

Cellular, Entertainment, and Navigation

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Description and Operation

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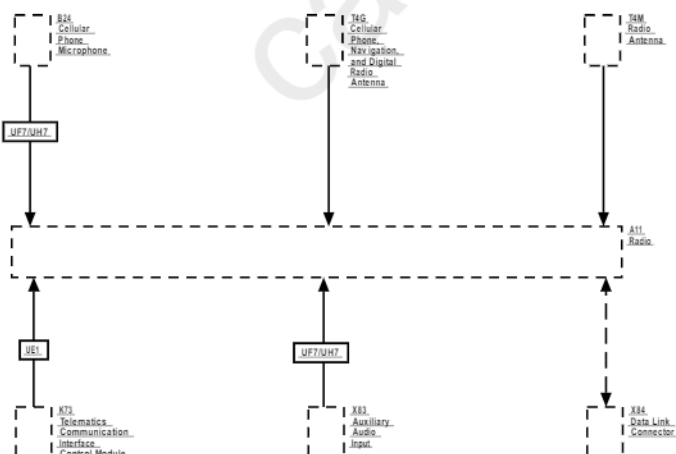
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Radio/Audio System Description and Operation

The entertainment system on this vehicle may have several different configurations available to it. To determine the specific configuration of the vehicle, please see the Service Parts ID Label, and refer to [RPO Code List](#).

Each item in the list below represents topics covered in detail below.

- Radio Circuit Operation
- Antenna System
- Radio Reception
- Digital Radio Receiver (If equipped)
- Speaker Operation
- Theft Deterrent
- OnStar®
- Auxiliary Audio Input Jack
- USB Port (if equipped)
- MyLink/Intellilink/Cue
- Bluetooth® (If equipped)
- Applications (if equipped)
- Steering Wheel Controls (If equipped)
- Speed Controlled Volume (SCV) (If equipped)



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Radio Circuit Operation

Radio Power

The radio does not use a discrete ignition feed circuit for power moding. The power mode master provides the system power mode to the radio via serial data messages. The power mode master determines the system power mode by processing power mode information from ignition switch inputs. Serial data power modes supported by the radio are OFF, ACCESSORY, RUN, and CRANK REQUEST.

Radio Grounds

The vehicle harness provides a ground for the radio circuits. The radio may also be case grounded.

Radio Data Link Communication

The radio communicates with other modules via serial data.

Radio Audio Outputs

Each of the audio output channel circuits (+) and (-), at the radio have a DC bias voltage that is approximately one half of battery voltage. The audio being played on the system is produced by a varying AC voltage that is centered around the DC bias voltage on the same circuit. The AC voltage is what causes the speaker cone to move and produce sound. The frequency (Hz) of the AC voltage signal is directly related to the frequency of the input (audio source playing) to the audio system. Both the DC bias voltage and the AC voltage signals are needed for the audio system to properly produce sound.

Remote Enable Output

The remote enable circuit is a discrete 12V signal supplied to infotainment system components when the radio is producing audio, needs the front display on, needs video entertainment system components on, or needs to produce chimes. This signal is used to control the power state of the components. There is no output on radio the remote enable circuit when the vehicle is in the CRANK powermode, this is to minimize current consumption from the attached modules and also to avoid audio pops during crank events.

Antenna System

Multi-Band Antenna

The multi-band antenna is located on the roof of the vehicle. Keep this antenna clear of snow and ice build up for clear reception. If the vehicle has a sunroof, the performance of the system may be affected if the sunroof is open. Loading items onto the roof of the vehicle can interfere with the performance of the system, ensure the multi-band antenna is not obstructed.

The radio antenna is enabled when the radio is turned on. The radio provides battery voltage to the antenna using the center conductor of the antenna coaxial cable. This DC voltage does not affect the incoming radio signal. When a 12V signal is seen by the antenna on the center conductor of the antenna coax, both AM and FM signals are amplified.

Radio Reception

AM/FM Radio Signal

The radio signal is sent from a broadcast station and is then received by an antenna. The strength of the signal received depends on the following:

- The power output (wattage) of the broadcasting station
- The location of the vehicle (or receiver) relative to the broadcast tower.
- Height of the broadcast antenna
- Height of the receiving antenna
- Obstacles between the tower and the receiver
- Atmospheric conditions
- What band (AM or FM) the station is broadcasting
- Type of antenna and the ground plane

Radio Data System (RDS)

The RDS feature is available only on FM stations that broadcast RDS information. This system relies upon receiving specific information from these stations and only works when the information is available. While the radio is tuned to an FM-RDS station, the station name or call letters display. RDS data is carried in what is known as a "subcarrier". A subcarrier is a frequency that the FM broadcaster is authorized to use to send data that is not audible in the main audio program.

RDS functions will only work with FM broadcast stations that are broadcasting RDS data. Not all FM Broadcast stations broadcast RDS data or offer all of the RDS services.

The information displayed is dependent upon the information broadcast by the particular station. The information may vary greatly between stations. RDS functions may not work properly when reception is weak, reception is of poor quality, or RDS is not implemented properly by the FM Broadcaster. In some cases, a radio station broadcasting incorrect information may cause the RDS features of the radio to appear to work improperly.

With RDS, the radio can do the following:

- Display text information such as: station identification, type of programming, and general information (artist and song title, station messages, call in phone numbers, etc.).
- Seek to stations broadcasting the selected type of programming
- Receive announcements concerning local and national emergencies
- Receive alert warnings of local or national emergencies. When an alert announcement comes on the current radio station, ALERT! displays. You will hear the announcement, even if the volume is low or a CD is playing. If a CD is playing, play stops during the announcement. Alert announcements cannot be turned off. ALERT! is not affected by tests of the emergency broadcast system. This feature is not supported by all RDS stations.

Digital Radio Receiver (if equipped)

The XM satellite radio is integrated into the radio. XM satellite radio provides digital radio reception. The XM signal is broadcast from two satellites and, where necessary, terrestrial repeaters. The high power satellites allow the antenna to receive the XM signal even when foliage and other partial obstructions block the antenna's view of the satellite. Terrestrial repeaters are used in dense urban areas. These repeaters will receive the satellite signal and re-broadcast them at much higher power levels in order to ensure reception in areas with densely packed tall buildings. A service fee is required in order to receive the XM service.

Speaker Operation

Speakers turn electrical energy into mechanical energy to move air, using a permanent magnet and an electromagnet. The electromagnet is energized when the radio or amplifier (if equipped) delivers current to the voice coil on the speaker. The voice coil will form a north and south pole that will cause the voice coil and the speaker cone to move in relation to the permanent magnet. The current delivered to the speaker is rapidly changing alternating current (A/C). This causes the speaker cone to move in two directions producing sound.

Theft Deterrent

The radio theft deterrent system is intended to disable or limit radio functionality if incorrect vehicle information is received by the radio. The radio disables functionality if the VIN information received by the radio does not match the VIN information that has been learned by the radio. The radio receives this information via serial data. A possible cause of incorrect VIN info could be the radio was originally installed in another vehicle.

The radio has the following theft operating modes as part of the theft deterrent system:

- Normal Mode: The radio has learned a correct VIN sequence and the VIN information received via serial data matches the learned VIN sequence. In this mode the radio has full functionality.
- No VIN Mode: The radio has not received or learned a correct VIN sequence. In this mode the radio has limited functionality.
- Theft Detected Mode: The radio has learned a correct VIN sequence and the VIN information received via serial data does NOT match the learned VIN sequence. In this mode the radio may be disabled or have limited functionality. The radio display will indicate that theft protection is active.

OnStar® (If equipped)

When OnStar is activated, a serial data message is sent to the radio that activates a software program. When the software begins its process, the fade goes to the front, Bass and Treble are set to the mid range, the outputs are mono, and the audio source is OnStar. OnStar takes priority over any other audio source. All of these actions are preset values stored in the radio.

For additional OnStar information, refer to OnStar Description and Operation.

Auxiliary Audio Input Jack

The infotainment system has a 3.5mm (1/8 in.) auxiliary audio input jack available on the face of the radio. This input interfaces internally with the radio, no external circuits are involved.

The infotainment system may also have an additional auxiliary audio input jack located in the instrument panel compartment. Audio signals from the device are sent to the radio from the auxiliary jack via the left, right, and common audio signal circuits.

When a portable audio playback device is connected to the auxiliary jack, an internal switch detects the connection and the radio will switch to AUX as the audio source.

- When a device is first connected to the 3.5mm (1/8 in.) input jack the infotainment system automatically switches to that device. If an auxiliary device has already been connected, press the AUX or CD/AUX button to select the device.
- Playback of an audio device that is connected to the 3.5mm jack can only be controlled using the controls on the device.
- The volume control on the device may need to be adjusted to ensure sufficient playback volume through the infotainment system.

USB Port (if equipped)

The infotainment system may have a USB connector located in the instrument panel compartment. The USB connector interfaces directly with the radio. The USB connector supports both USB standards 1.1 and 2.0.

USB supported devices:

- USB Flash Sticks (Thumb Drives)
- Portable USB Hard Drives
- Portable Digital Media Players (iPOD®, ZUNE®, etc.)

Depending on the USB device, some devices may not be recognized, or some features/functions may not be able to be controlled with the radio controls. USB HUB devices are not supported.

MyLink/Intellilink/Cue

MyLink (Chevrolet and Holden), Intellilink (Buick, GMC and Opel) and Cue (Cadillac) are software packages based on a real-time operating system and voice recognition technology that can be loaded into certain radio models. It allows the use of online services through apps using voice commands or the touch screen interface. Online content is also available via a smartphone connected through Bluetooth. It can also play video, image files and song files in select formats and the user can also personalize the screens. For a complete list of features see the owners manual.

Bluetooth® (If Equipped)

Bluetooth® wireless technology is a short-range communications technology intended to replace the cables connecting portable and/or fixed devices while maintaining high levels of security. The operating range of the signal is approximately 30 feet.

The available features and functions are determined by the type of device and the software within the devices being used. For a feature or function to operate, it must be supported in both devices.

The first connection between devices is established through a process called pairing. In order to pair two devices, a password (passkey) has to be exchanged between the two devices. One device will generate the password, the other device accepts the password to complete the process. Once the devices are paired, future connections between the devices will occur automatically when the devices are on and within range of each other.

The Bluetooth® hardware is internal to the radio. The radio supports streaming of data (music, voice, information) from cellular phones and other mobile devices that support those features. The radio may also be capable of interfacing with cellular phones for hands-free features.

- The device must be paired to the radio to use the available Bluetooth® feature(s). The pairing process must only be performed once for each device, unless that device's information is deleted.
- Up to five devices can be paired to the system, but only one can be connected at any given time.
- Streaming Audio allows playing music from the mobile device wirelessly. Music stored on the mobile device can be viewed and controlled from the display.
- To stream audio from a mobile device, the device must be unlocked, and any additional applications should be closed.

Refer to the vehicle owners manual, supplements, and the device manufacturers information for pairing instructions.

Applications (If equipped)

When the system is equipped with Bluetooth®, the system may be capable of using applications, commonly referred to as apps.

The term application refers to any piece of software that works on a system (hardware) that is being operated by its own software.

Applications are typically small software programs which uses the hardware to perform a specific task, as opposed to operating the entire system.

- For an application to be used, it must be installed on both the vehicle infotainment system and a compatible mobile device.
- The device must be connected to the system. This may be done wirelessly via Bluetooth® or via the vehicle USB port. Refer to the device manufacturer's information for the proper connection method.
- When the device is connected, the application on the radio is used to remotely access and control the application on the mobile device.
- The application must work correctly on the device to work with the vehicle infotainment system.
- The user may be required to log-in to the application on the mobile device before using the application from the vehicle controls.
- Using applications will use the device's data plan.
- The device must be unlocked, and any additional applications should be closed.

Refer to the owner's manual and supplements for information on mobile devices, control, and operation.

Steering Wheel Controls (If equipped)

Some audio functions are available using the steering wheel controls. The steering wheel controls duplicate the function of the primary controls available on the radio.

For additional information on steering wheel controls, refer to Steering Wheel Controls Description and Operation.

Speed Compensated Volume (If equipped)

With Speed Controlled Volume (SCV), the audio system will adjust automatically to make up for road and wind noise as you drive, by increasing the volume as vehicle speed increases. To use SCV, set the volume at the desired level, and then select either Low, Medium, or High. To turn SCV off, select the Off screen button.

Diagnostic Information and Procedures

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DTC B1015

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category

DTC Descriptor

DTC B1015

Vehicle Identification Number (VIN) Information Error

Circuit/System Description

When the telematics communication interface control module receives Over-The-Air messages, it will compare the information received to the data stored in memory. If the VIN stored in memory does not match the VIN received via Over-The-Air messages, the telematics communication interface control module will set a DTC and commands the red LED on ON.

Conditions for Running the DTC

The system voltage is at least 9 volts and no more than 16 volts.

Conditions for Setting the DTC

B1015

- The telematics communication interface control module stored VIN digits does not match the digits stored in the BCM.
- The VIN stored in memory does not match the VIN received via an Over-The-Air message.

Action Taken When the DTC Sets

- The telematics communication interface control module sets a DTC.
- The telematics communication interface control module commands the red LED ON.

Conditions for Clearing the DTC

- The condition for setting the DTC is no longer present.
- The history DTC will clear after 50 fault-free ignition cycles.

Reference Information

Schematic Reference

[Radio/Navigation System Schematics](#)

Connector End View Reference

[Master Electrical Component List](#)

Description and Operation

[Radio/Audio System Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)

- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

1. Verify that DTC B1015 is not set.

- If the DTC is set, reprogram the telematics communication interface control module. If the DTC resets, replace the telematics communication interface control module

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the diagnostic procedure.

[Control Module References](#) for module replacement, setup and programming.

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DTC B1025, B1035, B1045, or B1055

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B1025

Left Front Audio Output Circuit

DTC B1035

Right Front Audio Output Circuit

DTC B1045

Left Rear Audio Output Circuit

DTC B1055

Right Rear Audio Output Circuit

For symptom byte information refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Speaker Output Signal	B1025 02, 1	B1025 04, 1	B1025 01, 1, 2	
Right Front Speaker Output Signal	B1035 02, 1	B1035 04, 1	B1035 01, 1, 2	
Left Rear Speaker Output Signal	B1045 02, 1	B1045 04, 1	B1045 01, 1, 2	
Right Rear Speaker Output Signal	B1055 02, 1	B1055 04, 1	B1055 01, 1, 2	
1. No or reduced audio from speaker(s) on the affected audio circuit.				
2. Noticeable audio distortion may be present.				

Circuit/System Description

Each of the audio output channel circuits (+) and (-), at the radio have a DC bias voltage that is approximately one half of battery voltage. When using a DMM, each of the audio output channel circuits will measure approximately 6.5 V DC. The audio being played on the system is produced by a varying AC voltage that is centered around the DC bias voltage on the same circuit. The AC voltage is what causes the speaker cone to move and produce sound. The frequency (Hz) of the AC voltage signal is directly related to the frequency of the input (audio source playing) to the audio system. Both the DC bias voltage and the AC voltage signals are needed for the audio system to properly produce sound.

Conditions for Running the DTC

- Vehicle in Service Mode/Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- The test is run once during radio wake up

Conditions for Setting the DTC

B1025 01, B1035 01, B1045 01, B1055 01

The radio detects a short to voltage on the specified audio (+) or (-) circuit.

B1025â€‰02, B1035â€‰02, B1045â€‰02, B1055â€‰02

The radio detects a short to ground on the specified audio (+) or (â€“) circuit.

B1025â€‰04, B1035â€‰04, B1045â€‰04, B1055â€‰04

The radio detects an open on the specified audio (+) or (â€“) circuit.

Action Taken When the DTC Sets

The radio continues to send the output signal to the speaker signal circuit with the current fault.

Conditions for Clearing the DTC

- A current DTC clears when the conditions for setting the DTC are no longer present and the ignition has been cycled from OFF to ON.
- A history DTC clears after 50 malfunction-free ignition cycles.

Diagnostic Aids

- Improper speaker mounting or loose trim may cause an audible buzz or distortion. Inspect the appropriate speaker and the surrounding interior trim for proper and secure mounting.
- The EL-50334-6 Audio System Diagnostic CD contains audio tracks that can be used to duplicate and isolate such concerns. Tracks 11 and 12 contain audio sweep tones for testing for speaker and grill rattles.
- The test tones on the CD may be copied to a USB drive or other device to use during testing.
- If the speaker or surrounding interior trim is found to be loose or improperly secured, correctly secure the item.
- If equipped with an Active Noise Cancellation system that utilizes an ANC module, the module acts as a pass-through for the high level audio signals from the radio to the speakers.

Reference Information

Schematic Reference

[Radio/Navigation System Schematics](#)

Connector End View Reference

[Master Electrical Component List](#)

Description and Operation

[Radio/Audio System Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/vehicle in Service Mode, A11 Radio ON, mute OFF.
2. Verify clear audio is heard from each speaker, adjusting fade and balance controls to test each speaker individually.
3.
 - If audio is inoperative from one or more speakers, or the audio emitted is not clear.

- Refer to Circuit/System Testing.

4.

- **If clear audio is heard from all speakers.**

5. All OK.

Circuit/System Testing

1. Note:

Some circuits supply audio signals to more than one speaker. It may be necessary to disconnect all speakers on the affected audio circuit when performing circuit tests.

2. Ignition OFF/vehicle OFF, disconnect the harness connector at the appropriate P19 Speaker. Ignition ON, A11 Radio ON, mute OFF.

3. Test for 5V between each audio signal circuit terminal 1 and terminal 2 and ground.

4.

- **If less than 5V**

5.

1. Ignition OFF/vehicle OFF, disconnect the appropriate speaker harness connector at the A11 Radio.

2. Test for infinite resistance between the signal circuits and ground.

3.

- If less than infinite resistance, repair the short to ground on the circuit.

4.

- If infinite resistance

5. Test for less than 2Ω in the signal circuit end to end.

6.

- If 2Ω or greater, repair the open/high resistance in the circuit.
- If less than 2Ω, replace the A11 Radio.

6.

- **If greater than 7V**

7.

1. Ignition OFF/vehicle OFF, disconnect the appropriate speaker harness connector at the A11 Radio. Ignition ON/vehicle in Service Mode.

2. Test for less than 1V between the signal circuit and ground.

3.

- If 1V or greater, repair the short to voltage on the circuit.
- If less than 1V, replace the A11 Radio.

8.

- **If between 5V-7V**

9. Test or replace the P19 Speaker.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Speaker Replacement Reference](#)
- [Control Module References](#) for radio replacement, programming, and setup.

