SERVICE MANUAL SECTION

CF 500, CF 600 Entertainment System

Truck Model: CF 500

Truck Model: CF 600

Unit Code: 08RGD

Unit Code: 08RGW

Unit Code: 08RGX

Unit Code: 08RHM

Unit Code: 08787

S16031

11/02/2005

Table of Contents

Safety Information

NOTE: Read the following before starting the service procedure.

The information contained in this International Service Manual Section was current at the time of printing and is subject to change without notice or liability.

You must follow your company safety procedures when you service or repair equipment. Be sure to understand all of the procedures and instructions before you begin work on the unit.

International uses the following types of notations to give warning of possible safety problems and to give information that will prevent damage to the equipment being serviced or repaired.

WARNING: A warning indicates procedures that must be followed exactly. Personal injury or possible death can occur if the procedure is not followed.

CAUTION: A caution indicates procedures that must be followed exactly. If the procedure is not followed, damage to equipment or components can occur.

NOTE: A note indicates an operation, procedure or instruction that is important for correct service.

Some procedures require the use of special tools for safe and correct service. Failure to use these special tools when required can cause injury to service personnel or damage to vehicle components.

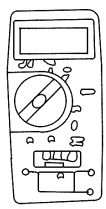
This service manual section is intended for use by professional technicians, NOT a "**do-it-yourselfer**." It is written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the service section applies to your vehicle. See your International Truck Dealer for information on whether this service section applies to your vehicle.

Entertainment System — General Information

Diagnosis and Testing

Refer to Wiring Diagrams for schematic and connector information.

Table 1 Special Tools

 ST1137-A	Automotive Meter ZTSE4357

Principles of Operation

Audio Unit

The audio unit can be powered up when the ignition is in the ON or ACC position. The audio unit provides audio signals to the speakers to produce sound.

Antenna

The antenna receives AM and FM radio waves. The AM and FM waves are sent to the audio unit through the antenna cables.

Inspection and Verification

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

Table 2 Visual Inspection Chart

Mechanical	Electrical
• Audio unit damaged, misaligned or controls inoperative • Antenna or antenna cable physically damaged or misaligned • Speaker mounting/speaker cone damaged	• Power distribution box fuse(s): — 27 (10A) — 42 (10A) • Damaged connectors • Circuitry • Damaged audio unit

Table 3 Symptom Chart

Condition	Possible Sources	Action
The audio unit is inoperative/does not operate correctly	• Circuitry • Audio unit.	Go to Pinpoint Test A.
Poor reception	• Antenna connections. • Audio unit.	Go to Pinpoint Test B.
Poor quality/distorted sound/no sound from one or more speakers (not all speakers)	• Speakers. • Circuitry. • Audio unit.	Go to Pinpoint Test C.
Poor quality/distorted sound/no sound from all speakers	• Audio unit.	Go to Pinpoint Test D.
One or more audio control buttons are not functional in either audio, tape or CD mode	• Audio unit.	INSTALL a new audio unit. REFER to Audio Unit. TEST the system for normal operation.

Pinpoint Tests

Pinpoint Test A: The Audio Unit Is Inoperative/Does Not Operate Correctly

Normal Operation

The audio unit receives power from the power distribution center circuit 137 (YE/BK) and ground through circuit 57 (BK). The audio unit receives voltage at all times from circuit 1772 (VT) for memory.

Possible Causes

- Fuse(s)
- Circuit 57 (BK) open
- Circuit 137 (YE/BK) open
- Circuit 1772 (VT) open
- Audio unit

Table 4 PINPOINT TEST A: THE AUDIO UNIT IS INOPERATIVE/DOES NOT OPERATE CORRECTLY

Test Step	Result / Action to Take
A1 CHECK THE OPERATION OF THE AUDIO UNIT • Key in ON position. • Turn on the audio unit. **Is the audio unit display illuminated?**	**Yes** GO to A2. **No** GO to A4.
A2 CHECK FOR SOUND COMING FROM THE SPEAKERS • Operate the audio unit. • Adjust the speaker controls left to right. • Check for sound from the speakers. **Is sound coming from the speakers?**	**Yes** GO to A3. **No** GO to Symptom Chart.
A3 CARRY OUT THE CONTROLS AND FEATURES TEST • Verify that all the audio system controls and features operate correctly. Refer to the owner's literature. **Do all the controls and features operate correctly?**	**Yes** INFORM the customer how to correctly operate the audio system controls and features. **No** INSTALL a new audio unit. REFER to Audio Unit. TEST the system for normal operation.

