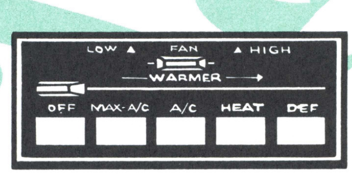
MASTER
TECHNICIANS
SERVICE
CONFERENCE
REFERENCE BOOK **69-11**

AIR-CONDITIONING DIAGNOSIS... *THE CONTROLS*



PLYMOUTH
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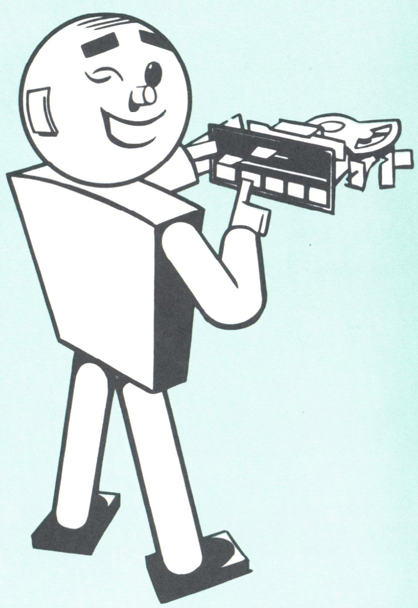

IS EVERYTHING UNDER CONTROL?

Air-conditioning service and diagnosis can be divided into two distinctly separate categories: the refrgeration part of the system and the air distribution and temperature controls. Last month's Reference Book covered the refrigeration system. This month's Tech session covers the vacuum and electrical circuits and controls for our full-size cars equipped with standard factory-installed air conditioning . . . Chrysler, Fury, Monaco and Polara models.

The only special equipment you'll need to diagnose and service the controls is a good understanding of how all the vacuum and electrical control units work. Since much of the control system is tucked up under the instrument panel where it's a little difficult to observe what happens when each of the push buttons is pushed, it's doubly important to know what you're doing before you tackle a job that involves troubleshooting the controls.

On the other hand, once you do understand all of the vacuum and electrical control units and know what they are supposed to do when they're working correctly, you'll find that troubleshooting this part of the air-conditioning system isn't at all mysterious or difficult.

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AIR FLOW AND THE AIR DOORS

Four different doors are used to control and direct air flow from the time it enters the system until it is discharged to the car interior. Any time you run into air distribution problems it is important to know how each of these doors work and what they do.

THE AIR DOOR CONTROLS THE INTAKE

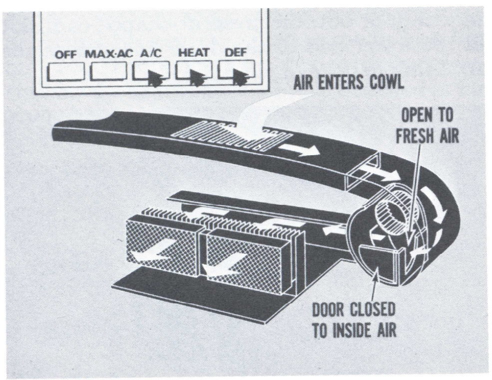


Fig. 1—Air door position for fresh-air intake

All incoming air has to flow through the air door housing. When the air door in this housing is open to fresh air and closed to inside air, fresh air enters the cowl and flows through the air door housing on its way to the blower. The

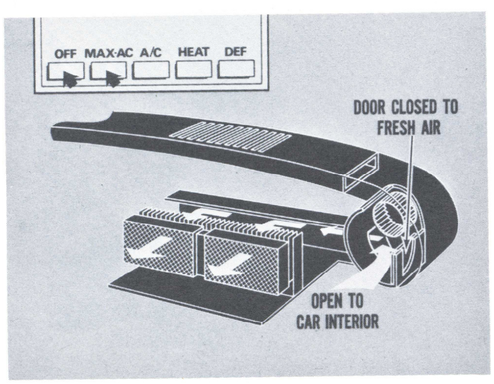


Fig. 2—Air door position for recirculating air

blower delivers this fresh, outside air to the car interior. This is the air door position for the HEAT, DEFROST and A/C push buttons.

When the air door is closed to fresh-air flow and open to the car interior, the system operates on recirculated air. This is the air door position for the MAX A/C and the OFF button.

AIR DOOR ACTUATOR AND MECHANISM

The air door actuator rod is connected directly to the hinged air door. When vacuum is applied to the "pot" side of the vacuum actuator, the door is closed to recirculation or inside air and open to outside or fresh air. It follows that vacuum to the rod side of the door shuts off fresh air and the system operates on recirculated, inside air.

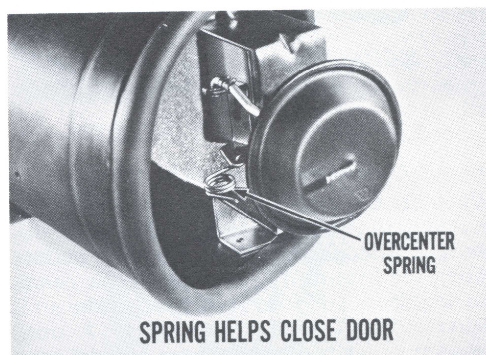


Fig. 3—The over-center spring helps close air door

DOUBLE-DUTY AIR DOOR CLOSER

The hinged air door is equipped with an over-center spring that assists in closing the door and helps keep it tightly closed in either the fresh air or the recirculating air position. If the door flutters, or does not close tightly, allowing ram air to leak from the outlets when the "OFF" button is pushed, make sure this spring is in place.

If you have reason to check the air door, the over-center spring or vacuum actuator, you'll have to remove the glove box. Once the glove box is removed, it's easy to get at the air door.

THE THREE-DOOR TEAM

Final air delivery and distribution to the car interior is controlled by the defroster, the air-conditioning and the heater doors. These three doors are controlled by two vacuum actuators and a system of interconnected links and levers. Knowing how these doors work will help you diagnose air distribution problems.

