Section XVI
RADIO, HI-FI AND HEATER
CONTENTS

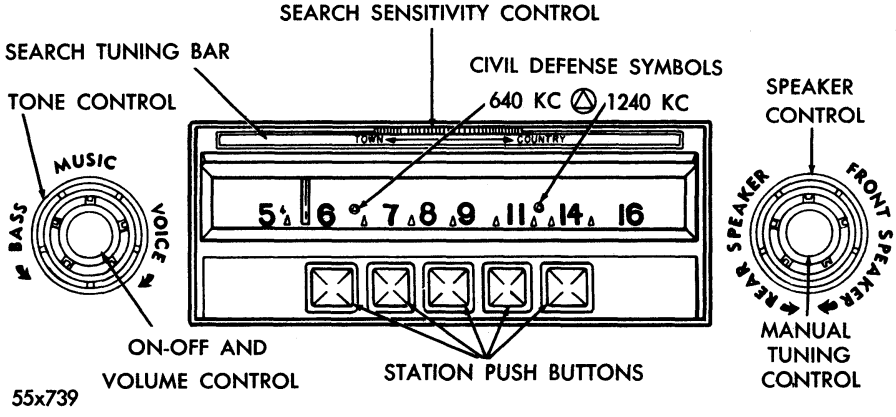

Fig. 1—Operating Controls (Model 912)

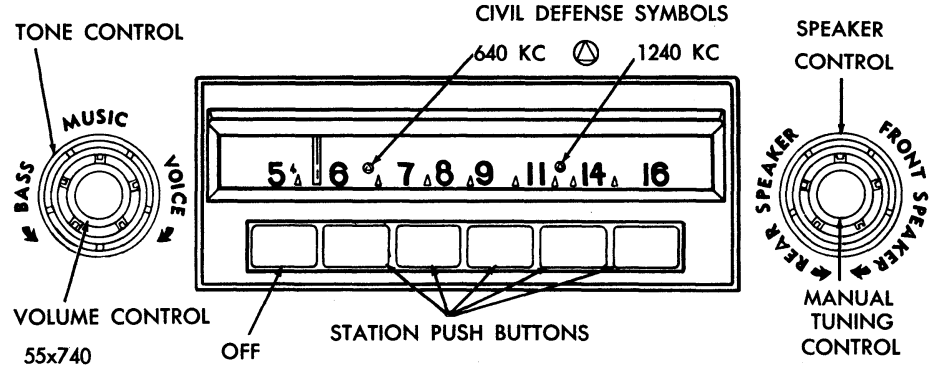

Fig. 2—Operating Controls (Model 844)

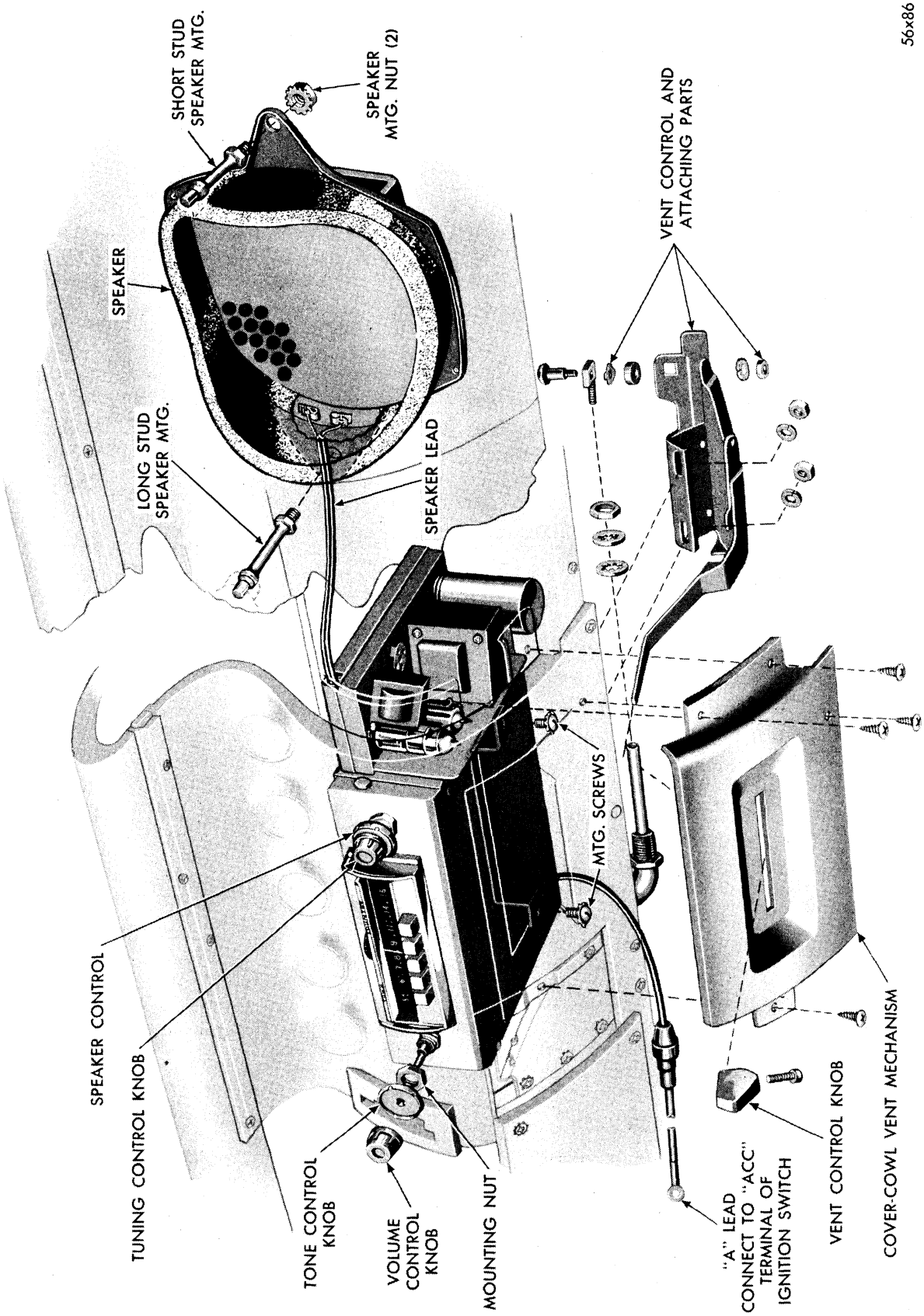

Fig. 3—Radio Installation (Model 912) (Typical of Model 844)

Section XVI

RADIO, HI-FI AND HEATER

RADIO

The Electro Touch-Tuner (Model 912) (Fig. 1), has nine tubes. It includes a variable tone control with manual tuning, push button tuning and automatic search tuning. The Music Master, (Model 844) (Fig. 2) has eight tubes. It includes a variable tone control with manual tuning and push button tuning.

SERVICE PROCEDURES

1. REMOVAL AND INSTALLATION — (FIG. 3)

Disconnect battery ground cable, antenna, battery lead and speaker lead wires from radio. Remove ash tray and cowl vent plate. Remove cowl vent lever knob and cowl vent mechanism. Remove radio control knobs and mounting nuts. Remove mounting screws from lower instrument panel to bracket on radio. Remove radio from underneath instrument panel. Install in reverse order and adjust antenna compensator.

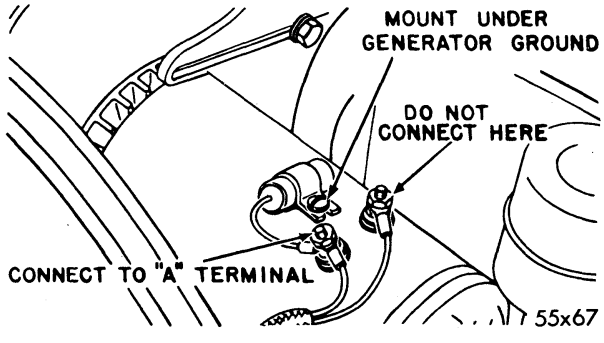

Fig. 4—Generator Condensor

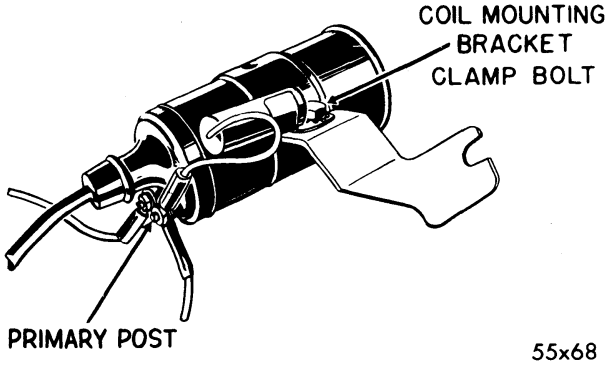

Fig. 5—Coil Condensor

NOTE

On cars equipped with lighter in ash receptacle, remove lead from junction box.

2. INTERFERENCE

Install suppression equipment for elimination of interference and tire static, (Figs. 4-5) Suburban Models use a special fuel gauge filter to filter out any interference caused by the fuel gauge points. Connect wires as shown in Figure 6.

