

5. Connect the blower motor ground wire to ground and the harness to the resistor and blower motor lead.
6. Connect the black vacuum supply hose to the vacuum check valve in the engine compartment.
7. Connect the high and low pressure refrigerant hoses to the combination valve using new O-rings dipped in refrigeration oil. Use a back-up wrench on the STV housing manifold to prevent component damage.
8. Install the instrument panel following the procedures under Instrument Panel Installation.
9. Connect the heater hoses to the heater core and fill the cooling system.
10. Leaktest, evacuate and charge the refrigeration system following the recommended procedures and safety precautions.

EVAPORATOR CORE

REMOVAL

1. Remove the evaporator case from the vehicle following the procedure under Evaporator Case Removal. Then, remove the air inlet duct and blower housing assembly from the evaporator case.
2. Remove five screws attaching the heater core access cover to the evaporator case and remove the access cover (Fig. 38).
3. Remove the heater core from the evaporator case.
4. Remove two nuts retaining the restrictor door vacuum motor to the mounting bracket. Then, disengage the vacuum motor arm from the restrictor door.
5. Remove eleven screws and six snap clips retaining the two halves of the evaporator case together, and separate the two halves of the evaporator case.
6. Lift the evaporator core, seal and combination valve from the lower half of the evaporator case.
7. Remove two nuts retaining the combination valve support to the evaporator core.
8. Remove the combination valve from the evaporator core. Then, remove the restrictor from the evaporator inlet line (Fig. 10).

INSTALLATION

1. Install the combination valve on the evaporator core tubes using new O-rings dipped in refrigeration oil. Be sure the restrictor (Fig. 10) is installed into the evaporator inlet line.
2. Install two nuts to retain the combination valve support to the evaporator core.
3. Position the evaporator core in the lower half of the evaporator case fitting the seal over the edge of the case lower half.
4. Position the case upper half on the case lower half making sure the temperature blend door and the heat defrost door are properly positioned.
5. Install the eleven screws and six snap clips to retain the two halves of the housing together.
6. Connect the restrictor door vacuum motor to the restrictor door and install the two restrictor door vacuum motor retaining nuts.

7. Install the heater core with new caulking cord between the core and the evaporator case. Then, install the heater core access cover.
8. Install the air inlet duct and blower housing assembly on the evaporator case.
9. Install the evaporator case in the vehicle following the procedure under Evaporator Case Installation.

HEATER CORE

REMOVAL

1. Remove the instrument panel and lay it on the front seat following the procedures under Instrument Panel Removal.
2. Drain the coolant from the engine cooling system. Then, disconnect the heater hoses from the heater core and plug the heater core tubes.
3. Working under the hood, remove two nuts retaining the evaporator case to the dash panel.
4. In the passenger compartment, remove the screws attaching the evaporator case support bracket and the air inlet duct support bracket to the cowl top panel.
5. Remove one nut retaining the bracket at the left end of the evaporator case to the dash panel, and one nut retaining the bracket below the case to the dash panel.
6. Carefully pull the evaporator case assembly away from the dash panel to gain access to the screws retaining the heater core access cover to the evaporator case (Fig. 38).
7. Remove five heater core access cover attaching screws, and remove the access cover from the evaporator case.
8. Lift the heater core and seals from the evaporator case.
9. Remove the two seals from the heater core tubes.

INSTALLATION

1. Install the heater core tube seals on the heater core tubes, the thin seal first.
2. Install the heater core in the evaporator case with the seals on the outside of the case.
3. Position the heater core access cover on the evaporator case and install the five attaching screws.
4. Position the evaporator case assembly to the dash panel and install the two support bracket attaching screws.
5. Install one nut retaining the mounting bracket at the left end of the evaporator case to the dash panel and another nut to retain the bracket below the evaporator case to the dash panel.
6. Working under the hood, install two nuts retaining the evaporator case to the dash panel. Tighten the four nuts (2 in engine compartment and 2 in passenger compartment) and the support bracket attaching screws.
7. Install the instrument panel following the procedures under Instrument Panel Installation.
8. Connect the heater hoses to the heater core tubes and fill the cooling system.

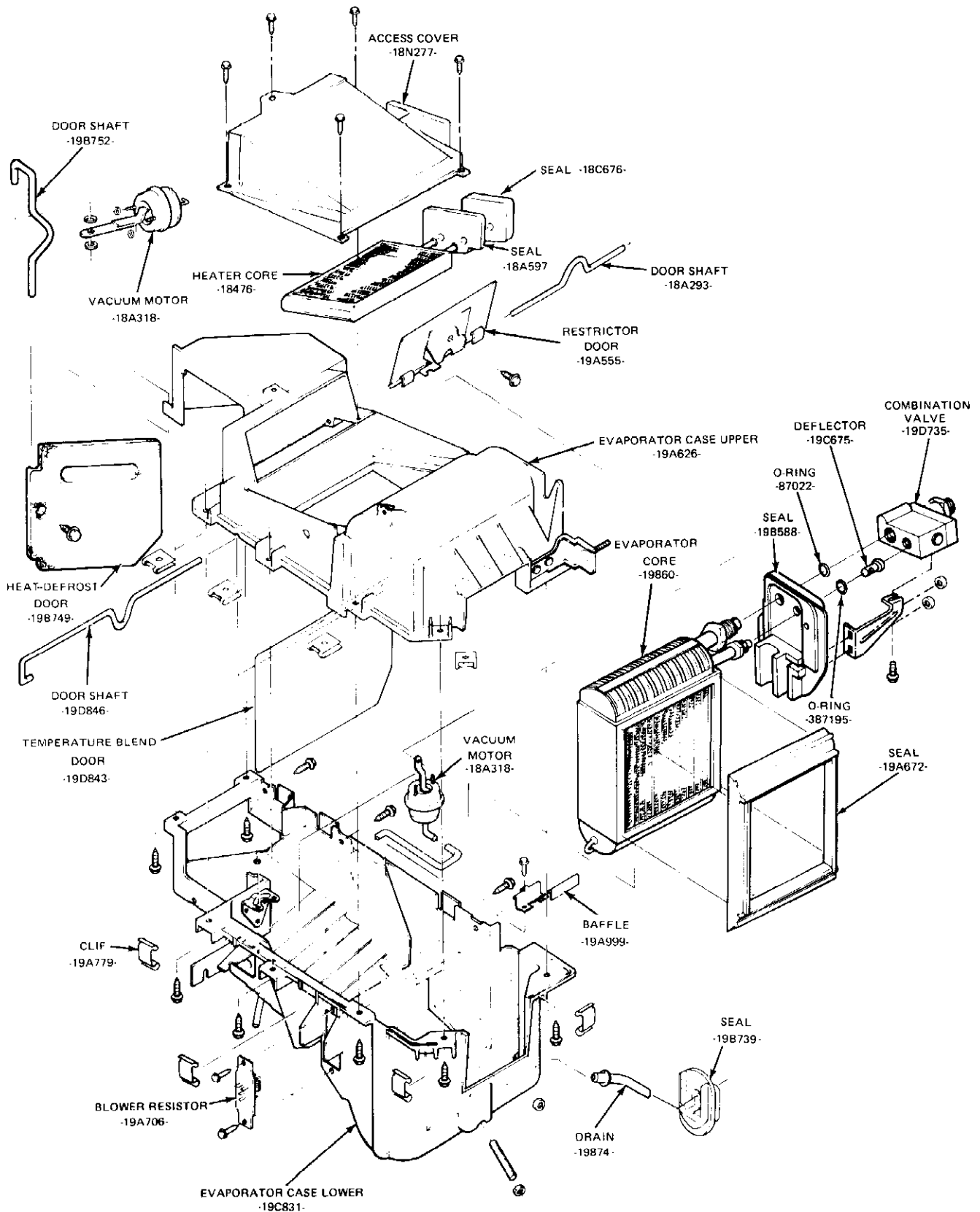


FIG. 38 Evaporator Case Assembly—Disassembled

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FLOOR AIR DISTRIBUTION DUCT

1. Remove two screws attaching the duct to the evaporator case assembly just below the A/C-Heat distribution duct (Fig. 7).
2. Pull the floor air distribution duct away from the evaporator case.
3. To install, position the duct to the evaporator case. Make sure the retainer at the forward edge of the duct is inserted over the edge of the opening in the evaporator case. Then, install the two attaching screws.

TEMPERATURE BLEND DOOR

1. Remove the evaporator case from the vehicle.
2. Remove the heater core and remove two nuts retaining the restrictor door vacuum motor to the mounting bracket. Disengage the vacuum motor arm from the restrictor door.
3. Remove eleven screws and six snap clips retaining the two halves of the evaporator case together, and separate the two halves of the evaporator case (Fig. 38).
4. Remove the temperature blend door from the evaporator case.
5. To install, reverse the removal procedure.

OUTSIDE-RECIRC DOOR AND/OR SHAFT

1. Remove the air inlet duct and blower housing assembly from the vehicle (Fig. 34).
2. Remove three snap clips and two screws attaching the air inlet duct to the blower housing. Then, separate the duct from the blower housing (Fig. 35).
3. Remove the screw retaining the door to the shaft and pull the door from the shaft.
4. To remove the shaft, disconnect the shaft from the vacuum motor and remove the shaft from the duct.
5. To install, reverse the removal procedure.

OUTSIDE-RECIRC DOOR VACUUM MOTOR

1. Remove the glove compartment and disconnect the vacuum hose from the vacuum motor.
2. Remove the motor arm retainer from the outside-recirc door shaft.
3. Remove two nuts retaining the vacuum motor to the mounting bracket and remove the motor.
4. To install, reverse the removal procedure.

RESTRICTOR DOOR AND SHAFT

1. Remove the heater core following the procedure for Heater Core Replacement.
2. Remove two nuts retaining the restrictor door vacuum motor to the mounting bracket (Fig. 38).
3. Disengage the vacuum motor from the mounting bracket and the restrictor door.
4. Remove the screw retaining the restrictor door to the shaft and pull the door from the shaft.
5. To install, reverse the removal procedure.

RESTRICTOR DOOR VACUUM MOTOR

1. Remove the heater core following the procedure for Heater Core Replacement.
2. Remove two nuts retaining the vacuum motor to the mounting bracket (Fig. 38).
3. Disengage the vacuum motor from the mounting bracket and the restrictor door.
4. Disconnect the vacuum hose from the vacuum motor and remove the motor from the plenum through the heat-defrost door opening.
5. To install, reverse the removal procedure.

HEAT-DEFROST DOOR VACUUM MOTOR

REMOVAL

1. Disconnect the ground cable from the battery.
2. Remove the radio from the vehicle, if so equipped.
3. Remove two screws and remove the floor air distribution duct from the evaporator case.
4. Remove four screws attaching the A/C-defrost distribution duct to the center register duct (Fig. 7). Then, pull the A/C-defrost distribution duct down from the installed position and disconnect the vacuum hose from the A/C-defrost vacuum motor.
5. Remove the spring nut retaining the vacuum motor arm on the heat-defrost door shaft.
6. Remove two nuts retaining the vacuum motor to the mounting bracket.
7. Remove the vacuum motor from the mounting bracket and disconnect the vacuum hoses from the vacuum motor.

INSTALLATION

1. Connect the vacuum hoses to the vacuum motor making sure the red stripe hose is on the side of the motor.
2. Position the vacuum motor to the mounting bracket and the motor arm on the door shaft. Then, install the two nuts retaining the vacuum motor to the mounting bracket.
3. Install a new spring nut (Part No. 383358-S) to retain the vacuum motor arm on the A/C-defrost door shaft.
4. Position the A/C-defrost distribution duct to the center register duct and the evaporator case assembly. Then, install the four screws to attach the A/C-defrost distribution duct to the center register duct (Fig. 7).
5. Position the floor air distribution duct to the evaporator case. Make sure the retainer on the forward edge of the duct is inserted over the edge of the opening in the evaporator case. Then, install two screws attaching the duct to the evaporator case.
6. Install the radio, if so equipped, and connect the ground cable to the battery.

HEAT-DEFROST DOOR

REMOVAL

1. Remove the instrument panel following the procedures given under Instrument Panel Removal.

2. Remove the screw retaining the heat-defrost door to the door shaft (Fig. 38).
3. Slide the door off the shaft and remove the door from the evaporator case.

INSTALLATION

1. Position the heat-defrost door in the evaporator case and slide it on the shaft. Be sure it is firmly seated on the shaft.
2. Install the heat-defrost door retaining screw.
3. Install the instrument panel following the procedures given under Instrument Panel Installation.

A/C—DEFROST DOOR VACUUM MOTOR

REMOVAL

1. Disconnect the ground cable from the battery.
2. Remove the radio from the vehicle, if so equipped.
3. Remove the floor air distribution duct from the evaporator case.
4. Remove four screws attaching the A/C-defrost distribution duct to the center register duct. Then, pull the A/C-defrost distribution duct down from its installed position.
5. Remove the spring nut retaining the A/C-defrost door vacuum motor arm to the door shaft.
6. Remove two nuts retaining the vacuum motor to the mounting bracket.
7. Remove the vacuum motor from the mounting bracket and disconnect the vacuum hose.

INSTALLATION

1. Position the vacuum motor to the mounting bracket and the door shaft.
2. Install two nuts to attach the A/C-defrost vacuum motor to the mounting bracket.

3. Install a new spring nut (Part No. 383358-S) to retain the vacuum motor arm on the heat-defrost door shaft.
4. Position the A/C-defrost distribution duct to the center register duct and the evaporator case. Then, install the four attaching screws.
5. Connect the vacuum hose to the A/C-defrost vacuum motor.
6. Install the radio and connect the ground cable to the battery.
7. Install the floor air distribution duct on the evaporator case.

A/C—DEFROST DOOR

REMOVAL

1. Remove the A/C-defrost distribution duct following the procedure under A/C-Defrost Door Vacuum Motor.
2. Remove one screw retaining the A/C-defrost door to the door crank and pull the door from the door crank.
3. To replace the door crank, remove the spring nut retaining the crank to the vacuum motor arm. Then, disengage the vacuum motor arm from the door crank and remove the crank from the A/C-defrost distribution duct.

INSTALLATION

1. Place the door crank in the A/C-defrost distribution duct. Place the flatwasher on the crank end of the shaft, then the vacuum motor arm and install a new spring nut (Part No. 383358-S) to retain the vacuum motor arm on the door crank.
2. Position the A/C-defrost door on the crank so the door is on the same side of the crank as the vacuum motor. Then, install the retaining screw.
3. Install the A/C-defrost distribution duct following the procedure under A/C-Defrost Door Vacuum Motor.

SPECIFICATIONS

REFRIGERANT			
TYPE	Refrigerant 12 (R-12) Dichlorodifluoromethane CCL ₂ F ₂		
FORD SPECIFICATION	ESA-M17B2A		
FORD PART NUMBER	D3AZ-198519-A		
CAPACITY	3 Lb. 8 Oz. + 4 Oz. - 0 Oz.		
REFRIGERANT OIL			
Ford Specification	ESA-M2C31-A		
Ford Part Number	C9AZ-19577-A		
Oil Capacity	11 Fluid Ounces ± 2 Oz.		
COMPRESSOR			
Displacement	10.3 Cu. Inch		
Type	2 Cylinder Piston		
Magnetic Clutch Current Draw	Approx. 3.75 Amps @ 12.8 V		
Drive Belt Tension	New — 120-160 Lbs. Used — 75-120 Lbs. (after operation of 10 minutes)		
Blower Motor Current Draw (Amps and Voltage)	AMPS	VOLTS	
	Low	4	3.9
	Med. Low	8	6.2
	Med. High	13	8.9
	High	23	12.8
Ambient Temp. Switch (Open and Close)	Opens 35°F Minimum Closes 50°F Maximum 30°F Minimum Difference Between Opening and Closing Temperatures.		
Protective Device	30 Amp. Fuse in Blower Circuit. 4 Amp. Fuse in Clutch Circuit. Thermal Limiter in Blower Resistor Circuit (Integral with Resistor).		

CR2190-2A

Mustang II, Pinto and Bobcat Heater — Air Conditioner System

PART
36-44

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION		REMOVAL AND INSTALLATION (Cont'd.)	
Independent Case Assembly		Condenser and Receiver Assembly —	
— Blower Upstream	44-2	Pinto and Bobcat	44-15
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System Operation	44-2	Control Assembly — Pinto and Bobcat	44-15
REMOVAL AND INSTALLATION		Defroster Nozzle	44-18
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CL2348-2B

This Part deals with the controls and components that are peculiar to the Mustang II, Pinto and Bobcat Manual Heater-A/C system. Parts 36-31 through 36-35 give the information and

procedures required for servicing the refrigeration system which is common to all car lines. Reference to all Parts is necessary for complete servicing of the system.

DESCRIPTION AND OPERATION

The Mustang II, Pinto and Bobcat manual air conditioning and heating system is an integral system receiving outside air directly from the cowl air intake, or recirculated air through the register on the right side of the evaporator case assembly.

INDEPENDENT CASE ASSEMBLY—BLOWER UPSTREAM

In systems using this type of case either outside air or interior (recirculating) air is drawn into the system by the blower motor and wheel. From this point, the blower "pushes" the air through the evaporator, then through/ or around the heater core into the plenum and on through ducts to the several outlets—panel, floor and defroster.

The Mustang II control assembly is located in the lower left corner of the instrument panel. The Pinto and Bobcat control assembly is located in the center consolette.

The instrument panel register vertical vanes can be moved from side to side and pivoted up and down for air distribution or can be closed by moving the vanes

to the side. On the Mustang II, Pinto and Bobcat, the left-hand and right-hand outboard registers are closed by moving the vanes inboard towards the centerline of the car.

SYSTEM OPERATION

Mustang II, Pinto and Bobcat Air Flow (See Fig. 2)

With the function control lever in any position except OFF, air is drawn directly into the system by the blower motor and wheel from the cowl or recirculating air intake. The air is then forced thru the evaporator core and depending upon the setting of the temperature blend door, is forced through and/or around the heater core into the air distribution ducts to the registers, defroster nozzles or floor area depending on the exact position of the function control lever setting. The temperature blend door is operated by a control cable connected to the temperature control lever.

When the temperature control lever is moved away from the maximum cool position one width of the lever (1/2 inch) the outside recirc. air door moves from recirc.

to outside air position and the water valve remains closed. Moving the lever one inch away from the maximum cool position opens the water valve. With the function control lever in **OFF** position the blower is off and the outside recirc. air door is closed to outside air, open to recirc. air (vacuum), the water valve is closed (vacuum), and the system is inoperative.

In **ECONOMY VENT** position, the outside-recirc. air door is open to outside air (no vacuum), the water valve is closed (vacuum), and the Heat-Defrost door directs air upward (no vacuum) thru the A/C-defrost door (vacuum) to the registers. The outside air cannot be heated or cooled as the water valve is closed and the A/C clutch switch is open.

In **A/C** position with the temperature lever in maximum cool the outside-recirc. door is closed to outside air, open to recirc. air (vacuum), the Heat-Defrost door is positioned the same as in **ECONOMY VENT** position (no vacuum), the water valve is closed (vacuum), the A/C-defrost door is open to A/C (panel) position (vacuum) and cold air is discharged through the four registers in the instrument panel. The compressor operates in this position (A/C) only when the ambient switch is closed.

In all the remaining **A/C** temperature control positions the outside-recirc. door is open to outside air (no vacuum) and the water valve is open (no vacuum).

In **HI/LO** position, the Heat-Defrost door is in the mid-position (partial vacuum), the A/C-defrost door is open to panel position (vacuum) and air is discharged thru the instrument panel registers and also to the floor outlets. Air flow thru the heater core is controlled

proportionate to the setting of the temperature blend door that controls the warm and cool air as it enters the air distribution (plenum) duct.

