

**Group 1**  
**ACCESSORIES, RADIOS, HEATERS,**  
**MIRRORS, ETC.**  
**CONTENTS**  
**RADIO**

	Paragraph	Page
Antenna Compensator Adjustment .....	14	11
Fader Control Performance.....	17	12
Foot Switch for Search Tuning.....	20	13
Interference Elimination .....	16	12
Local and Distant Push Buttons.....	19	13
Manual Antenna .....	21	13
Motorized Antenna .....	22	14
On-Off Switch and Volume Control.....	15	12
Push Button Adjustment.....	18	13
Radio Controls .....	12	6
Radio Removal and Installation.....	13	8
Service Diagnosis .....	1	3

**HEATER**

Heater Blower .....	26	16
Removal		
Installation		
Heater Core .....	29	17
Removal		
Installation		
Heater Vacuum Actuator Replacement.....	27	17
Rear Window Defroster.....	30	18
Vent Deflector—Replacement.....	28	17
Service Diagnosis .....	23	15

**AUTOMATIC BEAM CHANGER**

Aiming the Automatic Beam Changer.....	35	19
Aiming the Scanner.....	36	19
Driver Adjustments .....	34	19
Operation .....	33	18
Service Diagnosis .....	31	18

## MIRROR-MATIC ELECTRONIC REAR VIEW MIRROR

	Paragraph	Page
Driver Adjustment .....	40	21
Inspection and Trouble Shooting.....	42	22
Reassembly and Installation.....	43	22
Removal and Disassembly .....	41	21
Service Diagnosis .....	37	20

## ELECTRIC CLOCK

Electric Clock .....	45	23
Removal		
Installation		
Service Diagnosis .....	45	23

## REMOTE CONTROL OUTSIDE MIRROR

Operation .....	46	23
Removal		
Installation		

## AUTO-PILOT

Auto-Pilot .....	64	31
Removal		
Installation		
Control Cable Adjustment.....	65	32
Linkage Adjustment Procedure.....	66	32
Operation .....	63	29
Service Diagnosis .....	47	24

## RECORD CHANGER

Adjustments .....	80	36
Cleaning .....	81	38
Lubrication .....	82	38
Operation .....	79	35
Service Diagnosis .....	67	33

---

# RADIO

## SERVICE DIAGNOSIS

### 1. RADIO IS INOPERATIVE OR DEAD

Do not operate the radio without the front seat speaker connected and either the rear seat speaker or a jumper wire connected to the rear seat speaker socket; otherwise the receiver will not operate and damage to components may result.

a. Listen carefully for a slight “plop” noise in the speaker when the radio is turned on.

b. If no noise is heard, check the fuse in the fuse holder.

### 2. FUSE IS BLOWN

a. If the fuse is blown, install a new fuse and check to see if the slight “plop” noise is heard in the speaker when the radio is turned on.

b. If no noise is heard, make certain the voltage is available at the “A” lead and if it is, or if the new fuse blows, remove the radio for major repairs.

### 3. FUSE IS NOT BLOWN

a. Check for voltage at the “A” lead with a voltmeter.

b. If 13 volts are available and no “plop” is heard when the radio is turned on, remove the radio for major repair.

c. If the noise is heard, connect the test antenna to the radio and hold it so that it protrudes out of and away from the car.

d. If the radio operates, install a new antenna and lead-in. Make certain that the old antenna connector was clean and made a good connection before discarding it.

e. If the antenna is not at fault, disconnect the speaker and plug in the test speaker.

f. If the radio operates, replace the old speaker.

g. If the speaker is not at fault, remove the radio and substitute the test tubes for those in the radio, one at a time, allowing enough time for each tube to heat up before going on to the next.

h. If the radio is still inoperative, it must be removed for a major repair. **It will seldom be necessary to replace a power transistor. Replacement and testing of transistors should be left to a competent**

radio service man. After performing all of the preceding checks, be sure to remove all parts marked for use in testing.

### 4. RADIO RECEPTION IS WEAK

a. When reception is limited to a few strong local stations, adjust the antenna trimmer to align the radio to the antenna fully extended. If the reception is not improved, proceed with the following steps. Substitute a test antenna, remove the radio and substitute test tubes as outlined in Paragraph 3.

### 5. RADIO RECEPTION IS NOISY OR ERRATIC

a. The cause of noisy or erratic reception can be isolated by finding out when the noise occurs.

b. If it occurs while the vehicle is at a standstill with the engine not running, the trouble lies in the radio receiver (Do not check for noise near fluorescent lights.)

c. 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.

d. If the noise occurs only while the vehicle is in motion, it is probably caused by wheel and tire static, or by intermittent shorting of the antenna. Check the connection at the radio and the “Y” connection in the trunk.

e. Power lines, electric road signs, etc., are another source of noise.

### 6. RADIO IS NOISY WITH CAR STANDING STILL—ENGINE NOT RUNNING

a. Tune in a local station, and jar the side of the radio case with the hand.

b. Make sure that the connector plugs are firmly seated.

c. If the connectors are secure and the noisy reception continues as the receiver is jarred, remove the radio and proceed with the following steps.

d. Tap the tubes gently with the finger tips, while holding the tubes in the socket to eliminate disturbing the tube contacts.

e. If the radio becomes noisy as any particular tube is tapped, substitute a test tube.

## 4 — ACCESSORIES, RADIOS, HEATERS, MIRRORS, ETC.

---

f. If none of the tubes are noisy, a repair is indicated.

### 7. RADIO IS NOISY WITH CAR STANDING STILL—ENGINE RUNNING

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

b. Start engine, turn on radio and tune to a spot between stations.

c. Engine noise will usually appear in radio as a clicking sound that varies in frequency with speed of engine. Check to see that all ignition wires are properly connected at the distributor cap and the spark plugs.

d. If noise is present, check voltage regulator, ignition coil, and generator capacitors for clean, tight connections; also check that antenna lead-in cable shield makes good ground contact at radio receptacle and that antenna mounting nut is tight and grounding collar is contacting the quarter panel.

e. Check the radio mounting for good grounding contact both at the support bracket mounting and where the radio contacts the instrument panel.

f. If noise is still present, substitute the good suppression test parts, one at a time. Remove the radio for repairs.

### 8. RADIO IS NOISY WITH CAR IN MOTION

a. Turn on radio and check for engine noise as described in Paragraph 7 above.

b. If engine noise is present, correct as outlined.

c. Retract the antenna and flex it slightly to let it vibrate.

d. Move and twist the lead-in slightly.

e. If noise occurs when this is done, replace the antenna.

### 9. RADIO IS NOISY WHEN CAR EQUIPMENT IS OPERATED

a. When excessive 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.

b. A poor ground connection at any point can produce the above trouble.

c. A limited amount of noise from electrical apparatus may be considered normal.

### 10. RADIO RECEPTION IS DISTORTED OR GARBLED

a. 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 component in the radio.

b. 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.

c. To determine if the speaker is at fault, substitute the test speaker, tighten the attaching nuts finger tight only.

d. If the reception is not corrected, substitute tubes as outlined in Paragraph 1 (b) or replace speaker.

e. Remove radio for repair.

### 11. RADIO MECHANISM RUNS CONTINUOUSLY (PC-1, PC-2, PC-3, PY-1)

When checking the operation of the search-tuner, make certain that the manual portion of the radio will tune in distant stations, that the antenna is fully extended, and that the antenna trimmer is adjusted. It may also be necessary to move the vehicle to a location where normal station signal strength is available (out of and away from steel reinforced buildings).

If the touch-tuner mechanism starts and runs continuously without the "LOC" and "DIST" buttons having been operated, remove the radio for a repair.

If the touch-tuner mechanism runs continuously after the "LOC" button is operated, depress the "DIST" button momentarily. If the tuner still runs continuously when the "DIST" button is operated, the receiver must be removed for repair.

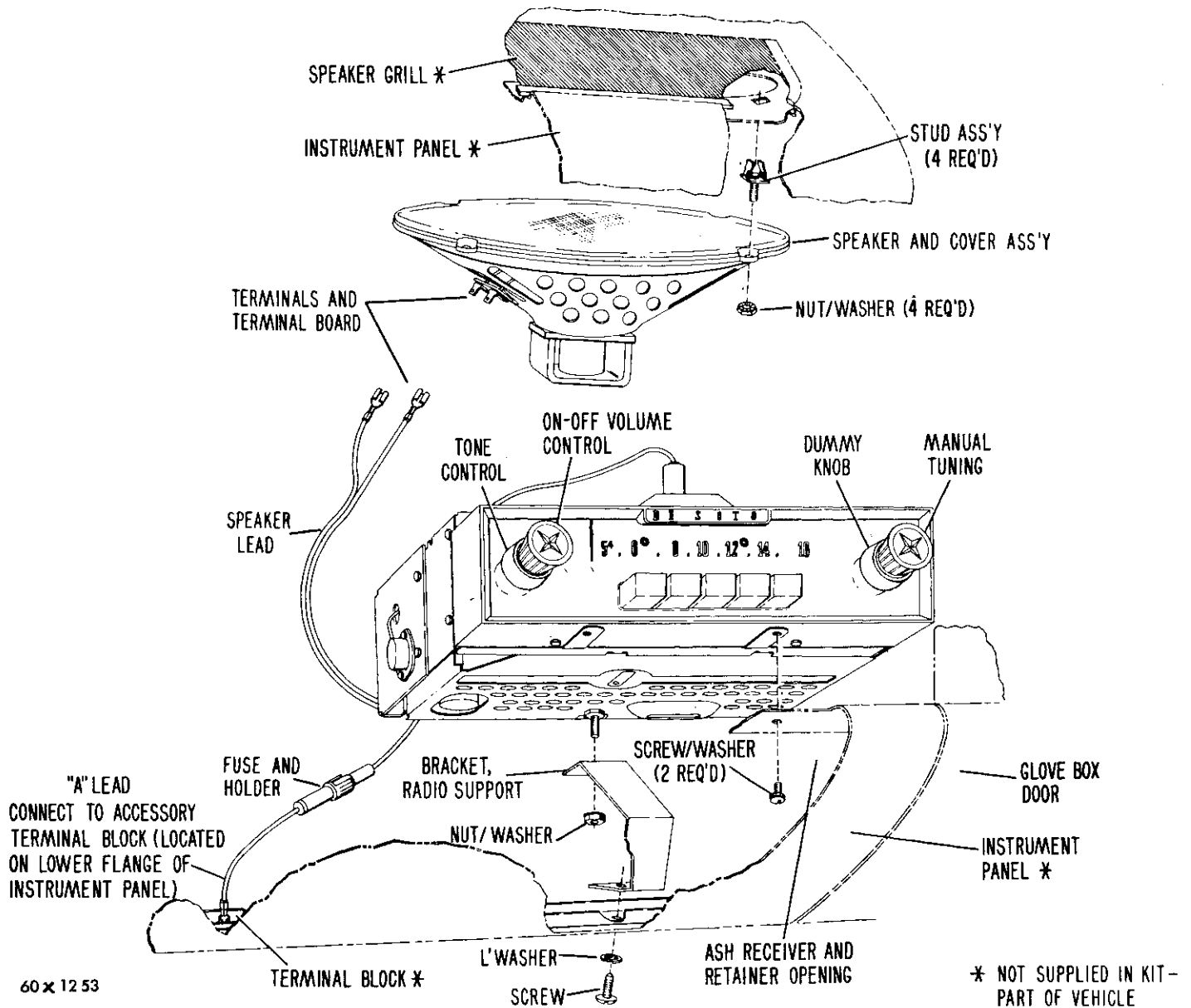
# Group 1

## ACCESSORIES, RADIOS, HEATERS, MIRRORS, ETC.

### RADIO

DeSoto vehicles are equipped with hybrid-type radio models 112 or 304 (Figs. 1 and 2). The radio receiver features a two transistor push-pull audio out-

put (Fig. 3), a transistor driver stage, a continuously variable tone and rear speaker fader control and a socket for the record player.



60 x 12 53

Fig. 1—Radio Installation Model 112

Chrysler vehicles are equipped with hybrid-type radio models 303 and 402 (Fig. 4). Imperial vehicles are equipped with radio model 403 (Fig. 5) which is electrically identical to model 402. The radio receivers are featuring a two transistor push-pull audio output, a transistor drive stage and Panelescent set lighting. The model 303 is a push button type radio with continuously variable tone and rear speaker control. Radio models 402 and 403 are search tuned radios with a step position tone and rear speaker control.

12. RADIO CONTROLS (Figs. 6, 7, and 8)

On push button radios, tuning is controlled by five push buttons and the manual tuning knob is to the right of the radio dial. On search tuned radios, (models 402 and 403) tuning is controlled manually by five push buttons and the tuning knob; search tuning is controlled by two additional push buttons and a foot switch. Volume, tone and on-off switch are controlled by the dual knob to the left of the radio dial. Rear speaker fader control (if so equipped) and tuning knob are located to the right of the radio dial.

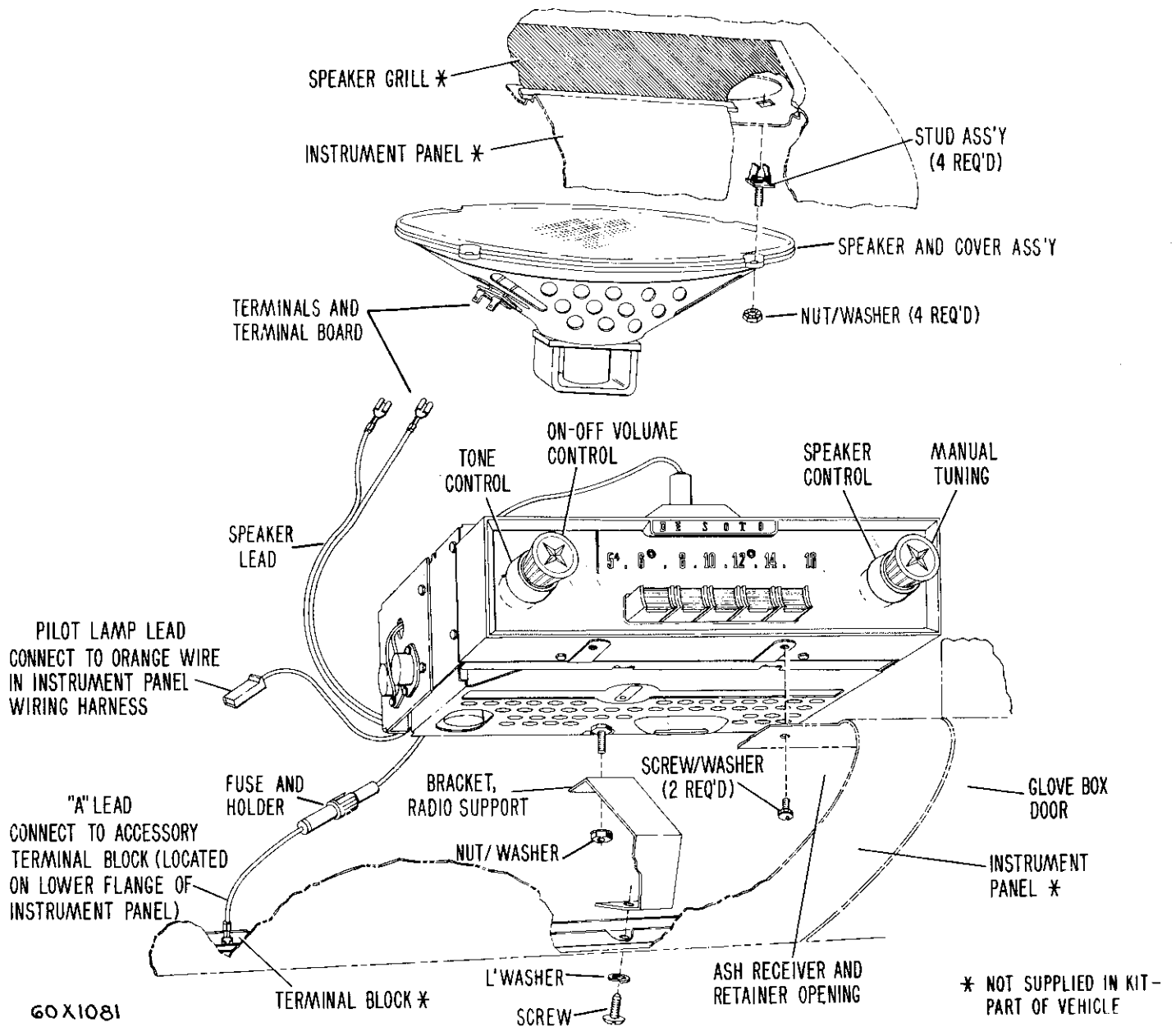


Fig. 2—Radio Installation Model 304

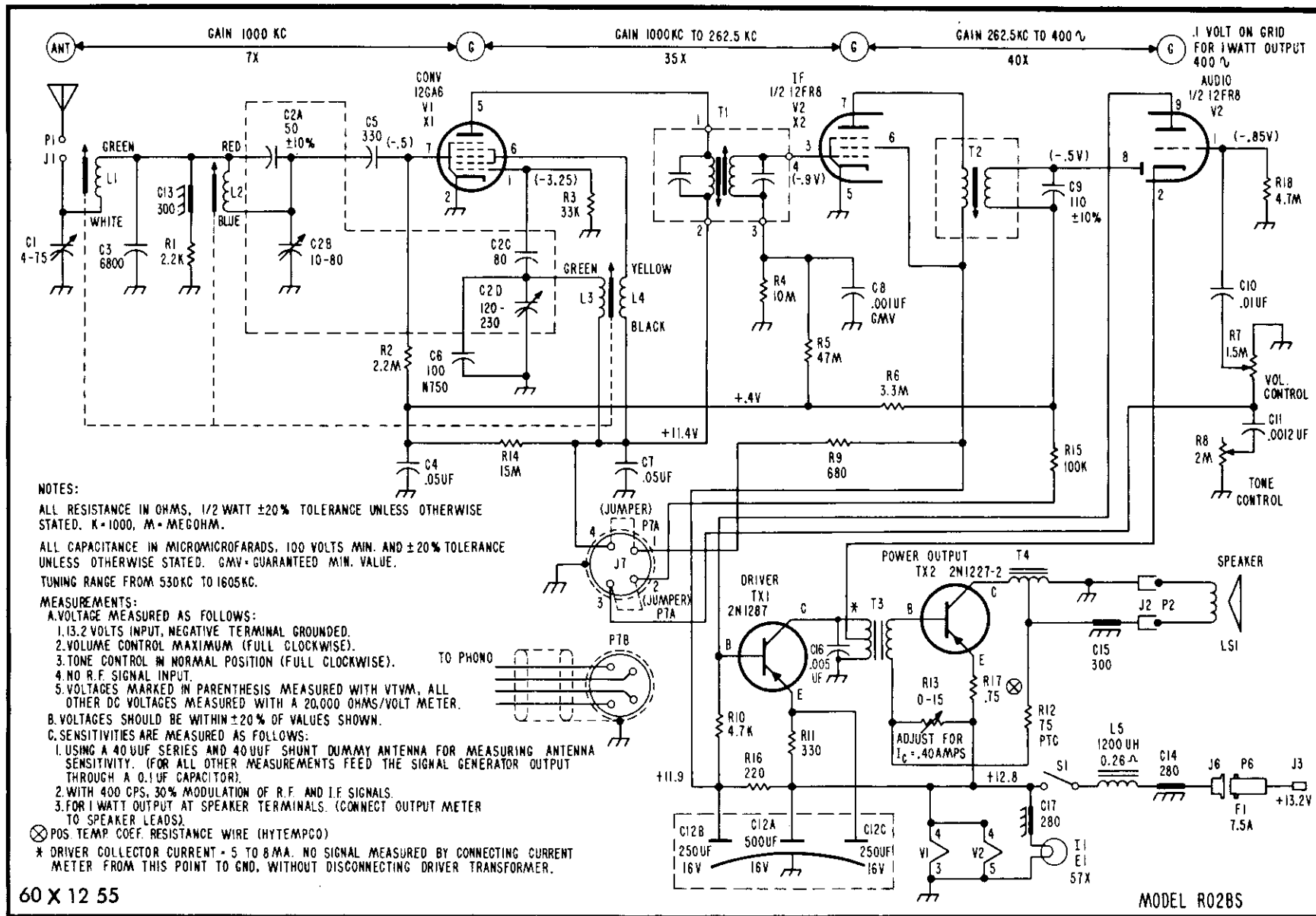


Fig. 3—Radio Schematic Wiring Diagram Radio Model 112

## SERVICE PROCEDURES

### 13. REMOVAL AND INSTALLATION

Be sure that the battery is disconnected before removal of the radio.