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DTC B124B

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC B124B

USB 1 Circuit

For symptom byte information refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	B124B, 1, 6	1, 5	â€”	â€”
Auxiliary Audio Common Signal	â€”	8	â€”	â€”
Auxiliary Detection Signal	7	8	â€”	â€”
Left Auxiliary Audio Signal	2	2	2, 4	â€”
Right Auxiliary Audio Signal	3	3	3, 4	â€”
USB Cable	B124B	B124B	B124B	â€”
Ground	â€”	1	â€”	â€”

1. USB port Inoperative

2. No left side audio from device connected to AUX jack

3. No right side audio from device connected to AUX jack

4. Noticeable distortion may be present in affected audio channel

5. Fault may affect one or more components, dependant on fault location

6. Fault affects multiple components, dependant on vehicle equipment

7. Radio does not detect auxiliary device connection, AUX not available as input selection

8. AUX always available as an input selection, with or without auxiliary device connected

Circuit/System Description

The infotainment system has a auxiliary jack and USB receptacle assembly. The auxiliary jack and USB receptacle assembly receives fused battery voltage and ground from the harness to power the internal hub device as well as providing additional amperage to power USB devices. The internal hub device interfaces directly with the radio via a standard USB cable.

Auxiliary Audio Input Jack

When a portable audio playback device is connected to the 3.5mm (1/8 in.) auxiliary audio input jack an internal switch opens the detection signal circuit. The radio detects the device and AUX becomes available as an audio source. Audio signals from the device are sent to the radio from the auxiliary input jack via the left, right, and common audio signal circuits.

USB Port

The USB receptacle interfaces directly with the radio via a standard USB cable. A Mini type USB connector is used to connect the cable at the radio and at the auxiliary jack and USB receptacle assembly. USB male to female connections are typically used for connecting USB cables together where an in-line connection is required. An in-line cable connection is typically found between the console and I/P harness.

The USB port allows connectivity to the infotainment system from portable media players or a USB storage device (memory stick/ flash drive). When a device is connected to the USB port, the system detects the device and USB becomes available as an audio source. Once connected, the device can be controlled from the radio controls.

Not all portable media player devices or file types are compatible. Refer to the owner's manual for information on USB devices, control, and operation.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16V
- The infotainment system is ON
- The test is run once per second when the infotainment system is operating

Conditions for Setting the DTC

The radio detects an excessive current condition on the USB 5V circuit.

Action Taken When the DTC Sets

The USB port is inoperative while the DTC is current.

Conditions for Clearing the DTC

- The condition for setting the DTC is no longer present.
- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Diagnostic Aids

This DTC may be set due to the connection of an incompatible or faulty USB device.

Reference Information

Schematic Reference

[Radio/Navigation System Schematics](#)

Connector End View Reference

[Master Electrical Component List](#)

Description and Operation

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Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Special Tools

- *EL-50334-20* Multi-Media Interface Tester (MIT)
- *EL-50334-50* USB Cable and Adapter Kit

- *EL-50334-14* Infotainment Test Cable

Circuit/System Verification

1. Verify DTC B124B is not set. Since occurrences of this DTC can be caused by an incompatible or faulty USB device, review with the customer the conditions under which their concern occurred.
2.
 - **If DTC B124B is set.**
 - Refer to Circuit/System testing.
3.
 - **If DTC B124B is not set.**
4. Ignition ON, infotainment system ON.
5. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
6. Verify the audio from the EL-50334-20 Multi-Media Interface Tester (MIT) is heard through the infotainment system while operating the system to play audio from the test tool.
7.
 - **If audio is not heard from the test tool**
 - Refer to Circuit/System Testing.
8.
 - **If audio is heard from the test tool**
9. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the X83 Auxiliary Audio Input.
2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.
3.
 - **If 10 Ω or greater**
4.
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 3.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
5.
 - **If less than 10 Ω**
6. Verify the USB cable is properly connected at all components and any in-line connections, and there is no damage to the cable or connections.
7.
 - **If connection problems or cable damage is noted.**
 - Perform the appropriate repair or replacement to correct any issues.

8.
 - **If no connection problems or cable damage is noted.**
9. Disconnect the vehicle USB cable at the A11 Radio and the X83 Auxiliary Audio Input.
10. Connect the EL-50334-14 Infotainment Test Cable and the EL-50334-2 Type-A Female to Mini-B Male Cable together. Connect the assembled test cable to the A11 Radio and the X83 Auxiliary Audio Input.
11. Ignition ON, infotainment system ON.
12. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
13. Verify the audio from the EL-50334-20 Multi-Media Interface Tester (MIT) is heard through the infotainment system while operating the system to play audio from the test tool.
14.
 - **If audio is not heard from the test tool**
15.
 1. Replace the X83 Auxiliary Audio Input. Connect all harness connectors.
 2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
 3. Verify the audio from the EL-50334-20 Multi-Media Interface Tester (MIT) is heard through the infotainment system while operating the system to play audio from the test tool.
4.
 - If audio is not heard from the test tool, replace the A11 Radio.
5.
 - If audio is heard from the test tool.
6. All OK.
16.
 - **If audio is heard from the test tool**
17. Replace the USB cable assembly.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Audio Disc Player and USB Receptacle Replacement](#)
- [Control Module References](#) control module replacement, programming, and setup.

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DTC B124F

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC B124F

Universal Serial Bus (USB) Programming

For symptom byte information, refer to [Symptom Byte List](#).

Circuit/System Description

Certain devices in the entertainment system must be programmed with specific software and other information to operate correctly. This DTC is the result of an unsuccessful USB programming event of the device. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved

Conditions for Running the DTC

Once upon each USB Programming Event.

Conditions for Setting the DTC

The programming event was incomplete, or completed with errors.

Action Taken When the DTC Sets

The entertainment system has limited or no functionality.

Conditions for Clearing the DTC

The programming event completes successfully.

Diagnostic Aids

DTC B124F could set if a programming attempt was made when the module already had the latest update available installed.

Circuit/System Verification

1. Ignition ON/vehicle in Service Mode.
2. Verify DTC B124F is not set.
3.
 - If DTC B124F is set
4.
 1. Program the device that set the DTC.
 2. Verify the DTC does not set.
 3.
 - If DTC is set, replace the device that set the DTC.

4.

- If the DTC is not set

5. All OK.

5.

- If DTC B124F is not set

6. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming, and setup.

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DTC B125A

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B125A01

Antenna Signal Circuit Short to Battery

DTC B125A02

Antenna Signal Circuit Short to Ground

DTC B125A04

Antenna Signal Circuit Open Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Radio Antenna Coax	B125A02	B125A04	B125A01	â€”

Circuit/System Description

The radio antenna for AM and FM radio reception is connected to the radio with a coaxial cable.

Conditions for Running the DTC

- Ignition ON/Vehicle in Service Mode.
- Battery voltage must be between 9â€”16V.

Conditions for Setting the DTC

B125A01

The radio detects a short to battery in the antenna signal circuit center conductor.

B125A02

The radio detects a short to ground in the antenna signal circuit center conductor.

B125A04

The radio detects an open in the antenna signal circuit center conductor.

Action Taken When the DTC Sets

Radio reception may be poor or not available.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear after 50 consecutive malfunction-free ignition cycles have occurred.

Diagnostic Aids

Poor AM and FM radio reception is dependent on multiple influences, some of which may not be vehicle related. Areas which have high RF traffic or block the signal path may cause a degradation in radio reception. Radio reception may also be influenced by items within the vehicle, but are not part of the radio system. Such examples are aftermarket electrical accessories or other items which may generate noise in the vehicle electrical system.

Reference Information

Schematic Reference

[Radio/Navigation System Schematics](#)

Connector End View Reference

[Master Electrical Component List](#)

Description and Operation

[Radio/Audio System Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Inspect the antenna for proper mounting or physical damage.
2.
 - **If damage is found**
 - Repair or replace as necessary
3.
 - **If no damage is found**
4. Ignition ON/Vehicle in Service Mode, All Radio ON.
5. Verify station reception is normal when tuned to several known good AM and FM stations.
6.
 - **If AM or FM reception is poor.**
 - Refer to Circuit/System Testing
7.
 - **If reception is normal**
8. All OK.

Circuit/System Testing

1. Ignition OFF/Vehicle OFF, disconnect the radio antenna coax cable from the All Radio and from the T2RF Antenna - Roof Front.
2. Verify the antenna coax cable passes the coax cable component test. Refer to Component Testing.

3.
 - **If the coax cable does not pass the test**
 - Replace the antenna coax cable
4.
 - **If the coax cable passes the test**
5. Connect the antenna coax cable to the T2RF Antenna - RoofFront.
6. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield at the radio end of the coax cable.
7.
 - **If less than infinite resistance**
 - Replace the T2RF Antenna - RoofFront.
8.
 - **If infinite resistance**
9. Test for less than 10 Ω between the coax cable outer shield and ground at the radio end of the coax cable.
10.
 - **If 10 Ω or greater**
11.
 1. Clean the mounting surface of the radio antenna base.
 2. Connect the antenna coax cable to the T2RF Antenna - RoofFront.
 3. Test for less than 10 Ω between the coax cable outer shield and ground at the radio end of the coax cable.
 4.
 - If 10 Ω or greater, replace the T2RF Antenna - RoofFront.
 - If less than 10 Ω , connect all harness connectors. Verify station reception is normal when tuned to several known good AM and FM stations. If AM or FM reception concerns are still present, replace the A11 Radio.
12.
 - **If less than 10 Ω**
13. Test or replace the A11 Radio.

Component Testing

Caution:

Refer to [Test Probe Caution](#).

Note:

Before testing the coax cable, check the cable exterior for being pinched, cut, damaged, or having loose connections at the components, which can cause reception issues.

To prevent false reading when testing the center coax terminals, use care not to ground the test probe on the outer housing/shield.

Coax Cable Test

1. Ignition OFF/Vehicle OFF, disconnect the coax cable at both components.
2. Test for less than 5 Ω between coax cable center terminal end to end.
- 3.

- If 5â€™ or greater
- Replace the coax cable

4.

- If less than 5â€™

5. Test for less than 5â€™ between the coax cable outer shield end to end.

6.

- If 5â€™ or greater
- Replace the coax cable

7.

- If less than 5â€™

8. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.

9.

- If less than infinite resistance
- Replace the coax cable

10.

- If infinite resistance

11. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the diagnostic procedure.

- [Radio Antenna Base Replacement](#)
- [Control Module References](#) for radio replacement, programming, and setup.

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DTC B125E

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B125E

Digital Audio Broadcast (DAB) Circuit

For symptom byte information refer to [Symptom Byte List](#).

Circuit/System Description

The digital audio broadcast receiver, located inside the radio, receives digital radio information from the digital radio antenna located on the outside of the vehicle. The digital audio broadcast receiver is connected to the digital radio antenna via a shielded coax cable. The digital radio antenna contains an amplifier which is powered by the radio through the coax cable.

Conditions for Running the DTC

This DTC is run every 300 milliseconds.

Conditions for Setting the DTC

The radio detects a circuit fault in the digital radio antenna.

Action Taken When the DTC Sets

The digital radio has limited or no reception.

Conditions for Clearing the DTC

- A current DTC clears when the condition for setting the DTC is no longer present.
- A history DTC clears after 100 malfunction-free ignition cycles.

Reference Information

Schematic Reference

[Radio/Navigation System Schematics](#)

Connector End View Reference

[Master Electrical Component List](#)

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Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)

- [Wiring Repairs](#)

Circuit/System Testing

1. Ignition OFF, disconnect the digital radio antenna coax cable from the T2RF Antenna – Roof Front and the A11 Radio.
2. Verify the digital radio antenna coax cable passes the coax cable component test. Refer to Component Testing.
3.
 - **If the coax cable does not pass the test**
 - Replace the antenna coax cable
4.
 - **If the coax cable passes the test**
5. Replace the T2RF Antenna – Roof Front.
6. Ignition ON, A11 radio ON, tune to digital band.
7. Verify DTC B125E is not set as current and digital reception is improved.
8.
 - **If DTC B125E is set as current or digital reception is not improved**
 - Replace the A11 Radio.
9.
 - **If DTC B125E is not set as current and digital reception is improved**
10. All OK.

Component Testing

Caution:

Refer to [Test Probe Caution](#).

Note:

Before testing the coax cable, check the cable exterior for being pinched, cut, damaged, or having loose connections at the components, which can cause reception issues.

To prevent false reading when testing the center coax terminals, use care not to ground the test probe on the outer housing/shield.

Coax Cable Test

1. Ignition OFF, disconnect the coax cable at both components.
2. Test for less than 5â€™%â„,| between coax cable center terminal end to end.
3.
 - **If 5â€™%â„,| or greater**
 - Replace the coax cable
4.
 - **If less than 5â€™%â„,|**
5. Test for less than 5â€™%â„,| between the coax cable outer shield end to end.
6.
 - **If 5â€™%â„,| or greater**

- Replace the coax cable

7.

- **If less than 5Ω**

8. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.

9.

- **If less than infinite resistance**
- Replace the coax cable

10.

- **If infinite resistance**

11. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Radio Antenna Base Replacement](#)
- [Control Module References](#) for radio replacement, programming, and setup.

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DTC B1271

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC B1271

Theft Protection Active

Circuit/System Description

When the radio is initially installed in the vehicle, the radio receives VIN information via serial data. The radio stores a portion of the VIN and compares this sequence to the VIN information received each time the radio powers on. The VIN in the radio is a single one-time learn.

The radio theft deterrent system is intended to disable or limit radio functionality if incorrect vehicle information is received by the radio. The radio disables functionality if the VIN information received by the radio does not match the VIN information that has been learned by the radio. This DTC is generated by the module when the Theft Protection is activated.

Conditions for Running the DTC

This DTC test runs when the radio changes from OFF to ON.

Conditions for Setting the DTC

The radio has learned a correct VIN sequence and the VIN information received via serial data does NOT match the learned VIN sequence.

Action Taken When the DTC Sets

- The radio may be disabled or have limited functionality.
- The radio display will indicate that theft protection is active.

Conditions for Clearing the DTC

The radio receives the correct VIN information via serial data.

Diagnostic Aids

A possible cause of incorrect VIN info could be the radio was originally installed in another vehicle.

Reference Information

Schematic Reference

[Radio/Navigation System Schematics](#)

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[Master Electrical Component List](#)

Description and Operation

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Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON, A11 Radio ON.
2. Verify DTC B1271 is not set.
3.
 - **If DTC B1271 is set**
 - Replace the A11 Radio.
4.
 - **If DTC B1271 is not set**
5. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Radio replacement, programming, and setup

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Symptoms - Entertainment

Important:

The following steps must be completed before using the symptom table.

1. Perform the [Diagnostic System Check - Vehicle](#) before using the Symptom Tables in order to verify that all of the following are true:
2.
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
3. Review the system operation in order to familiarize yourself with the system functions. Refer to [Radio/Audio System Description and Operation](#).

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the Radio/Audio System.
- Inspect for easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to [Testing for Intermittent Conditions and Poor Connections](#).

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- [Application Malfunction](#)
- [Auxiliary Audio Input Malfunction](#)
- [Bluetooth Malfunction](#)
- [Digital Radio Poor or No Reception](#)
- [Radio Poor Reception](#)
- [Speaker Malfunction](#)

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Application Malfunction

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provide an overview of each diagnostic category.

Circuit/System Description

The term application refers to any piece of software that works on a system (hardware) that is being operated by its own software. Applications are typically small software programs which uses the hardware to perform a specific task, as opposed to operating the entire system.

Diagnostic Aids

- For an application to be used, it must be installed on both the vehicle infotainment system and a compatible mobile device.
- The application must work correctly on the device to work with the vehicle infotainment system.
- The user may be required to log-in to the application on the mobile device before using the application from the vehicle controls.
- Applications use the mobile device and connection to a service provider to operate. Connection quality issues, or service provider data transmission issues can give the appearance of a vehicle malfunction.
- The device must be connected to the system. This may be done wirelessly via Bluetooth® or via the vehicle USB port.
- When a mobile device is connected via Bluetooth®, some or all of the device controls may be unavailable from the radio controls. This varies dependant upon the device being used. Refer to the vehicle owners manual, supplements, and the device manufacturers information for information on devices, control, and operation.
- Refer to the device manufacturers information for the preferred connection method.
- The device must be unlocked, and any additional applications should be closed.
- If the device has any sound enhancement features such as noise reduction or echo control, these features should be turned off.
- A low battery condition in the mobile device may not allow the device to connect to the system, or can create communication issues with the device. Verify the device battery state of charge and re-charge or replace as needed.
- If a "Please See Device" or similar type error message is displayed, this may indicate the device has lost its connection to the vehicle, or the device has lost its external data connection.
- If a cable is used for connection, attempt to connect the device using a different cable; cables can deteriorate over time or become damaged.

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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Verify the application is installed on the mobile device and is up to date.
2.
 - **If the application is not installed or is not up to date.**
 - Install or update the application on the device.
3.
 - **If the application is installed on the mobile device and is up to date**
4. Verify the application operates correctly on the mobile device.
5.
 - **If the application is not operating correctly on the mobile device.**
 - Refer to the application website.
6.
 - **If the application is operating correctly on the mobile device.**
7. Verify the A11 Radio calibrations are current.
8.
 - **If the radio calibrations are not current**
 - Reprogram the A11 Radio and re-evaluate the concern.
9.
 - **If no update calibrations are available**
10. Verify the application is installed on the A11 Radio and is up to date.
11.
 - **If the application is not installed or is not up to date.**
 - Install or update the application on the A11 Radio.
12.
 - **If the application is installed on the A11 Radio and is up to date**
13. Ignition ON, A11 Radio ON.
14. Verify the mobile device can connect to the infotainment system. Refer to the owners manual for information on the preferred connection method for the device.
15.
 - **If the mobile device cannot connect to the vehicle infotainment system.**
16.
 - If unable to connect via Bluetooth, refer to [Bluetooth Malfunction](#).

- If unable to connect via USB, refer to [Auxiliary Audio Input Malfunction](#).

17.

- **If the mobile device connects to the vehicle infotainment system.**

18. Launch the application.

19. Verify the application operates properly with the vehicle infotainment system.

20.

- **If the application does not function properly**
- Refer to diagnostic aids.

21.

- **If the application functions properly**

22. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for radio replacement, programming, and setup.

