

GROUP 11

RADIO, HEATER, AIR CONDITIONER

SECTIONS IN GROUP 11

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SECTION 11-A

RADIO

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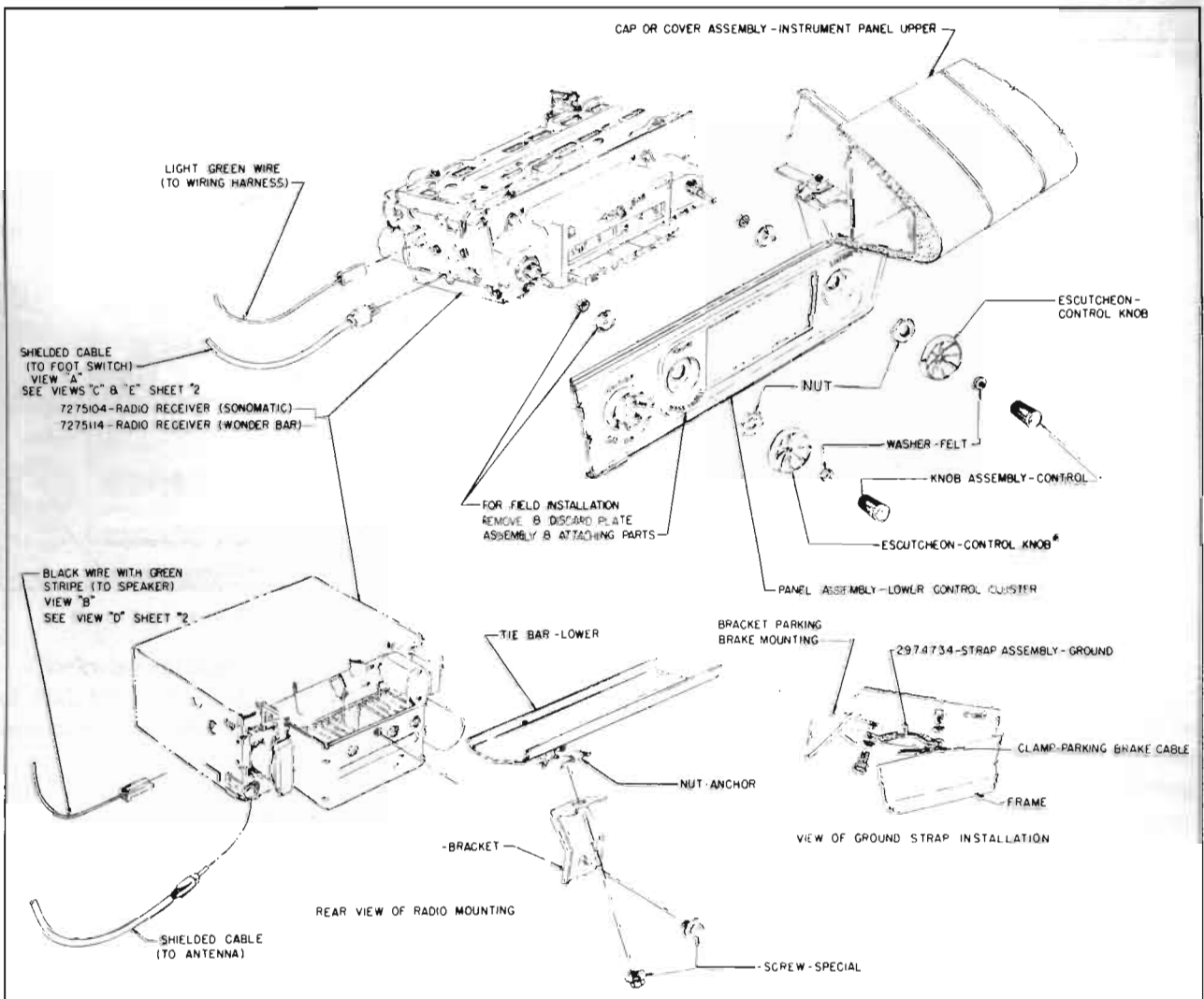


Figure 11-1—Radio Receiver Installation—Illustration #1

11-1 BUICK RADIO DESCRIPTION AND OPERATING INSTRUCTIONS

a. Description

Two radios are available as optional equipment—the Sonomatic, and the Wonderbar.

The Buick *Sonomatic* and *Wonderbar* radio installation consists of a receiver with separate speaker mounted at the center of the instrument panel. Both radios use the sectional antenna mounted on left front fender, and suppression parts installed at various locations to eliminate interference. The *Wonderbar* radio installation also includes a foot control switch mounted on the toe panel to left of the brake pedal.

The *Wonderbar* and *Sonomatic* have five push buttons for push-tuning of five pre-selected stations. In addition to the push buttons, a control knob permits manual selection of other stations.

The *Wonderbar* radio receiver also contains an automatic signal-seeking tuner by which the

operator can change stations by merely depressing the single selector bar on the receiver, or the foot control switch on the toe panel. The seeking operation is a uni-directional sweep of the broadcast band from low to high frequency with instantaneous return. The tuning mechanism is driven by a spring loaded mechanical motor which is stopped on station by a triggering circuit actuated by voltage developed from an incoming signal. The number of stations on which the tuner will stop can be regulated by use of the sensitivity control on the receiver.

A manual antenna which may be extended and retracted by hand is standard equipment.

An electrically operated antenna is available as optional equipment. Both "Casco" and "Tenna" are used without optional selection of specified make. In both the Casco and Tenna, a motor drives a nylon tape attached to the upper section of the antenna.

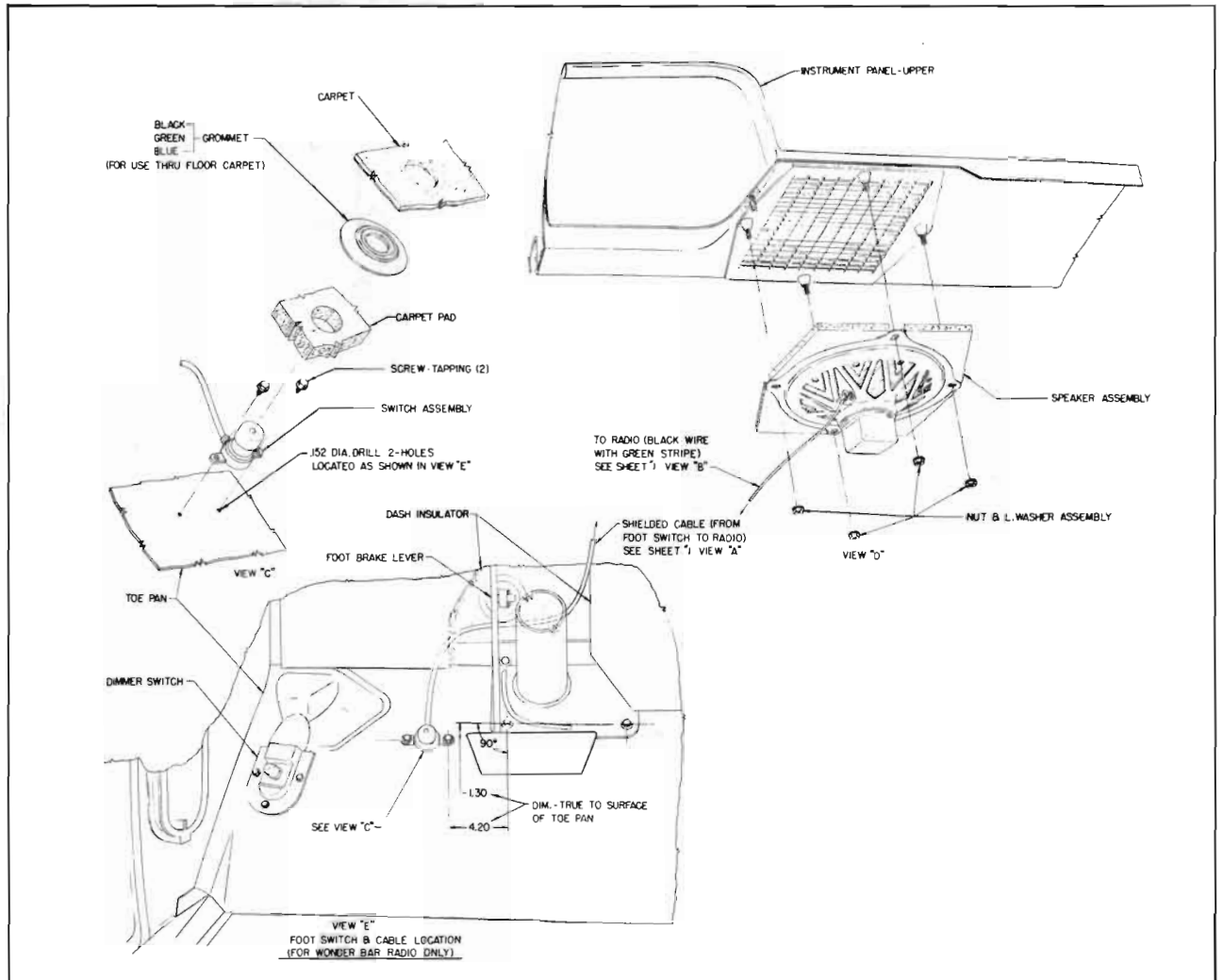


Figure 11-2—Radio Receiver Installation—Illustration #2

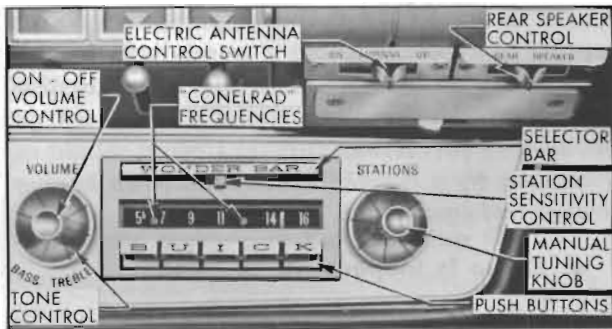


Figure 11-3—Receiver Controls—Wonderbar Radio

A 3-position slide switch on lower edge of instrument panel roll controls the motor, which will run in either direction. Pushing the switch handle to the right raises the antenna and pushing handle to the left lowers the antenna. When the handle is released the switch returns to center "Off" position.

