

HEATING AND ACCESSORIES

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TEMPEST HEATER

GENERAL DESCRIPTION

Pontiac's Tempest Heating and Defroster System provides rapid warm-up sensation and even distribution of warmed air to all parts of the car. All air entering the system is taken through hood high cowl vents providing air with a minimum of dust, foreign material and undesirable fumes.

The use of outside air exclusively provides constant and rapidly changing air inside the car, eliminating a smoke-filled interior and keeps the occupants comfortable.

The driver has fingertip temperature control of the air entering the car. When heated air is desired, the blower forces air taken from the hood high cowl air inlet duct through the heater core and then through an air-distributing system to the air outlets.

The design of the heater and defroster system, its valves and controls permits a method of obtaining different amounts of forced air flow for ventilation.

AIR OUTLETS AND CONTROLS (Fig. 12-1)

AIR OUTLETS

Heated air enters the interior of the car and is distributed by a center outlet grille opening at the

bottom of the heater duct, which disperses air over the front floor area and is so aimed that it also directs air to the rear passenger compartment.

Additional outlets are provided on the right and left sides of the heater outlet air duct for additional air distribution to the driver and front seat passenger floor area.

CONTROL PANEL

The heater control panel (Fig. 12-2) is located to the right of the steering column. The panel has two levers sliding in a horizontal plane which control air flow and temperature. When these levers are in the extreme left position, all valves and control units are closed. The blower speed is controlled by a switch located to the left of the temperature and air levers.

FAN CONTROL

The fan control lever has four distinct positions - OFF, LO, MED, and HI; HI is in the full up position, LO and MED partially down, and OFF in the full down position (Fig. 12-3).

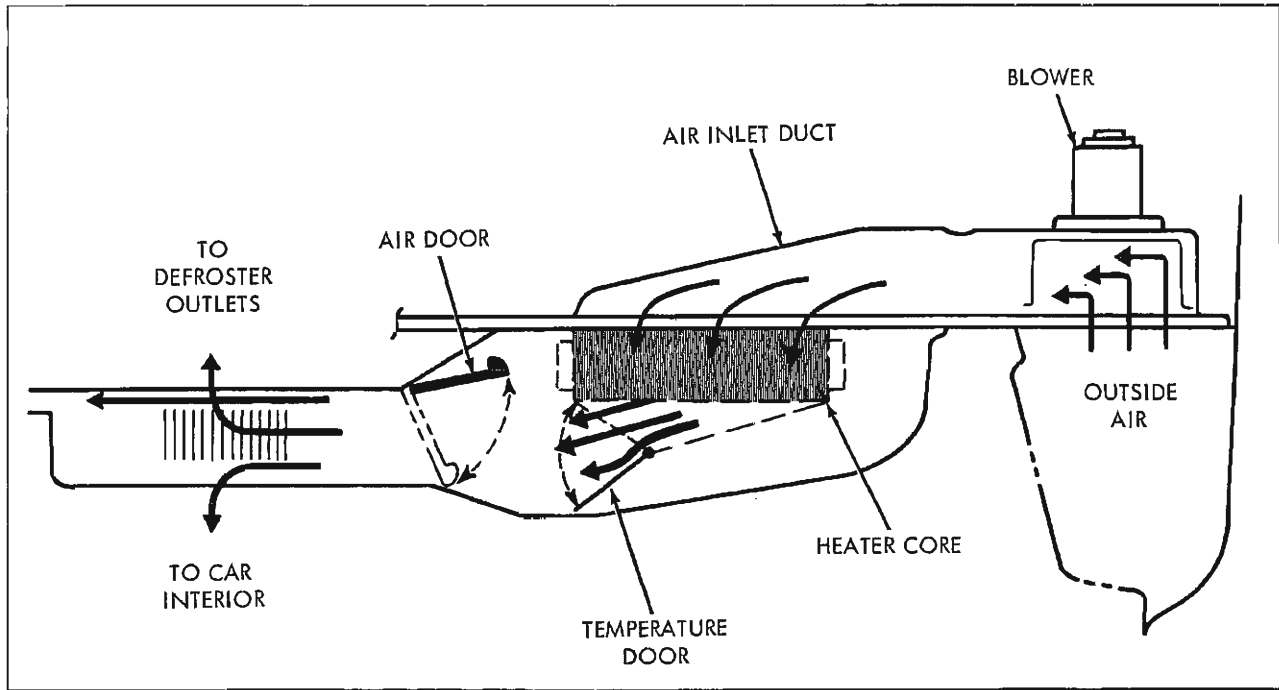


Fig. 12-1 Air Flow — Heater System

TEMPERATURE CONTROL

When the temperature control lever is in the extreme left position the heater air valve is closed preventing heat from entering the passenger compartment. As the lever is moved progressively to the right, more and more air is introduced through the heater core. In the full right position, maximum heat is obtained if the air control lever is positioned in NORMAL or DEFROST detent.

With the air control lever in the NORMAL detent, slide the temperature control to the full right position during engine warm-up. After the inside of the car is at the desired temperature level, adjust the temperature lever to maintain this temperature.

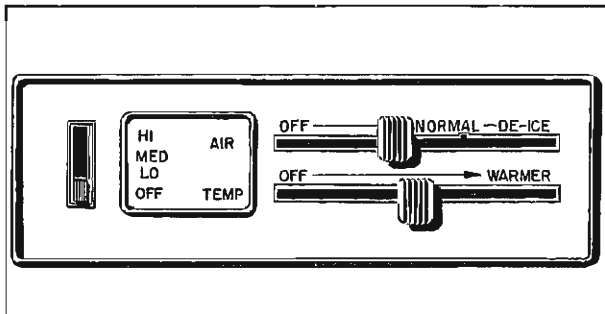


Fig. 12-2 Heater Control Panel

AIR CONTROL

With the air lever in the extreme left position very little air will enter through the heater system. As the lever is moved to NORMAL or DEFROST detent, outside air is introduced through the heater air system.

NORMAL detent position permits partial air flow out of the defroster nozzles while providing the majority of air flow through the heater air system.

Moving the air control lever to the right from the NORMAL detent position to the DEFROST detent

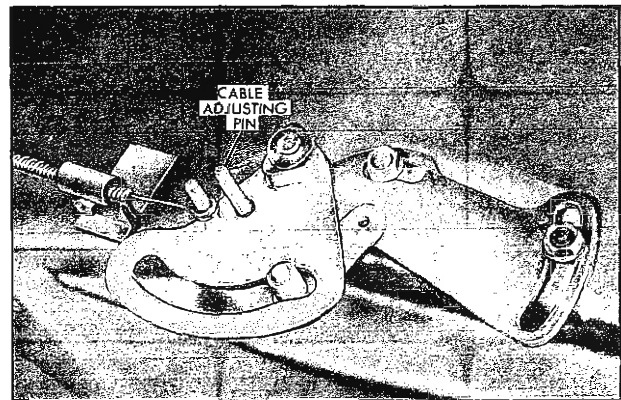


Fig. 12-3 Temperature Control Cable Adjusting Pin in Position

position permits air to be directed to the windshield, with only a limited amount of air coming out of the heater outlets.

TIPS ON USE OF HEATER AND DEFROSTER SYSTEM

KEEPING COMFORTABLE IN EXTREMELY HUMID "MUGGY" WEATHER

When the relative humidity is extremely high causing discomfort on a day when the temperature is 55°F.-70°F., move the air control lever to the mid-way position (normal) and move the temperature control lever to the right slightly. This will permit outside air to enter the heater core and provide minimum heating. Move the fan control lever to the low speed position.

KEEPING COMFORTABLE IN MILD WEATHER

When the weather is cool, but the sun is very bright, as in spring or fall or at high altitudes, use both the heater and the cowl ventilators at the same time, positioning the air control lever at NORMAL or DE-ICE detent and setting the temperature control and fan speed for desired comfort.

CONTROLLING TEMPERATURE IN CAR

The most satisfactory method of controlling the temperature in the car is to:

1. Set air control lever to the right for maximum air flow (normal detent).
2. Position temperature control lever to the extreme right for maximum heating, then adjust to maintain the desired temperature in the car.
3. Set fan speed for your personal comfort.

USING THE HEATING SYSTEM FOR VENTILATION

The heating system is designed so that it can also be used for ventilation when it is not necessary to warm the air. Ventilation may be obtained by placing the air control lever in the NORMAL detent position for maximum air flow and the temperature control lever in the extreme left (OFF) position to prevent the air from passing over the heater core. Select the amount of air flow desired by positioning the fan control lever at the speed desired.

MINOR ADJUSTMENTS

TEMPERATURE CONTROL CABLE

NOTE: Some warming of air is normal even though temperature lever is at OFF. Cable should be connected securely at both ends before adjusting.

1. Remove glove box.
2. Place temperature control lever in OFF position.
3. Adjust turnbuckle as necessary to allow 3/16"-diameter gauge pin to pass freely from control cam into bracket on heater case (Fig. 12-3).
4. With gauge pin in place adjust turnbuckle to move control lever against end of slot in control panel, then turn in the opposite direction to move control lever 1/16 to 1/8 inch away from end of slot.
5. Remove gauge pin.
6. Move temperature lever to full heat, then back to OFF and recheck to make sure gauge pin fits freely in index holes.
7. Replace glove box.

AIR CONTROL CABLE

1. Place air control lever in OFF POSITION.
2. Hold outside air door lever on heater case in closed position.
3. Holding air door lever in off position, adjust turnbuckle to move control lever to full OFF position against end of slot in control panel, then turn in opposite direction to move control lever 1/16 to 1/8 inch from end of slot.
4. Operate lever to DE-ICE position, then back to OFF and check to see that there is a slight spring back from end of slot not to exceed 1/8".

DEFROSTER CONTROL CABLE

1. Place air control lever in DE-ICE position.
2. Hold de-ice door lever in open (de-ice) position.

3. While holding door open, adjust turnbuckle to move control lever against end of slot in control panel, then turn in opposite direction to move control lever 1/16 to 1/8 inch from end of slot.

4. Operate control lever to OFF, then back to DE-ICE and check to see that there is a slight spring back from end of slot not to exceed 1/8".

