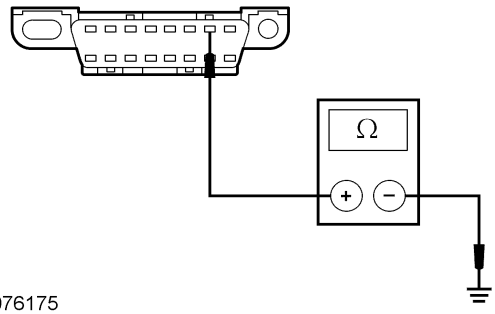
PINPOINT TEST G: PINPOINT TEST G: THE RCM DOES NOT RESPOND TO THE SCAN TOOL OR NO ISO 9141 NETWORK COMMUNICATION (Continued)

Test Step		Result / Action to Take
G1	**CHECK THE Data Link Connector (DLC) PINS FOR DAMAGE (Continued)**	
	• Inspect the DLC C251-7 for damage.  N0053184 • **Is the DLC pin 7 OK?**	**Yes** GO to **G2**. **No** REPAIR the DLC as necessary. CLEAR the DTCs. REPEAT the network test with the scan tool.
G2	**CHECK THE RCM CONNECTION**	
	• Depower the SRS. Refer to Section 501-20B. • Disconnect: RCM C2041a. • **Are RCM C2041a pins 11, 12 and 16 OK?**	**Yes** GO to **G3**. **No** REPAIR the RCM connector pins as necessary. REPOWER the SRS. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the network test with the scan tool.
G3	**CHECK THE RCM VOLTAGE SUPPLY CIRCUIT FOR AN OPEN**	
	• Deactivate the SRS. Refer to Section 501-20B. • Repower the SRS. Refer to Section 501-20B. • Ignition ON. • Measure the voltage between RCM C2041a-12, circuit 937 (RD/WH), harness side and ground.  A0039638 • **Is the voltage greater than 10 volts?**	**Yes** GO to **G4**. **No** VERIFY the Smart Junction Box (SJB) fuse 17 (10A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the Wiring Diagrams Manual to IDENTIFY the possible causes of the short circuit. REACTIVATE the SRS. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the network test with the scan tool.
G4	**CHECK THE RCM GROUND CIRCUIT FOR AN OPEN**	
	• Ignition OFF. • Disconnect: Negative Battery Cable.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

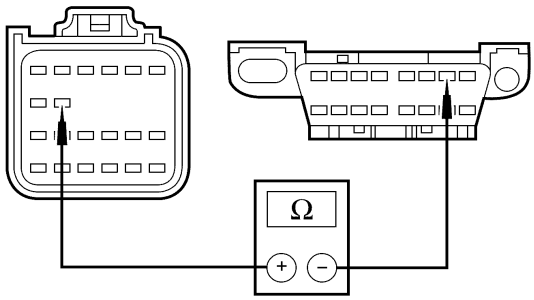
PINPOINT TEST G: PINPOINT TEST G: THE RCM DOES NOT RESPOND TO THE SCAN TOOL OR NO ISO 9141 NETWORK COMMUNICATION (Continued)

Test Step		Result / Action to Take
G4	**CHECK THE RCM GROUND CIRCUIT FOR AN OPEN (Continued)**	
	• Measure the resistance between RCM C2041a-16, circuit 1203 (BK/LB), harness side and a sheet metal ground near the RCM.  A0039639 • **Is the resistance less than 5 ohms?**	**Yes** CONNECT the negative battery cable. GO to **G5**. **No** REPAIR the circuit. CONNECT the negative battery cable. REACTIVATE the SRS. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the network test with the scan tool.
G5	**CHECK THE ISO 9141 CIRCUIT FOR A SHORT TO VOLTAGE**	
	• Ignition ON. • Measure the voltage between the DLC C251-7, circuit 70 (LB/WH), harness side and ground.  A0076176 • **Is any voltage present?**	**Yes** REPAIR the circuit. REACTIVATE the SRS. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** GO to **G6**.
G6	**CHECK THE ISO 9141 CIRCUIT FOR A SHORT TO GROUND**	
	• Ignition OFF. • Measure the resistance between the DLC C251-7, circuit 70 (LB/WH), harness side and ground.  A0076175 • **Is the resistance greater than 10,000 ohms?**	**Yes** GO to **G7**. **No** REPAIR the circuit. REACTIVATE the SRS. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the network test with the scan tool.

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST G: PINPOINT TEST G: THE RCM DOES NOT RESPOND TO THE SCAN TOOL OR NO ISO 9141 NETWORK COMMUNICATION (Continued)

Test Step		Result / Action to Take
G7	**CHECK THE ISO CIRCUIT BETWEEN THE RCM AND THE DLC FOR AN OPEN**	
	• Measure the resistance between the RCM C2041a-11, circuit 70 (LB/WH), harness side and the Data Link Connector (DLC) C251-7, circuit 70 (LB/WH), harness side.  A0041599 • **Is the resistance less than 5 ohms?**	**Yes** GO to **G8**. **No** REPAIR the circuit in question. REACTIVATE the SRS. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the network test with the scan tool.
G8	**CHECK FOR CORRECT RCM OPERATION**	
	• Disconnect all the RCM connectors. • Check for: — corrosion — damaged pins — pushed-out pins • Connect all the RCM connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new RCM. REACTIVATE the SRS. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. REACTIVATE the SRS. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the network test with the scan tool.

Pinpoint Test H: Intermittent No Medium Speed Controller Area Network (MS-CAN) Communication, Communication Can Be Intermittently Established

Normal Operation

The Medium Speed Controller Area Network (MS-CAN) uses an unshielded twisted pair cable, circuits VDB06 (GY/OG) and VDB07 (VT/OG). The Audio Control Module (ACM), Satellite Digital Audio Receiver System (SDARS) module, Smart Junction Box (SJB) and the Instrument Cluster (IC) all communicate on the MS-CAN.

In the event that one of the 2 network circuits (MS-CAN + or MS-CAN -) becomes open to a module on the network, unreliable network communication to all modules on the network may result.

This pinpoint test is intended to diagnose the following:

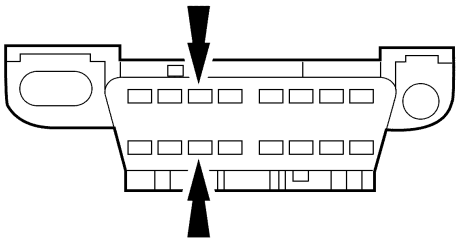
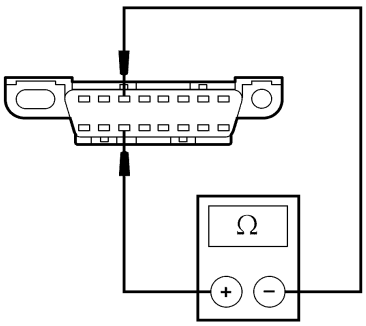
- Wiring, terminals or connectors

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST H: INTERMITTENT NO MS-CAN COMMUNICATION, COMMUNICATION CAN BE INTERMITTENTLY ESTABLISHED

NOTE: Various modules will set network DTCs during this test procedure. Clear DTCs from all modules after the diagnostic procedure is completed.

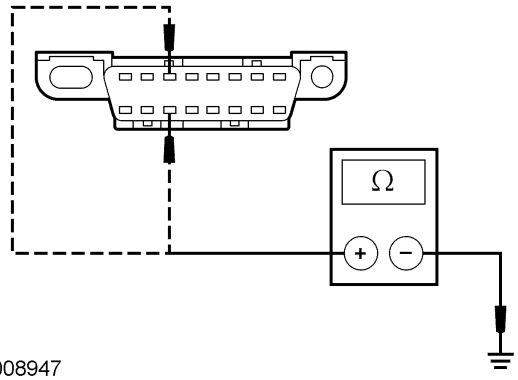
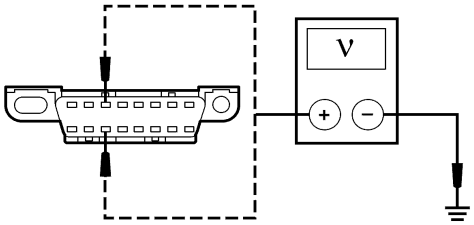
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
H1	**CHECK THE DLC PINS FOR DAMAGE**	
	• Ignition OFF. • Disconnect the scan tool cable from the Data Link Connector (DLC). • Inspect DLC pins 3 and 11 for damage.  N0053178 • **Are DLC pins 3 and 11 OK?**	**Yes** GO to **H2**. **No** REPAIR the DLC as necessary. CLEAR the DTCs. REPEAT the network test with the scan tool.
H2	**CHECK THE MS-CAN TERMINATION RESISTANCE**	
	• Disconnect: Negative Battery Cable. • Measure the resistance between the DLC C251-3, circuit VDB06 (GY/OG), harness side and the DLC C251-11, circuit VDB07 (VT/OG), harness side.  N0050701 • **Is the resistance between 54 and 66 ohms?**	**Yes** GO to **H3**. **No** CONNECT the negative battery cable. GO to Pinpoint Test I.