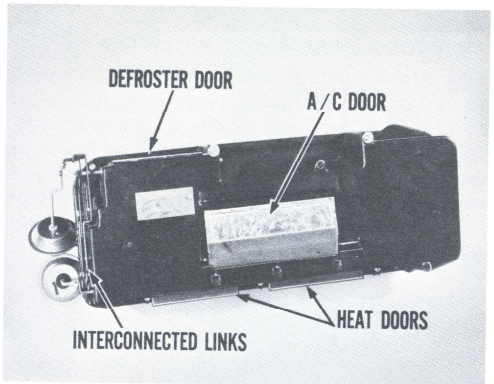


Fig. 4—These doors control air to car interior

THE AIR-CONDITIONING AND HEAT DOORS

When the air-conditioning doors are open, the heat doors are always closed and all air is discharged through the air-conditioning outlets. When the heat doors are open, the air-conditioning doors are closed and most of the air is delivered through the floor outlets. A small amount of air is delivered from the defroster outlets but we'll cover that later.

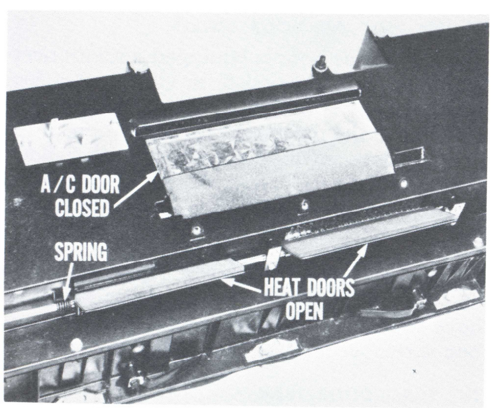


Fig. 5—A spring holds the heat doors open

In the accompanying illustration you'll notice a spring attached to the left heat door. This spring holds both the heat doors open.

THE COMBINATION A/C-HEAT ACTUATOR

Next, let's consider the combination A/C-Heat actuator. This vacuum actuator is connected to a lever called the drive link. A short A/C link, that's part of the drive link assembly, is connected to the end of the A/C door shaft. There is no direct connection between the actuator rod and the A/C door shaft or the HEAT door shaft. As the vacuum actuator rod moves in or out, the crescent-shaped cam slot in the lower end of the drive link moves the A/C link to open or close the A/C door.

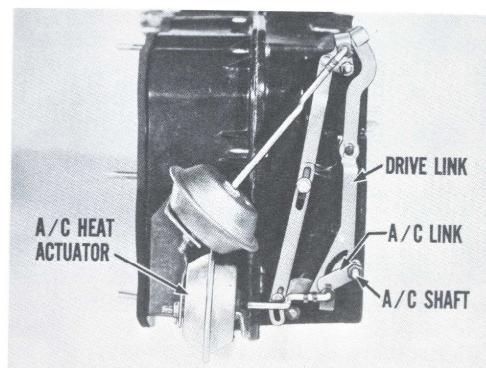


Fig. 6—This actuator operates the heat and A/C doors

THE DRIVE LINK NUDGES THE HEAT DOOR

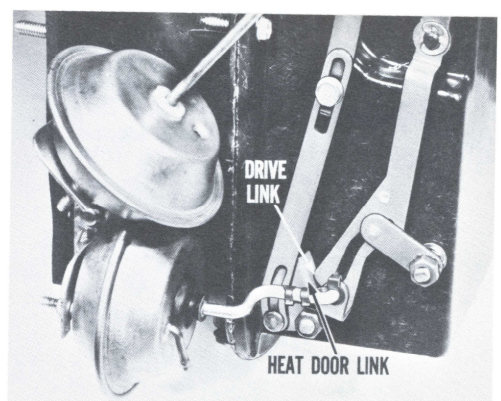


Fig. 7—The drive link pushes the heat door closed

A nose-like projection at the lower end of the drive link pushes against a cam surface on the heat door link to *close* the heat door. Remember, the heat door spring opens the heat door.

SOME DRIVE LINKS ARE DIFFERENT

On early production cars, the drive link and the A/C door link are two separate pieces . . . not a two-piece assembly like current production. The accompanying illustration shows the difference between the two drive link arrangements. If the linkage adjustments described in the DIAGNOSIS AND SERVICE ADJUSTMENT section don't correct air distribution problems, the new type linkage can be installed on early production cars. Instructions for installing the new linkage are also included in the last section of this Reference Book.

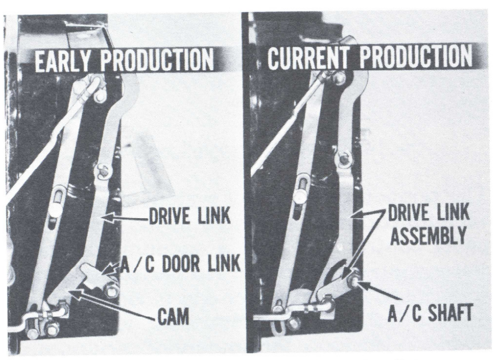


Fig. 8—Early and late production drive links

THE SPRING-LOADED DEFROSTER ACTUATOR

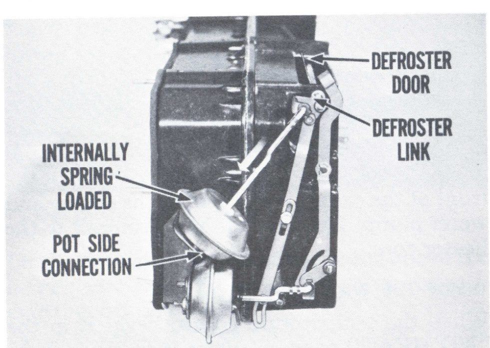


Fig. 9—Defroster actuator pulls defrost door open

The defroster actuator is internally spring-loaded on the rod side. This spring load keeps the defroster door closed. The only vacuum connection is to the pot side of the actuator so vacuum pulls on the defroster link to open the defroster door.

The position of the defroster link on the defroster door shaft can be adjusted to change the amount that the defroster door opens. You'll find instructions for making this adjustment in the final section of this Reference Book.

THE HEAT BLEED LINKAGE IS ADJUSTABLE, TOO

An adjustable bleed linkage connects the defroster link to the heat door link. When the DEFROST button is pushed, the defroster vacuum actuator opens the defroster door all the way. At the same time, the slot in the lower end of the adjustable bleed link bottoms against the pin in the heat door link and the heat door is pushed to the almost-closed position. When properly adjusted, the heat door remains open just far enough to allow some heat to be discharged from the heat outlets near the floor.