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Auxiliary Audio Input Malfunction (IP1)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	B124B, 1, 6	1, 5	â€”	â€”
Auxiliary Audio Common Signal	â€”	8	â€”	â€”
Auxiliary Detection Signal	7	8	â€”	â€”
Left Auxiliary Audio Signal	2	2	2, 4	â€”
Right Auxiliary Audio Signal	3	3	3, 4	â€”
USB Cable	B124B	B124B	B124B	â€”
Ground	â€”	1	â€”	â€”
1. USB port Inoperative 2. No left side audio from device connected to AUX jack 3. No right side audio from device connected to AUX jack 4. Noticeable distortion may be present in affected audio channel 5. Fault may affect one or more components, dependant on fault location 6. Fault affects multiple components, dependant on vehicle equipment 7. Radio does not detect auxiliary device connection, AUX not available as input selection 8. AUX always available as an input selection, with or without auxiliary device connected				

Circuit/System Description

Auxiliary Audio Input Jack

The 3.5â€”mm (1/8â€”in.) auxiliary audio input jack is located in the console. All circuits from the auxiliary jack are connected directly to the radio. When a device is connected to the auxiliary jack an internal switch opens. The radio detects the device and switches to AUX as the audio source. Audio signals from the device are sent to the radio from the auxiliary input jack via the left, right, and common audio signal circuits.

USB Port

The vehicle may be equipped with a USB port in the console. This port allows USB connectivity to the infotainment system from portable media players or a USB storage device (memory stick/flash drive). When a device is connected to the USB port, the system detects the device and switches to USB as the audio source. Once connected, the device can be controlled from the radio controls.

The USB port is connected to the radio via a standard USB cable. Mini type USB connectors are used to connect the cable at the USB port and at the radio or multimedia player interface module. Standard USB male to female connections are typically used for connecting USB cables together where an in-line connection is required. An in-line cable connection is typically found between the console and I/P harness.

Not all portable media player devices are compatible. Refer to the ownerâ€™s manual for information on USB devices, control, and operation.

Diagnostic Aids

Auxiliary Audio Input Jack

- When a device is first connected to the 3.5â€”mm (1/8â€”in.) input jack the infotainment system automatically switches to that device. If

an auxiliary device has already been connected, press the AUX or CD/AUX button to select the device.

- If the system detects the device, but the audio is not heard or is not clear, attempt to connect the device using a different cable; cables can deteriorate over time or become damaged.
- Playback of an audio device that is connected to the 3.5mm jack can only be controlled using the controls on the device.
- The volume control on the device may need to be adjusted to ensure sufficient playback volume through the infotainment system.

USB

- When a device is first connected to the USB port, the infotainment system automatically switches to that device. If an auxiliary device has already been connected, press the AUX or CD/AUX button to select the device.
- A low battery condition in a portable media player may not allow the device to connect to the system, or can create communication issues with the device. Verify the device battery state of charge and re-charge or replace as needed.
- Connect the device directly to the USB port if possible. Only use a cable if it is required to connect the device. The use of extension cables can cause communication issues.
- If a cable is required for connection, attempt to connect the device using a different cable; cables can deteriorate over time or become damaged.
- Attempt audio playback from multiple USB devices when diagnosing USB concerns. Device compatibility can vary based on vehicle equipment. If the infotainment system is capable of operating any USB type device, the cause of the concern is not with the vehicle system. The inoperative device(s) may be incompatible or contain no recognized media types.
- If a "Device Not Supported" or similar type error message is displayed, this indicates the system has connected to the device but cannot communicate with it properly. This does not indicate an issue with the vehicle system. The device may be incompatible, may require a "reset", or may require an update to its software/firmware.
- If a "No Supported Data Found" or similar type error message is displayed, this indicates the system has connected to the device and is communicating, but cannot find any compatible files/data. This does not indicate an issue with the vehicle system. Verify the device contains compatible media/file types.
- Poor connections or damaged USB cables can cause intermittent or no operation of USB devices. Inspect connectors, terminals, and cables for damage and replace components as necessary. Ensure all USB inline connections and connections at components are fully seated and connector position retainers/locks are secure.

Reference Information

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Special Tools

- *EL-50334-20* Multi-Media Interface Tester (MIT)

- *EL-50334-50* USB Cable and Adapter Kit

For equivalent regional tools, refer to [Special Tools](#)

Circuit/System Verification

Auxiliary Audio Input Jack

1. Verify no DTCs are present.
2.
 - **If any DTCs are present**
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
3.
 - **If no DTCs are present**
4. Ignition ON/vehicle in Service Mode, radio ON.
5. Verify the infotainment system switches to AUX as the audio source with the *EL-50334-20* Multi-Media Interface Tester (MIT) connected to the auxiliary audio input jack.
6.
 - **If the infotainment system does not switch to AUX as the audio source**
 - Refer to Circuit/System Testing "Auxiliary Input Jack."
7.
 - **If the infotainment system switches to AUX as the audio source**
8. Verify the audio from the *EL-50334-20* Multi-Media Interface Tester (MIT) is heard through the vehicle infotainment system while operating the test tool to begin audio playback.
9.
 - **If audio is not heard from the test tool.**
 - Refer to Circuit/System Testing "Auxiliary Input Jack."
10.
 - **If audio is heard from the test tool.**

11. All OK

USB Port

1. Verify no DTCs are present.
2.
 - **If any DTCs are present**
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
3.
 - **If no DTCs are present**
4. Ignition ON/vehicle in Service Mode, radio ON.
5. Verify the infotainment system switches to USB as the audio source with the *EL-50334-20* Multi-Media Interface Tester (MIT) connected to the USB port.
6.
 - **If the infotainment system does not switch to USB as the audio source**

- Refer to Circuit/System Testing – USB Port.

7.

- **If the infotainment system switches to USB as the audio source**

8. Verify the audio from the *EL-50334-20* Multi-Media Interface Tester (MIT) is heard through the vehicle infotainment system while operating the system to play audio from the test tool.

9.

- **If audio is not heard from the test tool.**
- Refer to Circuit/System Testing – USB Port.

10.

- **If audio is heard from the device**

11. All OK.

Circuit/System Testing

Auxiliary Audio Input Jack

1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the X83 Auxiliary Audio Input. Ignition ON/vehicle in Service Mode, radio ON.

2. Test for 2.5–3.5V between the signal circuit terminal 5 and ground.

3.

- **If less than 2.5V**

4.

1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
2. Test for infinite resistance between the signal circuit and ground.

3.

- If less than infinite resistance, repair the short to ground on the circuit.

4.

- If infinite resistance

5. Test for less than 2Ω in the signal circuit end to end

6.

- If 2Ω or greater, repair the open/high resistance in the circuit.
- If less than 2Ω, replace the A11 Radio.

5.

- **If greater than 3.5V**

6.

1. Ignition OFF/vehicle OFF, disconnect the X2 harness connector at the A11 Radio, ignition ON/vehicle in Service Mode.
2. Test for less than 1V between the detection circuit and ground.
- 3.

- If 1V or greater, repair the short to voltage on the circuit.

- If less than 1â€‰V, replace the A11 Radio.

7.

- **If between 2.5â€‰–3.5â€‰V**

8. Test for less than 1â€‰V between the signal circuits listed below and ground:

9.

- Left auxiliary audio signal circuit terminalâ€‰1
- Right auxiliary audio signal circuit terminalâ€‰2
- Auxiliary audio common signal circuit terminalâ€‰3

10.

- **If 1â€‰V or greater**

11.

1. Ignition OFF/vehicle OFF, disconnect the X2 harness connector at the A11 Radio. Ignition ON/vehicle in Service Mode.

2. Test for less than 1â€‰V between the signal circuit and ground.

3.

- If 1â€‰V or greater, repair the short to voltage on the circuit.
- If less than 1â€‰V, replace the A11 Radio.

12.

- **If less than 1â€‰V**

13. Ignition OFF/vehicle OFF, disconnect the X2 harness connector at the A11 Radio.

14. Test for infinite resistance between the signal circuits listed below and ground:

15.

- Auxiliary audio common signal circuit terminalâ€‰26
- Left auxiliary audio signal circuit terminalâ€‰25
- Right auxiliary audio signal circuit terminalâ€‰24

16.

- **If less than infinite resistance**
- Repair the short to ground on the circuit.

17.

- **If infinite resistance**

18. Test for less than 5â€‰â„Ž between the signal circuit terminals listed below:

19.

- A11 Radio terminalâ€‰25â€‰X2 and the X83 Auxiliary Audio Input terminalâ€‰1â€‰X1
- A11 Radio terminalâ€‰24â€‰X2 and the X83 Auxiliary Audio Input terminalâ€‰2â€‰X1
- A11 Radio terminalâ€‰26â€‰X2 and the X83 Auxiliary Audio Input terminalâ€‰3â€‰X1

20.

- **If 5â€‰â„Ž greater**

- Repair the open/high resistance in the circuit.

21.

- **If less than 5â€™â€™,**

22. Replace the X83 Auxiliary Audio Input. Connect all harness connectors.

23. Connect and operate the *EL-50334-20* Multi-Media Interface Tester (MIT).

24. Verify the audio from the test tool is heard through the vehicle infotainment system.

25.

- **If audio is not heard from the test tool**
- Replace the A11 Radio.

26.

- **If audio is heard from the test tool**

27. All OK.

USB Port

1. Ignition OFF/vehicle OFF, disconnect the USB cable connection at the A11 Radio.

2. Note:

USB cables and adapters for the following tests are found in the *EL-50334-50* USB Cable and Adapter Kit.

3. Connect the EL-50334-1 Typeâ€™A male to Miniâ€™A male USB Cable to the A11 Radio. Connect the EL-50334-3 Typeâ€™A female to Typeâ€™A female adapter to the EL-50334-1 Cable.

4. Ignition ON/vehicle in Service Mode, radio ON, connect the *EL-50334-20* Multi-Media Interface Tester (MIT) to the EL-50334-3 adapter.

5. Verify the infotainment system switches to USB as the audio source.

6.

- **If the infotainment system does not switch to USB as the audio source**
- Replace the A11 Radio.

7.

- **If the infotainment system switches to USB as the audio source**

8. Ignition OFF/vehicle OFF, connect the vehicle USB cable to the A11 Radio. Disconnect the I/P to floor console inline USB cable connector.

9. Note:

The EL-50334-3 or EL-50334-4 adapter may be required for the following test.

10. Ignition ON/vehicle in Service Mode, radio ON, connect the *EL-50334-20* Multi-Media Interface Tester (MIT) to the I/P side of the inline USB cable connector.

11. Verify the infotainment system switches to USB as the audio source.

12.

- **If the infotainment system does not switch to USB as the audio source**
- Replace the I/P USB cable assembly.

13.

- **If the infotainment system switches to USB as the audio source**

14. Ignition OFF/vehicle OFF, connect the I/P to floor console inline USB cable connector.
15. Disconnect the USB cable at the X83 Auxiliary Audio Input. Connect the EL-50334-4 Type A female to Mini B female adapter to the USB cable.
16. Ignition ON/vehicle in Service Mode, radio ON, connect the *EL-50334-20* Multi-Media Interface Tester (MIT) to the EL-50334-4 adapter.
17. Verify the infotainment system switches to USB as the audio source.
18.
 - If the infotainment system does not switch to USB as the audio source
 - Replace the console USB cable assembly.
19.
 - If the infotainment system switches to USB as the audio source
20. Test or replace the X83 Auxiliary Audio Input.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Audio Disc Player and USB Receptacle Replacement](#)
- [Control Module References](#) for radio replacement, programming, and setup.

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Auxiliary Audio Input Malfunction (UCH)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Auxiliary Audio Common Signal	â€”	6	â€”	â€”
Auxiliary Detection Signal	5	6	â€”	â€”
Left Auxiliary Audio Signal	2	2	2, 4	â€”
Right Auxiliary Audio Signal	3	3	3, 4	â€”
USB Cable	1	1	1	â€”
1. USB port Inoperative 2. No left side audio from device connected to AUX jack 3. No right side audio from device connected to AUX jack 4. Noticeable distortion may be present in affected audio channel 5. Radio does not detect auxiliary device connection, AUX not available as input selection 6. AUX always available as an input selection, with or without auxiliary device connected				

Circuit/System Description

Auxiliary Audio Input Jack

The 3.5 mm auxiliary audio input jack is located in the console. All circuits from the auxiliary jack are connected directly to the radio. Audio signals from the device are sent to the radio from the auxiliary input jack via the left, right, and common audio signal circuits.

The infotainment system may also have an additional auxiliary audio input jack available on the radio face. This input interfaces internally with the radio, no external circuits are involved.

When a portable audio playback device is connected to an auxiliary jack, an internal switch detects the connection and the radio will switch to AUX as the audio source.

USB Port

The vehicle may be equipped with a USB port in the console. This port allows USB connectivity to the infotainment system from portable media players or a USB storage device (memory stick/flash drive). When a device is connected to the USB port, the system detects the device and switches to USB as the audio source. Once connected, the device can be controlled from the radio controls.

The USB port is connected to the radio via a standard USB cable. Mini type USB connectors are used to connect the cable at the USB port and at the radio. Standard USB male to female connections are typically used for connecting USB cables together where an in-line connection is required. An in-line cable connection is typically found between the console and I/P harness.

Not all portable media player devices are compatible. Refer to the owner's manual for information on USB devices, control, and operation.

Diagnostic Aids

Auxiliary Audio Input Jack

- When a device is first connected to the 3.5mm (1/8 in) input jack the infotainment system automatically switches to that device. If an auxiliary device has already been connected, press the AUX or CD/AUX button to select the device.

- If the system detects the device, but the audio is not heard or is not clear, attempt to connect the device using a different cable; cables can deteriorate over time or become damaged.
- Playback of an audio device that is connected to the 3.5mm jack can only be controlled using the controls on the device.
- The volume control on the device may need to be adjusted to ensure sufficient playback volume through the infotainment system.

USB

- When a device is first connected to the USB port, the infotainment system automatically switches to that device. If an auxiliary device has already been connected, press the AUX or CD/AUX button to select the device.
- A low battery condition in a portable media player may not allow the device to connect to the system, or can create communication issues with the device. Verify the device battery state of charge and re-charge or replace as needed.
- Connect the device directly to the USB port if possible. Only use a cable if it is required to connect the device. The use of extension cables can cause communication issues.
- If a cable is required for connection, attempt to connect the device using a different cable; cables can deteriorate over time or become damaged.
- Attempt audio playback from multiple USB devices when diagnosing USB concerns. Device compatibility can vary based on vehicle equipment. If the infotainment system is capable of operating any USB type device, the cause of the concern is not with the vehicle system. The inoperative device(s) may be incompatible or contain no recognized media types.
- If a "Device Not Supported" or similar type error message is displayed, this indicates the system has connected to the device but cannot communicate with it properly. This does not indicate an issue with the vehicle system. The device may be incompatible, may require a "reset", or may require an update to its software/firmware.
- If a "No Supported Data Found" or similar type error message is displayed, this indicates the system has connected to the device and is communicating, but cannot find any compatible files/data. This does not indicate an issue with the vehicle system. Verify the device contains compatible media/file types.
- Poor connections or damaged USB cables can cause intermittent or no operation of USB devices. Inspect connectors, terminals, and cables for damage and replace components as necessary. Ensure all USB inline connections and connections at components are fully seated and connector position retainers/locks are secure.

Reference Information

Schematic Reference

[Radio/Navigation System Schematics](#)

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Description and Operation

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Electrical Information Reference

- [Circuit Testing](#)
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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Special Tools

- *EL-50334-20* Multi-Media Interface Tester (MIT)
- *EL-50334-50* USB Cable and Adapter Kit

Circuit/System Verification

Auxiliary Audio Input Jack - Console

1. Verify no DTCs are present.
2.
 - **If any DTCs are present**
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
3.
 - **If no DTCs are present**
4. Ignition ON, radio ON.
5. Verify the infotainment system switches to AUX as the audio source with the *EL-50334-20* Multi-Media Interface Tester (MIT) connected to the auxiliary audio input jack.
6.
 - **If the infotainment system does not switch to AUX as the audio source**
 - Refer to Circuit/System Testing "Auxiliary Audio Input Jack."
7.
 - **If the infotainment system switches to AUX as the audio source**
8. Verify the audio from the *EL-50334-20* Multi-Media Interface Tester (MIT) is heard through the vehicle infotainment system while operating the test tool to begin audio playback.
9.
 - **If audio is not heard from the test tool**
 - Refer to Circuit/System Testing "Auxiliary Audio Input Jack"
10.
 - **If audio is heard from the test tool**
11. All OK

Auxiliary Audio Input Jack - Radio (If Equipped)

1. Verify no DTCs are present.
2.
 - **If any DTCs are present**
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
3.
 - **If no DTCs are present**
4. Ignition ON, radio ON.
5. Verify the infotainment system switches to AUX as the audio source with the *EL-50334-20* Multi-Media Interface Tester (MIT) connected to the auxiliary audio input jack.
6.
 - **If the infotainment system does not switch to AUX as the audio source**
 - Replace the A11 Radio.
- 7.

- **If the infotainment system switches to AUX as the audio source**
8. Verify the audio from the *EL-50334-20* Multi-Media Interface Tester (MIT) is heard through the vehicle infotainment system while operating the test tool to begin audio playback.
 9.
 - **If audio is not heard from the test tool**
 - Replace the A11 Radio.
 10.
 - **If audio is heard from the test tool**
 11. All OK.
- USB Port
1. Verify no DTCs are present.
 2.
 - **If any DTCs are present**
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
 3.
 - **If no DTCs are present**
 4. Ignition ON, radio ON.
 5. Verify the infotainment system switches to USB as the audio source with the *EL-50334-20* Multi-Media Interface Tester (MIT) connected to the USB port.
 6.
 - **If the infotainment system does not switch to USB as the audio source**
 - Refer to Circuit/System Testing “USB Port.
 7.
 - **If the infotainment system switches to USB as the audio source**
 8. Verify the audio from the *EL-50334-20* Multi-Media Interface Tester (MIT) is heard through the vehicle infotainment system while operating the system to play audio from the test tool.
 9.
 - **If audio is not heard from the test tool**
 - Refer to Circuit/System Testing “USB Port.
 10.
 - **If audio is heard from the test tool**
 11. All OK.

Circuit/System Testing

Auxiliary Audio Input Jack

1. Ignition OFF, disconnect the X1 harness connector at the X83 Auxiliary Audio Input. Ignition ON, radio ON.
2. Test for 2.5-3.5V between the signal circuit terminal and ground.
- 3.

- **If less than 2.5â€‰V**

4.

1. Ignition OFF, disconnect the X1 harness connector at the A11 Radio.
2. Test for infinite resistance between the signal circuit and ground.
3.
 - If less than infinite resistance, repair the short to ground on the circuit.

4.

- If infinite resistance

5. Test for less than 2â€‰â„Ž in the signal circuit end to end

6.

- If 2â€‰â„Ž or greater, repair the open/high resistance in the circuit.
- If less than 2â€‰â„Ž, replace the A11 Radio.