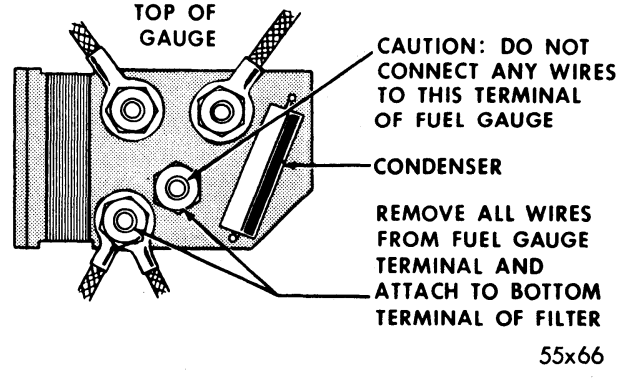

Fig. 6—Fuel Gauge Filter

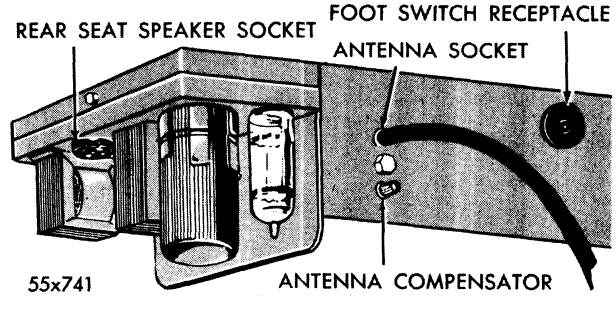

Fig. 7—Antenna Compensator Adjustment (Model 912) (Typical of Model 844)

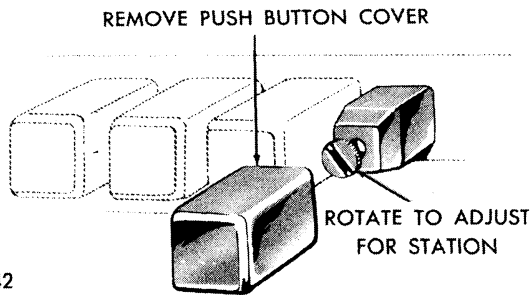

Fig. 8—Push Button Adjustment (Model 912) (Typical)

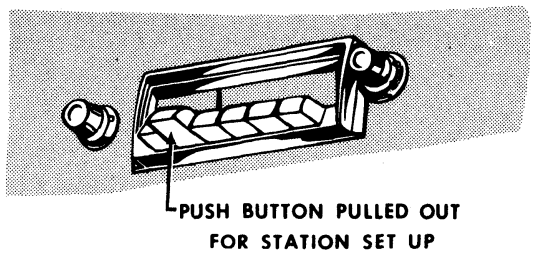

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Fig. 9—Push Button Adjustment (Model 844) (Typical)

3. ANTENNA COMPENSATOR

Extend antenna fully, tune radio manually to a weak station, 1400 KC, turn antenna compensator, (Fig. 7) for maximum volume.

NOTE

It is important when adjusting the compensator that antenna is fully extended and compensator be trimmed at 1400 KC.

4. PUSH BUTTON ADJUSTMENT (MODEL 912) (Fig. 8)

Extend antenna fully and turn radio on for fifteen minutes. Push search tuning bar and after pointer stops, tune in desired station manually. Pull off push button cover and turn radio off. Push in push botton, turn radio on, turn adjusting screw until desired station is received. Replace push button cover and repeat operation on other push buttons.

5. PUSH BUTTON ADJUSTMENT (MODEL 844) (Fig. 9)

Extend antenna fully and turn radio on for fifteen minutes. Unlock push buttons by pulling them out. Manually tune in desired station and relock push buttons. Repeat operation on other push buttons.

6. SEARCH SENSITIVITY CONTROL

With search sensitivity control in "Town" position, the tuning bar will tune only strong stations. In its mid-position, it will tune strong and medium-powered stations. With control in "Country" position, it will tune all stations within range of radio.

Fig. 10 — Hi-Fi Record Player (Disassembled View)

1—Limit arm
2—Tone arm bearing (nylon)
3—Tone arm, with counterweight and pivot
4—Retaining clip for pickup lead
5—Screw, No. 0—80 x 3/8 in. brass for cartridge
6—Screw, No. 0—80 x 5/16 in. brass
7—Pickup cartridge
8—Stylus for pickup cartridge
9—Pickup lead assembly
10—Rocker arm assembly
11—Ball bearing for tone arm pivot
12—Screw, No. 4—40 x 3/8 in. for tone arm stop
13—Lockwasher, No. 4 for tone arm stop screw
14—Tone arm stop screw and indexing latch
15—Tone arm indexing latch set screw nut
16—Tone arm indexing latch set screw
17—Screw, No. 6—32 x 1/4 in. for motor cover
18—Lockwasher, No. 6 for motor cover screw
19—Motor cover
20—Grommet for motor cover
21—Motor bracket
22—Rubber motor mount
23—Motor
24—Screw, No. 5—40 x 1/4 in. for mounting motor to bracket
25—Lockwasher for motor mounting screws
26—Coupling sleeve for motor
27—Capacitor, Elec. 50/50 mfd., 25 V.—Capacitor, Mica 400 mfd., 500 V.—R. F. choke
28—Grommet for phono to radio cable
29—Phono to radio cable
30—Hood for pilot lamp
31—Pilot lamp
32—Shell and liner for plug for phono to radio cable
33—Plug for phono to radio cable Switch, radio—phono, less knob
34—Knob for radio-phono switch
35—Vibrator
36—Shielded lead, control chassis to slider plate
37—Cable, control chassis to motor. Cable clamp, clamps (items 36 and 37) to slider plate.—Screw, No. 4 x 3/16 in. for the above cable clamp
38—Screw, No. 4—40 x 1/4 in. black for item 40
39—Screw for item 38
40—Spring for idler lifter crank
41—Idler lifter crank
42—Spindle for turntable
43—Turntable
44—Retaining ring for spindle, item 42
45—Shaft for turntable drive assembly, item 49
46—Shaft clamp for items 45 and 59
47—Lockwasher, No. 4, for item 48
48—Screw, No. 4—40 x 1/4 in. for shaft clamp 46
49—Turntable drive assembly
50—Damping spring for shaft 45
51—Lockwasher, No. 2, for damping spring screw 52
52—Screw, No. 2—56 x 3/16 in. for damping spring 50
53—Thrust spring for bearing block shaft
54—Bearing block and drive shaft assembly
55—Lockwasher for screw 56
56—Screw, No. 4—40 x 3/8 in. bearing block to casting
57—Motorboard casting
58—Turntable support for idler wheel (nylon)
59—Shaft for idler wheel 58
60—Retaining ring for idler wheel 58
61—Ballast weight
62—Lockwasher, No. 6 for screw 63
63—Screw, No. 6 x 1/2 in., ballast weight to casting
64—Screw, No. 4 x 40 x 1/4 in., ground lead 65 and shaft clamp 46
65—Ground lead, motorboard to slider plate
66—Shock mount cushion, right side and rear (2 used)
67—Shock mount cushion, front left (1 used)
68—Screw, No. 4 x 3/16 in., ground lead to shock cushion tray
69—Slide assembly
70—Record storage press plate.—Screw, No. 4—40 x 3/8 in. control chassis to case.—Lockwasher, No. 4, control chassis mounting screw.—Standoff mounts control chassis in case.—Screw, No. 4—40 x 1/4 in. control chassis to standoff.—Lockwasher, standoff to chassis

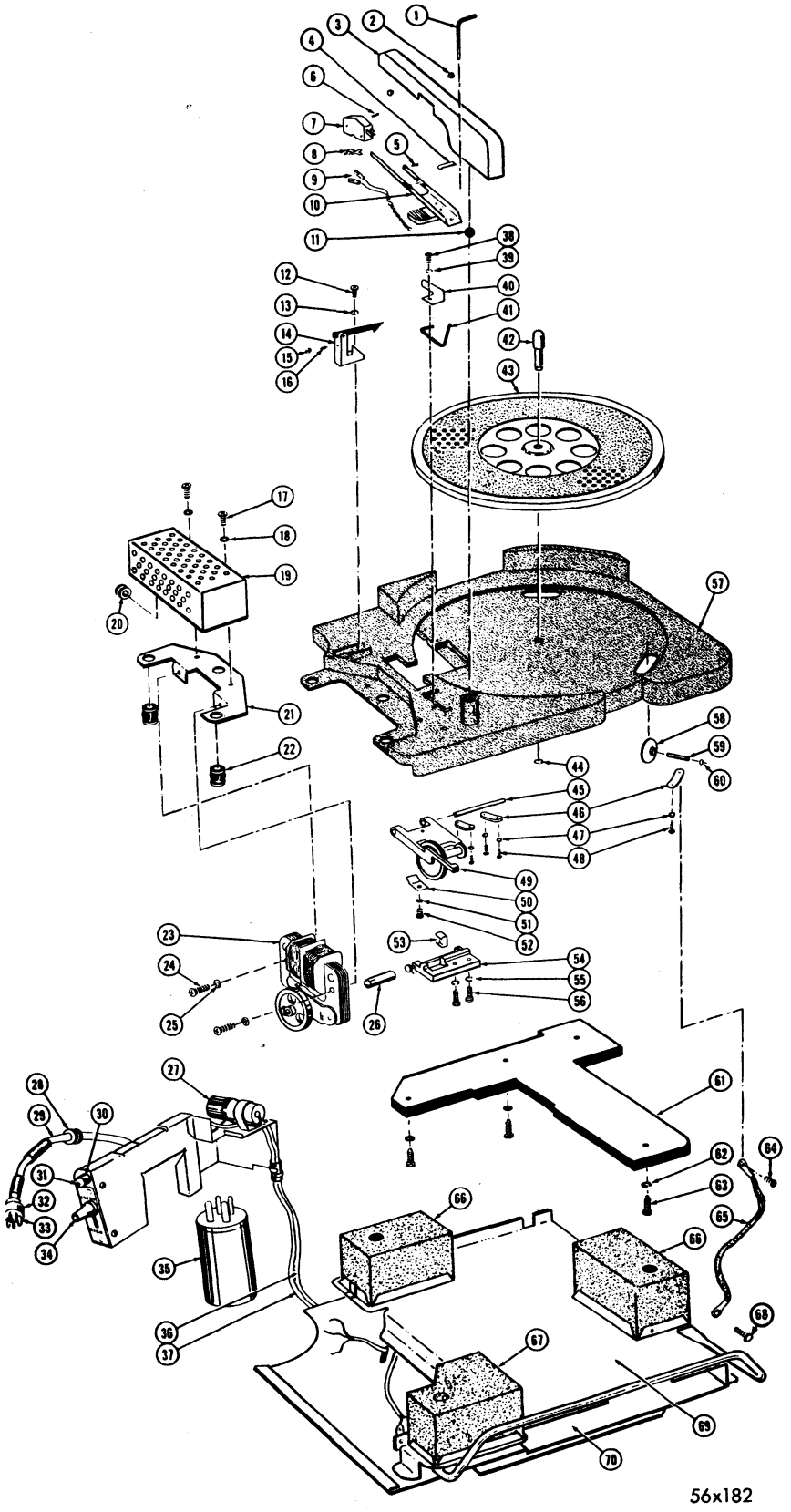

Fig. 10—Hi-Fi Record Player (Disassembled View)

