Information and Entertainment System

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

Audio Unit

NOTE: *The audio unit is also referred to as the audio control module.*

The audio unit can be powered up when the ignition is in the ON or ACC position. When on, the audio unit directs audio signals to the speakers through separate positive and negative circuits for each of the audio channels. The audio unit provides internal circuit protection for shorts to ground, shorts to voltage, or shorts between any output circuits.

Noise Suppression Equipment

The radio interference suppression equipment reduces interference transmitted through the speakers by the engine ignition and electrical systems.

Antenna

The antenna is a fixed mast antenna mounted on the exterior of the vehicle. The antenna receives both AM and FM radio waves. The audio signals are then sent to the audio unit through the antenna cables.

Subwoofers

The subwoofer speakers on the 500-watt system are located in the front doors and are powered by individual amplifiers located on each speaker. In addition to these subwoofer speakers, the 1000-watt system includes an enclosure with 2 subwoofer speakers powered by 2 amplifiers, each. The enable/clip circuit carries out 2 functions: to turn on the subwoofer amplifier, and to monitor an overload condition to the subwoofer amplifier. In the event of an overload, the audio unit clips the audio output signal to the subwoofer amplifier (heard as distortion).

Satellite Audio

The satellite audio system consists of a satellite radio receiver, a satellite radio antenna, and antenna cable (part of the decklid harness). The satellite radio antenna receives digital audio signals and sends them to the satellite radio receiver, where the signals are converted and sent to the audio unit. The wake-up signal for the satellite radio receiver is sent from the audio unit through the medium speed controller area network (MS-CAN).

Audio Input Jack

The audio input jack allows for a portable MP3 player to be connected to the vehicle audio system. When a portable MP3 player is connected, audio from the MP3 player can be played through the vehicle speakers.

Navigation

The navigation module is integrated in the audio unit and controls the operation and the interface between the user, the vehicle subsystems, and the external components. The navigation module communicates with other vehicle systems via the MS-CAN and can be diagnosed with a scan tool. When installing a new audio unit, programmable module installation (PMI) is required.

The vehicle navigation system guides the user to a pre-entered destination. A navigation map digital versatile disc (DVD) stored in the navigation module sends route calculation data to the audio unit. The audio unit audibly and visually instructs the user of the maneuvers required to arrive at the destination entered.

In order to calculate the initial vehicle position, the global positioning system (GPS) antenna is used to track several available satellites simultaneously. The GPS antenna only receives data and does not communicate with the satellites. A gyroscope, integral to the navigation module, monitors the pitch and yaw of the vehicle created during cornering or turning. Vehicle speed and reverse signals received through the CAN are also used to detect vehicle speed and direction changes.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect the following for obvious signs of mechanical or electrical damage.

   Visual Inspection Chart

Mechanical	Electrical

• Audio unit
• Antenna or antenna cable(s)
• Global positioning system (GPS) antenna
• Navigation map DVD
• Satellite radio antenna
• Speakers, mounting/speaker cones
• Radio ignition interference capacitors, radio frequency interference suppression bond, and radio receiver hood bonding strap
	• Smart junction box (SJB) fuse(s):
	  ▪ 6 (5A) (audio unit)
	  ▪ 20 (10A) (audio unit)
	• Bussed electrical center (BEC) fuse(s):
	  ▪ 6 (30A) (luggage compartment amplifiers)
	  ▪ 9 (30A) (luggage compartment amplifiers)
	  ▪ 16 (30A) (door amplifiers)
	  ▪ 56 (20A) (audio unit, satellite radio receiver)
	• Circuitry

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **NOTE:** *Make sure to use the latest scan tool software release.*

   If the cause is not visually evident, connect the scan tool to the data link connector (DLC).
5. **NOTE:** *The vehicle communication module (VCM) LED prove-out confirms power and ground from the DLC are provided to the VCM.*

   If the scan tool does not communicate with the VCM:

- Check the VCM connection to the vehicle.
- Check the scan tool connection to the VCM.
- Refer to Section 418-00, No Power To The Scan Tool, to diagnose no communication with the scan tool.

6. If the scan tool does not communicate with the vehicle:
   - Verify the ignition key is in the ON position.
   - Verify the scan tool operation with a known good vehicle.
   - Refer to Section 418-00 to diagnose no response from the powertrain control module (PCM).

7. Carry out the network test:
   - If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
   - If the network test passes, retrieve and record the continuous memory diagnostic trouble codes (DTCs).

8. Clear the continuous DTCs and carry out the self-test diagnostics for the audio unit.

9. If the DTCs retrieved are related to the concern, go to the Audio Unit Diagnostic Trouble Code (DTC) Index or the Satellite Radio Receiver Diagnostic Trouble Code (DTC) Index.

10. If no DTCs related to the concern are retrieved, go to the Speaker Walk-Around Test, the Audio Unit Self-Diagnostic Mode, the Navigation Audio Unit Self Diagnostic Mode, or the Satellite Audio Bezel Diagnostic Test.

Speaker Walk-Around Test

NOTE: *To enter the speaker walk-around test or audio unit self-diagnostic mode, the audio unit must be on and in radio tuner mode (AM/FM).*

1. To enter the speaker walk-around test, simultaneously press and hold the audio unit preset buttons 3 and 6.

2. The speaker walk-around test stops at each speaker and applies sound to each speaker for about 1-2 seconds. Each speaker is tested and displayed on the audio unit in the following sequence: RF, LF, LR, RR, and SUBWOOFER.

3. To exit the speaker walk-around test, turn the key to OFF, turn the audio unit off, or press preset button 1 for diagnostics (DIA).

