

RADIO-TAPE PLAYER

GROUP 9

ACCESSORIES

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GENERAL INFORMATION

STEREO TRANSMISSION

FM Stereo

FM broadcasts are "line of sight" from station antenna to receiving antenna. The range is often limited to 25 miles (40 km) or less for steady reception. Tall buildings or hills may cause flutter or noise which is not the fault of the radio. If a customer complains of such flutter suggest that they tune to a stronger station for clear sound.

AM Stereo

AM stereo broadcasts, unlike FM, do not have flutter characteristics. However, they are subject to interference from power lines, neon signs, atmospheric conditions and unwanted stations.

Stations broadcasting AM stereo may be received in stereo if the ETR receiver has this feature. Switching to stereo improves the fidelity, but may increase noise on weaker stations. Switching stereo off may improve reception of weaker stations.

Whenever, an FM or AM stereo broadcast is received by an ETR receiver with stereo reception capability, the stereo indicator will light.

Delco Speaker Systems Caution

All Delco sound systems have ungrounded speakers. Damage may occur to the on-car Delco sound system speakers if add-on tape players, CB units or other receivers use these same speaker assemblies.

GENERAL DESCRIPTION

The following gives operational descriptions of several types of radios. Most electronically tuned receivers (ETRs) operate similarly. If the ETR you are servicing is not

pictured or described, read about the system which is most similar.

AM RADIO

(See Figure 9A-1)

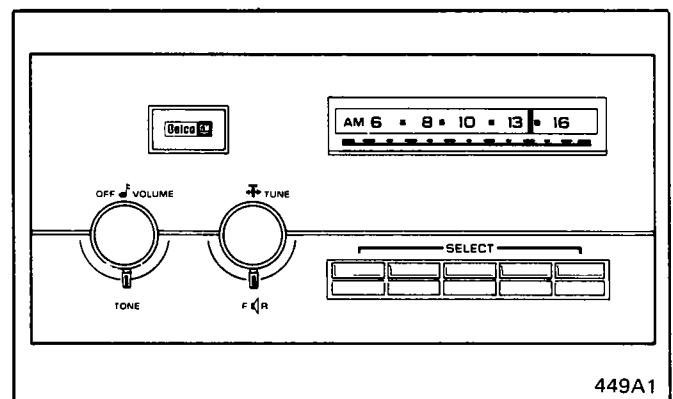


Figure 9A-1 U63-AM

Operation

- Left Knob - rotate knob to turn radio on or off, and to control volume.
- Tone Control (located behind left knob) - rotate control to adjust between bass and treble.
- Right Knob - rotate knob to manually tune radio stations. Frequency is indicated by position of pointer.
- Front/Rear Speaker Control (located behind right knob) - rotate control to adjust the sound between the front and rear speakers.
- Pushbuttons

The radio has five pushbuttons. To preset a station for pushbutton tuning:

1. Manually tune in the desired station.

2. Gently pull the button out and then push it in. After this, the radio will tune to the preset station when the button is pushed.

AM-FM STEREO WITH SEEK-SCAN (UK-4)

Operation

- Power Button-press PWR to turn radio on and off.
- Upper Knob-rotate knob to control volume.
- Balance Control (behind upper knob)-turn to adjust speaker balance right or left.
- Lower Knob-Rotate knob to tune stations manually. Press knob in to alternately select AM or FM band. Frequency is displayed during tuning.
- Front/Rear Speaker Control (behind lower knob)-rotate control to adjust sound from front and rear speakers.
- Base and Treble Controls-slide treble control up to increase treble or down to decrease treble. Slide base control up to increase bass, or down to decrease base.
- Pushbuttons

The radio has four pushbuttons. Four AM and four FM stations can be preset for a total of eight selections. To set pushbuttons:

1. Make sure the bandswitch (AM-FM control) is on the band you want. Then, tune in the desired station.
2. Push SET button. (The SET indicator light will then light up.) Then push one of the four station pushbuttons. (The SET indicator light will then go out.) The radio will tune to the preset station when the button is pressed.

- Seek and Scan

Use the SEEK and SCAN buttons for automatic station tuning. Press SCAN to sample each station being received automatically. To stop scanning, press SCAN button again. The SCAN indicator light will be lit during scan operation.

Press the SEEK button to automatically locate and retain the next listenable station on the band.

Whenever the FM stereo indicator is lit, an FM stereo signal is being received.

AM-FM STEREO (ETR) WITH SEEK/SCAN AND CLOCK-V.F. (UM-7, N-SERIES)

Operation

- Turn Radio On - Press POWER. Press again to turn radio off.
- Adjust Volume - Press VOL (arrow up) to increase volume, VOL (arrow down) to decrease volume. Pressing both up and down buttons at the same time will set volume to a factory preset level. When radio is turned off, the last volume setting is retained; when turned back on, the volume will slowly return to that level.
- Select AM or FM - Press AM-FM. The last station heard on each band is retained; when switching back to that band, it will automatically return.
- Select Station - Use one of the following methods:
 Seek - Press SEEK to have radio automatically search for the next listenable station.
 Scan - Press SCAN to have radio sample each station for a few seconds; press SCAN again to stop scanning. When radio is scanning, SCAN will be displayed.
 Manual Tuning - Press and hold TUNE with arrow; release when desired frequency is displayed.

Station Preset Buttons - Press a STATION PRESET to tune in a preset station on the band selected with the AM-FM button.

- Presetting Stations - Tune in the desired station, using seek, scan, or manual tuning. Press the SET button, and then a STATION PRESET button. Ten stations can be preset -- five AM and five FM.
- Adjust Tone - Press BASS (arrow up) to increase bass, BASS (arrow down) to decrease bass; pressing both at once moves bass response to center. Press TREB (arrow up) to increase treble, TREB (arrow down) to decrease treble; pressing both at once moves treble response to center.
- Adjust Front-Rear Volume (Fader) - Press FADE (arrow up) to increase front speaker volume, FADE (arrow down) to increase rear speaker volume. Pressing both at once equalizes front and rear volume.
- Adjust Speaker Balance - Press BAL (arrow pointing right) to increase volume from right speakers, BAL (arrow pointing left) to increase volume from left speakers. Pressing both at once moves balance to center.
- Setting Time - Set hours by pressing SET and then pressing SEEK until the desired hour is displayed. Set minutes by pressing SET and then pressing SCAN until the desired minute is displayed.
- To Display Time with Ignition Off - Press RCL (recall).
- To Display Frequency - If radio is on and time is being displayed, press RCL.
- To Receive Stereo - The radio automatically switches to stereo when turned to an FM stereo signal.

AM-FM STEREO (ETR) WITH SEEK/SCAN AND CLOCK - VF

(See Figure 9A-2)

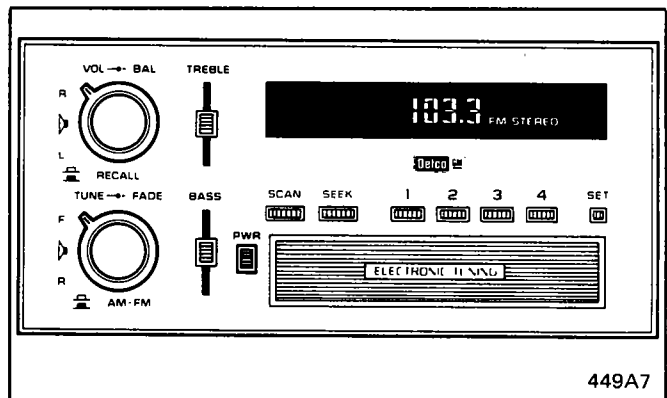


Figure 9A-2 UM7 AM-FM Stereo (ETR) w/Seek & Scan & Clock-VF

Operation

Refer to "AM-FM Stereo (ETR) with Seek-Scan" for radio control operation.

- To set time:
 To set hour, push SET button. (The SET indicator light will then light up, and radio frequency will be displayed.) Then, push SCAN button until correct hour appears.
 To set minutes, push SET button. (The SET indicator light will then light up, and radio frequency will be displayed.) Then, push SEEK button until correct minute appears.

After you push SET button, the radio frequency will be displayed.

AUTO-REVERSE CASSETTE PLAYER WITH AUTO-REVERSE, SEEK-AND-REPEAT

(See Figure 9A-3)

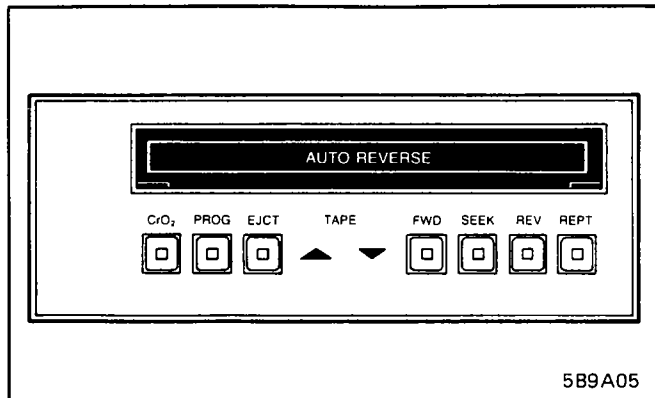


Figure 9A-3 U56 Cassette Player With Auto-Reverse, Seek & Repeat

Operation

- **Tape Door** - Inserting tape in door activates the player.
- **Eject Button** - Pressing EJCT button ejects the tape.
- **Program Change Button** - Pressing PROG button reverses tape to play selections on the other side of the tape. Upon reaching the end of the tape, the unit automatically reverses the tape to play the opposite side.
- **Indicator Lights** - When the triangle pointing up is lit, the top side of the tape is playing. When the triangle pointing down is lit, the bottom side of the tape is playing.
- **Forward Button ("FWD")** - Press to fast forward the tape. To stop fast forward press FWD button again.
- **Reverse Button ("REV")** - Press to fast reverse the tape. To stop fast reverse press REV button again.
- **Seek Button ("SEEK")** - Automatically fast forwards the cassette tape to the beginning of the next selection. To operate this feature press the SEEK button.
(There must be at least three blank seconds between selections on the cassette tape for this function to work properly.)
- **Repeat Button ("REPT")** - Automatically reverses the tape until it finds the beginning of the selection presently playing. To operate this feature, press the REPT button.
(There must be at least three blank seconds between selections on the cassette tape for this function to work properly.)
- **Chromium Dioxide Tape Button ("CrO₂")** - Allows equalization for metal or chromium tapes. This feature will automatically be activated. To defeat it, press the CrO₂ button. Whenever the ignition or radio is turned off, the CrO₂ feature will be reset so when the ignition or radio is turned on, CrO₂ equalization will automatically occur. We recommend leaving the CrO₂ feature activated only when using CrO₂ tapes.

Operation of the tape player is explained in detail within the description about a model UX1 AM Stereo-FM Stereo ETR system with a cassette player.

AM-FM STEREO (ETR) W/CASSETTE - DELCO/BOSE

(See Figure 9A-4)

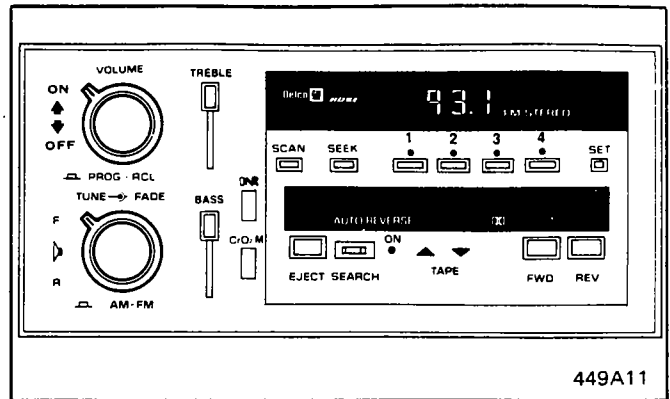


Figure 9A-4 UU8 AM-FM Stereo (ETR) w/Cassette-Delco Bose

Operation

- **Upper Knob** - rotate knob to turn radio on or off, and to control volume. There will be a slight delay after the knob is turned before the radio comes on. Depress knob to call up station frequency when listening to radio with ignition on, or to display time-of-day with ignition off. Depress knob to select other side of tape when cassette is playing.
- **Lower Knob** - rotate knob to manually tune radio stations. Frequency will be displayed during tuning. Depress knob to alternately select AM or FM band.
- **Front/Rear Speaker Control** (located behind lower knob) - rotate control to adjust the sound between the front and rear speakers.
- **Bass and Treble Controls** - slide treble control down to decrease treble; slide bass control down to decrease bass. (Normal position is with the control all the way up to the top.)
- **SCAN button** - Press to have radio sample AM or FM stations for 5 to 10 seconds each. Press again to stop SCAN. The scan indicator lights during SCAN.
- **SEEK button** - Press to have the radio automatically locate and retain the next listenable station on the band displayed.
- **Tape door** - Insert tape to activate tape player.
- **Tape eject button** - Press lightly to stop fast forward or fast reverse motion of tape; press harder to eject tape. (Note: The use of any cassette tapes over C-90 in playing length is not recommended.)
- **Tape indicator lights (2)** - When the left indicator light is lit, the top side of the tape is playing. When the right indicator light is lit, the bottom side of the tape is playing.
- **FWD and REV buttons** - Press one to advance or reverse tape direction. To advance tape, press the button next to the lighted indicator. To reverse tape direction, press the button next to the unlighted indicator. To stop the forward or reverse movement, press the eject button when you have the tape at the desired stopping point.
- **Dynamic noise reduction (DNR)** - Press to remove high frequency background hiss on AM, FM, FM stereo, and cassette tapes,

9A-4 RADIO-TAPE PLAYER

- Tape equalization - Select the 70 usec (push button in) or 120 usec (button is out) setting, depending on the bias of your tape.
- Tuning Pushbutton Set-Up
Operation of the radio portion of the Delco-GM/Bose is simplified by the SIGNAL SEEK and SCAN functions. Station frequencies are numerically displayed and can be selected by using either the manual tuning control or the electronic memory pushbuttons. To present a station, tune in the desired station on the AM or FM band. Then press the SET button, followed by one of the four present station buttons.
- Time-of-Day Setting
To set the hour, press SET button. Then press SCAN button until the desired hour is displayed. To set minutes, press SET button; then press SEEK button until the desired minutes appear.

AM STEREO-FM STEREO (ETR) WITH SEEK/SCAN-CASSETTE- 5 BAND EQUALIZER & CLOCK

(See Figure 9A-5)

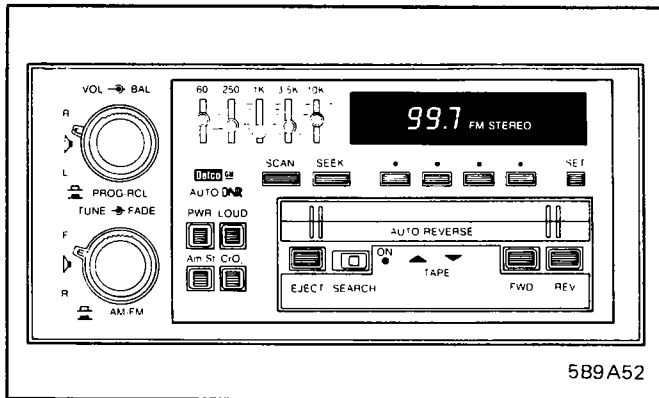


Figure 9A-5 UX1 AM Stereo & FM Stereo (ETR)
w/Seek-Scan, Auto Rev, Equalizer, Clock (VF)

Operation

- Depress power button (PWR) to turn radio on. Depress again to turn radio off.
- Upper Knob - rotate knob to control volume. Press knob to recall station frequency when listening to the radio with the ignition on, or to display time-of-day with ignition off. Press knob to select the other side of the tape when the cassette is playing.
- Loudness Button (LOUD) - press to boost bass when the radio is playing at low volume.
- Balance Control (located behind upper knob) - turn to adjust left/right speaker balance.
- Lower Knob - rotate knob to tune radio stations manually. Frequency will be displayed during tuning. Press knob to alternately select AM or FM band.
- Front/Rear Speaker Control (located behind lower knob) - rotate control to adjust the sound between the front (F) and rear (R) speakers.
- AM Stereo ("Am-St") - press to receive AM stereo. Stereo indicator light is on when stereo signal is received. When the button is out, all AM stations will be received in mono.
- FM Stereo - the stereo indicator light also is on when an FM stereo signal is being received.
- 5-Band Graphic Equalizer allows adjustment of bass, midrange, and treble control to suit personal taste.

Move control up to increase that frequency range, or down to decrease that frequency range. When a control is in the center position, that frequency range will not be processed by the graphic equalizer. When all 5 controls are in the center position, the system has a flat frequency response. 60 and 250 denote bass; 1K denotes midrange; 3.5K and 10K denote treble.

Dynamic Noise Reduction (DNR) - This is automatic and reduces high frequency background hiss on AM, FM, AM Stereo, FM Stereo, and tape.

- Pushbuttons - Four pushbuttons can be used to preselect favorite stations. Four AM and four FM stations for a total of eight can be selected.

To set station pushbuttons:

1. Make sure the bandswitch is on the band desired. Then, tune in the desired station.
2. Press SET button. The SET indicator light on the dial will light up. Then press one of the four station pushbuttons. The SET indicator light will go out.

The radio will then tune to the selected station whenever you press the station button.

- Seek and Scan - Use the SEEK and SCAN buttons for automatic station tuning. Press SCAN button to sample each station being received automatically. To stop SCAN, press SCAN button again. The SCAN indicator light on the frequency dial will be lit during SCAN operation.

Press the SEEK button to locate and retain the next listenable station on the band automatically.

- Time Set - To set hour, press SET button. The SET indicator light on the dial will light up. Then press SCAN button until correct hour appears.

To set minutes, press SET button. The SET indicator light will light up. Then press SEEK button until correct minute appears.

- Tape Operation

Insert the cassette squarely through the door. This automatically switches the unit from radio to tape operation. If the sound is garbled or there is no sound, eject the tape and reinsert it squarely.

After the cassette has snapped into position, adjust the volume and fader controls as desired.

To advance the tape, press the forward (FWD) button. To listen to an earlier portion of the tape, press the reverse (REV) button. To stop forward or reverse movement, press the opposite button or press the EJECT button to eject the tape.

To listen to the next selection, slide the SEARCH button to the right and press the forward (FWD) button. The radio will seek the next selection.

To listen to the previous selection again, slide the SEARCH button to the right and press the reverse (REV) button. The radio will repeat the previous selection.

The "On" light, to the right of the SEARCH switch, is on while the search function is engaged.

When the left triangle indicator light is lit, the top side of the tape is playing. When the right triangle indicator light is lit, the bottom side of the tape is playing.

To play the other side of the tape before the present side has ended, press the upper left knob. This will automatically play the opposite side of the tape.

NOTE: When end-of-tape is reached in one direction, the unit automatically plays the other side of the tape. When the ignition is turned off, the tape is automatically ejected.

Insertion of the cassette tape cartridge overrides the radio and the time-of-day will be displayed continuously.

Select the setting for proper tape equalization (Cr0*) as follows:

1. Select 70 usec (push button in).
2. Select 120 usec (button is out).

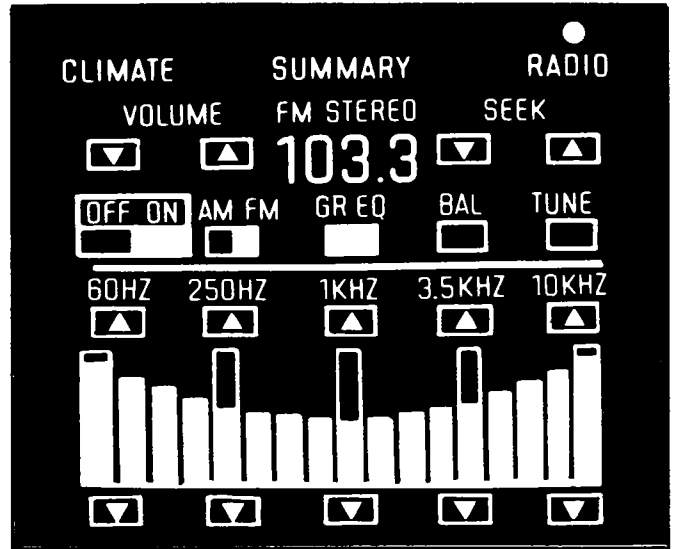
The equalization setting which is desired will vary according to the type of tape being used. Chrome and metal tapes have 70 usec equalization, while iron tapes have 120 usec equalization.

The tape bias is often indicated on the cassette label or case.

For best results, use only tapes which are 30 to 60 minutes in length.

Remote CRT Control (E-Series)

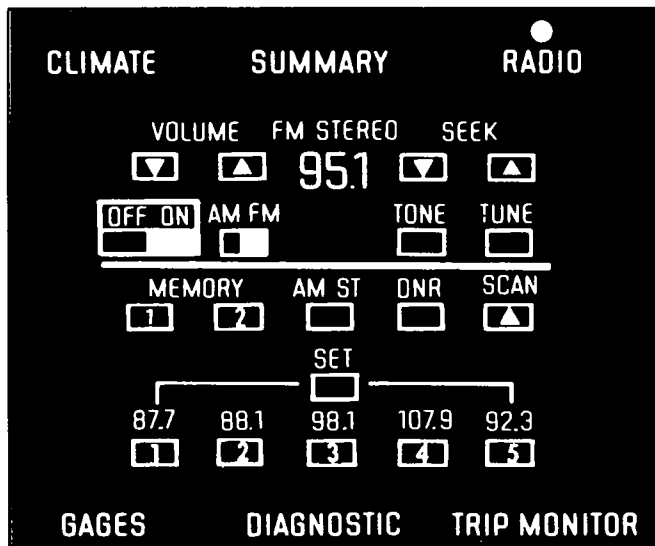
(See Figures 9A-6, 9A-7 & 9A-8)



Typical Graphic Equalizer Subpage



Typical Summary Page



Typical Radio Page

With the ignition switch turned to the RUN position the (hard key) SUMMARY PAGE provides a status check of the car and lets the operator control other such "page" systems as air conditioning and the radio. By touching the RADIO hard key on the rim of the CRT the following radio soft key controls and functions will be displayed on the screen:

- ON-OFF switch
- VOLUME
- AM or FM band
- TONE control (or GRAPHIC EQUALIZER option if so equipped)
- TUNING control (up or down the band)
- BALANCE or FADE control
- DNR (noise reduction)
- AM STEREO (option)

Operation of the system is controlled by pressing the desired control. The CRT will monitor the control operation.

To play a cassette tape when the optional tape player is installed, open the tape door by pressing the STOP/EJCT button on the side of the tape player. Slide the cassette, wide end down, into the door and close the door. With the radio on, press the PLAY PROG button on the side of the tape player. The TAPE page will be displayed and the tape will start playing.

Tone or graphic equalizer and balance or fade controls for the tape player work the same as for the radio.

When the lighted arrow above the tape door points right, selections on the side of the cassette facing the tape door are being played. If the lighted arrow points left, selections on the other side are being played. To play the other side of the tape, press PLAY PROG button again.

Locking fast forward and fast reverse are obtained by pressing FWD or REV buttons, respectively. To return the tape to playing speed, press PLAY PROG.

For automatic music search, press the SEEK button on the side of the tape player to locate the next selection forward. To repeat a selection being played, press REPT. There must be a 3 to 4 second pause between selections for these functions to operate.

Tape bias adjustments are made automatically when the tape cartridge is inserted. The Cr0₂ indicator will light when most chrome or metal tapes are being played.

To stop the tape, press the STOP/EJCT button. To eject the tape, press it again.

Stereo ETR systems available on E-series vehicles consist of a remote radio receiver, a tape deck option, a Graphic Control Center (GCC) monitor (dubbed the CRT) the GCC Controller and amplifier modules.

AM-FM STEREO (ETR) SYSTEMS WITH SEEK-SCAN, AUTO-REVERSE CASSETTE, CLOCK

(See Figure 9A-9)

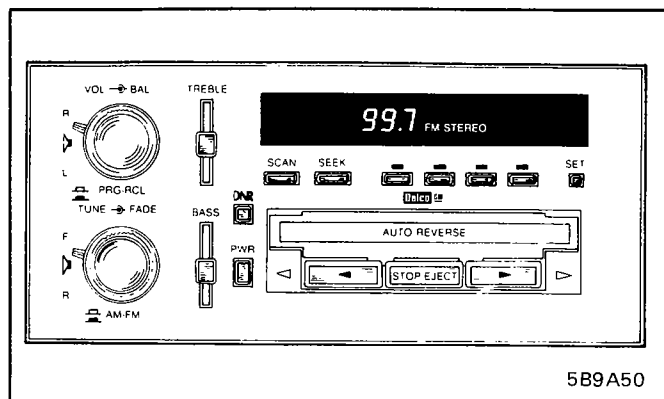


Figure 9A-9 UM6 AM-FM Stereo (ETR) w/Seek-Scan, Auto-Reverse Cassette & Clock (VF)

Refer to the UM7 system (Figure 9A-2) to operate the radio controls and set the time.

- To operate tape player:

Insert the cassette squarely through the door. This automatically switches the unit from radio to tape operation. If the sound is garbled (or there is no sound), eject the tape and reinsert it squarely. Insertion of the tape cassette overrides the radio and the time-of-day will be displayed.

After the cassette has snapped into position, adjust the volume and fader controls as desired.

To quickly advance to the next selection, press the button next to the lighted indicator. To listen to an earlier selection, press the button next to the unlighted indicator. To stop the forward or reverse movement, press the STOP-EJECT button; press again to eject the tape.

When the left indicator is lit, the top side of the tape is playing. When the right indicator light is lit, the bottom side of the tape is playing.

When the end-of-tape is reached; the unit automatically plays the other side.

When pressed the Dynamic Noise Reduction (DNR) button reduces high frequency background hiss on AM, FM, FM stereo, and tape.

For best results, use only cassettes which are 30 to 60 minutes in length.

AM MONAURAL ETR

(See Figure 9A-10)

Operation

- ON-OFF Button** - Press to turn radio ON. Press again to turn radio OFF.
- Volume Control (VOL-MIN/MAX)** - Slide to the right (MAX) to increase volume; slide to the left (MIN) to decrease.
- Bass and Treble Control (BASS-TREB)** - Slide to the right to increase treble and decrease bass. Slide to the left to increase bass and decrease treble.
- Tuning (TUNE) Control Bars** - Press upper bar to tune up the frequency band. Press lower bar to tune down the frequency band.