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST H: INTERMITTENT NO MS-CAN COMMUNICATION, COMMUNICATION CAN BE INTERMITTENTLY ESTABLISHED (Continued)

Test Step		Result / Action to Take
H3	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO GROUND**	
	• Measure the resistance between the DLC C251-3, circuit VDB06 (GY/OG), harness side and ground; and between the DLC C251-11, circuit VDB07 (VT/OG), harness side and ground.  N0008947 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT the negative battery cable. GO to **H4**. **No** CONNECT the negative battery cable. GO to Pinpoint Test I.
H4	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO VOLTAGE**	
	• Ignition ON. • Measure the voltage between the DLC C251-3, circuit VDB06 (GY/OG), harness side and ground; and between the DLC C251-11, circuit VDB07 (VT/OG), harness side and ground.  N0050702 • **Is the voltage greater than 6 volts?**	**Yes** REPAIR the circuit. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** GO to **H5**.
H5	**CHECK FOR RESTORED NETWORK COMMUNICATION WITH THE ACM AND SDARS MODULE DISABLED**	
	NOTE: When re-running the network test, the network test application must be first closed or the screen display will revert back to the prior run network test results. • Disconnect: SJB Fuse 56 (20A). • Enter the following diagnostic mode on the scan tool: Network Test. • Repeat the network test. • **Do all other modules pass the network test?**	**Yes** If the vehicle is equipped with a SDARS module, GO to **H6**. Otherwise, GO to Pinpoint Test E. **No** INSTALL the removed fuse. GO to **H7**.

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST H: INTERMITTENT NO MS-CAN COMMUNICATION, COMMUNICATION CAN BE INTERMITTENTLY ESTABLISHED (Continued)

Test Step		Result / Action to Take
H6	**CHECK FOR RESTORED NETWORK COMMUNICATION WITH THE ACM DISCONNECTED**	**Yes** CONNECT the ACM. GO to Pinpoint Test E. **No** CONNECT the ACM. GO to Pinpoint Test F.
	NOTE: When re-running the network test, the network test application must be first closed or the screen display will revert back to the prior run network test results. • Disconnect: ACM C290a. • Enter the following diagnostic mode on the scan tool: Network Test. • Repeat the network test. • **Do all other modules pass the network test?**	
H7	**CHECK FOR RESTORED NETWORK COMMUNICATION WITH THE SJB DISABLED**	**Yes** INSTALL the removed fuses. GO to Pinpoint Test D. **No** INSTALL the removed fuses. GO to **H8**.
	NOTE: When re-running the network test, the network test application must be first closed or the screen display will revert back to the prior run network test results. • Disconnect: Bussed Electrical Center (BEC) Fuses 59 (30A), 63 (30A) and 67 (30A). • Enter the following diagnostic mode on the scan tool: Network Test. • Repeat the network test. • **Do all other modules pass the network test?**	
H8	**CHECK FOR RESTORED NETWORK COMMUNICATION WITH THE IC DISABLED**	**Yes** INSTALL the removed fuses. GO to Pinpoint Test C. **No** INSTALL the removed fuse. GO to **H9**.
	NOTE: When re-running the network test, the network test application must be first closed or the screen display will revert back to the prior run network test results. • Disconnect: SJB Fuses 19 (5A) and 16 (5A). • Enter the following diagnostic mode on the scan tool: Network Test. • Repeat the network test. • **Do all other modules pass the network test?**	
H9	**CHECK FOR RESTORED NETWORK COMMUNICATION WITH THE IC DISCONNECTED**	**Yes** INSTALL the removed fuses. GO to Pinpoint Test C. **No** INSTALL the removed fuse. An intermittent fault is not present. GO to Pinpoint Test I.
	• Disconnect: IC C220. • Enter the following diagnostic mode on the scan tool: Network Test. • Repeat the network test. • **Do all other modules pass the network test?**	

Pinpoint Test I: No Medium Speed Controller Area Network (MS-CAN) Communication, All Modules Are Not Responding

Refer to Wiring Diagrams Cell 14, Module Communications Network for schematic and connector information.

Normal Operation

The Medium Speed Controller Area Network (MS-CAN) uses an unshielded twisted pair cable, circuits 1847 (WH/OG) and 1848 (PK/OG). The Smart Junction Box (SJB), the Audio Control Module (ACM), the Satellite Digital Audio Receiver System (SDARS) module and the Instrument Cluster (IC) communicate with the scan tool using the MS-CAN.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- ACM
- IC
- SDARS module
- SJB

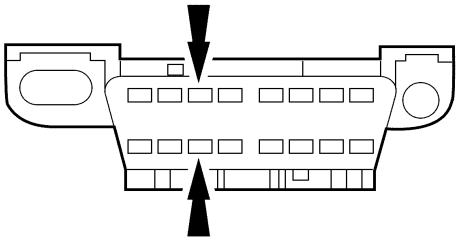
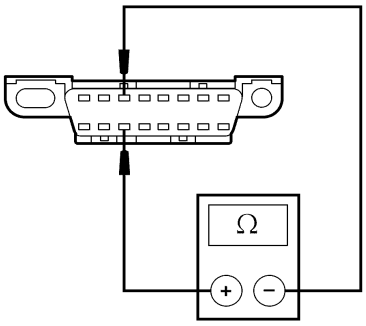
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING

NOTICE: **Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.**

NOTE: Most faults are due to connector and/or wiring concerns. Carry out a thorough inspection and verification before proceeding with the pinpoint test.

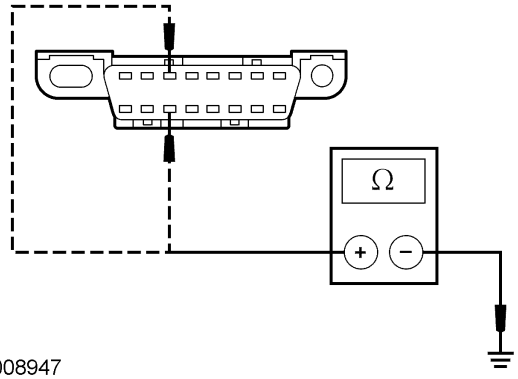
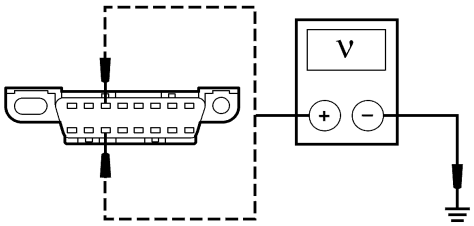
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
I1	**CHECK Data Link Connector (DLC) PINS FOR DAMAGE**	
	• Ignition OFF. • Disconnect the scan tool cable from the DLC. • Inspect DLC pins 3 and 11 for damage.  N0053178 • **Are DLC pins 3 and 11 OK?**	**Yes** GO to I2. **No** REPAIR the DLC as necessary. CLEAR the DTCs. REPEAT the network test with the scan tool.
I2	**CHECK THE MS-CAN TERMINATION RESISTANCE**	
	• Disconnect: Negative Battery Cable. • Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance between 54 and 66 ohms?**	**Yes** GO to I3. **No** GO to I5.

(Continued)

DIAGNOSIS AND TESTING (Continued)

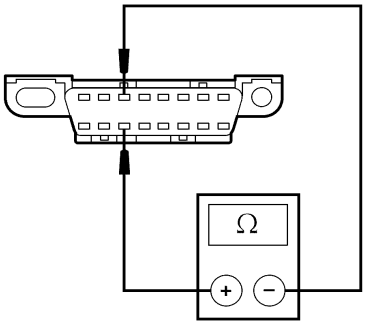
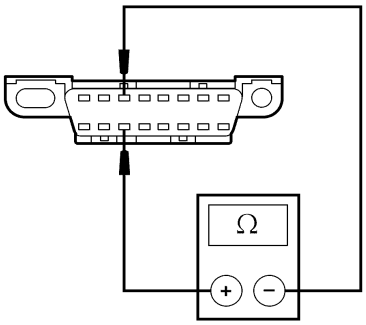
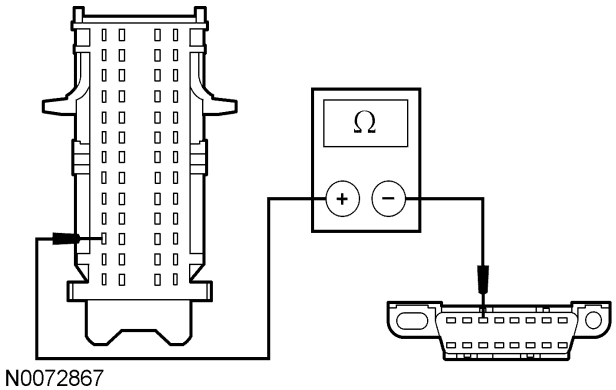
PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
I3	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO GROUND**	
	• Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and ground; and between the DLC C251-11, circuit 1848 (PK/OG), harness side and ground.  N0008947 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT the negative battery cable. GO to **I4**. **No** GO to **I16**.
I4	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO VOLTAGE**	
	• Ignition ON. • Measure the voltage between the DLC C251-3, circuit 1847 (WH/OG), harness side and ground; and between the DLC C251-11, circuit 1848 (PK/OG), harness side and ground.  N0050702 • **Is the voltage greater than 6 volts?**	**Yes** REPAIR the circuit. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The CAN has tested within specifications. GO to Pinpoint Test H to test for an intermittent network fault condition.