Audio Unit Self-Diagnostic Mode

NOTE: *To enter the audio unit self-diagnostic mode, the audio unit must be on and in radio tuner mode (AM/FM).*

1. To enter the following tests, press the desired preset button while in the speaker walk-around test.

2. To exit the audio unit self-diagnostic mode, turn the key to OFF or turn the audio unit off.

3. If the concern remains and the fault is not detected, GO to Symptom Chart.

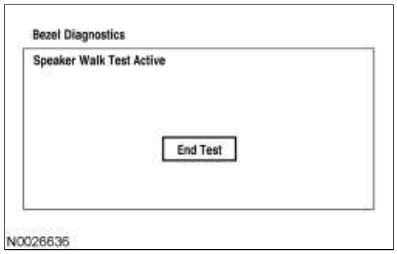
4. The self-diagnostic mode has the following functions available:
   - Preset button 1 = On-Demand Self-Test. This button runs the on-demand self-test.
     - Pressing the MENU DOWN button allows scrolling of any DTCs found during the test while in this menu.
   - Preset button 2 = Display Continuous DTCs. This button enables viewing of any continuous DTCs that have been logged.
     - Pressing the MENU UP button allows scrolling of any DTCs while in this menu.
     - While continuous DTCs are being displayed, pressing the EJECT button will clear all present DTCs. The key must be cycled OFF, then ON, to permanently clear DTCs.
   - Preset button 3 = Signal Strength Test. This button displays the signal strength.
   - Preset button 4 = Software Version Display. This button displays the audio unit software version.
     - Pressing the MENU UP button allows scrolling of all audio subsystem software versions while in this menu.

- Preset button 5 = Display Test. This test illuminates all the display segments for 5 seconds, then either turns all segments off or indicates DISPLAY TEST on the screen.
- Preset button 6 = Configuration Status. This button enables audio unit configuration status.
  - Pressing the MENU UP button displays the ACM part number while in this menu.

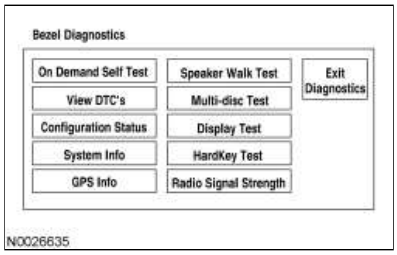
5. To exit the self-diagnostic mode, turn the key to OFF or turn the audio unit off.

6. If the concern remains and the fault is not detected, GO to Symptom Chart.

Navigation Audio Unit Self-Diagnostic Mode



1. To enter the self-diagnostic mode, press "End Test" during the speaker walk-around test.



2. The following diagnostic modes are available using the on-screen buttons:
   - "On Demand Self Test" — provides internal self-test diagnostics and displays all the DTCs resulting from the self-test.
   - "View DTC's" — provides a list of all the DTCs currently stored in memory.
   - "Configuration Status" — displays the current unit configuration.
   - "System Info" — provides the navigation module part number and software information.
   - "GPS Info" — provides satellite information and vehicle current information.
   - "Speaker Walk Test" — performs a speaker walk-around test.
   - "Multi-disc Test" — performs a test of the CD player mechanism.
   - "Display Test" — allows the screen colors to be checked, and allows individual touch sectors of the display screen to be tested.
   - "Hardkey Test" — checks the operation of any audio unit button.
   - "Radio Signal Strength" — performs a test of the AM/FM antenna signal.

3. To exit the self-diagnostic mode, turn the audio unit off, turn the key to OFF, or press "Exit Diagnostics".

4. If the concern remains and the fault is not detected, GO to Symptom Chart to continue diagnostics.

Satellite Audio Bezel Diagnostic Test

NOTE: *To enter the audio unit self-diagnostic mode, the audio unit must be on and in SAT mode.*

1. To enter the satellite audio bezel diagnostic test, simultaneously press and hold the AUX button and preset button 2.
2. Upon entering the self-test, the audio unit produces 2 continuously alternating tones of different pitch, one for the right channel, then one for the left.
3. The test continues by displaying any DTCs currently present. If no DTCs are present, NO DTCS will be displayed. If there are DTCs present, the audio unit will auto-scroll through the list of active DTCs.
4. Historical DTCs can be viewed by pressing the AUX button and preset button 2 simultaneously while in the active DTC mode.
   - If any DTCs are present, pressing the AUX button and preset button 2 will prompt CLEAR DTCS? on the audio unit.
   - To clear historical DTCs, press preset buttons 1, 2, and 3 consecutively within 4 seconds.
   - To exit historical DTCs (with or without clearing DTCs), press the AUX button and preset button 2 simultaneously.
5. If no historical DTCs are present, pressing the AUX button and preset button 2 simultaneously while in active DTC mode will display the DLP software version.
6. To exit the satellite audio bezel diagnostic test, press the AUX button and preset button 2 simultaneously while the DLP software version is displayed, or turn the audio unit off.
7. If the concern remains and the fault is not detected, GO to Symptom Chart.

Audio Unit Diagnostic Trouble Code (DTC) Index

DTC	Description	Action
B1117	Audio Steering Wheel Button Stuck	DTC is not applicable. The vehicle is not equipped with steering wheel controls. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
B1119	Audio Disc DVD Player Thermal Shutdown	ALLOW the audio unit to cool. REPEAT the self-test. If DTC B1119 is retrieved again, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
B1136	Audio Steering Wheel Switch #2 Circuit Failure	DTC is not applicable. The vehicle is not equipped with steering wheel controls. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
B1140	Map Disk Invalid	INSERT a good known navigation map DVD. CLEAR the DTCs. REPEAT the self-test. If DTC B1140 is retrieved again, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
B1318	Battery Voltage Low	CLEAR the DTCs. REPEAT the self-test. If DTC B1318 is retrieved again, REFER to Section 414-00 to diagnose the low battery voltage condition.
B1342	ECU is Faulted	CLEAR the DTCs. REPEAT the self-test. If DTC B1342 is retrieved again, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
B2103	Antenna Not Connected	GO to Pinpoint Test A.
B2204	GPS Antenna Connection Open or Short	GO to Pinpoint Test H.
B2274	Phone Transceiver Active Circuit Failure	DTC is not applicable. The vehicle is not equipped with cellular phone functionality. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.