5.

- **If greater than 3.5â€‰V**

6.

1. Ignition OFF, disconnect the X1 harness connector at the A11 Radio, ignition ON.
2. Test for less than 1â€‰V between the signal circuit and ground.
3.
 - If 1â€‰V or greater, repair the short to voltage on the circuit.
 - If less than 1â€‰V, replace the A11 Radio.

7.

- **If between 2.5â€‰–3.5â€‰V**

8. Test for less than 1â€‰V between the signal circuits listed below and ground:

9.

- Left auxiliary audio signal circuit terminalâ„Ž1
- Right auxiliary audio signal circuit terminalâ„Ž2
- Auxiliary audio common signal circuit terminalâ„Ž3

10.

- **If 1â€‰V greater**

11.

1. Ignition OFF, disconnect the X1 harness connector at the A11 Radio. Ignition ON.
2. Test for less than 1â€‰V between the signal circuit and ground.
3.
 - If 1â€‰V or greater, repair the short to voltage on the circuit.
 - If less than 1â€‰V, replace the A11 Radio.

12.

- **If less than 1â€‰V**

13. Ignition OFF, disconnect the X1 harness connector at the A11 Radio.

14. Test for infinite resistance between the signal circuits listed below and ground:

15.

- Auxiliary audio common signal circuit terminalâ€‰23
- Left auxiliary audio signal circuit terminalâ€‰24
- Right auxiliary audio signal circuit terminalâ€‰10

16.

- **If less than infinite resistance**
- Repair the short to ground on the circuit.

17.

- **If infinite resistance**

18. Test for less than 5â€‰â„Ž between the signal circuit terminals listed below:

19.

- A11 Radio terminalâ€‰24 X1 and the X83 Auxiliary Audio Input terminalâ€‰1 X1
- A11 Radio terminalâ€‰10 X1 and the X83 Auxiliary Audio Input terminalâ€‰2 X1
- A11 Radio terminalâ€‰23 X1 and the X83 Auxiliary Audio Input terminalâ€‰3 X1

20.

- **If 5â€‰â„Ž greater**
- Repair the open/high resistance in the circuit.

21.

- **If less than 5â€‰â„Ž**

22. Replace the X83 Auxiliary Audio Input. Connect all harness connectors.

23. Connect and operate the *EL-50334-20* Multi-Media Interface Tester (MIT).

24. Verify the audio from the test tool is heard through the vehicle infotainment system.

25.

- **If audio is not heard from the test tool**
- Replace the A11 Radio.

26.

- **If audio is heard from the test tool**

27. All OK.

USB Port

1. Ignition OFF, disconnect the USB cable connection at the A11 Radio.

2. Note:

USB cables and adapters for the following tests are found in the *EL-50334-50* USB Cable and Adapter Kit.

3. Connect the EL-50334-2 Type A female to Mini B male USB Cable to the A11 Radio.

4. Connect the *EL-50334-20* Multi-Media Interface Tester (MIT) to the EL-50334-2 cable. Ignition ON, radio ON
5. Verify the infotainment system switches to USB as the audio source.
6.
 - **If the infotainment system does not switch to USB as the audio source**
 - Replace the A11 Radio.
7.
 - **If the infotainment system switches to USB as the audio source**
8. Ignition OFF, connect the vehicle USB cable to the A11 Radio. Disconnect the USB cable at the X83 Auxiliary Audio Input.
9. Note:

The EL-50334 adapter may be required for the following test.
10. Connect the *EL-50334-20* Multi-Media Interface Tester (MIT) to the vehicle USB cable. Ignition ON, radio ON.
11. Verify the infotainment system switches to USB as the audio source.
12.
 - **If the infotainment system does not switch to USB as the audio source**
 - Replace the USB cable assembly.
13.
 - **If the infotainment system switches to USB as the audio source**
14. Test or replace the X83 Auxiliary Audio Input.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [USB Receptacle Replacement](#)
- [Control Module References](#) for radio replacement, programming, and setup.

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Auxiliary Audio Input Malfunction (IOA)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	B124B, 1, 6	1, 5	â€”	â€”
Auxiliary Audio Common Signal	â€”	8	â€”	â€”
Auxiliary Detection Signal	7	8	â€”	â€”
Left Auxiliary Audio Signal	2	2	2, 4	â€”
Right Auxiliary Audio Signal	3	3	3, 4	â€”
USB Cable	B124B	B124B	B124B	â€”
Ground	â€”	1	â€”	â€”
1. USB port Inoperative 2. No left side audio from device connected to AUX jack 3. No right side audio from device connected to AUX jack 4. Noticeable distortion may be present in affected audio channel 5. Fault may affect one or more components, dependant on fault location 6. Fault affects multiple components, dependant on vehicle equipment 7. Radio does not detect auxiliary device connection, AUX not available as input selection 8. AUX always available as an input selection, with or without auxiliary device connected				

Circuit/System Description

Auxiliary Audio Input Jack

The 3.5â€”mm (1/8â€”in.) auxiliary audio input jack is located in the console. All circuits from the auxiliary jack are connected directly to the radio. When a device is connected to the auxiliary jack an internal switch opens. The radio detects the device and switches to AUX as the audio source. Audio signals from the device are sent to the radio from the auxiliary input jack via the left, right, and common audio signal circuits.

USB Port

The vehicle may be equipped with a USB port in the console. This port allows USB connectivity to the infotainment system from portable media players or a USB storage device (memory stick/flash drive). When a device is connected to the USB port, the system detects the device and switches to USB as the audio source. Once connected, the device can be controlled from the radio controls.

The USB port is connected to the radio via a standard USB cable. Mini type USB connectors are used to connect the cable at the USB port and at the radio or multimedia player interface module. Standard USB male to female connections are typically used for connecting USB cables together where an in-line connection is required. An in-line cable connection is typically found between the console and I/P harness.

Not all portable media player devices are compatible. Refer to the ownerâ€™s manual for information on USB devices, control, and operation.

Diagnostic Aids

Auxiliary Audio Input Jack

- When a device is first connected to the 3.5â€”mm (1/8â€”in.) input jack the infotainment system automatically switches to that device. If

an auxiliary device has already been connected, press the AUX or CD/AUX button to select the device.

- If the system detects the device, but the audio is not heard or is not clear, attempt to connect the device using a different cable; cables can deteriorate over time or become damaged.
- Playback of an audio device that is connected to the 3.5mm jack can only be controlled using the controls on the device.
- The volume control on the device may need to be adjusted to ensure sufficient playback volume through the infotainment system.

USB

- When a device is first connected to the USB port, the infotainment system automatically switches to that device. If an auxiliary device has already been connected, press the AUX or CD/AUX button to select the device.
- A low battery condition in a portable media player may not allow the device to connect to the system, or can create communication issues with the device. Verify the device battery state of charge and re-charge or replace as needed.
- Connect the device directly to the USB port if possible. Only use a cable if it is required to connect the device. The use of extension cables can cause communication issues.
- If a cable is required for connection, attempt to connect the device using a different cable; cables can deteriorate over time or become damaged.
- Attempt audio playback from multiple USB devices when diagnosing USB concerns. Device compatibility can vary based on vehicle equipment. If the infotainment system is capable of operating any USB type device, the cause of the concern is not with the vehicle system. The inoperative device(s) may be incompatible or contain no recognized media types.
- If a "Device Not Supported" or similar type error message is displayed, this indicates the system has connected to the device but cannot communicate with it properly. This does not indicate an issue with the vehicle system. The device may be incompatible, may require a "reset", or may require an update to its software/firmware.
- If a "No Supported Data Found" or similar type error message is displayed, this indicates the system has connected to the device and is communicating, but cannot find any compatible files/data. This does not indicate an issue with the vehicle system. Verify the device contains compatible media/file types.
- Poor connections or damaged USB cables can cause intermittent or no operation of USB devices. Inspect connectors, terminals, and cables for damage and replace components as necessary. Ensure all USB inline connections and connections at components are fully seated and connector position retainers/locks are secure.

Reference Information

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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Special Tools

- *EL-50334-20* Multi-Media Interface Tester (MIT)

- *EL-50334-50* USB Cable and Adapter Kit

For equivalent regional tools, refer to [Special Tools](#)

Circuit/System Verification

Auxiliary Audio Input Jack

1. Verify no DTCs are present.
2.
 - **If any DTCs are present**
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
3.
 - **If no DTCs are present**
4. Ignition ON/vehicle in Service Mode, radio ON.
5. Verify the infotainment system switches to AUX as the audio source with the *EL-50334-20* Multi-Media Interface Tester (MIT) connected to the auxiliary audio input jack.
6.
 - **If the infotainment system does not switch to AUX as the audio source**
 - Refer to Circuit/System Testing "Auxiliary Input Jack."
7.
 - **If the infotainment system switches to AUX as the audio source**
8. Verify the audio from the *EL-50334-20* Multi-Media Interface Tester (MIT) is heard through the vehicle infotainment system while operating the test tool to begin audio playback.
9.
 - **If audio is not heard from the test tool.**
 - Refer to Circuit/System Testing "Auxiliary Input Jack."
10.
 - **If audio is heard from the test tool.**

11. All OK

USB Port

1. Verify no DTCs are present.
2.
 - **If any DTCs are present**
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
3.
 - **If no DTCs are present**
4. Ignition ON/vehicle in Service Mode, radio ON.
5. Verify the infotainment system switches to USB as the audio source with the *EL-50334-20* Multi-Media Interface Tester (MIT) connected to the USB port.
6.
 - **If the infotainment system does not switch to USB as the audio source**

- Refer to Circuit/System Testing – USB Port.

7.

- **If the infotainment system switches to USB as the audio source**

8. Verify the audio from the *EL-50334-20* Multi-Media Interface Tester (MIT) is heard through the vehicle infotainment system while operating the system to play audio from the test tool.

9.

- **If audio is not heard from the test tool.**
- Refer to Circuit/System Testing – USB Port.

10.

- **If audio is heard from the device**

11. All OK.

Circuit/System Testing

Auxiliary Audio Input Jack

1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the X83 Auxiliary Audio Input. Ignition ON/vehicle in Service Mode, radio ON.

2. Test for 2.5–3.5V between the signal circuit terminal 5 and ground.

3.

- **If less than 2.5V**

4.

1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
2. Test for infinite resistance between the signal circuit and ground.

3.

- If less than infinite resistance, repair the short to ground on the circuit.

4.

- If infinite resistance

5. Test for less than 2Ω in the signal circuit end to end

6.

- If 2Ω or greater, repair the open/high resistance in the circuit.
- If less than 2Ω, replace the A11 Radio.

5.

- **If greater than 3.5V**

6.

1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio, ignition ON/vehicle in Service Mode.
2. Test for less than 1V between the detection circuit and ground.
3.
 - If 1V or greater, repair the short to voltage on the circuit.

- If less than 1â€‰V, replace the A11 Radio.

7.

- **If between 2.5â€‰–3.5â€‰V**

8. Test for less than 1â€‰V between the signal circuits listed below and ground:

9.

- Left auxiliary audio signal circuit terminalâ€‰1
- Right auxiliary audio signal circuit terminalâ€‰2
- Auxiliary audio common signal circuit terminalâ€‰3

10.

- **If 1â€‰V or greater**

11.

1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio. Ignition ON/vehicle in Service Mode.
2. Test for less than 1â€‰V between the signal circuit and ground.
- 3.

- If 1â€‰V or greater, repair the short to voltage on the circuit.
- If less than 1â€‰V, replace the A11 Radio.

12.

- **If less than 1â€‰V**

13. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.

14. Test for infinite resistance between the signal circuits listed below and ground:

15.

- Auxiliary audio common signal circuit terminalâ€‰18
- Left auxiliary audio signal circuit terminalâ€‰19
- Right auxiliary audio signal circuit terminalâ€‰20

16.

- **If less than infinite resistance**
- Repair the short to ground on the circuit.

17.

- **If infinite resistance**

18. Test for less than 5â€‰â„Ž between the signal circuit terminals listed below:

19.

- A11 Radio terminalâ€‰19â€‰X1 and the X83 Auxiliary Audio Input terminalâ€‰1â€‰X1
- A11 Radio terminalâ€‰20â€‰X1 and the X83 Auxiliary Audio Input terminalâ€‰2â€‰X1
- A11 Radio terminalâ€‰18â€‰X1 and the X83 Auxiliary Audio Input terminalâ€‰3â€‰X1

20.

- **If 5â€‰â„Ž greater**

- Repair the open/high resistance in the circuit.

21.

- **If less than 5â€™â€™,**

22. Replace the X83 Auxiliary Audio Input. Connect all harness connectors.

23. Connect and operate the *EL-50334-20* Multi-Media Interface Tester (MIT).

24. Verify the audio from the test tool is heard through the vehicle infotainment system.

25.

- **If audio is not heard from the test tool**
- Replace the A11 Radio.

26.

- **If audio is heard from the test tool**

27. All OK.

USB Port

1. Ignition OFF/vehicle OFF, disconnect the USB cable connection at the A11 Radio.

2. Note:

USB cables and adapters for the following tests are found in the *EL-50334-50* USB Cable and Adapter Kit.

3. Connect the EL-50334-1 Typeâ€™A male to Miniâ€™A male USB Cable to the A11 Radio. Connect the EL-50334-3 Typeâ€™A female to Typeâ€™A female adapter to the EL-50334-1 Cable.

4. Ignition ON/vehicle in Service Mode, radio ON, connect the *EL-50334-20* Multi-Media Interface Tester (MIT) to the EL-50334-3 adapter.

5. Verify the infotainment system switches to USB as the audio source.

6.

- **If the infotainment system does not switch to USB as the audio source**
- Replace the A11 Radio.

7.

- **If the infotainment system switches to USB as the audio source**

8. Ignition OFF/vehicle OFF, connect the vehicle USB cable to the A11 Radio. Disconnect the I/P to floor console inline USB cable connector.

9. Note:

The EL-50334-3 or EL-50334-4 adapter may be required for the following test.

10. Ignition ON/vehicle in Service Mode, radio ON, connect the *EL-50334-20* Multi-Media Interface Tester (MIT) to the I/P side of the inline USB cable connector.

11. Verify the infotainment system switches to USB as the audio source.

12.

- **If the infotainment system does not switch to USB as the audio source**
- Replace the I/P USB cable assembly.

13.

- **If the infotainment system switches to USB as the audio source**

14. Ignition OFF/vehicle OFF, connect the I/P to floor console inline USB cable connector.
15. Disconnect the USB cable at the X83 Auxiliary Audio Input. Connect the EL-50334-4 Type A female to Mini B female adapter to the USB cable.
16. Ignition ON/vehicle in Service Mode, radio ON, connect the *EL-50334-20* Multi-Media Interface Tester (MIT) to the EL-50334-4 adapter.
17. Verify the infotainment system switches to USB as the audio source.
18.
 - If the infotainment system does not switch to USB as the audio source
 - Replace the console USB cable assembly.
19.
 - If the infotainment system switches to USB as the audio source
20. Test or replace the X83 Auxiliary Audio Input.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Audio Disc Player and USB Receptacle Replacement](#)
- [Control Module References](#) for radio replacement, programming, and setup.

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Bluetooth Malfunction

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provide an overview of each diagnostic category.

Circuit/System Description

Bluetooth® wireless technology is a short-range communications technology intended to replace the cables connecting portable and/or fixed devices while maintaining high levels of security. The operating range of the signal is approximately 300 feet.

The available features and functions are determined by the type of device and the software within the devices being used. For a feature or function to operate, it must be supported in both devices.

The Bluetooth® hardware is internal to the radio. The radio supports interfacing with cellular phones for hands-free features.

Refer to the vehicle owner manual, supplements, and the device manufacturer's information for information on devices, control, operation, and pairing instructions.

Diagnostic Aids

- Verify the mobile device is properly configured for the feature being used. Refer to the device manufacturer's information.
- Verify the device has the latest software available. Refer to the device manufacturer's information.
- Verify the function/feature that is being used is supported by the mobile device.
- The device must be paired to the radio to use the available Bluetooth® feature(s). The pairing process must only be performed once for each device, unless that device's information is deleted.
- The system can store pairing information for multiple devices, certain radios can have up to two devices actively connected at any given time, refer to owners manual for further details.
- For features that require a cellular connection make sure to perform tests in an area where the customers device has a strong signal.
- Close all other applications running in the background on the phone.
- If issue persists unpair the phone in both the phone and radio settings, then start the pairing process over from the beginning.
- Before beginning testing, if available verify the customers device can pair with a like vehicle, meaning: Same year, same model, same radio RPO and same radio software level.

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Verify no DTCs are present.
2.
 - **If any DTCs are present**
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
3.
 - **If no DTCs are present**
4. Verify the A11 Radio calibrations are current.
5.
 - **If the radio calibrations are not current**
 - Reprogram the A11 Radio and re-evaluate the concern.
6.
 - **If no update calibrations are available**
7. Ignition ON, infotainment system ON.
8. Verify the infotainment system successfully pairs with a compatible mobile device.
9.
 - **If the infotainment system does not successfully pair with the compatible mobile device.**
10.
 1. Perform the 3 vehicle Factory Resets located in Setting>System>Return to Factory Settings.
 2. Verify the infotainment system successfully pairs with a compatible mobile device.
 3.
 - If the infotainment system does not successfully pair with a compatible mobile device.
 - Replace the A11 Radio.
11.
 - **If the infotainment system successfully pairs with a compatible mobile device.**
12. Verify audio can be heard while streaming from the device.
13.
 - **If audio can be heard while streaming from the device but the audio is distorted.**
 - Refer to [Speaker Malfunction](#)
 - **If audio can not be heard while streaming from the device**
 - Replace the A11 Radio.

14.

- **If audio can be heard while streaming from the device.**

15. Verify the customers device can be paired with the infotainment system.

16.

- **If the device can not be paired with the infotainment system.**
- Perform a reset on the device. Refer to device manufacturer's information.

17.

- **Verify the customers device can be paired with the infotainment system.**
- If the device still will not pair inform the customer the issue is with the device.

18.

- **If the device successfully pairs with the infotainment system.**

19. Verify audio can be heard while streaming from the device.

20.

- **If audio can not be heard while streaming.**
- Ensure the volume on the device is turned up to an adequate level.

21.

- **If audio can be heard while streaming.**

22. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for radio replacement, programming, and setup

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Digital Radio Poor or No Reception

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B125E

Digital Audio Broadcast (DAB) Circuit

For symptom byte information refer to [Symptom Byte List](#).

Circuit/System Description

The digital audio broadcast receiver, located inside the radio, receives digital radio information from the digital radio antenna located on the outside of the vehicle. The digital audio broadcast receiver is connected to the digital radio antenna via a shielded coax cable. The digital radio antenna contains an amplifier which is powered by the radio through the coax cable.