The radio is attached to the instrument panel with two mounting nuts and with a support bracket at the rear of the set (Figs. 4 and 5).

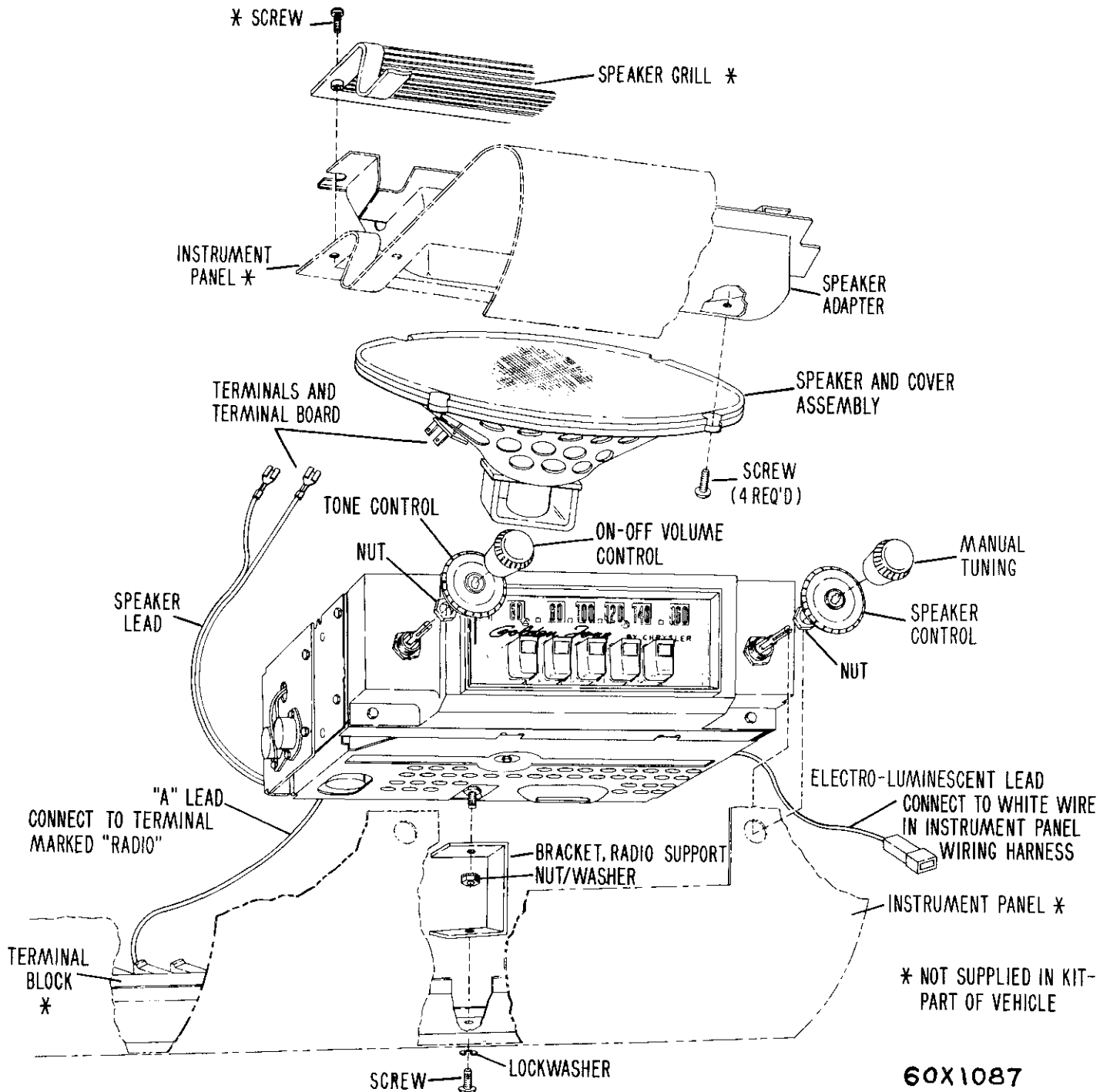


Fig. 4—Radio Installation Model 303



**CAUTION**

Do not operate the radio with speaker detached, since damage to the transistors may result. If the rear seat speaker is disconnected from the radio, insert a jumper wire in rear seat speaker socket to allow the receiver to operate (Fig. 9).

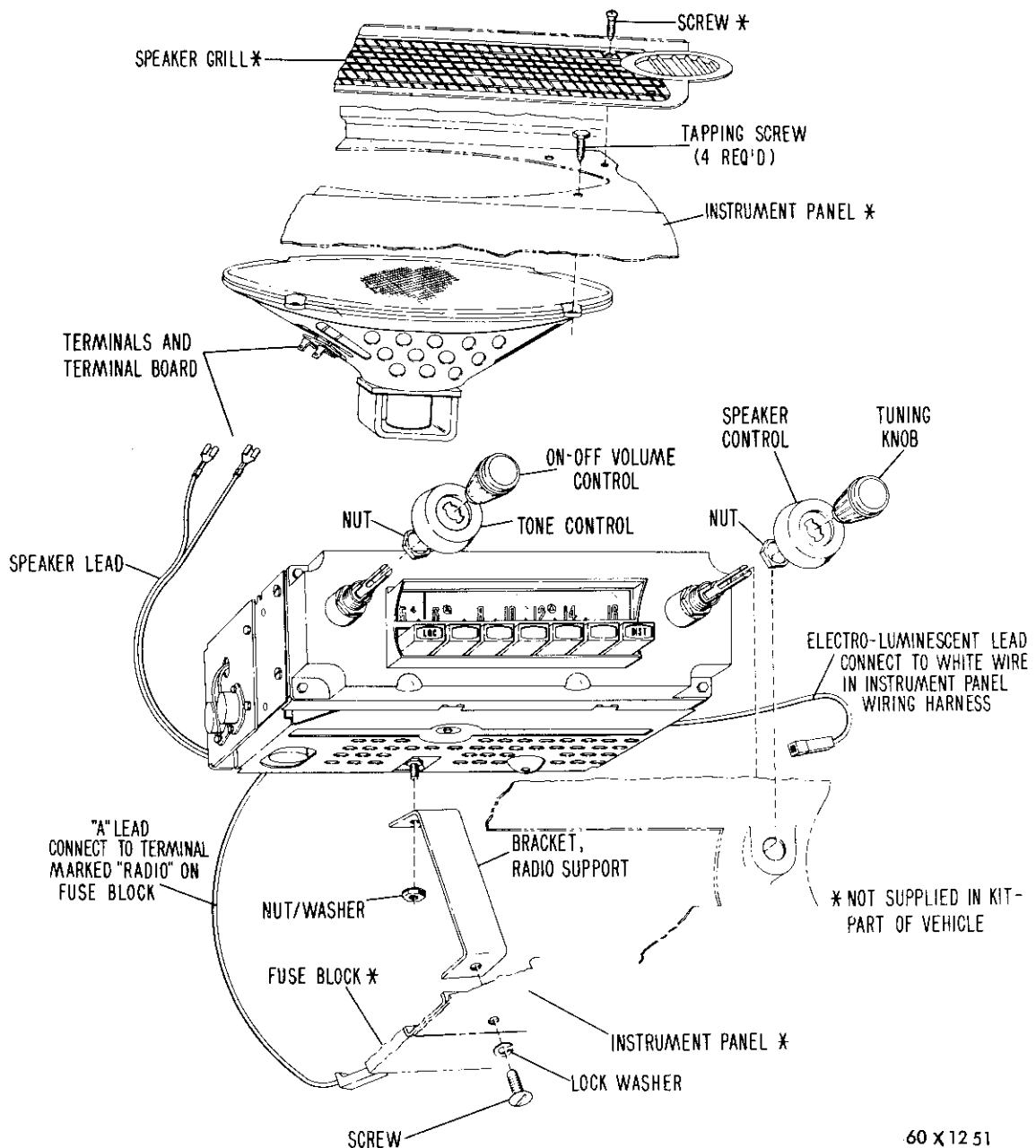
**a. Radio Removal (DeSoto Vehicles) (With or Without Air Conditioning) (Fig. 2)**

- (1) Disconnect battery.
- (2) Disconnect antenna leading "A" lead, light lead, front and rear speaker leads.

- (3) Remove ash tray assembly to gain access to mounting bolts.
- (4) Remove mounting bolts.
- (5) Remove both radio-to-dash support brackets.
- (6) Withdraw the radio assembly from underside of instrument panel.

**b. Radio Removal (Chrysler Vehicles Only) (With Air Conditioning) (Figs. 4 and 5)**

On Chrysler vehicles with air conditioning, time and effort can be saved by removing the radio and speaker



**Fig. 5—Radio Installation Model 403**

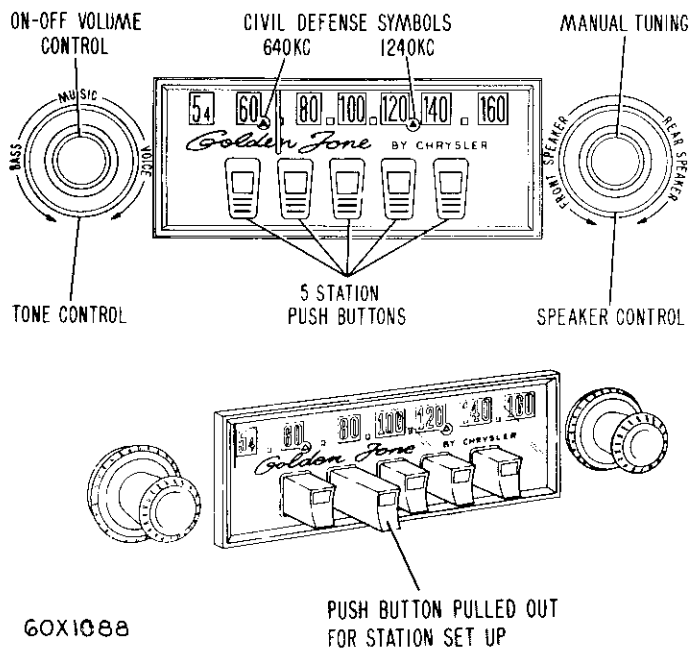


Fig. 6—Radio Controls Model 303

assembly up through the speaker opening instead of from the underside of the instrument panel.

- (1) Disconnect battery.
- (2) Remove control knobs and shaft mounting nuts.
- (3) Remove radio-to-dash support brackets.
- (4) Disconnect "A" lead, light lead, front and rear speaker leads, antenna lead and foot selector switch (if so equipped).
- (5) Remove speaker attaching screws and grille from top side of instrument panel.
- (6) Remove speaker and radio assembly up through the opening of instrument panel.

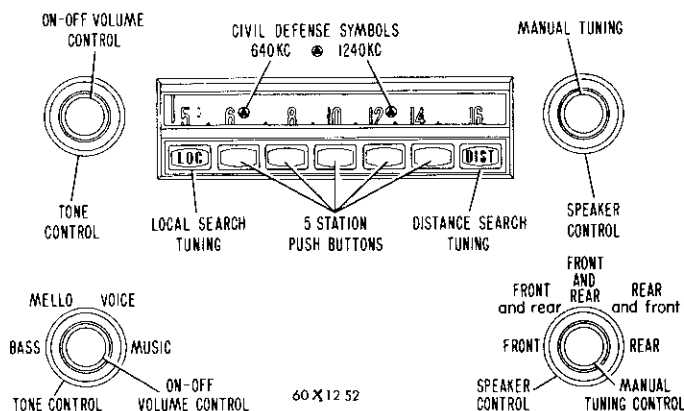


Fig. 7—Radio Controls Model 403

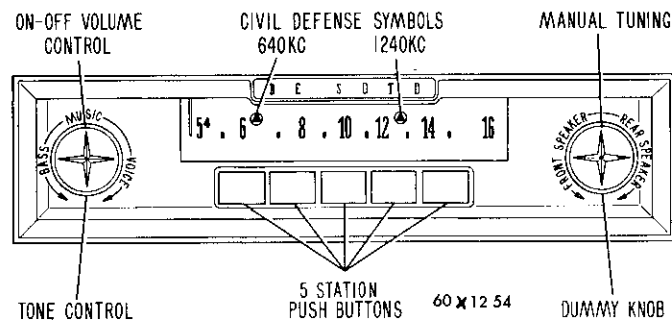


Fig. 8—Radio Controls Model 112

**c. Removal (Chrysler Vehicles)  
(Without Air Conditioning)**

- (1) Disconnect battery.
- (2) Remove control knobs and shaft mounting bolts.
- (3) Remove radio-to-dash support bracket.
- (4) Disconnect "A" lead, light lead, front and rear speaker leads, antenna lead and foot selector switch connector (if so equipped).
- (5) Withdraw the radio assembly from underside of instrument panel.

**d. Removal (Imperial Models)  
(With or Without Air Conditioning)**

- (1) Disconnect battery negative terminal.
- (2) Remove radio-to-dash support bracket.
- (3) Remove 2 screws attaching fuse block to instrument panel and lower the fuse block to facilitate removal of the radio.
- (4) Disconnect the "A" lead, light lead, front and rear speaker leads, antenna leads and foot control switch connector (if so equipped).
- (5) Withdraw the radio assembly from underside of instrument panel.

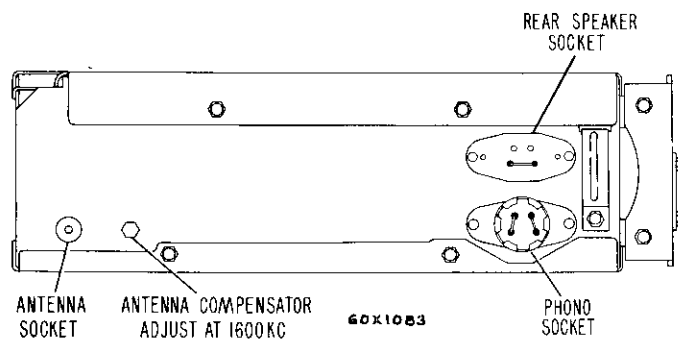


Fig. 9—Radio Compensator Model 304

**e. Installation (Imperial Models)**

(With or Without Air Conditioning)

(1) Install the radio assembly from underside of the instrument panel.

(2) Install the radio-to-dash support bracket and radio attaching nuts.

(3) Connect the antenna light "A" lead, speaker leads and rear seat speaker leads and foot selector switch connector (if so equipped).

(4) Connect the battery.

**f. Installation (Chrysler Cars)**

(Without Air Conditioning)

(1) Enter the radio from underside of instrument panel and install the two shaft mounting nuts.

(2) Install radio-to-dash support bracket and attaching nuts.

(3) Connect the antenna, light, "A" and speaker leads (to connect rear seat speaker leads remove jumper wire from rear speaker socket).

(4) Connect the foot selector switch lead, if so equipped.

(5) Connect the battery.

**g. Installation (Chrysler Cars) (With Air Conditioning)**

(1) Enter the radio assembly through the instrument panel speaker opening.

(2) Install the radio assembly in the instrument panel.

(3) Install the mounting bracket to dash panel and underside of radio assembly.

(4) Mount the speaker to the speaker grille.

(5) Install the speaker grille with attaching screws.

(6) Connect the "A," antenna and speaker leads.

(7) Connect the light and foot selector switch connector if so equipped.

(8) Connect the battery.

**h. Installation (DeSoto Vehicles)**

(With or Without Air Conditioning)

(1) Enter the radio from underside of instrument panel and install the two mounting bolts.

(2) Install the radio-to-dash support bracket and attaching nuts.

(3) Connect the antenna, lead in light, "A" and speaker leads (to connect rear seat speaker leads remove jumper wire from rear speaker socket).

(4) Install the ash tray assembly.

(5) Connect the battery.

