Information and Entertainment System

Special Tool(s)

	Fluke 77-IV Digital Multimeter FLU77-4 or equivalent
	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent diagnostic scan tool
	Flex Probe Kit NUD105-R025D or equivalent
	Multi-Media Interface Tester 105-00120
	Universal Serial Bus (USB) Male-A To Male-A Cable CCMUSB2-AM-AM-10

Principles of Operation

AM/FM Antenna

The AM/FM 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 ACM through the antenna cables.

Audio DSP Amplifier

The 8 channel non-networked audio DSP amplifier is found on Shaker/Shaker Pro-equipped vehicles. Audio signals are sent from the ACM to the audio DSP amplifier. These signals are amplified and sent to the 8-inch (203 mm) subwoofer speaker in each door , the 2 speaker assembly found in each door, and the 2 rear package tray (coupe) or 2 quarter panel (convertible) speakers.

Audio Front Control Module (ACM)

The ACM operates with the ignition in RUN or ACC. The accessory delay feature allows the audio system to be operated for a preset period of time after the key is turned off and a door has not been opened. The ACM sends AC voltage audio signals to the speakers or to the amplifiers, depending on vehicle configuration. The ACM produces its own DTCs, which are communicated to the diagnostic scan tool through the Medium Speed Controller Area Network (MS-CAN) . The enable/clip circuit is used to turn on the audio DSP amplifier or subwoofer amplifier, depending on vehicle configuration, and to monitor an overload condition of the amplifiers. In the event of an overload, the ACM clips the audio output signal to the amplifier (heard as distortion).

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.

Audio Signals

Stereo signals contain left and right channel information, and are used for most audio signals.

A mono signal is used for the microphone input to the APIM . The mono signal is also used for the voice prompts, the TTS feature, ringtones, and any audio received through a connected mobile phone. These audio signals are output from the APIM to the ACM . The mono and stereo outputs from the APIM utilize separate circuits.

A digital signal is used to transmit data from a media device connected through the USB port to the APIM . The APIM then converts the signal to analog and relays the signal to the ACM .

A wireless signal is used to broadcast audio signals from a Bluetooth device to the APIM . As with a digital signal sent through the USB port, the APIM converts the wireless audio signal to analog and relays it to the ACM .

Front Controls Interface Module (FCIM)

The Front Controls Interface Module (FCIM) acts as a customer interface with the audio system and the climate control system. When a switch is pressed, a message is broadcast over the MS-CAN . When a climate control switch is pressed, the HVAC module sends a message back to the FCIM to illuminate the correct switches to indicate the status of the climate control.

Front Display Interface Module (FDIM) (Without Navigation)

The Front Display Interface Module (FDIM) receives MS-CAN messages for all of its displays, which include:

- Audio information
- Climate control fan speed and temperature setting
- Outside air temperature
- Compass heading

Front Display Interface Module (FDIM) (With Navigation)

The FDIM does not communicate on the CAN and is hardwired to the ACM . When the touchscreen is pressed, a signal is sent to the ACM , which acts on the signal by changing either the audio setting or by broadcasting a message via the MS-CAN to the module controlling the function that was selected. The audio system, navigation, and climate control video feed to the FDIM is provided by the ACM . If equipped with a rear view camera, the video feed for the camera is provided directly by the rear view camera.

GPS Antenna

The GPS antenna is integral to the satellite radio antenna and is only present on vehicles with navigation. The location signals are sent to the ACM via a coaxial cable. A GPS /SDARS antenna splitter is used to provide separate satellite radio and Global Positioning System (GPS) inputs to the ACM .

Global Positioning System Module (GPSM)

The Global Positioning System Module (GPSM) provides vehicle location for real-time traffic reports and re-routing, and for identifying vehicle location in the event of a collision. The vehicle location information is broadcast to the APIM over the MS-CAN . The GPSM is only present on vehicles with SYNC® and without navigation.

Jukebox Feature (With Navigation)

The ACM contains a 10 gigabyte on-board hard-drive that is capable of storing music from a CD. Music can be loaded into the ACM jukebox by inserting a non-MP3 CD, and following the on-screen instructions. If the ACM is replaced, the music contained on the hard-drive cannot be retained. For more information about the Jukebox feature, REFER to the Owner's Literature.

Luggage Compartment Subwoofer Amplifier

The 4 channel non-networked luggage compartment subwoofer amplifier is found on Shaker Pro-equipped vehicles. Audio signals are sent from the ACM to the luggage compartment subwoofer amplifier. These signals are amplified and sent to the 10-inch (254 mm) luggage compartment subwoofer enclosure. Only 2 of the 4 channels are utilized, and are bridged for higher power output to the subwoofer.

Navigation System

The vehicle navigation system guides the user to a pre-entered destination. No navigation map DVD is needed, as the map guidance information is stored in the ACM hard-drive. The ACM calculates route information based on GPS data. The ACM also uses vehicle speed and transmission gear selected signals received through the MS-CAN to detect vehicle speed and direction, resulting in more accurate navigation tracking.

The navigation display is shown on the FDIM . Either the FDIM touchscreen or the buttons on the FCIM can be used to interact with the navigation system.

The compass heading is derived from the GPS antenna signal. There are no serviceable parts for the compass.

A voice recognition system allows the user to interface with the system without using the touchscreen. A microphone contained in the overhead console provides the voice recognition input and is shared with the SYNC® system.

Noise Suppression Equipment

The radio frequency suppression equipment reduces interference transmitted through the speakers by the engine ignition and electrical systems. When installing any new radio suppression equipment components, make sure that a good contact is made at all connections.

Satellite Radio Antenna

The satellite radio antenna receives satellite radio signals. The signals are sent to the ACM through the satellite radio antenna cables. If equipped with the navigation system, an antenna splitter is used to provide separate satellite radio and Global Positioning System (GPS) inputs to the ACM .

Steering Wheel Switches

The steering wheel switches consist of a series of resistors. Each steering wheel switch function corresponds with a specific resistance value within the switch. When a switch is pressed, the ACM (or the APIM) monitors the change in reference voltage to determine the requested function.

Subwoofers

The 8-inch (203 mm) subwoofer speakers utilized in the Shaker/Shaker Pro systems are located in the doors. Each subwoofer speaker is powered by 2 of the available 8 audio DSP amplifier channels. In addition to these subwoofer speakers, the Shaker Pro system includes an enclosure with one 10-inch (254 mm) dual voice coil subwoofer powered by a 4 channel amplifier.

SYNC® System

The SYNC® system allows interaction with several types of customer devices, including mobile phones and media devices. The APIM contains an on-board Bluetooth chipset which enables certain wireless devices to interact with the system.

The APIM consists of 2 internal modules: the Consumer Interface Processor (CIP) and the Vehicle Interface Processor (VIP) . These modules are not replaceable individually, but can be flashed independently, if required.

The CIP interfaces with all of the inputs to the APIM . The CIP contains an analog-to-digital-to-analog converter, as well as the Bluetooth chipset. Any consumer-available application upgrades that are available are loaded directly to the CIP through the USB port.

The VIP provides an interface between the CIP and the vehicle. The main functions of the VIP are controlling the APIM power management and translating both inbound and outbound signals over the CAN .

The APIM can receive inputs from the following audio sources:

- USB port
- Audio input jack
- Bluetooth

The USB port can be used for connecting a media device (such as an iPod®) with the device's available cable, or for directly plugging in a portable mass storage device (such as a "thumb drive"). When playing media files stored on a mass storage device, the SYNC® system only plays files that do not have Digital Rights Management (DRM) protection. The USB port can also be used for uploading vehicle application upgrades.

The USB port is powered by the APIM , so no external power source is needed to power a device plugged into the USB port if the device supports this feature.

The audio input jack can be used for connecting a media device (such as an iPod®) utilizing a 1/8-inch audio jack. When a device is connected through the audio input jack, only the speaker volume can be controlled by the ACM . All other functions (such as seek, fast forward, pause, etc.) must be carried out on the device itself.

The Bluetooth interface can accommodate both Bluetooth-enabled mobile phones and Bluetooth-enabled media devices. Any Bluetooth device used with the SYNC® system must first be paired with the system before it is operational.

Bluetooth is a secure, short-range radio frequency that allows devices to communicate wirelessly through radio waves. The operating range of a Bluetooth signal is a maximum of 9.75 m (32 ft).

Only one Bluetooth phone and one Bluetooth media device can be connected to the system at any one time. If an additional device of either type is paired with the system and made active, the APIM will disconnect any active connection and establish a connection with the new device.

It is important to understand that not all mobile phones will have the same level of features when interacting with the SYNC® system. For a list of compatible phones, refer to the SyncMyRide website.

In addition to audio information, metadata may also be sent to the APIM from a device plugged into the USB port. Metadata consists of such information as artist, album title, song title, and genre. The metadata is used by the APIM to create indexes that can be used to sort for particular music, based on customer preference. Not all USB devices can send metadata to the APIM ; also, no metadata is transferred when a device is connected through the audio input jack. When a new media device is connected to the SYNC® system, the APIM automatically indexes the information. This may take several minutes (depending on the amount of data on the device), and is considered normal operation. When a device that was previously connected to the SYNC® system is reconnected, the APIM updates the index (rather than creating a new one), which reduces the amount of time needed to create the index.

The APIM receives both stereo and mono sound inputs and can also transmit both stereo and mono sound. The mono function is used to receive the microphone input, and to send sound to the ACM for voice prompts, the Text-To-Speech (TTS) feature, ringtones, and any audio received through a connected mobile phone. The TTS feature speaks information so that it does not have to be read from the display.

The APIM communicates on the MS-CAN and the High Speed Controller Area Network (HS-CAN) . Communication with the diagnostic scan tool is established through the HS-CAN .

Voice Recognition [With Navigation (If Equipped), And With SYNC®]

When the audio system enters voice recognition mode, the ACM initially controls the voice recognition feature. The microphone is wired directly to the APIM , which relays the microphone input to the ACM through dedicated wiring. If the first command spoken is part of the ACM voice recognition set, the ACM retains control of the voice recognition and takes the appropriate action(s). If the first command spoken is part of the APIM voice recognition set, the ACM shuts off its own voice recognition and broadcasts a Controller Area Network (CAN) message to the APIM , which transfers the spoken voice command to the SYNC® system. The ACM controls the voice engine for the base audio, navigation, and climate control systems. The APIM controls the voice engine for the SYNC® system (USB port, audio input jack, Bluetooth).

Network Communication

The following audio system modules communicate via the MS-CAN :

- ACM (with and without navigation)
- FCIM
- FDIM (without navigation)
- APIM
- GPSM

There are numerous messages internal to the audio system. The functions of these messages include, but are not limited to:

- Changing the audio source
- Changing equalizer settings
- Updating the FDIM display
- Dialing phone numbers from the APIM (with SYNC®)

In addition, the following messages are utilized by the audio system in conjunction with systems outside of the audio system:

Audio System

Message	Transmitting Module	Receiving Module(s)	Audio System Function
Accessory Delay Status	SJB	ACM APIM FCIM FDIM (without navigation)	When active, this signal allows the audio component to be operated after the vehicle is shut off.
AFE (Average Fuel Economy) Data	IPC	ACM	Provides average fuel economy data to the ACM . This message only applies to vehicles with navigation.
Brake Sensor Data	IPC	GPSM	Provides vehicle yaw rate to the GPSM for use in vehicle tracking.
Compass Display Data	IPC	FDIM (without navigation)	Indicates the compass heading or mode (calibration, zone). This message only applies to vehicles without navigation.
eCall Notification	RCM	APIM	Provides the eCall status to the APIM . This message is also used to confirm that the APIM and the RCM are both configured for the eCall feature.
eCall Status	APIM	RCM	Provides the eCall status to the RCM . This message is also used to confirm that the APIM and the RCM are both configured for the eCall feature.
English/Metric Mode	IPC	ACM	Indicates whether English or metric units is currently selected.
FCIM Button State	FCIM	ACM APIM IPC	Indicates when a button is pressed on the FCIM so the audio system can make the desired setting change.
HVAC System Button Status (from ACM)	ACM	HVAC module	Indicates when a climate control setting is changed using the FDIM touchscreen (which is hardwired to the ACM) so the HVAC module can make the desired setting changes. This message only applies to vehicles with navigation.
HVAC System Button	FCIM	HVAC module	Indicates when a climate control button is pressed on the FCIM so the

Message	Transmitting Module	Receiving Module(s)	Audio System Function
Status (from FCIM)			HVAC module can make the desired setting change.
HVAC System Indication Command (to ACM)	HVAC module	ACM	Indicates the mode of the HVAC module so the ACM can send the correct display information to the FDIM (with navigation).
HVAC System Indication Command (to FCIM)	HVAC module	FCIM	Indicates the mode of the HVAC module so the FCIM can illuminate the appropriate indicator on the bezel face.
HVAC System Voice Request Status	ACM	HVAC module	Provides climate control setting changes that are initiated through the voice recognition system. This message only applies to vehicles with navigation.
Ignition Switch Position	SJB	ACM APIM FCIM FDIM (with navigation) GPSM	Indicates the ignition position to the audio system modules in order to control power management.
Instrument Illumination Level	SJB	ACM FCIM FDIM (with navigation)	Controls the backlight intensity based on the position of the dimmer switch.
Navigation Rolling Wheel Count	IPC	ACM	Used by the ACM (with navigation) to provide more accurate vehicle position tracking when the GPS signal is temporarily unavailable.
		GPSM	Used by the GPSM for vehicle tracking if the vehicle speed signal is lost.
Odometer Rolling Count	PCM	APIM	Provides the odometer reading to the APIM in order to initiate maintenance interval notifications.
Park Brake Status	SJB	ACM	Provides the park brake status to the ACM .
Temperature Display Status	HVAC module	ACM (with navigation) FDIM (without navigation)	Indicates certain climate control settings such as temperature, fan speed, air distribution, and outside air temperature.
TPMS Status	SJB	APIM	Provides the current tire pressure and TPMS warning indicator status to the APIM .
Transmission Selector (PRNDL) Status	IPC	ACM GPSM	• For vehicles with navigation, this signal is used for more accurate navigation tracking. • For vehicles without navigation and with SYNC®, this signal is used by the GPSM for more accurate vehicle tracking. • For vehicles with navigation and a rear view camera, this signal is used by the ACM to determine if it should allow the video feed from the rear view camera to be shown on the FDIM .
Vehicle Speed	IPC	ACM	Used by the ACM for the speed-compensated volume function.
		APIM	Used by the APIM to prevent driver distraction by limiting certain SYNC® functions based on vehicle speed.
		GPSM	Used by the GPSM for vehicle tracking.
VIN Information	IPC	ACM APIM	Provides the VIN to verify the correct modules are installed.

Inspection and Verification

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

Visual Inspection Chart

Mechanical	Electrical
• Front Controls Interface Module (FCIM) • Front Display Interface Module (FDIM) • AM/FM antenna • Audio input jack • Noise suppression equipment • Satellite radio antenna • Speakers • Steering wheel switches • Universal Serial Bus (USB) port	• Battery Junction Box (BJB) fuse(s): ▪ 20 (30A) (VBATT) ▪ 33 (30A) (VBATT) • Smart Junction Box (SJB) fuse(s): ▪ 3 (15A) (VBATT) ▪ 14 (10A) (VBATT) ▪ 28 (5A) (START signal) ▪ 39 (20A) (VBATT) • Wiring, terminals or connectors

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 diagnostic scan tool software release.*

   If the cause is not visually evident, connect the diagnostic 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 diagnostic scan tool does not communicate with the VCM :
   - Check the VCM connection to the vehicle.
   - Check the diagnostic scan tool connection to the VCM .
   - REFER to Section 418-00, No Power To The Diagnostic Scan Tool, to diagnose no power to the diagnostic scan tool.

6. If the diagnostic scan tool does not communicate with the vehicle:
   - Verify the ignition is in RUN.
   - Verify the diagnostic scan tool operation with a known good vehicle.
   - REFER to Section 418-00 to diagnose no response from the PCM.

7. Carry out the network test.
   - If the diagnostic 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 DTCs.

8. **NOTE:** *Do not press any buttons on the FCIM or FDIM (with navigation) while the ACM is carrying out the self-test.*

   CLEAR the continuous DTCs and carry out the self-test diagnostics for the ACM .

9. If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, REFER to the Diagnostic Trouble Code (DTC) Chart in Section 419-10.

10. If no DTCs related to the concern are retrieved, GO to Symptom Charts.

DTC Charts

NOTE: *For a SYNC®-related concern, refer to the SYNC® System Symptom Chart before connecting the diagnostic scan tool and beginning DTC-based diagnostics.*

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

Audio Front Control Module (ACM) DTC Chart (Without Navigation)

DTC	Description	Action
B11BA:1C	Steering Wheel Audio Switch Pack: Circuit Voltage out of Range	GO to Pinpoint Test R.
B11BA:63	Steering Wheel Audio Switch Pack: Circuit / Component Protection Time-Out	GO to Pinpoint Test R.

DTC	Description	Action
B1A01:01	Speaker #1: General Electrical Failure	GO to Pinpoint Test G.
B1A01:11	Speaker #1: Circuit Short to Ground	GO to Pinpoint Test G.
B1A01:12	Speaker #1: Circuit Short to Battery	GO to Pinpoint Test G.
B1A01:13	Speaker #1: Circuit Open	GO to Pinpoint Test G.
B1A02:01	Speaker #2: General Electrical Failure	GO to Pinpoint Test G.
B1A02:11	Speaker #2: Circuit Short to Ground	GO to Pinpoint Test G.
B1A02:12	Speaker #2: Circuit Short to Battery	GO to Pinpoint Test G.
B1A02:13	Speaker #2: Circuit Open	GO to Pinpoint Test G.
B1A03:01	Speaker #3: General Electrical Failure	GO to Pinpoint Test G.
B1A03:11	Speaker #3: Circuit Short to Ground	GO to Pinpoint Test G.
B1A03:12	Speaker #3: Circuit Short to Battery	GO to Pinpoint Test G.
B1A03:13	Speaker #3: Circuit Open	GO to Pinpoint Test G.
B1A04:01	Speaker #4: General Electrical Failure	GO to Pinpoint Test G.
B1A04:11	Speaker #4: Circuit Short to Ground	GO to Pinpoint Test G.
B1A04:12	Speaker #4: Circuit Short to Battery	GO to Pinpoint Test G.
B1A04:13	Speaker #4: Circuit Open	GO to Pinpoint Test G.
B1A05:02	Speaker #5: General Signal Failure	GO to Pinpoint Test H.
B1A56:21	Antenna: Signal Amplitude < Minimum	GO to Pinpoint Test A.
B1A89:01	Satellite Antenna: General Electrical Failure	GO to Pinpoint Test B.
B1A89:13	Satellite Antenna: Circuit Open	GO to Pinpoint Test B.
B1D19:49	Compact Disc Unit: Internal Electronic Failure	CLEAR the DTCs. REPEAT the self-test. If DTC B1D19:49 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
U0140:00	Lost Communication With Body Control Module: No Sub Type Information	GO to Pinpoint Test AF.
U0155:00	Lost Communication With Instrument Panel Cluster (IPC) Control Module: No Sub Type Information	GO to Pinpoint Test AI.
U0159:00	Lost Communication with Parking Assist Control Module "A": No Sub Type Information	GO to Pinpoint Test AJ.
U0197:00	Lost Communication With Telephone Control Module: No Sub Type Information	GO to Pinpoint Test AQ.