(Continued)

DIAGNOSIS AND TESTING (Continued)

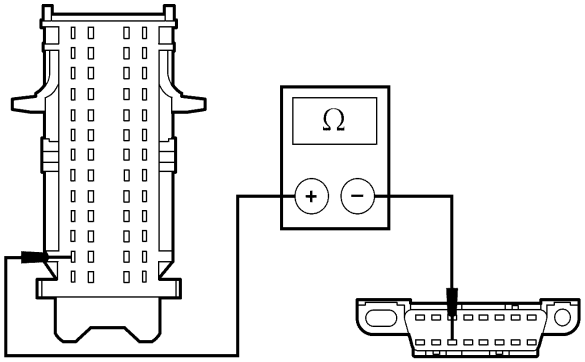
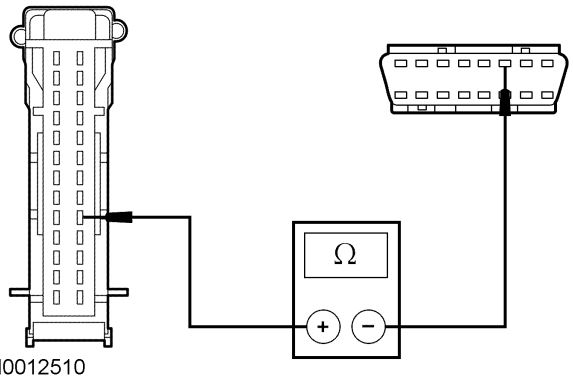
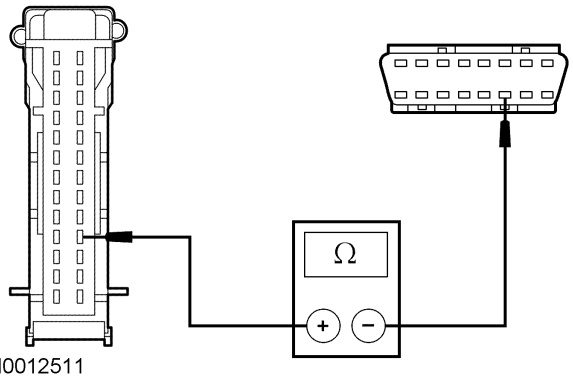
PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
I5	**CHECK THE MS-CAN TERMINATION RESISTOR**	
	• Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance between 108 and 132 ohms?**	**Yes** GO to I6. **No** GO to I9.
I6	**CHECK THE MS-CAN TERMINATION RESISTOR WITH THE SJB DISCONNECTED**	
	• Disconnect: SJB C2280b. • Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance between 108 and 132 ohms?**	**Yes** GO to I7. **No** GO to I8.
I7	**CHECK THE MS-CAN CIRCUITS BETWEEN THE SJB AND THE DLC FOR AN OPEN**	
	• Measure the resistance between the SJB C2280b-50, circuit 1847 (WH/OG), harness side and the DLC C251-3, circuit 1847 (WH/OG), harness side.  N0072867	

(Continued)

DIAGNOSIS AND TESTING (Continued)

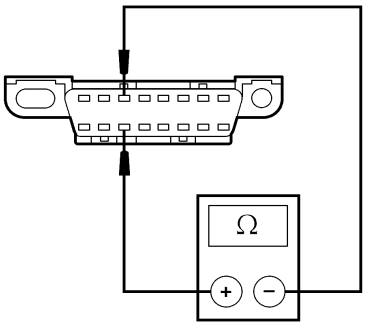
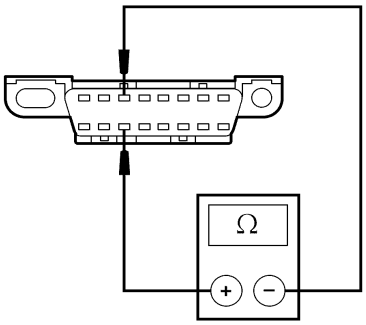
PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
I7	**CHECK THE MS-CAN CIRCUITS BETWEEN THE SJB AND THE DLC FOR AN OPEN (Continued)**	
	• Measure the resistance between the SJB C2280b-51, circuit 1848 (PK/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0072868 • **Are the resistances less than 5 ohms?**	**Yes** CONNECT the negative battery cable. GO to **I21**. **No** REPAIR the circuit in question. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
I8	**CHECK HIGH SPEED CAN CIRCUITS BETWEEN THE IC AND THE DLC FOR AN OPEN**	
	• Disconnect: IC C220. • Measure the resistance between the IC C220-18, circuit 1827 (WH/LG), harness side and the DLC C251-6, circuit 1827 (WH/LG), harness side.  N0012510 • Measure the resistance between the IC C220-17, circuit 1828 (PK/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0012511 • **Are the resistances less than 5 ohms?**	**Yes** CONNECT all modules. CONNECT the negative battery cable. GO to **I21**. **No** REPAIR the circuit in question. CONNECT the negative battery cable. CONNECT all modules. CLEAR the DTCs. REPEAT the network test with the scan tool.

(Continued)

DIAGNOSIS AND TESTING (Continued)

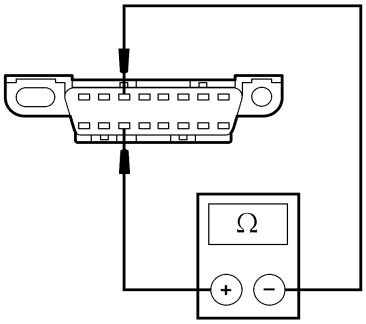
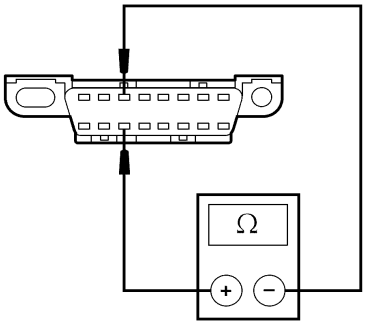
PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
I9	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TOGETHER**	
	• Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance less than 5 ohms?**	**Yes** GO to **I11**. **No** GO to **I10**.
I10	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR AN OPEN**	
	• Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance greater than 1,000 ohms?**	**Yes** REPAIR the circuit. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** A capacitor internal to a module may still be draining causing irregular resistance readings. WAIT 5 minutes. REPEAT the pinpoint test.
I11	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE SJB DISCONNECTED**	
	• Disconnect: SJB C2280b.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

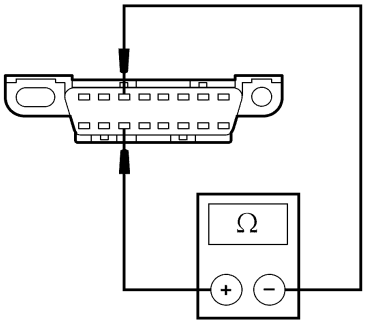
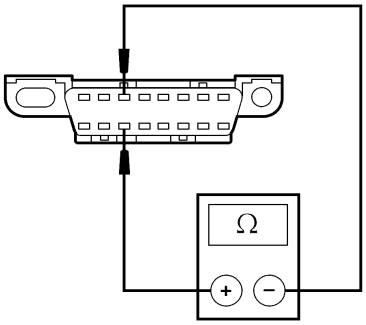
PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
I11	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE SJB DISCONNECTED (Continued)**	
	• Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance less than 5 ohms?**	**Yes** GO to **I12**. **No** CONNECT the negative battery cable. GO to **I21**.
I12	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE IC DISCONNECTED**	
	• Disconnect: IC C220. • Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance less than 5 ohms?**	**Yes** GO to **I13**. **No** CONNECT all modules. CONNECT the negative battery cable. GO to **I22**.
I13	**VERIFY VEHICLE EQUIPMENT — SDARS MODULE**	
	• Inspect the vehicle for a Satellite Digital Audio Receiver System (SDARS) module. • **Is the vehicle equipped with a SDARS module?**	**Yes** GO to **I14**. **No** GO to **I15**.
I14	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE SDARS MODULE DISCONNECTED**	
	• Disconnect: SDARS Module C4344.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