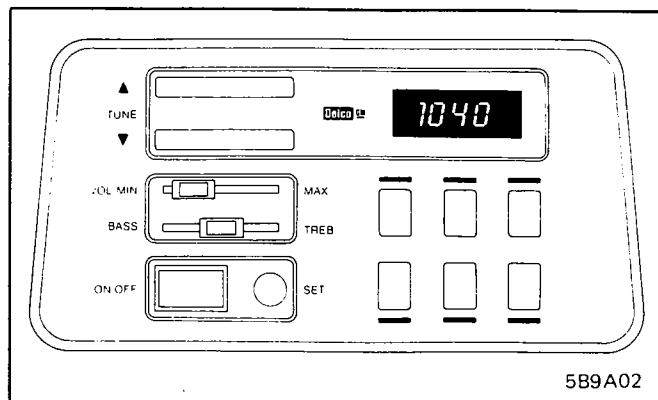


Figure 9A-10 UP4 AM Monaural

Tuning rate can be increased by first pressing a tuning bar then pressing the other tuning bar. Upon reaching the highest frequency on the band, the receiver will continue tuning starting at the low end of the band. The opposite is true when tuning down the band upon reaching the low end of the frequency band.

- Preset Station Buttons (6)** - Six preselected stations can be set by first tuning in the station desired. Then press the SET button followed by one of the six preset buttons.

HANG ON C.B.

(See Figure 9A-11)

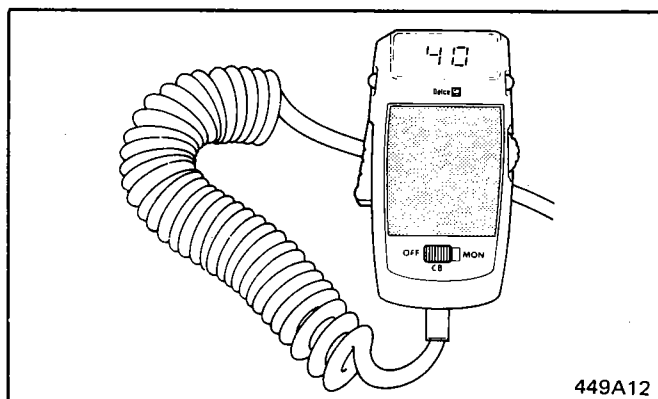


Figure 9A-11 UN8 Hang On C.B.

Operation

With the Delco-GM Radio/C.B. Microphone combination, you can listen to your favorite news, sports, music, or the citizen band (C.B.). In addition, your radio/C.B. system has the capability to monitor two bands at the same time. For example; you can set the controls to listen to your favorite entertainment station, and at the same time, set the CB on standby to receive C.B. calls. When a C.B. station broadcasts on the channel being monitored, the radio automatically switches to the C.B. station and is heard through the car's front speakers. The entertainment station can be continuously heard through the car's rear seat speakers. Concluding the C.B. broadcast, the radio will automatically switch and the station will again return to the front speakers. This also takes place when the microphone is keyed for transmission.

The volume level of the station (rear speakers) can be adjusted with the Volume control on the radio; the volume level of the C.B. broadcast (front speakers) can be adjusted with the Volume Control located on the microphone.

By switching the C.B. MODE switch to the OFF position, uninterrupted listening to your favorite AM or FM station, or tape may be obtained.

To listen to AM, FM, or tape only:

- Set C.B. MODE switch, located on the microphone, to the OFF position.
- Select AM, FM or insert tape cartridge.
- Use the Manual Tuning Control to locate a desired AM or FM station or use pushbuttons to locate a pre-selected station.

To listen to C.B. broadcasts only:

- Turn radio OFF.
- Set C.B. MODE switch, located on the microphone, to the MON position.
- Rotate the C.B. Channel Selector switch, located on the microphone, until a desired channel appears in the lighted display portion of the microphone.
- Set Squelch Control, located on the microphone, on approximately the mid-travel point. When a moderate to strong C.B. broadcast is received the C.B. broadcast will be heard on the front speakers.

With the microphone facing you, clockwise rotation of the Squelch Control will permit weaker C.B. broadcasts to be received. Counter-clockwise rotation reduces the noise level and limits reception to stronger nearby broadcasts.

To receive C.B. broadcasts while listening to AM, FM, or tape:

- Select an AM or FM station or insert tape cartridge.
- Set C.B. MODE switch, located on the microphone, to the MON position.
- Rotate the C.B. channel selector switch, located on the microphone, until a desired channel appears in the lighted display portion of the microphone.
- Set Squelch Control, located on the microphone, on approximately the mid-travel point. When a moderate to strong C.B. broadcast is received, your radio will automatically switch to the C.B. broadcast and will be heard on the front speakers. Concluding the C.B. broadcast received, your pre-selected station or tape will resume.

With the microphone facing you, clockwise rotation of the Squelch Control will permit weaker C.B. broadcasts to be received. Counter-clockwise rotation reduces the noise level and limits reception to stronger nearby broadcasts.

To transmit on C.B.:

- Set C.B. MODE switch, located on the microphone, to the MON position. Transmitting on C.B. is possible while radio or tape is ON or OFF.
- Rotate the C.B. Channel Selector switch to locate a desired C.B. channel.
- Set Squelch Control to the mid-travel point or other desired setting. This control only affects receiving sensitivity, it has no effect while transmitting.
- On transmit, the front speakers become silent until the transmission is over. During transmission rear seat speakers continue to play entertainment audio.

RADIO ANTENNAS

Three types of antennas are in use: the power, tri-band, and fixed mast antennas.

Fixed Mast Antenna

Description

The fixed mast antenna is designed to provide good radio reception even in moderate fringe areas. It is very

flexible and will pass through automatic car washes without damage.

Power Antenna

Many antenna troubles can be prevented by cleaning and lightly oiling the antenna rod at periodic intervals, or when car is being washed, by wiping the rod with a soft cloth.

Thoroughly clean power antenna mast sections as follows:

1. Actuate antenna to fully extend the mast.
2. Wipe clean cloth dampened with mineral spirits over antenna mast sections to remove any dirt.
3. Extend and retract antenna through one complete cycle.
4. Repeat Steps 1 through 3 at least two more times to make sure dirt has been removed. Then fully extend the mast extension.
5. Dampen clean cloth with light sewing machine oil and evenly distribute the oil over the extended mast section surfaces.
6. Extend and retract antenna through one complete cycle.
7. Repeat Steps 5 and 6 at least two more times to assure thorough lubrication of the mast sections.

If a car has been undercoated, check to make sure that drain holes in the motor housing below the body tube mounting point, have not been plugged.

Weak reception or fading may be caused by moisture in the support tube, due to condensation or leakage through the insulation condensation or leakage through the insulation bushings. If trouble has been traced to moisture in the tube, remove the antenna, disassemble it, and clean it thoroughly. All moisture can be removed by blowing out with compressed air then pushing a clean dry cloth through the support tube as far as possible. Before assembling antenna check the drain holes in motor housing to be sure they are not obstructed.

DIAGNOSIS

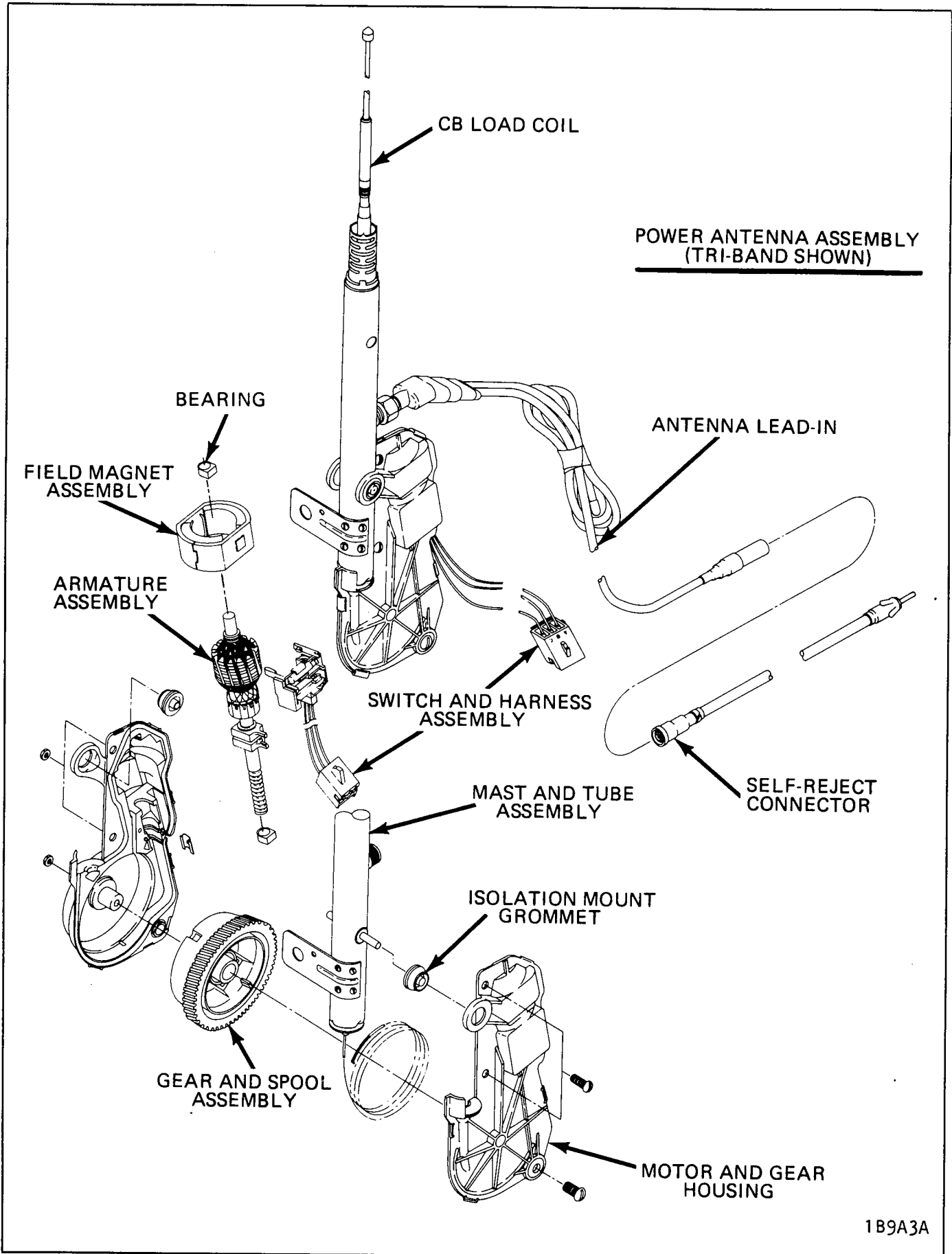
GENERAL

Troubleshooting methods for servicing remote radio systems are identical to procedures used to diagnose conventional radio systems with the exception of Delco-GM Bose systems. However, when the remote ETR is removed for service, both the remote control head and remote receiver must be removed and sent to an authorized AC-Delco Service Repair Station.

Since radio problems are most often repaired at authorized warranty repair stations, the tendency is to remove the set when a problem is reported, without any preliminary diagnosis. This results in a large number of radios showing up as "NO TROUBLE FOUND" units when received by the warranty repair stations. Many times, when this is the case, the trouble usually could have been corrected without removal of the radio, such as noise complaints.

The inconvenience of driving without a radio, while the set is being serviced at a warranty repair station, can frequently be avoided if the following quick checks are used to eliminate external radio system problems before removing the radio for repair:

1. Turn ignition to the accessory position and turn radio and/or tape player/CB on to verify customer's complaint or identify symptom.
2. On AM/FM radios (with or without stereo), if the radio is dead on FM, but the AM plays normally, the



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Figure 9A-12 Iso-Mounted Power Antenna

POWER ANTENNA

General Description and Operation

The power antenna automatically raises the antenna mast to its full height whenever the radio and ignition are turned on. The antenna retracts into the fender when either the ignition or radio is turned off.

The power antenna drive unit is housed in a 2 piece plastic housing attached to the mast and tube assembly. A permanent magnet motor with worm drive moves the antenna mast up and down with a plastic cable attached to the top mast section. No clutch is used in this unit. Upper and lower travel limits are controlled by switches opened by armature shaft thrust as the mast reaches the end of its travel. A circuit breaker is used to protect the motor armature from over heating.

Two types of power antennas are used depending on the type of radio used in the car:

- 1) AM-FM Type
- 2) AM-FM-CB (Tri-Band) Type

The AM-FM antenna extends to a maximum height of 794 mm (31 1/4"). The AM-FM-CB (Tri-Band) antenna extends to a height of 914 mm (36"). The tri-band antenna has a load coil mounted on the center mast section to tune it to the CB radio band and a stub antenna lead taped to the support tube. The stub matches the antenna to the FM band and should not be removed except for replacement.

On Car Service

There is no on car service of the AM-FM antenna other

than cleaning of the mast sections. On the Tri-Band antenna the load coil and tip are servicable in the event of damage or loss. The load coil has an adjustable band to set SWR (Standing Wave Ratio) for CB operation. The SWR is preset on complete antenna assemblies but replacement load coils must be checked and/or adjusted using available SWR meters.

Checking SWR

NOTICE: SWR checking procedures require transmitter operation and FCC regulations governing CB radio operation apply. The following options are available.

- Have SWR test performed by a technician who has a CB license.
- Acquire a dealership CB radio operator's license which allows technicians to use license during business hours.
- Ask owner or an operator possessing a permanent CB Radio license to properly operate transmitter during the test.

Adjustments or repairs referred to in the procedure that follows are limited to the antenna itself or the antenna lead in and connections.

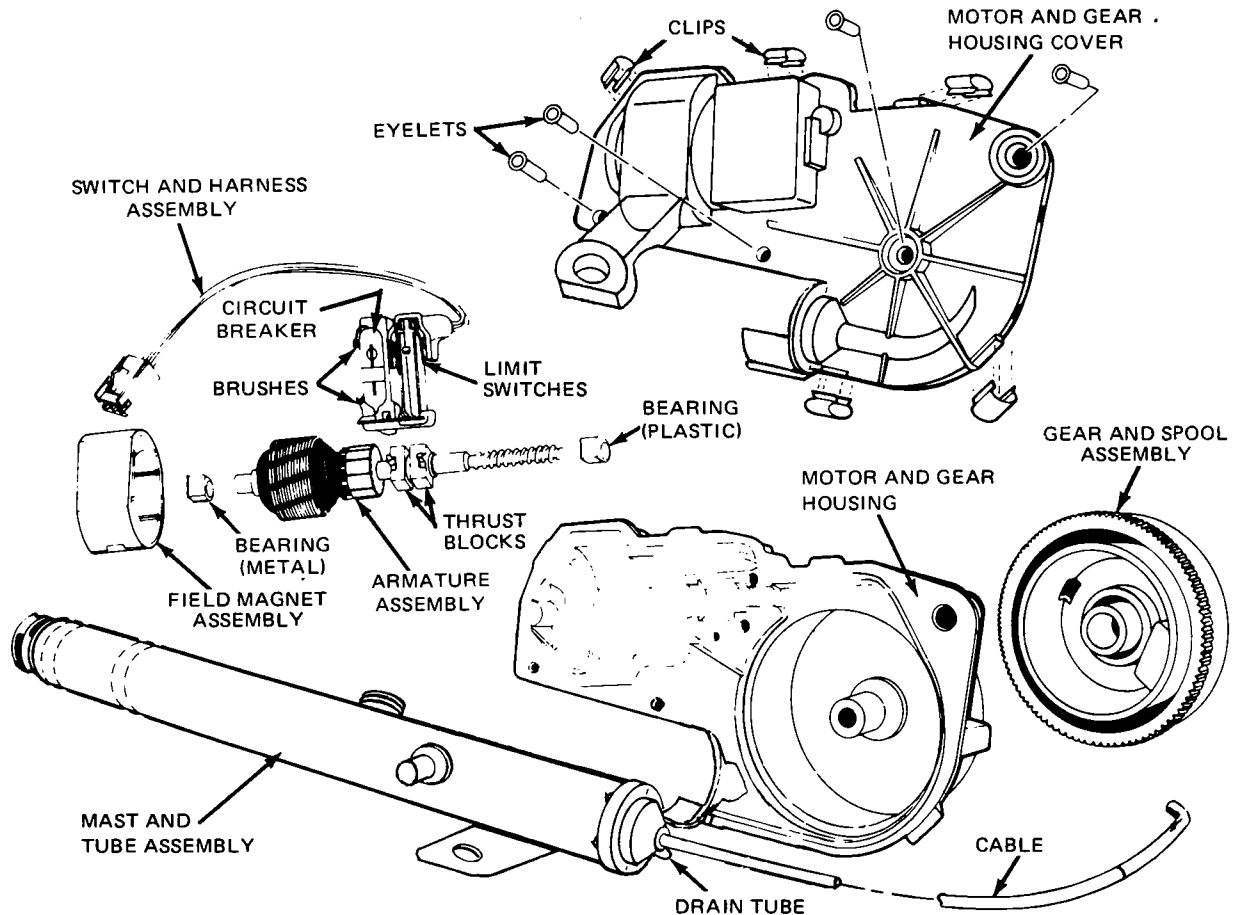


Figure 9A-13 Power Antenna

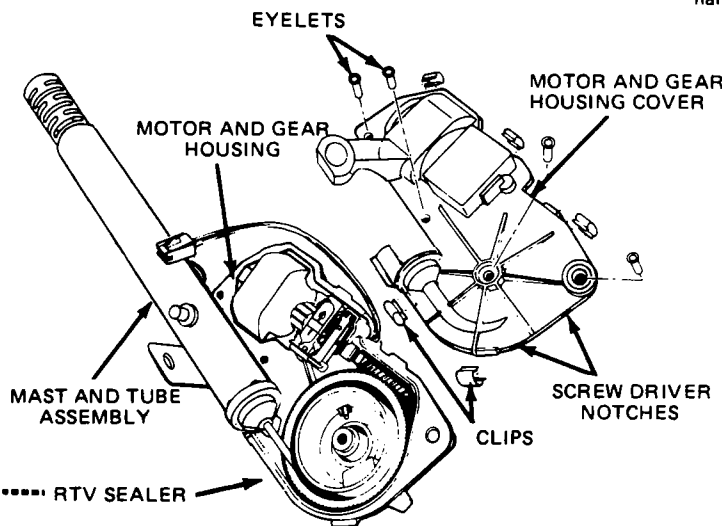
POWER ANTENNA DISASSEMBLE AND ASSEMBLE

NOTICE: With the exception of load coil on the tri-band antenna, all service operations require opening the motor and gear housing. All disassembly will require a bolt and clip package.

1. REMOVE AND INSTALL MOTOR AND GEAR HOUSING COVER.

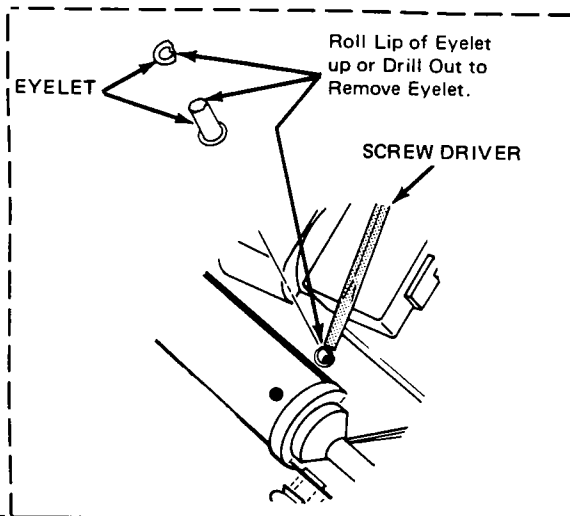
REMOVAL

1. Remove parts shown.
2. Separate housing and cover as shown.



INSTALL

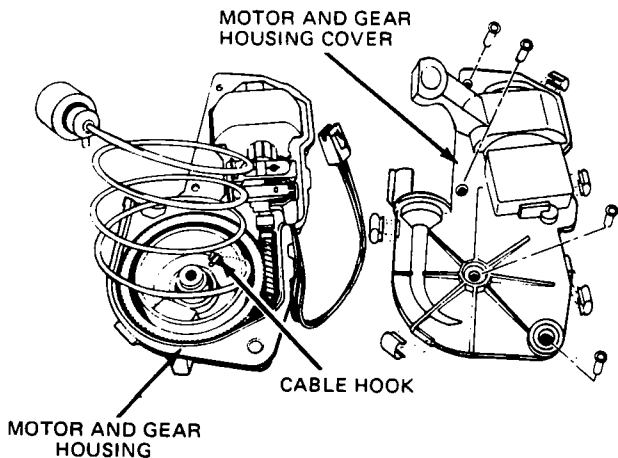
1. Remove loose or excess sealer and reassemble using 3 bolts and nuts, from service package and the 5 clips.
2. Apply RTV sealer around support tube and along seam on top half of housing.



2. REMOVE AND INSTALL MAST AND TUBE ASSEMBLY.

REMOVAL

1. Remove parts as shown.



Disengage cable from gear by rotating cable 90°

INSTALL

1. Reassemble as shown with mast extended to reduce length of cable.
2. Run motor to lower mast into support tube. Reseal housing and support tube.

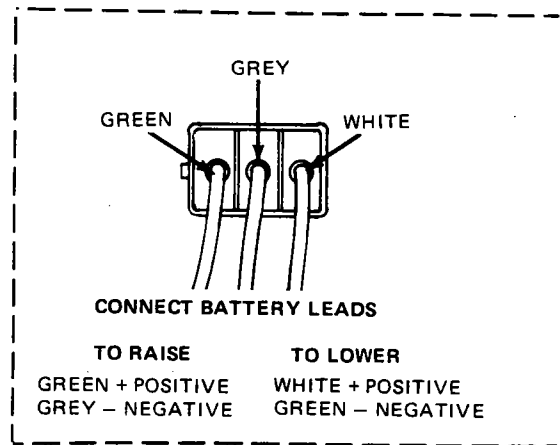


Figure 9A-14 Power Antenna Disassembly

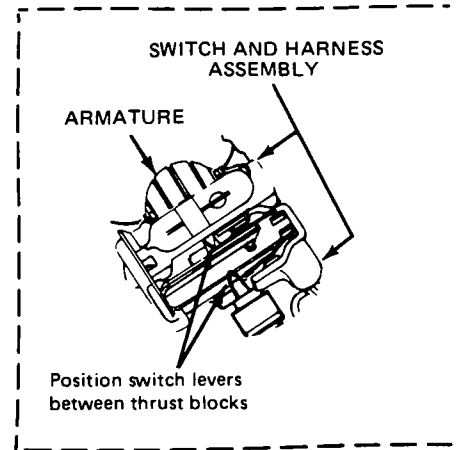
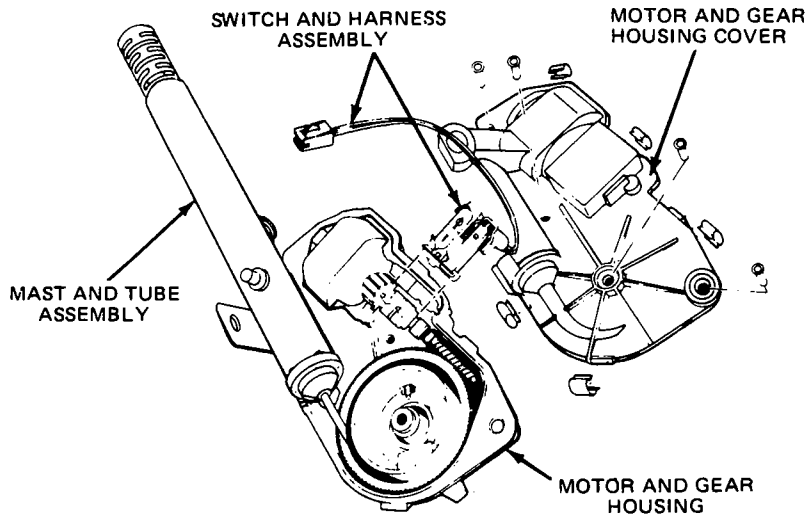
3. REMOVE AND INSTALL SWITCH AND HARNESS ASSEMBLY.

REMOVAL

1. Remove parts as shown.
2. Remove excess sealer where wire goes through housing.

INSTALL

1. Position switch.
2. Reseal area where wires come out of housing. Reseal housing.



4. REMOVE AND INSTALL ARMATURE AND MAGNET ASSEMBLY.

REMOVAL

1. Remove parts as shown.
2. Cleanout old grease.

INSTALL

1. Lubricate worm and gear with lithium soap grease such as Sun Oil Prestige #2 or equivalent.
2. Apply drop of light oil to bearings.
3. Reassemble and seal housing.

