SECTION : 415-04 Audio Interface Module

VEHICLE APPLICATION : 2008.0 Falcon

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DESCRIPTION AND OPERATION

Audio Interface Module System

The audio Interface Module system consists of the following components:

* Audio Interface Module: 8R29-19C142-Ax
* iPod Curly Cord   8R29-14D454-Ax
* iPod/Curly Cord storage pouch   8R29-F044H64-Ax
* Console wiring harness   8R29-14C575-Ax

The Audio Interface module (also known as FEM Front Entertainment Module) is controlled via the integrated controls on the ICC panel, and the steering wheel. Refer to the owner's manual for complete operating guidelines.

The AIM consists of only one variant regardless of the series of Audio system and/or Screen fitted to the vehicle.

AUX INPUT:

All audio systems include an Auxiliary audio input function, where an external device can be connected to provide audio functionality via the vehicle audio controls. Suitable audio units are portable cassette players, CD players, DVD or MP3 players. On vehicles fitted with the AIM, this 3.5mm auxiliary jack is wired to the AIM module, which switches between this audio source or a connected iPod audio source. The iPod audio source takes priority if both devices are attached simultaneously.

The Auxiliary input is located adjacent to the 12V power supply beneath the tissue box.

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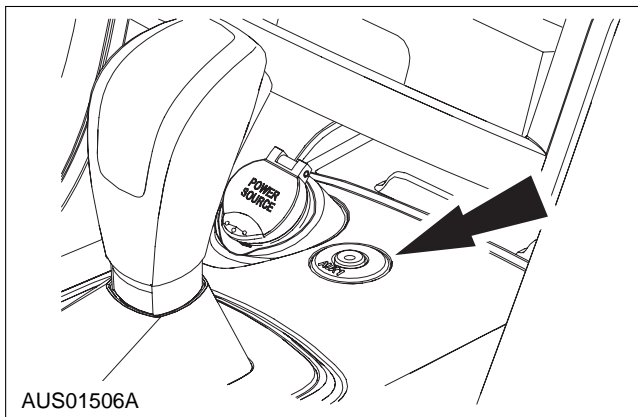
iPod Input:

iPod audio is input to the system via the supplied curly cord. This cord is designed for use only with approved Apple™ products containing the 30 pin docking connector. When a working iPod is connected to the system using this cord, the FDM will display "iPod" as the media mode when switched to the usual AUX1 input. Whenever an iPod is connected, even if it is not playing, the AUX1 input is disabled.
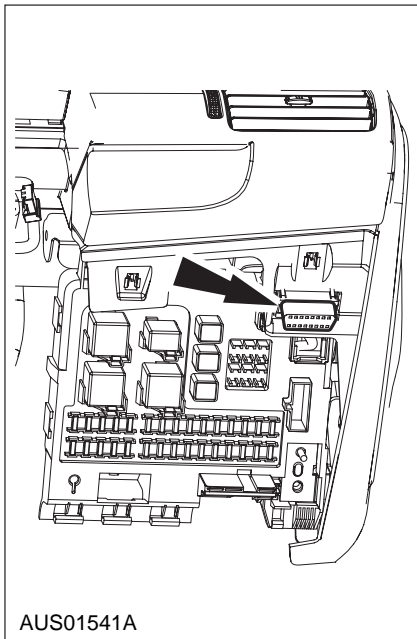
DIAGNOSIS AND TESTING

Audio Interface Module System

Audio System

1. Principles of Operation

The following diagnostics are available by connecting the IDS/PDS tool to the diagnostic link connector located on the right hand side of the fuse box.

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The IDS/PDS tool will support the following modes

* On Demand Self Test (for all purpose)
* Diagnostic trouble codes (DTCs)
* Parameter identifiers (PID's)
* Module configuration (EOL) - Method 2
* Module Programming (File Download) - Method 3

Module Configuration

The AIM has the following configuration options:

* VIN

Module configuration is carried out by using the IDS/PDS tool.

Module Programming

The AIM has the following programming options:

* Application Software
* ECU Calibration Software

Module Programming is carried out by using the IDS/PDS tool.