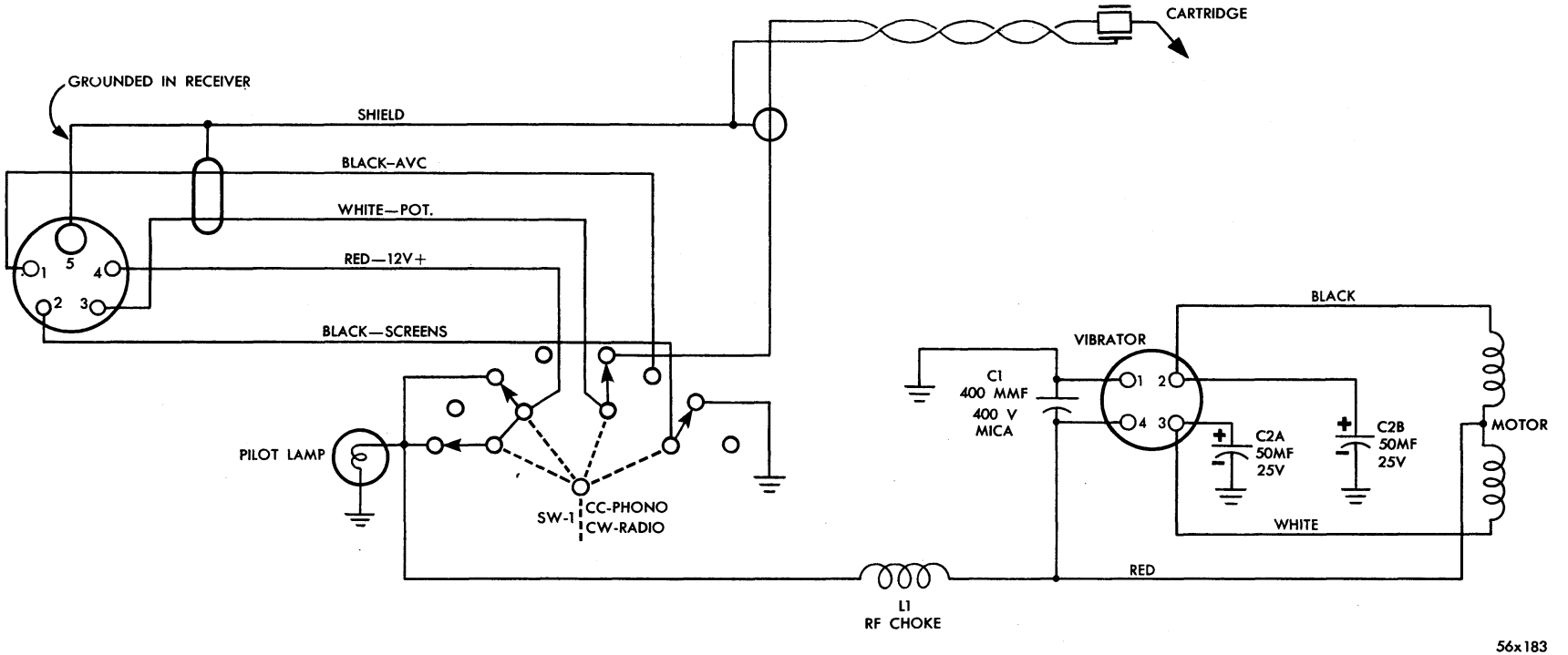

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Fig. 11—Hi-Fi Record Player Electrical Circuit Wiring Diagram

HIGHWAY HI-FI RECORD PLAYER

7. OPERATION

Turn on radio. Put control knob in "Phono" position, of Hi-Fi record player. Place record on turntable, and push down gently on red tab located on left side of tone arm. While pushing down on tab, move arm to right until it contacts stop.

Release tab, and stylus (needle) will come to rest on record. Slide player back into case, adjust volume and tone on radio.

Care of Records—To prevent damage to records (particularly in hot weather), remove records from turntable and place in storage space. Pressure plate on bottom of storage space rises and holds records firmly in place between two flat surfaces when unit is pushed back into case.

NOTE

Always place tone arm in "off" position when Hi-Fi unit is not in use and push red knob down to radio position. To shut off Hi-Fi unit in an emergency turn radio control knob to off position.

SERVICE PROCEDURES

8. REMOVAL AND INSTALLATION OF CHASSIS (FIGS. 10 AND 11)

a. Removal

Remove vibrator from left rear. Remove four screws from left side of case and one at rear of case. Release grommet on plug wire. Release stop on bottom of chassis, and pull out until there is sufficient room to remove ground wire on underside of set. Remove set and place it on bench for repair.

b. Installation

When set is being installed, feed plug and wire through hole in case, and engage chassis into slides in case. Push set in about halfway, and install ground wire in chassis. Install retaining screws and wire retainer. Install vibrator and insert plug into socket in radio. After installation, alignment of chassis can be made through hole used to install vibrator.

9. REMOVAL OF TURNTABLE (CHASSIS REMOVED FROM CASE)

To remove turntable, remove spindle retainer clip. Lift turntable and spindle from base plate. Check nylon wheels; wheels must spin freely. Inspect turntable top pad and make sure pad is properly cemented. The table and pad must be flat to provide good audio quality. Check turntable drive ring for proper cementing on under side of turntable.

10. REMOVAL OF IDLER ASSEMBLY (CHASSIS REMOVED FROM CASE)

Remove coupling shaft and bearing block. Remove four crosshead screws, and idler assembly. Use care when removing assembly because nicks or depressions in rubber wheel will result in poor audio quality (Flutter).

11. REPLACEMENT OF MOTOR (CHASSIS REMOVED FROM CASE)

Remove screws retaining cover to motor support. Unsolder black, red and white wires from terminals. Remove both screws which retain motor frame to bracket. Remove motor assembly and coupling will drop out. Install coupling on motor; install motor and resolder wires. Do not burn separators when soldering wires to terminals.

12. REMOVAL AND INSTALLATION OF COUPLING (CHASSIS REMOVED FROM CASE)

Two types of couplings are used, pin type with brass coupling shaft, and star type with nylon coupling shaft. The motor, coupling shaft, and bearing block with pin type coupling is not interchangeable with star type, unless all three components are replaced as a unit.

To remove coupling, pull carefully outward on motor and coupling will fall out. To install coupling, pull motor outward, engage coupling, and engage bearing block. There is sufficient movement in rubber mounts to install coupling.

13. REMOVAL OF TONE ARM (CHASSIS IN CASE)

To remove tone arm, press down gently on red

tab and rotate arm until it is stopped by positioning latch. Allow stylus to fall momentarily; gently press down on red tab, swing arm to outboard position, and lift straight up. Do not lift arm up too high because this action may break connecting wires. A special lubricant is used on tone arm pivot and ball bearing. In addition to acting as a lubricant the material damps the lateral movement of tone arm. It is absolutely essential this lubricant not be wiped off and under no circumstances should a substitute be employed other than specified lubricant. If new tone arm is installed use specified lubricant.

14. REMOVAL OF ROCKER ARM (CHASSIS IN CASE)

Remove wire retaining clip by prying carefully with small screwdriver. If arm is to be replaced, it will be necessary to unsolder lead wires from underside of base. Press tab toward arm side until pivot pin is out of nylon bearing. (It may be necessary to lift retaining spring slightly, on opposite side of tone arm, to release rocker arm.) When assembly is removed, the tension spring under rocker arm will snap back toward rear of rocker arm.

Make sure this spring is held in forward position, when rocker arm is installed in tone arm. Use care to prevent distorting spring. If spring is distorted, contact pressure of stylus will be changed. When rocker arm is installed, position lead wires. The arm should not contact the wire. The rocker arm must pivot freely in its nylon bearings.

Replacement of Needle

Pull needle from needle holder. When installing needle, make sure it snaps into slot on holder.

SERVICE DIAGNOSIS

15. TURNTABLE DOES NOT TURN

Check to see that motor is turning by observing flywheel. If motor is turning, check coupling between motor and bearing block. This may have been disconnected at either end, or it may have dropped off completely. If coupling is in proper position, check to see that damping spring is not too tightly set against idler lift arm, preventing it from dropping to its normal operating position.

16. MOTOR IS NOT TURNING

Make sure "Radio-Phono" switch is in "Phono" position and pilot lamp is lit. If pilot lamp is not lit and motor and vibrator are inoperative, check plug to see that it is secure in radio receptacle and check radio fuse.

With tone arm in "Off" and locked position, turn operating switch to radio position and spin flywheel with finger. The flywheel should spin freely. If flywheel spins freely, turn operating switch to "Phono" position, and check vibrator to make sure it is operating. If no vibration is felt, vibrator should be replaced. Remove motor shield and check for open or shorted windings, or for wires shorting to chassis.

17. MOTOR DOES NOT SPIN FREELY

Check coupling to see that it is properly seated on both shafts. If coupling is properly seated, tightness may be caused by shift in position of self-aligning bearing used for motor shaft. Place screwdriver on center of flywheel. With handle of another screwdriver, gently tap handles together. (Care must be exercised to avoid hitting flywheel too hard or damage to motor may result.) When properly done, this should relieve misalignment of bearings. If flywheel is still tight, motor should be replaced.

18. TURNTABLE TURNS SLOWLY

Try another vibrator. Check for tight motor bearings, as outlined in Paragraph 17. Check battery voltage.