MAJOR REPAIRS

HEATER CONTROL PANEL ASSEMBLY— REMOVE AND REPLACE (Fig. 12-4)

1. Disconnect battery.
2. Remove radio.
3. Disconnect wires from blower control switch and control cables from heater core and case assembly.
4. Remove two stamped nuts at bottom and two at top from backside of heater control assembly.
5. Remove control assembly and remove cables.
6. Replace by reversing the above procedure.
7. Adjust air control bowden cable.
8. Adjust temperature control bowden cable.
9. Adjust defroster control bowden cable.
10. Connect battery.

HEATER FAN (BLOWER) SWITCH— REMOVE AND REPLACE

1. Disconnect battery.
2. Remove radio.
3. Disconnect wires from blower switch.
4. Remove blower switch from control assembly.
5. Replace by reversing the above procedure.

TEMPERATURE CONTROL CABLE— REMOVE AND REPLACE

1. Remove glove box.

2. Remove temperature control bowden cable from heater core and case assembly.

3. Remove temperature control bowden cable from control assembly.

4. Replace by reversing the above procedure.

5. Adjust the temperature control bowden cable.

6. Replace glove box.

AIR CONTROL CABLE—REMOVE AND REPLACE

1. Remove radio.
2. Remove air control bowden cable from heater core and case assembly.
3. Remove air control bowden cable from control assembly.
4. Replace air control bowden cable.
5. Adjust air control bowden cable.
6. Replace radio.

DEFROSTER CONTROL CABLE— REMOVE AND REPLACE

1. Remove radio.
2. Remove defroster control bowden cable from heater core and case assembly.
3. Remove defroster control bowden cable from control assembly.
4. Replace defroster control bowden cable.
5. Adjust defroster control bowden cable.
6. Replace radio.

BLOWER MOTOR OR AIR INLET DUCT ASSEMBLY— REMOVE AND REPLACE (Fig. 12-5)

1. Hoist front end of car.
2. Remove right front wheel assembly.

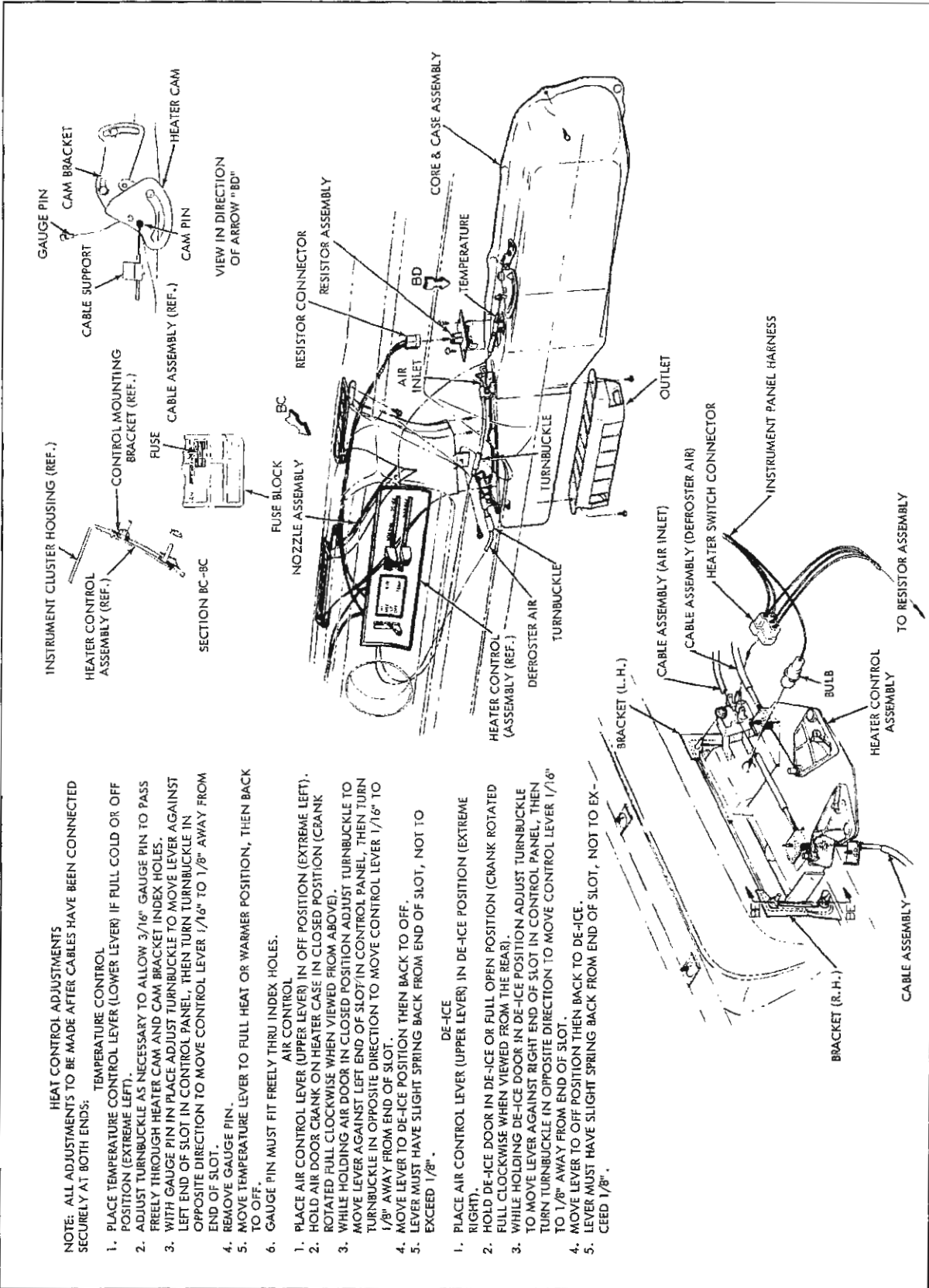


Fig. 12-4 Reference Illustration - Body Interior Details

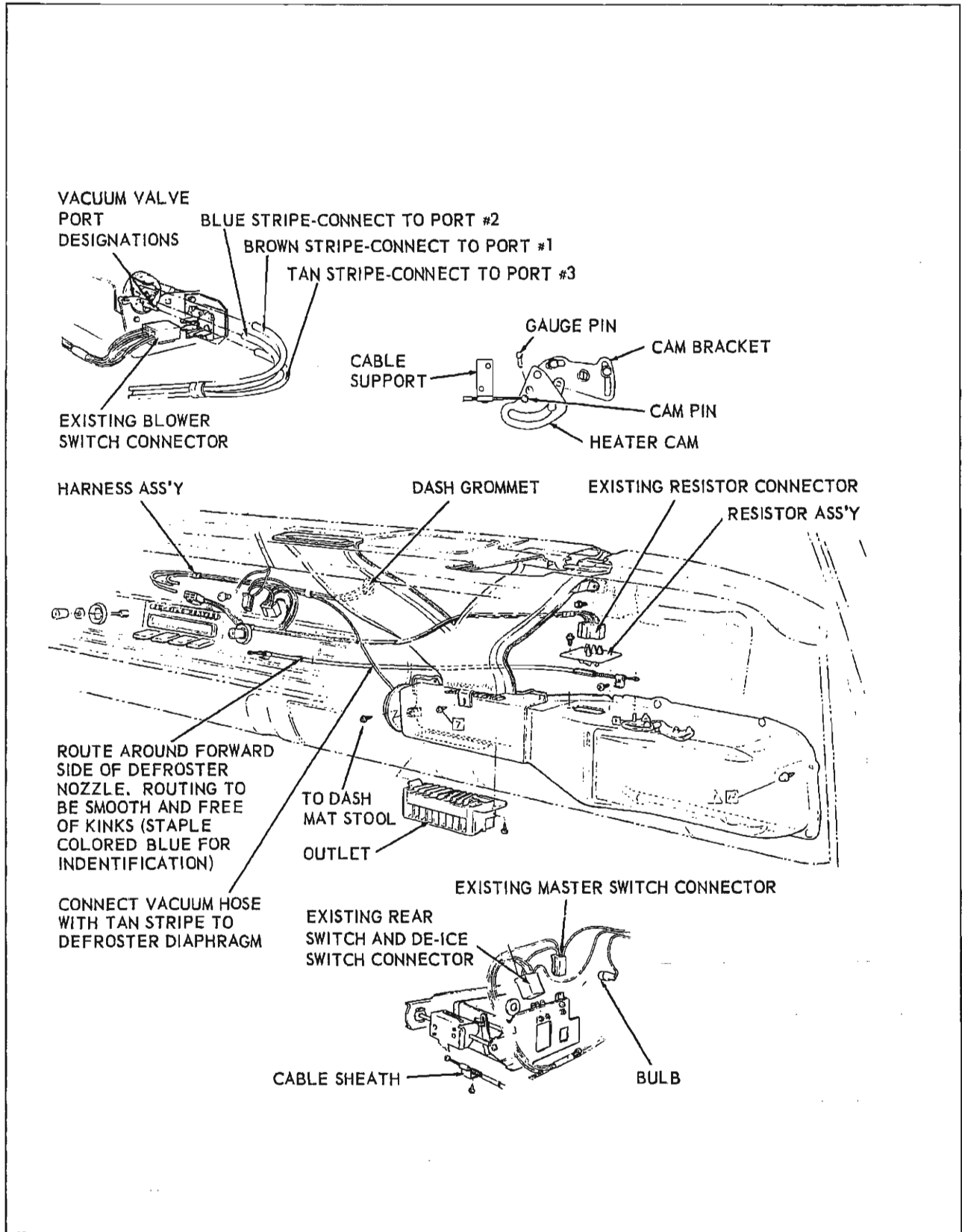


Fig. 12-5 Reference Illustration - Heater Parts in Engine Compartment

3. Remove right front headlamp assembly.
4. Remove right front fender assembly.
5. Disconnect wire at blower motor.
6. If blower motor only is to be replaced, remove five attaching screws and remove assembly.
7. If air inlet duct assembly is to be replaced, remove two attaching screws and five attaching nuts and remove assembly.
8. Replace by reversing the above procedure.