DTC	Description	Action
U0255:00	Lost Communication With Front Display Interface Module: No Sub Type Information	GO to Pinpoint Test AR.
U0256:00	Lost Communication With Front Controls Interface Module "A": No Sub Type Information	GO to Pinpoint Test AS.
U2014:41	Control Module Hardware: General Checksum Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U2014:41 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
U2014:42	Control Module Hardware: General Memory Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U2014:42 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
U2014:96	Control Module Hardware: Component Internal Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U2014:96 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
U201A:51	Control Module Main Calibration Data: Not Programmed	REFER to Section 418-01.
U2100:00	Initial Configuration Not Complete: No Sub Type Information	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to Audio Control Module (ACM).
U2101:00	Control Module Configuration Incompatible: No Sub Type Information	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to Audio Control Module (ACM).
U3003:16	Battery Voltage: Circuit Voltage Below Threshold	GO to Pinpoint Test AT.
U3003:17	Battery Voltage: Circuit Voltage Above Threshold	GO to Pinpoint Test AU.

Audio Front Control Module (ACM) DTC Chart (With Navigation)

DTC	Description	Action
B108E:63	Display: Circuit / Component Protection Time-Out - FDIM	CLEAR the DTCs. REPEAT the self-test. If DTC B108E:63 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
B119F:01	GPS Antenna: General Electrical Failure	GO to Pinpoint Test AA.
B119F:13	GPS Antenna: Circuit Open	GO to Pinpoint Test AA.
B11BA:1C	Steering Wheel Audio Switch Pack: Circuit Voltage out of Range	GO to Pinpoint Test R.
B11BA:63	Steering Wheel Audio Switch Pack: Circuit / Component Protection Time-Out	GO to Pinpoint Test R.
B1201:1C	Steering Wheel Audio Switch Pack 2: Circuit Voltage out of Range	GO to Pinpoint Test R.
B1201:63	Steering Wheel Audio Switch Pack 2: Circuit / Component Protection Time-Out	GO to Pinpoint Test R.

DTC	Description	Action
B121C:01	Hard Drive: General Electrical Failure	CLEAR the DTCs. REPEAT the self-test. If DTC B121C:01 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
B121C:44	Hard Drive: Data Memory Failure	CLEAR the DTCs. REPEAT the self-test. If DTC B121C:44 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
B1A56:21	Antenna: Signal Amplitude < Minimum	GO to Pinpoint Test A.
B1A89:01	Satellite Antenna: General Electrical Failure	GO to Pinpoint Test B.
B1A89:13	Satellite Antenna: Circuit Open	GO to Pinpoint Test B.
B1D19:49	Compact Disc Unit: Internal Electrical Failure	CLEAR the DTCs. REPEAT the self-test. If DTC B1D19:49 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
B1D19:4B	Compact Disc Unit: Over Temperature	The ACM was over-temperature. This may occur during extended use. Audio operation can resume after the ACM cools. CLEAR the DTCs. This is normal operation.
C1001:01	Vision System Camera: General Electrical Failure	REFER to Parking Aid - Video in Section 413-13.
U0140:00	Lost Communication With Body Control Module: No Sub Type Information	GO to Pinpoint Test AF.
U0155:00	Lost Communication With Instrument Panel Cluster (IPC) Control Module: No Sub Type Information	GO to Pinpoint Test AI.
U0159:00	Lost Communication with Parking Assist Control Module "A": No Sub Type Information	GO to Pinpoint Test AJ.
U0162:00	Lost Communication With Navigation Display Module: No Sub Type Information	GO to Pinpoint Test T.
U0164:00	Lost Communication With HVAC Control Module: No Sub Type Information	GO to Pinpoint Test AL.
U0197:00	Lost Communication With Telephone Control Module: No Sub Type Information	GO to Pinpoint Test AQ.
U0256:00	Lost Communication With Front Controls Interface Module "A": No Sub Type Information	GO to Pinpoint Test AS.
U2014:09	Control Module Hardware: Component Failure	GO to Pinpoint Test AB.
U2014:41	Control Module Hardware: General Checksum Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U2014:41 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
U2014:96	Control Module Hardware: Component Internal Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U2014:96 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
U201A:51	Control Module Main Calibration Data: Not Programmed	REFER to Section 418-01.
U2100:00	Initial Configuration Not Complete: No Sub Type Information	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to Audio Control Module (ACM).

DTC	Description	Action
U2101:00	Control Module Configuration Incompatible: No Sub Type Information	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to Audio Control Module (ACM).
U3000:45	Control Module Program Memory Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U3000:45 is retrieved again, INSTALL a new ACM . REFER to Audio Control Module (ACM). REPEAT the self-test.
U3003:16	Battery Voltage: Circuit Voltage Below Threshold	GO to Pinpoint Test AT.
U3003:17	Battery Voltage: Circuit Voltage Above Threshold	GO to Pinpoint Test AU.

Accessort Protocol Interface Module (APIM) DTC Chart

DTC	Description	Action
B1201:1C	Steering Wheel Audio Switch Pack 2: Circuit Voltage Out of Range	GO to Pinpoint Test R.
B1201:63	Steering Wheel Audio Switch Pack 2: Circuit / Component Protection Time-Out	GO to Pinpoint Test R.
B1252:04	USB Port: System Internal Failure	GO to Pinpoint Test P.
B1252:11	USB Port: Circuit Short to Ground	GO to Pinpoint Test P.
B12B8:04	USB Port #2: System Internal Failure	**NOTE:** *This DTC refers to USB port #2 on the APIM itself, which is not used.* • INSPECT the APIM USB port #2 for damage and REMOVE any debris. • CLEAR the DTCs. • WAIT at least 10 seconds. • REPEAT the self-test. • If DTC B12B8:04 is retrieved again,  **VIN required to access Guided Routine (APIM)**
B12B8:11	USB Port #2: Circuit Short To Ground	**NOTE:** *This DTC refers to USB port #2 on the APIM itself, which is not used.* • INSPECT the APIM USB port #2 for damage and REMOVE any debris. • CLEAR the DTCs. • WAIT at least 10 seconds. • REPEAT the self-test. • If DTC B12B8:11 is retrieved again,  **VIN required to access Guided Routine (APIM)**
B1D79:01	Microphone Input: General Electrical Failure	GO to Pinpoint Test Z.
B1D79:11	Microphone Input: Circuit Short To Ground	GO to Pinpoint Test Z.
B1D79:12	Microphone Input: Circuit Short To Battery	GO to Pinpoint Test Z.

DTC	Description	Action
B1D79:13	Microphone Input: Circuit Open	GO to Pinpoint Test Z.
U0100:00	Lost Communication With ECM /PCM "A": No Sub Type Information	GO to Pinpoint Test AD.
U0140:00	Lost Communication With Body Control Module: No Sub Type Information	GO to Pinpoint Test AF.
U0151:00	Lost Communication With Restraints Control Module: No Sub Type Information	GO to Pinpoint Test AG.
U0155:00	Lost Communication With Instrument Panel Cluster (IPC) Control Module: No Sub Type Information	GO to Pinpoint Test AI.
U016A:00	Lost Communication With Global Positioning System Module: No Sub Type Information	GO to Pinpoint Test AM.
U0184:00	Lost Communication With Radio: No Sub Type Information	GO to Pinpoint Test AO.
U0255:00	Lost Communication With Front Display Interface Module: No Sub Type Information	**NOTE:** *This DTC is only applicable for vehicles without navigation. For vehicles with navigation, disregard this DTC.* GO to Pinpoint Test AR.
U0256:00	Lost Communication With Front Controls Interface Module "A": No Sub Type Information	GO to Pinpoint Test AS.
U0422:00	Invalid Data Received From Body Control Module: No Sub Type Information	RETRIEVE and FOLLOW DTCs present in the SJB . REFER to Section 419-10.
U0423:00	Invalid Data Received From Instrument Panel Control Module: No Sub Type Information	RETRIEVE and FOLLOW DTCs present in the IPC . REFER to Section 413-01.
U2100:00	Initial Configuration Not Complete: No Sub Type Information	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions, I  **VIN required to access Guided Routine (APIM)**
U2101:00	Control Module Configuration Incompatible: No Sub Type Information	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions,  **VIN required to access Guided Routine (APIM)**
U3000:04	Control Module: System Internal Failure	GO to Pinpoint Test J.
U3000:41	Control Module: General Checksum Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U3000:41 is still present,  **VIN required to access Guided Routine (APIM)**

DTC	Description	Action
U3000:42	Control Module: General Memory Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U3000:42 is still present,  **VIN required to access Guided Routine (APIM)**
U3000:88	Control Module: Bus Off	**NOTE:** *Network communication/missing message DTCs may result from intermittent concerns such as damaged wiring or low battery voltage occurrences. Additionally, vehicle repair procedures such as module reprogramming often set these DTCs. To avoid repeat network concerns, Inspect for damaged or corroded wiring at the APIM . Test the vehicle battery. Refer to Charging Systems in Section 414-00. Replacing a module to resolve a network DTC is unlikely to resolve the concern.* 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 diagnostic scan tool.
U3003:16	Battery Voltage: Circuit Voltage Below Threshold	GO to Pinpoint Test AT.
U3003:17	Battery Voltage: Circuit Voltage Above Threshold	GO to Pinpoint Test AU.

Front Controls Interface Module (FCIM) DTC Chart

DTC	Description	Action
U0140:00	Lost Communication With Body Control Module: No Sub Type Information	GO to Pinpoint Test AF.
U0184:00	Lost Communication With Radio: No Sub Type Information	GO to Pinpoint Test AO.
U2013:63	Switch Pack: Circuit / Component Protection Time-Out	GO to Pinpoint Test S.
U2014:41	Control Module Hardware: General Checksum Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U2014:41 is still present, INSTALL a new FCIM . REFER to Front Controls Interface Module (FCIM). REPEAT the self-test.
U2014:42 (without navigation)	Control Module Hardware: General Memory Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U2014:42 is still present, INSTALL a new FCIM . REFER to Front Controls Interface Module (FCIM). REPEAT the self-test.
U201A:51	Control Module Main Calibration Data: Not Programmed	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to Front Controls Interface Module (FCIM).
U3003:16	Battery Voltage: Circuit Voltage Below Threshold	GO to Pinpoint Test AT.
U3003:17	Battery Voltage: Circuit Voltage Above Threshold	GO to Pinpoint Test AU.

Front Display Interface Module (FDIM) DTC Chart (Without Navigation)

DTC	Description	Action
B1318	Battery Voltage Low	GO to Pinpoint Test AC.
B1342	ECU is Faulted	CLEAR the DTCs. REPEAT the self-test. If DTC B1342 is still present, INSTALL a new Front Display Interface Module (FDIM) . REFER to Front Display Interface Module (FDIM). REPEAT the self-test.
B2477	Module Configuration Failure	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to Front Display Interface Module (FDIM).
B2924	Audio Button Stuck	CLEAR the DTCs. REPEAT the self-test. If DTC B2924 is still present, replace the FDIM . REFER to Front Display Interface Module (FDIM). REPEAT the self-test.
U0140	Lost Communication With Body Control Module (GEM)	GO to Pinpoint Test AE.
U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module	GO to Pinpoint Test AH.
U0164	Lost Communication With HVAC Control Module - EATC	GO to Pinpoint Test AK.
U0184	Lost Communication With Radio (ACM)	GO to Pinpoint Test AN.
U0197	Lost Communication With Telephone Control Module	GO to Pinpoint Test AP.
U2050	No Application Present	REFER to Section 418-01.
U2051	One or More Calibration Files Missing/Corrupt	REFER to Section 418-01.

Global Positioning System Module (GPSM) DTC Chart

DTC	Description	Action
U0100:00	Lost Communication With ECM /PCM "A": No Sub Type Information	GO to Pinpoint Test AD.
U0140:00	Lost Communication With Body Control Module: No Sub Type Information	GO to Pinpoint Test AF.
U0155:00	Lost Communication With Instrument Panel Cluster (IPC) Control Module: No Sub Type Information	GO to Pinpoint Test AI.
U0401:00	Invalid Data Received from ECM/PCM A: No Sub Type Information	RETRIEVE and FOLLOW DTCs present in the PCM . REFER to Section 303-14.
U0422:00	Invalid Data Received From Body Control Module: No Sub Type Information	RETRIEVE and FOLLOW DTCs present in the SJB . REFER to Section 419-10.
U0423:00	Invalid Data Received from Instrument Panel Cluster Control Module: No Sub Type Information	RETRIEVE and FOLLOW DTCs present in the IPC . REFER to Section 413-01.

DTC	Description	Action
U2100:00	Initial Configuration Not Complete: No Sub Type Information	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to Global Positioning System Module (GPSM).
U2101:00	Control Module Configuration Incompatible: No Sub Type Information	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to Global Positioning System Module (GPSM).
U3000:09	Control Module: Component Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U3000:09 is still present, INSTALL a new GPSM . REFER to Global Positioning System Module (GPSM). REPEAT the self-test.
U3000:41	Control Module: General Checksum Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U3000:41 is still present, INSTALL a new GPSM . REFER to Global Positioning System Module (GPSM). REPEAT the self-test.
U3000:42	Control Module: General Memory Failure	CLEAR the DTCs. REPEAT the self-test. If DTC U3000:42 is still present, INSTALL a new GPSM . REFER to Global Positioning System Module (GPSM). REPEAT the self-test.
U3003:16	Battery Voltage: Circuit Voltage Below Threshold	GO to Pinpoint Test AT.
U3003:17	Battery Voltage: Circuit Voltage Above Threshold	GO to Pinpoint Test AU.

Symptom Charts

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

Symptom Chart — General Audio System

Condition	Possible Sources	Action
• No communication with the Audio Front Control Module (ACM)	• Fuse • Wiring, terminals or connectors • ACM	• REFER to Section 418-00.
• No communication with the Accessory Protocol Interface Module (APIM)	• Fuse • Wiring, terminals or connectors • APIM	• REFER to Section 418-00.
• No communication with the Front Controls Interface Module (FCIM)	• Fuse • Wiring, terminals or connectors • FCIM	• REFER to Section 418-00.
• No communication with the Front Display Interface Module (FDIM) (without navigation)	• Fuse • Wiring, terminals or connectors • FDIM	• REFER to Section 418-00.
• No communication with the Global Positioning System Module (GPSM)	• Fuse • Wiring, terminals or connectors • GPSM	• REFER to Section 418-00.
• The steering wheel switches are inoperative or do not operate correctly	• Steering wheel switch • Wiring, terminals, or connectors • Clockspring • ACM (without SYNC® and without navigation), (with	• GO to Pinpoint Test R.

	SYNC® and with navigation) • Accessory Protocol Interface Module (APIM) (with SYNC® and without navigation)	
• The CD player is inoperative or 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 Control Module (ACM). TEST the system for normal operation.
• The speed sensitive volume does not operate correctly	• Speed sensitive volume setting • ACM	• GO to Pinpoint Test C.
• The compass is inoperative or does not operate correctly	• Fuse • Wiring, terminals, or connectors • Auto-dimming interior mirror • FDIM • IPC	• REFER to Section 413-01.
• The audio system does not operate correctly from the Front Controls Interface Module (FCIM)	• FCIM	• GO to Pinpoint Test S.
• The Front Controls Interface Module (FCIM) illumination is inoperative	• Backlighting system concern • FCIM	• REFER to Section 413-00.
• The audio input jack is inoperative or does not operate correctly (without SYNC®)	• Customer's device • Wiring, terminals or connectors • Audio input jack • ACM	• GO to Pinpoint Test O.
• The audio system does not operate correctly from the Front Display Interface Module (FDIM) (with navigation)	• Wiring, terminals or connectors • FDIM • ACM	• GO to Pinpoint Test T.
• The Front Display Interface Module (FDIM) is inoperative (without navigation)	• FDIM	• GO to Pinpoint Test U.
• The Front Display Interface Module (FDIM) is inoperative (with navigation)	• Fuse • Wiring, terminals or connectors • Video cable • FDIM • ACM	• GO to Pinpoint Test W.
• An individual Front Display Interface Module (FDIM) display is inoperative (without navigation)	• FDIM	• GO to Pinpoint Test V.
• An individual Front Display Interface Module (FDIM) display is inoperative (with navigation)	• FDIM • ACM	• GO to Pinpoint Test X.
• The Front Display Interface Module (FDIM) illumination is inoperative (without navigation)	• Wiring, terminals or connectors • FDIM • ACM	• REFER to Section 413-00.

• The Front Display Interface Module (FDIM) illumination is inoperative (with navigation)	• Fuse • Wiring, terminals or connectors • Video cable • FDIM • ACM	• GO to Pinpoint Test W.
• The Front Display Interface Module (FDIM) (with navigation) does not display video from the Audio Front Control Module (ACM)	• Wiring, terminals or connectors • FDIM • ACM	• GO to Pinpoint Test Y.
• Loud popping sound when cycling the ignition	• Fuse • Wiring, terminals or connectors • ACM	• GO to Pinpoint Test D.
• The ACM does not reduce the audio volume when the parking aid tone sounds	• ACM	• GO to Pinpoint Test I.