Table 4 PINPOINT TEST A: THE AUDIO UNIT IS INOPERATIVE/DOES NOT OPERATE CORRECTLY (cont.)

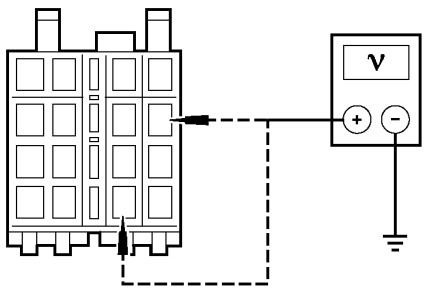
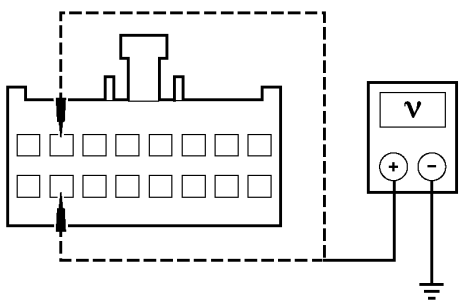
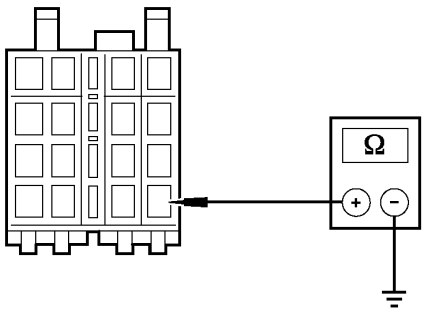
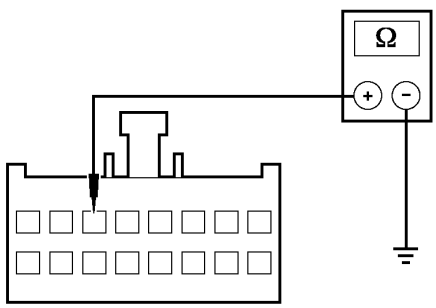
Test Step	Result / Action to Take
A4 CHECK CIRCUITS 137 (YE/BK) AND 1772 (VT) FOR VOLTAGE • Key in OFF position. • **Disconnect:** Audio Unit C240 or C290 (If equipped with premium radio) • Key in ACCESSORY position. • If equipped with base radio, measure the voltage between audio unit C240-4 circuit 137 (YE/BK), harness side and ground; and between audio unit C240-7 circuit 1772 (VT), harness side and ground.  N0020198 • If equipped with premium radio, measure the voltage between audio unit C290-B circuit 137 (YE/BK), harness side and ground; and between audio unit C290-O circuit 1772 (VT), harness side and ground.  N0020197 **Are the voltages greater than 10 volts?**	**Yes** GO to A5. **No** VERIFY the power distribution center (PDC) fuse 27 (10A) or fuse 42 (10A) is OK. If OK, REPAIR the circuit in question. TEST the system for normal operation.

Table 4 PINPOINT TEST A: THE AUDIO UNIT IS INOPERATIVE/DOES NOT OPERATE CORRECTLY (cont.)