19. MOTOR VIBRATES WHEN UNIT IS ON

Make sure coupling is properly seated on both shafts, and that three rubber motor mounts are properly seated in motor support bracket and main casting.

20. ARM POSITIONS IMPROPERLY ON RECORD

If arm positions improperly when red tab is

depressed and arm moved to "Stop", adjust tone arm stop assembly (in direction necessary) by loosening cross-headed screw located in slotted hole on top of assembly, moving entire assembly. Then, tighten screw.

21. STOP LATCH OUT OF ADJUSTMENT

If tone arm is not positively stopped when red tab is depressed and arm moved to "Stop", lower stop latch by turning Allen-head screw (facing left on stop latch) counter-clockwise. Tighten nut on screw. If arm will not start records because stop latch is hooked over rocker arm, raise stop latch to clear arm. (Do not raise stop latch so high that positive stopping is not achieved.) To raise stop latch, loosen nut on Allen Screw, turn screw clockwise as much as necessary, and tighten nut.

22. TONE ARM STUCK

If tone arm cannot be moved out of "Off" position by gently depressing red tab and gently pushing towards center of unit, check to see that tone arm shell is not hung up over idler lift crank. If it is hung up, tone arm can be released by gently lifting it until idler lift crank can be moved to left, then arm should be pushed down.

Check to see that entire front of arm has not been pushed down by a severe blow. If this has happened, lift rear of arm about ¼ inch, press red tab, and move arm until it is no longer under housing. The arm may then be lifted completely off turntable for examination. If it is slightly bent, it may be possible to straighten arm with fingers, using care not to distort original shape of arm or damage needle. Make sure that rocker arm still pivots freely. If arm is badly bent, it should be replaced.

23. FLUTTER

This is a repeating sound (such as a thump or a gurgle), which occurs at frequency of about 40 cycles per second. Flutter can be caused by following conditions:

a. A bump or depression in idler wheel.

b. Motor flywheel rubbing.

c. Incorrectly aligned coupling.

d. Shock mount out of mounting hole.

e. Rough or non-concentric shaft in bearing block.

f. Rough nylon idler wheel (under turntable.) The braided ground wire at right front of unit (going from underside of casting to front base rubber shock mount tray) may be rubbing against nylon idler wheel.

24. AUDIO DISTORTION

This is a slow repeating distortion (occurring every 1 or 2 seconds), which can be described as a change in pitch, such as that caused by warped record. Some causes of Audio Distortion may be:

a. Frozen or tight nylon idler wheels under turntable.

b. Slippery rubber drive ring under turntable (due to oil or grease on ring).

c. Bump or poor cementing of rubber drive ring.

d. Worn knurl on idler wheel. (This wheel drives rubber ring under turntable.)

e. Tight or rough center spindle.

f. Poorly cemented rubber top on turntable (edge too high or loose).

g. Warped turntable or record.

25. STYLUS SKIPS OR JUMPS GROOVES WHEN CAR IS IN MOTION

a. Insufficient stylus pressure.

b. Defective stylus.

c. Unbalanced rocker arm.

d. Unbalanced tone arm.

e. Tone arm pivot improperly lubricated.

HOT WATER HEATER

26. DESCRIPTION AND OPERATION

The Chrysler MOPAR All Weather Comfort System supplies fresh air through cowl vent for ventilating, heating and defrosting.

For summer operation there are two ventilator doors provided, which direct fresh air from cowl vent opening to bottom of driver compartment. The summer doors should be closed when driving under extremely dusty or rainy conditions. A drain tube is provided in bottom of air duct in case water does come in through vent. Each (fresh air) door operates independently (Fig. 12).

For winter operation, cowl vent should be open. The fresh air can then flow downward through blower heat exchange, and distributor duct. Temperature control is provided by controls on instrument panel (Fig. 13). The temperature is maintained by means of an automatic water valve.

Defrosting is provided by heated air flowing from distributor duct to a slotted passage across lower side of windshield. The defroster motor is a separate unit.

27. REMOVING AND INSTALLING CORE (Fig. 14)

Drain cooling system, remove hoses from engine side of firewall, remove heater housing (engine side) and remove core. When installing housing be sure to draw bolts up evenly-alternate from top to bottom, working from center out. Fill cooling system, check for leaks with heater controls set at warmest position. Check blower and defroster for proper operation.

NOTE

In event an "air lock" condition occurs, remove heater outlet hose and turn temperature control to warmest position. Run engine until trapped air is forced out.

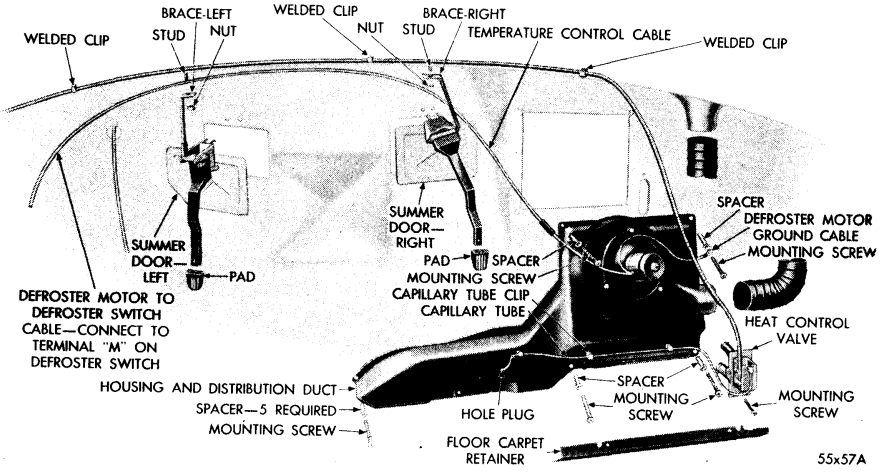

Fig. 12—Heater Installation (Driver's Side) (Typical)

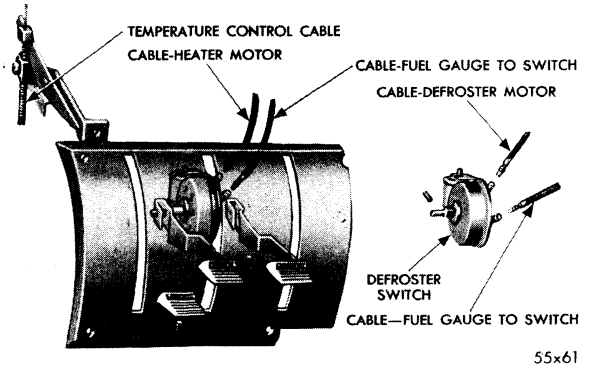

Fig. 13—Heater Controls (Typical)

28. DEFROSTER MOTOR (REMOVAL AND INSTALLATION) (Fig. 15)

Remove glove compartment, disconnect electrical lead wires to motor, remove defroster motor mounting plate at distributor duct and remove motor and fan assembly.

When installing fan on motor shaft, adjust fan clearance between edge of fan wheel and mounting plate to $\frac{7}{16}$ inch (Fig. 15).

29. BLOWER MOTOR (REMOVAL AND INSTALLATION) (Fig. 16)

Disconnect electrical lead wires to blower mo-

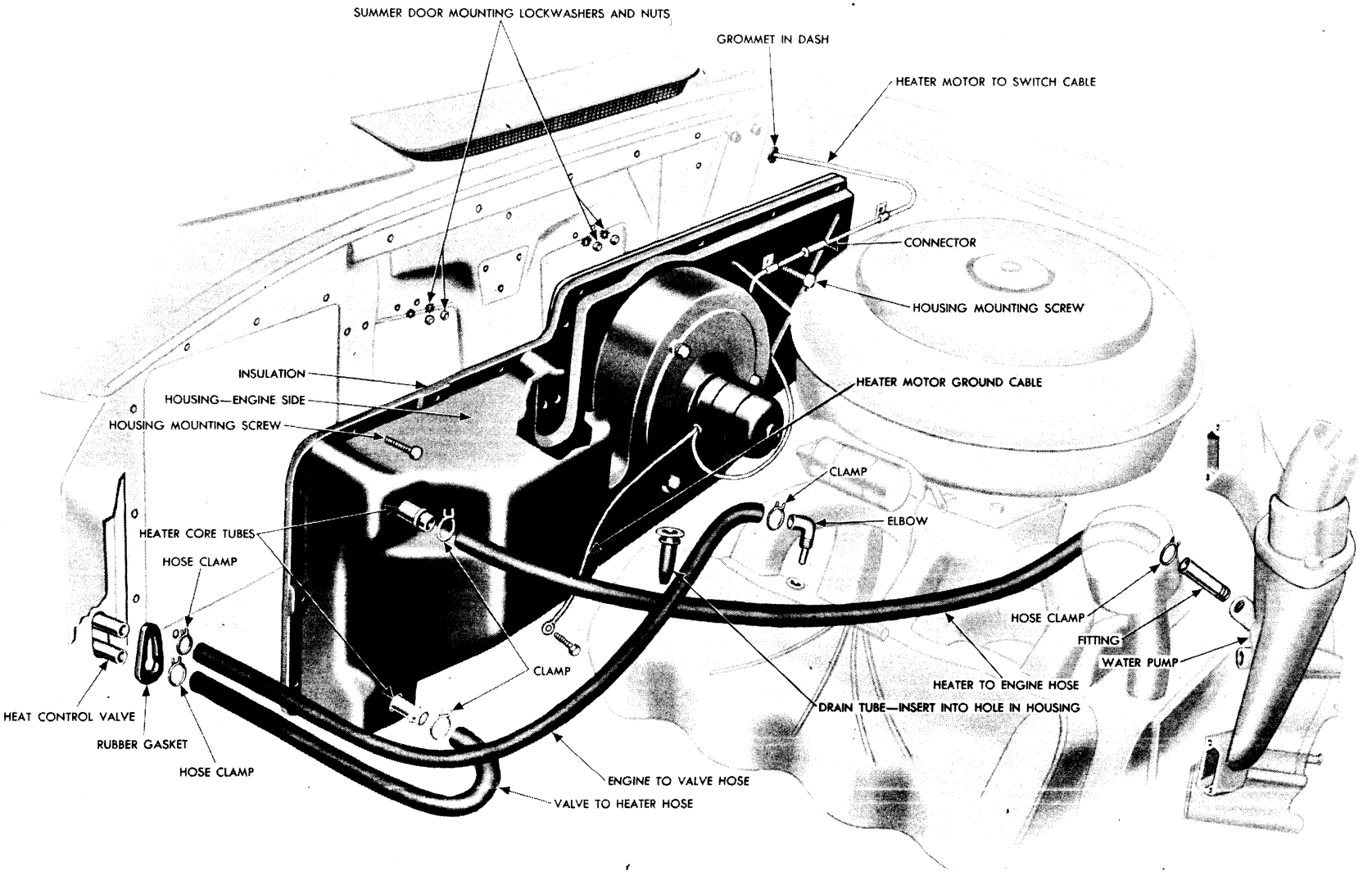

Fig. 14—Heater Installation (Engine Side) (Typical)