In **HEAT** position, the Heat-Defrost door restricts air to the registers (full vacuum), and diverts the air to the floor with some defrost bleed.

In **DEFOG** (mid-position), the Heat-Defrost door is in the mid-position (partial vacuum), the A/C-defrost door is open to the defroster outlets (no vacuum); the air is distributed to the defrosters and floor outlets. The compressor operates in this position when the ambient temperature switch is closed. This aids in reducing fogging by dehumidifying the incoming outside air.

In **DEFROST** position, the Heat-Defrost door restricts air to the floor outlets (no vacuum), the A/C-defrost door is open to the defroster outlets (no vacuum) and diverts air to the defrosters with some floor bleed. The compressor operates in this position, to reduce the humidity when the ambient temperature switch is closed.

A blower switch and resistor assembly provides four blower speeds to control the quantity of air flow. The system on-off and **A/C** clutch control switch is mounted on the control head 9-port vacuum selector (Fig. 3) and is actuated when the functional control lever is in all positions except **OFF**. The A/C clutch switch is actuated in the **A/C**, **DEFOG** and **DEFROST** position.

CONTROLS—MUSTANG II (SEE FIG. 1)

Function Control Lever (See Figs. 3 and 4)

The function control lever actuates a 9 port vacuum selector that controls vacuum to all of the vacuum motors in the system. It also controls the blower switch and activates the A/C clutch circuit in A/C, DEFOG and DEFROST positions. Selection of any positions except **OFF** and **A/C** will activate the outside-recirc. door to the outside air position regardless of the temperature lever position.

Clutch operation is dependent upon an ambient temperature switch and the function lever position. The clutch will be on when the function lever is in the A/C, DEFOG and DEFROST positions and the ambient temperature is closed.

The blower motor runs at all times except when the function lever is in the OFF position.

Temperature Control Lever (See Fig. 1)

The temperature control lever actuates a 3 port vacuum selector that controls the outside-recirc. door and water valve vacuum motors. It also operates the control cable which controls the temperature blend door.

The system operates to recirculate (inside) air when the temperature lever is in the **COOL** position and the function lever is set on A/C. When the temperature lever has moved approximately 1/2 inch to the right of the extreme left (cool) position, the outside/recirc. air door opens to admit outside air. Regardless of the temperature lever setting the system will operate with outside air in all positions except **OFF** and **A/C**.

The water valve opens (hot water to the heater core) when the temperature lever has moved approximately

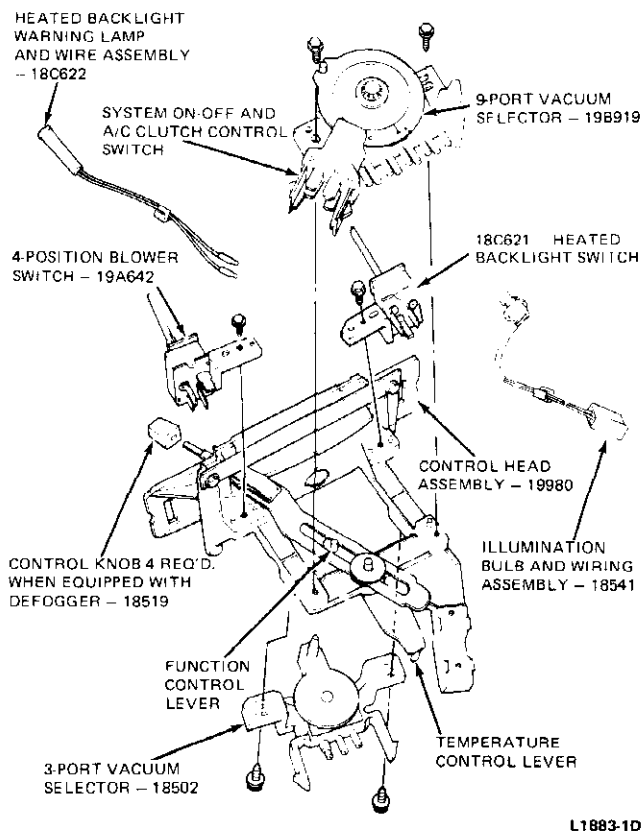
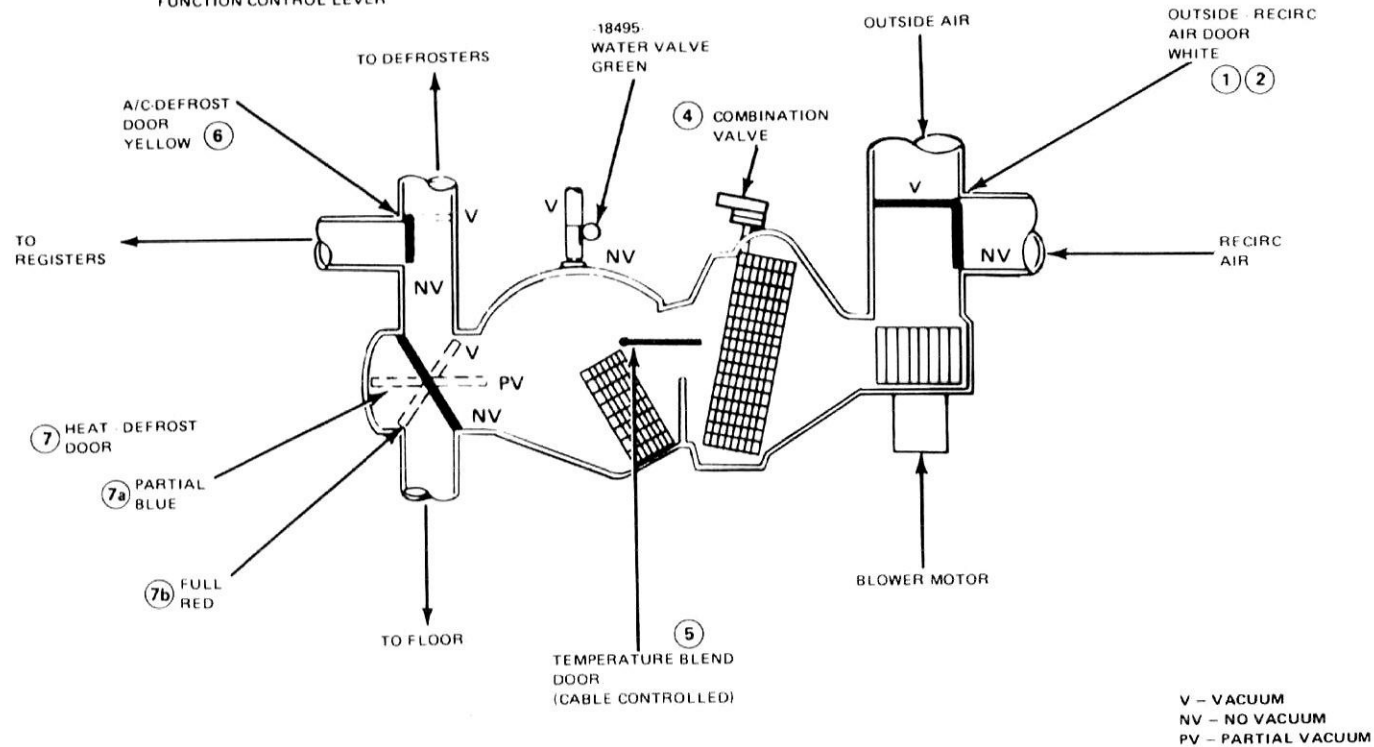
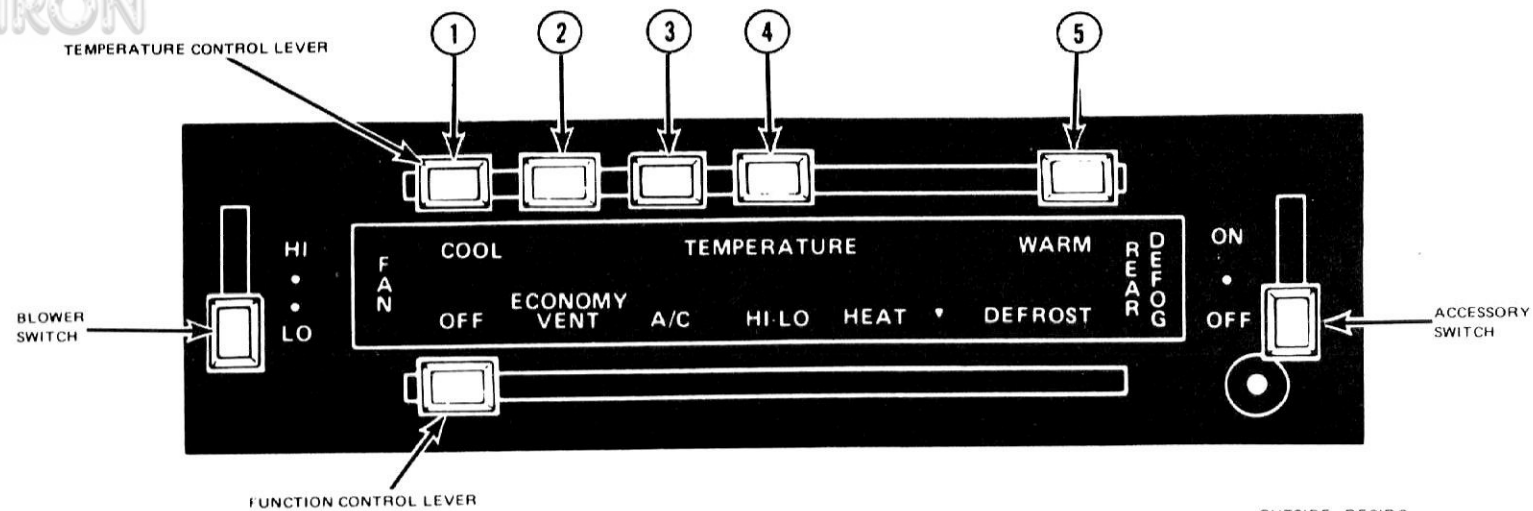


FIG. 1 A/C Control Assembly Disassembled—Mustang II, Pinto and Bobcat



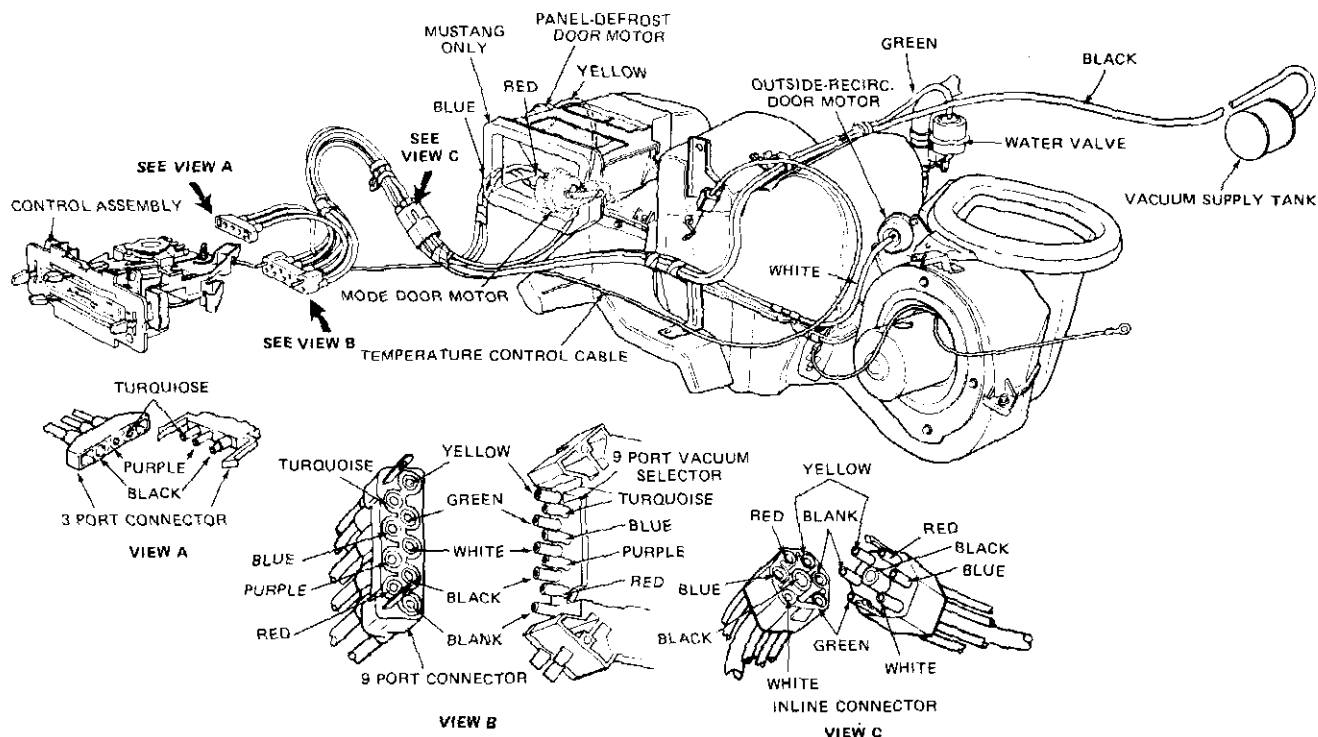
MANUAL A/C-HEATER SYSTEM VACUUM MOTOR TEST CHART						
FUNCTION CONTROL LEVER POSITION	TEMPERATURE CONTROL LEVER POSITION	VACUUM MOTORS APPLIED WITH VACUUM				
		OUTSIDE- RECIRC.	WATER VALVE	A/C- DEFROST	HEAT - DEFROST	
					PARTIAL	FULL
OFF	Any Position	1 - 2	4	—	7a	7b
ECONOMY VENT	Any Position	—	4	6	—	—
A/C *	Cool - 1	1 - 2	4	6	—	—
	Cool - 2	—	4	6	—	—
	Cool - 3 Temp - 4	—	—	—	—	—
	Warm - 5	—	—	6	—	—
HI - LO	Cool - 1	—	4	6	7a	—
	Cool - 2	—	4	6	7a	—
	Cool - 3 Temp - 4	—	—	—	7a	—
	Warm - 5	—	—	6	7a	—
HEAT	Cool - 1	—	4	—	7a	7b
	Cool - 2	—	4	—	7a	7b
	Cool - 3 Temp - 4	—	—	—	7a	7b
	Warm - 5	—	—	—	7a	7b
▽ (DEFOG) *	Cool - 1	—	4	—	7a	—
	Cool - 2	—	4	—	7a	—
	Cool - 3 Temp - 4	—	—	—	7a	—
	Warm - 5	—	—	—	7a	—
DEFROST *	Cool - 1	—	4	—	—	—
	Cool - 2	—	4	—	—	—
	Cool - 3 Temp - 4	—	—	—	—	—
	Warm - 5	—	—	—	—	—
VACUUM LINE COLOR CODE		WHITE	GREEN	YELLOW	BLUE (TOP)	RED (SIDE)

* COMPRESSOR CLUTCH ENGAGED WHEN AMBIENT CUT-OFF SWITCH IS CLOSED.

— NO VACUUM

K3441-2B2

FIG. 2 Air Flow—Mustang II, Pinto and Bobcat



L1984-2H

FIG. 3 Independent Case, Manual A/C-Heater System Assembly—Mustang II, Pinto and Bobcat

one inch to the right of the extreme left (cool) position. The water valve will be closed when the lever is in **either OFF or VENT** position regardless of the temperature lever setting.

Blower Switch and Resistor Assembly (See Figs. 3, 4 and 5)

The blower switch is located on the left side of the control assembly. The switch and a resistor assembly provide four blower speeds to control the amount of air flowing through the system. The switch cannot turn the blower off. The blower runs at all times except when the function lever is in the **OFF** position. The resistor assembly is located on the rear surface of the lower evaporator case assembly near the blower motor.

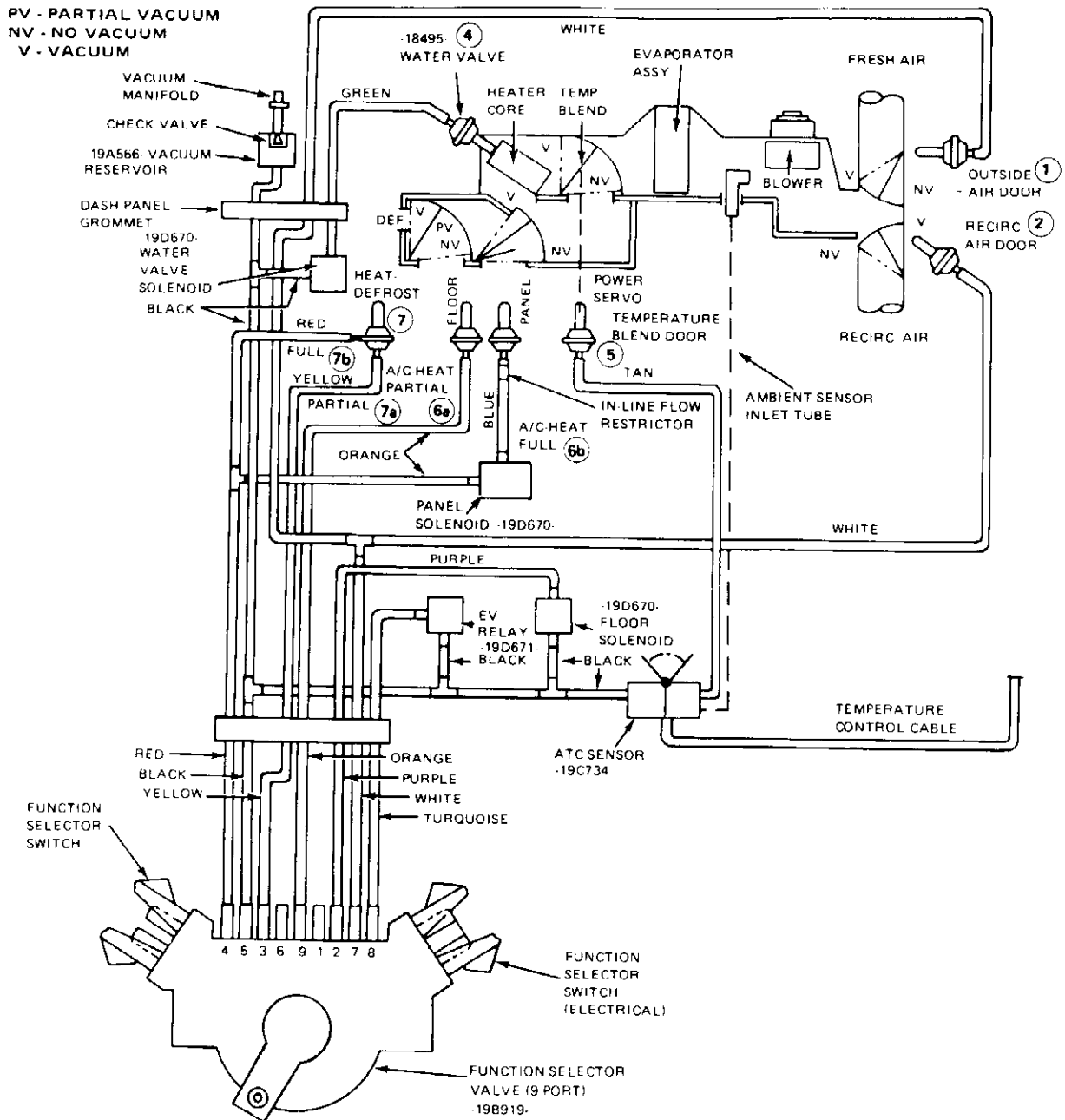
Water Valve

The water valve is located in the engine compartment in the heater core inlet water line near the dash panel.

