

Part THREE
ELECTRICAL AND ACCESSORIES

Chapter
IV

Accessories

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1. TROUBLE SHOOTING

a. Radio.

Procedures for the location and elimination of the majority of minor troubles interfering with normal radio receiver operation, are presented here. The procedures given are not intended to cover all of the possible radio receiver troubles. Each procedure either locates the minor trouble or determines that the receiver should have a major repair. As a major repair on the radio should only be made by a competent radio repairman, do not go beyond the procedures given.

The following parts will be required to make the radio trouble shooting tests.

- Spare Fuses (5 ampere)
- Antenna and lead
- Speaker
- 12-volt Vibrator, 3 prong.
- Radio Tubes (One each: 12AQ5, 12AU6, 12AV6, 12BA6, 12BE6, 12X4)
- Suppression condensers (Complete Set)
- Distributor High Tension Lead

NOTE: Pretest and mark all of the test parts (except fuses) so that these known good parts will not be left in a tested receiver.

(1) **NO RECEPTION.** Turn the ignition switch to the accesory position and turn the receiver on. Listen for the vibrator buzz. If the vibrator is not buzzing follow "(a) No Vibrator Buzz" below. If the vibrator is buzzing follow "(b) Vibrator Buzzes" below.

(a) **NO VIBRATOR BUZZ.** Check to see if the fuse is blown. If the fuse is blown follow "(1) Fuse Is Blown" below. If the fuse is not blown follow "(2) Fuse Is Not Blown" below.

(1) **FUSE IS BLOWN.** If the fuse is blown, remove the vibrator, install a new fuse and check to see if

the tubes are lighted.

If the tubes do not light up, make certain that voltage is available at the "A" lead and if it is, remove the receiver for major repair.

If the tubes light up, plug in the original vibrator. If the new fuse blows replace the fuse and plug in the test vibrator. If the set plays, replace the test vibrator with a new vibrator. If however the fuse blows, replace the 12X4 rectifier tube (fig. 9), and the fuse. If the fuse blows again, remove the receiver for major repair.

(2) **FUSE IS NOT BLOWN.** Check for voltage at the "A" lead with a voltmeter. If 12 volts are available and the tubes are lighted, plug in the test vibrator. If there is no reception or if the tubes do not light up, remove the receiver for major repair.

(b) **VIBRATOR BUZZES.** If the vibrator buzzes when the set is turned on, connect the test antenna to the receiver and hold it so that it protrudes out of the vehicle. If this cures the trouble install a new antenna and lead.

If the antenna is not at fault, disconnect the speaker and plug in the test speaker. If this cures the trouble replace the old speaker.

If the speaker is not at fault, substitute the test tubes for those in the receiver, one at a time, allowing enough time for each tube to heat up before going on to the next. Start the substitution with the 12X4 rectifier tube (fig. 9), as it is more likely to be defective than the others. If the receiver still will not play, it must be removed for major repair.

NOTE: After performing all of the preceding checks, be sure to remove all tubes, vibrator etc., marked and used for testing.

(2) **NOISY OR ERRATIC RECEPTION.** The cause of noisy or erratic reception can be isolated by finding

out when the noise occurs. If it occurs while the vehicle is at a standstill with the engine not running, the trouble lies in the radio receiver or the fuel sending unit. If the noise occurs only while the vehicle is standing with the motor running, it is probably caused by ignition or electrical units on the vehicle. If the noise occurs only while the vehicle is in motion, it is probably caused by intermittent shorting of the antenna.

(a) **NOISY WHILE STANDING—ENGINE NOT RUNNING.** Tune in a local station, and jar the side of the receiver case with the hand.

Make sure that the connector plugs are firmly seated. If the connectors are secure and the noisy reception continues as the receiver is jarred, tap the tubes gently with the finger tips while holding the tubes in the socket to eliminate disturbing the tube contacts. If the receiver becomes noisy as any particular tube is tapped, replace the defective tube. If none of the tubes are noisy, the receiver must be removed for major repair.

(b) **NOISY RECEPTION—ENGINE RUNNING.** Inspect the installation of suppression equipment (fig. 10). If the suppression equipment is complete, substitute the good test parts one at a time. Be sure that all condensers are properly grounded.

Check the receiver mounting to determine if the paint was properly removed before the receiver was mounted. The receiver must make a good ground contact at both the support bracket mountings.

(c) **NOISY RECEPTION—VEHICLE IN MOTION.** Retract the antenna and flex it slightly to let it vibrate. Move and twist the load-in slightly. If noise occurs when this is done, replace the antenna.