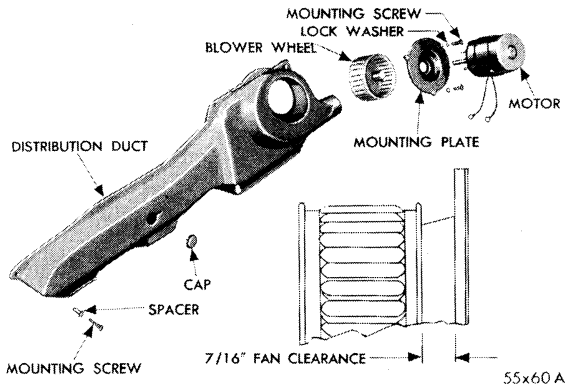

Fig. 15—Assembled Blower and Motor to Distributor Duct

tor. Remove blower motor mounting plate from heater housing and remove motor assembly.

When installing fan, adjust to ½ inch clearance between fan wheel and mounting plate.

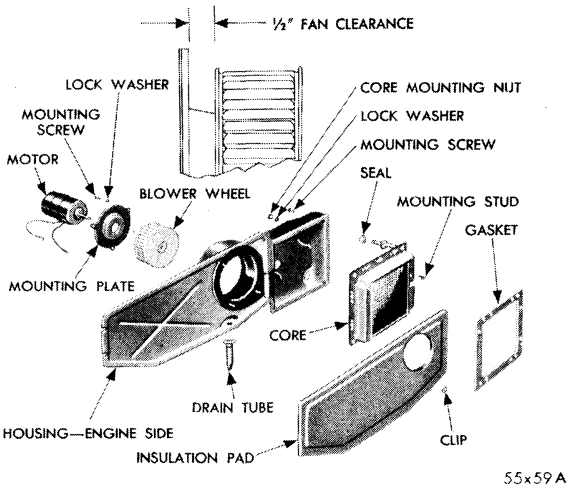

Fig. 16—Blower and Motor Assembly, Heater Core and Insulation to Heater Housing (Engine Side)

INSTANT HEAT CONDITIONAIRE HEATER (MODEL 800)

The heater (Fig. 17) is a combustion type, gasoline-burning unit and mounts in space normally occupied by conventional hot water heater core.

30. CYCLE OF HEATER OPERATION

Open cowl vent and close fresh air doors. When heater blower control is moved to "ON" position, following events occur simultaneously (providing temperature control is moved to higher temperature than atmosphere in car to complete thermostat electrical circuit).

The fuel valve coil is energized and operates valve, permitting fuel to flow to heater. The burner blower and fuel pump motor starts. The burner blower supplies combustion air to burner, and fuel pump forces fuel through nozzle, into burner housing assembly in an atomized state.

The burner blower forces combustion air through a louver plate, which creates turbulence to air and atomized fuel. This action thoroughly mixes air and fuel.

The electrical circuit is completed in ignition unit, and causes a continuous vibrating spark to occur in spark plug electrode gap, igniting fuel mixture.

The ventilator air blower electrical circuit is completed, forcing air into heater case and around heat exchanger, heating air. The heated air is then forced out into interior of car.

The operation of heater system continues to function until temperature at heater duct rises slightly higher than thermostat setting; at which time, thermostat opens, shutting off fuel valve and secondary circuit of ignition unit.

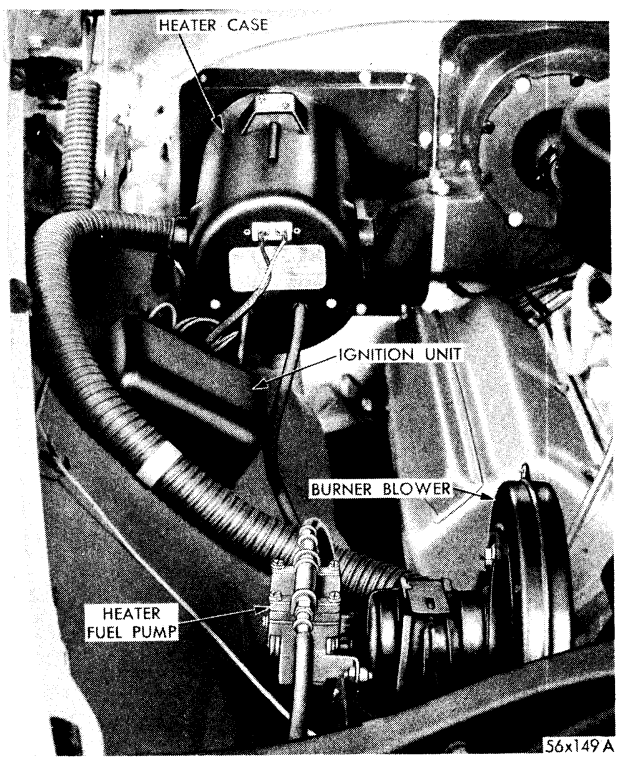

Fig. 17—Model 800 Heater Installed

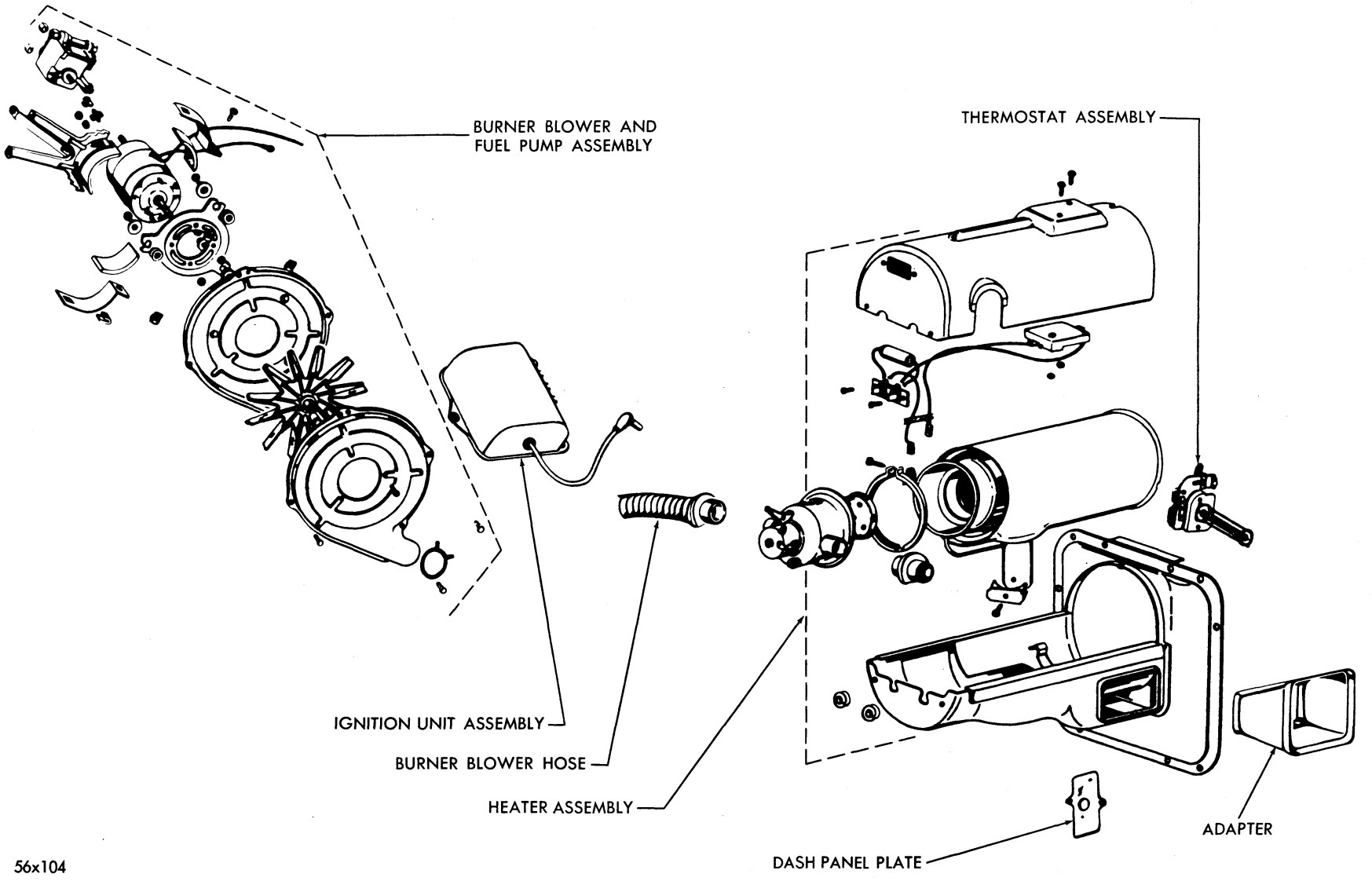

Fig. 18—Heater Assembly (Disassembled View)

SERVICE PROCEDURES

The ignition unit and thermostat assembly with micro-switch are serviced as assemblies only. The components of exhaust system can be replaced as required. The heater assembly and heater burner blower and fuel pump assembly can be partially disassembled for servicing as outlined in paragraphs 34 and 35.