CAUTION: *Never attempt to force an electric antenna up or down by hand. This will cause permanent damage to the operating mechanism.*

b. Switch, Volume, and Tone Control Operation

The engine can be started with the radio on, because of the addition of the audio-power transistor which eliminates the need for a vibrator.

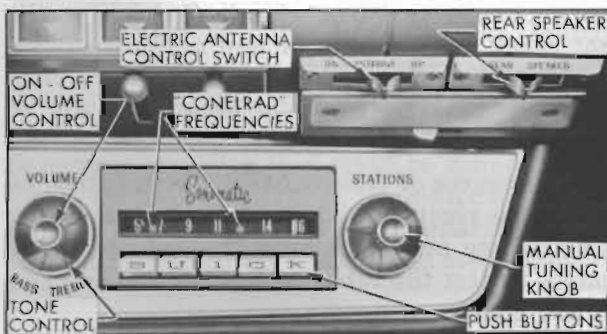


Figure 11-4—Receiver Controls—Sonomatic Radio

Clockwise rotation of the switch knob, to left of dial, turns the radio on, and further rotation increases the volume.

High fidelity (true tone) is provided when the tone control knob, behind the switch knob, is at the mid position of the tone control range. A detent in the circuit provides a method of quick location of this position. Rotation clockwise of the tone control knob will diminish bass speaker response. Rotation counterclockwise will diminish treble speaker response.

The rear seat speaker may be optionally installed at the factory or by the dealer. On the

4800 series the assembly is concealed beneath the package shelf and the bezel is eliminated.

When rear seat speaker is installed, a separate sliding speaker control is mounted on the under side of the upper instrument panel roll.

The right position of the control turns on the rear speaker only, the midway position blends front and rear speakers together in any desired ratio, and the left position turns on the front speaker only. After the volume has been set by the radio volume control, it will remain constant regardless of the position of the rear seat speaker control.

c. Push Button Tuning Operation—Wonderbar or Sonomatic

To tune in the station for which the push button is set simply push the button in as far as possible. The button will move easily at start, then a slightly harder push is required to complete the travel. At end of button travel the tuner will rest at the station for which the button has previously been set as described in paragraph 11-5 (b).

d. Selective Tuning Operation—Wonderbar Radio

NOTE: *To insure adequate sensitivity for selective tuning of the Wonderbar radio it is best to have antenna extended at least half way.*

With the radio turned on, selective tuning of available stations is accomplished by depressing either the selector bar above the dial (fig. 11-3), or the foot control switch on toe panel to left of the brake pedal.

When the bar or switch is fully depressed and released the tuner will automatically move to the right and stop, accurately tuned, when it reaches the next station having adequate strength to stop it. The tuner will stop at a station having adequate strength even though the volume control is not turned up high enough for the station to be audible.

When the tuner reaches the right end of the dial it flies back to the left end and again starts moving to the right until it reaches a station having sufficient strength to stop it. By holding the selector bar or foot control switch down, unwanted stations or areas of the dial can be quickly passed over.

The number of stations on which the tuner will stop in selective tuning is regulated by manual setting of the sensitivity control. This is a step control having three positions. This control is in the circuit only while the tuner is

seeking and does not affect the "on station" sensitivity of the receiver. See Figure 11-3.

Moving the sensitivity control lever to the right position increases the number of stations that can be received. Moving the control lever to the left decreases the number of stations by eliminating those having weak signal strength in the area where the car is located. In the full left position of the control, the tuner will usually stop only on strong local stations only.

If the *Wonder Bar* tuner is operated in certain localities or around buildings where a strong signal is not available, the tuner will automatically search the band from one end to the other without stopping.

The sensitivity control should be moved to the full right position and the antenna fully extended when this condition is encountered.

e. Manual Tuning Operation

The instrument panel manual tuning knob is to right of the dial. See figures 11-3 and 11-4.

On the *Sonomatic* radio, this knob may be used to tune in stations other than those for which the push buttons are set; it is also used when tuning to set the buttons for selected stations. On the *Wonderbar* radio, the tuning knob may also be used to tune in stations that are too weak to stop the electronic tuning mechanism.

When tuning manually, and particularly when setting up a station on one of the push buttons, careful adjustment of the tuning knob is essential to good radio reception.

On push button selection, if the program sounds screechy or distorted, it is probably caused by improper tuning and can be corrected by adjusting the tuning knob slightly. Since the low notes are apparently more affected by tuning than the high ones, it is a good plan to tune the set to a point where the low notes are heard best and high notes are clear but not screechy. This point may be most readily found by listening to the background noise and tuning for the lowest volume and pitch of this noise. Turning the control knob back and forth until the station is almost lost on either side will enable the operator to hear the difference in reception and select the intermediate position giving best results.

11-2 RADIO TROUBLE DIAGNOSIS—ON CAR

The trouble diagnosis information in this paragraph is of a non-technical nature. It is in-

tended as an aid in locating minor faults which can be corrected without a specialized knowledge of radio and without special radio test equipment. If the suggestions given here do not affect a correction, further testing should be done *only by a trained radio technician having proper test equipment.*

a. Radio Is Inoperative or "Dead"

1. Turn on the radio. The dial should light and a popping noise should be heard in the speaker.

2. If dial does not light, check the bulb, and the fuse located in fuse block. If fuse is okay check radio lead cable for proper connection to fuse block. Check cable for open circuit. If source of trouble has not been found, remove receiver for test by a trained radio technician.

If fuse and tubes are satisfactory, substitute a test antenna consisting of a piece of wire about 10 feet long connected to a standard antenna lead-in cable. Place test antenna outside and away from the car. If radio operates near normal with substitute antenna, some part of car antenna or lead-in is at fault.

Lead-in wire may be checked for "grounds" by removing lead-in cable connector from radio receiver and checking with an ohmmeter from connector tip to car body. This check should show an entirely "open" circuit. CAUTION: *Do not check with a lamp or any device drawing current, since the conductor inside loom is only .010" in diameter and will burn off easily if grounded.*

5. If source of trouble has not been found remove the receiver and check the tubes by replacing one at a time until the bad one is located, or test the tubes with a reliable checker if available.

6. If radio is still inoperative it should be tested by a trained radio technician.

b. Radio Reception Is Weak

1. Fully extend the antenna and turn on radio. Turn volume control to maximum position and tune across the dial.

2. If reception seems just slightly weak, tune in a station having good volume for listening and grasp the antenna rod with your hand. If volume increases adjust the antenna trimmer (par. 11-5). If volume decreases proceed with the following steps.

3. Substitute a test antenna as described in subparagraph a, above.

4. Open the receiver and check for weak tubes by replacing one at a time until the faulty one is located, or test the tubes with a reliable checker if available. If this does not reveal source of trouble, remove the receiver for test by a trained radio technician.

c. Radio Noisy with Car Standing Still

1. Close and securely latch hood before checking for noise.

2. Start engine, turn on radio and tune radio to a spot between stations. Engine noise will usually appear in radio as a clicking sound that varies in frequency with speed of engine. If noise is present disconnect antenna lead-in cable from receiver.

3. If engine noise stops when antenna is disconnected, check all high tension wires for full seat in sockets of coil and distributor cap.

4. Check antenna lead-in cable shield for proper ground (par. 11-3) (g).

5. If engine noise continues with antenna disconnected, check ignition coil and generator capacitors for clean, tight connections; also check the bond straps between engine and cowl to make sure that there are clean tight connections at both ends. Observe generator armature and brushes; if sparking is excessive, check for open armature.

6. If source of noise has not been found, check ignition coil and generator capacitors against known good ones. Ignition oil capacitor lead must be attached to battery terminal of coil. Generator capacitor lead must be connected to "A" terminal of generator. Regulator capacitor must be connected to "BAT" terminal of regulator. All capacitors must have clean metal ground contact.

d. Radio Noisy with Car Moving at High Speed

1. Turn on radio and check for engine noise as described in subparagraph *c* above. If engine noise is present, correct as outlined.

2. Drive over different types of roads, especially macadam, with radio on and tuned between stations. Listen for presence of wheel or tire static. In mild form this static shows up as a click in radio that increases with speed; when more severe it shows up as heavy static or a constant roar. The surface of the road determines the strength of static discharge. Wheel or tire static very seldom occurs on dirt or gravel roads.

3. If wheel or tire static is present, apply brakes lightly and if noise decreases check front wheels to see that static collectors have been properly installed and make sure that all grease has been wiped off contacts.

e. Radio Noisy on Rough Road

1. Turn on radio and check for engine noise as described in subparagraph *c* above. If engine noise is present, correct as outlined.

2. Jar the receiver by striking the case with heel of hand, or a rubber mallet. If this produces noisy reception, remove receiver cover and tap each tube with handle of screwdriver until noisy tube is found. Make sure that all tubes are firmly pressed into sockets. If this does not correct the noise, remove receiver for test by a trained radio technician.