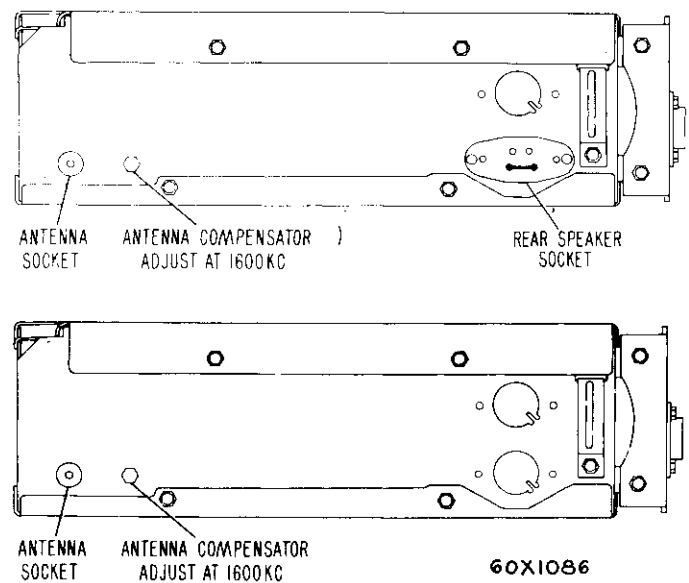
**14. ANTENNA COMPENSATOR ADJUSTMENT**

(Figs. 9 and 10)

**CAUTION**

The antenna compensator must be properly adjusted for the satisfactory operation of the radio.

The antenna compensator receives its original adjustment at the time the set is manufactured; however, a final adjustment must be made so that the radio can be matched exactly to the specific antenna used in each vehicle. Generally a quarter of a turn of this trimmer in either direction will match the antenna to the radio. With antenna fully extended, tune the radio to the general area of 1600 KC on the dial—preferably off station—and turn up the volume until a hissing sound is heard. Then, with the antenna fully extended adjust the antenna compensator (located on the rear of the radio chassis) by carefully rotating it back and forth until a position is found that gives peak response and maximum volume. Unless the receiver is properly aligned to the antenna, optimum performance cannot be obtained. This is particularly true in the case of the touch-tuner where the signal strength materially affects the over-all efficiency of the radio receiver. The same procedure can be followed when using a weak station to adjust the compensator for maximum signal volume. When this hissing sound is at its maximum or the station volume is greatest, the antenna compensator is properly adjusted and should be left in this position.



**Fig. 10—Radio Compensator Model 402**

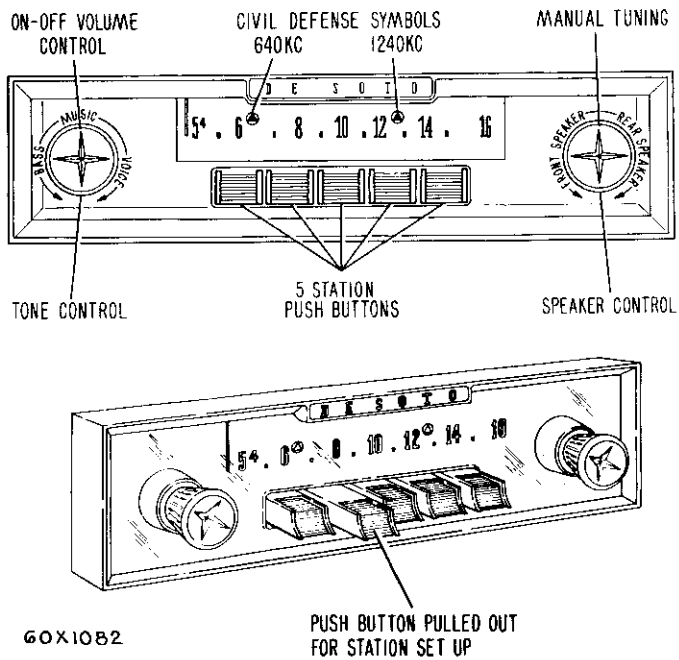


Fig. 11—Radio Operating Controls Model 304

**15. ON-OFF SWITCH AND VOLUME CONTROL**  
(Figs. 7 and 11)

The on-off switch and volume control are combined and operative from the left-hand radio knob.

**16. INTERFERENCE ELIMINATION**

When installing suppression items, make certain that all paint and dirt have been removed from the grounding area between the condensers and the engine or body components. Tighten all nuts and bolts securely.

The high tension portion of the engine ignition system uses radio resistance wire as standard equip-

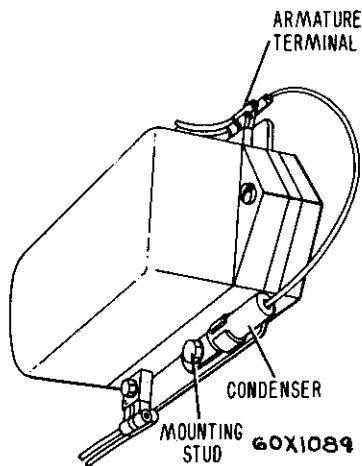


Fig. 12—Voltage Regulating Condenser

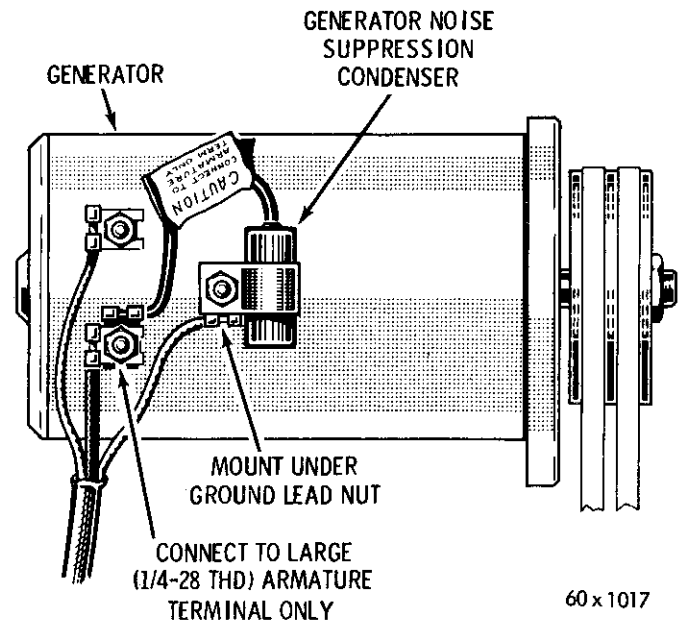


Fig. 13—Generator Condenser

ment. The balance of the suppression equipment is installed as follows:

Install the voltage regulator condenser, as shown in Figure 12.

Connect the generator condenser lead to the armature terminal of the generator, Figure 13.

Install the ignition coil condenser, as shown in Figure 14.

**17. FADER CONTROL PERFORMANCE**

This control is used only when the vehicle is equipped with a rear seat speaker. Positioning control in one extreme position allows operation of rear seat speaker. Rotating the control to extreme opposite position allows both speakers to operate with varying

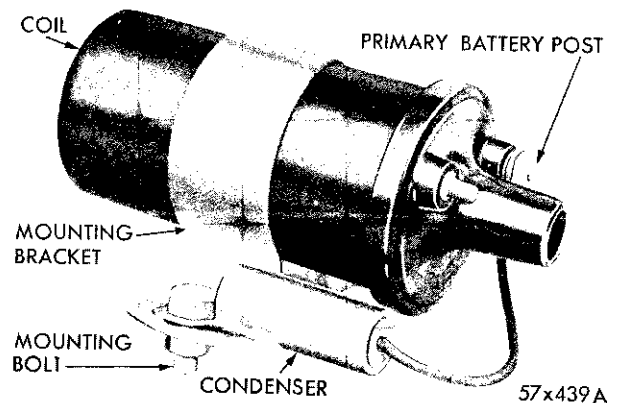


Fig. 14—Ignition Coil Condenser

volume as desired, or with equal volume at mid-position.

On the 402-403 Models, a five position switch speaker fader control is used in conjunction with the rear speaker. This new Deluxe feature provides an extremely wide range of sound level variation between the front and rear compartments without the usual degree of precise tuning required of the normal variable controls.

**18. PUSH BUTTON ADJUSTMENT—RADIO MODELS (Figs. 6, 7, 8, and 11)**

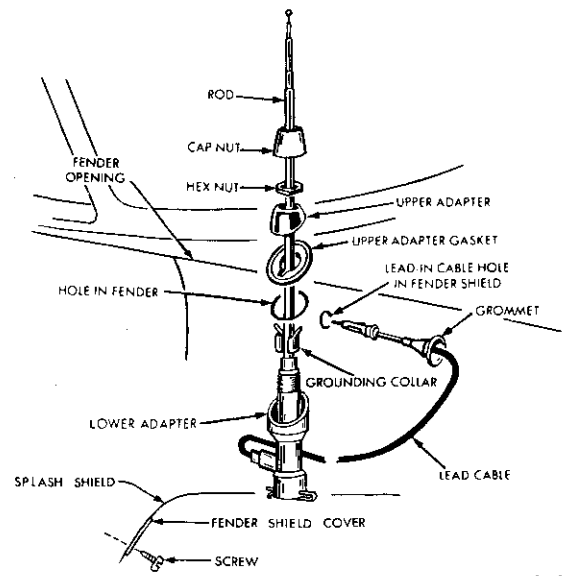
- (1) Extend the antenna fully and turn the radio on for fifteen minutes.
- (2) Unlock the push button by pulling it out and manually tune in the desired station.
- (3) Push the button back into position to lock the adjustment.
- (4) Repeat the operation on the other push buttons.

**19. LOCAL AND DISTANT PUSH BUTTONS**

Local push button will tune the receiver to only strong signal stations. Distant push button will tune the receiver to most of the stations within range of the radio. For weak stations, manual control should be used for precise tuning.

**20. FOOT SWITCH FOR SEARCH TUNING**

The foot switch for search tuning, on Models 402 and 403 is located on the left forward end of the floor panel. By depressing the foot switch, it will



60x1342

**Fig. 16—Motorized Antenna Installation (Front)**

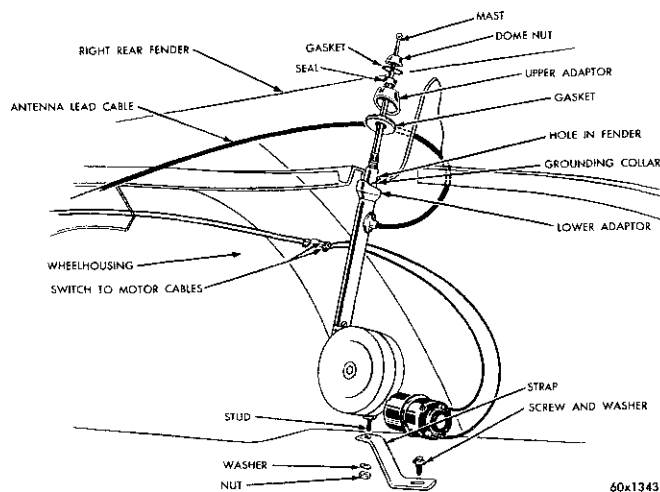
select a station on the radio.

The foot switch activates the tuner mechanism in the same manner as the search-tuning buttons (LOC and DIST). Therefore, the foot switch will cause the search-tuner to operate at a sensitivity pre-determined by which of the two search-tuning buttons was last depressed.

**21. CHRYSLER, IMPERIAL AND DESOTO (Manual Antenna Equipped Cars) (Fig. 15)**

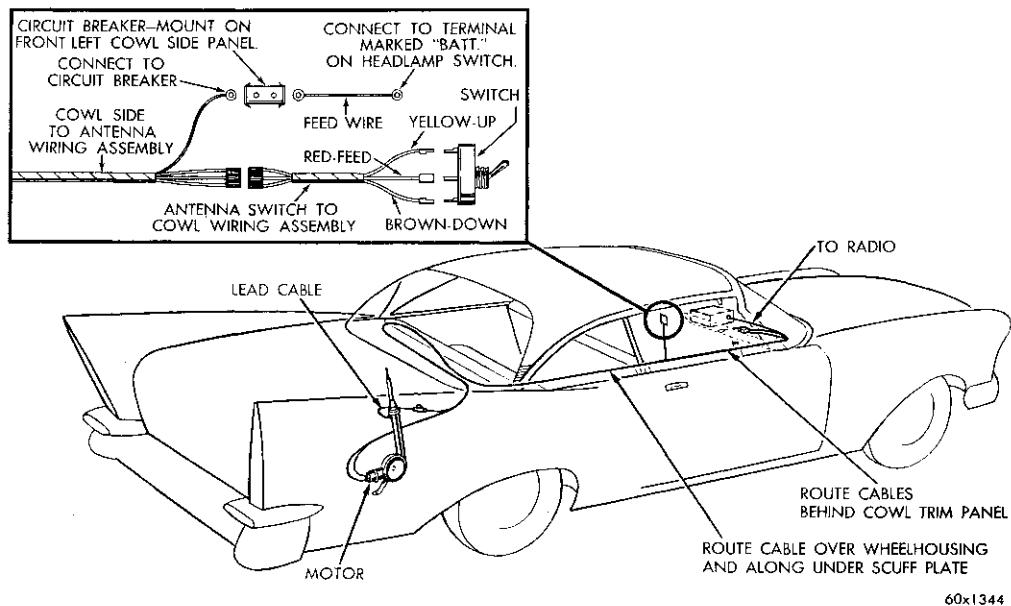
**a. Removal**

- (1) On front fender antenna equipped models



60x1343

**Fig. 15—Manual Antenna Installation (Front)**



**Fig. 17—Motorized Antenna Installation (Rear)**

unplug the antenna lead-in wire from radio set at instrument panel. On rear mounted antennas, unplug the antenna short lead from the extension cable at the "Y" connector located in the trunk compartment.

(2) Lower the antenna.

(3) Remove plastic cap and nut attaching the antenna to rear wheel housing.

(4) Remove the hexagon nut, plastic adapter, gasket and ground collar.

(5) Remove antenna assembly.

When installing the antenna, care should be taken to route the "lead-in" cable over the glove box compartment to allow for ample cable length when plugging the "lead-in" cable into the radio receptacle.

**b. Installation**

(1) Install antenna rod, lower adapter and mount antenna to quarter panel or front fender.

(2) Install gasket, upper adapter and attaching hexagon nut.

(3) Tighten the attaching nut and install hexagon nut plastic cap.

(4) Install lead-in cable to "Y" connector on rear mounted antenna and in radio set on front fender equipped models.

(5) Check radio for proper operation.

**22. CHRYSLER, IMPERIAL AND DESOTO (Motorized Antenna) (Figs. 16 and 17)**

**a. Removal**

(1) On rear or right front fender equipped models,

unplug antenna switch to antenna motor wires at connector (Fig. 16 and 17).

(2) Unplug the antenna to radio set lead-in wire at connector.

(3) Lower the antenna.

(4) Remove the plastic dome nut attaching antenna to the wheel housing.

(5) Remove the upper adapter and gasket.

(6) Remove antenna to bracket attaching screws and remove antenna.

**b. Installation**

(1) Lower antenna.

(2) Install antenna to bracket and tighten bracket attaching screws.

(3) Mount antenna to fender on wheel housing, or right front fender on Imperial models.

(4) Install lower adapter, grounding collar, gasket, upper adapter and dome attaching nuts.

(5) Tighten dome attaching nut and check radio for operation.

On the field installed dual antennas care should be taken to route the rear antenna cable around the rear fender well behind the trunk liner to the "Y" connector located behind the rear slot in the trunk compartment so as to avoid interference from the hinges of the trunk when opening and closing the trunk lid.

# HEATER

## SERVICE DIAGNOSIS

### 23. INSUFFICIENT HEAT

- a. Temperature control valve not opening.
- b. Engine thermostat opening too soon, too wide, or at low temperature.
- c. Faulty push button controls.
- d. Vacuum line to shut-off damper disconnected or broken.
- e. Faulty vacuum actuator or broken or cracked nipple.
- f. Insufficient coolant in radiator.
- g. Collapsed water hose on the return side, or partially plugged hose on the pressure side.
- h. Heater system airbound; needs bleeding.
- i. Blower motor not operating, fuse blown, faulty wiring or loose connections.

### 24. TOO MUCH HEAT

- a. Temperature control valve stuck in open position.
- b. Disconnected or broken bowden cable wire.
- c. Engine thermostat controlling at two high a temperature.
- d. Thermostat stuck in closed position.
- e. Temperature control valve not closing properly, cable needs adjusting.

### 25. BLOWER MOTOR NOT OPERATING

- a. Fuse blown.
- b. Faulty motor.
- c. Faulty electrical connections.
- d. Push button not completing circuit.
- e. Clip holding fan motor to shaft broken or loose.