31. THERMOSTAT

a. Removal

The thermostat is located at right end of heater housing in passenger compartment side of dash panel (Fig. 18). Loosen control cable swivel screw and disengage cable clamp from thermostat. Remove two sheet metal screws attaching thermostat mounting plate to heater housing. Carefully withdraw thermostat from heater housing, disconnect two wires at micro-switch, and remove thermostat assembly.

CAUTION

The thermostat assembly has been calibrated at the factory. Do not attempt to adjust or alter the micro-switch or plastic cam.

b. Installation

(Refer to Figure 18). Inspect thermostat assembly and thermostat helix coil guard for distortion. Check micro-switch terminals for loose attaching screws.

Viewing thermostat from micro-switch end, connect green wire to upper terminal and white wire to lower terminal (Fig. 19). Carefully insert helix coil portion of thermostat into heater housing (cable clip up) and install retaining screws. Install control cable, but do not tighten screw. Move temperature control (on instrument panel) to fully open position. Move thermostat control linkage downward to fully open position and tighten swivel screw.

NOTE

When thermostat cable is properly installed, the temperature control lever should move thermostat linkage from one extreme to other, without interference with cable housing.

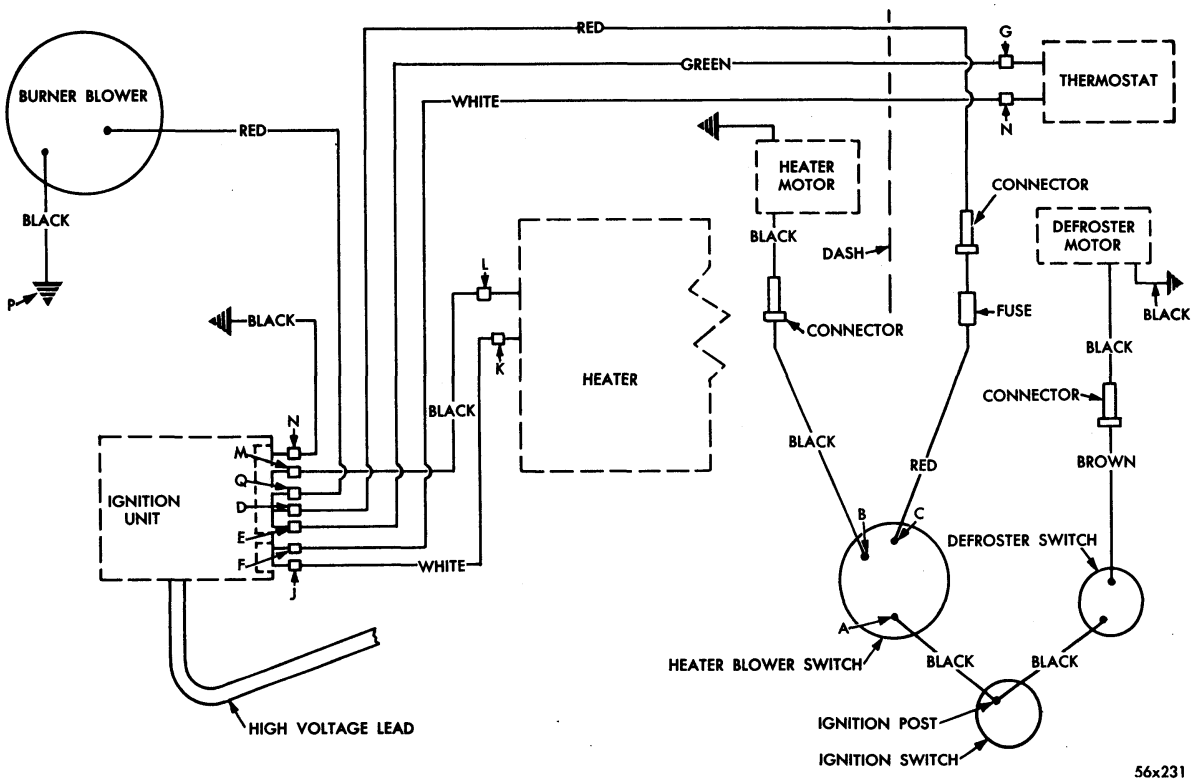

Fig. 19—Heater Wiring Circuit Diagram

32. IGNITION UNIT

a. Removal

(Refer to Figs. 18 and 19). Disconnect two wires at front end of heater. Remove three screws holding upper half of heater case. Raise front end of heater case, disconnect and remove spark plug wire and grommet from lower half of case. Disconnect wires from ignition unit.

NOTE

The ignition unit is sealed and serviced as an assembly only. If inspection or tests indicate unit to be faulty, replace assembly.

b. Installation

Install ignition unit assembly on fender shield. Connect wiring harness at ignition unit and heater case (Fig. 19). Connect spark plug wire to spark plug, insert grommet in lower half of case, and install upper half of case and attaching screws.

33. BURNER AND HEAT EXCHANGER ASSEMBLY

a. Removal

Disconnect two wires from terminals at front end of heater assembly. Remove retaining screws and raise front end of case. Disconnect two fuel valve coil wires, and remove spark plug wire and grommet. Remove heater case upper half and fuel line.

Disconnect heater blower hose with grommet and disengage exhaust pipe. Remove rubber adapter connecting heater housing (engine side) to heater. Remove burner and heat exchanger assembly from heater case.

b. Installation

Inspect heater case upper and lower halves for distortion, broken welds or other visible damage. Inspect overheat switch (located in upper half of heater case) for broken porcelain, burned or broken wiring, and loose or broken contact points. If wire connections are loose at overheat switch, correct by soldering. If any other conditions exist, replace overheat switch as follows: Unsolder white wire at terminal strip. Disengage both wires from cover clip. Remove two screws, and remove overheat switch and wire assembly. Replace overheat switch by reversing above procedure.

Check burner blower hose for visible damage. Replace hose if necessary.

Connect exhaust pipe to heat exchanger tube. Insert heater burner blower hose on burner housing opening. Install spark plug cable on spark plug terminal. Install fuel line. Position both grommets in lower case.

Position heater case upper half and connect overheat switch wires (black wire to coil cover terminal, and white wire to coil terminal, as

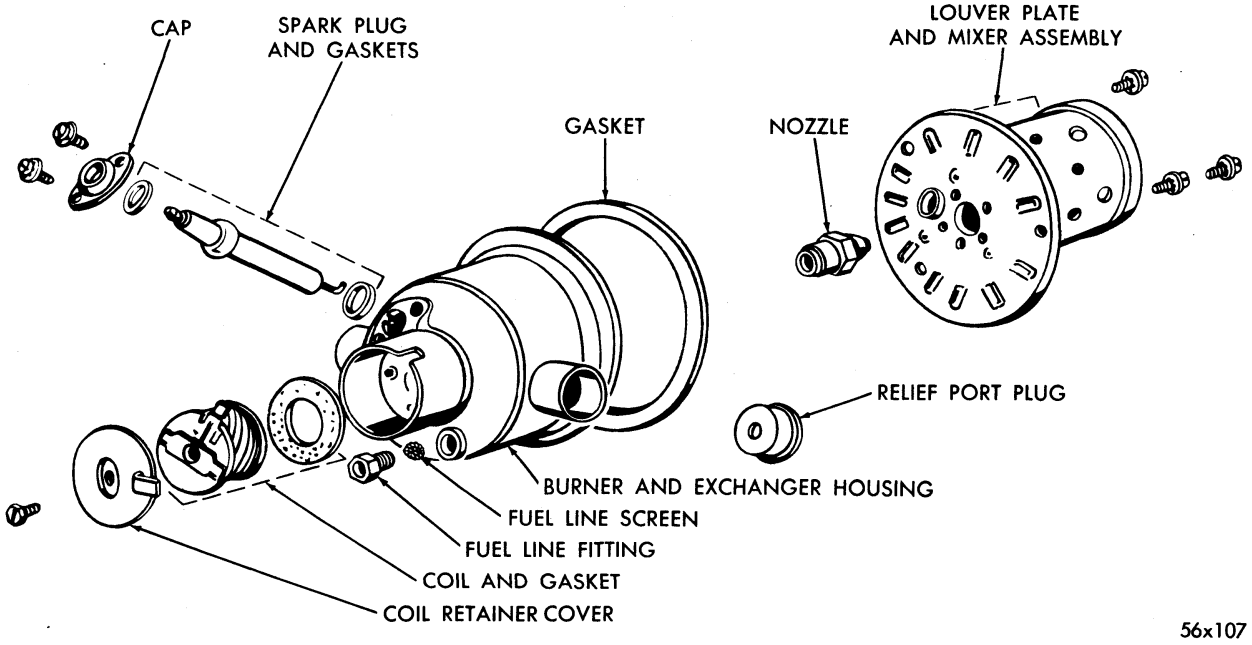

Fig. 20—Burner and Exchange Assembly

shown in Figure 19). Install heater case upper half, and place rubber adapter between blower housing and heater case. Connect two heater wires at heater upper case.

34. SERVICING THE BURNER HOUSING ASSEMBLY

a. Removal

(Refer to Figure 20). Remove heater upper case, and disconnect and remove spark plug wire, fuel line and grommet from heater case lower half. Disconnect heater blower hose with grommet from burner housing assembly. Remove clamp attaching burner assembly to heat exchanger. Lightly tap burner assembly to break seal of gasket and remove burner assembly as a unit.

b. Disassembly

(Refer to Figure 20). Remove two screws and lockwashers, and carefully remove spark plug, cap and two gaskets. Remove fuel valve coil cover screw and cover. Lift out coil and gasket. Remove three screws attaching louver plate, and remove louver plate and mixer assembly and gasket. Remove fuel line inlet fitting and fuel nozzle. Check fuel line inlet screen and screen of nozzle for restrictions. Clean or replace as condition warrants.