CONTROL	SETTING
Air control lever	extreme right until windshield is "de-iced" or "de-fogged", then to midway position for maximum air flow at heater outlets and partial defrost
Car windows	front door vent and door window open slightly to assist in de-icing or defogging, then closed or positioned to provide comfort for all occupants

HEAT CORE AND CASE—REMOVE AND REPLACE

1. Drain radiator and remove glove box.
2. Disconnect heater inlet and outlet water hoses at heater.
3. Disconnect control cables at heater core and case assembly.
4. Remove wire connector from resistor assembly at top left side of heater air outlet duct assembly by prying connector up with a flat blade screwdriver.
5. Cut hole in skirt as above.
6. Remove six nuts securing heater to air inlet duct assembly and remove heater assembly.
7. Remove heater core and case assembly.
8. Replace by reversing above procedures.
9. Plug skirt hole.
10. Adjust control cables.

Side cowl ventilators. . . . closed

SLOW CITY DRIVING IN COLD WEATHER

CONTROL	SETTING
Fan control lever	full up for high speed
Temperature control lever	extreme right for maximum heating, then adjusted for comfort

Air control lever at midway position for maximum air flow and partial defrost

Car windows closed

Side cowl ventilators closed

NORMAL COOL WEATHER HIGHWAY CRUISING

CONTROL	SETTING
Fan control lever	full up for high speed
Temperature control lever	position to obtain desired temperature
Air control lever	at midway position for maximum air flow and partial defrost

Car windows closed, door vent(s) may be opened to suit occupant comfort

Side cowl ventilators. . . . closed

OPERATING INSTRUCTIONS

To warm a car under various weather and driving conditions, use the following control settings after the engine has reached its normal operating temperature.

CONTROL	SETTING
Fan control lever	full up for high speed
Temperature control lever	extreme right, for maximum heating, then adjusted for occupant comfort

COLD WEATHER HIGHWAY CRUISING

CONTROL

SETTING

CONTROL

SETTING

Fan control lever full up for high speed

Air control lever at midway position for maximum air flow and partial defrost

Temperature control lever extreme right for maximum heating, then adjusted for occupant comfort

Car windows closed

Side cowl ventilators . . . closed

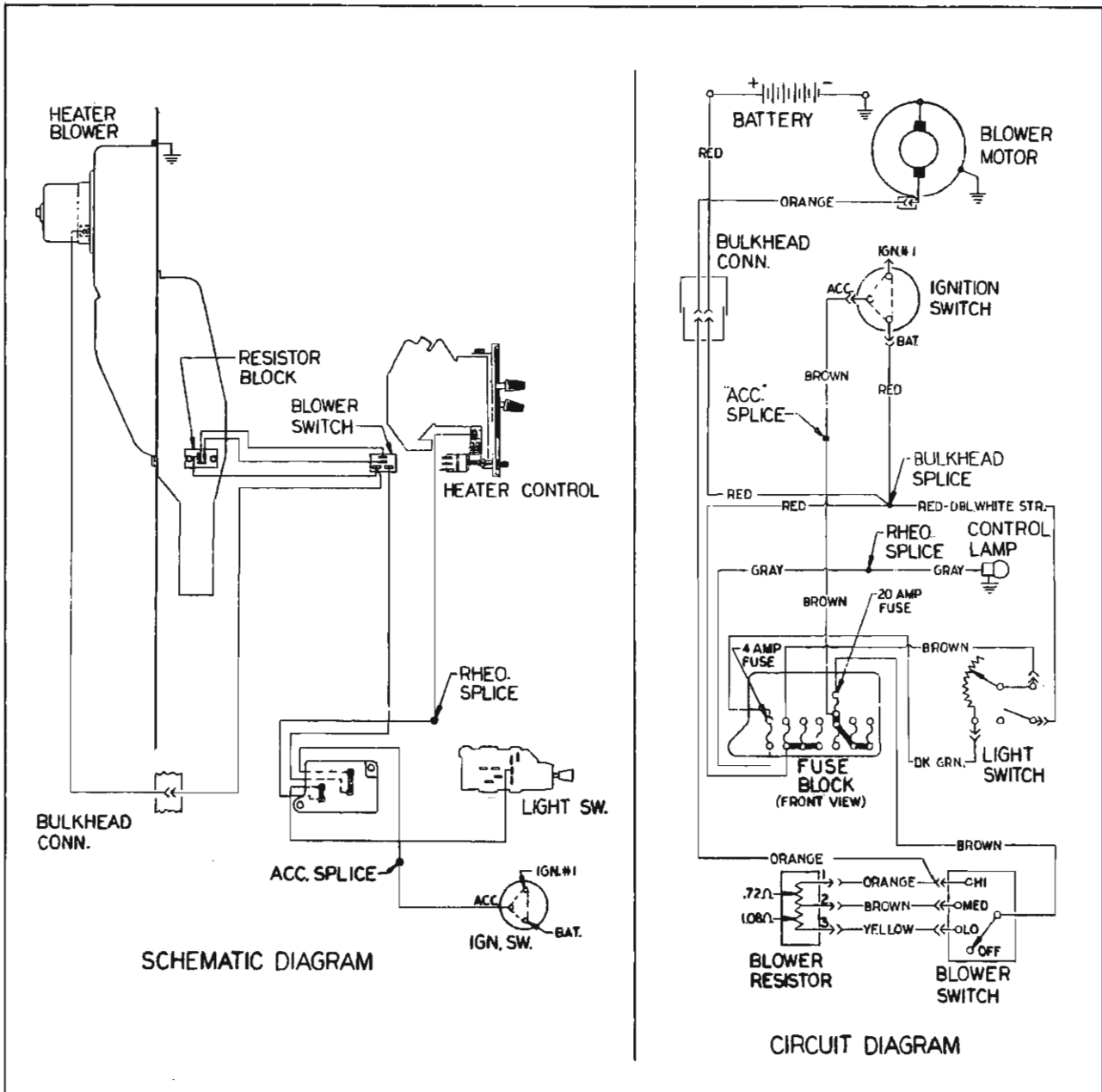


Fig. 12-6 Schematic and Circuit Diagram of Heater Electrical System

TESTING

OPERATIONAL TEST

The purpose of performing a heater operational test is to prove the heater system is operating properly.

PRELIMINARY CHECKS

Engine Compartment

1. Check radiator for proper engine coolant level.
2. Inspect radiator core and heater hoses for leaks, at the same time inspecting for kinked or collapsed heater hoses.
3. Inspect the blower to heater air distributor to see that it is properly installed (to prevent any air leaks from engine compartment, which may have objectionable fumes or odors).

Inside Car Body

1. Check to see that control levers operate smoothly, and they are in alignment when all are in the off position.
2. Start engine.

3. Place "FAN" control lever in OFF position; blower should not operate.

4. Move "FAN" lever to the LO and MED position; blower should operate. Continue by moving lever to the HI position; blower should operate at a speed faster than at LO and MED positions.

5. Move AIR lever slowly to the right until the normal detent is reached (slightly to right of center); more and more air should flow through outlet as lever is moved.

6. Move "AIR" lever slowly until the extreme right position is reached, at the same time sensing the amount of air flowing from the defroster outlets. More and more air should flow through these outlets as the lever is moved to the right.

7. After engine has warmed up, move "TEMP" control lever from the extreme left to the extreme right position. Air at outlet should get progressively warmer.

Should the heater control levers operate satisfactorily during the above checks, it would appear that heater controls operation is normal. If during the checks irregularities are noted or complaints on heater operation could not be noted or determined, then refer to TROUBLE DIAGNOSIS for the complaint or cause and the remedy.

HEATER TROUBLE DIAGNOSIS

INSUFFICIENT HEATING

COMPLAINT OR CAUSE	REMEDY
Slow warming in car.	Incorrect operation of controls. Advise operator of proper operation of heater controls.
Objectionable engine or exhaust fumes in car.	Check for good seal between hood and cowl. Check for good seal between vent grille and cowl. Locate and seal any other air leaks.
Cold drafts on floor.	Check operation and adjustment of cowl vent cables. Check adjustment of air valve cable. Advise operator of proper operation of heater system.
Insufficient heat to rear seat.	Check for obstructions under front seat. Advise owners to operate blower.
Low engine coolant level.	Check radiator and fill to proper level, run engine to clear air lock.

INSUFFICIENT HEATING (Continued)

COMPLAINT OR CAUSE	REMEDY
Failure of engine cooling system to warm up.	Check radiator cap and engine thermostat and replace if required. See section on ENGINE COOLING AND LUBRICATION.
Kinked heater hoses.	Remove kink or replace hose.
Foreign material obstructing water flow in heater core.	Remove foreign material if possible, otherwise replace core.
Temperature control cable improperly adjusted.	Adjust cable.
Air valve does not open.	Check for proper installation and/or adjustment of air control cables.

INADEQUATE REMOVAL OF FOG OR ICE

CAUSE	REMEDY
Air door does not open.	Check for proper installation and/or adjustment of air control cable.
Temperature control door does not open.	Check and adjust temperature control cable.
Defroster door does not open fully.	Adjust air control cable.
Obstructions in defroster outlets at windshield.	Remove obstruction.
Blower motor not connected.	Connect wire.
Inoperative blower motor.	Check heater fuse. Replace motor.
Inoperative blower motor switch.	Replace switch.

TOO WARM IN CAR

CAUSE	REMEDY
Inoperative temperature control door.	Adjust temperature control cable.
Incorrect operation of controls.	Advise operator of proper operation of heater system.

BLOWER INOPERATIVE

CAUSE	REMEDY
Blown fuse.	Replace fuse.
Inoperative motor.	Replace motor.
Open circuit.	Replace circuit between ignition switch, blower switch, and blower motor.
Inoperative blower motor switch.	Replace faulty switch.

MISCELLANEOUS

PROBLEM	REMEDY
Control levers not aligned due to incorrect adjustment.	Adjust control cables.
Blown fuses.	Shorts in electrical system. Locate and correct short. Blower wheel rubbing on case. Failed blower motor.
Heater "gurgle".	Check engine coolant level in radiator.

SPECIFICATIONS

Cooling System Capacity (Engine with Heater)	L-6, 11.3 qts. V-8, 20-5 qts.
Fuse Sizes	
Heater Electrical System (on fuse block - special 5/8" fuse)	20 amp.
Heater Control Panel Lamp (on fuse block)	4 amp.

PUSH BUTTON RADIO

DESCRIPTION

The all-transistorized Push Button Radio (Fig. 12-7) gives instant response when radio is turned on. Station pick-up and power output are excellent and current drain is less than half that of manual types.

