

# AUDIO SYSTEMS

# GROUP 15

(17000 & 18000)

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## SECTION 15-00 Audio Systems—Service

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<p><b>VEHICLE APPLICATION</b></p> <p>Taurus / Sable.</p>	
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### DESCRIPTION AND OPERATION

<p><b>Radio</b></p> <p><b>Radio Reception</b></p> <p><b>Antenna Position</b></p> <p>The automatic antenna, if so equipped, will adjust to the full extended height for best FM reception.</p> <p>FM Stereo has a range of about 32 km (20 mile) before interference noises are heard. This means that in concern areas with tall buildings or hills, it is necessary to select the strongest possible station. The electronic radio automatically tunes to the center of any given station, eliminating the need for manual fine tuning.</p> <p><b>Tone Control</b></p> <p>Favoring the rear speakers in noisy areas will help to reduce noise.</p>	<p><b>Antennas and Mobility</b></p> <p>Although an automobile radio will give outstanding mobile reception, it cannot provide the continuous reception of home audio components. The home receiver is not limited by the vehicle operating characteristics and certain geographical effects as is the mobile unit. For example, for the best FM reception, the automobile antenna should be designed like a TV antenna and pointed in the direction of the station. The best AM antenna is a long piece of wire, the higher the wire the better the reception. However, because of design necessity, the automobile antenna is restricted in size, height and direction and must receive both AM and FM stations. This means that a limited amount of the station's signal reaches the vehicle radio.</p>
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## DESCRIPTION AND OPERATION (Continued)

### Interfering Noise

The vehicle ignition system is a possible source of radio interference. This high-voltage switching system produces a radio frequency electromagnetic field that radiates at AM, FM and CB frequencies. Although components have been designed into the vehicle to minimize this concern, the noise is more noticeable if the radio is tuned slightly off channel when listening to FM programs. Vehicle electrical accessories and owner add-on accessories may also contribute to radio interference. Furthermore, there are many noise sources which are external to the vehicle. These include power lines, communication systems, ignition systems of other vehicles, neon signs, etc.

Noise or static may result from many causes. Two of the most common sources of radio noise are listed below:

#### Ignition Noise

The most effective method of evaluating ignition noise is to compare the radio performance with the engine on, versus engine off. If ignition noise is present with engine running:

- Check to see that the spark plug wires are the suppressor type and that the spark plugs are the correct resistor type.
- If so equipped, check to see that the carbon center insert in distributor cap is secure.
- If so equipped, check distributor cap and rotor electrodes for silicone grease as this may cause ignition noise on FM. This noise is characterized by a "motor boat" type sound on weak to moderate strength stations. The noise can only be eliminated by replacing the distributor cap and rotor with a cap and rotor that does not have grease.

NOTE: Silicone grease must not be removed from vehicles equipped with powertrain control module (12A650) PCM.

#### Missing or Malfunctioning Noise Suppression Components

- Noise suppression components may be malfunctioning or missing.
- Check bond strap grounding effectiveness by wedging a large file between metal parts to ensure proper ground, such as between the tail pipe and body, or between the fender and frame, while radio is playing and engine is running. Listen for a decrease in the objectionable radio noise. If a reduction in radio noise is noted, first try tightening body and exhaust system clamps and brackets. Then, if necessary, install a new bond strap between the two metal parts to ensure proper ground.

### FM Flutter

Flutter can best be described as repeated pops and hissing bursts heard in the speaker, during an otherwise good broadcast. Usually this condition exists while traveling in the fringe area of the station. Flutter will become more severe beyond approximately 40 km (25 mile) of the station. The signal loss becomes greater away from the station, until finally noise takes over and reception becomes impossible. Flutter may also be noticed near the station because of the line-of-sight characteristics of FM radio waves. This condition can happen when a building or large structure is between the radio receiver and the station being received. Some of the FM signal bends around the building, but certain spots have almost no signal. Some of these signal losses are only a few inches wide and if the vehicle is parked in one of these dead spots, you will only hear noise from the speaker. After moving out of the shadow of the structure, the station will return to normal. Flutter will not occur on AM because the AM radio waves are much longer than FM waves.

### FM Multi-Path Cancellation

Another effect caused by the line-of-sight characteristic is called cancellation. This condition exists when the radio waves are reflected from objects or structures. The noise produced by cancellation is similar to flutter, with the addition of distortion in the program. A more familiar description of cancellation is its similarity to the multiple ghosts and picture jumping that occurs on television when a low flying plane passes. The same condition exists in the vehicle, except that the vehicle is moving and the reflecting structure is stationary. The reflected signal cancels the normal signal, causing the antenna to pick up noise and distortion. Cancellation effects are most prominent in metropolitan areas, but can also become quite severe in hilly terrain and depressed roadways.

### FM Strong Signal Capture and AM Overloading

FM capture is an unusual condition that occurs when traveling in the vicinity of a broadcast tower. If listening to a weak FM station, when passing the broadcast tower, a stronger station may interfere without changing the tuning control. When passing the tower, the station may switch back and forth a few times before returning to the station originally tuned. When several broadcast towers are present (common in metropolitan areas) several stations may overload the receiver resulting in considerable station changing, mixing and distortion. Fortunately, this condition is localized and it will not harm the receiver. Some overloading may also be noticed on AM, but usually to a lesser degree.

### DESCRIPTION AND OPERATION (Continued)

#### Receiving FM Stereo

Because more data is carried in the FM Stereo waves than in the monaural FM broadcasts, flutter, cancellation and capture are even more noticeable. The FM Stereo noise-free broadcast range is approximately 8 km (5 mile) less than that received with the monaural FM radio. The AM/FM, FM Stereo radio may never encounter any of these troublesome conditions as they are more prominent in metropolitan areas, hilly terrain and depressed roadways. However, when diagnosing FM Stereo concerns, it is recommended to accurately tune to the strongest FM Stereo station.

#### Stereo Indicator Inoperative or Flickering (AM and FM Reception are OK)

- Verify that customer is listening to stereo stations.
- A weak or distant signal may cause the stereo indicator to flicker. Tune radio to a nearby FM stereo station. If reception is good, but stereo indicator is still intermittent, remove radio chassis for service.

The diagnosis charts and tests should be used with the Wiring Diagram Book and an appropriate Radio Tester to accurately diagnose and quickly service most radio system concerns.

#### Diagnosis Charts

##### Tools Required:

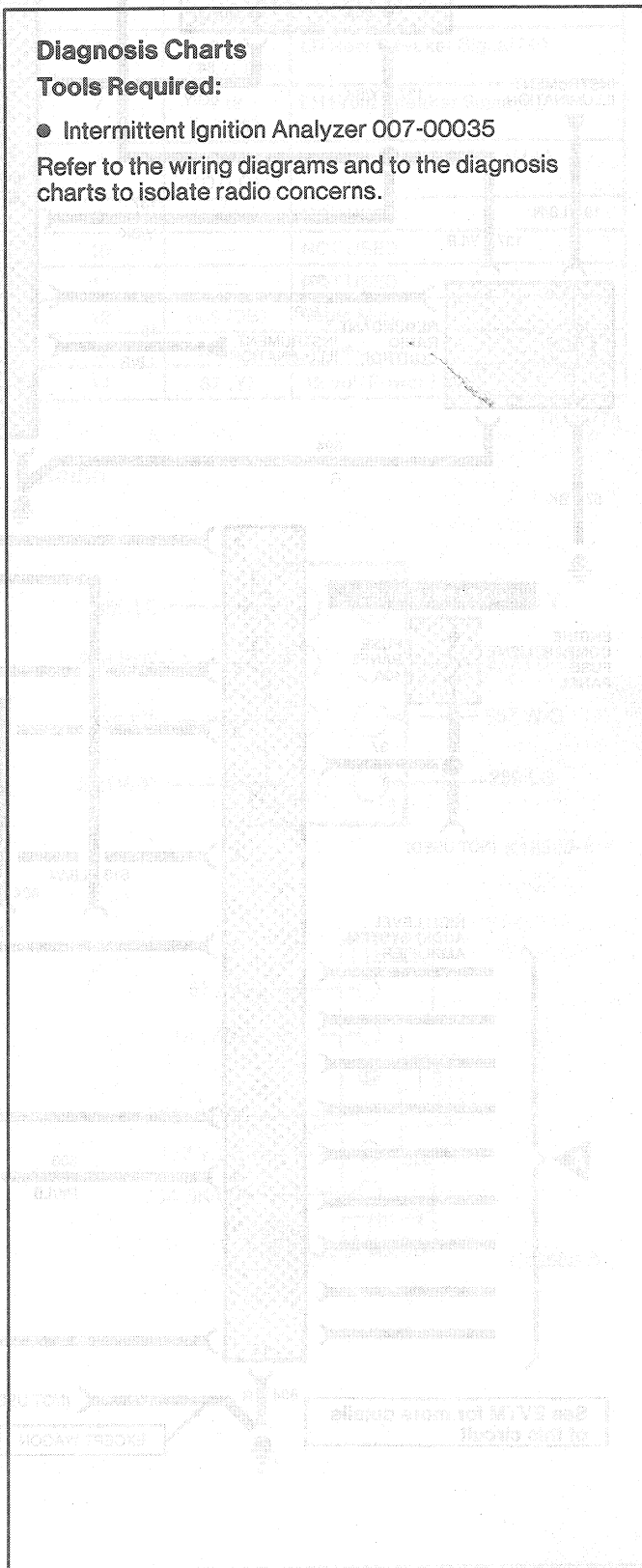
- Intermittent Ignition Analyzer 007-00035

Refer to the wiring diagrams and to the diagnosis charts to isolate radio concerns.