FOR INFORMATION ON PINTO, BOBCAT AND MUSTANG II REFRIGERANT SYSTEMS, SEE PART 36-32

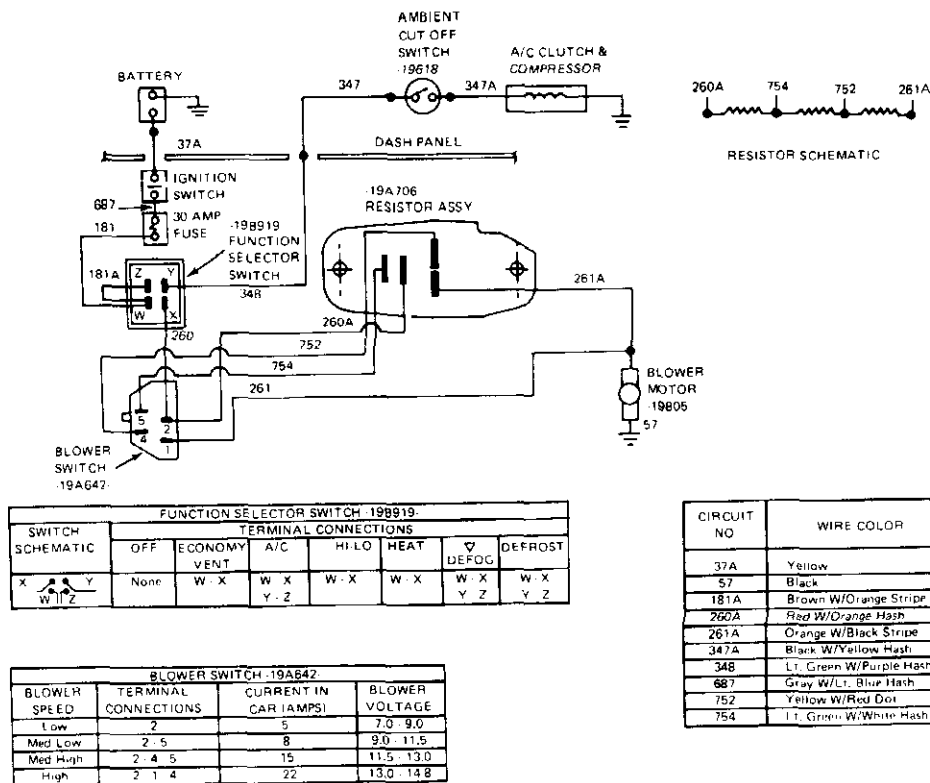
REFRIGERANT CHARGING VALVES

The two service access gauge port valves for charging the refrigerant system with Refrigerant-12 are located as shown in Figs. 6 through 10. A *third* service access gauge port valve is located on the combination valve to monitor the evaporator pressure.



PORT	FUNCTION	FUNCTION SELECTOR VALVE POSITIONS					HOSE COLOR
		OFF	ECONOMY VENT	AUTO	DEFOG	DEFROST	
1	No Function	Seal	Seal	Seal	Seal	Seal	-
2	Floor Solenoid	Seal	Seal	To 9	Seal	Seal	Purple
3	Heat/Def Partial	V	V	V	V		Yellow 7a
4	Heat/Def Full	V	V	V			Red 7b
5	Source Vacuum	V	V	V	V	V	Black
6	No Function	Seal	Seal	Seal	Seal	Seal	-
7	Outside-Recirc.	V		To 8			White 1-2
8	EV Relay	Seal	Seal	To 7	Seal	Seal	Turquoise
9	A/C-Heat Partial		V	To 2			Orange 6a

FIG. 4 Vacuum Diagram



K3444-2A

FIG. 5 Electrical Wiring Diagram—Mustang II, Pinto and Bobcat

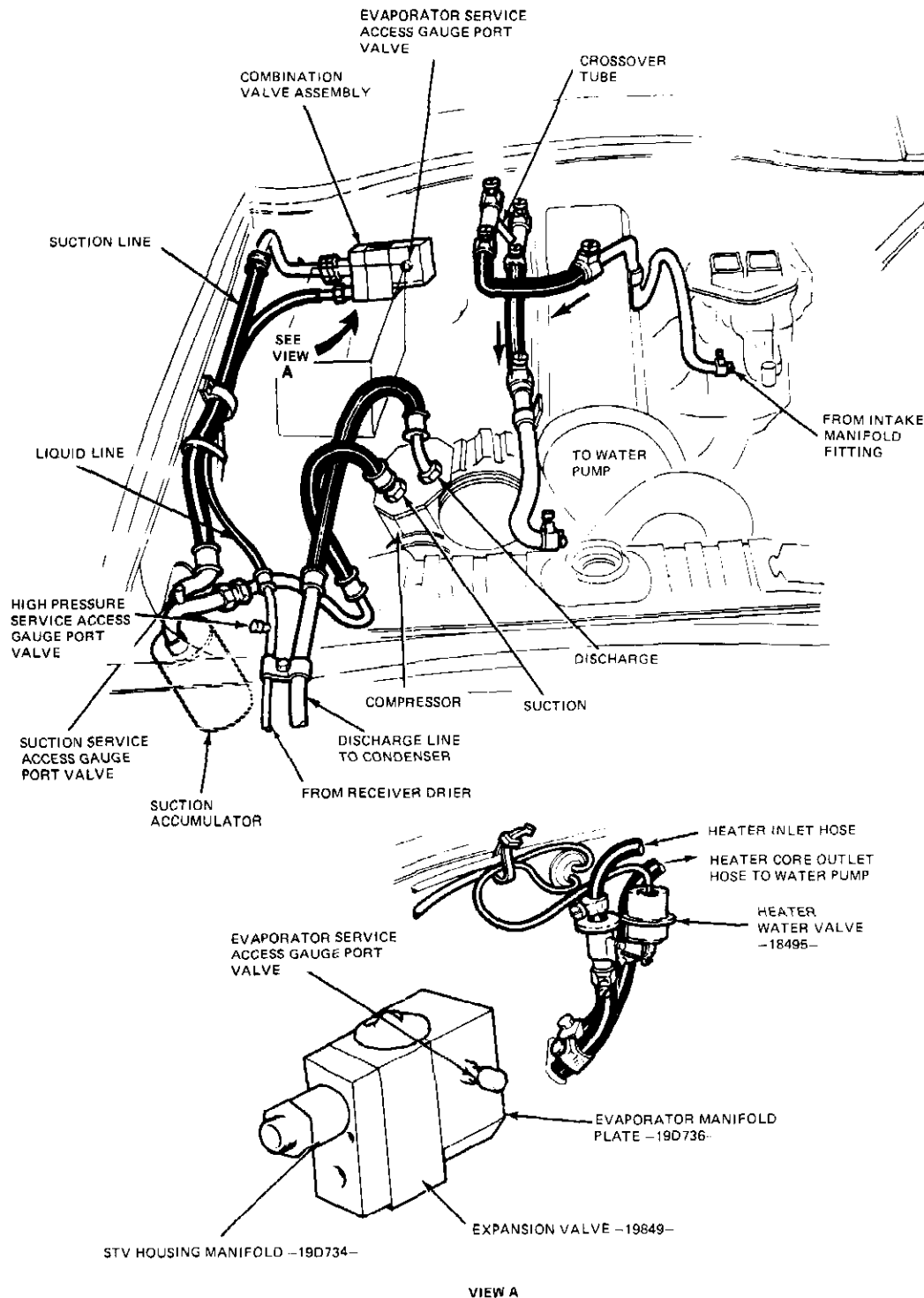
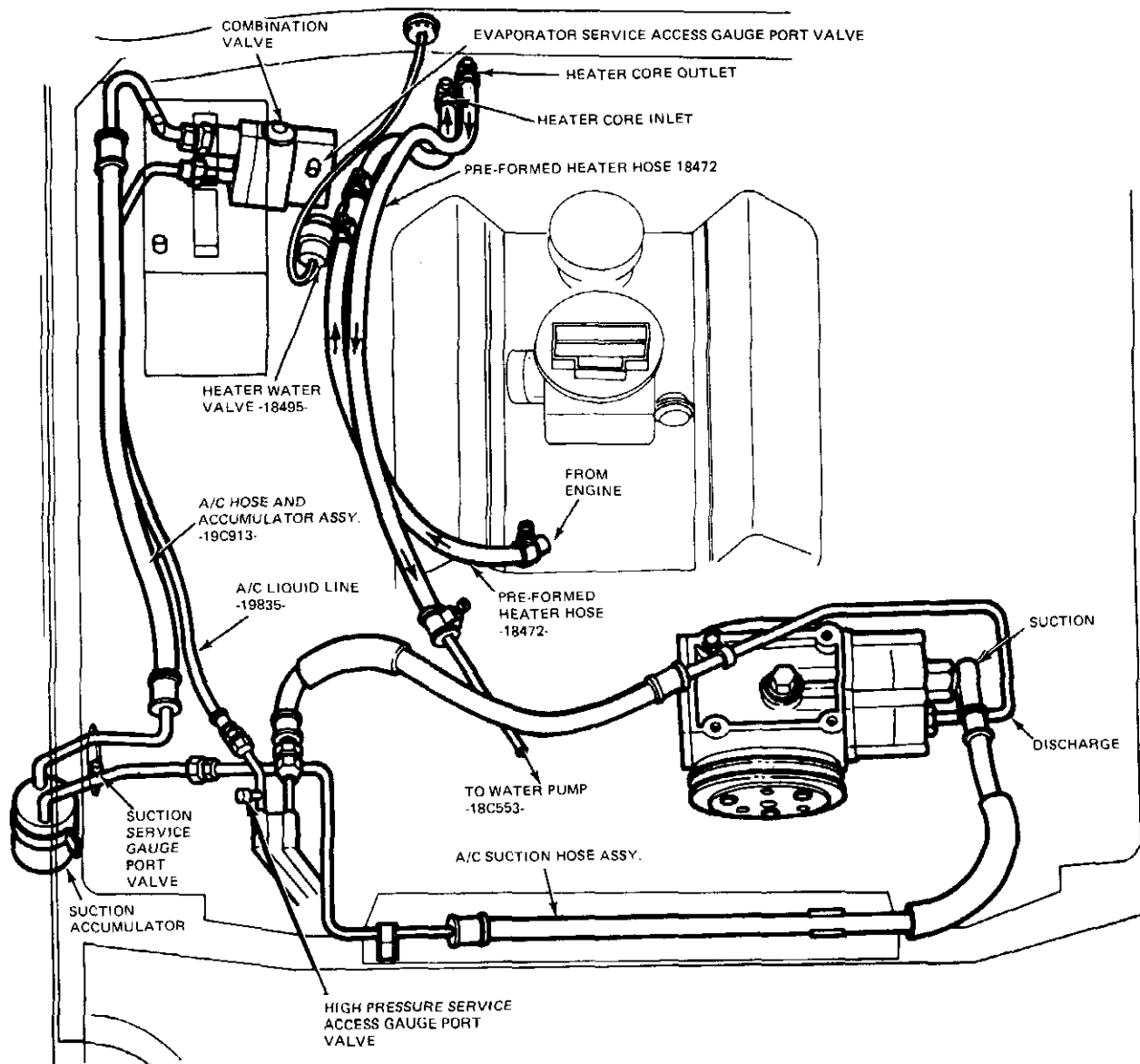


FIG. 6 Mustang II— A/C and Heater Hose Routings—2.3L Engines



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FIG. 7 Mustang II A/C and Heater Hose Routings—2.8L Engines

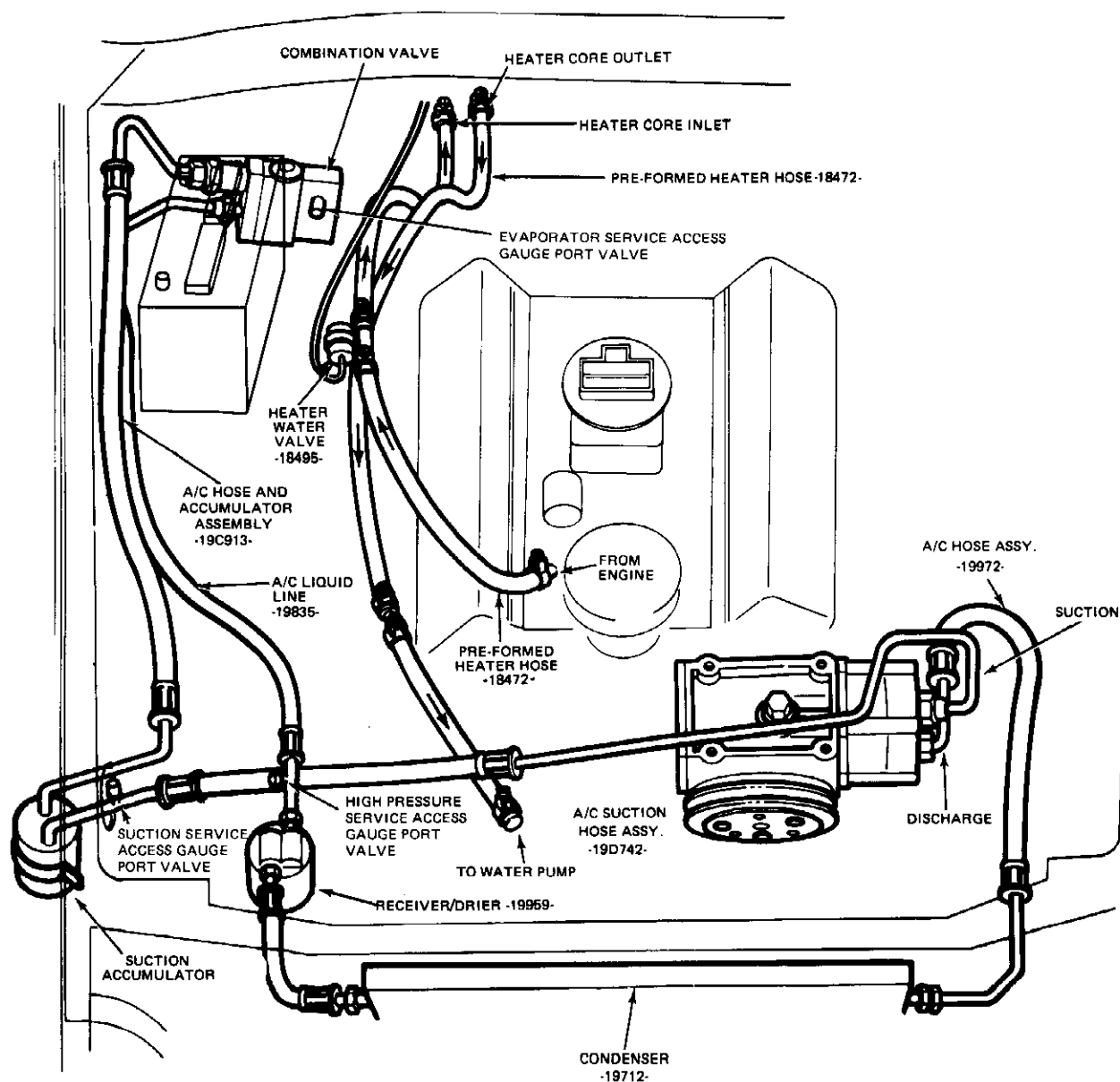
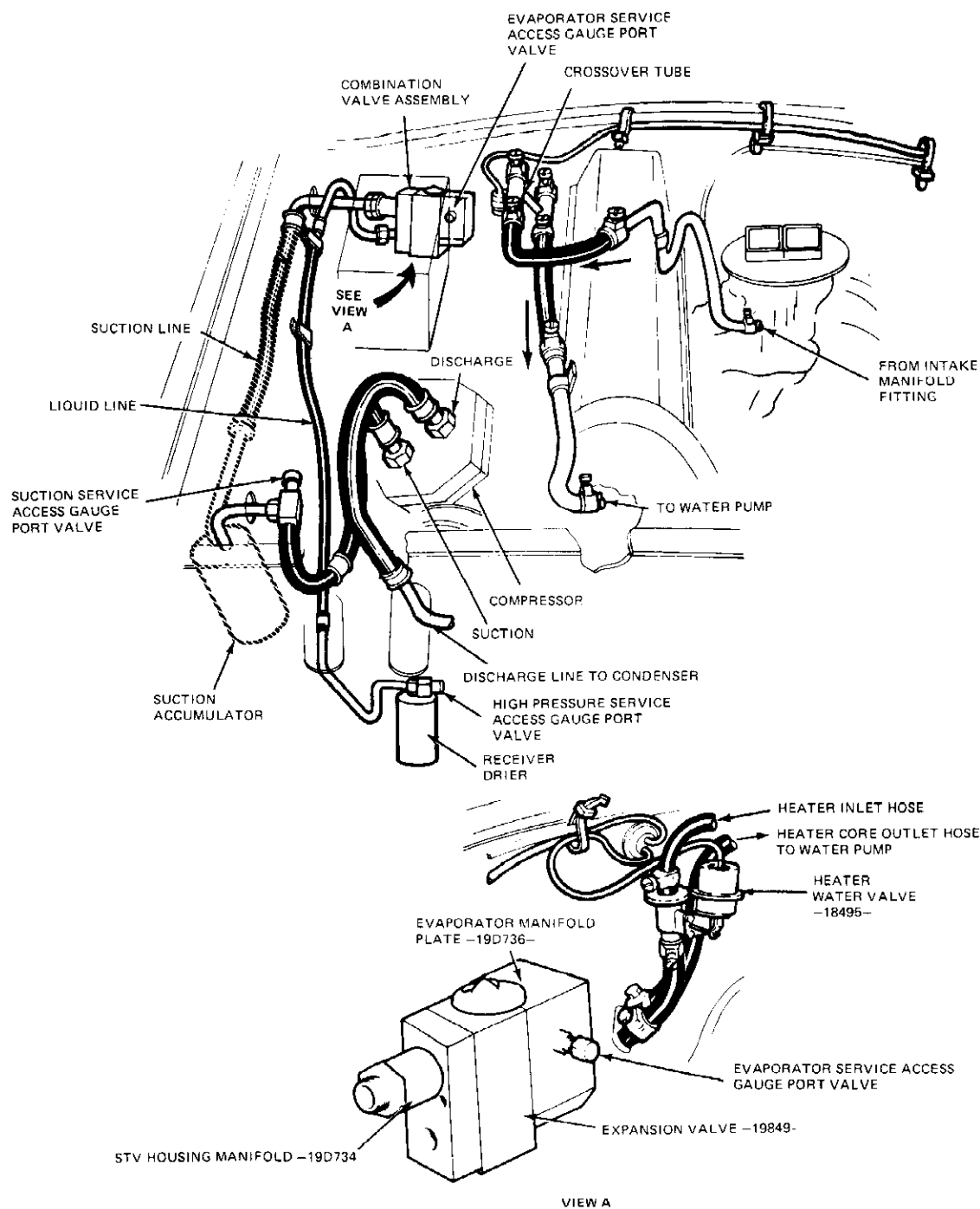