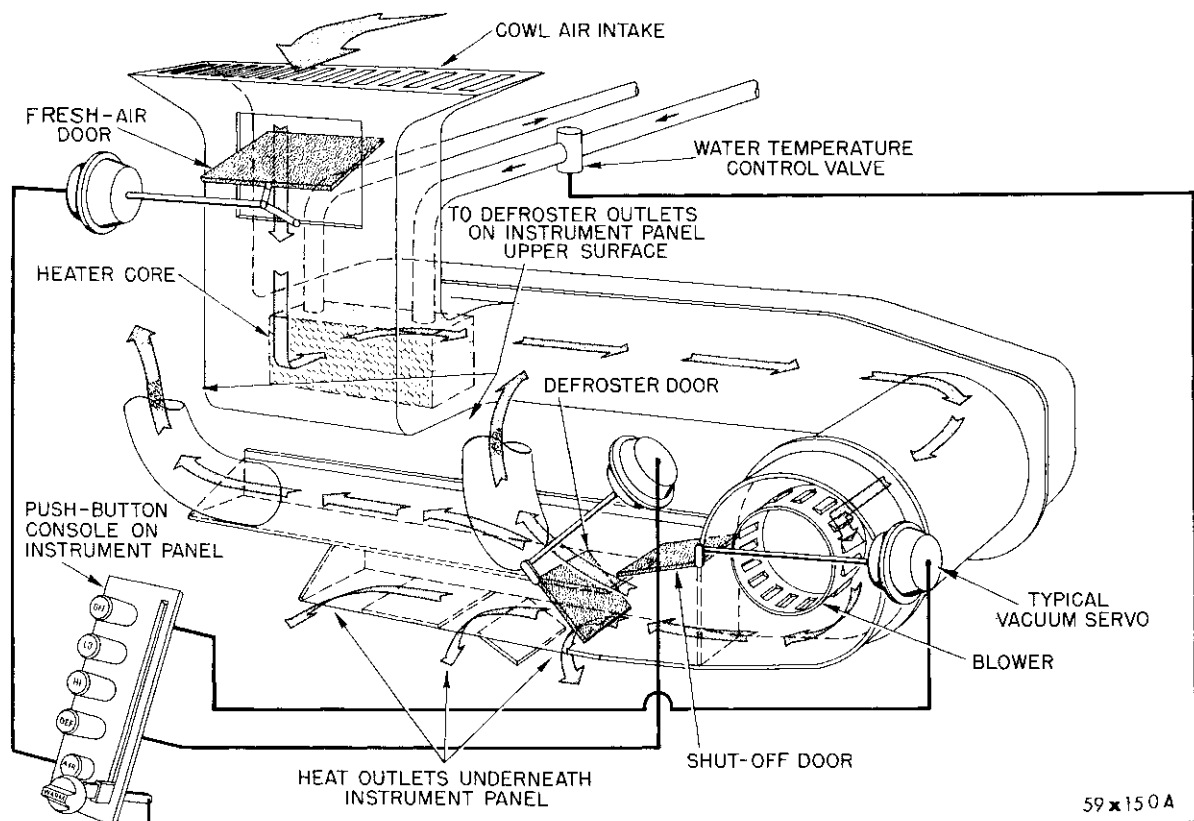


Fig. 18—Push Button Operated Heater (Schematic View)

## HEATER

The hot water heating system (Fig. 18) used on all 1960 models for heating and defrosting is controlled by four push buttons and a temperature control lever (Fig. 19). A fifth push button independently controls the summer ventilation system.

**The Temperature Control Lever**—operates the water valve through a bowden cable. It is important that the bowden cable be adjusted to provide full opening and closing of the water valve for efficient functioning of the system.

**Summer Ventilation**—is controlled by opening of the ventilator air damper (Fig. 18).

**For Heating**—air enters through the cowl air intake (Fig. 18) passes through the heater core into the blower and distribution duct through the opened shut-off damper (Fig. 18).

**Defrosting**—is controlled by the defroster damper (Fig. 18). For maximum defrosting or deicing, the temperature control lever must be set in the full warm position.

**Temperature Control Lever**—selects the temperature of the air discharged through the lower and upper outlets. When the lever is to the left, air is not being heated. Air temperature is increased by moving the lever toward "WARM" position.

**OFF Button**—When "OFF" button is pushed in, the system will not operate. The "OFF" button cuts off the current from the control lever switch and blower motor. The ventilation doors are closed, preventing outside air from entering car.

**VENT Button**—Opens the ventilation door to allow outside air to enter the car directly. It does not operate the blower.

**DEF Button**—Causes a major portion of the air to be forced onto the windshield through air outlets on top of instrument panel for defrosting or defogging.

**"HI" Button**—Causes major portion of air to be directed toward the car floor, at high blower speed.

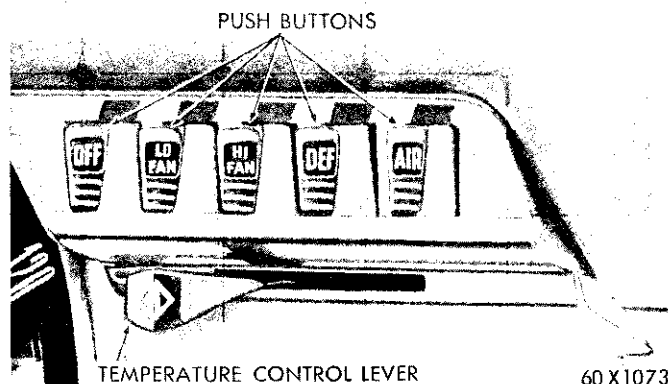


Fig. 19—Temperature Control Heater

**"LO" Button**—Provides gentle heat at low blower speed.

### Heating the Car

Until the engine warms up, make sure the "OFF" button is pushed in and the temperature control lever is in the "WARM" position. Then, push in the "HI" button and leave the temperature control lever in the "WARM" position for fast initial car warm-up. After warm-up use the "LO" button to adjust the speed as desired, and adjust the position of the temperature control lever to maintain desired temperature. **When the "HI" button is pushed in, sufficient warm air will be forced onto windshield through the upper air outlets for adequate defogging during average driving conditions.**

### Defrosting or Defogging the Windshield

Push the "DEF" button for maximum defrosting, move the temperature control lever to the "WARM" position.

### Summer Ventilation

Push in the "VENT" button to open the ventilation door. Move the temperature control lever to the extreme left. The ventilation door may be left open during rain.

### Rear Window Defroster (When So Equipped)

A toggle switch (at left and under the instrument panel) operates a blower which circulates air over the rear window to prevent fogging.

## SERVICE PROCEDURES

### 26. HEATER BLOWER

#### a. Removal (Fig. 20)

- (1) Disconnect the battery ground cable.
- (2) Disconnect the heater ground wire at wind-

shield wiper motor mounting bracket.

(3) Disconnect the heater wires from harness connectors.

(4) Disconnect the vacuum hoses at each vacuum unit.



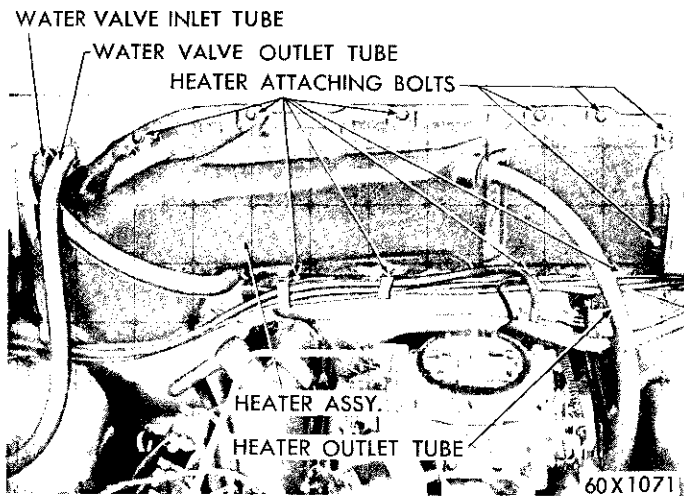


Fig. 20—Heater Removal or Installation

- (5) Remove hoses from their attaching clips.
- (6) Remove heater valve capillary coil from the opening in heater housing (driver's compartment, passenger side).
- (7) Remove the clips from housing.
- (8) Remove the three screws attaching the heater distribution duct to dash panel, (one is located to the left of vent door and to the right of brake pedal bracket; one below the heater at passenger side and one screw is located at the windshield wiper motor right link pivot). **To facilitate removal, disconnect the windshield wiper right link at pivot to expose the housing screws.**
- (9) Remove the housing and blower by pulling down and out of driver's compartment.
- (10) Remove the blower, mounting plate and motor.

#### b. Installation

If the blower motor was removed from the mounting plate be sure the mounting grommets are installed at the attaching bolts. If blower wheel has been removed from motor shaft, be sure to use new tinnerman clip when reassembling wheel to shaft.

- (1) Install the blower motor and mounting plate to the heater housing. Be sure the blower wheel is free and does not rub.
- (2) Position the housing on dash panel and install the three attaching screws. **There is a spacer at each attaching screw, be sure these spacers are installed between the heater housing and the dash panel when**

installing housing; otherwise, the housing could be damaged when tightening the screws.

- (3) Reposition the heater water valve capillary coil in the heater housing and install attaching clips.
- (4) Connect the vacuum hoses at vacuum unit and install the attaching clips.
- (5) Connect the heater wire at harness connectors and install the black ground wire at windshield wiper motor bracket.
- (6) Attach the windshield wiper motor pivot link (if disconnected).
- (7) Connect the battery ground cable.

#### 27. HEATER VACUUM ACTUATOR REPLACEMENT

To replace a vacuum actuator proceed as follows:

- (1) Disconnect the vacuum hoses.
- (2) Remove the two nuts and lockwashers attaching the vacuum unit to housing, and the one clip attaching the vacuum unit rod to the actuated unit.

#### 28. VENT DEFLECTOR—REPLACEMENT

The vent deflector is held to the heater housing by three screws. This deflector should be removed whenever the radio is to be removed.

#### 29 HEATER CORE

##### a. Removal

- (1) Disconnect the battery ground strap.
- (2) Drain the cooling system as necessary.
- (3) Disconnect the heater hoses at heater.
- (4) Remove the screws attaching the heater core housing to the dash panel.
- (5) Remove the housing and core as an assembly.
- (6) Remove the mastic to expose plastic rivets (if used).

(7) Remove the heater core from outer housing. **The core is held in position in the outer housing with plastic rivets. Care should be used when pressing out these rivets to avoid damaging the housing or the rivets.**

##### b. Installation

- (1) Place the heater core in the heater outer housing and install plastic rivets.

- (2) Install new mastic.
- (3) Position the heater housing and core assembly on the dash panel.
- (4) Install all screws before tightening to insure proper alignment.
- (5) Connect the heater hoses at heater.
- (6) Refill the cooling system as necessary.

### 30. REAR WINDOW DEFROSTER

The rear window defroster (optional on all Models) is located on and under the rear shelf panel of the car, and consists of a blower, flexible hose and nozzle. A switch, located on the instrument panel, controls the blower for defrosting the rear window. The rear window defroster operates independently from the car heater. The air recirculated on the rear window glass is drawn by the defroster blower from air inside the car.

## AUTOMATIC BEAM CHANGER SERVICE DIAGNOSIS

### 31. UNIT NOT OPERATING

- a. Poor grounding of control units.
- b. Electrical connections not connected according to color code.
- c. Faulty dimmer switch.
- d. Faulty tube.
- e. Faulty scanner.

f. Faulty control units.

### 32. TUBE NOT LIGHTED

- a. Faulty dimmer switch.
- b. Poor grounding of control units.
- c. Faulty tube.
- d. Poor electrical connections.

## AUTOMATIC BEAM CHANGER

The automatic beam changer is an automatic headlight control unit which senses the headlight intensity from other vehicles and automatically adjusts the headlights to a bright or dim setting.

A scanner and base assembly is mounted on top of the instrument panel (Fig. 21). The control unit is mounted on a convenient structural part (grounding purposes) of the vehicle's body, see Figure 22.

### 33. OPERATION

The automatic beam changer will dim the headlights when an oncoming car is seen at a distance of approximately 1200 feet. The unit will reset the headlights on "bright" within approximately 1/2 second after the approaching car has passed.

The headlight setting can be interrupted by using the conventional dimmer switch. If the unit has a "bright" setting and the driver feels that a "dim" setting is required, he can override the automatic

control by depressing the dimmer switch to obtain the "dim" condition. Automatic operation is restored when the driver again depresses the dimmer switch.

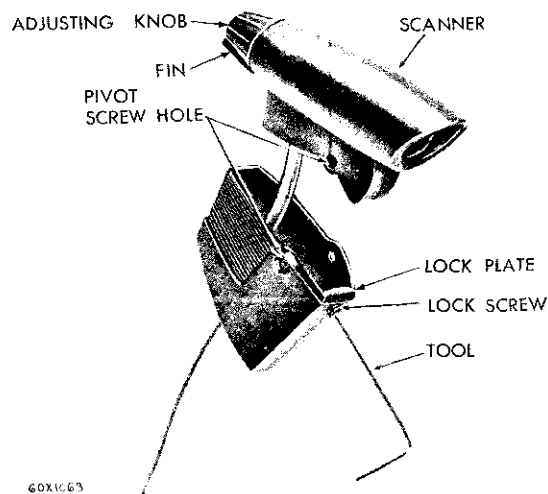


Fig. 21—Scanner Assembly

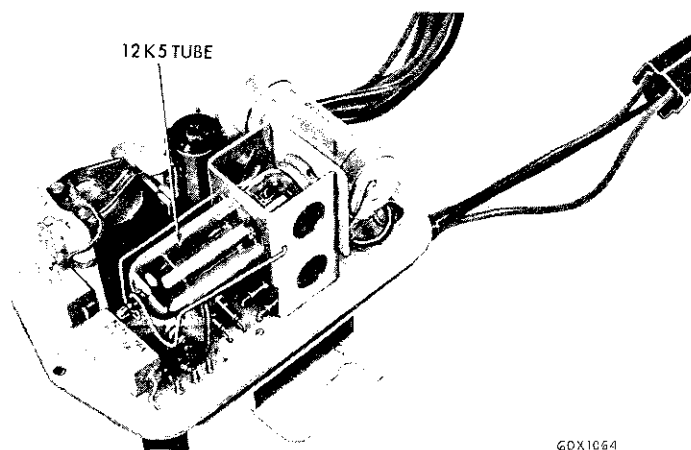


Fig. 22—Scanner Control Box Assembly

### 34. DRIVER ADJUSTMENTS

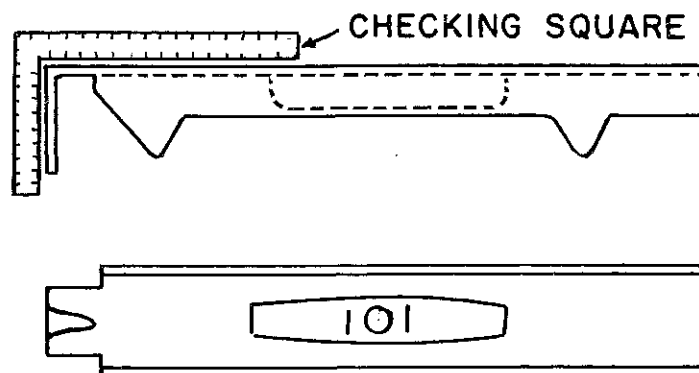
A knob, located at the rear of the scanner unit, Figure 21, provides a sensitivity adjustment. If the headlights do not “dim” quickly enough upon approaching another car, it is an indication that sensitivity is set too “low” and correction is made by turning the scanner knob clockwise (to the right). If the headlights “dim” too soon, sensitivity can be decreased by turning the scanner knob counterclockwise (to the left).

### 35. AIMING THE AUTOMATIC BEAM CHANGER

Pre-aiming instructions—before attempting to aim the automatic beam changer, complete the following pre-aiming instructions: Place vehicle on a level floor. Check front spring height. Adjust to specifications, if necessary. Check tire inflation. Tire pressure should not vary more than 3-5 pounds. Rock vehicle sideways to allow spring shackles and other suspension parts to assume normal position. If gasoline tank is not full, place an equivalent weight in trunk of vehicle. There should be no other load in the vehicle, other than the driver.

### 36. AIMING THE SCANNER

Mount “scanner” aimer leveling Tool C-3697, on the



60x1067

Fig. 23—Scanner Leveling Hood

“scanner” unit, as shown in Figure 23. Make sure that all conditions listed under “pre-aiming instructions” have been met, before proceeding with the aiming operation.

Loosen the phillips head pivot locking screw Figure 21, just enough to permit free movement of the “scanner” through its arc, as controlled by the mounting base. (Total angular deflection of the “scanner” unit is 14 degrees.)

Pivot “scanner” forward or backwards on base (through arc) until the leveler assumes a level position. Tighten pivot and locking screws.

## SERVICE PROCEDURES

#### a. Removal (Scanner Unit)

- (1) Disconnect battery.
- (2) Disconnect feed wires.
- (3) Remove the pivot and locking screws.
- (4) Remove scanner assembly.

#### b. Installation (Scanner Unit)

- (1) Mount scanner to scanner base.
- (2) Install pivot and locking screw.
- (3) Connect feed wires.
- (4) Connect battery.

(5) Perform operations listed under "Aiming the Automatic Beam Changer" and "Aiming the Scanner."

**c. Removal (Control Unit)**

- (1) Disconnect battery.
- (2) Disconnect control box wires at connectors.
- (3) Remove control box attaching screws.
- (4) Remove the control box assembly.

**d. Installation (Control Unit)**

- (1) Clean area around the body where the control box spacer is attached to the fire wall so as to secure proper metal to metal ground.
- (2) Mount control box assembly to body and install attaching screws.
- (3) Connect control box wires to connectors.
- (4) Connect battery.

---

## MIRROR-MATIC ELECTRONIC REAR VIEW MIRROR (Optional Equipment)

### SERVICE DIAGNOSIS

**37. FLIP ANGLE INADEQUATE OR EXCESSIVE**

Possible Cause.

- a. Chassis stop tab angle incorrect.

**38. TUBE DOES NOT LIGHT**

Possible Causes:

- a. Low battery voltage.

- b. Faulty tube.

- c. Broken circuit.

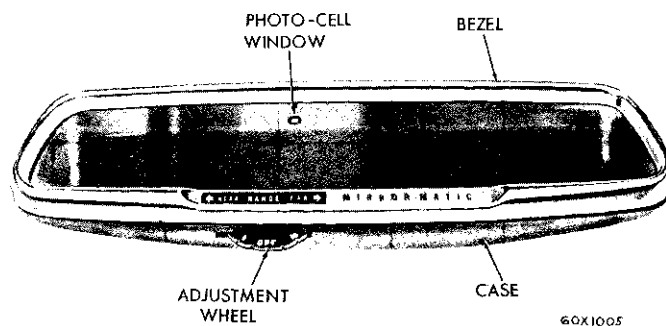
**39. SENSITIVITY NOT WITHIN SPECIFIED LIMITS**

Possible Causes:

- a. Potentiometer out of adjustment.
- b. May occur when new tube is replaced.

