

2018 ACCESSORIES & EQUIPMENT

Cellular, Entertainment, And Navigation - Diagnostic Information And Procedures - Equinox & Terrain

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B0560: ENGINE RPM INPUT CIRCUIT SIGNAL INVALID

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B0560 08

Engine RPM Input Circuit Signal Invalid

Circuit/System Description

The Radio receives a discrete pulse-width modulated engine speed signal from the Engine Control Module. The Radio uses the engine RPM signal for operating active noise cancellation.

Conditions for Running the DTC

- Engine running, Radio ON
- Battery voltage between 9 - 16 volts.

Conditions for Setting the DTC

- The Radio receives a serial data message that the engine is running.
- The discrete engine speed signal to the Radio indicates the engine speed is less than 300 RPM or greater than 9000 RPM.

Action Taken When the DTC Sets

The active noise cancellation system is disabled.

Conditions for Clearing the DTC

- A current DTC clears when a valid engine speed signal between 300 - 9000 RPM is received.
- A history DTC clears when the ignition cycle counter reaches the reset threshold without a repeat of the malfunction.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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

NOTE: **Diagnose any Engine Control Module DTCs before performing this diagnostic.**

1. Ignition OFF, disconnect the X1 harness connector at the A11 Radio.
2. Engine running at 600 RPM,
3. Test for 575-800 Hz AC between the signal circuit terminal 23 and ground.
 - **If not between 575-800 Hz AC**
 1. Ignition OFF, disconnect the harness connector at the K20 Engine Control Module. Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF.
 4. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 5. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K20 Engine Control Module.
 - **Go to next step: If between 575-800 Hz AC**
4. Test or replace the A11 Radio.

Repair Instructions

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

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

DTC B0997: AUXILIARY ELECTRONIC CONTROL UNIT PERFORMANCE

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B0997 3A

Auxiliary Electronic Control Unit Performance Incorrect Component Installed

Auxiliary Electronic Control Unit Performance Internal Electronic Failure**Circuit/System Description**

The Info Display Module monitors itself for internal failures and reports its condition to the Human Machine Interface Control Module when requested. The info display also reports electronic identification information when requested.

Conditions for Running DTC

- Ignition On/Vehicle in Service Mode.
- The system voltage is 9-16 V
- DTC B101E is not set as current in the Human Machine Interface Control Module
- The test is run once during Human Machine Interface Control Module wake up

Conditions for Setting the DTC**B0997 3A**

The Info Display Module has reported identification information that differs from the information calibrated in the Human Machine Interface Control Module.

B0997 39

The Info Display Module reports an internal malfunction.

Action Taken When DTC Sets

The Human Machine Interface Control Module will set the DTC and the Info Display Module will have limited or no functionality.

Conditions for Clearing the DTC

The Human Machine Interface Control Module detects a compatible Info Display Module with no internal malfunctions reported.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

Electrical Information Reference

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

Scan Tool Reference

Circuit/System Verification

1. Ignition On/Vehicle in Service Mode. Infotainment system ON.
2. Verify DTC B101E is not set
 - **If DTC B101E is set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If DTC B101E is not set**
3. Verify DTC B0997 is not set
 - **If DTC B0997 is set**

Replace the P17 Info Display Module.
 - **Go to next step: If DTC B0997 is not set**
4. All OK

Repair Instructions

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

Refer to [Radio Control Assembly Replacement \(Equinox\)](#), [Radio Control Assembly Replacement \(Terrain\)](#).

DTC B1024: CIRCUIT BOARD TEMPERATURE SENSOR

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B1024

Circuit Board Temperature Sensor

Symptom Byte Information: [Symptom Byte List](#)

Circuit/System Description

The internal module circuitry temperature is monitored. If the an over-heat condition which exceeds the maximum threshold of the internal circuitry or a malfunctioning temperature sensor is detected, the module will shut down until the internal circuitry cools.

Conditions for Running the DTC

- The radio is in the ON or ACCY position
- The system voltage is at least 9 volts and no more than 16 volts.

Conditions for Setting the DTC

The module detects an over-heat condition or a malfunctioning sensor.

Action Taken When the DTC Sets

Module functionality is suspended.

Conditions for Clearing the DTC

- A current DTC clears when the module temperature returns to an acceptable level.

- A history DTC clears after 100 malfunction-free ignition cycles.

Diagnostic Aids

Extended use of extremely high volume, especially in warm weather conditions, may cause this DTC to set in the Control module. Under these conditions, it may be normal for this DTC to set to prevent permanent damage to the Control module circuitry and no repair should be attempted.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

Electrical Information Reference

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

Circuit/System Verification

NOTE: Allow the vehicle cabin to cool if the temperature inside the vehicle is excessive before proceeding with this diagnostic procedure.

1. Verify the DTC sets outside of the Conditions for Running and Setting. Since most occurrences of this DTC are caused by extreme vehicle cabin temperatures due to ambient conditions, review with the customer the conditions under which the DTC set.

- **If the DTC sets within the Conditions for Running and Setting.**

The system is operating as designed, All OK.

- **Go to next step: If the DTC sets outside the Conditions for Running and Setting.**

2. Using the scan tool, clear the DTC.

3. Verify the DTC does not set while operating the infotainment system under the conditions the customer experienced the concern.

- **If the DTC sets**

Replace the appropriate module.

- **Go to next step: If the DTC does not set**

4. All OK.

Repair Instructions

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

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

DTC B1025, B1035, B1045 OR B1055: AUDIO OUTPUT CIRCUITS (WITHOUT UQA/UZ6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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.

B1025 02, B1035 02, B1045 02, B1055 02

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

B1025 04, B1035 04, B1045 04, B1055 04

The radio detects an open on the specified audio (+) or (-) 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 Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#)

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.
 - **If audio is inoperative from one or more speakers, or the audio emitted is not clear.**
Refer to Circuit/System Testing.
 - **Go to next step: If clear audio is heard from all speakers.**
3. All OK.

Circuit/System Testing

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.

1. Ignition OFF/vehicle OFF, disconnect the harness connector at the appropriate P19 Speaker. Ignition ON, A11 Radio ON, mute OFF.
2. Test for 5 - 7 V between each audio signal circuit terminal 1 and terminal 2 and ground.
 - **If less than 5 V**
 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.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **If greater than 7 V**
 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 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **Go to next step: If between 5 - 7 V**
3. Test or replace the P19 Speaker.

Repair Instructions

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

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

DTC B1025, B1045, B1065, B1075, B1085, B1095 OR B1105: AUDIO OUTPUT CIRCUITS (UQA WITH IO5/IO6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1025

Audio Output 1 Circuit

DTC B1045

Audio Output 3 Circuit

DTC B1065

Audio Output 5 Circuit

DTC B1075

Audio Output 6 Circuit

DTC B1085

Audio Output 7 Circuit

DTC B1095

Audio Output 8 Circuit

DTC B1105

Audio Output 9 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
Audio Output 1 Signal Circuits (Left Front Door)	B1025 02	B1025 04	B1025 01	-
Audio Output 3 Signal Circuits (Right Front Door)	B1045 02	B1045 04	B1045 01	-
Audio Output 5 Signal Circuits (Left Rear Door)	B1065 02	B1065 04	B1065 01	-
Audio Output 6 Signal Circuits (Right Rear Door)	B1075 02	B1075 04	B1075 01	-
Audio Output 7 Signal Circuits (Left Front Tweeter)	B1085 02	B1085 04	B1085 01	-
Audio Output 8 Signal Circuits (Right Front Tweeter)	B1095 02	B1095 04	B1095 01	-
Audio Output 9 Signal Circuits (Center I/P)	B1105 02	B1105 04	B1105 01	-

Circuit/System Description

The Media Oriented Systems Transport (MOST) is a high-speed multimedia network technology. The serial MOST bus uses a ring topology and synchronous data communication to transmit audio, video, data and control information between any devices attached.

The audio amplifier is a participant on the MOST network. The audio amplifier receives audio inputs and control information from the MOST bus.

Each of the audio output channel circuits (+) and (-), at the audio amplifier have a DC bias voltage that is approximately one half of the battery voltage. When using a DMM, each of the audio output channel circuits will measure approximately 6.5V 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.

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.

If the speaker or surrounding interior trim is found to be loose or improperly secured, correctly secure the item.

- The test tones on the CD may be copied to a USB drive or other device to use during testing.
- Some audio output circuits are connected to more than one speaker, dependant on vehicle equipment. It may be necessary to disconnect one or more speakers during testing of some circuits.

Conditions for Running the DTC

NOTE: DTC B1325 must not be set as current for the amplifier to run any of the following tests.

DTC B1025 01, B1045 01, B1065 01, B1075 01, B1085 01, B1095 01, B1105 01

The test is run initially upon amplifier wake-up, and periodically every one second after amplifier operation begins.

DTC B1025 02, B1045 02, B1065 02, B1075 02, B1085 02, B1095 02, B1105 02

The test is run initially upon amplifier wake-up, and periodically every one second after amplifier operation begins.

DTC B1025 04, B1045 04, B1065 04, B1075 04, B1085 04, B1095 04, B1105 04

The test is run once during amplifier wake-up.

Conditions for Setting the DTC

DTC B1025 01, B1045 01, B1065 01, B1075 01, B1085 01, B1095 01, B1105 01

A short to voltage is detected on the specified (+) or (-) signal circuit

DTC B1025 02, B1045 02, B1065 02, B1075 02, B1085 02, B1095 02, B1105 02

A short to ground is detected on the specified (+) or (-) signal circuit

DTC B1025 04, B1045 04, B1065 04, B1075 04, B1085 04, B1095 04, B1105 04

An open is detected on the specified (+) or (-) signal circuit

Action Taken When the DTC Sets

The amplifier mutes the output channel and no sound is present from the speaker(s) that have a current circuit fault.

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.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

COMPONENT CONNECTOR END VIEWS - INDEX

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-50334-50 USB Cable and Adapter Kit

Circuit/System Verification

1. Ignition ON, infotainment system ON, mute OFF.
2. Verify clear audio is heard from each speaker, adjusting fade and balance controls to test each speaker individually.
 - **If audio is inoperative from one or more speakers, or the audio emitted is not clear**
Refer to Circuit/System Testing.
 - **Go to next step: If clear audio is heard from all speakers**
3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate P19 Speaker. Ignition ON, infotainment system ON, mute OFF.
2. Test for 5 - 7 V between each audio signal circuit terminal 1 and terminal 2 and ground.
 - **If less than 5 V**
 1. Ignition OFF, disconnect the X1 and X2 harness connectors at the T3 Audio Amplifier.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the T3 Audio Amplifier.
 - **If greater than 7 V**
 1. Ignition OFF, disconnect the X1 and X2 harness connectors at the T3 Audio Amplifier. Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the T3 Audio Amplifier.
 - **Go to next step: If between 5 - 7 V**
3. Test or replace the P19 Speaker.

Repair Instructions

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

- Refer to [Speaker Replacement Reference](#)

- Refer to [Control Module References](#) for amplifier replacement, programming, and setup.

DTC B1025, B1035, B1045 OR B1055: AUDIO OUTPUT CIRCUITS (UZ6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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

- 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.

B1025 02, B1035 02, B1045 02, B1055 02

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

B1025 04, B1035 04, B1045 04, B1055 04

The radio detects an open on the specified audio (+) or (-) 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 replicates the high level audio signals from the radio to the speakers. If the module malfunctions, all the speakers may become inop.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), **[Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#)**, **[Radio/Navigation System Wiring Schematics \(IOR\)](#)**, **[Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)**.

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), **[Radio/Audio System Description and Operation \(IOB\)](#)**, **[Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#)**, **[Radio/Audio System Description and Operation \(IOR\)](#)**.

Electrical Information Reference

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

Scan Tool Reference

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.
 - **If audio is inoperative from one or more speakers but not all.**

Refer to Circuit/System Testing One Speaker.
 - **If audio is Inoperative from all speakers .**

Refer to Circuit/System Testing All Speakers.
 - **Go to next step: If clear audio is heard from all speakers.**
3. All OK.

Circuit/System Testing

One Speaker

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.

1. Ignition OFF, disconnect the harness connector at the appropriate P19 Speaker. Ignition ON, A11 Radio ON, mute OFF.
2. Test for 5 - 7 V between each audio signal circuit terminal 1 and terminal 2 and ground.
 - **If less than 5 V**
 1. Ignition OFF, disconnect the appropriate harness connector at the K108 Active Noise Cancellation Module/T3 Audio Amplifier.
 2. Test for infinite resistance between the appropriate signal circuits and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K108 Active Noise Cancellation Module/T3 Audio Amplifier.
 - **If greater than 7 V**
 1. Ignition OFF, disconnect the appropriate harness connector at the K108 Active Noise Cancellation Module/T3 Audio Amplifier.
 2. Ignition ON, A11 Radio ON, mute OFF. Test for less than 1 V between the appropriate signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K108 Active Noise Cancellation Module/T3 Audio Amplifier.
 - **Go to next step: If between 5 - 7 V**
3. Ignition OFF, disconnect the appropriate harness connector at the K108 Active Noise Cancellation Module/T3 Audio Amplifier.
4. Ignition ON, A11 Radio ON, mute OFF. Test for 5 - 7 V between each appropriate audio signal circuit from the A11 Radio and Ground.
 - **If less than 5 V**
 1. Ignition OFF, Disconnect the appropriate speaker harness connector at the A11 Radio.
 2. Test for infinite resistance between the signal circuits and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **If greater than 7 V**
 1. Ignition OFF, disconnect the appropriate speaker harness connector at the A11 Radio. Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **Go to next step: If between 5 - 7 V**
5. Test or replace the P19 Speaker.

All Speakers

1. Ignition OFF, disconnect the X1 harness connector at the K108 Active Noise Cancellation Module/T3 Audio Amplifier.
2. Test for less than 10 Ω between the ground circuit terminal 8 and ground.
 - **If 10 Ω or greater**
 1. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
3. Verify that a test lamp illuminates between the B+ circuit terminal 4 and ground.
 - **If the test lamp does not illuminate**
 1. Remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - **Go to next step: If the test lamp illuminates**
4. Ignition ON, A11 Radio ON.
5. Verify that a test lamp illuminates between the control circuit terminal 3 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **Go to next step: If the test lamp illuminates**
6. Test for 5 - 7 V between any audio signal circuit from the A11 Radio and Ground.
 - **If not between 5 - 7 V**

Test or replace the A11 Radio.
 - **Go to next step: If between 5 - 7 V**
7. Test or replace the K108 Active Noise Cancellation Module/T3 Audio Amplifier.

Repair Instructions

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

- Refer to [Speaker Replacement Reference](#)

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

DTC B1025, B1045, B1065, B1085, B1095, B1105 OR B1115: AUDIO OUTPUT CIRCUITS (UQA WITH IOS/IOT/IOU)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1025

Audio Output 1 Circuit

DTC B1045

Audio Output 3 Circuit

DTC B1065

Audio Output 5 Circuit

DTC B1085

Audio Output 7 Circuit

DTC B1095

Audio Output 8 Circuit

DTC B1105

Audio Output 9 Circuit

DTC B1115

Audio Output 10 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
Audio Output 1 Signal Circuits (Left Front Door)	B1025 02	B1025 04	B1025 01	-
Audio Output 3 Signal Circuits (Right Front Door)	B1045 02	B1045 04	B1045 01	-
Audio Output 5 Signal Circuits (Center I/P)	B1065 02	B1065 04	B1065 01	-
Audio Output 7 Signal Circuits (Left Rear Door)	B1085 02	B1085 04	B1085 01	-
Audio Output 8 Signal Circuits (Right Rear Door)	B1095 02	B1095 04	B1095 01	-
Audio Output 9 Signal Circuits (Left Front I/P)	B1105 02	B1105 04	B1105 01	-
Audio Output 10 Signal Circuits (Right Front I/P)	B1115 02	B1115 04	B1115 01	-

Circuit/System Description

Each of the audio output channel circuits (+) and (-), at the audio amplifier have a DC bias voltage that is approximately one half of the battery voltage. When using a DMM, each of the audio output channel circuits will measure approximately 6.5V 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.

If the speaker or surrounding interior trim is found to be loose or improperly secured, correctly secure the item.

- The test tones on the CD may be copied to a USB drive or other device to use during testing.
- Some audio output circuits are connected to more than one speaker, dependant on vehicle equipment. It may be necessary to disconnect one or more speakers during testing of some circuits.

Conditions for Running the DTC

NOTE: DTC B1325 must not be set as current for the amplifier to run any of the following tests.

DTC B1025 01, B1045 01, B1065 01, B1085 01, B1095 01, B1105 01, B1115 01

The test is run initially upon amplifier wake-up, and periodically every one second after amplifier operation begins.

DTC B1025 02, B1045 02, B1065 02, B1085 02, B1095 02, B1105 02, B1115 02

The test is run initially upon amplifier wake-up, and periodically every one second after amplifier operation begins.

DTC B1025 04, B1045 04, B1065 04, B1085 04, B1095 04, B1105 04, B1115 04

The test is run once during amplifier wake-up.

Conditions for Setting the DTC

DTC B1025 01, B1045 01, B1065 01, B1085 01, B1095 01, B1105 01, B1115 01

A short to voltage is detected on the specified (+) or (-) signal circuit

DTC B1025 02, B1045 02, B1065 02, B1085 02, B1095 02, B1105 02, B1115 02

A short to ground is detected on the specified (+) or (-) signal circuit

DTC B1025 04, B1045 04, B1065 04, B1085 04, B1095 04, B1105 04, B1115 04

An open is detected on the specified (+) or (-) signal circuit

Action Taken When the DTC Sets

The amplifier mutes the output channel and no sound is present from the speaker(s) that have a current circuit fault.

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.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IOS/IOT/IOU)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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-50334-50 USB Cable and Adapter Kit

Circuit/System Verification

1. Ignition ON, infotainment system ON, mute OFF.
2. Verify clear audio is heard from each speaker, adjusting fade and balance controls to test each speaker individually.
 - **If audio is inoperative from one or more speakers, or the audio emitted is not clear**
Refer to Circuit/System Testing.
 - **Go to next step: If clear audio is heard from all speakers**
3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate P19 Speaker. Ignition ON, infotainment system ON, mute OFF.
2. Test for 5 - 7 V between each audio signal circuit terminal 1 and terminal 2 and ground.
 - **If less than 5 V**
 1. Ignition OFF, disconnect the X1 and X2 harness connectors at the T3 Audio Amplifier.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the T3 Audio Amplifier.
 - **If greater than 7 V**
 1. Ignition OFF, disconnect the X1 and X2 harness connectors at the T3 Audio Amplifier. Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the T3 Audio Amplifier.
 - **Go to next step: If between 5 - 7 V**
3. Test or replace the P19 Speaker.

Repair Instructions

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

- Refer to [Speaker Replacement Reference](#)
- Refer to [Control Module References](#) for audio amplifier replacement, programming, and setup.

DTC B123E: RADIO KEYPAD BUTTON SIGNAL CIRCUIT

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

DTC Descriptor

DTC B123E

Radio Keypad Button Signal Circuit

Symptom Byte Information: [Symptom Byte List](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	B123E 02	B123E 01	B123E 01	-
Ground Return Terminal 2	-	1	-	-
Low Reference Terminal 8	-	1	-	-
1. Radio Control buttons inoperative				

Circuit/System Description

The radio controls communicate radio control inputs directly to the radio through a discrete circuit for volume up, volume down and power button. It also uses a series of resistors through a signal circuit when the home, seek up, seek down and phone buttons are pressed. After receiving the message the radio will perform the requested function. Messages communicated between the radio and the radio controls include the following:

- Button presses/knob rotations
- Commands for the state of indicators
- Controls back-lighting

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 infotainment system is ON
- The test is run once every 250 ms when the infotainment system is operating

Conditions for Setting the DTC

B123E 01

The radio detects an open/high resistance or short to voltage on the radio controls key signal circuit

B123E 02

The radio detects a short to ground on the radio controls key signal circuit

Actions Taken When the DTC Sets

Radio control buttons will be inoperative

Conditions for Clearing the DTC

The condition for setting the DTC is no longer detected for 250 ms.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

Electrical Information Reference

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

Scan Tool Reference

Control Module References

Circuit/System Verification

1. Ignition On/vehicle in Service Mode.
2. Verify that each button on the A22 radio controls operates normally by pressing each button individually.

- **If none of the buttons operate normally**

Refer to Circuit/System Testing

- **If some, but not all, of the buttons operate normally**

Test or replace the A22 radio controls

- **Go to next step: If all of the buttons operate normally**

3. All OK

Circuit/System Testing

1. Ignition OFF/vehicle OFF and all vehicle systems OFF. Disconnect the harness connector at the A22 radio controls. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10 Ω between the following circuits and ground.

- Ground return terminal 2
- Low reference terminal 8
- **If 10 Ω or greater**

1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the P17 Info Display Module.

2. Test for less than 2 Ω in the circuits end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the P17 Info Display Module

• **Go to next step: If less than 10 Ω**

3. Ignition ON/vehicle in Service Mode.

4. Test for 2.5 - 3.5 V on the signal circuit terminal 3 @ the A 22 Radio Controls and ground.

• **If less than 2.5 V**

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.

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

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

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

• **If greater than 3.5 V**

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

2. Ignition ON/vehicle in Service Mode, test for less than 1 V between the signal circuit and ground.

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

• **Go to next step: If between 2.5 - 3.5 V**

5. Test or replace the A22 Radio Controls

Repair Instructions

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

- For control module replacement, programming, and setup refer to: [Control Module References](#)

DTC B124B: USB 1 CIRCUIT (IO5/IO6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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, 2	B124B, 1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
USB Cable	B124B	B124B	B124B	-
Ground	-	1	-	-
1. Fault may affect one or more components, dependant on fault location 2. Fault affects multiple components, dependant on vehicle equipment				

Circuit/System Description

The infotainment system has a USB port and a Auxiliary Audio Input Jack located in the center console. The 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 human machine interface control module via a standard USB cable. A Mini type USB connector is used to connect the human machine interface control module and the USB receptacle. 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.

Auxiliary Audio Input Jack

When a portable audio playback device is connected to the 3.5 mm (1/8 in.) auxiliary audio input jack an internal switch opens the detection signal circuit within the hub. The HMI detects the device and AUX becomes available as an audio source. Audio signals from the device are converted from analog to digital, these signals are then sent to the HMI from the auxiliary input jack via USB.

USB Port

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 switches to USB as the 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 On/Vehicle in Service Mode.
- The system voltage is 9-16 V
- The infotainment system is ON
- The test is run once per second when the infotainment system is operating

Conditions for Setting the DTC

B124B 0B

The human machine interface control module detects an excessive current condition on the USB 5 V circuit.

B124B 04

The human machine interface control module does not detect the vehicle hub device.

B124B 11

The human machine interface control module detects an additional hub device attached to the vehicle USB port.

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 Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

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.

- **If DTC B124B is set.**

Refer to Circuit/System Testing.

- **Go to next step: If DTC B124B is not set.**

2. Ignition On/Vehicle in Service Mode. Infotainment system ON.
3. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
4. 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.

- **If audio is not heard from the test tool**

Refer to Circuit/System Testing

- **Go to next step: If audio is heard from test tool**

5. Verify the infotainment system can be switched to AUX as the audio source with the EL-50334-20 Multi-Media Interface Tester (MIT) connected to the auxiliary audio input jack.

- **If the infotainment system can not be switched to AUX as the audio source**

Refer to Circuit/System Testing

- **Go to next step: If the infotainment system can be switched to AUX as the audio source**

6. 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.

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

Refer to Circuit/System Testing

- **Go to next step: If audio is heard from the test tool.**

7. 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.

- **If 10 Ω or greater**

1. Ignition OFF.

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

- 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.

- **Go to next step: If less than 10 Ω**

3. Verify that a test lamp illuminates between the B+ circuit terminal 6 and ground.

- **If the test lamp does not illuminate**

1. Ignition OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- **Go to next step: If the test lamp illuminates**

4. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.

- **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.

- **Go to next step: If no connection problems or cable damage is noted.**

5. Connect the X1 harness connector at the X83 Auxiliary Audio Input.

6. Disconnect the vehicle USB cable harness connector at the K74 Human Machine Interface Control Module and the X83 Auxiliary Audio Input Adapter.

7. 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 K74 Human Machine Interface Control Module and the X83 Auxiliary Audio Input.

8. Ignition On/Vehicle in Service Mode. Infotainment system ON.

9. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.

10. 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.

- **If audio is not heard from the test tool**

1. Replace the X83 Auxiliary Audio Input Adapter. 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.

- If audio is not heard from the test tool, replace the K74 Human Machine Interface Control Module.

- **Go to next step: If audio is heard from the test tool**

11. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input AUX port and select the AUX test mode.
12. 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.

- **If audio is not heard from the test tool**

1. Replace the X83 Auxiliary Audio Input Adapter. Connect all harness connectors.

- **Go to next step: If audio is heard from the test tool.**

13. Replace the vehicle USB cable between the K74 Human Machine Interface Control Module and the X83 Auxiliary Audio Input Adapter.

Repair Instructions

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

- Refer to [Audio Disc Player and USB Receptacle Replacement \(Equinox\)](#), [Audio Disc Player and USB Receptacle Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup.

DTC B124B (IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to 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	-	-
Auxiliary Audio Common Signal	-	8	-	-
Auxiliary Detection Signal	7	8	-	-
Left Auxiliary Audio Signal	2	2	2, 4	-
Right Auxiliary Audio Signal	3	3	3, 4	-
USB Cable	B124B	B124B	B124B	-
Ground	-	1	-	-
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 3.5 mm (1/8 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 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 3.5 mm (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 3.5 mm 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

[Radio/Navigation System Wiring Schematics \(IOB\)](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

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

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

For equivalent regional tools, refer to [Special Tools Special Tools \(MIT Tool Instructions\)](#)

[Circuit/System Verification](#)

Auxiliary Audio Input Jack

1. Verify no DTCs are present.

- **If any DTCs are present**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If no DTCs are present**

2. Ignition ON/vehicle in Service Mode, radio ON.

3. 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.

- **If the infotainment system does not switch to AUX as the audio source**

Refer to Circuit/System Testing - Auxiliary Input Jack.

- **Go to next step: If the infotainment system switches to AUX as the audio source**

4. 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.

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

Refer to Circuit/System Testing - Auxiliary Input Jack.

- **Go to next step: If audio is heard from the test tool.**

5. All OK

USB Port

1. Verify no DTCs are present.

- **If any DTCs are present**

- **Go to next step: If no DTCs are present**

2. Ignition ON/vehicle in Service Mode, radio ON.

3. 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.

- **If the infotainment system does not switch to USB as the audio source**

Refer to Circuit/System Testing - USB Port.

- **Go to next step: If the infotainment system switches to USB as the audio source**

4. 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.

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

Refer to Circuit/System Testing - USB Port.

- **Go to next step: If audio is heard from the device**

5. 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 - 3.5 V between the signal circuit terminal 5 and ground.

- **If less than 2.5 V**

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.

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

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

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

- **If greater than 3.5 V**

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 1 V between the detection circuit and ground.

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

- **Go to next step: If between 2.5 - 3.5 V**

3. Test for less than 1 V between the signal circuits listed below and ground:

- Left auxiliary audio signal circuit terminal 1
- Right auxiliary audio signal circuit terminal 2
- Auxiliary audio common signal circuit terminal 3

- **If 1 V or greater**

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 1 V between the signal circuit and ground.

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

- **Go to next step: If less than 1 V**

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

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

- Auxiliary audio common signal circuit terminal 18
- Left auxiliary audio signal circuit terminal 19
- Right auxiliary audio signal circuit terminal 20
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **Go to next step: If infinite resistance**

6. Test for less than 5 Ω between the signal circuit terminals listed below:

- A11 Radio terminal 19 X1 and the X83 Auxiliary Audio Input terminal 1 X1
- A11 Radio terminal 20 X1 and the X83 Auxiliary Audio Input terminal 2 X1
- A11 Radio terminal 18 X1 and the X83 Auxiliary Audio Input terminal 3 X1
- **If 5 Ω greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 5 Ω**

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

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

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

- **If audio is not heard from the test tool**

Replace the A11 Radio.

- **Go to next step: If audio is heard from the test tool**

10. All OK.

USB Port

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

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

2. Connect the EL-50334-1 Type A male to Mini A male USB Cable to the A11 Radio. Connect the EL-50334-3 Type A female to Type A female adapter to the EL-50334-1 Cable.

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

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

- **If the infotainment system does not switch to USB as the audio source**

Replace the A11 Radio.

- **Go to next step: If the infotainment system switches to USB as the audio source**

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

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

6. 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.

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

- **If the infotainment system does not switch to USB as the audio source**

Replace the I/P USB cable assembly.

- **Go to next step: If the infotainment system switches to USB as the audio source**
8. Ignition OFF/vehicle OFF, connect the I/P to floor console inline USB cable connector.
 9. 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.
 10. Ignition ON/vehicle in Service Mode, radio ON, connect the **EL-50334-20** Multi-Media Interface Tester (MIT) to the EL-50334-4 adapter.
 11. Verify the infotainment system switches to USB as the audio source.
 - **If the infotainment system does not switch to USB as the audio source**
 Replace the console USB cable assembly.
 - **Go to next step: If the infotainment system switches to USB as the audio source**
 12. Test or replace the X83 Auxiliary Audio Input.

Repair Instructions

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

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

DTC B124B: USB 1 CIRCUIT (IOR)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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, 3	1, 2	-	-
USB Cable	B124B	B124B	B124B	-
Ground	-	1	-	-
1. USB port Inoperative 2. Fault may affect one or more components, dependant on fault location 3. Fault affects multiple components, dependant on vehicle equipment				

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 3.5 mm (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.

SD Card Reader

On Navigation vehicles the SD card will contain the map information for the vehicle region. The map data will be updated quarterly either by replacing the SD card or wireless updates via WiFi.

Refer to the owners manual for information on the Navigation system.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- 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 5 V 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 Wiring Schematics (IOR)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOR)

- [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.

- **If DTC B124B is set.**

Refer to Circuit/System testing.

- **Go to next step: If DTC B124B is not set.**

2. Ignition ON, infotainment system ON.
3. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
4. 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.

- **If audio is not heard from the test tool**

Refer to Circuit/System Testing.

- **Go to next step: If audio is heard from the test tool**

5. 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 3 and ground.

- **If 10 Ω or greater**

1. Ignition OFF.

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

- 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.

- **Go to next step: If less than 10 Ω**

3. Verify that a test lamp illuminates between the B+ circuit terminal 1 and ground.

- **If the test lamp does not illuminate**

1. Ignition OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- **Go to next step: If the test lamp illuminates**

4. 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.

- **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.

- **Go to next step: If no connection problems or cable damage is noted.**

5. Disconnect the vehicle USB cable at the A11 Radio and the X83 Auxiliary Audio Input.
6. 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.
7. Ignition ON, infotainment system ON.
8. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
9. 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.

- **If audio is not heard from the test tool**

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.
 - If audio is not heard from the test tool, replace the A11 Radio.
 - If audio is heard from the test tool.