Test Step	Result / Action to Take
A5 CHECK CIRCUIT 57 (BK) FOR AN OPEN • Key in OFF position. • If equipped with base radio, measure the resistance between audio unit C240-8 circuit 57 (BK), harness side and ground.  N0020200 • If equipped with premium radio, measure the resistance between audio unit C290–C circuit 57 (BK), harness side and ground.  N0020199 **Is the resistance less than 5 ohms?**	**Yes** GO to A6. **No** REPAIR the circuit. TEST the system for normal operation.
A6 CHECK FOR CORRECT AUDIO UNIT OPERATION • Disconnect all the audio unit connectors. • Check for: — corrosion. — pushed-out pins. • Connect the audio unit connectors and make sure they seat correctly. • Operate the system and determine if the concern is still present. **Is the concern still present?**	**Yes** INSTALL a new audio unit. REFER to Audio Unit. TEST the system for normal operation. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

Pinpoint Test B: Poor Reception

Normal Operation

The antenna receives AM and FM signals. The AM and FM signals are sent to the audio unit through the antenna cables.

Possible Causes

- Antenna
- Antenna connections
- Audio unit

Table 5 PINPOINT TEST B: POOR RECEPTION

Test Step	Result / Action to Take
B1 CHECK THE ANTENNA CABLE CONNECTIONS • Key in OFF position. • Check the antenna connections. **Are the connections clean, secure and in metal-to-metal contact?**	**Yes** GO to B2. **No** CLEAN or SECURE the antenna cable connections as necessary. TEST the system for normal operation.
B2 CHECK THE IGNITION CIRCUITS • Key in OFF position. • Check the ignition circuits for correct routing, grounding and security of connections. **Are the circuits OK?**	**Yes** GO to B3. **No** REPAIR the circuits as necessary. TEST the system for normal operation.
B3 CHECK IGNITION SYSTEM • Test the ignition system. Refer to the Powertrain Control/Emissions Diagnosis manual. **Is the ignition system OK?**	**Yes** GO to B4. **No** REPAIR the ignition system as necessary. REFER to the Engine Operation and Maintenance Manual. TEST the system for normal operation.

Table 5 PINPOINT TEST B: POOR RECEPTION (cont.)

Test Step	Result / Action to Take
B4 SUBSTITUTE THE ANTENNA CABLE • Key in OFF position. • Substitute a known good antenna cable. Refer to Antenna. • Key in ON position. • Verify the operation of the audio unit. **Is the noise eliminated?**	**Yes** REPAIR or INSTALL a new antenna cable. REFER to Antenna. TEST the system for normal operation. **No** REINSTALL the original antenna cable. REFER to Antenna. GO to B5.
B5 SUBSTITUTE AUDIO UNIT • Key in OFF position. • Substitute a known good audio unit. Refer to Audio Unit. • Key in ON position. • Verify the operation of the audio unit. **Is the noise eliminated?**	**Yes** REPAIR or INSTALL a new audio unit. REFER to Audio Unit. TEST the system for normal operation. **No** INSTALL the original audio unit. USE a jumper cable to ground various parts of the vehicle to the frame (for example, the engine, fenders, quarter panels, stone deflectors, engine air cleaner or body sheet metal). When the noise is eliminated, PROVIDE a permanent ground where necessary. TEST the system for normal operation.

Pinpoint Test C: Poor Quality/Distorted Sound/No Sound From One Or More Speakers (Not All Speakers)

Normal Operation

The audio unit directs the audio signals to the speakers through separate positive and negative circuits for each of the audio channels LF and RF.

Possible Causes

- Speakers
- Audio unit
- High resistance or short to ground in speaker circuits

Table 6 PINPOINT TEST C: POOR QUALITY/DISTORTED SOUND/NO SOUND FROM ONE OR MORE SPEAKERS (NOT ALL SPEAKERS)