The radio is designed to allow manual or push button tuning and has additional advantages of automatic volume control and excellent tone control.

ON CAR TROUBLE DIAGNOSIS

Most radio complaints usually fall into one of three categories; the radio is either dead, weak or noisy. Before removing a radio from the car, a few simple checks can be made in a very short time. In some cases the radio will not need to be removed at all. Refer to the RADIO TROUBLE DIAGNOSIS before removing radio.

If all the diagnosis checks fail to turn up the problem, the condition is in the radio itself. The radio should be removed from the car and sent to an authorized service station. Enclose all pertinent

information, including date of purchase, mileage, customer's name and address and customer's complaint. This information is important to the radio technician and will aid him when making repairs.

RADIO—REMOVE AND REPLACE (Figs. 12-8 and 12-9)

1. Remove radio control knobs.
2. Remove retaining nuts and escutcheons.
3. Disconnect antenna and speaker leads.
4. Remove lamp wire assembly (top of receiver on push button models—bottom of receiver on manual radios).

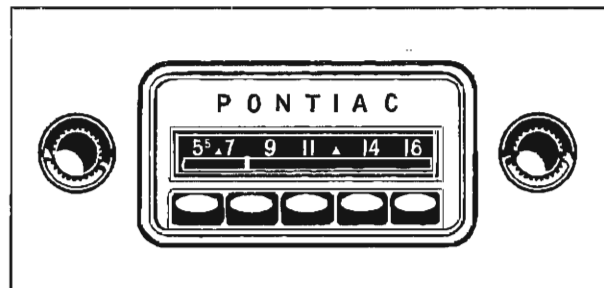


Fig. 12-7 Tempest Radio

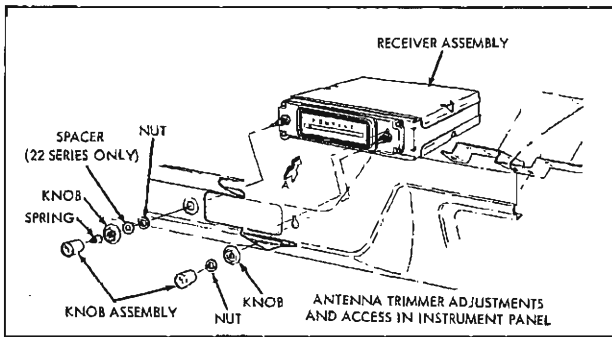


Fig. 12-8 Tempest Radio — Front View — Reference Illustration

5. Remove support to radio bracket bolt and washers and remove radio.

NOTE: On Custom air-conditioned cars it will be necessary to remove the cold air distributor duct.

SPEAKER—REMOVE AND REPLACE (Fig. 12-10)

1. Remove heater control retainer brackets and move control out of way.
2. Remove speaker and support assembly.
3. Remove screws and nuts securing speaker to speaker support.
3. Disconnect output connector and remove speaker.
5. Reverse above procedure to install.

ADJUST ANTENNA TRIMMER

In order to make the antenna trimmer adjustment, the car should be outdoors and as far removed from

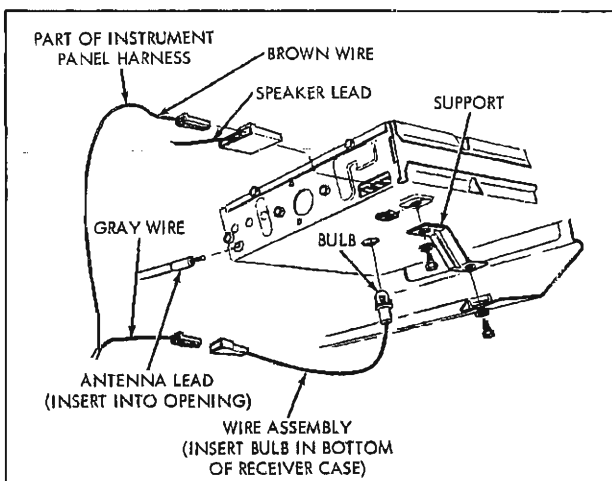


Fig. 12-9 Tempest Radio — Rear View — Reference Illustration

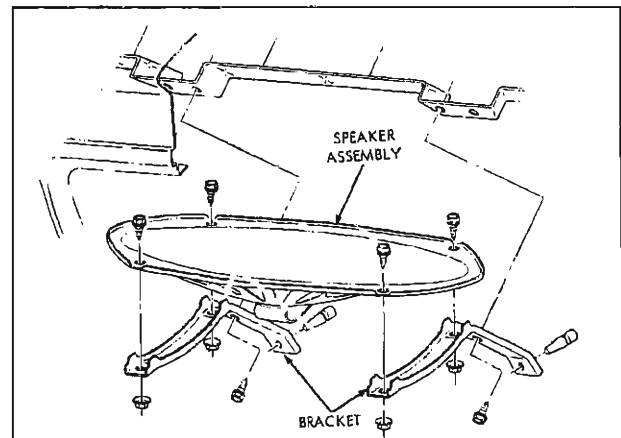


Fig. 12-10 Front Speaker Installation

electrical disturbances as possible. Set the manual antenna and the electric antenna height at 31 inches. Tune in a weak station, approximately 1400 kilocycles, and turn the volume control on full. This is necessary in order to offset the action of the automatic volume control. Using a screwdriver, turn the trimmer adjusting screw located behind the dummy knob on the manual tuning shaft. Turn the screw until the station peaks in volume.

The antenna trimmer adjustment should be made after a set has been removed from the car and worked on by a radio repair man. The reason for trimming the antenna after service work has been performed is that the radio repair man will undoubtedly have adjusted the trimmer to match the antenna so that it no longer matches the antenna in the car from which it was removed.

Trimming the antenna is especially important with the all-transistor radios as this will directly offset sensitivity and selectivity. Complaints of station "mixing" on all-transistor radios can be reduced by this adjustment.

SET RADIO PUSH BUTTONS

1. Turn radio on.
2. Select five desired stations (set buttons one at a time).
3. Pull selector button out as far as it will go.
4. Tune in the desired station, using the manual control knob.
5. Push the selector button in and release.

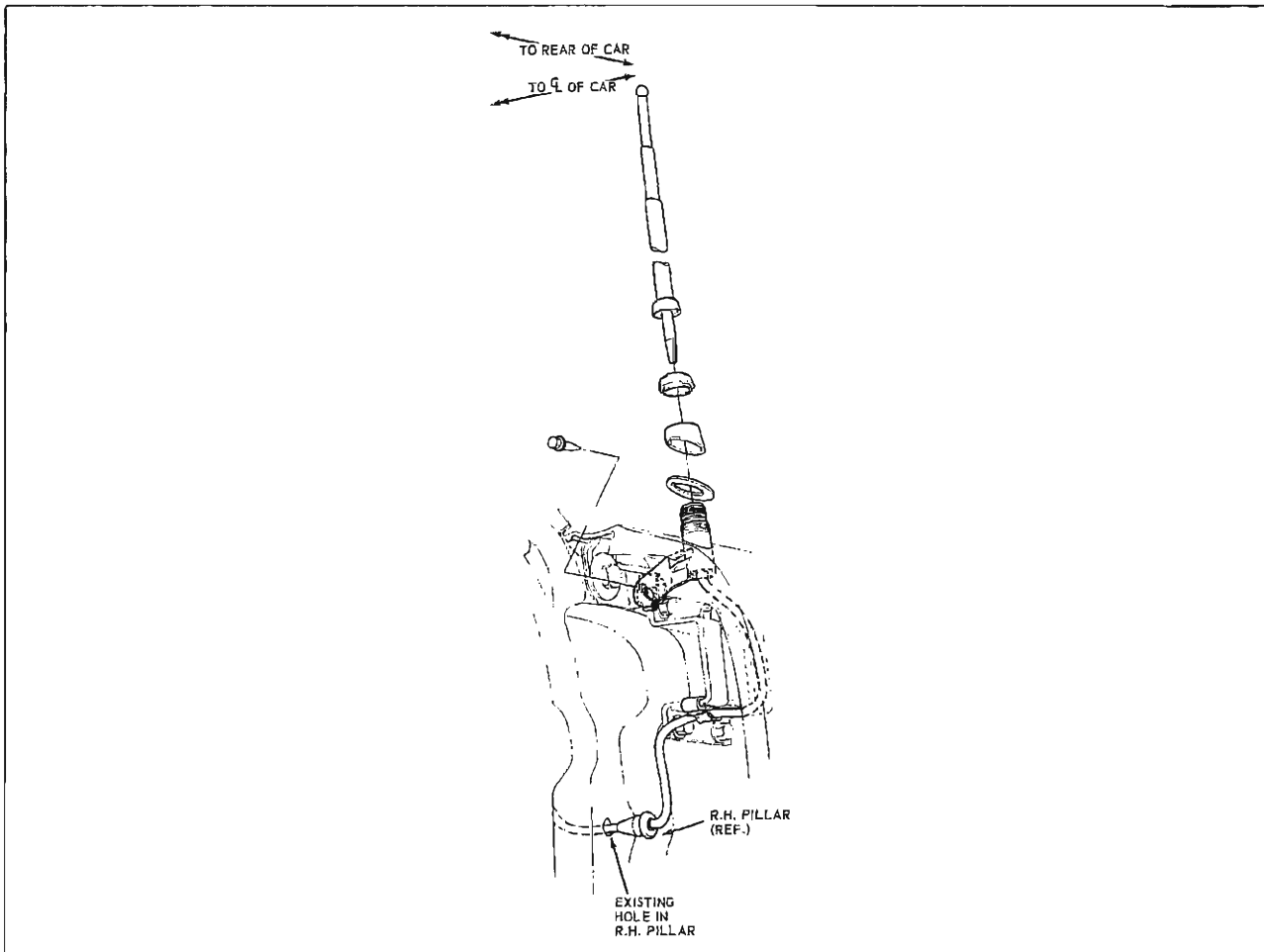


Fig. 12-11 Reference Illustration — Tempest Antenna

MANUAL ANTENNA

The manual antenna is mounted on the right front fender, in approximately a vertical position (Fig. 12-11).

PERIODIC SERVICE

Many antenna troubles can be prevented by cleaning the antenna mast at periodic intervals (at least once a month). This is easily performed by wiping the extended mast with a soft cloth when the car is being lubricated or washed.