## MIRROR-MATIC ELECTRONIC REAR VIEW MIRROR

The electronically operated mirror-matic rear view mirror, as shown in Figure 24, is a self-dimming automatic device which provides maximum rearward vision at night. The mirror assembly reflects images from a silvered surface in the bright position utilizing the optical characteristics of a prism to reduce glare when the lights of an overtaking vehicle directed at the mirror reaches a certain intensity and actuates the mirror. The electronic glare detecting and mirror actuating mechanism is housed entirely within the mirror assembly (Fig. 25). The automatic tripping mechanism is a tiny photo-electric cell which "sees" through a small aperture in the silvered



**Fig. 24—Mirror Assembly**

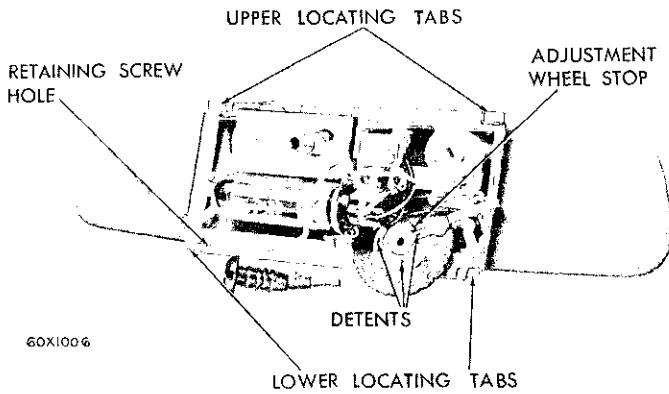


Fig. 25—Mirror Actuating Mechanism

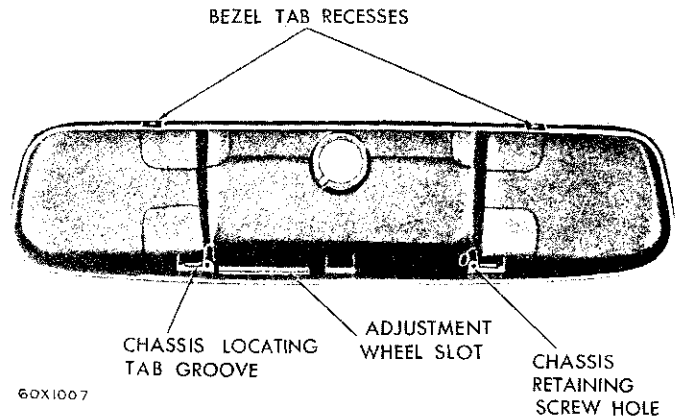


Fig. 27—Locating Grooves

mirror surface. Light striking the cell generates a small current which increases with increasing light intensity.

When the light intensity becomes high enough to cause annoying glare, the current is enough to activate a miniature amplifier and solenoid assembly which tilts the prism mirror slightly upward. In this position, the image seen by the driver is a dim one off the front surface of the glass, (Fig. 26). As long as glare is present, the mirror will remain in its "dim" position, returning immediately to its normal "bright" position when the glare drops below a pre-set level.

The sensitivity of the sensing device is easily adjusted, to cause the automatic controls to actuate the mirror at whatever light intensity the driver finds most satisfactory.

#### 40. DRIVER ADJUSTMENT (Positioning Mirror)

When adjusting the position of mirror-matic for

best visibility, the headlights must be turned off to prevent the headlight circuit from energizing the photo-electric cell and creating a false reading.

An adjustment wheel (Fig. 24) protruding from the bottom of the mirror assembly is marked with an "off" position and numbered through the turning range from "one" to "ten," with number "three" "six" and "ten" detented to facilitate adjustment by feel.

The adjustment wheel must be turned "counter-clockwise" to reach the "off" position on the wheel. When the mirror is set at the number "three" notch (normal city driving), the mirror will be actuated by low beams from an overtaking car within approximately 80 feet. When the mirror is set at the number "six" notch (normal highway driving) the beams will be actuated within 250 feet, when set at the number "ten" notch the beam will be effective at 400 to 500 feet.

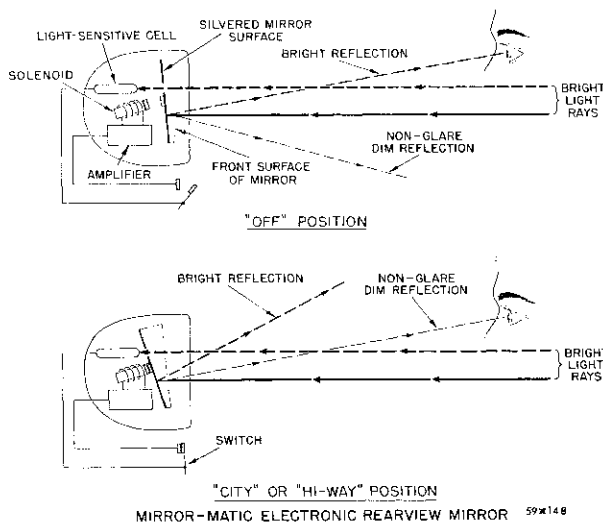


Fig. 26—Electronic R/V Mirror Operation

#### 41. REMOVAL AND DISASSEMBLY

- (1) Remove mirror assembly from attaching pedestal.
- (2) Carefully pull the bezel from the case assembly.
- (3) Locate the ball joint in the down position towards the adjustment wheel.
- (4) Bend top of case upwards so as to disengage each of the upper locating tabs from case retaining grooves (Fig. 27).
- (5) Press on the ball joint extension so as to tip the mirror assembly out of case.
- (6) Pivot adjusting wheel in slot of case until upper part of the electronic chassis is outside of the upper forward edge of case.

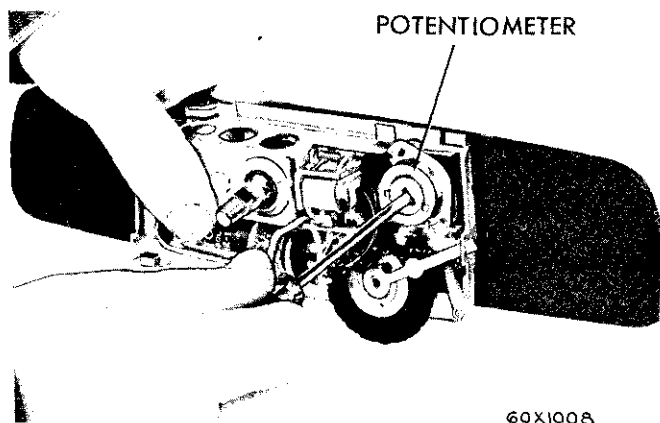


Fig. 28—Adjusting Potentiometer

#### 42. INSPECTION AND TROUBLE SHOOTING

##### a. Before Disassembly

In case the mirror does not function properly the following inspection operations should be performed:

(1) Test fuse and replace if necessary.

(2) Inspect lead wire, ground and other connections to make sure current is flowing to the mirror.

(3) Check flip angle of mirror through which the image moves, when the mirror is actuated by sighting at some object through the rear window while actuating the mirror. If the image changes position when mirror is actuated the flip angle is incorrect.

##### b. After Disassembly

(1) Check the spring load on the chassis using a spring scale, attach the scale to the chassis at the photo cell opening. Hold the assembly firmly and measure the spring load. The spring load should be at least 8 ounces. If less than 8 ounces the tension can be increased by shortening the two return springs at the lower corner of the chassis assembly. **The small coil spring located on top of the relay along side the potentiometer should not be tampered with since this spring is pre-set to specific dimensions.**

(2) If sensitivity was incorrect adjust potentiometer by turning clockwise to increase, counterclockwise to decrease, (Fig. 28).

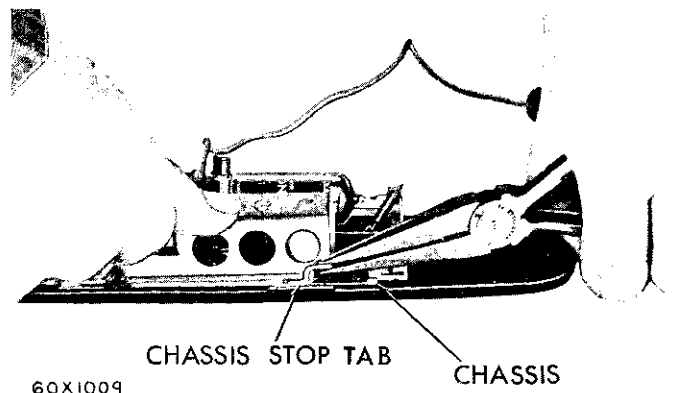


Fig. 29—Bending Chassis Tabs

(3) If flip angle was incorrect, bend the chassis top tab (Fig. 29) rear the solenoid, toward glass to reduce flip angle or away from glass to increase flip angle. Do not bend the tab more than **one or two degrees** or the solenoid will not operate properly.

(4) Should it be necessary to separate the glass from the chassis it can be done by releasing the chassis return springs and disengaging the mirror from the chassis pivots.

#### 43. REASSEMBLY AND INSTALLATION

With ball joint end in the down position:

(1) Install lead wire through hole in the rear of case.

(2) Position lower edge of mirror in case so as to allow for easy entrance of adjustment wheel in slot.

(3) Engage the chassis lower locating tabs in the case recess.

(4) Bend up the upper edges of the outer case slightly so as to allow for clearance of the upper locating tabs of the chassis.

(5) Assemble mirror in case by slightly tipping the assembly.

(6) Engage locating tabs in case recesses.

(7) Install bezel on case.

## ELECTRIC CLOCK SERVICE DIAGNOSIS

#### 44. CLOCK DOES NOT WORK

a. Blown fuse.

b. Bowden cable wire binding. Loosen cable to dash nut and reroute cable.

## ELECTRIC CLOCK SERVICE PROCEDURES

### 45. ELECTRIC CLOCK

All models are equipped with a solenoid actuated self regulating clock, using a two ampere fuse located at the lower end of the clock. The clock can be regulated by pulling out the regulating stem below the clock face and turning until the correct setting is accomplished.

#### a. Removal (DeSoto)

- (1) Disconnect battery.
- (2) Remove transmission push button on left side of clock.
- (3) Remove the attaching stud nuts on either side of the clock.
- (4) Remove bezel from instrument panel and remove the clock.

#### b. Removal (Chrysler)

- (1) Remove the screw attaching the clock to the instrument panel, and the other two screws attaching the clock retainer to the rear of the instrument panel.
- (2) These screws can be reached, after removing the glove box door, and the glove box assembly.

#### c. Removal (Imperial)

- (1) Remove the three screws attaching the instrument cluster bezel to the instrument panel.

- (2) Pull the cluster forward from the instrument panel, just far enough to allow for disconnecting of the bowden cable clockwire and remove the clock attaching screws.

#### d. Installation (DeSoto)

- (1) Install instrument bezel.
- (2) Install 2 bezel attaching stud nuts.
- (3) Install clock assembly and attaching nuts.
- (4) Install transmission push button bezel.
- (5) Connect clock feed wire.
- (6) Connect battery.

#### e. Installation (Chrysler)

- (1) Install the clock retainer screws.
- (2) Connect the bowden cable clockwire and clock lamp wire.
- (3) Install the bezel retainer screw.
- (4) Install the glove box assembly and glove box door.

#### f. Installation (Imperial)

- (1) Install the clock and retainer screws.
- (2) Install the bowden cable clockwire and lamp wire.
- (3) Install the instrument cluster bezel screws.

## REMOTE CONTROL OUTSIDE MIRROR

### 46. OPERATION

The remote control outside mirror is controlled by stainless steel wires attached to wobble plates and a lever within the mirror assembly and is operated by a toggle lever located on the instrument panel (Fig. 30). Adjustment of mirror to meet driving requirements can be made without moving from the normal driving position.

#### a. Removal

- (1) Remove the toggle lever assembly bezel.
- (2) Remove the (2) screws attaching mirror to

fender.

- (3) Remove mirror, gasket, cable and lever assembly.

#### b. Installation

- (1) Install the gasket, mirror and cable assembly in fender opening.
- (2) Route the cable and lever assembly up through body to instrument panel opening.
- (3) Attach bezel to cover assembly and tighten.
- (4) Test and adjust the operation of mirror.

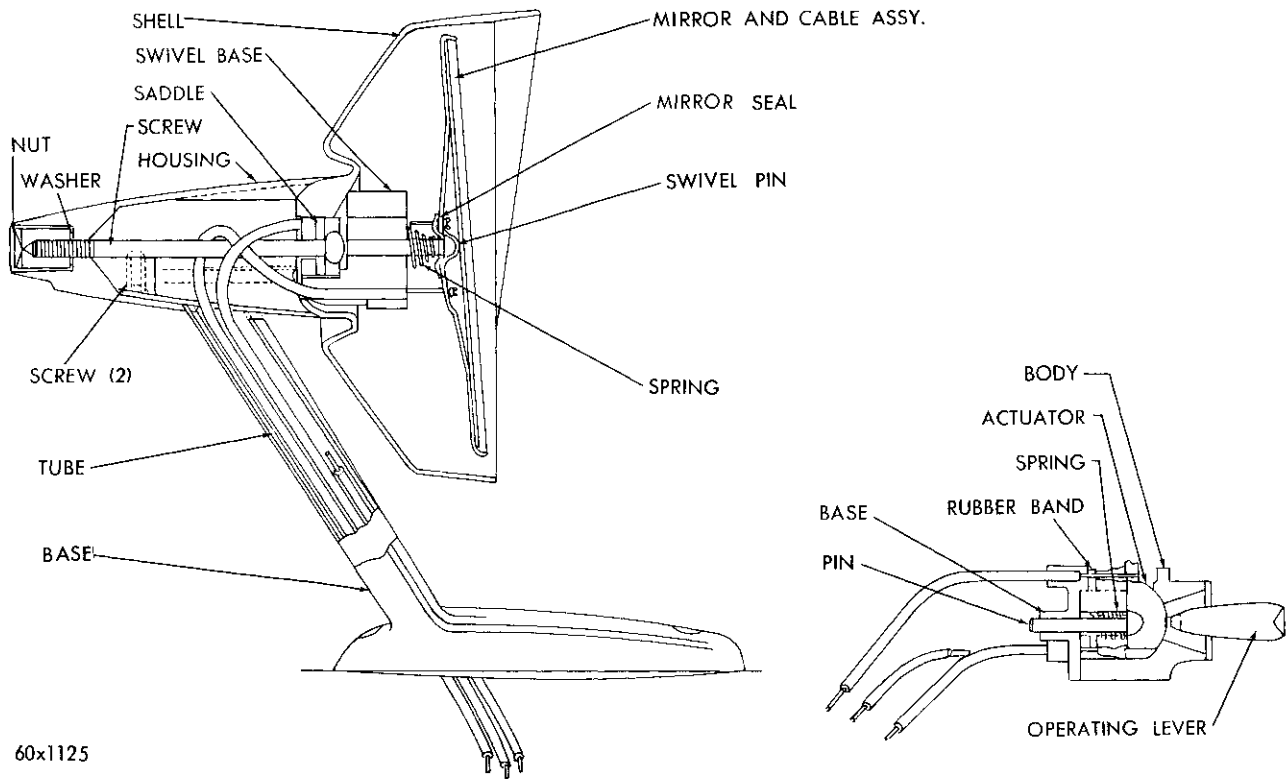


Fig. 30—Mirror Operating Lever

## AUTO-PILOT SERVICE DIAGNOSIS

### 47. NO AUTO-PILOT RESPONSE (AT ANY SPEED)

**Possible Causes:**

- a. Drive cable extending from the transmission to Auto-Pilot or speedometer broken.
- b. Speedometer pinion in the transmission broken.
- c. Fuse blown.
- d. Broken wire from ignition switch to number one terminal on Auto-Pilot, (Fig. 31).
- e. Auto-Pilot electric motor not functioning.
- f. Wire terminal loose or not pushed all the way down to complete circuit.
- g. Inspect the Auto-Pilot linkage rod and rod connections, at the accelerator pedal extension end and at the Auto-Pilot rod end, for possible loose nut and out of adjustment (Fig. 32).

### 48. AUTOMATIC CONTROL DOES NOT ENGAGE AT SELECTED SPEED (WHEN SELECTOR BUTTON IS PULLED OUT)

**Possible Causes:**

- a. Automatic control will not engage when driver's foot rides the brake pedal. Resistance must be felt in the accelerator pedal before the Auto-Pilot will engage.
- b. Check for brake pedal free travel. When the brake pedal is sticking and not returning to normal position, Auto-Pilot automatic control will not engage because brake switch remains open.
- c. Inspect the mechanical brake switch bracket and switch position on bracket.
- d. Raise the female connector plug sufficiently to expose terminals without disconnecting the plug. Connect one lead of the test lamp Tool C-744 to the exposed number 2 terminal and ground the other



lead of the test lamp. With the ignition switch "ON," if the test lamp "lights," it indicates a normal circuit. If the test lamp fails to "light," it may indicate a faulty circuit, hydraulic or mechanical brake switch.

e. Test the wiring for possible break (open circuit) or a faulty connection between the number 2 terminal on the Auto-Pilot unit and the brake switches (Fig. 31).

f. Inspect and test the operation of both brake switches. If both switches test satisfactorily, trace and test the wiring back to the fuse and the ignition switch terminal. (Refer to Wiring Diagram.)

g. If the brake switches and wiring test satisfactorily, test the pull button circuit as follows:

Raise the female wiring connector plug on the

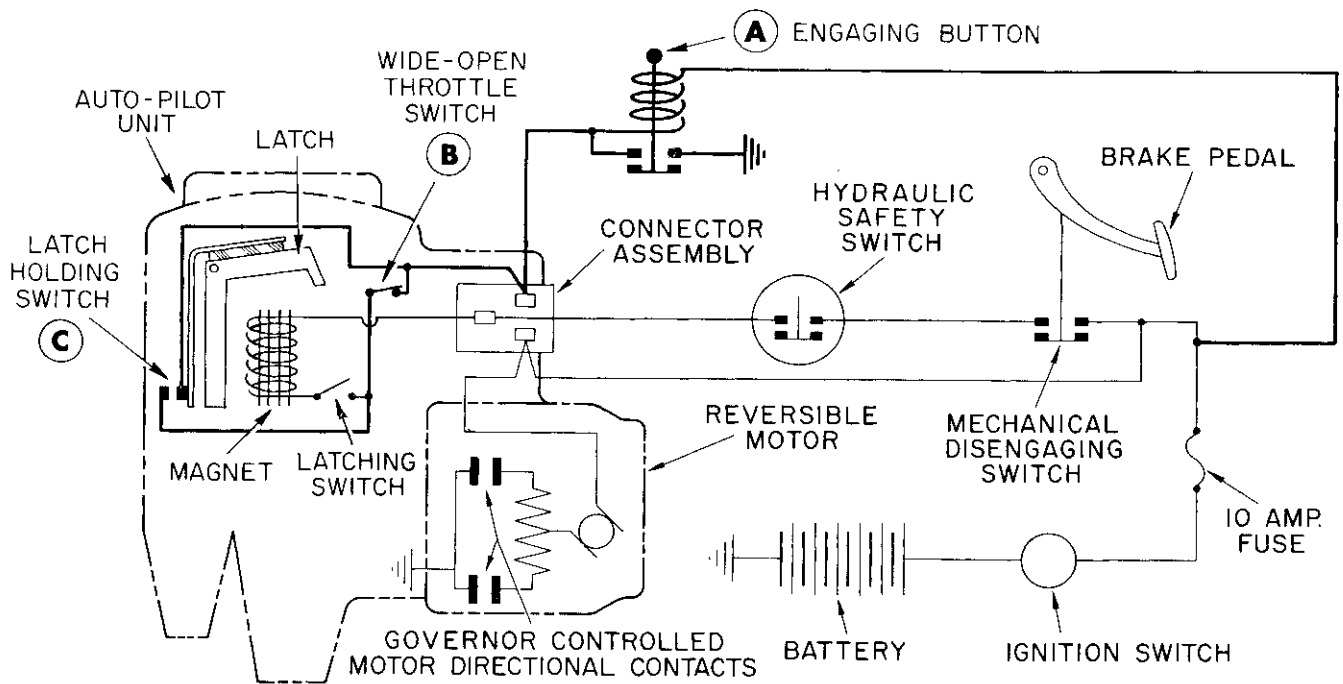
Auto-Pilot to expose the number 3 terminal. Connect one lead of the test lamp to the number 3 terminal and the other test lamp lead to the positive (ungrounded) terminal post of the battery.