(3) **DISTORTED OR GARBLED SOUND.** Distorted or garbled sound may be caused by the voice coil rubbing on the center pole piece of the speaker magnet, by a torn speaker cone, by foreign material coming in contact with the cone, or by a defective tube in the receiver. The voice coil may be thrown out of alignment by a twisting or bending of the speaker frame if the speaker unit is improperly mounted in the speaker grille. To determine if the speaker is at fault, substitute the test speaker before removing the suspected unit.

If the reception is not improved, substitute the test tubes as described in paragraph "(b) Vibrator Buzzes" above, but start with the output tubes (fig. 9).

(4) **WEAK RECEPTION.** When reception is limited to a few strong local stations, adjust the antenna trimmer to align the receiver to the antenna. Substitute the test tubes as described in paragraph "(b) Vibrator Buzzes" above.

b. Heater.

(1) **INSUFFICIENT OR NO HEAT.** The automatic temperature control unit could cause insufficient heat.

With the engine at operating temperature and the temperature control knob pulled out all the way, feel the heater unit, it should be warm. If it is cool, the temperature control unit could be defective, not allowing the water to circulate through the heater.

If the control unit is not at fault, inspect the control cables. Make sure that the cables are correctly installed, not kinked, and that they allow full travel of both the temperature-control valve and the air-control valve.

Incorrect water flow could also cause insufficient heat. Check the water hoses to see that they are not kinked or collapsed (possibly due to the water outlet elbow pointing in the wrong direction). Check the thermostat for proper installation and operation. It may be necessary to use a higher temperature thermostat and permanent anti-freeze in cold climates. Make sure that the heater unit is not at fault, such as the core obstructing the flow of water.

If the trouble has not already been found, inspect the heater blower for a blown fuse or loose wires. Check for a poor ground, fan loose on the motor shaft, blower wheel or housing damaged (preventing rotation), foreign objects in blower, and damaged or burned out heater switch.

Check for air leaks in the ventilating system. Look for grommets missing in the dash or a missing felt pad around the accelerator rod. Make certain that the air intake screens and the honey comb of the heater core are not clogged with foreign material.

Test for body air leaks caused by poor or missing seals around the door or windows or by loose fitting doors.

(2) **INSUFFICIENT OR NO DEFROSTING.** All of the preceding procedures also apply to this subject.

In addition, check the defroster control cable; it should be connected properly to allow full travel of the defroster valve. Make certain that the defroster hose is connected, the defroster damper is tight on the control shaft, the defroster nozzles are clear and attached, and that there are no obstructions in the windshield outlets.

c. Turn Indicator.

Figure 1 shows the turn signal schematic diagram.

(1) **TURN SIGNAL LIGHTS DO NOT OPERATE.** The fuse may be blown, the flasher may be defective or the switch and wiring may be defective or the lights may be burned out. Figure 2 shows a "road map" for this symptom. Before any testing is done, turn the ignition switch key to the "ACC" position.

(a) **FUSE.** Remove the fuse to see if it is burned out.

(1) **FUSE IS BURNED OUT.** Of the fuse is burned out, check the current drawn by the system by connecting an ammeter between the "ACC" terminal of the igni-

tion switch and the fuse holder terminal that connects to the flasher unit (with the fuse removed). Place the switch in both the left and right positions. The current draw with the flasher operating and the front, rear, and pilot light on one side operating, should oscillate between 0 and 4 amperes at 12 volts. This is caused by the flasher turning ON and OFF. If the current is greater than this in either the right or left-hand position, check the wiring on the side indicated by the high current for shorts, and repair where necessary. If the current is high in both right and left-hand operation, check the manual switch, flasher unit, and associated wiring for shorts. Repair or replace wiring as necessary.

(2) **FUSE IS NOT BURNED OUT.** If the fuse is not burned out, install the fuse, then test the flasher unit by removing the unit from the flasher receptacle and plugging in a new flasher assembly.

(a) **Flasher Assembly Defective.** If the lights now operate when the switch is operated, the flasher unit is defective. Replace it with the new unit.

(b) **Flasher Assembly Good.** If the flasher is good, run a jumper wire from the "ACC" terminal on the ignition switch to the center terminal (blue wire) on the manual switch. The lights should burn steadily.

(1) If the lights burn steadily when the switch is operated, the wires running from the manual switch through the flasher unit to the ignition switch terminal are defective or disconnected.

(2) If the lights still do not operate, the turn indicator switch may be defective. Remove the wires that connect to the switch from the bullet connectors (fig. 20) and temporarily connect a new switch. If the lights now burn when the switch is operated, repair or replace the switch and wiring.

(2) **SIGNAL LIGHTS OPERATE INCORRECTLY.** The procedures are listed under the symptom headings.