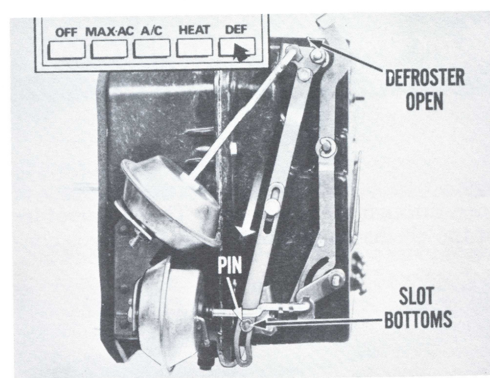


Fig. 10—Adjustable bleed controls heat door bleed

THE DEFROSTER BLEED MECHANISM

When the HEAT button is pushed, the upper end of the drive link provides defroster bleed to keep the windshield clear. Actually, the drive link pushes the defroster door part-way open against the pressure of the spring-loaded defroster actuator. Here's how that works.

Vacuum to the rod side of the HEAT-A/C actuator moves the upper end of the drive link

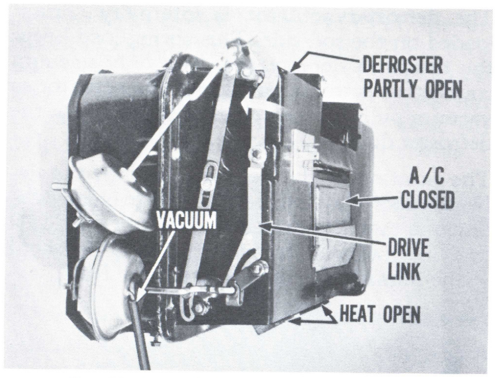


Fig. 11—Drive link provides defrost bleed

so that it pushes on the defroster link to partly open the defroster door. At the same time, the actuator closes the A/C door and moves the lower end of the drive link away from the heat door link so that the heat door spring can open the heat doors.

THE TEMPERATURE CONTROL SYSTEM

All incoming air entering the air-conditioning system is routed through the evaporator and then through the heater core. The temperature of the air discharged to the car interior is con-

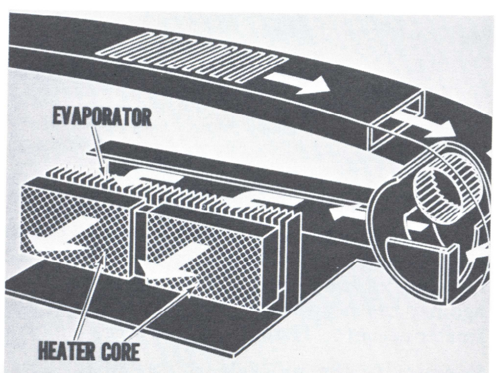


Fig. 12—Temperature controlled by water flow

trolled by regulating the amount of water flowing through the heater core. When the system is operating to provide cooling, reheating the air after it passes through the evaporator removes excess moisture and reduces the humidity. This is a very good feature and particularly desirable when outside temperature is moderate and humidity is high.

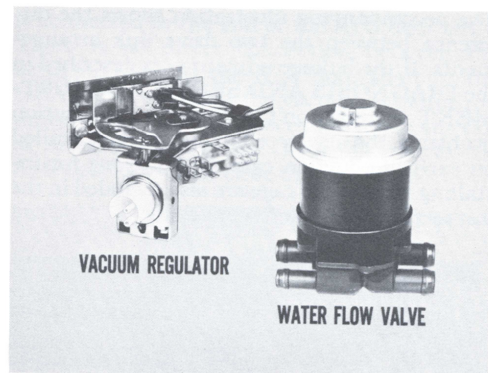


Fig. 13—Temperature control system units

The temperature control system consists of a vacuum regulator mounted in the instrument panel control unit and a vacuum-controlled water valve in the engine compartment. A cam arrangement at the inner end of the temperature control slide lever moves the vacuum regulator and changes the amount of vacuum supplied to the water valve. This controls the amount of water flow through the heater core.

NO SIMPLE SERIES WATER FLOW VALVE

Flow through the vacuum-controlled water valve is much less affected by variations in water pump pressure. This insures excellent temperature control at all engine speeds. This type water valve has four hose connections instead of two because it is a combination bypass and flow-control valve. The two hoses toward the front of the car are connected to the engine and water pump. The two rear hoses connect to the heater core.

INSIDE THE WATER FLOW VALVE

When the temperature control lever is in the "NO HEAT" position, there is no vacuum to the water valve and no water flow to the heater core. However, water flows from the engine, through an internal bypass and back to the water pump inlet.

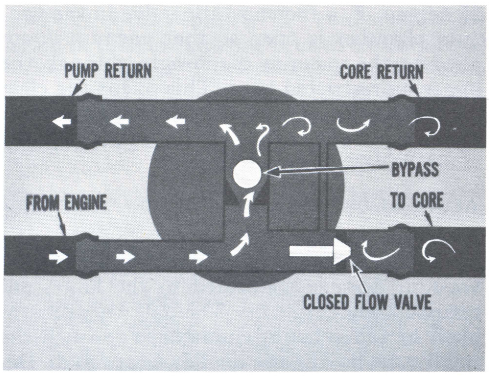


Fig. 14—Combination flow and bypass water valve

In the accompanying illustration you can see that there is also an open passage through the bypass to the heater core return line. This means that there is water pressure to the heater core at all times. But, in the "NO HEAT" position all flow through the heater core is blocked by the closed flow valve.

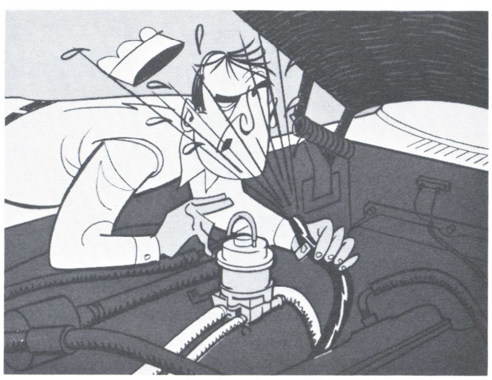


Fig. 15—The wrong way to check for valve shut-off

Don't make the mistake of removing one of the heater core hoses to see if the water valve is shutting off flow in the "NO HEAT" position. Since there is always pressure to the heater core, you'll get a bath if you remove one of the heater hoses. You'll find instructions for checking the vacuum regulator and the water flow valve in the last section of this book.