3. If noisy reception is not produced when receiver is jarred, fully extend antenna and turn radio volume control on full. If noise appears in speaker check antenna and lead-in wire for loose connections. If movement of lead-in does not cause noise, rap antenna rod with insulated end of screwdriver; if noise then appears, check antenna for shorting to car body or corrosion between antenna sections.

f. Radio Noisy When Car Equipment is Operated

When excessively loud "clicks" and "pops" are heard in the radio due to the operation of directional signals, brake lights, power seats or power windows, all ground connections to the radio antenna and lead-in wire should be thoroughly checked. A poor ground connection at any point can produce the above trouble.

g. Electric Antenna Operates Improperly

1. If operation of antenna to full up or full down position is slower than 10 seconds for a Casco antenna or slower than 12 seconds for a Tenna antenna, check for dirty, corroded or bent antenna sections. Antenna sections must be kept clean and straight. The sections may occasionally be oiled sparingly on the surface with light machine oil.

2. If antenna sections are clean and straight and operation is still faulty, check all wiring including ground connections to cowl; also check for defective control switch.

3. If cause of faulty operation has not been found, remove antenna and check for defective tube and nylon assembly or defective motor.

h. Electric Antenna Does Not Operate

1. If antenna fails to operate and motor does not operate as indicated by deflection on charge indicator, then check fuse, all wiring including ground connection. Also check for defective control switch.

2. If motor still does not operate, or new fuse blows out, either the motor or its leads are faulty and must be repaired or replaced.

3. When motor operates but antenna will not raise or lower (as evidenced by clicking of antenna clutch) check for dirty, corroded or bent antenna sections.

4. If antenna still fails to operate it will be necessary to remove antenna from car, disassemble for inspection and service.

11-3 RADIO INSTALLATION INSTRUCTIONS

If radio parts are removed from car for any reason, the following instructions must be carefully observed to insure proper reinstallation and satisfactory operation. These instructions cover reinstallation only; if an original installation is to be made carefully follow instructions contained in the parts package, particularly with reference to cutting holes in sheet metal and trim.

IMPORTANT: *The standard Buick antenna is matched with the receiver within the range of the trimmer adjustment. Other antennas may not match the receiver within the range of the trimmer adjustment; therefore the use of other than a standard Buick antenna and lead-in cable is not recommended.*

a. Installation of Receiver

1. Remove right lower control housing side panel.

2. Install receiver from beneath, inserting threaded bushings through control holes in instrument panel. Install and tighten hex nuts on bushings. See Figure 11-1.

3. Install and tighten bolt in tie bar to receiver bracket slotted hole.

4. Install tone control escutcheon knob on shaft to left of the dial. Install dummy escutcheon on shaft to right of dial. Install felt washers and control knobs making sure spring clips properly engage flats of control shafts.

5. Plug in speaker wire, antenna lead in wire, wire harness wire, and if so equipped, Wonder Bar foot control wire. See Figure 11-1 and 11-2.

6. Make antenna trimmer adjustment. (Par. 11-5, sub. par. a).

7. Reinstall right lower control housing side panel.

b. Installation of Interference Suppression Parts

The capacitor leads are connected to the armature ("A") terminal of generator (.3 MF) and to the "BAT" terminal of regulator (.5 MF). Capacitors must never be connected to the field ("F") terminal of either unit as this will cause bad pitting of the voltage regulator points, thus preventing it from operating properly.

The built-in resistance of each spark plug wire approximates 4,000 ohms per foot.

The coil capacitor (.3 MF) is mounted on the coil bracket and the lead is connected to the battery positive (+) terminal of coil. If capacitor is connected to the distributor negative (-) terminal excessive pitting of distributor contact points will result.

A static collector is installed in each front wheel hub cup. For good results the cup and the center of steering knuckle spindle must be clean and free from grease. The center of static collector is made of self-lubricating material.

In addition to the items mentioned above, bond straps are connected between the cowl and the rear corners of the engine.

11-4 REMOVAL, DISASSEMBLY, REASSEMBLY, AND INSTALLATION OF ANTENNA

IMPORTANT NOTE: *Two models of the Casco antenna are used in 1960. The first type is identical to that used in 1959 and can be identified by the adjusting screw on the side of drive housing and larger motor. The second type Casco antenna has a smaller motor than the first type and no adjusting screw on the side of the drive housing. Service information for the first type Casco antenna will be found in the 1959 Chassis Service Manual.*

a. Removal of Antenna

1. Remove antenna nut, adapter, and pad from top of fender.

2. Remove screw from left rear outer fender skirt to lower antenna mounting bracket. Remove left rear fender skirt.

3. Remove the antenna lead in wire nut. Unplug antenna lead in.

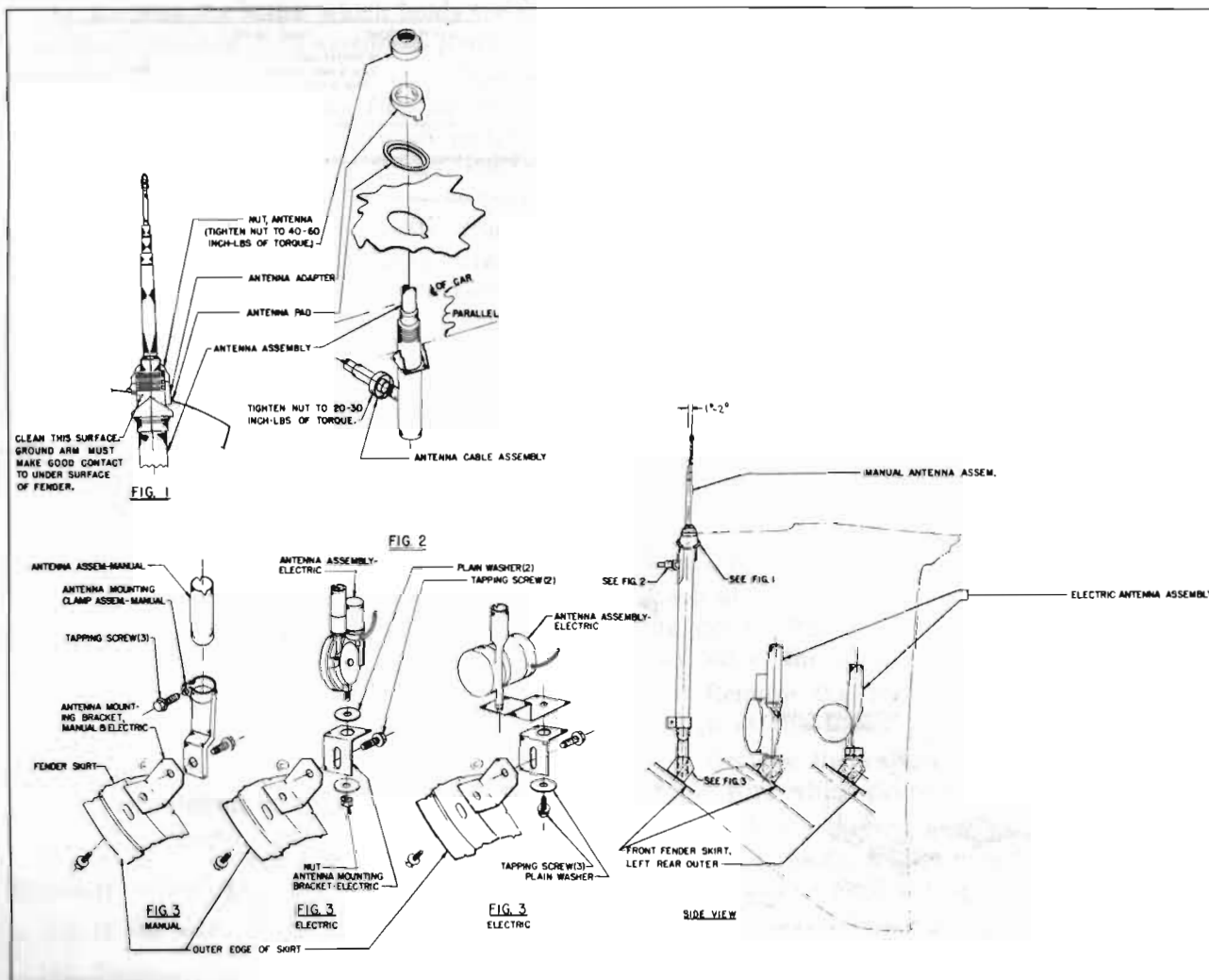


Figure 11-5—Antenna Installation—Illustration #1

4. On electric antenna jobs, disconnect motor control wires.

5. Remove antenna.

b. Disassembly and Repair Procedure for Antenna Drive and/or Motor Assembly (Casco)

If radio reception is weak and a loose connection is determined to exist in the antenna, it will be necessary to remove the body and replace the antenna tube and nylon assembly. For the removal of the body tube, refer to sub. par. c.

If, however, the antenna trouble is in the drive assembly or motor, perform the following operations.

1. Remove screw and lockwasher holding cover to drive assembly housing. Remove cover.

2. Remove retaining ring and washer from shaft extending through the reel assembly.

3. Remove reel assembly and washer by sliding upward along shaft.

4. Pry upward to remove the spring which fits on the tang of the yoke and is wedged against the drive housing. This relieves the pressure of the nylon reed against the pulley. See figure 11-7.

5. Remove the three screws holding the mast section to the drive housing.

6. Pull upward on mast section by holding the upper end of largest diameter chrome plated tube. Do not pull on the body tube as the lead-in wire is soldered and will break on the inside. Pull nylon reed all the way out of the housing. See figure 11-8.