(a) **SIGNAL LIGHTS BURN BUT DO NOT FLASH.** If the signal lights burn but do not flash, replace the flasher assembly.

(b) **ONE SIGNAL LIGHT OUT ON EITHER SIDE.** If one signal light only is out, either the light is burned out on that side, or the wiring to the light is defective.

Check first to see if the light is burned out. The rear lamps may be checked by placing the manual switch in the center position and depressing the foot brake. Both rear lamps should light. If the light in question does not light while the other one does, the light is either burned out or the wiring to the light is defective.

The front lights may be tested by disconnecting the leads (green with white tracer and white with blue tracer) from the connector block behind the instrument panel and connecting a jumper from the "ACC" terminal of the ignition switch to each lead. If the lights do not

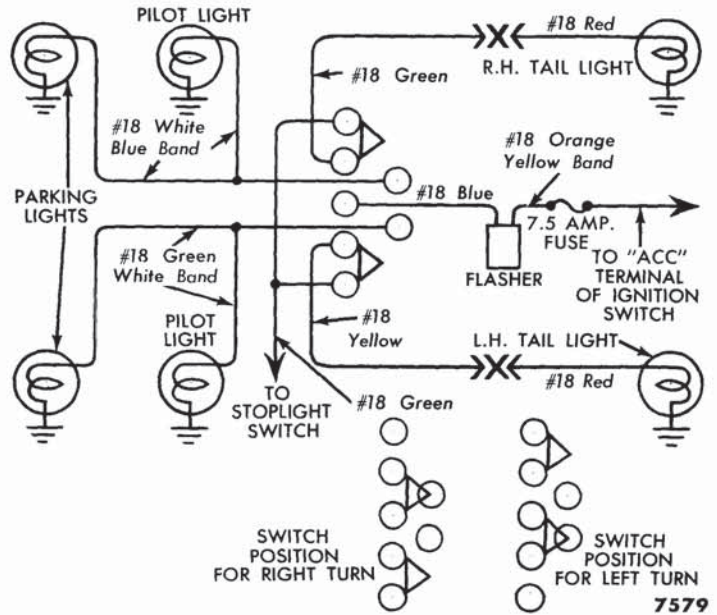


Fig. 1—Turn Signal Schematic Diagram

burn, the light is burned out or the wiring to the light is defective. Repair the wiring or replace the light, whichever is indicated.

(c) **ALL LIGHTS ON ONE SIDE DO NOT BURN.** If all the lights, including the pilot light, on one side only do not burn when the switch is operated, either the manual switch is defective, the wiring to all three lights is de-

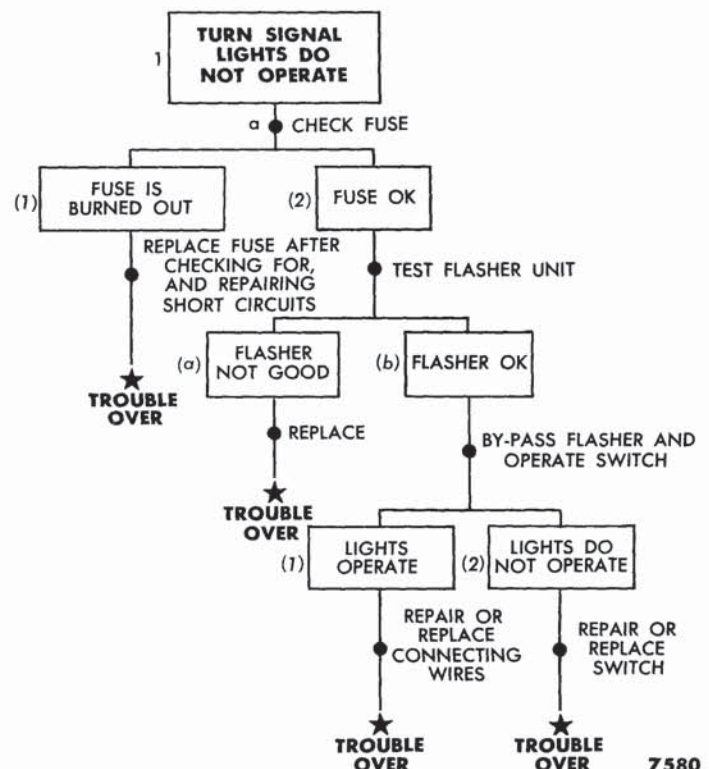


Fig. 2—Turn Signal Trouble Shooting—"Road Map"

fective, or all three lights are burned out. Replace the tail light on the side in question. If this light still does not burn when the turn switch is operated, the switch is probably defective. Disconnect the switch wires from the connector block behind the instrument panel, and connect a new switch in its place. If the lights now burn, the old switch was defective. Replace it. If the lights still do not burn, the wiring to all three lights is defective. Repair the wiring.