DTC	Description	Action
B2384	Audio Reverse Aid Mute Input Ckt Failure	DTC is not applicable. The vehicle is not equipped with parking aid. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
B2404	Audio Steering Wheel Switch Circuit Fault	DTC is not applicable. The vehicle is not equipped with steering wheel controls. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
B2405	Audio Disc CD Player Thermal Shutdown Fault	ALLOW the unit to cool. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
B2406	Audio Disc CD Player Internal Fault	CLEAR the DTCs. REPEAT the self-test. If DTC B2406 is retrieved again, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
B2477	Module Configuration Failure	REFER to Section 418-01 to diagnose the module configuration.
B2633	Driver-Front Microphone Circuit Failure	DTC is not applicable. The vehicle is not equipped with voice-activated navigation. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
B2656	DVD (Digital Versatile Disc) Error	REMOVE the navigation map DVD. With a soft cloth, WIPE the DVD in an outward direction starting from the center. MAKE SURE there are no fingerprints or scratches on the DVD surface. INSERT the DVD. CLEAR the DTCs. REPEAT the self-test. If DTC B2656 is retrieved again, INSERT a good known navigation map DVD. CLEAR the DTCs. REPEAT the self-test. If DTC B2656 is retrieved again, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
B2924	Audio Button Stuck	For the navigation audio unit, GO to Pinpoint Test K. For all others, VERIFY no audio unit buttons are stuck. CLEAR the DTCs. REPEAT the self-test. If DTC B2924 is retrieved again, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
B2965	Audio System Speaker Circuit Fault	GO to Pinpoint Test B.
C1992	Vehicle Speed Circuit Failure	VERIFY the audio unit is configured to receive the vehicle speed signal through the medium speed controller area network (MS-CAN). REFER to Section 418-01.
P0812	Reverse Input Circuit	VERIFY the audio unit is configured to receive the reverse signal through the MS-CAN. REFER to Section 418-01.
U0140	Lost Communication With Body Control Module (GEM)	**NOTE:** *Diagnose DTC B1318 (if present) before diagnosing DTC U0140.* VERIFY the operation of the vehicle illumination and the accessory delay. ▪ If the vehicle illumination or accessory delay does not operate correctly, REFER to Section 413-00 (illumination) or Section 501-11 (accessory delay). ▪ If the vehicle illumination and accessory delay operate correctly, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
U0155	Lost Communication With Instrument Panel Cluster (IC) Control Module	**NOTE:** *If no related concern is currently present, disregard the DTC.* If the speed sensitive volume does not operate correctly, GO to Pinpoint Test M. If the navigation is inaccurate, GO to Pinpoint Test L.
U0159	Lost Communication With Parking Assist Control	DTC is not applicable. The vehicle is not equipped with parking aid. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.

DTC	Description	Action
	Module (PAM)	
U0193	Lost Communication With Digital Audio Control Module (SDARS)	GO to Pinpoint Test F.
U0196	Lost Communication With Entertainment Control Module - Rear (AUX)	DTC is not applicable. The vehicle is not equipped with rear audio controls. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
U0197	Lost Communication With Telephone Control Module	DTC is not applicable. The vehicle is not equipped with cellular phone functionality. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
U0238	Lost Communication With Digital Audio Control Module "D" (DSP)	DTC is not applicable. The vehicle is not equipped with a DSP module. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
U0249	Lost Communication With Entertainment Control Module - Rear "B" (RCU)	DTC is not applicable. The vehicle is not equipped with rear audio controls. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
U2050	No Application Present	CONFIGURE the audio unit. REFER to Section 418-01 to carry out programmable module installation (PMI). CLEAR the DTCs. REPEAT the self-test. If DTC U2050 is retrieved again, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
U2051	One or More Calibration Files Missing/Corrupt	CONFIGURE the audio unit. REFER to Section 418-01 to carry out PMI. CLEAR the DTCs. REPEAT the self-test. If DTC U2051 is retrieved again, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
U2473	Unexpected Vehicle Speed (VSS)	GO to Pinpoint Test L.

Satellite Radio Receiver Diagnostic Trouble Code (DTC) Index

NOTE: *While running the satellite audio bezel diagnostic test, DTCs contain the characters "SAT" after the 5-digit DTC.*

DTC	Description	Action
B1031	SDARS Satellite Antenna Open	GO to Pinpoint Test G.
B1032	SDARS Satellite Antenna Short	GO to Pinpoint Test G.
B1318	Battery Voltage Low	CLEAR the DTCs. REPEAT the self-test. If DTC B1318 is retrieved again, REFER to Section 414-00 to diagnose the low battery voltage condition.
B1342	ECU is Faulted	CLEAR the DTCs. REPEAT the self-test. If DTC B1342 is retrieved again, REMOVE the satellite radio receiver and SEND it to an authorized audio system repair facility. REFER to Satellite Radio Receiver in this section. TEST the system for normal operation after the repair.
B2477	Module Configuration Failure	REFER to Section 418-01 to diagnose the module configuration.

DTC	Description	Action
U0184	Lost Communication With Radio (ACM)	DISREGARD the DTC. CLEAR the DTC. REPEAT the self-test.
U0196	Lost Communication With Entertainment Control Module - Rear (AUX)	DTC is not applicable. The vehicle is not equipped with rear audio controls. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
U0197	Lost Communication With Telephone Control Module	DTC is not applicable. The vehicle is not equipped with cellular phone functionality. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
U0249	Lost Communication With Entertainment Control Module - Rear "B" (RCU)	DTC is not applicable. The vehicle is not equipped with rear audio controls. DISREGARD the DTC. CLEAR the DTCs. REPEAT the self-test.
U2050	No Application Present	CONFIGURE the satellite radio receiver. REFER to Section 418-01 to carry out PMI. CLEAR the DTCs. REPEAT the self-test. If DTC U2050 is retrieved again, REMOVE the satellite radio receiver and SEND it to an authorized audio system repair facility. REFER to Satellite Radio Receiver in this section. TEST the system for normal operation after the repair.