VACUUM OPENS THE FLOW VALVE

When the temperature control lever is set for "HEAT", the vacuum regulator supplies vacuum to the water valve. Vacuum opens the flow valve and flow is then from the engine, through the heater core and then back to the water pump inlet.

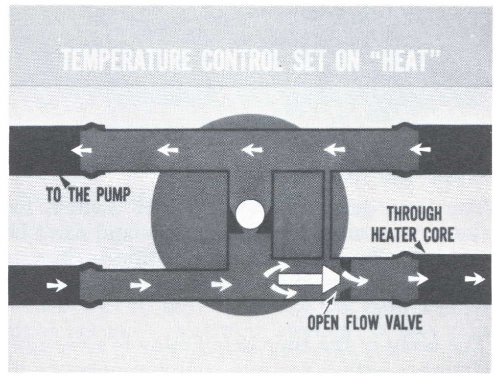


Fig. 16—The vacuum regulator opens the water valve

THE VACUUM AND ELECTRICAL CIRCUITS

The vacuum circuits control the air circulation doors and the water flow valve. The electrical circuits control the blower speeds and the compressor clutch. You'll find vacuum and electrical circuit diagrams in your Service Manual. However, the following discussion will help you trace and understand these control circuits.

THE TIME DELAY RELAY

The time delay relay is a vacuum-operated electrical switch that's connected into the compressor clutch circuit. The time delay relay provides a separate circuit which energizes the compressor clutch when the "DEFROST" or "HEAT" button is pushed and the outside temperature is above twenty-five degrees. Running the compressor cools the air to reduce the likelihood of condensation on the windshield.

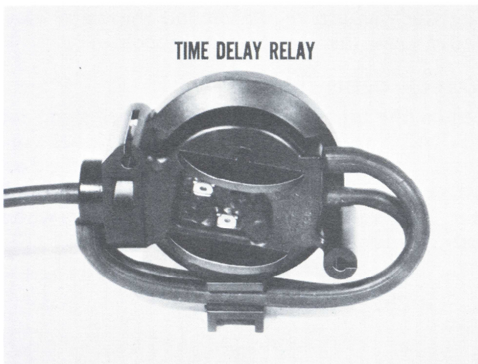


Fig. 17—Vacuum-operated clutch circuit switch

INSIDE THE TIME DELAY RELAY

The time delay relay or T-D-R Switch, for short, is serviced as an assembly and can't be repaired. However, an explanation of how it works will give you a better understanding of what it does.

The body of the time delay relay is a vacuum chamber with a vacuum source connection at one end. There are a set of electrical contacts inside the vacuum chamber. One of these contacts is fixed but the other is movable and connected to a vacuum diaphragm. These electrical contacts are normally closed, completing the auxiliary circuit to the compressor clutch.

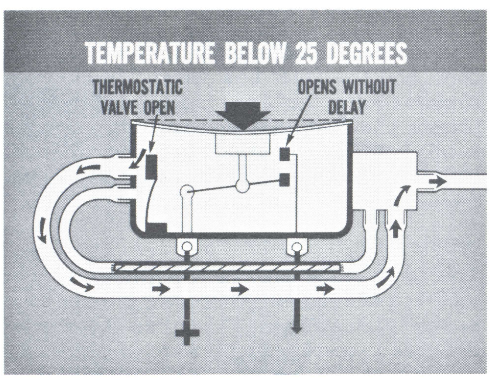


Fig. 18—Unrestricted vacuum opens the contacts

Two external vacuum tubes run from the vacuum source connection to the vacuum chamber connections at the other end of the switch. Notice that the smaller tube contains a restriction which slows down air flow from the vacuum chamber. When the temperature is below 25 degrees **F.** a thermostatic valve in the vacuum chamber is open so that vacuum is applied to the vacuum diaphragm through the larger, unrestricted tube. This opens the electrical delay. So, in cold weather the compressor clutch is not engaged when the "HEAT" or the "DEFROST" button is pushed.

ABOVE 25 DEGREES THINGS ARE DIFFERENT

When the temperature is above 25 degrees **F.**, the thermostatic vacuum valve closes off the vacuum passage connected to the large, unrestricted vacuum tube. The only vacuum applied to the vacuum chamber is through the small tube having the air flow restriction. Because of this restriction, it takes from two to ten minutes to pull enough air out of the vacuum chamber to open the electrical contacts. This delay in opening the circuit to the compressor clutch is just enough to cool the evaporator and dry the air discharged to the car interior.

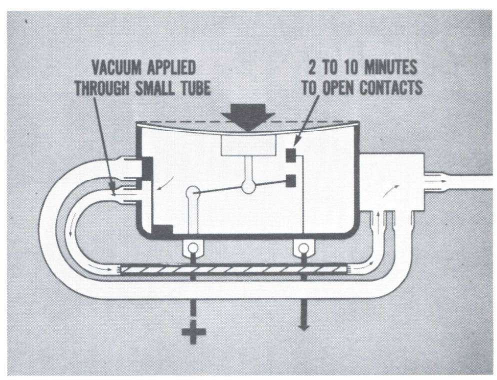


Fig. 19—Vacuum restriction delays opening of contacts

THE VACUUM PART OF THE CONTROL SYSTEM

The push-button switch is serviced as an assembly and you can't install the vacuum connector wrong. However, when diagnosing vacuum system problems it is helpful to know what each branch of the vacuum system does. That way you can apply vacuum to each port in the connector and check to see if that part of the system is operating correctly.

THE VACUUM SOURCE CIRCUIT

Port #6, identified in Figure 20, is for the vacuum source part of the system. A tube with a green stripe connects this port to the vacuum reservoir. Notice that a "T" connector is inserted in this line and one branch of this circuit contains a piece of insulated, stranded wire. This piece of wire is a vacuum bleed. You might call it a planned leak that lets air bleed into the vacuum reservoir when the engine is stopped.

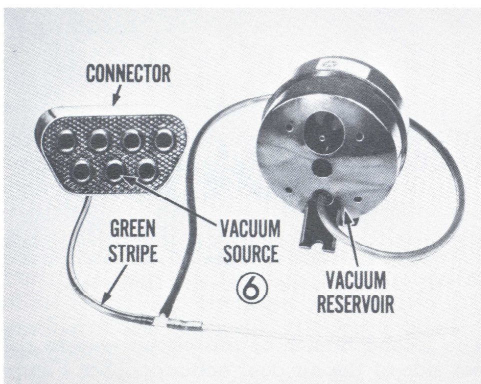


Fig. 20—The vacuum source port and circuit

If it were not for that vacuum bleed, vacuum trapped in the time delay relay would keep the electrical contacts open. As a result, the relay wouldn't engage the compressor clutch the next time the "DEFROST" or "HEAT" button was pushed. If you remove that wire, the time delay relay won't work correctly.