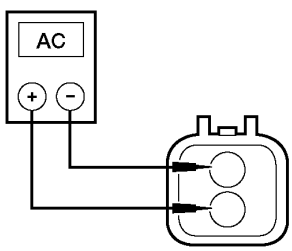
Test Step	Result / Action to Take
C1 CHECK FOR POOR QUALITY SOUND/NO SOUND FROM THE SPEAKERS • Key in ON position. • Turn on the audio unit. • Adjust the speaker controls left to right. **Do all speakers have poor quality/no sound?**	**Yes** IF poor quality/distorted sound/no sound from all speakers, GO to Pinpoint Test D. **No** GO to C2.
C2 CHECK SIGNAL TO SUSPECT SPEAKER • Key in OFF position. • **Disconnect:** Suspect Speaker C523 (LF) or C612 (RF) • Key in ACCESSORY position. • Turn on the audio unit. • Measure the A/C voltage between connector pins of suspect speaker, harness side as follows: Suspect Speaker **LH Front**: Connector-Pin **C523-2** — Circuit **804 (OG/LG)** Suspect Speaker **LH Front**: Connector-Pin **C523-1** — Circuit **287 (BK/WH)** Suspect Speaker **RH Front**: Connector-Pin **C612-2** — Circuit **805 (WH/LG)** Suspect Speaker **RH Front**: Connector-Pin **C612-1** — Circuit **287 (BK/WH)**  N0020201 **Is there fluctuating A/C voltage present?**	**Yes** GO to C3. **No** GO to C5.

Table 6 PINPOINT TEST C: POOR QUALITY/DISTORTED SOUND/NO SOUND FROM ONE OR MORE SPEAKERS (NOT ALL SPEAKERS) (cont.)

Test Step	Result / Action to Take
C3 SUBSTITUTE SPEAKER • Key in OFF position. • Substitute a known good speaker. • Key in ACCESSORY position. • Verify operation of the audio unit. **Is the concern eliminated?**	**Yes** INSTALL a new speaker. REFER to Speakers. TEST the system for normal operation. **No** GO to C4.

C4 CHECK FOR CORRECT AUDIO UNIT OPERATION • Key in OFF position. • Disconnect all the audio unit connectors. • Check for: — corrosion. — pushed-out pins. • Connect the audio unit connectors and make sure they seat correctly. • Operate the system and determine if concern is still present. **Is the concern still present?**	**Yes** INSTALL a new audio unit. REFER to Audio Unit. TEST the system for normal operation. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.
C5 CHECK CIRCUITS 804 (OG/LG), 287 (BK/WH) AND 805 (WH/LG) FOR AN OPEN OR A SHORT TO GROUND • Key in OFF position. • **Disconnect:** Audio Unit C240 (Base radio) or C290 (Premium radio) • Key in ACCESSORY position. • Measure the resistance between audio unit C240 or C290, harness side and suspect speaker, harness side; and between audio unit C240 or C290, harness side and ground as follows: **Are the resistances less than 5 ohms between the audio unit and the suspect speaker, and greater than 10,000 ohms between the audio unit and ground?**	**Yes** INSTALL a new speaker. REFER to Speakers. TEST the system for normal operation. **No** REPAIR the circuit(s) in question. TEST the system for normal operation.

Suspect Speaker	Audio Unit Connector-Pin	Speaker Connector-Pin	Circuit
LH Front	C240-13 or C290-L	C523-2	804 (OG/LG)
	C240-14 or C290-M	C523-1	287 (BK/WH)
RH Front	C240-11 or C290-J	C612-2	805 (WH/LG)
	C240-12 or C290-K	C612-1	287 (BK/WH)

Pinpoint Test D: Poor Quality/Distorted Sound/No Sound From All Speakers

Normal Operation

The audio unit directs the audio signals to speakers through separate positive and negative circuits.

Possible Causes

- Audio unit

Table 7 PINPOINT TEST D: POOR QUALITY/DISTORTED SOUND/NO SOUND FROM ALL SPEAKERS

Test Step	Result / Action to Take
D1 CHECK FOR CORRECT AUDIO UNIT OPERATION • Key in ON position. • Turn the audio unit on. **Does the audio unit display illuminate?**	**Yes** GO to D2. **No** GO to Pinpoint Test A.
D2 CHECK FOR CORRECT AUDIO UNIT OPERATION • Disconnect all the audio unit connectors. • Check for: — corrosion. — pushed-out pins. • Connect the audio unit connectors and make sure they seat correctly. • Operate the system and determine if the concern is still present. **Is the concern still present?**	**Yes** INSTALL a new audio unit. REFER to Audio Unit. TEST the system for normal operation. **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

Audio Unit

Description and Operation

Audio System

There are 3 audio units available for this vehicle:

- AM/FM (Base radio)
- AM/FM CD (Premium radio)
- AM/FM cassette (Premium radio)

Refer to the owner's literature for complete operating guidelines.