7. Perform the following test.

(a) Connect antenna motor to a 12 volt D.C. power source. Connect negative lead of power source to ground wire of the motor. Touch the positive leads to "UP" wire (yellow) and then

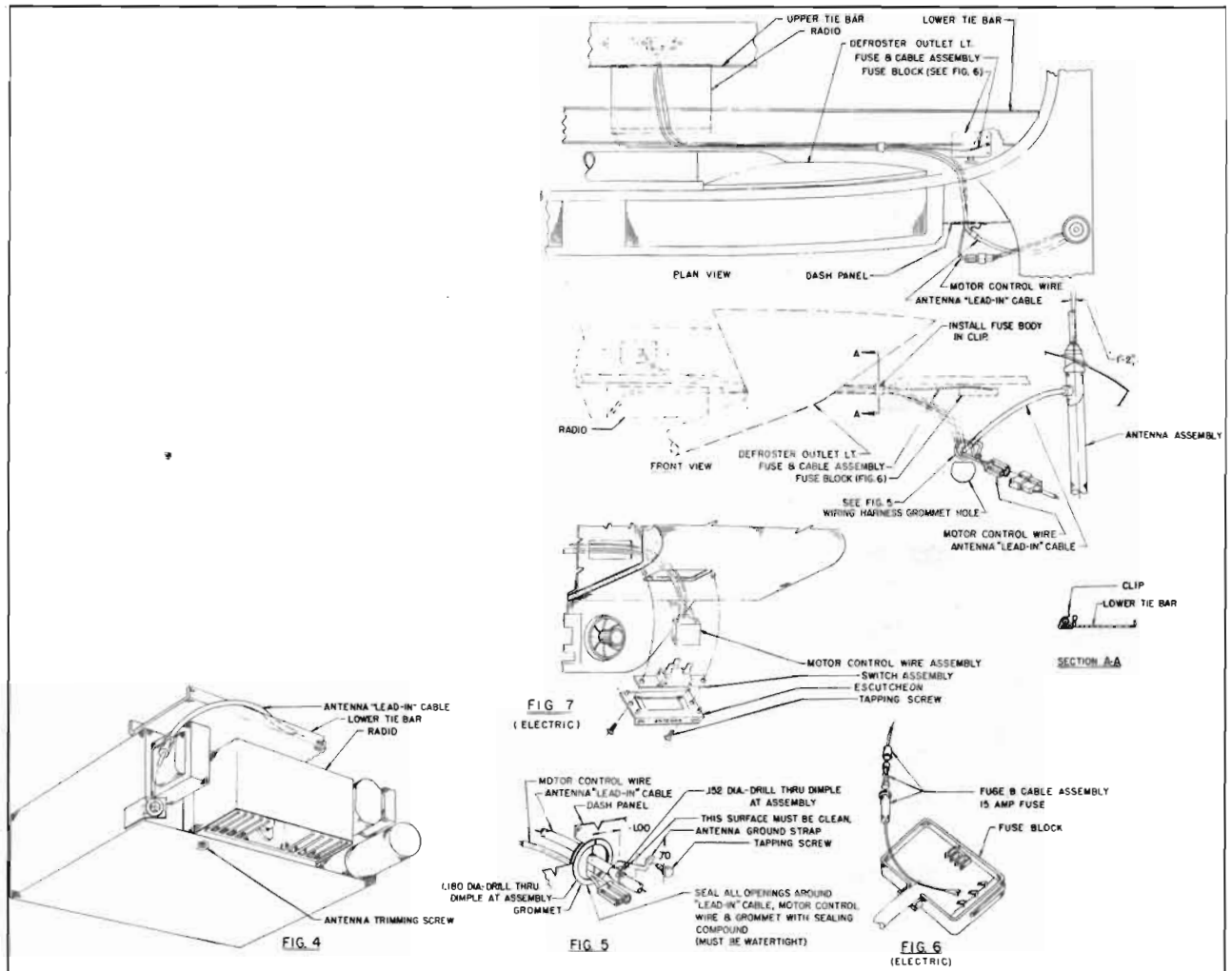


Figure 11-6—Antenna Installation—Illustration #2

to "Down" (black) wire of motor cable. If motor shaft rotates and the drive pulley assembly does

not rotate, replace the drive gear using the following procedures:

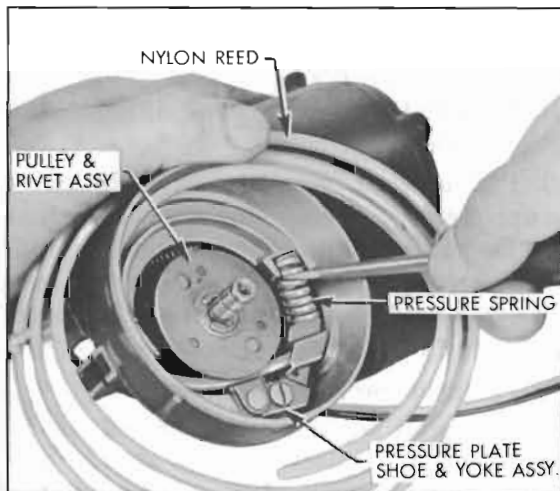


Figure 11-7—Removal of Pressure Spring

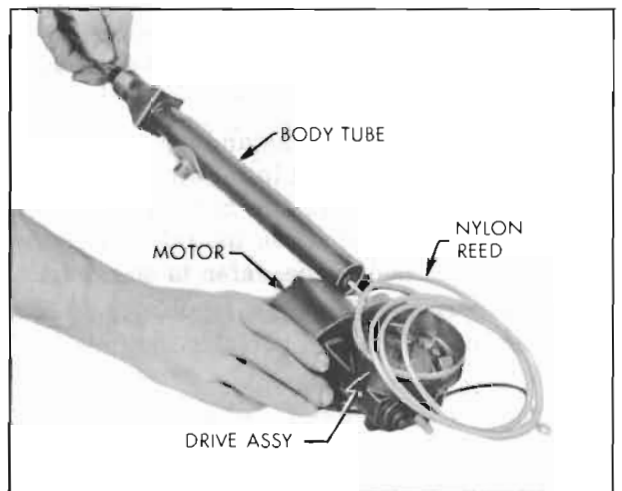


Figure 11-8—Removal of Nylon Reed & Mast Section

(1) Remove the screw which holds the pressure plate shoe and yoke assembly. Remove the assembly.

(2) Remove the retaining ring and washers from the shaft extending through pulley and rivet assembly. Remove the pulley and rivet assembly. See Figure 11-9.

(3) Remove the 3 steel balls from the springs recessed in the drive gear. Invert the housing to remove the springs or use needle nose pliers to remove the springs.

(4) Remove the drive gear from the housing.

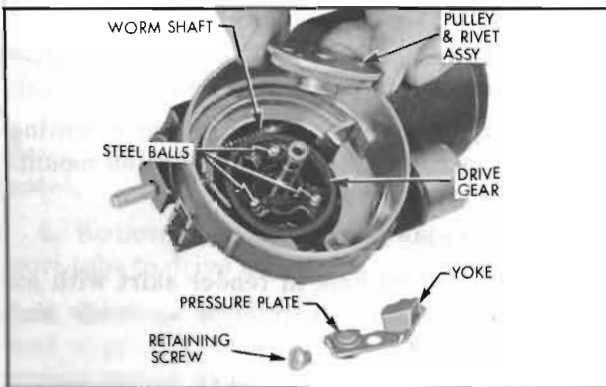


Figure 11-9—Complete disassembly of Drive Unit

(5) Visually inspect the drive gear teeth for breakage or warpage, and replace if necessary.

(b) If the motor is defective.

(1) Remove the 2 screws from the top of the motor.

(2) Separate the motor from the drive assembly housing at the point where they join, and lift the motor case away. The armature will remain with the drive shaft (worm shaft) still extending into the housing. Remove the armature worm shaft making sure that the ball and disc at the end of the worm shaft do not fall out. See Figure 11-10.

(3) Assemble new motor into drive assembly housing making sure that there is end play in the worm shaft. Motor should run evenly, if not, tap motor cap lightly to align the self-aligning bearings.

c. Disassembly of Body Tube

1. Using a 12-volt power source, extend the antenna to its extreme "up" position..

2. Remove the 3 screws holding the mast section to the drive housing.

3. Pull upward on the mast section by holding the upper end of largest diameter chrome

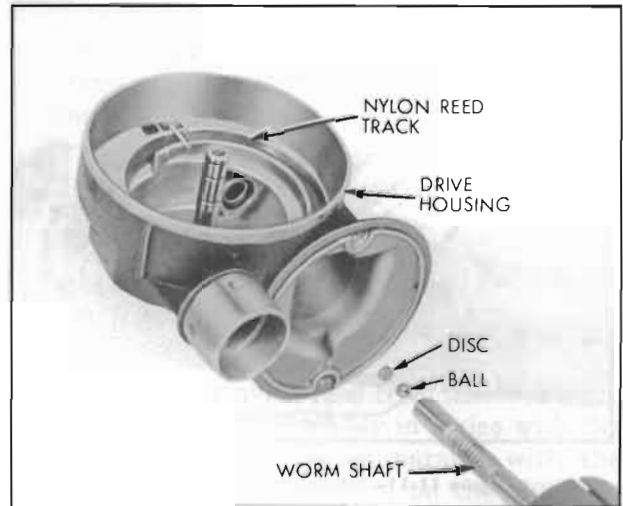


Figure 11-10—Removal of Motor Assembly

plated tube. Do not pull on the body tube as the lead-in wire is soldered and will break on the inside. Pull remaining nylon reed all the way out of the housing. See Figure 11-8.

4. Remove the plate covering the antenna lead-in at the tube.

5. Remove the rubber surrounding the end of the wire which protrudes from the tube.

6. With a soldering gun, melt the solder at the end of the tip of the wire, and remove the hollow tip. See Figure 11-11.

7. Slide the antenna and the attached nylon from the body tube.

d. Assembly of the Antenna Drive

1. Lubricate the drive gear with Lubriplate and place it in the drive housing, then apply Lubriplate to balls, springs, rivet heads and washers.