THE DEFROSTER ACTUATOR PORT

Figure 21 illustrates port #4 which is connected to the pot side of the defroster door actuator by a short tube having a white stripe. Notice that this branch of the vacuum circuit has a small plastic restrictor inserted between the port and the actuator. The purpose of the plastic restrictor is to slow down the opening of the defroster door. As a result, when the "DEFROST" button is pushed, most of the moisture in the system is discharged from the heat ducts instead of onto the windshield. This also gives the time delay relay a chance to chill the evaporator and dry the air before the defroster door has a chance to open all the way.

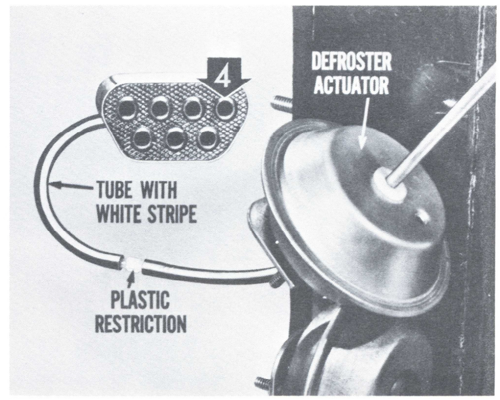


Fig. 21—The defroster actuator port and circuit

THE RED TUBE MAKES IT HOT

Port #7, to the right of the vacuum source connection, is illustrated in Figure 22. The connecting tube is a short one having a red stripe which goes to the rod side of the A/C-HEAT door actuator. Vacuum applied to this port closes the A/C door and opens the HEAT door.

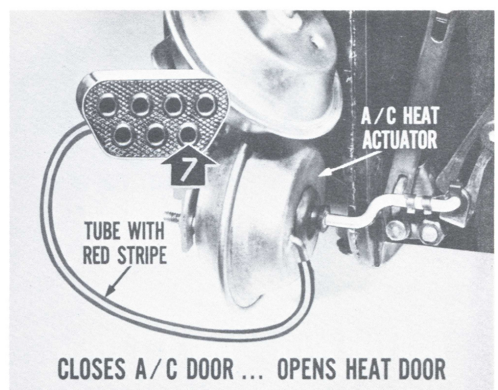


Fig. 22—This port and circuit closes the A/C door

THE WHITE TUBE COOLS IT

Port #5, to the left of the vacuum source connection, is illustrated in Figure 23. This short tube with a white stripe is connected to the pot side of the A/C-HEAT door actuator. Vacuum in this line opens the A/C door for cooling and closes the HEAT door.

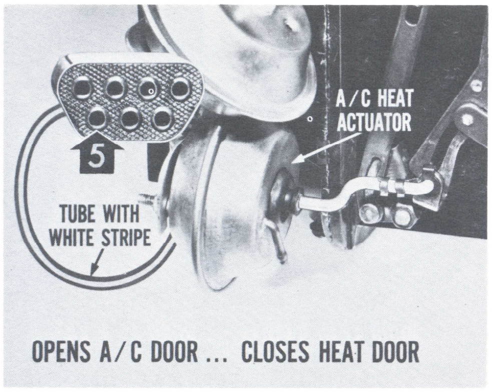


Fig. 23—This is the port that closes the heat door

THE NEXT TUBE IS A BUSY ONE

The tube connected to port #3, illustrated in Figure 24, has three branches. One branch goes to the vacuum regulator for the water valve, one splits off and goes to the air door actuator and the remaining one connects to the time delay relay. Let's look at each of the three branches illustrated in Figure 24.

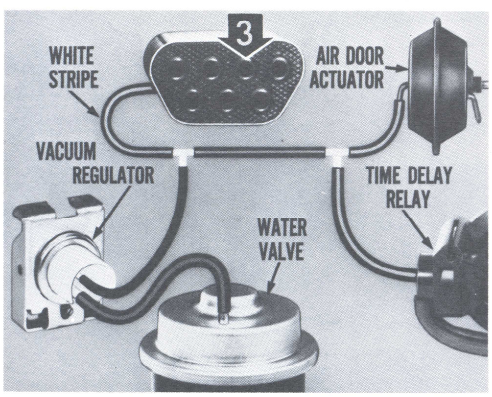


Fig. 24—This circuit has three branches

The first branch goes to the vacuum regulator. From there a larger tube having a green stripe goes to the water valve. (See Figure 25) On present production cars there is no vacuum in this circuit when the OFF or the MAX-A/C button is pushed. As a result, there is no water flow through the heater core for these button positions regardless of the temperature control lever position. On very early production cars, the vacuum regulator was connected directly into the vacuum reservoir circuit so that it was possible to have water flow through the heater core for all push-button positions . . . including OFF and MAX-A/C.

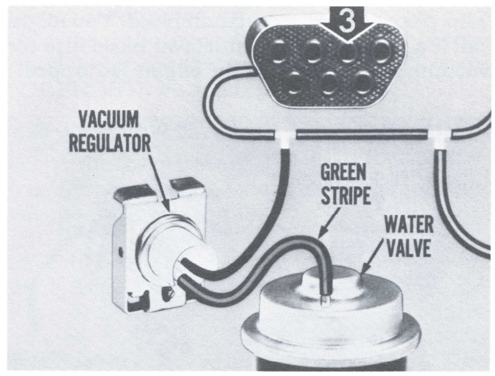


Fig. 25—This is the temperature control circuit

The second branch of this circuit goes to the pot side of the air door actuator. (See Figure 26) Vacuum applied through this tube opens the air door to fresh air and closes off recirculating or interior air.