FIG. 8 Mustang II A/C and Heater Hose Routings—5.0L (302 CID) Engines



K3479-2B

FIG. 9 Pinto and Bobcat A/C and Heater Hose Routings—2.3L Engines

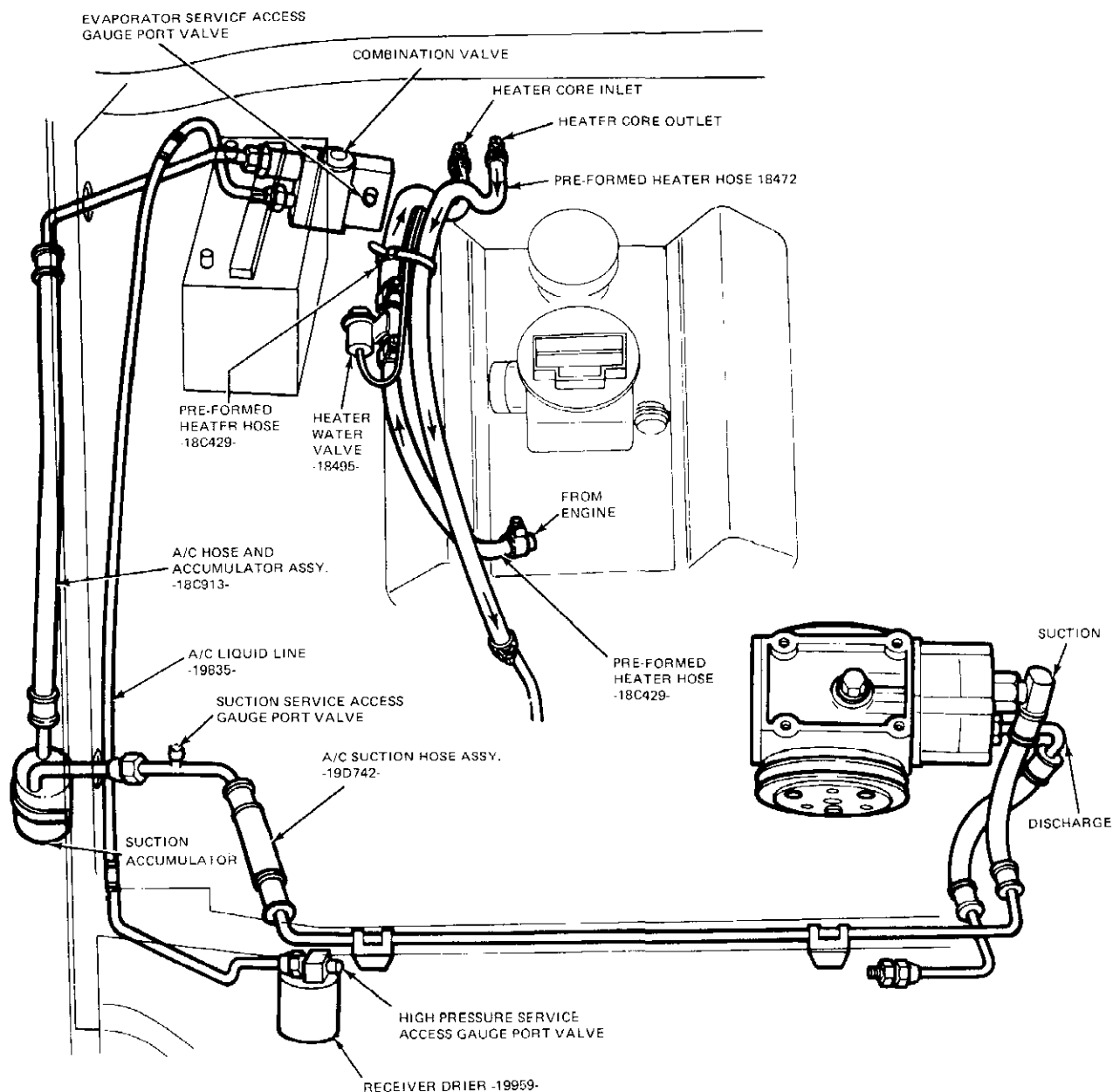
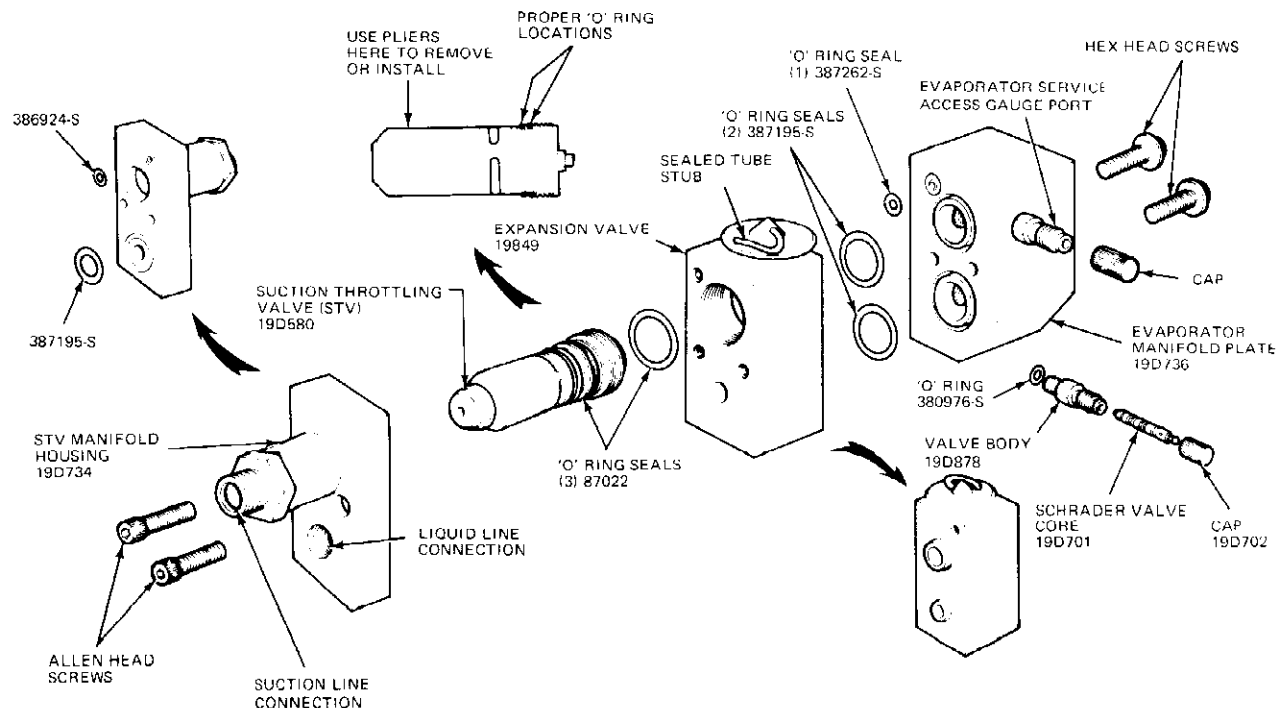


FIG. 10 Pinto and Bobcat A/C and Heater Hose Routings—2.8L Engines



K3481-2B

FIG. 11 Combination Valve—Disassembled View

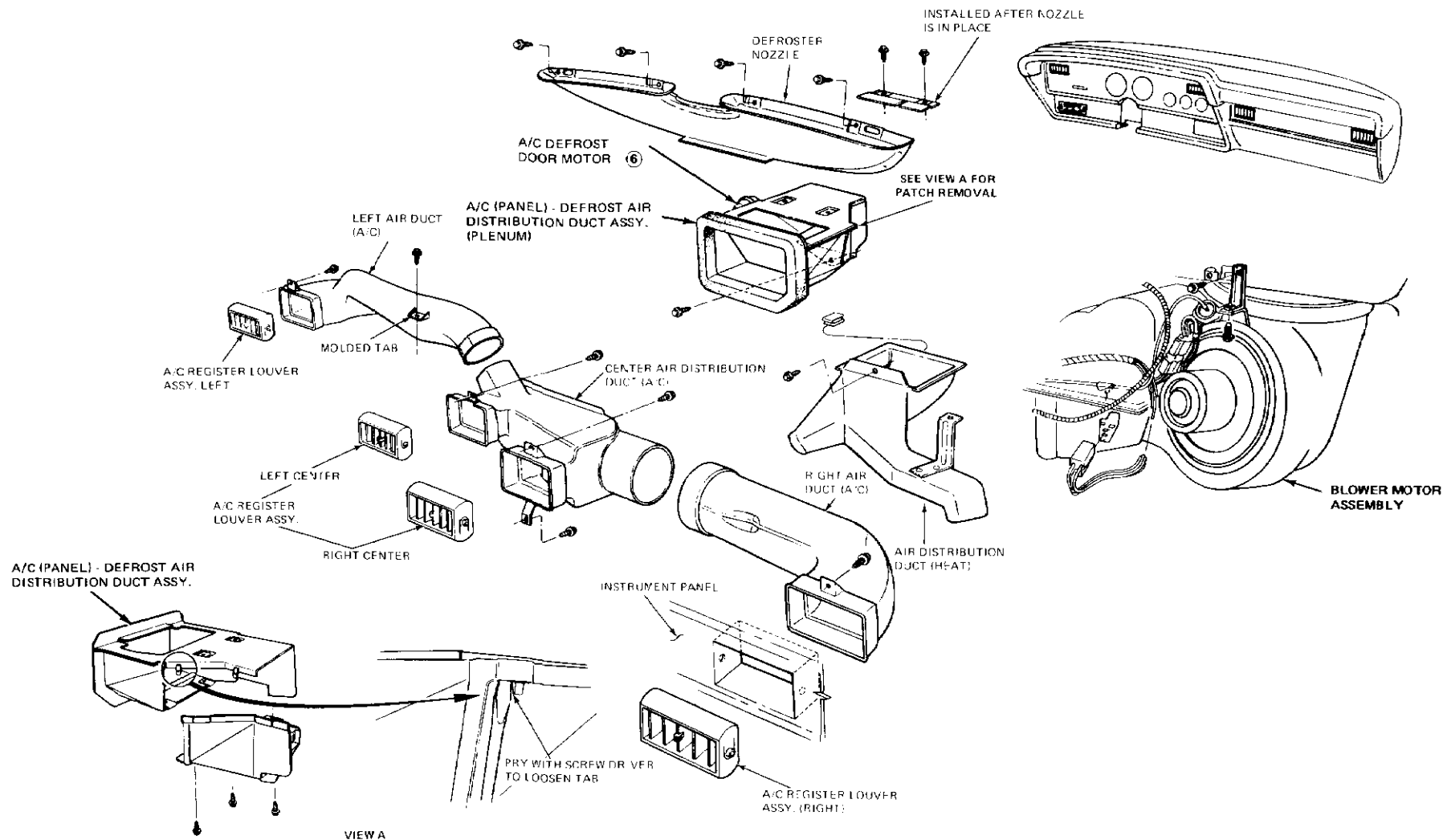


FIG. 12 Independent Case—Manual A/C-Heater System—Mustang II

REMOVAL AND INSTALLATION

COMBINATION VALVE ASSEMBLY (FIG. 11)

Observe the Safety Precautions outlined in Part 36-31.

Removal

1. Discharge the refrigerant system.
2. Remove the battery cables, battery and battery heat shield for access to the Combination Valve assembly.
3. Remove the (2) refrigerant lines from the STV Housing Manifold, using a back-up wrench on the STV Housing Manifold hex fitting (large diameter line), to prevent component damage.
4. Remove the (2) hex-head attaching bolts from the side of the Manifold Plate and remove the Expansion Valve and STV Housing Manifold from the Evaporator Manifold Plate.
5. Remove the (2) socket-head (Allen) screws attaching the STV Housing Manifold to the Expansion Valve body.
6. Separate the STV Housing Manifold from the Expansion Valve body.
7. Using curved jaw "channel lock" type pliers, grasp the STV body on the surface nearest the tapered end (opposite end from the slots). Unscrew in a counter-clockwise direction and remove the STV.
8. Remove the STV O-ring seal from the Expansion Valve body.

Installation

1. Lubricate and install (3) new O-rings, two on the STV to seal the STV Housing Manifold and one in the STV opening of the Expansion Valve body.
2. Thread the STV into the Expansion Valve body and tighten, hand tight, with curved jaw "channel lock" type pliers.

CAUTION: To prevent STV damage, grasp the body of the STV on the end nearest the taper, opposite from the slotted end.

3. Lubricate and install the two remaining O-rings in the STV Housing Manifold.
4. Place the STV Housing Manifold over the STV and position against the Expansion Valve body.
5. Install the (2) socket-head (Allen) screws and torque to 4-6 ft-lbs.
6. Lubricate and install (3) new O-rings on the Evaporator Manifold Plate.
7. Position the Expansion Valve and the STV Housing Manifold assembly on the Evaporator Manifold Plate. Install the (2) hex-head attaching bolts and torque to 4-8 ft-lbs.
8. Lubricate and install (2) new O-rings on the refrigerant line fittings.
9. Install the refrigerant lines, using a back-up wrench on the STV Housing Manifold hex fitting to prevent component damage.
10. Install the battery heat shield, battery and battery cables.
11. Evacuate, leak check and recharge the refrigerant system to specifications.

CONDENSER AND RECEIVER ASSEMBLY—MUSTANG II (SEE FIG. 14)

Observe the safety precautions outlined in Part 36-31.

1. Discharge the refrigerant system.
2. Remove the lower hood lock and vertical support brace.
3. Disconnect the ambient temperature switch wiring.
4. If equipped with power steering, remove the power steering cooler tube mounting screws from the radiator support and move the cooler up and outward away from the condenser. **DO NOT DISCONNECT THE LINES.**
5. Disconnect the liquid and discharge lines at the fittings.
6. Remove four condenser mounting screws and move the condenser upward out of the vehicle.
7. To install, reverse the preceding procedure. Install new O-rings in the refrigerant lines. Dip the O-rings in refrigerant oil before installing.
8. Evacuate and charge the system (Part 36-32).

CONDENSER AND RECEIVER ASSEMBLY—PINTO AND BOBCAT (SEE FIG. 14)

Observe the safety precautions outlined in Part 36-31.

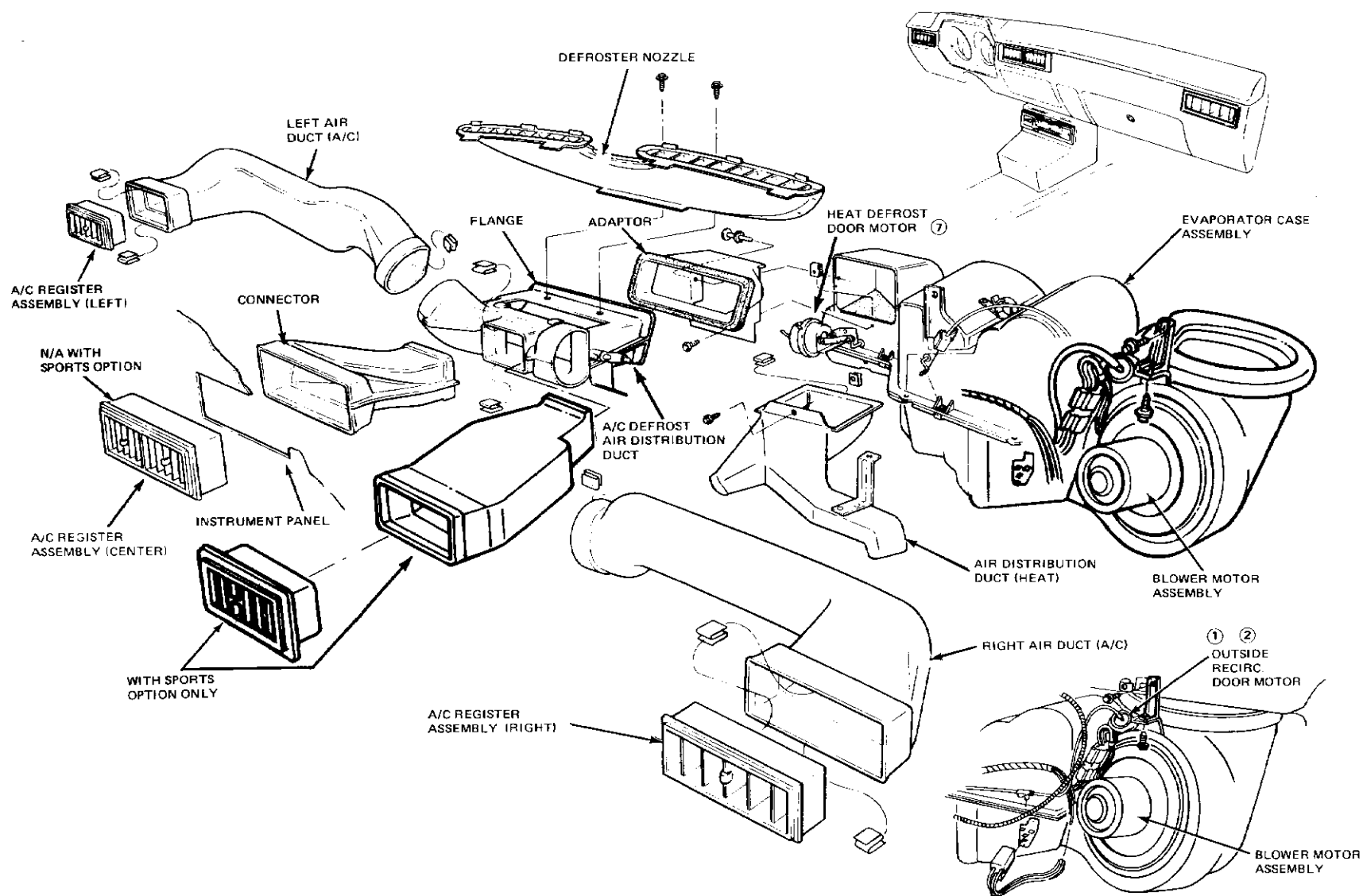
The condenser and receiver assembly is located forward of the radiator and mounted to the radiator support with four screws. It can be serviced by removing the lower hood latch bracket and sliding the assembly up through the opening forward of the radiator support.

CONTROL ASSEMBLY—MUSTANG II

1. Remove the two control head mounting screws from the rear of the instrument panel and one control support bracket screw from the lower lip of the instrument panel.
2. Lower the control assembly from the rear of the panel opening.
3. Remove the temperature control cable from the control head (one screw and one push nut).
4. Disconnect the vacuum harness from the two vacuum selectors.
5. Disconnect the electrical wiring connectors from the blower switch, clutch switch, and illumination bulb. Disconnect the wiring from the rear defogger switch and warning lamp, if so equipped.
6. Remove the control head.
7. To install, reverse the preceding procedure and adjust the temperature control cable at the evaporator case, as required.

CONTROL ASSEMBLY—PINTO AND BOBCAT

1. Remove the consolette trim cover.
2. Disconnect the temperature control cable from the evaporator case.
3. Remove two screws retaining the consolette to the support bracket and pull the consolette rearward.