### DIAGNOSIS AND TESTING

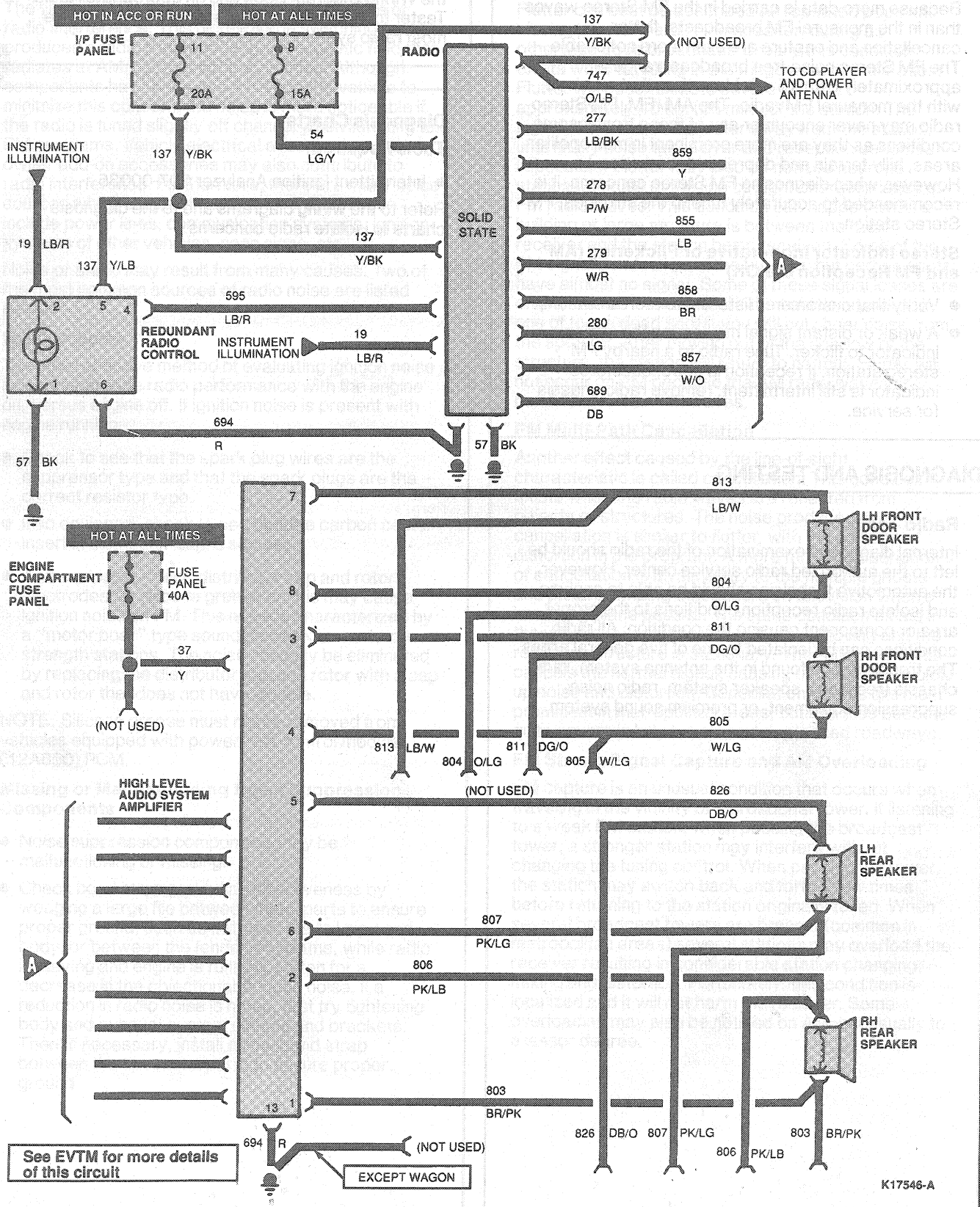
#### Radio Tests

Internal diagnostic examination of the radio should be left to the authorized radio service center. However, the automotive technician should be able to analyze and isolate radio reception conditions to the proper area or component causing the condition. All radio conditions can be isolated to one of five general areas. The trouble will be found in the antenna system, radio chassis (receiver), speaker system, radio noise suppression equipment, or premium sound system.



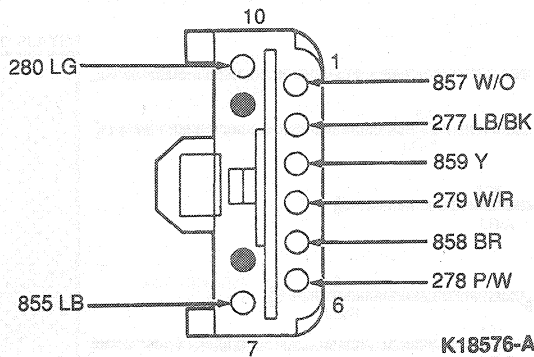
DIAGNOSIS AND TESTING (Continued)

Premium Analog Cassette (PAC) with Amplifier (Sable)



DIAGNOSIS AND TESTING (Continued)

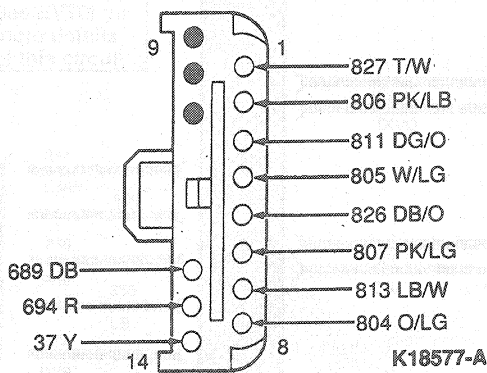
Amplifier



K18576-A

Pin Number	Circuit	Circuit Function
1	857 (W/O)	LH Front Speaker Signal (-)
2	277 (LB/BK)	LH Rear Speaker Signal (+)
3	859 (Y)	LH Rear Speaker Signal (-)
4	279 (W/R)	RH Front Speaker Signal (+)
5	858 (BR)	RH Front Speaker Signal (-)
6	278 (P/W)	RH Rear Speaker Signal (+)
7	855 (LB)	RH Rear Speaker Signal (-)
8	—	NOT USED
9	—	NOT USED
10	280 (LG)	LH Front Speaker Signal (+)

TK18576A



K18577-A

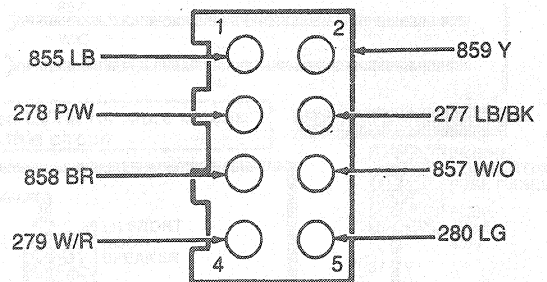
Pin Number	Circuit	Circuit Function
1	827 (T/W)	RH Rear Speaker Signal (-)
2	806 (PK/LB)	RH Rear Speaker Signal (+)
3	811 (DG/O)	RH Front Speaker Signal (-)

(Continued)

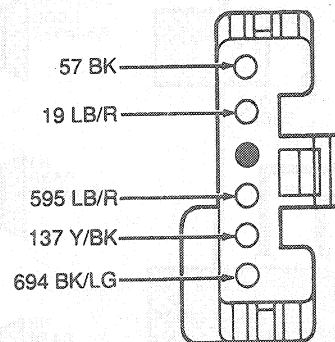
Pin Number	Circuit	Circuit Function
4	805 (W/LG)	RH Front Speaker Signal (+)
5	826 (DB/O)	LH Rear Speaker Signal (-)
6	807 (PK/LG)	LH Rear Speaker Signal (+)
7	813 (LB/W)	LH Front Speaker Signal (-)
8	804 (O/LG)	LH Front Speaker Signal (+)
9	—	NOT USED
10	—	NOT USED
11	—	NOT USED
12	689 (DB)	Logic Mute
13	694 (R)	Ground
14	37 (Y)	12 Volt Power Feed

TK18577A

Radio

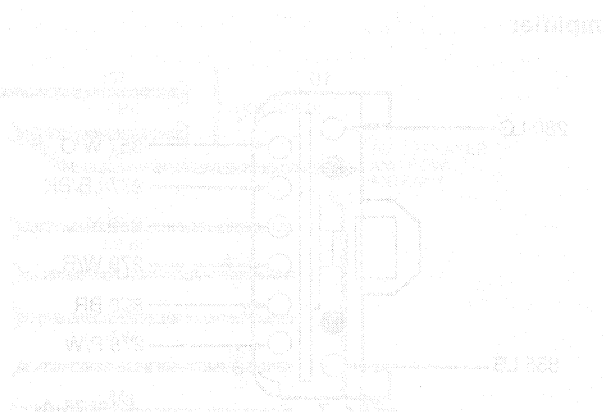
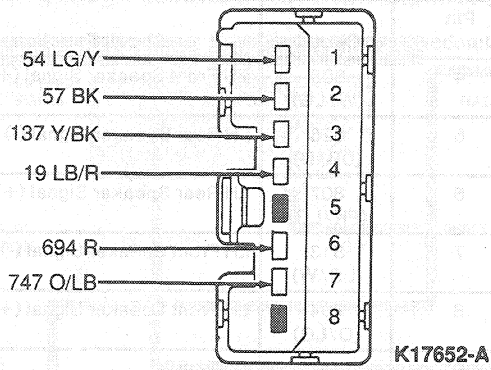


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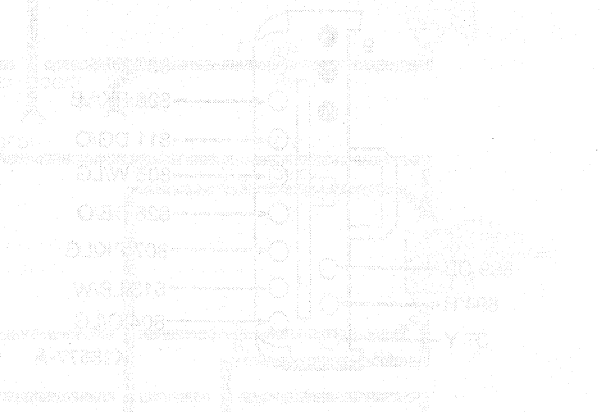


K18582-A

DIAGNOSIS AND TESTING (Continued)



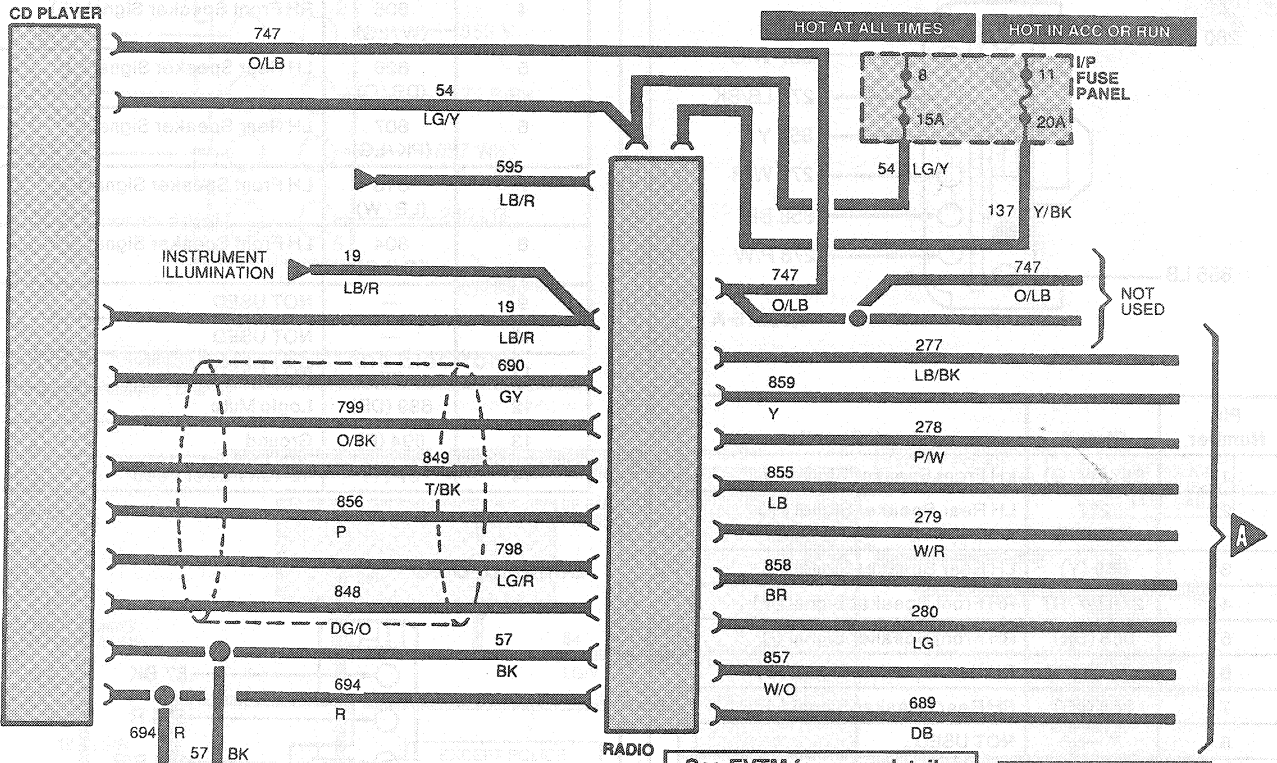
Pin Number	Signal	Circuit Function
1	811 DBO	Left Front Speaker Signal (+)
2	811 DBO	Left Front Speaker Signal (-)
3	811 DBO	Right Front Speaker Signal (+)
4	811 DBO	Right Front Speaker Signal (-)
5	811 DBO	Left Rear Speaker Signal (+)
6	811 DBO	Left Rear Speaker Signal (-)
7	811 DBO	Right Rear Speaker Signal (+)
8	811 DBO	Right Rear Speaker Signal (-)
9	811 DBO	NOT USED
10	811 DBO	Left Front Passenger Signal (+)