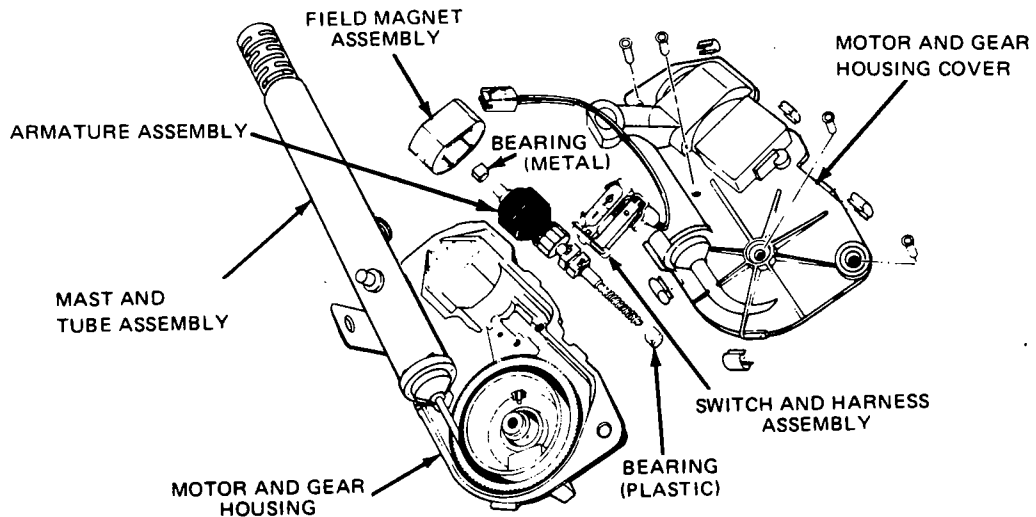


Figure 9A-15 Power Antenna Disassembly

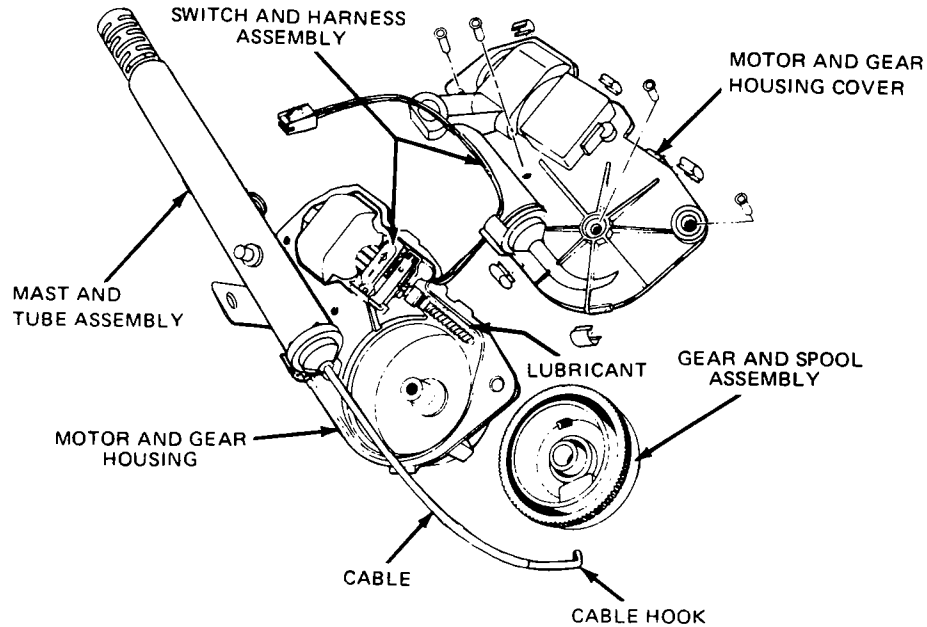
5. REMOVE AND INSTALL GEAR ASSEMBLY.

REMOVAL

1. Disassemble as shown.
2. Clean out old lubricant.

INSTALL

1. Apply lubricant to worm and gear.
2. Reassemble and seal housing.



6. REMOVE AND INSTALL CB LOAD COIL AND/OR TIP.

REMOVAL

1. Disconnect Neg. Battery Cable.
2. Turn on ignition and radio then connect battery long enough to raise antenna about half way.
3. Remove parts as shown using padded pliers.

INSTALL

1. Reassemble as shown using thread cement to lock in place.
2. Adjust S.W.R. (See SWR adjustment procedure)

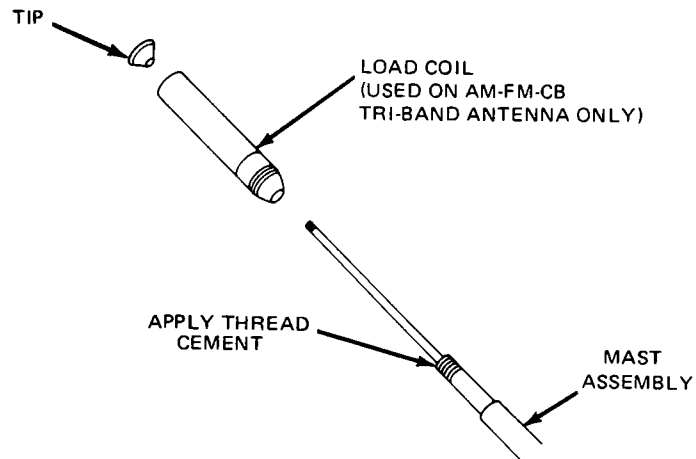
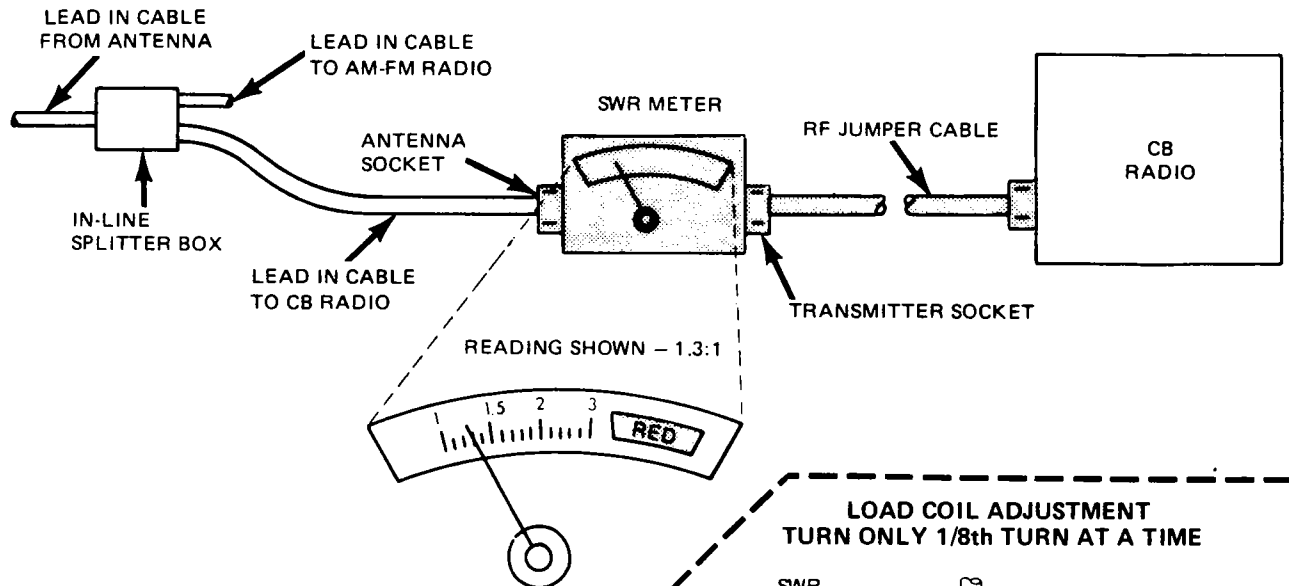


Figure 9A-16 Power Antenna Disassembly

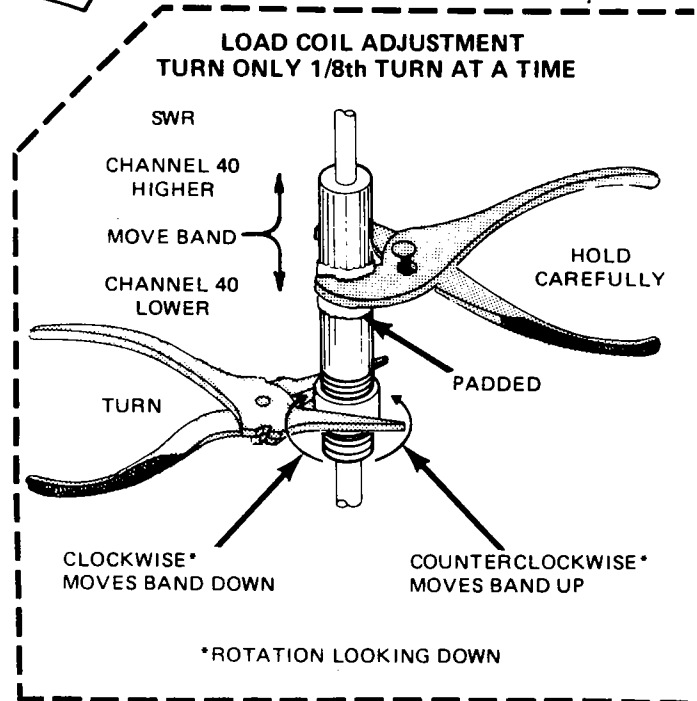
SWR (STANDING WAVE RATIO) CHECK

1. With Ignition and Radio off install an SWR meter as shown following meter manufacturers instructions.
 2. Turn on Ignition and Radio.
 3. Check Antenna height – Must be fully extended.
914 mm (36") from fender to tip
286 mm (11-1/4") top of load coil to tip.
 4. After adjustment is complete apply a small amount of thread cement to adjusting band.
- NOTICE: Operation of transmitter requires FCC CB Operators License.
When making this check, car should be at least 20 feet away from any building, hood closed and no one should be standing close to the antenna.



POSSIBLE SWR READINGS

1. Initial readings taken on Channel 1, 20, 40
 - a. SWR of 2:1 or lower on Channel 20 and nearly equal on Channels 1 and 40 is considered good. No adjustment required.
 - b. SWR higher than 2:1 on Channel 20. Adjustment required.
 - c. Unequal SWR on Channels 1 and 40 (one channel in red) indicates adjustment required.



ANY READING IN THE RED BAND (ABOVE 3:1 SWR) CHECK FOR:

- Antenna mounting screws tight making a good ground connection between antenna mounting surface and car sheet metal.
- Lead in cable connections to radio, splitter and antenna are tight.
- Lead in cables not pinched and cutting the insulation.

Figure 9A-17 Standing Wave Ratio (SWR) Check

radio should be removed for repair. (The reverse of this condition does not necessarily call for radio removal.)

3. On combination radio/tape units, if the radio operate properly but the tape player does not, the unit should be removed for repair. (The reverse of this condition does not necessarily call for radio/tape removal.)
4. For more detailed diagnosis, see the following appropriate charts to locate and resolve NOISE, CB/or Tape, and AM-FM (ETR) problems. Charts 1 through 7 relate to the Delco-GM/Bose Music System. Charts 6 through 12 relate to noise problems.
5. Refer to Section 8A for schematics and further diagnostic testing and troubleshooting.

Always determine the exact nature of the radio problem to aid in diagnosis. Knowing whether the condition is intermittent or constant, whether it occurs with engine off or running, and whether it occurs with car stationary or moving, will help pinpoint the problem.

ON-CAR DIAGNOSIS

Check that: (1) the battery is supplying 12-14VDC to the radio's power connector, (2) a known good speaker is connected to the radio output, (Hint: If equipped with rear speaker, fade the output between both speakers.) and (3) a known good antenna is supplying a signal to the input (Hint: FM can give weak reception with a bad antenna - so check antenna on AM.). When checking the digital radio, be sure that the battery cable is connected properly.

On the in-dash CB unit, check that: (1) the power source is properly connected to the unit and the fuse is good, (2) a known good CB antenna is functioning properly and has a good ground, (3) all transmission line connections are secure, (4) the VSWR for the antenna is between 1.5 and 1, while the set is tuned to a frequency midway on the tuning band (the lowest VSWR setting is most desirable) (5) the microphone connection is good, and (6) the generator voltage does not exceed 15 volts at high engine speeds. Also check the control settings; make sure the unit is on and the volume is loud enough, it is set in the CB position, and operating channel is ON, the squelch control is set properly. On the in-dash CB unit, check the preceding items for the entertainment radio.

Isolate radio problems to the following areas, then proceed to diagnostic charts.

IN-CAR TROUBLESHOOTING OF CB UNITS

(See Figure 9A-40)

A number of common problems can prevent good transmission and reception on your CB. Always make certain that you have checked the "obvious" before going into further diagnosis procedures. Listed below are typical problem areas that should be checked:

1. Check for blown fuse and proper power connection.
2. Check that antenna is securely mounted to chassis and that connector is snug.
Never operate transmit section of CB radio without an antenna connected. Also check that VSWR is below 1.5 to 1 while set is tuned to station in middle of band (the lowest VSWR setting is most desirable).
3. Check squelch level, make sure it is low enough to receive signal properly.
4. Check to make sure the volume control is turned up.
5. Check to make sure the RAD-MON-CB switch is in the proper position.

For additional information, see SWR Setting Procedure and Figure 9A-17.

ON-CAR SERVICE

- For electrical wiring schematics, see Section 8A.
- For Removal and Installation of radios, see Section 8C.

Tape Player Problems

When a tape player problem is encountered, always be sure that a known good tape is inserted to determine if the tape player is at fault or if bad tapes are being used.

WARRANTY REPAIRS

A nationwide network of AC-Delco authorized repair centers have the necessary equipment, service information, parts or training to provide competent service. If, after diagnosis, a radio is determined to be defective fill out a Warranty Repair Claim for AC-Delco Items form. Refer to the Radio Label (Figure 9A-41) for information used to fill out a warranty repair claim before sending radio to an authorized repair center.

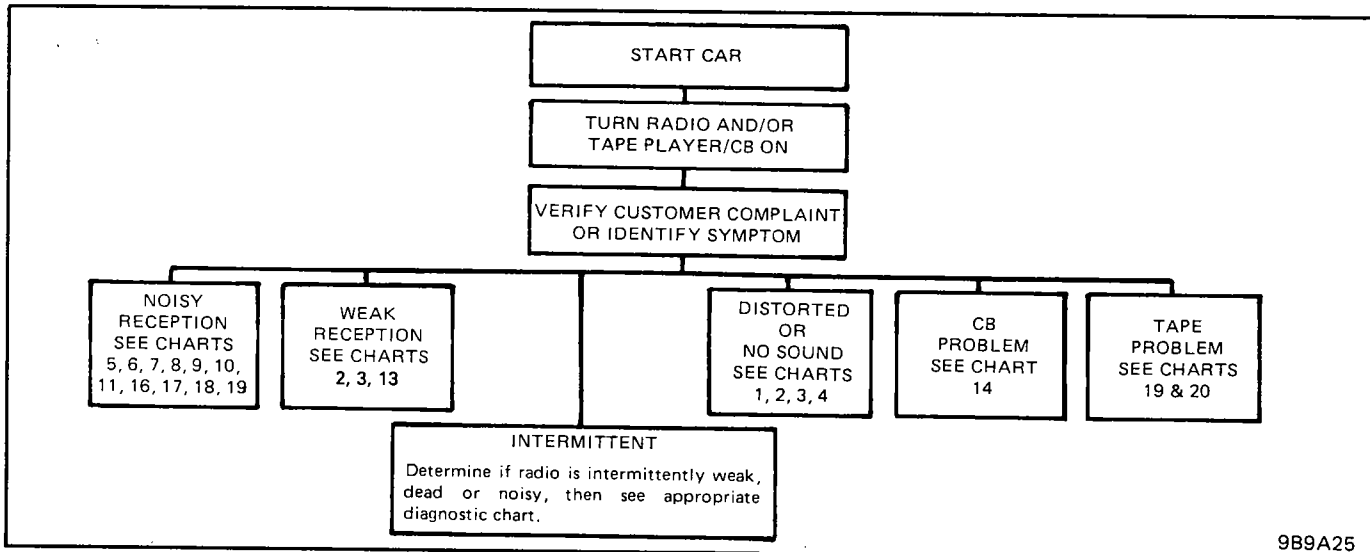
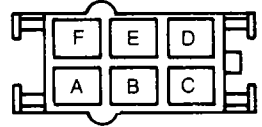
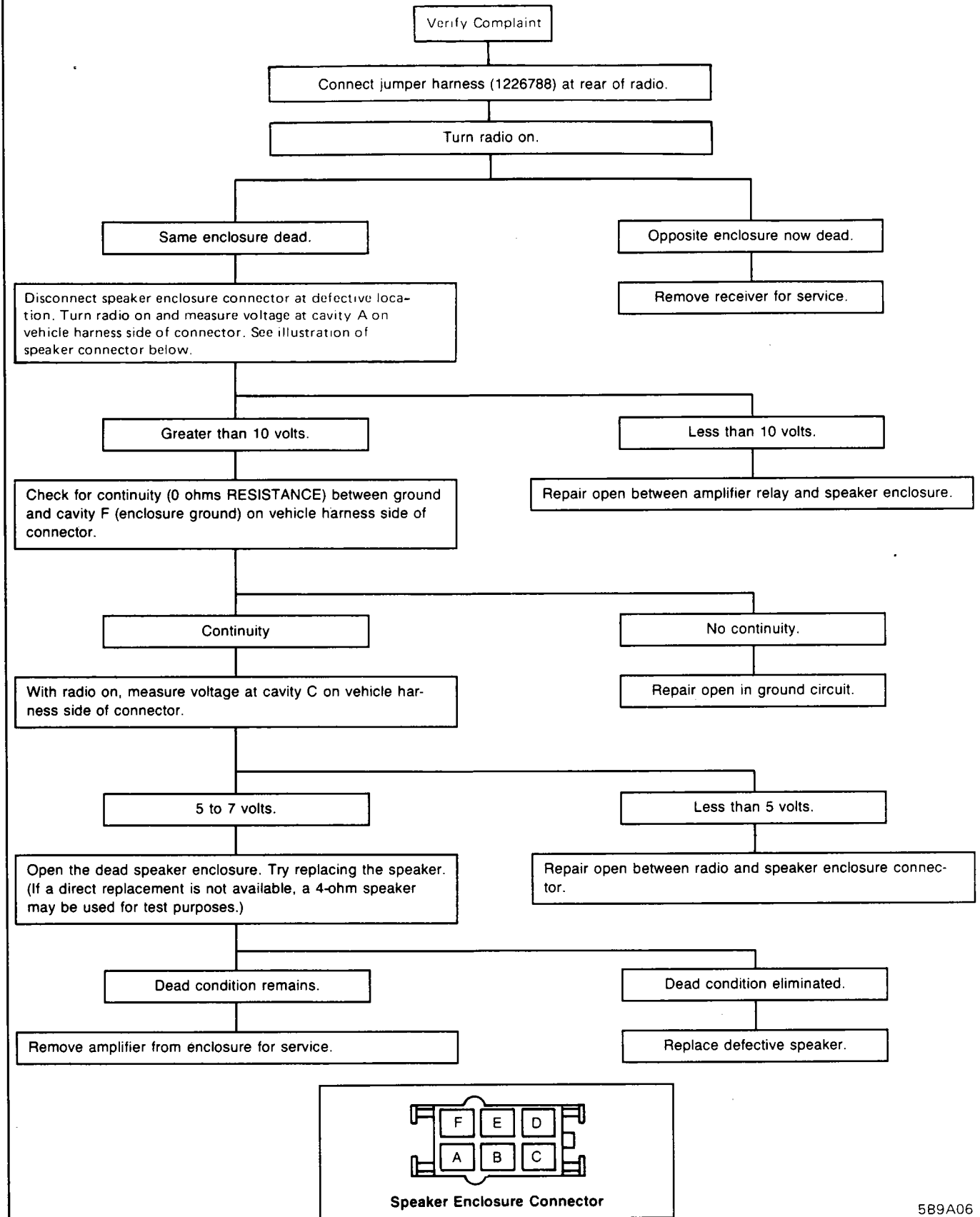


Figure 9A-18 Identify Symptom & Analyze Problem

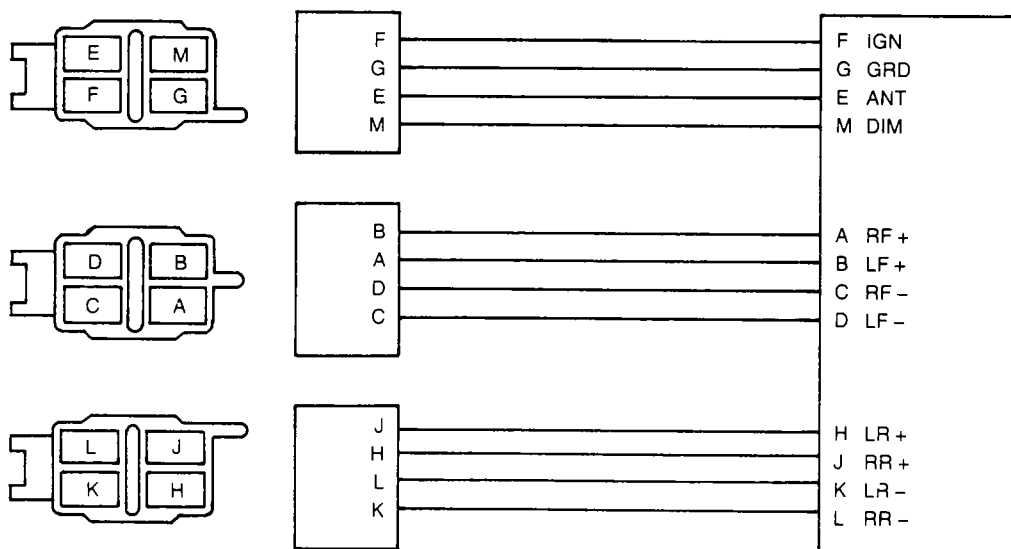
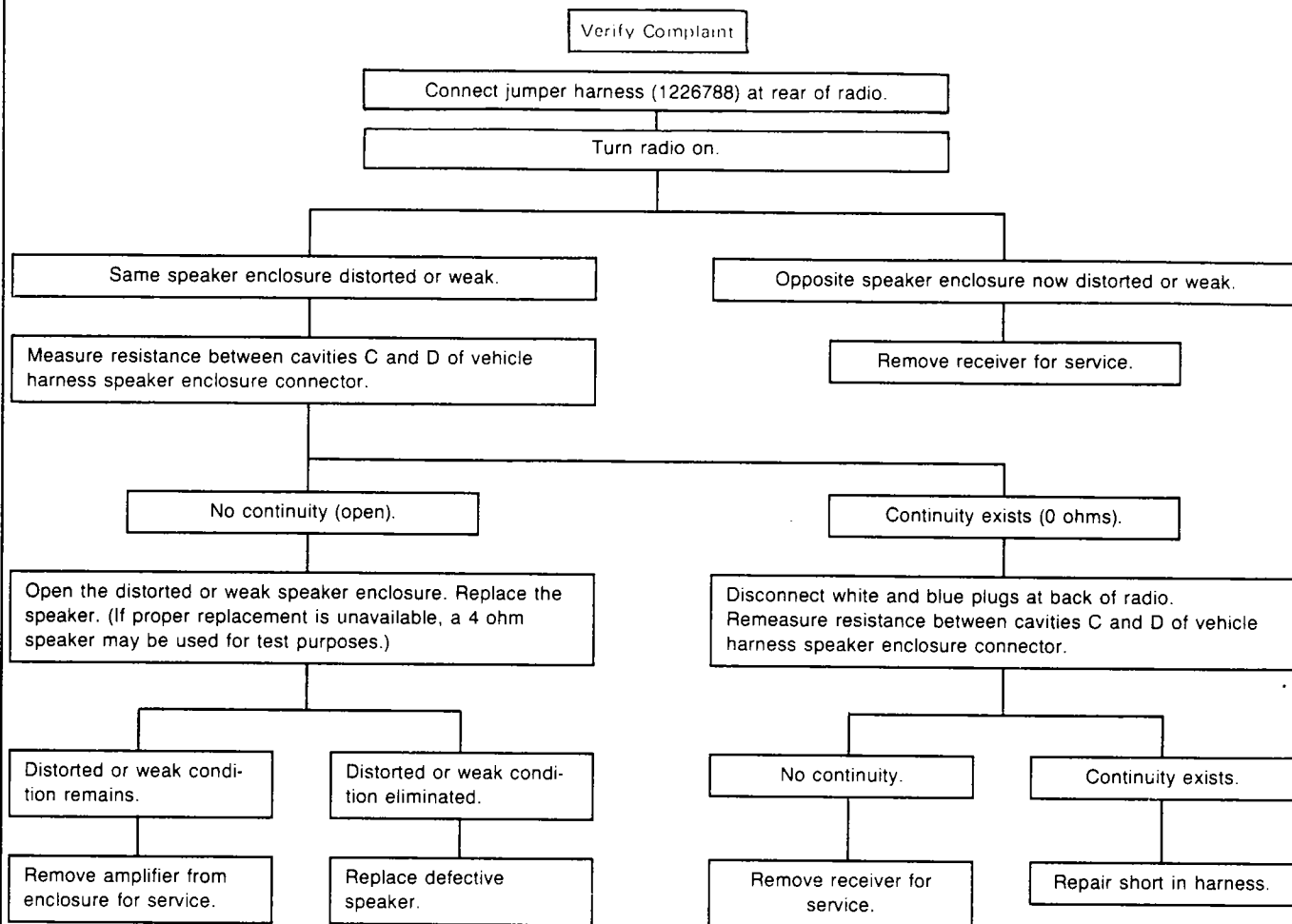
NO SOUND FROM ONE SPEAKER ENCLOSURE



Speaker Enclosure Connector

Figure 9A-19 Chart 1-No Sound from One Speaker (Bose System)

SOUND FROM ONE SPEAKER ENCLOSURE DISTORTED OR WEAK (No Engine Noise)



Diagnostic Jumper Harness Schematic (Part No. 1226778)

Figure 9A-20 Chart 2-Sound from One Speaker Distorted or Weak (Bose System)

NO SOUND FROM TWO SPEAKER ENCLOSURES OR IS DISTORTED/WEAK (No Engine Noise)