Symptom Chart

Symptom Chart — Audio System

Condition	Possible Sources	Action
• No communication with the audio unit	• Fuse • Circuitry • Audio unit	• REFER to Section 418-00.
• No communication with the satellite radio receiver	• Fuse • Circuitry • Audio unit	• REFER to Section 418-00.
• The audio unit is inoperative/does not operate correctly — satellite audio	• Circuitry • Satellite radio receiver • Audio unit	• GO to Pinpoint Test F.

• The audio unit backlighting does not operate correctly	• Module configuration
	• Circuitry
	• Audio unit
		• VERIFY the audio unit is configured for network-based illumination.
		  • If the audio unit is configured correctly, REFER to Section 413-00, to diagnose a single illumination source inoperative.
		  • If the audio unit is not configured correctly, CONFIGURE the audio unit. REFER to Section 418-01, to carry out programmable module installation (PMI). TEST the system for normal operation.

• Poor reception — AM/FM	• Antenna • Antenna cable(s) • Charging system • Ignition system • Noise suppression equipment • Audio unit	• GO to Pinpoint Test A.

• Poor reception — satellite audio	• Obstructions to the line of sight	• DRIVE the vehicle to an open area and TEST the reception.
		  • If the reception is OK, INFORM the customer of the normal condition.
		  • If the reception is not OK, GO to Pinpoint Test G.

	• Satellite antenna • Satellite antenna cable • Satellite radio receiver	• GO to Pinpoint Test G.

• Continuous seek/scan in AM/FM	• RDS function setting	• VERIFY the RDS is set to ALL SCAN.
		  • If a good channel is found, the cause of the concern was that no RDS channel in the selected category was found. The system is OK.
		  • If a good channel is not found, GO to Pinpoint Test A.

	• Antenna cable(s) • Noise suppression equipment • Antenna • Audio unit	• GO to Pinpoint Test A.
• Poor quality/distorted/no sound from one or more speakers (not all speakers) — except subwoofers	• Circuitry • Speaker • Audio unit	• GO to Pinpoint Test B.

• Poor quality/distorted/no sound from all speakers	• Circuitry
	• Audio unit
		• With the key in any position except START, MEASURE the voltage between the audio unit C290D Pin 15, circuit 1000 (RD/BK), harness side and ground.
		  • If any voltage is present, REPAIR the circuit. TEST the system for normal operation.
		  • If no voltage is present, REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.

• The subwoofer is inoperative/does not operate correctly — front subwoofers	• Fuse • Circuitry • Subwoofer amplifier • Front subwoofer • Audio unit	• GO to Pinpoint Test C.
• The subwoofer is inoperative/does not operate correctly — rear subwoofers	• Fuse • Circuitry • Subwoofer amplifier • Rear subwoofer • Audio unit	• GO to Pinpoint Test D.
• Loud popping sound when cycling the ignition switch	• Fuse • Circuitry • Subwoofer amplifier • Audio unit	• GO to Pinpoint Test E.

• The speed sensitive volume does not operate correctly.	• Instrument cluster • Audio unit	• GO to Pinpoint Test M.
• The audio unit is inoperative/does not operate correctly — audio input jack	• Circuitry • Audio input jack • Audio unit	• GO to Pinpoint Test N.

• The CD player is inoperative/does not operate correctly	• CD
	• ACM
		• INSPECT the CD for scratches, fingerprints, a loose paper label, incorrect format, or damage. INSERT a known good CD and TEST the system.
		  • If the system operates correctly, the concern was caused by a damaged CD.
		  • If the system does not operate correctly, INSTALL a new ACM . REFER to Audio Unit in this section. TEST the system for normal operation.

Symptom Chart — Navigation

Condition	Possible Sources	Action
• No global positioning system (GPS) antenna signal	• GPS antenna • Audio unit	• GO to Pinpoint Test H.
• The position cursor is inaccurate	• Audio unit	• GO to Pinpoint Test L.
• The audible switch feedback is inoperative	• Audio unit	• GO to Pinpoint Test I.
• The voice guidance is inoperative/does not operate correctly	• Audio unit	• GO to Pinpoint Test J.
• The display screen is inoperative	• Audio unit	• REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
• Unable to insert or eject map disc	• Audio unit	• REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.

Pinpoint Tests

Pinpoint Test A: Poor Reception — AM/FM

Normal Operation

The noise suppression equipment reduces interference transmitted through the speakers by the engine ignition and electrical systems.

DTC B2103 — sets when an open is detected in the antenna circuit.

Possible Causes

- Antenna
- Antenna cable(s)
- Charging system
- Ignition system
- Noise suppression equipment
- Audio unit

PINPOINT TEST A : POOR RECEPTION — AM/FM

A1 REVIEW THE DTCS

- Review the DTCs from the audio unit self-test.

Is DTC B2103 present?

Yes	GO to A7.
No	GO to A2.

A2 CHECK THE AUDIO UNIT RECEPTION

- Check the audio unit signal reception with the engine running, and with the engine off.

Does the poor reception only occur with the engine running?

Yes	GO to A3.
No	GO to A7.

A3 CHECK THE SUPPRESSION EQUIPMENT/MOUNTING AND CONNECTING CIRCUITS

- Ignition OFF.
- Check all necessary suppression equipment and the radio frequency interference suppression bond.
- **NOTE:** *The capacitor mounting points are used to complete the electrical circuit and must be mounted securely to clean surfaces.*

  Check the mounting and connecting circuits of the radio interference capacitor for integrity, cleanliness, and metal-to-metal contact.

Are the connections clean, secure, and in metal-to-metal contact?

Yes	GO to A4.
No	CLEAN, SECURE, or INSTALL new suppression equipment as necessary. TEST the system for normal operation.

A4 CHECK THE RADIO INTERFERENCE CAPACITOR

- Check the operation of the radio interference capacitor by installing a known good component.
- Start the vehicle.
- Operate the audio unit in radio tuner mode.

Is the reception OK?

Yes	INSTALL a new radio interference capacitor. TEST the system for normal operation.
No	INSTALL the original radio interference capacitor. GO to A5 .