There are other parts still incorporated in burner housing assembly, such as coil retainer, gasket, fuel valve and spring, and nozzle metering screw. Further disassembly is not recommended as none of these parts are available separately for service.

c. Cleaning all parts and Inspection

Clean burner housing with volatile mineral spirits and blow dry with compressed air. Clean fuel line inlet screen, or replace. Clean carbon from spark plug porcelain and electrode. Check spark plug for cracked porcelain and broken or excessively burned electrode.

Inspect louver plate and mixer for loose rivets, broken ground electrode. Inspect burner housing for cracks, restricted fuel inlet screen, and broken or distorted spark plug gasket seating surfaces. Check for damaged housing threads.

Inspect fuel valve coil for loose or broken terminals. Check retainer cover for corrosion or loose terminal rivet. Inspect clamp assembly for broken welds or cracks. Check rubber gasket for deterioration or other visible damage. Repair or replace parts as necessary.

d. Assembly of Burner Housing

If fuel line inlet screen was removed from housing, install new screen. Install fuel line inlet fitting.

Be certain to use only a box socket wrench.

Insert coil retainer gasket and coil assembly in coil retainer and install retainer cover and screw. Install nozzle and tighten securely. Install rubber gasket over louver plate, with inside portion of gasket contacting outer flange of louver and tapered portion of louver gasket facing mixer. Align three screw holes and spark plug hole with their respective holes in burner housing and install louver plate and mixer assembly. Exercise extreme care to tighten alternately and securely.

Install two spark plug gaskets with concave side of gaskets facing ball portion of plug, (one gasket below ball part of plug and one gasket on top). Install spark plug by positioning spark plug electrode to ground electrode, tightening spark plug cap attaching screws evenly and securely. Adjust spark plug gap to .085 inch by bending ground electrode. Do not bend spark plug electrode.

e. Installation of Burner Assembly

Place clamp assembly over burner end, and insert mixer portion of burner assembly into heat exchanger. The exhaust tube portion of heat exchanger must be straight down, and burner housing blower hose inlet must be at a right angle. With flanges properly positioned, install clamp assembly over both flanges and gasket, tighten clamp screw.

Install grommet over burner blower metering plug, flat portion down and tapered side toward heat exchanger. Install spark plug cable on plug terminal and position cable grommet in lower case. Install fuel line and grommet. Install heater case upper half, connecting overheat switch wires (black wire to fuel valve coil cover terminal, and white wire to coil terminal, as shown in Figure 19.) Install rubber adapter between blower housing and heater case and install heater case attaching screws. Connect two heater wires at front end of heater upper case.

35. BURNER BLOWER AND FUEL PUMP ASSEMBLY

a. Removal

Disconnect inlet and outlet fuel line at fuel

pump. Disconnect ground wire at radiator yoke and red lead wire at ignition unit. Loosen blower hose clamp and remove hose. Loosen motor clamp screw, disengage two halves of clamp, and remove motor, fuel pump and blower housing as an assembly.

b. Disassembly

Remove fuel pump assembly (two nuts and lockwashers). Remove rubber coupling and connectors from pump shaft and motor shaft. Use pair of needle nose pliers to hold shaft from turning while unscrewing connectors. Remove four screws and fasteners from blower housing flange, and separate blower housing halves. Remove blower wheel from motor ($^{3}/_{32}$ inch Allen wrench).

If motor mounting bracket is to be removed, scribe aligning marks on motor and bracket for assembly before removing three mounting stud nuts.

c. Inspection

Inspect the motor mounting bracket rubber pads for looseness or deterioration. Recement or replace as necessary. Inspect fuel pump assembly for cracked housing, loose screws, distorted or cracked fuel line fittings. Tighten loose screws and replace damaged fuel line fittings. If fuel pump housing is damaged, replace complete assembly. Inspect fuel pump coupling connector for broken or distorted shoulders. Replace connector if necessary. Inspect blower wheel for stripped threads, excessively worn shaft hole, and broken or distorted blades. Repair or replace if necessary. Inspect blower housing halves for broken studs, distortion or other visible damage. Repair or replace housing as necessary. Inspect motor mounting to blower housing bracket for looseness, worn or deteriorated grommets. Replace damaged grommets and tighten mounting stud nuts evenly, so as to insure equal space between blower wheel and housing when assembled. If motor is burned out or damaged in any way, the complete motor assembly must be replaced. Inspect coupling connector on end of motor shaft for distorted or cracked shoulders. Replace connector as necessary. Inspect rubber coupling for visible damage or deterioration. Replace if necessary. Inspect heater burner blower to burner and exchanger housing flexible hose, grommet and clamp for deterioration or other visible damage. Replace hose with grommet if necessary. Replace clamp if necessary.

d. Assembly

If grommets were removed from motor to blower housing mounting bracket, install new ones in each of the three holes. Position the motor mounting bracket on the blower housing studs, aligning the scribe marks (refer to paragraph 36). Install the three sleeves through the grommets. Install the three lock washer nuts. Tighten nuts evenly and securely.

Tightening the stud nuts evenly will equalize the clearance between housing and wheel when assembled.

Position the blower wheel on the motor shaft. Make certain that the hub of the wheel is up and Allen screw in line with the flat portion of the motor shaft. Tighten Allen screw securely. Rotate blower wheel to make certain that sufficient clearance exists between the dished portion of the housing and the wheel (refer to note above). If sufficient clearance cannot be obtained in this manner, reposition the wheel on the shaft and retighten the Allen screw. Position the other half of the blower housing over the blower wheel aligning the four screw holes in the two housing halves. Install the four screws and tinnerman fasteners. Tighten screws securely. If the coupling connector was removed from the motor shaft for any reason, hold the blower wheel and install the new connector on the threaded end of the motor shaft. Tighten connector on shaft finger tight. Position coupling between shoulders of connector on the motor shaft. Install connector on fuel pump shaft finger tight. Position fuel pump assembly over mounting studs (top of fuel pump must be in a general line with the two wires coming out of the motor), using extreme care to guide the fuel pump coupling connector shoulders over the proper grooves in the coupling. Install the two lock washers and nuts on the fuel pump mounting studs. Tighten nuts securely. Rotate blower wheel to make certain that it rotates freely.

e. Installation

Position the burner blower and fuel pump assembly in the mounting bracket. The fuel pump assembly must be in the up-right position and nearest the fender splash shield. Install the mounting bracket clamp halves, making certain that the motor wires are free of the clamp.

Tighten clamp screw securely. Slide the spring type clamp over the burner blower hose and install hose onto blower housing and position clamp. Connect the fuel line from the engine fuel pump to the "inlet" side of the burner blower fuel pump but do not tighten fitting at this time. Connect the fuel line leading to the heater to the "outlet" side of the fuel pump. Tighten fitting securely. Connect motor (black) ground wire to fender splash shield.

SERVICE DIAGNOSIS

Failure of heating system to produce peak efficiency is traceable to any one, or combination of following conditions: Restricted fresh air intake, restriction in combustion air supply, restriction of fuel or, electrical circuit failure.

36. RESTRICTED FRESH AIR INTAKE

Restricted fresh air intake is caused by any one of following conditions:

a. Heater operated with cowl ventilator and summer doors closed. Peak efficiency can only be obtained by operating heater with summer doors closed and cowl ventilator open.

b. Fresh air inlet to heater case adapter missing would also greatly effect proper heater operation. Make certain, rubber adapter is properly installed and is not cut or torn.

c. The heater case upper half must be properly seated in lower half of case as well as two grommets which are connected to burner and exchanger housing. If either of these conditions exists, flow of fresh air across heater would be effected.

d. The fresh air blower motor could be faulty, the motor may be slow due to normal wear, worn brushes, loose or sticking impeller.

37. RESTRICTED COMBUSTION AIR SUPPLY

Restrictions in combustion air supply could be caused by any one or combination of following conditions.

a. Grommet disconnected at burner housing.

b. Combustion air hose kinked, torn, obstruction in hose or disconnected at blower housing.

c. Impeller binding in housing or loose on motor shaft.

d. Motor running slow due to normal wear, poor ground connection, worn or sticky brushes or, fuel pump shaft binding. The latter can easily be checked by removing fuel pump from motor mounting studs and notice if motor speed increases considerably and velocity of air is greater. If no appreciable difference is noted, replace the motor.

38. FUEL RESTRICTION

There are several conditions within fuel system that could prevent proper operation of heater. They are restriction in nozzle, fuel line screen plugged, insufficient fuel pressure, or slow running burner blower wheel. The following checks are outlined in order of their simplicity:

a. Check Fuel Pump Pressure

If fuel pump was removed for any reason, the fuel inlet line must be bled before fuel pump pressure readings can be obtained.

Install a "tee" fitting and pressure gauge in fuel line at "outlet" side of heater fuel pump. Remove white wire from heater case terminal (closing fuel valve). Start engine (make certain heater control and temperature control are in "high" position) and check fuel pump pressure. The reading should be 23 to 27 psi. While taking this reading, touch white wire to terminal on case, pressure should drop to 21-23 psi. If fuel pump pressure operates within these two ranges, the fuel pump is satisfactory, fuel line screen is open, and fuel valve coil and fuel valve are also operating satisfactorily.

b. Diagnosis of Fuel Pressures

The following diagnosis can be made from fuel pump pressure reading:

(1) If fuel pressure is low, cause would be a damaged coupling or connector, faulty fuel pump, obstruction in blower wheel and housing, or faulty fuel pump motor. After checking coupling and connectors and also for obstruction at blower wheel, replace fuel pump assembly. If fuel pump pressure is still low, original fuel pump, in all probability, is satisfactory and motor is faulty. Replace motor.

(2) If fuel pressure remains in high range (23 to 27 psi) cause would be traceable to restricted fuel line, screen, or faulty fuel valve coil. Clean or replace as condition warrants.