L1920-2C

FIG. 13 Independent Case—Manual Integral A/C-Heater System—Pinto and Bobcat

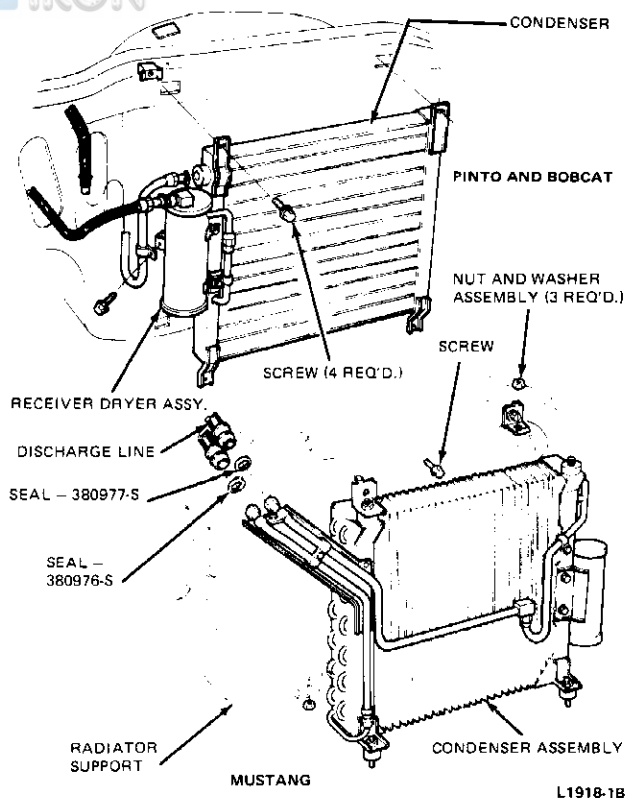


FIG. 14 Condenser Receiver Assembly

1. Remove two screws from the face of control assembly.
2. Pull the control assembly away from the console.
3. Disconnect the vacuum harness from the vacuum selector and water valve vacuum switch.
4. Disconnect the electrical wiring from the blower switch, clutch switch and illumination bulb wire.
5. Remove the control head assembly.

To install, reverse the procedure and adjust the temperature cable.

AIR DISTRIBUTION DUCTS—MUSTANG II (SEE FIG. 12)

Right Air Duct

1. Remove the glove box.
2. Remove the register louver assembly.
3. Remove the air duct to the instrument panel retaining screw at the register opening.
4. Disconnect the air duct from the A/C-Defrost plenum and remove the duct.
5. To install, reverse the procedure.

Left Air Duct

1. Remove the instrument cluster.
2. Remove the register louver assembly.
3. Remove the air duct to instrument panel retaining screws at the register opening and near the center air duct.
4. Rotate the duct and remove it through the cluster opening or from below the instrument panel.
5. To install, reverse the procedure.

Center Air Duct

1. Remove the two center register louver assemblies.
2. Remove the radio.
3. Remove the one retaining screw at the left center register louver opening and the two retaining screws at the right center register louver opening.
4. Disconnect the center air duct and remove from under the instrument panel.
5. To install, reverse the procedure.

Air Distribution Duct—Heat

1. Remove the heat duct bracket retaining screw.
2. Remove the heat duct to evaporator case assembly retaining screw and remove the heat duct.
3. To install, reverse the procedure.

AIR DISTRIBUTION DUCTS—PINTO AND BOBCAT (SEE FIG. 13)

Right Air Duct

1. Remove the glove box.
2. Remove the register assembly.
3. Disconnect right air duct from A/C-Defrost plenum and remove the duct.
4. To install, reverse the preceding procedure. **Make sure S-clips are positioned properly on each end of the duct as shown (Fig. 13).**

Left Air Duct

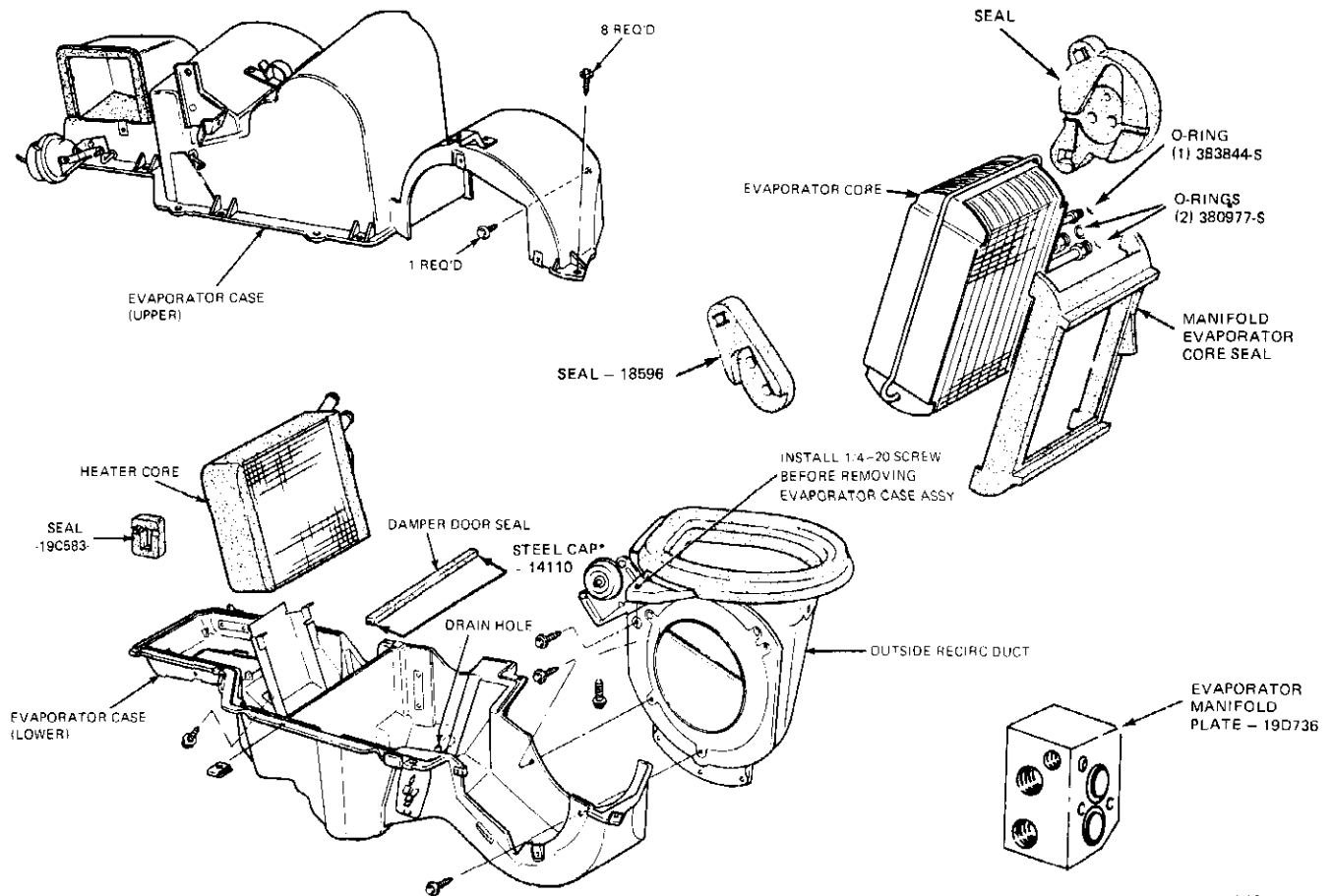
1. Remove the instrument cluster.
2. Remove the left register assembly.
3. Disconnect the left air duct from the A/C-Defrost plenum.
4. Rotate the duct and remove it through the cluster opening or below the instrument panel.
5. To install, reverse the preceding procedure. **Make sure the S-clips are positioned properly on each end of the duct as shown (Fig. 13).**

Center Air Duct

1. Remove the center register assembly.
2. Remove the console.
3. Remove the radio.
4. Disconnect the center air duct and remove the center air duct and connector from under the instrument panel.
5. To install, reverse the preceding procedure and make sure the S-clips are installed properly as shown (Fig. 13).

A/C-Defrost Plenum

1. Remove the right air duct and center duct.
2. Remove two A/C-Defrost plenum to speaker mounting bracket stud nuts.
3. Remove vacuum hose from the A/C-Defrost door vacuum motor.
4. Remove two (2) plenum to defroster nozzle mounting screws.
5. Move plenum rearward to separate it from the defroster nozzle and toward the right side to separate the plenum from left air duct S-clip.



L1922-2C

FIG. 15 A/C Evaporator Case Disassembled—Pinto, Bobcat and Mustang II

6. To install, reverse the preceding procedure and **make sure S-clips are installed properly as shown (Fig. 13).**

Air Distribution Duct—Heat

1. Remove the heat duct bracket retaining screw.
2. Remove the heat duct to evaporator case retaining screw and remove the heat duct.
3. To install, reverse the procedure.

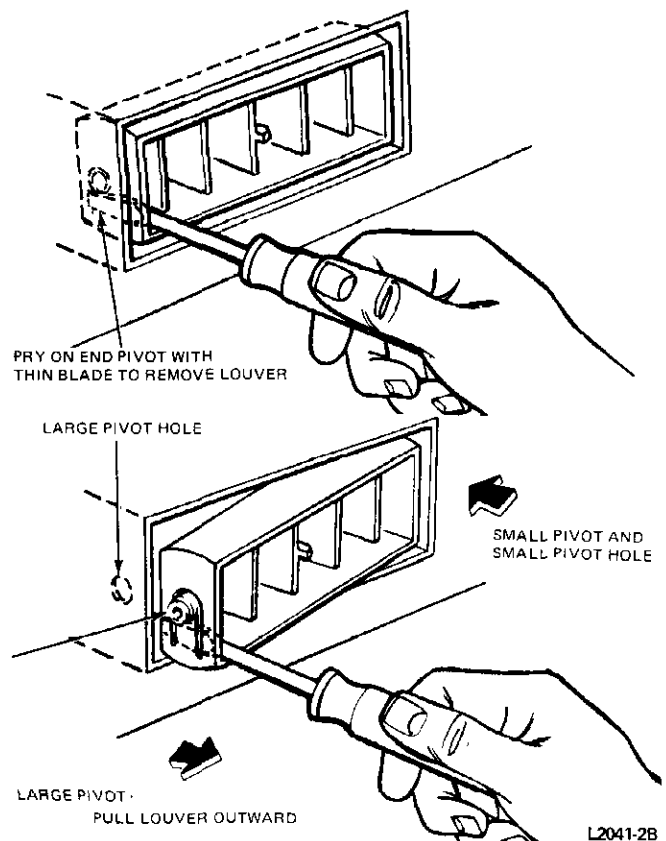
REGISTER LOUVERS

With reference to Fig. 16, pry on the end pivot with a thin blade to separate the pivot from the pivot hole and pull the barrel assembly rearward from the register housing.

DEFROSTER NOZZLE

Mustang II (See Fig. 12)

1. Remove the instrument panel crash pad.
2. Loosen the four instrument mounting bolts and move the panel assembly rearward.
3. Remove the two screws from the nozzle retaining plate on top of the plenum and remove the plate.
4. Remove the four nozzle to panel mounting screws.
5. Remove one plenum to case attaching screw to allow plenum to move rearward.
6. Remove the defroster nozzle upward through the crash pad opening.
7. To install, reverse the procedure.



L2041-2B

FIG. 16 Register Louver Removal

Pinto and Bobcat (See Fig. 13)

1. Remove the glove box.
2. Remove the A/C-Defrost plenum right and center air ducts.
3. Straighten the four defroster to instrument panel flange tabs, lower the nozzle toward the right and remove it from below the instrument panel.
4. To install, reverse the preceding procedure. Be sure that the access door is **securely closed to prevent air leakage**.

EVAPORATOR ASSEMBLY

Mustang II (Fig. 12)

Observe the safety precautions outlined in Part 36-31.

Removal

1. Disconnect the battery cables, remove the battery, drain the cooling system and discharge the refrigerant from the A/C system.
2. Remove the instrument panel pad assembly. Refer to Volume 4, Group 45—Part 61.
3. Remove the radio speaker assembly (if so equipped). Refer to Part 35-30.
4. Remove both "A" pillar mouldings.
5. Remove both side kick panel pad assemblies.
6. Remove the lower steering column cover (2 screws).
7. Remove the steering column-to-cowl panel shake brace (4 nuts).
8. Remove the accelerator pedal assembly and disconnect the (2) control cables.
9. Remove the bottom bolt retaining center shake brace to the instrument panel assembly.
10. Disconnect the antenna lead from the radio (if so equipped).
11. Disconnect (5) connectors at the left cowl panel.
12. Disconnect the wiper harness plug from the wiper switch.
13. Disconnect (5) connectors at the right cowl panel.
14. Disconnect the plug from the dimmer switch assembly.
15. Disconnect the heater blower motor resistor.
16. Disconnect temperature control cable. Remove two evaporator-to-upper cowl bracket screws.
17. Disconnect the main wiring harness (in the engine compartment) and then, push the harness into the passenger compartment.
18. Disconnect the (3) remaining connectors and push the connectors into the passenger compartment.
19. Disconnect the turn signal indicator switch assembly.
20. Drop the steering column assembly (4) nuts.
21. Disconnect the multiple connector(s) at the ignition switch.
22. Disconnect the plug at the stoplight switch assembly.
23. Remove the instrument panel-to-steering column center support bracket (1 bolt) and remove the bracket.

24. Remove (4) instrument panel retaining bolts and remove the instrument panel.
25. Disconnect the heater hoses from the heater core tubes in the engine compartment.
26. Remove the two hex head screws attaching the evaporator manifold plate to the expansion valve body.
27. Separate the expansion valve body and the STV housing manifold from the evaporator manifold plate.
28. Remove (4) nuts retaining the evaporator to the dash panel and remove the evaporator assembly.
29. Remove the defroster and A/C duct assembly (5 screws).
30. Remove the mounting brackets from the evaporator case assembly and place on work bench.
31. Remove blower motor, wheel and recirc. duct.
32. Remove (11) screws from the evaporator case, separate the case and remove the evaporator core assembly.

Installation

1. Position the evaporator core to the evaporator case making sure the damper door seal and steel cap are in position (Fig. 15), and install the (11) attaching screws, blower motor and recirc. duct.
2. Install the mounting brackets to the evaporator case assembly (2 bolts).
3. Install the defroster and A/C duct assembly (5 screws). Attach temperature control cable.
4. Install the heater assembly to the dash panel and install the (4) retaining nuts. Install two evaporator-to-upper cowl bracket screws.
5. Insert new, freshly lubricated O-rings on the openings between the evaporator manifold plate and the expansion valve and STV housing manifold assembly.
6. Position the expansion valve body on the evaporator manifold plate and install the two hex-head attaching screws. Tighten the screws to 4-8 ft-lbs torque.
7. Connect the heater hoses to the heater core tubes.
8. Install the instrument panel to the dash panel (4 bolts).
9. Install the instrument panel-to-steering column center support bracket (1 bolt).
10. Connect the plug to the stoplight switch assembly.
11. Connect the multiple connector(s) to the ignition switch.
12. Place the steering column into position and install the (4) retaining nuts.
13. Connect the turn signal indicator switch to the connector plug.
14. Insert the (3) connectors and 14401 harness into the engine compartment, connect and install the attaching screw.
15. Connect the heater blower resistor.
16. Connect the dimmer switch plug.
17. Connect the (5) connectors at the right cowl panel.
18. Connect the wiper harness plug to the wiper switch assembly.

19. Connect the (5) connectors at the left cowl panel.
20. Connect the radio antenna lead to the radio (if so equipped).
21. Install the bottom bolt-center shake brace-to-instrument panel.
22. Connect the accelerator control cables (2) and install the accelerator pedal assembly.
23. Install the steering column-to-cowl panel shake brace (4 nuts).
24. Install the lower steering column cover (2 screws).
25. Install the left and right side kick panel pad assemblies.
26. Install the left and right "A" pillar mouldings.
27. Install the radio speaker assembly (if so equipped).
28. Install the instrument cluster and cluster finish panel.
29. Install the instrument panel pad assembly.
30. Install the battery, fill the cooling system and charge the refrigerant system (Part 36-32).

Pinto and Bobcat (Fig. 12)

Observe the safety precautions outlined in Part 36-31.

1. Drain the engine coolant, discharge the refrigerant from the A/C system and disconnect the battery.
2. Remove the two hex head screws attaching the evaporator manifold plate to the expansion valve body.
3. Separate the expansion valve body and the STV housing manifold from the evaporator manifold plate. **NOTE:** On reassembly, use new, freshly lubricated O-rings between the expansion valve body and the evaporator manifold plate. Torque the attaching screws to 4-8 ft-lbs.
4. Disconnect the two heater hoses from the core tubes in the engine compartment.
5. Remove the glove box.
6. Disconnect the vacuum hoses from the evaporator case with reference to Fig. 8 or 9.
7. Disconnect the temperature control cable from the blend door crank arm.
8. Remove the heat distribution duct.
9. On the Pinto and Bobcat, to remove the A/C defrost plenum, remove adapter duct.
10. Remove the blower motor and wheel from the blower scroll.
11. Install one 1/4-20 hex-washer head screw to the mounting tab on the inlet duct to upper cowl bracket to hold the duct in place.

NOTE: Leave this screw in place when installing the case assembly.

12. Remove the three inlet duct to evaporator case attaching screws through blower scroll opening.
13. Remove one upper case to inlet duct attaching screw located under outside-recirc. motor mounting bracket.
14. Remove two evaporator to upper cowl bracket attaching screws.
15. Remove four evaporator to dash panel attaching nuts in engine compartment.

16. Rotate the evaporator assembly down and away from dash panel and out from under the instrument panel.
17. To install, reverse the above procedure. Make sure to follow the note on installation in Steps 3 and 12. Evacuate and charge the refrigerant system (Part 36-32). Observe the Safety Precautions outlined in Part 36-31.

EVAPORATOR AND HEATER CORES (SEE FIG. 15)

Observe the Safety Precautions outlined in Part 36-31.

1. Remove the evaporator case assembly from the vehicle.
2. Remove nine upper to lower case attaching screws.
3. Remove the blower motor and wheel (Fig. 17).
5. Remove the rubber seal from heater core tubes.
6. Remove the upper half of the evaporator case.
7. Move the rubber seal on the evaporator core forward to clear case mounting stud and pull core out of lower case.
8. Remove the air deflector mounting screw on lower case to left of heater core, remove the deflector and remove the heater core.
9. Remove the rubber gaskets from the core.
10. Remove the evaporator manifold plate from the evaporator core tubes.
11. Remove the rubber and urethane seals from the core tubes and the rubber core seal from the right side of the core.
12. To install, reverse the preceding procedure. **Be sure to install new rope sealer around the flange of the lower case before installing the upper half of the case. Install new O-rings on the evaporator manifold plate. Always dip O-rings in refrigerant oil before installation.**
13. Evacuate and charge the refrigerant system with Refrigerant 12 following the procedure in Part 36-32.

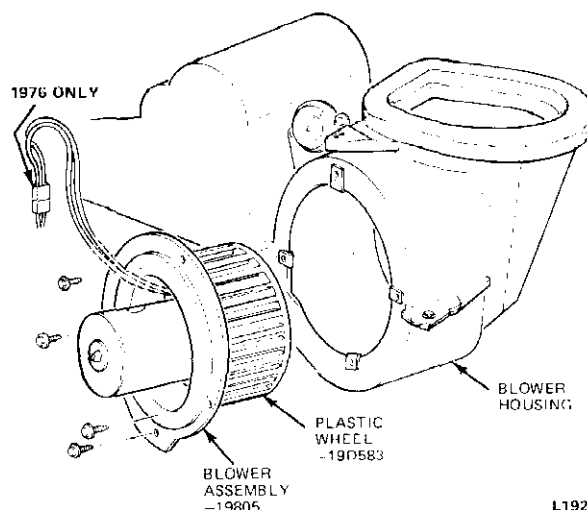


FIG. 17 Blower Motor and Wheel

BLOWER MOTOR AND WHEEL

The blower motor and wheel is integrally located within the scroll portion of the evaporator assembly on the right side of the evaporator case. To remove the blower motor and wheel, remove the glove box and remove the four screws retaining the blower motor and wheel in the blower scroll (Fig. 16). NOTE: It may be necessary to remove the bolt securing the instrument panel to the right side cowl and pull the instrument panel rearward in the vehicle to obtain clearance for blower motor removal.

VACUUM MOTORS

1. The outside-recirc. door vacuum motor is accessible for service by removing the glove box.
2. The A/C-defrost door motor and Heat-Defrost door motor can be serviced from under the instrument panel.
3. The vacuum controlled water valve in the engine compartment near the dash panel can be serviced as an assembly.