4. All OK.

- **Go to next step: If audio is heard from the test tool**

10. Replace the USB cable assembly.

Repair Instructions

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

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

DTC B124B (IOS/IOT/IOU)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+ (front floor console compartment USB/SD card reader)	B124B, 1, 3	B124B, 1, 2	-	-
B+ (inside center console USB ports)	B124C, 1, 3	B124C, 1, 2	-	-
USB Cable (front floor console compartment USB/SD card reader)	B124B, 1	B124B, 1	B124B, 1	-
USB Cable (inside center console USB ports)	B124C, 4	B124C, 4	B124C, 4	-
Ground	-	1, 4	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
1. Auxiliary Jack, SD Card reader and/or USB port(s) Inoperative 2. Fault may affect one or more components, dependant on fault location 3. Fault affects multiple components, dependant on vehicle equipment 4. Inside center console USB ports inoperative				

Circuit/System Description

The infotainment system has a auxiliary jack, USB, and memory card receptacle assembly located in the front floor console compartment. The auxiliary jack, two USB ports and the card reader slot interface with a hub device, internal to the assembly. The 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 with the additional USB receptacle via a standard USB cable. A Mini type USB connector is used to connect the cable at the USB receptacle and at the auxiliary jack, USB, and memory card receptacle assembly. 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.

An additional USB receptacle assembly is available inside the front of the center console. The USB receptacles in the assembly interfaces with a hub device, internal to the assembly. The 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 radio via a standard USB cable.

Auxiliary Audio Input Jack and USB Ports

The Auxiliary Audio Input Jack and USB ports 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 Auxiliary Audio Input Jack or the USB port, the system detects the device and AUX or USB becomes available as an audio source.

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

SD Card Reader

On Navigation vehicles the SD card will contain the Map information for the vehicle region. The Map data will be updated quarterly either by replacing the SD card or wireless updates via WiFi.

Refer to the owners manual for information on the Navigation system.

Diagnostic Aids

3.5 mm (1/8 in.) Input Jack

- 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 3.5 mm 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 Ports and SD Card Reader

- 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 Wiring Schematics (IOS/IOT/IOU)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOS/IOT/IOU)

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. Ignition ON, infotainment system ON.
2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle port inside the center console 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.
 - **If audio is not heard from the test tool**

Refer to Circuit/System Testing - USB Ports (Inside Center Console)

- **Go to next step: If audio is heard from the test tool**
4. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input 3.5 mm (1/8 in.) input jack and select the AUX test mode.
 5. 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.
 - **If audio is not heard from the test tool.**

Refer to Circuit/System Testing - Auxiliary Audio Input Jack, USB Port and SD Card Reader (Front Floor Console).

- **Go to next step: If audio is heard from the test tool.**
6. Ignition ON, infotainment system ON.
 7. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port (Front Floor Console) and select the USB test mode.
 8. 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.
 - **If audio is not heard from the test tool**
 1. Insert the correct SD card for the vehicle into the SD card slot.
 2. Verify map data can be accessed by selecting Navigation.
 - If the SD card reader cannot be accessed, refer to Circuit/System Testing - Auxiliary Audio Input Jack, USB Port and SD Card Reader (Front Floor Console).
 - If the SD card reader can be accessed, replace the X83 Auxiliary Audio Input.
 - **Go to next step: If audio is heard from the test tool**
 9. All OK

Circuit/System Testing

NOTE: You must perform the Circuit/System Verification before proceeding with Circuit/System Testing.

USB Ports (Inside Center Console)

1. Ignition OFF, disconnect the X1 harness connector at the X92 USB Receptacle.
2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
3. Verify that a test lamp illuminates between the B+ circuit terminal 6 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - **Go to next step: If the test lamp illuminates**
4. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.
 - **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.

- **Go to next step: If no connection problems or cable damage is noted.**
5. Replace the X92 USB Receptacle. Connect all harness connectors.

6. Ignition ON, infotainment system ON.
7. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle USB port and select the USB test mode.
8. 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.
 - **If audio is not heard from the test tool**
 1. Replace the USB cable assembly between the X92 USB receptacle and the A11 Radio. Connect all harness connectors.
 2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle 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.
 - If audio is not heard from the test tool, replace the A11 Radio.
 - If audio is heard from the test tool.
 4. All OK.
 - **Go to next step: If audio is heard from the test tool**
9. All OK.

Auxiliary Audio Input Jack, USB Port and SD Card Reader (Front Floor Console)

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 3 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
3. Verify that a test lamp illuminates between the B+ circuit terminal 1 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - **Go to next step: If the test lamp illuminates**
4. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.
 - **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.
 - **Go to next step: If no connection problems or cable damage is noted.**
5. Connect the X1 harness connector at the X83 Auxiliary Audio Input.
6. Disconnect the vehicle USB cable X3 harness connector at the X92 USB Receptacle and the X83 Auxiliary Audio Input.
7. 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 X92 USB Receptacle and the X83 Auxiliary Audio Input.
8. Ignition ON, infotainment system ON.
9. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the following one at a time.
 - X83 Auxiliary Audio Input Auxiliary Jack and select Test Mode
 - X83 Auxiliary Audio Input USB port and select Test Mode
10. Verify the audio from the EL-50334-20 Multi-Media Interface Tester (MIT) is heard through the infotainment system on both auxiliary jack and USB port while operating the system to play audio

from the test tool.

- **If audio is not heard from the test tool from one or both**

1. Replace the X83 Auxiliary Audio Input. Connect all harness connectors.
2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the following one at a time.
 - X83 Auxiliary Audio Input Auxiliary Jack and select Test Mode
 - X83 Auxiliary Audio Input USB port and select Test Mode
3. Verify the audio from the EL-50334-20 Multi-Media Interface Tester (MIT) is heard through the infotainment system on both the auxiliary jack and USB port while operating the system to play audio from the test tool.
 - If audio is not heard from the test tool from one or both, replace the X92 USB Receptacle.
 - If audio is heard from the test tool.
4. All OK.

- **Go to next step: If audio is heard from the test tool**

11. Connect the vehicle USB cable X3 harness connector at the X92 USB Receptacle.
12. Disconnect the console to I/P USB in-line connector. Connect the assembled test cable to the I/P side of the in-line USB cable connector and the X83 Auxiliary Audio Input.
13. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
14. 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.

- **If audio is not heard from the test tool**

Replace the I/P USB cable assembly.

- **Go to next step: If audio is heard from the test tool**

15. Replace the console USB cable assembly.

Repair Instructions

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

- Refer to [Audio Disc Player and USB Receptacle Replacement \(Equinox\)](#), [Audio Disc Player and USB Receptacle Replacement \(Terrain\)](#).
- Refer to [USB Receptacle Replacement](#)
- Refer to [Control Module References](#) for radio or human machine interface control module replacement, programming, and setup.

DTC B124C: USB 2 CIRCUIT (I05/I06)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B124C

USB 2 Circuit

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

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	B124C, 1, 3	B124C, 1, 2	-	-
USB Cable - USB receptacle X2	B124C, 1	B124C, 1	B124C, 1	-
USB Cable - USB receptacle X3	4	4	4	-
Ground	-	1	-	-
1. Front console and display/controls USB ports inoperative 2. Fault may affect one or more components, dependant on fault location 3. Fault affects multiple components, dependant on vehicle equipment 4. Single USB port behind display/controls inoperative				

Circuit/System Description

The infotainment system has a USB receptacle assembly located in the front of the console. The USB ports interface with a hub device, internal to the assembly. The 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 human machine interface control module via a standard USB cable. A Mini type USB connector is used to connect the cable at the USB port and at the human machine interface control module and at the auxiliary jack, USB, and memory card receptacle. 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.

An additional USB port is located in the storage compartment behind the display/controls. This USB port is part of a USB cable that is connected to the front receptacle assembly, and interfaces through the front receptacle internal hub to connect to the system.

USB Port

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 switches to USB as the 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 9-16 V
- The infotainment system is ON
- The test is run once per second when the infotainment system is operating

Conditions for Setting the DTC

B124C 0B

The human machine interface control module detects an excessive current condition on the USB 5 V circuit.

B124C 04

The human machine interface control module does not detect the vehicle hub device.

B124C 11

The human machine interface control module detects an additional hub device attached to the vehicle USB port.

Action Taken When the DTC Sets

The USB port and SD card reader are 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.
- The human machine interface control module has two available USB connections. The human machine interface control module calibrations determine what is expected to be connected to each of these connection. USB 1 and USB 2 refers to the connector at the module that the port or hub is connected to.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

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 B124C 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.
 - **If DTC B124C is set.**

Refer to Circuit/System Testing.
 - **Go to next step: If DTC B124C is not set.**
2. Ignition ON, infotainment system ON.
3. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle and select the USB test mode.
4. 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.

- **If audio is not heard from the test tool**

Refer to Circuit/System Testing.

- **Go to next step: If audio is heard from the test tool**

5. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the X92 USB Receptacle.
2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
3. Verify that a test lamp illuminates between the B+ circuit terminal 6 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the X92 USB Receptacle.
 - **Go to next step: If the test lamp illuminates**
4. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.
 - **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.
 - **Go to next step: If no connection problems or cable damage is noted.**
5. Disconnect the vehicle USB cable X4 harness connector at the K74 Human Machine Interface Control Module and the X2 harness connector at the X92 USB Receptacle.
6. Connect the EL-50034-14 Infotainment Test Cable and the EL-50334-2 Type-A Female to Mini-B Male Cable together. Connect the assembled test cable to the K74 Human Machine Interface Control Module and the X92 USB Receptacle.
7. Ignition ON, infotainment system ON.
8. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle USB port and select the USB test mode.
9. 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.
 - **If audio is not heard from the test tool**
 1. Replace the X92 USB Receptacle. Connect all harness connectors.
 2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle 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.
 - If audio is not heard from the test tool, replace the K74 Human Machine Interface Control Module.

- If audio is heard from the test tool.

4. All OK.

- **Go to next step: If audio is heard from the test tool**

10. Connect the vehicle USB cable X4 harness connector at the K74 Human Machine Interface Control Module.
11. Disconnect the console to I/P USB in-line connector. Connect the assembled test cable to the I/P side of the in-line USB cable connector and the X92 USB Receptacle.
12. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle 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.

- **If audio is not heard from the test tool**

Replace the I/P USB cable assembly.

- **Go to next step: If audio is heard from the test tool**

14. Replace the console USB cable assembly.

Repair Instructions

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

- Refer to [Audio Disc Player and USB Receptacle Replacement \(Equinox\) Audio Disc Player and USB Receptacle Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup.

DTC B124C: USB 2 CIRCUIT (IOS/IOT/IOU)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B124C 00

USB 2 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+	B124C, 1, 3	B124C, 1, 2	-	-
USB Cable	B124C	B124C	B124C	-
Ground	-	1	-	-
1. USB ports Inoperative 2. Fault may affect one or more components, dependant on fault location 3. Fault affects multiple components, dependant on vehicle equipment				

Circuit/System Description

The infotainment system has a USB receptacle assembly in the front of the console. The USB receptacles in the assembly interface with a hub device, internal to the assembly. The 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. A mini type USB connector is used to connect the cable at the radio and at the 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 ports allow 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 infotainment controls.

Not all portable media player devices, storage 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 9-16 V
- The infotainment system is ON
- The test is run once per second when the infotainment system is operating

Conditions for Setting the DTC

B124C 00

The radio detects a general failure condition on the USB 5 V circuit.

Action Taken When the DTC Sets

The USB ports are 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 Wiring Schematics (IOS/IOT/IOU)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOS/IOT/IOU)

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

- **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 B124C 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.

- **If DTC B124C is set.**

Refer to Circuit/System testing.

- **Go to next step: If DTC B124C is not set.**

2. Ignition ON, infotainment system ON.
3. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle USB port and select the USB test mode.
4. 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.

- **If audio is not heard from the test tool**

Refer to Circuit/System testing

- **Go to next step: If audio is heard from the test tool**

5. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the X92 USB Receptacle.
2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.

- **If 10 Ω or greater**

1. Ignition OFF.

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

- 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.

- **Go to next step: If less than 10 Ω**

3. Verify that a test lamp illuminates between the B+ circuit terminal 6 and ground.

- **If the test lamp does not illuminate**

1. Ignition OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- **Go to next step: If the test lamp illuminates**

4. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.

- **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.

- **Go to next step: If no connection problems or cable damage is noted.**

5. Connect the X1 harness connector at the X92 USB Receptacle.
6. Disconnect the vehicle USB cable harness connector at the A11 Radio and the X92 USB Receptacle.
7. Connect the EL-50034-14 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 X92 USB Receptacle.

8. Ignition ON, infotainment system ON.
9. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle USB port and select the USB test mode.
10. 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.
 - **If audio is not heard from the test tool**
 1. Replace the X92 USB Receptacle. Connect all harness connectors.
 2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle 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.
 - If audio is not heard from the test tool, replace the A11 Radio.
 - If audio is heard from the test tool.
 4. All OK.
 - **Go to next step: If audio is heard from the test tool**
11. Replace the USB cable assembly.

Repair Instructions

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

- Refer to [Audio Disc Player and USB Receptacle Replacement \(Equinox\)](#), [Audio Disc Player and USB Receptacle Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup.

DTC B124F: UNIVERSAL SERIAL BUS (USB) PROGRAMMING

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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.
 - **If DTC B124F is set**
 1. Program the device that set the DTC.
 2. Verify the DTC does not set.
 - If DTC is set, replace the device that set the DTC.
 - If the DTC is not set
 3. All OK.
 - **Go to next step: If DTC B124F is not set**
3. All OK

Repair Instructions

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

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

DTC B125A: ANTENNA SIGNAL CIRCUIT

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B125A 02

Antenna Signal Circuit Short to Ground

DTC B125A 04

Antenna Signal Circuit Open Circuit

DTC B125A 01

Antenna Signal Circuit Short to Battery

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Radio Antenna Coax	B125A 02	B125A 04	B125A 01	-

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 9 - 16 V.

Conditions for Setting the DTC

B125A 02

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

B125A 04

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

B125A 01

The radio detects a short to battery 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 Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

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.

- **If damage is found**

Repair or replace as necessary

- **Go to next step: If no damage is found**

2. Ignition ON/Vehicle in Service Mode, A11 Radio ON.

3. Verify station reception is normal when tuned to several known good AM and FM stations.

- **If AM or FM reception is poor.**

Refer to Circuit/System Testing

- **Go to next step: If reception is normal**

4. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the radio antenna coax cable from the A11 Radio and from the T2RR Antenna - Rear Roof.

2. Verify the antenna coax cable passes the coax cable component test. Refer to Component Testing.

- **If the coax cable does not pass the test**

Replace the antenna coax cable

- **Go to next step: If the coax cable passes the test**

3. Connect the radio antenna coax cable to the A11 Radio.

4. Ignition ON, A11 Radio ON.

5. Verify a test lamp illuminates between the antenna coax cable center terminal at the T2RR Antenna - Rear Roof and chassis ground.

- **If the test lamp does not illuminate**

Replace the A11 Radio.

- **Go to next step: If the test lamp illuminates**

6. Test or replace the T2RR Antenna - Rear Roof.

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.

- **If 5 Ω or greater**

Replace the coax cable

- **Go to next step: If less than 5 Ω**

3. Test for less than 5 Ω between the coax cable outer shield end to end.

- **If 5 Ω or greater**

Replace the coax cable

- **Go to next step: If less than 5 Ω**

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

- **If less than infinite resistance**

Replace the coax cable

- **Go to next step: If infinite resistance**

5. All OK

Repair Instructions

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

- Refer to [High Frequency Antenna Replacement \(Equinox\)](#), [High Frequency Antenna Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for radio replacement, programming, and setup.

DTC B125C: SATELLITE ANTENNA CIRCUIT

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B125C 01

Satellite Antenna Circuit Short to Battery

DTC B125C 02

Satellite Antenna Circuit Short to Ground

DTC B125C 04

Satellite Antenna Circuit Open

Circuit/System Description

The digital radio receiver, located inside the radio, receives digital radio information from the digital radio antenna located on the outside of the vehicle. The digital radio 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 radio displays No XM Signal or Check Antenna.

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.

Diagnostic Aids

The digital radio antenna requires a clear line of sight to the sky to operate properly. Reception may be limited, intermittent, or unavailable inside structures.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

Electrical Information Reference

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

Special Tools

EL-48028 Digital Radio Test Antenna

Circuit/System Verification

1. With the vehicle outside in an area with an unobstructed view of the southern sky, tune to XM.
2. Verify DTC B125C is not set as current and the No XM Signal message is not displayed on the radio.
 - **If DTC B125C is set as current or the No XM Signal message is displayed.**
Refer to Circuit/System Testing.
 - **Go to next step: If DTC B125C is not set as current and the No XM Signal message is not displayed.**
3. All OK.

Circuit/System Testing

1. Ignition OFF/Vehicle OFF, disconnect the digital radio antenna coax cable from the A11 Radio. Connect the **EL-48028** Digital Radio Test Antenna to the radio and place on the roof of the vehicle.
2. Ignition ON/Vehicle in Service Mode, radio tuned to XM channel 1.
3. Verify DTC B125C is not set as current and XM reception is improved.
 - **If DTC B125C is set as current or XM reception is not improved**
Replace the A11 Radio.
 - **Go to next step: If DTC B125C is not set as current and XM reception is improved**
4. Ignition OFF/Vehicle OFF, disconnect the digital radio antenna coax cable from the T2RR Antenna - Roof Rear.

5. Verify the digital radio antenna coax cable passes the coax cable component test. Refer to Component Testing.

- **If the coax cable does not pass the test**

Replace the antenna coax cable

- **Go to next step: If the coax cable passes the test**

6. Test or replace the T2RR Antenna - Roof Rear.

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.

- **If 5 Ω or greater**

Replace the coax cable

- **Go to next step: If less than 5 Ω**

3. Test for less than 5 Ω between the coax cable outer shield end to end.

- **If 5 Ω or greater**

Replace the coax cable

- **Go to next step: If less than 5 Ω**

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

- **If less than infinite resistance**

Replace the coax cable

- **Go to next step: If infinite resistance**

5. All OK

Repair Instructions

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

- Refer to [High Frequency Antenna Replacement \(Equinox\)](#), [High Frequency Antenna Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for radio replacement, programming, and setup.

DTC B125E: DIGITAL AUDIO BROADCAST (DAB) CIRCUIT

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

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 Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

Electrical Information Reference

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

Circuit/System Testing

1. Ignition OFF/vehicle OFF, disconnect the digital radio antenna coax cable from the T2RR Antenna - Roof Rear and the A11 Radio.
2. Verify the digital radio antenna coax cable passes the coax cable component test. Refer to Component Testing.
 - **If the coax cable does not pass the test**

Replace the antenna coax cable

- **Go to next step: If the coax cable passes the test**
- 3. Replace the T2RR Antenna - Roof Rear.
- 4. Ignition ON/vehicle in Service Mode, A11 Radio ON, tune to digital band.
- 5. Verify DTC B125E is not set as current and digital reception is improved.
 - **If DTC B125E is set as current or digital reception is not improved**
Replace the A11 Radio.
 - **Go to next step: If DTC B125E is not set as current and digital reception is improved**
- 6. 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/vehicle OFF, disconnect the coax cable at both components.
2. Test for less than 5 Ω between coax cable center terminal end to end.
 - **If 5 Ω or greater**
Replace the coax cable
 - **Go to next step: If less than 5 Ω**
3. Test for less than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**
Replace the coax cable
 - **Go to next step: If less than 5 Ω**
4. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.
 - **If less than infinite resistance**
Replace the coax cable
 - **Go to next step: If infinite resistance**
5. All OK

Repair Instructions

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

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

DTC B1265: ENTERTAINMENT SYSTEM REMOTE ENABLE CIRCUIT

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC B1265

Entertainment System Remote Enable 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
Remote Enable	DTC B1265 02, 1	DTC B1265 04, 1	DTC B1265 01, 2	-
1. all components requiring remote enable inoperative 2. components will not power off with infotainment system				

Circuit/System Description

When the radio is on, a discrete 12 V signal is supplied on the entertainment remote enable circuit to the Active Noise Cancellation Module/Audio Amplifier. This signal is used to control the power state of the component.

Conditions for Running the DTC

- The radio is ON.
- The system voltage is 9 - 16 V

Conditions for Setting the DTC

- The radio detects an open, short to ground or short to voltage on the entertainment remote enable circuit.
- The above condition is present for greater than 250 ms.

Action Taken When the DTC Sets

- The radio implements a current limiting mode and disables the output on the entertainment remote enable circuit.
- All components connected on the entertainment remote enable circuit will be inoperative.

Conditions for Clearing the DTC

- The condition for setting the DTC no longer exists.
- After the ignition has been OFF for a sufficient amount of time to allow the radio to enter a low power/sleep state, the radio will re-enable the output on the following ignition cycle and the DTC will become history.
- A history DTC clears after 50 malfunction-free ignition cycles.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the radio/infotainment systems.
- The radio's current limiting logic may not re-enable the output on the entertainment remote enable circuit until after the radio performs a full power - down. It may be necessary to wait 5 minutes between each test attempt with the key OFF and retained accessory power OFF.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

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. Ignition OFF, radio OFF. It may take up to 2 min for all vehicle systems to power down.
2. Disconnect the X1 harness connector at the K108 Active Noise Cancellation Module/T3 Audio Amplifier.
3. Test for less than 10 Ω between the ground circuit terminal 8 and ground.
 - **If 10 Ω or greater**
 1. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
4. Ignition ON, A11 Radio ON.
5. Verify that a test lamp illuminates between the control circuit terminal 3 and ground.
 - **If test lamp does not illuminate**
 1. Ignition OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **Go to next step: If test lamp illuminates**
6. Ignition OFF, radio OFF. It may take up to 2 min for all vehicle systems to power down.
7. Test for less than 1 V between the control circuit terminal 3 and ground.
 - **If 1 V or greater**
 1. Disconnect the harness connector at the A11 Radio, ignition ON.
 2. Test for less than 1 V between the control circuit and ground.
 - If greater than 1 V, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **Go to next step: If less than 1 V**
8. Test or replace the K108 Active Noise Cancellation Module/T3 Audio Amplifier.

Repair Instructions

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

Refer to [Control Module References](#) for radio and active noise cancellation module replacement, programming, and setup

DTC B1271: THEFT PROTECTION ACTIVE 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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B1271 00

Theft Protection Active Malfunction

Circuit/System Description

This DTC is generated by the module when the Theft Protection is activated. This occurs when the VIN as received over the data communication circuit and the VIN as stored in the module memory do not match. This also occurs when no VIN is received over the data communication circuit. The only circuit required is the communication line.

Conditions for Running the DTC

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

Conditions for Setting the DTC

This DTC is generated by the module when the VIN as received over the data communication circuit and the VIN as stored in the module memory do not match. This also occurs if no VIN is received over the data communication circuit.

Action Taken When the DTC Sets

The radio does not function. The radio will display indicate that Theft Lock is active.

Conditions for Clearing the DTC

Re-calibration with the correct calibrations for the vehicle and cycling the radio to OFF then to ON will clear the DTC if there is no damage to the radio.

Diagnostic Aids

When diagnosing digital radio concerns, the vehicle should be located outside with an unobstructed view of the sky to ensure proper reception of the digital radio signal. Reception may be limited, intermittent or not possible inside structures or under heavy cover.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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

Perform the appropriate radio programming or setup as directed in Control Module References.

- If the DTC resets, replace the A11 Radio.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Refer to **Control Module References** for radio replacement, setup and programming

DTC B1277: MICROPHONE 1 INPUT SIGNAL CIRCUIT (IO5/IO6)

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.
- Refer to **Diagnostic Procedure Instructions** to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1277

Microphone 1 Input Signal 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
Microphone Signal	B1277 02	B1277 04	B1277 04	-
Microphone Low Reference	B1277 02	B1277 04	-	-

Circuit/System Description

The human machine interface control module uses the cellular telephone microphone for voice recognition and cellular features. The human machine interface control module provides a bias voltage to each microphone (+) and (-) signal circuits for operation of the microphone.

Conditions for Running the DTC

The human machine interface control module performs a self diagnostic of the microphone circuits once after initial power up.

Conditions for Setting the DTC

B1277 02

The human machine interface control module detects an short to ground in the cellular phone microphone high signal circuit.

B1277 04

The following conditions will set this DTC:

- The human machine interface control module detects an open/high resistance in the cellular phone microphone high signal circuit.
- The human machine interface control module detects an open/high resistance in the microphone low signal circuit.

Action Taken When the DTC Sets

The voice recognition system malfunctions or is inoperative.

Conditions for Clearing the DTC

- A current DTC clears when the self diagnostic passes on the next ignition cycle.
- A history DTC clears when the ignition cycle counter reaches the reset threshold without a repeat of the malfunction.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

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. Ignition OFF, disconnect the harness connector at the B24 Cellular Phone Microphone. Ignition On/Vehicle in Service Mode.
2. Test for 9 - 11 V between the signal circuit terminal B and ground.
 - **If less than 9 V**
 1. Ignition OFF, disconnect the X1 harness connector at the K74 Human Machine Interface Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K74 Human Machine Interface Control Module.

- **If greater than 11 V**
 1. Ignition OFF, disconnect the X1 harness connector at the K74 Human Machine Interface Control Module. Ignition On/Vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K74 Human Machine Interface Control Module.
 - **Go to next step: If between 9 - 11 V**
- 3. Test for less than 1 V between the signal circuit terminal A and ground.
 - **If greater than 1 V**
 1. Ignition OFF, X1 harness connector at the K74 Human Machine Interface Control Module. Ignition On/Vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V, replace the K74 Human Machine Interface Control Module.
 - **Go to next step: If less than 1 V**
- 4. Ignition OFF, disconnect the X1 harness connector at the K74 Human Machine Interface Control Module.
- 5. Test for infinite resistance between the B24 Cellular Phone Microphone signal circuit terminal A and ground.
 - **If less than infinite resistance**
Repair the short to ground in the circuit
 - **Go to next step: If infinite resistance**
- 6. Test for less than 2 Ω in the signal circuit end to end.
 - **If 2 Ω or greater**
Repair the open/high resistance in the circuit
 - **Go to next step: If less than 2 Ω**
- 7. Replace the B24 Cellular Phone Microphone.
- 8. Ignition On/Vehicle in Service Mode.
- 9. Verify the DTC does NOT set.
 - **If the DTC sets**
Replace the K74 Human Machine Interface Control Module
 - **Go to next step: If the DTC does not set**
- 10. All OK.

Repair Instructions

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

- Refer to [Mobile Telephone Microphone Replacement \(Equinox\)](#), [Mobile Telephone Microphone Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup.

DTC B1277: CELLULAR PHONE MICROPHONE CIRCUIT (IOS/IOT/IOU)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1277 02

Cellular Phone Microphone Circuit Short to Ground

DTC B1277 04

Cellular Phone Microphone Circuit Open/High Resistance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	B1277 02	B1277 04	B1277 04	-
Low Reference	B1277 02	B1277 04	B1277 04	-

Circuit/System Description

The radio provides the cellular phone microphone with a supplied voltage on the cellular phone microphone high signal circuit. When the microphone is in use, voice data from the user is sent back to the radio on the cellular microphone low signal circuit.

Conditions for Running the DTC

- The ignition must be in the RUN or ACC position/vehicle in Service Mode.
- The system voltage is at least 9.5 V and no more than 15.5 V.
- All the above conditions are present for greater than 10 s.

Conditions for Setting the DTC

B1277 02

The radio detects a short to ground in the cellular phone microphone high signal circuit for 10 s or greater.

B1277 04

The following conditions will set this DTC:

- The radio detects an open/high resistance in the cellular phone microphone high signal circuit for 10 s or greater.
- The radio detects an open/high resistance in the microphone low signal circuit for 10 s or greater.

Action Taken When the DTC Sets

- The radio will not receive a signal from the cellular phone microphone.
- Calls can be placed but the caller cannot be heard.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Radio/Audio System Description and Operation (IOS/IOT/IOU).

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. Ignition OFF/vehicle OFF, disconnect the harness connector at the B24LF Mobile Telephone Microphone - Left Front, ignition ON/vehicle in Service Mode.
2. Test for 9-11 V between the signal circuit terminal B and ground.
 - **If less than 9 V**
 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.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **If greater than 11 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Ignition ON/vehicle in Service Mode, test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **Go to next step: If between 9-11 V**
3. Test for less than 1 V between the low reference circuit terminal A and ground.
 - **If greater than 1 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Ignition ON/vehicle in Service Mode, test for less than 1 V between the low reference circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V, replace the A11 Radio
 - **Go to next step: If less than 1 V**
4. Test for greater than 9 V between the signal circuit terminal B and the low reference circuit terminal A.
 - **If less than 9 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Test for infinite resistance between the low reference circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.

- Go to next step: If greater than 9 V

5. Test or replace the B24LF Mobile Telephone Microphone - Left Front.

Repair Instructions

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

- Refer to [Mobile Telephone Microphone Replacement \(Equinox\)](#), [Mobile Telephone Microphone Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

DTC B1277: CELLULAR PHONE MICROPHONE CIRCUIT (IOR)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1277 02

Cellular Phone Microphone Circuit Short to Ground

DTC B1277 04

Cellular Phone Microphone Circuit Open/High Resistance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	B1277 02	B1277 04	B1277 04	-
Low Reference	B1277 02	B1277 04	B1277 04	-

Circuit/System Description

The radio provides the cellular phone microphone with a supplied voltage on the cellular phone microphone high signal circuit. When the microphone is in use, voice data from the user is sent back to the radio on the cellular microphone low signal circuit.

Conditions for Running the DTC

- The ignition must be in the RUN or ACC position/vehicle in Service Mode.
- The system voltage is at least 9.5 V and no more than 15.5 V.
- All the above conditions are present for greater than 10 s.

Conditions for Setting the DTC

B1277 02

The radio detects a short to ground in the cellular phone microphone high signal circuit for 10 s or greater.

B1277 04

The following conditions will set this DTC:

- The radio detects an open/high resistance in the cellular phone microphone high signal circuit for 10 s or greater.
- The radio detects an open/high resistance in the microphone low signal circuit for 10 s or greater.

Action Taken When the DTC Sets

- The radio will not receive a signal from the cellular phone microphone.
- Calls can be placed but the caller cannot be heard.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IOR)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOR)

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. Ignition OFF/vehicle OFF, disconnect the harness connector at the B24LF Mobile Telephone Microphone - Left Front, ignition ON/vehicle in Service Mode.
2. Test for 8.5-9.5 V between the signal circuit terminal B and ground.
 - **If less than 8.5 V**
 1. Ignition OFF/vehicle OFF, disconnect the X2 harness connector at the A11 Radio.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **If greater than 9.5 V**
 1. Ignition OFF/vehicle OFF, disconnect the X2 harness connector at the A11 Radio.
 2. Ignition ON/vehicle in Service Mode, test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **Go to next step: If between 8.5-9.5 V**
3. Test for less than 1 V between the low reference circuit terminal A and ground.
 - **If greater than 1 V**
 1. Ignition OFF/vehicle OFF, disconnect the X2 harness connector at the A11 Radio.