Symptom Chart — HD Radio® (If Equipped)

Condition	Possible Sources	Action
• Echo, stutter, skip, or repeat	• Radio broadcaster time alignment error	• ADVISE the customer that the HD Radio® is functioning correctly.
• FM multicast channels (HD 2, HD 3, HD 4, etc.) are unavailable that were once available	• Broadcast station not broadcasting • Broadcast station maintenance • Broadcast program change • Broadcast station change • Station unavailable for the current location • Digital signal loss • Poor reception	• ADVISE the customer that there must be an available FM multicast channel in order to output HD content. The HD Radio® is functioning correctly.
• FM multicast channels (HD 2, HD 3, HD 4, etc.) are unavailable when using the seek, tune, or scan functions	• Unavailable stations • Insufficient waiting time	• ADVISE the customer that the scan function does not scan for multicast channels. There must be an available FM multicast channel in order to output (HD) content. If FM multicast channels are available, HD Radio® takes time to detect and switch from analog to digital. The HD icon turns orange when the digital broadcast is available. The HD Radio® is functioning correctly.
• FM multicast channels (HD 2, HD 3, HD 4, etc.) are unavailable when using a radio preset or direct tune	• Station unavailable for the current location • Digital signal loss • Poor reception	• ADVISE the customer that there must be an available FM multicast channel in order to output HD content. The HD Radio® is functioning correctly.
• FM multicast channels (HD 2, HD 3, HD 4, etc.) have an audio mute delay when using a radio preset or direct tune	• Insufficient waiting time	• ADVISE the customer that FM multicast channels take time to decode and make the audio available. The HD Radio® is functioning correctly.
• HD not immediately available when using the seek or tune functions	• Insufficient waiting time	• ADVISE the customer that the HD Radio® takes time to detect and switch from analog to digital. The HD icon turns orange when

		the digital broadcast is available. The HD Radio® is functioning correctly.
• Metadata does not match audio being played	• Radio broadcaster data error	• ADVISE the customer that the HD Radio® is functioning correctly.
• Metadata is not shown for the selected frequency	• Radio broadcaster data error	• ADVISE the customer that the HD Radio® is functioning correctly.
• Sound dropout when analog transitions to HD	• Radio broadcaster digital encoder error	• ADVISE the customer to turn HD off for this frequency to allow the analog signal to be heard. The HD Radio® is functioning correctly.
• Sound dropout while listening to FM multicast channels (HD 2, HD 3, HD 4, etc.)	• Digital signal loss	• ADVISE the customer that FM multicast channels do not have analog equivalents. The HD Radio® is functioning correctly.
• Sound transitioning between HD and analog	• Digital signal loss • Poor reception	• ADVISE the customer that there must be an available HD channel in order to output HD content. The HD Radio® is functioning correctly.
• Volume fluctuation	• Radio broadcaster audio alignment error	• ADVISE the customer that the HD Radio® is functioning correctly.

Symptom Chart — Navigation (If Equipped)

Condition	Possible Sources	Action
• No Global Positioning System (GPS) antenna signal	• Satellite radio antenna cable • Audio Front Control Module (ACM)	• GO to Pinpoint Test AA.
• The position cursor is inaccurate	• ACM	• GO to Pinpoint Test AB.
• The voice guidance is inoperative or does not operate correctly	• Customer's setting • ACM	• GO to Pinpoint Test N.
• Voice recognition is inoperative or does not operate correctly	• Wiring, terminals or connectors • Microphone (contained in the overhead console) • ACM (with navigation) • Accessory Protocol Interface Module (APIM)	• GO to Pinpoint Test Z.

Symptom Chart — Satellite Radio

Condition	Possible Sources	Action
• Poor reception — satellite radio	• Obstructions in the antenna's line of sight • Satellite radio antenna coaxial cable • Satellite radio antenna • ACM	• GO to Pinpoint Test B.
• Poor sound quality or no sound while in satellite radio mode - all other functions operate correctly	• Expired subscription • Obstructions in the antenna's line of sight • Incorrectly matched ESN • Satellite radio antenna coaxial cable • Satellite radio antenna • ACM	• GO to Pinpoint Test B.
• The satellite radio is inoperative or does not operate correctly	• Expired subscription • Obstructions in the antenna's line of sight • Incorrectly matched ESN	• GO to Pinpoint Test B.

	• Satellite radio antenna coaxial cable • Satellite radio antenna • ACM	

Symptom Chart — Sound Quality

Condition	Possible Sources	Action
• Poor reception — AM/FM	• Wiring, terminals or connectors • AM/FM antenna • AM/FM antenna cable • Charging system • Ignition system • Noise suppression equipment • Audio Front Control Module (ACM)	• GO to Pinpoint Test A.
• Continuous seek or scan — AM/FM	• No channel found in the selected category • AM/FM antenna • AM/FM antenna cable • Noise suppression equipment • ACM	• GO to Pinpoint Test A.
• Poor sound quality or distorted sound from one or more speakers (not all speakers)	• Loose component fasteners • Loose door handle, lock, and other trim panel components and fasteners • Loose items in storage areas • Loose speaker grilles • Loose wire harnesses or wire harness fasteners • Speaker(s) • Water shield bonding and placement	• GO to Pinpoint Test E.
• No sound from all speakers	• Fuse • Wiring, terminals or connectors • ACM • Audio DSP amplifier (Shaker/Shaker Pro)	• GO to Pinpoint Test F.
• No sound from one or more speakers (not all speakers) — except luggage compartment subwoofer	• Speaker(s) • Wiring, terminals or connectors • Audio DSP amplifier (Shaker/Shaker Pro) • ACM	• GO to Pinpoint Test G.
• No sound from the luggage compartment subwoofer	• Luggage compartment subwoofer enclosure • Fuse • Wiring, terminals or connectors • Luggage compartment subwoofer amplifier • ACM	• GO to Pinpoint Test H.

Symptom Chart — SYNC® System

Condition	Possible Sources	Action
• The SYNC® system is inoperative (no response is received from phone, voice, and media inputs)	• Customer's device • Accessory Protocol Interface Module (APIM)	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test J.
• All SYNC® Services features are inoperative or inaccurate (traffic, directions, and information)	• Unregistered SYNC® owner account • Unregistered or expired SYNC® Services subscription • Unregistered mobile phone number • Mobile phone being used not selected as "Active"	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test L.

	• SYNC® Services server • Accessory Protocol Interface Module (APIM) • GPSM	
• The SYNC® system voice or tone prompts, TTS feature, or ringtones are inoperative or do not operate correctly	• Customer's setting • Wiring, terminals, or connectors • Accessory Protocol Interface Module (APIM) • ACM	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test M.
• During a phone call, no incoming audio is heard in the vehicle	• Customer's setting • Wiring, terminals, or connectors • Accessory Protocol Interface Module (APIM) • ACM	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test M.
• Voice recognition is inoperative or does not operate correctly	• Wiring, terminals, or connectors • Microphone (contained in the overhead console) • ACM (with navigation) • Accessory Protocol Interface Module (APIM)	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test Z.
• During a phone call, no outgoing audio is heard on the outside device	• Wiring, terminals, or connectors • Microphone (contained in the overhead console) • Accessory Protocol Interface Module (APIM)	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test Z.
• No sound from all SYNC® audio sources (Bluetooth, USB , audio input jack)	• Customer's device • Wiring, terminals, or connectors • Accessory Protocol Interface Module (APIM) • ACM	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test K.
• The SYNC® steering wheel switches are inoperative or do not operate correctly	• Steering wheel switch • Wiring, terminals, or connectors • Clockspring • ACM (with navigation) • Accessory Protocol Interface Module (APIM) (without navigation)	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test R.
• The audio input jack is inoperative or does not operate correctly (with SYNC®)	• Customer's device • Wiring, terminals or connectors • Audio input jack • APIM	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test O.
• The Universal Serial Bus (USB) port is	• Customer's device • Universal Serial Bus (USB) cable/port	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module

inoperative or does not operate correctly	• APIM	(APIM) Reset. If the concern is still present, GO to Pinpoint Test P.
• Unable to pair Bluetooth device	• Incompatible Bluetooth device • APIM	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. If the concern is still present, GO to Pinpoint Test Q.
• An individual Bluetooth device feature is inoperative (text messaging, media playback or controls, phone book download, call history, or call waiting)	• Customer's device compatibility	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. • If the concern is still present, INSTRUCT the customer to review the device compatibility list on the SyncMyRide website. It is normal operation for unsupported or incompatible Bluetooth features to be unavailable through the SYNC® system. • If the inoperative feature is compatible, ADVISE the customer to check their device for firmware updates, and if required, reset their device following the manufacturer's instructions.
• SYNC® AppLink™ is inoperative or does not operate correctly	• Universal Serial Bus (USB) cable/port • Customer's device • APIM	• PERFORM the Accessory Protocol Interface Module (APIM) Reset. REFER to Accessory Protocol Interface Module (APIM) Reset. • If the concern is still present, INSTRUCT the customer to review the mobile device platform, application, and application version compatibility list on the SyncMyRide website. It is normal operation for incompatible mobile device platforms, applications, and application versions to be unavailable through SYNC® AppLink™. • If the mobile device platform, application, and application version are compatible, and the device is connected through Bluetooth only, GO to Pinpoint Test Q. • If the mobile device platform, application, and application version are compatible, and the device is connected through Bluetooth and the USB port, GO to Pinpoint Test P

• 911 Assist™ or Vehicle Health Report (VHR) is inoperative or does not operate correctly	• Unregistered SYNC® owner account
	• RCM misconfiguration
	• IPC misconfiguration
		• Verify that the customer has a SYNC® Owner Account on the SyncMyRide website.
		• This error message appears due to incomplete or incorrect PMI procedures. CHECK the vehicle service history for recent service actions related to the IPC or RCM .
		  • If there have been recent service actions with the IPC or RCM , REPEAT/PERFORM the PMI procedure as directed by the diagnostic scan tool. REFER to Programmable Module Installation (PMI) in Section 418-01.
		  • If there have been no recent service actions,  **VIN required to access Guided Routine (APIM)**

Pinpoint Tests

Pinpoint Test A: Poor Reception Or Continuous Seek Or Scan — AM/FM

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

The AM/FM antenna receives AM and FM radio waves and transmits them to the Audio Front Control Module (ACM) through the AM/FM antenna cables. The ACM powers the AM/FM antenna in order to amplify the AM signal.

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

The RDS function allows the vehicle operator to choose which genre (category) of music to listen to. When the SCAN button is pressed, the ACM only stops at channels falling within the selected category. If no channel in the selected category is found, the ACM continues to scan without stopping. This may appear to be a reception issue, but it is actually due to the customer setting.

- DTC B1A56:21 (Antenna: Signal Amplitude < Minimum) — set by the ACM (without navigation) and ACM (with navigation) when the signal strength is less than the pre-configured threshold value during the self-test.

This pinpoint test is intended to diagnose the following:

- No channel found in the selected category
- Wiring, terminals or connectors
- Noise suppression equipment
- Charging system
- Ignition system
- AM/FM antenna
- AM/FM antenna cable
- ACM

PINPOINT TEST A : POOR RECEPTION OR CONTINUOUS SEEK OR SCAN — AM/FM

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

A1 CHECK THE RDS SETTING

- Turn the RDS function off. REFER to the Owner's Literature.
- Scan for a good channel.

Does the audio system find a good channel with normal reception?

Yes	The system is operating correctly at this time. The concern was a result of no channel being found in the selected category.
No	GO to A2.

A2 CHECK THE AUDIO SYSTEM RECEPTION WITH THE ENGINE RUNNING

- Operate the audio system in radio tuner AM/FM mode.
- Check the reception with the engine running, and with the engine off.

Is poor reception only present with the engine running?

Yes	GO to A3.
No	GO to A7.

A3 CHECK THE NOISE SUPPRESSION EQUIPMENT

- Check the engine ground strap for security, cleanliness, and metal-to-metal contact.

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

Yes	GO to A4.
No	CLEAN and SECURE the connections, or INSTALL a new engine ground strap as needed. TEST the system for normal operation.

A4 CHECK THE RADIO INTERFERENCE CAPACITOR

- INSTALL a new radio interference capacitor.
- START the vehicle.
- Operate the audio system in radio tuner AM/FM mode.

Is the reception OK?

Yes	The cause of the concern was an inoperative radio interference capacitor. The system is now operating correctly.
No	GO to A5.

A5 CHECK THE GENERATOR

- Ignition OFF.
- Disconnect: Generator C102A .
- Start the engine.
- Operate the audio system in radio tuner AM/FM mode.

Is the reception OK?

Yes	INSTALL a new generator. REFER to Section 414-00. TEST the system for normal operation.
No	GO to A6.

A6 CHECK THE IGNITION CIRCUITS

- Ignition OFF.
- Connect: Generator C102A .
- Visually inspect the engine compartment and make sure all ignition coils are correctly and securely connected, and that there are no visible cracks in the coil housings.
- Inspect all the wiring harnesses and connectors for damaged insulation and loose or broken conditions.

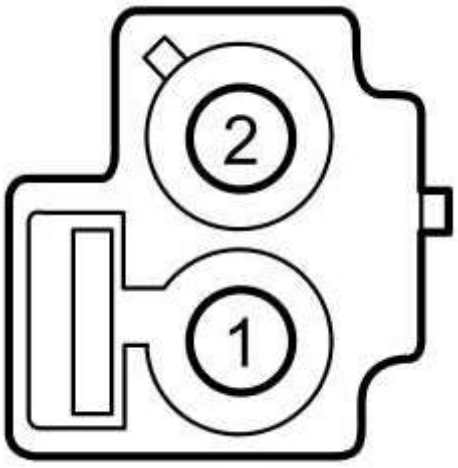
Are the ignition components OK?

Yes	USE a jumper cable to ground various parts of the vehicle (example: engine, fenders, quarter panels, stone deflectors, air cleaner, body sheet metal) to the frame. When the noise is eliminated, PROVIDE a permanent ground where necessary. TEST the system for normal operation.
No	REPAIR the ignition system as necessary. TEST the system for normal operation.

A7 CHECK THE ANTENNA ENABLE CIRCUIT FOR CORRECT VOLTAGE

- Ignition OFF.
- Disconnect: AM/FM Antenna C4082 .
- Ignition ON.
- Operate the audio system in radio tuner AM/FM mode.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4082 Pin 1	CME44 (YE/GN)	—	Ground



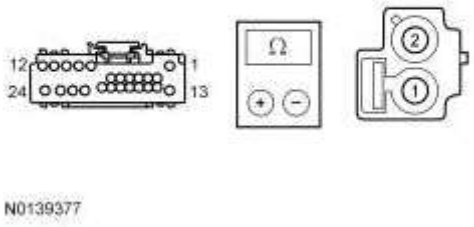
Is the voltage greater than 11 volts?

Yes	GO to A9.
No	GO to A8.

A8 CHECK THE AM/FM ANTENNA ENABLE CIRCUIT FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Disconnect: ACM C290D .
- Measure the **resistance** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4082 Pin 1	CME44 (YE/GN)	C290D Pin 5	CME44 (YE/GN)
C4082 Pin 1	CME44 (YE/GN)	—	Ground



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Are the resistances less than 3 ohms between the AM/FM antenna and ACM , and greater than 10,000 ohms between the AM/FM antenna and ground?

Yes	GO to A11.
No	REPAIR the circuit. TEST the system for normal operation.

A9 ISOLATE THE AM/FM ANTENNA

- Ignition OFF.
- Connect: ACM C290D .
- INSTALL a new AM/FM antenna. REFER to Antenna — AM/FM.

- Operate the audio system in radio tuner AM/FM mode.

Is the reception OK?

Yes	The concern was caused by an inoperative AM/FM antenna. The system is now operating correctly.
No	GO to A10.

A10 ISOLATE THE AM/FM ANTENNA CABLES

- Ignition OFF.
- Substitute each AM/FM antenna cable one at a time by routing a new component. Do not remove the original antenna cable at this time.
- Operate the audio system in radio tuner AM/FM mode.

Is the reception OK?

Yes	INSTALL a new AM/FM antenna cable for the inoperative cable. REFER to Antenna Cable — AM/FM. TEST the system for normal operation.
No	GO to A11.

A11 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test B: The Satellite Radio Is Inoperative, Has Poor Reception, or No Sound

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

Digital signals are received by the satellite radio antenna and sent to the Audio Front Control Module (ACM) through the satellite radio antenna cable. The satellite radio receiver is internal to the ACM .

When a satellite radio subscription is activated, the Electronic Serial Number (ESN) of the built-in satellite radio receiver is associated with the Vehicle Identification Number (VIN) . As a result, the ACM cannot be swapped from one vehicle to another.

Obstructions to the antenna line of sight can affect reception, and is considered normal operation. Possible obstructions include hills, tall buildings, tunnels, and being parked inside a garage. Be sure the vehicle is in a clear area, free of obstructions, before testing satellite radio reception. When there is an open in the satellite radio antenna circuit, there is no satellite audio. The audio system display indicates a satellite radio antenna concern when the audio system is operated in satellite radio mode.

- DTC B1A89:01 (Satellite Antenna: General Electrical Failure) — set by the ACM (without navigation) and ACM (with navigation) when any fault is detected in the satellite radio antenna coaxial cable between the ACM and GPS /SDARS splitter. This DTC can be either continuous or on-demand.
- DTC B1A89:13 (Satellite Antenna: Circuit Open) — set by the ACM (without navigation) and ACM (with navigation) when an open is detected in the satellite radio antenna coaxial cable between the ACM and GPS /SDARS splitter. This DTC can be either continuous or on-demand.

This pinpoint test is intended to diagnose the following:

- Expired subscription
- Obstructions in the antenna's line of sight
- Incorrectly matched ESN
- Satellite radio antenna coaxial cable
- Satellite radio antenna
- ACM

PINPOINT TEST B : THE SATELLITE RADIO IS INOPERATIVE, HAS POOR RECEPTION, OR NO SOUND

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

B1 VERIFY AN ACTIVE SUBSCRIPTION

- Operate the audio system in satellite radio mode and observe the FDIM display.

Does the display indicate the subscription has expired?

Yes	The subscription has expired. INFORM the customer to contact SIRIUS to reactivate the subscription.
No	GO to B2.

B2 CHECK THE SATELLITE RADIO RECEPTION

- Drive the vehicle to an open location that is free from obstacles such as tall buildings or large trees.
- Enter the following diagnostic mode on the scan tool: ACM DataLogger .
- Monitor the satellite radio signal strength ACM PID (SAT_SIG_STR).
- If the PID reads "No Signal" or "Poor," move the vehicle to another area and retest until "Good," "Very Good," or "Excellent" PID values are obtained.

Can a "Good," "Very Good," or "Excellent" PID value be obtained?

Yes	GO to B5.
No	GO to B3.