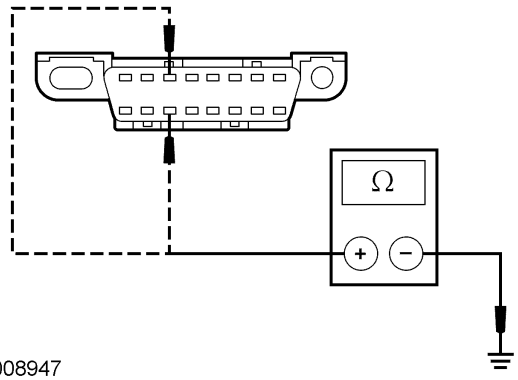
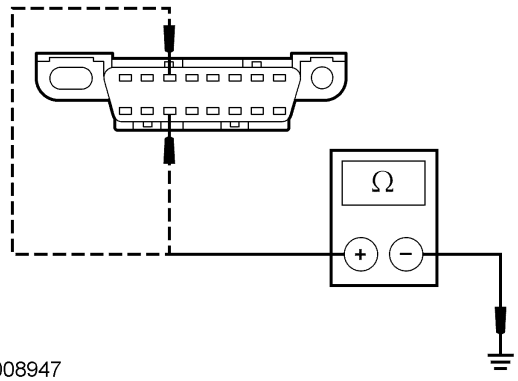
PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
I14	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE SDARS MODULE DISCONNECTED (Continued)**	
	• Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance less than 5 ohms?**	**Yes** GO to **I15**. **No** CONNECT all modules. CONNECT the negative battery cable. GO to **I23**.
I15	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE ACM DISCONNECTED**	
	• Disconnect: ACM C290a. • Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and the DLC C251-11, circuit 1848 (PK/OG), harness side.  N0050701 • **Is the resistance less than 5 ohms?**	**Yes** REPAIR the circuit. CONNECT all modules. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** CONNECT all modules. CONNECT the negative battery cable. GO to **I24**.
I16	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE SJB DISCONNECTED**	
	• Disconnect: SJB C2280b.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

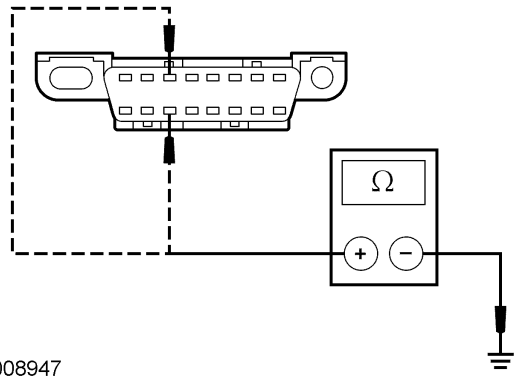
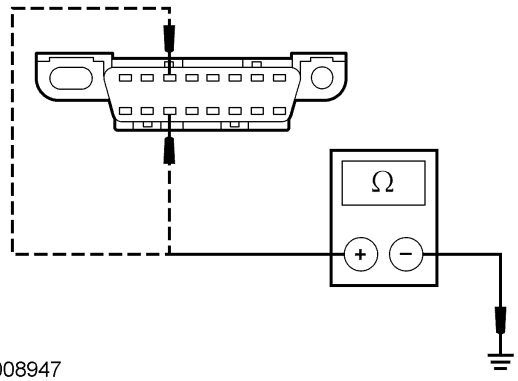
PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
I16	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE SJB DISCONNECTED (Continued)**	
	• Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and ground; and between the DLC C251-11, circuit 1848 (PK/OG), harness side and ground.  N0008947 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT the negative battery cable. GO to **I21**. **No** GO to **I17**.
I17	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE IC DISCONNECTED**	
	• Disconnect: IC C220. • Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and ground; and between the DLC C251-11, circuit 1848 (PK/OG), harness side and ground.  N0008947 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT all modules. CONNECT the negative battery cable. GO to **I22**. **No** GO to **I18**.
I18	**VERIFY VEHICLE EQUIPMENT — SDARS MODULE**	
	• Inspect the vehicle for a Satellite Digital Audio Receiver System (SDARS) module. • **Is the vehicle equipped with a SDARS module?**	**Yes** GO to **I19**. **No** GO to **I20**.
I19	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE SDARS MODULE DISCONNECTED**	
	• Disconnect: SDARS Module C4344.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
I19	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE SDARS MODULE DISCONNECTED (Continued)**	
	• Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and ground; and between the DLC C251-11, circuit 1848 (PK/OG), harness side and ground.  N0008947 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT all modules. CONNECT the negative battery cable. GO to **I23**. **No** GO to **I20**.
I20	**CHECK THE MS-CAN (+) AND MS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE ACM DISCONNECTED**	
	• Disconnect: SJB C290a. • Measure the resistance between the DLC C251-3, circuit 1847 (WH/OG), harness side and ground; and between the DLC C251-11, circuit 1848 (PK/OG), harness side and ground.  N0008947 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT all modules. CONNECT the negative battery cable. GO to **I24**. **No** REPAIR the circuit. CONNECT all modules. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
I21	**CHECK FOR CORRECT SJB OPERATION**	
	• Disconnect all the SJB connectors. • Check for: — corrosion — damaged pins — pushed-out pins • Connect all the SJB connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new SJB. REFER to Section 419-10. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST I: NO MS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
I22	**CHECK FOR CORRECT IC OPERATION**	
	• Disconnect the IC connector. • Check for: — corrosion — damaged pins — pushed-out pins • Connect the IC connector and make sure it seats correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new IC. REFER to Section 413-01. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.
I23	**CHECK FOR CORRECT SDARS MODULE OPERATION**	
	• Disconnect the SDARS module connector. • Check for: — corrosion — damaged pins — pushed-out pins • Connect the SDARS module connector and make sure it seats correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new SDARS module. REFER to Section 415-00. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.
I24	**CHECK FOR CORRECT ACM OPERATION**	
	• Disconnect all of the ACM connectors. • Check for: — corrosion — damaged pins — pushed-out pins • Connect all of the ACM connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new ACM. REFER to Section 415-00. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.

Pinpoint Test J: Intermittent No High Speed Controller Area Network (HS-CAN) Communication, Communication Can Be Intermittently Established

Normal Operation

The High Speed Controller Area Network (HS-CAN) is used for communication between the PCM, the ABS module and the Instrument Cluster (IC). An open circuit VDB04 (WH/BU) (HS-CAN +) or VDB05 (WH) (HS-CAN -) may cause intermittent or unreliable communication to all modules on the HS-CAN.

In the event that either circuit VDB04 (WH/BU) (HS-CAN +) or VDB05 (WH) (HS-CAN -) becomes open to any module on the network, unreliable network communication to all modules on the network may result.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors

PINPOINT TEST J: INTERMITTENT NO HS-CAN COMMUNICATION, COMMUNICATION CAN BE INTERMITTENTLY ESTABLISHED

NOTE: Various modules will set network DTCs during this test procedure. Clear DTCs from all modules after the diagnostic procedure is completed.

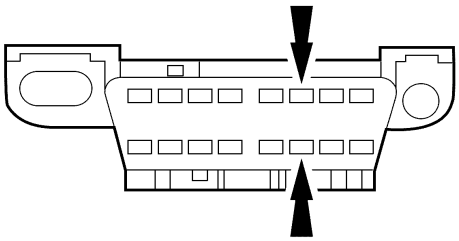
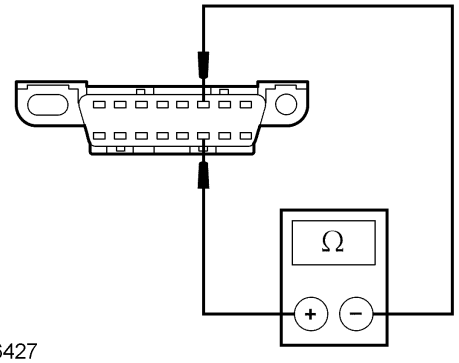
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
J1	**CHECK THE DLC PINS FOR DAMAGE**	
	• Ignition OFF.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

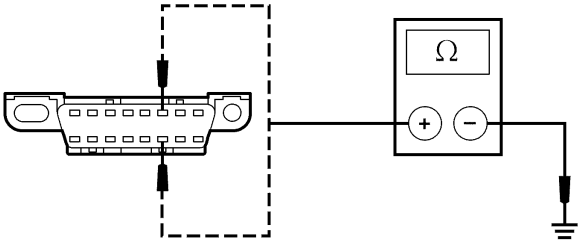
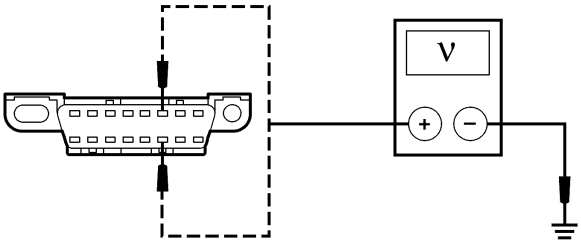
PINPOINT TEST J: INTERMITTENT NO HS-CAN COMMUNICATION, COMMUNICATION CAN BE INTERMITTENTLY ESTABLISHED (Continued)

Test Step		Result / Action to Take
J1	**CHECK THE DLC PINS FOR DAMAGE (Continued)**	
	• Disconnect the scan tool cable from the Data Link Connector (DLC). • Inspect DLC pins 6 and 14 for damage.  A0093867 • **Are DLC pins 6 and 14 OK?**	**Yes** GO to **J2**. **No** REPAIR the DLC as necessary. CLEAR the DTCs. REPEAT the network test with the scan tool.
J2	**CHECK THE HS-CAN TERMINATION RESISTANCE**	
	• Disconnect: Negative Battery Cable. • Measure the resistance between the DLC C251-6, circuit VDB04 (WH/BU), harness side and the DLC C251-14, circuit VDB05 (WH), harness side.  N0026427 • **Is the resistance between 54 and 66 ohms?**	**Yes** GO to **J3**. **No** GO to Pinpoint Test K.