(d) **PILOT LIGHTS DO NOT BURN.** If either pilot light does not burn, the light is burned out, or the wiring to the light is defective. Replace the light or repair the wiring where necessary.

2. RADIO

a. General Information.

A diagram showing the radio connections is given in fig. 3.

(1) **MODEL IDENTIFICATION.** One radio receiver (Model 66BT) is supplied for trucks. The receiver is in two units, the power unit and the tuner unit, plus the speaker and grille assembly and the antenna. The model number (66BT) identifies the year of manufacture, the number of tubes, the manufacturer (Bendix), and indicates that the radio is for a truck. Figure 4 shows the location of the model number which is the prefix for the serial number. The part number of the truck radio is FDV-18805-A.

(2) **CONTROLS.** A disassembled view of the dial and the control knobs is shown in fig. 5. The smallest knob is the on-off and volume control. Directly behind the volume control knob is the tone control knob. The large knob controls the tuning. The tuning control is normally in the fine tuning position. For coarse or rapid tuning, push the tuning control knob inward while turning it. The dial indicator is visible through the transparent tuning knob, and indicates the approximate frequency to which the radio is tuned.

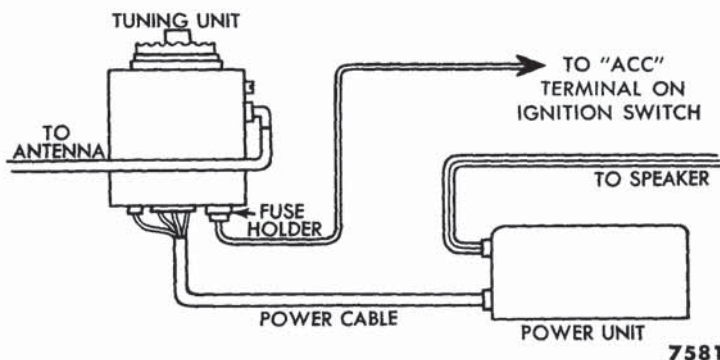


Fig. 3—Radio Wiring Connections

(3) **IMPROPER TURN SIGNAL CANCELLATION.** If the turn signal cancels prematurely, check the tension of the conical switch hold down spring. Stretch the spring lightly to increase the tension.

If the signal does not cancel at all, measure the distance between the steering wheel hub and the steering column flange. This distance should not be more than $\frac{1}{16}$ inch for the canceling cam on the steering wheel to make positive contact with the canceling pawls on the switch. A click should be heard when the steering wheel is rotated. Make certain that there are no burrs on the steering column flange where the turn indicator shaft goes through the flange.

(3) **CHASSIS CONNECTORS.** The antenna connector and the antenna trimmer are located on the left side of the tuner unit (fig. 6). The power cable and "A" lead plug into the back of the tuner unit (fig. 6).

One end of the power cable is permanently fastened to the power unit (fig. 7). One end of the speaker cable plugs into the power unit. The other end of the speaker cable plugs into connectors on the speaker. A permanent magnet speaker is used.

(4) **CHASSIS MOUNTINGS.** The tuner unit is mounted to the instrument panel by four screws (fig. 7). The power unit is mounted to the dash by a stud at the back of the unit.

The speaker and grille assembly (fig. 7) is mounted at the center of the windshield header and is connected to the power unit by a cable which goes through the header and left-hand pillar post.