During the winter months the mast should be lubricated also by wiping it with a cloth containing a light oil.

ANTENNA BODY—REMOVE AND REPLACE

1. Open right front door.

2. Disconnect antenna lead-in from antenna body.
3. Remove screw from antenna mounting bracket.
4. Remove antenna mast.
5. Remove nut, adapter and pad from antenna body.
6. Replace by reversing the above procedure.

ANTENNA LEAD-IN—REMOVE AND REPLACE

1. Remove glove box.
2. Disconnect lead-in plug from radio receiver (Fig. 12-11).
3. Remove windshield wiper arm.
4. Remove air intake grille.

5. Disconnect the antenna lead-in from antenna body and remove antenna lead-in from vehicle.

6. Replace by reversing the above procedure.

REAR SEAT SPEAKER

DESCRIPTION

The radio rear seat speaker system employs a single speaker and is controlled by a lever mounted under the instrument cluster bezel. The speaker is mounted below the package shelf.

Control of the speaker features a circuit design whereby switching a choke coil and condenser in and out of the circuit causes the lower frequency tone to be accentuated in the rear and the high frequency tone in the front.

Operation of the control for ideal sound selection is as follows:

1. Front speaker - full response.
2. Front and rear - Sera-Phonic sound.
3. Rear speaker - full response.

RADIO TROUBLE DIAGNOSIS

ALTERNATOR NOISE

Connect capacitor from the "BAT" terminal on the alternator to ground or frame of the car.

VOLTAGE REGULATOR NOISE

Place capacitor between the "V" terminal of the regulator and chassis.

BALL ON END OF ANTENNA ROD

Ball eliminates the sharp point and reduces the effect of static discharge. Curb feelers bent too close to ground will cause noise in the auto radio.

WHEEL STATIC

Caused by voltage being developed as the wheel rotates on the axle. Noise is eliminated by placing

wheel static collectors in the two front wheels; button end of spiral spring must ride snugly in hole on end of axle and be free from grease.

TIRE STATIC

Caused by electrical charge being built up inside tire due to friction between tire and road. Noise is eliminated by inserting tire static powder into tires, using a special injection gun.

CAUTION: Inject powder carefully or powder will backfire in face.

MOST AUTO RADIO COMPLAINTS FALL INTO ONE OF THREE CATEGORIES

A. Radio Is Dead

1. Thump check radio—turn radio on and listen intently for a distinct "thump" from the speaker which should be heard as current builds up through the power transistor.

- a. If "thump" is heard, go to check (3).
- b. If no "thump", check fuse.

(1) A 2.5-ampere fuse is used in all Pontiac radios. If radio plays, after replacing fuse, tap radio with rubber mallet or heel of hand and race the engine; if another fuse blows, remove radio for repair.

(2) If use is OK, check all radio interconnecting cables for secure connections. If still no thump, remove radio for repair.

(3) Check antenna by substitution; simply unplug regular antenna and plug in a spare. If radio is still dead, remove for repair.

B. Radio Is Weak

1. Check to see if antenna trimmer is peaked by tuning to a weak station and grasping antenna rod with hand. If volume drops considerably, the trimmer is peaked properly; if the volume remains same or increases slightly, antenna trimmer needs adjusting. Use procedure outlined under ADJUST ANTENNA TRIMMER.

2. If radio is still weak, trimmer does not peak, check antenna by substitution.

3. Plug speaker in securely. Make sure speaker is plugged in securely at radio. If radio is still weak, remove the receiver for repair.

C. Radio Is Noisy

1. Constant noise complaint is almost always due to a defect inside the radio but could be caused by a bad antenna. Check with a substitute antenna.

2. Noise when tapped or jarred, is caused by loose antenna connection to the radio, a poor connection to car's power, poor speaker connection, or a loose part or connection inside the radio.

3. Noisy only when engine is running due to faulty noise suppression equipment.

a. Check antenna lead-in shielding for proper grounding at both antenna base and radio. Poor connections at either of these points can result in engine noise interference.

4. If noise is present only while car is moving, problem is either wheel or tire static, or the result of missing ball at antenna tip.

a. To check for wheel or tire static, drive car on a macadam road until noise is noticed then apply brakes; if noise disappears, it's wheel static; if noise persists, it's tire static.

5. Noisy when car equipment is operated such as directional lights, brake lights, power seat, or power windows.

a. Check to see that lead-in wire is tight and properly seated in radio.

b. Make certain antenna body is grounded to car body.

If all the above checks fail to turn up the problem, the condition is in the radio itself. The radio should be removed from the car and sent to an authorized service station. Include all pertinent information that might help the radio technician repair the radio as quickly as possible.

ELECTRIC CLOCK

The electric clock operates on direct current from the car battery and must not be compared too closely for accuracy to the home electric clock operating on alternating current. The cycles per second of alternating current used in the home are controlled and periodically corrected at the power house, thereby eliminating accumulation of errors.

With the direct current system no such control is possible; therefore, automobile electric clocks will accumulate errors day-by-day the same as hand-wound, spring-operated clocks.

The electric clock provides automatic regulation of the rate when the position of the hands is changed manually. Moving the hands forward or backward adjusts the length of the hair spring to make the clock run faster or slower. The amount of change in rate depends upon the amount the hands are changed. Maximum rate change is approximately 20 seconds per day and is obtained when the hands are moved five minutes. If the clock is reset less than five minutes the change in rate is proportionally less than 20 seconds.

SETTING CLOCK

When setting clock to correct for errors in time, pull reset stem out, move hands counterclockwise to correct time if clock is running fast, or move hand clockwise to correct time if clock is running slow, then allow reset stem to return to its normal position. This will automatically adjust the rate of the clock.

Owners should be advised to set the clock to the correct time once a week at regular intervals to ensure maximum accuracy.

CLOCK—REMOVE AND REPLACE

1. Disconnect power lead and remove lamps at rear of clock.

2. Remove four retaining screws (Fig. 12-12).

3. Remove clock from back of instrument panel.

4. Replace by reversing above procedures.

NOTE: On custom air-conditioned cars it will be necessary to remove the cold air distributor duct.

BACKUP-LAMPS

The back-up lamp switch on automatic transmission-equipped cars is incorporated in the starter neutralizer switch. This switch is located on the steering column on column shift automatics and in the console on floor shift automatics.

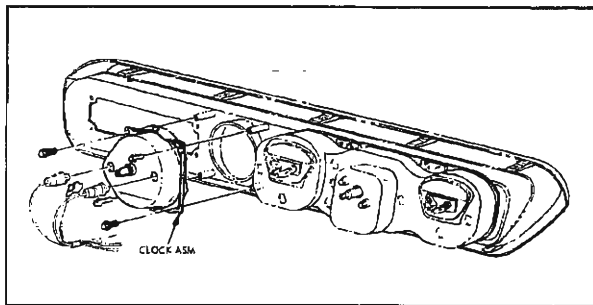


Fig. 12-12 Reference Illustration - Clock

The back-up lamp switch used with vehicles equipped with column shift synchromesh transmissions is mounted on the steering column. Moving the shift lever to the reverse position causes the switch actuating pin in the gearshift lower lever to close the switch, completing the electrical circuit anytime the ignition key is in the ON or ACC position.

The actuating pin should be adjusted to clear the switch by 1/8" when the gearshift lower lever is moved into second gear position.

TACHOMETER

DESCRIPTION

The tachometer is mounted in the opening to the right of the speedometer in the cluster and bezel assembly, and is available as part of the Rally Kit only.

This unit indicates the number of engine rpm in hundreds and has an adjustable red pointer which can be moved to any desired position on the dial to indicate pre-determined shift points.

TACHOMETER—REMOVE AND REPLACE

1. Disconnect power lead and remove lamps at rear of tachometer.
2. Remove four retaining screws.
3. Remove tachometer from back of instrument panel.
4. Replace by reversing above procedures.

NOTE: On custom air-conditioned cars it will be necessary to remove the cold air distributor duct.

RESET TACHOMETER NEEDLE

If it becomes necessary to reset the tachometer, a precision tachometer must be hooked up to work in conjunction with assembly in car.

1. Remove cluster and bezel assembly as outlined above, but do not disconnect leads.
2. Connect precision tachometer to assembly in car.
3. Remove round metal plug from rear of tachometer housing.
4. Turn engine over at 3000 rpm as indicated on precision tach (lower or higher readings may result in inaccurate needle setting).
5. Insert small screwdriver through hole at rear of housing and turn rheostat clockwise to lower needle or counterclockwise to raise needle.

6. When proper needle setting has been obtained as indicated on precision instrument, turn engine off, remove precision tachometer and replace unit by reversing removal procedures.

Rally Kit

Refer to Electrical section for service of gauges.

ELECTRIC ANTENNA

DESCRIPTION (Fig. 12-13)

The electric antenna is mounted on the right rear quarter of car and can be operated at the discretion of the operator by means of a switch located on the instrument panel (Fig. 12-14). To raise the antenna, move switch to left; to lower antenna, move switch to right. When the switch is released, it returns automatically to the "off" position. The antenna can be raised or lowered to any height by releasing the switch when the desired position is reached.

NOTE: The ratcheting of the clutch may be heard in the full travel positions of the antenna.

PERIODIC SERVICE

Many antenna troubles can be prevented by cleaning the antenna mast at periodic intervals (at least once a month). This is easily performed by wiping the extended mast with a soft cloth when the car is being lubricated or washed. During the winter months the mast should be lubricated also by wiping it with a cloth containing a light oil.

ON CAR TROUBLE DIAGNOSIS

Before removing antenna from car, determine whether fault is in the antenna drive or in the switch and wiring circuit. This is done as follows:

1. Disconnect motor cable at antenna end.
2. Connect antenna to a 12-volt D.C. power source. Negative lead of the power source should be grounded to antenna motor case. Touch positive lead to each terminal individually on motor cable of antenna. If antenna does not operate, the fault is in the antenna drive. If antenna does operate, the fault is in the switch and wiring circuit.

ELECTRIC ANTENNA—REMOVE AND REPLACE

1. Fully lower antenna.
2. Remove spare tire.
3. Disconnect ground wire, power wire and lead-in.
4. Remove attaching nut located under mounting bracket and remove antenna (removal of attaching bracket unnecessary).