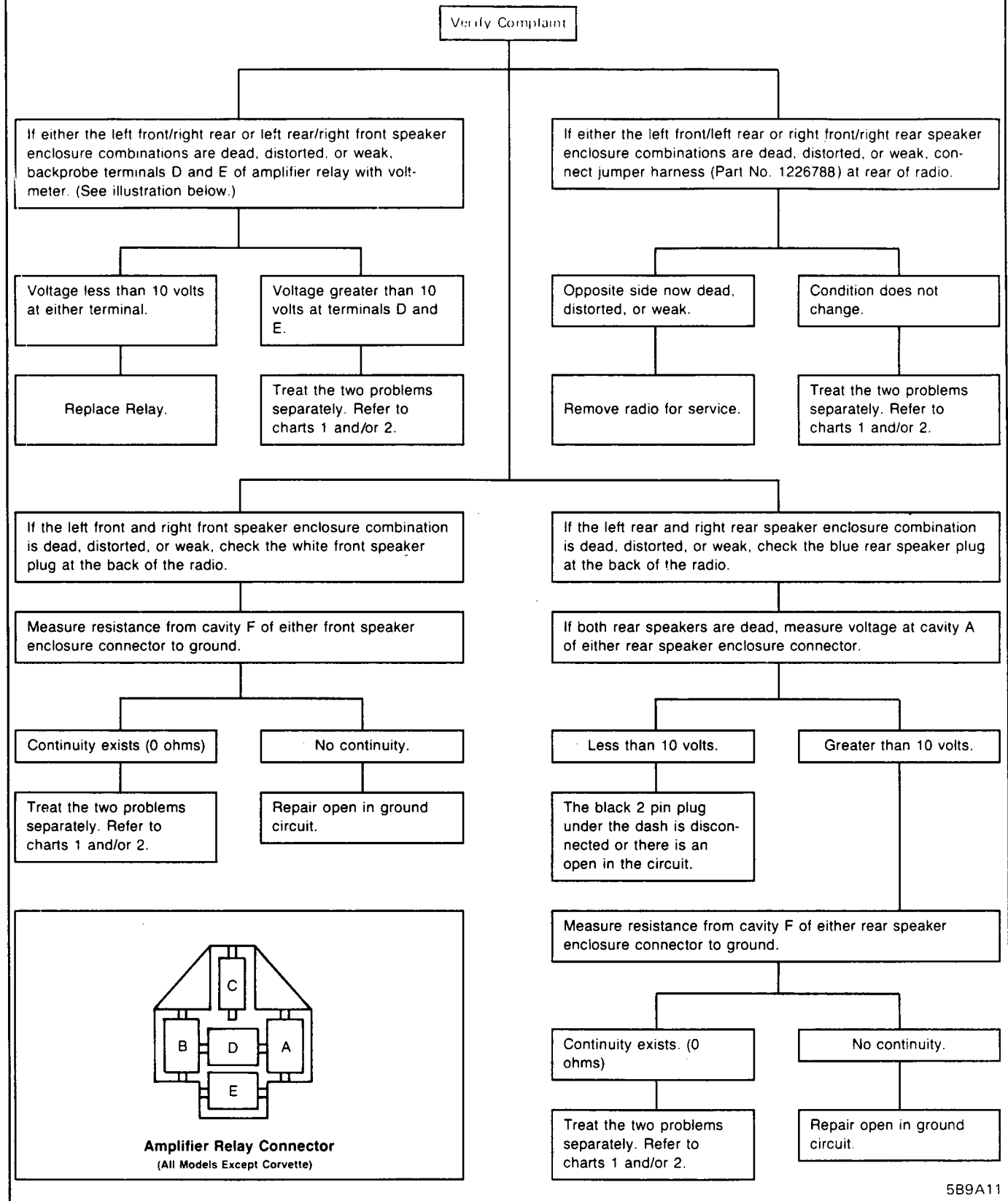
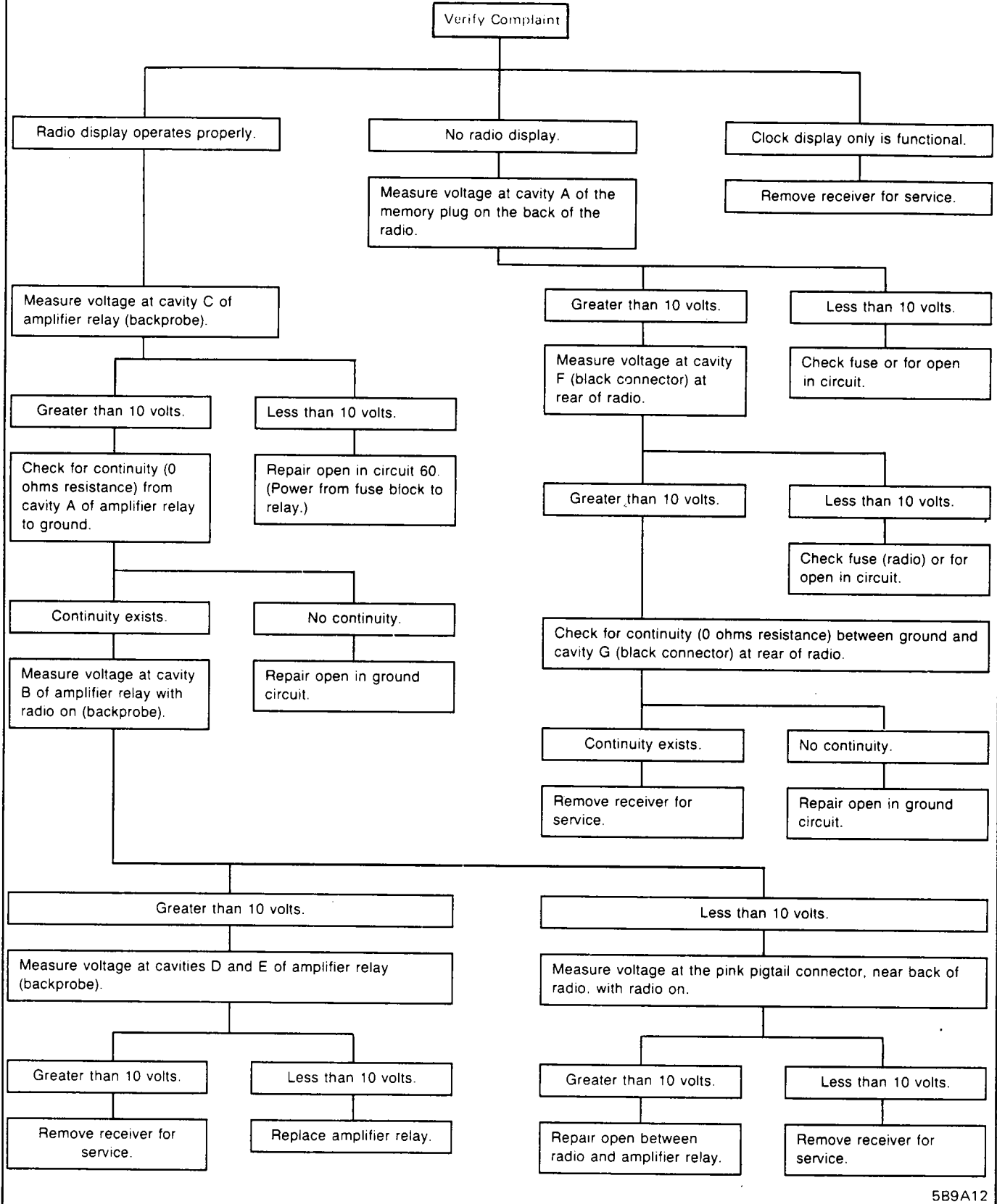


Figure 9A-21 Chart 3-No Sound or Weak/Distorted from Two Speakers (Bose System)

NO SOUND FROM ALL FOUR SPEAKERS (No Engine Noise)



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Figure 9A-22 Chart 4-No Sound from All Four Speakers (Bose System)

GENERATOR WHINE AND/OR IGNITION NOISE IN ALL 4 SPEAKERS (May Occur Only at Low Volume)

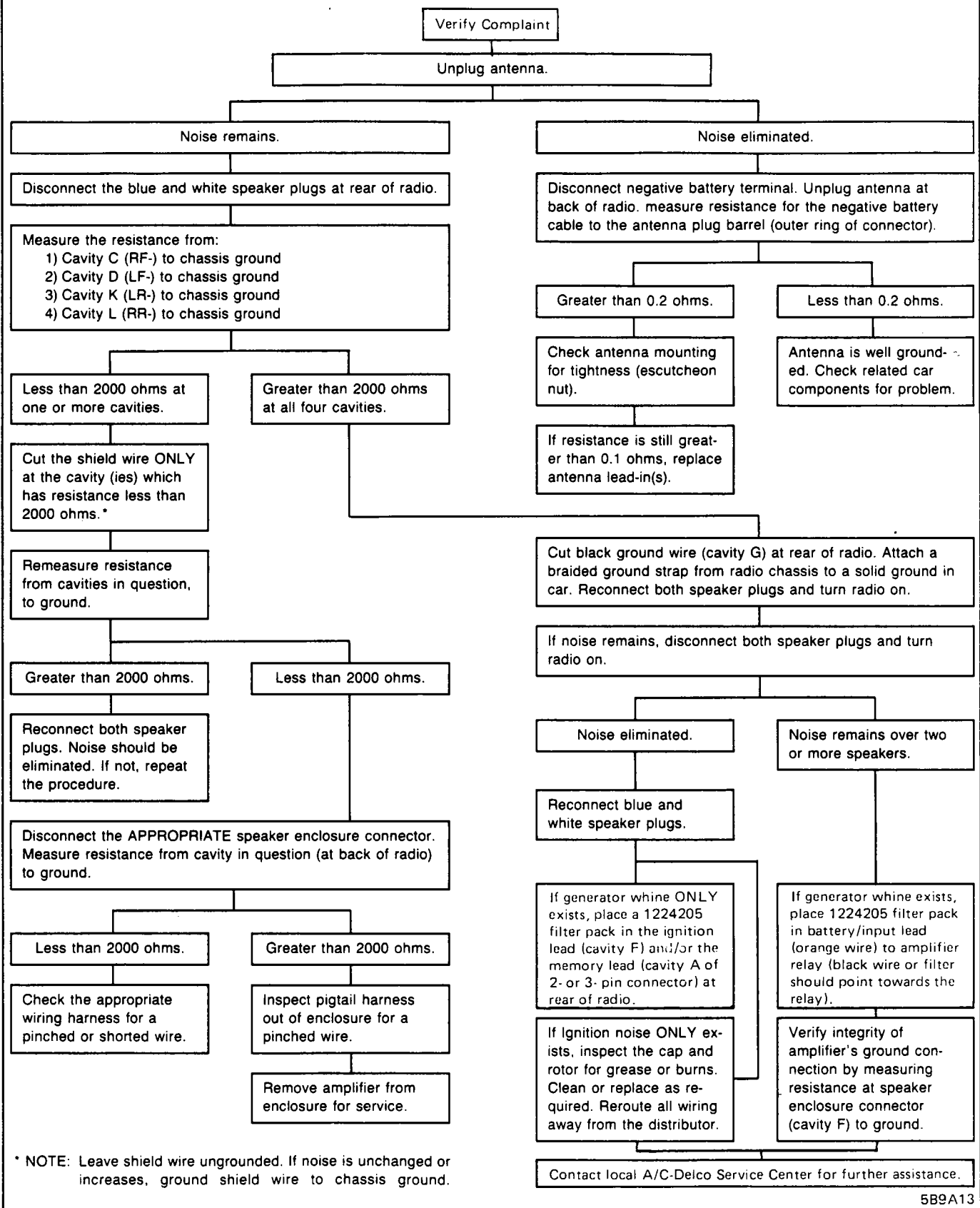


Figure 9A-23 Chart 5-Generator Whine/Ignition Noise in All Four Speakers (Bose System)

ENGINE NOISE IN 1, 2 OR 3 SPEAKERS

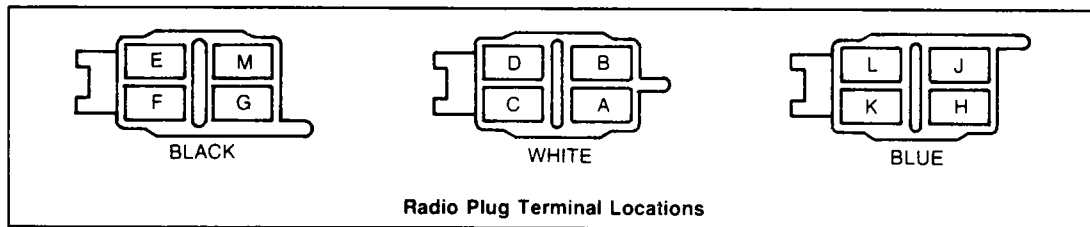
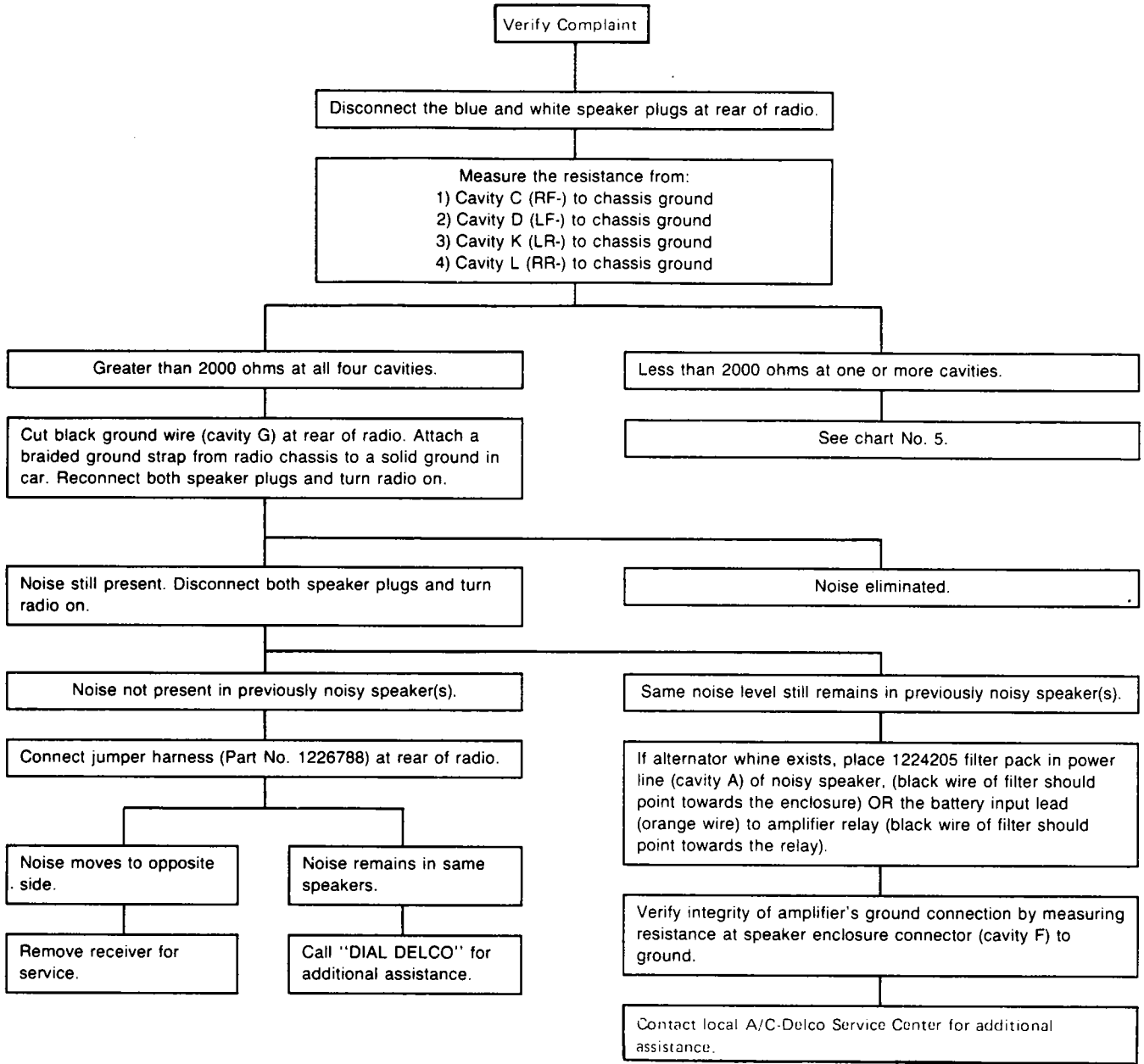
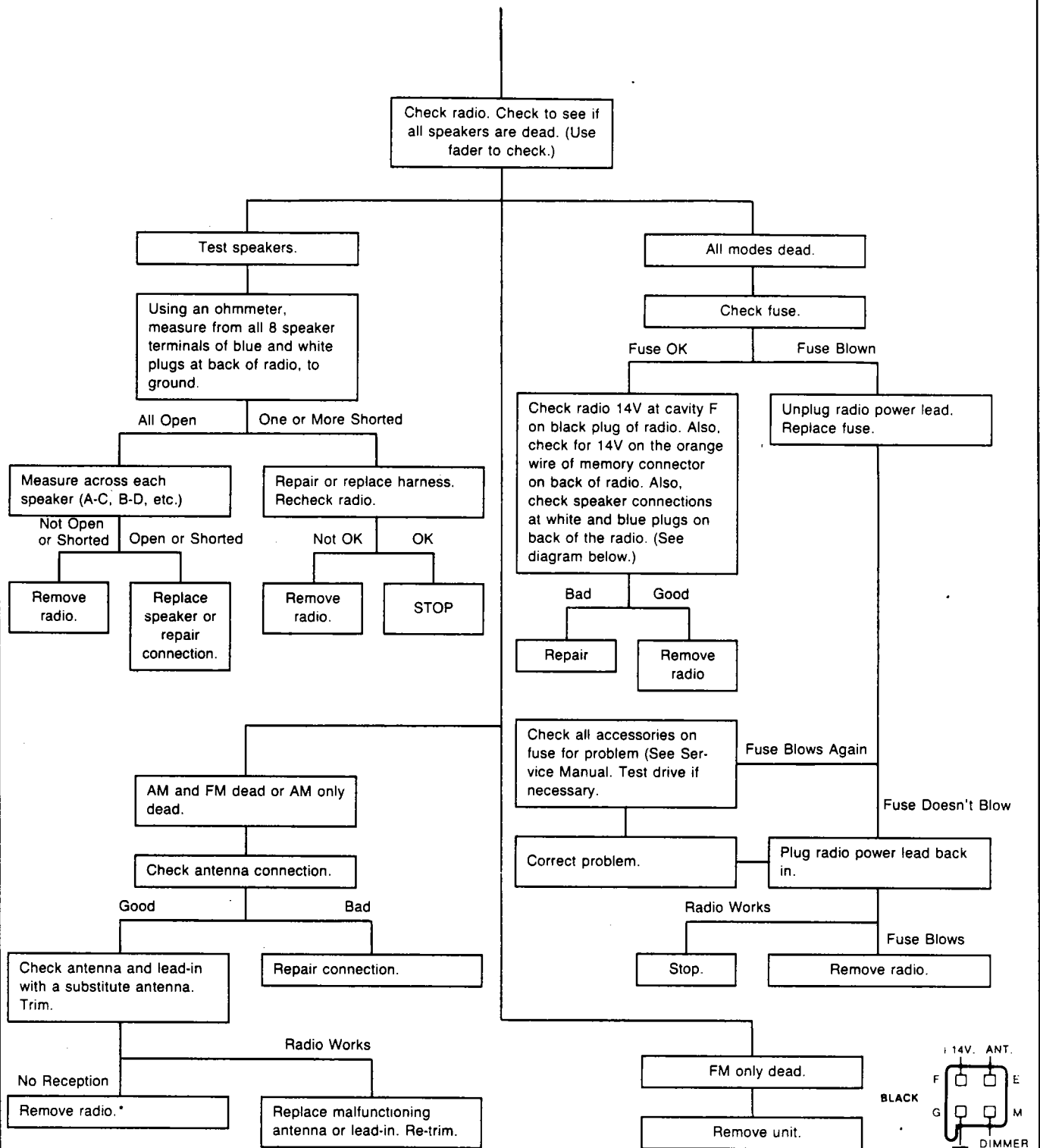


Figure 9A-24 Chart 6-Engine Noise in 1, 2, or 3 Speakers (Bose System)

NO SOUND



*When radio has been determined to be defective, be sure to describe symptoms to aid the radio technician.

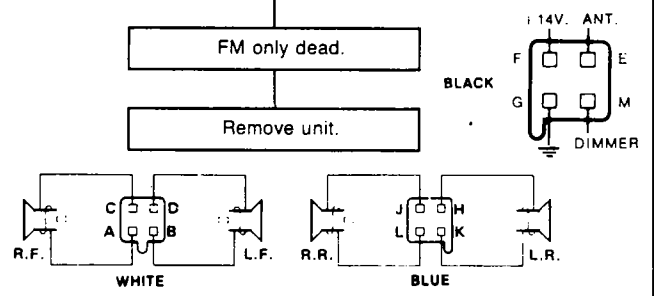


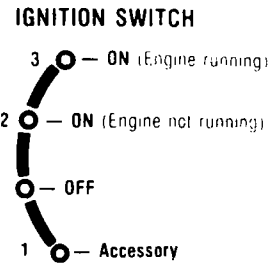
Figure Front & Rear Car Speaker Harnesses, and Power Plug Connector Pin Views

Figure 9A-25 Chart 7-No Sound (Bose System)

NOISY RECEPTION

STEP 1

Before starting, check for Noise in the 3 positions shown below . . .



NOISE ON 1 — check radio
 NOISE ON 2 — check engine controls
 NOISE ON 3 — check other car areas

Verify Complaint

Check for the noise in each of the following three switch positions:

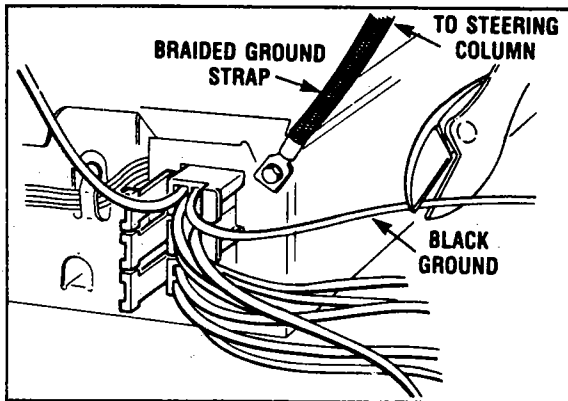
1. Accessory (all electrical accessories OFF).
2. Ignition ON (engine NOT running)
3. Engine running.

NOTE: If the noise is ONE switch pop, go immediately to the **ACCESSORY NOISE** chart, page . . . For MORE THAN one switch pop, refer to **ANTENNA** chart.

If the noise occurs in position 1, substitute a known good radio. If it plays fine, send malfunctioning unit to an authorized AC-Delco Repair Center.

If the noise occurs in position 2, it is probably related to the ECM or digital dash. See ECM-DIGITAL DASH Chart.

If the noise occurs in position 3, continue on this chart.



Measure the ground from the case of the radio to the accelerator mounting bracket, using the **LOWEST** scale on a digital ohmmeter.

Less than 0.2 Ohms

Greater than 0.2 Ohms

Good Ground

Noise Remains

A poor ground exists. Cut the ground wire from connector (pin G) at back of radio. Attach a braided ground strap from the case of the radio to steering column. (See illustration of ground strap and Section 8A Electrical Diagnosis as appropriate for specific carline.)

Noise eliminated.

Unplug antenna from the back of the radio and check for the noise.

Noise Eliminated

Noise Remains

Go to **ANTENNA** chart,

(Go to Figure 9A-27)

Figure 9A-26 Chart 8-Noisy Reception

NOISY RECEPTION (Continued)

With radio powered up and all speakers and antenna connected, slowly pull radio in and out of mounting on car dash and check for noise.