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST J: INTERMITTENT NO HS-CAN COMMUNICATION, COMMUNICATION CAN BE INTERMITTENTLY ESTABLISHED (Continued)

Test Step		Result / Action to Take
J3	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TO GROUND**	
	• Measure the resistance between the DLC C251-6, circuit VDB04 (WH/BU), harness side and ground; and between the DLC C251-14, circuit VDB05 (WH), harness side and ground.  N0002963 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT the negative battery cable. GO to **J4**. **No** GO to Pinpoint Test K.
J4	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TO VOLTAGE**	
	• Ignition ON. • Measure the voltage between the DLC C251-6, circuit VDB04 (WH/BU), harness side and ground; and between the DLC C251-14, circuit VDB05 (WH), harness side and ground.  N0002964 • **Is the voltage greater than 6 volts?**	**Yes** REPAIR the circuit. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** GO to **J5**.
J5	**CHECK FOR RESTORED COMMUNICATION WITH THE PCM DISABLED**	
	NOTE: An IDS session must be established prior to disabling the PCM in this test step. If the PCM has failed communication during multiple attempts to identify the vehicle, first identify the vehicle manually by entering a PCM part number, calibration number or tear tag when prompted by IDS. **NOTE:** When a vehicle is manually identified by a PCM part number, calibration number or tear tag, the IDS will not automatically run a network test. The network test must be manually selected and run. **NOTE:** When re-running the network test, the network test application must be first closed or the screen display will revert back to the prior run network test results. • Disconnect: Bussed Electrical Center (BEC) Fuses 42 (15A), 45 (10A) and SJB fuse 19 (5A). • Enter the following diagnostic mode on the scan tool: Network Test. • Repeat the network test. • **Do all other modules pass the network test?**	**Yes** INSTALL the removed fuses. GO to Pinpoint Test A. **No** INSTALL the removed fuses. GO to **J6**.

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST J: INTERMITTENT NO HS-CAN COMMUNICATION, COMMUNICATION CAN BE INTERMITTENTLY ESTABLISHED (Continued)

Test Step		Result / Action to Take
J6	**CHECK FOR RESTORED NETWORK COMMUNICATION WITH THE ABS MODULE DISABLED**	
	NOTE: When re-running the network test, the network test application must be first closed or the screen display will revert back to the prior run network test results. • Disconnect: BEC Fuse 65 (30A) and SJB fuse 18 (10A). • Enter the following diagnostic mode on the scan tool: Network Test. • Repeat the network test. • **Do all other modules pass the network test?**	**Yes** INSTALL the removed fuse. GO to Pinpoint Test B. **No** INSTALL the removed fuse. GO to **J7**.
J7	**CHECK FOR RESTORED NETWORK COMMUNICATION WITH THE IC DISABLED**	
	NOTE: When re-running the network test, the network test application must be first closed or the screen display will revert back to the prior run network test results. • Disconnect: SJB Fuses 16 (5A) and 19 (5A). • Enter the following diagnostic mode on the scan tool: Network Test. • Repeat the network test. • **Do all other modules pass the network test?**	**Yes** INSTALL the removed fuses. GO to Pinpoint Test C. **No** INSTALL the removed fuses. GO to **J8**.
J8	**CHECK FOR RESTORED NETWORK COMMUNICATION WITH THE IC DISCONNECTED**	
	• Disconnect: IC C220. • Enter the following diagnostic mode on the scan tool: Network Test. • Repeat the network test. • **Do all other modules pass the network test?**	**Yes** CONNECT the IC. GO to Pinpoint Test C. **No** CONNECT the IC. An intermittent fault is not present. GO to Pinpoint Test K.

Pinpoint Test K: No High Speed Controller Area Network (HS-CAN) Communication, All Modules Are Not Responding

Refer to Wiring Diagrams Cell 14, Module Communications Network for schematic and connector information.

Normal Operation

The High Speed Controller Area Network (HS-CAN) uses an unshielded twisted pair cable, circuits 1827 (WH/LG) and 1828 (PK/LG). The PCM, the ABS module (if equipped) and the Instrument Cluster (IC) all communicate with the scan tool using the HS-CAN.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- ABS module (if equipped)
- IC
- PCM

PINPOINT TEST K: NO HS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING

NOTICE: **Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.**

NOTE: Most faults are due to connector and/or wiring concerns. Carry out a thorough inspection and verification before proceeding with the pinpoint test.

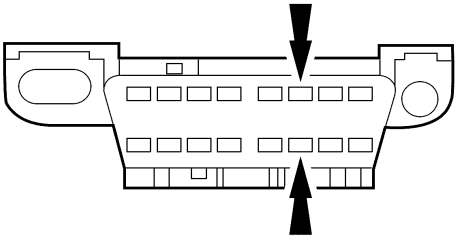
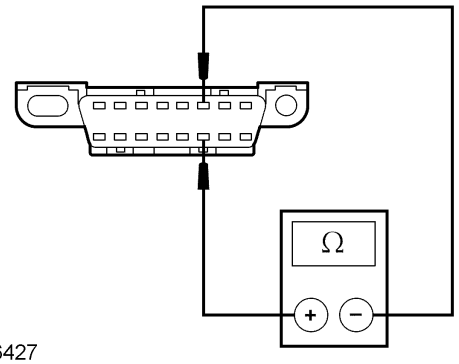
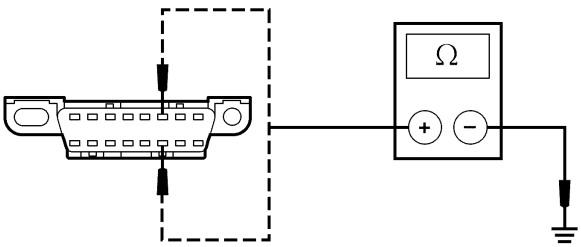
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
K1	**CHECK THE Data Link Connector (DLC) PINS FOR DAMAGE**	
	• Ignition OFF. • Disconnect the scan tool cable from the DLC.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

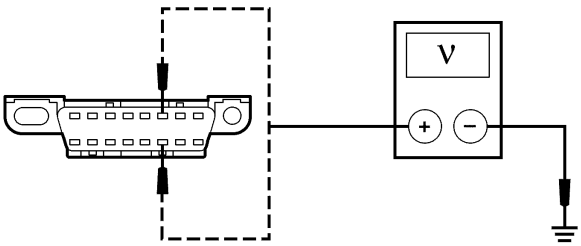
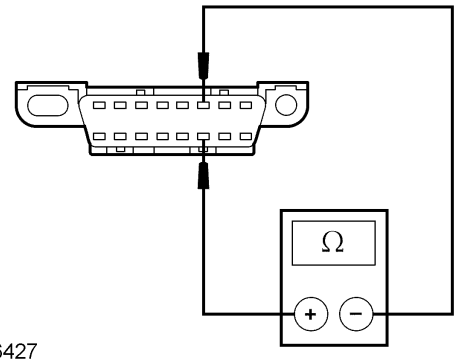
PINPOINT TEST K: NO HS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
K1	**CHECK THE Data Link Connector (DLC) PINS FOR DAMAGE (Continued)**	
	• Inspect DLC pins 6 and 14 for damage.  A0093867 • **Are DLC pins 6 and 14 OK?**	**Yes** GO to K2. **No** REPAIR the DLC as necessary. CLEAR the DTCs. REPEAT the network test with the scan tool.
K2	**CHECK THE HS-CAN TERMINATION RESISTANCE**	
	• Disconnect: Negative Battery Cable. • Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance between 54 and 66 ohms?**	**Yes** GO to K3. **No** GO to K5.
K3	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TO GROUND**	
	• Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and ground; and between the DLC C251-14, circuit 1828 (PK/LG), harness side and ground.  N0002963 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT the negative battery cable. GO to K4. **No** GO to K15.