5. To install antenna, reverse removal procedure, making sure antenna is properly mounted onto the wheel house flange. Adjust nut to provide support and tighten lock nut. Proper support adjustment is finger tight plus four full turns.

ANTENNA—OVERHAUL

Replace drive assembly, mast assembly, or support tube assembly as follows:

CAUTION: Before attempting replacement of any of the three major sub-assemblies listed above, the hook-up wire should be removed from the pin and insulator assembly to prevent this wire from being broken where it is soldered to .400 tube section of mast.

1. Remove two screws holding flange to support tube.
2. Remove flange from pin and insulator assembly.
3. Unsolder hook-up pin.

NOTE: Do not over heat pin by slow soldering as this will destroy pin insulator. Use needle-nose pliers to hold pin while soldering.

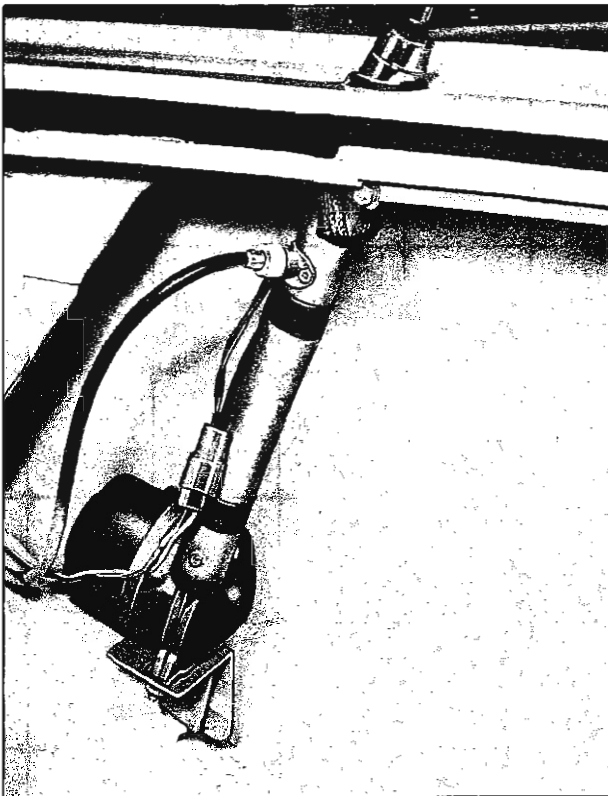


Fig. 12-13 Electric Antenna

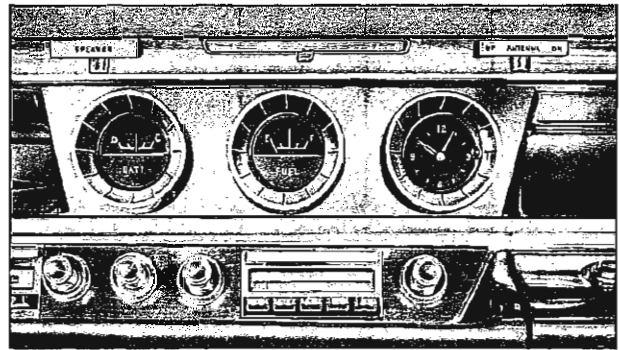


Fig. 12-14 Electric Antenna Control

4. Remove pin and insulator assembly with gasket. If replacement of drive assembly, support tube assembly, or mast assembly is indicated.

5. Remove three screws which hold support tube to drive assembly.

6. Holding drive assembly in one hand and supporting tube in other hand, pull (applying back-and-forth rotary motion at same time) until support tube is removed from antenna.

To replace support tube assembly:

7. If only replacing a damaged support tube assembly, apply the reverse of steps 1 through 6, making sure that hook-up wire is extended through proper hole in support tube.

If replacement of drive assembly or mast assembly is indicated:

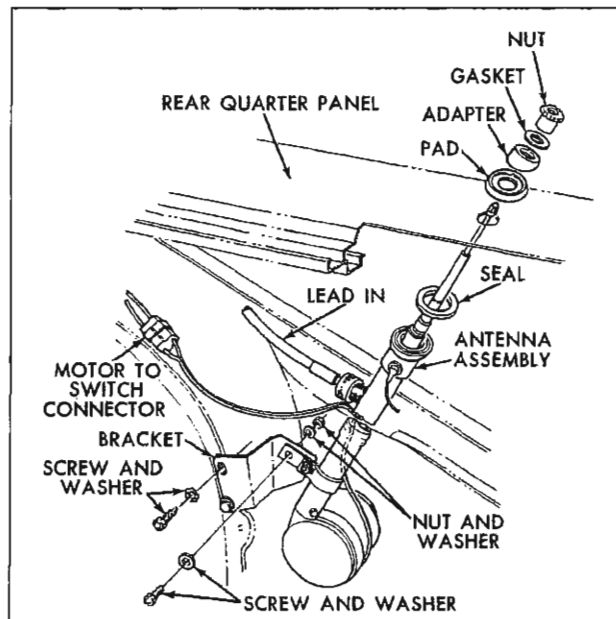


Fig. 12-15 Reference Illustration - Electric Antenna

8. Holding drive assembly in one hand and mast assembly in other hand (grasp near bottom of mast assembly), rock mast assembly back and forth and pull at same time. This will remove insulator bushing and .400 tube section from tubular fitting on drive assembly.

9. Apply 12-volts D.C. (up direction of mast) to power leads until entire length of nylon cord has been expelled from drive assembly. To prevent kink or bend in nylon cord, keep it taut by pulling on mast.

NOTE: If drive assembly is inoperative, it will be necessary to manually remove nylon cord from drive assembly. To remove nylon cord from disabled drive assembly, place the assembly in a vise so the normal plane of the nylon cord is parallel with the floor. Then, using both hands, pull on .300-diameter mast tube until nylon cord is removed completely from the drive assembly.

CAUTION: DO NOT attempt service on components of drive assembly. This must be serviced as a complete unit.

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

11. Thread nylon cord through bottom insulator with small diameter end down. Then thread nylon cord through water seal washer.

ELECTRIC ANTENNA TROUBLE DIAGNOSIS

Weak Reception or Fading

1. Remove antenna and check for moisture in the support tube. If moisture is present, disassemble, clean, dry and reassemble. Check drain holes in the drive housing.

Antenna Will Not Raise or Lower

1. Check for blown fuse and replace if necessary.
2. Check for loose electrical connections at fuse panel, switch or antenna.
3. Check for bent antenna and straighten or replace if necessary.
4. Check for inoperative parts. Disassemble and repair as outlined under ANTENNA—OVERHAUL.

Slow Operating Mast

1. Check for dirt or foreign material on mast. Clean and wipe with light oil.
2. Check for bent mast and straighten or replace.

SUPERLIFT GENERAL DESCRIPTION

The Superlift system is an assist-type leveling device which the owner controls manually by varying air pressure in the system. The leveling unit is a unique combination of a pliable neoprene boot and air cylinder built around a hydraulic shock absorber. As an integral part of the rear suspension it offers the car owner added load-carrying flexibility. A level ride can be maintained when carrying abnormal loads by merely increasing the air pressure in the system. When load is removed the car is lowered to its normal riding height by decreasing the air pressure. Air pressure is adjusted by means of a tire-type valve conveniently located in the rear bumper area as illustrated. Since one valve serves both units, air pressure is equal at all times.

Leveling Unit

The Superlift leveling unit is normally mounted in the same location as a conventional rear shock absorber. The units are designed so that shock absorber function is not impaired in the event of accidental air loss.

Tee Valve

The tee valve contains a valve core. Its function is identical to that of a tire valve.

Air Line

A flexible air line is used to allow for relative motion of shock absorbers with rear suspension movement. Connections to the Superlift leveling units and tee valve are made with the compression fitting.

PRECAUTIONS

The precautions outlined below should be heeded to insure satisfactory function of the Superlift system.

Minimum Pressure - 10 psi

For best ride characteristics with an empty car, a minimum pressure of 10 psi should be maintained.

Maximum Pressure - 90 psi

The pressure may be varied to a maximum of 90 psi to level the car with loads.

Neoprene Boot

Do not rotate free end of a Superlift unit after opposite end has been attached.

Exhaust System

The air lines cannot withstand exhaust system temperatures. At least 3" clearance should be maintained between the air lines and any portion of the exhaust system.

DIAGNOSING PROBLEMS

LEAKS

An air leak is the most common problem associated with the Superlift system. The leak is usually found in the air lines or connections and not in the Superlift unit. A procedure for detecting leaks would be:

1. Inflate system to approximately 100 psi.
2. Visually inspect lines and connections for evidence of escaping air.
3. Leak check air line connections and the valve core with soap and water solution.
4. For a more positive leak check at the tee valve, detach valve assembly and with air pressure retained, immerse assembly in water.

If the leak is still not detected after above steps, the Superlift units should be replaced.

NOISE

Insufficient torque on the mounting bolts is a frequent source of noise complaints. Tighten both upper and lower mountings and road test before replacing a Superlift unit.

Remove and Replace

1. Remove vacuum lines from both shocks and seal port openings.
2. Remove nuts bolts and lock washers at upper end of shock absorbers.
3. Remove self-locking nuts from lower end and remove shock absorbers.
4. Install shock absorbers by reversing above steps.
5. Tighten lower self-lock nut 55-75 lb. ft. torque and upper bolt 15-25 lb. ft. torque.

GUIDE-MATIC AUTOMATIC HEADLAMP CONTROL

DESCRIPTION (Fig. 12-16)

The Guide-Matic is an electronic device which provides automatic switching of headlamps between upper and lower beam in response to light from an approaching vehicle.

The system consists of a phototube unit, amplifier unit, power relay, and a combination dimmer-override type foot switch.

The phototube unit, mounted on top of the instrument panel, is the light sensing device which converts

light into an electrical signal for use by the amplifier unit. A control is located on the rear of the unit which allows the driver to limit the amount of sensitivity of the unit.

The amplifier unit receives and amplifies the signal from the phototube unit into a signal strong enough to actuate the power relay. It is mounted above the slave box.

The power relay has special heavy-duty contacts for switching headlamp beams. It is located on the firewall to the right of the steering column.