B3 CHECK THE SATELLITE RADIO ANTENNA CABLE RESISTANCE

- Ignition OFF.
- Disconnect: Satellite Radio Antenna Connection At ACM .
- Disconnect: Satellite Radio Antenna Cable In-Line Connection Behind The Glove Compartment .
- Disconnect: Satellite Radio Antenna Connection At Satellite Radio Antenna .
- Measure the **resistance** of the front satellite radio antenna cable core between the ACM and the satellite radio antenna inline connection; and between the front satellite radio antenna cable core and shield.
- Measure the **resistance** of the rear satellite radio antenna cable core between the satellite radio antenna and the satellite radio antenna inline connection; and between the rear satellite radio antenna cable core and shield.

Is the resistance of each satellite radio antenna cable core less than 2 ohms, and the resistance between the core and shield of each satellite radio antenna cable greater than 10,000 ohms?

Yes	GO to B4.

No	INSTALL a new front or rear satellite radio antenna cable. REFER to Antenna Cable — Satellite Radio. CLEAR any DTCs present. TEST the system for normal operation.

B4 ISOLATE THE SATELLITE RADIO ANTENNA

- INSTALL a new satellite radio antenna. REFER to Antenna — Satellite Radio.
- Operate the audio system in satellite radio mode.

Is the reception OK?

Yes	The concern was caused by an inoperative satellite radio antenna. The system is operating correctly at this time. CLEAR any DTCs present.
No	GO to B5.

B5 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test C: The Speed Sensitive Volume Does Not Operate Correctly

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

The speed sensitive volume function adjusts the volume based on the Vehicle Speed Sensor (VSS) signal from the IPC . The IPC does not generate the VSS signal; it gateways the signal from the PCM. The Smart Junction Box (SJB) also receives this signal and should exhibit symptoms if the signal is lost.

This pinpoint test is intended to diagnose the following:

- Speed sensitive volume setting
- ACM

PINPOINT TEST C : THE SPEED SENSITIVE VOLUME DOES NOT OPERATE CORRECTLY

C1 CHECK THE SPEEDOMETER OPERATION

- Drive the vehicle and observe the speedometer.

Does the speedometer operate correctly?

Yes	GO to C2.
No	REFER to Section 413-01.

C2 CHECK THE SPEED SENSITIVE VOLUME SETTING

- Turn the speed sensitive volume off. REFER to the Owner's Literature.
- Operate the audio system in radio tuner AM/FM mode.
- Drive the vehicle at various speeds and observe the speaker volume.
- Set the speed sensitive volume to maximum compensation. REFER to the Owner's Literature.
- Operate the audio system in radio tuner AM/FM mode.
- Drive the vehicle at various speeds and observe the speaker volume.

Does the volume remain constant with the speed sensitive volume turned off, and increase and decrease with vehicle speed with the speed sensitive volume set to maximum?

Yes	The system is operating correctly at this time. INSTRUCT the customer in the correct usage of the speed sensitive volume feature.
No	GO to C3.

C3 CHECK FOR DTC U0155 OR DTC U0155:00

- Using the diagnostic scan tool, retrieve all continuous DTCs.

Is DTC U0155 or DTC U0155:00 retrieved in any module?

Yes	For DTC U0155, GO to Pinpoint Test AH. For DTC U0155:00, GO to Pinpoint Test AI.
No	GO to C4.

C4 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test D: Loud Popping Sound When Cycling The Ignition Switch

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

Voltage is sent through the start input circuit to the Audio Front Control Module (ACM) with the ignition in START. Upon receiving this signal, the ACM mutes all speaker outputs to eliminate the possibility of voltage spikes producing a popping noise through the speakers.

The ACM disables the audio DSP amplifier (Shaker/Shaker Pro) and subwoofer amplifier (Shaker Pro) with the ignition in START by keeping the enable circuit voltages below 0.4 volt.

If there is a short to voltage on any of the enable circuits, distortion is heard from the speakers whenever the ACM is powered on, and that should be the primary concern addressed. If the speakers have distorted sound, GO to Symptom Chart — Sound Quality.

When the ACM is powered on, normal operating voltage for the amplifier enable circuit is between 3.8 and 6.7 volts.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- ACM

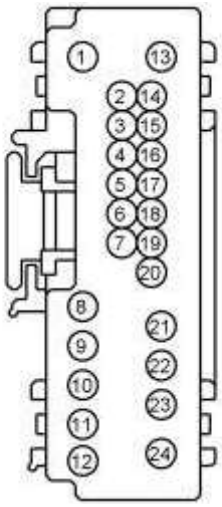
PINPOINT TEST D : LOUD POPPING SOUND WHEN CYCLING THE IGNITION SWITCH

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

D1 CHECK THE START INPUT CIRCUIT VOLTAGE

- Ignition OFF.
- Disconnect: ACM C290D .
- Disconnect: Starter Relay .
- Hold ignition in START.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C290D Pin 15	CBP28 (GY/VT)	—	Ground



Is the voltage greater than 11 volts?

Yes	GO to D2.

No	VERIFY the Smart Junction Box (SJB) fuse 28 (5A) is OK. If OK, REPAIR the circuit. TEST the system for normal operation. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

D2 CHECK FOR CORRECT ACM OPERATION

- Connect: Starter Relay .
- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test E: Poor Sound Quality Or Distorted Sound From One Or More Speakers (Not All Speakers)

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

Normal Operation and Fault Conditions

The ACM sends audio signals to the speakers in the form of AC voltage, resulting in clear audio output.

Possible Sources

- Loose component fasteners
- Loose door handle, lock, and other trim panel components and fasteners
- Loose items in storage areas
- Loose speaker grilles
- Loose wire harnesses or wire harness fasteners
- Speaker(s)
- Water shield bonding and placement

Visual Inspection and Diagnostic Pre-checks

Visually inspect around the suspect area for any possible rattle conditions such as:

- Any storage compartments including cup holders (if equipped)
- Door map pockets for contents that can rattle (if equipped)
- Door pull cup attachments (if equipped)
- Door switch bezels (if equipped)
- Package tray (if equipped)
- Speaker grilles
- Trim panels and fasteners

PINPOINT TEST E : POOR SOUND QUALITY OR DISTORTED SOUND FROM ONE OR MORE SPEAKERS (NOT ALL SPEAKERS)

E1 ISOLATE THE ZONE

- Operate the audio system using digital media (CD, MP3, etc.).

- Using the audio system fade and balance feature, adjust the audio sound to each of the four zones (LF , RF , LR , and RR) of the vehicle to isolate the poor sound quality.
- Locate and apply pressure to the trim panel(s) around the poor sound quality area in question.

Does applying pressure to a trim panel reduce or eliminate the audible noise?

Yes	REPAIR or REPLACE the trim panel as needed.
No	GO to E2.

E2 REMOVE AND INSPECT BEHIND/UNDERNEATH THE SUSPECT TRIM PANEL(S)

- Remove the trim panel to access the suspect speaker.
- Operate the audio system using digital media (CD, MP3, etc.).
- Validate where the poor sound quality area is located.
- Check:
  - Trim panel for loose components around the speaker area such as the speaker grille
  - Trim panel joining components for missing or broken pieces
  - Lock and handle mechanical parts for correct attachment
  - Wire harnesses for correct routing
  - Wire harness fasteners for correct attachment
  - Water shield for correct placement (speaker air path not blocked)
  - Water shield for correct bonding to sheet metal
  - Storage areas for loose items
  - All child safety belt anchors (if equipped)
  - All safety belt retractors
  - All speaker bracket fasteners and other fasteners are secured and tightened to specified torque

Was the source of the noise located?

Yes	REPAIR or REPLACE any loose or broken component or fastener as needed.
No	GO to E3.

E3 CHECK THE SUSPECT SPEAKER FOR WATER INTRUSION

- Inspect for watermarks.
- Check the:
  - Cone
  - Magnet
  - Basket

Are any watermarks present on the speaker?

Yes	VERIFY the water shield is in the correct location, REPAIR or REPLACE any trim, door, or speaker seal as required. DRY the speaker in question and TEST the system for normal operation.
No	GO to E4.

E4 ISOLATE SPEAKER TO VERIFY NOISE

- Remove the suspect speaker from its location and leave the speaker connected to the harness.
- Hold the speaker away from any trim panel(s) and ensure the speaker is isolated from contact.
- Operate the audio system using digital media (CD, MP3, etc.).

Is the noise still present in the suspect speaker?

Yes	INSTALL a new speaker for the one in question.
No	LOCATE the source of the noise and REPAIR as needed.

Pinpoint Test F: No Sound From All Speakers

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

When the ignition is in START, voltage is supplied to the Audio Front Control Module (ACM) through the start sense circuit. When the ACM receives this voltage, it mutes the speaker output.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- ACM
- Audio DSP amplifier

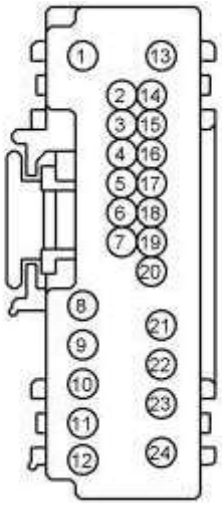
PINPOINT TEST F : NO SOUND FROM ALL SPEAKERS

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

F1 CHECK THE START SENSE CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: ACM C290D .
- Ignition ON.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C290D Pin 15	CBP28 (GY/VT)	—	Ground



Is any voltage present?

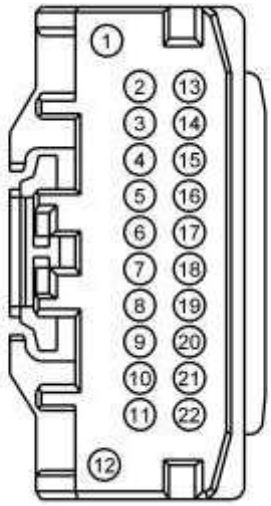
Yes	VERIFY the SJB fuse 28 (5A) is OK. If OK, REPAIR the circuit. TEST the system for normal operation. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

No	For Shaker/Shaker Pro, GO to F2. For premium audio, GO to F7.

F2 CHECK THE AUDIO DSP AMPLIFIER VOLTAGE SUPPLY

- Ignition OFF.
- Disconnect: Audio DSP Amplifier C2385A .
- Ignition ON.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2385A Pin 12	SBB33 (RD)	—	Ground



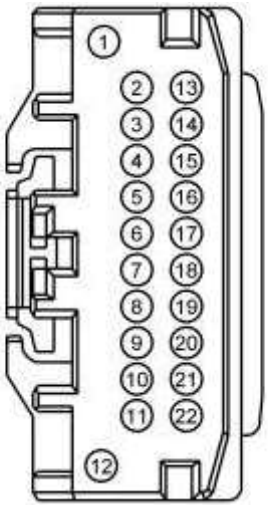
Is the voltage greater than 11 volts?

Yes	GO to F3.
No	VERIFY the BJB fuse 33 (30A) is OK. If OK, REPAIR the circuit. TEST the system for normal operation. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

F3 CHECK THE AUDIO DSP AMPLIFIER GROUND FOR CONTINUITY

- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2385A Pin 12	SBB33 (RD)	C2385A Pin 1	GD115 (BK/GY)



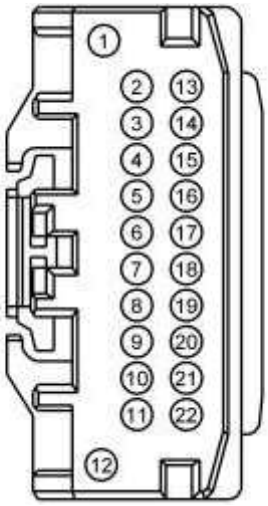
Is the voltage greater than 11 volts?

Yes	GO to F4.
No	REPAIR the circuit. CLEAR any DTCs present. TEST the system for normal operation.

F4 CHECK THE AUDIO DSP AMPLIFIER ENABLE CIRCUIT FOR CORRECT VOLTAGE

- Operate the audio system in radio tuner AM/FM mode.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2385A Pin 14	CME31 (BU/GN)	—	Ground



Is the voltage between 3.8 and 8.5 volts?

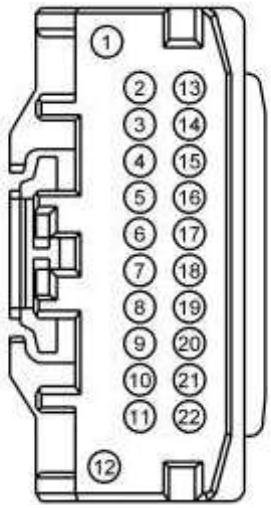
Yes	GO to F8.
No	GO to F5.

F5 CHECK THE AUDIO DSP AMPLIFIER ENABLE CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.

- Disconnect: ACM C290B .
- Ignition ON.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2385A Pin 14	CME31 (BU/GN)	—	Ground



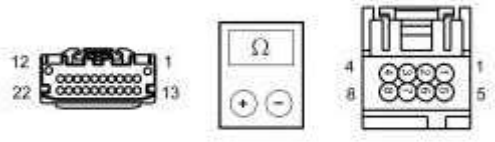
Is any voltage present?

Yes	REPAIR the circuit. TEST the system for normal operation.
No	GO to F6.

F6 CHECK THE AUDIO DSP AMPLIFIER ENABLE CIRCUIT FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the **resistance** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2385A Pin 14	CME31 (BU/GN)	C290B Pin 4	CME31 (BU/GN)
C2385A Pin 14	CME31 (BU/GN)	—	Ground



Are the resistances less than 3 ohms between the audio DSP amplifier and the ACM , and greater than 10,000 ohms between the audio DSP amplifier and ground?

Yes	GO to F7.
No	REPAIR the circuit. TEST the system for normal operation.

F7 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

F8 CHECK FOR CORRECT AUDIO DSP AMPLIFIER OPERATION

- Ignition OFF.
- Disconnect and inspect all the audio DSP amplifier connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the audio DSP amplifier connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new audio DSP amplifier. REFER to Audio Amplifier.
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test G: No Sound From One Or More Speakers (Not All Speakers) — Except Luggage Compartment Subwoofer

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

The Audio Front Control Module (ACM) directs audio signals to the speakers in the form of an AC voltage. The ACM provides internal circuit protection for shorts to ground or shorts to voltage.

A short to ground or short to voltage in the circuitry to one of the speakers can cause multiple speakers to lose sound due to the built-in overload protection feature of the ACM . In this case, a speaker fault DTC sets, and this pinpoint test should be followed to isolate the

damaged circuit.

- DTC B1A01:01 (Speaker #1: General Electrical Failure) — set by the Audio Front Control Module (ACM) (without navigation) when a failure is detected on the LF speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A01:11 (Speaker #1: Circuit Short To Ground) — set by the Audio Front Control Module (ACM) (without navigation) when a short to ground is detected on the LF speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A01:12 (Speaker #1: Circuit Short To Battery) — set by the Audio Front Control Module (ACM) (without navigation) when a short to voltage is detected on the LF speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A01:13 (Speaker #1: Circuit Open) — Set by the Audio Front Control Module (ACM) (without navigation) when an open is detected on the LF speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A02:01 (Speaker #2: General Electrical Failure) — set by the Audio Front Control Module (ACM) (without navigation) when a failure is detected on the RF speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A02:11 (Speaker #2: Circuit Short To Ground) — set by the Audio Front Control Module (ACM) (without navigation) when a short to ground is detected on the RF speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A02:12 (Speaker #2: Circuit Short To Battery) — set by the Audio Front Control Module (ACM) (without navigation) when a short to voltage is detected on the RF speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A02:13 (Speaker #2: Circuit Open) — Set by the Audio Front Control Module (ACM) (without navigation) when an open is detected on the RF speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A03:01 (Speaker #3: General Electrical Failure) — set by the Audio Front Control Module (ACM) (without navigation) when a failure is detected on the RR speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A03:11 (Speaker #3: Circuit Short To Ground) — set by the Audio Front Control Module (ACM) (without navigation) when a short to ground is detected on the RR speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A03:12 (Speaker #3: Circuit Short To Battery) — set by the Audio Front Control Module (ACM) (without navigation) when a short to voltage is detected on the RR speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A03:13 (Speaker #3: Circuit Open) — Set by the Audio Front Control Module (ACM) (without navigation) when an open is detected on the RR speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A04:01 (Speaker #4: General Electrical Failure) — set by the Audio Front Control Module (ACM) (without navigation) when a failure is detected on the LR speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A04:11 (Speaker #4: Circuit Short To Ground) — set by the Audio Front Control Module (ACM) (without navigation) when a short to ground is detected on the LR speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A04:12 (Speaker #4: Circuit Short To Battery) — set by the Audio Front Control Module (ACM) (without navigation) when a short to voltage is detected on the LR speaker circuits. This DTC can be continuous or on-demand.
- DTC B1A04:13 (Speaker #4: Circuit Open) — set by the Audio Front Control Module (ACM) (without navigation) when an open is detected on the LR speaker circuits. This DTC can be continuous or on-demand.