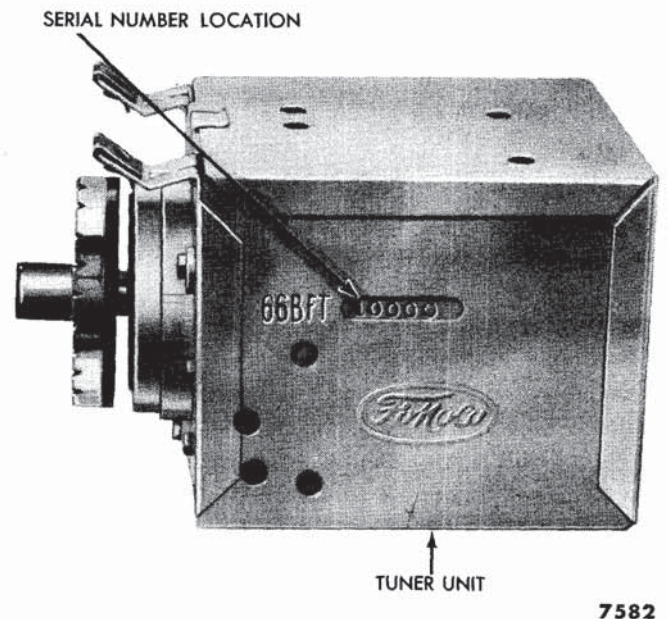
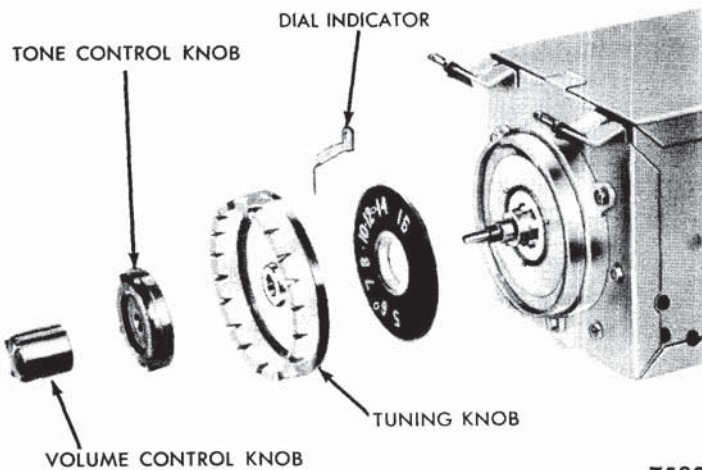


Fig. 4—Serial Number Location



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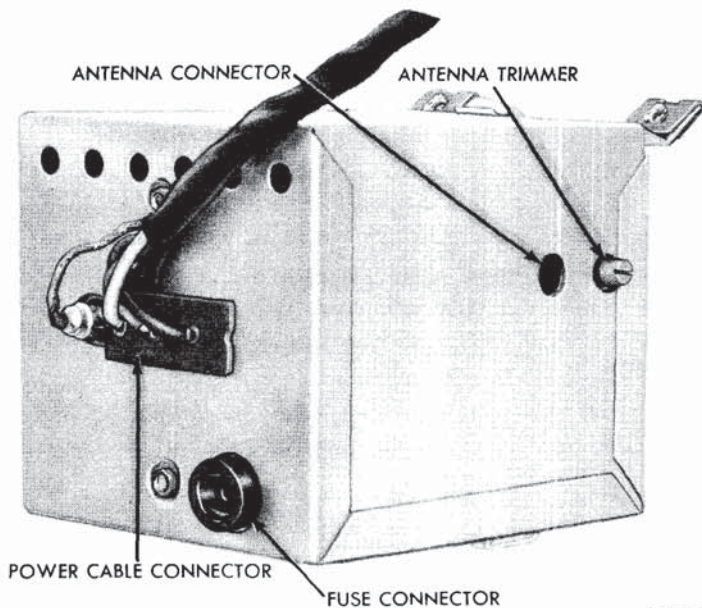
Fig. 5—Control Knobs—Disassembled

The antenna is mounted on the right-hand cowl.

(5) **ACCESSIBILITY.** The radio can be tested (minor repair test) and tubes or vibrator changed while the receiver is mounted in the vehicle. Access may be had to the tuner unit tubes by removal of the unit cover (fig. 9). It may be easier to first remove the tuner unit from the instrument panel.

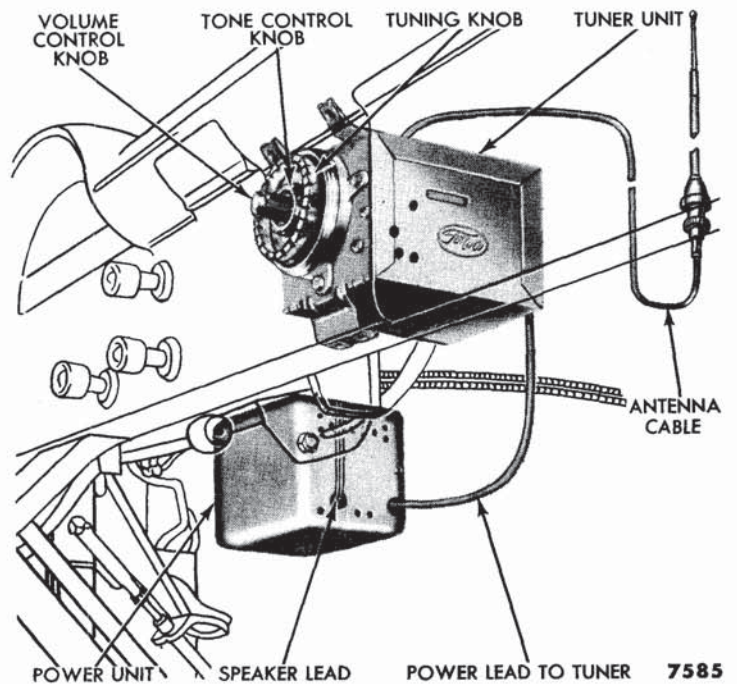
The cover can be removed from the tuner unit by unplugging the power lead and "A" lead and removing the hex-head screws (fig. 6). The entire cover is removed as one unit. When installing the cover, make certain that the top and bottom are slid under the clips at the front of the unit.