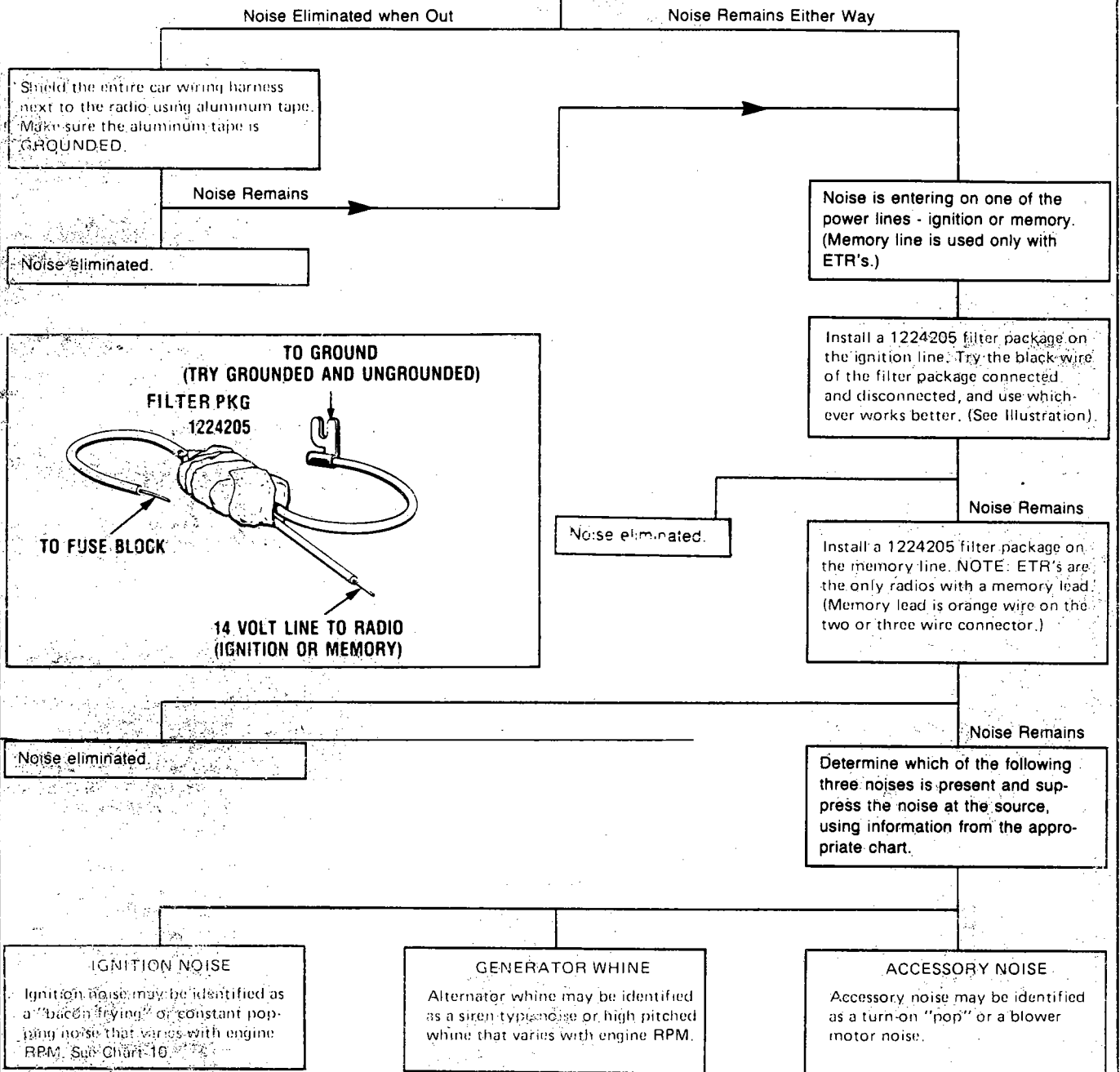


Figure 9A-27 Chart 8 (Continued) Noisy Reception

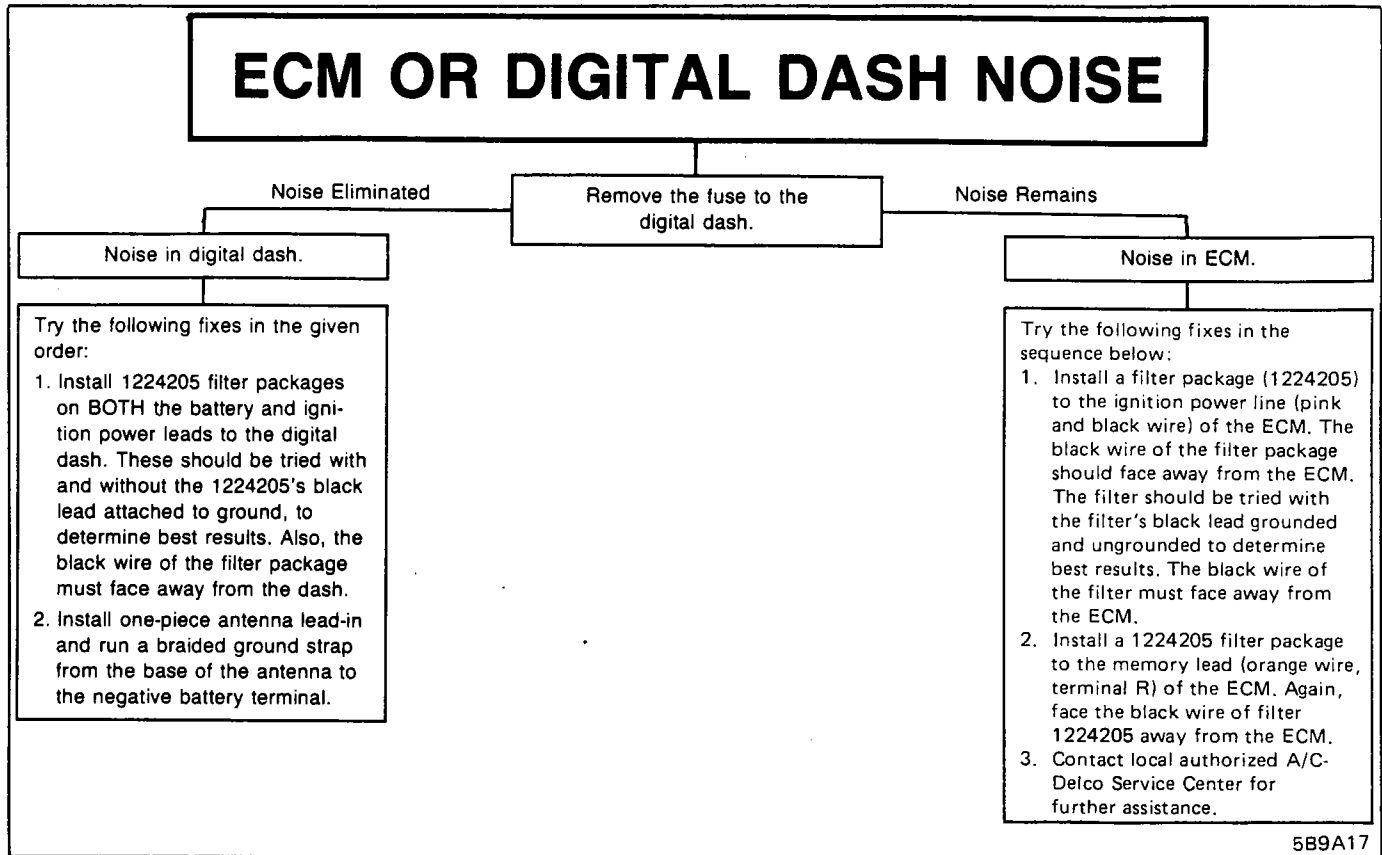


Figure 9A-28 Chart 9-ECM/Digital Dash Noise

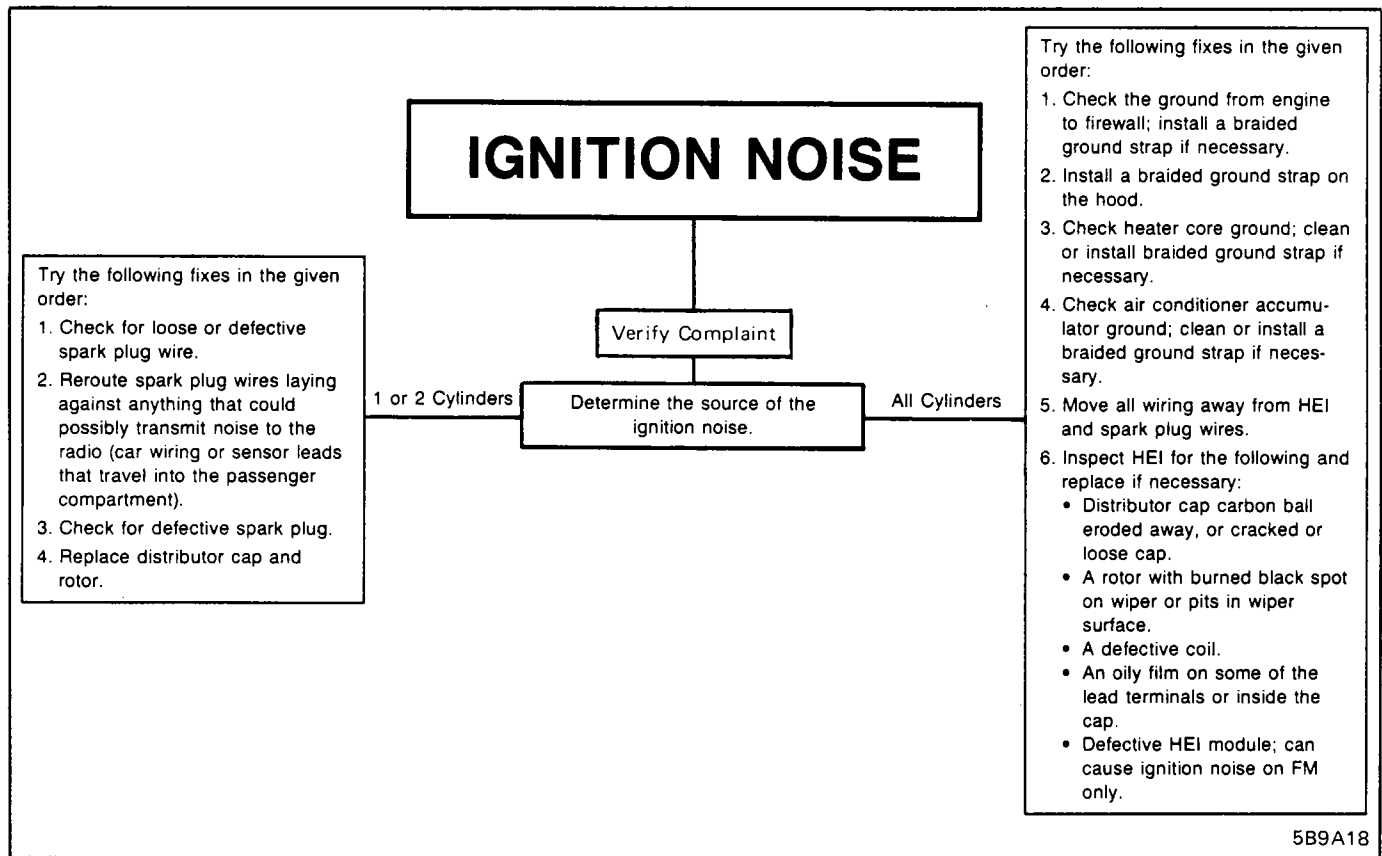


Figure 9A-29 Chart 10-Ignition Noise

ANTENNA NOISE (Fixed or Power Mast)

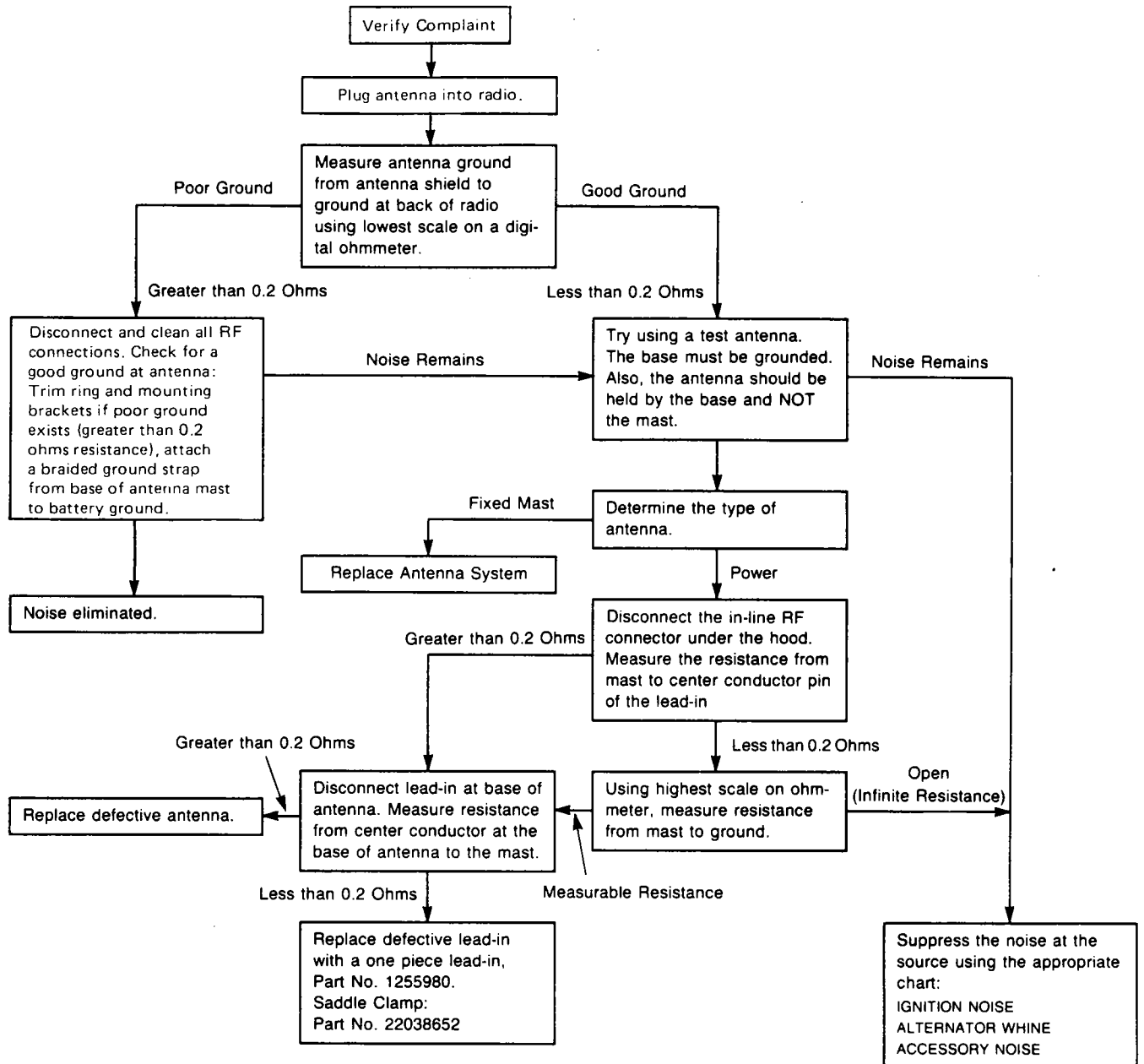
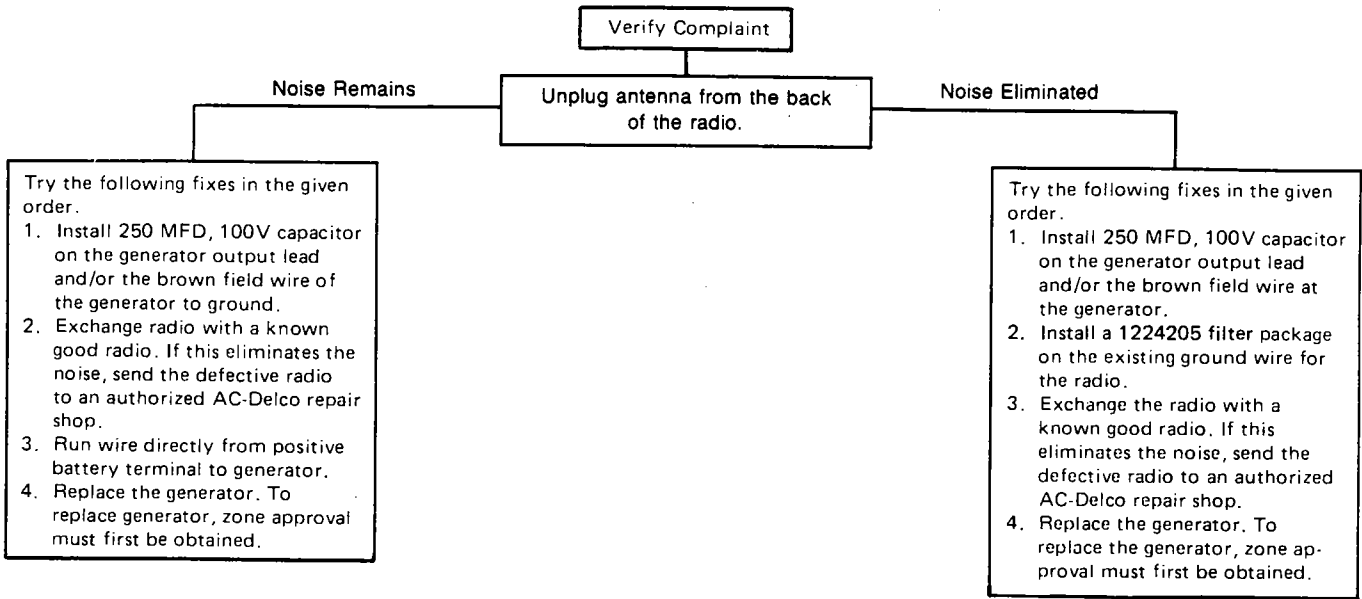


Figure 9A-30 Chart 11-Antenna Noise

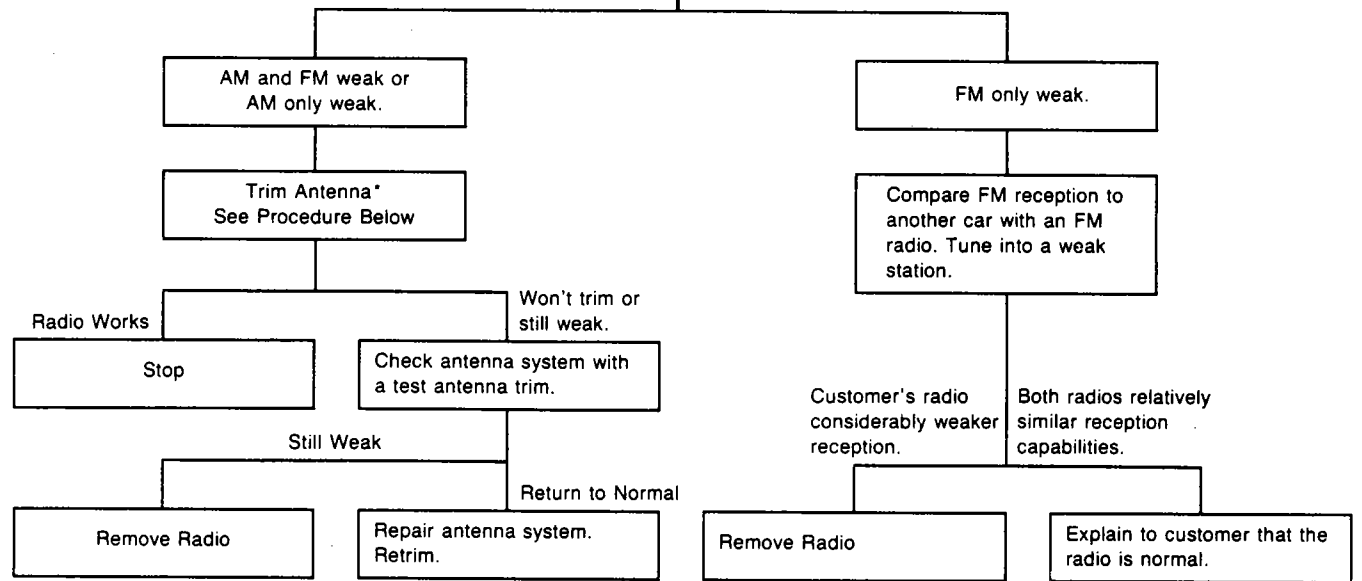
GENERATOR WHINE



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Figure 9A-31 Chart 12-Generator Whine

STATION RECEPTION WEAK (AM-FM)



*ETR and 2000 series radios do not have antenna trimmer. Try substitute antenna.

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Figure 9A-32 Chart 13-Station Reception Weak-AM/FM