This pinpoint test is intended to diagnose the following:

- Speaker(s)
- Wiring, terminals or connectors
- Audio DSP amplifier (Shaker/Shaker Pro)
- ACM

PINPOINT TEST G : NO SOUND FROM ONE OR MORE SPEAKERS (NOT ALL SPEAKERS) — EXCEPT LUGGAGE COMPARTMENT SUBWOOFER

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

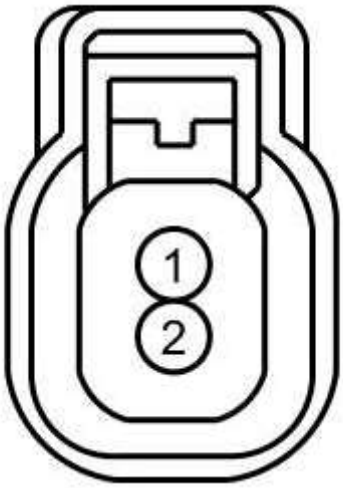
NOTE: *Failure to disconnect the battery when instructed will result in false resistance readings. REFER to Section 414-01.*

G1 CHECK THE AUDIO SIGNAL TO THE SUSPECT SPEAKER

- Ignition OFF.
- Disconnect: Suspect Speaker .
- Operate the audio system in radio tuner AM/FM mode.
- For all speakers except the front door subwoofer speakers (Shaker/Shaker Pro), measure the **AC voltage** between:

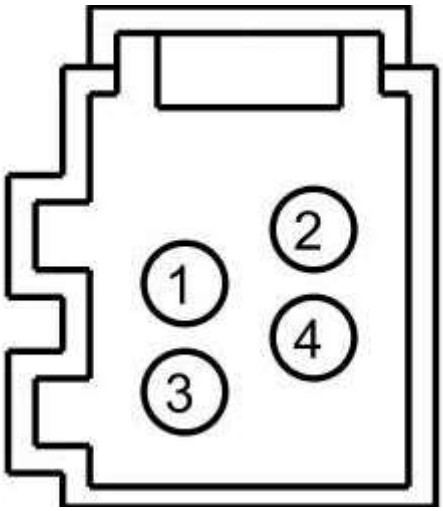
Suspect Speaker	Positive Lead	Negative Lead
LF door	C523 Pin 1 VME07 (WH)	C523 Pin 2 RME07 (WH/BN)
RF door	C612 Pin 1 VME10 (WH/VT)	C612 Pin 2 RME10 (WH/OG)
LR parcel shelf (coupe)	C484 Pin 1 VME09 (WH/GN)	C484 Pin 2 RME09 (BN/YE)
RR parcel shelf (coupe)	C485 Pin 1	C485 Pin 2

Suspect Speaker	Positive Lead	Negative Lead
	VME12 (BN/WH)	RME12 (BN/BU)
LR quarter panel (convertible)	C395 Pin 1 VME09 (WH/GN)	C395 Pin 2 RME09 (BN/YE)
RR quarter panel (convertible)	C396 Pin 1 VME12 (BN/WH)	C396 Pin 2 RME12 (BN/BU)



- For the front door subwoofer speakers (Shaker/Shaker Pro), measure the **AC voltage** between:

Suspect Front Subwoofer Speaker	Positive Lead	Negative Lead
LF subwoofer	C536 Pin 1 VME74 (BN)	C536 Pin 2 RME74 (BU/BN)
	C536 Pin 3 VME75 (GY/YE)	C536 Pin 4 RME75 (VT/WH)
RF subwoofer	C628 Pin 1 VME76 (WH/OG)	C628 Pin 2 RME76 (GY/BU)
	C628 Pin 3 VME77 (WH/VT)	C628 Pin 4 RME77 (GY/OG)



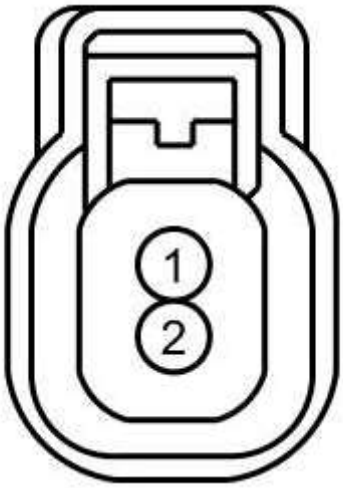
Is an alternating AC voltage present?

Yes	INSTALL a new speaker for the suspect speaker. REFER to the appropriate speaker procedure in this section. CLEAR any DTCs present. TEST the system for normal operation.
No	GO to G2.

G2 CHECK THE SPEAKER CIRCUITS FOR A SHORT TO VOLTAGE

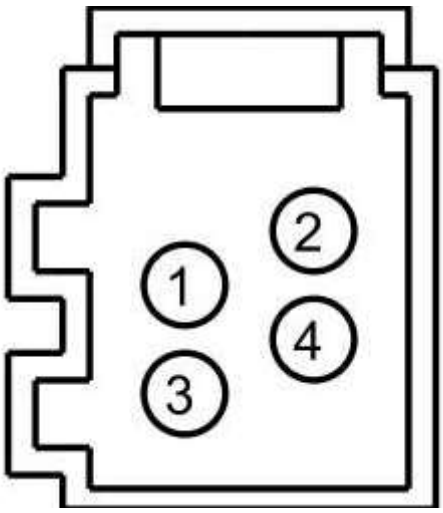
- Ignition OFF.
- Disconnect: ACM C290D (premium audio) .
- Disconnect: Audio DSP Amplifier C2385B (Shaker/Shaker Pro) .
- Ignition ON.
- For all speakers except the front door subwoofer speakers (Shaker/Shaker Pro), measure the **voltage** between:

Suspect Speaker	Positive Lead	Negative Lead
LF door	C523 Pin 1 VME07 (WH)	Ground
	C523 Pin 2 RME07 (WH/BN)	Ground
RF door	C612 Pin 1 VME10 (WH/VT)	Ground
	C612 Pin 2 RME10 (WH/OG)	Ground
LR parcel shelf (coupe)	C484 Pin 1 VME09 (WH/GN)	Ground
	C484 Pin 2 RME09 (BN/YE)	Ground
RR parcel shelf (coupe)	C485 Pin 1 VME12 (BN/WH)	Ground
	C485 Pin 2 RME12 (BN/BU)	Ground
LR quarter panel (convertible)	C395 Pin 1 VME09 (WH/GN)	Ground
	C395 Pin 2 RME09 (BN/YE)	Ground
RR quarter panel (convertible)	C396 Pin 1 VME12 (BN/WH)	Ground
	C396 Pin 2 RME12 (BN/BU)	Ground



- For the front door subwoofer speakers (Shaker/Shaker Pro), measure the **voltage** between:

Suspect Front Subwoofer Speaker	Positive Lead	Negative Lead
LF subwoofer	C536 Pin 1 VME74 (BN)	Ground
	C536 Pin 2 RME74 (BU/BN)	Ground
	C536 Pin 3 VME75 (GY/YE)	Ground
	C536 Pin 4 RME75 (VT/WH)	Ground
RF subwoofer	C628 Pin 1 VME76 (WH/OG)	Ground
	C628 Pin 2 RME76 (GY/BU)	Ground
	C628 Pin 3 VME77 (WH/VT)	Ground
	C628 Pin 4 RME77 (GY/OG)	Ground



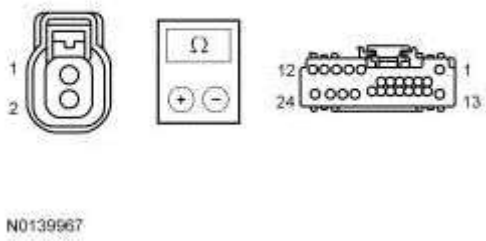
Is any voltage present?

Yes	REPAIR the circuit in question. CLEAR any DTCs present. TEST the system for normal operation.
No	For premium audio, GO to G3. For Shaker/Shaker Pro, GO to G4.

G3 CHECK THE SPEAKER CIRCUITS FOR AN OPEN OR SHORT TO GROUND (PREMIUM AUDIO)

- Ignition OFF.
- For all speakers, measure the **resistance** between:

Suspect Speaker	Positive Lead	Negative Lead	Circuit
LF door	C523 Pin 1	C290D Pin 8, then ground	VME07 (WH)
	C523 Pin 2	C290D Pin 21, then ground	RME07 (WH/BN)
RF door	C612 Pin 1	C290D Pin 11, then ground	VME10 (WH/VT)
	C612 Pin 2	C290D Pin 12 , then ground	RME10 (WH/OG)
LR parcel shelf (coupe)	C484 Pin 1	C290D Pin 9, then ground	VME09 (WH/GN)
	C484 Pin 2	C290D Pin 22, then ground	RME09 (BN/YE)
RR parcel shelf (coupe)	C485 Pin 1	C290D Pin 10, then ground	VME12 (BN/WH)
	C485 Pin 2	C290D Pin 23, then ground	RME12 (BN/BU)
LR quarter panel (convertible)	C395 Pin 1	C290D Pin 9, then ground	VME09 (WH/GN)
	C395 Pin 2	C290D Pin 22, then ground	RME09 (BN/YE)
RR quarter panel (convertible)	C396 Pin 1	C290D Pin 10, then ground	VME12 (BN/WH)
	C396 Pin 2	C290D Pin 23, then ground	RME12 (BN/BU)



N0139967

Are the resistances less than 3 ohms between the suspect speaker and the ACM , and greater than 10,000 ohms between the suspect speaker and ground?

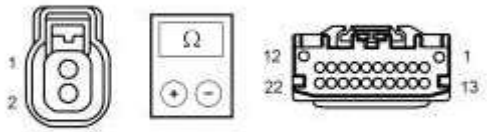
Yes	GO to G8.
No	REPAIR the circuit in question. CLEAR any DTCs present. TEST the system for normal operation.

G4 CHECK THE SPEAKER CIRCUITS FOR AN OPEN OR SHORT TO GROUND (SHAKER/SHAKER PRO)

- Ignition OFF.
- For all speakers except the front door subwoofer speakers (Shaker/Shaker Pro), measure the **resistance** between:

Suspect Speaker	Positive Lead	Negative Lead	Circuit
LF door	C523 Pin 1	C2385B Pin 2	VME07 (WH)
	C523 Pin 1	Ground	VME07 (WH)
	C523 Pin 2	C2385B Pin 13	RME07 (WH/BN)

Suspect Speaker	Positive Lead	Negative Lead	Circuit
	C523 Pin 2	Ground	RME07 (WH/BN)
RF door	C612 Pin 1	C2385B Pin 6	VME10 (WH/VT)
	C612 Pin 1	Ground	VME10 (WH/VT)
	C612 Pin 2	C2385B Pin 17	RME10 (WH/OG)
	C612 Pin 2	Ground	RME10 (WH/OG)
LR parcel shelf (coupe)	C484 Pin 1	C2385B Pin 3	VME09 (WH/GN)
	C484 Pin 1	Ground	VME09 (WH/GN)
	C484 Pin 2	C2385B Pin 14	RME09 (BN/YE)
	C484 Pin 2	Ground	RME09 (BN/YE)
RR parcel shelf (coupe)	C485 Pin 1	C2385B Pin 7	VME12 (BN/WH)
	C485 Pin 1	Ground	VME12 (BN/WH)
	C485 Pin 2	C2385B Pin 18	RME12 (BN/BU)
	C485 Pin 2	Ground	RME12 (BN/BU)
LR quarter panel (convertible)	C395 Pin 1	C2385B Pin 3	VME09 (WH/GN)
	C395 Pin 1	Ground	VME09 (WH/GN)
	C395 Pin 2	C2385B Pin 14	RME09 (BN/YE)
	C395 Pin 2	Ground	RME09 (BN/YE)
RR quarter panel (convertible)	C396 Pin 1	C2385B Pin 7	VME12 (BN/WH)
	C396 Pin 1	Ground	VME12 (BN/WH)
	C396 Pin 2	C2385B Pin 18	RME12 (BN/BU)
	C396 Pin 2	Ground	RME12 (BN/BU)



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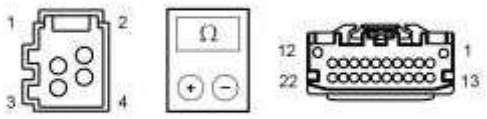
- For the front door subwoofer speakers (Shaker/Shaker Pro), measure the **resistance** between:

Suspect Front Subwoofer Speaker	Positive Lead	Negative Lead	Circuit
LF subwoofer	C536 Pin 1	C2385B Pin 4	VME74 (BN)
	C536 Pin 1	Ground	VME74 (BN)
	C536 Pin 2	C2385B Pin 15	RME74 (BU/BN)
	C536 Pin 2	Ground	RME74 (BU/BN)
	C536 Pin 3	C2385B Pin 5	VME75 (GY/YE)
	C536 Pin 3	Ground	VME75 (GY/YE)
	C536 Pin 4	C2385B Pin 16	RME75 (VT/WH)
	C536 Pin 4	Ground	RME75 (VT/WH)
RF subwoofer	C628 Pin 1	C2385B Pin 8	VME76 (WH/OG)
	C628 Pin 1	Ground	VME76 (WH/OG)

Suspect Front Subwoofer Speaker	Positive Lead	Negative Lead	Circuit
	C628 Pin 2	C2385B Pin 19	RME76 (GY/BU)
	C628 Pin 2	Ground	RME76 (GY/BU)
	C628 Pin 3	C2385B Pin 9	VME77 (WH/VT)
	C628 Pin 3	Ground	VME77 (WH/VT)
	C628 Pin 4	C2385B Pin 20	RME77 (GY/OG)
	C628 Pin 4	Ground	RME77 (GY/OG)



N0139969

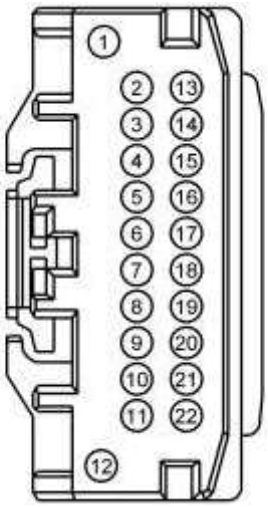
Are the resistances less than 3 ohms between the suspect speaker and the audio DSP amplifier, and greater than 10,000 ohms between the suspect speaker and ground?

Yes	GO to G5.
No	REPAIR the circuit in question. CLEAR any DTCs present. TEST the system for normal operation.

G5 CHECK THE AUDIO SIGNALS TO THE AUDIO DSP AMPLIFIER

- Disconnect: Audio DSP Amplifier C2385A .
- Operate the audio system in radio tuner AM/FM mode.
- Measure the **AC voltage** between:

Suspect Audio Channel	Positive Lead	Negative Lead
LF	C2385A Pin 4 VME17 (GN)	C2385A Pin 15 RME17 (GY)
RF	C2385A Pin 6 VME18 (VT)	C2385A Pin 17 RME18 (YE)
LR	C2385A Pin 5 VME60 (GN/BN)	C2385A Pin 16 RME60 (GY/BN)
RR	C2385A Pin 7 VME61 (VT/BN)	C2385A Pin 18 RME61 (YE/BU)



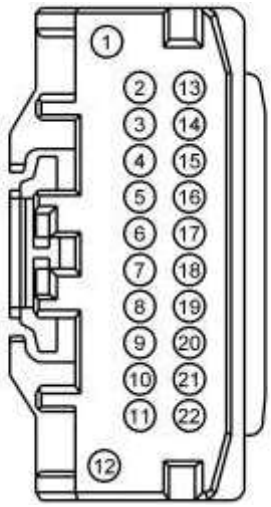
Is a fluctuating AC voltage present?

Yes	INSTALL a new audio DSP amplifier. REFER to Audio Amplifier. CLEAR any DTCs present. TEST the system for normal operation.
No	GO to G6.

G6 CHECK THE AUDIO CIRCUITS TO THE AUDIO DSP AMPLIFIER FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: ACM C290D .
- Ignition ON.
- Measure the **voltage** between:

Suspect Audio Channel	Positive Lead	Negative Lead
LF	C2385A Pin 4 VME17 (GN)	Ground
	C2385A Pin 15 RME17 (GY)	Ground
RF	C2385A Pin 6 VME18 (VT)	Ground
	C2385A Pin 17 RME18 (YE)	Ground
LR	C2385A Pin 5 VME60 (GN/BN)	Ground
	C2385A Pin 16 RME60 (GY/BN)	Ground
RR	C2385A Pin 7 VME61 (VT/BN)	Ground
	C2385A Pin 18 RME61 (YE/BU)	Ground



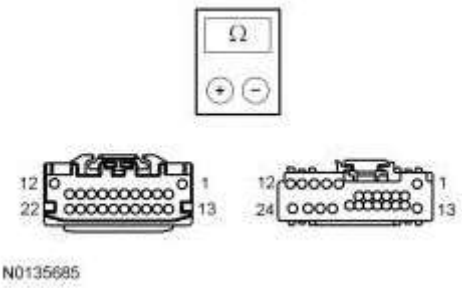
Is any voltage present?

Yes	REPAIR the circuit in question. CLEAR any DTCs present. TEST the system for normal operation.
No	GO to G7.

G7 CHECK THE AUDIO CIRCUITS TO THE AUDIO DSP AMPLIFIER FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the **resistance** between:

Audio Channel	Positive Lead	Negative Lead	Circuit
LF	C2385A Pin 4	C290D Pin 8	VME17 (GN)
	C2385A Pin 4	Ground	VME17 (GN)
	C2385A Pin 15	C290D Pin 21	RME17 (GY)
	C2385A Pin 15	Ground	RME17 (GY)
RF	C2385A Pin 6	C290D Pin 11	VME18 (VT)
	C2385A Pin 6	Ground	VME18 (VT)
	C2385A Pin 17	C290D Pin 12	RME18 (YE)
	C2385A Pin 17	Ground	RME18 (YE)
LR	C2385A Pin 5	C290D Pin 9	VME60 (GN/BN)
	C2385A Pin 5	Ground	VME60 (GN/BN)
	C2385A Pin 16	C290D Pin 22	RME60 (GY/BN)
	C2385A Pin 16	Ground	RME60 (GY/BN)
RR	C2385A Pin 7	C290D Pin 10	VME61 (VT/BN)
	C2385A Pin 7	Ground	VME61 (VT/BN)
	C2385A Pin 18	C290D Pin 23	RME61 (YE/BU)
	C2385A Pin 18	Ground	RME61 (YE/BU)



Are the resistances less than 3 ohms between the audio DSP amplifier and the ACM , and greater than 10,000 ohms between the audio DSP amplifier and ground?

Yes	GO to G8
No	REPAIR the circuit in question. CLEAR any DTCs present. TEST the system for normal operation.

G8 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test H: No Sound From The Luggage Compartment Subwoofer

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

The luggage compartment subwoofer is powered by its exclusive amplifier.

To enable the luggage compartment subwoofer amplifier, the ACM sends voltage through the enable/clip circuit. The circuit acts as both an output (to enable the amplifier) and an input (to detect an overload condition). The voltage sent by the ACM passes through a variable resistor in the amplifier, then to ground. As the amplifier reaches maximum output, the resistance in the variable resistor decreases. This decreases the voltage drop, resulting in the ACM detecting a higher voltage on the enable/clip circuit. When the voltage reaches the clip threshold, the ACM clips the audio output signal to the amplifier (heard as distortion) in order to prevent damage to the amplifier and subwoofer speaker.

The enable/clip status is based on the following voltages, as detected by the ACM :

- Less than 0.4 volt: amplifier disabled

- Between 3.8 and 6.7 volts (nominal): amplifier enabled
- Greater than 8.5 volts: amplifier clipped

An open in the enable/clip circuit causes the speakers powered by that particular amplifier to produce no sound because the enable signal does not reach the audio amplifier. A short to ground or short to voltage can cause severe distortion to be heard in the speakers.

- DTC B1A05:02 (Speaker #5: General Signal Failure) — set by the ACM (without navigation) when a fault is detected with the enable or speaker circuits between the ACM and subwoofer amplifier. This DTC can be continuous or on-demand.