SPECIFICATIONS

MUSTANG, BOBCAT AND PINTO HEATER-A/C

Protective Device	— 30 Amp Fuse in Fuse Panel
Control Illumination	— One 1 CP 161 Bulb
Blower Motor Current Draw @ 12.8 Volts	— 25 Amps (Maximum)
Compressor Drive Ratio	— 42:1
Refrigerant Charge — Refrigerant 12	
Mustang	— 3-1/4 lbs. (+ 1/4; — 0)
Pinto and Bobcat	— 2-1/4 lbs. (+ 1/4; — 0)
Clutch Current Draw	— 3.75 Amps (Maximum)
Ambient Temperature Switch	— 35°F Minimum Cut-Out 50°F Maximum Cut-In

CL1775-1C

SERVICE COMPONENTS

Eight component packages have been made up for servicing the combination valve assembly.

1. Evaporator Manifold Plate—19D736. Packaged with six O-rings as follows:
 - 1 — O-ring — 387262-S
 - 2 — O-rings — 387195-S
 - 1 — O-ring — 380976-S
 - 1 — O-ring — 38977-S
 - 1 — O-ring — 383844-S
2. A/C Charging Valve Body—19D878. Packaged with 1 O-ring — 380976-S.

3. Schrader Valve—19D701.
4. Cap A/C Charging — 19D702.
5. Expansion Valve — 19849. Packaged with eight O-rings as follows:
 - 3 — O-rings — 87022-S91.
 - 3 — O-rings — 387195-S
 - 1 — O-ring — 386924-S
 - 1 — O-ring — 387262-S
6. STV Valve — 19D580. Packaged with five O-rings as follows:
 - 3 — O-rings — 87022-S91
 - 1 — O-ring — 386924-S
 - 1 — O-ring — 387195-S
7. STV Housing Manifold — 19D734. Packaged with four O-rings as follows:
 - 2 — O-rings — 87022-S91
 - 1 — O-ring — 386924-S
 - 1 — O-ring — 387195-S
8. Seal Kit — 19D881. Contains nine O-rings as follows:
 - 3 — O-rings — 87022-S91
 - 2 — O-rings — 386924-S
 - 3 — O-rings — 387195-S
 - 1 — O-ring — 387262-S

Assembly Bolts Required:

- 2 hex head screws — 56710-S2—1/4 x 20 x 2-1/4 inches;
- 2 socket head screws — 302202-S2—1/4x20x1 inch.

LTD II, Cougar and Thunderbird Manual A/C—Heater System

PART
36-45

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION	45-1	SYSTEM COMPONENTS (Cont'd.)	
OPERATION		Vacuum Motors	45-6
System Air Flow	45-2	Water Valve	45-4
SYSTEM COMPONENTS		REMOVAL AND INSTALLATION	
Blower Motor Housing Assembly	35-5	Air Distribution Ducts	45-9
Blower Resistor Assembly	45-5	Ambient Temperature Cut-Off Switch	45-9
Blower Switch	45-4	Blower Motor and Wheel Assembly	45-9
Compressor and Clutch Assembly	45-6	Condenser	45-10
Condenser and Receiver Assembly	45-6	Control Assembly	45-7
Controls	45-4	Defroster Nozzles	45-9
Defroster Nozzles	45-6	Evaporator Case and Core	45-8
Electrical System	45-6	Heater Core	45-8
Evaporator Case Assembly	45-5	Plenum Assembly	45-9
Plenum Chamber and Air Distribution Ducts ..	45-5	Temperature Control Cable Adjustment	45-10
Pressure Relief Valve	45-6	SPECIFICATIONS	45-11
Refrigerant Charging Valves	45-6		

CL2349-28

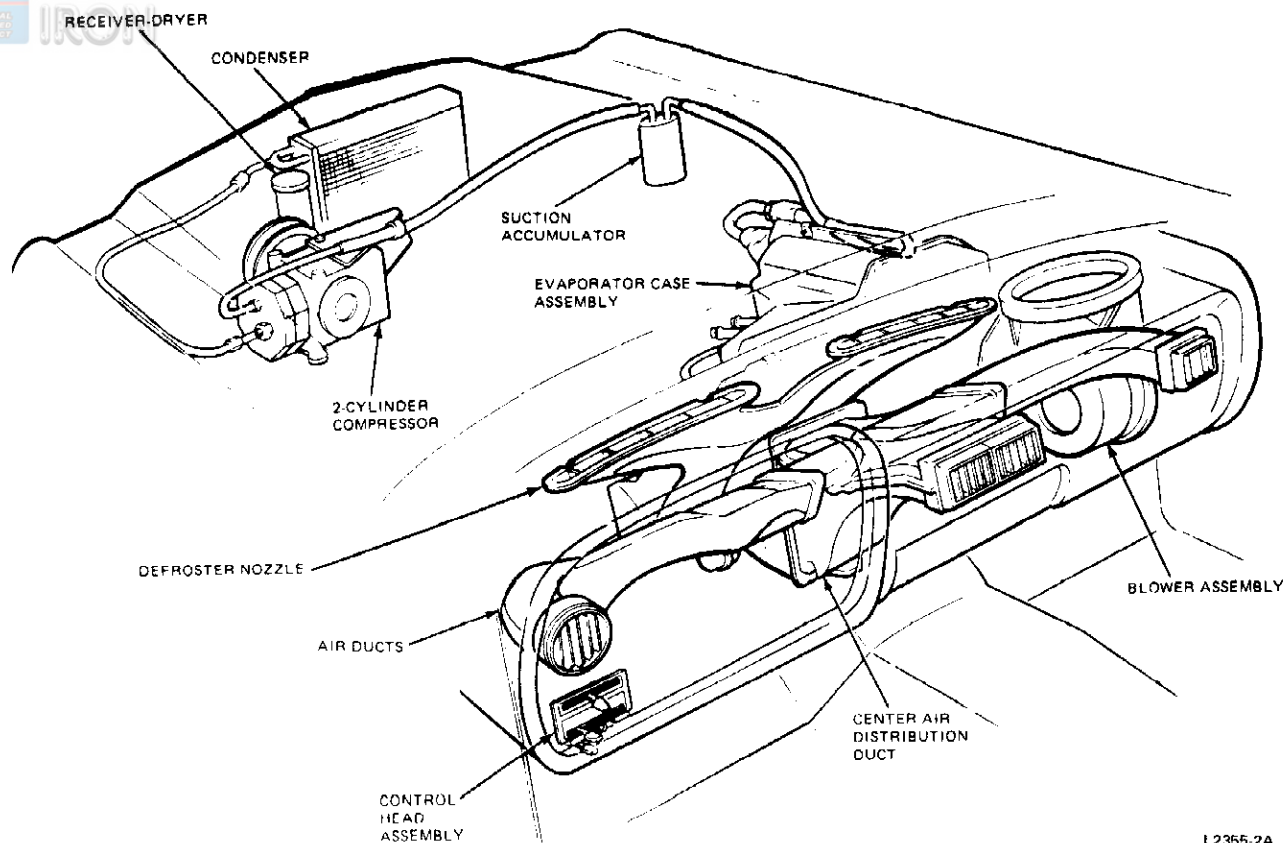
DESCRIPTION

The LTD II, Cougar and Thunderbird manual air conditioning and heating system is an integral system receiving outside air directly from the cowl air intake, or recirculated air through the grilled opening of the recirc duct located on the blower housing. This system features a "High Airflow" plenum for greater air output.

The control assembly is located at the lower left side of the instrument panel to the left of the steering column. Two horizontal levers in the control assembly control air distribution and temperature. A four position blower switch below the control levers and a resistor assembly on the evaporator assembly provides four

blower speeds to control air quantity. The A/C compressor clutch is engaged through an ambient temperature switch in all function lever positions except OFF, ECONOMY-VENT, HI-LO and HEAT in all fan switch positions.

Four panel registers of various styling configurations are utilized. The left outboard register is a louvered ball type design. The center and right outboard registers have an adjustable set of louvers contained in a pivoting housing to control air distribution. The louvers can be adjusted to a shut off position in each register. See Fig. 1.



L2365-2A

FIG. 1 A/C System Installation—LTD II, Thunderbird, Cougar

OPERATION

Air is drawn directly into the system by the blower motor and wheel from the cowl air intake independent of the temperature lever position in all control settings except OFF and A/C. In the A/C position air flow is through the grilled opening in the recirc duct when the temperature lever is in the COOL position. When the temperature control lever is moved away from the COOL position, approximately 1.0 inch, the outside-recirc air door moves from recirc to outside air position.

The water valve is closed (no hot water to heater core) independent of temperature lever position in the OFF and ECONOMY-VENT control settings. In all other control settings, the water valve is opened when the temperature control lever is moved away from the COOL position approximately 1/2 inch.

After being drawn either from the outside through the cowl air intake or from inside the vehicle through the opening in the recirc duct, the air is forced through the evaporator core. Depending upon the setting of the temperature blend door, the air is then forced through and/or around the heater core and into the plenum. The air then moves to the distribution ducts and to the registers, defroster nozzles, or floor duct depending on the function control lever setting. The temperature blend door is operated by a control cable connected to the temperature (upper) lever of the control assembly.

SYSTEM AIR FLOW

Fig. 2 shows the system air flow schematics with door positions and vacuum motor requirements for each

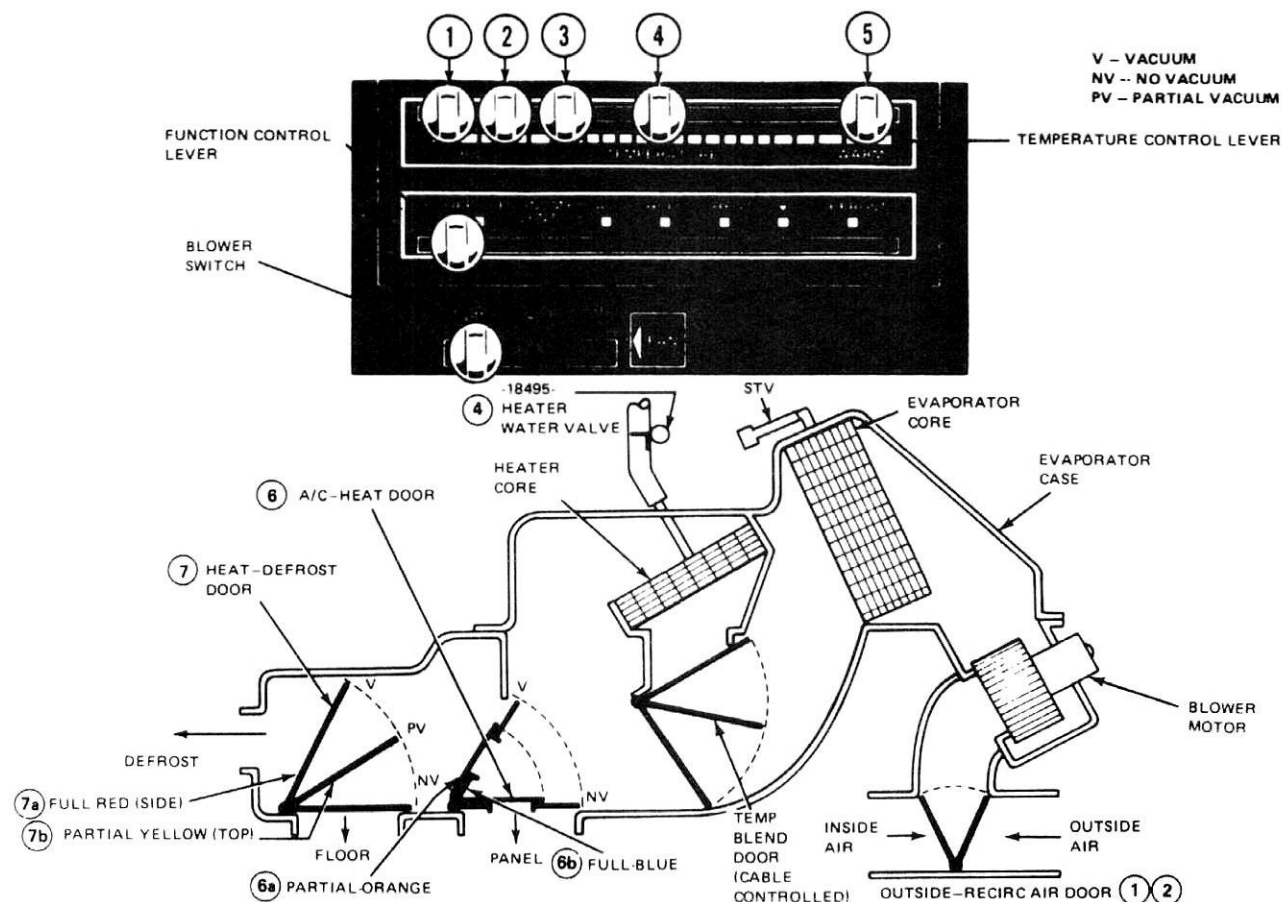
control setting. Also refer to Fig. 3 for information on vacuum hose routing.

In OFF position, the outside-recirc air door is in the recirc position (vacuum), the water valve is closed (vacuum) and no air passes through the system. The blower is "ON" in all positions except OFF position.

In ECONOMY-VENT position, the outside-recirc door is in the outside position (no vacuum), the water valve is closed (vacuum), the A/C-Heat doors are open (vacuum to both doors) and air is discharged through the panel registers. Move the temperature control lever to COOL position for maximum ventilation through the panel registers. The A/C compressor does not operate in ECONOMY-VENT position.

In A/C position, the A/C-Heat doors are positioned the same as ECONOMY-VENT. When the temperature control lever is in the COOL position, the outside-recirc door is in the recirculating air position (vacuum). Maximum A/C performance is obtained in this position. In the A/C position, all air comes out the panel registers except for a slight floor bleed.

In HI-LO position, the partial A/C-Heat door in the plenum chamber is open (vacuum), the heat-defrost door is in the heat position (full vacuum), and air is discharged through the panel registers and also through the floor duct to the floor area. Air flow through the heater core is controlled by the setting of the temperature blend door that controls the warm and cool air as it enters the plenum chamber. The compressor is inoperative.

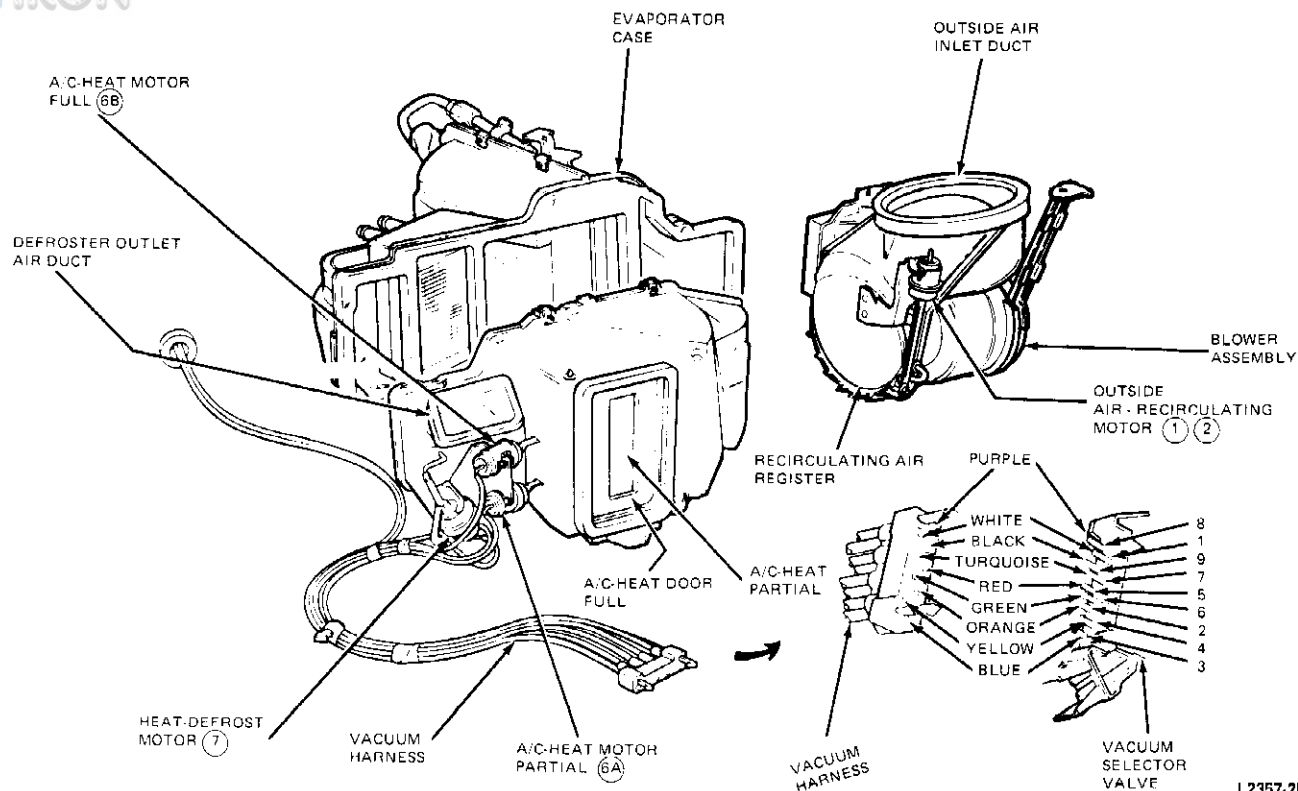


LTD II, COUGAR AND THUNDERBIRD MANUAL A/C-HEATER SYSTEM VACUUM MOTOR TEST CHART							
FUNCTION CONTROL LEVER POSITION	TEMPERATURE CONTROL LEVER POSITION	VACUUM MOTORS APPLIED WITH VACUUM					
		OUTSIDE- RECIRC.	WATER VALVE	A/C-HEAT		HEAT-DEFROST	
				PARTIAL	FULL	PARTIAL	FULL
OFF	Any Position	1 - 2	4	-	-	7a	7b
ECONOMY VENT	Any Position	-	4	6a	6b	7a	7b
A/C *	Cool - 1	1 - 2	4	6a	6b	7a	7b
	Cool - 2	1 - 2	-	6a	6b	7a	7b
	Cool - 3 Temp - 4	-	-	6a	6b	7a	7b
	Warm - 5	-	-	6a	-	7a	7b
HI - LO	Cool - 1	-	4	6a	-	7a	7b
	Cool - 2	-	-	6a	-	7a	7b
	Cool - 3 Temp - 4	-	-	6a	-	7a	7b
	Warm - 5	-	-	6a	-	7a	7b
HEAT	Cool - 1	-	4	-	-	7a	7b
	Cool - 2	-	-	-	-	7a	7b
	Cool - 3 Temp - 4	-	-	-	-	7a	7b
	Warm - 5	-	-	-	-	7a	7b
▽ (DEFOG) *	Cool - 1	-	4	-	-	7a	-
	Cool - 2	-	-	-	-	7a	-
	Cool - 3 Temp - 4	-	-	-	-	7a	-
	Warm - 5	-	-	-	-	7a	-
DEFROST *	Cool - 1	-	4	-	-	-	-
	Cool - 2	-	-	-	-	-	-
	Cool - 3 Temp - 4	-	-	-	-	-	-
	Warm - 5	-	-	-	-	-	-
VACUUM LINE COLOR CODE		WHITE	GREEN	ORANGE	BLUE	YELLOW (TOP)	RED (SIDE)

* COMPRESSOR CLUTCH ENGAGED WHEN AMBIENT CUT-OFF SWITCH IS CLOSED.
- NO VACUUM

L2356-28

FIG. 2 Manual A/C-Heater System Air Flow Schematic and Vacuum Control Chart—LTD II, Cougar and Thunderbird



L2357-2B

FIG. 3 Manual A/C Vacuum System Locations

In **HEAT** position, the A/C-Heat doors restrict air to the registers (no vacuum), the heat-defrost door is in the heat position (full vacuum) and the air is discharged through the plenum floor duct to the floor with some defrost bleed. The compressor is inoperative.