Conditions for Running the DTC

This DTC is run every 300 milliseconds.

Conditions for Setting the DTC

The radio detects a circuit fault in the digital radio antenna.

Action Taken When the DTC Sets

The digital radio has limited or no reception.

Conditions for Clearing the DTC

- A current DTC clears when the condition for setting the DTC is no longer present.
- A history DTC clears after 100 malfunction-free ignition cycles.

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- [Wiring Repairs](#)

Circuit/System Testing

1. Ignition OFF, disconnect the digital radio antenna coax cable from the T2RF Antenna – Roof Front and the A11 Radio.
2. Verify the digital radio antenna coax cable passes the coax cable component test. Refer to Component Testing.
3.
 - **If the coax cable does not pass the test**
 - Replace the antenna coax cable
4.
 - **If the coax cable passes the test**
5. Replace the T2RF Antenna – Roof Front.
6. Ignition ON, A11 radio ON, tune to digital band.
7. Verify DTC B125E is not set as current and digital reception is improved.
8.
 - **If DTC B125E is set as current or digital reception is not improved**
 - Replace the A11 Radio.
9.
 - **If DTC B125E is not set as current and digital reception is improved**
10. All OK.

Component Testing

Caution:

Refer to [Test Probe Caution](#).

Note:

Before testing the coax cable, check the cable exterior for being pinched, cut, damaged, or having loose connections at the components, which can cause reception issues.

To prevent false reading when testing the center coax terminals, use care not to ground the test probe on the outer housing/shield.

Coax Cable Test

1. Ignition OFF, disconnect the coax cable at both components.
2. Test for less than 5â€™%â„,| between coax cable center terminal end to end.
3.
 - **If 5â€™%â„,| or greater**
 - Replace the coax cable
4.
 - **If less than 5â€™%â„,|**
5. Test for less than 5â€™%â„,| between the coax cable outer shield end to end.
6.
 - **If 5â€™%â„,| or greater**

- Replace the coax cable

7.

- **If less than 5Ω**

8. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.

9.

- **If less than infinite resistance**
- Replace the coax cable

10.

- **If infinite resistance**

11. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Radio Antenna Base Replacement](#)
- [Control Module References](#) for radio replacement, programming, and setup.

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Phone Projection Malfunction (Android Auto)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Circuit/System Description

Android Auto is a phone integration feature that enables Android users to display certain apps and functionality from their phone on the vehicle's infotainment display. Users can control the apps and functions via the vehicle's infotainment system touchscreen, button control or voice commands. Vehicles equipped with RPO PPW have wireless phone projection.

Diagnostic Aids

- Listed below are some common Android Auto Error Messages or Error Codes
- Note:

For vehicles equipped with radio RPO IOR, error messages will not be displayed on the vehicle or device screen.

- - Google Play Services error: Android Auto could not connect with Google Play Services
 - Likely cause: Something went wrong while setting up Android Auto.
 - Suggested solutions:
 - Connect your phone to your vehicle with a USB cable first, before attempting to open the Android Auto app on your phone.
 - After you have connected your phone to the vehicle open Android Auto and follow the getting started flow and accept all permissions.
 - If it still does not work, uninstall Google Play Services update and re-update then follow the steps above.
 - Communication error 6: If phone battery below 20% Android Auto will not work.
 - Likely cause: Radio software or Google Play version out of date.
 - Suggested solutions: Update to Google Play version 12.6.85 or beyond and check for any radio updates.
 - Communication error code 7: Android Auto failed to set up a secured communication with the head unit.
 - Suggested solution: Make sure Google Play services is up to date and try a different recommended USB cable.
 - Communication error 8: Authentication failed between the car and the phone.
 - Likely cause: This is most likely caused by the incorrect date on the radio.
 - Suggested solutions: Disconnect your phone from the vehicle. In radio settings set the correct date. Make sure it matches the settings on your phone.
 - Communication error 12: Vehicle is not responding
 - Likely cause: Transient software failure. If this occurs frequently it could be caused by a faulty USB cable.
 - Suggested solution: Try a new USB cable approved by the manufacture.
 - For additional information refer to "Android Auto Help" site.

- Visit for a list of Android Auto compatible apps. This does not guarantee the functionality of the app.
- Android Auto will only automatically launch the first time it is time it is connected to the system within a key cycle.
- It is required the device be connected to the vehicles USB port. It is recommended to use the device's factory provided USB cable. Aftermarket or third-party cables may not work.
- Note:
Vehicles equipped with RPO PPW have Wireless Phone Projection.
- The device Location needs to be set to On for Wireless Phone Projection to work. Ensure the customers device Location is ON by going to Settings > Biometrics and Security > Location.
- Before beginning diagnostics, if available verify Android Auto works from the customers device on a like vehicle, meaning: Same year, same model, same radio RPO and same radio software level.

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Circuit/System Verification

Note:

Before launching Android Auto verify transmission is in park or parking brake on for manual transmission vehicles.

1. Verify the vehicle date matches the device date.
2.
 - **If dates do not match**
 - Change vehicle date to match device date and reattempt to launch Android Auto
3.
 - **If dates match**
4. Verify the device is Bluetooth paired to the vehicle before launching Android Auto
5.
 - **If the device is not Bluetooth paired**
 - Pair the device to Bluetooth and reattempt to launch Android Auto
6.
 - **If the device is Bluetooth paired**

7. Verify no DTCs are present.
8.
 - **If any DTCs are present.**
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#)
9.
 - **If no DTCs are present.**
10. Verify the correct settings on the radio and the connected device that will allow Android Auto functionality.
11.
 - **If the settings are not correct.**
 - Radio Setting “Settings>Apps>Android Auto = ON
 - Phone Setting “Open Android Auto>Settings>Connected Cars>Add cars to Android Auto = ON
 - For RPO PPW, Phone Setting “Settings > Biometrics and Security> Location = ON.
12.
 - **If the settings are correct.**
13. Verify the software is up to date on the connected device, refer to the device’s owner manual or manufacturers website.
14.
 - **If the connected device software is not up to date.**
 - Recommend the customer update their device to the newest software version.
15.
 - **If the connected device software has the newest version.**
16. Verify the device’s cable is recommended or approved by the device manufacture and there is no damage to the cable or terminals.
17. Note:

Vehicles equipped with RPO PPW have wireless phone projection.
18.
 - **If the cable is not the correct part or damage is noted advise the customer.**
19.
 - **If no issues with the cable**
20. Connect a compatible USB device to the USB port and attempt to play audio.
21. Verify audio from the USB device is heard through the vehicles speakers.
22.
 - **If audio is not heard through the vehicles speakers.**
 - Refer to [Auxiliary Audio Input Malfunction](#)
23.
 - **If audio is heard through the vehicles speakers.**
24. Verify the radio detects the connected device when plugged in by automatically launching Android Auto or noting a change in the Phone Projection/Android Auto icon on the Home screen.
- 25.

- If the radio does not automatically launch Android Auto or no change in the Phone Projection/Android Auto icon.

26.

1. Perform a device reset by holding both the Home and Power buttons on the device.
2. Verify the radio detects the connected device when plugged in by automatically launching Android Auto or noting a change in the Phone Projection/Android Auto icon on the Home screen.
3.
 - If the radio does not automatically launch Android Auto or no change in the Phone Projection/Android Auto icon.
4. Attempt to launch the application by pressing the Phone Projection/Android Auto icon within the Home screen.
5.
 - If the application does not launch
6. Perform the 3 vehicle Factory Resets located in Setting>System>Return to Factory Settings.
7. Attempt to launch the application by pressing the Phone Projection/Android Auto icon within the Home screen.
8.
 - If the application does not launch
 - Replace the A11 Radio.
9.
 - If the application does launch
 - All OK

27.

- If the radio does automatically launch Android Auto.

28. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Control Module References](#) for control module replacement, programming, and setup.

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Phone Projection Malfunction (Apple CarPlay)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Circuit/System Description

Apple CarPlay is a new phone integration feature that enables iPhone users to display certain apps and functionality from their phone on the vehicle's infotainment display. Users can control the apps and functions via the vehicle's infotainment system touchscreen or voice commands. Vehicles equipped with RPO PPW have wireless phone projection.

Diagnostic Aids

- It is not required to download an app to your device for Apple CarPlay.
- It is recommended to use the device's factory provided USB cable. Aftermarket or third-party cables may not work.
- Visit [Apple CarPlay compatible apps](#) for a list of Apple CarPlay compatible apps. This does not guarantee the functionality of the app.
- Before beginning diagnostics, if available verify Apple CarPlay works from the customer's device on a like vehicle, meaning: Same year, same model, same radio RPO and same radio software level.

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- [Wiring Repairs](#)

Circuit/System Verification

1. Verify no DTCs are present.
2.
 - If any DTCs are present.
 - Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#)
3.
 - If no DTCs are present.

4. Verify the correct settings on the radio and the connected device that will allow Apple CarPlay functionality.
5.
 - **If the settings are not correct.**
 - Refer to the vehicle and devices owner manual or manufacturers website for details on enabling CarPlay.
6.
 - **If the settings are correct.**
7. Verify the software is up to date on the connected device, refer to the device's owner manual or manufacturers website.
8.
 - **If the connected device software is not up to date.**
 - Recommend the customer update their device to the newest software version.
9.
 - **If the connected device software has the newest version.**
10. Connect a compatible USB device to the USB port and attempt to play audio from the customers vehicle.
11. Verify audio is heard through the infotainment system while operating the USB device.
12.
 - **If audio is not heard.**
 - Refer to [Auxiliary Audio Input Malfunction](#)
13.
 - **If audio is heard.**
14. Verify the A11's Radio detects the connected device when plugged in by noting a change in the Phone Projection/Apple CarPlay icon on the Home screen.
15.
 - **If the A11's Radio does not show a change in the Phone Projection/Apple CarPlay icon.**
16.
 1. Verify the device's cable is recommended or approved by the device manufacture and there is no damage to the cable or terminals.
 2. Note:

Vehicles equipped with RPO PPW have wireless phone projection
 3.
 - If the cable is not the correct part or damage is noted advise the customer.
 4.
 - If no issues with the cable
 5. Perform a device rest by holding both the Home and Power buttons on the device.
 6. Attempt to launch the application by pressing the Phone Projection/Apple CarPlay icon within the Home screen.
 7.
 - If the application does not launch
 8. Perform the 3 vehicle Factory Resets located in Setting>System>Return to Factory Settings.

17.

- If the A11â€™s Radio does show a change in the Phone Projection/Apple CarPlay icon.

18. Attempt to launch the application by pressing the Phone Projection/Apple CarPlay icon within the Home screen.

19.

- If the application does not launch

20.

1. Perform the 3 vehicle Factory Resets located in Setting>System>Return to Factory Settings.

21.

- If the application does launch
- All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Control Module References](#) for control module replacement, programming, and setup.

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Radio Poor Reception

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B125A01

Antenna Signal Circuit Short to Battery

DTC B125A02

Antenna Signal Circuit Short to Ground

DTC B125A04

Antenna Signal Circuit Open Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Radio Antenna Coax	B125A02	B125A04	B125A01	â€”

Circuit/System Description

The radio antenna for AM and FM radio reception is connected to the radio with a coaxial cable.

Conditions for Running the DTC

- Ignition ON/Vehicle in Service Mode.
- Battery voltage must be between 9â€”16V.

Conditions for Setting the DTC

B125A01

The radio detects a short to battery in the antenna signal circuit center conductor.

B125A02

The radio detects a short to ground in the antenna signal circuit center conductor.

B125A04

The radio detects an open in the antenna signal circuit center conductor.

Action Taken When the DTC Sets

Radio reception may be poor or not available.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear after 50 consecutive malfunction-free ignition cycles have occurred.

Diagnostic Aids

Poor AM and FM radio reception is dependent on multiple influences, some of which may not be vehicle related. Areas which have high RF traffic or block the signal path may cause a degradation in radio reception. Radio reception may also be influenced by items within the vehicle, but are not part of the radio system. Such examples are aftermarket electrical accessories or other items which may generate noise in the vehicle electrical system.

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Inspect the antenna for proper mounting or physical damage.
2.
 - **If damage is found**
 - Repair or replace as necessary
3.
 - **If no damage is found**
4. Ignition ON/Vehicle in Service Mode, All Radio ON.
5. Verify station reception is normal when tuned to several known good AM and FM stations.
6.
 - **If AM or FM reception is poor.**
 - Refer to Circuit/System Testing
7.
 - **If reception is normal**
8. All OK.

Circuit/System Testing

1. Ignition OFF/Vehicle OFF, disconnect the radio antenna coax cable from the All Radio and from the T2RF Antenna - Roof Front.
2. Verify the antenna coax cable passes the coax cable component test. Refer to Component Testing.

3.
 - **If the coax cable does not pass the test**
 - Replace the antenna coax cable
4.
 - **If the coax cable passes the test**
5. Connect the antenna coax cable to the T2RF Antenna - RoofFront.
6. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield at the radio end of the coax cable.
7.
 - **If less than infinite resistance**
 - Replace the T2RF Antenna - RoofFront.
8.
 - **If infinite resistance**
9. Test for less than 10 Ω between the coax cable outer shield and ground at the radio end of the coax cable.
10.
 - **If 10 Ω or greater**
11.
 1. Clean the mounting surface of the radio antenna base.
 2. Connect the antenna coax cable to the T2RF Antenna - RoofFront.
 3. Test for less than 10 Ω between the coax cable outer shield and ground at the radio end of the coax cable.
 4.
 - If 10 Ω or greater, replace the T2RF Antenna - RoofFront.
 - If less than 10 Ω , connect all harness connectors. Verify station reception is normal when tuned to several known good AM and FM stations. If AM or FM reception concerns are still present, replace the A11 Radio.
12.
 - **If less than 10 Ω**
13. Test or replace the A11 Radio.

Component Testing

Caution:

Refer to [Test Probe Caution](#).

Note:

Before testing the coax cable, check the cable exterior for being pinched, cut, damaged, or having loose connections at the components, which can cause reception issues.

To prevent false reading when testing the center coax terminals, use care not to ground the test probe on the outer housing/shield.

Coax Cable Test

1. Ignition OFF/Vehicle OFF, disconnect the coax cable at both components.
2. Test for less than 5 Ω between coax cable center terminal end to end.
- 3.

- If 5â€™ or greater
- Replace the coax cable

4.

- If less than 5â€™

5. Test for less than 5â€™ between the coax cable outer shield end to end.

6.

- If 5â€™ or greater
- Replace the coax cable

7.

- If less than 5â€™

8. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.

9.

- If less than infinite resistance
- Replace the coax cable

10.

- If infinite resistance

11. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the diagnostic procedure.

- [Radio Antenna Base Replacement](#)
- [Control Module References](#) for radio replacement, programming, and setup.

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Speaker Replacement Reference

Component	Repair Instruction
Front Door Speaker	Refer to Radio Front Speaker Replacement
Rear Door Speaker	Refer to Radio Rear Quarter Trim Panel Speaker Replacement

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Speaker Malfunction

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Speaker Output Signal	B1025â€‰02, 1	B1025â€‰04, 1	B1025â€‰01, 1, 2	â€”
Right Front Speaker Output Signal	B1035â€‰02, 1	B1035â€‰04, 1	B1035â€‰01, 1, 2	â€”
Left Rear Speaker Output Signal	B1045â€‰02, 1	B1045â€‰04, 1	B1045â€‰01, 1, 2	â€”
Right Rear Speaker Output Signal	B1055â€‰02, 1	B1055â€‰04, 1	B1055â€‰01, 1, 2	â€”
1. No or reduced audio from speaker(s) on the affected audio circuit.				
2. Noticeable audio distortion may be present.				

Circuit/System Description

Each of the audio output channel circuits (+) and (â€”), at the radio have a DC bias voltage that is approximately one half of battery voltage. When using a DMM, each of the audio output channel circuits will measure approximately 6.5 V DC. The audio being played on the system is produced by a varying AC voltage that is centered around the DC bias voltage on the same circuit. The AC voltage is what causes the speaker cone to move and produce sound. The frequency (Hz) of the AC voltage signal is directly related to the frequency of the input (audio source playing) to the audio system. Both the DC bias voltage and the AC voltage signals are needed for the audio system to properly produce sound.

Diagnostic Aids

- Improper speaker mounting or loose trim may cause an audible buzz or distortion. Inspect the appropriate speaker and the surrounding interior trim for proper and secure mounting.
- The EL-50334-6 Audio System Diagnostic CD contains audio tracks that can be used to duplicate and isolate such concerns. Tracks 11 and 12 contain audio sweep tones for testing for speaker and grill rattles.
- The test tones on the CD may be copied to a USB drive or other device to use during testing.
- If the speaker or surrounding interior trim is found to be loose or improperly secured, correctly secure the item.

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Scan Tool Reference

[Control Module References](#) for scan tool information

Special Tools

EL-50334-502 USB Cable and Adapter Kit

Circuit/System Verification

1. Ignition ON, A11 Radio ON, mute OFF.
2. Verify clear audio is heard from each speaker, adjusting fade and balance controls to test each speaker individually.
3.
 - If audio is inoperative from one or more speakers, or the audio emitted is not clear
 - Refer to Circuit/System Testing.
4.
 - If clear audio is heard from all speakers
5. All OK.

Circuit/System Testing

1. Note:

Some circuits supply audio signals to more than one speaker. It may be necessary to disconnect all speakers on the affected audio circuit when performing circuit tests.
2. Ignition OFF, disconnect the harness connector at the appropriate P19 Speaker. Ignition ON, radio ON, mute OFF.
3. Test for 5â€“7â€“V between each audio signal circuit terminalâ€“1 and terminalâ€“2 and ground.
4.
 - If less than 5â€“V
5.
 1. Ignition OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Test for infinite resistance between the signal circuit and ground.
 3.
 - If less than infinite resistance, repair the short to ground on the circuit.
 4.
 - If infinite resistance
 5. Test for less than 2â€“â„“ in the signal circuit end to end.
 6.
 - If 2â€“â„“ or greater, repair the open/high resistance in the circuit.
 - If less than 2â€“â„“, replace the A11 Radio.
6.
 - If greater than 7â€“V
7.
 1. Ignition OFF, disconnect the X1 harness connector at the A11 Radio. Ignition ON.

Figure 5-11, disconnect the P11 harness connector at the A11 Radio Figure 5-11

2. Test for less than 1V between the signal circuit and ground.

3.

- If 1V or greater, repair the short to voltage on the circuit.
- If less than 1V, replace the A11 Radio.

8.