(Continued)

DIAGNOSIS AND TESTING (Continued)

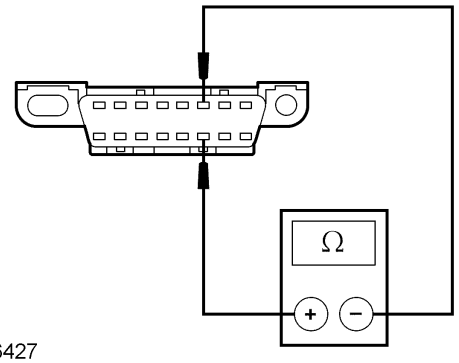
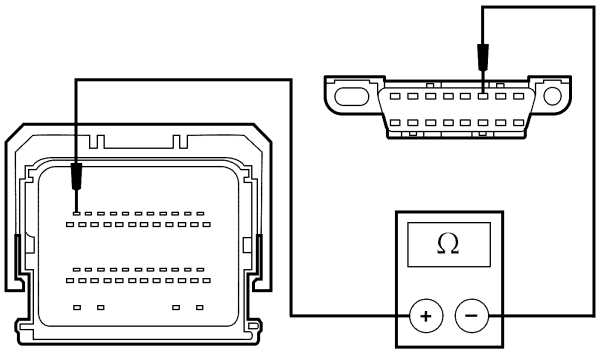
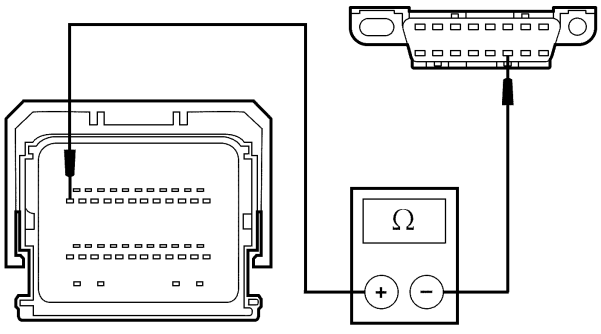
PINPOINT TEST K: NO HS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
K4	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TO VOLTAGE**	
	• Ignition ON. • Measure the voltage between the DLC C251-6, circuit 1827 (WH/LG), harness side and ground; and between the DLC C251-14, circuit 1828 (PK/LG), harness side and ground.  N0002964 • **Is the voltage greater than 6 volts?**	**Yes** REPAIR the circuit. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The CAN has tested within specifications. GO to Pinpoint Test J to test for an intermittent network fault condition.
K5	**CHECK THE HS-CAN TERMINATION RESISTOR**	
	• Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance between 108 and 132 ohms?**	**Yes** GO to **K6**. **No** GO to **K9**.
K6	**CHECK THE HS-CAN TERMINATION RESISTOR WITH THE PCM DISCONNECTED**	
	• Disconnect: PCM C175b.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

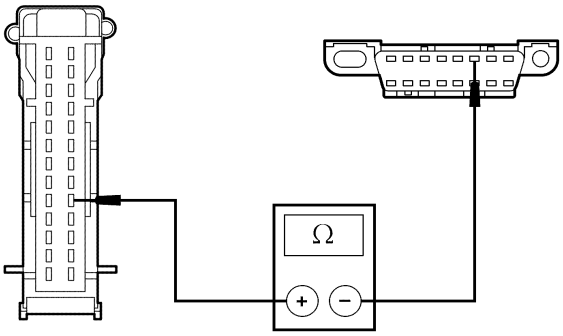
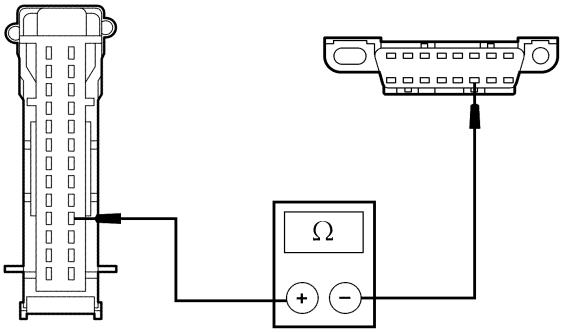
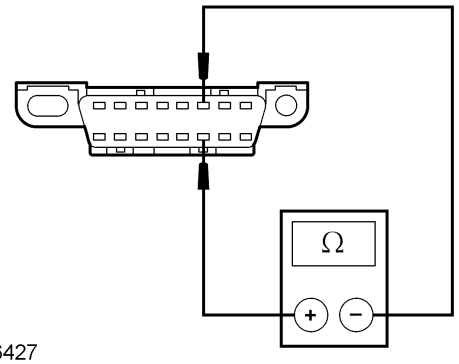
PINPOINT TEST K: NO HS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
K6	**CHECK THE HS-CAN TERMINATION RESISTOR WITH THE PCM DISCONNECTED (Continued)**	
	• Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance between 108 and 132 ohms?**	**Yes** GO to **K7**. **No** GO to **K8**.
K7	**CHECK THE HS-CAN CIRCUITS BETWEEN THE PCM AND THE DLC FOR AN OPEN**	
	• Measure the resistance between the PCM C175b-11, circuit 1827 (WH/LG), harness side and the DLC C251-6, circuit 1827 (WH/LG), harness side.  N0002560 • Measure the resistance between the PCM C175b-23, circuit 1828 (PK/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0002561 • **Are the resistances less than 5 ohms?**	**Yes** CONNECT the negative battery cable. GO to **K19**. **No** REPAIR the circuit in question. CONNECT the negative battery cable. CONNECT the PCM. CLEAR the DTCs. REPEAT the network test with the scan tool.

(Continued)

DIAGNOSIS AND TESTING (Continued)

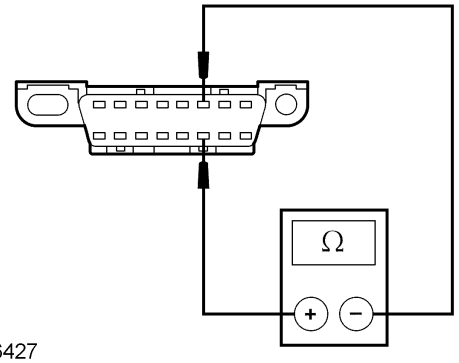
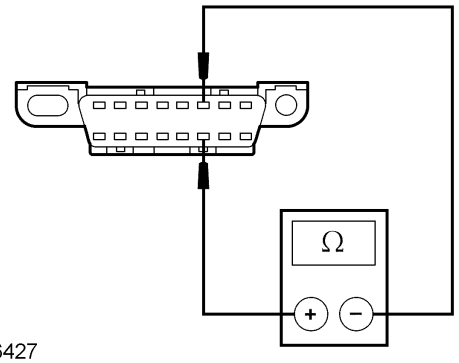
PINPOINT TEST K: NO HS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
K8	**CHECK THE HS-CAN CIRCUITS BETWEEN THE IC AND THE DLC FOR AN OPEN**	
	• Disconnect: IC C220. • Measure the resistance between the IC C220-18, circuit 1827 (WH/LG), harness side and the DLC C251-6, circuit 1827 (WH/LG), harness side.  N0062185 • Measure the resistance between the IC C220-17, circuit 1828 (PK/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0062186 • **Are the resistances less than 5 ohms?**	**Yes** CONNECT all modules. CONNECT the negative battery cable. GO to **K21**. **No** REPAIR the circuit in question. CONNECT all modules. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
K9	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TOGETHER**	
	• Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance less than 5 ohms?**	**Yes** GO to **K11**. **No** GO to **K10**.

(Continued)

DIAGNOSIS AND TESTING (Continued)

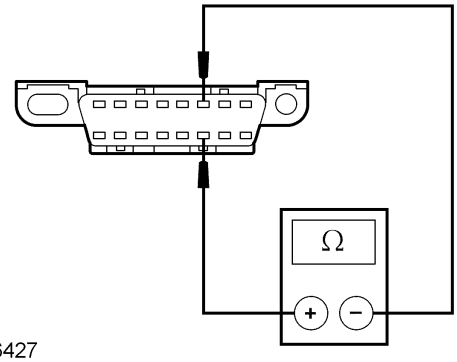
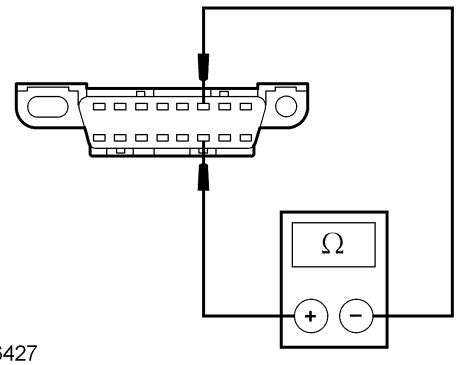
PINPOINT TEST K: NO HS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
K10	**CHECK THE HS-CAN CIRCUITS FOR AN OPEN AT THE DLC**	**Yes** REPAIR the DLC or REPAIR the circuit in question. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** A capacitor internal to a module may still be draining causing irregular resistance readings. WAIT 5 minutes. REPEAT the pinpoint test.
	• Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance greater than 10,000 ohms?**	
K11	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE PCM DISCONNECTED**	**Yes** GO to **K12**. **No** CONNECT the negative battery cable. GO to **K19**.
	• Disconnect: PCM C175b. • Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance less than 5 ohms?**	
K12	**VERIFY VEHICLE EQUIPMENT - ABS MODULE**	**Yes** GO to **K13**. **No** GO to **K14**.
	• Inspect the vehicle for an ABS module. • **Is the vehicle equipped with an ABS module?**	
K13	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE ABS MODULE DISCONNECTED**	
	• Disconnect: ABS Module C135.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