Pin Number	Signal	Circuit Function
1	811 DBO	Left Front Speaker Signal (+)
2	811 DBO	Left Front Speaker Signal (-)
3	811 DBO	Right Front Speaker Signal (+)
4	811 DBO	Right Front Speaker Signal (-)

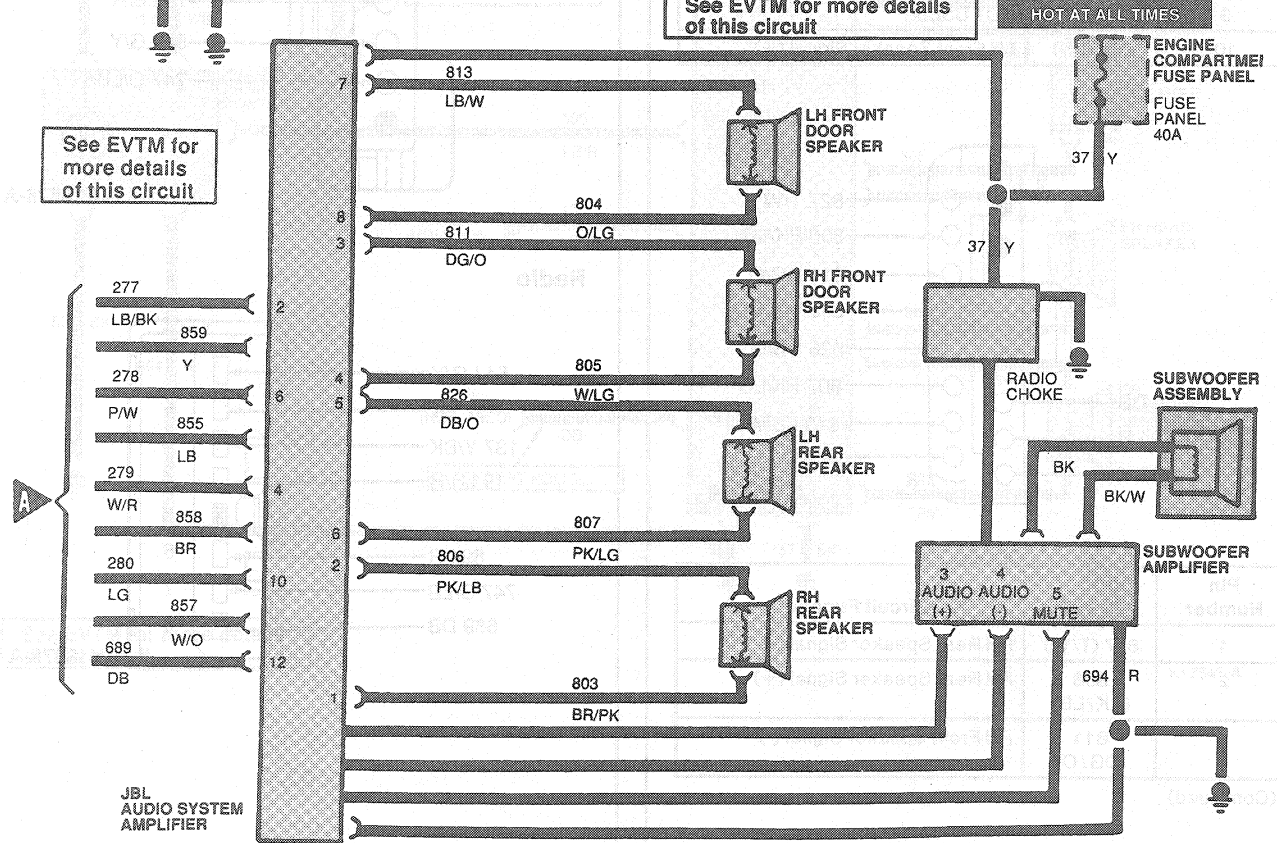
DIAGNOSIS AND TESTING (Continued)

Premium Analog Cassette (PAC) with JBL Amplifier and With Audio Disc Player



See EVTM for more details of this circuit

See EVTM for more details of this circuit



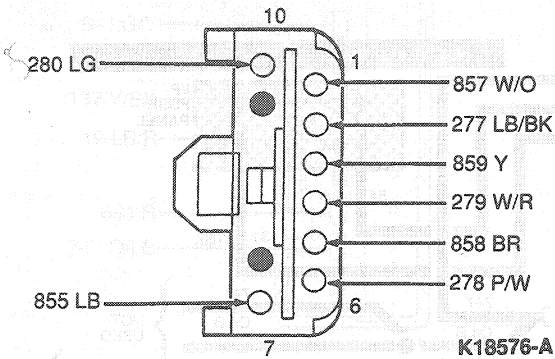
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K17547-A

DIAGNOSIS AND TESTING (Continued)

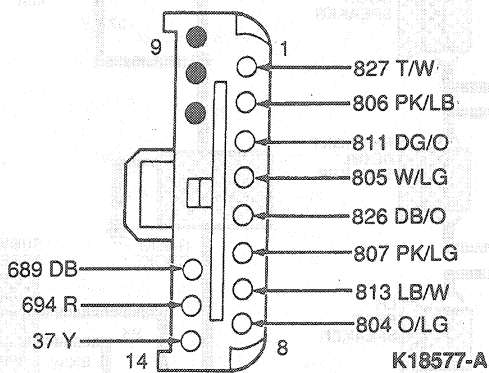
Amplifier



K18576-A

Pin Number	Circuit	Circuit Function
1	857 (W/O)	LH Front Speaker Signal (-)
2	277 (LB/BK)	LH Rear Speaker Signal (+)
3	859 (Y)	LH Rear Speaker Signal (-)
4	279 (W/R)	RH Front Speaker Signal (+)
5	858 (BR)	RH Front Speaker Signal (-)
6	278 (P/W)	RH Rear Speaker Signal (+)
7	855 (LB)	RH Rear Speaker Signal (-)
8	—	NOT USED
9	—	NOT USED
10	280 (LG)	LH Front Speaker Signal (+)

TK18576A



K18577-A

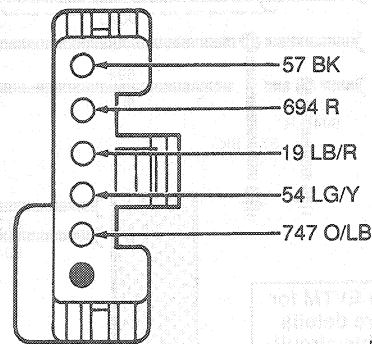
Pin Number	Circuit	Circuit Function
1	827 (T/W)	RH Rear Speaker Signal (-)
2	806 (PK/LB)	RH Rear Speaker Signal (+)
3	811 (DG/O)	RH Front Speaker Signal (-)

(Continued)

Pin Number	Circuit	Circuit Function
4	805 (W/LG)	RH Front Speaker Signal (+)
5	826 (DB/O)	LH Rear Speaker Signal (-)
6	807 (PK/LG)	LH Rear Speaker Signal (+)
7	813 (LB/W)	LH Front Speaker Signal (-)
8	804 (O/LG)	LH Front Speaker Signal (+)
9	—	NOT USED
10	—	NOT USED
11	—	NOT USED
12	689 (DB)	Logic Mute
13	694 (R)	Ground
14	37 (Y)	12 Volt Power Feed

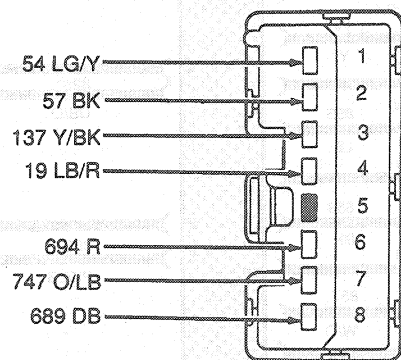
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Compact Disc



K18578-A

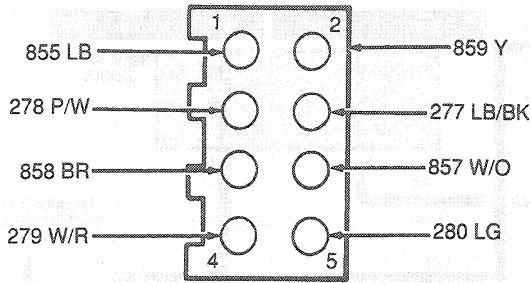
Radio



K18579-A

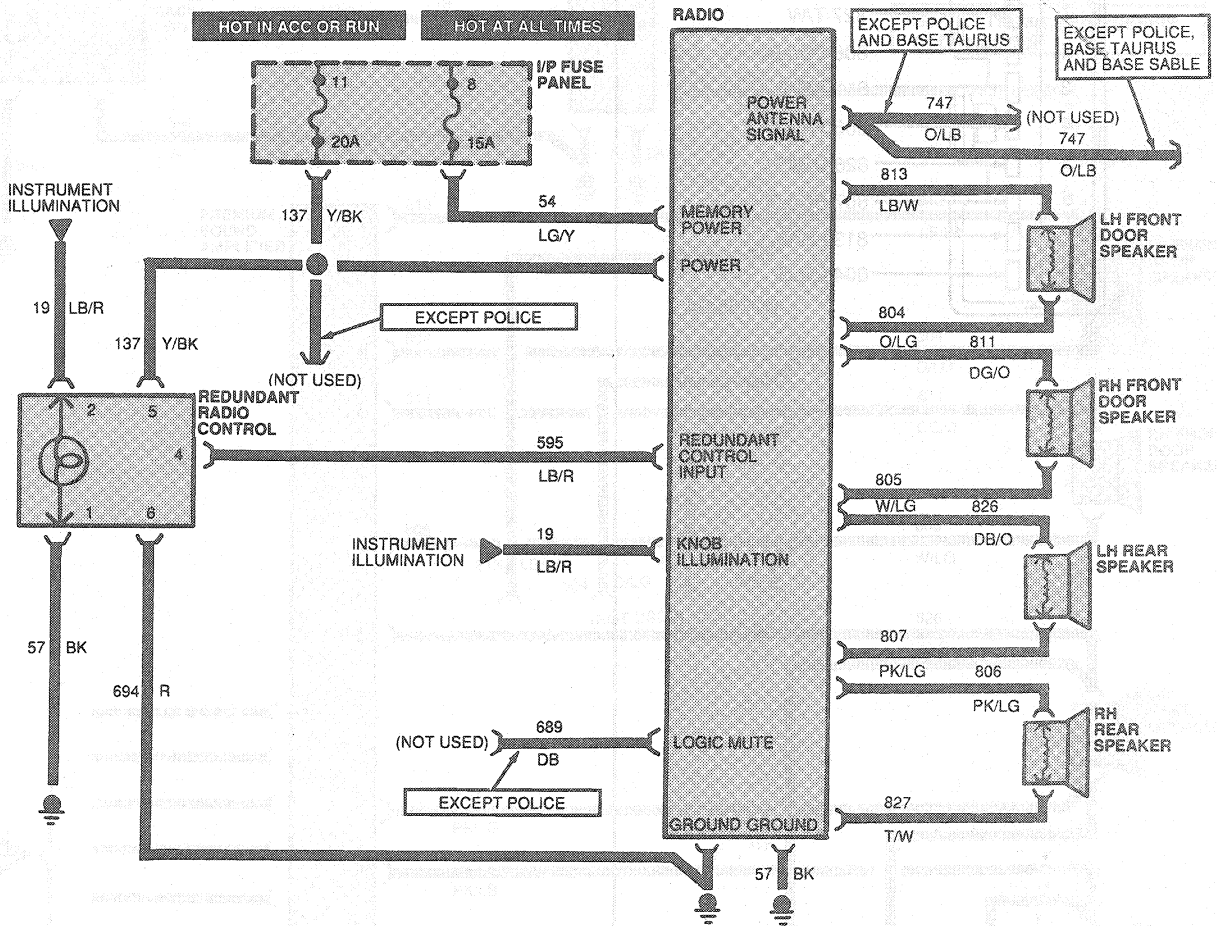


DIAGNOSIS AND TESTING (Continued)