2. Reinstall the recessed springs in the drive gear face and place the 3 steel balls on top of the springs.

3. Reinstall the pulley and rivet assembly and replace the washer(s) and retaining ring to securely hold the assembly in place.

4. Replace the pressure plate, shoe and yoke assembly and tighten the assembly holding screw.

5. Replace the pressure plate assembly spring.

6. Apply Lubriplate to shaft and replace washer and reel assembly.

7. Assemble washer and retaining ring to shaft.

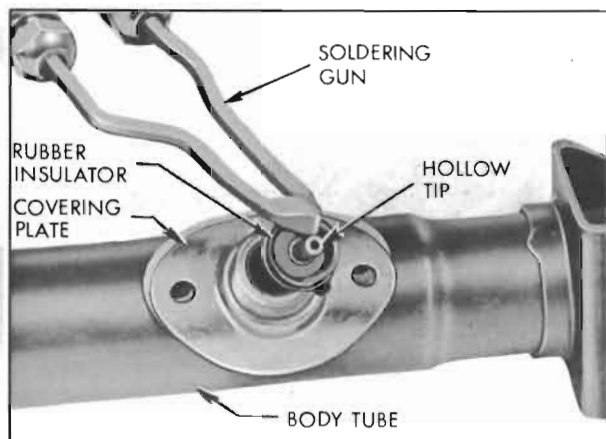


Figure 11-11—Disassembly of Body Tube

8. Assemble cover, lockwasher and screw.
9. Check the operation of the motor.

e. Assembly and Replacement of the Body Tube

If a new mast is used.

1. Slide the new antenna and nylon assembly through the body tube.
 2. Pull the attached antenna wire through the lead-in opening.
 3. Using a soldering gun, solder the hollow tip to the wire securely. See Figure 11-11.
 4. Replace the rubber surrounding the wire and replace the plate and its cork washer.
- If assembling the antenna (no disassembly of body tube performed).
5. Make sure the insulators are properly positioned on the body tube and in the drive assembly housing.

6. Starting at the end of the nylon reed, measure about 2' of the reed and begin to feed this portion into the drive assembly housing.

7. Motor the rest of the reed into the drive assembly housing and push the mast assembly into place on the drive housing.

8. Assemble the mast assembly to the drive assembly housing with the three screws provided. The mast tube is positioned with the antenna wire lead-in opening on the motor side of the antenna.

9. Run antenna fully up and then fully down. The clutch should override when the mast is at the extended and retracted positions; a slight clicking will occur at these positions.

NOTE: The antenna should draw 3.0-6.5 amps at 12 volts. The antenna should also fully extend and retract using 12 volts in 10 sec. maximum.

f. Reinstallation of Antenna

NOTE: Refer to Figures 11-5 and 11-6 for the re-installation procedure for the antenna assembly. When installing an antenna assembly for the first time, consult the instruction sheet within the antenna parts package.

1. Loosely assemble mounting brackets to antenna assembly.
2. Insert antenna assembly under fender with ground arm points parallel to centerline of car.
3. Place antenna pad, adapter and mounting nut over antenna assembly and tighten mounting nut securely.
4. Reassemble skirt to fender.
5. Align slotted hole in fender skirt with an awl to bracket hole in antenna assembly and tighten securely.
6. Adjust antenna assembly in mounting brackets to allow antenna assembly to lean 1-2° toward rear of car and tighten mounting brackets.
7. Connect lead-in cable and motor control wire connector.

g. Disassembly of Tenna Antenna (unit within warranty)

To aid in the identification of antenna parts, an exploded view is shown.

NOTE: Before work is started on the Tenna Antenna, determine if the antenna is in the warranty period which is 12,000 miles or one year whichever occurs first. If the antenna is in warranty do not attempt service on components of the Drive Assembly as it will void the warranty arrangement agreed upon by Buick and Tenna. The drive assembly components must be serviced by Tenna as a complete unit.

Use the following procedure to replace the drive assembly and to disassemble mast assembly body and upper insulator assembly, or support tube.

CAUTION: Before replacing any of the four major sub-assemblies listed above, the "lead-in wire" should be unsoldered from the ".400" tube section of the mast to prevent this wire

from being broken at the "pin and insulator assembly." To unsolder the "lead-in wire" from the tube section proceed as follows:

1. Remove the 3 screws holding the body and upper insulator assembly to support tube.

2. While applying a back and forth rotary motion, carefully pull the body upper insulator assembly out of the support tube and continue to slide it over the .400" tube section of the mast until the solder joint is accessible.

3. Unsolder hook-up wire at the .400" tube section.

4. Remove the body and upper insulator assembly from the mast assembly.

Proceed as follows if replacement of drive assembly support tube or mast assembly is indicated.

5. Remove the 3 screws which hold the support tube to drive assembly.

6. Holding the drive assembly in one hand and support tube in other hand, pull with a rotary motion until the support tube is removed from the antenna.

7. Holding the drive assembly in one hand and the mast assembly in other hand, pull with a rocking motion, until the insulator bushing and .400" tube section are freed from the tubular fitting.

8. Apply 12 volts D.C. to the orange (up) lead wire until the entire length of nylon reed has been expelled from drive. Pull on the mast to keep the nylon taut.

NOTE: If the drive assembly is inoperative, it will be necessary to manually remove the nylon reed from the drive assembly. **DO NOT DISASSEMBLE DRIVE ASSEMBLY FOR ANY PURPOSE WHILE THE ANTENNA IS COVERED BY THE MANUFACTURER'S WARRANTY.**

To remove the nylon reed from disabled drive assembly, place the assembly in a vice with the normal plane of the nylon parallel with the floor. Using both hands, pull on the .300 dia. mast tube until the nylon is removed completely from the drive assembly.

9. Remove bottom insulator and water seal washer from tubular fitting using wire hook or long nose pliers.

IF THE ANTENNA IS IN WARRANTY DO NOT DISASSEMBLE BEYOND THIS POINT AS IT WILL VOID THE WARRANTY AGREEMENT.

h. Reassembly of Mast, Support and Body and Upper Insulator Assemblies

1. Thread nylon reed into drive assembly making sure that bottom insulator and water seal washer are in place. (Recessed side of in-