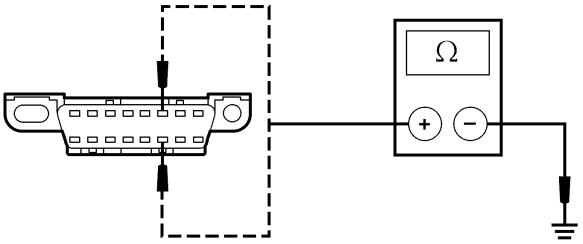
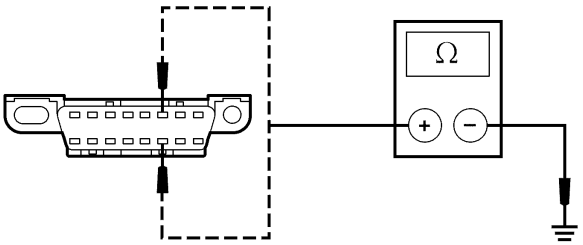
PINPOINT TEST K: NO HS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
K13	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE ABS MODULE DISCONNECTED (Continued)**	
	• Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance less than 5 ohms?**	**Yes** GO to **K14**. **No** CONNECT all modules. CONNECT the negative battery cable. GO to **K20**.
K14	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TOGETHER WITH THE IC DISCONNECTED**	
	• Disconnect: IC C220. • Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and the DLC C251-14, circuit 1828 (PK/LG), harness side.  N0026427 • **Is the resistance less than 5 ohms?**	**Yes** REPAIR the circuit. CONNECT all modules. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** CONNECT all modules. CONNECT the negative battery cable. GO to **K21**.
K15	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE PCM DISCONNECTED**	
	• Disconnect: PCM C175b.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

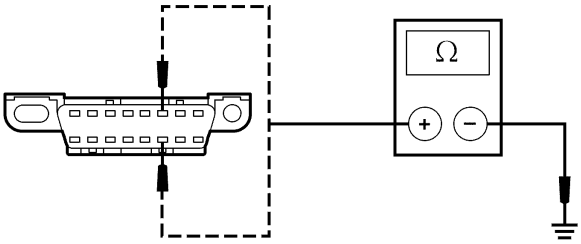
PINPOINT TEST K: NO HS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
K15	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE PCM DISCONNECTED (Continued)**	
	• Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and ground; and between the DLC C251-14, circuit 1828 (PK/LG), harness side and ground.  N0002963 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT the negative battery cable. GO to **K19**. **No** GO to **K16**.
K16	**VERIFY VEHICLE EQUIPMENT — ABS MODULE**	
	• Inspect the vehicle for an ABS module. • **Is the vehicle equipped with an ABS module?**	**Yes** GO to **K17**. **No** GO to **K18**.
K17	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE ABS MODULE DISCONNECTED**	
	• Disconnect: ABS Module C135. • Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and ground; and between the DLC C251-14, circuit 1828 (PK/LG), harness side and ground.  N0002963 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT all modules. CONNECT the negative battery cable. GO to **K20**. **No** GO to **K18**.
K18	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE IC DISCONNECTED**	
	• Disconnect: IC C220.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST K: NO HS-CAN COMMUNICATION, ALL MODULES ARE NOT RESPONDING (Continued)

Test Step		Result / Action to Take
K18	**CHECK THE HS-CAN (+) AND HS-CAN (-) CIRCUITS FOR A SHORT TO GROUND WITH THE IC DISCONNECTED (Continued)**	
	• Measure the resistance between the DLC C251-6, circuit 1827 (WH/LG), harness side and ground; and between the DLC C251-14, circuit 1828 (PK/LG), harness side and ground.  N0002963 • **Are the resistances greater than 1,000 ohms?**	**Yes** CONNECT all modules. CONNECT the negative battery cable. GO to **K21**. **No** REPAIR the circuit. CONNECT all modules. CONNECT the negative battery cable. CLEAR the DTCs. REPEAT the network test with the scan tool.
K19	**CHECK FOR CORRECT PCM OPERATION**	
	• Disconnect all the PCM connectors. • Check for: — corrosion — damaged pins — pushed-out pins • Connect all the PCM connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new PCM. REFER to Section 303-14. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.
K20	**CHECK FOR CORRECT ABS MODULE OPERATION**	
	• Disconnect the ABS module connector. • Check for: — corrosion — damaged pins — pushed-out pins • Connect the ABS module connector and make sure it seats correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new ABS module. REFER to Section 206-09. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.
K21	**CHECK FOR CORRECT IC OPERATION**	
	• Disconnect the IC connector. • Check for: — corrosion — damaged pins — pushed-out pins • Connect the IC connector and make sure it seats correctly. • Operate the system and verify the concern is still present. • **Is the concern still present?**	**Yes** INSTALL a new IC. REFER to Section 413-01. CLEAR the DTCs. REPEAT the network test with the scan tool. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the network test with the scan tool.

Pinpoint Test L: No Power To The Scan Tool

Refer to Wiring Diagrams Cell 14, Module Communications Network for schematic and connector information.

DIAGNOSIS AND TESTING (Continued)

Normal Operation

The scan tool is connected to the Data Link Connector (DLC) to communicate with the High Speed Controller Area Network (HS-CAN), Medium Speed Controller Area Network (MS-CAN), and International Standards Organization (ISO) 9141 communications network. Voltage for the scan tool is provided by circuit 1047 (LG/RD). Ground is provided by circuits 570 (BK/WH) and 1205 (BK).

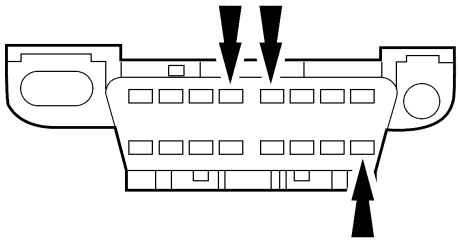
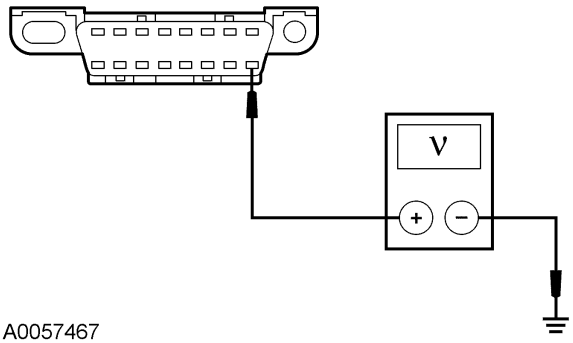
This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Scan tool
- DLC

PINPOINT TEST L: NO POWER TO THE SCAN TOOL

NOTE: Most faults are due to connector and/or wiring concerns. Carry out a thorough inspection and verification before proceeding with the pinpoint test.

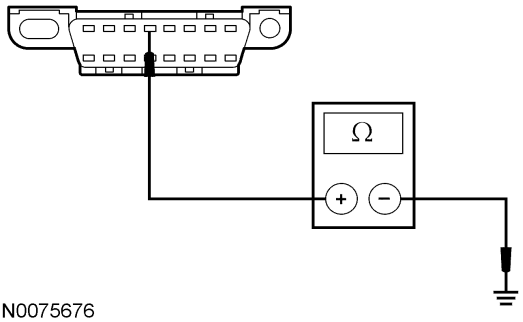
NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01.