The dimmer-override foot switch provides automatic control of the headlamp beams in one position, and manual low beams in the other position. In automatic position, a spring-load momentary contact-type switch is also provided. Depressing the foot switch slightly provides an overriding upper beam condition, regardless of light on the phototube unit. This permits the driver to signal if an approaching vehicle fails to switch to low beam promptly, and also, in a lighted area, provides a simple test for "automatic" position of the foot switch.

The Guide-Matic is connected to turn on with the headlamps. After approximately 30 seconds' warm-up period, the Guide-Matic will provide complete automatic switching of the headlamp beams. Street lights and other extraneous lights encountered in the city are sufficient to maintain its vehicle headlamps on low beam. Occasionally, when trailing an older model car with poor lighting on the rear, or due to some other unfavorable condition, it may be desirable to change the foot switch position to manual low beam. The Guide-Matic is disconnected from its vehicle headlamps in this position, but is not turned off. It continues to function as long as vehicle headlamps are turned on.

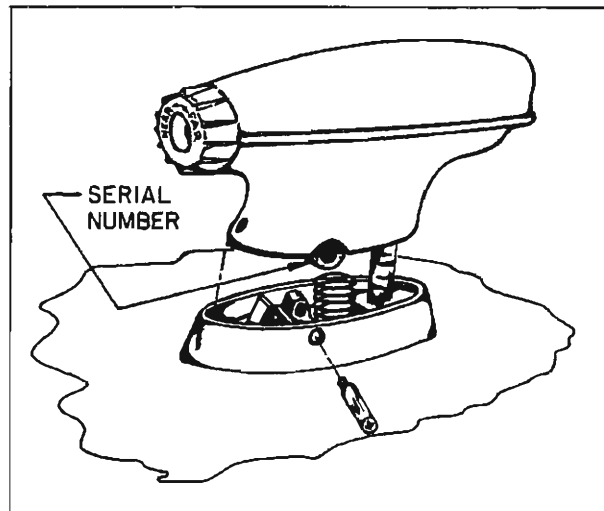


Fig. 12-16 Phototube Unit

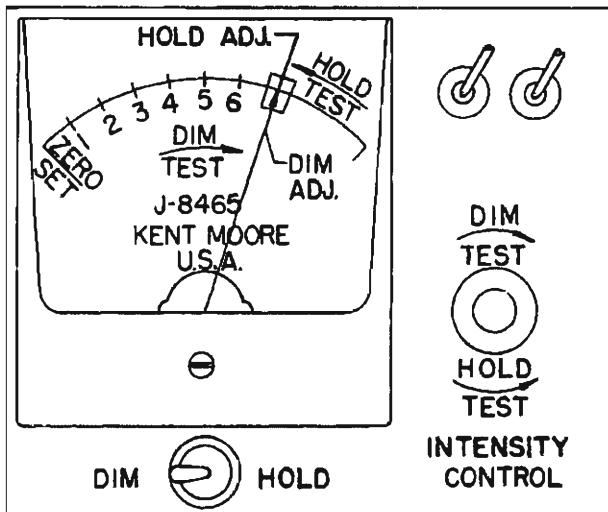


Fig. 12-17 J-8465 Tester

TESTING EQUIPMENT

Tester J-8465 is required for installing, checking or adjusting the Guide-Matic. The tester includes vertical aiming device No. 6 and a sensitivity test lamp (Fig. 12-17).

ADJUSTMENTS AND TESTS

VERTICAL AIMING PROCEDURE

Proper performance of the Guide-Matic power headlight control requires that the phototube unit be accurately aimed vertically. If the unit is aimed too low, back reflections from the headlamps which are being controlled will lock the amplifier on lower

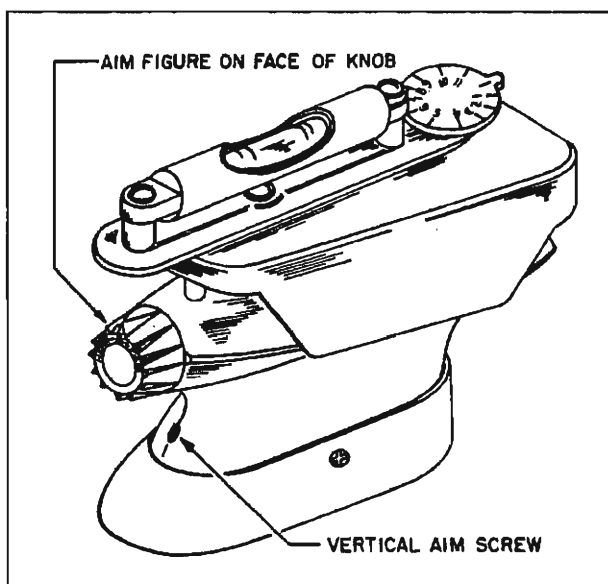


Fig. 12-18 Aiming Device - Installed

beam. However, the unit must be aimed as low as possible to provide maximum tolerance for car loading.

NOTE: Due to normal settling of front and rear springs, it is recommended that the aiming procedure outlined below should be made with the 2,000-mile inspection.

1. Phototube unit vertical aiming should be done with car unloaded, trunk empty except for spare tire gas tank at least half full, and with tires at correct pressure.

2. Locate car on a level floor (level within 1/4 be fore and aft of car).

3. Rock car sideways to equalize springs.

4. Set aiming device No. 6 on top of phototube unit. (Fig. 12-18)

NOTE: (1) the three points on aiming device must be resting on top of phototube unit. (2) The aiming device must be touching front of phototube unit.

5. Observe number stamped on drive control knob. Adjust aiming dial until corresponding number is under pointer.

6. Adjust vertical aiming screw until bubble is centered in level.

DIM AND HOLD SENSITIVITY TEST PROCEDURE

NOTE: Phototube unit must be covered with black cloth during test. Tests or adjustments only.

Guide-Matic should be made with the phototube unit below 100°F. If the car has been in the sun immediately prior to checking, allow it to cool in a covered place for approximately one hour before the check is actually made.

1. Set drive control to "neutral" position.

2. Install tester J-8465. (Fig. 12-19).

3. Start engine and operate at fast idle while making adjustments.

4. Turn headlamps on and wait at least five minutes for amplifier unit to stabilize. Place foot switch in "automatic" position.

5. Turn zero corrector on face of meter until meter pointer is on zero set line. (Fig. 12-19).

6. Turn tester intensity control counterclockwise.

7. Connect battery leads of Guide-Matic tester to battery terminals.

DIM SENSITIVITY TEST

1. Rotate tester intensity control completely counterclockwise.
2. Turn selector or dim-hold switch to "hold" position and then back to "dim" position. Headlamps should be on upper beam.
3. Turn tester intensity control clockwise slowly just to point where headlamps switch to lower beam. The meter pointer should now read in the black dim sensitivity range on the meter scale. If not, proceed to "hold" sensitivity adjustment on car.

HOLD SENSITIVITY TEST

1. Rotate intensity control clockwise.
2. Place dim-hold switch in dim position and back to hold position. Headlamps should be on low beam.

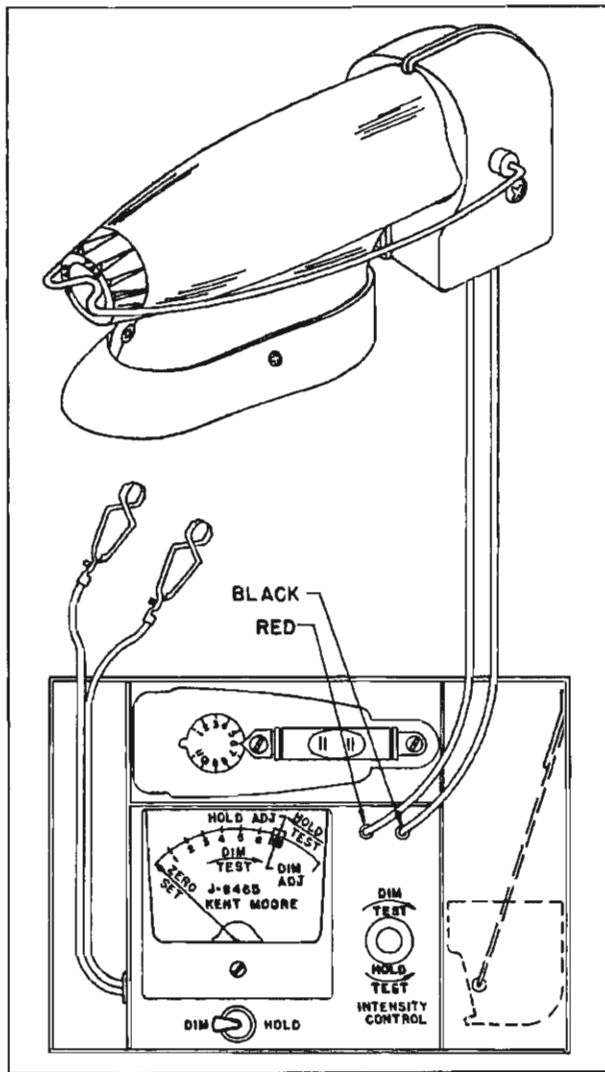


Fig. 12-19 Dim and Hold Test Equipment Installed

3. Rotate intensity control slowly counterclockwise to point where headlamps switch to upper beam. The meter pointer should be in the green hold sensitivity range on meter scale. If not, proceed to hold sensitivity adjustment on car.

SENSITIVITY ADJUSTMENT ON CAR

NOTE: Hold sensitivity must be properly adjusted before adjusting dim sensitivity. Phototube unit must be covered with a black cloth during adjustments.

Preparation for adjustment is same as for dim and hold-sensitivity test on car.

HOLD-SENSITIVITY ADJUSTMENT

1. Hold-and dim-sensitivity controls are slotted for screwdriver adjustment and are located at the side of the amplifier unit. (Fig. 12-20).
2. Rotate the amplifier hold control completely clockwise.
3. Rotate tester intensity control completely clockwise.
4. Place dim-hold switch momentarily in dim position to obtain low beam and then place the switch in hold position.