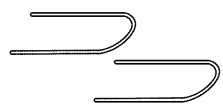
Diagnosis and Testing

Audio System

Refer to Entertainment System.

Removal and Installation

Table 8 Special Tools

 ST1445-A	Radio Removal Tool ZTSE4715

Audio Unit Removal

1. Disconnect the battery ground cable. For additional information, refer to Battery, Mounting and Cables in S08307.
2. Remove the audio unit from the instrument panel.

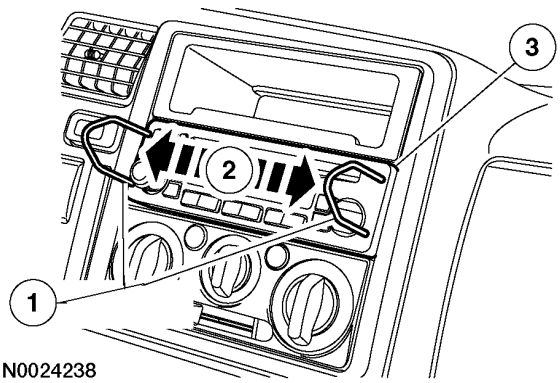


Figure 1

1. Using the special tool, release the audio unit retaining clips.
2. Apply outward pressure on the special tool, while pulling the audio unit away from the instrument panel.
3. Remove the audio unit.

• Disconnect the audio unit electrical connectors.

Audio Unit Installation

1. Connect the audio unit electrical connectors.
2. Connect the audio unit electrical connectors.

Antenna

Description and Operation

Antenna

The antenna receives AM and FM radio frequency waves. These radio frequency waves are sent to the audio unit through the antenna mast, antenna base and antenna lead-in cable.

Diagnosis and Testing

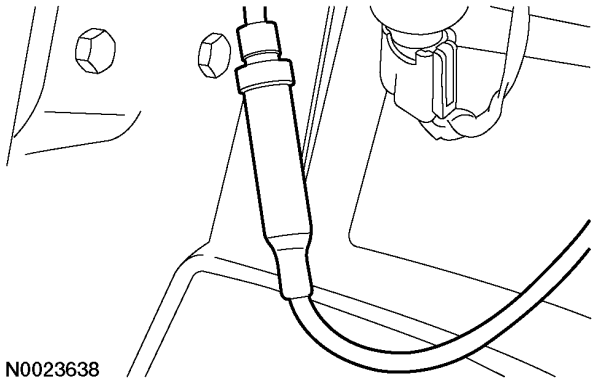
Antenna

Refer to Entertainment System.