On Demand Self Tests (Field Self Test $02)

The following test is carried out within 2 minutes, during the On Demand Self Test (Field Test).

* Checks that there is no Short or over current on the power supply
* Checks that an iPod is connected
* Checks that an iPod is authenticated
* Checks RAM, ROM Checksum
* Checks that IGN is in RUN
* Checks that the Battery voltage is within valid range

Note that this self test (Field Test) with identifier $02 is distinct from the production plant self test (Assembly Test) with identifier $11 in that this test will verify that the module works with a connected iPod. Therefore execution time can take up to two minutes whilst re-authentication of a connected iPod is carried out.

How to do an On Demand Self Test ($02)

Step	Test	Action
1	* Connect IDS/PDS tool * ECU TEST ENTRY Requirements Key in Run. Battery within Normal Operating Voltage (Usually 11-16 Volts) Compatible iPod Connected * Carry out self test	—
2	* On Demand Self test	—
3	* Is DTC logged?	* Refer to DTC chart

DTC Chart

DTC	Description	Possible Causes	Action
B1342	ECU is Faulted	ECU failure - Flash ROM checksum failure	Document and clear the DTCs. Carry out the self test. If the DTC is registered again **replace AIM**. Test the system for correct operation.
UI900	CAN Communication Bus Fault	ECU CAN controller transmitted a signal onto CAN and did not receive the same signal back via CAN.	Check integrity of wiring harness connection referring to EDS CAN trouble shooting. Carry out the self test. If the DTC is registered again **replace AIM**. Test the system for correct operation.
U0256	Lost Communication With Front Display Control Module (FDM)	Loss of Comms with FDM. Set when 0x55C missing for more than five (5) seconds.	Document and clear the DTCs. Run vehicle for 10 seconds. If the DTC is registered again refer to Front Display Module (FDM) section 413-08.
U0184	Lost Communication With Radio (ACM)	Loss of Comms with Radio. Set when 0x50C missing for more than five (5) seconds.	Document and clear the DTCs. Run vehicle for 10 seconds. If the DTC is registered again refer to Audio Control Module (ACM) section 415-01.
B1318	Battery Voltage Low	Low voltage	Document and clear the DTCs. Run vehicle for 2 mins. Read DTCs. If the DTC is registered again **check / correct battery**.
9180	UART Comms	Set if Communications with the iPod is lost	Document and clear the DTC's. Repeat Self Test $02 with: - different working iPod - New Curly loom Repeat Self Test $02 to check if DTC is set. If curly loom is faulty replace loom else **replace AIM**. Test the system for correct operation.
9181	Buffer Overflow	Set if Communications input buffer overflows	Document and clear the DTCs. Repeat Self Test $02 with different working iPod. If the DTC is registered again **replace AIM**. Test the system for correct operation.
B2477	Vehicle Configuration Failure	Set if Vehicle Configuration data has not been programmed (via Method 2)	Document and clear the DTC's. Configure AIM module using IDS Diagnostic tool. If the DTC is registered again **replace AIM**. Test the system for correct operation.
C2784	RAM Failure	Set if RAM memory read/write fails	Document and clear the DTCs. Carry out the self test. If the DTC is registered again **replace AIM**. Test the system for correct operation.
P062F	EEPROM Checksum Failure	Set if EEPROM Checksum fails	Document and clear the DTCs. Carry out the self test. If the DTC is registered again **replace AIM**. Test the system for correct operation.
B2207	ROM Checksum Failure	Set if ROM Checksum fails	Document and clear the DTCs. Carry out the self test. If the DTC is registered again **replace AIM**. Test the system for correct operation.
9182	iPod Authentication Failed	Set if Authentication of an attached iPod device fails.	Document and clear the DTCs. Replace iPod with one from the approved iPod list. Carry out the self test. If the DTC is registered again **replace AIM**. Test the system for correct operation.