In **DEFOG** position (), the heat-defrost door is in the mid-position (partial vacuum) and the air is discharged through the defrosters and plenum floor duct. The compressor operates in this position to assist in reducing window fogging by dehumidifying the incoming air.

In **DEFROST** position, the heat-defrost door is in defrost position (no vacuum) and air is discharged through the defrosters with some bleed air to the floor. The compressor operates in this position also to reduce the humidity of the incoming air.

A four position blower switch and resistor assembly provides four blower speeds to control air volume. The master blower switch is mounted on the control head assembly 9-port vacuum selector and is energized when the function control lever is in all positions except OFF. Refer to Electrical Diagram, Fig. 4.

SYSTEM COMPONENTS

CONTROLS

The Temperature and Function control levers operate all vacuum motors and doors.

FUNCTION CONTROL LEVER (BOTTOM)

The function control lever actuates a 9-port vacuum selector that controls vacuum motors at the A/C-Heat and heat-defrost doors and also controls the A/C clutch and blower switches. Selection of **ECONOMY-VENT**, **HI-LO**, **HEAT**, **DEFOG**, **DEFROST** will also activate the outside-recirc door to the outside air position regardless of the temperature lever position.

Clutch operation is dependent upon an ambient temperature cut-off switch (Fig. 5) and the function lever position. The clutch will be off only when the lever is in the **OFF**, **ECONOMY-VENT**, **HI-LO**, or **HEAT** position and/or the ambient temperature cut-off switch opens at 35°F and closes at 50°F with a minimum differential of 3°F between opening and closing temperatures.

The blower motor runs at all times except when the function control lever is in the **OFF** position. A separate four position, four speed blower motor switch is used to regulate the volume of airflow and cannot turn the blower off (Fig. 4).

TEMPERATURE LEVER (TOP)

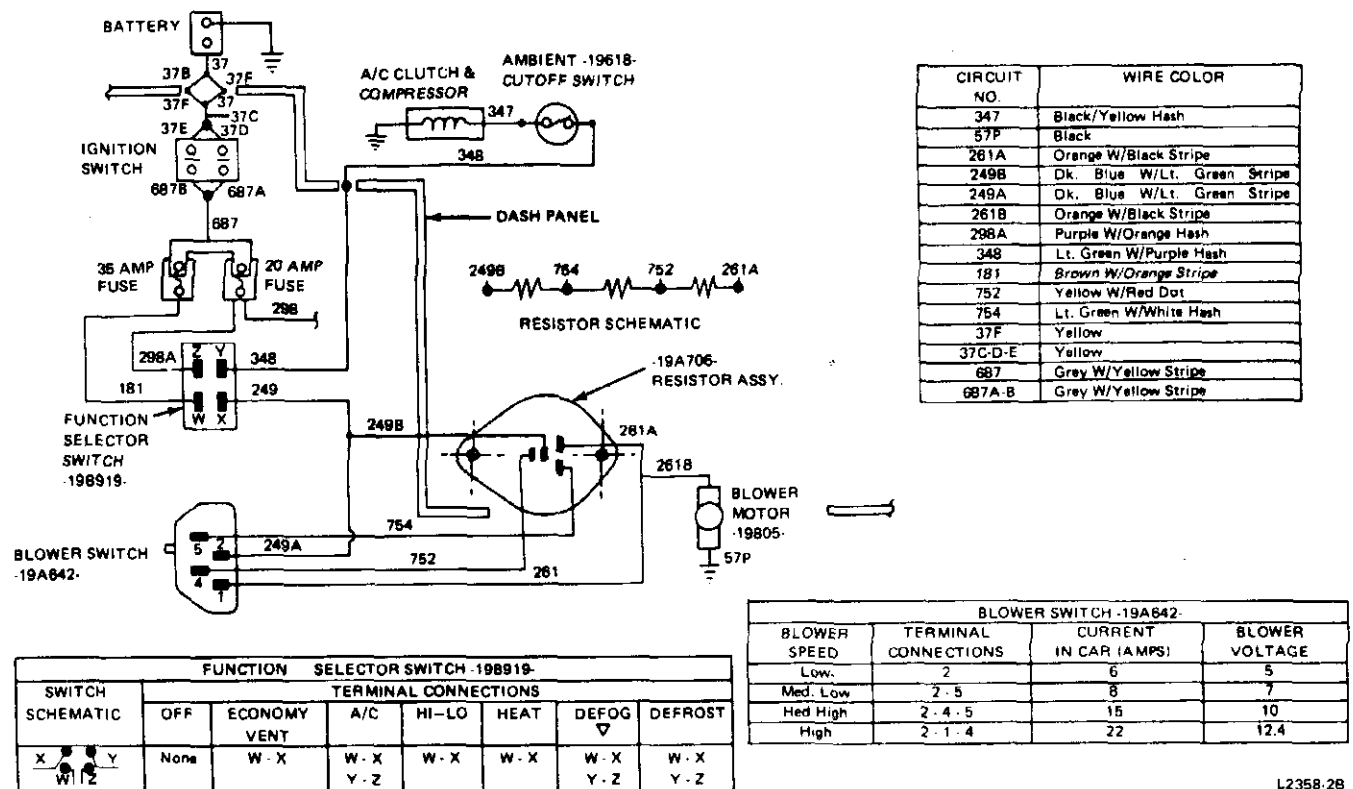
The temperature lever actuates a 3-port vacuum selector that controls the outside-recirc door and water valve vacuum motors via the 9-port selector valve. It also operates the control cable which controls the temperature blend door.

BLOWER SWITCH

The blower switch is located at the lower left corner of the control assembly (Fig. 6).

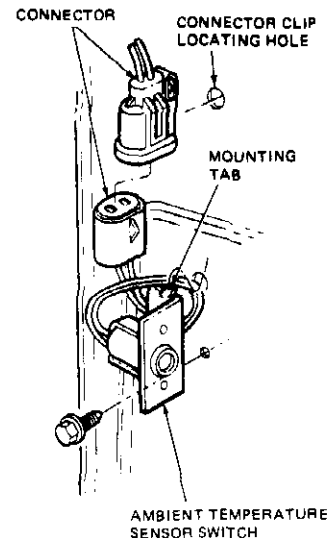
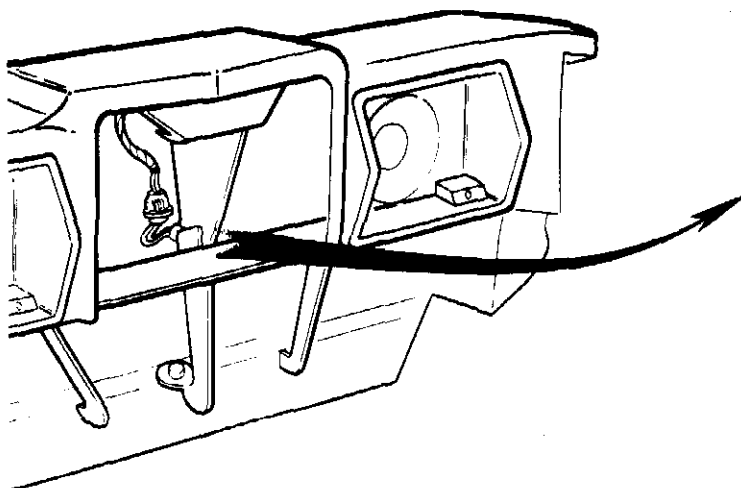
WATER VALVE

The water valve is located in the engine compartment in the inlet water line near the dash panel.



L2358-28

FIG. 4 Manual A/C-Heater System Electrical Wiring Diagram and Continuity Test—LTD II, Cougar and Thunderbird



L2359-2A

FIG. 5 Ambient Temperature Sensor Switch Installation

BLOWER RESISTOR ASSEMBLY

The resistor assembly is located on the right surface of the evaporator assembly (Fig. 7).

EVAPORATOR CASE ASSEMBLY

The evaporator case assembly, located in the engine compartment on the right side of the dash panel, must be removed from the vehicle to service the evaporator core. A gasket around the evaporator case mounting flange provides a positive seal to the dash panel openings. See Figs. 7 and 8.

BLOWER MOTOR HOUSING ASSEMBLY

The blower motor housing, located under the right side of the instrument panel adjacent to the plenum assembly, contains the outside-recirc air door and recirc duct as well as the blower motor and wheel assembly.

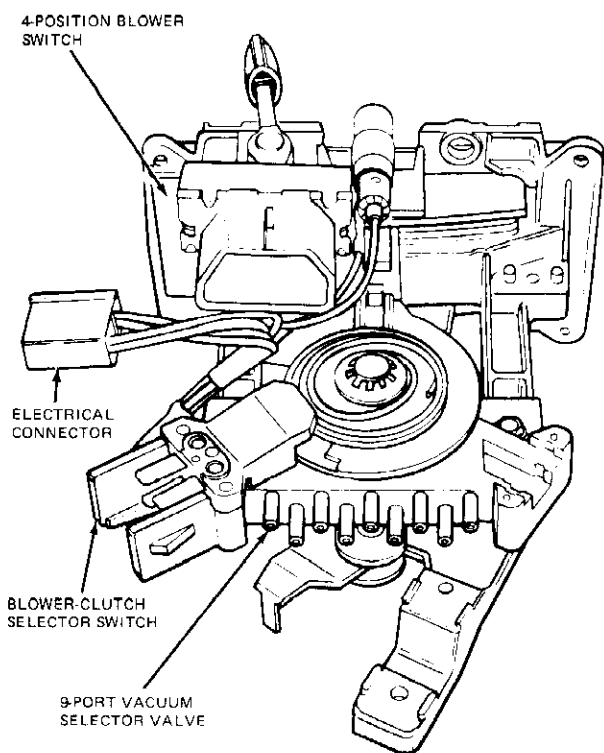
PLENUM CHAMBER AND AIR DISTRIBUTION DUCTS

The plenum chamber is attached to the dash panel directly over the evaporator outlet openings and contains the temperature blend door, partial and full

A/C-heat doors, and heat-defrost door. The center air distribution duct containing air mix baffles, seats firmly over the rectangular opening in the plenum chamber and distributes air directly to the center panel registers and to the left and right registers through rigid air ducts. See Fig. 9.

DEFROSTER NOZZLES

The defroster nozzle is connected to the plenum and retained to the cowl top inner panel.



L2360-1A

FIG. 6 Manual A/C Control Head, Bottom Rear View

CONDENSER AND RECEIVER ASSEMBLY

The condenser and receiver assembly is located forward of the radiator and is mounted to the radiator support in four places. Clearance for removal is provided by removing the upper radiator mounts and tilting the radiator rearward.

COMPRESSOR AND CLUTCH ASSEMBLY

The A/C compressor and clutch assembly is located in a horizontal position on the forward left side of all engines. An idler pulley is provided to adjust belt tension.

PRESSURE RELIEF VALVE

The pressure relief valve has been incorporated in the York and Tecumseh compressors to relieve unusual high pressure build-ups (450 PSIG and above) and prevents damage to the compressor and other A/C components.

REFRIGERANT CHARGING VALVES

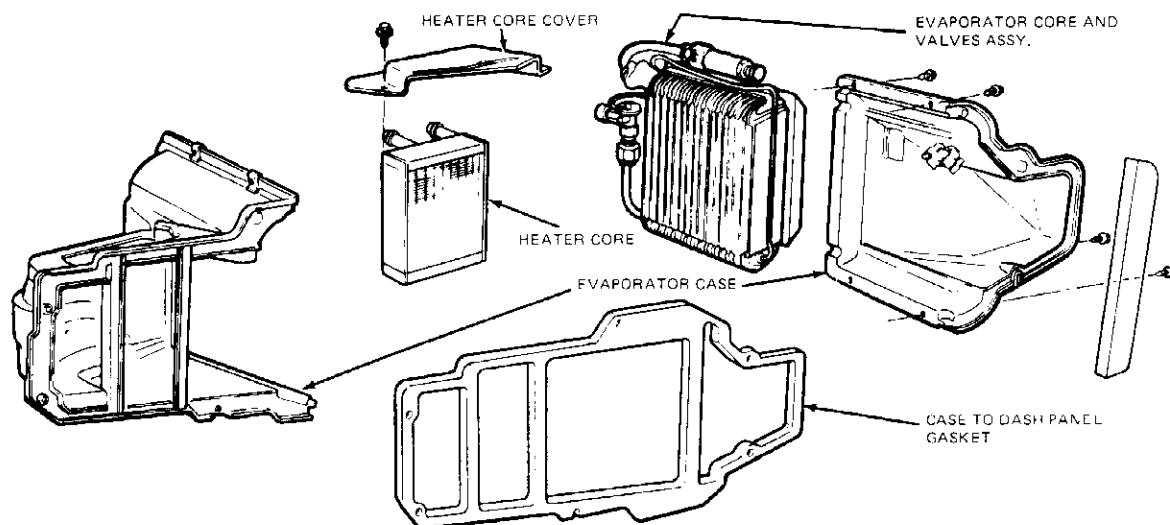
The valves for charging the system with refrigerant-12 are located in the refrigerant lines near the compressor. A refrigerant tag that indicates the amount of refrigerant to be charged into the system is located at the front of the engine compartment on the radiator support or fan shroud.

VACUUM MOTORS

1. The outside-recirc air door vacuum motor is accessible for service by removing the glove box.
2. The heat-defrost door vacuum motor can be serviced from under the instrument panel.
3. The partial and full A/C-Heat door vacuum motors can be serviced only by removing the plenum chamber.

ELECTRICAL SYSTEM

Refer to Electrical Schematic in Fig. 4 for wire color coding and continuity tests.



L2361-2A

FIG. 7 Evaporator Case Disassembled

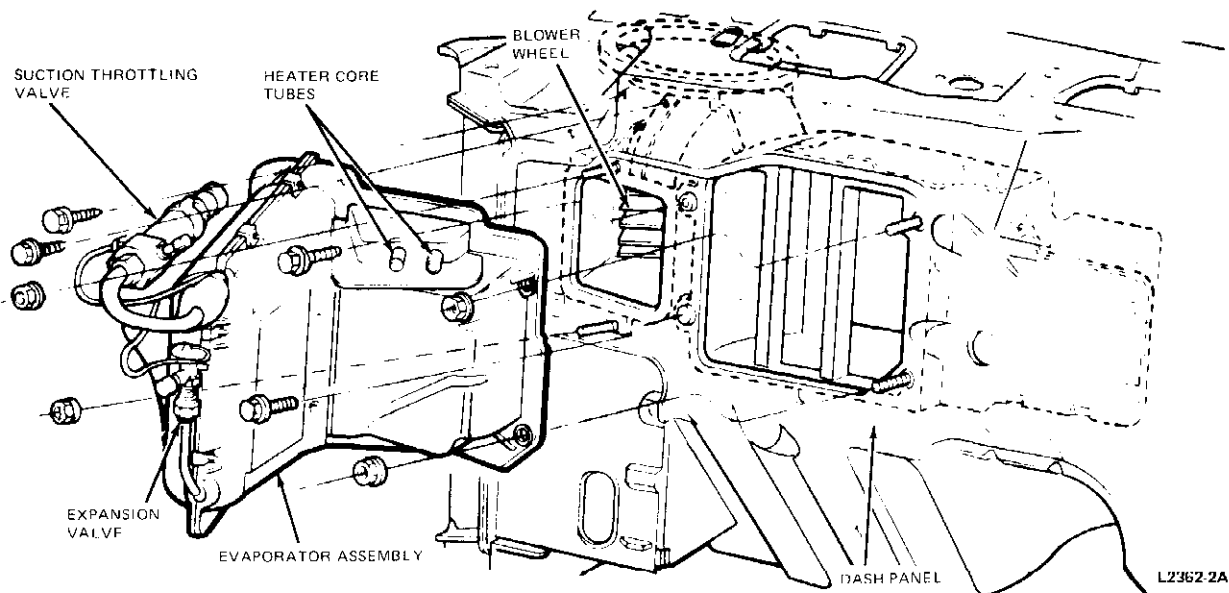


FIG. 8 Evaporator Assembly Installation

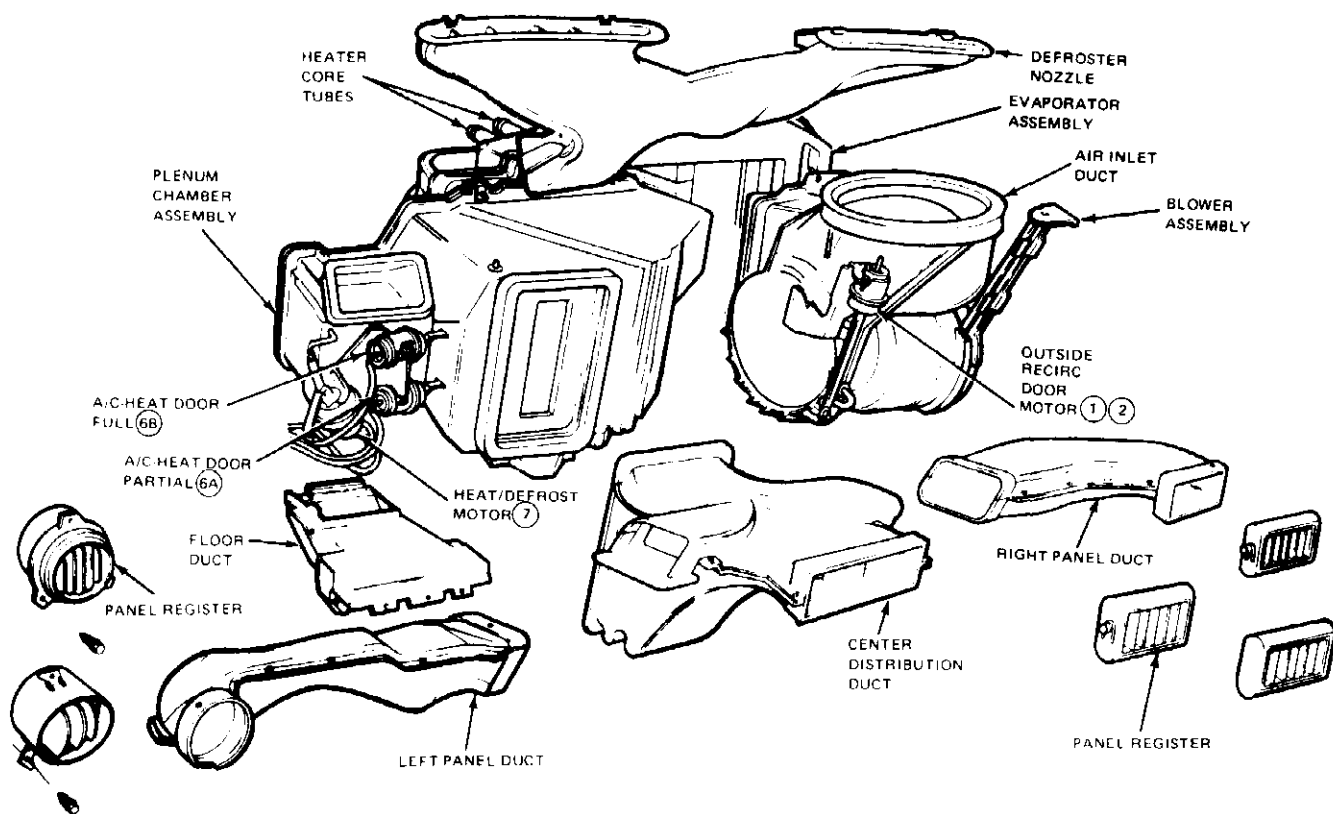


FIG. 9 Air Distribution Ducts—LTD II, Thunderbird and Cougar

REMOVAL AND INSTALLATION

CONTROL ASSEMBLY

1. Remove A/C control knobs and accessory switch knob.
2. Remove two (2) lower control assembly attaching screws.
3. Remove two (2) upper control assembly attaching screws.
4. Remove temperature control cable from control heat (1 screw).