Pull out the button on the Auto-Pilot speed control unit. With the button pulled out the lamp should light to indicate a satisfactory circuit. If the test lamp does not light, test the control assembly for proper ground and wiring connections.

**49. CONTROL BUTTON DOES NOT STAY ENGAGED WHEN BUTTON IS PULLED OUT**

**Possible Causes:**

On Imperial models the Auto-Pilot control assembly is mounted on the side of the instrument panel between the speedometer and instrument cluster. Electrical leads with blade type terminals are connected to the control assembly.



**AUTO-PILOT ELECTRICAL CIRCUIT  
AUTOMATIC ENGAGEMENT**

- (A) ENGAGING BUTTON: Energizes Auto-Pilot automatic speed control circuit. Current in solenoid coil holds switch closed until the button is pushed in or the ignition is shut off.
- (B) WIDE-OPEN THROTTLE SWITCH: Prevents engagement

- of automatic speed control when throttle is opened wide below dialed speed.
- (C) LATCH HOLDING SWITCH: By-passes wide-open throttle switch while automatic speed control is engaged to prevent disengagement when throttle is opened wide.

**Fig. 31—Auto-Pilot Electric Circuit Automatic Engagement**

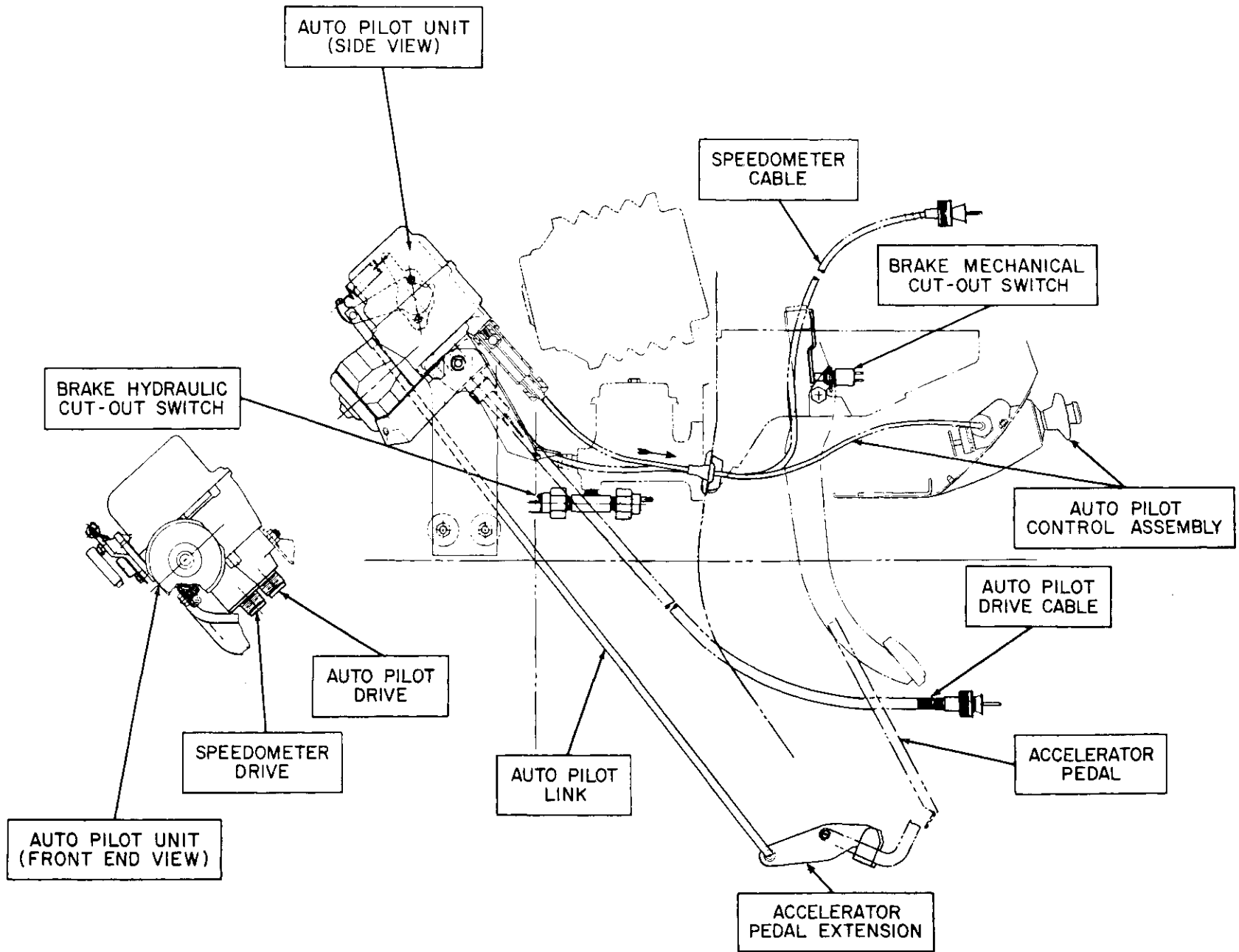


Fig. 32—Auto-Pilot Schematic

On De Soto and Chrysler models the Auto-Pilot control assembly is mounted on the instrument panel. The electrical leads are attached to the back of the control assembly and routed through wiring harness with blade type connectors attached to the Auto-Pilot assembly.

The control button is energized when ignition key is turned on and button is pulled out.

- a. Blown fuse.
- b. Broken, loose, or disconnected switch wire.
- c. Open circuit in control wiring.
- d. Mis-aligned disc.
- e. Faulty control assembly.

#### 50. BRAKE APPLICATION REQUIRED TO DISENGAGE AUTO-PILOT FROM AUTOMATIC CONTROL

##### Possible Causes:

If a brake application is required before the Auto-Pilot disengages from automatic control:

- a. Inspect and test for a faulty or improperly positioned mechanical brake switch. The mechanical brake switch contacts are normally closed when the brake pedal is released and should be adjusted so that the contact points will be open when the brake pedal moves within pedal free-play travel.

#### 51. AUTOMATIC CONTROL REMAINS ENGAGED

##### Possible Causes:

If the automatic control does not disengage when the brake pedal is moved within the free-play limits test the circuit as follows:

- a. Disconnect the female connector at the Auto-Pilot unit. Connect one lead of the test lamp to the number 2 terminal of the female connector plug at the Auto-Pilot unit. Connect the other test lamp lead to ground. Turn "ON" the ignition switch. Depress the brake pedal within the free-play travel. The test lamp should **not light** as the pedal is depressed through the free-play travel.

- b. If the test lamp lights after the brake pedal free-play is taken up, depress the brake pedal further to apply the brakes. If the test lamp **does not light**, it indicates that the mechanical brake switch is either faulty or out of adjustment.

- c. If the test lamp remains lighted when the brake pedal is depressed to the point of brake application, it may indicate faulty (mechanical and hydraulic) brake switches or a maladjusted brake mechanical switch.

#### 52. AUTO-PILOT ENGAGES WHEN CONTROL BUTTON IS NOT PULLED OUT

##### Possible Causes:

When the automatic control does not engage proceed as follows:

- a. Disconnect the electrical connection at the control electrical lead.
- b. Rotate the selector knob to the lowest setting.
- c. Drive the vehicle and accelerate to the selected speed.
- d. If the Auto-Pilot engages without pulling out the control button, inspect for possible ground between the disconnected wire circuit and car body or chassis.

#### 53. AUTO-PILOT DISENGAGES FROM AUTOMATIC CONTROL WHEN ASCENDING HILLS OR WHEN SPEED SELECTOR KNOB IS ADVANCED TO A HIGHER SETTING

##### Possible Causes:

- a. Inspect the Auto-Pilot linkage adjustment and adjust as indicated in Pedal Linkage Adjustment Paragraph 66 (Fig. 32).

- b. Inspect the possible loose electrical connection at the number 2 terminal of the Auto-Pilot unit, the brake hydraulic switch, the brake mechanical switch, the fuse holder, and the terminal at the ignition switch.

- c. If inspection shows the units are not at fault, conditions check out OK, the Auto-Pilot assembly should be replaced.

#### 54. PULSATING THROTTLE (INDICATED BY FLUCTUATING FLUTTER ON THE ACCELERATOR PEDAL)

##### Possible Causes:

- a. Inspect drive cable and speedometer cable for sharp bends or tight fittings.

- b. Inspect the condition of the speedometer pinion.

- c. Lubricate the drive cable and speedometer cables as described in the lubrication section, of this manual.

- d. Inspect and adjust the linkage.

- e. Check for binding condition in the linkage and correct as necessary.

- f. Test speedometer head for proper function.

- g. If the above fails replace the Auto-Pilot.

**55. SPEEDOMETER POINTER FLUTTER**

**Possible Causes:**

- a. Inspect the Auto-Pilot drive cable and speedometer cable for sharp bends and tight fittings. Lubricate or correct as necessary.
- b. Inspect the condition of the speedometer pinion at the transmission.
- c. Test the speedometer head for proper function.
- d. Manually check gears in Auto-Pilot for smooth operation—if a high spot is felt—replace unit.
- e. If above fails to correct try a replacement unit (possible dynamic unbalance in unit).

**56. AUTO-PILOT MOTOR RUNS CONSTANTLY**

**Possible Causes:**

- a. Inspect and adjust the linkage.
- b. If the linkage is within specified limits and the Auto-Pilot motor still runs, replace the Auto-Pilot assembly.

**57. CARBURETOR WILL NOT RETURN TO NORMAL IDLE**

**Possible Causes:**

- a. Inspect the carburetor, accelerator, and Auto-Pilot linkage for binding, correct and adjust.
- b. Inspect carburetor accelerator spring for proper tension and color requirements.

**58. IF BACK PRESSURE IS FELT AT THE SAME SPEED ALL THE TIME REGARDLESS OF SPEED SETTING**

**Possible Causes:**

- a. Broken feed wire.
- b. Bad connection.
- c. Motor stalled, (closed contacts).
- d. Motor not functioning.
- e. Drive worm or ball nut worn or damaged.
- f. No voltage at number 1 terminal.

**59. MINIMUM REGULATING SPEED ABOVE 25 MPH ON THE SPEEDOMETER**

**Possible Causes:**

Test the control cable adjustment at the Auto-Pilot unit.

- a. Turn the control knob counterclockwise until the knob stop is reached.
- b. Loosen the cable sleeve nut at the Auto-Pilot unit and push control cable all the way into the Auto-Pilot unit until a click is heard.
- c. Tighten the sleeve nut on the cable end.

**60. SELECTOR KNOB HARD TO ROTATE**

**Possible Causes:**

- a. Knob binding the control body, or binding on the speed control knob shaft. Free-up as required.
- b. Remove the control cable end from the Auto-Pilot unit and turn knob to test for freeness.
- c. If the knob is still hard to turn, inspect for kinked control cable.
- d. Improperly routed cable. If unable to free-up or correct, replace assembly.

**61. CONTROL PULL BUTTON WILL NOT STAY OUT WHEN IGNITION IS TURNED ON**

**Possible Causes:**

- a. Broken wires or faulty connection from control head to ground or to ignition switch.
- b. Broken wires on magnet control.
- c. Blown fuse.
- d. Loose feed wires.
- e. Faulty control magnet.

**62. CONTROL BUTTON DOES NOT RELEASE AFTER IGNITION KEY IS TURNED OFF**

**Possible Causes:**

- a. Faulty control head.
- b. Bent or binding control shaft.

---

## AUTO-PILOT

The Auto-Pilot (Fig. 33) is a voluntary speed regulating device which can be used either as a speed reminder to indicate when a pre-set vehicle speed has been attained or as an automatic speed control device.

The Auto-Pilot is governed by car speed and is driven by a flexible cable from the transmission speedometer pinion (Fig. 34) to the input shaft of the Auto-Pilot. This cable drives a spring loaded governor in the Auto-Pilot assembly which in turn

---

is controlled by a speed control knob mounted on the instrument panel (Fig. 35).

A reversible electric motor in the Auto-Pilot assembly is connected directly to the accelerator linkage. When used as a **speed reminder** the Auto-Pilot provides an accelerator pedal reaction pressure of approximately 5 to 7 pounds which acts as a reminder to the operator that the pre-set speed has been reached. This reaction pedal pressure can be overcome by pressing with slightly more force on the accelerator pedal to attain high speeds momentarily. Reducing the pedal pressure to approximately five or seven pounds will automatically return the vehicle to the pre-set Auto-Pilot speed.

The Auto-Pilot is equipped with a newly developed automatic lock-in feature whereby pulling out the knob located in the center of the speed selector activates an automatic lock-in whenever the ignition key has been turned on.

When **automatic speed control** of the vehicle is desired the vehicle must be accelerated to the selected speed where reaction pedal pressure is felt. When the selected vehicle speed is reached, and the lock-in knob is pulled out, the Auto-Pilot will automatically lock-in at the selected speed and will maintain automatic speed control without pressure on the accelerator pedal. The automatic speed control will be maintained until pressure is exerted on the brake pedal or by pushing in the knob in the center of the speed selector, however, depressing the brake pedal will not cancel the automatic lock-in feature. To cancel the lock-in feature it will be necessary to push in the knob on the speed selector.

### 63. OPERATION

The Auto-Pilot speed regulating knob located on the

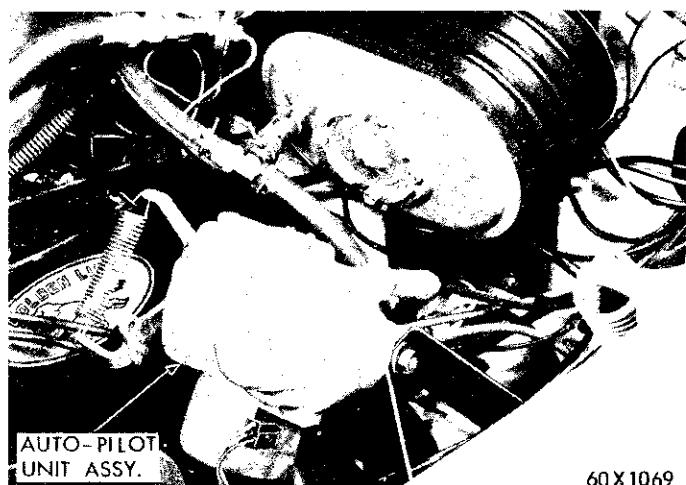


Fig. 33—Auto-Pilot Installed

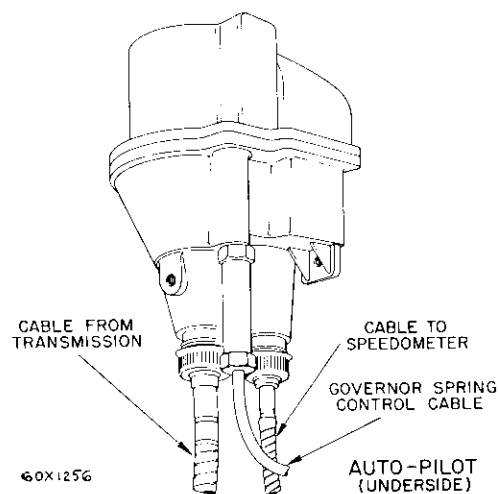


Fig. 34—Auto-Pilot Drive Cables

instrument panel (Figs. 36 and 37) operates a rack and pinion assembly which applies or releases pressure whenever the speed regulating knob is set to any given speed. This pressure when activated by the speed regulating knob is applied to the flyweight governor located in the Auto-Pilot assembly (Fig. 35). Whenever the automatic control knob is pulled out and the vehicle is in motion, the governor is activated and moves up and down on its shaft and for any given spring loading it will position itself when the vehicle speed causes the governor centrifugal forces to balance off the spring forces as set by the speed regulating control.

The governor is linked to a contact arm which rotates back and forth between two points, one on the pintle assembly and the other on the magnet assembly (Fig. 38). These two contact points control the direction of the electric drive motor rotation.

When the vehicle is traveling at a speed in excess of the set control speed the governor moves higher than normal on its shaft and causes the contact arm to make contact with the points of the pintle assembly causing the electric motor to rotate the worm shaft against the ball nut and pintle assembly to close the throttle. If continued pressure is held on the accelerator pedal the forces of the Auto-Pilot seeking to close the throttle to the speed control setting will be absorbed in the over-ride-spring which will continue to exert additional pressure against the pedal until vehicle speed slows to the speed setting of the speed control knob.

When the vehicle is traveling at a speed lower than the set speed, the governor is in a lower than normal position on its shaft causing the contact arm points to make contact with the magnet assembly, activating the drive motor to turn in the opposite direc-

tion moving the magnet assembly away from the closed position which allows the vehicle to be brought up to set speed.