Login Tracking Code

DTC	Description	Possible Causes	Action
9183	Power Supply Failure	Short Circuit or over-current condition in Internal Power Supply	Document and clear the DTCs. Carry out the self test. If the DTC is registered again **replace AIM**. Test the system for correct operation.
9184	iPod Physical Connection Status	No iPod Connected to AIM, AIM cable damaged.	Document and clear the DTCs. Replace iPod curly cord cable. Carry out the self test. If the DTC is registered again **replace AIM**. Test the system for correct operation. **NOTE: This takes precedence over action for DTC 9182.**
B2900	VIN Mismatch	Set if VIN stored in AIM does not match VIN sent by ACM	Document and clear the DTCs. Reprogram VIN number on both ACM and AIM. Carry out the self test. If the DTC is registered again **replace AIM**. Test the system for correct operation.
E050	Application not present	Set when application not present in module	Program AIM with current software. Document and clear the DTC. If the DTC is registered again **replace AIM**. Test the system for correct operation.

PID Chart

Command	Description
IPOD_MODELSTR	iPod Model String – containing the model number of the connected iPod (912A)
IPOD_NAME	iPod Name – containing the customer's name given to the iPod (912B)
IPOD_SIMPREM	Reports the ability of the connected iPod to support basic control functions (911E)
IPOD_DISPREM	Reports the ability of the connected iPod to support text display (911F)
SEC_STAT	Reports the AIM module's security status (8213)
AUTHENT_DEVER	Reports error code associated with authenticating an attached iPod (911D)
AIM_State	Reports the AIM module diagnostic state (D100)
IPOD_FRMVER	Reports the firmware version of the attached iPod (911C)

Login Tracking Code

2. Troubleshooting

2-1 Carry out an On Demand Self Test

2-2 Carry out action according to DTC Chart recorded DTCs

2-3 Follow the Symptom Chart for issues not found during self test

Symptom Chart

No.	Condition	Possible Sources	Action
1	Sound can not be heard through standard 3.5mm input	* iPod is still connected * Damaged iPod cable * Internal fault * <u>Volume in ACM settings is turned to minimum</u>	* Standard audio input check
2	Sound can not be heard through iPod input or can not access iPod mode.	* iPod not connected correctly * Damaged iPod cable * Internal fault * <u>Volume in ACM settings is turned to minimum</u>	* iPod audio input check
3	Sound is heard through iPod input but limited or no controls are working	* Attached iPod does not support functions * Internal fault	* iPod controls check * refer to ACM
4	Attached iPod is not charging	* AIM in security lock mode * Low system voltage * Internal fault * Insecure connection	* iPod charging check

Service Procedures

Service Procedure	Description
Standard audio input check (Test A)	Steps required to confirm system is set up for standard audio input
iPod audio input and mode check (Test B)	Steps required to confirm system is set up for iPod audio input
iPod controls check (Test C)	Steps required to confirm that the system will control an attached iPod
iPod charging check (Test D)	Steps required to confirm that the system will charge an attached iPod

Login Tracking Code

TEST A: Standard audio input check

Test Step		Result/Action to Take	Acronyms
A1	* Turn the ignition on. * **Is the ignition on?**	**Yes** Go to A2 **No** Repair faulty ignition system and retest.	
A2	* Check that the accessories are on. * **Are the accessories on?**	**Yes** Go to A3 **No** Repair faulty ignition system and retest	
A3	* Check to see if the ICC audio is turned on. * **Is the audio on?**	**Yes** Go to A5 **No** Go to A4	
A4	* Press the ICC audio power button. * Check CAN Message, using data logger. * **Does the ICC audio turn on?**	**Yes** Go to A5 **No** See ICC repair manual.	
A5	* Operate each audio switch / knob. * **Are any switches / knobs sticking or stuck?**	**Yes** See ICC repair manual. **No** Go to A6	
A6	* Check that each audio switch / knob operates. * Check CAN Message, using data logger. * **Any response from ICC?**	**Yes** Go to A7 **No** See ICC repair manual.	
A7	* Set the ICC in AUX1 Audio mode * **Does the ICC allow AUX1 Audio mode?**	**Yes** Go to A8 **No** See ACM repair manual, confirm ACM is configured for AUX1 audio.	
A8	* Set the ICC to an audible volume level 20 and confirm MUTE is not active. * **Does the ICC change volume to step 20?**	**Yes** Go to A9 **No** See ACM Repair manual.	
A9	* Set the AUX1/iPod media volume to the mid point, 0dB. * **Does the ICC change to mid point (0dB) for AUX1 media volume?**	**Yes** Go to A10 **No** See ACM Repair manual.	
A10	* Ensure that there is no iPod connected to the curly cord. Note AIM will switch to iPod mode by default even if iPod is not playing. * Connect an Audio source to the 3.5mm jack input, test for audio output from source using headphones first. * **Audio can be heard?**	**Yes** No issue. **No** See ACM and EDS wiring repair manuals. If no issues found with ACM or EDS AIM has an internal fault. Return for service.	