This pinpoint test is intended to diagnose the following:

- Luggage compartment subwoofer enclosure
- Fuse
- Wiring, terminals or connectors
- Luggage compartment subwoofer amplifier
- ACM

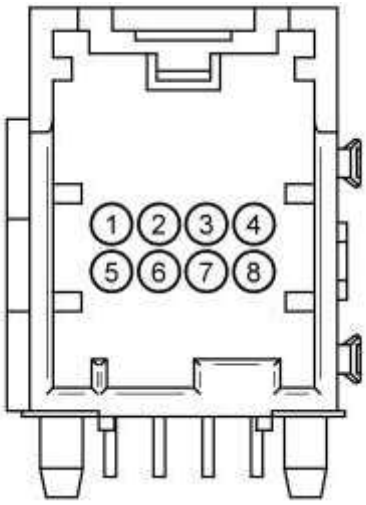
PINPOINT TEST H : NO SOUND FROM THE LUGGAGE COMPARTMENT SUBWOOFER

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.*

H1 CHECK THE AUDIO SIGNALS TO THE LUGGAGE COMPARTMENT SUBWOOFER ENCLOSURE

- Ignition OFF.
- Disconnect: Luggage Compartment Subwoofer Amplifier C4109B .
- Ignition ON.
- Operate the audio system in radio tuner AM/FM mode.
-



- Measure the **AC voltage** on the component side between:

Subwoofer Speaker Channel	Positive Lead	Negative Lead
1	C4109B Pin 1 (WH)	C4109B Pin 2 (BK)
2	C4109B Pin 3 (RD)	C4109B Pin 4 (BU)

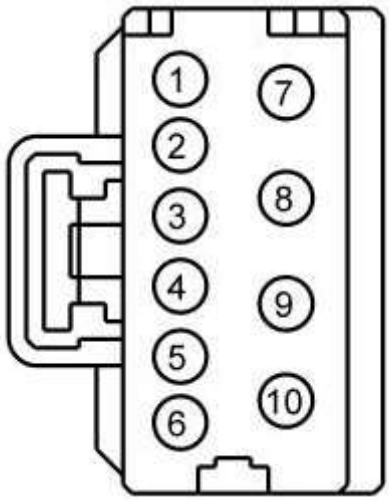
Is a fluctuating AC voltage present?

Yes	INSTALL a new luggage compartment subwoofer enclosure. REFER to Speaker Enclosure. CLEAR any DTCs present. TEST the system for normal operation.
No	GO to H2.

H2 CHECK THE LUGGAGE COMPARTMENT SUBWOOFER AMPLIFIER VOLTAGE SUPPLY

- Ignition OFF.
- Disconnect: Luggage Compartment Subwoofer Amplifier C4109A .
- Ignition ON.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4109A Pin 7	SBB20 (GN/RD)	—	Ground



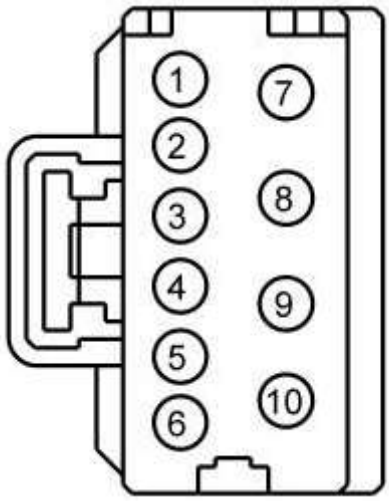
Is the voltage greater than 11 volts?

Yes	GO to H3.
No	VERIFY the Battery Junction Box (BJB) fuse 20 (30A) is OK. If OK, REPAIR the circuit. TEST the system for normal operation. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

H3 CHECK THE LUGGAGE COMPARTMENT SUBWOOFER AMPLIFIER GROUND CIRCUIT

- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4109A Pin 7	SBB20 (GN/RD)	C4109A Pin 10	GD173 (BK)



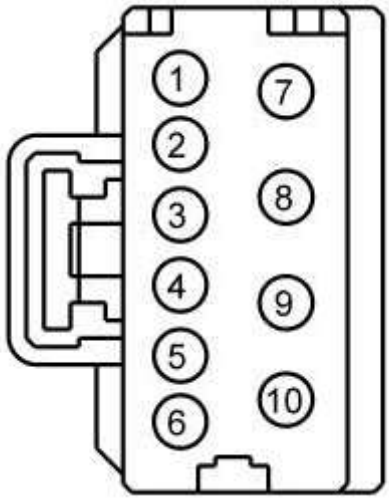
Is the voltage greater than 11 volts?

Yes	GO to H4.
No	REPAIR the circuit. TEST the system for normal operation.

H4 CHECK THE LUGGAGE COMPARTMENT SUBWOOFER AMPLIFIER ENABLE CIRCUIT FOR CORRECT VOLTAGE

- Operate the audio system in radio tuner AM/FM mode.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4109A Pin 1	SME51 (GY/VT)	—	Ground



Is the voltage between 3.8 and 6.7 volts?

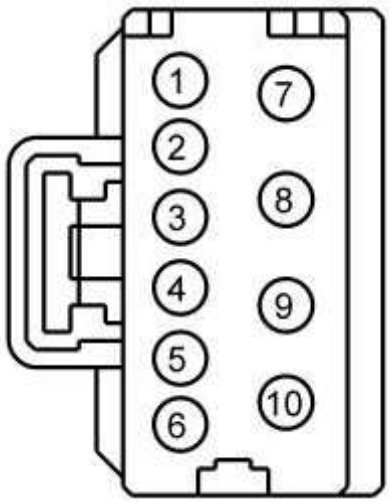
Yes	GO to H7.
No	GO to H5.

H5 CHECK THE LUGGAGE COMPARTMENT SUBWOOFER AMPLIFIER ENABLE CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.

- Disconnect: ACM C290B .
- Ignition ON.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4109A Pin 1	SME51 (GY/VT)	—	Ground



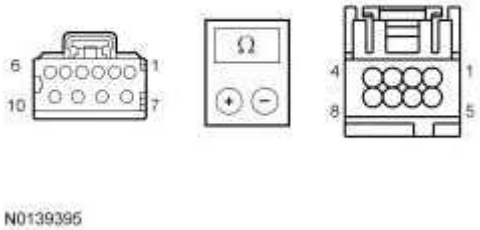
Is any voltage present?

Yes	REPAIR the circuit. TEST the system for normal operation.
No	GO to H6.

H6 CHECK THE LUGGAGE COMPARTMENT SUBWOOFER AMPLIFIER ENABLE CIRCUIT FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the **resistance** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4109A Pin 1	SME51 (GY/VT)	C290B Pin 4	SME51 (GY/VT)
C4109A Pin 1	SME51 (GY/VT)	—	Ground



Is the resistance less than 3 ohms between the luggage compartment subwoofer amplifier and the ACM , and greater

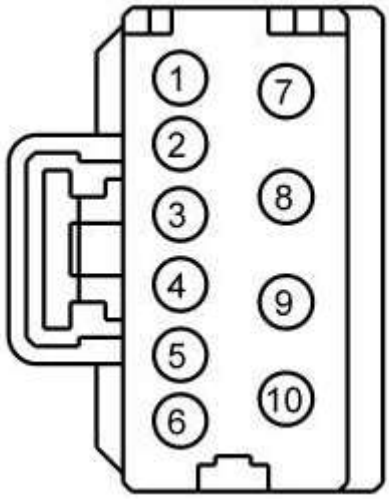
than 10,000 ohms between the luggage compartment subwoofer amplifier and ground?

Yes	GO to H10.
No	REPAIR the circuit. TEST the system for normal operation.

H7 CHECK THE AUDIO SIGNALS TO THE LUGGAGE COMPARTMENT SUBWOOFER AMPLIFIER

- Operate the audio system in radio tuner AM/FM mode.
- Measure the **AC voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4109A Pin 3	VME51 (BN/BU)	C4109A Pin 4	RME51 (WH/BU)



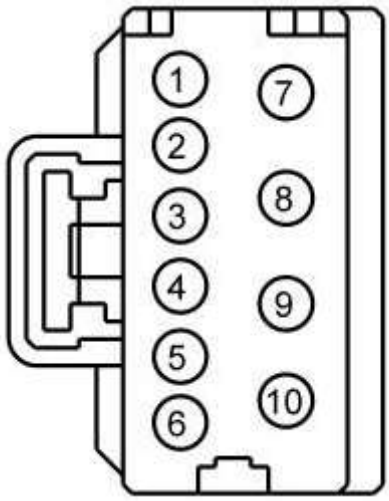
Is a fluctuating AC voltage present?

Yes	INSTALL a new luggage compartment subwoofer amplifier. REFER to Subwoofer Amplifier — Luggage Compartment. CLEAR any DTCs present. TEST the system for normal operation.
No	GO to H8.

H8 CHECK THE AUDIO SIGNALS TO THE LUGGAGE COMPARTMENT SUBWOOFER AMPLIFIER FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: ACM C290B .
- Ignition ON.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4109A Pin 3	VME51 (BN/BU)	—	Ground
C4109A Pin 4	RME51 (WH/BU)	—	Ground



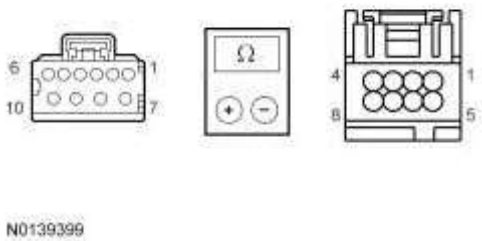
Is any voltage present?

Yes	REPAIR the circuit in question. CLEAR any DTCs present. TEST the system for normal operation.
No	GO to H9.

H9 CHECK THE AUDIO SIGNALS TO THE LUGGAGE COMPARTMENT SUBWOOFER AMPLIFIER FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the **resistance** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C4109A Pin 3	VME51 (BN/BU)	C290B Pin 1	VME51 (BN/BU)
C4109A Pin 3	VME51 (BN/BU)	—	Ground
C4109A Pin 4	RME51 (WH/BU)	C290B Pin 2	RME51 (WH/BU)
C4109A Pin 4	RME51 (WH/BU)	—	Ground



N0139399

Are the resistances less than 3 ohms between the luggage compartment subwoofer amplifier and the ACM , and greater than 10,000 ohms between the luggage compartment subwoofer amplifier and ground?

Yes	GO to H10.
No	REPAIR the circuit in question. CLEAR any DTCs present. TEST the system for normal operation.

H10 CHECK FOR CORRECT ACM OPERATION

- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test I: The ACM Does Not Reduce the Audio When the Parking Aid Tone Sounds

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

When the PAM sounds the parking aid tone, it sends a volume cutback enabled message over the HS-CAN to the IPC . The IPC in turn sends it over the MS-CAN to the ACM . When the ACM receives the message, it reduces the speaker output so the parking aid tone can be heard.

This pinpoint test is intended to diagnose the following:

- ACM

PINPOINT TEST I : THE ACM DOES NOT REDUCE THE AUDIO WHEN THE PARKING AID TONE SOUNDS

I1 CHECK THE PARKING AID SIGNAL

- Apply the parking brake.
- Place an object behind the vehicle within the range of the parking aid sensors. REFER to Section 413-13.
- Ignition ON.
- Place the transmission in REVERSE (R).
- Enter the following diagnostic mode on the scan tool: ACM DataLogger .
- Monitor the parking aid input status PID (RPA_STAT) while the parking aid tone is sounding.

Does the PID read "Enabled" when the parking aid tone is sounding?

Yes	GO to I2.
No	Refer to Section 413-13 to continue diagnosis of the parking aid system.

I2 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.

- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test J: The SYNC® System Is Inoperative (No Response Is Received From Phone, Voice, And Media Inputs)

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

Normal Operation

When a button on the FCIM is pressed, a network message is broadcast to the APIM via the MS-CAN . The APIM takes the appropriate action and sends a status message to the FDIM (without navigation) or the ACM (with navigation) in order to update the display screen.

- DTC U3000:04 (Control Module: System Internal Failure) — set by the APIM when it detects a fault due to a device conflict or an internal failure.

This pinpoint test is intended to diagnose the following:

- Customer's device
- APIM

PINPOINT TEST J : THE SYNC® SYSTEM IS INOPERATIVE (NO RESPONSE IS RECEIVED FROM PHONE, VOICE, AND MEDIA INPUTS)

J1 CHECK FOR DIAGNOSTIC SCAN TOOL COMMUNICATION WITH THE APIM

- Using the diagnostic scan tool, carry out the network test.

Does the APIM pass the network test?

Yes	GO to J2.
No	REFER to Section 418-00.

J2 CHECK THE SYNC® SYSTEM OPERATION

NOTE: *Carrying out a Master Reset returns all preference settings to the factory defaults, erases all the phone book and call histories, and deletes any devices paired with the SYNC® system.*

- Connect: Multi-Media Interface Tester (105-00120) .
- Using the Multi-Media Interface Tester (105-00120), TEST the audio output for the audio input jack, USB port, and Bluetooth connection using the VOICE switch on the steering wheel switches to enter each mode.

Do all of the SYNC® inputs function correctly?

Yes	The SYNC® system is operating correctly at this time. CARRY OUT a SYNC® system Master Reset. REFER to the Owner's Literature. REVIEW the SYNC® system operation with the customer. If the customer device still does not operate correctly, the fault is with the customer device.
No	GO to J3.

J3 RESET THE APIM AND RECHECK SYNC® SYSTEM OPERATION

- Carry out an APIM power reset by disconnecting the battery for 5 minutes, then reconnecting it.
- Connect: Multi-Media Interface Tester (105-00120) .
- Using the Multi-Media Interface Tester (105-00120), TEST the audio output for the audio input jack, USB port, and Bluetooth connection using the VOICE switch on the steering wheel switches to enter each mode.

Do all of the SYNC® inputs function correctly?

Yes	The SYNC® system is operating correctly at this time. CARRY OUT a SYNC® system Master Reset. REFER to the Owner's Literature. REVIEW the SYNC® system operation with the customer. If the customer device still does not operate correctly, the fault is with the customer device.
No	If only some (but not all) of the inputs are inoperative, GO to Symptom Chart — SYNC System to diagnose the observed symptom. If all inputs are inoperative and/or DTC U3000:04 is present,  **VIN required to access Guided Routine (APIM)**

Pinpoint Test K: No Sound From All SYNC® Audio Sources (Bluetooth, USB , Audio Input Jack)

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

The Accessory Protocol Interface Module (APIM) sends left and right channel analog audio signals to the Audio Front Control Module (ACM) . This includes inputs from the Universal Serial Bus (USB) port, the audio input jack, and a Bluetooth media device.

This pinpoint test is intended to diagnose the following:

- Customer's device
- Wiring, terminals, or connectors
- APIM
- ACM

PINPOINT TEST K : NO SOUND FROM ALL SYNC® AUDIO SOURCES (BLUETOOTH, USB , AUDIO INPUT JACK)

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

K1 VERIFY THE OPERATION OF THE SYNC® SYSTEM AUDIO SOURCES

- Connect: Multi-Media Interface Tester (105-00120) .
- Using the Multi-Media Interface Tester (105-00120), TEST the audio output for the audio input jack, USB port, and Bluetooth connection.

Is there poor quality, distorted, or no sound from each SYNC® audio source?

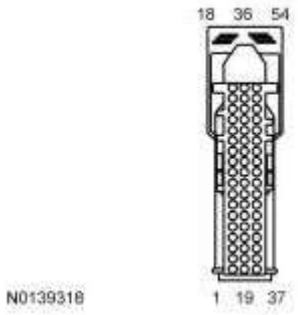
Yes	GO to K2.
No	If the concern is only with some (but not all) of the audio sources, GO to Symptom Chart — SYNC System to diagnose the observed symptom. If all audio sources operate correctly, the concern is with the customer device.

K2 CHECK THE CIRCUITS FROM THE APIM FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: ACM C290A .
- Disconnect: APIM C2383 .
- Ignition ON.

- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2383 Pin 23	VME53 (VT/GN)	—	Ground
C2383 Pin 24	RME53 (BN/WH)	—	Ground
C2383 Pin 25	VME52 (BU)	—	Ground
C2383 Pin 26	RME52 (GY/OG)	—	Ground



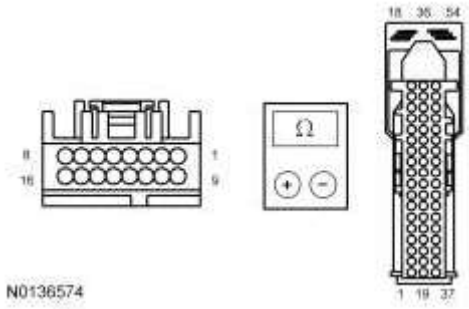
Is any voltage present?

Yes	REPAIR the circuit in question. TEST the system for normal operation.
No	GO to K3.

K3 CHECK THE CIRCUITS FROM THE APIM FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the **resistance** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C290A Pin 9	VME53 (VT/GN)	C2383 Pin 23	VME53 (VT/GN)
C290A Pin 9	VME53 (VT/GN)	—	Ground
C290A Pin 10	RME53 (BN/WH)	C2383 Pin 24	RME53 (BN/WH)
C290A Pin 10	RME53 (BN/WH)	—	Ground
C290A Pin 1	VME52 (BU)	C2383 Pin 25	VME52 (BU)
C290A Pin 1	VME52 (BU)	—	Ground
C290A Pin 2	RME52 (GY/OG)	C2383 Pin 26	RME52 (GY/OG)
C290A Pin 2	RME52 (GY/OG)	—	Ground



Are the resistances less than 3 ohms between the ACM and the APIM , and greater than 10,000 ohms between the ACM and ground?

Yes	GO to K4.
No	REPAIR the circuit in question. TEST the system for normal operation.

K4 CHECK FOR CORRECT APIM OPERATION

- Ignition OFF.
- Disconnect and inspect the APIM connector.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the APIM connector. Make sure it seats and latches correctly.
- Wait at least 2 minutes for the APIM to re-initialize.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, **VIN required to access Guided Routine (APIM)** If the concern is still present, GO to K5.
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

K5 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test L: All SYNC® Services Features Are Inoperative Or Inaccurate (Traffic, Directions, And Information)

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

Normal Operation and Fault Conditions

Refer to SYNC® Services in Information and Entertainment System.