2. Ignition ON/vehicle in Service Mode, test for less than 1 V between the low reference circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V, replace the A11 Radio
 - **Go to next step: If less than 1 V**
4. Test for greater than 8.5 V between the signal circuit terminal B and the low reference circuit terminal A.
 - **If less than 8.5 V**
 1. Ignition OFF/vehicle OFF, disconnect the X2 harness connector at the A11 Radio.
 2. Test for infinite resistance between the low reference circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **Go to next step: If greater than 8.5 V**
5. Test or replace the B24LF Mobile Telephone Microphone - Left Front.

Repair Instructions

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

- Refer to [Mobile Telephone Microphone Replacement \(Equinox\)](#), [Mobile Telephone Microphone Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

DTC B127C: MICROPHONE 2 INPUT SIGNAL CIRCUIT (IOS/IOT/IOU)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B127C 02

Microphone 2 Input Signal Circuit Short to Ground

DTC B127C 04

Microphone 2 Input Signal Circuit Open/High Resistance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	B127C 02	B127C 04	B127C 04	-
Low Reference	B127C 02	B127C 04	B127C 04	-

Circuit/System Description

The radio provides the microphone 2 with a supplied voltage on the microphone high signal circuit. When the microphone is in use, voice data from the user is sent back to the radio on the microphone low signal circuit. This microphone is used for driver side hands free calling enhancement, as well as a reference microphone for the primary microphone.

Conditions for Running the DTC

- The ignition must be in the RUN or ACC position/vehicle in Service Mode.
- The system voltage is at least 9.5 V and no more than 15.5 V.
- All the above conditions are present for greater than 5 s.

Conditions for Setting the DTC

B127C 02

The radio detects a short to ground in the microphone high signal circuit for 5 s or greater.

B127C 04

The following conditions will set this DTC:

- The radio detects an open/high resistance in the microphone high signal circuit for 10 s or greater.
- The radio detects an open/high resistance in the microphone low signal circuit for 10 s or greater.

Action Taken When the DTC Sets

- The radio will not receive a signal from the microphone.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IOS/IOT/IOU)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOS/IOT/IOU)

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. Ignition OFF/vehicle OFF, disconnect the harness connector at the B24RF Mobile Telephone Microphone - Right Front, ignition ON/vehicle in Service Mode.
2. Test for 9-11 V between the signal circuit terminal B and ground.
 - **If less than 9 V**
 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.
 - If less than infinite resistance, repair the short to ground in the circuit.

- If infinite resistance
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **If greater than 11 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **Go to next step: If between 9-11 V**
 3. Test for less than 1 V between the low reference circuit terminal A and ground.
 - **If greater than 1 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Test for less than 1 V between the low reference circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V, replace the A11 Radio
 - **Go to next step: If less than 1 V**
 4. Test for greater than 9 V between the signal circuit terminal B and the low reference circuit terminal A.
 - **If less than 9 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Test for infinite resistance between the low reference circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **If greater than 9 V**
 5. Test or replace the B24RF Mobile Telephone Microphone - Right Front.

Repair Instructions

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

- Refer to [Mobile Telephone Microphone Replacement \(Equinox\)](#), [Mobile Telephone Microphone Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

DTC B127E: FRONT VIDEO DISPLAY OUTPUT SIGNAL (IO5/IO6 WITHOUT MAH/MBC)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B127E 00

Front Video Display Output Signal

Circuit/System Description

The infotainment display and controls are a separate component from the radio, combined into an assembly. The assembly is supplied battery voltage and ground from the vehicle harness. The human machine interface control module communicates digital video data for on-screen display through a dedicated cable containing the LVDS data circuits.

Control information, touch communications and dimming level for the display are communicated via a LIN serial data circuit to the human machine interface control module.

If the human machine interface control module detects the display is not responding to the output on the LVDS circuits, the human machine interface control module sets the DTC.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- The infotainment system is ON
- The test is continuously when the infotainment system is operating

Conditions for Setting the DTC

The human machine interface control module detects the display is not responding to the output on the LVDS circuits.

Action Taken When the DTC Sets

- The human machine interface control module sets this DTC
- No images are shown on the Info Display Module

Conditions for Clearing the DTC

- The human machine interface control module detects a properly synced digital video signal.
- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

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-50334-2 Type A female to Mini B male USB Cable
- EL-50334-14 Infotainment Test Cable

Circuit/System Verification

1. Verify no DTCs are present.

- **If any DTCs are present**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).

- **Go to next step: If no DTCs are present**

2. Ignition ON, infotainment system ON.

3. Using a scan tool, access the HMI control functions and select Info Display Test.

- **If the Info Display can not display the test image.**

Refer to Circuit/System Testing.

- **Go to next step: If the Info Display can display the test image.**

4. All OK

Circuit/System Testing

1. Vehicle OFF/Ignition OFF.

2. Verify the LVDS interface cable is properly connected at the P17 Info Display Module X2 and the K74 Human Machine Interface Control Module X5 connections and there is no damage to the cable or connections.

3. Ignition ON/Vehicle in Service Mode, infotainment system ON.

4. Verify the P17 Info Display Module does not display an image.

- **If the P17 Info Display Module displays an image.**

All OK.

- **Go to next step: If the P17 Info Display Module does not display an image.**

5. Vehicle OFF/Ignition OFF.

6. Disconnect the LVDS interface cable from the P17 Info Display Module X2.

7. Connect the EL-50334-2 Type A female to Mini B male USB Cable to the P17 Info Display Module X2. Connect the EL-50334-14 Infotainment Test Cable to the adapter.

8. Disconnect the LVDS interface cable from the K74 Human Machine Interface Control Module X5. Connect the EL-50334-14 Infotainment Test cable to the K74 Human Machine Interface Module X5.

9. Ignition ON/Vehicle in Service Mode, infotainment system ON.

10. Verify the P17 Info Display Module displays an image.

- **If the P17 Info Display Module does not display an image**

1. Replace the P17 Info Display Module. Connect all harness connectors.

2. Ignition ON/Vehicle in Service Mode, infotainment system ON.

3. Verify the P17 Info Display Module displays an image.

- If the P17 Info Display Module still does not display an image, replace the K74 Human Machine Interface Control Module.
- If the P17 Info Display Module displays an image.

4. All OK.

- **Go to next step: If the P17 Info Display Module displays an image.**

11. Replace the vehicle LVDS interface cable from the P17 Info Display Module X2 to the K74 Human Machine Interface Module X5.

Repair Instructions

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

- Refer to [Radio Control Assembly Replacement \(Equinox\)](#), [Radio Control Assembly Replacement \(Terrain\)](#).

- Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup.

DTC B127E: FRONT VIDEO DISPLAY OUTPUT SIGNAL (IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B127E 00

Front Video Display Output Signal Malfunction

DTC B127E 01

Front Video Display Output Signal Short to Battery

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Radio Display LVDS Lock Signal	B127E 00	-	-	-
Radio Display LVDS Error Signal	B127E 00	-	-	-
LVDS cable	B127E 00	B127E 00	B127E 01	-

Circuit/System Description

The infotainment display and controls are separate components from the radio. The components are supplied battery voltage and ground from the vehicle harness. The radio communicates digital video data for on-screen display through a dedicated cable containing the LVDS data circuits.

If the radio detects the display is not responding to the output on the LVDS circuits, the radio sets the DTC.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- The infotainment system is ON
- The test is run once every 14 ms when the infotainment system is operating

Conditions for Setting the DTC

The radio detects the display is not responding to the output on the LVDS circuits.

Action Taken When the DTC Sets

- The radio sets this DTC
- No images are shown on the info display module

Conditions for Clearing the DTC

- The radio detects a properly synced digital video signal.
- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Reference Information

[Radio/Navigation System Wiring Schematics \(IOB\)](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

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

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-50334-2 Type A female to Mini B male USB Cable
- EL-50334-14 Infotainment Test Cable

Circuit/System Testing

1. Vehicle OFF/Ignition OFF, disconnect the X1 harness connector at the P17 Info Display Module
2. Test for infinite resistance between the signal circuits listed below and ground:
 - Radio display LVDS lock signal circuit terminal 5
 - Radio display LVDS error signal circuit terminal 6
 - **If less than infinite resistance**

Repair the short to ground on the circuit.
 - **Go to next step: If infinite resistance**
3. Reconnect the X1 harness connector at the P17 Info Display Module.
4. Disconnect the LVDS interface cable from the P17 Info Display Module.
5. Connect the EL-50334-2 Type A female to Mini B male USB Cable to the P17 Info Display Module. Connect the EL-50334-14 Infotainment Test Cable to the adapter.
6. Disconnect the LVDS interface cable from the A11 Radio. Connect the EL-50334-14 Infotainment Test cable to the A11 Radio.
7. Ignition ON/Vehicle in Service Mode, infotainment system ON.
8. Verify DTC B127E is not set as current.
 - **If DTC B127E is set as current**
 1. Replace the P17 Info Display Module. Connect all harness connectors.
 2. Ignition ON, infotainment system ON.
 3. Verify DTC B127E is not set as current.
 - If DTC B127E is still set as current, replace the A11 Radio.
 - If DTC B127E is not set.
 4. All OK.
 - **Go to next step: If DTC B127E is not set as current.**
9. Replace the vehicle LVDS interface cable from the P17 Info Display Module to the A11 Radio.

Repair Instructions

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

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

DTC B127E: FRONT VIDEO DISPLAY OUTPUT SIGNAL (IOS/IOT/IOU/IOR)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B127E 00

Front Video Display Output Signal - General failure

DTC B127E 06

Front Video Display Output Signal - Short to ground or open

Circuit/System Description

The infotainment display and controls are a separate component from the radio, combined into an assembly. The assembly is supplied battery voltage and ground from the vehicle harness. The radio communicates digital video data for on-screen display through a dedicated cable containing the LVDS data circuits.

Control information, touch communications and dimming level for the display are communicated via a LIN serial data circuit to the radio.

If the radio detects the display is not responding to the output on the LVDS circuits, the radio sets the DTC.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- The infotainment system is ON
- The test is continuously when the infotainment system is operating

Conditions for Setting the DTC

The radio detects the display is not responding to the output on the LVDS circuits.

Action Taken When the DTC Sets

- The radio sets this DTC
- No images are shown on the Info Display Module

Conditions for Clearing the DTC

- The radio detects a properly synced digital video signal.
- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOS/IOT/IOU), Radio/Audio System Description and Operation (IOR)

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. Vehicle OFF/Ignition OFF.
2. Verify the LVDS interface cable is properly connected at the P17 Info Display Module and the A11 Radio and there is no damage to the cable or connections.
3. Ignition ON/Vehicle in Service Mode, infotainment system ON.
4. Verify the P17 Info Display Module displays an image.
 - **If the P17 Info Display Module does not display an image.**

Replace LVDS interface cable from the P17 Info Display Module to the A11 Radio.

5. Ignition ON/Vehicle in Service Mode, infotainment system ON.
6. Verify the P17 Info Display Module displays an image.
 - **If the P17 Info Display Module does not display an image.**

Replace the P17 Info Display Module.

7. Ignition ON/Vehicle in Service Mode, infotainment system ON.
8. Verify the P17 Info Display Module displays an image.
 - **If the P17 Info Display Module does not display an image.**

Replace A11 Radio.

- **Go to next step: If the P17 Info Display Module displays an image.**

9. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- Refer to **Control Module References** for radio replacement, programming, and setup.

DTC B127E: FRONT VIDEO DISPLAY OUTPUT SIGNAL (IO5/IO6 WITH MAH/MBC)

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.
- Refer to **Diagnostic Procedure Instructions** to provide an overview of each diagnostic category.

DTC Descriptor

Front Video Display Output Signal

Circuit/System Description

The infotainment display and controls are a separate component from the radio, combined into an assembly. The assembly is supplied battery voltage and ground from the vehicle harness. The human machine interface control module communicates digital video data for on-screen display through a dedicated cable containing the LVDS data circuits.

Control information, touch communications and dimming level for the display are communicated via a LIN serial data circuit to the human machine interface control module.

If the human machine interface control module detects the display is not responding to the output on the LVDS circuits, the human machine interface control module sets the DTC.

Diagnostic Aids

Extended exposure to high temperatures, especially when in direct sunlight may result in the display becoming inoperative. Under these conditions, it may be normal for the display to shut down to prevent permanent damage to the circuitry. Display should return to normal operating condition when temperatures cool.

Malfunctions may include a flickering or distorted image or a blank screen.

Using a dry cloth to clean the instrument panel in the area of the Information Display may cause the screen to flicker due to static buildup/discharge. The owner manual recommends using a microfiber cloth dampened with water to remove dust and dirt from the instrument panel.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- The infotainment system is ON
- The test is continuously when the infotainment system is operating

Conditions for Setting the DTC

The human machine interface control module detects the display is not responding to the output on the LVDS circuits.

Action Taken When the DTC Sets

- The human machine interface control module sets this DTC
- No images are shown on the Info Display Module

Conditions for Clearing the DTC

- The human machine interface control module detects a properly synced digital video signal.
- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Diagnostic Aids

Extended exposure to high temperatures, especially when in direct sunlight may result in the display becoming inoperative. Under these conditions, it may be normal for the display to shut down to prevent permanent damage to the circuitry. Display should return to normal operating condition when temperatures cool.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (105/106)

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

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. Vehicle OFF/Ignition OFF.
2. Verify the LVDS interface cable is properly connected at the P17 Info Display Module, K188 Human Machine Interface Control Module Bypass Module, and the K74 Human Machine Interface Control Module and there is no damage to the cable or connections.
3. Ignition ON/Vehicle in Service Mode, infotainment system ON.
4. Verify the P17 Info Display Module does display an infotainment image.
 - **If the P17 Info Display Module does not display an infotainment image.**
Refer to **Rear Vision Camera System Malfunction (IO5/IO6 with MAH/MBC)**.
 - **Go to next step: If the P17 Info Display Module displays an infotainment image.**
All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- Refer to **Radio Control Assembly Replacement (Equinox)**, **Radio Control Assembly Replacement (Terrain)**.
- Refer to **Control Module References** for control module replacement, programming, and setup.

DTC B1287: AMPLIFIER CONTROL SIGNAL CIRCUIT

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.
- Refer to **Diagnostic Procedure Instructions** to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1287 01

Amplifier Control Signal Circuit Short to Battery

DTC B1287 02

Amplifier Control Signal Circuit Short to Ground

DTC B1287 04

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Amplifier Control	B1287 02	B1287 04	B1287 01*	-
* No audio output.				

Circuit/System Description

The radio amplifier control circuit provides varying pulse width modulated (PWM) signals to control overall muting of the amplifier. The PWM signals are varying duty cycle percentages ranging from 0 - 100 percent. A low duty cycle unmutes all amplifier channels and a high duty cycle mutes all amplifier channels. The amplifier control circuit will measure less than 1 V when the mute function is OFF, and approximately 8 V when at full mute. The radio monitors the amp control circuit for faults.

Conditions for Running the DTC

- The radio is on.
- The system voltage is 9 - 16 V.
- The radio performs the test once during wakeup.

Conditions for Setting the DTC

The radio detects a fault on the amplifier control circuit 400 ms after radio activates the remote enable circuit.

Action Taken When the DTC Sets

Radio sets the DTC and continues to output correct state.

Conditions for Clearing the DTC

- The condition must no longer be present.
- A history DTC clears after 50 malfunction-free ignition cycles.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#)

Electrical Information Reference

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

Scan Tool Reference

Circuit/System Testing

NOTE: To prevent misdiagnosis, the door chime must be OFF during testing. Ensure the driver door latch is closed during testing.

1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the T3 Amplifier. Ignition ON/vehicle in Service Mode, A11 Radio ON, mute ON.
2. Test for 7.5 - 8.5 V between the control circuit terminal 3 and ground.
 - **If greater than 8.5 V**
 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 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **If less than 7.5 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **Go to next step: If between 7.5 - 8.5 V**
3. A11 Radio ON, mute OFF.
4. Test for less than 1 V between the control circuit terminal 3 and ground.
 - **If 1 V or greater**

Replace the A11 Radio.
 - **Go to next step: If less than 1 V**
5. Test or replace the T3 Amplifier.

Repair Instructions

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

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

DTC B1446 OR B1447: BACKUP POWER SOURCE (IO5/IO6/IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1446

Replace Backup Power Source Below Minimum Threshold

DTC B1447

Backup Power Source Open Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Backup Battery B+	-	B1447 04	-	-
Backup Battery Low Reference	-	B1447 04	-	-

Circuit/System Description

The backup power source provides voltage to the telematics communication interface control module, to be able to successfully place a call in the event of a main battery disconnect during a collision event.

Conditions for Running the DTC

B1446 03

- Ignition On/Vehicle in Service Mode.
- System voltage is between 9.5 and 15.5 V.
- DTC B1447 is not set.

B1447 04

- Ignition On/Vehicle in Service Mode.
- System voltage is between 9.5 and 15.5 V.
- The above conditions are present for greater than 10 s.

Conditions for Setting the DTC

B1446 03

The telematics communication interface control module detects that the backup power source voltage has dropped below the minimum threshold value.

B1447 04

The telematics communication interface control module detects no voltage from the backup power source.

Action Taken When the DTC Sets

B1446 03

The OnStar[®] status LED turns red.

B1447 04

- The OnStar[®] status LED turns red.
- The telematics communication interface control module will be unable to place a call in the event of a main battery disconnect during a collision event.

Conditions for Clearing the DTC

- A current DTC B1446 will clear when the telematics communication interface control module detects the voltage of the backup power source is above the minimum threshold value.
- A current DTC B1447 will clear when the telematics communication interface control module detects voltage from the backup power source.
- A history DTC clears after 50 malfunction-free ignition cycles.

Diagnostic Aids

- Shorting the backup power source positive voltage circuit to the backup power source ground circuit or chassis ground will activate the internal circuit protection of the backup power source, rendering the backup power source inoperative.
- DTC B1447 may set if the K73 Telematics Communication Interface Control Module has been incorrectly disconnected or serviced. When disconnecting the K73 Telematics Communication Interface Control Module, disconnect the harness connector X1 at the K73 Telematics Communication Interface Control Module prior to disconnecting any other harness connectors. This will ensure the backup power source is preserved when voltage is removed from the K73 Telematics Communication Interface Control Module.

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR). OnStar Description and Operation (UE1 with IOU/IOT/IOR).

Electrical Information Reference

- Testing for Intermittent Conditions and Poor Connections
- Circuit Testing
- Wiring Repairs
- Connector Repairs

Circuit/System Testing

1. Ignition OFF/Vehicle OFF and all vehicle systems OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for greater than 12.3 V between the B+ circuit terminal 14 and the low reference circuit terminal 13.
 - **If 12.3 V or less**
 1. Disconnect the C3 Telematics Communication Interface Control Module Battery.
 2. Test for infinite resistance between the circuits listed below and ground.
 - B+ circuit terminal 14
 - Low reference circuit terminal 13.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance.
 3. Test for less than 2 Ω in the circuits end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the C3 Telematics Communication Interface Control Module Battery.
 - **Go to next step: If greater than 12.3 V**
3. Replace the K73 Telematics Communication Interface Control Module.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

- Refer to Communication Interface Module Battery Replacement

- Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

DTC B1446 OR B1447: BACKUP POWER SOURCE (IOU/IOS/IOT/IOR)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1446 03

Replace Backup Power Source Voltage Below Threshold

DTC B1447 04

Backup Power Source Open Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Backup Battery B+	-	B1447 04	-	-
Backup Battery Low Reference	-	B1447 04	-	-

Circuit/System Description

The backup power source provides voltage to the telematics communication interface control module, to be able to successfully place a call in the event of a main battery disconnect during a collision event. The backup power source is under an access cover on the telematics communication interface control module.

Conditions for Running the DTC

B1446

- Vehicle is ON.
- System voltage is between 9.5 and 15.5 V.
- DTC B1447 is not set.

B1447

- Vehicle is ON.
- System voltage is between 9.5 and 15.5 V.
- The above conditions are present for greater than 10 s.
- DTC B1446 is not set.

Conditions for Setting the DTC

B1446 03

The telematics communication interface control module detects that the backup power source voltage has dropped below the minimum threshold value. Threshold voltage is checked once every ignition On cycle. There is a counter in memory which counts the number of passes and fails. On the first fail the DTC sets as current. The counter must record 10 consecutive passes before the DTC current status clears. This counter carries over across ignition On/Off cycles.

B1447 04

The telematics communication interface control module detects no voltage from the backup power source. Voltage is checked every 10 m during ignition On cycle

Action Taken When the DTC Sets

B1446

The OnStar[®] status LED turns red.

B1447

- The OnStar[®] status LED turns red.
- The telematics communication interface control module will be unable to place a call in the event of a main battery disconnect during a collision event.

Conditions for Clearing the DTC

- A current DTC B1446 will clear when the telematics communication interface control module detects the voltage of the backup power source is above the minimum threshold value. This will take 10 consecutive ignition cycles to run the DTC pass/fail tests.
- A current DTC B1447 will clear when the telematics communication interface control module detects voltage from the backup power source. Voltage is checked every 10 m during ignition On cycle.
- A history DTC clears after 40 malfunction-free ignition cycles.

Diagnostic Aids

- Shorting the backup power source positive voltage circuit to the backup power source ground circuit or chassis ground will activate the internal circuit protection of the backup power source, rendering the backup power source inoperative.
- DTC B1447 may set if the K73 Telematics Communication Interface Control Module has been incorrectly disconnected or serviced. When the backup power source mode is enabled due to a loss of vehicle battery power the K73 Telematics Communication Interface Control Module will wait 10 s before placing an emergency call. If an emergency call is deemed not necessary the K73 Telematics Communication Interface Control Module will disconnect the C3 Telematics Communication Interface Control Module Battery preventing the discharge of the backup power source.

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR) OnStar Description and Operation (UE1 with IOU/IOT/IOR)

Electrical Information Reference

- Testing for Intermittent Conditions and Poor Connections
- Circuit Testing
- Wiring Repairs
- Connector Repairs

Circuit/System Verification

1. Verify DTC B1446/B1447 is not set.

- If DTC B1446/B1447 is set

Test or replace the C3 Telematics Communication Interface Control Module Battery.

2. Verify DTC B1446/B1447 is not set.

- If DTC B1446/B1447 is set

Test or replace the K73 Telematics Communication Interface Control Module

- Go to next step: If DTC B1446/B1447 is not set

3. All OK.

Repair Instructions

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

- Refer to [Communication Interface Module Battery Replacement](#)
- Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

DTC B2455: CELLULAR PHONE MICROPHONE CIRCUIT (IO5/IO6/IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2455 02

Cellular Phone Microphone Circuit Short to Ground

DTC B2455 04

Cellular Phone Microphone Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Microphone Signal	B2455 02	B2455 04	B2455 04	-
Microphone Low Signal	B2455 02	B2455 04	B2455 04	-

Circuit/System Description

The telematics communication interface control module provides the cellular phone microphone with a supplied voltage on the cellular phone microphone high signal circuit. When the microphone is in use, voice data from the user is sent back to the telematics communication interface control module on the microphone low signal circuit.

Conditions for Running the DTC

- The Vehicle must be ON or in Service Mode.
- The system voltage is at least 9.5 V and no more than 15.5 V.
- All the above conditions are present for greater than 10 s.

Conditions for Setting the DTC

B2455 02

The telematics communication interface control module detects a short to ground in the cellular phone microphone signal circuit for 10 s or greater.

B2455 04

The following conditions will set this DTC:

- The telematics communication interface control module detects an open/high resistance in the cellular phone microphone signal circuit for 10 s or greater.
- The telematics communication interface control module detects an open/high resistance in the low signal circuit for 10 s or greater.

Action Taken When the DTC Sets

- The OnStar[®] status LED turns red.
- The telematics communication interface control module will not receive a signal from the cellular phone microphone.
- Calls can be placed but the caller cannot be heard.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR). OnStar Description and Operation (UE1 with IOU/IOT/IOR).

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. Ignition OFF/Vehicle OFF, disconnect the harness connector at the B24 cellular phone microphone, Ignition ON/Vehicle in Service Mode.
2. Test for 8.0-10.5 V between the signal circuit terminal B and ground.
 - **If less than 8.0 V**
 1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the K73 telematics communication interface control module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance

3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the vehicle K73 Telematics Communication Interface Control Module.
- **If greater than 10.5 V**
 1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the K73 telematics communication interface control module, Ignition ON/Vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K73 Telematics Communication Interface Control Module.
- **Go to next step: If between 9.5-10.5 V**
3. Test for less than 1 V between the signal circuit terminal A and ground.
 - **If greater than 1 V**
 1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the K73 telematics communication interface control module, Ignition ON/Vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V, repair the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If less than 1 V**
4. Test for greater than 8 V between the signal circuit terminal B and the signal circuit terminal A.
 - **If less than 8 V**
 1. Ignition OFF/Vehicle OFF, disconnect the connector X2 at the K73 telematics communication interface control module.
 2. Test for infinite resistance between the low signal circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the vehicle K73 Telematics Communication Interface Control Module.
 - **Go to next step: If greater than 8 V**
5. Test or replace the B24 Cellular Phone Microphone.

Repair Instructions

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

- Refer to [Mobile Telephone Microphone Replacement \(Equinox\)](#), [Mobile Telephone Microphone Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

DTC B2455: CELLULAR PHONE MICROPHONE CIRCUIT (IOR/IOU/IOT/IOS)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2455 02

DTC B2455 04

Cellular Phone Microphone Circuit Open/High Resistance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal Terminal B	B2455 02	B2455 04	-	-
Low Reference Terminal A	-	B2455 04	B2455 04	-

Circuit/System Description

The telematics communication interface control module provides the cellular phone microphone with a supplied voltage on the cellular phone microphone signal circuit. When the microphone is in use, voice data from the user is sent back to the telematics communication interface control module on the cellular microphone low reference circuit.

Conditions for Running the DTC

- Ignition ON/Vehicle in Service Mode.
- The system voltage is at least 9.5 V and no more than 15.5 V.
- All the above conditions are present for greater than 10 s.

Conditions for Setting the DTC**B2455 02**

The telematics communication interface control module detects a short to ground in the cellular phone microphone signal circuit for 10 s or greater.

B2455 04

The following conditions will set this DTC:

- The telematics communication interface control module detects an open/high resistance in the cellular phone microphone signal circuit for 10 s or greater.
- The telematics communication interface control module detects an open/high resistance in the microphone low reference circuit for 10 s or greater.

Action Taken When the DTC Sets

- The telematics status LED turns red.
- The telematics communication interface control module will not receive a signal from the cellular phone microphone.
- Calls can be placed but the caller cannot be heard.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

OnStar Description and Operation (UE1 without IOU/IOT/IOR), **OnStar Description and Operation (UE1 with IOU/IOT/IOR)**

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. Ignition OFF/vehicle OFF, disconnect the harness connector at the B24 Cellular Phone Microphone, ignition ON/vehicle in Service Mode.
2. Test for 8.0-10.5 V between the signal circuit terminal B and ground.
 - **If less than 8.0 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K73 Telematics Communication Interface Control Module.
 - **If greater than 10.5 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module, ignition ON/vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If between 8.0-10.5 V**
3. Test for less than 1 V between the low reference circuit terminal A and ground.
 - **If greater than 1 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module, ignition ON/vehicle in Service Mode.
 2. Test for less than 1 V between the low reference circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If less than 1 V**
4. Test for greater than 8 V between the signal circuit terminal B and the low reference circuit terminal A.
 - **If less than 8 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module.
 2. Test for infinite resistance between the low reference circuit and ground.

- If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the vehicle K73 Telematics Communication Interface Control Module.
- **Go to next step: If greater than 8 V**
5. Test or replace the B24 Cellular Phone Microphone.

Repair Instructions

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

- Refer to [Mobile Telephone Microphone Replacement \(Equinox\)](#), [Mobile Telephone Microphone Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for control module replacement, programming and setup.

DTC B2462: GLOBAL POSITIONING SYSTEM (IO5/IO6 WITH UE1)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2462 02

Global Positioning System Short to Ground

DTC B2462 04

Global Positioning System Open

Circuit/System Description

The navigation antenna is connected to the Telematics Communication Interface Control Module. The module supplies 5 V to the antenna to power the internal amplifier through the center conductor of the antenna coax cable.

When the vehicle is equipped with the optional navigation system, a Navigation Antenna Signal Splitter is installed to distribute the navigation signal to both the Telematics Communication Interface Control Module and the Human Machine Interface Control Module. The Human Machine Interface Control Module supplies 5 V through the coax cable to power the Navigation Antenna Signal Splitter.

Conditions for Running the DTC

- Radio On
- System voltage is greater than 9 V and less than 16 V.
- The navigation system/telematics communication interface control module tests the GPS antenna every 10 s.

Conditions for Setting the DTC

B2462 02

The Telematics Communication Interface Control Module or Human Machine Interface Control Module detects a short to ground on the GPS antenna signal circuit.

B2462 04

The Telematics Communication Interface Control Module or Human Machine Interface Control Module detects a open/high resistance on the GPS antenna signal circuit.

Action Taken When the DTC Sets

- The Telematics Communication Interface Control Module or Human Machine Interface Control Module uses the last reported position and the vehicle speed signal to calculate the vehicle position.
- Route guidance may be inaccurate.
- Turn by turn navigation may be inaccurate or inoperative.

Conditions for Clearing the DTC

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

Diagnostic Aids

- The scan tool Telematics Communication Interface Control Module GPS signal parameter will display a Yes or No dependent upon whether or not the module sees an increment of the seconds transmitted by GPS signals to the Telematics Communication Interface Control Module. Upon entering this screen, the GPS signal title will initially display Yes, regardless of the presence of time increment, for at least 2 seconds, while the algorithm in the scan tool determines the status of the clock. If increment is found, Yes is continually displayed. If the clock remains static, No is displayed. The scan tool looks for increment every second, regardless of current display.
- Inaccurate or aged GPS position concerns which are no longer present may have been due to the temporary loss of GPS signal reception by the vehicle. Conditions such as tunnels or parking structures will restrict the cellular phone and navigation antenna from a clear view of the satellites in the sky and may have caused this temporary data loss.
- The GPS requires a clear line of sight to the sky to operate properly. In most cases the GPS will not have reception near tall buildings or inside structures.

Reference Information

Schematic Reference

- [OnStar/Telematics Wiring Schematics](#)
- [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

- [OnStar Description and Operation \(UE1 without IOU/IOT/IOR\)](#), [OnStar Description and Operation \(UE1 with IOU/IOT/IOR\)](#)
- [Radio/Audio System Description and Operation \(IO5/IO6\)](#)

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

Circuit/System Verification

NOTE: The following verification requires the vehicle to be outside with an unobstructed view of the southern sky. Allow 5 minutes after turning the ignition ON for the vehicle to acquire the GPS satellites signal.