- **If between 5V–7V**

9. Note:

In the following tests, audio signal frequencies (Hz) will be tested. To prevent misdiagnosis, the door chime must be OFF during testing. Ensure the driver door latch is closed during testing.

10. Insert the EL-50334-6 Audio Test CD from the *EL-50334-502* USB cable and adapter kit. Play track number three (50 Hz bass test tone) from the test CD.

11. Test for 49–51 Hz between each signal circuit terminal 1 and terminal 2 and ground.

12.

- **If not between 49–51 Hz**
- Replace the A11 Radio.

13.

- **If between 49–51 Hz**

14. Test or replace the P19 Speaker.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

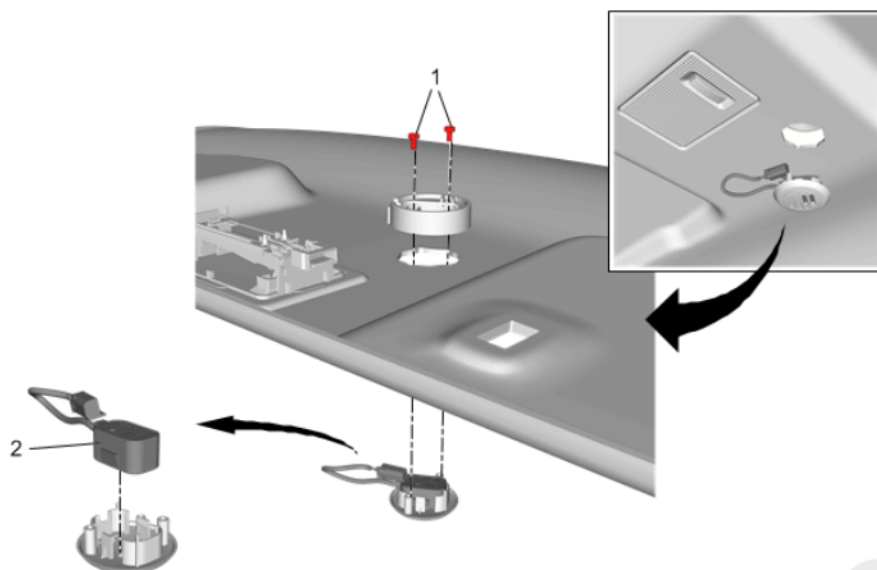
- [Speaker Replacement Reference](#)
- [Control Module References](#) for radio replacement, programming, and setup.

Repair Instructions

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Mobile Telephone Microphone Replacement



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Callout	Component Name
	Preliminary Procedure 1. Remove the sunshade. Refer to Sunshade Replacement. 2. Remove the assist handle at the passenger side. Refer to Assist Handle Replacement. 3. Remove the windshield garnish molding. Refer to Windshield Garnish Molding Replacement.
1	Mobile Telephone Microphone Fastener (Qty: 2) Caution: Refer to Fastener Caution.
2	Mobile Telephone Microphone Procedure 1. At the front of the headlining trim, lower the headlining trim gently to access the mobile telephone microphone screws. 2. Disconnect the electrical connector. 3. Remove the mobile telephone microphone with the cover from the headlining trim. 4. Remove the cover from the mobile telephone microphone assembly. 5. When installing the microphone, secure the microphone wiring harness to the headlining trim with the GM preferred adhesive tape. Refer to electronic part catalog.

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Compact Disc Care and Cleaning

Care of CDs

Handle CDs carefully. Store them in their original cases or other protective cases and away from direct sunlight and dust. The CD player scans the bottom surface of the disc. If the surface of a CD is damaged, such as cracked, broken, scratched, or wrinkled labeling, the CD will not play properly or not at all. If the surface of a CD is soiled, take a soft, lint free cloth or dampen a clean, soft cloth in a mild, neutral detergent solution mixed with water, and clean it. Make sure the wiping process starts from the center to the edge. Do not touch the bottom side of a CD while handling it. This could damage the surface. Pick up CDs by grasping the outer edges or the edge of the hole and the outer edge.

Care of CD Player

The use of CD lens cleaners for CD players is not advised, due to the risk of contaminating the internal lens of the CD optics with lubricants.

Stuck CDs

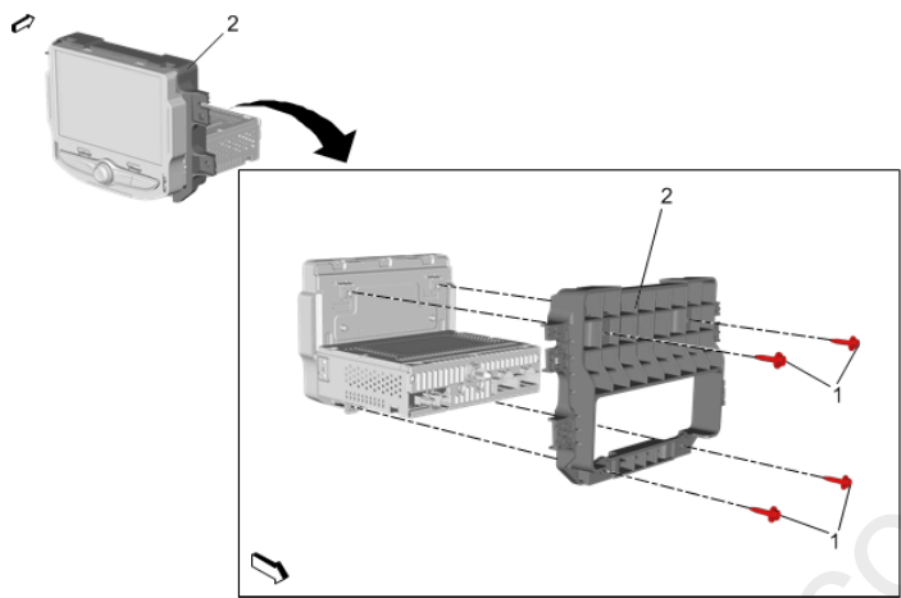
Interrupting the battery power by pulling the fuse will sometimes release a stuck CD. If a CD is stuck, and removed, inspect it for warps, cracks, etc. If the CD is damaged, do not replace the radio.

Labelling CDs

Paper labels can eventually warp and wrinkle, and this will cause the disc to jam inside the CD player. Try labeling the top of the discs with a soft magic marker instead.

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Radio Bracket Replacement (RPO IOA)

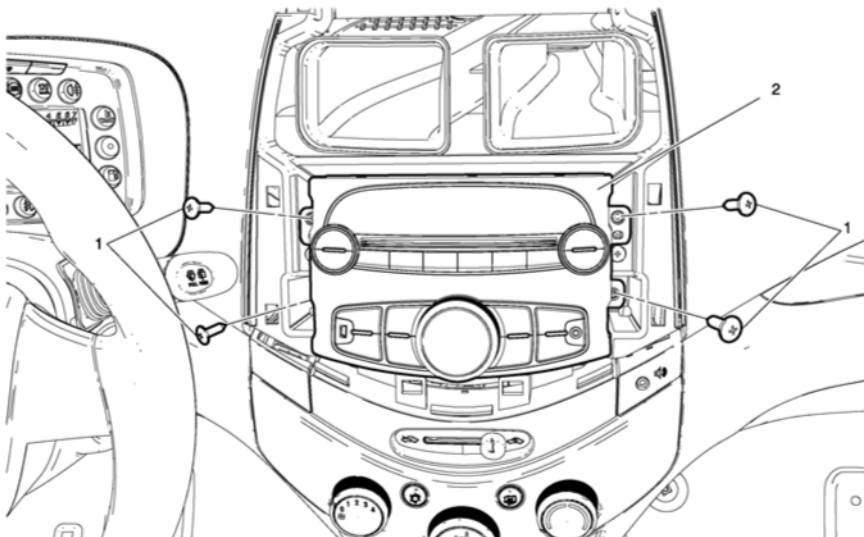


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Callout	Component Name
Preliminary Procedure	
Radio Replacement	
1>	Radio Bracket Bolt [4>x] Caution : Fastener Caution Tighten 2.5N-m (22 lb in)
2>	Radio Bracket Procedure Slide out the bracket from radio assembly.

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Radio Replacement (RPO IP1)





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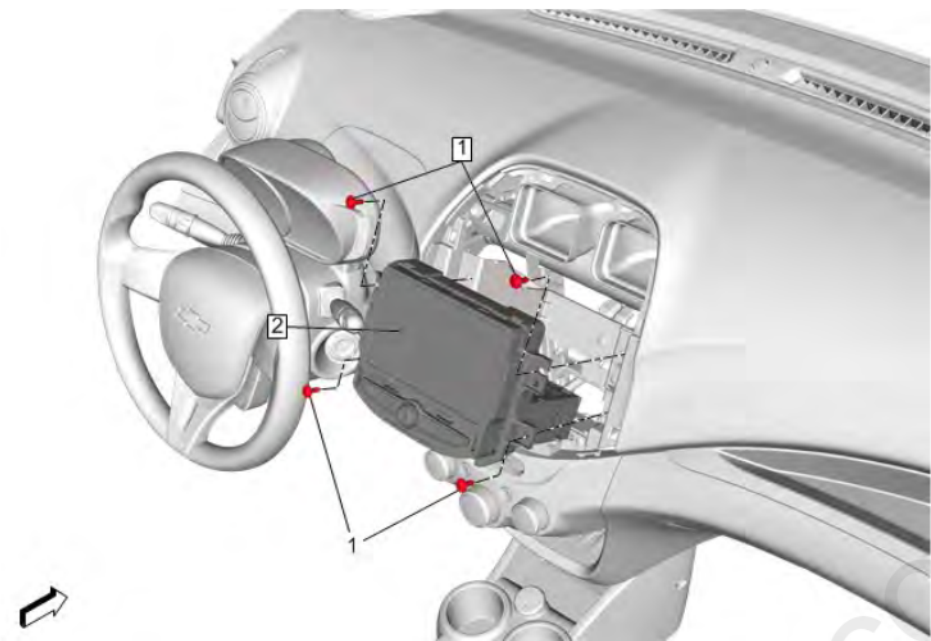
Callout	Component Name
Preliminary Procedures	
1. Disconnect the battery negative cable.	
2. Remove I/P center molding. Refer to Instrument Panel Center Molding Replacement .	
1	Radio Screw (Qty:4) Caution: Refer to Fastener Caution . Tighten 3N-m (27lb-in)

Callout	Component Name
2	Radio Assembly Procedure 1. Disconnect electrical components. 2. Remove the radio from the instrument panel.

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Radio Replacement (RPO IOA)

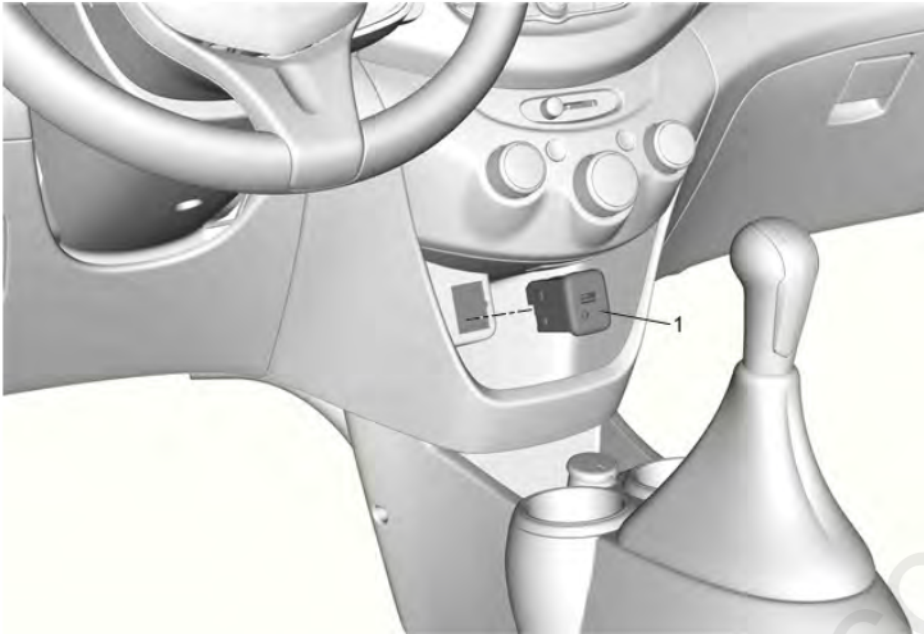


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Callout	Component Name
Preliminary Procedure	
Instrument Panel Center Molding Replacement	
1>	Radio Bolt [4>x] Caution : Fastener Caution Tighten 2>N-m (18 lb in)
2>	Radio Procedure 1. Disconnect the electrical connector. 2. If necessary, remove the radio bracket. Radio Bracket Replacement

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Audio Disc Player and USB Receptacle Replacement



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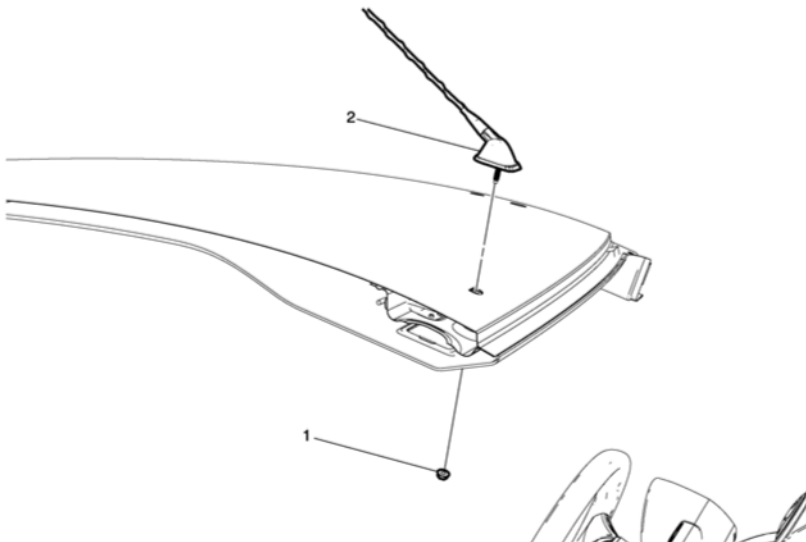
Callout	Component Name
1	Audio Disc Player and USB Receptacle
	Procedure
	Use a flat bladed plastic trim tool.

Related Part Information

Part Name	Catalog Name	Part Code
Audio Player and USB Receptacle	RECEPTACLE,AUDIO PLYR & USB	9258A

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Radio Antenna Base Replacement





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Callout	Component Name
Preliminary Procedures	
Remove the dome lamp. Refer to Dome Lamp Replacement .	
1	Radio Antenna Base Nut Caution: Refer to Fastener Caution. Tighten 3â€%N-m (27â€%lbâ€%in)
2	Radio Antenna Base Procedure 1. Disconnect electrical connector. 2. Remove the antenna base from the roof panel.

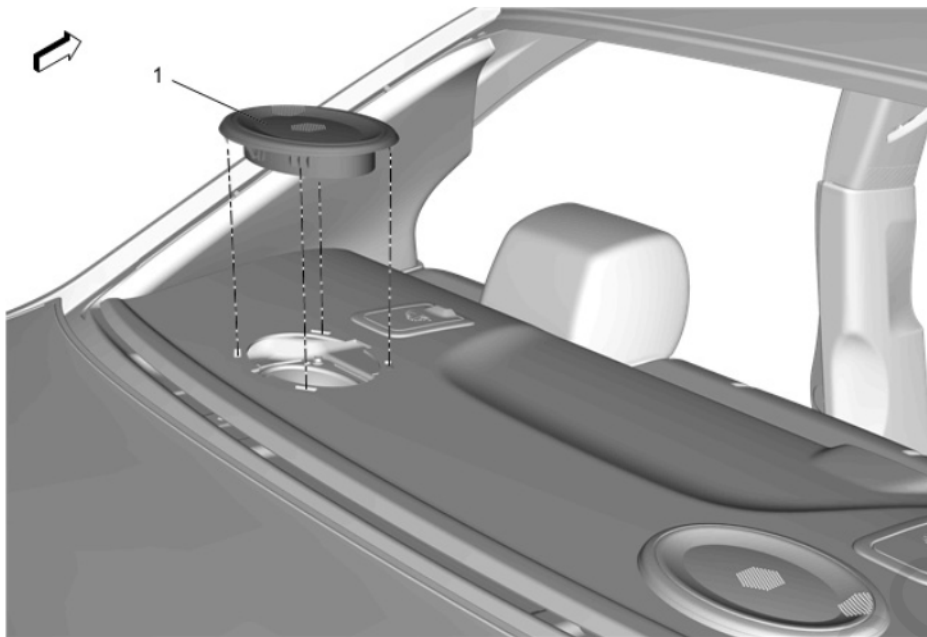
Related Part Information

Part Name	Catalog Name	Part Code
Radio Antenna Base	BASE,RDO ANT (W/O AMPF)	0921A
Radio Antenna Base	BASE,RDO ANT	0922A
Radio Antenna Base	BASE,RDO ANT (RPR)	0922H
Radio Antenna Base	BASE,RDO ANT (W/R/WDO WA NOZ)	0922M

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Radio Rear Speaker Grille Replacement



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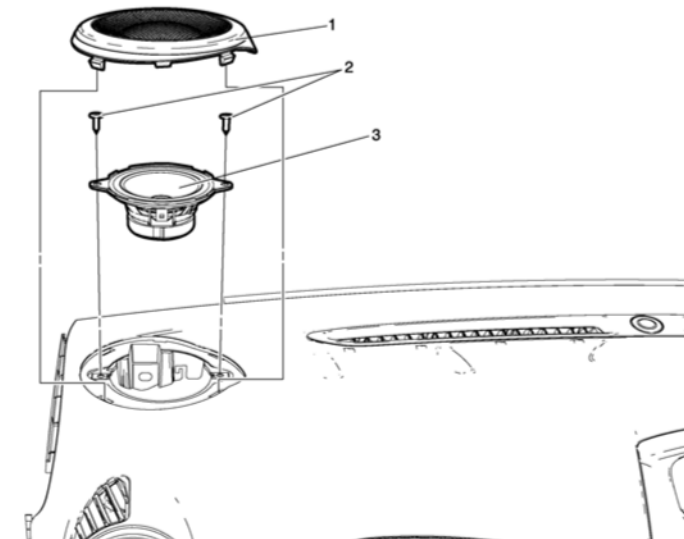
Callout	Component Name
1	Radio Rear Speaker Grille
	Procedure
	Use a flat bladed plastic tool to remove.