Possible Sources

- Unregistered SYNC® owner account
- Unregistered or expired SYNC® Services subscription
- Unregistered mobile phone number
- Mobile phone being used not selected as "Active"
- SYNC® Services server
- APIM
- GPSM

PINPOINT TEST L : ALL SYNC® SERVICES FEATURES ARE INOPERATIVE OR INACCURATE (TRAFFIC, DIRECTIONS, AND INFORMATION)

L1 VERIFY THE CUSTOMER'S SYNC® OWNER ACCOUNT AND SYNC® SERVICES REGISTRATION AND SUBSCRIPTION

- Verify that the customer has a SYNC® Owner Account on SyncMyRide
- Verify that the customer has registered for SYNC® Services and has an active subscription.

Does the customer have a SYNC® Owner Account and an active SYNC® Services subscription?

Yes	GO to L2.
No	If the customer does not have a SYNC® Owner Account, INFORM the customer that an account must be created in order to sign up for SYNC® Services. REFER to SyncMyRide. If the customer does not have an active SYNC® Services subscription, INFORM the customer that in order for SYNC® Services to function, the subscription needs to be activated. REFER to SyncMyRide.

L2 VERIFY THE CUSTOMER'S REGISTERED PHONE NUMBER AND STATUS

- Verify that the mobile phone being used has the correct phone number registered with SYNC® Services.
- Verify that the mobile phone being used is selected as "Active" on SyncMyRide.

Is the customer using the registered and active mobile phone associated with the SYNC® Services account?

Yes	GO to L3.
No	INFORM the customer that the correct phone number must be registered on the SYNC® website and selected as "Active." REFER to SyncMyRide.

L3 CHECK FOR APIM DTCS

- Ignition ON.
- Using a diagnostic scan tool, perform the APIM self-test.

Are any DTCs recorded in the APIM ?

Yes	REFER to the APIM DTC Chart in Information and Entertainment System.
No	GO to L4.

L4 CHECK FOR GPSM DTCS

- Using a diagnostic scan tool, perform the GPSM self-test.

Are any DTCs recorded in the GPSM ?

Yes	REFER to the GPSM DTC Chart in Information and Entertainment System.
No	GO to L5.

L5 VERIFY THE CUSTOMER'S PHONE CONNECTION TO SYNC® SERVICES

- Advise the customer to connect their phone to SYNC® Services. Caller ID blocking must be disabled on the customer's phone. Refer to the Owner's Literature.
- Operate a SYNC® Services feature.
- Verify that the phone call is placed and that the phone is connected to SYNC® Services.

Does the phone connect to SYNC® Services and operate correctly?

Yes	GO to L6.
No	GO to Pinpoint Test Q.

L6 OBSERVE THE SYNC® SERVICES SUBSCRIPTION COMMERCIAL

- Once the customer's phone is connected to SYNC® Services, observe the subscription commercial.

Does the SYNC® Services subscription commercial repeat with no selection option?

Yes	There is a potential SYNC® Services server issue, and the problem does not reside in the vehicle's audio system. CONTACT the Ford Technical Hotline for assistance.
No	GO to L7.

L7 CHECK THE OPERATION OF THE DIRECTIONS FROM SYNC® SERVICES

- When prompted, select directions from SYNC® Services and observe the audible prompts from the audio system.

Is a single chime, audible prompt, then a short chime heard, indicating the navigation route is being sent to the vehicle?

Yes	SYNC® Services is operating correctly at this time.
No	If a single chime, audible prompt, then a repeating chime is heard, indicating the navigation route is being sent to the vehicle, GO to L8. If no chime or audible prompt is heard, indicating that the system was unable to locate the vehicle, there is a potential SYNC® Services server issue. The problem does not reside in the vehicle's audio system. CONTACT the Ford Technical Hotline for assistance.

L8 CHECK FOR CORRECT APIM OPERATION

- Ignition OFF.
- Disconnect and inspect the APIM connector.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the APIM connector. Make sure it seats and latches correctly.
- Wait at least 2 minutes for the APIM to re-initialize.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern,   **VIN required to access Guided Routine (APIM)** If the concern is still present, GO to L9.
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

L9 CHECK FOR CORRECT GPSM OPERATION

- Ignition OFF.
- Disconnect and inspect the GPSM connector.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the GPSM connector. Make sure it seats and latches correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new GPSM . REFER to Global Positioning System Module (GPSM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test M: The SYNC® System Voice Or Tone Prompts, TTS Feature, Or Ringtones Are Inoperative Or Do Not Operate Correctly

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

The Text-To-Speech (TTS) and voice prompt features speak certain text information and interaction requests in order to minimize driver distraction while driving. The ringtone alerts the driver to an incoming call.

Audible prompts can range from a simple tone to more elaborate spoken text, based on the customer setting. When interaction mode is set to standard, detailed guidance is provided. When interaction mode is set to advanced, most prompts are tones only and minimal audible guidance is provided. REFER to the Owner's Literature for further information on voice interaction.

The audio signals for the TTS and voice prompt features, the ringtones, and audio from the outside device during a phone call, are sent from the Accessory Protocol Interface Module (APIM) to the Audio Front Control Module (ACM) .

This pinpoint test is intended to diagnose the following:

- Customer's setting
- Wiring, terminals, or connectors
- APIM
- ACM

PINPOINT TEST M : THE SYNC® SYSTEM VOICE OR TONE PROMPTS, TTS FEATURE, OR RINGTONES ARE INOPERATIVE OR DO NOT OPERATE CORRECTLY

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

M1 CHECK THE AUDIBLE PROMPT SETTING

- Operate the audio system in SYNC® mode.
- Verify the audible prompts are enabled. REFER to "SYNC® Voice Recognition Feature" in the Owner's Literature.
- Press the VOICE switch on the steering wheel switches and observe the SYNC® system audible prompt.

Does the SYNC® system produce an audible prompt correctly?

Yes	The system is operating correctly at this time. The concern was caused by a customer setting. INSTRUCT the customer in the correct operation of the audible prompt feature.
No	GO to M2.

M2 CHECK FOR A VOLTAGE SIGNAL FROM THE APIM

- Operate the audio system in SYNC® mode.
- While pressing the VOICE switch repeatedly, measure the **AC voltage** by back-probing between the ACM C290A Pin 4, circuit VMN14 (WH/VT), harness side, and the ACM C290A Pin 5, circuit RMN14 (GY/BN), harness side.

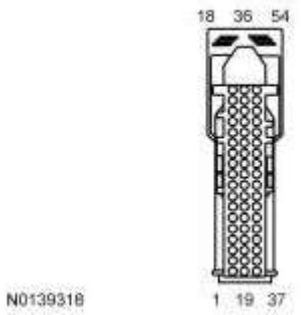
Is an AC voltage produced each time the VOICE switch is pressed?

Yes	GO to M6.
No	GO to M3.

M3 CHECK THE AUDIBLE PROMPT CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: ACM C290A .
- Disconnect: APIM C2383 .
- Ignition ON.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2383 Pin 3	VMN14 (WH/VT)	—	Ground
C2383 Pin 4	RMN14 (GY/BN)	—	Ground



Is any voltage present?

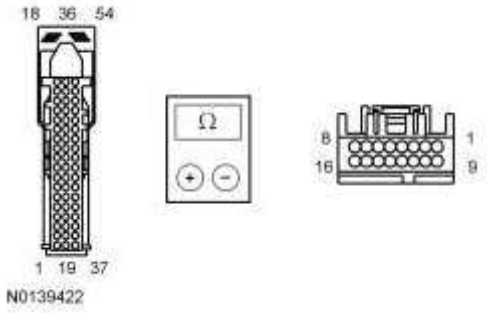
Yes	REPAIR the circuit in question. TEST the system for normal operation.

No	GO to M4.

M4 CHECK THE AUDIBLE PROMPT CIRCUITS FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the **resistance** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2383 Pin 3	VMN14 (WH/VT)	C290A Pin 4	VMN14 (WH/VT)
C2383 Pin 3	VMN14 (WH/VT)	—	Ground
C2383 Pin 4	RMN14 (GY/BN)	C290A Pin 5	RMN14 (GY/BN)
C2383 Pin 4	RMN14 (GY/BN)	—	Ground



Are the resistances less than 3 ohms between the APIM and the ACM , and greater than 10,000 ohms between the APIM and ground?

Yes	GO to M5.
No	REPAIR the circuit in question. TEST the system for normal operation.

M5 CHECK FOR CORRECT APIM OPERATION

- Ignition OFF.
- Disconnect and inspect the APIM connector.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the APIM connector. Make sure it seats and latches correctly.
- Wait at least 2 minutes for the APIM to re-initialize.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, **VIN required to access Guided Routine (APIM)** If the concern is still present, GO to M6.
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

M6 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test N: The Voice Guidance Is Inoperative Or Does Not Operate Correctly

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

The voice-assisted route guidance is broadcast through the front speakers. The voice guidance volume can be adjusted using the settings on the Audio Front Control Module (ACM) .

This pinpoint test is intended to diagnose the following:

- Customer's setting
- ACM

PINPOINT TEST N : THE VOICE GUIDANCE IS INOPERATIVE OR DOES NOT OPERATE CORRECTLY

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

N1 CHECK THE VOICE GUIDANCE SETTING

- Adjust the voice volume to approximately 50%. REFER to the Owner's Literature.
- Set a destination and start the route using the navigation controls. REFER to the Owner's Literature.
- Observe the voice guidance.

Does the voice guidance operate correctly?

Yes	The concern was caused by an incorrect customer setting. INSTRUCT the customer in the correct use of the voice guidance feature.
No	GO to N2.

N2 CHECK THE SPEAKER OUTPUT

- Carry out the speaker walk test. REFER to Audio Control Module (ACM) Self-Diagnostic Mode.

Do the front speakers operate correctly?

Yes	GO to N3.
No	GO to Pinpoint Test G.

N3 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test O: The Audio Input Jack Is Inoperative Or Does Not Operate Correctly

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation — Without SYNC®

Audio signals are sent from the audio input jack to the Audio Front Control Module (ACM) . There are no external power or ground circuits to the audio input jack.

Normal Operation — With SYNC®

Audio signals are sent from the audio input jack to the Accessory Protocol Interface Module (APIM) . The signals are then sent to the ACM . There are no external power or ground circuits to the audio input jack.

This pinpoint test is intended to diagnose the following:

- Customer's device
- Wiring, terminals, or connectors
- Audio input jack
- ACM (without SYNC®)
- APIM (with SYNC®)

PINPOINT TEST O : THE AUDIO INPUT JACK IS INOPERATIVE OR DOES NOT OPERATE CORRECTLY

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

NOTE: *Before carrying out this pinpoint test, make sure the MP3 device is operating correctly.*

O1 CHECK THE AUDIO INPUT JACK AUDIO

- Connect: Multi-Media Interface Tester (105-00120) .
- Using the Multi-Media Interface Tester (105-00120), attempt to play an audio file using the audio input jack.

Does the file play correctly?

Yes	The system is operating correctly at this time. The concern may be with the customer device.
No	GO to O2.

O2 DETERMINE THE VEHICLE CONTENT

- Determine if the vehicle is equipped with the SYNC® system.

Is the vehicle equipped with the SYNC® system?

Yes	GO to O3.
No	GO to O4.

O3 CHECK THE APIM AUDIO OUTPUT

- Using the Multi-Media Interface Tester (105-00120), attempt to play an audio file using either the Universal Serial Bus (USB) port or Bluetooth.

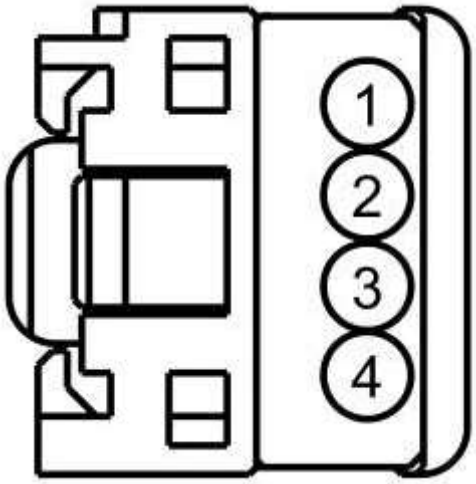
Is the audio output OK for the USB port or Bluetooth?

Yes	GO to O4.
No	GO to Pinpoint Test K.

O4 CHECK THE AUDIO INPUT JACK CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Audio Input Jack C2362 .
- Disconnect: ACM C290A (without the SYNC® system) or APIM C2383 (with the SYNC® system) .
- Ignition ON.
- Measure the **voltage** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2362 Pin 1	VME46 (BU/GN)	—	Ground
C2362 Pin 2	RME46 (WH/GN)	—	Ground
C2362 Pin 3	RME45 (YE/GN)	—	Ground
C2362 Pin 4	VME45 (BU)	—	Ground



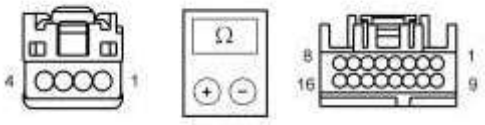
Is any voltage present?

Yes	REPAIR the circuit in question. TEST the system for normal operation.
No	GO to O5.

O5 CHECK THE AUDIO INPUT JACK CIRCUITS FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- For vehicles without SYNC®, measure the **resistance** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C2362 Pin 1	VME46 (BU/GN)	C290A Pin 6	VME46 (BU/GN)
C2362 Pin 1	VME46 (BU/GN)	—	Ground
C2362 Pin 2	RME46 (WH/GN)	C290A Pin 14	RME46 (WH/GN)
C2362 Pin 2	RME46 (WH/GN)	—	Ground
C2362 Pin 3	RME45 (YE/GN)	C290A Pin 8	RME45 (YE/GN)
C2362 Pin 3	RME45 (YE/GN)	—	Ground
C2362 Pin 4	VME45 (BU)	C290A Pin 7	VME45 (BU)
C2362 Pin 4	VME45 (BU)	—	Ground



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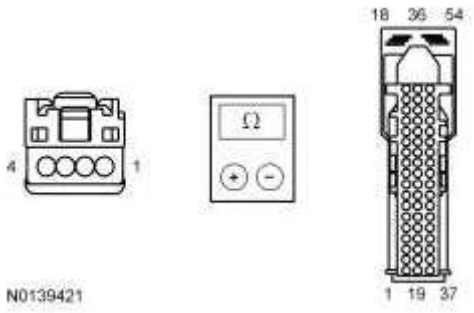
- For vehicles with SYNC®, measure the **resistance** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit

C2362 Pin 1	VME46 (BU/GN)	C2383 Pin 47	VME46 (BU/GN)
C2362 Pin 1	VME46 (BU/GN)	—	Ground
C2362 Pin 2	RME46 (WH/GN)	C2383 Pin 48	RME46 (WH/GN)
C2362 Pin 2	RME46 (WH/GN)	—	Ground
C2362 Pin 3	RME45 (YE/GN)	C2383 Pin 46	RME45 (YE/GN)
C2362 Pin 3	RME45 (YE/GN)	—	Ground
C2362 Pin 4	VME45 (BU)	C2383 Pin 45	VME45 (BU)
C2362 Pin 4	VME45 (BU)	—	Ground



Are the resistances less than 3 ohms between the audio input jack and the ACM (or APIM , with SYNC®), and greater than 10,000 ohms between the audio input jack and ground?

Yes	GO to O6.
No	REPAIR the circuit in question. TEST the system for normal operation.

O6 ISOLATE THE AUDIO INPUT JACK

- Connect: ACM C290A (without the SYNC® system) or APIM C2383 (with the SYNC® system) .
- INSTALL a known good audio input jack. REFER to Audio Input Jack.
- Connect: Multi-Media Interface Tester (105-00120) .
- Using the Multi-Media Interface Tester (105-00120), attempt to play an audio file using the audio input jack.

Does the file play correctly?

Yes	The concern was caused by an inoperative audio input jack. The system is operating correctly at this time.
No	For vehicles without SYNC®, GO to O7. For vehicles with SYNC®, GO to O8.

O7 CHECK FOR CORRECT ACM OPERATION

- Ignition OFF.
- Disconnect and inspect all the ACM connectors.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the ACM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new ACM . REFER to Audio

	Control Module (ACM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

O8 CHECK FOR CORRECT APIM OPERATION

- Ignition OFF.
- Disconnect and inspect the APIM connector.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the APIM connector. Make sure it seats and latches correctly.
- Wait at least 2 minutes for the APIM to re-initialize.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern,    **VIN required to access Guided Routine (APIM)**
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test P: The Universal Serial Bus (USB) Port Is Inoperative Or Does Not Operate Correctly

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

Normal Operation

The Universal Serial Bus (USB) port is connected to the Accessory Protocol Interface Module (APIM) through the USB cable. The USB port can be used to play audio files or upload software from mass storage devices, or for connecting a media device.

If supported by the user device, the USB can provide charging. Because of this feature, when a USB device is plugged into the USB port, the SYNC® system does not automatically switch to the device.

If a USB mass storage device is used to play an audio file, the SYNC® system only plays audio files that do not have Digital Rights Management (DRM) protection.

The USB cable and port are not serviceable separately.

- DTC B1252:04 (USB Port: System Internal Failure) — set by the APIM when it detects any fault with the USB circuit. This can be caused by a fault with the USB cable or port, or by the customer USB device.
- DTC B1252:11 (USB Port: Circuit Short to Ground) — set by the APIM when it detects a short to ground in the USB circuit.

This pinpoint test is intended to diagnose the following:

- Customer's device
- Universal Serial Bus (USB) cable/port
- APIM

PINPOINT TEST P : THE UNIVERSAL SERIAL BUS (USB) PORT IS INOPERATIVE OR DOES NOT OPERATE CORRECTLY

P1 CHECK THE USB CONNECTION

- Connect: Multi-Media Interface Tester (105-00120) . Using the Multi-Media Interface Tester (105-00120), attempt to play a file using the USB port.

Does the audio file play successfully using the USB connection?

Yes	The SYNC® system is operating correctly. REVIEW the operation of the USB port with the customer. If the customer device still does not operate correctly, the fault is with the customer device.
No	GO to P2.

P2 INSPECT THE USB CABLE

- Ignition OFF.
- Disconnect: USB Cable At APIM .
- Inspect the USB cable for damage.
- Connect: USB Cable At APIM .
- Ignition ON.
- Connect: Multi-Media Interface Tester (105-00120) . Using the Multi-Media Interface Tester (105-00120), attempt to play a file using the USB port.

Does the audio file play successfully using the USB connection?

Yes	The concern was caused by the USB connection not being seated correctly. The system is now operating correctly.
No	GO to P3.