K18580-A

Electronic Search Radio (ESR) and Electronic Cassette Radio (ECR)

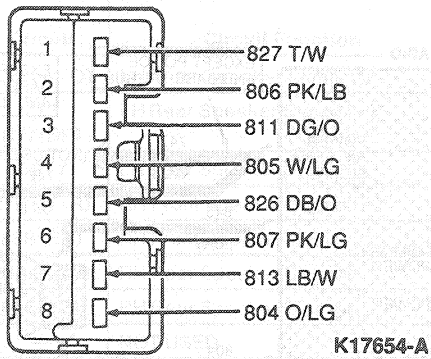
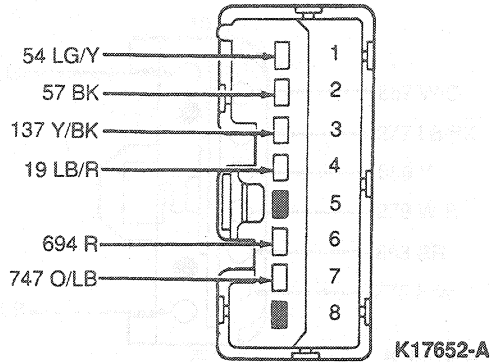


See EVTm for more details of this circuit

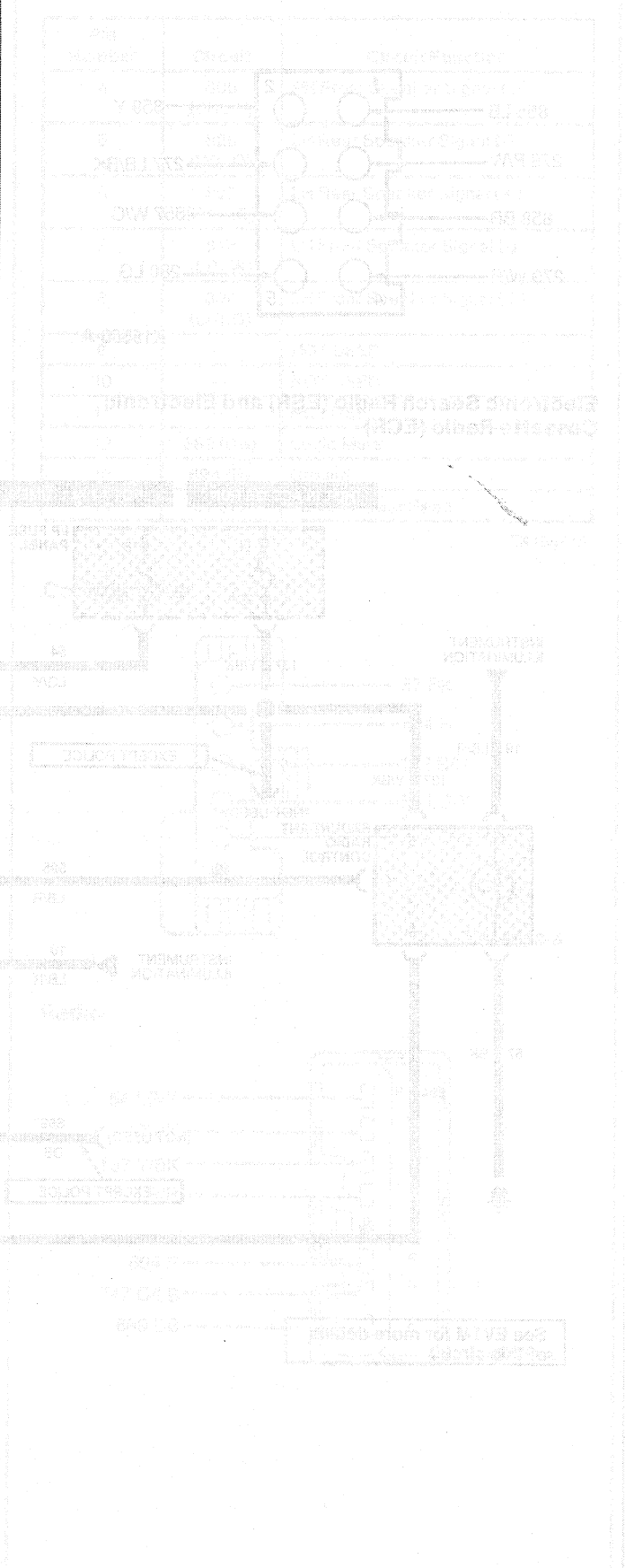
K17548-A

DIAGNOSIS AND TESTING (Continued)

Radio

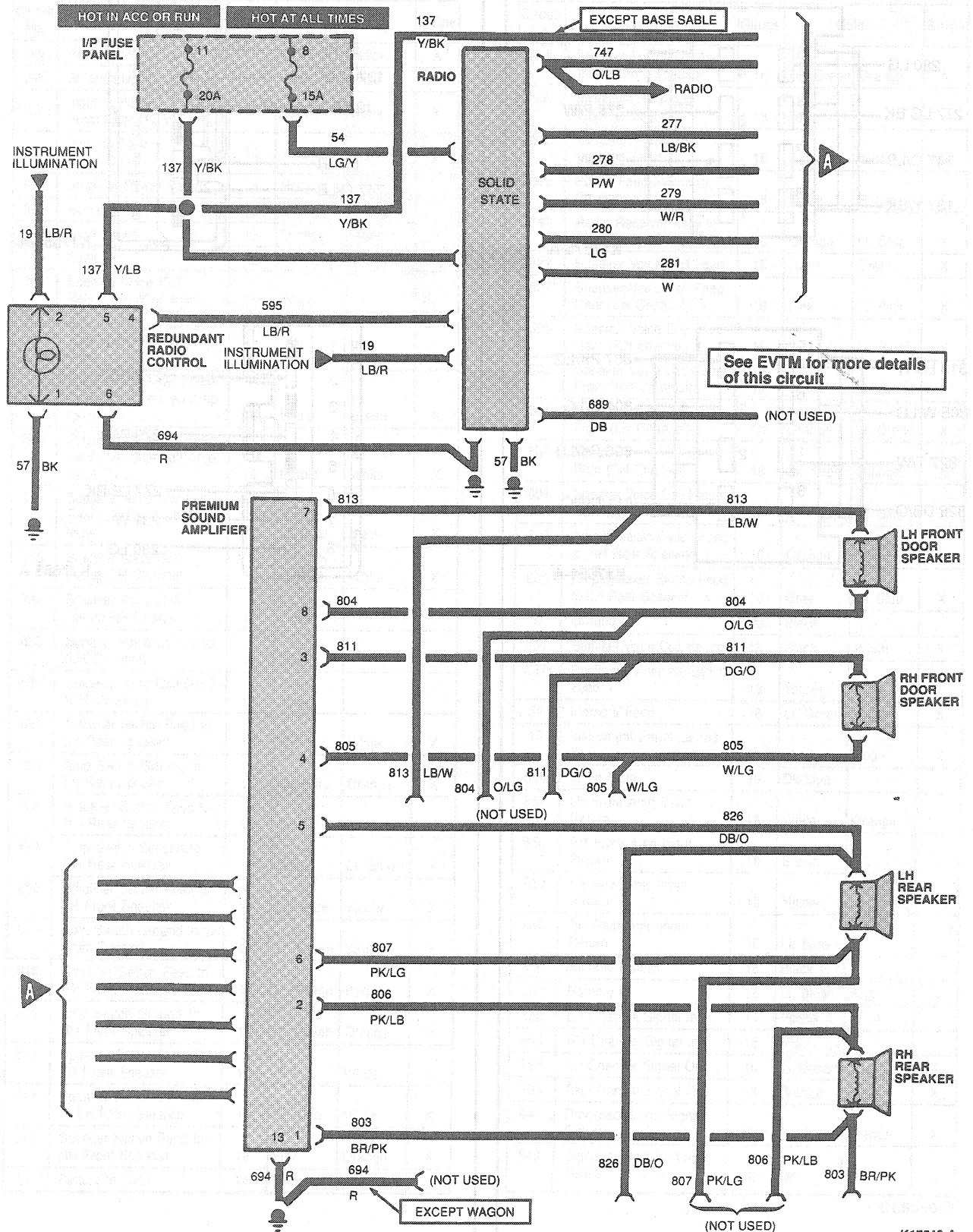


DIAGNOSIS AND TESTING (Continued)



DIAGNOSIS AND TESTING (Continued)

Electronic Search Radio (ESR), (ESC) with Premium Sound Amplifier (Sable)

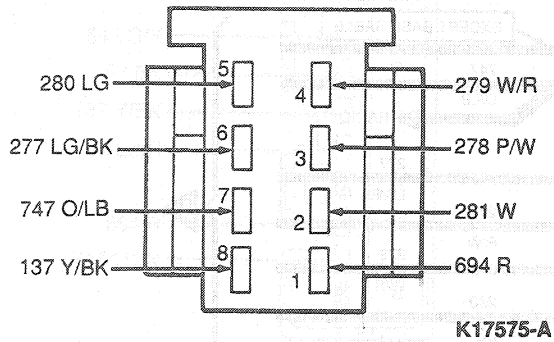


See EVTM for more details of this circuit

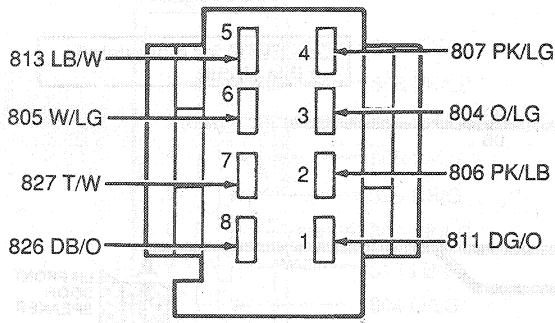
K17549-A

DIAGNOSIS AND TESTING (Continued)

Amplifier

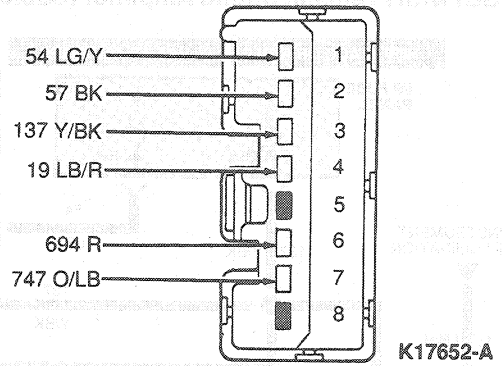


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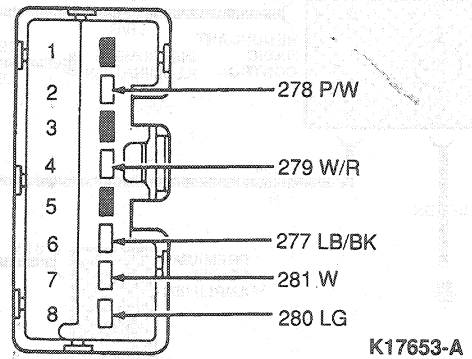