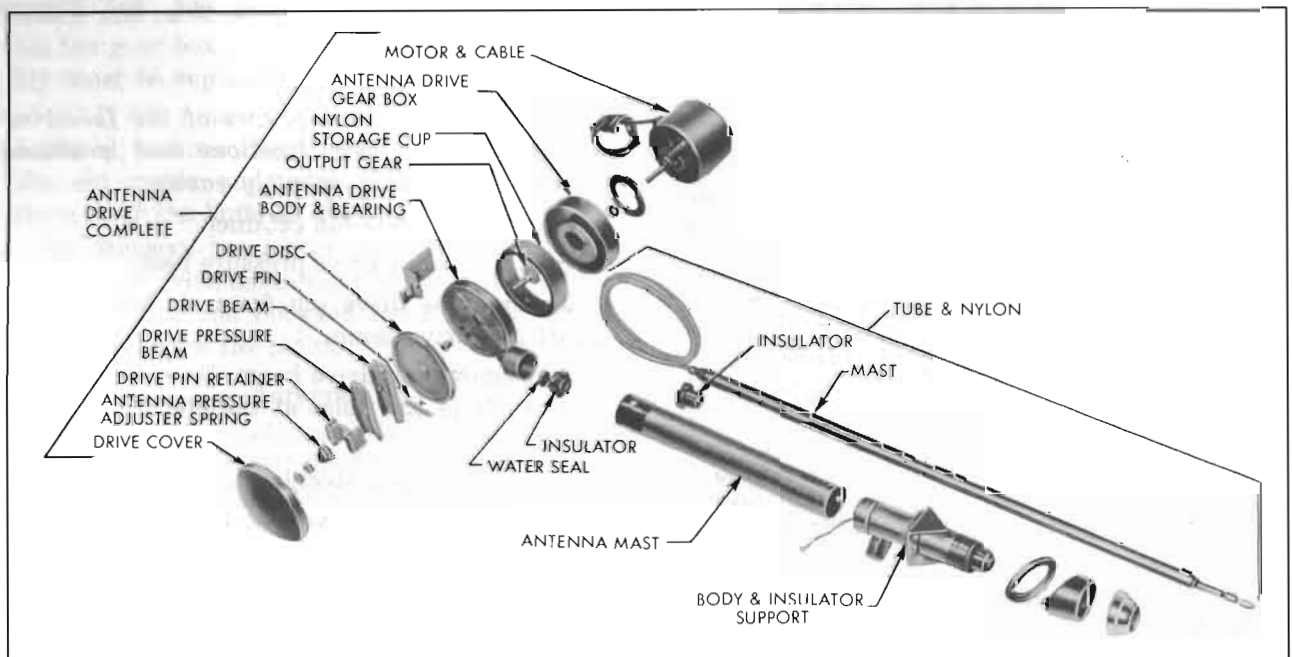


Figure 11-12—Exploded View of Tenna Antenna

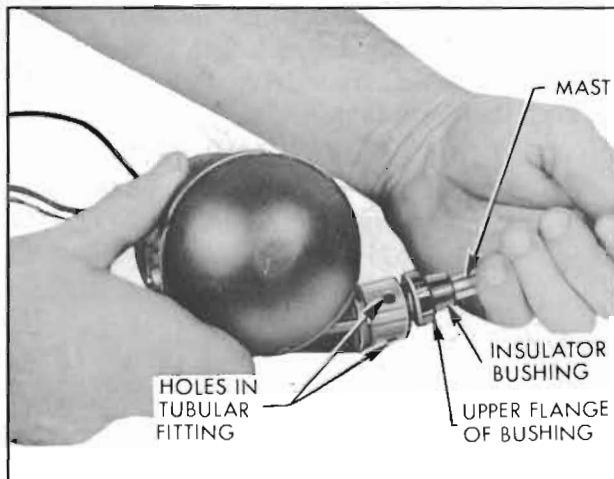


Figure 11-13—Positioning of Insulator Bushing

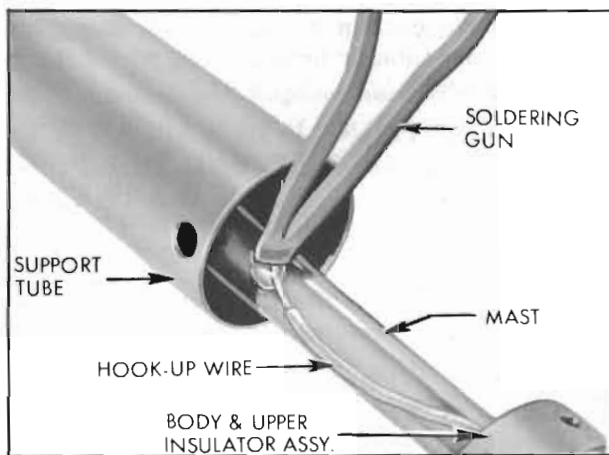


Figure 11-14—Soldering the Hook-up Wire to the Mast

sulator down.) Apply 12 volts D.C. to black power lead to assist feeding operation. Keep nylon reed straight to avoid kinking.

NOTE: Position water seal washer and bottom insulator in the tubular fitting before the nylon reed completely disappears in drive assembly.

2. Push .400 tube section and insulator bushing into tubular fitting. Make sure that the upper edge of insulator bushing flange is below center of the 3 holes in the tubular fitting on the drive assembly. See Figure 11-13.

3. Install support tube.

4. Slip body and upper insulator assembly on the .400 tube section, but do not connect to support tube. Make sure that the "free-end" of the hook-up wire extends below the lower edge of the body and upper insulator assembly.

5. Solder this free-end of the hook-up wire to the .400 tube section using rosin flux solder. See Figure 11-14.

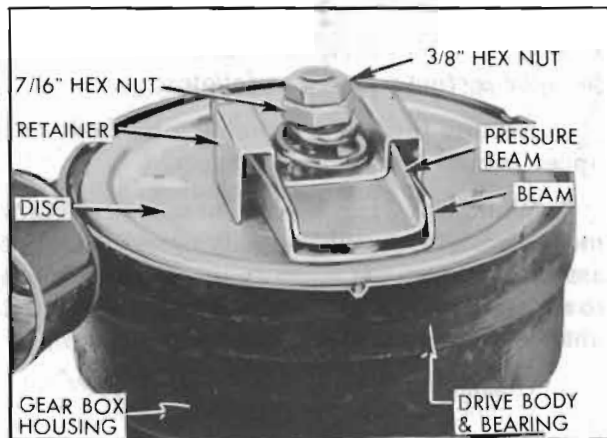


Figure 11-15—Antenna with Cover Removed

6. Position and connect body and upper insulator assembly to support tube.

i. Disassembly of Antenna (Unit Not in Warranty)

If the antenna is no longer covered by the manufacturer's warranty and it is necessary to replace the motor and cable assembly or repair the drive assembly, proceed as follows: It is assumed for this disassembly procedure that the mast, body and upper insulator, and support tube have been removed.

1. Remove front cover.

2. Holding the $\frac{7}{16}$ " hex nut on the output gear assembly shaft, remove the $\frac{3}{8}$ " hex nut.

3. Remove the $\frac{7}{16}$ " hex nut. See Figure 11-15.

4. Lift spring off shaft.

NOTE: When removing any of the following parts, observe their locations and positions carefully to make assembly easier.

5. Remove drive pin retainer.

6. Remove the drive pressure beam.

7. Slide the drive pin from its holes in the shaft and drive beam.

8. Remove the drive beam. Do not lose the 2 steel balls in the holes at the end of the drive beam.

9. Remove the 2 steel balls.

10. Remove the drive disc from the shaft. Do not bend the drive disc or burr the edges of the channel.

11. Remove the 2 sleeve nuts located in the face of the antenna drive body and bearing.

12. Carefully remove the body and bearing

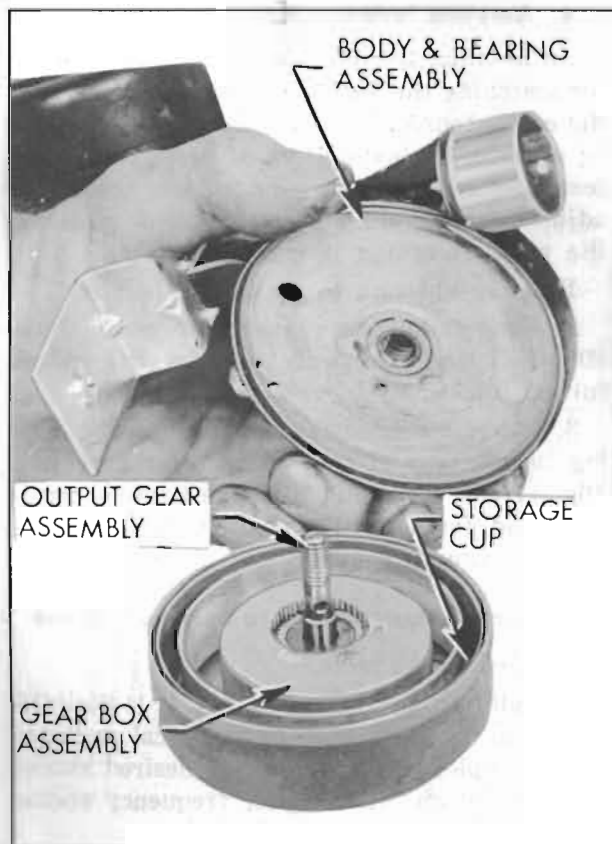


Figure 11-16—Removal of Body & Bearing Assembly

assembly so that the gear box assembly does not come apart. See Figure 11-16.

13. Remove the storage cup.

14. Remove the gear box assembly from the motor and cable assembly, but do not disassemble the gear box assembly. The gear box assembly must be replaced as a complete unit.

15. If the motor and cable assembly is to be replaced, remove the 2 seals from the bolts on the old motor and cable assembly and place them over the bolts of the new motor.

16. Remove the motor gasket from the old motor and drive assembly and place it over the motor pinion and between the 2 bolts. Center the gasket with the pinion.

j. Assembly of Antenna

Assemble the antenna drive components as they were removed, making sure that the proper alignment between gears, motor and output gear shaft is maintained. The following notes apply to certain assembly steps on which special emphasis is placed.

1. The teeth on the output gear shaft assembly must mesh with the 2 pinions visible through the hole in the gear box cover.

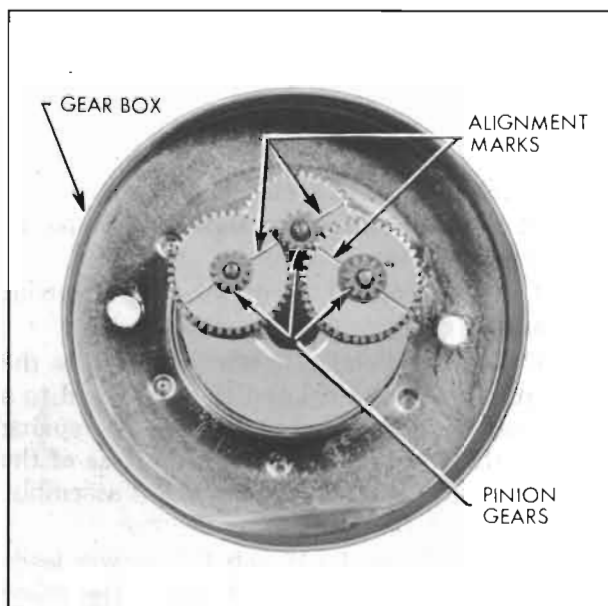


Figure 11-17—Alignment of Gears

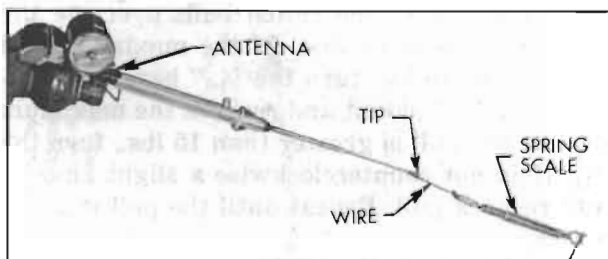


Figure 11-18—Antenna Ready for Adjusting Test

NOTE: If for any reason the gears within the gear box have fallen out or have been removed, it will be necessary to realign them. This is done by positioning the gears so that the left drive gear alignment mark is in line with the mark on the drive gear which receives the motor pinion. The alignment mark on the right drive gear must point at the pinion shaft on the drive gear which receives the motor pinion. See Figure 11-17.

2. After assembling the drive beam, pull upward on the output gear assembly shaft until all of the axial movement is taken up. Then rotate beam to align holes to receive the drive pin.

3. Assemble the spring on the output gear assembly shaft with the largest dia. toward the drive pin retainer.

4. Screw the $\frac{7}{16}$ " hex nut 1 full turn after it touches the spring.

NOTE: Do not assemble the $\frac{3}{8}$ " hex nut on the shaft or snap the front cover in place at this time.