Related Part Information

Part Name	Catalog Name	Part Code
Radio Rear Speaker Grille	GRILLE KIT,RDO RR SPKR	0749Z
Radio Rear Speaker Grille	GRILLE,RDO RR SPKR	0750A
Radio Rear Speaker Grille	GRILLE,RDO RR SPKR	0760A

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Radio Front Speaker Replacement





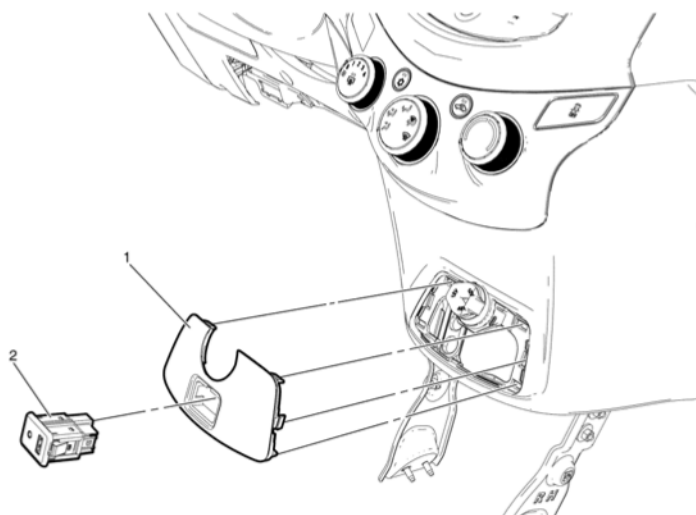
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Callout	Component Name
1	Radio Front Speaker Cover
2	Radio Front Speaker Screw (Qty: 2) Caution: Refer to Fastener Caution . Tighten 3 N-m (27 lb-in)
3	Radio Front Speaker

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USB Receptacle Replacement





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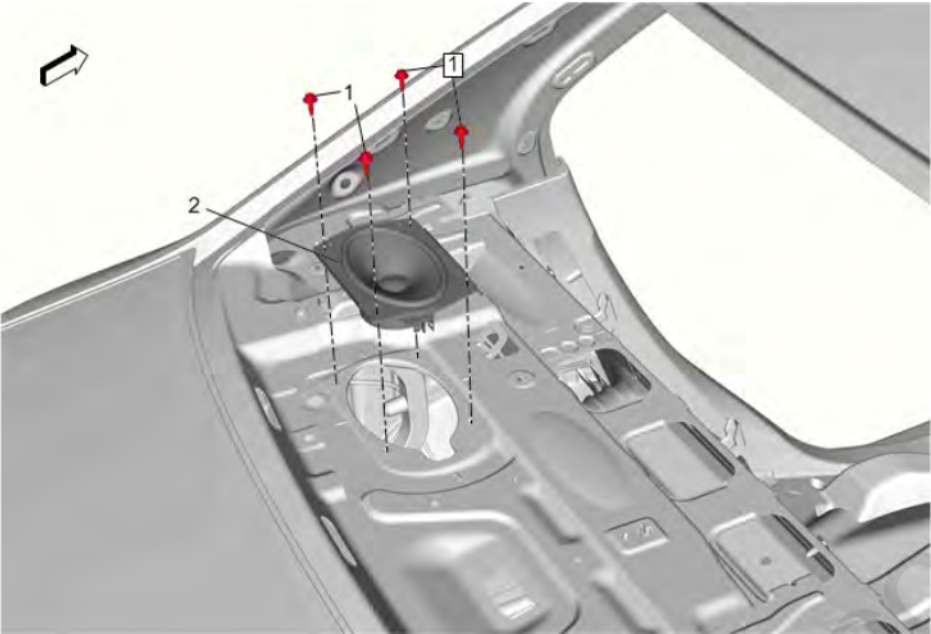
Callout	Component Name
1	USB Receptacle and Cover Procedure Remove the USB receptacle cover from the instrument panel by pushing out the tabs behind the cover.
2	USB Receptacle Procedure Remove the USB receptacle from the cover.

Related Part Information

Part Name	Catalog Name	Part Code
USB Receptacle	RECEPTACLE,USB 9262A	

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Radio Rear Speaker Replacement



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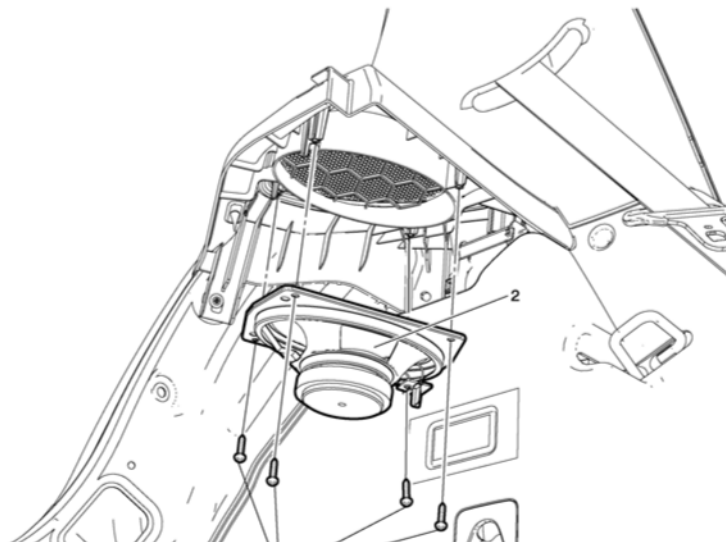
Callout	Component Name
Preliminary Procedure	
Rear Window Panel Trim Replacement	
1	Radio Rear Speaker Fastener [4>x]
	Caution:
	Refer to Fastener Caution .
	Tighten
2	2.5N-m (22 lb in)
	Radio Rear Speaker
	Procedure
Disconnect the electrical connector.	

Related Part Information

Part Name	Catalog Name	Part Code
Radio Rear Speaker	SPEAKER,RDO RR	0649Z
Radio Rear Speaker	SPEAKER,RDO RR	0650A
Radio Rear Speaker	SPEAKER,RDO RR	0650B
Radio Rear Speaker	SPEAKER,RDO RR	SJ901
Radio Rear Speaker	SPEAKER PKG,RDO RR	SS201
Radio Rear Speaker	SPEAKER PKG,RDO RR	SS077

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Radio Rear Quarter Trim Panel Speaker Replacement





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Callout	Component Name
1	Radio Rear Speaker Screw (Qty:4) Caution: Refer to Fastener Caution . Tighten 3N-m (27lb-in)
2	Radio Rear Quarter Trim Panel Speaker

Related Part Information

Part Name	Catalog Name	Part Code
Radio Rear Quarter Trim Panel Speaker	SPEAKER,RDO R/Q TR PNL 0642A	

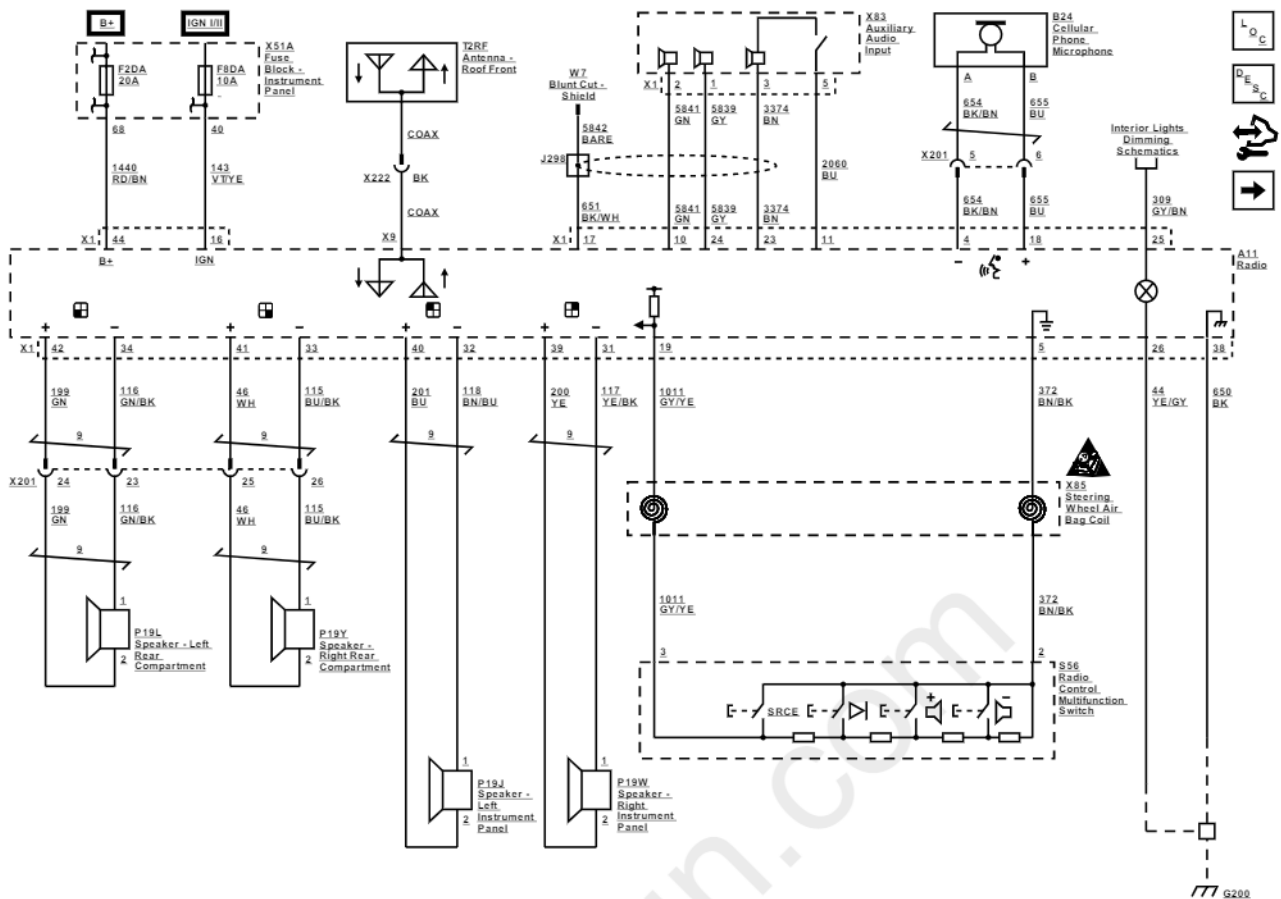
Schematic and Routing Diagrams

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Radio|Navigation System Schematics

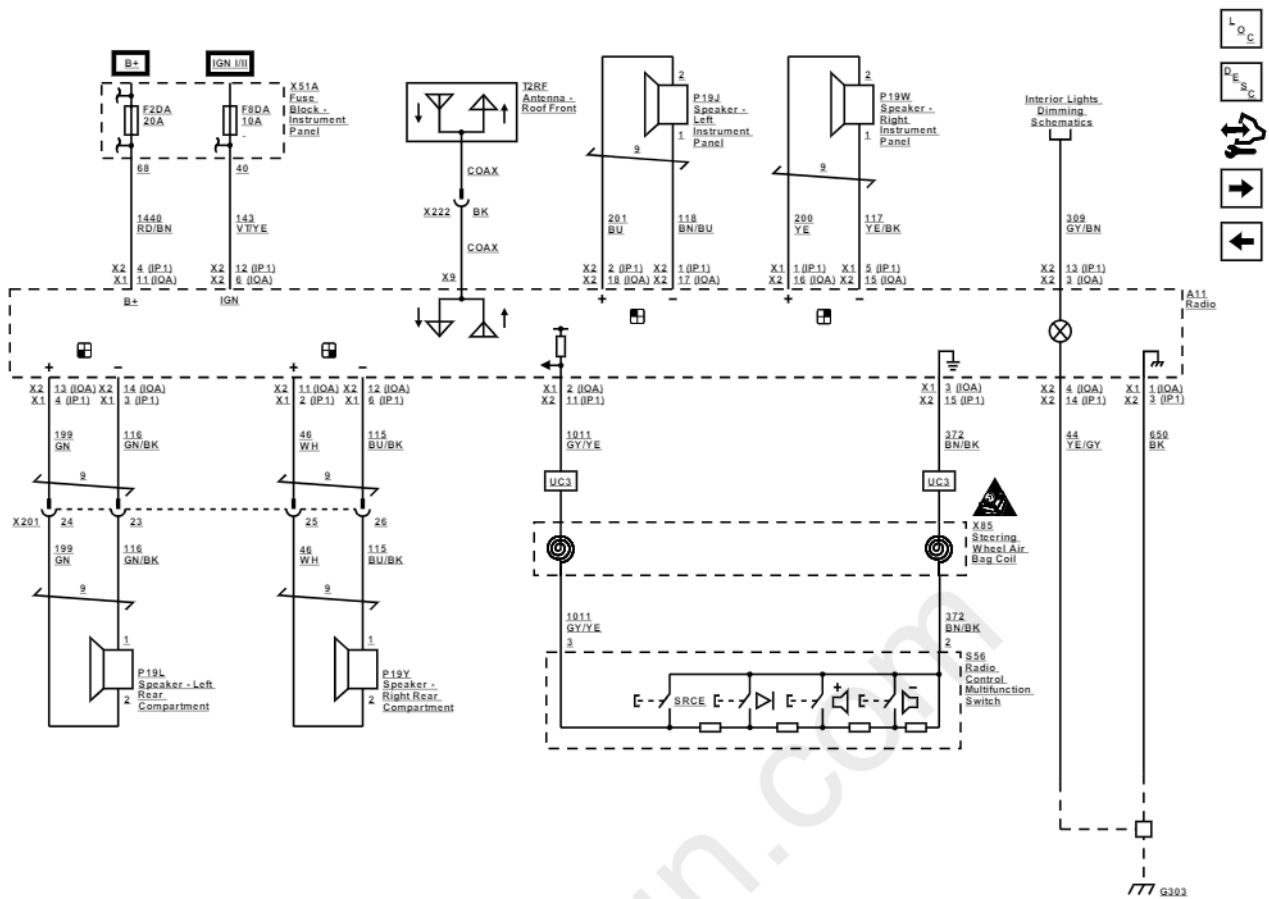
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Radio (UH7/UCH)



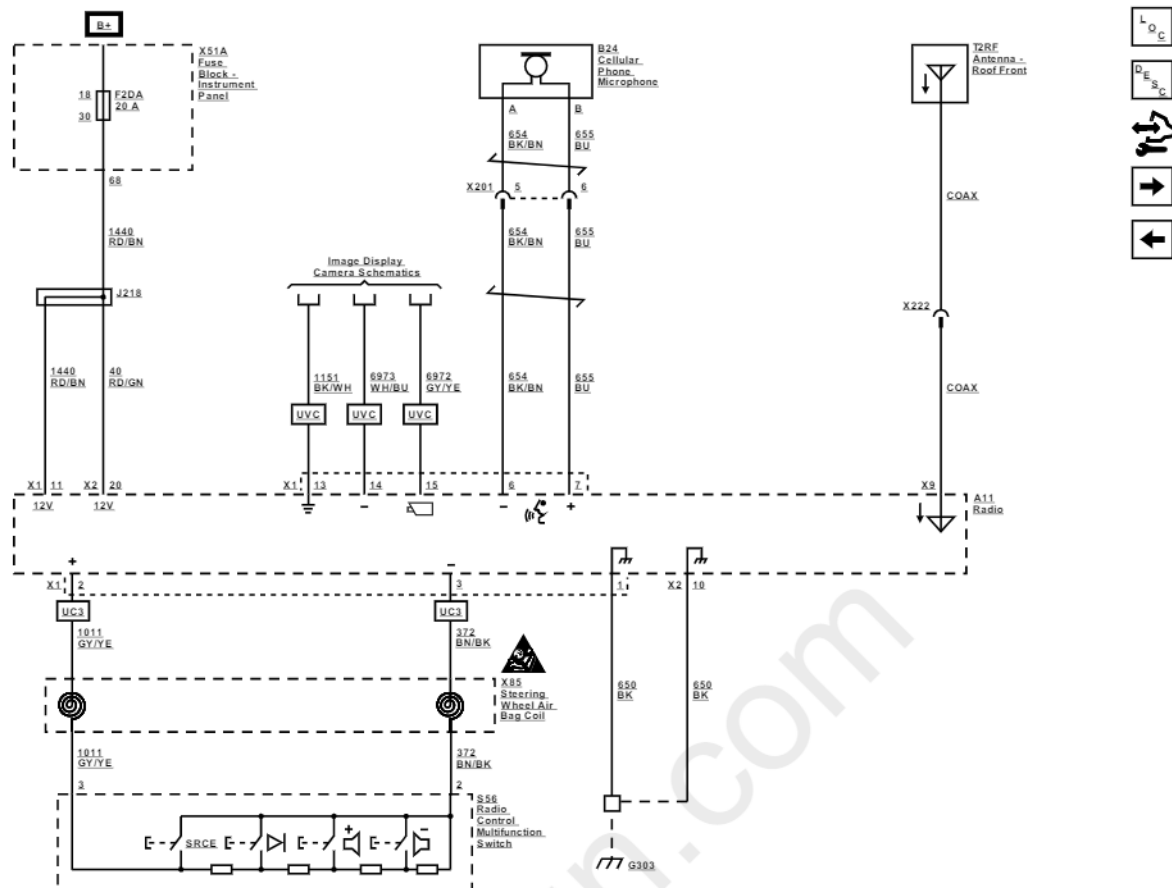
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Radio (IOA/IP1)