TEST B: iPod audio input check

Test Step		Result/Action to Take	Acronyms
B1	* Follow procedure in "Test A" to confirm Audio connection from AIM to ICC is functioning. * **With ICC still in AUX1 mode, connect iPod to AIM and verify system shows iPod mode.**	**Yes** Go to B3 **No** Go to B2	
B2	* Check that the attached iPod does not have a flat battery and is able to play music normally using headphones. * Check that the attached iPod is on the compatible list of devices. * **Reconnect working/approved iPod. Does system show iPod mode?**	**Yes** Go to B3 **No** See EDS wiring repair manuals to check for CAN integrity. If CAN is OK then either AIM or cable is faulty. Return for service.	
B3	* iPod should play immediately, confirm volume is still set to step 20 and MUTE is not active. If track time is not changing on screen select a track from the iPod menu mode. * **Is the audio heard?**	**Yes** No issue **No** AIM or cable is faulty. Return for service	

TEST C: iPod controls check

Test Step		Result/Action to Take	Acronyms
C1	* Follow procedure in "Test B" to confirm Audio connection from AIM to ICC is functioning and iPod mode can be activated. * **When iPod is connected, is "Menu Unavailable" shown on the screen?**	**Yes** The attached iPod has limited functionality – menu access is not supported on this iPod. Continue at A5 if buttons 2 through to 4 are not working. **No** Go to C2	
C2	* **Do multi function buttons 1 through to 4 show "iPod", RPT, RDM and pause respectively?**	**Yes** Go to C4 **No** Go to C3	
C3	* **Is multi function button 1 blank whilst buttons 2 through to 4 show RPT, RDM and pause respectively?**	**Yes** The attached iPod has limited functionality – menu access is not supported on this iPod. Continue at A5. **No** Go to C4	
C4	* **Pressing multi function button 1, is menu mode on the iPod activated?** * **Can the track list be scrolled up and down?** * **Pressing multi function button 1 again, is the top level MUSIC menu shown?** * **Can you select an item from the MUSIC menu to access a sub menu using the OK button on the fascia?** * **Pressing the back button on the fascia, are you returned to the MUSIC menu?** * **Pressing multi function button 6, are you returned to the home screen with track information shown?**	**Yes** Advanced iPod features are working, Go to C5. **No** Advanced iPod features are not working. Replace iPod with an approved model and retest. If problem persists return AIM for service, noting detail of all PIDs.	
C5	* **Pressing multi function button 2, does the screen cycle through repeat modes?** * Pressing multi function button 3, does the screen cycle through random modes? * Pressing multi function button 4, does the screen cycle through pause and un-paused modes?	**Yes** The attached iPod is working. No Issue. **No** Replace the iPod with a working charged sample from the approved list and retest. If this fails return AIM for service.	

TEST D: iPod charging check

Test Step		Result/Action to Take	Acronyms
D1	* Attach a working approved iPod to the AIM system and run diagnostic self test $02. * **Does AIM log DTC 9183?**	**Yes** Return Aim for service. **No** No issue	

REMOVAL AND INSTALLATION

Audio Interface Module System Security

All AIM units are fitted with a VIN security encoding scheme. The AIM will not operate unless the VIN number coded into the AIM matches that coded into the ACM which is trained to the vehicle. Ensure that this is done before attempting to operate of diagnose the system.

## Audio Interface Module Unit

Removal and Installation

The inner PCB of the AIM module must not be removed from the housing. Further, the top connection from the AIM module to the iPod curly cord may be left in place when returning a module for replacement/warranty.