A5 CHECK THE GENERATOR

- Ignition OFF.
- Check the generator by disconnecting the voltage regulator.
- Start the vehicle.
- Operate the audio unit in radio tuner mode.

Is the reception OK?

Yes	INSTALL a new generator. REFER to Section 414-02. TEST the system for normal operation.
No	TURN the key to OFF. CONNECT the voltage regulator. GO to A6 .

A6 CHECK THE IGNITION CIRCUITS

- Check the ignition circuits for correct routing, ground, and integrity of connections.
- Check the spark plugs and ignition coils.

Are the ignition components OK?

Yes	GO to A10.
No	REPAIR the ignition system as necessary. TEST the system for normal operation.

A7 CHECK THE ANTENNA GROUND

- Ignition OFF.
- Measure the resistance between the antenna base and the battery ground cable.

Is the resistance less than 5 ohms?

Yes	GO to A9.
No	GO to A8.

A8 CHECK THE ANTENNA CABLE CONNECTIONS

- Check the antenna connections, including the extension cable.
- Check to make sure the antenna is securely mounted to the vehicle body at ground points.

Are the connections clean, secure, and in metal-to-metal contact?

Yes	GO to A9.
No	CLEAN and SECURE the antenna connections as necessary. CLEAR the DTCs. REPEAT the self-test.

A9 SUBSTITUTE THE ANTENNA

- Substitute a known good antenna.
- Ignition ON.
- Operate the audio unit in radio tuner mode.

Is the reception OK?

Yes	INSTALL a new antenna. CLEAR the DTCs. REPEAT the self-test.
No	TURN the key to OFF. INSTALL the original antenna. GO to A10 .

A10 SUBSTITUTE THE ANTENNA CABLE

- Substitute a known good antenna cable.
- Ignition ON.
- Operate the audio unit in radio tuner mode.

Is the reception OK?

Yes	INSTALL a new antenna cable. REFER to Antenna Lead-In Cable in this section. CLEAR the DTCs. REPEAT the self-test.
No	TURN the key to OFF. INSTALL the original antenna cable. GO to A11 .

A11 SUBSTITUTE THE AUDIO UNIT

- Substitute a known good audio unit.
- Start the vehicle.
- Operate the audio unit in radio tuner mode.

Is the reception OK?

Yes	SEND the original audio unit to an authorized audio system repair facility. TEST the system for normal operation after the repair.
No	INSTALL the original audio unit. GO to A12 .

A12 REPOSITION THE COMPONENTS

- Determine if the concern can be corrected by repositioning the antenna extension cable, speaker circuits, or audio unit power feed circuits away from other circuits and brackets.
- Start the vehicle.
- Operate the audio unit in radio tuner mode.

Is the reception OK?

Yes	Permanently REPOSITION the components as needed. TEST the system for normal operation.
No	GROUND various parts of the vehicle to the frame using a jumper cable (for example: engine, fenders, quarter panels, stone deflectors, body sheet metal). When the concern is corrected, PROVIDE a permanent ground where necessary. TEST the system for normal operation.

Pinpoint Test B: Poor Quality/Distorted/No Sound from One or More Speakers (Not All Speakers) — Except Subwoofers

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

Normal Operation

The audio unit directs the audio signals to the speakers through separate positive and negative circuits for each of the audio channels. The audio unit provides internal circuit protection for shorts to ground, shorts to voltage, or shorts between any output circuits.

For the navigation system, if the voice guidance setting is set to zero rather than to off, it may appear that the front speakers intermittently produce no sound. Make sure the voice guidance setting is not set to zero before addressing a concern with the front speakers.

DTC B2965 — sets when a short to ground is detected on any of the speaker circuits. For all audio units except single CD, DTC B2965 also sets when an open circuit or short to voltage is detected.

Possible Causes

- Circuit 1722 (LB/WH) open, short to ground or voltage
- Circuit 1723 (OG/LG) open, short to ground or voltage
- Circuit 1725 (TN/YE) open, short to ground or voltage
- Circuit 1726 (GY/LB) open, short to ground or voltage
- Circuit 1777 (DG/OG) open, short to ground or voltage
- Circuit 1778 (WH/LG) open, short to ground or voltage
- Circuit 1780 (BN/PK) open, short to ground or voltage
- Circuit 1781 (OG/RD) open, short to ground or voltage
- Speaker
- Audio unit

PINPOINT TEST B : POOR QUALITY/DISTORTED/NO SOUND FROM ONE OR MORE SPEAKERS (NOT ALL SPEAKERS) — EXCEPT SUBWOOFERS

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

B1 CHECK FOR OTHER CONCERNS

- Ignition OFF.
- Remove the trim panel for the suspect speaker. Refer to Section 501-05.
- Remove the speaker and check for:
  - connector integrity.
  - debris in the speaker cone.
- Install the speaker, but leave the trim panel off.
- Ignition ON.
- Operate the audio unit in radio tuner (AM/FM) mode.
- Observe the operation of the suspect speaker.

Is the speaker sound OK?

Yes	INSPECT the trim panel and REPAIR as necessary. TEST the system for normal operation.
No	GO to B2.

B2 CHECK THE SPEAKER CIRCUITS FOR VOLTAGE

- Ignition OFF.
- Disconnect: Suspect Speaker.
- Ignition ON.
- Operate the audio unit in radio tuner mode.
- Measure the AC voltage between the suspect speaker pin 1 and pin 2, harness side as follows:

Suspect Speaker	Connector-Pin/ Circuit	Connector-Pin/ Circuit
LH front	C523 Pin 1 1723 (OG/LG)	C523 Pin 2 1722 (LB/WH)
RH front	C612 Pin 1 1778 (WH/LG)	C612 Pin 2 1777 (DG/OG)
LH rear	C484 Pin 1 1726 (GY/LB)	C484 Pin 2 1725 (TN/YE)
RH rear	C485 Pin 1 1781 (OG/RD)	C485 Pin 2 1780 (BN/PK)

Is an alternating AC voltage present?