The cover of the power unit (fig. 7) is held on by four screws. Removal of the cover gives access to the power unit tubes and vibrator (fig. 9).



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Fig. 6—Connections to Tuning Unit



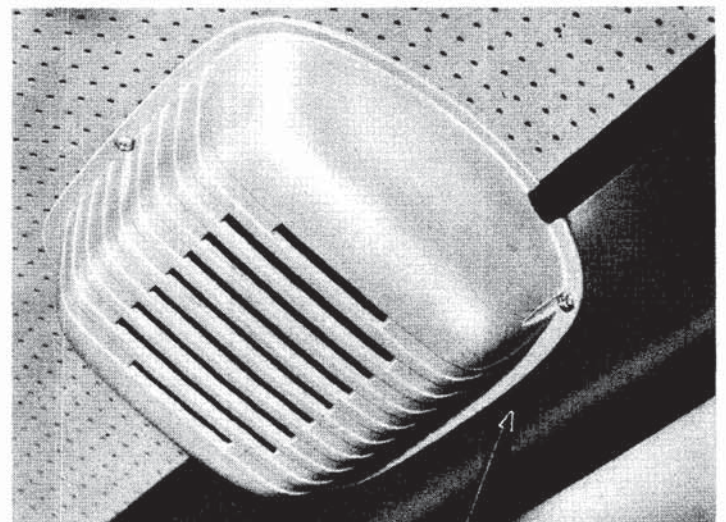
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Fig. 7—Radio Installation

(6) **REMOVAL AND INSTALLATION.** The tuner unit is removed by disconnecting the "A" lead, the power lead, the antenna lead and removing the four mounting screws (fig. 7).

The power unit is removed by disconnecting the speaker lead and removing the nut and washers from the power unit mounting stud in the engine compartment.

If a new radio is being installed a $2\frac{13}{16}$ inch hole and two $\frac{7}{32}$ inch holes must be drilled in the instrument panel to the left of the glove box. Use the template provided with the radio. Install the bezel and gasket in the



WINDSHIELD HEADER

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Fig. 8—Speaker and Grille Installation