P3 RESET THE APIM AND RECHECK SYNC® SYSTEM OPERATION

NOTE: *Carrying out a Master Reset returns all preference settings to the factory defaults, erases all the phone book and call histories, and deletes any devices paired with the SYNC® system.*

- Carry out an APIM power reset by disconnecting the battery for 5 minutes, then reconnecting it.
- Connect: Multi-Media Interface Tester (105-00120) .
- Using the Multi-Media Interface Tester (105-00120), TEST the audio output for the audio input jack, USB port, and Bluetooth connection using the VOICE switch on the steering wheel switches to enter each mode.

Do all of the SYNC® inputs function correctly?

Yes	The SYNC® system is operating correctly at this time. CARRY OUT a SYNC® system Master Reset. REFER to the Owner's Literature. REVIEW the SYNC® system operation with the customer. If the customer device still does not operate correctly, the fault is with the customer device.
No	If only the USB port is inoperative, GO to P4. If additional inputs are inoperative, GO to Symptom Chart — SYNC System to diagnose the observed symptom. If all inputs are inoperative,  **VIN required to access Guided Routine (APIM)**

P4 ISOLATE THE USB CABLE AND PORT

- INSTALL a new USB cable and port. REFER to Universal Serial Bus (USB) Cable and Port.
- Connect: Multi-Media Interface Tester (105-00120) . Using the Multi-Media Interface Tester (105-00120), attempt to play a file using the USB port.

Does the audio file play successfully using the USB connection?

Yes	The concern was caused by an inoperative USB cable. The system is now operating correctly.
No	GO to P5.

P5 CHECK FOR CORRECT APIM OPERATION

- Ignition OFF.
- Disconnect and inspect the APIM connector.

- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the APIM connector. Make sure it seats and latches correctly.
- Wait at least 2 minutes for the APIM to re-initialize.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern,  **VIN required to access Guided Routine (APIM)**
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test Q: Unable To Pair Bluetooth Device

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

Normal Operation

When a new Bluetooth device is added, the Accessory Protocol Interface Module (APIM) and the Bluetooth device must be paired together. Most Bluetooth devices can pair with the SYNC® system, although functionality may vary. To determine if a Bluetooth device is supported, retrieve the Consumer Interface Processor (CIP) software level using the Accessory Protocol Interface Module (APIM) Software Level Check, and verify the customer device is on the compatibility list for the current CIP software level.

Pairing a Bluetooth device is accomplished through the "Add Device" selection of the phone menu. When pairing a device, the SYNC® system generates a unique Personal Identification Number (PIN) that must be entered on the Bluetooth device in order for the pairing process to be successful. There are also some device-specific actions that must take place. For additional information on the pairing process, REFER to the Owner's Literature.

This pinpoint test is intended to diagnose the following:

- Incompatible Bluetooth device
- APIM

PINPOINT TEST Q : UNABLE TO PAIR BLUETOOTH DEVICE

Q1 CHECK THE BLUETOOTH CONNECTION

NOTE: *Carrying out a Master Reset returns all preference settings to the factory defaults, erases all the phone book and call histories, and deletes any devices paired with the SYNC® system.*

- Connect: Multi-Media Interface Tester (105-00120) .
- Using the Multi-Media Interface Tester (105-00120), connect to the SYNC® system using Bluetooth. Follow the tool instructions.
- Enter the following diagnostic mode on the scan tool: APIM DataLogger .
- Monitor the Bluetooth device paired PID (BT_PAIR) and the Bluetooth device connected PID (BT_CONN).

Do the PIDs BT_PAIR and BT_CONN both read "Yes"?

Yes	The SYNC® system is operating correctly at this time. CARRY OUT a SYNC® system Master Reset. REFER to the Owner's Literature. REVIEW the pairing process with the customer. If the customer device still does not pair, the fault is with the customer device.
No	GO to Q2.

Q2 CHECK FOR CORRECT APIM OPERATION

- Ignition OFF.
- Disconnect and inspect the APIM connector.
- Repair:
  - Corrosion (clean module pins or install new connectors or terminals)
  - Damaged or bent pins (install new terminals or pins)
  - Pushed-out pins (install new pins as necessary)
- Reconnect the APIM connector. Make sure it seats and latches correctly.
- Wait at least 2 minutes for the APIM to re-initialize.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern,    **VIN required to access Guided Routine (APIM)**
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Pinpoint Test R: The Steering Wheel Switches Are Inoperative Or Do Not Operate Correctly

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in Section 100-00 for information about these practices.

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

Normal Operation

There are 3 different steering wheel switch configurations:

- Without SYNC®, without navigation
  - VOL-, VOL+, SEEK-, SEEK+, MEDIA
  - All switches are wired to the ACM
- With SYNC®, without navigation
  - VOL-, VOL+, SEEK-, SEEK+, MEDIA, VOICE, PHONE, OK
  - The VOL-, VOL+, SEEK-, SEEK+, and MEDIA switches are wired to the ACM . The VOICE, PHONE, and OK switches are wired to the APIM .
- With SYNC®, with navigation
  - VOL-, VOL+, SEEK-, SEEK+, MEDIA, VOICE, PHONE
  - All switches are wired to the ACM

Voltage is sent from the ACM or APIM to the steering wheel switches, and the same module grounds the return circuit. The VOL-, VOL+, SEEK-, and SEEK+ switches share signal and return circuits, while the VOICE, MEDIA, PHONE and OK switches share a separate set of signal and return circuits.

For all configurations, when a switch is pressed, the voltage is routed through a specific resistor value for each function. The ACM or APIM then uses the reference voltage to determine which control input function has been selected.

- DTC B11BA:1C (Steering Wheel Audio Switch Pack: Circuit Voltage Out of Range) — set by the ACM (without navigation) and ACM (with navigation) when the reference voltage to the steering wheel switches is out-of-range. This can be caused by a number of different failures on the steering wheel switches circuit except for a stuck switch or a short to ground. This DTC applies to the VOL-, VOL+, SEEK-, SEEK+, and MEDIA switches.
- DTC B11BA:63 (Steering Wheel Audio Switch Pack: Circuit / Component Protection Time-Out) — set by the ACM (without navigation) and ACM (with navigation) when a steering wheel switch is detected as active for more than 120 seconds during normal operation, or for more than 3 seconds during the self-test. A short to ground does not set this DTC, as the reference voltage falls out-of-range, resulting in DTC B11BA:1C being set. This DTC applies to the VOL-, VOL+, SEEK-, SEEK+, and MEDIA switches.

- B1201:1C (Steering Wheel Audio Switch Pack 2: Circuit Voltage Out of Range) — set by the ACM (with navigation) when the reference voltage to the steering wheel controls is out-of-range. This can be caused by a number of different failures on the steering wheel switch circuit except for a stuck switch or a short to ground. This DTC applies to the VOICE and PHONE switches.
- B1201:1C (Steering Wheel Audio Switch Pack 2: Circuit Voltage Out of Range) — set by the APIM (with SYNC® and without navigation) when the reference voltage to the steering wheel controls is out-of-range. This can be caused by a number of different failures on the steering wheel switch circuit except for a stuck switch or a short to ground. This DTC applies to the VOICE, PHONE, and OK switches.
- B1201:63 (Steering Wheel Audio Switch Pack 2: Circuit / Component Protection Time-Out) — set by the ACM (with navigation) when a steering wheel switch is detected as active for more than 120 seconds during normal operation, or for more than 3 seconds during the self-test. This DTC applies to the PHONE and VOICE switches.
- B1201:63 (Steering Wheel Audio Switch Pack 2: Circuit / Component Protection Time-Out) — set by the APIM (with SYNC® and without navigation) when a steering wheel switch is detected as active for more than 120 seconds during normal operation, or for more than 3 seconds during the self-test. This DTC applies to the VOICE, PHONE, and OK switches.

This pinpoint test is intended to diagnose the following:

- Steering wheel switch
- Wiring, terminals, or connectors
- Clockspring
- ACM (without SYNC® and without navigation), (with SYNC® and with navigation)
- Accessory Protocol Interface Module (APIM) (with SYNC® and without navigation)

PINPOINT TEST R : THE STEERING WHEEL SWITCHES ARE INOPERATIVE OR DO NOT OPERATE CORRECTLY

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

R1 CHECK THE VEHICLE OPTION CONTENT

- Determine if the vehicle is equipped with SYNC®

Is the vehicle equipped with SYNC®?

Yes	GO to R2.
No	GO to R4.

R2 CHECK THE SYNC® SYSTEM OPERATION

NOTE: *Carrying out a Master Reset returns all preference settings to the factory defaults, erases all the phone book and call histories, and deletes any devices paired with the SYNC® system.*

- Connect: Multi-Media Interface Tester (105-00120) .
- Using the Multi-Media Interface Tester (105-00120), TEST the audio output for the audio input jack, USB port, and Bluetooth connection using the VOICE switch on the steering wheel switches to enter each mode.

Do all of the SYNC® inputs function correctly?

Yes	The SYNC® system is operating correctly at this time. CARRY OUT a SYNC® system Master Reset. REFER to the Owner's Literature. REVIEW the SYNC® system operation with the customer. If the customer device still does not operate correctly, the fault is with the customer device.
No	GO to R3.

R3 RESET THE APIM AND RECHECK SYNC® SYSTEM OPERATION

- Carry out an APIM power reset by disconnecting the battery for 5 minutes, then reconnecting it.
- Connect: Multi-Media Interface Tester (105-00120) .
- Using the Multi-Media Interface Tester (105-00120), TEST the audio output for the audio input jack, USB port, and Bluetooth connection using the VOICE switch on the steering wheel switches to enter each mode.

Do all of the SYNC® inputs function correctly?

Yes	The SYNC® system is operating correctly at this time. CARRY OUT a SYNC® system Master Reset. REFER to the Owner's Literature. REVIEW the SYNC® system operation with the customer. If the customer

	device still does not operate correctly, the fault is with the customer device.
No	GO to R4.

R4 DETERMINE THE INOPERATIVE STEERING WHEEL SWITCHES

- Determine which steering wheel switches are inoperative by pressing each steering wheel switch individually while operating the audio system in various modes such as AM/FM or SYNC® (if equipped).

Was a concern found with the VOL-, VOL+, SEEK-, SEEK+, or MEDIA switches?

Yes	GO to R5.
No	For VOICE or PHONE steering wheel switch concerns (with SYNC® and with navigation), GO to R6. For VOICE, PHONE, or OK steering wheel switch concerns (with SYNC® and without navigation), GO to R7.

R5 MONITOR THE STEERING WHEEL SWITCH PIDS

- Enter the following diagnostic mode on the scan tool: ACM DataLogger .
- Monitor the steering wheel switch PIDs while pressing each steering wheel switch:

Steering Wheel Switch	PID
VOL-	SW_VOLDOWN
VOL+	SW_VOLUP
SEEK-	SW_SEEKMINUS
SEEK+	SW_SEEKPLUS
MEDIA	SW_MODE

Do the PID values agree with the switch positions?

Yes	GO to R13.
No	If only one PID value is incorrect or the PID value always reads one particular switch position, INSTALL new steering wheel switches. REFER to Steering Wheel Controls. CLEAR any DTCs present. TEST the system for normal operation. If multiple PID values are incorrect or read incorrectly, GO to R8.

R6 MONITOR THE STEERING WHEEL SWITCH PIDS (WITH SYNC® AND NAVIGATION)

- Enter the following diagnostic mode on the scan tool: ACM DataLogger .
- Monitor the steering wheel switch PIDs while pressing each steering wheel switches switch:

Steering Wheel Switch	ACM PID
VOICE	SW_VOICE
PHONE	SW_PHONE

Do the PID values agree with the switch positions?

Yes	GO to R13.
No	If only one PID value is incorrect or the PID value always reads one particular switch position, INSTALL new steering wheel switches. REFER to Steering Wheel Controls. CLEAR any DTCs present. TEST the system

	for normal operation. If multiple PID values are incorrect or read incorrectly, GO to R8.

R7 MONITOR THE STEERING WHEEL SWITCH PIDS (WITH SYNC® AND WITHOUT NAVIGATION)

- Enter the following diagnostic mode on the scan tool: APIM DataLogger .
- Monitor the steering wheel switch PIDs while pressing each steering wheel switches switch:

Steering Wheel Switch	APIM PID
VOICE	SW_VOICE
PHONE	SW_PHONE
OK	SW_OK

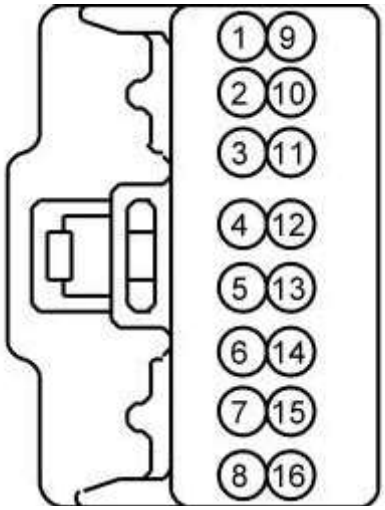
Do the PID values agree with the switch positions?

Yes	GO to R14.
No	If only one PID value is incorrect or the PID value always reads one particular switch position, INSTALL new steering wheel switches. REFER to Steering Wheel Controls in this section. CLEAR any DTCs present. TEST the system for normal operation. If multiple PID values are incorrect or read incorrectly, GO to R8.

R8 CHECK THE REFERENCE VOLTAGE CIRCUIT TO THE CLOCKSPRING FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Clockspring C2274A .
- Disconnect: ACM C290D .
- Disconnect: APIM C2383 (With SYNC® and without Navigation) .
- Ignition ON.
- Measure the **voltage** between:

Suspect Switch	Positive Lead	Negative Lead	Circuit
VOL-, VOL+, SEEK-, SEEK+, or MEDIA	C2274A Pin 13	Ground	VME14 (GY/YE)
VOICE, PHONE, or OK	C2274A Pin 6	Ground	VME54 (BU/OG)



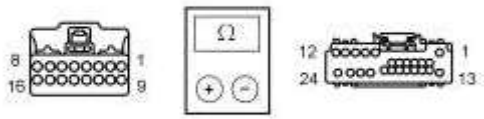
Is any voltage present?

Yes	REPAIR the circuit in question. CLEAR any DTCs present. TEST the system for normal operation.
No	GO to R9.

R9 CHECK THE CIRCUITS TO THE CLOCKSPRING FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the **resistance** between:

Suspect Switch	Positive Lead	Negative Lead	Circuit
VOL-, VOL+, SEEK-, SEEK+, or MEDIA	C2274A Pin 12	C290D Pin 19	RME14 (BN/GN)
	C2274A Pin 12	Ground	RME14 (BN/GN)
	C2274A Pin 13	C290D Pin 18	VME14 (GY/YE)
	C2274A Pin 13	Ground	VME14 (GY/YE)
VOICE or PHONE (With SYNC® and navigation)	C2274A Pin 4	C290D Pin 16	RME54 (WH/VT)
	C2274A Pin 4	Ground	RME54 (WH/VT)
	C2274A Pin 6	C290D Pin 17	VME54 (BU/OG)
	C2274A Pin 6	Ground	VME54 (BU/OG)



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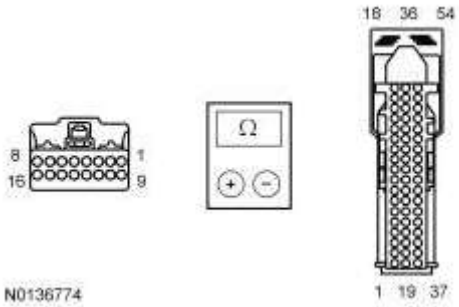
- Measure the **resistance** between:

Suspect Switch	Positive Lead	Negative Lead	Circuit
VOICE, PHONE, or OK (With SYNC® and without navigation)	C2274A Pin 4	C2383 Pin 15	RME54 (WH/VT)
	C2274A Pin 4	Ground	RME54 (WH/VT)
	C2274A Pin 6	C2383 Pin 14	VME54 (BU/OG)
	C2274A Pin 6	Ground	VME54 (BU/OG)



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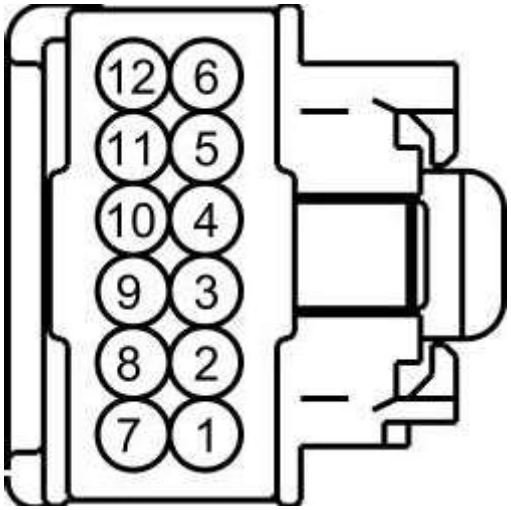
Are the resistances less than 3 ohms between the clockspring and ACM or APIM , and greater than 10,000 ohms between the clockspring and ground?

Yes	GO to R10.
No	REPAIR the circuit in question. CLEAR any DTCs present. TEST the system for normal operation.

R10 CHECK THE REFERENCE VOLTAGE CIRCUIT TO THE STEERING WHEEL SWITCHES FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Clockspring C2274B .
- Disconnect: Steering Wheel Switches C2999 .
- Ignition ON.
- Measure the **voltage** between:

Suspect Switch	Positive Lead	Negative Lead	Circuit
VOL-, VOL+, SEEK-, SEEK+, or MEDIA	C2274B Pin 10	Ground	VME14
VOICE, PHONE, or OK	C2274B Pin 3	Ground	VME54



Is any voltage present?

Yes	REPAIR the circuit. CLEAR any DTCs present. TEST the system for normal operation.
No	GO to R11.

R11 CHECK THE CIRCUITS TO THE STEERING WHEEL SWITCHES FOR AN OPEN OR SHORT TO GROUND

- Ignition OFF.
- Measure the **resistance** between:

Inoperative Switch	Positive Lead	Negative Lead	Circuit
VOL-, VOL+, SEEK-, SEEK+, or MEDIA	C2274B Pin 10	C2999 Pin 7	VME14
	C2274B Pin 10	Ground	VME14
	C2274B Pin 11	C2999 Pin 1	RMC27
	C2274B Pin 11	Ground	RMC27
VOICE, PHONE, or OK	C2274B Pin 3	C2999 Pin 3	VME54
	C2274B Pin 3	Ground	VME54
	C2274B Pin 5	C2999 Pin 2	RH111
	C2274B Pin 5	Ground	RH111