Yes	INSTALL a new speaker for the suspect speaker. REFER to Door Speaker or Quarter Panel Speaker in this section. CLEAR the DTCs. REPEAT the speaker walk-around test.
No	GO to B3.

B3 CHECK THE SPEAKER CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Audio Unit C290D .
- Ignition ON.
- Measure the voltage between the suspect speaker, harness side and ground as follows:

Suspect Speaker	Connector-Pin	Circuit
LH front	C523 Pin 1 C523 Pin 2	1723 (OG/LG) 1722 (LB/WH)
RH front	C612 Pin 1 C612 Pin 2	1778 (WH/LG) 1777 (DG/OG)
LH rear	C484 Pin 1 C484 Pin 2	1726 (GY/LB) 1725 (TN/YE)
RH rear	C485 Pin 1 C485 Pin 2	1781 (OG/RD) 1780 (BN/PK)

Is any voltage present?

Yes	REPAIR the circuit in question. CLEAR the DTCs. REPEAT the speaker walk-around test.
No	GO to B4.

B4 CHECK THE SPEAKER CIRCUITS FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the resistance between the suspect speaker, harness side and the audio unit, harness side; and between the suspect speaker, harness side and ground as follows:

Suspect Speaker	Speaker Connector- Pin	Audio Unit Connector- Pin	Circuit
LH front	C523 Pin 1	C290D Pin 8	1723 (OG/LG)
LH front	C523 Pin 2	C290D Pin 21	1722 (LB/WH)
RH front	C612 Pin 1	C290D Pin 11	1778 (WH/LG)
RH front	C612 Pin 2	C290D Pin 12	1777 (DG/OG)
LH rear	C484 Pin 1	C290D Pin 9	1726 (GY/LB)
LH rear	C484 Pin 2	C290D Pin 22	1725 (TN/YE)
RH rear	C485 Pin 1	C290D Pin 10	1781 (OG/RD)
RH rear	C485 Pin 2	C290D Pin 23	1780 (BN/PK)

Is the resistance less than 5 ohms between the suspect speaker and the audio unit, and greater than 10,000 ohms between the suspect speaker and ground?

Yes	GO to B5.
No	REPAIR the circuit in question. CLEAR the DTCs. REPEAT the speaker walk-around test.

B5 CHECK FOR CORRECT AUDIO UNIT OPERATION

- Disconnect the audio unit connectors.
- Check for:
  - corrosion
  - damaged pins
  - pushed-out pins
- Connect the audio unit connectors and make sure they seat correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
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 self-test.

Pinpoint Test C: The Subwoofer is Inoperative/Does Not Operate Correctly — Front Subwoofer

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

Normal Operation

The front subwoofers are powered by a separate subwoofer amplifier for each subwoofer speaker. The enable/clip circuit 173 (DG/VT) carries out 2 functions: to turn on the subwoofer amplifiers, and monitor an overload condition to the subwoofer amplifier. In the event of an overload, the audio unit clips the audio output signal to the subwoofer amplifiers (heard as distortion). The front subwoofer amplifiers receive voltage through circuit 829 (WH/VT), and ground through circuit 1204 (BK/OG).

Possible Causes

- Fuse
- Circuit 167 (BN/OG) open, short to ground or voltage
- Circuit 168 (RD/BK) open, short to ground or voltage
- Circuit 173 (DG/VT) open or short to ground
- Circuit 804 (OG/LG) open, short to ground or voltage
- Circuit 805 (WH/LG) open, short to ground or voltage
- Circuit 811 (DG/OG) open, short to ground or voltage
- Circuit 813 (LB/WH) open, short to ground or voltage
- Circuit 815 (LG/OG) open, short to ground or voltage
- Circuit 816 (LG/VT) open, short to ground or voltage
- Circuit 819 (LG/WH) open, short to ground or voltage
- Circuit 820 (DB/YE) open, short to ground or voltage

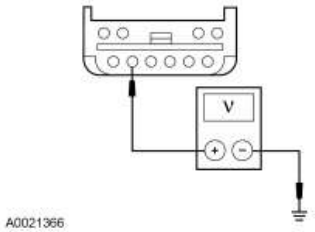
- Circuit 829 (WH/VT) open
- Circuit 1204 (BK/OG) open
- Subwoofer amplifier
- Subwoofer
- Audio unit

PINPOINT TEST C : THE SUBWOOFER IS INOPERATIVE/DOES NOT OPERATE CORRECTLY — FRONT SUBWOOFER

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

C1 CHECK CIRCUIT 829 (WH/VT) FOR VOLTAGE

- Ignition OFF.
- Disconnect: Left Front Subwoofer Amplifier C2993A and Right Front Subwoofer Amplifier C2994A .
- Measure the voltage between the left front subwoofer amplifier C2993A Pin 5, circuit 829 (WH/VT), harness side and ground; and between the right front subwoofer amplifier C2994A Pin 5, circuit 829 (WH/VT), harness side and ground.

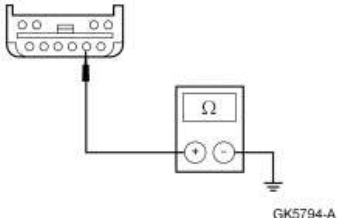


Are the voltages greater than 10 volts?

Yes	GO to C2.
No	VERIFY the bussed electrical center (BEC) fuse 16 (30A) is OK. If OK, REPAIR the circuit in question. TEST the system for normal operation.

C2 CHECK CIRCUIT 1204 (BK/OG) FOR AN OPEN

- Measure the resistance between the left front subwoofer amplifier C2993A Pin 2, circuit 1204 (BK/OG), harness side and ground; and between the right front subwoofer amplifier C2994A Pin 2, circuit 1204 (BK/OG), harness side and ground.

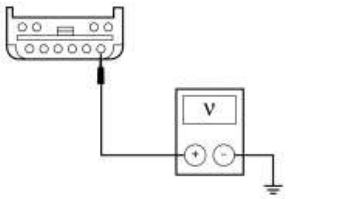


Are the resistances less than 5 ohms?