1. Ignition ON.
2. Verify that DTC B2462 is not set in the Telematics Communication Interface Control Module.
 - **If DTC B2462 is set in the Telematics Communication Interface Control Module and the vehicle is not equipped with a navigation system**

Refer to Circuit/System Testing Without Navigation System.
 - **If DTC B2462 is set in the Telematics Communication Interface Control Module and the vehicle is equipped with a navigation system**

Refer to Circuit/System Testing With Navigation System.
 - **Go to next step: If DTC B2462 is not set in the Telematics Communication Interface Control Module**
3. Verify an OnStar advisor can locate the vehicle after performing a blue button press.
 - **If the advisor can not locate the vehicle and the vehicle is not equipped with a navigation system**

Refer to Circuit/System Testing Without Navigation System
 - **If the advisor can not locate the vehicle and the vehicle is equipped with a navigation system**

Refer to Circuit/System Testing With Navigation System.
 - **Go to next step: If the advisor can locate the vehicle**
4. Verify DTC B2462 is not set in the Human Machine Interface Control Module.
 - **If DTC B2462 is set in the Human Machine Interface Control Module**

Refer to Circuit/System Testing With Navigation System - Step 9.
 - **Go to next step: If DTC B2462 is not set in the Human Machine Interface Control Module**
5. Verify that the NO GPS symbol/message is not displayed on the radio display.
 - **If the NO GPS symbol/message is displayed**

Refer to Circuit/System Testing With Navigation System - Step 9.
 - **Go to next step: If the NO GPS symbol/message is not displayed**
6. All OK.

Circuit/System Testing

without Navigation System

NOTE: You must perform the Circuit/System Verification before proceeding with Circuit/System Testing.

1. Ignition OFF, disconnect the GPS and cellular coax cable connector at the K73 Telematics Communication Interface Control Module.
2. Attach both leads of the EL-49903-1 OnStar test antenna to the EL-49903-5 combiner. Using the EL-49903-6 coax cable attach the grey connector to the combiner and the brown connector to the

K73 Telematics Communication Interface Control Module. Place the test antenna on the roof of the vehicle, ignition ON.

3. Verify DTC B2462 is not set or that the OnStar advisor can locate the vehicle.

- **If DTC B2462 is set or the advisor can not locate the vehicle**

Replace the K73 Telematics Communication Interface Control Module.

- **Go to next step: If DTC B2462 is not set or the advisor can locate the vehicle**

4. Test the coax cable between the K73 Telematics Communication Interface Control Module and the T2RR Antenna - Roof Rear. Refer to component testing.

- **If the coax cable does not pass the test**

Replace the coax cable.

- **Go to next step: If the coax cable passes the test**

5. Test or replace the T2RR Antenna - Roof Rear.

with Navigation System

NOTE: You must perform the Circuit/System Verification before proceeding with Circuit/System Testing.

1. Ignition OFF, disconnect the T2RR Antenna - Roof Rear coax cable at the T15 Navigation Antenna Signal Splitter.

2. Attach both leads of the EL-49903-1 OnStar test antenna to the EL-49903-5 combiner. Using the EL-49903-7 coax cable attach one grey connector to the combiner and the other grey connector to the T15 Navigation Antenna Signal Splitter. Place the test antenna on the roof of the vehicle, ignition ON.

3. Verify DTC B2462 is not set or that the OnStar advisor can locate the vehicle.

- **If DTC B2462 is not set or the advisor can locate the vehicle**

1. Test the coax cable between the T15 Navigation Antenna Signal Splitter and the T2RR Antenna - Roof Rear. Refer to Component Testing.

- If the coax cable does not pass the test

Replace the coax cable.

- If the coax cable passes the test

2. Replace the T2RR Antenna - Roof Rear.

- **Go to next step: If DTC B2462 is set or if the advisor can not locate the vehicle**

4. Ignition OFF, disconnect the GPS and cellular coax cable connector at the K73 Telematics Communication Interface Control Module.

5. Attach both leads of the EL-49903-1 OnStar test antenna to the EL-49903-5 combiner. Using the EL-49903-6 coax cable attach the grey connector to the combiner and the brown connector to the K73 Telematics Communication Interface Control Module. Place the test antenna on the roof of the vehicle, ignition ON.

6. Verify DTC B2462 is not set or that the OnStar advisor can locate the vehicle.

- **If DTC B2462 is set or the advisor can not locate the vehicle.**

Replace the K73 Telematics Communication Interface Control Module.

- **Go to next step: If DTC B2462 is not set or the advisor can locate the vehicle.**

7. Ignition OFF.

8. Test the coax cable between the T15 Navigation Antenna Signal Splitter and the K73 Telematics Communication Interface Control Module. Refer to Component Testing.

- **If the coax cable does not pass the test.**

Replace the coax cable.

- **Go to next step: If the coax cable passes the test.**
- 9. Ignition OFF, disconnect the blue GPS coax cable connector at the K74 Human Machine Interface Control Module.
- 10. Attach the EL-49903-1 OnStar test antenna blue connector to the K74 Human Machine Interface Control Module and place the test antenna on the roof of the vehicle.
- 11. Ignition ON.
- 12. Verify DTC B2462 is not set or that the NO GPS symbol/message is not displayed on the radio display.
 - **If DTC B2462 is set or the NO GPS symbol/message is displayed**

Replace the K74 Human Machine Interface Control Module
 - **Go to next step: If DTC B2462 is not set or if the NO GPS symbol/message is not displayed.**
- 13. Ignition OFF.
- 14. Test the coax cable between the T15 Navigation Antenna Signal Splitter and the K74 Human Machine Interface Control Module. Refer to Component Testing.
 - **If the coax cable does not pass the test.**

Replace the coax cable.
 - **Go to next step: If the coax cable passes the test.**
- 15. Test or replace the T15 Navigation Antenna Signal Splitter.

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.**
- **The vehicle may be equipped with sectioned coax. Test each section and replace only the faulty section, not the entire length of coax.**

Coax Cable Test

1. Ignition OFF, disconnect the coax cable at both components.
2. Test for less than 5 Ω between the coax cable center terminal end to end.
 - **If 5 Ω or greater**

Replace the coax cable.
 - **Go to next step: If less than 5 Ω**
3. Test for greater than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**

Replace the coax cable.
 - **Go to next step: If less than 5 Ω**
4. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.
 - **If less than infinite resistance**

Replace the coax cable.

- **Go to next step: If infinite resistance**

5. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- Refer to **Radio Antenna Base Replacement (Equinox)**, **Radio Antenna Base Replacement (Terrain)**.
- Refer to **Control Module References** for Human Machine Interface control module or Telematics Communication Interface Control Module replacement, programming, and setup

DTC B2462: GLOBAL POSITIONING SYSTEM SIGNAL (IO5/IO6 WITHOUT UE1)

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.
- Refer to **Diagnostic Procedure Instructions** to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2462

Global Positioning System Signal

For symptom byte information refer to **Symptom Byte List** .

Circuit Description

The navigation antenna is connected to the human machine interface control module by a shielded coaxial cable. The human machine interface control module supplies 5 V through the coax cable to power the internal antenna amplifier.

Conditions for Running the DTC

- Radio On.
- System voltage is greater than 9 V and less than 16 V.
- The human machine interface control module tests the GPS antenna every 10 seconds.

Conditions for Setting the DTC

B2462 01

The human machine interface control module detects a short to B+ on the GPS antenna signal circuit.

B2462 02

The human machine interface control module detects a short to ground on the GPS antenna signal circuit.

B2462 04

The human machine interface control module detects an open/high resistance on the GPS antenna signal circuit.

Actions Taken When the DTC Sets

- The human machine interface control module uses the last reported position and the vehicle speed signal to calculate the vehicle position.
- Route guidance may be inaccurate.
- Turn by turn navigation may be inaccurate or inoperative.

Conditions for Clearing the DTC

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

Diagnostic Aids

The navigation antenna requires a clear line of sight to the sky to operate properly. The GPS may have limited, intermittent, or no reception near tall buildings or inside structures.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

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-49903 OnStar Antenna Diagnostic Tool Kit

Circuit/System Testing

1. Ignition OFF/vehicle OFF, disconnect the navigation antenna coax cable connector at the K74 Human Machine Interface Control Module. Connect the **EL-49903** GM OnStar antenna diagnostic tool kit to the K74 Human Machine Interface Control Module, place the test antenna on the roof of the vehicle.
2. Ignition ON/vehicle in Service Mode, infotainment system ON, navigation selected.
3. Verify DTC B2462 is not set or the NO GPS symbol is not displayed on the information display.
 - **If DTC B2462 is set or if the NO GPS symbol is displayed**

Replace the K74 Human Machine Interface Control Module.
 - **Go to next step: If DTC B2462 is not set or the NO GPS symbol is not displayed**
4. Ignition OFF/vehicle OFF, disconnect the radio navigation coax cable at the.
5. Verify the radio navigation coax cable passes the coax cable component test. Refer to Component Testing.
 - **If the coax cable does not pass the test**

Replace the coax cable
 - **Go to next step: If the coax cable passes the test**
6. Test or replace the T2RR Antenna - Roof Rear.

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 5 Ω between coax cable center terminal end to end.
 - **If 5 Ω or greater**
Replace the coax cable
 - **Go to next step: If less than 5 Ω**
3. Test for less than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**
Replace the coax cable
 - **Go to next step: If less than 5 Ω**
4. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.
 - **If less than infinite resistance**
Replace the coax cable
 - **Go to next step: If infinite resistance**
5. All OK

Repair Instructions

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

- Refer to [High Frequency Antenna Replacement \(Equinox\)](#), [High Frequency Antenna Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup.

DTC B2462: GLOBAL POSITIONING SYSTEM (WITHOUT IO5/IO6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2462 02

Global Positioning System Short to Ground

DTC B2462 04

Global Positioning System Open

Circuit/System Description

The navigation antenna is connected to the Telematics Communication Interface Control Module. The module supplies 5 V to the antenna to power the internal amplifier through the center conductor of the antenna coax cable.

Conditions for Running the DTC

- Radio On.
- System voltage is greater than 9 V and less than 16 V.
- The navigation system/telematics communication interface control module tests the GPS antenna every 10 s.

Conditions for Setting the DTC

B2462 02

The telematics communication interface control module detects a short to ground on the GPS antenna signal circuit.

B2462 04

The telematics communication interface control module detects a open/high resistance on the GPS antenna signal circuit.

Action Taken When the DTC Sets

- The telematics communication interface control module uses the last reported position and the vehicle speed signal to calculate the vehicle position.
- Route guidance may be inaccurate.
- Turn by turn navigation may be inaccurate or inoperative.

Conditions for Clearing the DTC

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

Diagnostic Aids

- The scan tool Telematics Communication Interface Control Module GPS signal parameter will display a Yes or No dependent upon whether or not the module sees an increment of the seconds transmitted by GPS signals to the Telematics Communication Interface Control Module. Upon entering this screen, the GPS signal title will initially display Yes, regardless of the presence of time increment, for at least 2 seconds, while the algorithm in the scan tool determines the status of the clock. If increment is found, Yes is continually displayed. If the clock remains static, No is displayed. The scan tool looks for increment every second, regardless of current display.
- Inaccurate or aged GPS position concerns which are no longer present may have been due to the temporary loss of GPS signal reception by the vehicle. Conditions such as tunnels or parking structures will restrict the cellular phone and navigation antenna from a clear view of the satellites in the sky and may have caused this temporary data loss.
- The GPS requires a clear line of sight to the sky to operate properly. In most cases the GPS will not have reception near tall buildings or inside structures.

Reference Information

Schematic Reference

- [OnStar/Telematics Wiring Schematics](#)
- [Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

- [OnStar Description and Operation \(UE1 without IOU/IOT/IOR\)](#), [OnStar Description and Operation \(UE1 with IOU/IOT/IOR\)](#)
- [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#)

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-49903 OnStar Antenna Diagnostic Tool Kit

Circuit/System Testing

1. Ignition OFF/vehicle OFF, disconnect the GPS and cellular coax cable connector at the K73 Telematics Communication Interface Control Module.
2. Attach both leads of the EL-49903-1 OnStar test antenna to the EL-49903-5 combiner. Using the EL-49903-6 coax cable attach the grey connector to the combiner and the brown connector to the K73 Telematics Communication Interface Control Module. Place the test antenna on the roof of the vehicle, ignition ON.
3. Verify DTC B2462 is not set or that the OnStar advisor can locate the vehicle.
 - **If DTC B2462 is set or the advisor can not locate the vehicle**

Replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If DTC B2462 is not set or the advisor can locate the vehicle**
4. Test the coax cable between the K73 Telematics Communication Interface Control Module and the T2RR Antenna - Roof Rear. Refer to component testing.
 - **If the coax cable does not pass the test**

Replace the coax cable.
 - **Go to next step: If the coax cable passes the test**
5. Test or replace the T2RR Antenna - Roof Rear.

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.
- The vehicle may be equipped with sectioned coax. Test each section and replace only the faulty section, not the entire length of coax.

Coax Cable Test

1. Ignition OFF/vehicle OFF, disconnect the coax cable at both components.
2. Test for less than 5 Ω between the coax cable center terminal end to end.
 - **If 5 Ω or greater**
Replace the coax cable.
 - **Go to next step: If less than 5 Ω**
3. Test for greater than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**
Replace the coax cable.
 - **Go to next step: If less than 5 Ω**
4. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.
 - **If less than infinite resistance**
Replace the coax cable.
 - **Go to next step: If infinite resistance**
5. All OK.

Repair Instructions

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

- Refer to [Radio Antenna Base Replacement \(Equinox\)](#), [Radio Antenna Base Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for radio or telematics communication interface control module replacement, programming, and setup

DTC B2470: CELLULAR PHONE ANTENNA CIRCUIT 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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2470 02

Cellular Phone Antenna Circuit Malfunction Short to Ground

DTC B2470 04

Cellular Phone Antenna Circuit Malfunction Open Circuit

Circuit/System Description

The primary cellular phone antenna element is connected to the telematics communication interface control module (violet connector) via a shielded coaxial cable. Cellular communication takes place on both the primary cellular antenna signal circuit and the GPS/secondary cellular antenna signal circuit. This diagnostic only applies to the primary cellular antenna signal circuit. Internal to the antenna on the cellular antenna signal circuit resistance is used to apply a load, which the telematics communication interface control module uses to detect the presence of the antenna.

Conditions for Running the DTC

- Ignition in the RUN or ACC position.
- System voltage is between 9.5 V and 15.5 V.
- The above conditions are present for greater than 1 s.

Conditions for Setting the DTC

B2470 02

The telematics communication interface control module detects a short to ground on the primary cellular antenna signal circuit.

B2470 04

- The telematics communication interface control module detects an open or high resistance on the primary cellular antenna signal circuit.
- The above conditions are present for greater than 1 s.

Action Taken When the DTC Sets

The OnStar[®] status LED turns red.

Conditions for Clearing the DTC

- The telematics communication interface control module detects the presence of a cellular antenna.
- A history DTC clears after 50 malfunction-free ignition cycles.

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR). OnStar Description and Operation (UE1 with IOU/IOT/IOR).

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-49903-1 Test Antenna Navn-Cell Comn

Circuit/System Testing

NOTE:

- The vehicle may be equipped with sectioned coax. Test each section and replace only the faulty section, not the entire length of coax.
- The following verification requires the vehicle to be outside with an unobstructed view of the southern sky. Allow 5 min after turning the ignition ON for the GPS satellites to acquire vehicle signal.

1. Ignition OFF/Vehicle OFF and all vehicle systems OFF, disconnect the violet primary cellular coax cable connector at the K73 Telematics Communication Interface Control Module. It may take up to 2 min for all vehicle systems to power down.
2. Using the **EL-49903-1** Test Antenna Navn-Cell Comn connect the violet coax cable to the K73 Telematics Communication Interface Control Module. Place the test antenna on the roof of the vehicle, ignition ON/vehicle in Service Mode.
3. Verify the DTC does not set or a call can be completed to the OnStar Call Center while operating the vehicle within the conditions for running the DTC.

- **If the DTC sets or a call can not be completed to the OnStar Call Center**

Replace the K73 Telematics Communications Interface Control Module.

- **Go to next step: If the DTC does not set or a call can be completed to the OnStar Call Center**

4. Ignition OFF/Vehicle OFF.

5. Disconnect the **EL-49903-1** Test Antenna Navn-Cell Comn from the K73 Telematics Communication Interface Control Module

6. Test the coax cable. Refer to Component Testing.

- **If the coax cable does not pass the test**

Replace the coax cable.

- **Go to next step: If the coax cable passes the test**

7. Test or replace the T2RR Antenna - Roof Rear.

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 readings when testing the center coax terminals, use care not to ground the test probe on the outer housing/shield.**

Coax Cable Test

1. Test for less than 5 Ω between the coax cable center terminal end to end.

- **If 5 Ω or greater**

Replace the coax cable.

- **Go to next step: If less than 5 Ω**

2. Test for greater than 5 Ω between the coax cable outer shield end to end.

- **If 5 Ω or greater**

Replace the coax cable.

- **Go to next step: If less than 5 Ω**

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

- **If less than infinite resistance**

Replace the coax cable.

- **Go to next step: If infinite resistance**

4. All OK.

Repair Instructions

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

- Refer to [High Frequency Antenna Replacement \(Equinox\)](#), [High Frequency Antenna Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for telematics communication interface control module replacement, setup, and programming

DTC B2476 OR B2482: CELLULAR PHONE SELECT SERVICE SWITCH

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2476 04

Cellular Phone Select Service Switch Open

DTC B2476 59

Cellular Phone Select Service Switch Protection Time-out

DTC B2482 00

Cellular Phone Select Service Switch Range/Performance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
10 V Reference	B2476 02	B2476 04	B2476 04	-
Signal Terminal 17	B2476 02	B2476 04	B2476 59	B2476 59, B2482 00
Ground	-	B2476 04	-	-

Circuit/System Description

The OnStar[®] button assembly consists of 3 buttons: Call/Answer, OnStar[®] Call Center, and OnStar[®] Emergency. The telematics communication interface control module supplies the OnStar[®] button assembly with 10 V via the 10 V reference circuit. Each of the buttons, when pressed, completes the circuit across a resistor allowing a specific voltage to be returned to the telematics communication interface control module over the keypad signal circuit. Depending upon the voltage range returned, the telematics communication interface control module is able to identify which button has been pressed.

Conditions for Running the DTC

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

Conditions for Setting the DTC

B2476 04

The telematics communication interface control module detects an open/high resistance on the keypad supply voltage circuit.

B2482 and B2476 59

The telematics communication interface control module detects a valid signal on the keypad signal circuit for longer than 15 s. If one of the OnStar[®] buttons is held or stuck for 15 s or greater, the telematics communication interface control module will set this DTC.

Action Taken When the DTC Sets

- The OnStar[®] status LED turns red.
- No calls can be placed.
- The telematics communication interface control module will ignore all inputs from the OnStar[®] button assembly.

Conditions for Clearing the DTC

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

Diagnostic Aids

After any repair is made to the 10 V reference circuit or button signal circuit the fuse to the telematics communication interface control module must be removed for 30 s to reset the control module. Failure to do so could result in incorrect diagnosis.

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR), OnStar Description and Operation (UE1 with IOU/IOT/IOR)

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

NOTE:

- **10 V reference circuit measurement may vary with vehicle battery voltage.**
- **Test for voltage range with vehicle battery measuring at a minimum of 11.5 V**

1. Vehicle OFF/Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the A98 Front Overhead Console Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 5 and ground.
 - **If 10 Ω or greater**

1. Vehicle OFF/Ignition OFF.
2. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
- **Go to next step: If less than 10 Ω**
3. Vehicle in Service Mode/Ignition ON.
4. Test for 8.0 - 10.5 V between the 10 V reference circuit terminal 16 and ground.
 - **If less than 8.0 V**
 1. Vehicle OFF/Ignition OFF, disconnect the harness connector at the K73 Telematics Communication Interface Control Module.
 2. Test for infinite resistance between the 10 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the 10 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K73 Telematics Communication Interface Control Module.
 - **If greater than 10.5 V**
 1. Vehicle OFF/Ignition OFF, disconnect the harness connector at the K73 Telematics Communication Interface Control Module, vehicle in Service Mode/Ignition ON.
 2. Test for less than 1 V between the 10 V reference circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If between 8.0 - 10.5 V**
5. Vehicle OFF/Ignition OFF.
6. Test for 500 - 900 Ω between the signal circuit terminal 17 and ground.
 - **If less than 500 Ω**
 1. Disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K73 Telematics Communication Interface Control Module.
 - **If greater than 900 Ω**
 1. Disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module, vehicle in Service Mode/Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
3. Vehicle OFF.
4. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K73 Telematics Communication Interface Control Module.
- **Go to next step: If between 500 - 900 Ω**
7. Test or replace the A98 Front Overhead Console Assembly.

Repair Instructions

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

- Refer to [Roof Console Replacement](#)
- Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

SYMPTOMS - CELLULAR COMMUNICATION

NOTE: 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:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to [OnStar Description and Operation \(UE1 without IOU/IOT/IOR\)](#), [OnStar Description and Operation \(UE1 with IOU/IOT/IOR\)](#).

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the Radio/Audio System. Refer to [Checking Aftermarket Accessories](#).
- 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:

- [Bluetooth Malfunction \(IO5/IO6\)](#)[Bluetooth Malfunction \(without IO5/IO6\)](#)
- [No Global Positioning System \(GPS\) Reception \(UE1 with IO5/IO6\)](#)[No Global Positioning System \(GPS\) Reception \(IO5/IO6 without UE1\)](#)[No Global Positioning System \(GPS\) Reception \(without IO5/IO6\)](#)
- [OnStar Microphone Malfunction \(IO5/IO6/IOB\)](#)[OnStar Microphone Malfunction \(IOR/IOU/IOT/IOS\)](#)
- [OnStar Audio Malfunction \(IOB\)](#)[OnStar Audio Malfunction \(without IOB\)](#)
- [OnStar Button LED Malfunction](#)
- [OnStar Call Center Remote Function Requests Malfunction](#)
- [OnStar Button Malfunction](#)
- [Unable to Contact OnStar Call Center](#)
- [OnStar Voice Recognition Malfunction](#)
- [OnStar Steering Wheel Control Functions Malfunction](#)

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:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to [Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the Radio/Audio System. Refer to [Checking Aftermarket Accessories](#) .
- 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 \(IOB\)](#)[Auxiliary Audio Input Malfunction \(IO5/IO6\)](#)[Auxiliary Audio Input Malfunction \(IOR\)](#)[Auxiliary Audio Input Malfunction \(IOS/IOT/IOU\)](#)
- [Bluetooth Malfunction \(IO5/IO6\)](#)[Bluetooth Malfunction \(without IO5/IO6\)](#)
- [No Global Positioning System \(GPS\) Reception \(UE1 with IO5/IO6\)](#)[No Global Positioning System \(GPS\) Reception \(IO5/IO6 without UE1\)](#)[No Global Positioning System \(GPS\) Reception \(without IO5/IO6\)](#)
- [Radio Controls Malfunction \(IOB\)](#)[Radio Controls Malfunction \(IOR\)](#)
- [Radio Information Display Malfunction \(IOB\)](#)[Radio Information Display Malfunction \(IO5/IO6 without MAH/MBC\)](#)[Radio Information Display Malfunction \(IOS/IOT/IOU\)](#)[Radio Information Display Malfunction \(IO5/IO6 with MAH/MBC\)](#)[Radio Information Display Malfunction \(IOR\)](#)
- [Radio Poor Reception](#)
- [Speaker Malfunction \(UQA with IO5/IO6\)](#)[Speaker Malfunction \(UZ6\)](#)[Speaker Malfunction \(without UQA/UZ6\)](#)[Speaker Malfunction \(UQA with IOS/IOT/IOU\)](#)

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.
- Refer to [Diagnostic Procedure Instructions](#) to 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.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

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. Verify the application is installed on the mobile device and is up to date.

- **If the application is not installed or is not up to date.**

Install or update the application on the device.

- **Go to next step: If the application is installed on the mobile device and is up to date**

2. Verify the application operates correctly on the mobile device.

- **If the application is not operating correctly on the mobile device.**

Refer to the application website.

- **Go to next step: If the application is operating correctly on the mobile device.**

3. Verify the A11 Radio calibrations are current.

- **If the radio calibrations are not current**

Reprogram the A11 Radio and re-evaluate the concern.

- **Go to next step: If no update calibrations are available**

4. Verify the application is installed on the A11 Radio and is up to date.

- **If the application is not installed or is not up to date.**

Install or update the application on the A11 Radio.

- **Go to next step: If the application is installed on the A11 Radio and is up to date**

5. Ignition ON, A11 Radio ON.

6. 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.

- **If the mobile device cannot connect to the vehicle infotainment system.**
- If unable to connect via Bluetooth, refer to [Bluetooth Malfunction \(IO5/IO6\)Bluetooth Malfunction \(without IO5/IO6\)](#).
- If unable to connect via USB, refer to [Auxiliary Audio Input Malfunction \(IOB\)Auxiliary Audio Input Malfunction \(IO5/IO6\)Auxiliary Audio Input Malfunction \(IOR\)Auxiliary Audio Input Malfunction \(IOS/IOT/IOU\)](#).
- **Go to next step: If the mobile device connects to the vehicle infotainment system.**

7. Launch the application.

8. Verify the applications operates properly with the vehicle infotainment system.

- **If the application does not function properly**

Refer to diagnostic aids.

- **Go to next step: If the application functions properly**

9. All OK.

Repair Instructions

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

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

AUXILIARY AUDIO INPUT MALFUNCTION (IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to 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	-	-
Auxiliary Audio Common Signal	-	8	-	-
Auxiliary Detection Signal	7	8	-	-
Left Auxiliary Audio Signal	2	2	2, 4	-
Right Auxiliary Audio Signal	3	3	3, 4	-
USB Cable	B124B	B124B	B124B	-
Ground	-	1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
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 3.5 mm (1/8 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 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 3.5 mm (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 3.5 mm 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 Wiring Schematics (IOB)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOB)

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

For equivalent regional tools, refer to Special Tools Special Tools (MIT Tool Instructions)

Circuit/System Verification

Auxiliary Audio Input Jack

1. Verify no DTCs are present.

- **If any DTCs are present**

Refer to Diagnostic Trouble Code (DTC) List - Vehicle .

- **Go to next step: If no DTCs are present**

2. Ignition ON/vehicle in Service Mode, radio ON.
3. 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.

- **If the infotainment system does not switch to AUX as the audio source**

Refer to Circuit/System Testing - Auxiliary Input Jack.

- **Go to next step: If the infotainment system switches to AUX as the audio source**

4. 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.

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

Refer to Circuit/System Testing - Auxiliary Input Jack.

- **Go to next step: If audio is heard from the test tool.**

5. All OK

USB Port

1. Verify no DTCs are present.

- **If any DTCs are present**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).

- **Go to next step: If no DTCs are present**

2. Ignition ON/vehicle in Service Mode, radio ON.

3. 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.

- **If the infotainment system does not switch to USB as the audio source**

Refer to Circuit/System Testing - USB Port.

- **Go to next step: If the infotainment system switches to USB as the audio source**

4. 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.

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

Refer to Circuit/System Testing - USB Port.

- **Go to next step: If audio is heard from the device**

5. 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 - 3.5 V between the signal circuit terminal 5 and ground.

- **If less than 2.5 V**

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.

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

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

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

- **If greater than 3.5 V**

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 1 V between the detection circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **Go to next step: If between 2.5 - 3.5 V**
3. Test for less than 1 V between the signal circuits listed below and ground:
 - Left auxiliary audio signal circuit terminal 1
 - Right auxiliary audio signal circuit terminal 2
 - Auxiliary audio common signal circuit terminal 3
 - **If 1 V or greater**
 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 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **Go to next step: If less than 1 V**
4. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the A11 Radio.
5. Test for infinite resistance between the signal circuits listed below and ground:
 - Auxiliary audio common signal circuit terminal 18
 - Left auxiliary audio signal circuit terminal 19
 - Right auxiliary audio signal circuit terminal 20
 - **If less than infinite resistance**

Repair the short to ground on the circuit.

 - **Go to next step: If infinite resistance**
6. Test for less than 5 Ω between the signal circuit terminals listed below:
 - A11 Radio terminal 19 X1 and the X83 Auxiliary Audio Input terminal 1 X1
 - A11 Radio terminal 20 X1 and the X83 Auxiliary Audio Input terminal 2 X1
 - A11 Radio terminal 18 X1 and the X83 Auxiliary Audio Input terminal 3 X1
 - **If 5 Ω greater**

Repair the open/high resistance in the circuit.

 - **Go to next step: If less than 5 Ω**
7. Replace the X83 Auxiliary Audio Input. Connect all harness connectors.
8. Connect and operate the **EL-50334-20** Multi-Media Interface Tester (MIT).
9. Verify the audio from the test tool is heard through the vehicle infotainment system.
 - **If audio is not heard from the test tool**

Replace the A11 Radio.

 - **Go to next step: If audio is heard from the test tool**
10. All OK.

USB Port

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

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

2. Connect the EL-50334-1 Type A male to Mini A male USB Cable to the A11 Radio. Connect the EL-50334-3 Type A female to Type A female adapter to the EL-50334-1 Cable.
3. Ignition ON/vehicle in Service Mode, radio ON, connect the **EL-50334-20** Multi-Media Interface Tester (MIT) to the EL-50334-3 adapter.
4. Verify the infotainment system switches to USB as the audio source.
 - **If the infotainment system does not switch to USB as the audio source**
Replace the A11 Radio.
 - **Go to next step: If the infotainment system switches to USB as the audio source**
5. Ignition OFF/vehicle OFF, connect the vehicle USB cable to the A11 Radio. Disconnect the I/P to floor console inline USB cable connector.

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

6. 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.
7. Verify the infotainment system switches to USB as the audio source.
 - **If the infotainment system does not switch to USB as the audio source**
Replace the I/P USB cable assembly.
 - **Go to next step: If the infotainment system switches to USB as the audio source**
8. Ignition OFF/vehicle OFF, connect the I/P to floor console inline USB cable connector.
9. 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.
10. Ignition ON/vehicle in Service Mode, radio ON, connect the **EL-50334-20** Multi-Media Interface Tester (MIT) to the EL-50334-4 adapter.
11. Verify the infotainment system switches to USB as the audio source.
 - **If the infotainment system does not switch to USB as the audio source**
Replace the console USB cable assembly.
 - **Go to next step: If the infotainment system switches to USB as the audio source**
12. Test or replace the X83 Auxiliary Audio Input.

Repair Instructions

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

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

AUXILIARY AUDIO INPUT MALFUNCTION (IO5/IO6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+ (USB/SD card reader)	B124B, 1, 3	B124B, 1, 2	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+ (front console USB ports)	B124C, 1, 3	B124C, 1, 2	-	-
USB Cable	B124B/B124C, 2	B124B/B124C, 2	B124B/B124C, 2	-
Ground	-	1	-	-
1. SD Card reader and/or USB port(s) Inoperative 2. Fault may affect one or more components, dependant on fault location 3. Fault affects multiple components, dependant on vehicle equipment				

Circuit/System Description

Auxiliary Audio Input/USB/SD Card Reader

The infotainment system has a auxiliary jack, USB, and memory card receptacle assembly located in the console storage compartment. The two USB ports and the card reader slot interface with a hub device, internal to the assembly. The 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 human machine interface control module via a standard USB cable. A Mini type USB connector is used to connect the cable at the USB port and at the human machine interface control module and at the auxiliary jack, USB, and memory card receptacle. 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.