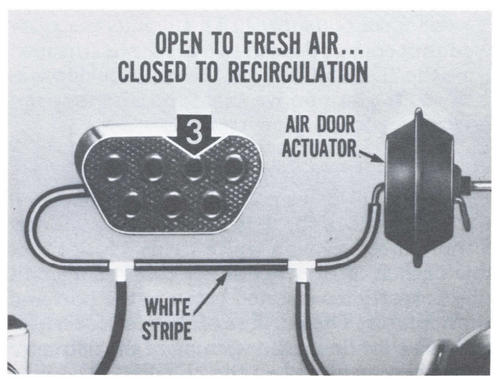


Fig. 26—This circuit opens the air door to fresh air

The third branch also has a white-striped tube. It connects the vacuum source to the time delay relay when the DEFROST or HEAT button is pushed. (See Figure 27) As pointed out earlier, this cools and dries the air before it is discharged through the defroster outlets.

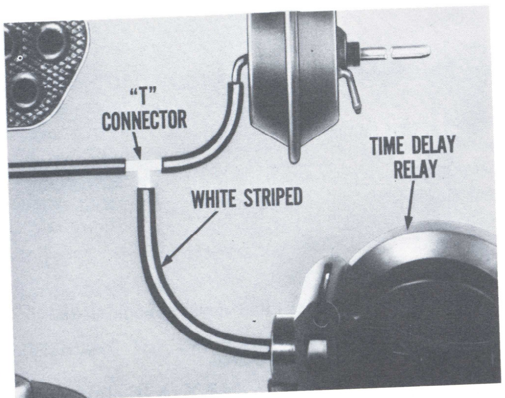


Fig. 27—This circuit supplies the Time Delay Relay

THE LAZIEST TUBE OF ALL

Port #2, illustrated in Figure 28, is the easiest of all to explain. The tube connected to it is pinched off and isn't used in this particular air-conditioning system.

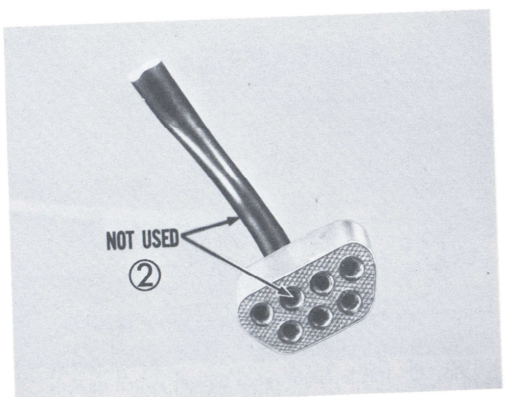


Fig. 28—This port is sealed for this A/C system

THE LAST PORT SHUTS THE DOOR

Port #1, and the vacuum branch illustrated in Figure 29, has a long tube with a red stripe. It goes to the rod side of the air door actuator. Vacuum applied through this port closes the air door to outside air . . . opens the air door to recirculation.

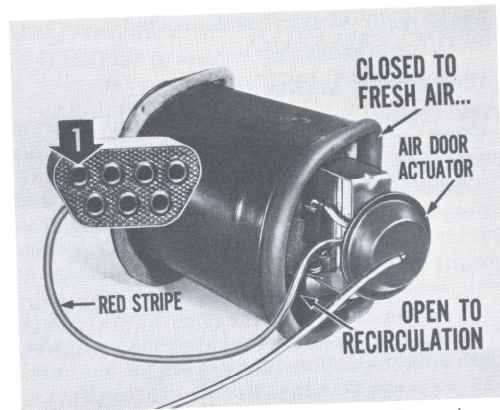


Fig. 29—This circuit shuts off the fresh-air supply

THE RED TO ROD SIDE RULE

The old thumb rule for vacuum actuator tube colors and connections still holds for the current air conditioners. Tubes with a red stripe are connected to the rod side of the actuator. Tubes with a white stripe go to the pot side of the actuator. Just remember: red to rod side.

THE COMPRESSOR CLUTCH CIRCUIT

The compressor clutch is controlled by a simple series circuit. The electrical part of the push-button switch completes the circuit to the clutch when either the A/C or the MAX-A/C is pushed in. The two clutch circuit terminals are identified in Figure 30. The lower terminal is the input or "battery" terminal and

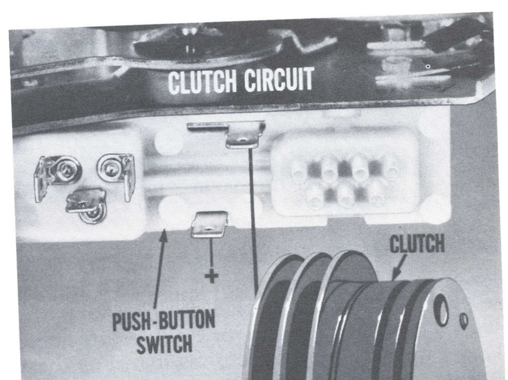


Fig. 30—Clutch switch built into the push buttons

the terminal above it is connected and "hot" for A/C or MAX-A/C.

THERE ARE SIX BLOWER SPEEDS

The blower circuit includes the push-button switch, the three-position blower switch, the resistor block and the blower motor. The blower circuits provide three speeds for heating and three somewhat higher speeds for cooling. You can trace these circuits out in the wiring diagrams in your Service Manuals. However, it will be easier to trace and understand these circuits if you know how the push-button switch fits into the circuit to provide six blower speeds with a three-position blower switch.

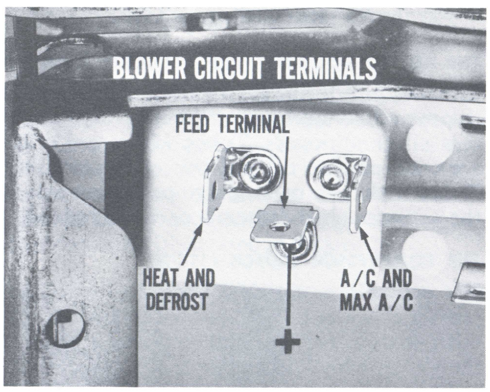


Fig. 31—Blower terminals in push-button assembly

There are three blower circuit terminals on the back of the push-button switch. The lower terminal is the input or battery terminal. The terminal above and to the left feeds the blower circuit when the HEAT or DEFROST is pushed. The terminal at the right feeds the blower circuit for the A/C and the MAX-A/C buttons. These terminals are identified and labeled in Figure 31.

EXTRA RESISTANCE FOR HEATING

When the HEAT or the DEFROST button is pushed, the push-button switch routes the blower circuit to the resistor block before going to the blower speed selector switch. For these button positions the circuit goes through one of the resistors in the resistor block regardless of the speed switch position.