5. Reassemble the mast, support tube and body and upper insulator according to the procedure previously given.

k. Adjustment of Antenna

1. Place antenna in a vice on bench with center line of motor and drive assembly both parallel to the bench top.

2. Using 12 volts D.C. run mast tip up about 6" from the extreme down position.

3. Connect one end of a wire securely to the mast just below the tip and the other end to a 25 lb. capacity spring scale. Secure the spring scale to the bench so that the center line of the scale is in line with that of the mast assembly. See Figure 11-18.

4. Attach one of the 12 volt D.C. power leads to the mounting bracket and touch the other power lead to the black (down) terminal to "jog" the drive assembly to the point of maximum pull before the clutch balls override the ridges of the drive disc. If the maximum pull is less than 15 lbs. turn the $\frac{7}{16}$ " hex nut clockwise a slight amount and recheck the maximum pull. If the pull is greater than 15 lbs., turn the $\frac{7}{16}$ " hex nut counterclockwise a slight amount and recheck pull. Repeat until the pull is set at 15 lbs.

5. Holding the $\frac{7}{16}$ " hex nut so it cannot turn, tighten the $\frac{3}{8}$ " hex nut against the $\frac{7}{16}$ " nut to lock it in place.

6. Disconnect spring scale and apply power to the orange (up) terminal. Run the mast all the way out and allow the motor to continue running until the clutch has made a minimum of 15 engagements or clicks.

7. Do the same in the down position.

8. Run antenna up and down for 3 minutes then reassemble spring scale to mast and recheck maximum pull. Adjust if necessary.

9. Snap front cover onto drive assembly, making sure that the vent hole is at the top when the mast is in operating position.

10. Reseal the assembly with waterproofing compound (heavy body sealer or its equivalent) making sure that neither the vent hole or the drain hole in the drive assembly is plugged.

11-5 RADIO ADJUSTMENTS—ON CAR

When making the adjustments covered in this paragraph it is essential to have the car in a location that is as free as possible from outside interference.

a. Antenna Trimmer Adjustment

An antenna trimmer adjustment is provided for matching the antenna coil in the receiver to the car antenna. *This adjustment must always be made after installation of receiver and antenna, or after any repairs to these units.* The adjustment should also be checked whenever the radio reception is unsatisfactory.

1. Raise antenna to maximum height.

2. Tune radio to a station between 600 and 1000 K.C. that can barely be heard with volume turned full on.

3. Insert a screwdriver up through the opening in the rear of the bottom of the receiver (fig. 11-10). Carefully turn the trimmer screw back and forth until a position is found that gives maximum volume.

b. Setting Push Buttons to Desired Stations

1. Turn on the radio.

2. Pull button all the way out. It is desirable to set up the push buttons in logical sequence. For example, lowest frequency desired station on first button, next higher frequency station on second button, etc.

3. Carefully tune in the desired station manually, then push the button all the way in.

4. Move dial pointer away from the selected station and push the button to make certain the station will be properly tuned in.

5. Turn tuning knob back and forth to make certain that best tuning is obtained with the push button. If best tuning is not obtained, repeat steps 2, 3, 4.

11-6 INSTALLATION OF REAR SEAT SPEAKERS

Rear seat speakers may be installed on closed bodies by either the factory or by dealers. A separate speaker may be mounted on the shelf behind the rear seat, or as on the Model 4867 (or 4667 with custom trim) it can be mounted in the notch of the rear seat back cushion.

A slider speaker control is used to vary the volume of each speaker. When the control is moved, one speaker gradually fades out, while the other speaker becomes louder. At the extremes only one speaker can be heard. At mid-point both speakers can be heard equally.

Rear seat speaker installation details are shown in Figures 11-19, 11-20 and 11-21. These instruction sheets are also packaged with each rear seat speaker kit.