Removal

1. Remove console PRNDL cover plate as identified in 'console removal' process.

2. Remove the AIM pouch.

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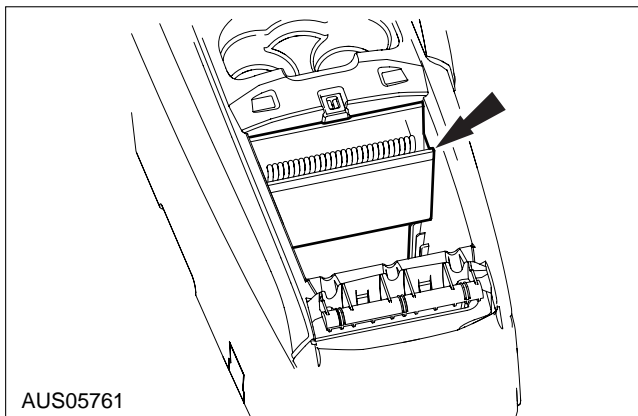
3. Release the rear part of the console as identified in 'console removal' process.

4. Elevate the rear edge of the console to enable hand access to the lock below the console bin and squeeze the lock arms together as shown.

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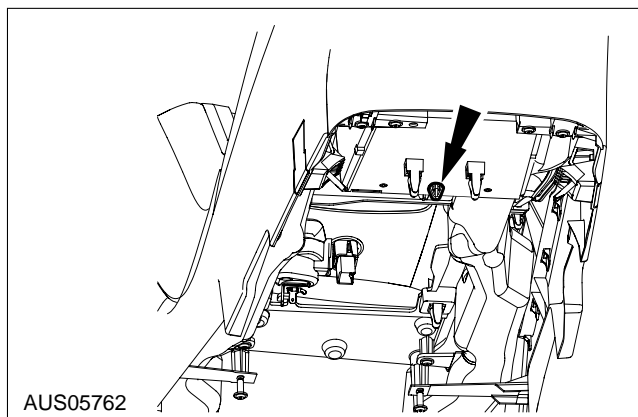
5. Slide the AIM assembly vertically upward until it is parallel with the top of the console.

6. Orientate the assembly to enable visual access AIM harness connection to the AIM assembly.

7. Place the index finger between the harness lock and cover plate as shown. Squeeze the lock between the thumb and forefinger to disengage the harness to enable removal of the module as shown.

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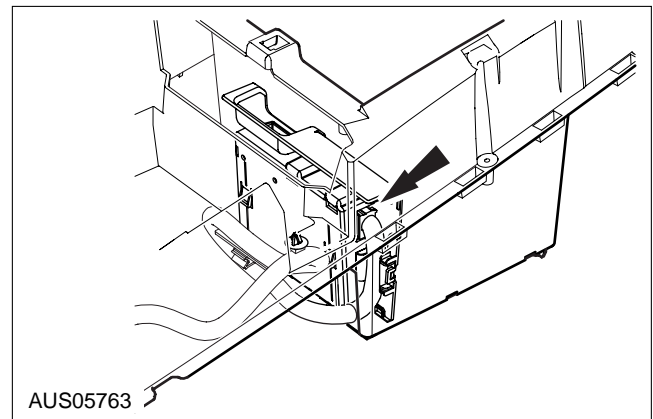
Installation

1. Extend the AIM harness to the top of the console bin and make connection to AIM assembly (Note: Lock side of harness connector should be adjacent to AIM Cover.

2. Orientate the harness parallel to the front face of the console bin ensuring that the harness is tucked between the AIM cover and the Console front face.

3. Slide the assembly down the inside section of the CD retention slots until the assembly lock engages (clicks) into the console lower base. (ensure that harness does not protrude below lower edge of AIM cover plate and that the carpet at the base of the console bin has been removed as this will prevent the assembly from engaging)

4. Re secure the console assembly to the floor as identified in the 'console assembly' process.

5. Replace the AIM pouch to the forward edge of the console bin and then replace the PRNDL cover plate as specified in the 'console assembly' process to retain the pouch in the correct position.