Front Console USB Ports

The infotainment system has a USB receptacle assembly located in the front of the console. The USB ports interface with a hub device, internal to the assembly. The 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 human machine interface control module via a standard USB cable. A Mini type USB connector is used to connect the cable at the USB port and at the human machine interface control module and at the auxiliary jack, USB, and memory card receptacle. 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.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

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

Auxiliary Audio Input Jack

1. Verify no DTCs are present.

- **If any DTCs are present**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If no DTCs are present**

2. Ignition ON, infotainment system ON.

3. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input 3.5 mm (1/8 in.) input jack and select the AUX test mode.

4. Verify that AUX becomes an available media selection to the infotainment system.

- **If AUX does not become an available media selection**

Refer to Circuit/System Testing - Auxiliary Audio Input, USB Port and SD Card Reader.

- **Go to next step: If AUX becomes an available media selection**

5. 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.

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

Refer to Circuit/System Testing - Auxiliary Audio Input, USB Port and SD Card Reader.

- **Go to next step: If audio is heard from the test tool.**

6. All OK

USB Ports and SD Card Reader

1. Ignition ON, infotainment system ON.

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.

- **If audio is not heard from the test tool**

1. Insert an SD card with compatible media into the SD card slot.

2. Verify the media on the SD card can be accessed while operating the system to connect to the SD card.

- If the SD card reader cannot be accessed, refer to Circuit/System Testing - Auxiliary Audio Input, USB Port and SD Card Reader.

- If the SD card reader can be accessed, replace the X83 Auxiliary Audio Input.

- **Go to next step: If audio is heard from the test tool**

4. Insert an SD card with compatible media into the SD card slot.

5. Verify the media on the SD card can be accessed while operating the system to connect to the SD card.

- **If the SD card reader media cannot be accessed**

Refer to Circuit/System Testing - Auxiliary Audio Input, USB Port and SD Card Reader

- **Go to next step: If the SD card reader media can be accessed**

6. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle USB port and select the USB test mode.
7. 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.

- **If audio is not heard from the test tool**

Refer to Circuit/System Testing - Front Console USB Ports.

- **Go to next step: If audio is heard from the test tool**

8. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92A USB Receptacle - Instrument Panel Compartment (if equipped) and select the USB test mode.
9. 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.

- **If audio is not heard from the test tool**

Refer to Circuit/System Testing - Instrument Panel Compartment USB Port.

- **Go to next step: If audio is heard from the test tool**

10. All OK.

Circuit/System Testing

Auxiliary Audio Input, USB Port and SD Card Reader

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.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
3. Verify that a test lamp illuminates between the B+ circuit terminal 6 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - **Go to next step: If the test lamp illuminates**
4. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.
 - **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.

- **Go to next step: If no connection problems or cable damage is noted.**

5. Connect the X1 harness connector at the X83 Auxiliary Audio Input.
6. Disconnect the vehicle USB cable X3 harness connector at the K74 Human Machine Interface Control Module and the X83 Auxiliary Audio Input Adapter.
7. Connect the EL-50034-14 Infotainment Test Cable and the EL-50334-2 Type-A Female to Mini-B Male Cable together. Connect the assembled test cable to the K74 Human Machine Interface Control Module and the X83 Auxiliary Audio Input.
8. Ignition ON, infotainment system ON.
9. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.

10. 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.
 - **If audio is not heard from the test tool**
 1. Replace the X83 Auxiliary Audio Input Adapter. 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.
 - If audio is not heard from the test tool, replace the K74 Human Machine Interface Control Module.
 - **Go to next step: If audio is heard from the test tool**
11. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input AUX port and select the AUX test mode.
12. 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.
 - **If audio is not heard from the test tool**
 1. Replace the X83 Auxiliary Audio Input Adapter. Connect all harness connectors.
 - **Go to next step: If audio is heard from the test tool.**
13. Replace the vehicle USB cable between the K74 Human Machine Interface Control Module and the X83 Auxiliary Audio Input Adapter.

Front Console USB Ports

1. Ignition OFF, disconnect the X1 harness connector at the X92 USB Receptacle.
2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
3. Verify that a test lamp illuminates between the B+ circuit terminal 6 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - **Go to next step: If the test lamp illuminates**
4. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.
 - **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.
 - **Go to next step: If no connection problems or cable damage is noted.**
5. Connect the X1 harness connector at the X92 USB Receptacle.
6. Disconnect the vehicle USB cable X4 harness connector at the K74 Human Machine Interface Control Module and the X2 harness connector at the X92 USB Receptacle.
7. Connect the EL-50034-14 Infotainment Test Cable and the EL-50334-2 Type-A Female to Mini-B Male Cable together. Connect the assembled test cable to the K74 Human Machine Interface Control Module and the X92 USB Receptacle.
8. Ignition ON, infotainment system ON.
9. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle USB port and select the USB test mode.

10. 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.
 - **If audio is not heard from the test tool**
 1. Replace the X92 USB Receptacle. Connect all harness connectors.
 2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle 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.
 - If audio is not heard from the test tool, replace the K74 Human Machine Interface Control Module.
 - If audio is heard from the test tool.
 4. All OK.
 - **Go to next step: If audio is heard from the test tool**
11. Connect the vehicle USB cable X4 harness connector at the K74 Human Machine Interface Control Module.
12. Disconnect the console to I/P USB in-line connector. Connect the assembled test cable to the I/P side of the in-line USB cable connector and the X92 USB Receptacle.
13. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle USB port and select the USB test mode.
14. 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.
 - **If audio is not heard from the test tool**

Replace the I/P USB cable assembly.
 - **Go to next step: If audio is heard from the test tool**
15. Replace the console USB cable assembly.

Instrument Panel Compartment USB Port (If equipped)

1. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.
 - **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.
 - **Go to next step: If no connection problems or cable damage is noted.**
2. Disconnect the vehicle USB cable X3 harness connector at the X92 USB Receptacle.
3. Connect the EL-50334-2 Type-A Female to Mini-B Male Cable to the X92 USB Receptacle.
4. Ignition ON, infotainment system ON.
5. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the EL-50334-2 Type-A Female to Mini-B Male Cable 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.
 - **If audio is not heard from the test tool**

Replace the X92 USB Receptacle.
 - **Go to next step: If audio is heard from the test tool**
7. Disconnect the console to I/P USB in-line connector.
8. Connect the EL-50034-14 Infotainment Test Cable and the EL-50334-2 Type-A Female to Mini-B Male Cable together. Connect the assembled test cable to the I/P side of the in-line USB cable connector and the X92 USB Receptacle.
9. Ignition ON, infotainment system ON.
10. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92A USB Receptacle - Instrument Panel Compartment and select the USB test mode.

11. 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.

- **If audio is not heard from the test tool**

Replace the X92A USB Receptacle - Instrument Panel Compartment.

- **Go to next step: If audio is heard from the test tool**

12. Replace the USB cable assembly between the X92A USB Receptacle - Instrument Panel Compartment and the X92 USB Receptacle.

Repair Instructions

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

- Refer to [Audio Disc Player, USB, Auxiliary In, and Memory Card Receptacle Replacement](#)
- Refer to [Audio Disc Player and USB Receptacle Replacement \(Equinox\)](#), [Audio Disc Player and USB Receptacle Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for radio or human machine interface control module replacement, programming, and setup.

AUXILIARY AUDIO INPUT MALFUNCTION (IOR)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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, 3	1, 2	-	-
USB Cable	B124B	B124B	B124B	-
Ground	-	1	-	-
1. USB port Inoperative 2. Fault may affect one or more components, dependant on fault location 3. Fault affects multiple components, dependant on vehicle equipment				

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 3.5 mm (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.

SD Card Reader

On Navigation vehicles the SD card will contain the map information for the vehicle region. The map data will be updated quarterly either by replacing the SD card or wireless updates via WiFi.

Refer to the owners manual for information on the Navigation system.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- 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 5 V 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 Wiring Schematics (IOR)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOR)

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.

- **If DTC B124B is set.**

Refer to Circuit/System testing.

- **Go to next step: If DTC B124B is not set.**

2. Ignition ON, infotainment system ON.
3. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
4. 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.

- **If audio is not heard from the test tool**

Refer to Circuit/System Testing.

- **Go to next step: If audio is heard from the test tool**

5. 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 3 and ground.

- **If 10 Ω or greater**

1. Ignition OFF.

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

- 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.

- **Go to next step: If less than 10 Ω**

3. Verify that a test lamp illuminates between the B+ circuit terminal 1 and ground.

- **If the test lamp does not illuminate**

1. Ignition OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- **Go to next step: If the test lamp illuminates**

4. 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.

- **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.

- **Go to next step: If no connection problems or cable damage is noted.**

5. Disconnect the vehicle USB cable at the A11 Radio and the X83 Auxiliary Audio Input.

6. 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.
7. Ignition ON, infotainment system ON.
8. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
9. 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.
 - **If audio is not heard from the test tool**
 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.
 - If audio is not heard from the test tool, replace the A11 Radio.
 - If audio is heard from the test tool.
 4. All OK.
 - **Go to next step: If audio is heard from the test tool**
10. Replace the USB cable assembly.

Repair Instructions

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

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

AUXILIARY AUDIO INPUT MALFUNCTION (IOS/IOT/IOU)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+ (front floor console compartment USB/SD card reader)	B124B, 1, 3	B124B, 1, 2	-	-
B+ (inside center console USB ports)	B124C, 1, 3	B124C, 1, 2	-	-
USB Cable (front floor console compartment USB/SD card reader)	B124B, 1	B124B, 1	B124B, 1	-
USB Cable (inside center console USB ports)	B124C, 4	B124C, 4	B124C, 4	-
Ground	-	1, 4	-	-
1. Auxiliary Jack, SD Card reader and/or USB port(s) Inoperative 2. Fault may affect one or more components, dependant on fault location 3. Fault affects multiple components, dependant on vehicle equipment 4. Inside center console USB ports inoperative				

Circuit/System Description

The infotainment system has a auxiliary jack, USB, and memory card receptacle assembly located in the front floor console compartment. The auxiliary jack, two USB ports and the card reader slot interface with a hub device, internal to the assembly. The 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 with the additional USB receptacle via a standard USB cable. A Mini type USB connector is used to connect the cable at the USB receptacle and at the auxiliary jack, USB, and memory card receptacle assembly. 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.

An additional USB receptacle assembly is available inside the front of the center console. The USB receptacles in the assembly interfaces with a hub device, internal to the assembly. The 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 radio via a standard USB cable.

Auxiliary Audio Input Jack and USB Ports

The Auxiliary Audio Input Jack and USB ports 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 Auxiliary Audio Input Jack or the USB port, the system detects the device and AUX or USB becomes available as an audio source.

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

SD Card Reader

On Navigation vehicles the SD card will contain the Map information for the vehicle region. The Map data will be updated quarterly either by replacing the SD card or wireless updates via WiFi.

Refer to the owners manual for information on the Navigation system.

Diagnostic Aids

3.5 mm (1/8 in.) Input Jack

- 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 3.5 mm 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 Ports and SD Card Reader

- 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 Wiring Schematics (IOS/IOT/IOU)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOS/IOT/IOU)

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. Ignition ON, infotainment system ON.
2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle port inside the center console 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.

- **If audio is not heard from the test tool**

Refer to Circuit/System Testing - USB Ports (Inside Center Console)

- **Go to next step: If audio is heard from the test tool**

4. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input 3.5 mm (1/8 in.) input jack and select the AUX test mode.
 5. 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.
- **If audio is not heard from the test tool.**

- **Go to next step: If audio is heard from the test tool.**

6. Ignition ON, infotainment system ON.

7. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port (Front Floor Console) and select the USB test mode.

8. 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.

- **If audio is not heard from the test tool**

1. Insert the correct SD card for the vehicle into the SD card slot.

2. Verify map data can be accessed by selecting Navigation.

- If the SD card reader cannot be accessed, refer to Circuit/System Testing - Auxiliary Audio Input Jack, USB Port and SD Card Reader (Front Floor Console).

- If the SD card reader can be accessed, replace the X83 Auxiliary Audio Input.

- **Go to next step: If audio is heard from the test tool**

9. All OK

Circuit/System Testing

NOTE: You must perform the Circuit/System Verification before proceeding with Circuit/System Testing.

USB Ports (Inside Center Console)

1. Ignition OFF, disconnect the X1 harness connector at the X92 USB Receptacle.

2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.

- **If 10 Ω or greater**

1. Ignition OFF.

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

- 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.

- **Go to next step: If less than 10 Ω**

3. Verify that a test lamp illuminates between the B+ circuit terminal 6 and ground.

- **If the test lamp does not illuminate**

1. Ignition OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- **Go to next step: If the test lamp illuminates**

4. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.

- **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.

- **Go to next step: If no connection problems or cable damage is noted.**

5. Replace the X92 USB Receptacle. Connect all harness connectors.

6. Ignition ON, infotainment system ON.

7. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle USB port and select the USB test mode.

8. 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.

- **If audio is not heard from the test tool**

1. Replace the USB cable assembly between the X92 USB receptacle and the A11 Radio. Connect all harness connectors.
2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X92 USB Receptacle 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.
 - If audio is not heard from the test tool, replace the A11 Radio.
 - If audio is heard from the test tool.
4. All OK.
 - **Go to next step: If audio is heard from the test tool**
9. All OK.

Auxiliary Audio Input Jack, USB Port and SD Card Reader (Front Floor Console)

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 3 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
3. Verify that a test lamp illuminates between the B+ circuit terminal 1 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - **Go to next step: If the test lamp illuminates**
4. Verify the USB cable is properly connected at all components and in-line connections, and there is no damage to the cable or connections.
 - **If connection problems or cable damage is noted.**

Perform the appropriate repair or replacement to correct any issues.
 - **Go to next step: If no connection problems or cable damage is noted.**
5. Connect the X1 harness connector at the X83 Auxiliary Audio Input.
6. Disconnect the vehicle USB cable X3 harness connector at the X92 USB Receptacle and the X83 Auxiliary Audio Input.
7. 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 X92 USB Receptacle and the X83 Auxiliary Audio Input.
8. Ignition ON, infotainment system ON.
9. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the following one at a time.
 - X83 Auxiliary Audio Input Auxiliary Jack and select Test Mode
 - X83 Auxiliary Audio Input USB port and select Test Mode
10. Verify the audio from the EL-50334-20 Multi-Media Interface Tester (MIT) is heard through the infotainment system on both auxiliary jack and USB port while operating the system to play audio from the test tool.
 - **If audio is not heard from the test tool from one or both**
 1. Replace the X83 Auxiliary Audio Input. Connect all harness connectors.
 2. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the following one at a time.
 - X83 Auxiliary Audio Input Auxiliary Jack and select Test Mode

- X83 Auxiliary Audio Input USB port and select Test Mode
3. Verify the audio from the EL-50334-20 Multi-Media Interface Tester (MIT) is heard through the infotainment system on both the auxiliary jack and USB port while operating the system to play audio from the test tool.
 - If audio is not heard from the test tool from one or both, replace the X92 USB Receptacle.
 - If audio is heard from the test tool.
 4. All OK.
 - **Go to next step: If audio is heard from the test tool**
11. Connect the vehicle USB cable X3 harness connector at the X92 USB Receptacle.
 12. Disconnect the console to I/P USB in-line connector. Connect the assembled test cable to the I/P side of the in-line USB cable connector and the X83 Auxiliary Audio Input.
 13. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select the USB test mode.
 14. 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.
 - **If audio is not heard from the test tool**

Replace the I/P USB cable assembly.
 - **Go to next step: If audio is heard from the test tool**
 15. Replace the console USB cable assembly.

Repair Instructions

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

- Refer to [Audio Disc Player and USB Receptacle Replacement \(Equinox\)](#) [Audio Disc Player and USB Receptacle Replacement \(Terrain\)](#).
- Refer to [USB Receptacle Replacement](#)
- Refer to [Control Module References](#) for radio or human machine interface control module replacement, programming, and setup.

BLUETOOTH MALFUNCTION (IO5/IO6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to 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 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 Bluetooth[®] hardware is internal to the human machine interface control module. The human machine interface control module supports streaming of data (music, voice, information) from cellular phones and other mobile devices that support those features. The human machine interface control module is also capable of 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, but can only be actively connected to one at any given time.
- For features that require a cellular connection make sure to perform tests in an area where the customer's device has a strong signal.
- The radio will return to the previous screen after a Bluetooth call has ended.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

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)

Circuit/System Verification

1. Verify no DTCs are present.
 - **If any DTCs are present**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
 - **Go to next step: If no DTCs are present**
2. Verify the K74 Human Machine Interface Control Module calibrations are current.
 - **If the K74 Human Machine Interface Control Module calibrations are not current**
Reprogram the K74 Human Machine Interface Control Module and re-evaluate the concern.
 - **Go to next step: If no update calibrations are available**

NOTE: The MIT tool can be used to test either cellular phone or streaming audio functions. Refer to the tool instructions, and perform the appropriate test(s) related to the customer's concern in the following steps.

3. Ignition ON, infotainment system ON.

4. Verify the infotainment system successfully pairs with the MIT tool.

- **If the infotainment system does not successfully pair with the MIT tool.**

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

2. Verify the infotainment system successfully pairs with the MIT tool.

- If the infotainment system does not successfully pair with the MIT tool.

Replace the K74 Human Machine Interface Control Module.

- **Go to next step: If the infotainment system successfully pairs with the MIT tool.**

5. Verify the infotainment system successfully completes the desired feature test using the MIT tool.

- **If the feature test is successful but the audio is distorted.**

Refer to [Speaker Malfunction \(UQA with IO5/IO6\)](#)[Speaker Malfunction \(UZ6\)](#)[Speaker Malfunction \(without UQA/UZ6\)](#)[Speaker Malfunction \(UQA with IOS/IOT/IOU\)](#).

- **If the feature test is not successful**

Replace the K74 Human Machine Interface Control Module.

- **Go to next step: If the feature test is successful**

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

- **If the device can not be paired with the infotainment system.**

1. Perform a reset on the device. Refer to device manufacture's information.

- 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.

- If the device successfully pairs with the infotainment system.

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

- If audio can not be heard while streaming.

Ensure the volume on the device is turned up to an adequate level.

- **Go to next step: If audio can be heard while streaming.**

7. All OK.

Repair Instructions

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

Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup

BLUETOOTH MALFUNCTION (WITHOUT IO5/IO6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to 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 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 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, but can only be actively connected to one at any given time.
- For features that require a cellular connection make sure to perform tests in an area where the customer's device has a strong signal.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

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)

For equivalent regional tools, refer to [Special Tools](#) [Special Tools \(MIT Tool Instructions\)](#).

Circuit/System Verification

1. Verify no DTCs are present.
 - **If any DTCs are present**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).

- **Go to next step: If no DTCs are present**
2. Verify the A11 Radio calibrations are current.
 - **If the radio calibrations are not current**
 Reprogram the A11 Radio and re-evaluate the concern.
 - **Go to next step: If no update calibrations are available**

NOTE: The MIT tool can be used to test either cellular phone or streaming audio functions. Refer to the tool instructions, and perform the appropriate test(s) related to the customers concern in the following steps.

3. Ignition ON, infotainment system ON.
4. Verify the infotainment system successfully pairs with the MIT tool.
 - **If the infotainment system does not successfully pair with the MIT tool.**
 1. Perform the 3 vehicle Factory Resets located in Setting > System > Return to Factory Settings.
 2. Verify the infotainment system successfully pairs with the MIT tool.
 - If the infotainment system does not successfully pair with the MIT tool.
 Replace the A11 Radio.
 - **Go to next step: If the infotainment system successfully pairs with the MIT tool.**
5. Verify the infotainment system successfully completes the desired feature test using the MIT tool.
 - **If the feature test is successful but the audio is distorted.**
 Refer to [Speaker Malfunction \(UZ6\)Speaker Malfunction \(without UQA/UZ6\)Speaker Malfunction \(UQA with IOS/IOT/IOU\)](#).
 - **If the feature test is not successful**
 Replace the A11 Radio.
 - **Go to next step: If the feature test is successful**
6. Verify the customers device can be paired with the infotainment system.
 - If the device can not be paired with the infotainment system.
 Perform a reset on the device. Refer to device manufacture's information.
 - 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.
 - If the device successfully pairs with the infotainment system.
7. Verify audio can be heard while streaming from the device.
 - If audio can not be heard while streaming.
 Ensure the volume on the device is turned up to an adequate level.
 - **Go to next step: If audio can be heard while streaming.**
8. All OK.

Repair Instructions

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

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

DIGITAL RADIO POOR OR NO RECEPTION (WITHOUT U2Q)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B125C 01

Satellite Antenna Circuit Short to Battery

DTC B125C 02

Satellite Antenna Circuit Short to Ground

DTC B125C 04

Satellite Antenna Circuit Open

Circuit/System Description

The digital radio receiver, located inside the radio, receives digital radio information from the digital radio antenna located on the outside of the vehicle. The digital radio 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 radio displays No XM Signal or Check Antenna.

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.

Diagnostic Aids

The digital radio antenna requires a clear line of sight to the sky to operate properly. Reception may be limited, intermittent, or unavailable inside structures.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio](#)

System Description and Operation (IOR)

Electrical Information Reference

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

Special Tools

EL-48028 Digital Radio Test Antenna

Circuit/System Verification

1. With the vehicle outside in an area with an unobstructed view of the southern sky, tune to XM.
2. Verify DTC B125C is not set as current and the No XM Signal message is not displayed on the radio.

- **If DTC B125C is set as current or the No XM Signal message is displayed.**

Refer to Circuit/System Testing.

- **Go to next step: If DTC B125C is not set as current and the No XM Signal message is not displayed.**

3. All OK.

Circuit/System Testing

1. Ignition OFF/Vehicle OFF, disconnect the digital radio antenna coax cable from the A11 Radio. Connect the **EL-48028** Digital Radio Test Antenna to the radio and place on the roof of the vehicle.
2. Ignition ON/Vehicle in Service Mode, radio tuned to XM channel 1.
3. Verify DTC B125C is not set as current and XM reception is improved.

- **If DTC B125C is set as current or XM reception is not improved**

Replace the A11 Radio.

- **Go to next step: If DTC B125C is not set as current and XM reception is improved**

4. Ignition OFF/Vehicle OFF, disconnect the digital radio antenna coax cable from the T2RR Antenna - Roof Rear.
5. Verify the digital radio antenna coax cable passes the coax cable component test. Refer to Component Testing.

- **If the coax cable does not pass the test**

Replace the antenna coax cable

- **Go to next step: If the coax cable passes the test**

6. Test or replace the T2RR Antenna - Roof Rear.

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.
 - **If 5 Ω or greater**
Replace the coax cable
 - **Go to next step: If less than 5 Ω**
3. Test for less than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**
Replace the coax cable
 - **Go to next step: If less than 5 Ω**
4. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.
 - **If less than infinite resistance**
Replace the coax cable
 - **Go to next step: If infinite resistance**
5. All OK

Repair Instructions

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

- Refer to [High Frequency Antenna Replacement \(Equinox\)](#). [High Frequency Antenna Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for radio replacement, programming, and setup.

DIGITAL RADIO POOR OR NO RECEPTION (U2Q)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

Electrical Information Reference

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

Circuit/System Testing

1. Ignition OFF/vehicle OFF, disconnect the digital radio antenna coax cable from the T2RR Antenna - Roof Rear and the A11 Radio.
2. Verify the digital radio antenna coax cable passes the coax cable component test. Refer to Component Testing.
 - **If the coax cable does not pass the test**

Replace the antenna coax cable
 - **Go to next step: If the coax cable passes the test**
3. Replace the T2RR Antenna - Roof Rear.
4. Ignition ON/vehicle in Service Mode, A11 Radio ON, tune to digital band.
5. Verify DTC B125E is not set as current and digital reception is improved.
 - **If DTC B125E is set as current or digital reception is not improved**

Replace the A11 Radio.
 - **Go to next step: If DTC B125E is not set as current and digital reception is improved**
6. 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/vehicle OFF, disconnect the coax cable at both components.
2. Test for less than 5 Ω between coax cable center terminal end to end.
 - **If 5 Ω or greater**

Replace the coax cable
 - **Go to next step: If less than 5 Ω**
3. Test for less than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**

Replace the coax cable
 - **Go to next step: If less than 5 Ω**
4. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.
 - **If less than infinite resistance**

Replace the coax cable
 - **Go to next step: If infinite resistance**
5. All OK

Repair Instructions

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

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

PHONE PROJECTION MALFUNCTION (APPLY 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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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 vehicles infotainment display. Users can control the apps and functions via the vehicle's infotainment system touchscreen or voice commands.

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 for a list of Apple CarPlay compatible apps. This does not guarantee the functionality of the app.

Reference Information

Schematic Reference

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#)

Electrical Information Reference

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

Circuit/System Verification

1. Verify no DTC's are present.

- **If any DTC's are present.**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#)

- **Go to next step: If no DTC's are present.**

2. Verify the correct settings on the radio and the connected device that will allow Apple CarPlay functionality.

- **If the settings are not correct.**

Refer to the vehicle and devices owner manual or manufacturers website for details on enabling CarPlay.

- **Go to next step: If the settings are correct.**

3. Verify the software is up to date on the connected device, refer to the device's owner manual or manufacturers website.

- **If the connected device software is not up to date.**

Recommend the customer update their device to the newest software version.

- **Go to next step: If the connected device software has the newest version.**

4. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select USB test mode,

5. 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.

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

Refer to [Auxiliary Audio Input Malfunction \(IOB\)](#), [Auxiliary Audio Input Malfunction \(IO5/IO6\)](#), [Auxiliary Audio Input Malfunction \(IOR\)](#), [Auxiliary Audio Input Malfunction \(IOS/IOT/IOU\)](#)

- **Go to next step: If audio is heard from the test tool.**

6. Verify the radio detects the connected device when plugged in by noting a change in the Phone Projection/Apple CarPlay icon on the Home screen.

- **If the radio does not show a change in the Phone Projection/Apple CarPlay icon.**

1. Verify the device's cable is recommended or approved by the device manufacture and there is no damage to the cable or terminals.

- If the cable is not the correct part or damage is noted advise the customer.
 - If no issues with the cable
2. Perform a device rest by holding both the Home and Power buttons on the device.
 3. Attempt to launch the application by pressing the Phone Projection/Apple CarPlay icon within the Home screen.
 - If the application does not launch
 4. Perform the 3 vehicle Factory Resets located in Setting > System > Return to Factory Settings.
 - **Go to next step: If the radio does show a change in the Phone Projection/Apple CarPlay icon.**
7. Attempt to launch the application by pressing the Phone Projection/Apple CarPlay icon within the Home screen.
- **If the application does not launch**
 1. Perform the 3 vehicle Factory Resets located in Setting > System > Return to Factory Settings.
 - **Go to next step: If the application does launch**
- All OK.

Repair Instructions

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

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

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Circuit/System Description

Android Auto is a new phone integration feature that enables Android users to display certain apps and functionality from their phone on the vehicles infotainment display. Users can control the apps and functions via the vehicle's infotainment system touchscreen, button control or voice commands.

Diagnostic Aids

- Verify the device is Bluetooth paired to the vehicle before launching Android Auto
- 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.
- Before launching Android Auto verify transmission is in park.
- Visit for a list of Android Auto compatible apps. This does not guarantee the functionality of the app.
- Listed below are some common Android Auto Error Messages or Error Codes -
 - 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 8: Authentication failed between the car and the phone.

Likely cause: This is most likely caused by the incorrect date and time on the radio.

Suggested solutions: Disconnect your phone from the vehicle. In radio settings set the correct date, time, time zone, daylight saving. 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.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

Electrical Information Reference

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

Circuit/System Verification

1. Verify no DTC's are present.

- **If any DTC's are present.**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#)

- **Go to next step: If no DTC's are present.**

2. Verify the correct settings on the radio and the connected device that will allow Android Auto functionality.

- **If the settings are not correct.**

Refer to the vehicle and devices owner manual or manufacturers website for details on enabling Android Auto.

- **Go to next step: If the settings are correct.**

3. Verify the software is up to date on the connected device, refer to the device's owner manual or manufacturers website.

- **If the connected device software is not up to date.**

Recommend the customer update their device to the newest software version.

- **Go to next step: If the connected device software has the newest version.**

4. Connect the EL-50334-20 Multi-Media Interface Tester (MIT) to the X83 Auxiliary Audio Input USB port and select USB test mode,
 5. 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.
- **If audio is not heard from the test tool.**

Refer to [Auxiliary Audio Input Malfunction \(IOB\)](#)[Auxiliary Audio Input Malfunction \(IO5/IO6\)](#)[Auxiliary Audio Input Malfunction \(IOR\)](#)[Auxiliary Audio Input Malfunction \(IOS/IOT/IOU\)](#)

- **Go to next step: If audio is heard from the test tool.**

6. 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.
- **If the radio does not automatically launch Android Auto or no change in the Phone Projection/Android Auto icon.**

NOTE: If the device displays an error message or error code refer to Diagnostic Aids.

7.

1. Verify the device's cable is recommended or approved by the device manufacture and there is no damage to the cable or terminals.
 - If the cable is not the correct part or damage is noted advise the customer.
 - If no issues with the cable
 2. Perform a device rest by holding both the Home and Power buttons on the device.
 3. 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.
 - 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.
 - If the application does not launch
 5. Perform the 3 vehicle Factory Resets located in Setting>System>Return to Factory Settings.
- **Go to next step: If the radio does automatically launch Android Auto.**

All OK.

Repair Instructions

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

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

ONSTAR MICROPHONE MALFUNCTION (IO5/IO6/IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2455 02

Cellular Phone Microphone Circuit Short to Ground

DTC B2455 04

Cellular Phone Microphone Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Microphone Signal	B2455 02	B2455 04	B2455 04	-
Microphone Low Signal	B2455 02	B2455 04	B2455 04	-

Circuit/System Description

The telematics communication interface control module provides the cellular phone microphone with a supplied voltage on the cellular phone microphone high signal circuit. When the microphone is in use, voice data from the user is sent back to the telematics communication interface control module on the microphone low signal circuit.

Conditions for Running the DTC

- The Vehicle must be ON or in Service Mode.
- The system voltage is at least 9.5 V and no more than 15.5 V.
- All the above conditions are present for greater than 10 s.

Conditions for Setting the DTC

B2455 02

The telematics communication interface control module detects a short to ground in the cellular phone microphone signal circuit for 10 s or greater.

B2455 04

The following conditions will set this DTC:

- The telematics communication interface control module detects an open/high resistance in the cellular phone microphone signal circuit for 10 s or greater.
- The telematics communication interface control module detects an open/high resistance in the low signal circuit for 10 s or greater.