Test Step		Result / Action to Take
L1	**CHECK THE DLC PINS FOR DAMAGE**	
	• Disconnect the scan tool cable from the DLC. • Inspect DLC pins 4, 5 and 16 for damage.  N0050767 • **Are DLC pins 4, 5 and 16 OK?**	**Yes** GO to L2. **No** REPAIR the DLC as necessary. CLEAR the DTCs. REPEAT the network test with the scan tool.
L2	**CHECK THE DLC VOLTAGE SUPPLY CIRCUIT FOR AN OPEN**	
	• Measure the voltage between the DLC C251-16, circuit 1047 (LG/RD), harness side and ground.  A0057467 • **Is the voltage greater than 10 volts?**	**Yes** GO to L3. **No** VERIFY the Smart Junction Box (SJB) fuse 8 (10A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the Wiring Diagrams Manual to IDENTIFY the possible causes of the short circuit. REPEAT the network test with the scan tool.
L3	**CHECK THE DLC GROUND CIRCUITS FOR AN OPEN**	
	• Disconnect: Negative Battery Cable.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

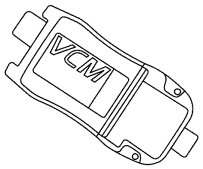
PINPOINT TEST L: NO POWER TO THE SCAN TOOL (Continued)

Test Step		Result / Action to Take
L3	**CHECK THE DLC GROUND CIRCUITS FOR AN OPEN (Continued)**	
	• Measure the resistance between the DLC C251-4, circuit 1205 (BK), harness side and ground; and between the DLC C251-5, circuit 570 (BK/WH), harness side and ground.  N0075676 • **Are the resistances less than 5 ohms?**	**Yes** REPAIR the scan tool. CONNECT the negative battery cable. REPEAT the network test with the scan tool. **No** REPAIR the circuit in question. CONNECT the negative battery cable. REPEAT the network test with the scan tool.

DIAGNOSIS AND TESTING

Module Configuration

Special Tool(s)

 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool

Principles of Operation

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

Configurable modules accommodate a variety of vehicle options, eliminating the need for many unique modules for one vehicle line. These modules must be configured when replaced as part of a repair procedure.

Configurable modules should not be exchanged between vehicles since the settings are unique to each vehicle. Failure to configure a new module may result in improper operation and/or any of the following DTCs setting:

- B2477 and/or B2141 — sets when a body/chassis module is not configured or is configured incorrectly.
- B2900 — sets when there is a VIN mismatch between the module with the B2900 and the PCM. Either the PCM or the body module stored VIN may be incorrect.
- P0602, P0605 and/or P1639 — sets when the PCM vehicle identification (VID) block is not configured or is configured incorrectly.
- U0300 and/or U0301 — sets when the configuration between 2 or more modules do not match.
- U2050 and/or U2051 — sets when a valid strategy/calibration is not present.

The following are the 3 different methods of configuration:

- Programmable module installation (PMI)
- Module reprogramming (‘‘flashing’’)
- Programmable parameters

Some modules do not support all 3 methods.

Definition of Terms

The following are definitions of configuration terms:

Programmable Module Installation (PMI)

PMI is a scan tool process which configures settings in a new module. Data used for the PMI process is automatically downloaded from the original module and stored when a scan tool session is started. If this data cannot be retrieved from the module being replaced, the scan tool may prompt for As-Built data entry or display a list of parameter values that need to be manually selected. Some modules are reprogrammed during PMI when a strategy/calibration update is available.

NOTE: A module must be able to communicate with the scan tool in order to carry out PMI. It is important that the scan tool identifies the vehicle and obtains configuration data prior to removing any modules.

To carry out PMI, refer to Programmable Module Installation in this section.

Module Reprogramming

Module reprogramming (also referred to as ‘‘flashing’’) is a scan tool process which updates the strategy/calibration in a module. Module reprogramming is automatically carried out during PMI when a later strategy/calibration is available.

Reprogramming a module with the same level of software will not improve module operation or repair a hardware failure.

NOTE: Module reprogramming should be limited to circumstances where a published Technical Service Bulletin (TSB) procedure recommends doing so.

NOTE: A module cannot communicate with other modules on the communication network while being reprogrammed. Clear any network communication DTCs which may have been set in other modules during reprogramming.

Programmable Parameters

Programmable parameters are customer preference items that may be modified by the dealer via scan tool or in some cases modified by the customer following a procedure listed in the vehicle Owner’s Literature. While many configuration options may exist for a module, only a few of these options are programmable parameters.

DIAGNOSIS AND TESTING (Continued)

Adaptive Learning and Calibration

Some modules require a separate learning procedure be carried out if replaced as part of a repair procedure. For adaptive learning and calibration instructions, refer to the specific module removal and installation procedures.

Vehicle Identification (VID) Block

Some PCMs contain a memory area called a vehicle identification (VID) block. The PCM VID block commonly stores powertrain configuration items such as VIN, tire size, axle ratio, and whether or not the vehicle is equipped with speed control.

As-Built Data

As-Built data is a VIN specific module configuration record. During vehicle build, the configuration from all modules is downloaded and stored in the As-Built database. As-Built data will not reflect customer preference items that have been changed from the default state. These items will need to be changed using programmable parameters after the module is configured.

NOTE: It is not necessary to obtain As-Built data unless directed to do so by the scan tool. This data may be accessed from the technician service publication website.

The following chart lists body/chassis module As-Built data addresses:

Body/Chassis Module Addresses for As-Built Entry

Module Name	Module Address
Audio control module (ACM)	727
Instrument cluster (IC)	720
Satellite digital audio receiver system (SDARS) module	782
Smart junction box (SJB)	726

The following chart describes specific module programming information:

Module Configuration and Parameter Index

Module Name	Reprogram/ Flash Capable	Requires PMI	Requires Adaptive Learning	Requires Calibration	Available Programmable Parameters
ABS module	No	No	No	No	• None
Audio control module (ACM)	Yes	Yes	No	No	• Language E/F/S (NAV only) • Display units English/metric (NAV only)
Instrument cluster (IC)	Yes	Yes	No	No	• None
PCM	Yes	Yes	Yes	No	• Speed control enable/disable • Tire size • Axle ratio
Restraints control module (RCM)	No	No	No	• Seat weight sensor re-zero	• None
Satellite digital audio receiver system (SDARS) module	No	Yes	No	No	• None
Smart junction box (SJB)	Yes	Yes	No	No	• None

DIAGNOSIS AND TESTING (Continued)

Inspection and Verification

This section provides step-by-step module configuration procedures. Carry out the programmable module installation (PMI) procedure in this section when another workshop manual section directs to carry out configuration or when DTCs from the below list are present:

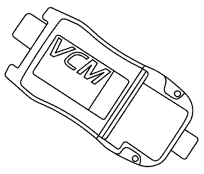
DTC Chart

DTC	Description	Source	Action
B2477	Module Configuration Failure	• Audio control module (ACM) • Instrument cluster (IC) • Restraints control module (RCM) • Smart junction box (SJB)	CARRY OUT PMI. REFER to Programmable Module Installation in this section.
P0602	Powertrain Control Module Programming Error	• PCM	CARRY OUT PMI. REFER to Programmable Module Installation in this section.
P0605	Internal Control Module Read Only Memory (ROM) Error	• PCM	CARRY OUT PMI. REFER to Programmable Module Installation in this section.
P1639	Vehicle ID Block Corrupted, Not Programmed	• PCM	CARRY OUT PMI. REFER to Programmable Module Installation in this section.
U0300	Internal Control Module Software Incompatibility	• PCM	CARRY OUT PMI. REFER to Programmable Module Installation in this section.
U2050	No Application Present	• ACM • ABS module • IC • PCM • Satellite digital audio receiver system (SDARS) module • SJB	CARRY OUT PMI. REFER to Programmable Module Installation in this section.
U2051	One or More Calibration Files Missing / Corrupt	• ABS module • ACM • PCM	CARRY OUT PMI. REFER to Programmable Module Installation in this section.

GENERAL PROCEDURES

Programmable Module Installation

Special Tool(s)

 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool

Programmable Module Installation (PMI) Using the Integrated Diagnostic System (IDS) When the Original Module is Available

NOTE: Following module installation, some modules require a separate learning procedure be carried out. For adaptive learning and calibration instructions, refer to the specific module removal and installation procedures.

1. Connect the IDS and identify the vehicle as normal.
2. From the Toolbox icon, select Module Programming and press the check mark.
3. Select Programmable Module Installation.
4. Select the module that is being replaced.
5. Follow the on-screen instructions, turn the ignition key to the OFF position, and press the check mark.
6. Install the new module and press the check mark.
7. Follow the on-screen instructions, turn the ignition key to the ON position, and press the check mark.
8. The IDS downloads the data into the new module and displays Module Configuration Complete.
9. Test module for correct operation.

Programmable Module Installation (PMI) Using the Integrated Diagnostic System (IDS) When the Original Module is NOT Available

NOTE: Following module installation, some modules require a separate learning procedure be carried out. For adaptive learning and calibration instructions, refer to the specific module removal and installation procedures.

1. Install the new module.
2. Connect the IDS and identify the vehicle as normal.
3. From the Toolbox icon, select Module Programming and press the check mark.
4. Select Programmable Module Installation.
5. Select the module that was replaced.
6. Follow the on-screen instructions, turn the ignition key to the OFF position, and press the check mark.
7. Follow the on-screen instructions, turn the ignition key to the ON position, and press the check mark.
8. If the data is not available, the IDS displays a screen stating to contact the As-Built Data Center. Retrieve the data from the technician service publication website at this time and press the check mark.
9. Enter the module data and press the check mark.
10. The IDS downloads the data into the new module and displays Module Configuration Complete.
11. Test module for correct operation.