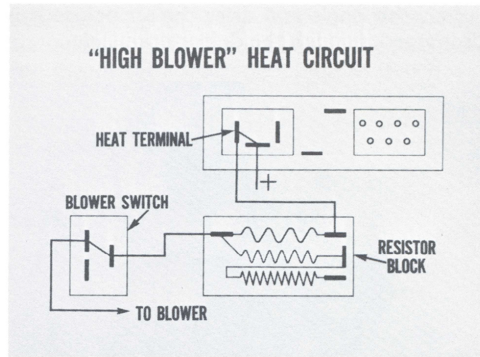


Fig. 32—Push buttons route circuit through resistor

HIGHER SPEEDS FOR COOLING

When the A/C or the MAX-A/C button is pushed, the push-button switch routes the circuit directly to the blower speed control switch . . . before going through any of the resistors. In other words, there is always one less resistor in the circuit for cooling than there is for heating. That's why blower speeds for cooling are higher than blower speeds for heating.

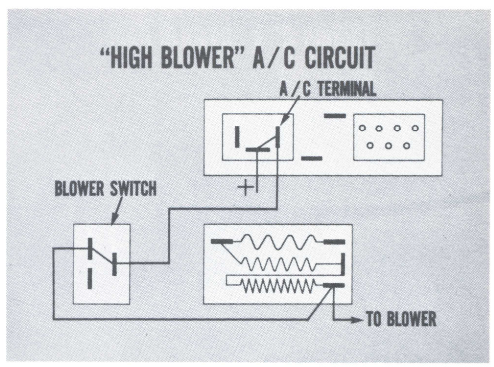


Fig. 33—This terminal feeds blower switch directly

DIAGNOSIS AND SERVICE ADJUSTMENTS

This section of the Reference Book is not intended to duplicate or replace your Service

Manuals and current Service Bulletins. Rather, it will review and summarize the information in these service publications.

AIR DISTRIBUTION PROBLEMS

Air distribution problems may be caused by either mechanical linkage adjustment or vacuum circuit troubles. Use the CONTROL FUNCTION CHART on the last page of this Reference Book to determine whether vacuum is being supplied correctly to each actuator for each push-button position. If vacuum supply is not right, be sure and check for pinched vacuum tubes and correct tube connections before blaming the push-button switch.

REPLACING THE DRIVE LINK ASSEMBLY

Earlier, we pointed out the difference between the drive link assembly on current-production cars and that used on early-production cars.

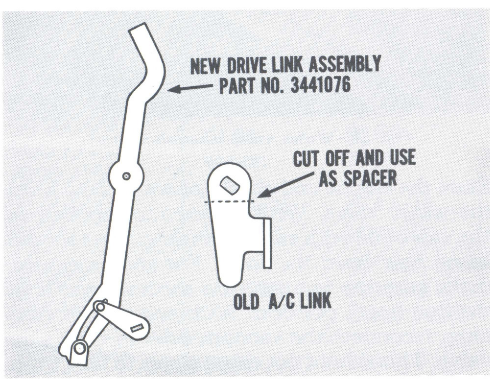


Fig. 34—New drive link and old A/C lever spacer

(See Figure 8) If linkage adjustment does not correct air distribution problems on early-production cars, a new drive link assembly (Part No. 3441076) should be installed. Detailed instructions for installing this new link assembly are contained in recent Service Bulletins. To replace the drive link:

- Disconnect the A/C door spring from the left side of the A/C door. You'll have to remove the A/C distribution duct to get at this spring.
- Remove the A/C door link from the A/C door shaft.
- Remove the drive link from its pivot shaft.
- Install the new drive link assembly.
- Test the operation of the linkage in each push-button position.

NOTE: In a limited number of cases, the tip of the drive link may not be properly centered and may slip off the heat link when the A/C button is pushed. If this happens, cut off the slotted portion of the old A/C door lever and install it behind the heat link as a spacer.

DEFROST DOOR BLEED ADJUSTMENT

After installing a new drive link or to correct improper air delivery from the defroster outlets, adjust the defrost bleed by changing the position of the defrost door link on the defrost door shaft. Defrost door position should be adjusted with the system operating and the HEAT button pushed in. Figure 35 illustrates how a simple spacing tool can be used as a gauge to obtain correct defroster bleed opening. This tool is an 8″ length of ⅜″ copper tubing with about 1″ at one end of the tubing bent to an included angle of 60 degrees.

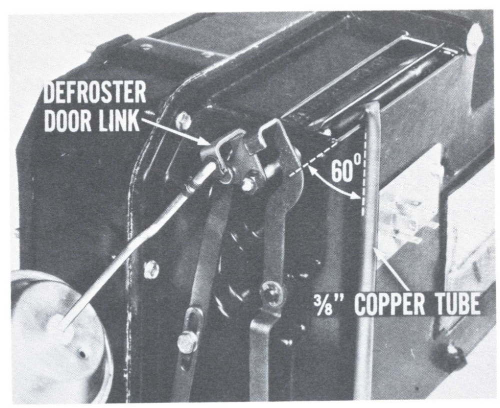


Fig. 35—Defroster bleed adjusting gauge

HEATER DOOR BLEED ADJUSTMENT

With the system operating on DEFROST, loosen the adjustable bleed link screw. The spring on the heat door shaft will open the heat doors. Insert the tool illustrated in Figure 36 through the rectangular slot in the heat duct and push the heat door closed until the end of the tool bottoms. Push the lower part of the adjustable heat bleed link downward until it bottoms against the pin in the heat door link. Tighten the screw in the adjustable bleed link.

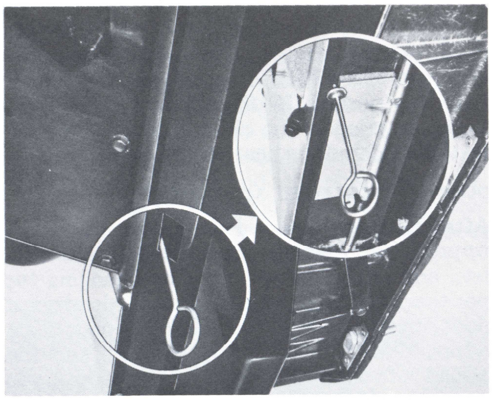


Fig. 36—Heat bleed adjusting gauge

The tool used to obtain the required heat door bleed is a piece of light rod with a washer brazed 5/16″ from the end to form a stop.