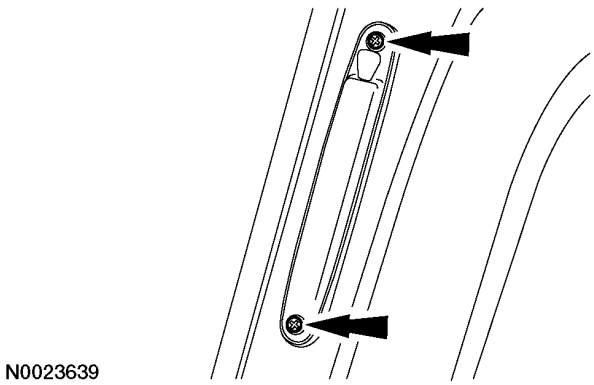
Removal and Installation

Antenna Base

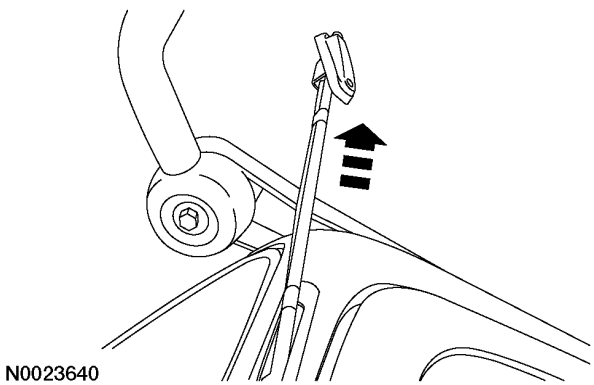
1. Remove the LH cowl side trim panel. For additional information, refer to Interior Trim and Ornamentation..
2. Disconnect the radio antenna lead-in cable.



3. Remove the 2 screws.



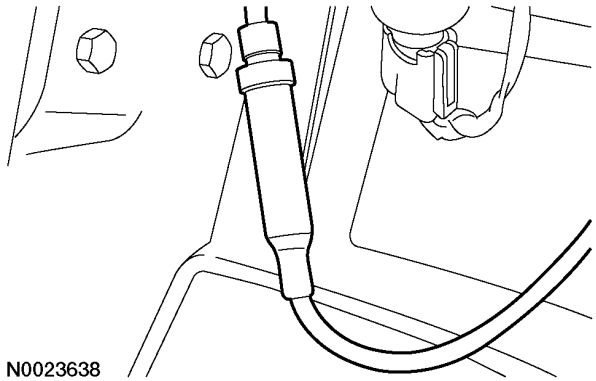
4. Remove the antenna base and cable assembly in an upward motion.



5. To install, reverse the removal procedure.

Antenna Lead-In Cable

1. Remove the audio unit. For additional information, refer to Audio Unit.
2. Remove the LH cowl side trim panel. For additional information, refer to Interior Trim and Ornamentation..
3. Disconnect the radio antenna lead-in cable.



4. Remove the antenna lead-in cable.
5. To install, reverse the removal procedure.

Speakers

Removal and Installation

Door Speaker

1. Remove the door trim panel. For additional information, refer to Interior Trim and Ornamentation..
2. Remove the speaker.

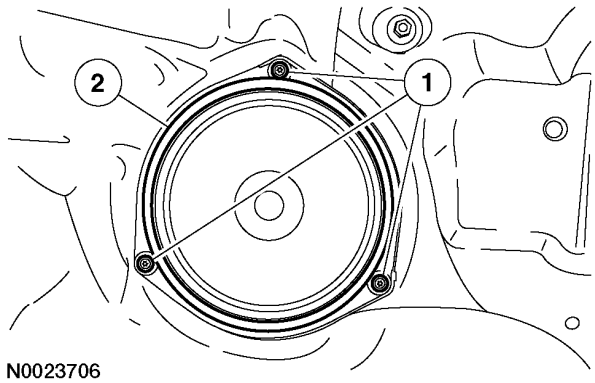
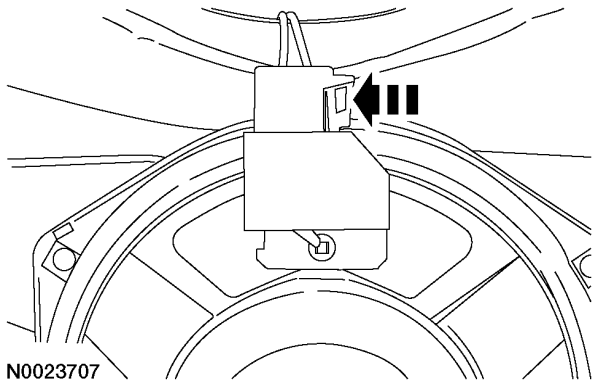


Figure 6

1. Remove the screws.
2. Remove the speaker.

3. Disconnect the electrical connector.



4. To install, reverse the removal procedure.