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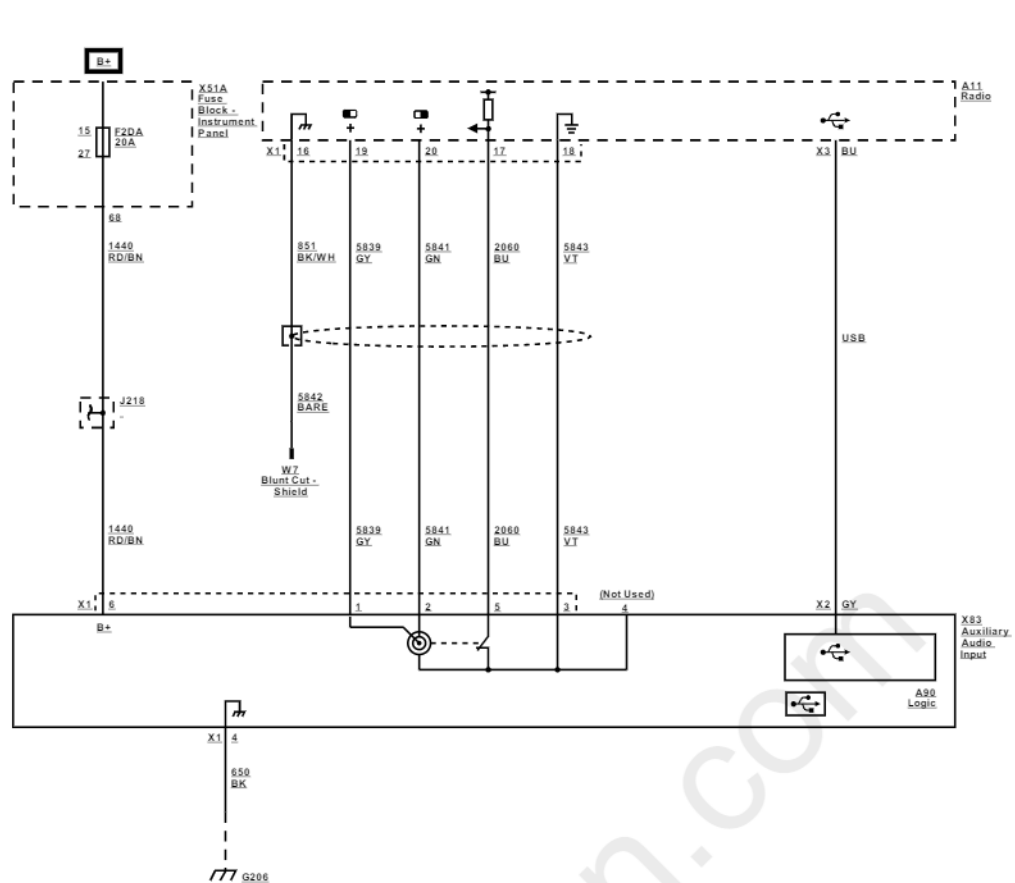
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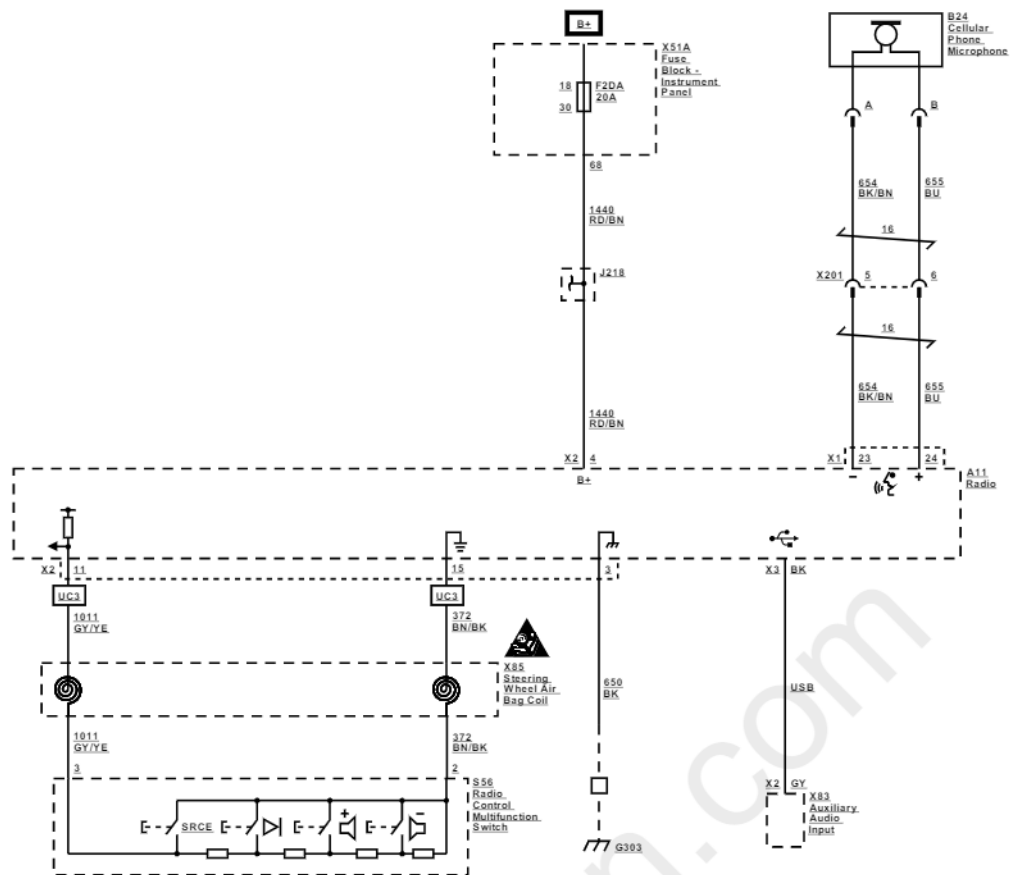


Auxiliary Inputs (IOA)



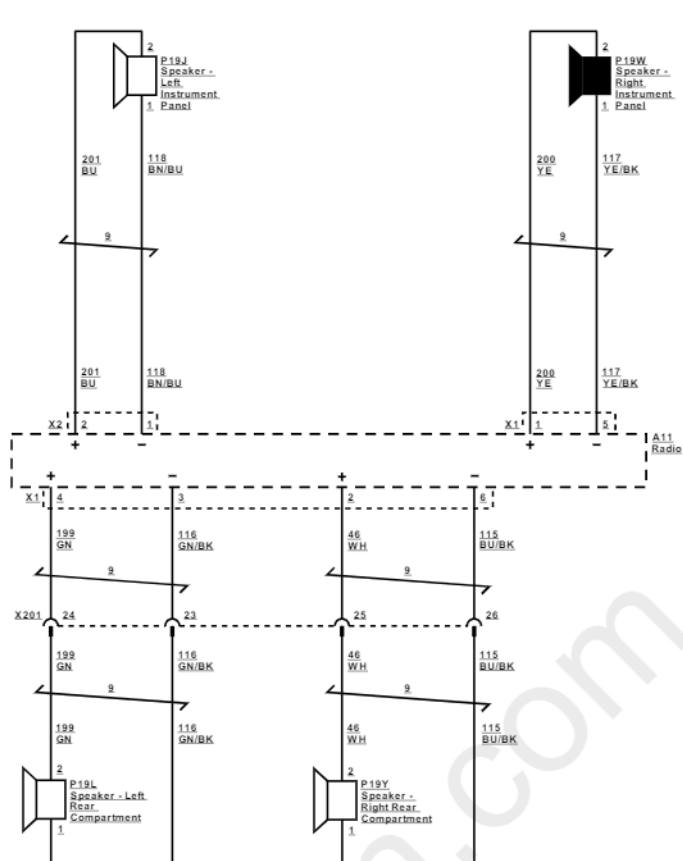
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Power, Ground, Serial Data, Microphone and Antenna (IP1)



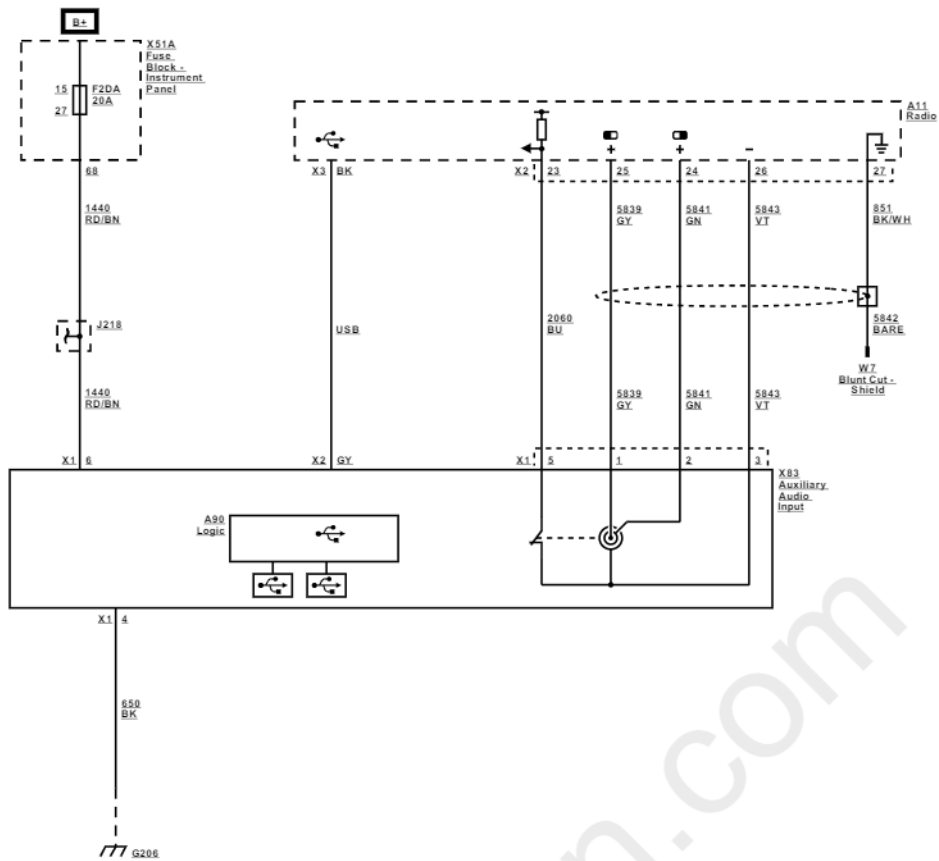
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Speakers (IP1)



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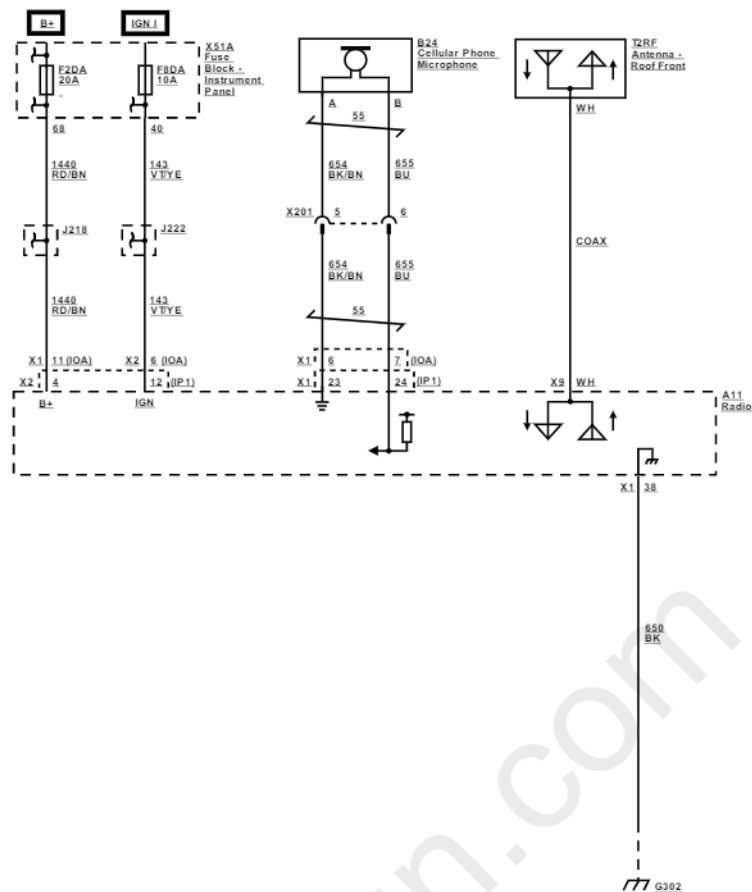
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Cellular Telephone Schematics

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Universal Handsfree Communications



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Special Tools and Equipment

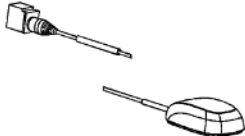
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Special Tools

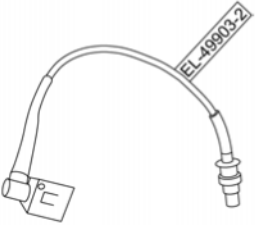
Illustration	Tool Number/Description
	ELâ€™50334â€™20 Multi-Media Interface Tester (MIT)
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Illustration	Tool Number/Description
	ELâ€™50334â€™50 USB Cable and Adapter Kit Click here for full size

Illustration	Tool Number/Description
	EL-48028 Digital Radio Test Antenna
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Illustration	Tool Number/Description
	EL-49903â€™1 Test Antenna, Navn-Cell Conn Click here for full size

Illustration	Tool Number/Description
	EL-49903â€™2 Adapter Cable-UHF RT Angle
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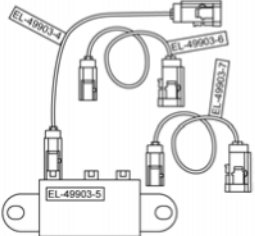
Illustration	Tool Number/Description
	EL-49903â€™3A Combiner Kit, Test Antenna Click here for full size

Illustration	Tool Number/Description
	EL-50334â€™12 Infotainment Test Cable â€™ RSE
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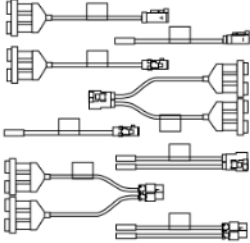
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Illustration	Tool Number/Description
	EL-50334â€™13 Infotainment Test Cable â€™ RSE Splitter Click here for full size

Illustration	Tool Number/Description
	EL-50334 Infotainment Test Cable

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Illustration	Tool Number/Description
	EL-52552 COAX FAKRA Cable Adapter Kit
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Special Tools (MIT Tool Instructions)

Bluetooth Pairing for Vehicles with Radio RPO: UF7

Either reset the pin code on the radio to 0000, or go under Device Info on the radio and see what the pin code is (to enter it later on the MIT).

1. Turn the BT discoverable ON in the radio Bluetooth settings.
2. Press Pair Device on radio (DO NOT PRESS SEARCH BLUETOOTH DEVICES ON THE RADIO).
3. Press the Pair button on the MIT.
4. When the three LED lights begin flashing on the MIT, enter the pin code (either 0000 if you reset it to that or what the radio pin code was).
5. MIT will then automatically connect with the radio and should show "MIT Connected" message.
6. Make test call and the audio streaming test.

Holden Radio Bluetooth Pairing Instructions

1. Using the radio controls, place the radio into "Discoverable Mode".
2. Place the MIT into Bluetooth mode by pressing TEST SELECTOR until the Bluetooth LED is illuminated.
3. With the MIT in Bluetooth mode Press and Release the #1 button (the Bluetooth LED will begin to slowly blink).
4. Now Press and release the PAIR/CALL button on the MIT (the Bluetooth LED will begin to blink a little faster).
5. On the radio Enter the PASSKEY when prompted: (press "0000" then Press "OK").
6. The MIT and radio will PAIR and CONNECT (the Bluetooth LED will be Fast Flashing).
7. Use as regular MIT at this point.

For all other Radios

Testing the Bluetooth Function

1. Verify connection of the MIT to the USB port.
2. Press and release the TEST SELECTOR button until the Bluetooth LED illuminates.
3. Disable all other Bluetooth devices present in the vehicle (ie. cell phones, laptops, etc.).

Standard Bluetooth Pairing/Bonding

1. Use the vehicle controls to place the radio into Bluetooth Pairing mode. The vehicle will prompt you with a security code.
2. Press and release the PAIR/CALL button. The Bluetooth LED will blink slowly while preparing to have a security code entered.
3. Wait for the all three LEDs to blink confirming it is ready to have the security code entered.
4. Enter the code with the MIT keypad and hit ENTER.
5. The Bluetooth LED will blink slowly while pairing/bonding and move to a quick flash once paired/bonded.
6. The vehicle should confirm pairing/bonding is complete.

Streaming Audio

1. Confirm pairing/bonding is complete " the Bluetooth LED will be in a quick flash mode.
2. On some radios the MIT automatically begins streaming audio via A2DP. The audio playback will confirm that the Bluetooth connection using streaming and the audio is working correctly.

3. On other radios you will need to select Bluetooth Audio from the Source menu to verify Audio Streaming.
4. Audio playback confirms that the Bluetooth connection using Streaming Audio is working correctly.
5. Placing a test call will temporarily stop the streaming audio function, but upon disconnection of that test call,
6. the streaming audio from the MIT will resume.

To Place a Test Call

1. Confirm pairing/bonding is complete – the Bluetooth LED will be in a quick flash mode. If the vehicle is equipped with streaming audio, and the radio is set to play a Bluetooth audio file, the streaming audio playback will be audible.
2. Press and release PAIR/CALL button to place a test call. Streaming audio will be temporarily turned off.
3. Use the vehicle controls to answer the call.
4. Note:

If the call is not answered within several rings, the MIT's audio files will not transmit, even though an active call is occurring.

5. Audio playback confirms that the Bluetooth connectivity is working correctly.
6. Note:

The MIT will remain paired/bonded when the call is ended by the vehicle. To re-test the call function, place the MIT in Bluetooth mode and press and release the Pair button to reconnect. When testing is completed, delete MIT from the audio system before returning the vehicle to the customer.

7. Use the vehicle controls to end the call. If applicable, streaming audio will resume.

Testing the AUX/Line-In Function

1. Verify connection of the MIT as stated above.
2. Press and release the TEST SELECTOR button until the MIT AUX LED illuminates.
3. Use the vehicle controls to put the audio system into Audio (Line-In) mode.
4. Audio playback confirms that the audio input is working correctly.

Testing the USB Function

1. Verify connection of the MIT as stated above.
2. Press and release the TEST SELECTOR button until the MIT USB LED illuminates.
3. Use the vehicle controls to put the audio system into USB mode.
4. Note:

Volume levels may vary dependent upon vehicle audio system.

5. Audio playback confirms that the USB is working correctly.

Troubleshooting Guide

If the MIT unit is still not working properly after following the below troubleshooting, the unit is malfunctioning and should be repaired or replaced.

Unit not Working

- Verify the MIT is powered on correctly as indicated by the green Power LED.
- If Power LED is not illuminated, verify USB power source is working properly.
- If USB power adapter is being used to power the MIT, check and, if necessary, replace the fuse in adapter.

Problem with Aux/Line-In Test

- Verify Aux/Line-In test cable is inserted properly into the vehicle audio input jack. Verify the MIT is in Aux/Line-In mode as indicated by the red AUX LED.

- Verify the vehicle audio system is in Auxiliary or Line-in mode. Verify the vehicle audio system volume is turned up and not in mute mode.

Problem with USB Test

- Verify MIT is in USB mode as indicated by the red USB LED. Verify the vehicle audio system is in USB mode.
- Verify the vehicle audio system volume is turned up and not in mute mode.

Problem with Bluetooth Pairing

- Delete previous devices stored in the device list of the radio and then pair the MIT
- Remove USB cable, and then reconnect to reset the MIT. Carefully follow the bonding instructions for the correct Passkey procedure.

Problem with Bluetooth Test Call Audio

- Verify the MIT is paired with the vehicle. This is indicated by the quick flashing Bluetooth LED.
- Audio system should have indicated the MIT is bonded.

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