Yes	GO to C3.
No	REPAIR the circuit in question. TEST the system for normal operation.

C3 CHECK CIRCUIT 173 (DG/VT) FOR VOLTAGE

- Ignition ON.
- Operate the audio unit in radio tuner mode.
- Measure the voltage between the left front subwoofer amplifier C2993A Pin 1, circuit 173 (DG/VT), harness side and ground; and between the right front subwoofer amplifier C2994A Pin 1, circuit 173 (DG/VT), harness side and ground.

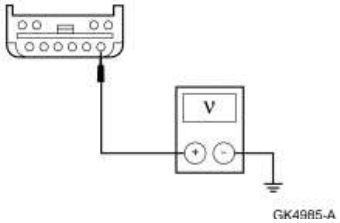


Is the voltage between 3.8 and 6.7 volts at both amplifiers?

Yes	GO to C6.
No	If the voltage is incorrect at one amplifier only, REPAIR the circuit in question. TEST the system for normal operation. If the voltage is incorrect at both amplifiers, GO to C4 .

C4 CHECK CIRCUIT 173 (DG/VT) FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Audio Unit C290B .
- Ignition ON.
- Measure the voltage between the left front subwoofer amplifier C2993A Pin 1, circuit 173 (DG/VT), harness side and ground.



Is any voltage present?

Yes	REPAIR the circuit. TEST the system for normal operation.
No	GO to C5.

C5 CHECK CIRCUIT 173 (DG/VT) FOR AN OPEN OR SHORT TO GROUND

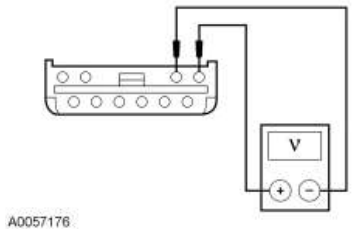
- Ignition OFF.
- Measure the resistance between the left front subwoofer amplifier C2993A Pin 1, circuit 173 (DG/VT), harness side and the audio unit C290B Pin 4, circuit 173 (DG/VT); and between the left front subwoofer amplifier C2993A Pin 1, circuit 173 (DG/VT), harness side and ground.

Is the resistance less than 5 ohms between the left front subwoofer amplifier and the audio unit, and greater than 10,000 ohms between the left front subwoofer amplifier and ground?

Yes	GO to C13.
No	REPAIR the circuit. TEST the system for normal operation.

C6 CHECK THE AUDIO SIGNALS TO THE FRONT SUBWOOFER AMPLIFIER

- Operate the audio unit in radio tuner mode.
- Measure the AC voltage between the left front subwoofer amplifier C2993A Pin 7, circuit 167 (BN/OG), harness side and the left front subwoofer amplifier C2993A Pin 8, circuit 168 (RD/BK), harness side; and between the right front subwoofer amplifier C2994A Pin 7, circuit 167 (BN/OG), harness side and the right front subwoofer amplifier C2994A Pin 8, circuit 168 (RD/BK), harness side.



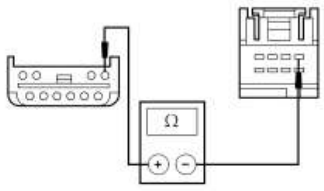
Is a fluctuating AC voltage present at both amplifiers?

Yes	GO to C10.
No	If the voltage is incorrect at one amplifier only, GO to C7 . If the voltage is incorrect at both amplifiers, GO to C8 .

C7 CHECK CIRCUIT 167 (BN/OG)) FOR AN OPEN

NOTE: *Carry out this step only for the inoperative subwoofer.*

- Ignition OFF.
- Disconnect: Audio Unit C290B .
- Measure the resistance between the left front subwoofer amplifier C2993A Pin 7, circuit 167 (BN/OG), harness side and the audio unit C290B Pin 1, circuit 167 (BN/OG), harness side; or between the right front subwoofer amplifier C2993A Pin 7, circuit 167 (BN/OG), harness side and the audio unit C290B Pin 1, circuit 167 (BN/OG), harness side.



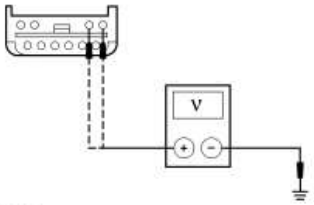
N0056195

Is the resistance less than 5 ohms?

Yes	REPAIR circuit 168 (RD/BK). TEST the system for normal operation.
No	REPAIR circuit 167 (BN/OG). TEST the system for normal operation.

C8 CHECK CIRCUITS 167 (BN/OG) AND 168 (RD/BK) FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Audio Unit C290B .
- Ignition ON.
- Measure the voltage between the left front subwoofer amplifier C2993A Pin 7, circuit 167 (BN/OG), harness side and ground; and between the left front subwoofer amplifier C2993A Pin 8, circuit 168 (RD/BK), harness side and ground.



N0035293

Is any voltage present?

Yes	REPAIR the circuit in question. TEST the system for normal operation.

No	GO to C9.

C9 CHECK CIRCUITS 167 (BN/OG) AND 168 (RD/BK) FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the resistance between the left front subwoofer amplifier, harness side and the audio unit, harness side; and between the left front subwoofer amplifier, harness side and ground as follows:

Subwoofer Amplifier Connector-Pin	Audio Unit Connector-Pin	Circuit
C2993A Pin 7	C290B Pin 1	167 (BN/OG)
C2993A Pin 8	C290B Pin 2	168 (RD/BK)

Is the resistance less than 5 ohms between the left front subwoofer amplifier and the audio unit, and greater than 10,000 ohms between the left front subwoofer amplifier and ground?

Yes	GO to C13.
No	REPAIR the circuit in question. TEST the system for normal operation.