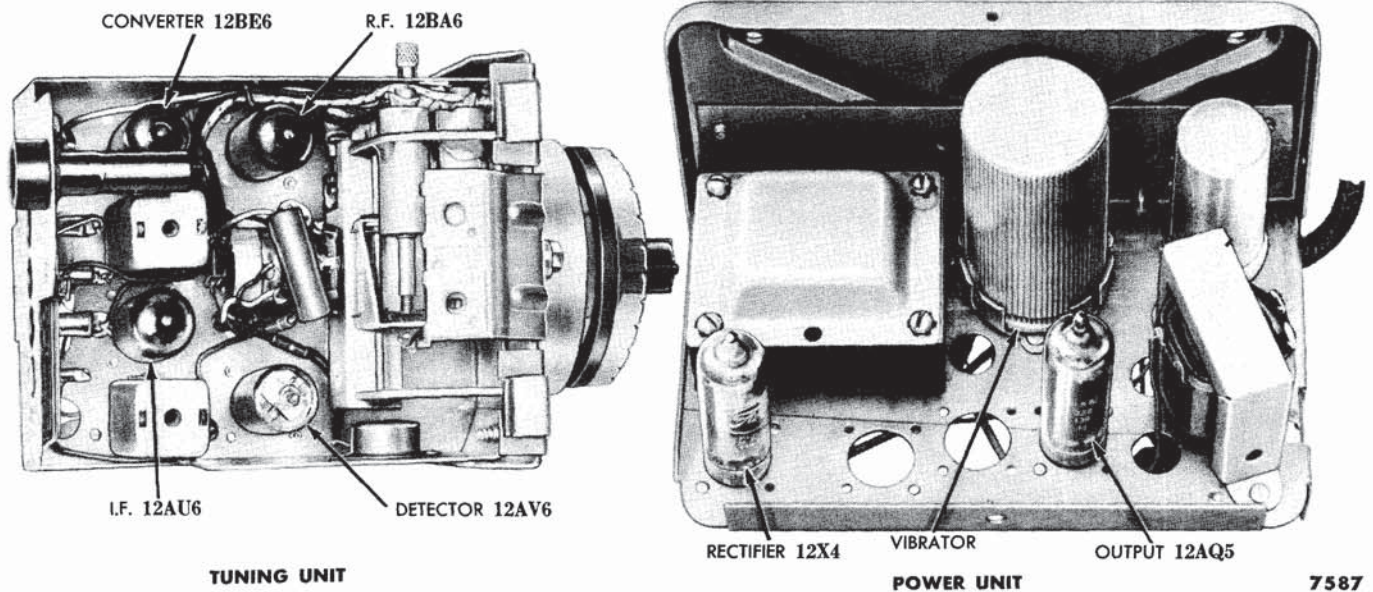


Fig. 9—Tube Arrangements

$2\frac{13}{16}$ inch hole before mounting the tuner unit in position.

A knockout hole is provided in the dash panel for the power unit mounting stud. Place the sleeve spacer on the stud before mounting the power unit to the dash panel.

The speaker and grille assembly is mounted to the windshield header panel with three screws. Two holes must be cut in the windshield header for the speaker as shown in the installation instructions with the radio. Install the speaker cable by removing the left-hand windshield visor and dropping the cable end with the three prong plug down the left-hand pillar post. Fish the pin end of the cable through the header with a piece of stiff wire. Attach the speaker with the top screw in the existing hole, drill the two bottom holes in the header panel, using the holes in the speaker assembly as guides, and install the two bottom mounting screws (fig. 8).

When attaching the speaker cable to the speaker, make certain that the large pin goes into the large terminal and the small pin goes into the small terminal of the speaker.

Connect the speaker plug to the power unit. Connect the antenna lead, "A" lead and fuse, and power lead to the tuner unit (fig. 6).

(7) ANTENNA INSTALLATION. The antenna is mounted on the right hand cowl. Use the template included with the antenna to locate the mounting hole. Drill a $1\frac{1}{8}$ inch diameter hole.

Install the antenna to the cowl. The lead-in is routed over the glove box and plugged into the antenna recep-

tacle on the left side of the tuner unit.

If the truck has a fresh air heater installed, remove the glove box. The antenna may then be installed. Re-mount the glove box.

(8) SUPPRESSION EQUIPMENT. When installing suppression items, make certain that all paint and dirt have been removed from between the condensers and the vehicle. Tighten all nuts and bolts securely.

Replace the distributor to coil high tension lead with the lead supplied in the kit. Install the lead as shown at "A," fig. 10.

It is not necessary to remove the generator assembly bolt to install the generator condenser. Loosen the bolt only enough to slide the mounting bracket under the lock washer ("B" fig. 10). Connect the condenser lead to the armature terminal of the generator.

Install the ignition switch condenser as shown at "C" fig. 10. Attach the condenser lead to the "ACC" terminal of the ignition switch.

Open the hood. Remove and discard the drive nail from the hood seal pad near the antenna. Install the hood bonding clip with the round-head screw provided ("D" fig. 10).

Install the oil gauge condenser as shown at "E," fig. 10. The fuel gauge condenser is installed as shown at "F," fig. 10.

b. Antenna Trimmer.

Turn the radio on and allow it to warm up for ten minutes before making the adjustment. Extend the antenna to its maximum length. Tune in the weakest