Whenever the **Auto-Pilot assembly is engaged** in automatic operation, the assembly will carry the

pintle assembly with it to open the throttle. When the **Auto-Pilot is not engaged**, the magnet assembly moves away from the pintle assembly allowing the application of the throttle opening to force the accelerator to force the acceleration opening without any emphasis of back pressure on the pedal.

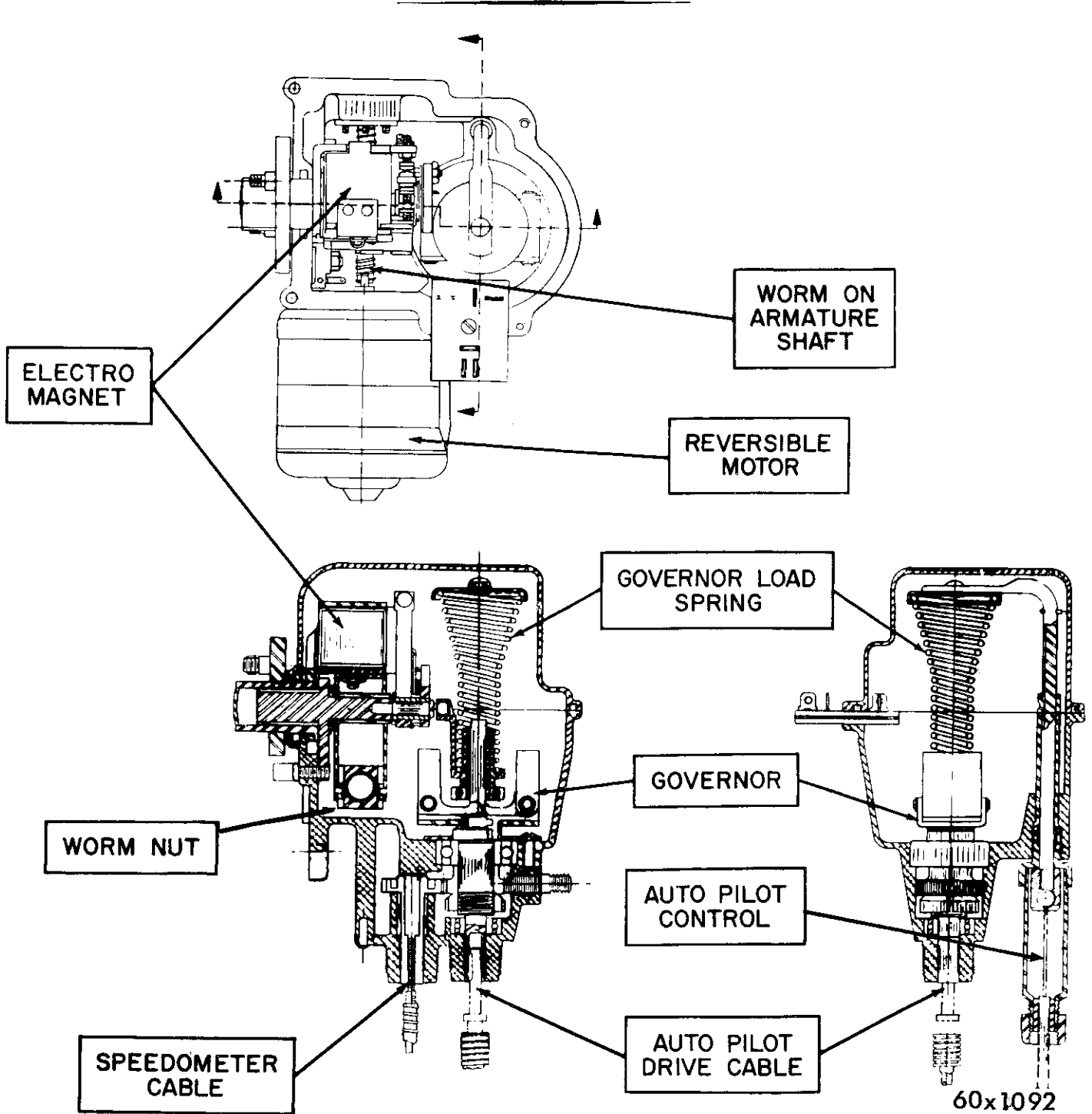


Fig. 35—Auto-Pilot (Cross Section View)

## SERVICE PROCEDURES

### 64. AUTO-PILOT

#### a. Removal

- (1) Disconnect the electrical leads from Auto-Pilot assembly terminals.
- (2) Remove the accelerator to Auto-Pilot lever rod.
- (3) Disconnect the speedometer and Auto-Pilot drive cables.
- (4) Disconnect the speed regulator control cable.
- (5) Remove the Auto-Pilot to bracket attaching bolts and nuts.

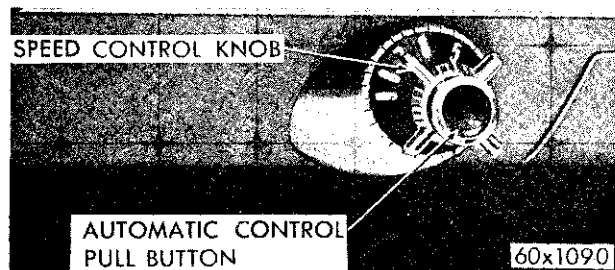


Fig. 36—Auto-Pilot Controls (Chrysler)

#### b. Installation

- (1) Mount the Auto-Pilot assembly to bracket and install and tighten attaching bolts.
- (2) Connect the speedometer, speed regulator control and Auto-Pilot drive cables.
- (3) Connect the electrical terminal leads.

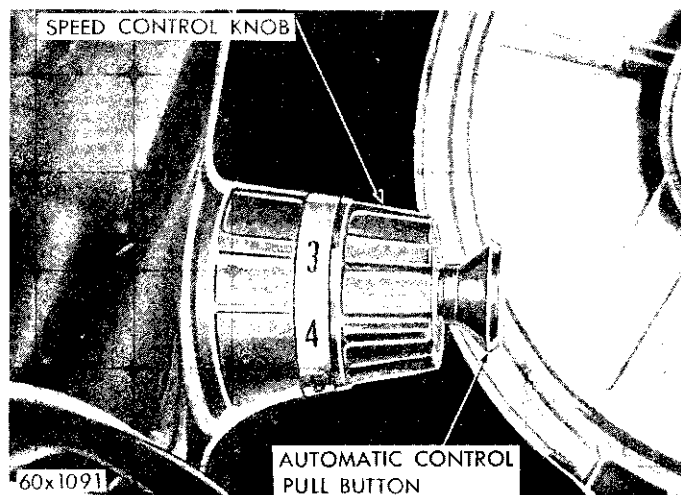


Fig. 37—Auto-Pilot Controls (Imperial)

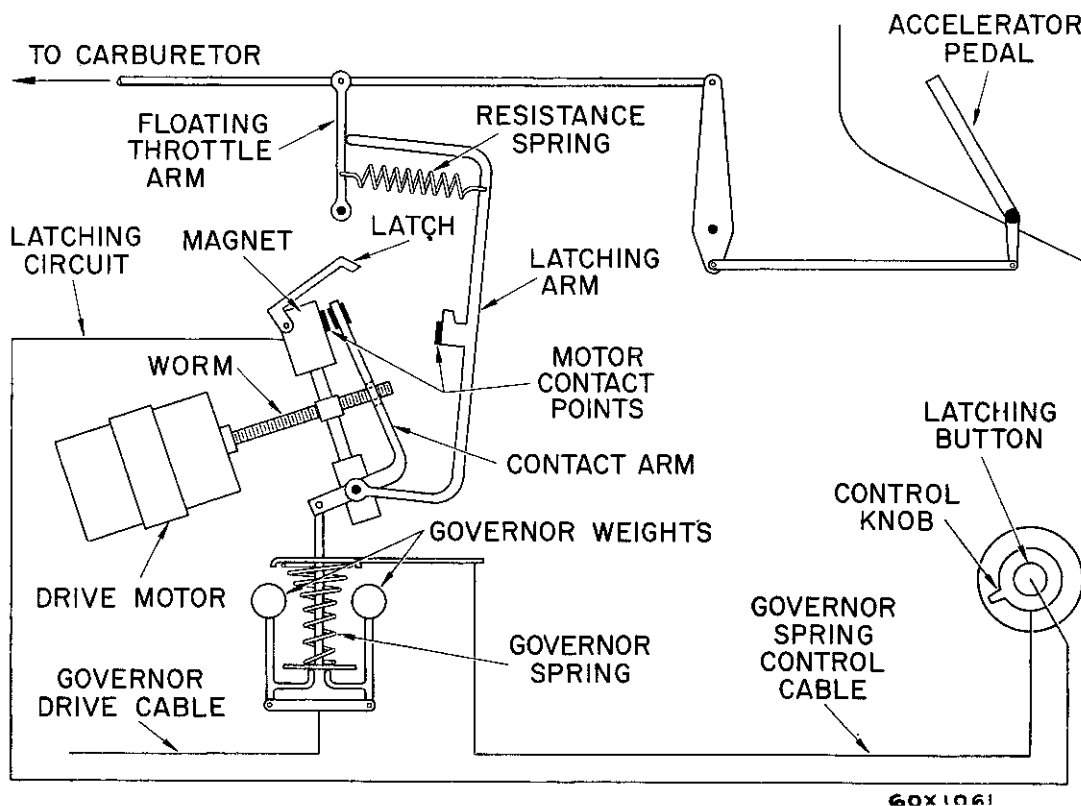
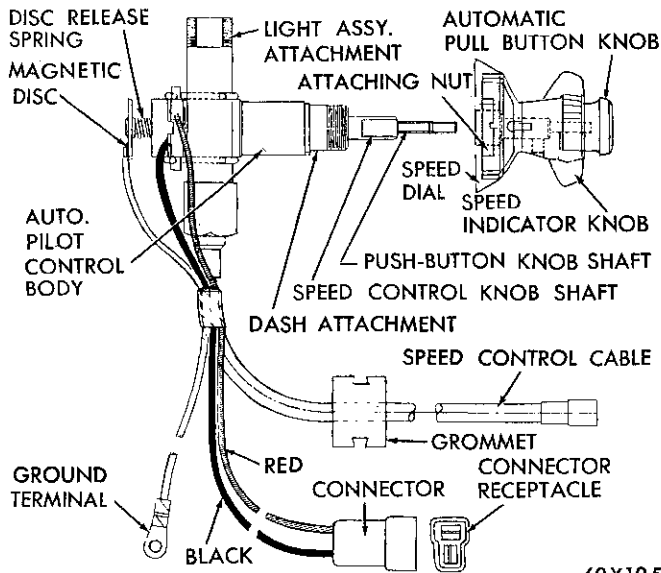


Fig. 38—Auto-Pilot Manual Application (Schematic View)



60X1059

Fig. 39—Auto-Pilot Speed Control Head (Schematic View)

### 65. CONTROL CABLE ADJUSTMENT (Fig. 39)

Accurate adjustment of the control cable and accelerator linkage is important to proper functioning of the Auto-Pilot. To adjust the control cable proceed as follows:

- (1) Turn the selector knob counterclockwise to the low speed position.
- (2) Hold the dust shield firmly to avoid rotation of the shield.
- (3) Unscrew control cable clamp nut and allow nut to slide down control cable (Fig. 34).
- (4) Pull control cable out of dust shield until ferrule at end of cable is free from bottom of dust

shield. If ferrule is tight in shield the four flanges at base of dust shield are probably squeezed together. Carefully pry flanges apart until ferrule can be easily pulled from dust shield.

(5) Re-insert the ferrule of control cable in dust shield and make certain ferrule rotates freely in dust shield.

(6) Rotate the pointer on selector knob to 60 mph and then turn knob counterclockwise to the low speed position. To properly position control cable in dust shield:

- (7) Push the cable up until a click is heard.
- (8) Replace the clamp nut and tighten securely.

### 66. LINKAGE ADJUSTMENT PROCEDURE (WITH LINKAGE DISCONNECTED)

(1) Recheck and connect Auto-Pilot linkage for possible binding (Fig. 32).

(2) Start the engine and warm up to operating temperature. (Be sure choke is open and carburetor linkage is on slow idle.)

(3) Insert a .060" sleeve gauge or feeler gauge between the stop stud and lock plate.

(4) Hold the lock plate securely against the sleeve gauge or feeler gauge for accurate measurement.

(5) Adjust the Auto-Pilot link ball joint so it will freely enter the hole in the lever. **Be sure carburetor is still on slow idle.**

(6) Tighten the ball joint to the lever.

## RECORD CHANGER (DE SOTO MODELS ONLY PS-1, PS-3)

### DATA AND SPECIFICATIONS

Make ..... RCA Victor  
 Model ..... AP-1  
 Turntable Speed ..... 45 rpm  
 Record Capacity ..... Fourteen 7 inch 45 rpm  
 Pickup Force ..... Approximately 10 grams  
 Stylus Tip Radius ..... 1 mil

POWER INPUT (Motor Only)  
 12 volts, d.c. .... Playing records 40 ma  
 Cycle (peak) 120 ma

DIMENSIONS (Over-all)  
 Height 5 $\frac{3}{4}$ "      Width 11 $\frac{3}{4}$ "      Depth 9"



## RECORD CHANGER

### SERVICE DIAGNOSIS

#### 67. FAILS TO REJECT

- (a) "START-REJECT" switch may have dirty contacts or an open connection.
- (b) Record-reject electromagnet coil may be open.
- (c) Slide bracket or record-reject electromagnet may not be properly adjusted (Fig. 43).
- (d) Inspect rubber roller for presence of grease or oil (Fig. 43).
- (e) Insufficient force of record-reject electromagnet due to low voltage.

#### 68. RECORDS FAIL TO SEPARATE

- (a) Stop dog spring may be weak or unhooked (Fig. 45).
- (b) Stop dog may bind in pivot (Fig. 45).
- (c) Tension of separator shelf springs may be insufficient.
- (d) Separator knife and shelf assembly may bind.
- (e) Insufficient friction between clutch plate and ratchet wheel (Fig. 45).
- (f) Inspect clutch plate for presence of grease or oil (Fig. 45).

#### 69. FIRST RECORD DROPS PREMATURELY

- (a) First-record-hold electromagnet coil may be open (Fig. 47).
- (b) Open circuit between first-record-hold switch and record hold electromagnet.
- (c) Insufficient force of first-record-hold electromagnet due either to low voltage or to a bent stop ear (Fig. 47).

#### 70. RECORD STRIKES PICKUP ARM WHEN DROPPING

- (a) Pickup arm may be incorrectly positioned (Fig. 46).

- (b) Stop dog may be improperly adjusted (Fig. 45).

#### 71. PICKUP-FAILS TO LAND PROPERLY

- (a) Landing adjustment may be improperly set (Fig. 46).
- (b) Return lever may be binding in pivot (Fig. 46).
- (c) Return lever spring may be weak or unhooked (Fig. 46).
- (d) Pickup arm clamp screw may be loose, or improperly positioned (Fig. 46).

#### 72. PICKUP SKIPS GROOVES

- (a) Stylus may be broken.
- (b) Counterbalance spring may be weak or unhooked.
- (c) Trip lever shaft may be binding in pivot (Fig. 44).
- (d) End stud on cycling slide may be loose or bent (Fig. 46).

#### 73. MECHANISM FAILS TO TRIP

- (a) Trip wire may be improperly adjusted (Fig. 44).
- (b) Trip lever shaft may be binding in pivot (Fig. 44).
- (c) Cycling cam set too close to roller (Fig. 44).
- (d) Cycling cam tab may be bent (Fig. 44).
- (e) Cycling cam shaft may be binding in pivot (Fig. 44).

#### 74. PREMATURE TRIPPING

- (a) Cycling cam may be set too close to roller (Fig. 43).

**75. CONTINUOUS TRIPPING**

- (a) "START-REJECT" switch may not open causing reject electromagnet to remain energized.
- (b) Cycling cam incorrectly positioned (Fig. 44).
- (c) Cycling cam shaft may be bent (Fig. 44).

**76. MECHANISM FAILS TO COMPLETE CYCLE**

- (a) Cycling cam may be bent.
- (b) Slide return spring may be weak or unhooked.
- (c) Inspect rubber roller for presence of grease or oil (Fig. 43).