K17651-A

Radio



K17652-A



K17653-A

## DIAGNOSIS AND TESTING (Continued)

## Circuit Description Chart

Circuit No.	Description	Gauge	Color		Stripe
746	Antenna Down Travel	18	Dk Green	Yellow	X
745	Antenna Up Travel	18	Red	Pink	X
*137B	Input to P.S.A. From Filter (12 V)	14	Yellow	Black	X
*137A	Input to Filter (12 V. D.C.)	14	Yellow	Black	X
694	Amplifier Power Return	14	Red		
372	Memory	18	Brown	Orange	X
370	Seek Down	18	Orange	Black	X
368	Seek Up	18	Red	Black	X
281	Speaker Voice Coil Return Amplifier Input	18	White		
280	Speaker Voice Coil Feed Front (LH Channel) Amp Input	18	Lt. Green		
279	Speaker Voice Coil Feed Front (RH Channel) Amp Input	18	White	Green	X
278	Speaker Voice Coil Feed Rear (RH Channel) Amp Input	18	Purple	White	X
277	Speaker Voice Coil Feed Rear (LH Channel) Amp Input	18	Lt. Blue	Black	X
785	Speaker Voice Coil Return LH Channel	18	Yellow	White	X
784	Speaker Voice Coil Return RH Channel	18	Violet		
835	Speaker Voice Coil Feed (LH Channel)	18	Red		
834	Speaker Voice Coil Feed (RH Channel)	18	Blue		
827	Amplifier Switch Feed to LH Rear Speaker	18	Tan	White	X
826	Amp Switch Ground to LH Rear Speaker	18	Dk. Blue	Orange	X
825	Amplifier Switch Feed to RH Rear Speaker	18	Tan	Lt. Green	X
824	Amp Switch Ground to RH Rear Speaker	18	White	Lt. Blue	X
820	Amplifier Switch Feed to LH Front Speaker	18	Dk. Blue	Yellow	X
819	Amp Switch Ground to LH Front Speaker	18	Lt. Green	White	X
816	Amplifier Switch Feed to RH Front Speaker	18	Lt. Green	Purple	X
815	Amp Switch Ground To RH Front Speaker	18	Lt. Green	Orange	X
814	Speaker Switch Feed To LH Front Speaker	18	Pink	White	X
813	Speaker Switch Ground To LH Front Speaker	18	Lt. Blue	White	X
812	Speaker Switch Feed to RH Front Speaker	18	Pink	Orange	X
37	Battery to Load	14	Yellow		

Circuit No.	Description	Gauge	Color		Stripe
811	Speaker Switch Ground To RH Front Speaker	18	Dk. Green	Orange	X
831	Switch to Fader LH Channel Feed	18	Tan		
830	Switch to Fader RH Channel Feed	18	Pink	Yellow	X
829	Power Feed-Switch to Front Amplifier	18	White	Purple	X
747	Radio Receiver Assy to Foot Control Switch	18	Orange	Lt. Blue	X
822	Speaker Voice Coil Feed	18	Black	Green	X
807	Speaker Voice Coil Feed Rear (LH Channel)	18	Pink	Lt. Pink	X
806	Speaker Voice Coil Feed Rear (RH channel)	18	Pink	Lt. Blue	X
805	Speaker Voice Coil Feed Front (RH Channel)	18	White	Lt. Green	X
804	Speaker Voice Coil Feed Front (LH Channel)	18	Orange	Lt. Green	X
803	Speaker Voice Coil Return Rear (RH Channel)	18	Dk. Green	Orange	X
801	Speaker Voice Coil Return Rear (LH Channel)	18	Pink	Lt. Blue	X
802	Amp/Speaker Switch Feed to RH Rear Speaker	18	Orange	Red	X
800	Amp/Speaker Switch Feed to LH Rear Speaker	18	Gray	Lt. Blue	X
57	Ground	20	Black		
287	Speaker Voice Coil Return	18	Black	White	X
*137	Radio and Antenna Switch Feed	18	Yellow	Black	X
54	Memory Feed	18	Lt. Green	Yellow	X
19	Instrument Panel Lamps Feed	18	Lt. Blue	Red	X
689	Logic Mute	18	Dk Blue		
857	LH Front Amp Input Return	18	White	Orange	X
858	RH Front Amp Input Return	18	Brown		
859	LH Rear Amp Input Return	18	Yellow		
855	RH Rear Amp Input Return	18	Lt. Blue		
586	Remote Return	18	Black		
595	Remote In	18	Lt. Blue	Red	X
856	LH Channel Signal In	18	Purple		
690	RH Channel Signal In	18	Gray		
798	LH Channel Signal Out	18	Lt. Green	Red	X
799	RH Channel Signal Out	18	Orange	Black	X
848	Processor Loop Signal Return	18	Dk. Green	Orange	X
849	Digital Audio Disc Logic Sense	18	Tan		

CL6680-B

**DIAGNOSIS AND TESTING (Continued)**

**Remote Radio Control Functional Test**

Verify operation of remote radio control.

**Step 1.** Turn ignition to RUN or ACC. Turn radio on and verify radio operation.

**Step 2.** Test the following switch buttons:

**MEMORY:** Will advance to the previously stored stations in the preset buttons.

**VOLUME:** Volume will decrease when button is pressed on left (-) side and increase when pressed on right (+) side.

**SEEK:** Will advance the display forward only.

If any of these functions are inoperative but radio is otherwise functional, replace remote radio control switch.

**PINPOINT TEST A: ALL ELECTRONIC RADIO CONTROL FUNCTIONAL TEST**

TEST STEP	RESULT	ACTION TO TAKE
<b>A1</b> VERIFY OPERATION OF RADIO		
<ul style="list-style-type: none"> <li>Turn ignition to ON or ACC. Turn radio on.</li> <li>Is radio display lit?</li> </ul>	Yes No	GO to A3. GO to A2.
<b>A2</b> VERIFY SOUND FROM SPEAKERS		
<ul style="list-style-type: none"> <li>Is sound coming from speakers?</li> </ul>	Yes No	GO to A17. REFER to radio inoperative procedure.
<b>A3</b> AM INDICATOR TEST		
<ul style="list-style-type: none"> <li>Push the band or AM button.</li> <li>Is "AM" indicator lit?</li> </ul>	Yes No	GO to A4. REMOVE radio for service.
<b>A4</b> UP TEST		
<ul style="list-style-type: none"> <li>Depress "seek (&gt;)" or "scan" button and verify that number on display increases (if display reads 16.10 AM or 107.9 FM display will not increase and the "seek (&gt;)" button should be depressed until display reads less than 16.10 AM or 107.9 FM).</li> <li>Is "up" function OK?</li> </ul>	Yes No	GO to A5. REMOVE radio for service.
<b>A5</b> DOWN TEST		
<ul style="list-style-type: none"> <li>Depress "seek (&lt;)" button and verify that number on display decreases (if display reads 53.0 AM or 88.1 FM, display will not decrease and the "seek (&lt;)" button should be depressed until display reads greater than 53.0 AM or 88.1 FM).</li> <li>Is "down" function OK?</li> </ul>	Yes No	GO to A6. REMOVE radio for service.
<b>A6</b> FAST UP TEST		
<ul style="list-style-type: none"> <li>Push AMS then SEEK (&gt;) button.</li> <li>Is "fast up" function OK?</li> </ul>	Yes No	GO to A7. REMOVE radio for service.
<b>A7</b> FAST DOWN TEST		
<ul style="list-style-type: none"> <li>Push AMS then SEEK (&lt;) button.</li> <li>Is "fast down" function OK?</li> </ul>	Yes No	GO to A8. REMOVE radio for service.
<b>A8</b> SCAN TEST		
<ul style="list-style-type: none"> <li>Press SCAN button.</li> <li>Is radio scanning to the next stations for five second samplings?</li> </ul>	Yes No	GO to A9. REMOVE radio for service.

## DIAGNOSIS AND TESTING (Continued)

DIAGNOSIS AND TESTING (Continued)

## PINPOINT TEST A: ALL ELECTRONIC RADIO CONTROL FUNCTIONAL TEST (Continued)

TEST STEP		RESULT	ACTION TO TAKE
<b>A9</b>	<b>STATION RECALL MEMORY TEST</b>		
	<ul style="list-style-type: none"> <li>Depress seek or scan tuning to select desired station. When station is tuned, depress and hold a memory button. When memory button is depressed, station's sound will be interrupted. Depress button for approximately two seconds. When station's sound returns, button is "set" and may be released. This process is repeated for each memory button. Turn radio off then on. Depress each station recall button and verify that stations indicated are the same as stations stored above.</li> <li>Is memory test successful?</li> </ul>	Yes No	GO to A10. REMOVE radio for service.
<b>A10</b>	<b>FM INDICATOR TEST</b>		
	<ul style="list-style-type: none"> <li>Push the band or FM button.</li> <li>Is FM indicator lit?</li> </ul>	Yes No	REPEAT the following tests described earlier on the FM band: A4, A5, A6, A7 and A9. GO to A11. REMOVE radio for service.
<b>A11</b>	<b>FM STEREO INDICATOR TEST</b>		
	<ul style="list-style-type: none"> <li>Tune radio to a known FM stereo station.</li> <li>Is stereo indicator lit?</li> </ul>	Yes No	GO to A12. REMOVE radio for service.
<b>A12</b>	<b>VOLUME CONTROL TEST</b>		
	<ul style="list-style-type: none"> <li>Tune radio to a local station. Press VOLUME + and verify that an increase in the sound level occurs. Press VOLUME - and verify a decrease in the sound level.</li> <li>Does volume change properly?</li> </ul>	Yes No	GO to A13. CHECK speaker connection and PERFORM speaker test. REPEAT volume vehicle test. If volume still is not OK, REMOVE radio to service. If volume OK, GO to A13.
<b>A13</b>	<b>tone CONTROL TEST</b>		
	<ul style="list-style-type: none"> <li>Push AUDIO button repeatedly until BASS is displayed. Push the RH (+) side of VOLUME button to increase low frequency sound or LH (-) side to decrease low frequency sounds.</li> <li>Push AUDIO button repeatedly until TREB is displayed. Push the RH (+) side of VOLUME button to increase high frequency sound or LH (-) side to decrease high frequency sounds.</li> <li>Does bass and treble change properly?</li> </ul>	Yes No	GO to A14. REMOVE radio for service.
<b>A14</b>	<b>BALANCE CONTROL TEST</b>		
	<ul style="list-style-type: none"> <li>Push AUDIO button repeatedly until BAL is displayed. Push the RH (+) side of VOLUME button to shift sound to RH speakers or LH (-) side to shift sound to LH speakers.</li> <li>Does balance change properly?</li> </ul>	Yes No	GO to A15. CHECK speakers and speaker connections. REPEAT balance control test. If balance still is not OK — REMOVE radio for service. If balance OK, GO to A15.
<b>A15</b>	<b>FADER CONTROL TEST</b>		
	<ul style="list-style-type: none"> <li>Push AUDIO button repeatedly until FADE is displayed. Push the RH (+) side of VOLUME button to shift sound to rear speakers or LH (-) side to shift sound to front speakers.</li> <li>Does fader change properly?</li> </ul>	Yes No	GO to A16. CHECK speakers and speaker connections. REPEAT fader control test. If fader is not OK, REMOVE radio for service. If fader is OK, GO to A16.