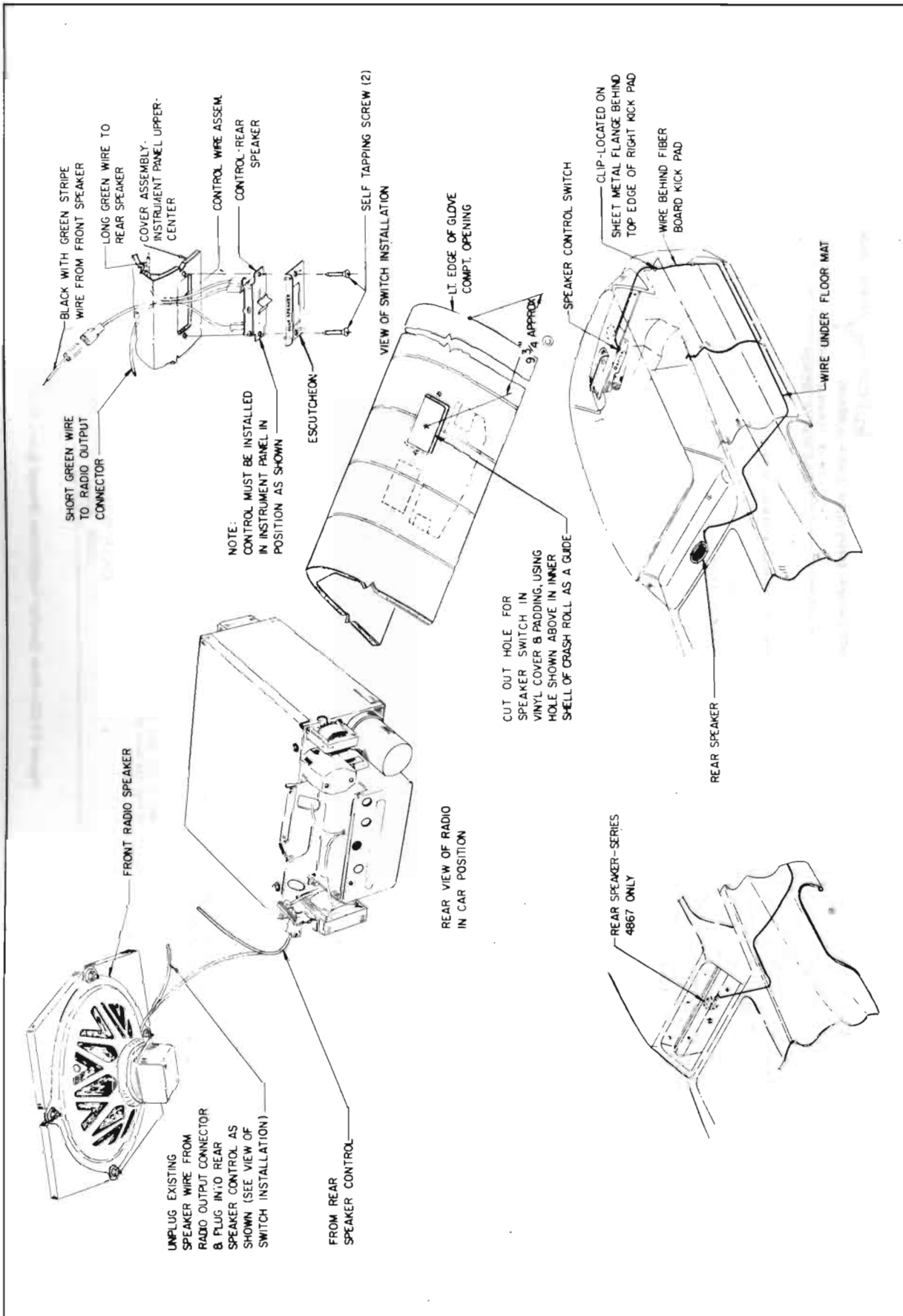


Figure 11-19—Wire Routing For Rear Speaker Installation

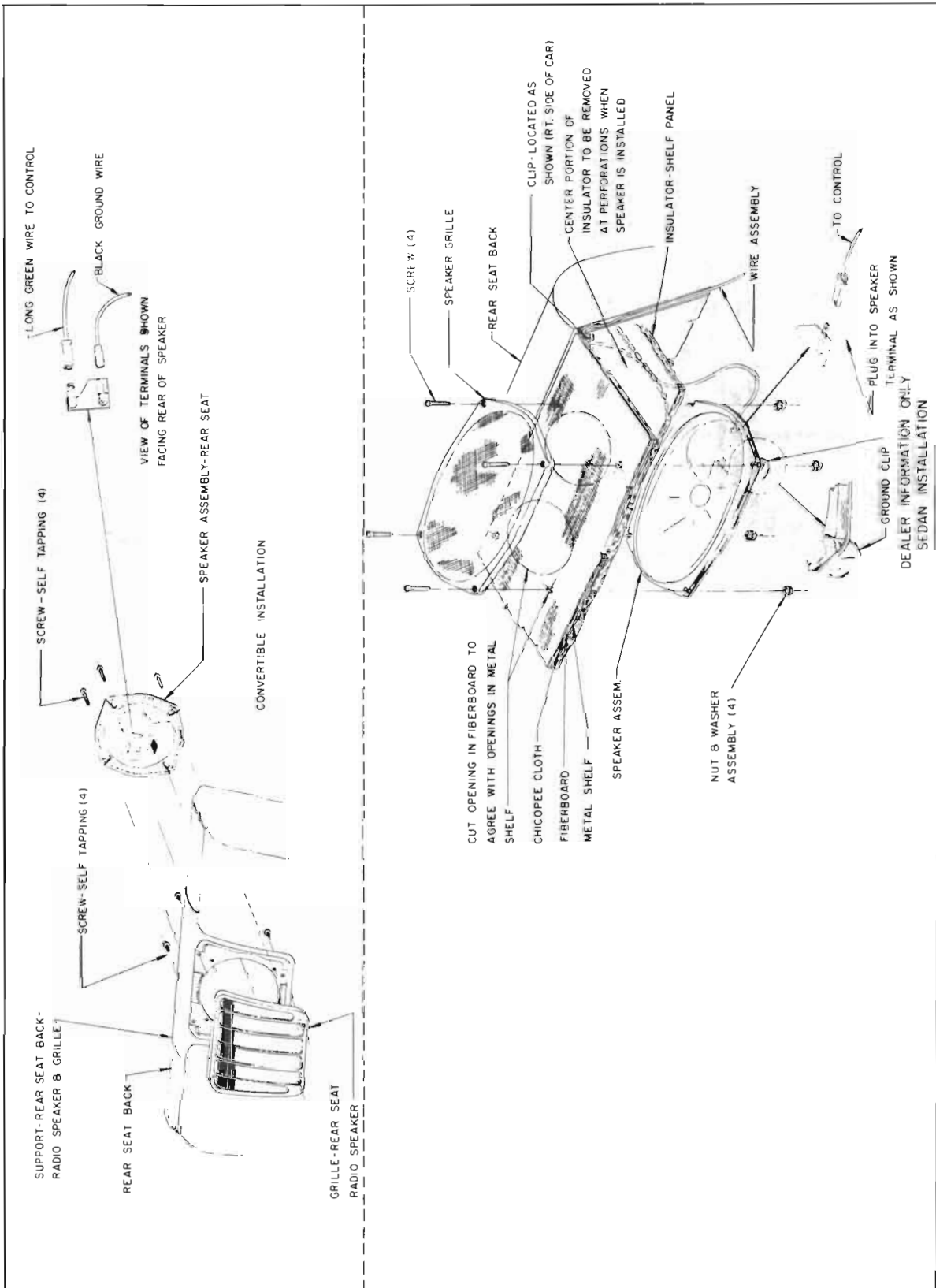


Figure 11-20—Rear Speaker Installation (Except Estate Wagons)

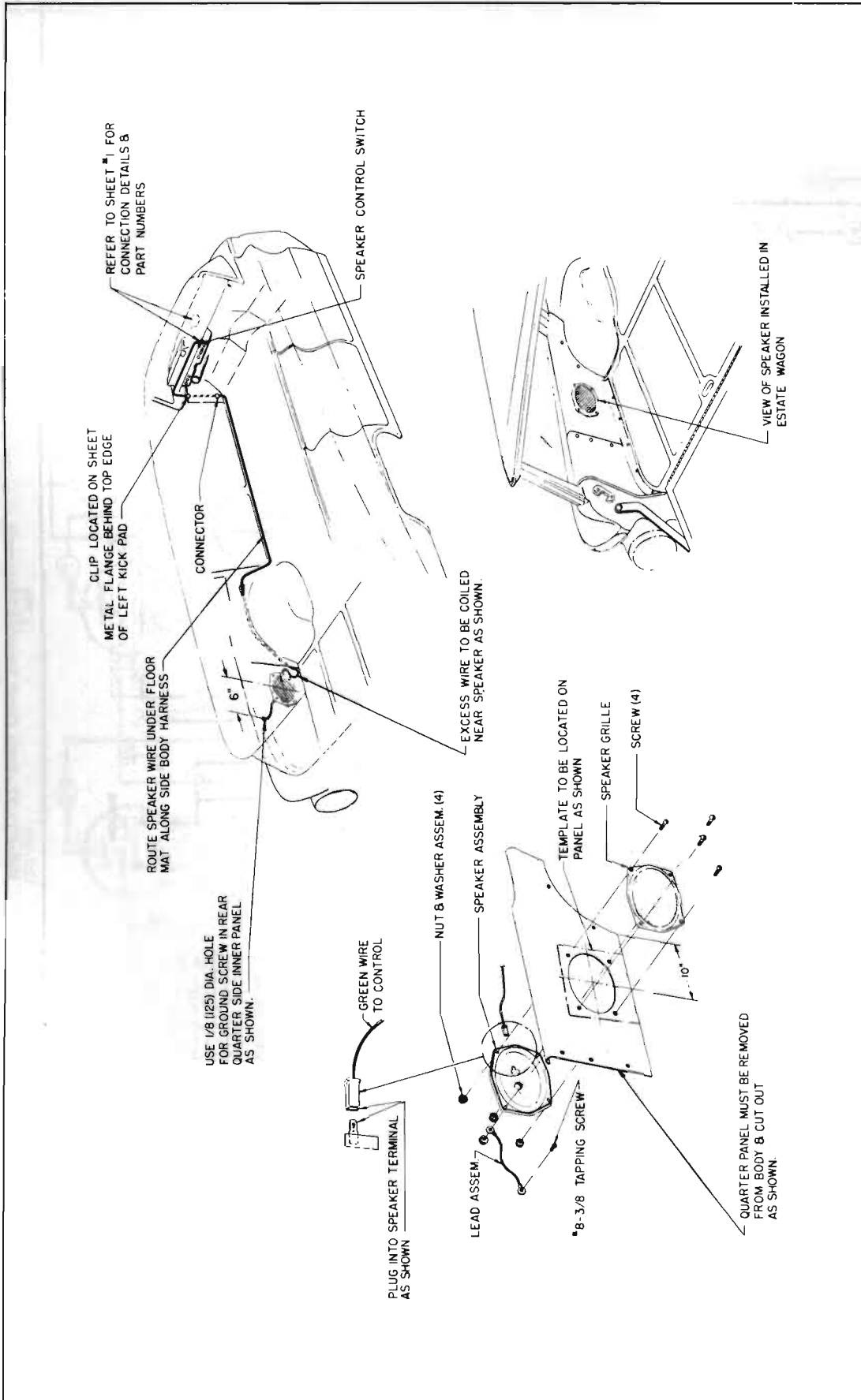


Figure 11-21 — Rear Speaker Installation (Estate Wagons)

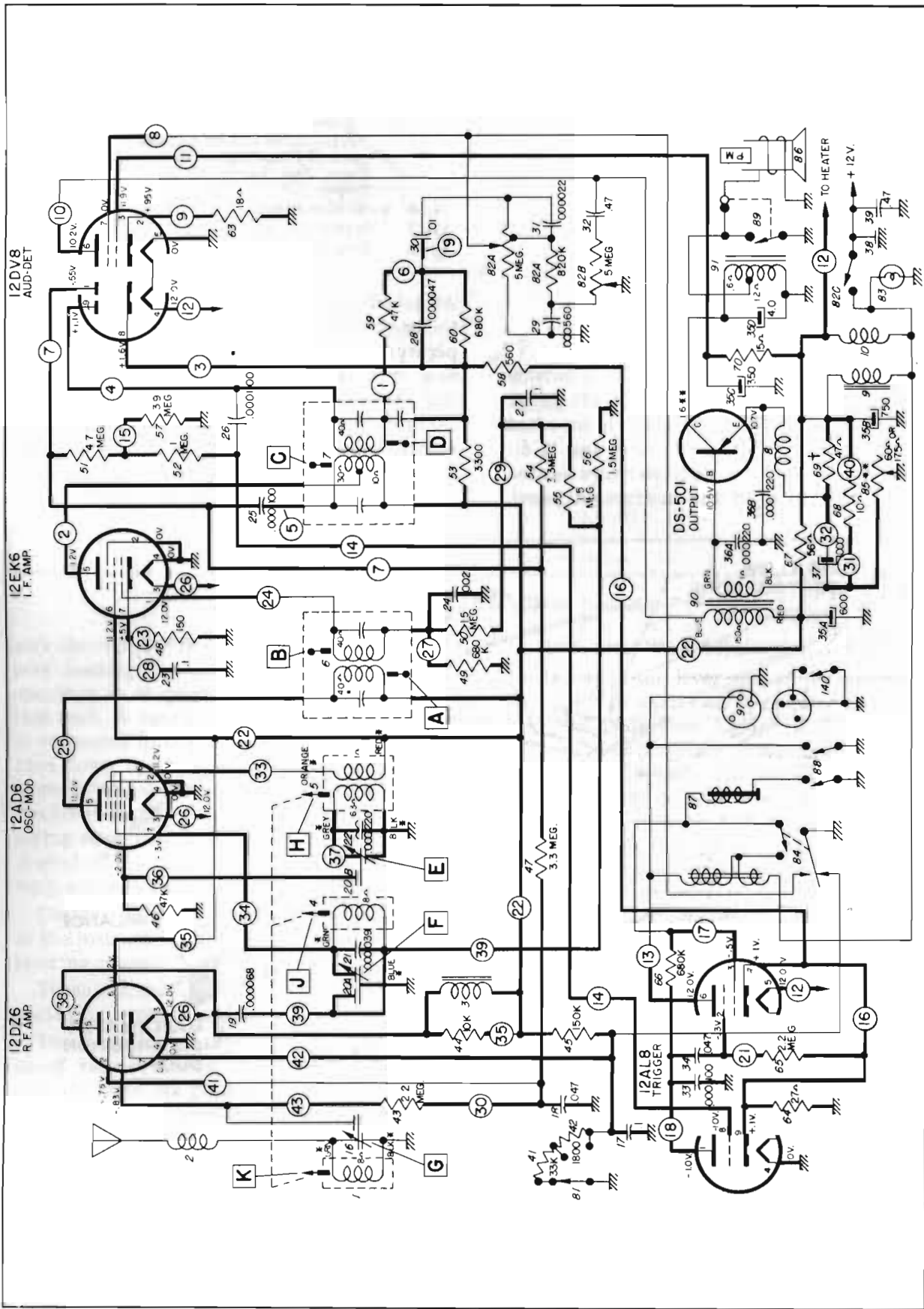


Figure 11-23—Radio Circuit Schematic—Wonderbar