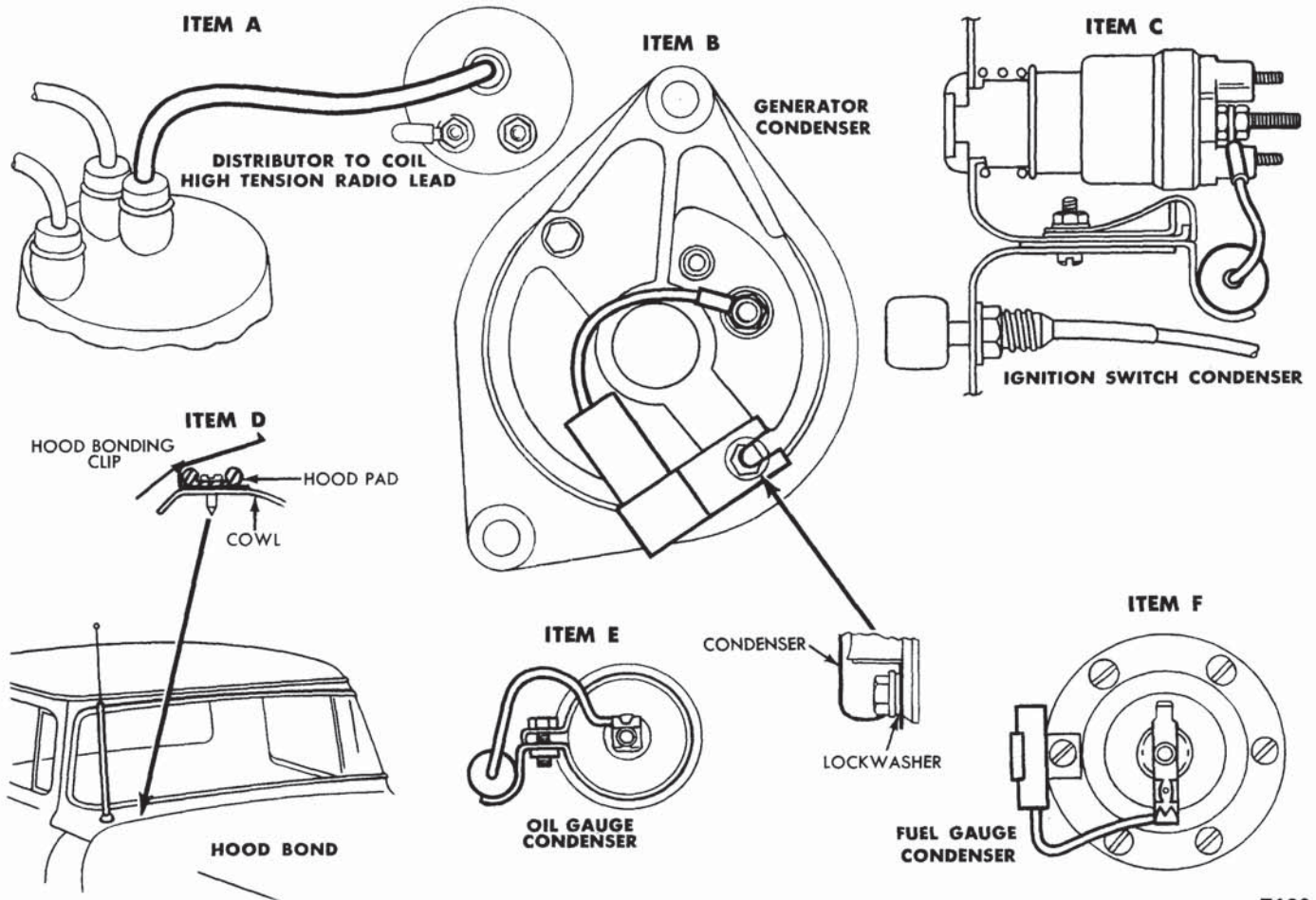


Fig. 10—Suppression Equipment Installation

station between 12 and 16 on the dial, and reduce the volume until the station is barely audible. Turn the antenna trimmer knob (fig. 6) slowly in either direction until a peak of volume is reached.

c. Minor Repair.

Procedures that can be used by a mechanic to do minor repair on the radio receiver are outlined here. Minor repair involves mechanical adjustments, replacement of control knobs, pilot light, tubes, vibrator, and antenna. The radio need not be removed for these repairs.

(1) **CONTROL KNOB REPLACEMENTS.** The volume, tone, tuning, and dial indicator knobs may be replaced by simply pulling them from the control shaft and putting others in their place. Figure 5 shows the sequence of assembly of the knobs. When assembling the dial indicator to its mounting tabs, rotate the tuning shaft as far counter-clockwise as it will go, and position the dial indicator with the number "16" at the top.

(2) **PILOT LIGHT REPLACEMENT.** The pilot light is in the tuning unit and may be replaced by removing the various leads and cover from the unit. The pilot light and socket may then be pulled from its mounting

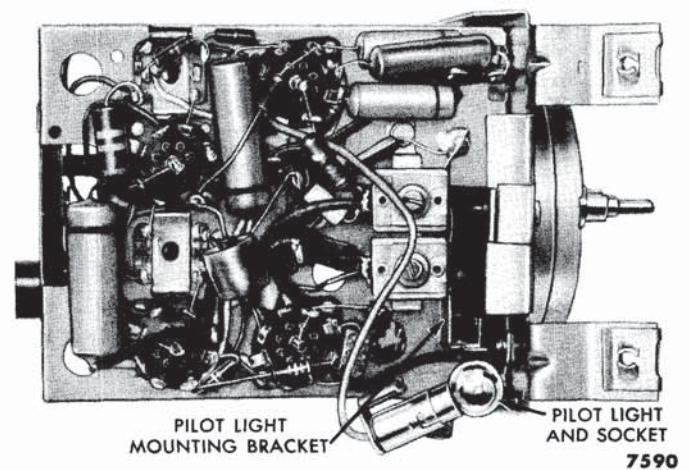


Fig. 11—Pilot Light Location