CB TROUBLESHOOTING

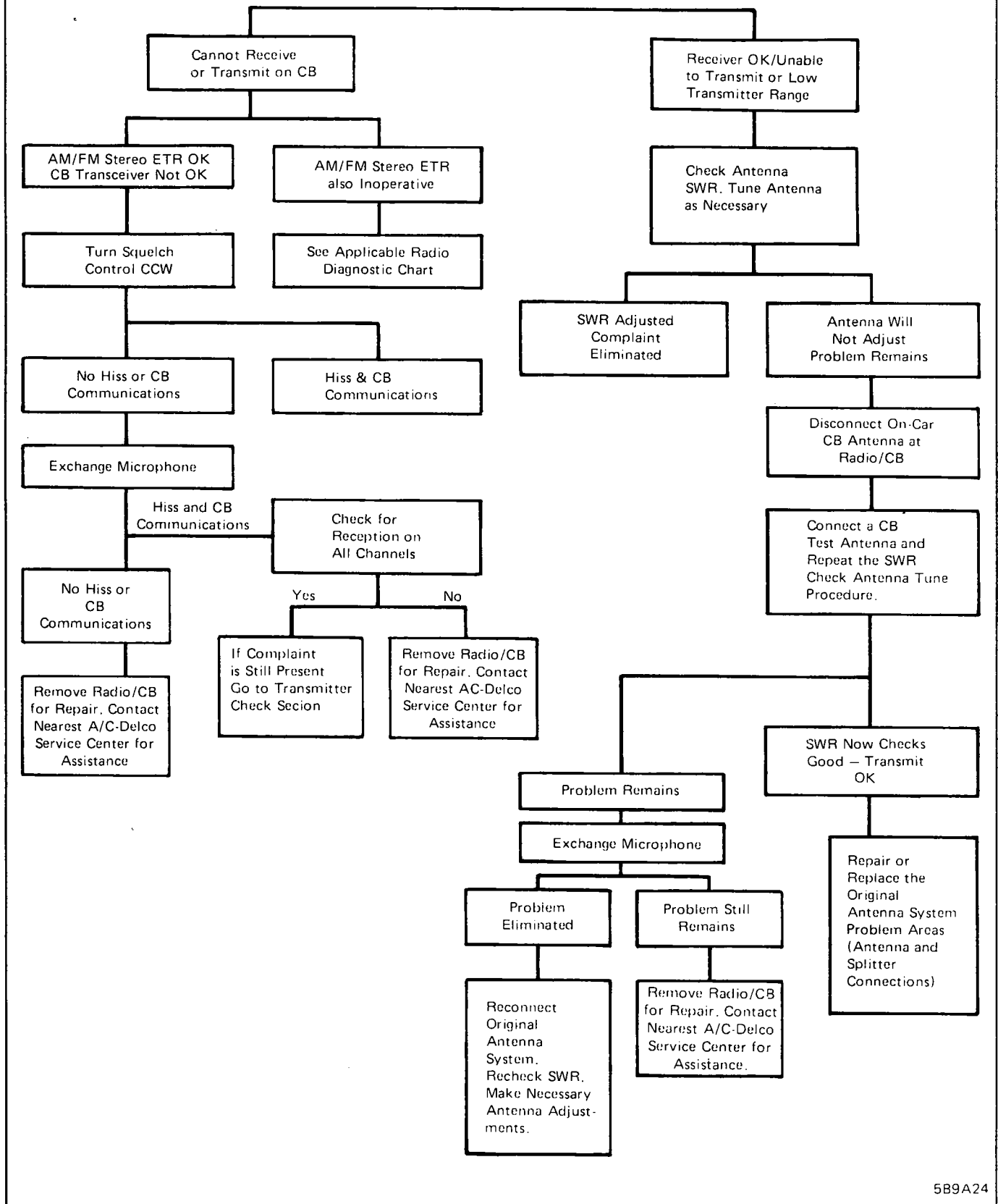


Figure 9A-33 Chart 14-CB Troubleshooting

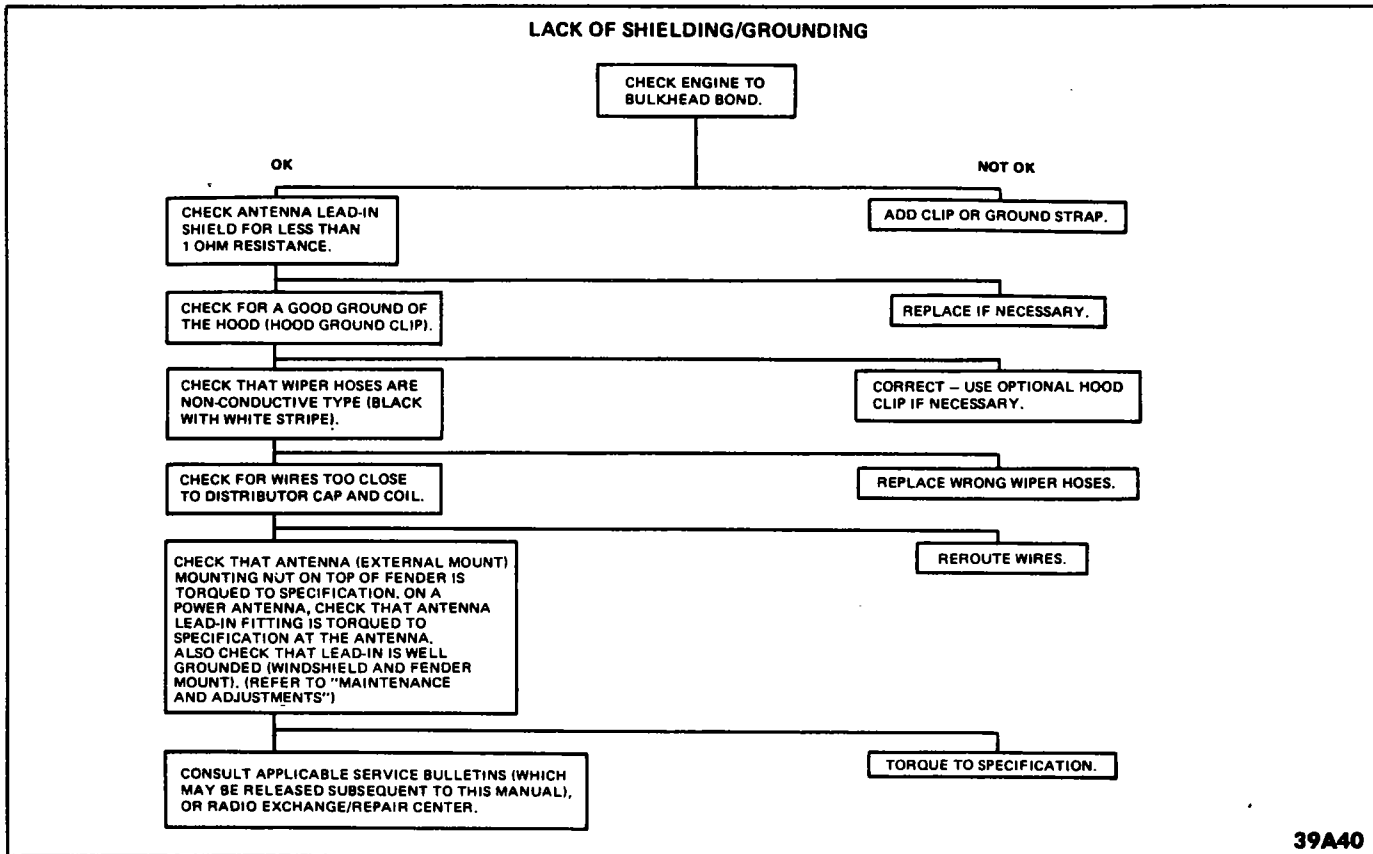


Figure 9A-34 Chart 15-Poor Ground-Little or No Shielding

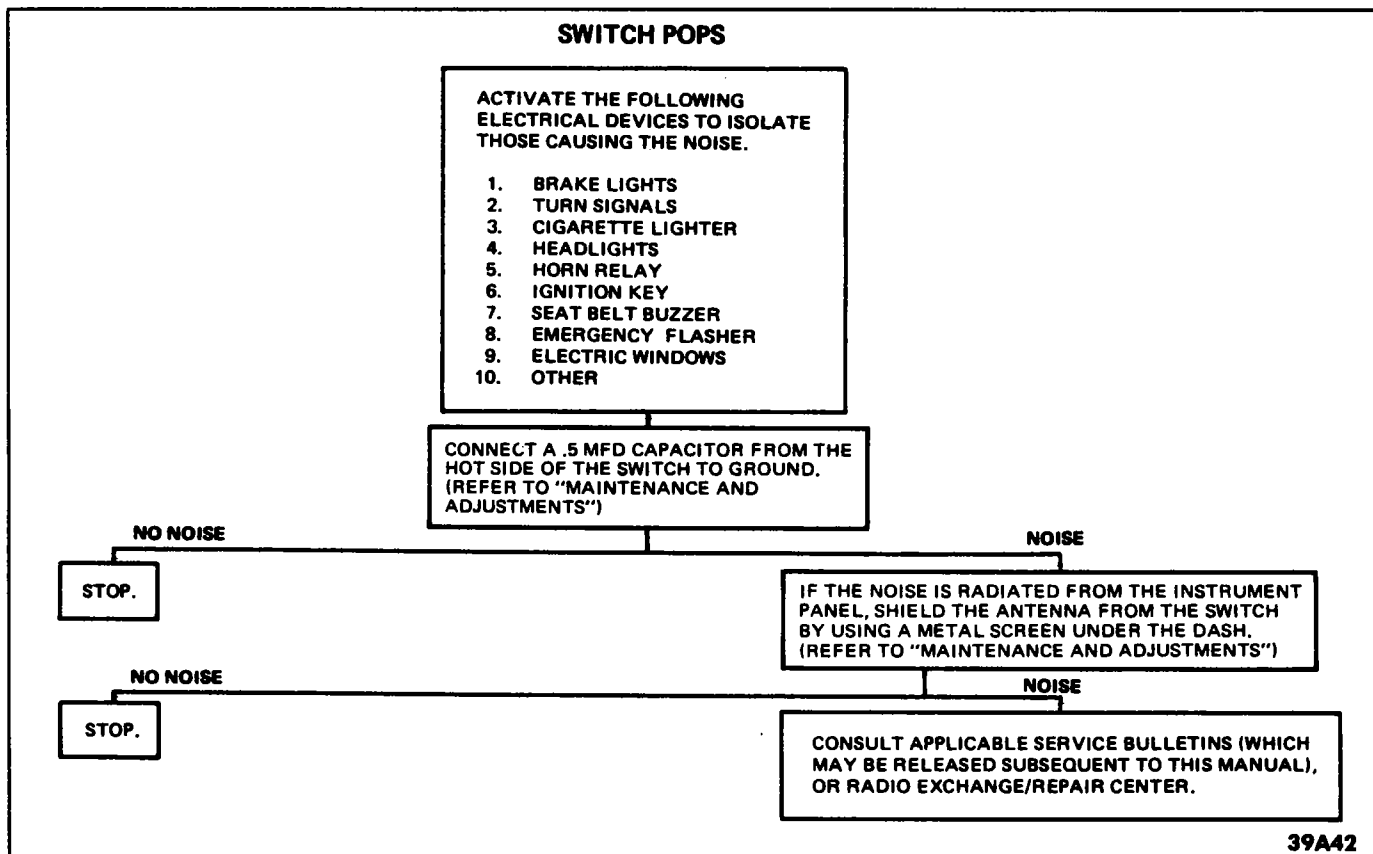


Figure 9A-35 Chart 16-Switch Noise in Radio

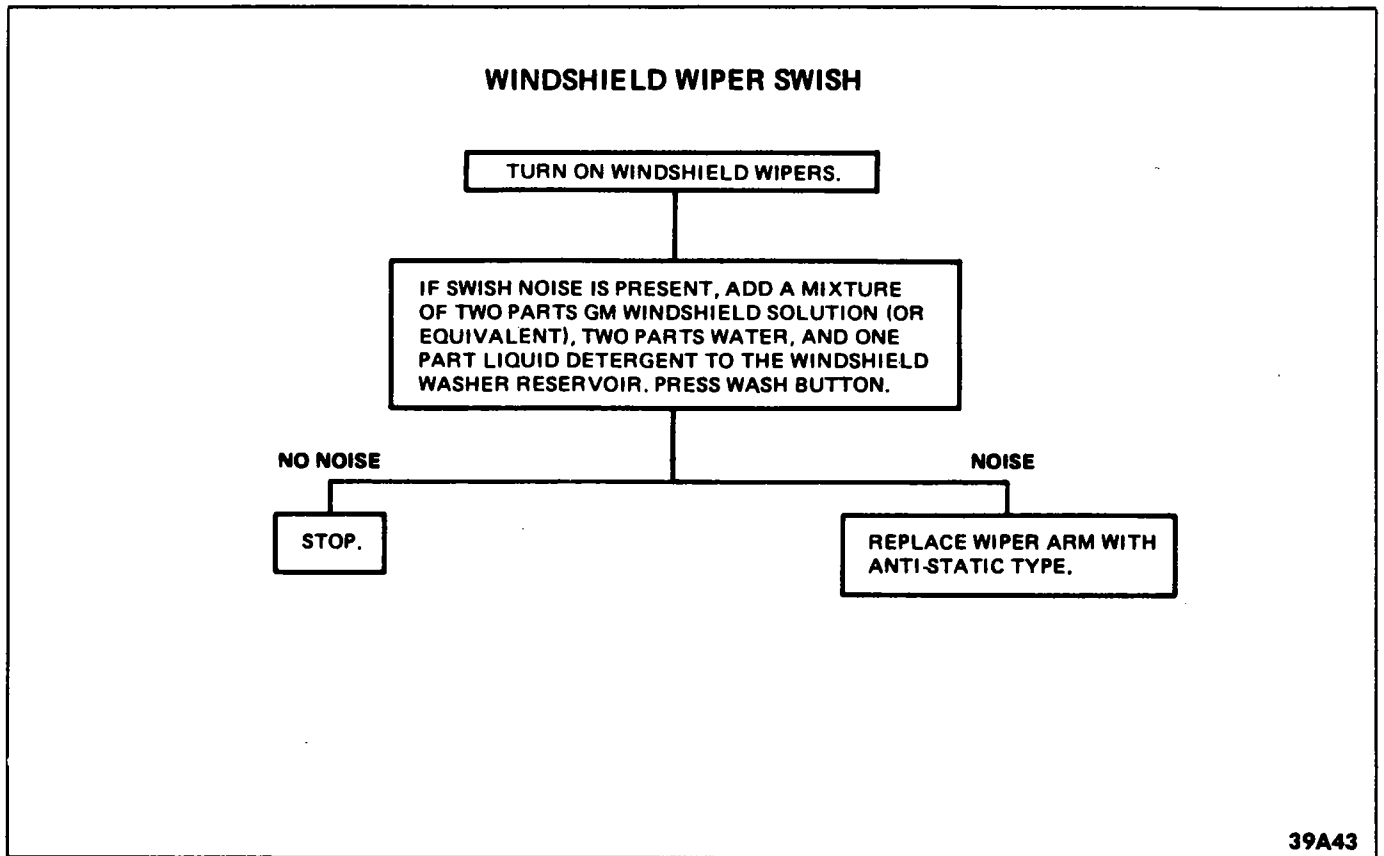


Figure 9A-36 Chart 17-Windshield Wiper Noise (Static)

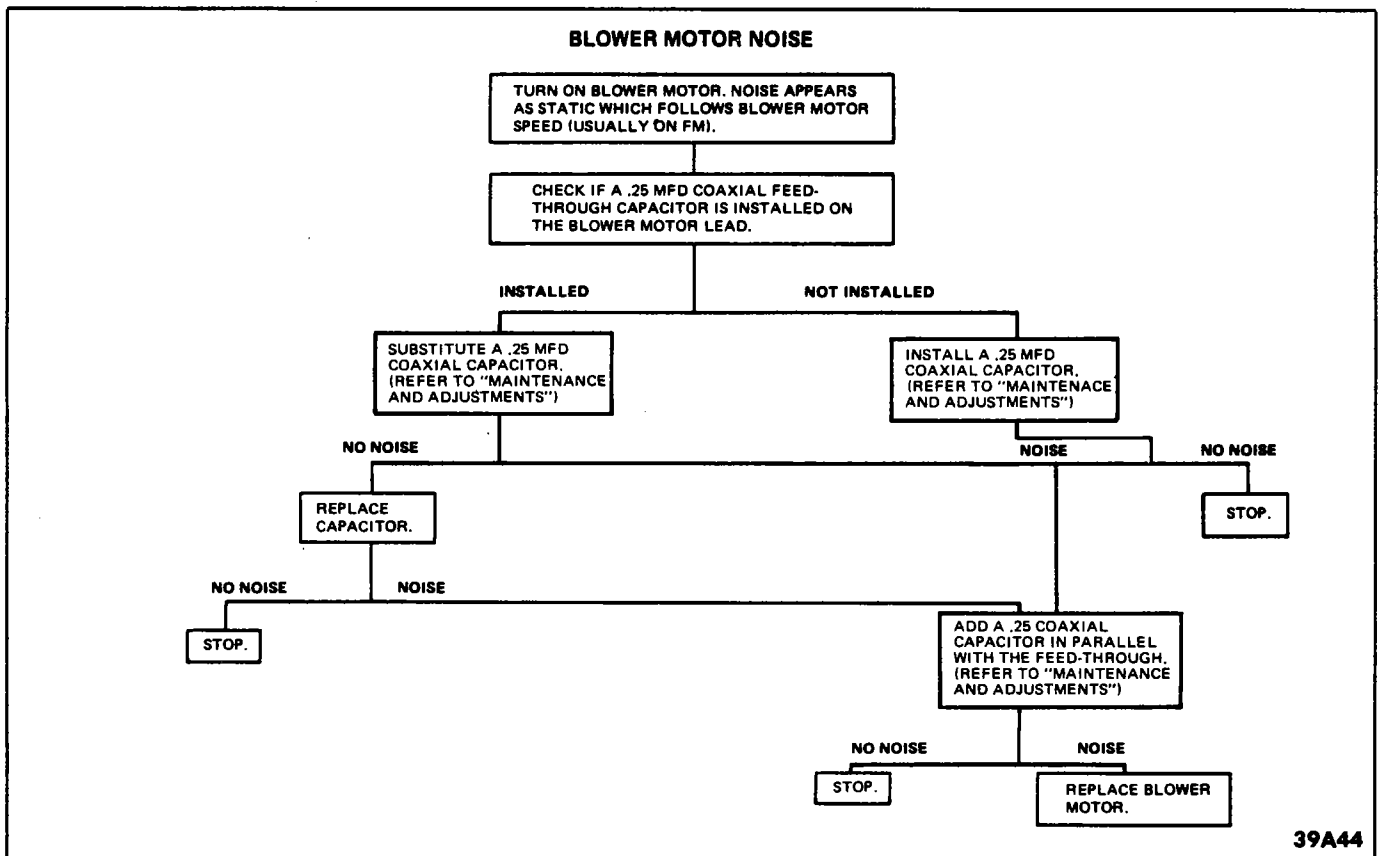
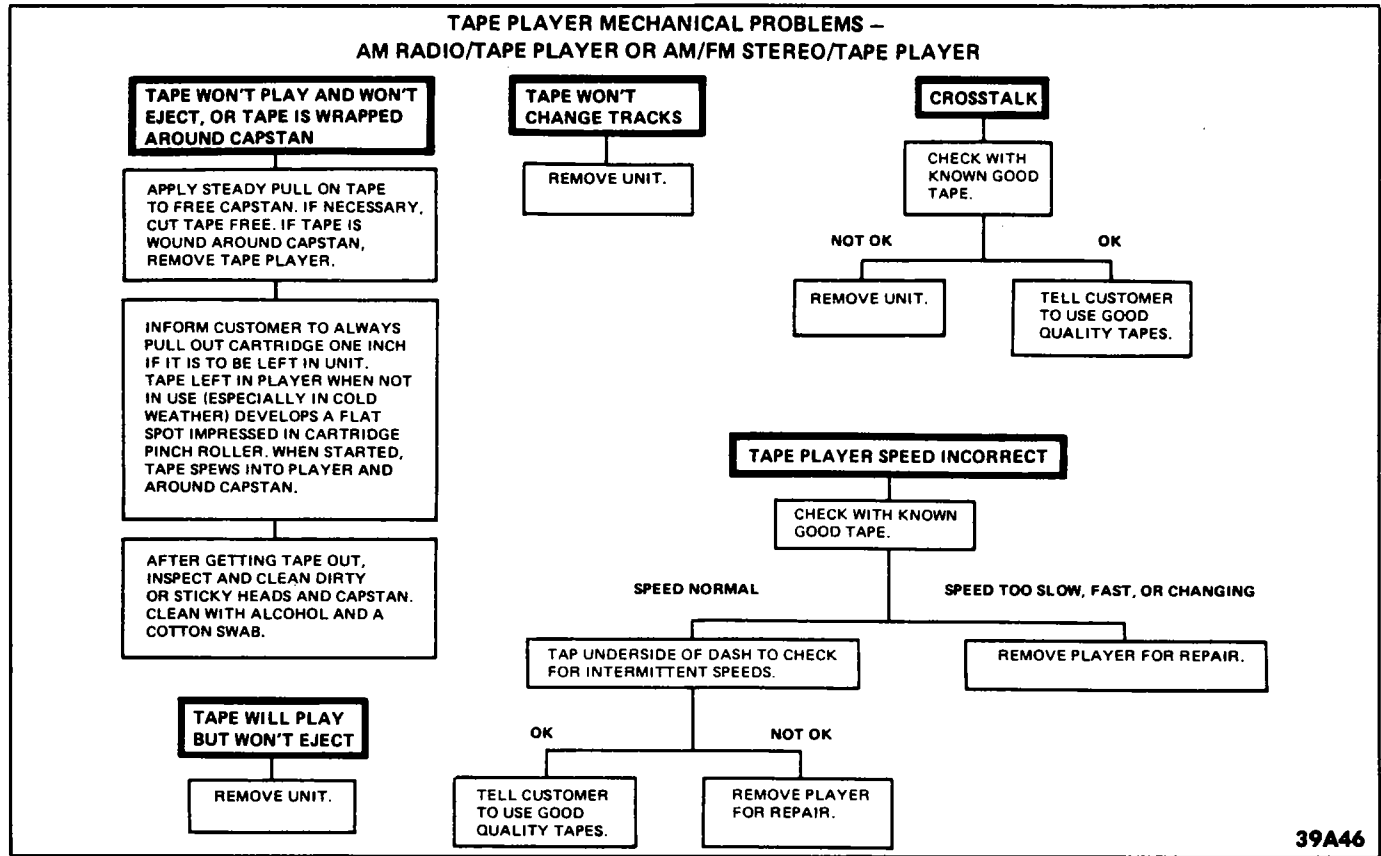
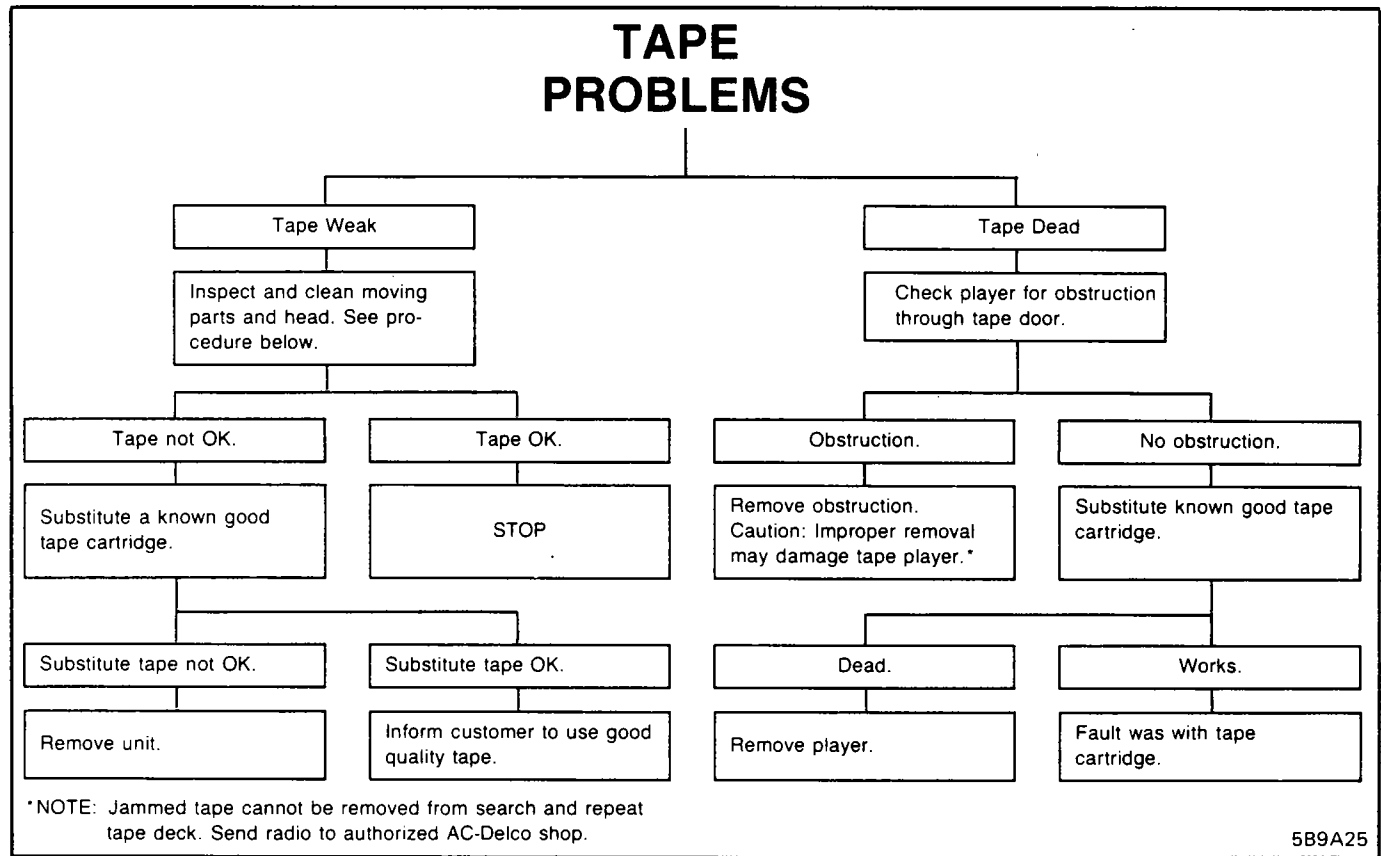


Figure 9A-37 Chart 18-Noise from Blower Motor



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Figure 9A-38 Chart 19-Tape Player-Mechanical



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Figure 9A-39 Chart 20-Tape Player Problems

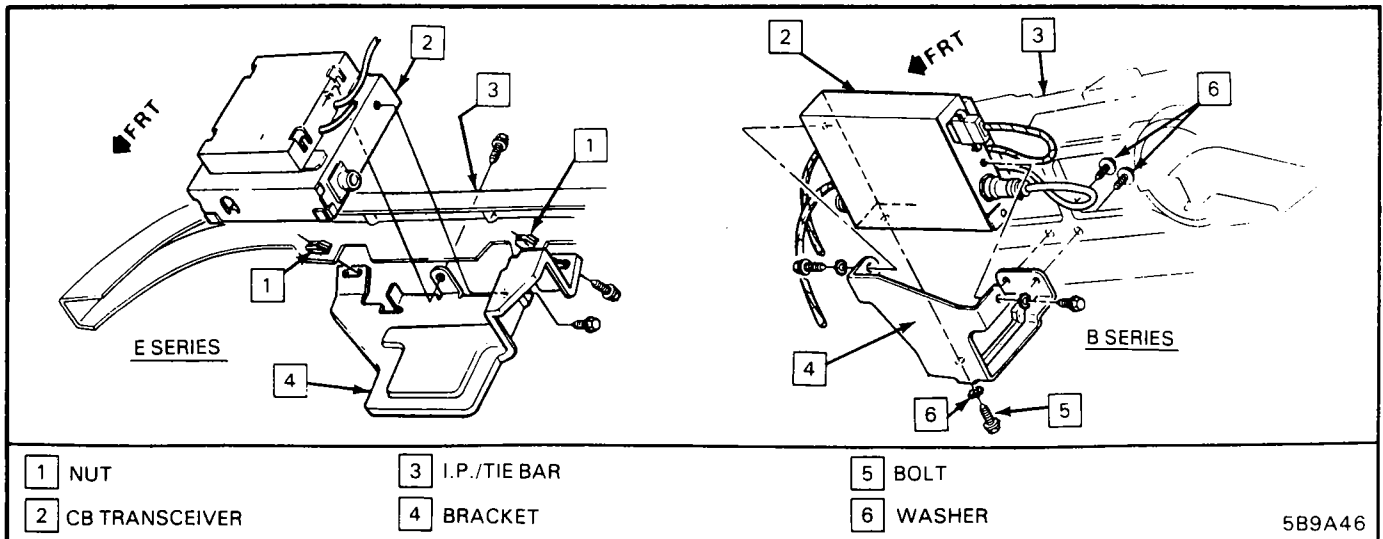


Figure 9A-40 CB Transceiver Installation (Typical)

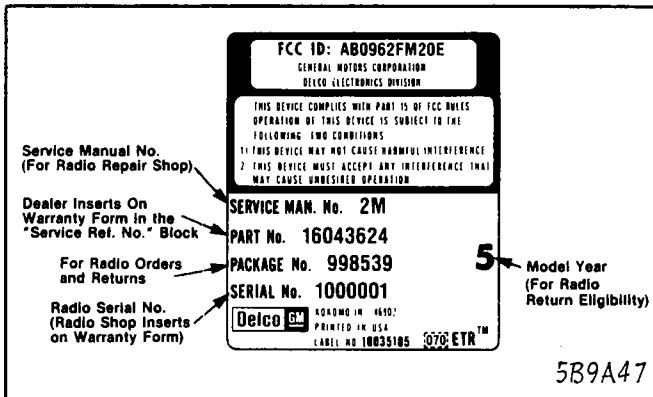


Figure 9A-41 ETR Warranty Label

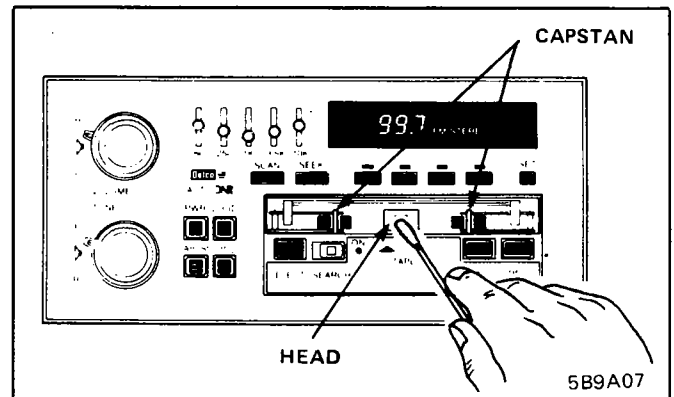


Figure 9A-42 Capstan Cleaning

TAPE PLAYER MAINTENANCE

Tape Head and Capstan Cleaning

(See Figures 9A-42 & 9A-43)

There are two parts that are cleaned on a tape player; the head and the capstan. Since they can be reached through the tape door, leave the tape player in the car. Optimum performance can be maintained by cleaning the internal tape head, capstan, and pinch roller periodically (approx. each 100 hours of operation). This can be done by inserting a nonabrasive cleaning cassette in place of the music tape.

To clean the head and capstan, use a cotton swab dipped in ordinary rubbing alcohol. Wipe the head and capstan as shown in Figures 9A-42 and 9A-43. Clean pickup head, tape guides and capstan (revolving metal post) after every 100 hours of operation.

Do not bring any magnetized tools near the tape head, if the head becomes magnetized, every cartridge played in the player will be degraded.

Cartridge and Tape Player Care

When leaving the car, cassettes may be left in the tape player if the deck is the "auto reverse" type (tapes are either automatically ejected or internally protected). In other models, tapes should be removed to prevent possible damage to the tape or tape player.

Store cartridges away from extreme heat or direct sunlight, and protect the open end from dirt or damage; store tapes in protective cases.

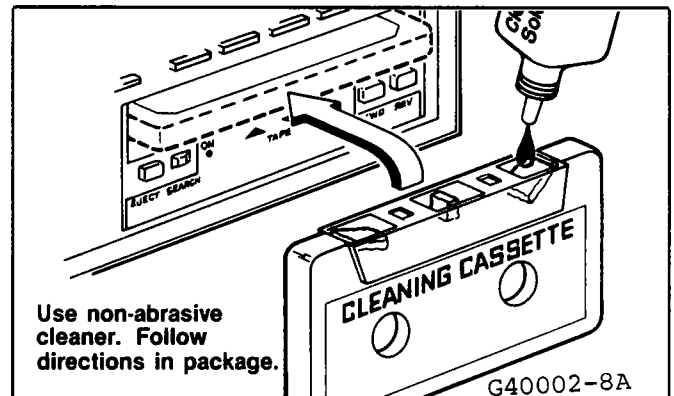


Figure 9A-43 Using Cleaning Cassette to Clean Head and Capstan

ANTENNA TRIMMER ADJUSTMENT

The antenna trimmer adjustment matches the antenna coil in the radio to the car antenna. Only AM radios, or the AM part of AM/FM radios, need this adjustment. ETR radios do not have trim adjustment. (See Figure 9A-44.)

1. Tune the radio to a weak AM station near 1400 KHz. Turn the volume all the way up. You should barely hear the station. (Fender mounted antennas should be fully extended).
2. Remove the right inner and outer knobs.
3. Use a small screwdriver to adjust the trimmer screw. Adjust the setscrew for the loudest volume.

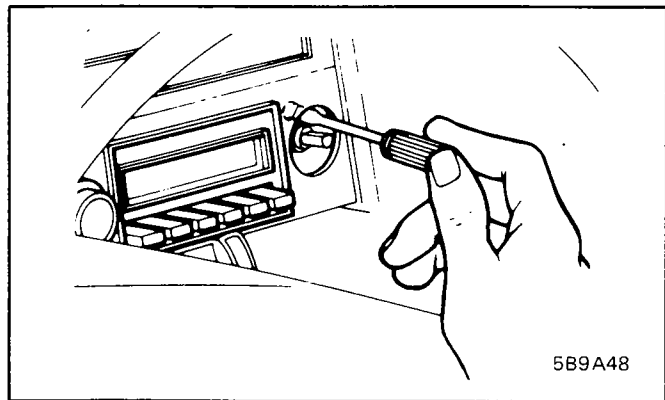


Figure 9A-44 Adjusting Trimmer for Best AM Reception

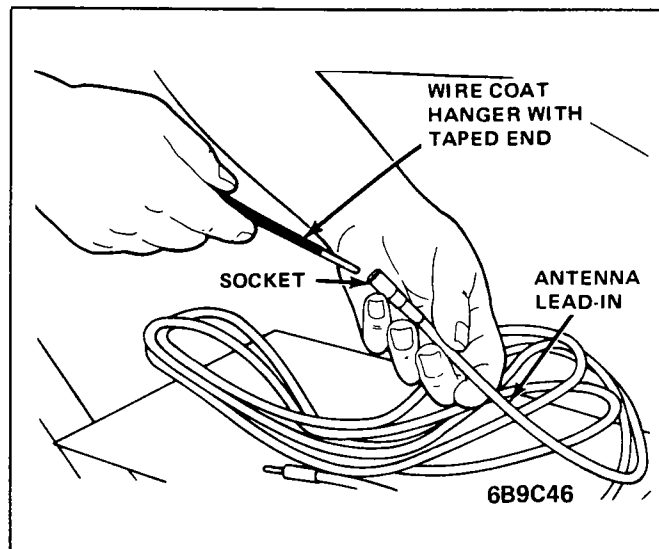


Figure 9A-46 Antenna Lead Test Probe

NOISE SUPPRESSION

TEST KIT

The following equipment should be part of the test kit for radio diagnosis and noise suppression.