## DIAGNOSIS AND TESTING (Continued)

## PINPOINT TEST A: ALL ELECTRONIC RADIO CONTROL FUNCTIONAL TEST (Continued)

TEST STEP		RESULT	ACTION TO TAKE
A16	SEEK TEST		
	<ul style="list-style-type: none"> <li>Depress seek button (&gt;) and verify that radio stops on next station. Repeat for SEEK (&lt;).</li> <li>Does radio stop on next station?</li> </ul>	Yes No	GO to A17. TURN radio off and then on to determine if seeking stops. If seek does not stop, REMOVE radio for service. If seek does stop, GO to A17.
A17	SCAN TEST		
	<ul style="list-style-type: none"> <li>Tune radio on AM band (should be done outside of any building). Press scan button and count the number of listenable stations that can be tuned. Compare to a vehicle with a known, good radio system.</li> <li>Are normal number of stations received?</li> </ul>	Yes No	GO to A18 PERFORM antenna system check. REFER to Section 15-02. REPEAT scan test. If still not receiving normal number of stations, REMOVE radio for service. If normal number of stations received GO to A18
A18	DISPLAY TEST		
	<ul style="list-style-type: none"> <li>Tune radio to 1000 AM.</li> <li>Is display correct and "AM" indicator lit?</li> </ul>	Yes No	GO to A19 Remove radio for service.
A19	DISPLAY TEST (Continued)		
	<ul style="list-style-type: none"> <li>Tune radio to 88.9 FM.</li> <li>Is display correct and "FM" indicator lit?</li> </ul>	Yes No	GO to A20 REMOVE radio for service.
A20	DISPLAY TEST (Continued)		
	<ul style="list-style-type: none"> <li>Tune radio to FM stereo station.</li> <li>Is display correct and "ST" indicator lit?</li> </ul>	Yes No	End of electronic radio controls function test. If other concerns exist, i.e., poor reception or noisy reception, REFER to appropriate diagnostic procedures. REMOVE radio for service.

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NOTE: When performing the following PAC radio test, keep in mind that bass, treble, balance and fade are adjusted using the AUDIO and VOLUME buttons. Volume level is normally displayed by the function bar below the station frequency. Each successive push on the AUDIO button sequentially selects bass, treble, balance, fade and returns to normal (frequency and volume) mode. The selected item is indicated in the display by the word BASS, TREB, BAL or FADE.

After selecting the appropriate mode, push the VOLUME button to adjust to the left (-) or right (+). In fade mode, the LH side represents the front speakers and the RH side represents the rear speakers. The normal volume and frequency mode will return five seconds after the last bass, treble, balance or fade adjustment. For additional control features, refer to Section 15-01.

## PINPOINT TEST B: PAC RADIO CONTROL FUNCTIONAL TEST

TEST STEP		RESULT	ACTION TO TAKE
B1	FM STEREO INDICATOR TEST		
	<ul style="list-style-type: none"> <li>Tune radio to a known FM stereo station.</li> <li>Does stereo indicator come on?</li> </ul>	Yes No	GO to B2. REMOVE radio for service.



## DIAGNOSIS AND TESTING (Continued)

## PINPOINT TEST B: PAC RADIO CONTROL FUNCTIONAL TEST (Continued)

TEST STEP		RESULT	ACTION TO TAKE
<b>B2</b>	<b>VOLUME CONTROL TEST</b>		
	<ul style="list-style-type: none"> <li>● Tune radio to a local station. Adjust volume control to the right and verify volume increase. Adjust volume control to the left and verify volume decrease.</li> <li>● Does volume change properly?</li> </ul>	Yes No	GO to <b>B3</b> . CHECK speaker connection and perform speaker test. REPEAT volume control test. If it is still not OK, REMOVE radio for service. If volume OK, GO to <b>B3</b> .
<b>B3</b>	<b>TONE CONTROL TEST</b>		
	<ul style="list-style-type: none"> <li>● Adjust bass control to right and verify an increase in low frequency content.</li> <li>● Adjust treble control to right and verify an increase in high frequency content.</li> <li>● Do bass and treble change properly?</li> </ul>	Yes No	GO to <b>B4</b> . REMOVE radio for service.
<b>B4</b>	<b>BALANCE CONTROL TEST</b>		
	<ul style="list-style-type: none"> <li>● Adjust balance control to right and then to left.</li> <li>● Does balance change properly?</li> </ul>	Yes No	GO to <b>B5</b> . CHECK speakers and speaker connections. REPEAT balance control test. If balance is still not OK, REMOVE radio for service. If balance OK, GO to <b>B5</b> .
<b>B5</b>	<b>FADER CONTROL TEST</b>		
	<ul style="list-style-type: none"> <li>● Adjust fade control to right and then to left.</li> <li>● Does fade change properly?</li> </ul>	Yes No	GO to <b>B6</b> . CHECK speakers and speaker connections. REPEAT fader control test. If fader is not OK, REMOVE radio for service. If fader is OK, GO to <b>B6</b> .
<b>B6</b>	<b>SEEK TEST</b>		
	<ul style="list-style-type: none"> <li>● Depress SEEK button.</li> <li>● Does radio stop on next station?</li> </ul>	No	TURN radio off and then on to determine if seeking stops. If seek does not stop, REMOVE radio for service. If seek does stop, GO to <b>B7</b> .
<b>B7</b>	<b>SEEK/SCAN TEST</b>		
	<ul style="list-style-type: none"> <li>● Tune radio on AM band (should be done outside of any building). Press SCAN button and count the number of listenable stations that can be tuned. Compare to a vehicle with a known good radio system.</li> <li>● Are number of stations received normal?</li> </ul>	Yes No	GO to <b>B8</b> . PERFORM antenna system check. REFER to Section 15-02. REPEAT SEEK / SCAN test. If still not receiving normal number of stations, REMOVE radio for service. If normal number of stations received, GO to <b>B8</b> .
<b>B8</b>	<b>DISPLAY TEST</b>		
	<ul style="list-style-type: none"> <li>● Tune radio to 1000 AM.</li> <li>● Is display correct and AM displayed?</li> </ul>	Yes No	GO to <b>B9</b> . REMOVE radio for service.
<b>B9</b>	<b>DISPLAY TEST (CONTINUED)</b>		
	<ul style="list-style-type: none"> <li>● Tune radio to 88.9 FM.</li> <li>● Is display correct and FM displayed?</li> </ul>	Yes No	GO to <b>B10</b> . REMOVE radio for service.

## DIAGNOSIS AND TESTING (Continued)

## PINPOINT TEST B: PAC RADIO CONTROL FUNCTIONAL TEST (Continued)

TEST STEP	RESULT	ACTION TO TAKE
<b>B10</b> DISPLAY TEST (CONTINUED)		
<ul style="list-style-type: none"> <li>● Tune radio to FM stereo station.</li> <li>● Is "ST" indicator on?</li> </ul>	Yes	End of PAC radio control test. If other concerns exist, REFER to appropriate diagnostic procedures.
	No	REMOVE radio for service.

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## PINPOINT TEST C: NOISY AM RECEPTION— ENGINE RUNNING, VEHICLE IN/NOT IN MOTION

TEST STEP	RESULT	ACTION TO TAKE
<b>C1</b> CHECK ANTENNA CABLE CONNECTIONS		
<ul style="list-style-type: none"> <li>● Verify condition by operating radio while engine is running, with vehicle in or not in motion.</li> <li>● Check antenna cable connections including extension cable (if so equipped).</li> <li>● Are connections clean and secure?</li> </ul>	Yes	GO to C2.
	No	CLEAN and/or SECURE antenna cable connections as required.
<b>C2</b> CHECK ANTENNA MOUNTING		
<ul style="list-style-type: none"> <li>● Check to make sure antenna is securely mounted to body at ground points. (Manual antenna — mounting screws to fender. Electric antenna — mounting nut above fender; and also, make sure that prongs of grounding collar at fender underside are contacting metal.)</li> <li>● Are contacts clean and have metal-to-metal contact?</li> </ul>	Yes	GO to C3.
	No	CLEAN and/or SECURE connections as required.
<b>C3</b> CHECK SUPPRESSION EQUIPMENT		
<ul style="list-style-type: none"> <li>● Check for presence of all required suppression equipment, body grounding strap and hood bonding strap (if so equipped) for security, cleanliness and metal-to-metal connection.</li> <li>● Are connections OK?</li> </ul>	Yes	GO to C4.
	No	REPLACE missing equipment and/or CLEAN connections as required.
<b>C4</b> CHECK MOUNTING AND CONNECTING WIRES OF FOLLOWING COMPONENTS		
<ul style="list-style-type: none"> <li>● Check the mounting and connecting wires of the generator's voltage regulator capacitor (if so equipped) and ignition coil capacitor for secureness, cleanliness and metal-to-metal contact. (Refer to Group 14).</li> <li>● Are connections OK?</li> </ul> <p>NOTE: The capacitor mounting points are used to complete the electrical circuit and must be mounted securely to clean surfaces.</p>	Yes	GO to C5.
	No	CLEAN and/or SECURE connections as required.
<b>C5</b> CHECK OPERATION OF THE FOLLOWING COMPONENTS		
<ul style="list-style-type: none"> <li>● Check the operation of the generator's regulator capacitor and voltage regulator capacitor by replacing with known good components.</li> <li>● Check generator by disconnecting wiring harness from voltage regulator.</li> <li>● Verify radio reception.</li> <li>● Is noise eliminated?</li> </ul>	Yes	GO to C6.
	No	SERVICE or REPLACE damaged components as required.
<b>C6</b> CHECK SPARK PLUG WIRES		
<ul style="list-style-type: none"> <li>● Check spark plug wires for proper routing, grounding and secureness of connections.</li> <li>● Are wires OK?</li> </ul>	Yes	GO to C7.
	No	REROUTE or REPLACE spark plug wires or SECURE connections as required.

**DIAGNOSIS AND TESTING (Continued)**

**PINPOINT TEST C: NOISY AM RECEPTION — ENGINE RUNNING, VEHICLE IN/NOT IN MOTION (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>C7</b>	<b>CHECK IGNITION SYSTEM</b>		
	<ul style="list-style-type: none"> <li>Check ignition system for proper operation. (Use EEC-IV Intermittent Ignition Analyzer (007-00035) or equivalent or check for open circuit spark plug wires using ohmmeter.) Also, check spark plugs for cracked insulators.</li> <li><b>Is ignition system OK?</b></li> </ul>	Yes No	GO to C8. SERVICE or REPLACE components as required.
<b>C8</b>	<b>CHECK CHASSIS MOUNTING POINTS</b>		
	<ul style="list-style-type: none"> <li>Check all radio chassis mounting points for secureness, cleanliness and metal-to-metal contact.</li> <li><b>Are mounting points OK?</b></li> </ul>	Yes No	GO to C9. CLEAN and/or SECURE as required.
<b>C9</b>	<b>SUBSTITUTE ANTENNA</b>		
	<ul style="list-style-type: none"> <li>Substitute a known good speaker and antenna being sure to ground antenna base to an unpainted metal surface.</li> <li>Verify operation of radio.</li> <li><b>Is noise eliminated?</b></li> </ul>	Yes No	REPLACE or SERVICE speaker or antenna. GO to C10.
<b>C10</b>	<b>SUBSTITUTE ANTENNA EXTENSION CABLE</b>		
	<ul style="list-style-type: none"> <li>Substitute a known good antenna cable.</li> <li>Verify operation of radio.</li> <li><b>Is noise eliminated?</b></li> </ul>	Yes No	REPLACE antenna extension cable. GO to C11.
<b>C11</b>	<b>SUBSTITUTE RADIO</b>		
	<ul style="list-style-type: none"> <li>Substitute known good radio.</li> <li>Verify operation of radio.</li> <li><b>Is noise eliminated?</b></li> </ul>	Yes No	Have radio unit serviced at an authorized service center. GO to C12.
<b>C12</b>	<b>CHECK AMPLIFIER</b>		
	<ul style="list-style-type: none"> <li>Substitute a known good amplifier (PAC system only).</li> <li>Verify operation of radio.</li> <li><b>Is noise eliminated?</b></li> </ul>	Yes No	Have amplifier serviced at an authorized service center. GO to C13.
<b>C13</b>	<b>REPOSITION THE FOLLOWING COMPONENTS</b>		
	<ul style="list-style-type: none"> <li>Check if noise can be eliminated by repositioning antenna, speaker or radio power feed wires away from other wires and/or brackets.</li> <li>Verify operation of radio.</li> <li><b>Is noise eliminated?</b></li> </ul>	Yes No	REPOSITION permanently by taping. GROUND various parts of the vehicle to the frame using a jumper cable. For example, engine, fenders, quarter panels, stone deflectors, air cleaner, body sheet metal. When noise is eliminated, provide a permanent ground where required.