TO CHECK THE VACUUM REGULATOR

To check the vacuum regulator, start the engine and push the HEAT button. Remove the vacuum line from the water valve and connect it to a vacuum gauge. With the engine running, vacuum readings should be 1″ or less with the temperature control lever on the "no heat" position, 8″ for the "mid heat" position and 15″ for the "full heat" position.

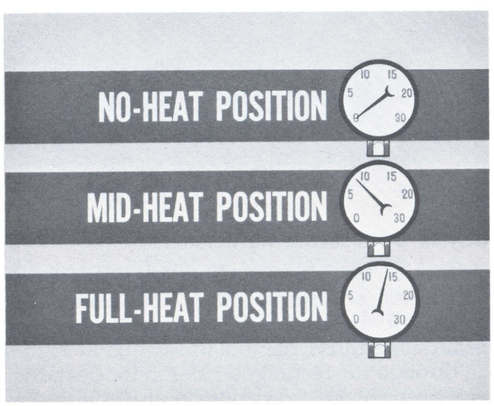


Fig. 37—Vacuum readings for temperature regulator

TO TEST WATER VALVE OPERATION

To test the water valve, disconnect the vacuum tube from the valve. Disconnect and plug the water hose leading from the valve to the heater core. That's the inboard hose directly behind the small hose coming from the engine.

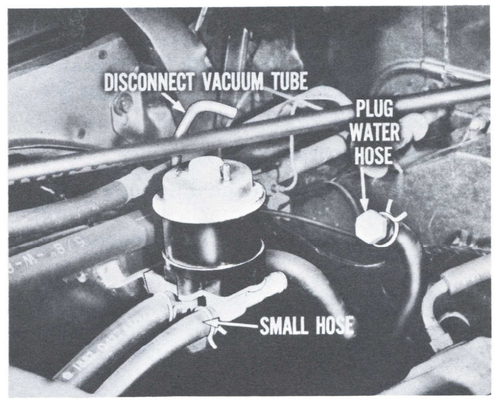


Fig. 38—Water valve operational test

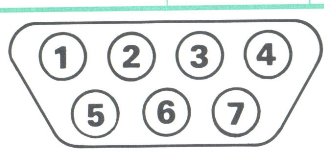
Start the engine and check for water flow from the water valve. With no vacuum applied to the valve and with engine running, there should be no flow from the valve. For good measure, make sure the temperature control lever is in the "no heat" position. With engine still running, reconnect the vacuum tube to the water valve. This should not cause water to flow from the valve. If water now flows from the valve, the trouble is in the vacuum regulator.

AND IN CONCLUSION

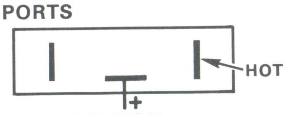
Troubleshooting the operation of the air-conditioning controls is mostly a matter of understanding how all of the control circuits work, topped off with a liberal helping of common sense. The previous sections of this Reference Book will help accomplish the "understanding" part of the trouble-shooting formula. The CONTROL FUNCTION CHART is a common-sense aid that will remind you what is supposed to happen to distribution doors, vacuum circuits and electrical circuits for each push-button position.

AIR-CONDITIONING CONTROL FUNCTION CHART

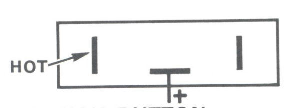
PUSH BUTTON POSITION	OFF	MAX-A/C	A/C	HEAT	DEFROST
AIR DOOR	Closed to Fresh Air	Closed to Fresh Air	Open to Fresh Air	Open to Fresh Air	Open to Fresh Air
A/C DOOR	Open	Open	Open	Closed	Closed
HEAT DOORS	Closed	Closed	Closed	Open	Bleed Position Open 5/16″
DEFROSTER DOOR	Closed	Closed	Closed	Bleed Position Open 3/8″	Open
AIR DOOR ACTUATOR	Vacuum to Rod Side (1) Port #1	Vacuum to Rod Side (1) Port #1	Vacuum to Pot Side (1) Port #3	Vacuum to Pot Side (1) Port #3	Vacuum to Pot Side (1) Port #3
A/C-HEAT DOOR ACTUATOR	Vacuum to Pot Side (1) Port #5	Vacuum to Pot Side (1) Port #5	Vacuum to Pot Side (1) Port #5	Vacuum to Rod Side (1) Port #7	Vacuum to Rod Side (1) Port #7
DEFROSTER DOOR ACTUATOR	No Vacuum	No Vacuum	No Vacuum	No Vacuum	Vacuum to Pot Side (1) Port #4
TIME DELAY RELAY	No Vacuum	No Vacuum	Engine Vacuum (1) Port #3	Engine Vacuum (1) Port #3	Engine Vacuum (1) Port #3
TO VACUUM TEMPERATURE REGULATOR	(2) No Vacuum	(2) No Vacuum	Engine Vacuum (1) Port #3	Engine Vacuum (1) Port #3	Engine Vacuum (1) Port #3
AT WATER VALVE	(3) 0 to 15 Inches Hg.	(3) 0 to 15 Inches Hg.	(3) 0 to 15 Inches Hg.	(3) 0 to 15 Inches Hg.	(3) 0 to 15 Inches Hg.
BLOWER CIRCUITS	All "Off"	(4) "Hot"-Speed Controlled by Blower Switch	(4) "Hot"-Speed Controlled by Blower Switch	(5) "Hot"-Speed Controlled by Blower Switch	(5) "Hot"-Speed Controlled by Blower Switch
MAIN CLUTCH CIRCUIT	"Off"	"Hot"	"Hot"	"Off"	"Off"
T-D-R- CLUTCH CIRCUIT	"Off"	"Off"	"Off"	(6) "Hot"	(6) "Hot"



(1) VACUUM CONNECTOR PORTS



(4) PUSH BUTTON TERMINALS



(5) PUSH BUTTON TERMINALS

(2) Early Production Models Will Have Vacuum to Regulator for All Button Positions

(3) CONTROL LEVER POSITION: No Heat—Less than 1″ Hg. Mid Heat—8″ Hg. Full Heat—15″ Hg.

(6) T-D-R Switch Circuit completed for 2 to 10 minutes after "Heat" or "Defrost" Button is *first* pushed and temperature is above 20° F. Engine or System must be shut down 10 minutes before T-D-R Switch will cycle and actuate Clutch Circuit again.

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