Action Taken When the DTC Sets

- The OnStar[®] status LED turns red.
- The telematics communication interface control module will not receive a signal from the cellular phone microphone.
- Calls can be placed but the caller cannot be heard.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR). OnStar Description and Operation (UE1 with IOU/IOT/IOR).

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. Ignition OFF/Vehicle OFF, disconnect the harness connector at the B24 cellular phone microphone, Ignition ON/Vehicle in Service Mode.
2. Test for 8.0-10.5 V between the signal circuit terminal B and ground.
 - **If less than 8.0 V**
 1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the K73 telematics communication interface control module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the vehicle K73 Telematics Communication Interface Control Module.
 - **If greater than 10.5 V**
 1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the K73 telematics communication interface control module, Ignition ON/Vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If between 9.5-10.5 V**
3. Test for less than 1 V between the signal circuit terminal A and ground.
 - **If greater than 1 V**
 1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the K73 telematics communication interface control module, Ignition ON/Vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V, repair the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If less than 1 V**
4. Test for greater than 8 V between the signal circuit terminal B and the signal circuit terminal A.
 - **If less than 8 V**
 1. Ignition OFF/Vehicle OFF, disconnect the connector X2 at the K73 telematics communication interface control module.
 2. Test for infinite resistance between the low signal circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.

- If infinite resistance
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the vehicle K73 Telematics Communication Interface Control Module.
 - **Go to next step: If greater than 8 V**
 5. Test or replace the B24 Cellular Phone Microphone.

Repair Instructions

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

- Refer to [Mobile Telephone Microphone Replacement \(Equinox\)](#), [Mobile Telephone Microphone Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

ONSTAR MICROPHONE MALFUNCTION (IOR/IOU/IOT/IOS)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2455 02

Cellular Phone Microphone Circuit Short to Ground

DTC B2455 04

Cellular Phone Microphone Circuit Open/High Resistance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal Terminal B	B2455 02	B2455 04	-	-
Low Reference Terminal A	-	B2455 04	B2455 04	-

Circuit/System Description

The telematics communication interface control module provides the cellular phone microphone with a supplied voltage on the cellular phone microphone signal circuit. When the microphone is in use, voice data from the user is sent back to the telematics communication interface control module on the cellular microphone low reference circuit.

Conditions for Running the DTC

- Ignition ON/Vehicle in Service Mode.
- The system voltage is at least 9.5 V and no more than 15.5 V.
- All the above conditions are present for greater than 10 s.

Conditions for Setting the DTC

B2455 02

The telematics communication interface control module detects a short to ground in the cellular phone microphone signal circuit for 10 s or greater.

The following conditions will set this DTC:

- The telematics communication interface control module detects an open/high resistance in the cellular phone microphone signal circuit for 10 s or greater.
- The telematics communication interface control module detects an open/high resistance in the microphone low reference circuit for 10 s or greater.

Action Taken When the DTC Sets

- The telematics status LED turns red.
- The telematics communication interface control module will not receive a signal from the cellular phone microphone.
- Calls can be placed but the caller cannot be heard.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 with IOU/IOT/IOR)

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. Ignition OFF/vehicle OFF, disconnect the harness connector at the B24 Cellular Phone Microphone, ignition ON/vehicle in Service Mode.
2. Test for 8.0-10.5 V between the signal circuit terminal B and ground.
 - **If less than 8.0 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , replace the K73 Telematics Communication Interface Control Module.
- **If greater than 10.5 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module, ignition ON/vehicle in Service Mode.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If between 8.0-10.5 V**
- 3. Test for less than 1 V between the low reference circuit terminal A and ground.
 - **If greater than 1 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module, ignition ON/vehicle in Service Mode.
 2. Test for less than 1 V between the low reference circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If less than 1 V**
- 4. Test for greater than 8 V between the signal circuit terminal B and the low reference circuit terminal A.
 - **If less than 8 V**
 1. Ignition OFF/vehicle OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module.
 2. Test for infinite resistance between the low reference circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the vehicle K73 Telematics Communication Interface Control Module.
 - **Go to next step: If greater than 8 V**
- 5. Test or replace the B24 Cellular Phone Microphone.

Repair Instructions

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

- Refer to [Mobile Telephone Microphone Replacement \(Equinox\)](#), [Mobile Telephone Microphone Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for control module replacement, programming and setup.

ONSTAR AUDIO MALFUNCTION (IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Audio Signal	1	1	1	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Audio Common Signal	-	1	-	-
1. No or noisy OnStar [®] audio				

Circuit/System Description

When an OnStar[®] keypress is made, a serial data message is sent to the audio system to mute all radio functions and output OnStar[®] originated audio. After the audio system is muted, the telematics communication interface control module transmits signals to the audio system on the audio signal and audio common circuits.

Reference Information

Schematic Reference

- [OnStar/Telematics Wiring Schematics](#)
- [Radio/Navigation System Wiring Schematics \(IOB\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR)

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, radio ON.
2. Verify that audio is heard clearly through all speaker channels when tuning radio to a known good station.

- **If audio is not heard clearly**

Refer to [Speaker Malfunction \(UQA with IO5/IO6\)](#)[Speaker Malfunction \(UZ6\)](#)[Speaker Malfunction \(without UQA/UZ6\)](#)[Speaker Malfunction \(UQA with IOS/IOT/IOU\)](#)

- **Go to next step: If audio is heard clearly**

3. Verify that the Connecting to OnStar[®] message is heard clearly through the audio system when the OnStar[®] blue button is pressed.

- **If OnStar message is noisy or distorted**

Refer to Circuit/System Testing

- **Go to next step: If OnStar message is heard clearly**

4. All OK.

Circuit/System Testing

1. Ignition OFF/Vehicle OFF, disconnect the X1 harness connector at the A11 Radio and the X2 harness connector at the K73 Telematics Communication Interface Control Module, ignition

ON/vehicle in Service Mode.

2. Test for less than 1 V between the signal circuit terminals listed below and ground:

- K73 Telematics Communication Interface Control Module signal circuit terminal 1 X2
- K73 Telematics Communication Interface Control Module signal circuit terminal 2 X2
- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **Go to next step: If less than 1 V**

3. Ignition OFF/Vehicle OFF.

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

- K73 Telematics Communication Interface Control Module signal circuit terminal 1 X2
- K73 Telematics Communication Interface Control Module signal circuit terminal 2 X2
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **Go to next step: If infinite resistance**

5. Test for less than 2 Ω between the signal circuit terminals listed below:

- K73 Telematics Communication Interface Control Module signal circuit terminal 1 X2 and the A11 Radio signal circuit terminal 10 X1
- K73 Telematics Communication Interface Control Module signal circuit terminal 2 X2 and the A11 Radio signal circuit terminal 9 X1
- **If 2 Ω or greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 2 Ω**

6. Replace the K73 Telematics Communication Interface Control Module.

7. Verify that the Connecting to OnStar[®] message is heard clearly through the audio system when the OnStar[®] blue button is pressed.

- **If audio is not heard clearly**

Replace the A11 Radio.

- **Go to next step: If audio is heard clearly**

8. All OK.

Repair Instructions

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

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

ONSTAR AUDIO MALFUNCTION (WITHOUT IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Audio Signal	1	1	1	-
Audio Common Signal	-	1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
1. No or noisy OnStar [®] audio				

Circuit/System Description

When an OnStar[®] keypress is made, a serial data message is sent to the audio system to mute all radio functions and output OnStar[®] originated audio. After the audio system is muted, the telematics communication interface control module transmits signals to the audio system on the audio signal and audio common circuits.

Reference Information

Schematic Reference

- [OnStar/Telematics Wiring Schematics](#)
- [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#) [Radio/Navigation System Wiring Schematics \(IOR\)](#) [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR)

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, radio ON.
2. Verify that audio is heard clearly through all speaker channels when tuning radio to a known good station.

- **If audio is not heard clearly**

Refer to [Speaker Malfunction \(UQA with IO5/IO6\)](#) [Speaker Malfunction \(UZ6\)](#) [Speaker Malfunction \(without UQA/UZ6\)](#) [Speaker Malfunction \(UQA with IOS/IOT/IOU\)](#).

- **Go to next step: If audio is heard clearly**

3. Verify that the Connecting to OnStar[®] message is heard clearly through the audio system when the OnStar[®] blue button is pressed.

- **If OnStar message is noisy or distorted**

Refer to Circuit/System Testing

- **Go to next step: If OnStar message is heard clearly**

4. All OK.

Circuit/System Testing

1. Ignition OFF/Vehicle OFF, disconnect the X1 harness connector at the A11 Radio and the X2 harness connector at the K73 Telematics Communication Interface Control Module, ignition

ON/vehicle in Service Mode.

2. Test for less than 1 V between the signal circuit terminals listed below and ground:

- K73 Telematics Communication Interface Control Module signal circuit terminal 1 X2
- K73 Telematics Communication Interface Control Module signal circuit terminal 2 X2
- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **Go to next step: If less than 1 V**

3. Ignition OFF/Vehicle OFF.

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

- K73 Telematics Communication Interface Control Module signal circuit terminal 1 X2
- K73 Telematics Communication Interface Control Module signal circuit terminal 2 X2
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **Go to next step: If infinite resistance**

5. Test for less than 2 Ω between the signal circuit terminals listed below:

- K73 Telematics Communication Interface Control Module signal circuit terminal 1 X2 and the A11 Radio signal circuit terminal 20 X1
- K73 Telematics Communication Interface Control Module signal circuit terminal 2 X2 and the A11 Radio signal circuit terminal 19 X1
- **If 2 Ω or greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 2 Ω**

6. Replace the K73 Telematics Communication Interface Control Module.

7. Verify that the Connecting to OnStar[®] message is heard clearly through the audio system when the OnStar[®] blue button is pressed.

- **If audio is not heard clearly**

Replace the A11 Radio.

- **Go to next step: If audio is heard clearly**

8. All OK.

Repair Instructions

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

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

NO GLOBAL POSITIONING SYSTEM (GPS) RECEPTION (UE1 WITH IO5/IO6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2462 02

Global Positioning System Short to Ground

DTC B2462 04

Circuit/System Description

The navigation antenna is connected to the Telematics Communication Interface Control Module. The module supplies 5 V to the antenna to power the internal amplifier through the center conductor of the antenna coax cable.

When the vehicle is equipped with the optional navigation system, a Navigation Antenna Signal Splitter is installed to distribute the navigation signal to both the Telematics Communication Interface Control Module and the Human Machine Interface Control Module. The Human Machine Interface Control Module supplies 5 V through the coax cable to power the Navigation Antenna Signal Splitter.

Conditions for Running the DTC

- Radio On
- System voltage is greater than 9 V and less than 16 V.
- The navigation system/telematics communication interface control module tests the GPS antenna every 10 s.

Conditions for Setting the DTC

B2462 02

The Telematics Communication Interface Control Module or Human Machine Interface Control Module detects a short to ground on the GPS antenna signal circuit.

B2462 04

The Telematics Communication Interface Control Module or Human Machine Interface Control Module detects an open/high resistance on the GPS antenna signal circuit.

Action Taken When the DTC Sets

- The Telematics Communication Interface Control Module or Human Machine Interface Control Module uses the last reported position and the vehicle speed signal to calculate the vehicle position.
- Route guidance may be inaccurate.
- Turn by turn navigation may be inaccurate or inoperative.

Conditions for Clearing the DTC

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

Diagnostic Aids

- The scan tool Telematics Communication Interface Control Module GPS signal parameter will display a Yes or No dependent upon whether or not the module sees an increment of the seconds transmitted by GPS signals to the Telematics Communication Interface Control Module. Upon entering this screen, the GPS signal title will initially display Yes, regardless of the presence of time increment, for at least 2 seconds, while the algorithm in the scan tool determines the status of the clock. If increment is found, Yes is continually displayed. If the clock remains static, No is displayed. The scan tool looks for increment every second, regardless of current display.
- Inaccurate or aged GPS position concerns which are no longer present may have been due to the temporary loss of GPS signal reception by the vehicle. Conditions such as tunnels or parking structures will restrict the cellular phone and navigation antenna from a clear view of the satellites in the sky and may have caused this temporary data loss.
- The GPS requires a clear line of sight to the sky to operate properly. In most cases the GPS will not have reception near tall buildings or inside structures.

Reference Information

Schematic Reference

- [OnStar/Telematics Wiring Schematics](#)
- [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

- [OnStar Description and Operation \(UE1 without IOU/IOT/IOR\)](#)
- [Radio/Audio System Description and Operation \(IO5/IO6\)](#)

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-49903 OnStar Antenna Diagnostic Tool Kit

Circuit/System Verification

NOTE:

The following verification requires the vehicle to be outside with an unobstructed view of the southern sky. Allow 5 minutes after turning the ignition ON for the vehicle to acquire the GPS satellites signal.

1. Ignition ON.
2. Verify that DTC B2462 is not set in the Telematics Communication Interface Control Module.
 - **If DTC B2462 is set in the Telematics Communication Interface Control Module and the vehicle is not equipped with a navigation system**

Refer to Circuit/System Testing Without Navigation System.
 - **If DTC B2462 is set in the Telematics Communication Interface Control Module and the vehicle is equipped with a navigation system**

Refer to Circuit/System Testing With Navigation System.
 - **Go to next step: If DTC B2462 is not set in the Telematics Communication Interface Control Module**
3. Verify an OnStar advisor can locate the vehicle after performing a blue button press.
 - **If the advisor can not locate the vehicle and the vehicle is not equipped with a navigation system**

Refer to Circuit/System Testing Without Navigation System
 - **If the advisor can not locate the vehicle and the vehicle is equipped with a navigation system**

Refer to Circuit/System Testing With Navigation System.
 - **Go to next step: If the advisor can locate the vehicle**

4. Verify DTC B2462 is not set in the Human Machine Interface Control Module.

- **If DTC B2462 is set in the Human Machine Interface Control Module**

Refer to Circuit/System Testing With Navigation System - Step 9.

- **Go to next step: If DTC B2462 is not set in the Human Machine Interface Control Module**

5. Verify that the NO GPS symbol/message is not displayed on the radio display.

- **If the NO GPS symbol/message is displayed**

Refer to Circuit/System Testing With Navigation System - Step 9.

- **Go to next step: If the NO GPS symbol/message is not displayed**

6. All OK.

Circuit/System Testing

without Navigation System

NOTE: You must perform the Circuit/System Verification before proceeding with Circuit/System Testing.

1. Ignition OFF, disconnect the GPS and cellular coax cable connector at the K73 Telematics Communication Interface Control Module.

2. Attach both leads of the EL-49903-1 OnStar test antenna to the EL-49903-5 combiner. Using the EL-49903-6 coax cable attach the grey connector to the combiner and the brown connector to the K73 Telematics Communication Interface Control Module. Place the test antenna on the roof of the vehicle, ignition ON.

3. Verify DTC B2462 is not set or that the OnStar advisor can locate the vehicle.

- **If DTC B2462 is set or the advisor can not locate the vehicle**

Replace the K73 Telematics Communication Interface Control Module.

- **Go to next step: If DTC B2462 is not set or the advisor can locate the vehicle**

4. Test the coax cable between the K73 Telematics Communication Interface Control Module and the T2RR Antenna - Roof Rear. Refer to component testing.

- **If the coax cable does not pass the test**

Replace the coax cable.

- **Go to next step: If the coax cable passes the test**

5. Test or replace the T2RR Antenna - Roof Rear.

with Navigation System

NOTE: You must perform the Circuit/System Verification before proceeding with Circuit/System Testing.

1. Ignition OFF, disconnect the T2RR Antenna - Roof Rear coax cable at the T15 Navigation Antenna Signal Splitter.

2. Attach both leads of the EL-49903-1 OnStar test antenna to the EL-49903-5 combiner. Using the EL-49903-7 coax cable attach one grey connector to the combiner and the other grey connector to the T15 Navigation Antenna Signal Splitter. Place the test antenna on the roof of the vehicle, ignition ON.

3. Verify DTC B2462 is not set or that the OnStar advisor can locate the vehicle.

- **If DTC B2462 is not set or the advisor can locate the vehicle**

1. Test the coax cable between the T15 Navigation Antenna Signal Splitter and the T2RR Antenna - Roof Rear. Refer to Component Testing.

- If the coax cable does not pass the test

Replace the coax cable.

- If the coax cable passes the test

2. Replace the T2RR Antenna - Roof Rear.

- **Go to next step: If DTC B2462 is set or if the advisor can not locate the vehicle**

4. Ignition OFF, disconnect the GPS and cellular coax cable connector at the K73 Telematics Communication Interface Control Module.

5. Attach both leads of the EL-49903-1 OnStar test antenna to the EL-49903-5 combiner. Using the EL-49903-6 coax cable attach the grey connector to the combiner and the brown connector to the K73 Telematics Communication Interface Control Module. Place the test antenna on the roof of the vehicle, ignition ON.

6. Verify DTC B2462 is not set or that the OnStar advisor can locate the vehicle.

- **If DTC B2462 is set or the advisor can not locate the vehicle.**

Replace the K73 Telematics Communication Interface Control Module.

- **Go to next step: If DTC B2462 is not set or the advisor can locate the vehicle.**

7. Ignition OFF.

8. Test the coax cable between the T15 Navigation Antenna Signal Splitter and the K73 Telematics Communication Interface Control Module. Refer to Component Testing.

- **If the coax cable does not pass the test.**

Replace the coax cable.

- **Go to next step: If the coax cable passes the test.**

9. Ignition OFF, disconnect the blue GPS coax cable connector at the K74 Human Machine Interface Control Module.

10. Attach the EL-49903-1 OnStar test antenna blue connector to the K74 Human Machine Interface Control Module and place the test antenna on the roof of the vehicle.

11. Ignition ON.

12. Verify DTC B2462 is not set or that the NO GPS symbol/message is not displayed on the radio display.

- **If DTC B2462 is set or the NO GPS symbol/message is displayed**

Replace the K74 Human Machine Interface Control Module

- **Go to next step: If DTC B2462 is not set or if the NO GPS symbol/message is not displayed.**

13. Ignition OFF.

14. Test the coax cable between the T15 Navigation Antenna Signal Splitter and the K74 Human Machine Interface Control Module. Refer to Component Testing.

- **If the coax cable does not pass the test.**

Replace the coax cable.

- **Go to next step: If the coax cable passes the test.**

15. Test or replace the T15 Navigation Antenna Signal Splitter.

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.

- The vehicle may be equipped with sectioned coax. Test each section and replace only the faulty section, not the entire length of coax.

Coax Cable Test

1. Ignition OFF, disconnect the coax cable at both components.
2. Test for less than 5 Ω between the coax cable center terminal end to end.
 - **If 5 Ω or greater**
Replace the coax cable.
 - **Go to next step: If less than 5 Ω**
3. Test for greater than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**
Replace the coax cable.
 - **Go to next step: If less than 5 Ω**
4. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.
 - **If less than infinite resistance**
Replace the coax cable.
 - **Go to next step: If infinite resistance**
5. All OK.

Repair Instructions

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

- Refer to [Radio Antenna Base Replacement \(Equinox\)](#), [Radio Antenna Base Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for Human Machine Interface control module or Telematics Communication Interface Control Module replacement, programming, and setup

NO GLOBAL POSITIONING SYSTEM (GPS) RECEPTION (IO5/IO6 WITHOUT UE1)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2462

Global Positioning System Signal

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

Circuit Description

The navigation antenna is connected to the human machine interface control module by a shielded coaxial cable. The human machine interface control module supplies 5 V through the coax cable to power the internal antenna amplifier.

Conditions for Running the DTC

- Radio On.
- System voltage is greater than 9 V and less than 16 V.

- The human machine interface control module tests the GPS antenna every 10 seconds.

Conditions for Setting the DTC

B2462 01

The human machine interface control module detects a short to B+ on the GPS antenna signal circuit.

B2462 02

The human machine interface control module detects a short to ground on the GPS antenna signal circuit.

B2462 04

The human machine interface control module detects an open/high resistance on the GPS antenna signal circuit.

Actions Taken When the DTC Sets

- The human machine interface control module uses the last reported position and the vehicle speed signal to calculate the vehicle position.
- Route guidance may be inaccurate.
- Turn by turn navigation may be inaccurate or inoperative.

Conditions for Clearing the DTC

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

Diagnostic Aids

The navigation antenna requires a clear line of sight to the sky to operate properly. The GPS may have limited, intermittent, or no reception near tall buildings or inside structures.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

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-49903 OnStar Antenna Diagnostic Tool Kit

1. Ignition OFF/vehicle OFF, disconnect the navigation antenna coax cable connector at the K74 Human Machine Interface Control Module. Connect the **EL-49903** GM OnStar antenna diagnostic tool kit to the K74 Human Machine Interface Control Module, place the test antenna on the roof of the vehicle.
2. Ignition ON/vehicle in Service Mode, infotainment system ON, navigation selected.
3. Verify DTC B2462 is not set or the NO GPS symbol is not displayed on the information display.
 - **If DTC B2462 is set or if the NO GPS symbol is displayed**

Replace the K74 Human Machine Interface Control Module.
 - **Go to next step: If DTC B2462 is not set or the NO GPS symbol is not displayed**
4. Ignition OFF/vehicle OFF, disconnect the radio navigation coax cable at the.
5. Verify the radio navigation coax cable passes the coax cable component test. Refer to Component Testing.
 - **If the coax cable does not pass the test**

Replace the coax cable
 - **Go to next step: If the coax cable passes the test**
6. Test or replace the T2RR Antenna - Roof Rear.

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 5 Ω between coax cable center terminal end to end.
 - **If 5 Ω or greater**

Replace the coax cable
 - **Go to next step: If less than 5 Ω**
3. Test for less than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**

Replace the coax cable
 - **Go to next step: If less than 5 Ω**
4. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.
 - **If less than infinite resistance**

Replace the coax cable
 - **Go to next step: If infinite resistance**
5. All OK

Repair Instructions

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

- Refer to [High Frequency Antenna Replacement \(Equinox\)](#), [High Frequency Antenna Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup.

NO GLOBAL POSITIONING SYSTEM (GPS) RECEPTION (WITHOUT IO5/IO6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2462 02

Global Positioning System Short to Ground

DTC B2462 04

Global Positioning System Open

Circuit/System Description

The navigation antenna is connected to the Telematics Communication Interface Control Module. The module supplies 5 V to the antenna to power the internal amplifier through the center conductor of the antenna coax cable.

Conditions for Running the DTC

- Radio On.
- System voltage is greater than 9 V and less than 16 V.
- The navigation system/telematics communication interface control module tests the GPS antenna every 10 s.

Conditions for Setting the DTC

B2462 02

The telematics communication interface control module detects a short to ground on the GPS antenna signal circuit.

B2462 04

The telematics communication interface control module detects a open/high resistance on the GPS antenna signal circuit.

Action Taken When the DTC Sets

- The telematics communication interface control module uses the last reported position and the vehicle speed signal to calculate the vehicle position.
- Route guidance may be inaccurate.
- Turn by turn navigation may be inaccurate or inoperative.

Conditions for Clearing the DTC

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

Diagnostic Aids

- The scan tool Telematics Communication Interface Control Module GPS signal parameter will display a Yes or No dependent upon whether or not the module sees an increment of the seconds transmitted by GPS signals to the Telematics Communication Interface Control Module. Upon entering this screen, the GPS signal title will initially display Yes, regardless of the presence of time increment, for at least 2 seconds, while the algorithm in the scan tool determines the status of the clock. If increment is found, Yes is continually displayed. If the clock remains static, No is displayed. The scan tool looks for increment every second, regardless of current display.
- Inaccurate or aged GPS position concerns which are no longer present may have been due to the temporary loss of GPS signal reception by the vehicle. Conditions such as tunnels or parking structures will restrict the cellular phone and navigation antenna from a clear view of the satellites in the sky and may have caused this temporary data loss.
- The GPS requires a clear line of sight to the sky to operate properly. In most cases the GPS will not have reception near tall buildings or inside structures.

Reference Information

Schematic Reference

- [OnStar/Telematics Wiring Schematics](#)
- [Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

- [OnStar Description and Operation \(UE1 without IOU/IOT/IOR\)](#), [OnStar Description and Operation \(UE1 with IOU/IOT/IOR\)](#)
- [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#)

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-49903 OnStar Antenna Diagnostic Tool Kit

Circuit/System Testing

1. Ignition OFF/vehicle OFF, disconnect the GPS and cellular coax cable connector at the K73 Telematics Communication Interface Control Module.
2. Attach both leads of the EL-49903-1 OnStar test antenna to the EL-49903-5 combiner. Using the EL-49903-6 coax cable attach the grey connector to the combiner and the brown connector to the K73 Telematics Communication Interface Control Module. Place the test antenna on the roof of the vehicle, ignition ON.
3. Verify DTC B2462 is not set or that the OnStar advisor can locate the vehicle.
 - **If DTC B2462 is set or the advisor can not locate the vehicle**

Replace the K73 Telematics Communication Interface Control Module.

- **Go to next step: If DTC B2462 is not set or the advisor can locate the vehicle**

4. Test the coax cable between the K73 Telematics Communication Interface Control Module and the T2RR Antenna - Roof Rear. Refer to component testing.

- **If the coax cable does not pass the test**

Replace the coax cable.

- **Go to next step: If the coax cable passes the test**

5. Test or replace the T2RR Antenna - Roof Rear.

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.**
- **The vehicle may be equipped with sectioned coax. Test each section and replace only the faulty section, not the entire length of coax.**

Coax Cable Test

1. Ignition OFF/vehicle OFF, disconnect the coax cable at both components.

2. Test for less than 5 Ω between the coax cable center terminal end to end.

- **If 5 Ω or greater**

Replace the coax cable.

- **Go to next step: If less than 5 Ω**

3. Test for greater than 5 Ω between the coax cable outer shield end to end.

- **If 5 Ω or greater**

Replace the coax cable.

- **Go to next step: If less than 5 Ω**

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

- **If less than infinite resistance**

Replace the coax cable.

- **Go to next step: If infinite resistance**

5. All OK.

Repair Instructions

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

- Refer to [Radio Antenna Base Replacement \(Equinox\)](#) [Radio Antenna Base Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for radio or telematics communication interface control module replacement, programming, and setup

ONSTAR BUTTON LED 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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
10 V Reference	B2476 02	B2476 04	B2476 04	-
Red LED Control Terminal 14	1	1	2	-
Green LED Control Terminal 15	1	1	2	-
Ground	-	B2476 04	-	-
1. OnStar [®] LED Inoperative 2. LED Illuminated At All Times				

Circuit Description

The OnStar[®] status LEDs are located with the OnStar buttons. The green LED is illuminated when the system is ON and operating normally. When the green LED is green and flashing, it is an indication that a call is in progress. When the red LED is illuminated, a system malfunction is present. In the event there is a system malfunction and the OnStar[®] system is still able to make a call, the LED will flash red during the call. The OnStar[®] LEDs are controlled by the telematics communication interface control module via the keypad green LED signal circuit and the keypad red LED signal circuit.

Reference Information

Schematic Reference

[OnStar/Telematics Wiring Schematics](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[OnStar Description and Operation \(UE1 without IOU/IOT/IOR\)](#), [OnStar Description and Operation \(UE1 with IOU/IOT/IOR\)](#)

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

NOTE:

- If the green LED is off with the ignition ON and the LED does not function when commanded with the scan tool, contact the OnStar Center to confirm the vehicle has a current subscription.

1. Vehicle in Service Mode/Ignition ON.

2. Verify no DTCs are set.

- If any DTCs are set

- **Go to next step: If no DTCs are set**

3. Verify that the green LED turns ON and OFF when commanding the Green Indicator ON and OFF with a scan tool.

- **If the green LED does not turn ON and OFF**

Refer to Circuit/System Testing - Green LED Test

- **Go to next step: If the green LED turns ON and OFF**

4. Verify that the red LED turns ON and OFF when commanding the Red Indicator ON and OFF with a scan tool.

- **If the red LED does not turn ON and OFF**

Refer to Circuit/System Testing - Red LED Test

- **Go to next step: If the red LED turns ON and OFF**

5. All OK.

Circuit/System Testing

Green LED Test

1. Vehicle OFF/Ignition OFF, and all vehicle systems OFF, disconnect the harness connector at the A98 Front Overhead Console. It may take up to 2 min for all vehicle systems to power down. Doors closed, courtesy lamps OFF.

2. Test for less than 10 Ω between the ground circuit terminal 5 and ground.

- **If 10 Ω or greater**

1. Vehicle OFF/Ignition OFF.

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

- 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.

- **Go to next step: If less than 10 Ω**

3. Vehicle in Service Mode/Ignition ON.

4. Test for less than 1 V between the control circuit terminal 15 and ground while commanding the Green Indicator OFF with a scan tool.

- **If 1 V or greater**

1. Vehicle OFF/Ignition OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module, vehicle in Service Mode/Ignition ON.

2. Test for less than 1 V between the control circuit terminal 15 and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K73 Telematics Communication Interface Control Module.

- **Go to next step: If less than 1 V**

5. Test for greater than 8 V between the control circuit terminal 15 and ground while commanding the Green Indicator ON with a scan tool.

- **If 8 V or less**

1. Vehicle OFF/Ignition OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module.

2. Test for infinite resistance between the control circuit terminal 15 and ground.

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

3. Test for less than 2 Ω in the control circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If greater than 8 V**
6. Test or replace the A98 Front Overhead Console.

Red LED Test

1. Vehicle OFF/Ignition OFF, and all vehicle systems OFF, disconnect the harness connector at the A98 Front Overhead Console. It may take up to 2 min for all vehicle systems to power down. Doors closed, courtesy lamps OFF.
2. Test for less than 10 Ω between the ground circuit terminal 5 and ground.
 - **If 10 Ω or greater**
 1. Vehicle OFF/Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
3. Vehicle in Service Mode/Ignition ON.
4. Test for less than 1 V between the control circuit terminal 14 and ground while commanding the Red Indicator OFF with a scan tool.
 - **If 1 V or greater**
 1. Vehicle OFF/Ignition OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module, vehicle in Service Mode/Ignition ON.
 2. Test for less than 1 V between the control circuit terminal 14 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If less than 1 V**
5. Test for greater than 8 V between the control circuit terminal 14 and ground while commanding the Red Indicator ON with a scan tool.
 - **If 8 V or less**
 1. Vehicle OFF/Ignition OFF, disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module.
 2. Test for infinite resistance between the control circuit terminal 14 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If greater than 8 V**
6. Test or replace the A98 Front Overhead Console.

Repair Instructions

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

- Refer to [Roof Console Replacement](#)
- Refer to [Control Module References](#) for control module replacement, programming and setup

ONSTAR CALL CENTER REMOTE FUNCTION REQUESTS 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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Circuit/System Description

The telematics communication interface control module has the capability of commanding the horn, initiating door lock/unlock, or operating the exterior lamps using the serial data circuits. These functions are commanded by the OnStar®, Call Center per a customer request.

Diagnostic Aids

The customer concern may have been due to a lack of cellular service in a given area, or a failure in the National Cellular Network infrastructure that has since been corrected.