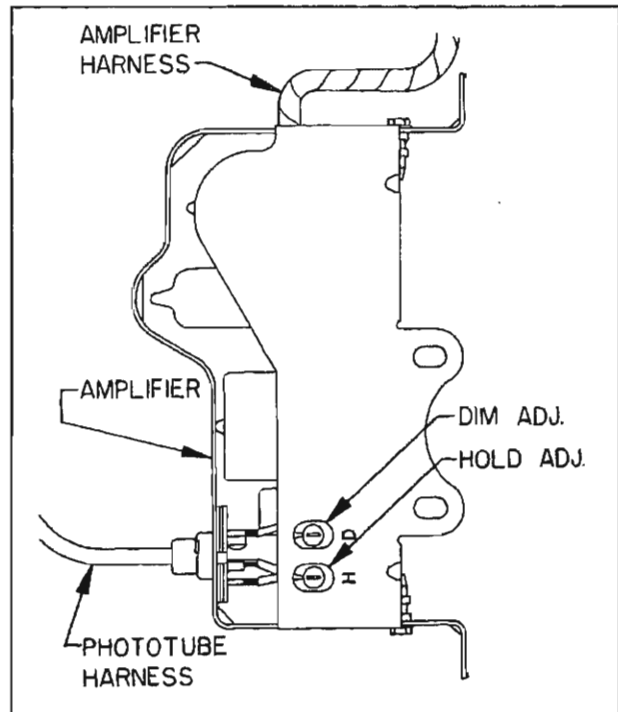


Fig. 12-20 Dim and Hold Adjustment Screw Location

NOTE: If lights do not switch to lower beam, the amplifier dim control must be turned completely clockwise and then readjusted after hold adjustment is correct.

5. Adjust intensity control slowly counterclockwise until meter pointer is on hold-sensitivity adjustment line.

6. Turn amplifier hold control slowly counterclockwise just to the point where headlamps switch to upper beam. Do not go beyond setting.

7. Recheck sensitivity as shown in steps 1 through 3 under hold-sensitivity test.

8. Reinstall button plug and hinge cover.

DIM SENSITIVITY ADJUSTMENT

NOTE: Dim sensitivity should not be adjusted until after hold sensitivity is properly adjusted.

1. Rotate amplifier dim control completely counterclockwise.

2. Momentarily place dim-hold switch on hold, then back to dim to obtain upper beam.

3. Adjust tester intensity control until meter pointer is at dim-sensitivity adjustment line.

4. Slowly rotate amplifier dim control clockwise just to the point where headlamps switch to lower beam.

NOTE: Do not go beyond this setting.

5. Recheck sensitivity as shown in steps 1 through 3 under dim sensitivity test on car. If sensitivity is not correct, repeat adjustment procedure.

6. If adjustment is correct, turn off headlamps and remove tester.

GUIDE-MATIC—REMOVE AND REPLACE

NOTE: If the diagnosis indicates the phototube unit must be removed for repair by an authorized warranty repair dealer, the amplifier unit should also be removed and sent with the phototube unit. If the amplifier unit must be removed for repair, the Phototube unit need not be sent with it if the diagnosis indicates it is functioning properly.

Manual switching of the headlights may be obtained by removing the fuse from the fuse holder behind the left kick pad in the event the Guide-Matic can not be repaired immediately.

PHOTOTUBE UNIT

1. Disconnect the phototube unit harness from the amplifier harness.

2. Remove cross recess head pivot pin from right side of phototube unit.

3. Lift unit off base and remove phototube unit and harness.

AMPLIFIER UNIT

1. Disconnect foot switch and power relay harness.

2. Disconnect phototube harness from amplifier.

3. Remove amplifier attaching screws.

POWER RELAY

1. Remove car harness and Guide-Matic harness from relay.

2. Remove two screws from relay.

To install, reverse the procedure. After installing the amplifier unit, check the dim- and hold-sensitivity adjustments.

TROUBLE DIAGNOSIS

Turn Guide-Matic on and allow at least one minute warm-up. In a lighted area, the headlamps should be on low beam in both positions of the foot switch. If not, refer to Headlamps Stay On Upper Beam. With a black cloth over the phototube unit, the headlamps should be on upper beam in one position of the foot switch. If not, refer to Headlamps Stay On Lower Beam.

If customer complains of the Guide-Matic dimming too late or too soon, refer to Sensitivity Adjustment.

NOTE: If car has been in the sun immediately prior to checking, allow to cool in a covered area for about one hour before checking.

1. Turn on headlamps.

2. Allow minimum of one minute warm-up.

3. Follow steps progressively under the specific complaint until trouble is located.

HEADLAMPS STAY ON LOW BEAM

1. Remove the phototube unit harness from the amplifier unit and operate the foot switch.

a. If headlamps are on low beam in both positions of the foot switch, go to step 2.

b. If headlamps are on upper beam in one position of foot switch, trouble is in the phototube unit and both units must be removed for servicing.

2. Remove the 4-amp fuse from the fuse holder near the amplifier unit and ratchet the foot switch.

a. If the headlamps change beams, the amplifier units is faulty and should be removed for servicing.

b. If upper beam is not obtained, trouble is in power relay, foot switch, or car harness.

2. Remove red wire from foot switch.

a. If headlamps go to low beam, replace foot switch.

b. If headlamps remain on upper beam, check power relay and if this unit is functioning normally, remove amplifier for servicing.

HEADLAMPS STAY ON UPPER BEAM

1. Ground the white wire of the phototube harness. (It may be necessary to drop amplifier. If so, use external ground for case of amplifier.) (Fig. 12-21)

a. If headlamps remain on upper beam, go to step 2.

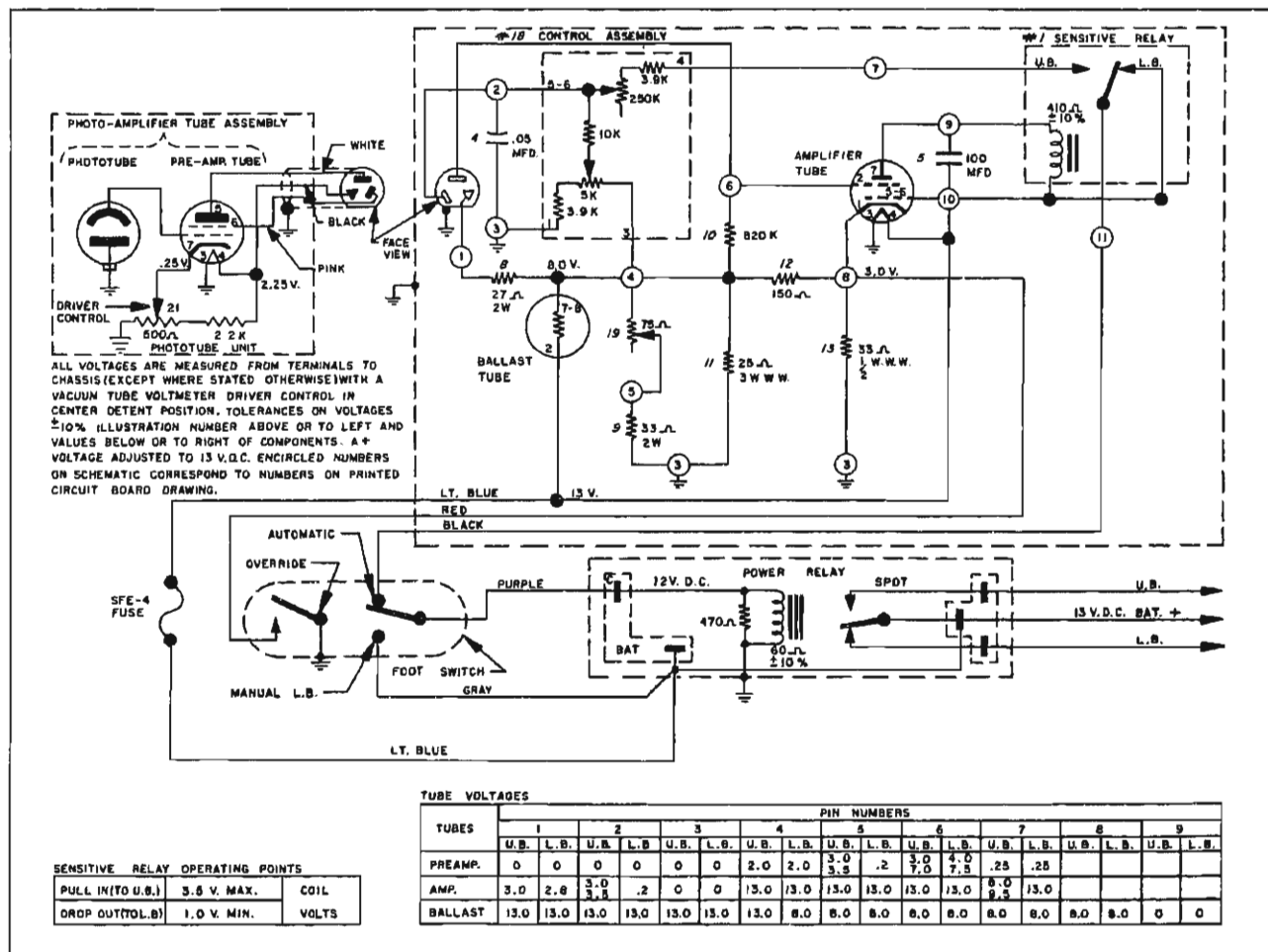
b. If headlamps go to lower beam, trouble is in the phototube unit and amplifier and phototube must be removed for servicing.

NO OVER RIDING HIGH BEAM

1. Check to see if red wire is connected to foot switch. If not, make connection.

2. If red wire is connected, remove red wire and place a jumper from red wire to ground. If override is obtained, replace foot switch.

3. If override is not obtained, trouble is in the amplifier. Remove for detailed servicing.



SENSITIVE RELAY OPERATING POINTS		
PULL IN (TO U.B.)	3.5 V. MAX.	COIL
DROP OUT (TOL.B)	1.0 V. MIN.	VOLTS

TUBES	PIN NUMBERS																		
	1		2		3		4		5		6		7		8		9		
	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	
PREAMP.	0	0	0	0	0	0	2.0	2.0	3.0	.2	3.0	4.0	.25	.25					
AMP.	3.0	2.8	3.0	3.5	.2	0	0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	8.0	9.5	13.0		
BALLAST	13.0	13.0	13.0	13.0	13.0	13.0	13.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	0	0

Fig. 12-21 Guide-Matic Circuit Diagram