1. Volt/ohmmeter
2. Capacitor, 0.5 MFD—fuse block or 1.5 for generator (several)
3. Capacitor, 0.5 MFD—general purpose (several)
4. Capacitor, 0.25 MFD coaxial feed-through—blower motor
5. Ground braid (several)
6. Hood ground clip—ground hood to car chassis (several)
7. Speakers/leads (2)
8. Antenna with 6 ft. lead-in
9. Test cartridge for tape player
10. Alcohol and swabs
11. 12 in. x 36 in. section of screening
12. Alligator clip heads
13. 9-12 ft. lead-in test probe
14. Test Probe

The kit should include one capacitor (Item No. 3) equipped with alligator clips (Figure 9A-45) for quick connect and disconnect.

A test probe can be made (Item No. 14) out of a long antenna lead-in (nine to twelve feet). If one end of the lead-in already has a female socket, cut a three inch piece of coat hanger to fit in the socket and tape over the end (Figure 9A-46). If there is no socket, cut away the shield on the end of the lead-in as shown in Figure 9A-47.

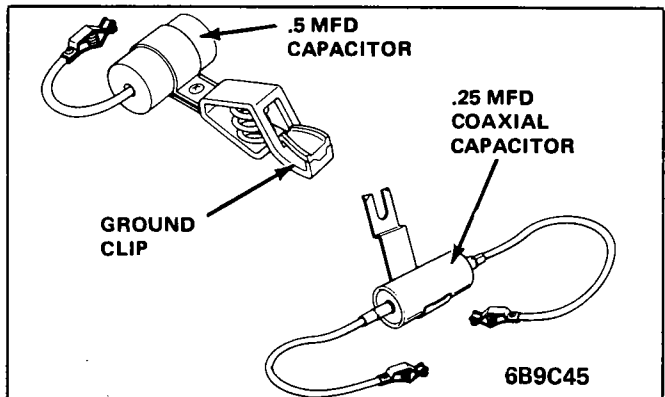


Figure 9A-45 Test Capacitors with Alligator Clips

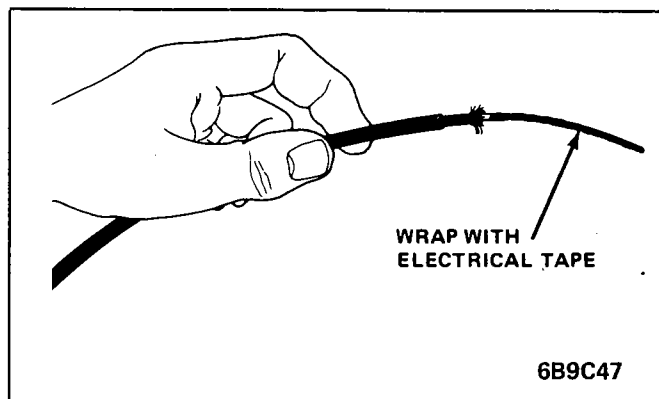


Figure 9A-47 Antenna Lead Test Probe

Using Test Probe

1. Unplug the antenna. Plug the test probe into the antenna socket.
2. Start the car, and turn the radio on.
3. Use the end of the lead-in to probe for "hot spots." Check the harnesses, upper part of the dash, and under the hood. Do not hold the end of the probe, or you will get distorted results.
4. When you get near a "hot spot" with the probe, the radio will become noisy. There will be some noise everywhere, but it will be most concentrated at a "hot spot."

NOTICE: Do not touch hot area with probe. Damage can result to radio.

Preliminary Steps for Suppressing Noise

1. Make sure vehicle's engine is properly tuned.
2. Clean and tighten all electrical connections (including generator, battery, regulator, and coil connections).

Preliminary Steps To Suppressing Noise

1. Make sure the vehicle's engine is well tuned.
2. Clean and tighten all electrical connections (including generator, battery, regulator and coil connections).
3. Perform the following maintenance steps as necessary. Clean and regap or replace spark plugs and set ignition timing.

4. Retune the engine according to the maintenance schedule.

NOISE SUPPRESSION METHODS

1. Test for ignition noise by tuning to a weak signal or no signal on channel. Ignition noise may be present at all engine speeds and is a "popping" sound which varies with engine speed. It stops immediately when the ignition key is turned off with the engine at a fast idle.
2. A "whining" noise which varies with engine speed and continues with the ignition turned off and the vehicle coasting in gear is a characteristic of the generator.
3. An irregular "clicking" sound which disappears at a slow idle characterizes the voltage regulator.
4. Irregular popping noises which vary with road surfaces indicate static discharge at any of several locations in the vehicle. Tighten loose nuts and bolts and bond large areas such as the fenders, exhaust pipe, firewall, etc. to the frame with heavy braid.

Adding a capacitor to stop radio noise does not have any adverse effect on the electrical circuit or the unit that is creating the noise. Sometimes, it is necessary to add more than one capacitor to eliminate a radio noise.

Connecting Capacitor to Fuse Block

1. Connect a 0.5 MFD ignition-type capacitor to the fuse block ignition terminal for the radio fuse. Ground the capacitor at the fuse block mounting stud.
2. Turn on the radio.
3. If the noise remains, try the other terminals on the fuse block.
4. If a connection is found that makes the noise disappear, install a capacitor permanently.

Connecting Capacitor to Generator

Connect a 250 MFD 100 volt capacitor between generator output and field wire to ground (Figure 9A-48).

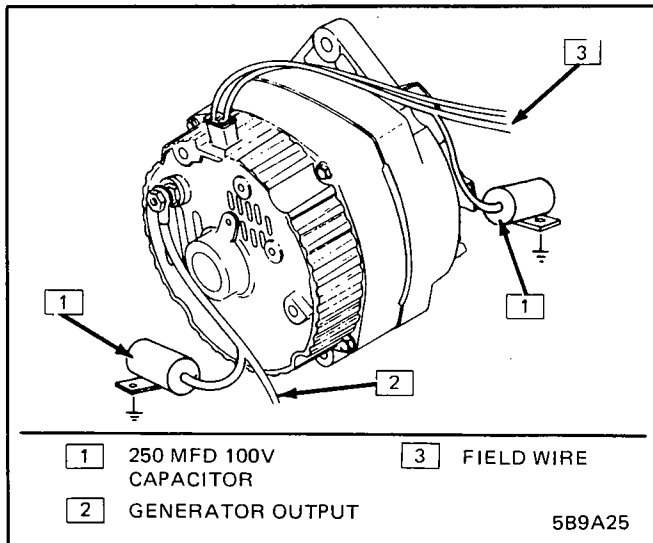


Figure 9A-48 Feed-Thru Capacitor Connected Across Generator

Screening Dash to Reduce Noise

1. Cut out a 36 inch by 12 inch piece of screen. Attach a clip lead to each end of the screen (Figure 9A-49).
2. Make sure the antenna is plugged in. Start the engine, and turn on the radio.

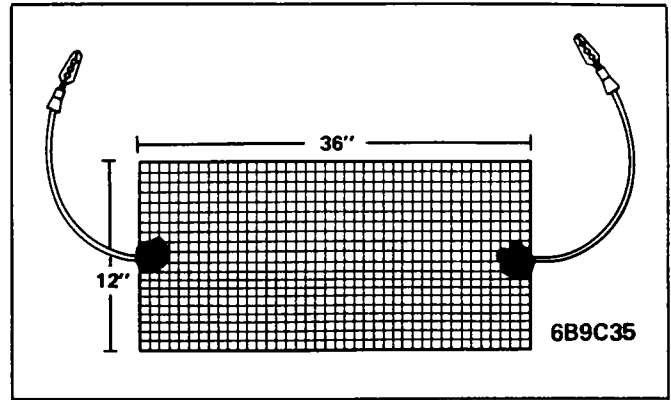


Figure 9A-49 Screen for Shielding the Dash

3. Lay the piece of screen on top of the dash (Figure 9A-50). Attach the clip leads from the screen to the car chassis (bare metal) to achieve a good ground.
4. If the noise reduces or disappears, the cause is under the dash. The screen acts as a shield to remove noise.

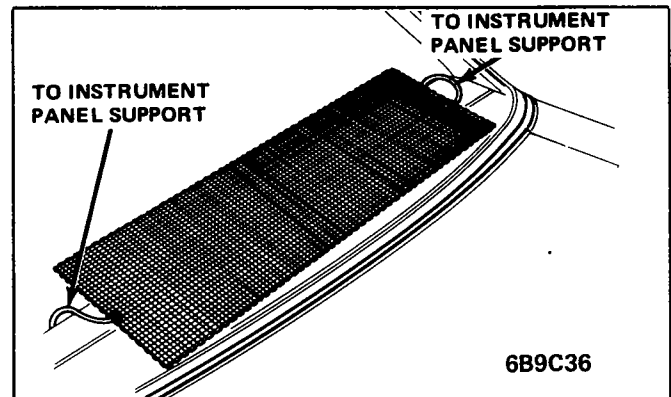


Figure 9A-50 Shielding Screen in Position on Dash

Installing Ground Braids

Install a braided strap in a "hot spot" area under the dash to improve ground connection (Figure 9A-51).

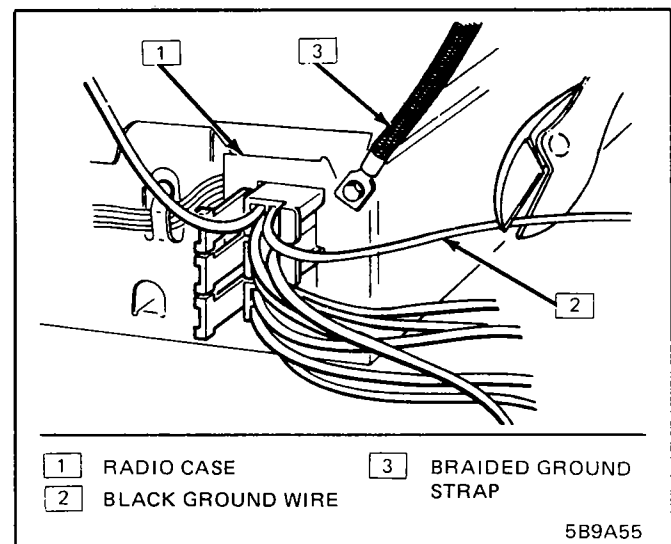


Figure 9A-51 Braided Strap to Radio Case Improves Ground Connection

Installing Capacitor on Harness Under Dash

1. Install the lead of a 0.5 MFD capacitor to a 12-volt "hot" wire. Connect it as close as you can to the component you think is causing the noise.
2. Install the case of the capacitor to a ground area.

Switch Pop Elimination

Connect a 0.5 MFD capacitor rated at 50 VDC from: (1) the hot side of the switch to ground, (2) across the switch contacts, or (3) both.

Blower Motor Noise

1. Disconnect the feed wire from the blower motor.
2. Install "feed-through" capacitor (#3906145 or equivalent)-to the blower motor (Figure 9A-52). Connect one lead to the feed wire; connect the other wire to the field wire and securely ground the ground tab on capacitor body. Be sure the capacitor has a good ground, or the noise will not be eliminated.

On cars equipped with FM radio, the capacitor is already installed. So when a capacitor is found on the blower motor, make sure that it is functioning correctly.

There is a filter package installed inside every blower motor from the factory so this installation probably won't be necessary.

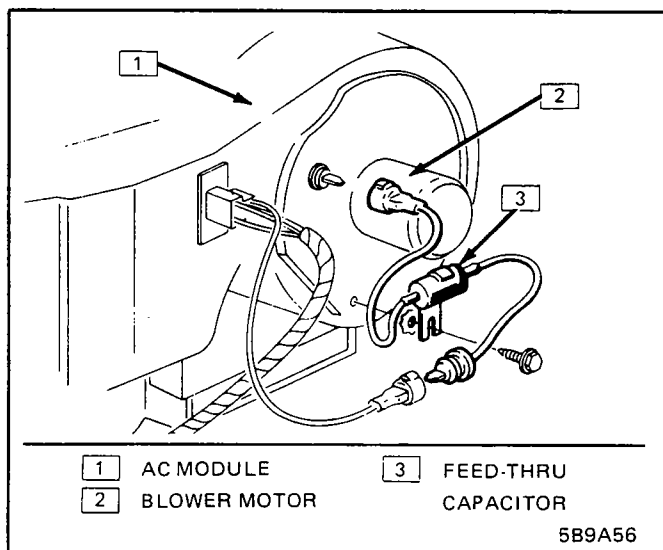


Figure 9A-52 Connecting Feed-Thru Capacitor to Blower Motor

3. If Step 2 is not effective, connect a ground braid as shown in Figure 9A-53.
4. If the noise is still present, add a 0.25 MFD coaxial capacitor in parallel with the first one as shown in Figure 9A-54.

EVRV NOISE SUPPRESSION

(See Figure 9A-55)

NOISE GENERATED BY ACCESSORIES

Automatic Trunk Pull-Down Motor Noise

Install a 0.5 MFD capacitor from orange wire of the pull down motor to ground at the plug. Ground the black wire to a good (solid) ground. Make sure area where the black wire is ground is clean and shiny. Scrape away paint at connection to trunk if necessary.

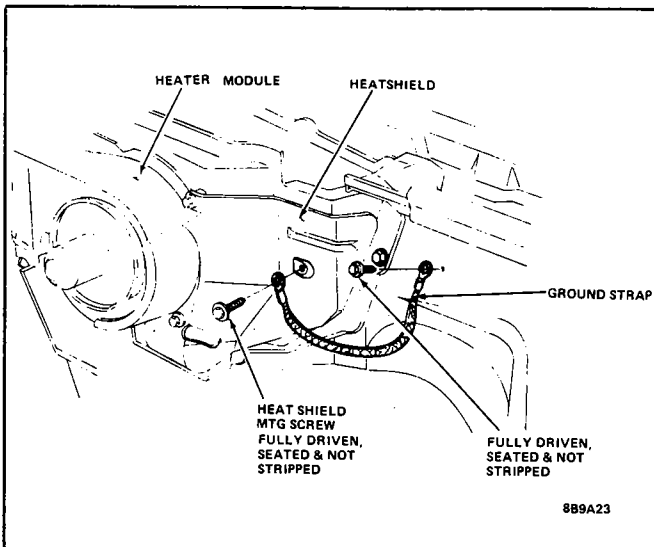


Figure 9A-53 Ground Strap, Heater Module to Dash

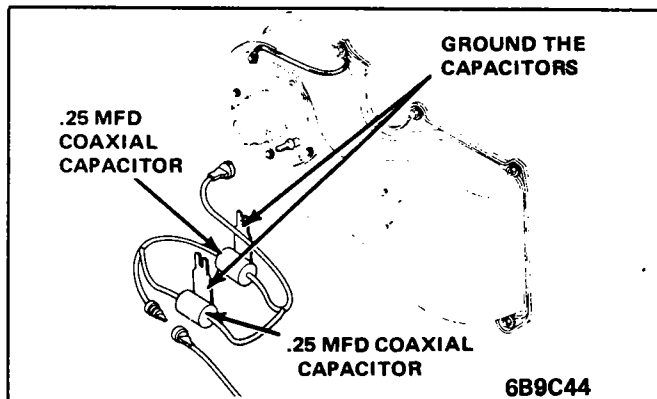


Figure 9A-54 Two Capacitors Installed in Parallel on Blower Motor

Blower Switch Pop (High Speed Setting Turned OFF)

Install a diode (P/# IN4001 or equivalent capable of withstanding a 50V inverse peak voltage) from the (orange) high speed switch wire to ground on the high speed blower relay (under the hood).

Brake Switch Pop

Install a 0.5 MFD capacitor between the two wires going to the brake switch at the brake pedal. Also, install a 0.5 MFD capacitor from the 14V lead to ground at the brake switch.

Cruise Control Pop (Electronics Module)

Install a new electronic cruise control module. Suppression is built into the new modules.

Cruise Control Pop (Transducer Type)

For cruise control engage and disengage pops, install a 0.5 MFD capacitor from the hold line at the transducer to ground. If disengage pops are still present, splice a 0.5 MFD capacitor across the contacts of the disengage switch at the brake pedal (see Figure 9A-56).

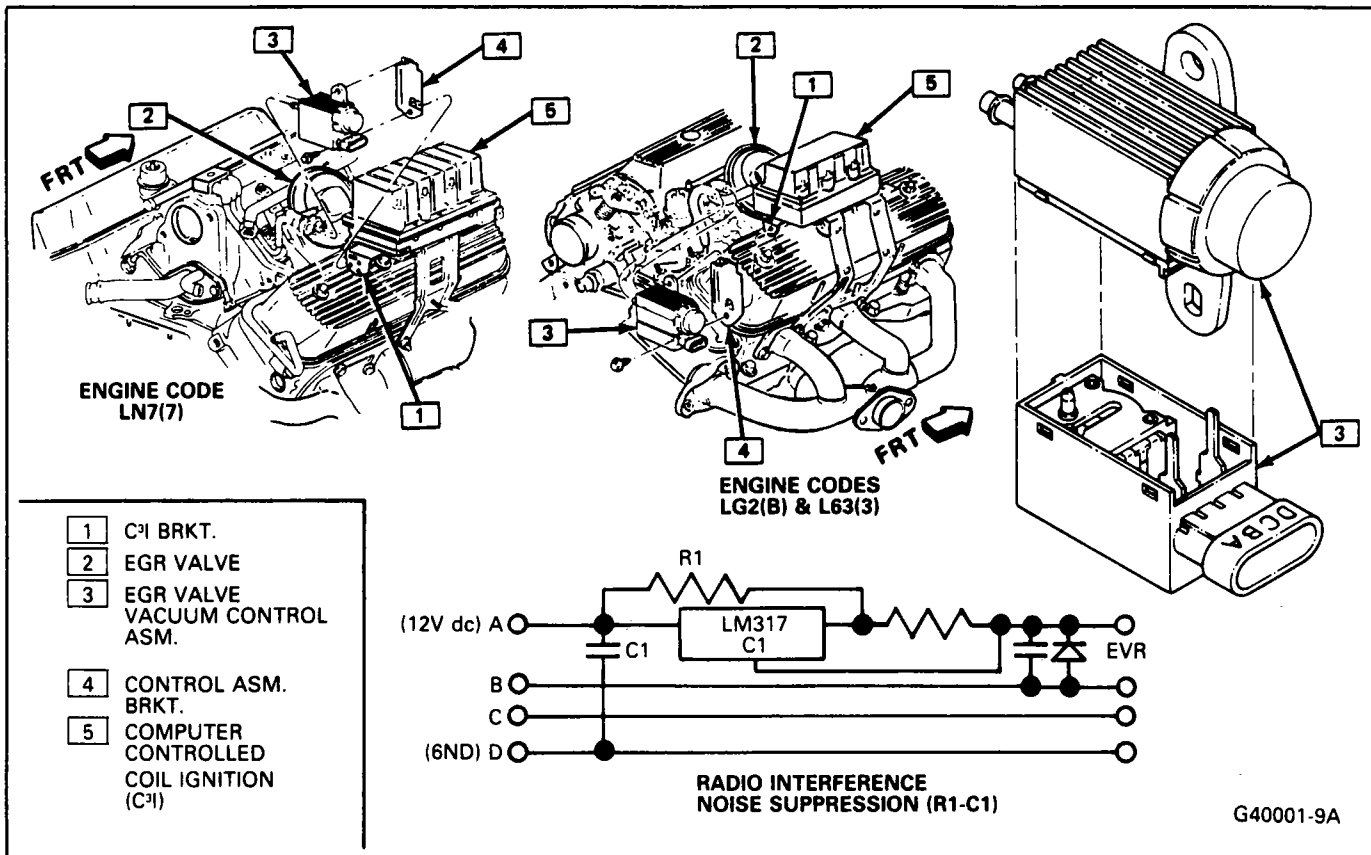


Figure 9A-55 EGR Vacuum Control (EVRV) Assembly Noise Suppression

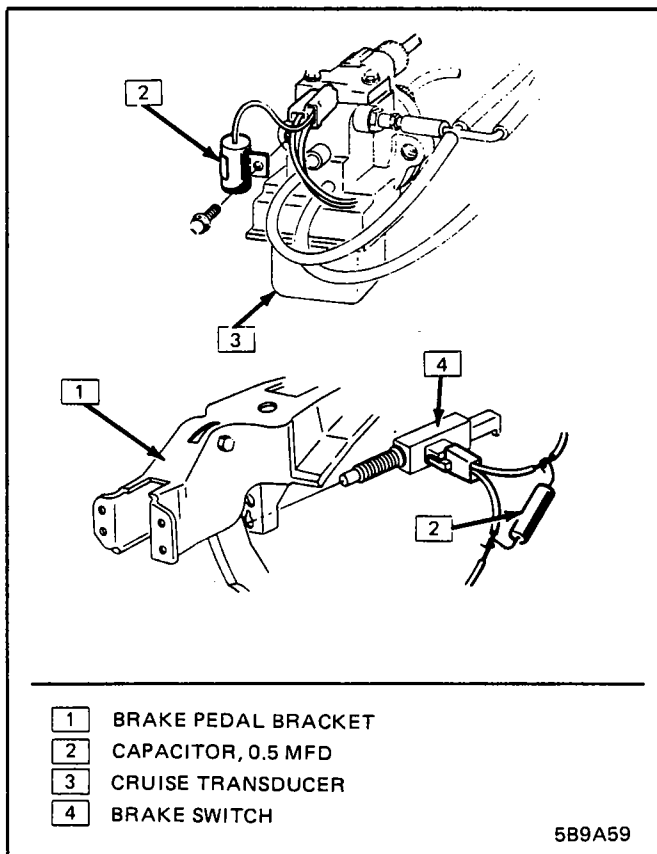


Figure 9A-56 Cruise Control Noise Filters

Automatic Door Locks Pop (Doors Unlock When Car Is In Park)

Install a 470 ohm resistor across coil of "lock enable" relay.

Flash-To-Pass

Install a 470 ohm resistor across the relay coil.

Horn Blow-Thru Noise or Hash (Static In Speakers)

Splice blower motor capacitors into each lead as indicated. Install the capacitors as close to the horn as possible. Ground the case of the capacitor to chassis ground using metal ground tab on the capacitor. The technician should solder all connections instead of using quick connects. See Figure 9A-57.

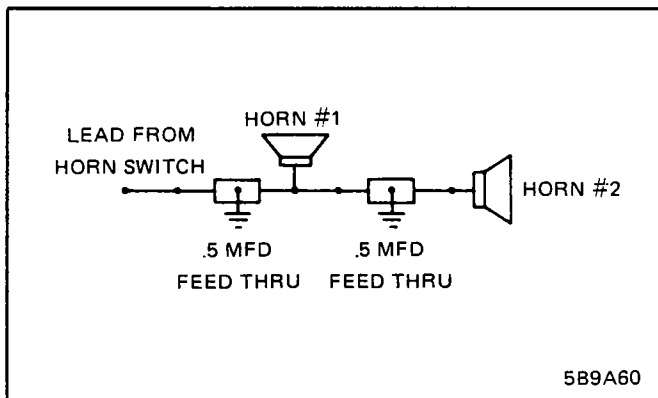


Figure 9A-57 "Feed-Thru" Capacitors Reduce Horn Switch Pop

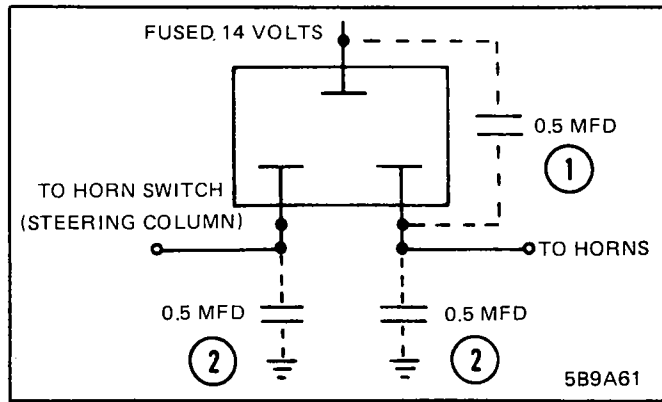


Figure 9A-58 Eliminating Horn Switch Pop With Capacitors

If pop persists, install a 0.5 MFD capacitor from the switched 14 volt lead of the horn relay to ground and a 0.5 MFD capacitor from the horn lead to ground. See Figure 9A-58. Also, install a 0.5 MFD capacitor between the switched 14 volt lead and horn lead at the horn relay.

Windshield Wiper Noise (Delay Wipe)

Replace the wipe motor relay with one which has internal suppression.

Windshield Washer Pump Noise

Replace the pump motor with one which has internal suppression.

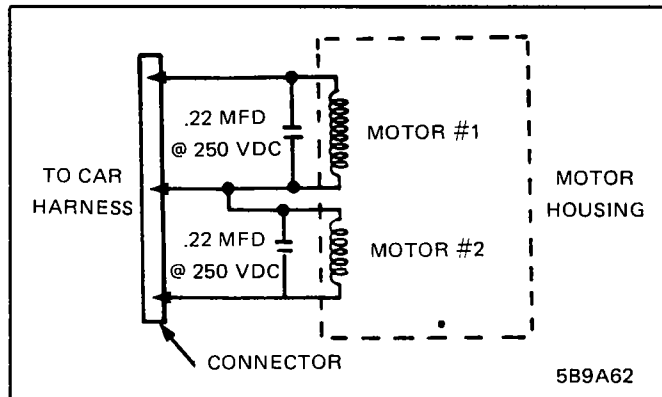


Figure 9A-59 Reducing Noise From Power Mirror Motors With Capacitors

Power Mirror Motor Noise

Install a 0.22 MFD capacitor across each motor. The capacitor should be as close to the motor as possible. See Figure 9A-59.