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR), OnStar Description and Operation (UE1 with IOU/IOT/IOR)

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

NOTE:

- It is necessary to inform the OnStar®, Call Center advisor that this call is for vehicle diagnostic purposes.
- It is necessary to have the vehicle in an open outside area where a cellular call can be successfully placed and GPS data can be received from satellites.

1. Vehicle in Service Mode.

2. Verify that the horn, lights, and the door locks on the vehicle operate properly.

- If an applicable vehicle system does not operate properly

Refer to [Diagnostic System Check - Vehicle](#) .

- Go to next step: If all applicable vehicle systems operate properly

3. Verify that a call can be successfully placed to the OnStar Call Center by pressing the blue OnStar button.

- If unable to contact the OnStar®, Call Center

Refer to [Unable to Contact OnStar Call Center](#)

- **Go to next step: If able to contact the OnStar Call Center**

4. Verify with the OnStar advisor that all remote functions (door locks, lights, and horn) work.

- **If the remote functions do not operate when requested**

Replace the K73 telematics communication interface control module

- **Go to next step: If the remote functions operate when requested**

5. All OK.

Repair Instructions

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

Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

ONSTAR BUTTON 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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2476 04

Cellular Phone Select Service Switch Open

DTC B2476 59

Cellular Phone Select Service Switch Protection Time-out

DTC B2482 00

Cellular Phone Select Service Switch Range/Performance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
10 V Reference	B2476 02	B2476 04	B2476 04	-
Signal Terminal 17	B2476 02	B2476 04	B2476 59	B2476 59, B2482 00
Ground	-	B2476 04	-	-

Circuit/System Description

The OnStar® button assembly consists of 3 buttons: Call/Answer, OnStar® Call Center, and OnStar® Emergency. The telematics communication interface control module supplies the OnStar® button assembly with 10 V via the 10 V reference circuit. Each of the buttons, when pressed, completes the circuit across a resistor allowing a specific voltage to be returned to the telematics communication interface control module over the keypad signal circuit. Depending upon the voltage range returned, the telematics communication interface control module is able to identify which button has been pressed.

Conditions for Running the DTC

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

Conditions for Setting the DTC

B2476 04

The telematics communication interface control module detects an open/high resistance on the keypad supply voltage circuit.

B2482 and B2476 59

The telematics communication interface control module detects a valid signal on the keypad signal circuit for longer than 15 s. If one of the OnStar[®] buttons is held or stuck for 15 s or greater, the telematics communication interface control module will set this DTC.

Action Taken When the DTC Sets

- The OnStar[®] status LED turns red.
- No calls can be placed.
- The telematics communication interface control module will ignore all inputs from the OnStar[®] button assembly.

Conditions for Clearing the DTC

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

Diagnostic Aids

After any repair is made to the 10 V reference circuit or button signal circuit the fuse to the telematics communication interface control module must be removed for 30 s to reset the control module. Failure to do so could result in incorrect diagnosis.

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOB), OnStar Description and Operation (UE1 with IOU/IOT/IOB)

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

NOTE:

- 10 V reference circuit measurement may vary with vehicle battery voltage.
- Test for voltage range with vehicle battery measuring at a minimum of 11.5 V

1. Vehicle OFF/Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the A98 Front Overhead Console Assembly. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 5 and ground.
 - **If 10 Ω or greater**
 1. Vehicle OFF/Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - 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.
 - **Go to next step: If less than 10 Ω**
3. Vehicle in Service Mode/Ignition ON.
4. Test for 8.0 - 10.5 V between the 10 V reference circuit terminal 16 and ground.
 - **If less than 8.0 V**
 1. Vehicle OFF/Ignition OFF, disconnect the harness connector at the K73 Telematics Communication Interface Control Module.
 2. Test for infinite resistance between the 10 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the 10 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K73 Telematics Communication Interface Control Module.
 - **If greater than 10.5 V**
 1. Vehicle OFF/Ignition OFF, disconnect the harness connector at the K73 Telematics Communication Interface Control Module, vehicle in Service Mode/Ignition ON.
 2. Test for less than 1 V between the 10 V reference circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If between 8.0 - 10.5 V**
5. Vehicle OFF/Ignition OFF.
6. Test for 500 - 900 Ω between the signal circuit terminal 17 and ground.
 - **If less than 500 Ω**
 1. Disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K73 Telematics Communication Interface Control Module.
 - **If greater than 900 Ω**
 1. Disconnect the X1 harness connector at the K73 Telematics Communication Interface Control Module, vehicle in Service Mode/Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Vehicle OFF.
 4. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If between 500 - 900 Ω**

Repair Instructions

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

- Refer to [Roof Console Replacement](#)
- Refer to [Control Module References](#) for telematics communication interface control module replacement, programming and setup.

ONSTAR STEERING WHEEL CONTROL FUNCTIONS MALFUNCTION

Some vehicles equipped with the OnStar[®] system have the capability of accessing voice mailboxes and other automated phone systems by means of the steering wheel controls, while the OnStar[®] Personal Calling feature is in use. If the "Talk" or "Mute" button (depending upon the vehicle) on the steering wheel controls is depressed during an OnStar[®] Personal Calling call, the telematics communication interface control module receives the message on the serial data bus from either the radio or body control module. This message is interpreted as a request to turn any spoken numbers into dual tone multi-frequency tones to be delivered over the airwaves to the phone system the user is communicating with. Complete instructions for operation of these features can be found in the information provided to the customer with the OnStar[®] system.

The steering wheel controls are a resistor network that consist of multiple momentary contact switches and a series of resistors. The switches and resistor network are arranged so that each switch has a different resistance value. When a switch is pressed, a voltage drop occurs in the resistor network, which produces a specific voltage value unique to the switch selected, to be interpreted by either the radio or BCM. In the event the OnStar[®] steering wheel control functions are inoperative, technicians should refer to [Steering Wheel Controls Malfunction](#), to begin diagnosis of the steering wheel control concern.

RADIO CONTROLS MALFUNCTION (IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal terminal 6	B123E 02, 1	B123E 01, 1	B123E 01, 1	-
Signal terminal 5	2	2	2	-
Signal terminal 7	3	3	3	-
signal terminal 8	3	3	3	-
Low Reference terminal 10	-	4	-	-
1. Home, Seek Up, Seek Down, and/or Phone button will not function 2. Power Button will not function 3. Unable to adjust volume 4. All Radio Control buttons may not function				

Circuit/System Description

The radio info display module, radio controls and radio are all separate components. The radio controls communicate radio control inputs directly to the radio through a discrete circuit for volume up, volume down and power ON button. It also uses a series of resistors through a single signal circuit when the home, seek up, seek down and phone buttons are pressed. After receiving the message the radio will perform the requested function. The info display module receives digital video data from the radio for on-screen display information through the LVDS (Low Voltage Differential Signal) cable. The radio communicates with the info display module over the radio display touch interrupt request signal for touch screen inputs.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IOB)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOB)

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. Verify DTC B123E is not set.

- **If DTC B123E is set.**

Refer to Diagnostic Trouble Code (DTC) List - Vehicle

- **Go to next step: If DTC B123E is not set**

2. Ignition ON/vehicle in Service Mode, A11 Radio ON.

3. Verify that all radio controls operate and perform the correct function.

- **If all or some of the radio controls are inoperative**

Refer to Circuit/System Testing.

- **Go to next step: If all radio controls operate and perform the correct function.**

4. All OK.

Circuit/System Testing

1. Ignition OFF/vehicle OFF, disconnect the harness connector at the A20 Radio/HVAC Controls.

2. Test for less than 10 Ω between the following low reference circuit terminal 10 and ground.

- **If 10 Ω or greater**

1. Disconnect the X1 harness connector at the P17 Info Display Module.

2. Test for less than 2 Ω in the low reference circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the P17 Info Display Module.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/vehicle in Service Mode, test for 2.5 - 3.5 V between the following signal circuit terminals and ground:

- Terminal 5 @ A20 Radio/HVAC Controls Harness
- Terminal 6 @ A20 Radio/HVAC Controls Harness
- Terminal 7 @ A20 Radio/HVAC Controls Harness
- Terminal 8 @ A20 Radio/HVAC Controls Harness

- **If less than 2.5 V**

1. Ignition OFF/vehicle OFF, disconnect the X1 & X2 harness connectors at the A11 Radio.
2. Test for infinite resistance between the following signal circuits and ground:
 - Terminal 5 @ A20 Radio/HVAC Controls Harness
 - Terminal 6 @ A20 Radio/HVAC Controls Harness
 - Terminal 7 @ A20 Radio/HVAC Controls Harness
 - Terminal 8 @ A20 Radio/HVAC Controls Harness
 - If less than infinite resistance repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 Ω between the following test points:
 - Terminal 5 @ A20 Radio/HVAC Controls Harness & Terminal 3 X2 @ A11 Radio Harness
 - Terminal 6 @ A20 Radio/HVAC Controls Harness & Terminal 8 X1 @ A11 Radio Harness
 - Terminal 7 @ A20 Radio/HVAC Controls Harness & Terminal 8 X2 @ A11 Radio Harness
 - Terminal 8 @ A20 Radio/HVAC Controls Harness & Terminal 9 X2 @ A11 Radio Harness
 - If 2 Ω or greater repair the open/high resistance in the circuit.
 - If less than 2 Ω replace the A11 Radio.

- **If greater than 3.5 V**

1. Ignition OFF/vehicle OFF, disconnect the X1 & X2 harness connectors at the A11 Radio.
2. Test for less than 1 V between the following signal circuits and ground:
 - Terminal 5 @ A20 Radio/HVAC Controls Harness
 - Terminal 6 @ A20 Radio/HVAC Controls Harness
 - Terminal 7 @ A20 Radio/HVAC Controls Harness
 - Terminal 8 @ A20 Radio/HVAC Controls Harness
 - If greater than 1 V repair the short to voltage in the circuit.
 - If less than 1 V replace the A11 Radio.

- **Go to next step: If between 2.5 - 3.5 V**

4. Replace the A20 Radio/HVAC Controls

Repair Instructions

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

Refer to [Control Module References](#) for radio or radio control assembly replacement, programming, and setup.

RADIO CONTROLS MALFUNCTION (IOR)

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

Circuit/System Description

For an overview of the component/system, refer to: [Radio/Audio System Description and Operation \(IOR\)](#).

Circuit	Description

Circuit	Description
Signal circuit	The control module input circuit has an internal resistance connected to ground.
Low Reference	Grounded through the control module.

Component	Description
A11 Radio	The radio is used for entertainment and may contain other functions like navigation.
P17 Info Display Module	The info display is the big screen in the center console.
A22 Radio Controls	This device is the user interface to control the HVAC and infotainment systems.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IOR)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Electrical Information Reference

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

DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Scan Tool Reference

Control Module References

Circuit/System Testing

1. Ignition/Vehicle & All vehicle systems - Off
2. Disconnect the electrical connector: @ A22 Radio Controls
3. Test for less than 10 ohms between the test points: Low Reference circuit terminal 4 & Ground
 - **If 10 ohms or greater**
 1. Disconnect the electrical connector: X1 @ P17 Info Display Module
 2. Test for less than 2 ohms between the test points: Low Reference circuit terminal 4 & The other end of the circuit
 - If 2 ohms or greater - Repair the open/high resistance in the circuit.
 - If less than 2 ohms - Replace the component: P17 Info Display Module
 - **Go to next step: If less than 10 ohms**
4. Ignition/Vehicle - On
5. Test for 3 to 3.5 V between the test points:
 - Signal circuit terminal 3 @ A22 Radio Controls & Ground
 - Signal circuit terminal 6 @ A22 Radio Controls & Ground
 - Signal circuit terminal 7 @ A22 Radio Controls & Ground
 - Signal circuit terminal 8 @ A22 Radio Controls & Ground
 - **If less than 3 V**
 1. Ignition/Vehicle & All vehicle systems - Off

2. Disconnect the electrical connector: X1 @ A11 Radio

3. Test for infinite resistance between the test points:

- Signal circuit terminal 3 @ A22 Radio Controls & Ground
- Signal circuit terminal 6 @ A22 Radio Controls & Ground
- Signal circuit terminal 7 @ A22 Radio Controls & Ground
- Signal circuit terminal 8 @ A22 Radio Controls & Ground
- If less than infinite resistance - Repair the short to ground on the circuit.
- If infinite resistance

4. Test for less than 2 ohms between the test points:

- Signal circuit terminal 3 @ A22 Radio Controls & Terminal 24 X1 @ A11 Radio
- Signal circuit terminal 6 @ A22 Radio Controls & Terminal 25 X1 @ A11 Radio
- Signal circuit terminal 7 @ A22 Radio Controls & Terminal 26 X1 @ A11 Radio
- Signal circuit terminal 8 @ A22 Radio Controls & Terminal 27 X1 @ A11 Radio
- If 2 ohms or greater - Repair the open/high resistance in the circuit.
- If less than 2 ohms - Replace the component: A11 Radio

• **If greater than 3.5 V**

1. Ignition/Vehicle & All vehicle systems - Off

2. Disconnect the electrical connector: X1 @ A11 Radio

3. Test for less than 1 V between the test points:

- Signal circuit terminal 3 @ A22 Radio Controls & Ground
- Signal circuit terminal 6 @ A22 Radio Controls & Ground
- Signal circuit terminal 7 @ A22 Radio Controls & Ground
- Signal circuit terminal 8 @ A22 Radio Controls & Ground
- If greater than 1 V

Repair the short to voltage on the circuit.

- If less than 1 V - Replace the component: A11 Radio

• **Go to next step: If between 3 and 3.5 V**

6. Replace the component: A22 Radio Controls

Repair Instructions

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

- For control module replacement, programming, and setup refer to: [Control Module References](#)

RADIO INFORMATION DISPLAY MALFUNCTION (IOB)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
5 V reference 3 X1	1	-	-	-
Signal terminal 1 X1	1, 2	1, 2	-	-
Signal terminal 7 X1	2	2	2	-
Signal LVDS X2	B127E 00	B127E 00	B127E 00	-
Ground terminal 9 X1	-	1	-	-
Ground terminal 10 X1	-	1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
1. Display blank 2. Touch screen does not function				

Circuit/System Description

The radio info display module, radio controls and radio are all separate components. The radio controls communicate radio control inputs directly to the radio through a discrete circuit for volume up, volume down and power ON button. It also uses a series of resistors through a single signal circuit when the home, seek up, seek down and phone buttons are pressed. After receiving the message the radio will perform the requested function. The info display module receives digital video data from the radio for on-screen display information through the LVDS (Low Voltage Differential Signal) cable. The radio communicates with the info display module over the radio display touch interrupt request signal for touch screen inputs.

Diagnostic Aids

Malfunctions may include a flickering or distorted image or a blank screen

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IOB)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOB)

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. Verify DTC B127E is not set.

- **If DTC B127E is set.**

Refer to Diagnostic Trouble Code (DTC) List - Vehicle .

- **Go to next step: If DTC B127E is not set.**

2. Ignition ON/vehicle in Service Mode, A11 Radio ON.

3. Verify the P17 Info Display Module turns on and information is shown on the display.

- **If the P17 Info Display Module does not turn on, or information is not shown clearly in the display.**

Refer to Circuit/System Testing - Blank Screen

- **Go to next step: If the P17 Info Display Module turns on and information is shown on the display.**

4. Verify the touch screen feature functions by touching a selection on the display.

- **If the display does not respond to the touch screen selection**

Refer to Circuit/System Testing - Touch Screen

- **Go to next step: If the display responds to the touch screen selection**

5. All OK.

Circuit/System Testing

Blank Screen

1. Ignition OFF/vehicle OFF and all vehicle systems OFF, disconnect the X1 harness connector at the P17 Info Display Module. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10 Ω between the following ground circuit terminals and ground:

- terminal 9
- terminal 10

- **If 10 Ω or greater**

1. Test for less than 2 Ω in the ground circuits end to end.

- 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.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/vehicle in Service Mode.

4. Test for 5 V or greater between control circuit terminal 1 and ground.

- **If less than 5 V**

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

2. Test for infinite resistance between the control circuit and ground.

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

3. Test for less than 2 Ω on the control circuit end to end.

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

- **Go to next step: If 5 V or greater.**

5. Disconnect the harness connector at the A22 Radio Controls.

6. Test for infinite resistance between the P17 Info Display Module harness connector X1 terminal 3 and ground.

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

- **Go to next step: If infinite resistance.**

7. Disconnect the LVDS interface cable from the P17 Info Display Module.

8. Connect the EL-50334-2 Type A female to Mini B male USB Cable to the P17 Info Display Module. Connect the EL-50334-14 Infotainment Test Cable to the adapter.

9. Disconnect the LVDS interface cable from the A11 Radio. Connect the EL-50334-14 Infotainment Test cable to the A11 Radio.

10. Ignition ON/Vehicle in Service Mode, infotainment system ON.

11. Verify the P17 Info Display Module displays an image.

- **If the P17 Info Display Module does not display an image**

1. Engine running, parking brake applied, transmission in REVERSE.

2. Verify the P17 Info Display Module displays a rear view image.

- If the P17 Info Display Module displays a rear view image, replace the A11 Radio.
- If the P17 Info Display Module does not display a rear view image.

3. Replace the P17 Info Display Module.

4. Ignition ON, infotainment system ON.

5. Verify the P17 Info Display Module displays an image.

- If the P17 Info Display Module still does not display an image, replace the A11 Radio.
- If the P17 Info Display Module displays an image.

6. All OK.

• **Go to next step: If the P17 Info Display Module displays an image.**

12. Replace the vehicle LVDS interface cable from the P17 Info Display Module to the A11 Radio.

Touch Screen

1. Ignition OFF/vehicle OFF and all vehicle systems OFF, disconnect the X1 harness connector at the P17 Info Display Module. It may take up to 2 min for all vehicle systems to power down.
2. Ignition ON/vehicle in Service Mode.
3. Test for 1.5 - 2 V between the signal circuit terminal 7 and ground.

• **If less than 1.5 V**

1. Ignition OFF/vehicle OFF, disconnect the X2 harness connector at the A11 radio.
2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 Ω on the signal circuit end to end.
 - If 2 Ω or greater repair the open/high resistance in the circuit.
 - If less than 2 Ω replace the A11 Radio.

• **If greater than 2 V**

1. Ignition OFF/vehicle OFF, disconnect the X2 harness connector at the A11 Radio.
2. Test for less than 1 V between the signal circuit and ground.
 - If greater than 1 V repair the short to voltage in the circuit.
 - If less than 1 V replace the A11 Radio.

• **Go to next step: If between 1.5 - 2 V**

4. Replace the P17 Info Display Module

Repair Instructions

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

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

RADIO INFORMATION DISPLAY MALFUNCTION (IO5/IO6 WITHOUT MAH/MBC)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B127E 00

Front Video Display Output Signal

Circuit/System Description

The infotainment display and controls are a separate component from the radio, combined into an assembly. The assembly is supplied battery voltage and ground from the vehicle harness. The human machine interface control module communicates digital video data for on-screen display through a dedicated cable containing the LVDS data circuits.

Control information, touch communications and dimming level for the display are communicated via a LIN serial data circuit to the human machine interface control module.

If the human machine interface control module detects the display is not responding to the output on the LVDS circuits, the human machine interface control module sets the DTC.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- The infotainment system is ON
- The test is continuously when the infotainment system is operating

Conditions for Setting the DTC

The human machine interface control module detects the display is not responding to the output on the LVDS circuits.

Action Taken When the DTC Sets

- The human machine interface control module sets this DTC
- No images are shown on the Info Display Module

Conditions for Clearing the DTC

- The human machine interface control module detects a properly synced digital video signal.
- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

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-50334-2 Type A female to Mini B male USB Cable
- EL-50334-14 Infotainment Test Cable

Circuit/System Verification

1. Verify no DTCs are present.
 - **If any DTCs are present**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).

- **Go to next step: If no DTCs are present**

2. Ignition ON, infotainment system ON.

3. Using a scan tool, access the HMI control functions and select Info Display Test.

- **If the Info Display can not display the test image.**

Refer to Circuit/System Testing.

- **Go to next step: If the Info Display can display the test image.**

4. All OK

Circuit/System Testing

1. Vehicle OFF/Ignition OFF.

2. Verify the LVDS interface cable is properly connected at the P17 Info Display Module X2 and the K74 Human Machine Interface Control Module X5 connections and there is no damage to the cable or connections.

3. Ignition ON/Vehicle in Service Mode, infotainment system ON.

4. Verify the P17 Info Display Module does not display an image.

- **If the P17 Info Display Module displays an image.**

All OK.

- **Go to next step: If the P17 Info Display Module does not display an image.**

5. Vehicle OFF/Ignition OFF.

6. Disconnect the LVDS interface cable from the P17 Info Display Module X2.

7. Connect the EL-50334-2 Type A female to Mini B male USB Cable to the P17 Info Display Module X2. Connect the EL-50334-14 Infotainment Test Cable to the adapter.

8. Disconnect the LVDS interface cable from the K74 Human Machine Interface Control Module X5. Connect the EL-50334-14 Infotainment Test cable to the K74 Human Machine Interface Module X5.

9. Ignition ON/Vehicle in Service Mode, infotainment system ON.

10. Verify the P17 Info Display Module displays an image.

- **If the P17 Info Display Module does not display an image**

1. Replace the P17 Info Display Module. Connect all harness connectors.

2. Ignition ON/Vehicle in Service Mode, infotainment system ON.

3. Verify the P17 Info Display Module displays an image.

- If the P17 Info Display Module still does not display an image, replace the K74 Human Machine Interface Control Module.
- If the P17 Info Display Module displays an image.

4. All OK.

- **Go to next step: If the P17 Info Display Module displays an image.**

11. Replace the vehicle LVDS interface cable from the P17 Info Display Module X2 to the K74 Human Machine Interface Module X5.

Repair Instructions

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

- Refer to [Radio Control Assembly Replacement \(Equinox\)](#), [Radio Control Assembly Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup.

RADIO INFORMATION DISPLAY MALFUNCTION (IOS/IOT/IOU)

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.
- Refer to **Diagnostic Procedure Instructions** to provide an overview of each diagnostic category.

DTC Descriptor

DTC B127E 00

Front Video Display Output Signal - General failure

DTC B127E 06

Front Video Display Output Signal - Short to ground or open

Circuit/System Description

The infotainment display and controls are a separate component from the radio, combined into an assembly. The assembly is supplied battery voltage and ground from the vehicle harness. The radio communicates digital video data for on-screen display through a dedicated cable containing the LVDS data circuits.

Control information, touch communications and dimming level for the display are communicated via a LIN serial data circuit to the radio.

If the radio detects the display is not responding to the output on the LVDS circuits, the radio sets the DTC.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- The infotainment system is ON
- The test is continuously when the infotainment system is operating

Conditions for Setting the DTC

The radio detects the display is not responding to the output on the LVDS circuits.

Action Taken When the DTC Sets

- The radio sets this DTC
- No images are shown on the Info Display Module

Conditions for Clearing the DTC

- The radio detects a properly synced digital video signal.
- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IOS/IOT/IOU)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IOS/IOT/IOU)

- [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. Vehicle OFF/Ignition OFF.
2. Verify the LVDS interface cable is properly connected at the P17 Info Display Module and the A11 Radio and there is no damage to the cable or connections.
3. Ignition ON/Vehicle in Service Mode, infotainment system ON.
4. Verify the P17 Info Display Module displays an image.
 - **If the P17 Info Display Module does not display an image.**

Replace LVDS interface cable from the P17 Info Display Module to the A11 Radio.

5. Ignition ON/Vehicle in Service Mode, infotainment system ON.
6. Verify the P17 Info Display Module displays an image.
 - **If the P17 Info Display Module does not display an image.**

Replace the P17 Info Display Module.

7. Ignition ON/Vehicle in Service Mode, infotainment system ON.
8. Verify the P17 Info Display Module displays an image.
 - **If the P17 Info Display Module does not display an image.**

Replace A11 Radio.

- **Go to next step: If the P17 Info Display Module displays an image.**

9. All OK.

Repair Instructions

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

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

RADIO INFORMATION DISPLAY MALFUNCTION (IO5/IO6 WITH MAH/MBC)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC B127E 00

Front Video Display Output Signal

Circuit/System Description

The infotainment display and controls are a separate component from the radio, combined into an assembly. The assembly is supplied battery voltage and ground from the vehicle harness. The human

machine interface control module communicates digital video data for on-screen display through a dedicated cable containing the LVDS data circuits.

Control information, touch communications and dimming level for the display are communicated via a LIN serial data circuit to the human machine interface control module.

If the human machine interface control module detects the display is not responding to the output on the LVDS circuits, the human machine interface control module sets the DTC.

Diagnostic Aids

Extended exposure to high temperatures, especially when in direct sunlight may result in the display becoming inoperative. Under these conditions, it may be normal for the display to shut down to prevent permanent damage to the circuitry. Display should return to normal operating condition when temperatures cool.

Malfunctions may include a flickering or distorted image or a blank screen.

Using a dry cloth to clean the instrument panel in the area of the Information Display may cause the screen to flicker due to static buildup/discharge. The owner manual recommends using a microfiber cloth dampened with water to remove dust and dirt from the instrument panel.

Conditions for Running the DTC

- Ignition is ON or in the ACC position
- The system voltage is 9-16 V
- The infotainment system is ON
- The test is continuously when the infotainment system is operating

Conditions for Setting the DTC

The human machine interface control module detects the display is not responding to the output on the LVDS circuits.

Action Taken When the DTC Sets

- The human machine interface control module sets this DTC
- No images are shown on the Info Display Module

Conditions for Clearing the DTC

- The human machine interface control module detects a properly synced digital video signal.
- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Diagnostic Aids

Extended exposure to high temperatures, especially when in direct sunlight may result in the display becoming inoperative. Under these conditions, it may be normal for the display to shut down to prevent permanent damage to the circuitry. Display should return to normal operating condition when temperatures cool.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Radio/Audio System Description and Operation (IO5/IO6)

- [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. Vehicle OFF/Ignition OFF.
2. Verify the LVDS interface cable is properly connected at the P17 Info Display Module, K188 Human Machine Interface Control Module Bypass Module, and the K74 Human Machine Interface Control Module and there is no damage to the cable or connections.
3. Ignition ON/Vehicle in Service Mode, infotainment system ON.
4. Verify the P17 Info Display Module does display an infotainment image.
 - **If the P17 Info Display Module does not display an infotainment image.**
Refer to [Rear Vision Camera System Malfunction \(IO5/IO6 with MAH/MBC\)](#).
 - **Go to next step: If the P17 Info Display Module displays an infotainment image.**
All OK.

Repair Instructions

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

- Refer to [Radio Control Assembly Replacement \(Equinox\)](#), [Radio Control Assembly Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for control module replacement, programming, and setup.

RADIO INFORMATION DISPLAY MALFUNCTION (IOR)

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

Circuit/System Description

For an overview of the component/system, refer to: [Radio/Audio System Description and Operation \(IOR\)](#).

Circuit	Description
Signal circuit terminal 6	The control module input circuit has an internal resistance connected to ground.
Control circuit terminal 9	The input voltage varies depending on the switch position.
12 V Reference circuit terminal 1	Regulated voltage supplied by the control module.
Low-Voltage Differential Signaling Cable	Audio and Video Module Cable

Component	Description

Component	Description
A11 Radio	The radio is used for entertainment and may contain other functions like navigation.
P17 Info Display Module	The info display is the big screen in the center console.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IOR)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Electrical Information Reference

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

DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Scan Tool Reference

Control Module References

Special Tools

- EL-50334-2 USB Type A Female to Type B Mini Male Adapter
- EL-50334-14 Infotainment Test Cable

Circuit/System Verification

1. Ignition - On/Vehicle - In Service Mode - Infotainment System State - ON
2. Verify the component turns On and Off: P17 Info Display Module
 - **If the component does not work as specified**

Refer to Circuit/System Testing.

- **Go to next step: If the component works as specified**

All OK.

Circuit/System Testing

1. Ignition/Vehicle & All vehicle systems - Off
2. Disconnect the electrical connector: X1 @ P17 Info Display Module
3. Ignition - On/Vehicle - In Service Mode - Infotainment System State - On
4. Test for greater than 3 V between the test points: Signal circuit terminal 6 & Ground
 - **If less than 3 V**
 1. Ignition/Vehicle & All vehicle systems - Off
 2. Disconnect the electrical connector: X1 @ A11 Radio
 3. Test for infinite resistance between the test points: Signal circuit terminal 6 & Ground
 - If less than infinite resistance - Repair the short to ground on the circuit.
 - If infinite resistance

4. Test for less than 2 ohms between the test points: Signal circuit terminal 6 & The other end of the circuit
 - If 2 ohms or greater - Repair the open/high resistance in the circuit.
 - If less than 2 ohms - Replace the component: A11 Radio
 - **Go to next step: If greater than 3 V**
5. Test for battery voltage between the test points: 12 V Reference circuit terminal 1 & Ground
 - **If less than battery voltage**
 1. Ignition/Vehicle - Off
 2. Disconnect the electrical connector: X1 @ A11 Radio
 3. Test for infinite resistance between the test points: 12 V Reference circuit terminal 1 @ P17 Info Display Module Component harness & Ground
 - If less than infinite resistance - Repair the short to ground on the circuit.
 - If infinite resistance
 4. Test for less than 2 ohms between the test points: 12 V Reference circuit terminal 1 @ P17 Info Display Module Component harness & The other end of the circuit
 - If 2 ohms or greater - Repair the open/high resistance in the circuit.
 - If less than 2 ohms - Replace the component: A11 Radio
 - **Go to next step: If battery voltage**
6. Adjust - Dimmer Switch - High
7. Test for 3 to 3.5 V between the test points: Control circuit terminal 9 & Ground
 - **If less than 3 V**
 1. Ignition/Vehicle - Off
 2. Disconnect the electrical connector: X1 @ A11 Radio
 3. Test for infinite resistance between the test points: Control circuit terminal 9 @ P17 Info Display Module Component harness & Ground
 - If less than infinite resistance - Repair the short to ground on the circuit.
 - If infinite resistance
 4. Test for less than 2 ohms between the test points: Control circuit terminal 9 @ P17 Info Display Module Component harness & The other end of the circuit
 - If 2 ohms or greater - Repair the open/high resistance in the circuit.
 - If less than 2 ohms - Replace the component: A11 Radio
 - **If greater than 3.5 V**
 1. Ignition/Vehicle - Off
 2. Disconnect the electrical connector: X1 @ A11 Radio
 3. Ignition - On/Vehicle - In Service Mode
 4. Test for less than 1 V between the test points: Control circuit terminal 9 @ P17 Info Display Module Component harness & Ground
 - If 1 V or greater - Repair the short to voltage on the circuit.
 - If less than 1 V - Replace the component: A11 Radio
 - **Go to next step: If between 3 and 3.5 V**
 - 8. Connect all electrical connectors.
 - 9. Verify the following conditions do not exist:

Damaged, defective, or loose component: Low-Voltage Differential Signaling Cable
 - 10. Disconnect the electrical connector: Low-Voltage Differential Signaling Cable @ P17 Info Display Module
 - 11. Connect - EL-50334-2 USB Type A Female to Type B Mini Male Adapter @ P17 Info Display Module & EL-50334-14 Infotainment Test Cable
 - 12. Disconnect the electrical connector: Low-Voltage Differential Signaling Cable @ A11 Radio
 - 13. Connect - EL-50334-14 Infotainment Test Cable @ A11 Radio

14. Ignition - On/Vehicle - In Service Mode - Infotainment System State - ON

15. Verify the component works as specified: P17 Info Display Module

- **If the component does not work as specified**

1. Replace the component: P17 Info Display Module - Connect all electrical connectors.

2. Ignition - On/Vehicle - In Service Mode - Infotainment System State - ON

3. Verify the component works as specified: P17 Info Display Module

- If the component does not work as specified

Replace the component: A11 Radio

- If the component works as specified

4. All OK.

- **Go to next step: If the component works as specified**

16. Replace the component: Low-Voltage Differential Signaling Cable

Repair Instructions

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

- For control module replacement, programming, and setup refer to: [Control Module References](#)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B125A 02

Antenna Signal Circuit Short to Ground

DTC B125A 04

Antenna Signal Circuit Open Circuit

DTC B125A 01

Antenna Signal Circuit Short to Battery

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Radio Antenna Coax	B125A 02	B125A 04	B125A 01	-

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 9 - 16 V.