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**PINPOINT TEST D: NOISY FM RECEPTION — ENGINE RUNNING, VEHICLE NOT IN MOTION**

TEST STEP		RESULT	ACTION TO TAKE
<b>D1</b>	<b>DETERMINE IF CONCERN IS WITH FM RECEPTION LIMITATION</b>		
	<ul style="list-style-type: none"> <li>Verify condition by operating radio with engine running and vehicle not in motion.</li> <li>If noise is on FM stereo, determine if customer concern is due to FM stereo reception limitation. Refer to normal operation description.</li> <li><b>Is reception normal?</b></li> </ul>	Yes No	EXPLAIN and DEMONSTRATE to customer. INFORM customer of methods for obtaining best reception. GO to D2.

## DIAGNOSIS AND TESTING (Continued)

## PINPOINT TEST D: NOISY FM RECEPTION— ENGINE RUNNING, VEHICLE NOT IN MOTION (Continued)

TEST STEP		RESULT	ACTION TO TAKE
<b>D2</b>	<b>CHECK ANTENNA CABLE CONNECTIONS</b>		
	<ul style="list-style-type: none"> <li>Check antenna cable connections.</li> <li>Are connections clean and tight?</li> </ul>	Yes No	GO to <b>D3</b> . CLEAN and/or SECURE as required.
<b>D3</b>	<b>CHECK ANTENNA MOUNTING</b>		
	<ul style="list-style-type: none"> <li>Check to make sure antenna is securely mounted to body and base screws are tight.</li> <li>Are mounting points tight?</li> </ul>	Yes No	GO to <b>D4</b> . CLEAN and/or SECURE as required.
<b>D4</b>	<b>CHECK SPARK PLUG WIRES ROUTING</b>		
	<ul style="list-style-type: none"> <li>Check spark plug wires for proper routing and secureness of connections.</li> <li>Are wires OK?</li> </ul>	Yes No	GO to <b>D5</b> . REROUTE and/or SECURE connections as required.
<b>D5</b>	<b>CHECK TYPE OF SPARK PLUG / WIRES</b>		
	<ul style="list-style-type: none"> <li>Check if wires are suppressor type and if spark plugs are the correct type.</li> <li>Are wires and plugs correct?</li> </ul>	Yes No	GO to <b>D6</b> . REPLACE spark plug or wires with the correct type.
<b>D6</b>	<b>CHECK IGNITION SYSTEM</b>		
	<ul style="list-style-type: none"> <li>Check ignition system for proper operation. (Use EEC-IV Intermittent Ignition Analyzer (007-00035) or check for open circuit spark plug wires using ohmmeter.) Also, check spark plugs for cracked insulators.</li> <li>Is ignition system OK?</li> </ul>	Yes No	GO to <b>D7</b> . SERVICE or REPLACE components as required.
<b>D7</b>	<b>CHECK CHASSIS MOUNTING</b>		
	<ul style="list-style-type: none"> <li>Check all radio chassis mounting points for secureness, cleanliness and metal-to-metal contact.</li> <li>Are radio mounting points OK?</li> </ul>	Yes No	GO to <b>D8</b> . CLEAN and/or SECURE as required.
<b>D8</b>	<b>SUBSTITUTE ANTENNA</b>		
	<ul style="list-style-type: none"> <li>Substitute a known good antenna being sure to ground antenna base to an unpainted metal surface.</li> </ul> <p>NOTE: All surfaces used for grounding must be clean to ensure good electrical contact. Remove any dirt, rust, grease, paint, etc.</p> <ul style="list-style-type: none"> <li>Verify operation of radio.</li> <li>Is noise eliminated?</li> </ul>	Yes No	REPLACE antenna. GO to <b>D9</b> .
<b>D9</b>	<b>SUBSTITUTE ANTENNA CABLE</b>		
	<ul style="list-style-type: none"> <li>Substitute a known good antenna cable.</li> <li>Verify operation of radio.</li> <li>Is noise eliminated?</li> </ul>	Yes No	REPLACE antenna extension cable. GO to <b>D10</b> .
<b>D10</b>	<b>CHECK GENERATOR</b>		
	<ul style="list-style-type: none"> <li>Check generator by disconnecting wiring from voltage regulator.</li> <li>Verify operation of radio.</li> <li>Is noise eliminated?</li> </ul>	Yes No	CHECK generator. REFER to Section 14-02. SERVICE or REPLACE as required. GO to <b>D11</b> .
<b>D11</b>	<b>SUBSTITUTE RADIO</b>		
	<ul style="list-style-type: none"> <li>Substitute a known good radio.</li> <li>Verify operation of radio.</li> <li>Is noise eliminated?</li> </ul>	Yes No	Have radio serviced at an authorized service center. GO to <b>D12</b> .

DIAGNOSIS AND TESTING (Continued)

**PINPOINT TEST D: NOISY FM RECEPTION— ENGINE RUNNING, VEHICLE NOT IN MOTION (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>D12</b>	<b>CHECK AMPLIFIER</b> <ul style="list-style-type: none"> <li>Substitute a known good amplifier. (PAC system only).</li> <li>Verify operation of radio.</li> <li>Is noise eliminated?</li> </ul>	Yes	Have amplifier serviced at an authorized service center.
		No	GO to D13.
<b>D13</b>	<b>REPOSITION THE FOLLOWING COMPONENTS</b> <ul style="list-style-type: none"> <li>Check if noise can be eliminated by repositioning antenna, speaker or radio power feed wires away from other wires and /or brackets.</li> </ul> <p>NOTE: All surfaces used for grounding must be clean to ensure good electrical contact. Remove any dirt, rust, grease, paint, etc.</p> <ul style="list-style-type: none"> <li>Verify operation of radio.</li> <li>Is noise eliminated?</li> </ul>	Yes	REPOSITION permanently by taping.
		No	GROUND various parts of the vehicle to the frame using a jumper cable for example, engine, fenders, quarter panels, stone deflectors, air cleaner, body sheet metal. When noise is eliminated, provide permanent ground where required.

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**PINPOINT TEST E: RADIO IS INOPERATIVE OR INTERMITTENT**

TEST STEP		RESULT	ACTION TO TAKE
<b>E1</b>	<b>CHECK RADIO OPERATION</b> <ul style="list-style-type: none"> <li>Check operation of radio to determine if radio is inoperative or intermittent.</li> </ul>	Radio inoperative	GO to E2.
		Radio intermittent	GO to E4.
<b>E2</b>	<b>CHECK FUSE</b> <ul style="list-style-type: none"> <li>Check fuse to see if it is blown.</li> <li>Is fuse OK?</li> </ul>	Yes	GO to E4.
		No	TURN OFF ignition switch. REPLACE fuse. Turn ignition switch ON. RECHECK fuse. If fuse is bad, GO to E3. If fuse is still OK, OPERATE radio, tape player and compact disc (if so equipped). If fuse fails, have radio serviced at an authorized service center. If fuse is still good, OPERATE other systems supplied by radio fuse. REFER to Section 18-01 for fuse listing. If fuse fails, SERVICE system identified to cause fuse failure using appropriate diagnostic chart. If fuse OK, radio system OK.
			NOTE: For a repeated customer complaint perform the above test while driving on rough road conditions to isolate the system exhibiting an intermittent short circuit condition.

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST E: RADIO IS INOPERATIVE OR INTERMITTENT (Continued)

TEST STEP	RESULT	ACTION TO TAKE
<b>E3</b> DETERMINE LOCATION OF GROUNDED POWER FEED		
<ul style="list-style-type: none"> <li>Turn ignition switch to OFF position.</li> <li>Determine location of grounded power feed to radio (common circuit to premium sound control, CB radio and power antenna, if so equipped).</li> </ul>	Grounded power feed found	SERVICE or REPLACE as required.
<b>E4</b> CHECK POWER FEED		
<ul style="list-style-type: none"> <li>Check power feed for proper connections.</li> <li>Are connections OK?</li> </ul>	Yes No	GO to E5. CONNECT power feed properly.
<b>E5</b> CHECK CONTINUITY PLUG		
<ul style="list-style-type: none"> <li>Check to be sure that the continuity plug is present. It should be inserted at the top RH side of the connector block at the rear of the radio chassis.</li> <li>Press in firmly on the plug, making sure it is fully seated. Check for proper audio operation.</li> <li>Is the continuity plug present?</li> </ul>	Yes No	GO to E6. REPLACE continuity plug.
<b>E6</b> CHECK FOR POWER TO RADIO		
<ul style="list-style-type: none"> <li>Check for power to radio using a test lamp or a voltmeter.</li> <li>Is there power to radio?</li> </ul>	Yes No	GO to E7. SERVICE harness as required.
<b>E7</b> CHECK SPEAKERS TO SEE IF CONDITION IS PRESENT ON ALL SPEAKERS		
<ul style="list-style-type: none"> <li>With radio operating, check if condition is present on all speakers.</li> <li>Is condition present at all speakers?</li> </ul>	Yes No	GO to E8. GO to E9.
<b>E8</b> CHECK ANTENNA SYSTEM		
<ul style="list-style-type: none"> <li>Check antenna system. Refer to Section 15-02.</li> <li>Is antenna system OK?</li> </ul>	Yes No	GO to E8. CONNECT, SERVICE or REPLACE antenna components as required.
<b>E9</b> CHECK RADIO CHASSIS		
<ul style="list-style-type: none"> <li>Check radio chassis.</li> <li>Connect a known good speaker directly to radio chassis.</li> <li>Verify operation of radio.</li> <li>Is radio OK?</li> </ul>	Yes  No	REPLACE speaker or CONNECT, SERVICE or REPLACE speaker wiring as required.  NOTE: Use premium sound diagnostic chart to service if vehicle is so equipped.  Have radio chassis serviced at authorized service center.

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PINPOINT TEST F  
RADIO HAS WEAK RECEPTION

TEST STEP	RESULT	ACTION TO TAKE
<b>F1</b> EXTEND POWER ANTENNA		
<ul style="list-style-type: none"> <li>Extend power antenna (if so equipped) and position vehicle in an open area away from steel buildings.</li> <li>Check radio reception.</li> <li>Is reception OK?</li> </ul>	Yes No	EXPLAIN to customer limitations of radio. GO to F2.
<b>F2</b> CHECK ANTENNA CONNECTIONS		
<ul style="list-style-type: none"> <li>Check antenna connections.</li> <li>Are connections OK?</li> </ul>	Yes No	GO to F3. CLEAN and / or TIGHTEN antenna connections as required.

**DIAGNOSIS AND TESTING (Continued)**

**PINPOINT TEST F  
RADIO HAS WEAK RECEPTION (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>F3</b>	<b>CHECK ANTENNA SYSTEM</b>	Yes	GO to F4.
	<ul style="list-style-type: none"> <li>Check antenna system using appropriate diagnostic procedure. Refer to Section 15-02.</li> <li>Is antenna system OK?</li> </ul>	No	SERVICE antenna as required.
<b>F4</b>	<b>CHECK RECEPTION OF RADIO ON AM AND FM</b>	Reception weak on AM only	VERIFY radio reception. If reception is OK, RETURN radio to service. If reception is still weak, have radio chassis serviced at an authorized service center.
	<ul style="list-style-type: none"> <li>Check for poor reception on both AM and FM.</li> </ul>	Reception weak on FM or both AM/FM	Have radio serviced at authorized service center.