Rear Defogger Noise or Hash

A broken grid in the rear glass defogger may cause a "hash" in the radio. Repairing this break will eliminate the noise. A break in the rear defogger grid can be found by touching each "line" of the grid while the rear defogger is on. The cold grid is the one broken.

Power Seat Recliner Motor

Install a 0.1 MFD capacitor rated at 50 VDC across the motor.

Power Seat (One Motor) Noise

Install a 0.5 MFD capacitor rated at 50 VDC across each solenoid clutch. The solenoid clutch is also known as a transmission assembly.

Power Seat (Three Motors) Noise

Install a 0.1 MFD capacitor rated at 50 VDC across each motor.

Other Electric Motor Noises (i.e. Power Windows, Blower Motors)

Install a 0.5 MFD capacitor rated at 50VDC across each motor.

POWER ANTENNA

See Figures 9A-60 and 9A-61

Remove negative cable from battery before servicing antenna. Disconnect antenna lead-in wire and power wires from relay in dash by glove box.

- On A Series vehicles it will be helpful to turn the steering wheel to the far right stop. Also remove the front wheelhouse panel fasteners to gain access.
- On J Series turn wheel to far left stop and remove splash shield.
- On B, and E - when equipped with Tri-band, unscrew stub bead (knob) from top of antenna and unscrew loading coil. Remove the 3 rearmost fender panel to wheelhouse attaching screws. Also remove the lower 4 screws attaching the fender panel to door line support. This can be done by opening the door to the half open position. Using a 1/4 inch drive set with a six inch extension and universal, remove the lowest screw from inside the door. Move the door to full open and remove the next 3 screws from outside the door. On some B Series it may be necessary to remove rocker panel molding.

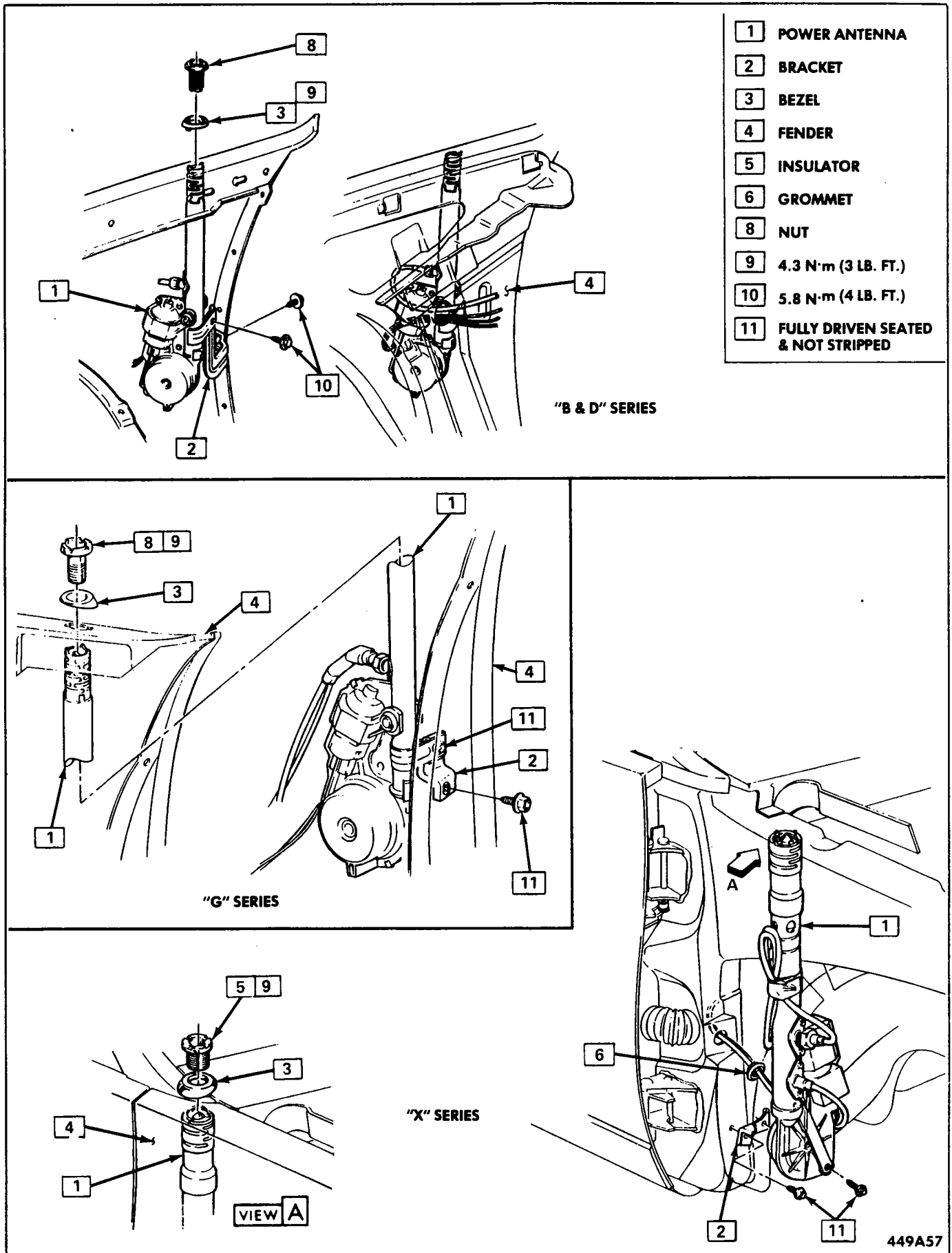


Figure 9A-60 Power Antenna Mounting (B & G Carlines)

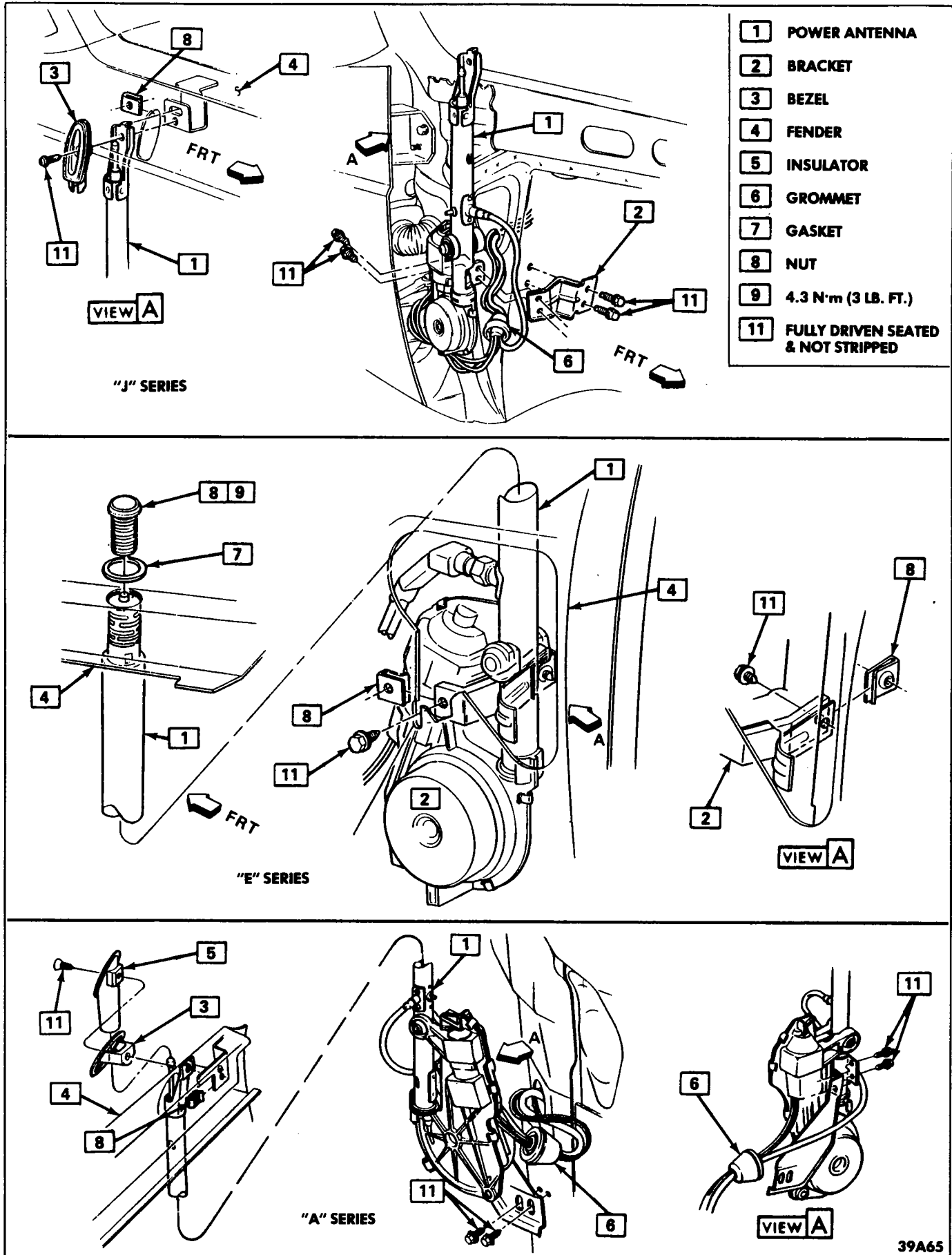
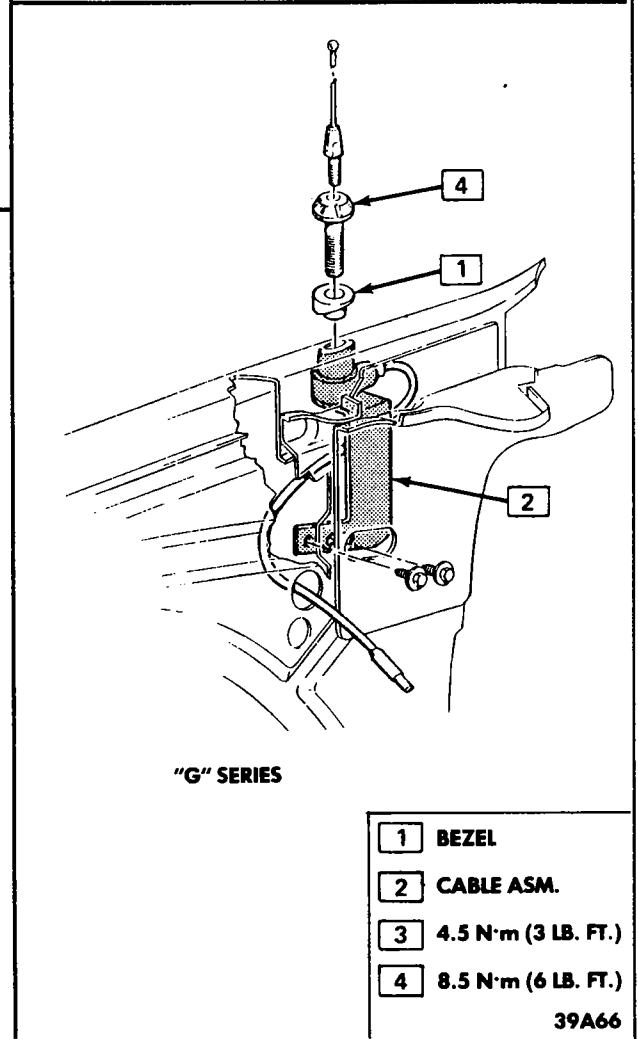
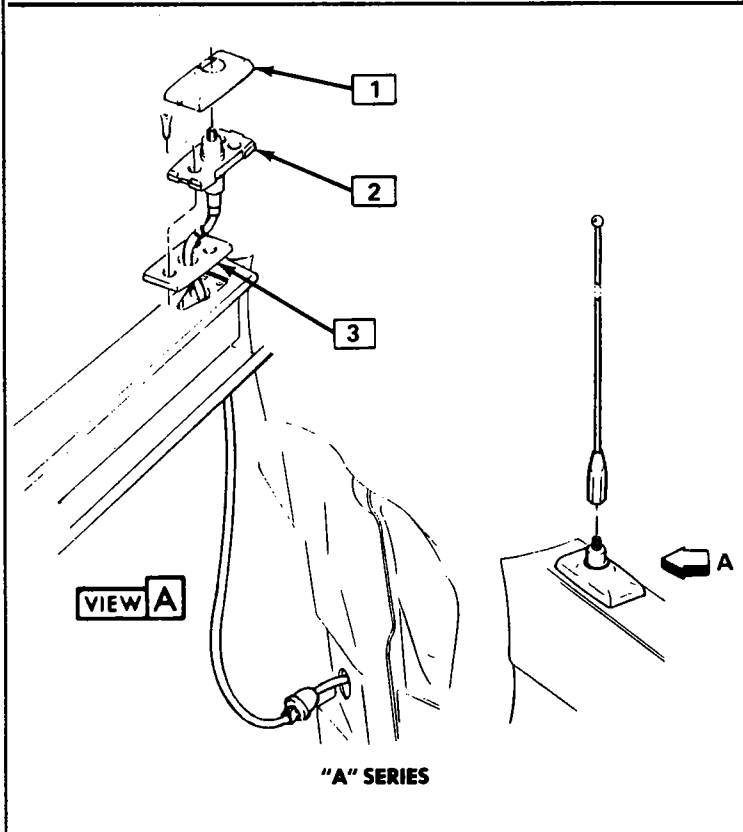
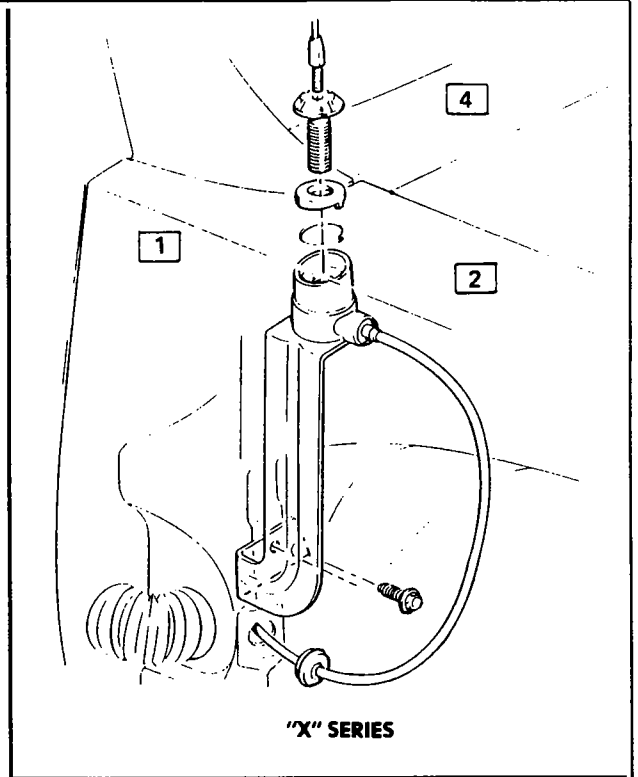
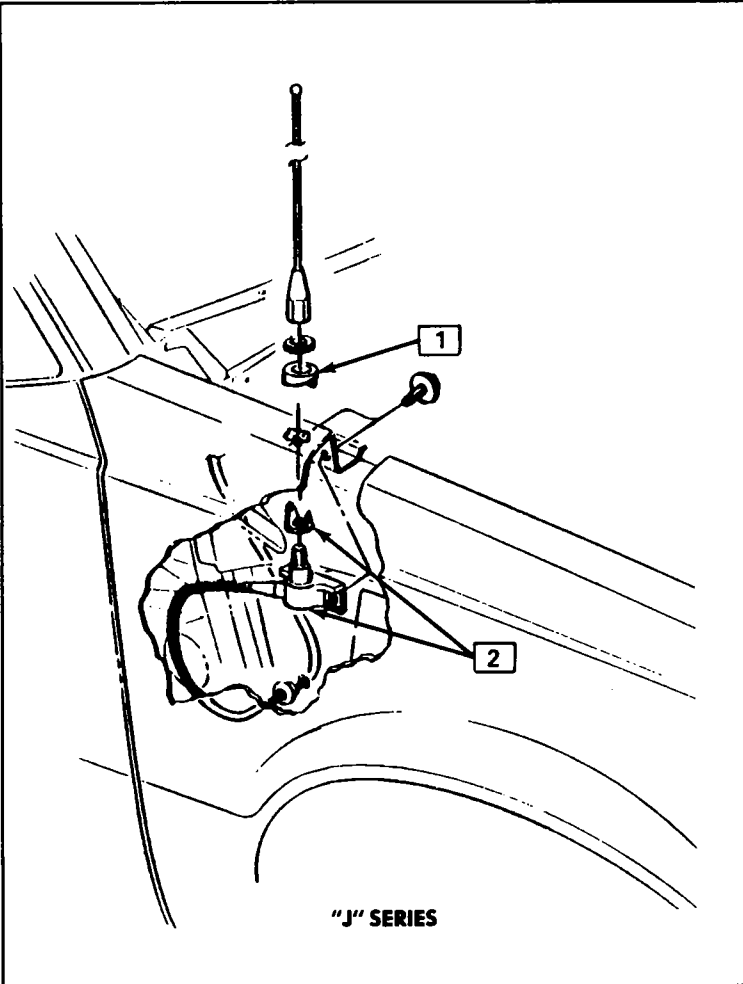


Figure 9A-61 Power Antenna Mounting (A, E & J Carlines)



- 1 BEZEL
 - 2 CABLE ASM.
 - 3 4.5 N·m (3 LB. FT.)
 - 4 8.5 N·m (6 LB. FT.)
- 39A66

Figure 9A-62 Fixed Mast Antenna Mounting (A, J, & G Carlines)

9A-40 RADIO-TAPE PLAYER

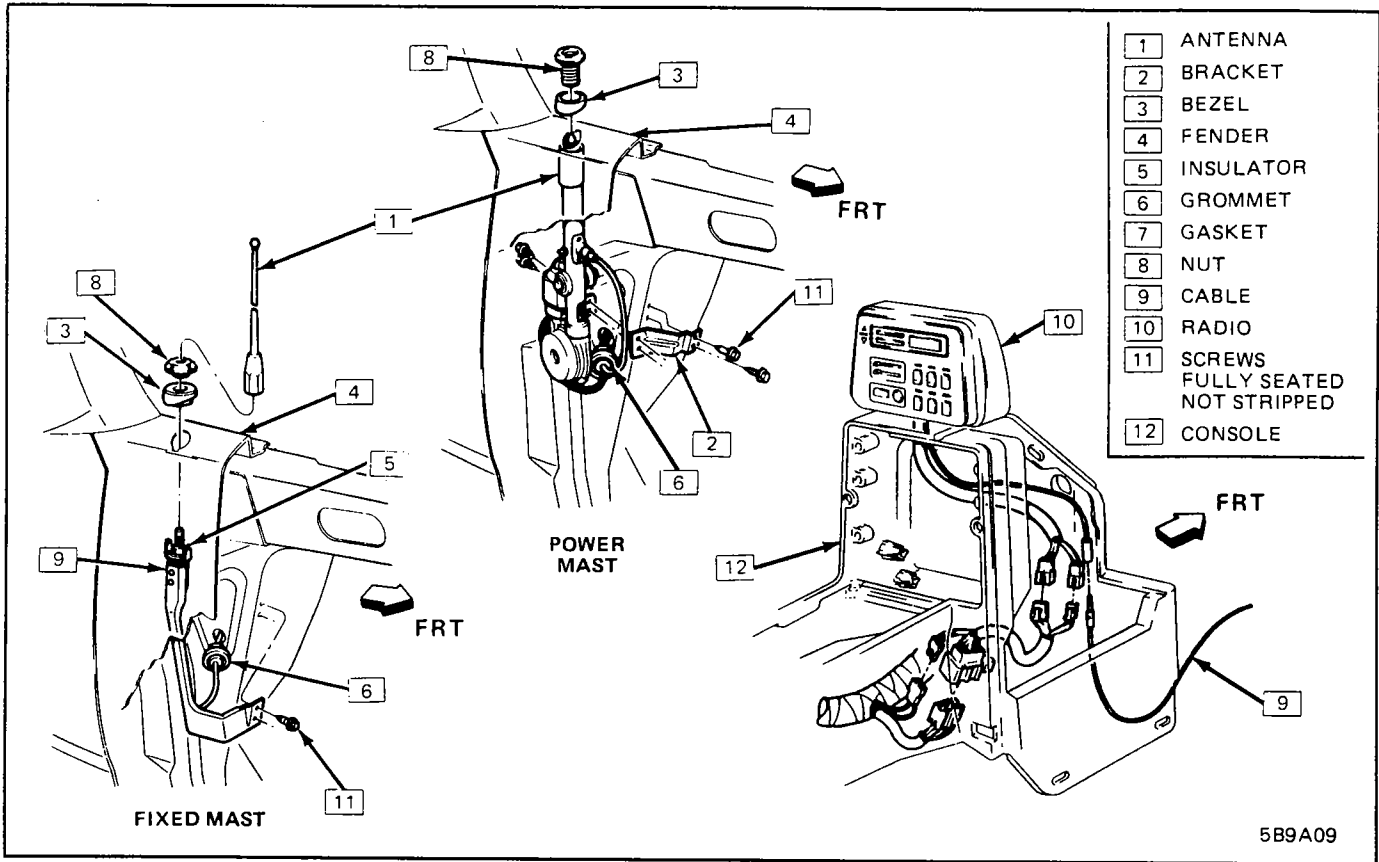


Figure 9A-63 Antenna Mounting & Cable Routing (N Carline)

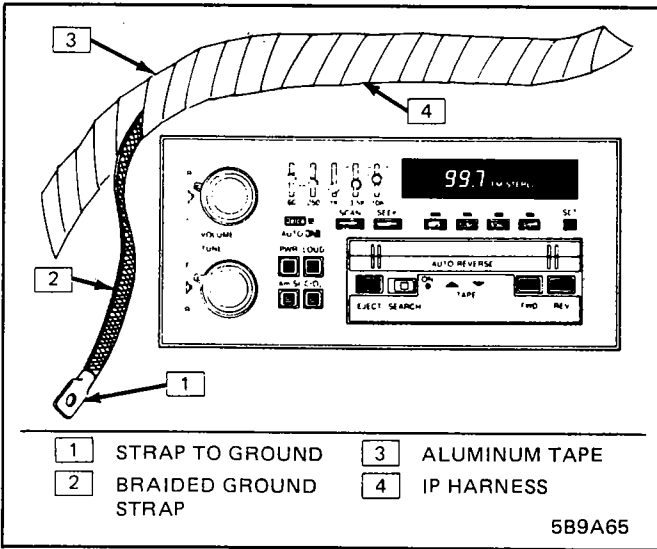


Figure 9A-64 IP Harness Shielded with Aluminum Tape (See Chart 8)

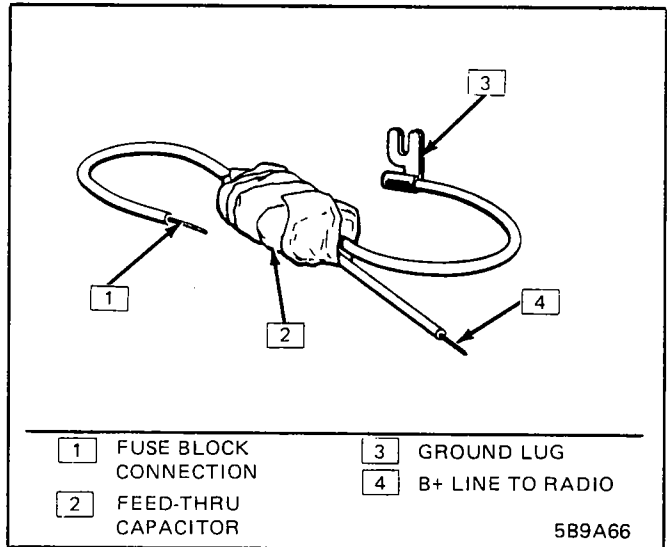


Figure 9A-65 Ignition Line Filter Capacitor (See Chart 8)

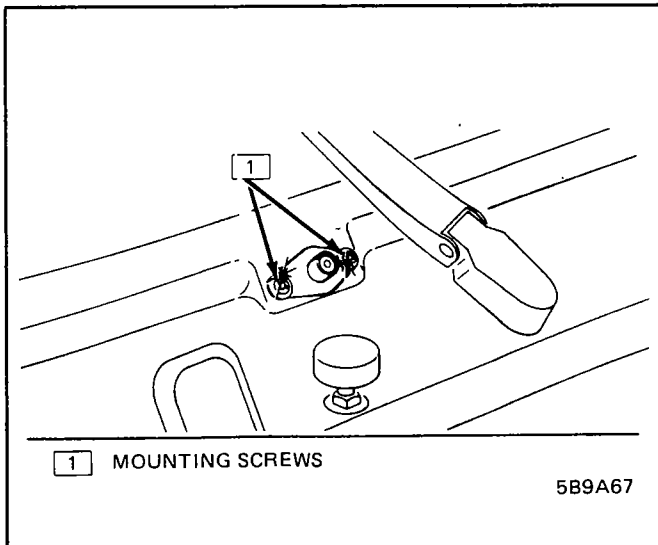


Figure 9A-66 Check for Loose Washer/Cowl Mounting Screws (See Chart 11)

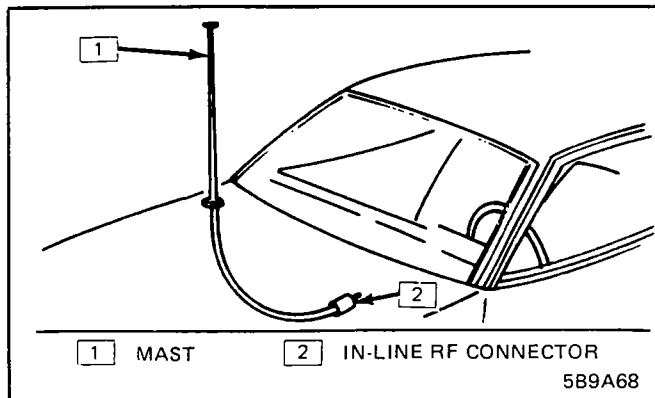


Figure 9A-67 Measure Resistance Between Mast & In-Line Connector (Chart 11)