Conditions for Setting the DTC

B125A 02

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

B125A 04

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

B125A 01

The radio detects a short to battery 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 Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

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.

- **If damage is found**

Repair or replace as necessary

- **Go to next step: If no damage is found**

2. Ignition ON/Vehicle in Service Mode, A11 Radio ON.

3. Verify station reception is normal when tuned to several known good AM and FM stations.

- **If AM or FM reception is poor.**

Refer to Circuit/System Testing

- **Go to next step: If reception is normal**

4. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the radio antenna coax cable from the A11 Radio and from the T2RR Antenna - Rear Roof.

2. Verify the antenna coax cable passes the coax cable component test. Refer to Component Testing.

- **If the coax cable does not pass the test**

Replace the antenna coax cable

- **Go to next step: If the coax cable passes the test**

3. Connect the radio antenna coax cable to the A11 Radio.

4. Ignition ON, A11 Radio ON.

5. Verify a test lamp illuminates between the antenna coax cable center terminal at the T2RR Antenna - Rear Roof and chassis ground.

- **If the test lamp does not illuminate**

Replace the A11 Radio.

- **Go to next step: If the test lamp illuminates**

6. Test or replace the T2RR Antenna - Rear Roof.

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.

- **If 5 Ω or greater**

Replace the coax cable

- **Go to next step: If less than 5 Ω**

3. Test for less than 5 Ω between the coax cable outer shield end to end.

- **If 5 Ω or greater**

Replace the coax cable

- **Go to next step: If less than 5 Ω**

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

- **If less than infinite resistance**

Replace the coax cable

- **Go to next step: If infinite resistance**

5. All OK

Repair Instructions

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

- Refer to [High Frequency Antenna Replacement \(Equinox\)](#), [High Frequency Antenna Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for radio replacement, programming, and setup.

SPEAKER REPLACEMENT REFERENCE

Component	Repair Instruction
Center I/P Speaker	Radio Front Center Speaker Replacement (Equinox) , Radio Front Center Speaker Replacement (Terrain)
Front Side Door Speakers	Radio Front Side Door Speaker Replacement
Front Tweeter Speakers	Radio Front Speaker Replacement (Equinox) , Radio Front Speaker Replacement (Terrain)
Rear Side Door Speakers	Radio Rear Side Door Speaker Replacement

SPEAKER MALFUNCTION (UQA WITH IO5/IO6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1025

Audio Output 1 Circuit

DTC B1045

Audio Output 3 Circuit

DTC B1065

Audio Output 5 Circuit

DTC B1075

Audio Output 6 Circuit

DTC B1085

Audio Output 7 Circuit

DTC B1095

Audio Output 8 Circuit

DTC B1105

Audio Output 9 Circuit

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

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Audio Output 1 Signal Circuits (Left Front Door)	B1025 02	B1025 04	B1025 01	-
Audio Output 3 Signal Circuits (Right Front Door)	B1045 02	B1045 04	B1045 01	-
Audio Output 5 Signal Circuits (Left Rear Door)	B1065 02	B1065 04	B1065 01	-
Audio Output 6 Signal Circuits (Right Rear Door)	B1075 02	B1075 04	B1075 01	-
Audio Output 7 Signal Circuits (Left Front Tweeter)	B1085 02	B1085 04	B1085 01	-
Audio Output 8 Signal Circuits (Right Front Tweeter)	B1095 02	B1095 04	B1095 01	-
Audio Output 9 Signal Circuits (Center I/P)	B1105 02	B1105 04	B1105 01	-

Circuit/System Description

The Media Oriented Systems Transport (MOST) is a high-speed multimedia network technology. The serial MOST bus uses a ring topology and synchronous data communication to transmit audio, video, data and control information between any devices attached.

The audio amplifier is a participant on the MOST network. The audio amplifier receives audio inputs and control information from the MOST bus.

Each of the audio output channel circuits (+) and (-), at the audio amplifier have a DC bias voltage that is approximately one half of the battery voltage. When using a DMM, each of the audio output channel circuits will measure approximately 6.5V 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.

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.

If the speaker or surrounding interior trim is found to be loose or improperly secured, correctly secure the item.

- The test tones on the CD may be copied to a USB drive or other device to use during testing.
- Some audio output circuits are connected to more than one speaker, dependant on vehicle equipment. It may be necessary to disconnect one or more speakers during testing of some circuits.

Conditions for Running the DTC

NOTE: DTC B1325 must not be set as current for the amplifier to run any of the following tests.

DTC B1025 01, B1045 01, B1065 01, B1075 01, B1085 01, B1095 01, B1105 01

The test is run initially upon amplifier wake-up, and periodically every one second after amplifier operation begins.

DTC B1025 02, B1045 02, B1065 02, B1075 02, B1085 02, B1095 02, B1105 02

The test is run initially upon amplifier wake-up, and periodically every one second after amplifier operation begins.

DTC B1025 04, B1045 04, B1065 04, B1075 04, B1085 04, B1095 04, B1105 04

The test is run once during amplifier wake-up.

Conditions for Setting the DTC

DTC B1025 01, B1045 01, B1065 01, B1075 01, B1085 01, B1095 01, B1105 01

A short to voltage is detected on the specified (+) or (-) signal circuit

DTC B1025 02, B1045 02, B1065 02, B1075 02, B1085 02, B1095 02, B1105 02

A short to ground is detected on the specified (+) or (-) signal circuit

DTC B1025 04, B1045 04, B1065 04, B1075 04, B1085 04, B1095 04, B1105 04

An open is detected on the specified (+) or (-) signal circuit

Action Taken When the DTC Sets

The amplifier mutes the output channel and no sound is present from the speaker(s) that have a current circuit fault.

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.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IO5/IO6)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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-50334-50 USB Cable and Adapter Kit

Circuit/System Verification

1. Ignition ON, infotainment system ON, mute OFF.
2. Verify clear audio is heard from each speaker, adjusting fade and balance controls to test each speaker individually.
 - **If audio is inoperative from one or more speakers, or the audio emitted is not clear**

Refer to Circuit/System Testing.

- **Go to next step: If clear audio is heard from all speakers**

3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate P19 Speaker. Ignition ON, infotainment system ON, mute OFF.
2. Test for 5 - 7 V between each audio signal circuit terminal 1 and terminal 2 and ground.
 - **If less than 5 V**
 1. Ignition OFF, disconnect the X1 and X2 harness connectors at the T3 Audio Amplifier.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the T3 Audio Amplifier.
 - **If greater than 7 V**
 1. Ignition OFF, disconnect the X1 and X2 harness connectors at the T3 Audio Amplifier. Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the T3 Audio Amplifier.
 - **Go to next step: If between 5 - 7 V**
3. Test or replace the P19 Speaker.

Repair Instructions

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

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

SPEAKER MALFUNCTION (UZ6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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

- 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.

B1025 02, B1035 02, B1045 02, B1055 02

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

B1025 04, B1035 04, B1045 04, B1055 04

The radio detects an open on the specified audio (+) or (-) 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 replicates the high level audio signals from the radio to the speakers. If the module malfunctions, all the speakers may become inop.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

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, mute OFF.
2. Verify clear audio is heard from each speaker, adjusting fade and balance controls to test each speaker individually.
 - **If audio is inoperative from one or more speakers but not all.**
Refer to Circuit/System Testing One Speaker.
 - **If audio is Inoperative from all speakers .**
Refer to Circuit/System Testing All Speakers.
 - **Go to next step: If clear audio is heard from all speakers.**
3. All OK.

Circuit/System Testing

One Speaker

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.

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

2. Test for 5 - 7 V between each audio signal circuit terminal 1 and terminal 2 and ground.

- **If less than 5 V**

1. Ignition OFF, disconnect the appropriate harness connector at the K108 Active Noise Cancellation Module/T3 Audio Amplifier.

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

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

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

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K108 Active Noise Cancellation Module/T3 Audio Amplifier.

- **If greater than 7 V**

1. Ignition OFF, disconnect the appropriate harness connector at the K108 Active Noise Cancellation Module/T3 Audio Amplifier.

2. Ignition ON, A11 Radio ON, mute OFF. Test for less than 1 V between the appropriate signal circuit and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K108 Active Noise Cancellation Module/T3 Audio Amplifier.

- **Go to next step: If between 5 - 7 V**

3. Ignition OFF, disconnect the appropriate harness connector at the K108 Active Noise Cancellation Module/T3 Audio Amplifier.

4. Ignition ON, A11 Radio ON, mute OFF. Test for 5 - 7 V between each appropriate audio signal circuit from the A11 Radio and Ground.

- **If less than 5 V**

1. Ignition OFF, Disconnect the appropriate speaker harness connector at the A11 Radio.

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

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

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

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

- **If greater than 7 V**

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

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

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

- **Go to next step: If between 5 - 7 V**

5. Test or replace the P19 Speaker.

All Speakers

1. Ignition OFF, disconnect the X1 harness connector at the K108 Active Noise Cancellation Module/T3 Audio Amplifier.

2. Test for less than 10 Ω between the ground circuit terminal 8 and ground.

- **If 10 Ω or greater**

1. Test for less than 2 Ω in the ground circuit end to end.

- 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.

- **Go to next step: If less than 10 Ω**

3. Verify that a test lamp illuminates between the B+ circuit terminal 4 and ground.

- **If the test lamp does not illuminate**
 1. Remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - **Go to next step: If the test lamp illuminates**
- 4. Ignition ON, A11 Radio ON.
- 5. Verify that a test lamp illuminates between the control circuit terminal 3 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the X1 harness connector at the A11 Radio.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **Go to next step: If the test lamp illuminates**
- 6. Test for 5 - 7 V between any audio signal circuit from the A11 Radio and Ground.
 - **If not between 5 - 7 V**

Test or replace the A11 Radio.
 - **Go to next step: If between 5 - 7 V**
- 7. Test or replace the K108 Active Noise Cancellation Module/T3 Audio Amplifier.

Repair Instructions

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

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

SPEAKER MALFUNCTION (WITHOUT UQA/UZ6)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide 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	1	1	1, 2	-
Right Front Speaker Output Signal	1	1	1, 2	-
Left Rear Speaker Output Signal	1	1	1, 2	-
Right Rear Speaker Output Signal	1	1	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.

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 Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

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.
 - **If audio is inoperative from one or more speakers, or the audio emitted is not clear.**

Refer to Circuit/System Testing.

- **Go to next step: If clear audio is heard from all speakers.**
3. All OK.

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.

1. Ignition OFF/vehicle OFF, disconnect the harness connector at the appropriate P19 Speaker. Ignition ON, A11 Radio ON, mute OFF.
2. Test for 5 - 7 V between each audio signal circuit terminal 1 and terminal 2 and ground.
 - **If less than 5 V**
 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.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A11 Radio.
 - **If greater than 7 V**
 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 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the A11 Radio.
 - **Go to next step: If between 5 - 7 V**
3. Test or replace the P19 Speaker.

Repair Instructions

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

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

SPEAKER MALFUNCTION (UQA WITH IOS/IOT/IOU)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B1025

Audio Output 1 Circuit

DTC B1045

Audio Output 3 Circuit

DTC B1065

Audio Output 5 Circuit

DTC B1085

Audio Output 7 Circuit

DTC B1095

Audio Output 8 Circuit

DTC B1105

Audio Output 9 Circuit

DTC B1115

Audio Output 10 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
Audio Output 1 Signal Circuits (Left Front Door)	B1025 02	B1025 04	B1025 01	-
Audio Output 3 Signal Circuits (Right Front Door)	B1045 02	B1045 04	B1045 01	-
Audio Output 5 Signal Circuits (Center I/P)	B1065 02	B1065 04	B1065 01	-
Audio Output 7 Signal Circuits (Left Rear Door)	B1085 02	B1085 04	B1085 01	-
Audio Output 8 Signal Circuits (Right Rear Door)	B1095 02	B1095 04	B1095 01	-
Audio Output 9 Signal Circuits (Left Front I/P)	B1105 02	B1105 04	B1105 01	-
Audio Output 10 Signal Circuits (Right Front I/P)	B1115 02	B1115 04	B1115 01	-

Circuit/System Description

Each of the audio output channel circuits (+) and (-), at the audio amplifier have a DC bias voltage that is approximately one half of the battery voltage. When using a DMM, each of the audio output channel circuits will measure approximately 6.5V 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.

If the speaker or surrounding interior trim is found to be loose or improperly secured, correctly secure the item.

- The test tones on the CD may be copied to a USB drive or other device to use during testing.
- Some audio output circuits are connected to more than one speaker, dependant on vehicle equipment. It may be necessary to disconnect one or more speakers during testing of some circuits.

Conditions for Running the DTC

NOTE: DTC B1325 must not be set as current for the amplifier to run any of the following tests.

DTC B1025 01, B1045 01, B1065 01, B1085 01, B1095 01, B1105 01, B1115 01

The test is run initially upon amplifier wake-up, and periodically every one second after amplifier operation begins.

DTC B1025 02, B1045 02, B1065 02, B1085 02, B1095 02, B1105 02, B1115 02

The test is run initially upon amplifier wake-up, and periodically every one second after amplifier operation begins.

DTC B1025 04, B1045 04, B1065 04, B1085 04, B1095 04, B1105 04, B1115 04

The test is run once during amplifier wake-up.

Conditions for Setting the DTC

DTC B1025 01, B1045 01, B1065 01, B1085 01, B1095 01, B1105 01, B1115 01

A short to voltage is detected on the specified (+) or (-) signal circuit

DTC B1025 02, B1045 02, B1065 02, B1085 02, B1095 02, B1105 02, B1115 02

A short to ground is detected on the specified (+) or (-) signal circuit

DTC B1025 04, B1045 04, B1065 04, B1085 04, B1095 04, B1105 04, B1115 04

An open is detected on the specified (+) or (-) signal circuit

Action Taken When the DTC Sets

The amplifier mutes the output channel and no sound is present from the speaker(s) that have a current circuit fault.

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.

Reference Information

Schematic Reference

Radio/Navigation System Wiring Schematics (IOS/IOT/IOU)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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

Circuit/System Verification

1. Ignition ON, infotainment system ON, mute OFF.
2. Verify clear audio is heard from each speaker, adjusting fade and balance controls to test each speaker individually.
 - **If audio is inoperative from one or more speakers, or the audio emitted is not clear**
Refer to Circuit/System Testing.
 - **Go to next step: If clear audio is heard from all speakers**
3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate P19 Speaker. Ignition ON, infotainment system ON, mute OFF.
2. Test for 5 - 7 V between each audio signal circuit terminal 1 and terminal 2 and ground.
 - **If less than 5 V**
 1. Ignition OFF, disconnect the X1 and X2 harness connectors at the T3 Audio Amplifier.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the T3 Audio Amplifier.
 - **If greater than 7 V**
 1. Ignition OFF, disconnect the X1 and X2 harness connectors at the T3 Audio Amplifier. Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the T3 Audio Amplifier.
 - **Go to next step: If between 5 - 7 V**
3. Test or replace the P19 Speaker.

Repair Instructions

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

- Refer to [Speaker Replacement Reference](#)
- Refer to [Control Module References](#) for audio amplifier replacement, programming, and setup.

UNABLE TO CONTACT ONSTAR CALL CENTER

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC B2470 02

Cellular Phone Antenna Circuit Malfunction Short to Ground

DTC B2470 04

Circuit/System Description

The primary cellular phone antenna element is connected to the telematics communication interface control module (violet connector) via a shielded coaxial cable. Cellular communication takes place on both the primary cellular antenna signal circuit and the GPS/secondary cellular antenna signal circuit. This diagnostic only applies to the primary cellular antenna signal circuit. Internal to the antenna on the cellular antenna signal circuit resistance is used to apply a load, which the telematics communication interface control module uses to detect the presence of the antenna.

Conditions for Running the DTC

- Ignition in the RUN or ACC position.
- System voltage is between 9.5 V and 15.5 V.
- The above conditions are present for greater than 1 s.

Conditions for Setting the DTC**B2470 02**

The telematics communication interface control module detects a short to ground on the primary cellular antenna signal circuit.

B2470 04

- The telematics communication interface control module detects an open or high resistance on the primary cellular antenna signal circuit.
- The above conditions are present for greater than 1 s.

Action Taken When the DTC Sets

The OnStar[®] status LED turns red.

Conditions for Clearing the DTC

- The telematics communication interface control module detects the presence of a cellular antenna.
- A history DTC clears after 50 malfunction-free ignition cycles.

Reference Information

Schematic Reference

OnStar/Telematics Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

OnStar Description and Operation (UE1 without IOU/IOT/IOR), OnStar Description and Operation (UE1 with IOU/IOT/IOR)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Special Tools

EL-49903-1 Test Antenna Navn-Cell Comn

Circuit/System Testing

NOTE:

- The vehicle may be equipped with sectioned coax. Test each section and replace only the faulty section, not the entire length of coax.
- The following verification requires the vehicle to be outside with an unobstructed view of the southern sky. Allow 5 min after turning the ignition ON for the GPS satellites to acquire vehicle signal.

1. Ignition OFF/Vehicle OFF and all vehicle systems OFF, disconnect the violet primary cellular coax cable connector at the K73 Telematics Communication Interface Control Module. It may take up to 2 min for all vehicle systems to power down.
2. Using the **EL-49903-1** Test Antenna Navn-Cell Comn connect the violet coax cable to the K73 Telematics Communication Interface Control Module. Place the test antenna on the roof of the vehicle, ignition ON/vehicle in Service Mode.
3. Verify the DTC does not set or a call can be completed to the OnStar Call Center while operating the vehicle within the conditions for running the DTC.
 - **If the DTC sets or a call can not be completed to the OnStar Call Center**
Replace the K73 Telematics Communications Interface Control Module.
 - **Go to next step: If the DTC does not set or a call can be completed to the OnStar Call Center**
4. Ignition OFF/Vehicle OFF.
5. Disconnect the **EL-49903-1** Test Antenna Navn-Cell Comn from the K73 Telematics Communication Interface Control Module
6. Test the coax cable. Refer to Component Testing.
 - **If the coax cable does not pass the test**
Replace the coax cable.
 - **Go to next step: If the coax cable passes the test**
7. Test or replace the T2RR Antenna - Roof Rear.

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

Coax Cable Test

1. Test for less than 5 Ω between the coax cable center terminal end to end.
 - **If 5 Ω or greater**
Replace the coax cable.

- **Go to next step: If less than 5 Ω**
- 2. Test for greater than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**

Replace the coax cable.
 - **Go to next step: If less than 5 Ω**
- 3. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.
 - **If less than infinite resistance**

Replace the coax cable.
 - **Go to next step: If infinite resistance**
- 4. All OK.

Repair Instructions

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

- Refer to [High Frequency Antenna Replacement \(Equinox\)](#), [High Frequency Antenna Replacement \(Terrain\)](#)
- Refer to [Control Module References](#) for telematics communication interface control module replacement, setup, and programming

ONSTAR VOICE RECOGNITION 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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Circuit/System Description

The telematics communication interface control module is capable of interpreting voice commands received over the cellular microphone circuit. Speech recognition allows the user to speak to one computer in the vehicle, and one reached over the cellular communication network. The module attempts to understand the users command, and responds by speaking back, or by taking the appropriate action, e.g. dialing the phone.

Reference Information

Schematic Reference

[OnStar/Telematics Wiring Schematics](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[OnStar Description and Operation \(UE1 without IOU/IOT/IOR\)](#), [OnStar Description and Operation \(UE1 with IOU/IOT/IOR\)](#)

Electrical Information Reference

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

NOTE:

- It is necessary to have the vehicle in an open outside area where a cellular call can be successfully placed and GPS data can be received from satellites.
- The vehicle should be located in a quiet area.

1. Ignition ON/vehicle in Service Mode, press the blue OnStar Call button.
2. Verify that your voice is heard clearly by the OnStar Call center.

- **If your voice can not be heard clearly**

Refer to [OnStar Microphone Malfunction \(IO5/IO6/IOB\)](#) [OnStar Microphone Malfunction \(IOR/IOU/IOT/IOS\)](#)

- **Go to next step: If your voice can be heard clearly**

3. Verify that the system responds appropriately to all voice commands by pressing the voice command button and attempting to operate the system using multiple voice commands.

- **If the OnStar system does not respond to any voice commands**

Replace the K73 Telematics Communication Interface Control Module

- **If the OnStar system responds to some, but not all voice commands**

Refer to [OnStar Description and Operation \(UE1 without IOU/IOT/IOB\)](#), [OnStar Description and Operation \(UE1 with IOU/IOT/IOB\)](#) for tips on proper pronunciation

- **Go to next step: If the OnStar system responds to all voice commands**

4. All OK.

Repair Instructions

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

Refer to [Control Module References](#) for telematics communication interface control module replacement, programming, and setup.

VOICE RECOGNITION MALFUNCTION (UE1)**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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Voice Recognition Audio Signal	1	1	1	-
Voice Recognition Audio Low Reference	-	1	-	-
1. infotainment system voice recognition inoperative				

Circuit/System Description

When voice recognition for the infotainment system is started, voice signals from the cellular phone microphone are passed through the telematics communication interface control module to the Human Machine Interface Control Module via the voice recognition audio circuits.

Diagnostic Aids

- Refer to the Owners Manual and/or the Navigation System Owners Manual for voice recognition use and commands.
- When the system recognizes the command the system will either perform the function or ask to confirm the choice by clearly saying "yes" or "no".
- If experiencing difficulty with the system recognizing a command, confirm that the command is correct.
- Background noise such as a climate control fan positioned on high, open windows, or very loud outside noises, can cause voice commands to be misunderstood.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#).

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#).

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. Verify the OnStar[®] voice recognition system is operating normally.
 - If the OnStar[®] voice recognition system is not operating normally.
Refer to [OnStar Voice Recognition Malfunction](#).
 - Go to next step: If the OnStar[®] voice recognition system is operating normally.
2. Ignition On/Vehicle in Service Mode. Infotainment system ON.

NOTE: Refer to the Owners Manual and/or the Navigation System Owners Manual for voice recognition use and commands.

3. Begin voice recognition for the infotainment system and clearly speak one of the available commands.
4. Verify the infotainment system responds correctly to the command.
 - If the infotainment system does not respond correctly to the command.
 1. Clearly speak a different command.
 2. Verify the infotainment system responds correctly to the command.
 - If the infotainment system does not respond correctly to any commands, refer to Circuit/System Testing.
 - If the infotainment system responds correctly to the command.

3. Refer to the Owners Manual and/or the Navigation System Owners Manual for hints on speaking commands.

- **Go to next step: If the infotainment system responds correctly to the command.**

5. All OK

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the K74 Human Machine Interface Control Module.

2. Disconnect the X2 harness connector at the K73 Telematics Communication Interface Control Module. Ignition On/Vehicle in Service Mode.

3. Test for less than 1 V between the signal circuit terminal listed below and ground.

- Voice recognition audio signal terminal 6
- Voice recognition audio low reference terminal 12
- **If 1 V greater**

Repair the short to voltage on the circuit.

- **Go to next step: If less than 1 V**

4. Ignition OFF.

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

- Voice recognition audio signal terminal 6
- Voice recognition audio low reference terminal 12
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **Go to next step: If infinite resistance**

6. Test for less than 5 Ω between the terminals listed below:

- K74 Human Machine Interface Control Module signal circuit terminal 1 X1 and the K73 Telematics Communication Interface Control Module signal circuit terminal 6 X2
- K74 Human Machine Interface Control Module low reference circuit terminal 2 X1 and the K73 Telematics Communication Interface Control Module low reference circuit terminal 12 X2
- **If 5 Ω greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 5 Ω**

7. Replace the K74 Human Machine Interface Control Module. Connect all harness connectors.

NOTE: Refer to the Owners Manual and/or the Navigation System Owners Manual for voice recognition use and commands.

8. Begin voice recognition for the infotainment system and clearly speak one of the available commands.

9. Verify the infotainment system responds correctly to the command.

- **If the infotainment system does not respond correctly to the command**

1. Clearly speak a different command.

2. Verify the infotainment system responds correctly to the command.

- If the infotainment system does not respond correctly to any commands, replace the K73 Telematics Communication Interface Control Module.

- **Go to next step: If the infotainment system responds correctly to the command**

10. All OK

Repair Instructions

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

Refer to [Control Module References](#) for human machine interface control module or telematics communication interface control replacement, programming and setup.

VOICE RECOGNITION MALFUNCTION (WITHOUT UE1)

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.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Microphone Signal	B1277 02	B1277 04	B1277 04	-
Microphone Low Reference	B1277 02	B1277 04	-	-

Circuit/System Description

The human machine interface control module uses the cellular telephone microphone for voice recognition and cellular features. The human machine interface control module provides a bias voltage to each microphone (+) and (-) signal circuits for operation of the microphone.

Diagnostic Aids

- Refer to the Owners Manual and/or the Navigation System Owners Manual for voice recognition use and commands.
- When the system recognizes the command the system will either perform the function or ask to confirm the choice by clearly saying "yes" or "no".
- If experiencing difficulty with the system recognizing a command, confirm that the command is correct.
- Background noise such as a climate control fan positioned on high, open windows, or very loud outside noises, can cause voice commands to be misunderstood.

Reference Information

Schematic Reference

[Radio/Navigation System Wiring Schematics \(IOB\)](#), [Radio/Navigation System Wiring Schematics \(IO5/IO6\)](#), [Radio/Navigation System Wiring Schematics \(IOR\)](#), [Radio/Navigation System Wiring Schematics \(IOS/IOT/IOU\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Radio/Audio System Description and Operation \(IO5/IO6\)](#), [Radio/Audio System Description and Operation \(IOB\)](#), [Radio/Audio System Description and Operation \(IOS/IOT/IOU\)](#), [Radio/Audio System Description and Operation \(IOR\)](#)

Electrical Information Reference

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

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, infotainment system ON.

NOTE: Refer to the Owners Manual and/or the Navigation System Owners Manual for voice recognition use and commands.

2. Begin voice recognition for the infotainment system and clearly speak one of the available commands.
3. Verify the infotainment system responds correctly to the command.
 - **If the infotainment system does not respond correctly to the command.**
 1. Clearly speak a different command.
 2. Verify the infotainment system responds correctly to the command.
 - If the infotainment system does not respond correctly to any commands, refer to Circuit/System Testing.
 - If the infotainment system responds correctly to the command.
 - 3. Refer to the Owners Manual and/or the Navigation System Owners Manual for hints on speaking commands.
 - **Go to next step: If the infotainment system responds correctly to the command.**
4. All OK

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the B24 Cellular Phone Microphone. Ignition ON.
2. Test for 9 - 11 V between the signal circuit terminal B and ground.
 - **If less than 9 V**
 1. Ignition OFF, disconnect the X1 harness connector at the K74 Human Machine Interface Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K74 Human Machine Interface Control Module.
 - **If greater than 11 V**
 1. Ignition OFF, disconnect the X1 harness connector at the K74 Human Machine Interface Control Module. Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K74 Human Machine Interface Control Module.
 - **Go to next step: If between 9 - 11 V**
3. Test for less than 1 V between the signal circuit terminal A and ground.
 - **If greater than 1 V**
 1. Ignition OFF, X1 harness connector at the K74 Human Machine Interface Control Module. Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V, replace the K74 Human Machine Interface Control Module.
 - **Go to next step: If less than 1 V**

4. Ignition OFF, disconnect the X1 harness connector at the K74 Human Machine Interface Control Module.
5. Test for infinite resistance between the B24 Cellular Phone Microphone signal circuit terminal A and ground.
 - **If less than infinite resistance**

Repair the short to ground in the circuit
 - **Go to next step: If infinite resistance**
6. Test for less than 2 Ω in the signal circuit end to end.
 - **If 2 Ω or greater**

Repair the open/high resistance in the circuit
 - **Go to next step: If less than 2 Ω**
7. Replace the B24 Cellular Phone Microphone.
8. Ignition ON, infotainment system ON.
9. Begin voice recognition for the infotainment system and clearly speak one of the available commands.
10. Verify the infotainment system responds correctly to the command.
 - **If the infotainment system does not respond correctly to the command.**
 1. Clearly speak a different command.
 2. Verify the infotainment system responds correctly to the command.
 - If the infotainment system does not respond correctly to any commands, replace the K74 Human Machine Interface Control Module.
 - If the infotainment system responds correctly to the command.
 3. Refer to the Owners Manual and/or the Navigation System Owners Manual for hints on speaking commands.
 - **Go to next step: If the infotainment system responds correctly to the command.**
11. All OK.

Repair Instructions

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

- Refer to [Mobile Telephone Microphone Replacement \(Equinox\)](#), [Mobile Telephone Microphone Replacement \(Terrain\)](#).
- Refer to [Control Module References](#) for human machine interface control module replacement, programming, and setup.

RADIO RESET

Radio Reset Procedure

For radio RPO's IOU and IOT this procedure needs to be followed before a radio is removed for replacement.

NOTE: Selecting Continue restores all factory settings

1. In Radio, Settings select Return to Factory Settings.
2. Three options will be listed, select each option below then select Continue to reset.
 - Reset Vehicle Settings
 - Erase Settings and Personal Data
 - Clear Default Applications
3. Wait 2 min then ignition/vehicle OFF.
4. Replace A11 Radio and program, refer to [Control Module References](#)
5. Start engine and allow to run for 3 min.

6. Ignition/Vehicle OFF, open/close driver door.
7. Allow vehicle modules to sleep, this may take up to 5 min.
8. Ignition/vehicle ON, download customers desired applications.

NOTE: **If the Radio Reset is unable to be performed on the original radio due to a blank screen or similar failure follow the steps below:**

1. Replace A11 Radio and program, refer to [Control Module References](#) .
 2. Attempt to download or access any app.
 3. If an error is displayed perform an OnStar Blue Button press and diagnose the issue with the help of an OnStar advisor.
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