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**PINPOINT TEST G: PREMIUM ANALOG CASSETTE (PAC) SOUND SYSTEM—NO RADIO SOUND FROM ANY SPEAKERS (RADIO TURNED ON)**

TEST STEP		RESULT	ACTION TO TAKE
<b>G1</b>	<b>CHECK OPERATION OF RADIO</b>	Yes	GO to G2.
	<ul style="list-style-type: none"> <li>Turn ignition to ACC or RUN and radio to ON.</li> <li>Observe radio for digital display.</li> <li>Is radio display lit?</li> </ul>	No	REFER to Pinpoint Test E.
<b>G2</b>	<b>CHECK AMPLIFIER CONTROL CIRCUITS</b>	Yes	GO to G3.
	<ul style="list-style-type: none"> <li>Check power and control to amplifier as follows:</li> <li>Ensure all harnesses are connected.</li> <li>Turn ignition to ACC and radio to ON.</li> <li>Check for battery voltage at the amplifier yellow wire and at orange, light blue striped wire.</li> <li>Check for ground at the amplifier on the red wire.</li> <li>Check shorting plug (PACs used without a CD player must have a fully seated plug).</li> <li>Is amplifier control circuit OK?</li> </ul>	No	Vehicle wiring or speaker is damaged. Follow procedure for diagnosing and servicing of damage.
<b>G3</b>	<b>CHECK FOR SHORT TO GROUND AT SPEAKER(S)</b>	Yes	CHECK terminals at connector for solder bridge, stray wire strands, bent terminals, or pinched shorted speaker wire. SERVICE or REPLACE as necessary.
	<ul style="list-style-type: none"> <li>Check for short to ground at one or more speakers, which can cause amplifier to shut down.</li> <li>Are any shorts found?</li> </ul>	No	REPLACE EPC Sound Amplifier.

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**PINPOINT TEST H: ELECTRONIC SEARCH RADIO (ESR) SOUND SYSTEM—NO RADIO SOUND FROM ANY SPEAKERS (RADIO TURNED ON)**

TEST STEP		RESULT	ACTION TO TAKE
<b>H1</b>	<b>CHECK OPERATION OF RADIO</b>	Yes	GO to H2.
	<ul style="list-style-type: none"> <li>Turn ignition to ACC or RUN and radio to ON.</li> <li>Observe radio for digital display.</li> <li>Is radio display lit?</li> </ul>	No	REFER to Pinpoint Test E.

## DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST H: ELECTRONIC SEARCH RADIO (ESR) SOUND SYSTEM—NO RADIO SOUND FROM ANY SPEAKERS  
(RADIO TURNED ON) (Continued)

TEST STEP		RESULT	ACTION TO TAKE
<b>H2</b>	<b>CHECK AMPLIFIER CONTROL CIRCUITS</b>		
	<ul style="list-style-type: none"> <li>● Check power and control to amplifier as follows:               <ul style="list-style-type: none"> <li>— Ensure all harnesses are connected.</li> <li>— Turn ignition to ACC and radio to ON.</li> <li>— Check for battery voltage at the amplifier yellow wire and at orange / light blue striped wire.</li> <li>— Check for ground at the amplifier on the red wire.</li> </ul> </li> <li>● Is amplifier control circuit OK?</li> </ul>	Yes No	GO to H3. SERVICE wiring as required.
<b>H3</b>	<b>CHECK FOR SHORT TO GROUND AT SPEAKER(S)</b>		
	<ul style="list-style-type: none"> <li>● Check for short to ground at one or more speakers, which can cause amplifier to shut down.</li> <li>● Are any shorts found?</li> </ul>	Yes No	CHECK terminals at connector for solder bridge, stray wire strands, bent terminals, or pinched shorted speaker wire. SERVICE or REPLACE as necessary. REPLACE Premium Sound Amplifier.

TK10003E

## PINPOINT TEST I: PAC AND ESR SOUND SYSTEMS—NO SOUND FROM ONE OR MORE SPEAKERS

TEST STEP		RESULT	ACTION TO TAKE
<b>I1</b>	<b>VERIFY CONDITION AT EACH SPEAKER</b>		
	<ul style="list-style-type: none"> <li>● Check for sound at each speaker.</li> <li>● Are all speakers out?</li> </ul>	Yes No	GO to I2. GO to I3.
<b>I2</b>	<b>CHECK FOR POWER TO AMPLIFIER</b>		
	<ul style="list-style-type: none"> <li>● Check power and control circuits to amplifier as follows:               <ul style="list-style-type: none"> <li>— Connect all connectors of radio and sound system.</li> <li>— Turn ignition to ACC and radio to ON.</li> <li>— Check for battery voltage at the amplifier on yellow wire and orange / light blue striped wire.</li> </ul> </li> <li>● Is amplifier power circuit OK?</li> </ul>	Yes No	REFER to PAC Sound System Procedure or ESR Sound System Procedure (depending on PAC or ESR equipped vehicles). SERVICE wiring as required.
<b>I3</b>	<b>CHECK CONTINUITY OF INOPERATIVE SPEAKER(S)</b>		
	<ul style="list-style-type: none"> <li>● Disconnect amplifier from radio and speakers.</li> <li>● Check continuity of inoperative speaker wiring harness from amplifier.</li> <li>● Is there continuity?</li> </ul>	Yes No	GO to I4. CHECK for broken wires or connector pins. SERVICE or REPLACE control assembly as necessary.
<b>I4</b>	<b>CHECK FOR SHORT AT SPEAKER</b>		
	<ul style="list-style-type: none"> <li>● Check for short between inoperative speaker wires at the speaker connector.</li> <li>● Are any shorts found?</li> </ul>	Yes No	CHECK terminals at connector for solder bridge, stray wire strands, or bent terminals. SERVICE or REPLACE as necessary. GO to I6.
<b>I5</b>	<b>CHECK CONNECTOR AT AMPLIFIER</b>		
	<ul style="list-style-type: none"> <li>● Check amplifier wiring for damage.</li> <li>● Check connector at amplifier for broken pins or wires or for shorts caused by stray wire strands between pins.</li> <li>● Is amplifier connector OK?</li> </ul>	Yes No	Amplifier is damaged. SEND to authorized service station for service. SERVICE open or shorted circuits as required.



DIAGNOSIS AND TESTING (Continued)

**PINPOINT TEST I: PAC AND ESR SOUND SYSTEMS—NO SOUND FROM ONE OR MORE SPEAKERS (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
16	<b>CHECK RADIO-TO-AMPLIFIER HARNESS</b> <ul style="list-style-type: none"> <li>● Check radio-to-amplifier wiring harness for damage and connectors for broken terminal pins, solder bridge or stray wire strands.</li> <li>● <b>Is harness OK?</b></li> </ul>	Yes	GO to I7. SERVICE harness as necessary.
		No	
17	<b>CHECK WIRING AND CONNECTORS ON AMPLIFIER</b> <ul style="list-style-type: none"> <li>● Check wiring on amplifier for damage.</li> <li>● Check connectors on amplifier for broken pins., solder bridge or shorts caused by stray wire strands.</li> <li>● <b>Are connectors and wiring OK?</b></li> </ul>	Yes	Amplifier is damaged. RETURN to authorized service station for service.
		No	SERVICE open or shorted circuits as necessary.

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**PINPOINT TEST J: PAC AND ESR SOUND SYSTEMS—DISTORTED SOUND FROM ONE OR MORE SPEAKERS**

TEST STEP		RESULT	ACTION TO TAKE
J1	<b>CHECK FOR:</b> <ul style="list-style-type: none"> <li>● Loose trim panels, grilles, or attachments which might cause rattles in the area of the speaker which is considered distorted.</li> <li>● Pinched or broken wires at or near the radio.</li> <li>● Pinched or broken wires elsewhere in the vehicle wiring to the speaker.</li> <li>● <b>Are wires and attachments OK?</b></li> </ul> NOTE: In PAC installations neither wire to the speaker can be grounded. Grounding of either wire will cause distortion.	Yes	GO to J2. SERVICE and / or REPLACE as necessary.
		No	
J2	<b>CONNECT A TEST SPEAKER</b> <ul style="list-style-type: none"> <li>● Connect a test speaker to the wiring for the distorted speaker.</li> <li>● <b>Is sound OK?</b></li> </ul>	Yes	Speaker is damaged. REPLACE speaker.
		No	REFER to Test Step I4.

TK10006E

**PINPOINT TEST K: COMPACT DISC PLAYER IS INOPERATIVE OR INTERMITTENT**

TEST STEP		RESULT	ACTION TO TAKE
K1	<b>VERIFY CD PLAYER IS INOPERATIVE OR HAS INTERMITTENT OPERATION</b>		
K2	<b>CHECK CD PLAYER OPERATION</b> <ul style="list-style-type: none"> <li>● Determine if CD player is inoperative or intermittent.</li> </ul>	CD player inoperative	GO to K3.
		CD player intermittent	GO to K4.

## DIAGNOSIS AND TESTING (Continued)

## PINPOINT TEST K: COMPACT DISC PLAYER IS INOPERATIVE OR INTERMITTENT (Continued)

TEST STEP		RESULT	ACTION TO TAKE
<b>K3</b>	<b>CHECK FUSE</b>		
	<ul style="list-style-type: none"> <li>Check fuse to see if it is blown.</li> <li>Is fuse blown?</li> </ul>	Yes	<p>TURN OFF ignition switch, radio, premium sound system, and CB radio (if so equipped). REPLACE fuse. TURN ignition switch on. RECHECK fuse. If fuse is bad, GO to K5. If fuse is still OK, OPERATE radio and tape player (if so equipped). If fuse fails, have radio serviced at authorized service center. If fuse still good, OPERATE power antenna, premium sound, and CB radio (if so equipped). If fuse fails, SERVICE system identified to cause fuse failure using appropriate diagnostic chart. If fuse OK, radio system OK.</p> <p>NOTE: For a repeated customer complaint, perform the above test while driving on rough road conditions to isolate the system exhibiting an intermittent short circuit condition.</p>
		No	GO to K4.
<b>K4</b>	<b>CHECK POWER FEED</b>		
	<ul style="list-style-type: none"> <li>Check power feed for proper connections.</li> <li>Are connections OK?</li> </ul>	Yes	GO to K6.
		No	CONNECT power feed properly.
<b>K5</b>	<b>DETERMINE LOCATION OF GROUNDED POWER FEED</b>		
	<ul style="list-style-type: none"> <li>Turn ignition switch to OFF position.</li> <li>Determine location of grounded power feed to CD player (common circuit to premium sound control, CB radio, and power antenna, if so equipped).</li> </ul>	Grounded power feed found	SERVICE or REPLACE as required.
<b>K6</b>	<b>CHECK FOR POWER TO CD PLAYER</b>		
	<ul style="list-style-type: none"> <li>Check for power to CD player using a test lamp or a voltmeter.</li> <li>Is there power?</li> </ul>	Yes	GO to K7.
		No	SERVICE harness as required.
<b>K7</b>	<b>CHECK SPEAKERS TO SEE IF CONDITION PRESENT ON ALL SPEAKERS</b>		
	<ul style="list-style-type: none"> <li>With CD player operating, check if condition is present on all speakers.</li> <li>Is condition present at all speakers?</li> </ul>	Yes	Have CD player chassis serviced at authorized service center.
		No	GO to K8.

**DIAGNOSIS AND TESTING (Continued)**

**PINPOINT TEST K: COMPACT DISC PLAYER IS INOPERATIVE OR INTERMITTENT (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>K8</b>	<b>CHECK CD PLAYER CHASSIS</b>		
	<ul style="list-style-type: none"> <li>● Check CD player chassis.</li> <li>● Connect a known good speaker directly to CD player chassis.</li> <li>● Verify operation of CD player.</li> <li>● Does CD player operate properly?</li> </ul>	Yes	REPLACE speaker or connect, SERVICE or REPLACE speaker wiring as required.  NOTE: Use premium sound diagnostic chart to service if vehicle is so equipped.
		No	Have CD player chassis serviced by authorized service center.

TK19305A

**SPECIAL SERVICE TOOLS**

**ROTUNDA EQUIPMENT**

Model	Description
007-00035	EEC-IV Intermittent Ignition Analyzer