**77. "WOW" OR SPEED VARIATION**

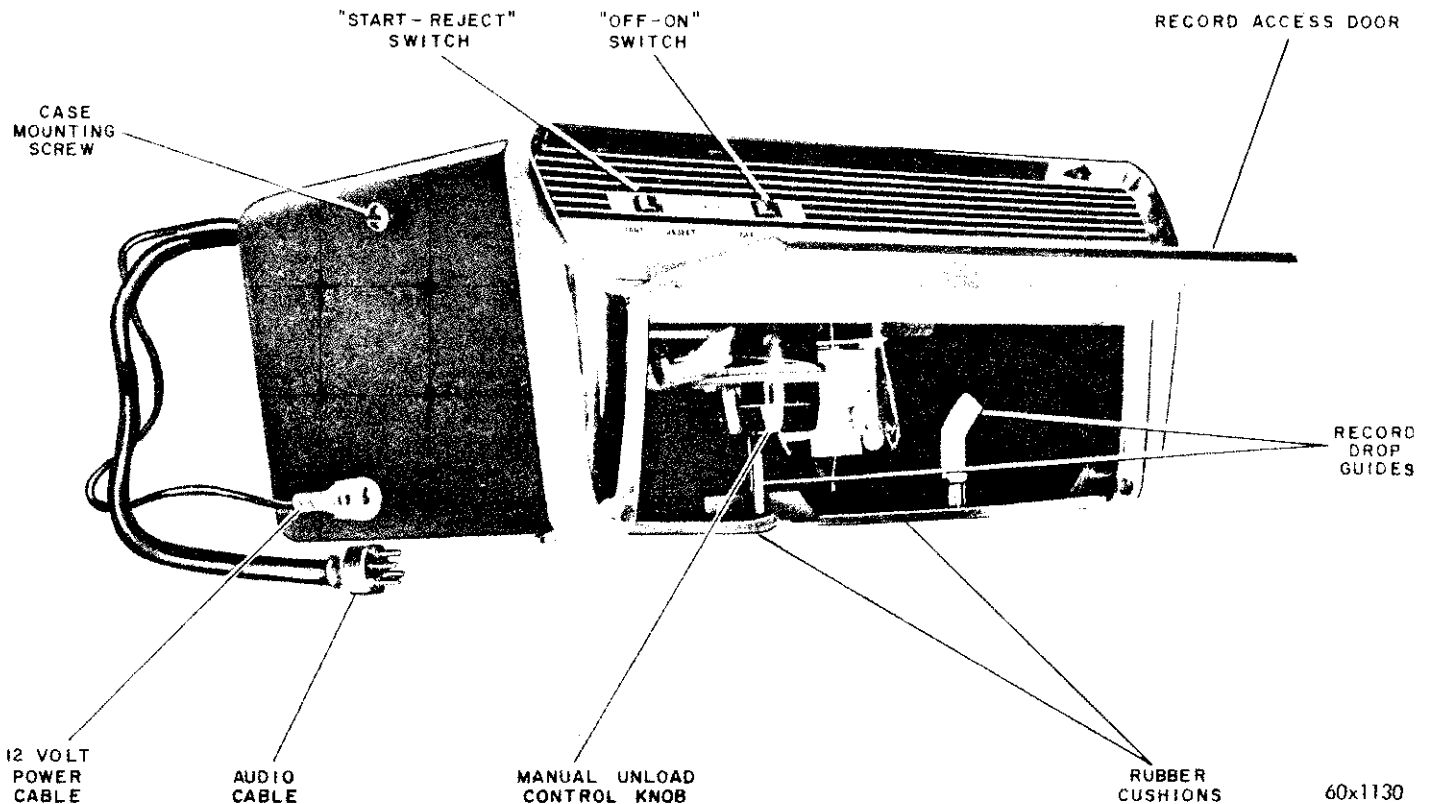
- (a) Inspect idler wheel and rim or turntable for

presence of grease or oil.

- (b) Turntable bearing race may be worn.
- (c) Idler spring may be weak.
- (d) Idler link may be binding in pivot.

**78. DISTORTED OR NO OUTPUT**

- (a) Cartridge may have broken element.
- (b) Stylus may be worn.
- (c) Pickup leads may be shorted or open.
- (d) Stylus holder may be off center and touch side of cartridge.
- (e) Stylus holder may be dirty.



**Fig. 40—Model SP-1 Record Changer**

## RECORD CHANGER

The model AP-1 record changer is a 45 rpm automatic record player attachment designed to play through the amplifier and speaker system of the automobile radio. The model AP-1 also includes the radio-phonograph switch.

The model AP-1 is constructed with the spindle pointed downward to facilitate the loading of records from the bottom, and provides for automatic unloading. The mechanism will play up to fourteen 7" records in automatic sequence.

The records are held in position by a spring-loaded stabilizer disc assembly. The record changer mechanism is suspended in its mounting case from three coil springs enclosed within rubber (balloon) shock absorbers. A balanced tone arm and cam wheel assembly provide proper operation under conditions of normal acceleration, vibration, and stopping of the automobile.

### 79. OPERATION (Figs. 40 and 41)

(1) Turn automobile radio on; increase volume to approximate half-way position.

(2) Slide record player "OFF-ON" switch to the "ON" position.

**NOTE:** Before loading, pause long enough to permit the last cycle to be automatically cleared. Stack records with the desired selections facing downward and with the last record to be played on top of the stack.

(3) Lift the record player compartment door and insert up to fourteen records into bottom of case, through the door opening and pushing them firmly up onto the spindle far enough so that the bottom record rests on the separator shelves. Close the cabinet door.

### CAUTION

Do not load additional records when other records are already on the spindle, unless you first manually move the pickup arm aside to clear the records.

**NOTE:** When there are no other records already on the spindle, records being inserted will automatically push the pickup arm out of the way.

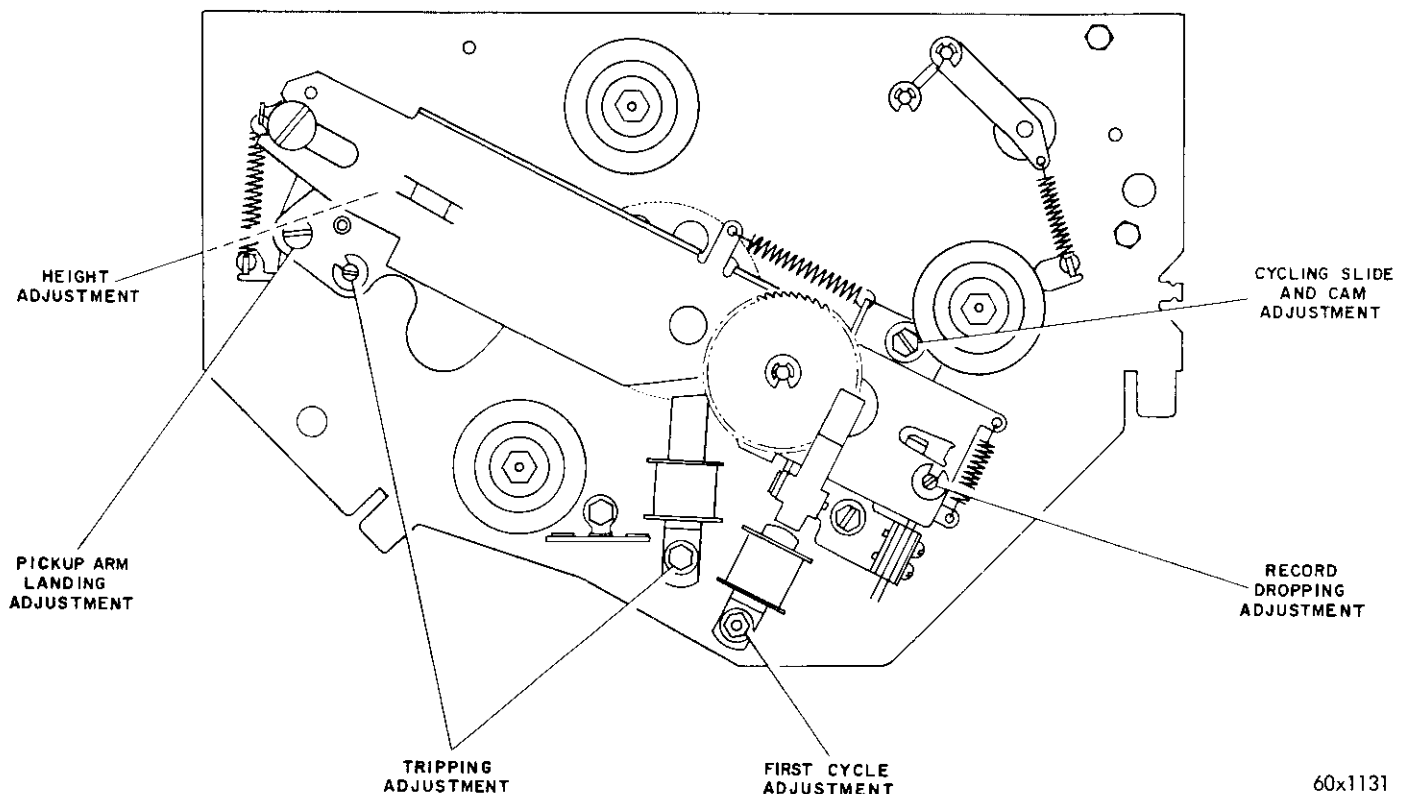


Fig. 41—Adjustment Locations

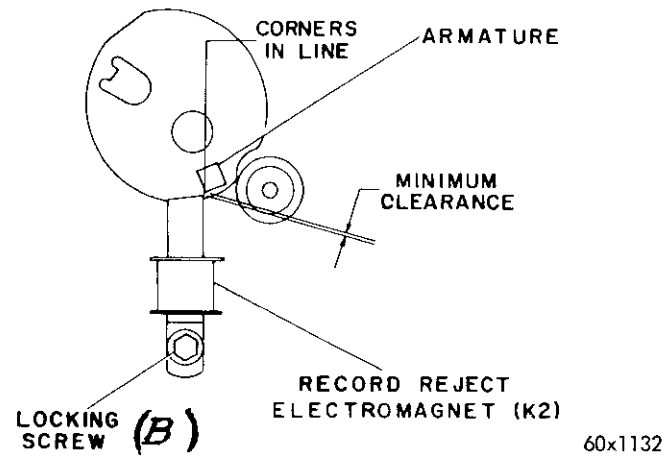
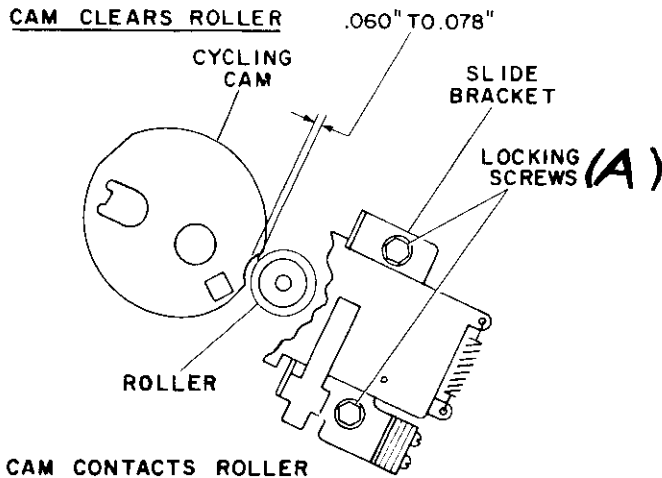


Fig. 42—Manual Tripping Adjustment

(4) Slide "START-REJECT" switch to the "START" position, hold for a moment, then release. Adjust volume and tone on radio control knob as desired.

**NOTE:** After each record plays, it will be dropped automatically to the bottom of the case where it may be stored, or removed to permit reloading. If the mechanism has been shut off before the last record has played, the remaining records may be unloaded by moving the pickup arm off the record and turning the unload knob at the bottom center of the spindle 1/2 turn in either direction will release all records from the spindle.

(5) To reject a record at any time, slide the "START-REJECT" switch to the "REJECT" position and then release. To repeat a record before end of play, slide the "START-REJECT" switch to "START".

80. ADJUSTMENTS (Fig. 42—Adjustment Locations)

a. Tripping Adjustments (Figs. 43 and 44)

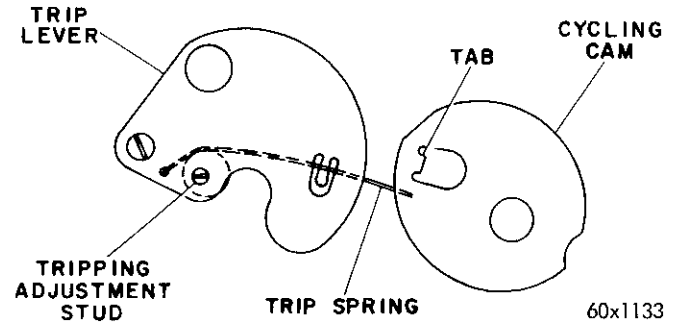


Fig. 43—Automatic Tripping Adjustment

**NOTE:** The mechanism may be started into a change cycle either manually or automatically.

(1) Manual tripping occurs when the "START-REJECT" switch is pushed to the "REJECT" position. This permits record reject electromagnet to attract the armature located on the cycling cam; adjust as follows:

- a. Loosen locking screws (A) located on slide bracket (Fig. 43).
- b. Move the bracket so it is as near perpendicular to the slide as possible.
- c. Position the bracket so that the cut-away section of the cycling cam clears the rubber roller in accordance with dimensions shown in Fig. 43.
- d. Tighten screws
- e. Rotate cam to contact roller.
- f. Loosen screw (B) and position corner of the electromagnet to provide minimum clearance without touching corner of armature on cam.
- g. Tighten screw.

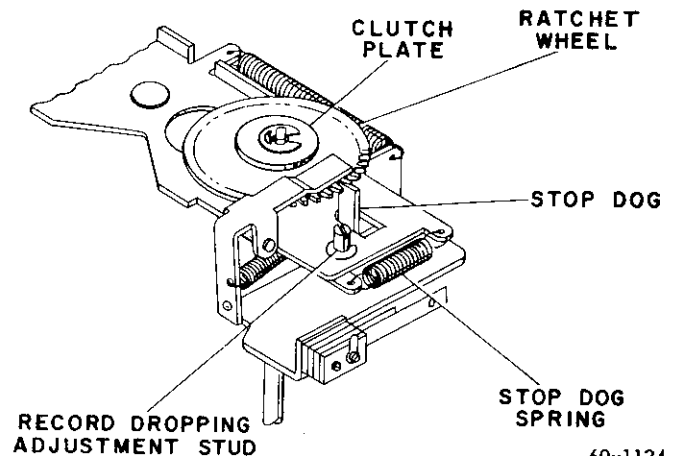


Fig. 44—Record Dropping Adjustment

(2) Automatic tripping occurs after each record has been played. The tripping position is adjusted by means of the small eccentric stud located on the trip lever. Turning this stud varies the position of the tripping spring in relation to the turned down lance on cycling cam (Fig. 44) adjust as follows:

a. Position cycling cam as described in under manual tripping operations 1a thru d.

b. Turn stud so that the mechanism trips when the stylus is  $1\frac{1}{32}$ " from side of spindle.

#### b. Pickup Arm Stop Adjustment

The stop bracket on the pickup arm swivel determines the stop position of the pickup arm. Adjust bracket so that the stylus tip is  $\frac{1}{4}$ " below the turntable surface.

#### c. Slide and Cam Adjustments

The cycling slide should be adjusted as described under manual tripping, operations 1a thru d.

#### d. Record Dropping Adjustment

The time during cycle at which the record drops from the spindle is controlled by means of an eccentric stud located on the end of cycling slide (Fig. 45).

**NOTE:** This stud regulates the position of the stop dog in relation to the rotating ratchet wheel. If timed too soon the record in dropping will strike the pickup arm. If timed too late the record may not drop.

Make adjustments as follows:

a. Place a stack of records on the spindle.

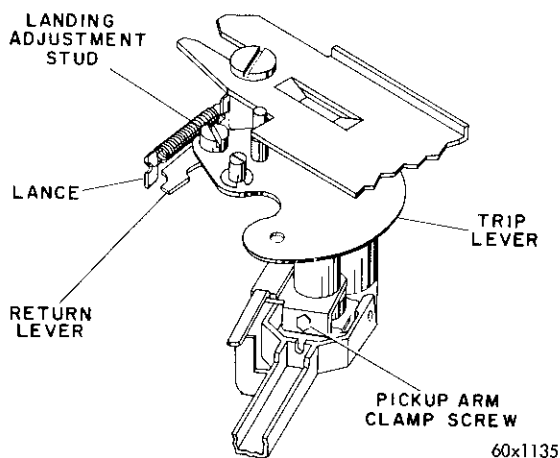


Fig. 45—Pickup Arm Landing Adjustment

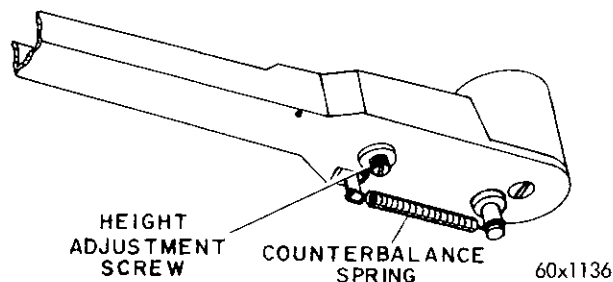


Fig. 46—Pickup Arm Height Adjustment

b. Rotate the turntable by hand and adjust the position of eccentric stud so that the record drops when the pickup arm has moved to its maximum outward travel.

#### e. Pickup Landing Adjustment

Under ordinary conditions the landing position may be adjusted by turning the large eccentric stud located on the trip lever. Turning this stud gives approximately  $\frac{3}{16}$ " of variation in the pickup landing position.

#### f. Pickup Arm Height Adjustment

The pickup arm height during cycle is adjusted by means of a slotted screw located in the pickup arm (Fig. 46) as follows:

(a) Rotate the turntable by hand in the correct direction until the pickup arm has lowered to its maximum height.

(b) Turn height adjustment screw so that during change cycle the stylus tip is  $1\frac{3}{8}$ " below the turntable surface.

#### g. First Cycle Adjustment

First-record-hold is adjusted by means of a stop ear located on slide bracket (Fig. 47) as follows:

(a) Adjust stop ear so that the gap between contact and electromagnet is  $.025$ ".

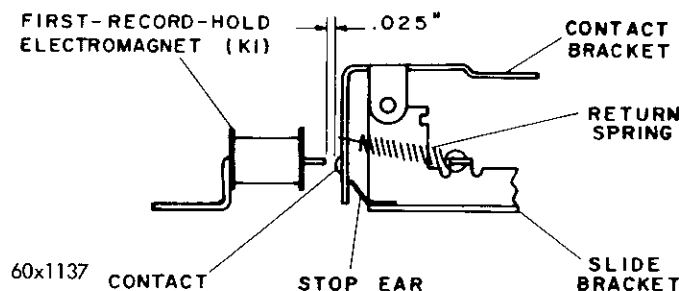


Fig. 47—First Cycle Adjustment

(b) In the energized position, the contact bracket will prevent stop dog from engaging ratchet wheel. The contact bracket should not drag on ratchet wheel during cycle in the energized position.

(c) In the de-energized position the contact bracket will permit stop dog to engage ratchet wheel during cycle.

#### **81. CLEANING**

The drive motor shaft, turntable rim, idler wheel, rubber roller cam wheel and clutch plate must be kept free from grease and oil. Use chlorothene or equivalent cleaning solvent for cleaning these parts.

#### **82. LUBRICATION**

The mechanism is properly lubricated when it leaves the factory to provide good performance under extremes of temperature; additional lubrication should not be necessary for a long period of time.

All bearing surfaces should be lubricated with \*Cosmo-Lubric #270. On all sliding surfaces and cam wheel shaft, lubricant Type DC3 is recommended.

The record separator shelves should be lubricated with a very thin film of Cosmo-Lubric #270.

#### **\*CAUTION**

**Use of improper lubricants may cause failure in cold weather.**

---