(3) If fuel pressure drops to low range (21 to 23 psi) momentarily when white wire is held to heater case terminal and instantly moves to high range again, difficulty is in nozzle. Replacement of nozzle is recommended.

39. CHECKING THE ELECTRICAL SYSTEM (refer to electrical circuit diagram) (Fig. 19)

The following checks must be made with ignition switch and heater switch turned to "on" position, unless otherwise specified.

The 12-volt electrical system used on current production cars is capable of producing heat four times greater than that of 6-volt electrical system. For this reason, it is extremely important to remove all rings, watches, bracelets etc,. from fingers and wrists before working under instrument panel or other restricted areas. Failure to do so could result in permanent injury.

a. Check Heater Blower Switch

(1) Connect one wire of test light to terminal "A" and other wire of test light to a good ground. The test light should be "on". If test light does not go "on", wire might be loose at ignition switch terminal or at heater blower switch terminal or, the wire itself may be at fault. Tighten terminals or replace wire as necessary.

(2) Leaving ground wire of test light connected, connect other wire of test light to terminal "B". The test light should be "on". If light does not go "on", heater blower switch is faulty and must be replaced. However, if test light does go "on" but fresh air blower motor fails to operate, then trouble could be traceable to: faulty wire leading to motor, loose motor ground connection, blower impeller blades stuck, motor itself may be faulty and must be replaced.

(3) Leaving ground wire of test light connected, connect other wire of test light to terminal "C". The test light should be "on". If test light does not go "on", heater blower switch is faulty and must be replaced.

(4) Connect one wire of test light to ignition unit terminal "D". Connect other wire of test light to a good ground. The test light should go "on". Failure of test light to go "on" would be traceable to: burned out fuse, wade connector or terminals faulty, or wire itself is faulty. Replace fuse with a 9 amp. short type. Correct or replace wade connector or wire as necessary.

b. Check Ignition Unit to Thermostat Assembly

Leave test light ground wire connected as described in A (4) above. Connect other wire of test light to terminal "E" of ignition unit. The test light should be "on". If test light does not light, ignition unit is faulty and must be replaced. If test light does go "on", move test light wire from terminal "E" to terminal "F". The test light should light. If test light does not go "on", either of two wires leading to thermostat are faulty, or thermostat itself is faulty. To isolate this trouble, proceed with step c. below before removing test light.

c. Check Thermostat Assembly

First operate temperature control from one extreme to other to make certain thermostat linkage and cable are operating properly. If test light does not go "on" after thermostat linkage has been properly adjusted and set to fully open position, remove test light and proceed as follows:

(1) Connect one wire of test light to a good ground. Connect other wire of test light to terminal "G" of thermostat. The test light should be "on", failure to do so indicates wire leading from ignition unit to thermostat to be faulty. Repair or replace wire as necessary.

(2) Transfer test light wire from terminal "G" to terminal "H" and test light should be "on". If test light does not go "on", thermostat is faulty and must be replaced.

(3) Again ground one wire of test light and connect other wire to terminal "F" of ignition unit. Test light should now be "on". If test light does not light, wire between thermostat and ignition unit is faulty. Correct or replace as necessary.

d. Check Ignition Unit to Heater Assembly

(1) With one wire of test light grounded as

described in (3) above, connect other wire of test light to terminal "J" of ignition unit. Test light should be "on". If test light does not go "on", ignition unit is faulty and must be replaced.

(2) Transfer test light wire from terminal "J" to terminal "K" of heater assembly. The test light should be "on". If test light does not light, wire between ignition unit and heater is faulty. Correct or replace as necessary.

(3) Transfer ground wire of test light to heater terminal "L". The test light should be "on". If test light does not go "on", check ignition unit ground wire at splash shield for poor connection. Correct if necessary. If test light still does not go "on", remove three screws attaching heater case upper half and raise it sufficiently to check points of overheat switch which, of course, is attached to underside of case upper half. Also make certain two wires connected to coil terminals are properly installed. The white wire should be connected to coil terminal and black wire connected to coil cover terminal. If overheat switch points appear to be open, push them together with a fibre stick or some other insulated object. If test light now goes "on", overheat switch is faulty and must be replaced. If points are closed and test light still does not go "on", connect one wire of test light to good ground and momentarily touch other wire of test light to two terminals of overheat switch and then to coil terminal. In each case, light should go "on". In making above check, it can be determined if wire from case terminal board to overheat switch is faulty, the overheat switch itself is faulty, or if wire from overheat switch to coil terminal is faulty. Correct as necessary. Next check ground circuit. To accomplish this, connect one wire of test light again to terminal "K" and connect other wire of test light first to coil cover terminal and then to case board terminal "L", in both instances light should go "on". Failure during first check indicates faulty ground connection at coil cover, or faulty coil. Correct ground connection or replace coil as necessary. Failure during second check indicates faulty ground wire leading to case cover terminal or faulty case cover terminal connections. Correct as necessary and reinstall case cover upper half.

Under no circumstances should heater be permitted to operate for any period of time with case upper half removed.

(4) Transfer test light ground wire to ignition unit terminal "M". Test light should go "on". Failure to do so indicates wire or connections faulty between ignition unit and heater. Correct as necessary.

(5) Transfer test light ground wire to ignition unit terminal "N". Test light should go "on". Failure to do so indicates poor ignition unit ground wire connection or faulty ignition unit. Correct ground connections or replace ignition unit as necessary.

40. CHECK BURNER BLOWER AND FUEL PUMP MOTOR

First check motor ground wire and connection "P". Correct as necessary. Connect one wire of test light to good ground. Connect other wire of test light to ignition unit terminal "Q", test light should go "on". Failure to do so indicates a faulty ignition unit. Replace ignition unit. If during this test light does go "on" but burner blower motor fails to operate, cause would be traceable to: faulty wire between ignition unit and motor, blower impeller binding, or motor itself is shorted out. Correct as inspection warrants.

41. CHECK SPARK PLUG AND WIRE

Disconnect burner blower and fuel pump motor wire from ignition unit terminal "Q". This will cut off the combustion air and fuel to burner. With heater switch off, raise the case upper half and disconnect spark plug wire from spark plug terminal. Connect a spare spark plug to spark plug wire. While helper turns heater "on", mechanics should hold spark plug cable (Caution: Not the Plug) so electrode of plug is close to a good ground. The spark should jump at least $\frac{1}{16}$ inch. If no spark is evident, either the wire leading to ignition unit is broken or ignition unit itself is faulty, and must be replaced. If after the above check, sufficient spark is noted, turn off heater switch and remove burner housing from heat exchanger. Place burner housing in a convenient location in case lower half (mixer assembly opening exposed).

Make certain ignition unit terminal "Q" is disconnected and moved away from the terminal.

Reconnect spark slug wire to plug in burner casting and turn heater "on". Note spark between ground and plug electrodes, a constant pulsating spark should exist. If spark is weak, intermittent or making contact other than across the electrodes, replace the plug and adjust the gap as described in paragraph 34, c. Before reinstalling burner housing assembly, check fuel spray pattern as described in paragraph 42 below.

42. CHECKING NOZZLE SPRAY PATTERN

With heater switch turned off, remove spark plug wire from spark plug and connect it to a spare plug. Securely ground the electrode of spare plug. Reconnect burner blower and fuel pump motor wire to ignition unit terminal "Q". Make certain temperature control is set high enough to energize the fuel coil.

The spare spark plug is grounded to prevent damage to the ignition coil during this test. Turn heater "on" and note the fuel spray pattern in mixer, the spray must be equally spaced in mixer and cone shaped if pattern is otherwise, replace nozzle. Reassemble heater.

43. HEATER FAILS TO START WHEN SWITCH IS TURNED ON. BLOWER DOES NOT RUN

a. Replace fuse. Check fuse and receptacle, correct as necessary.

b. Repair or replace heater switch.

c. Repair or replace red wire from ignition unit to blower motor.

d. Check blower ground.

e. Replace burner blower motor.

44. BURNER BLOWER RUNS BUT HEATER FAILS TO IGNITE

a. Check thermostat and wiring. Repair or replace as required.

b. Check overheat switch and replace if necessary.

c. Replace ignition unit.

d. Replace spark plug and adjust gap.

e. Replace fuel valve coil.

f. Replace nozzle.

g. Replace fuel pump.

h. Repair or replace combustion air hose.

i. Replace motor to fuel pump coupling.

45. HEATER IGNITES BUT GOES OUT LATER

a. Repair or replace fresh air blower.

b. Open cowl ventilator.

c. Remove obstruction in fresh air passage.

d. Replace adapter between heater and fresh air housings.

46. HEATER BURNS INTERMITTENTLY, HEAT OUTPUT IS TOO LOW

a. Temperature control cable loose at thermostat linkage. Correct or replace thermostat as necessary.

b. Bleed fuel line between engine fuel pump and heater fuel pump and check all connections for leaks. Turn takeoff tee in engine fuel pump down if not already in this position.

47. HEATER BURNS INTERMITTENTLY, HEAT OUPUT IS TOO GREAT

a. Temperature control cable loose at thermostat linkage.

b. Correct or replace thermostat as necessary.

48. HEATER BURNS CONTINUOUSLY, HEAT OUTPUT IS TOO LOW

a. Replace nozzle.

b. Replace heater fuel pump.

49. ODOR OF RAW GASOLINE IN CAR

a. Tighten or replace fuel line and fitting at the burner casting.

50. ODOR OF BURNED GASOLINE IN CAR

a. Replace leaking connection in exhaust pipe or exhaust tube. Correct as necessary.

b. Replace broken or loose burner clamp.

51. EXCESSIVE AMOUNT OF SMOKE FROM HEATER ERHAUST WHEN HEATER STARTS

a. Replace burner casting assembly.

b. Repair burner blower.

c. Clean exhaust, correct cause if clogged with carbon.

52. POPPING NOISE WHEN HEATER STARTS OR CYCLES

a. Replace burner casting assembly.

b. Install new nozzle, check spray and adjust plug.

c. Check blower motor and hose. Repair or replace as required.