C10 CHECK THE AUDIO CIRCUITS TO THE SUSPECT FRONT SUBWOOFER

- Ignition OFF.
- Connect: Left Front Subwoofer Amplifier C2993A and Right Front Subwoofer Amplifier C2994A .
- Disconnect: Left Front Subwoofer C536 or Right Front Subwoofer C628 .
- Ignition ON.
- Operate the audio unit in radio tuner mode.
- Measure the AC voltage between the suspect front subwoofer circuits, harness side as follows:

Suspect Subwoofer	Subwoofer Connector-Pin/ Circuit	Subwoofer Connector-Pin/ Circuit
Left front	C536 Pin 1 804 (OG/LG)	C536 Pin 2 813 (LB/WH)
Left front	C536 Pin 3 820 (DB/YE)	C536 Pin 4 819 (LG/WH)
Right front	C628 Pin 1 805 (WH/LG)	C628 Pin 2 811 (DG/OG)
Right front	C628 Pin 3 816 (LG/VT)	C628 Pin 4 815 (LG/OG)

Is a fluctuating AC voltage present?

Yes	INSTALL a new subwoofer for the suspect subwoofer. REFER to Subwoofer Speaker in this section. TEST the system for normal operation.
No	GO to C11.

C11 CHECK THE AUDIO CIRCUITS TO THE SUSPECT SUBWOOFER FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Left Front Subwoofer Amplifier C2993A and Right Front Subwoofer Amplifier C2994A .
- Ignition ON.
- Measure the voltage between the suspect front subwoofer, harness side and ground as follows:

Suspect Subwoofer	Subwoofer Connector-Pin	Circuit
Left front	C536 Pin 1	804 (OG/LG)
	C536 Pin 2	813 (LB/WH)
	C536 Pin 3	820 (DB/YE)
	C536 Pin 4	819 (LG/WH)
Right front	C628 Pin 1	805 (WH/LG)
	C628 Pin 2	811 (DG/OG)
	C628 Pin 3	816 (LG/VT)
	C628 Pin 4	815 (LG/OG)

Is any voltage present?

Yes	REPAIR the circuit in question. TEST the system for normal operation.
No	GO to C12.

C12 CHECK THE AUDIO CIRCUITS TO THE SUSPECT SUBWOOFER FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the resistance between the suspect front subwoofer, harness side and the front amplifier, harness side; and between the suspect front subwoofer, harness side and ground as follows:

Suspect Subwoofer	Subwoofer Connector- Pin	Audio Unit Connector- Pin	Circuit
Left front	C536 Pin 1	C2993B Pin 1	804 (OG/LG)
	C536 Pin 2	C2993B Pin 2	813 (LB/WH)
	C536 Pin 3	C2993B Pin 3	820 (DB/YE)
	C536 Pin 4	C2993B Pin 4	819 (LG/WH)
Right front	C628 Pin 1	C2994B Pin 1	805 (WH/LG)
	C628 Pin 2	C2994B Pin 2	811 (DG/OG)
	C628 Pin 3	C2994B Pin 3	816 (LG/VT)
	C628 Pin 4	C2994B Pin 4	815 (LG/OG)

Is the resistance less than 5 ohms between the suspect front subwoofer and the front subwoofer amplifier, and greater than 10,000 ohms between the suspect front subwoofer and ground?

Yes	INSTALL a new front subwoofer amplifier for the suspect amplifier. REFER to Subwoofer Amplifier — Door in this section. TEST the system for normal operation.
No	REPAIR the circuit in question. TEST the system for normal operation.

C13 CHECK FOR CORRECT AUDIO UNIT OPERATION

- Disconnect the audio unit connectors.
- Check for:
  - corrosion
  - damaged pins
  - pushed-out pins
- Connect the audio unit connectors and make sure they seat correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	REMOVE the audio unit and SEND it to an authorized audio system repair facility. REFER to Audio Unit in this section. TEST the system for normal operation after the repair.
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

Pinpoint Test D: The Subwoofer is Inoperative/Does Not Operate Correctly — Rear Subwoofer

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

Normal Operation

The rear subwoofers are powered by a separate subwoofer amplifier for each subwoofer speaker. The enable/clip circuit 174 (GY/BK) carries out 2 functions: to turn on the subwoofer amplifiers, and monitor an overload condition to the subwoofer amplifiers. In the event of an overload, the audio unit clips the audio output signal to the subwoofer amplifiers (heard as distortion). The rear subwoofer amplifiers receive voltage through circuit 828 (VT/LB) (right subwoofers) or circuit 830 (PK/YE) (left subwoofers), and ground through circuit 1204 (BK/OG).

Possible Causes

- Fuse
- Circuit 174 (GY/BK) open or short to ground
- Circuit 176 (PK/LG) open or short to ground
- Circuit 179 (OG/RD) open or short to ground
- Circuit 800 (GY/LB) open or short to ground
- Circuit 801 (TN/YE) open or short to ground
- Circuit 802 (OG/RD) open or short to ground
- Circuit 803 (BN/PK) open or short to ground
- Circuit 806 (PK/LB) open or short to ground
- Circuit 807 (PK/LG) open or short to ground
- Circuit 825 (TN/LG) open or short to ground
- Circuit 827 (TN/WH) open or short to ground
- Circuit 828 (VT/LB) open
- Circuit 830 (PK/YE) open
- Circuit 1204 (BK/OG) open
- Subwoofer amplifier
- Subwoofer
- Audio unit

PINPOINT TEST D : THE SUBWOOFER IS INOPERATIVE/DOES NOT OPERATE CORRECTLY — REAR SUBWOOFER

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

D1 CHECK CIRCUIT 828 (VT/LB) OR 830 (PK/YE) FOR VOLTAGE

- Ignition OFF.
- Disconnect: Suspect Subwoofer Amplifier(s).
- Measure the voltage between the suspect subwoofer amplifier, harness side and ground as follows:

Suspect Subwoofer Amplifier	Subwoofer Amplifier Connector-Pin	Circuit
Left outboard	C4157A Pin 5	830 (PK/YE)
Left inboard	C4158A Pin 5	828 (VT/LB)
Right inboard	C4159A Pin 5	830 (PK/YE)
Right outboard	C4160A Pin 5	828 (VT/LB)

Is the voltage greater than 10 volts?

Yes	GO to D2.