5. Disconnect vacuum harness from vacuum selector valve.
6. Disconnect electrical wiring connectors from blower switch.
7. Remove control head from rear of instrument panel.

To install reverse the above procedure. Adjust the temperature cable for proper output.

EVAPORATOR CASE AND CORE

1. Discharge the A/C system at the STV (observe safety precautions).
2. Raise the vehicle and remove the right front wheel.
3. Drill a 1.50 inch service hole in the fender apron. See Fig. 10. A drill dimple is provided for proper location of the hole.
4. Drain engine coolant and disconnect the heater hoses at the heater core.
5. Disconnect refrigerant lines from the STV and expansion valve. Cap the lines. Disconnect the wiring connector at the blower resistor.
6. Seven fasteners retain the A/C evaporator assembly to the dash panel. One is removed from the inside of vehicle and is located on the lower flange of the evaporator housing on the inboard side of the evaporator core.
7. Remove 2 self-tapping screws (1/4-20) located at the top of the evaporator assembly; one on each side of the evaporator core.
8. Remove 2 nuts from the inboard side of the evaporator (these nuts also retain the A/C plenum).
9. Remove the top nut on the outboard side of the evaporator (this nut also retains the A/C blower assembly).
10. Through the service hole in the fender apron, loosen the lower nut on the outboard side and run the nut to the end of the stud. Do not remove the nut.
11. On the inside of the vehicle, remove the instrument panel pad and R.H. cowl side trim panel. Remove the 2 fasteners retaining the instrument panel to the body (one is located on the cowl inner panel, the other is located on the cowl side panel). This permits the instrument panel to be pulled rearward to allow the A/C ducts to be removed.
12. Remove the radio speaker or support rod at the instrument cluster.
13. Remove 4 screws retaining the defroster nozzle and remove the nozzle.
14. Remove 3 retaining clips from the R.H. duct and remove the duct.
15. Remove the 2 retaining clips from the floor ducts and remove the ducts.
16. Remove 2 screws retaining the center duct to the plenum. Remove the 3 retaining clips from the center duct. Lift the end of the L.H. duct from the center duct and remove the center duct.
17. Remove the 2 outboard nuts retaining the plenum.
18. Remove the screw retaining the blower assembly support bracket to the inner cowl.
19. Move the plenum and blower assemblies rearward to reduce the length of studs protruding through the

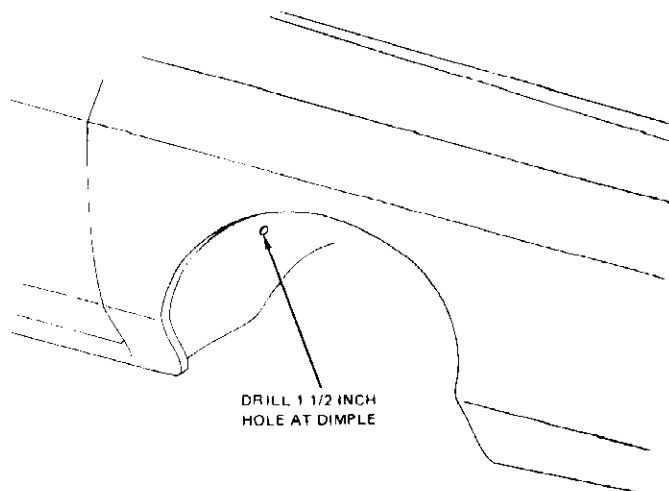


FIG. 10 Location for Cutting Access Hole in Right Fender Apron

- dash. These components do not have to be removed.
20. Remove the A/C evaporator housing by moving it forward and lifting upward.
21. Remove 7 screws from the evaporator flange and separate the two halves of the assembly. Remove the STV support clamp.
22. Remove the evaporator core and valve assembly from the R.H. housing. The STV and expansion valve can be removed with the evaporator core (Fig. 7).
23. Replace the evaporator core. Re-assemble the valves with new "O" rings.
24. Remove and replace the sealer between the two case halves.
25. Re-assemble the evaporator assembly.
26. Replace the evaporator dash seal. Inspect the condensate drainage hole for any blockage.
27. Install the evaporator assembly. Re-assemble all components using the reverse procedure.
28. Replace the "O" rings on the refrigerant hoses and connect to valves.
29. Turn the blower on and check for air leakage around the evaporator core.
30. Evacuate and charge the A/C system. Check for refrigerant leaks.
31. Install a plug button, 377901-S, in the service hole in the fender apron.

HEATER CORE

The heater core can be removed from the A/C evaporator assembly by removing the heater cover plate.

1. Drain engine coolant and disconnect heater hoses from heater core.
2. Remove heater core cover plate (4 screws).
3. Press down on the heater core and tip it towards the front of vehicle. This is to release the heater core seal from the housing.

4. Remove heater core by lifting upward. See Fig. 11.
5. Replace heater core and seals. Carefully install the new heater assembly. Verify that the seals on the sides of the core fit against their respective metal support brackets in the evaporator housing. Press down on the heater core and tip it rearward so that the notch on seal is aligned with the flange on the evaporator housing.
6. Clean off old sealer from the heater cover plate and evaporator housing. Apply rope sealer, ESB-M4G32-A, in the formed depression and sides of the heater cover plate.
7. Install cover plate (4 screws).
8. Check for air leaks by placing the A/C control temperature lever in maximum heat, the function control lever in HEAT and the blower in high. Seal oil leaks.
9. Connect hoses and fill cooling system. Start engine and check for coolant leaks. Run the engine until the thermostat opens then recheck the coolant level for proper fill.

DEFROSTER NOZZLES

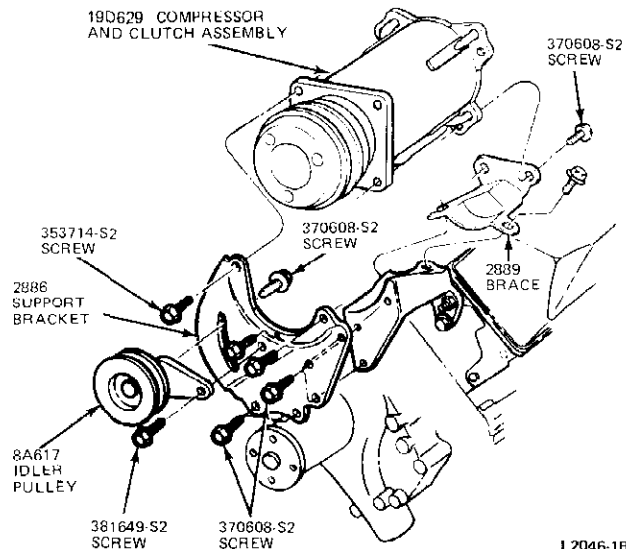
1. Remove instrument panel upper finish panel. Remove speaker bracket or support rod. Refer to Part 45-61.
2. Remove upper attaching screws (2) at each defroster nozzle outlet.
3. Remove nozzle upward through opening in panel.
4. Visually inspect the defroster nozzle openings for proper alignment and eliminate any blockage.

To install, reverse the above procedure.

PLENUM ASSEMBLY

1. Remove instrument panel pad.
2. Loosen instrument panel enough to allow panel to be moved approximately one inch rearward.
3. Remove right and left A/C distribution ducts (4 clips).
4. Remove center duct (2 screws) (2 clips).
5. Remove floor register duct (2 clips).
6. Disconnect control cable from bottom of plenum (1 screw).
7. Disconnect vacuum hose harness from control head, water valve and vacuum source in engine compartment and from recirc vacuum motor on recirc duct.
8. Remove two 1/4 x 20 nuts from the right side of plenum chamber located on the passenger side of the dash panel. Remove two 1/4 x 20 nuts from the left side of the plenum chamber located on the engine side of the dash panel. See Fig. 8.
9. To remove plenum and vacuum harness assembly, pull plenum rearward until studs on left side of plenum are clear of the dash panel and move plenum to the right of the transmission tunnel.

To install, reverse the above procedure.



L2046-1B

FIG. 11 Heater Core Disassembled

BLOWER MOTOR AND WHEEL ASSEMBLY—FIGURE 12

1. Remove instrument panel pad.
2. Remove glove box.
3. Remove side cowl trim panel.
4. Remove instrument panel attachment on right side.
5. Remove one (1) blower housing to dash nut (in engine compartment).
6. Remove one (1) blower housing to dash nut (in passenger compartment).
7. Remove one (1) blower housing mounting bracket and cowl top inner screw.
8. Disconnect outside-recirc air door vacuum motor hose (white).
9. Disconnect blower motor lead wire plug from harness connector, and motor ground wire (black) (one screw).
10. Remove blower assembly.
11. Remove the blower motor and wheel as an assembly from the blower.

To install, reverse the above procedure.

AIR DISTRIBUTION DUCTS

The air distribution ducts can be serviced by removing the instrument panel upper finish panel with reference to Fig. 9.

AMBIENT TEMPERATURE CUT-OFF SWITCH

The ambient temperature switch is located on the hood lock vertical support bracket in front of the condenser. It is a temperature sensitive, snap-action unit that is installed in the compressor clutch circuit to prevent unnecessary compressor operation at low temperatures. It closes the circuit to the clutch at 50°F and opens the circuit at 35°F.

The switch is serviced by disconnecting the electrical connector and removal of the attaching screw at the bracket. See Fig. 5.

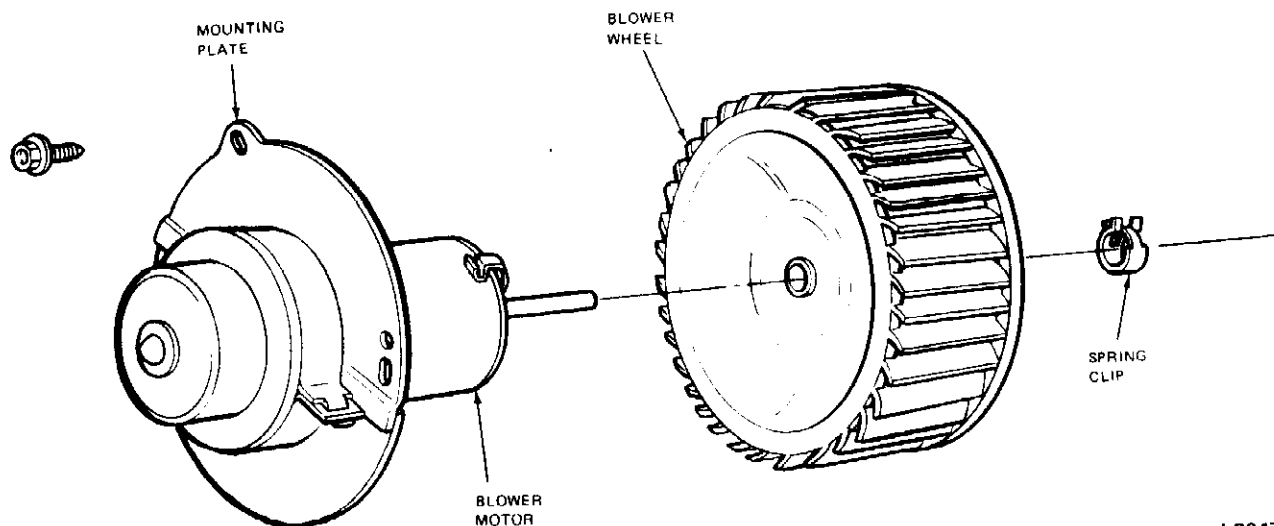
TEMPERATURE CONTROL CABLE ADJUSTMENT

1. Move the temperature control lever to maximum WARM position.
2. Adjust the cable at the bracket on the bottom of the plenum by sliding cable flag in bracket groove until the temperature door crank arm is in the full heat position. Provide 1/8 inch clearance between

the temperature control lever and right end of the lever slot to insure maximum heat position before tightening cable screw at plenum bracket.

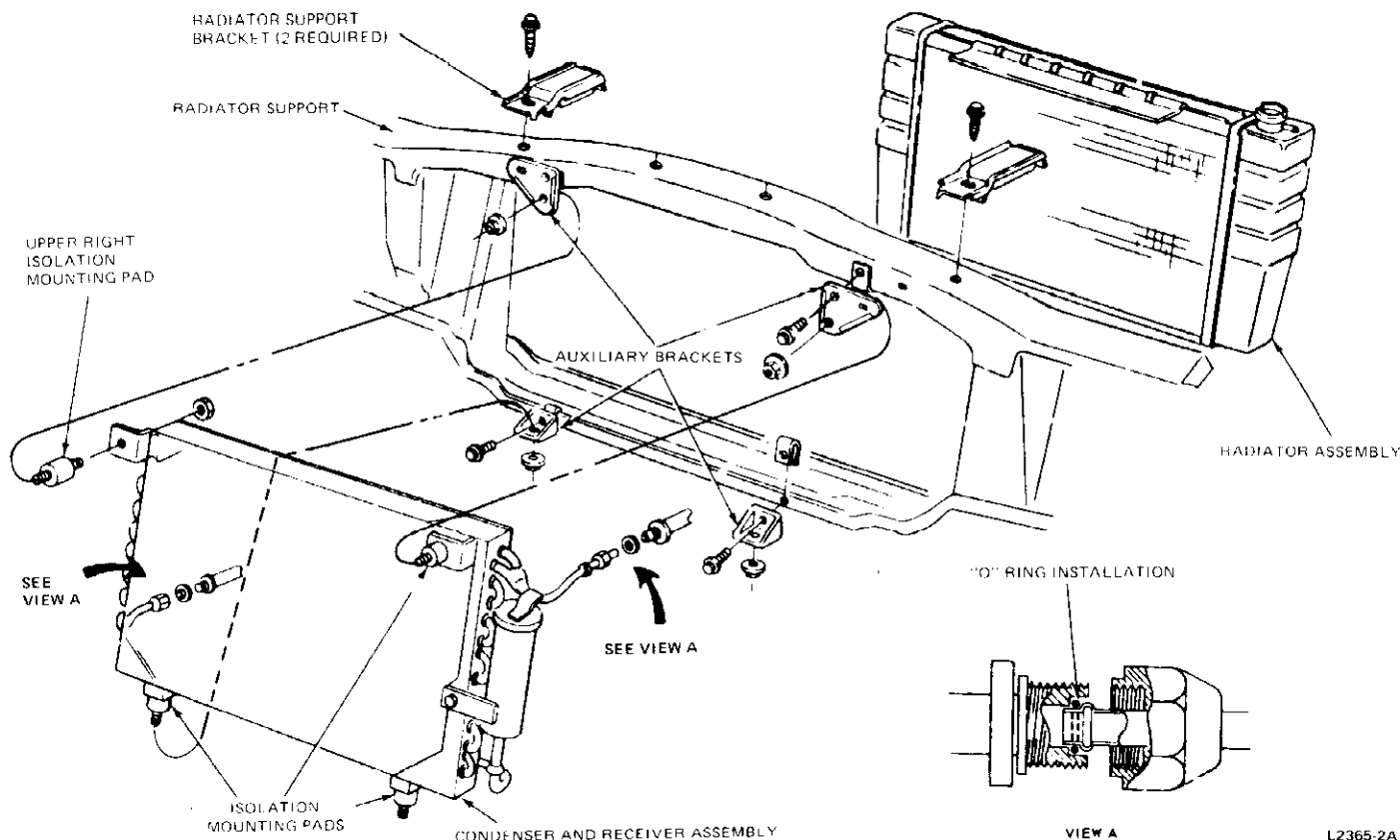
CONDENSER

The condenser assembly is serviced by removing four nuts at the isolation mounts, one screw at the liquid line to condenser bracket, and the liquid and discharge lines. See Fig. 13.



L2047-2A

FIG. 12 Blower Motor and Wheel Disassembled



L2365-2A

FIG. 13 Condenser Installation—LTD II, Thunderbird, Cougar

SPECIFICATIONS

MANUAL A/C-HEATER SYSTEM – LTD II, Cougar and Thunderbird			
Protection Device	20 amp fuse in clutch circuit 35 amp fuse in blower circuit	Compressor (Cont'd.) Refrigerant Capacity Refrigerant Type Oil Specification	4-1/4 lbs. + 1/4 lb. R-12 ESA-M2C31-A (Ford Part No. C9AZ-19577-A)
Control Illumination Blower Motor Current (Amps.) and Voltage	One TCP, No. 161 bulb Low 6 amps 5 volts Medium Low 8 amps 7 volts Medium High 15 amps 10 volts High 22 amps 12.4 volts	Clutch – Magnetic	Approx. 3.75 amps @ 12.8 volts Open: 35°F. Min. Closed: 50°F. Max.
Compressor Displacement Oil Capacity	10.3 cubic inch (York and Tecumseh) York – 10 oz. Tecumseh – 11 oz.	Compressor Drive Belt	New: 120 to 160 lbs. Used: 75 to 120 lbs. (after operation for 10 minutes or more)

CL2390-2A

Ford, Mercury and Lincoln Continental ATC

**PART
36-71**

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION	71-1	REMOVAL AND INSTALLATION (Cont'd.)	
TESTS	71-12	Heat-Defrost Door Vacuum Motor	71-33
ADJUSTMENTS	71-19	Heater Core	71-43
REMOVAL AND INSTALLATION		High Blower Relay	71-35
A/C-Heat Door Vacuum Motor	71-33	Instrument Panel Pad	71-26
Ambient Cut-Off Switch	71-45	Outside Air Door Assembly	71-35
ATC Sensor Seals	71-29	Outside Air Door Vacuum Motor	71-31
Blower/Accessory Switches	71-24	Plenum Chamber	71-30
Blower Motor and Wheel Assembly	71-34	Receiver-Drier	71-45
Compressor	71-46	Recirculating Air Door Vacuum Motor	71-33
Condenser	71-45	Refrigerant Lines	71-36
Control Assembly	71-23	Register Assemblies	71-24
Defroster Nozzles	71-26	Register Ducts	71-25
E.V. Relay	71-30	Resistor Assembly	71-35
Evaporator Case Assembly	71-44	Sensor Assembly	71-28
Evaporator Core	71-36	Servo Assembly	71-29
Expansion Valve	71-35	Suction Throttling Valve	71-36
Functional Control Vacuum Selector Valve	71-24	Water Valve	71-34
		SPECIFICATIONS	71-47

CL2350-2A

DESCRIPTION AND OPERATION

The Automatic Temperature Control System is a split case design, integral blower system and will automatically control the temperature and reduce the relative humidity of air inside the car (See Fig. 1). Two control levers are provided to maintain the desired temperature and system functions. The system will deliver heated or cooled air to maintain the car interior temperature and will maintain the set comfort level automatically. The blower speed can be adjusted for more or less air as desired.

Automatic control of passenger compartment temperature is maintained in all operational modes except when the system is turned off. In hot weather, it will cool the car to the pre-set comfort level and then modulate cooling or heating to whatever is required to maintain the desired temperature.

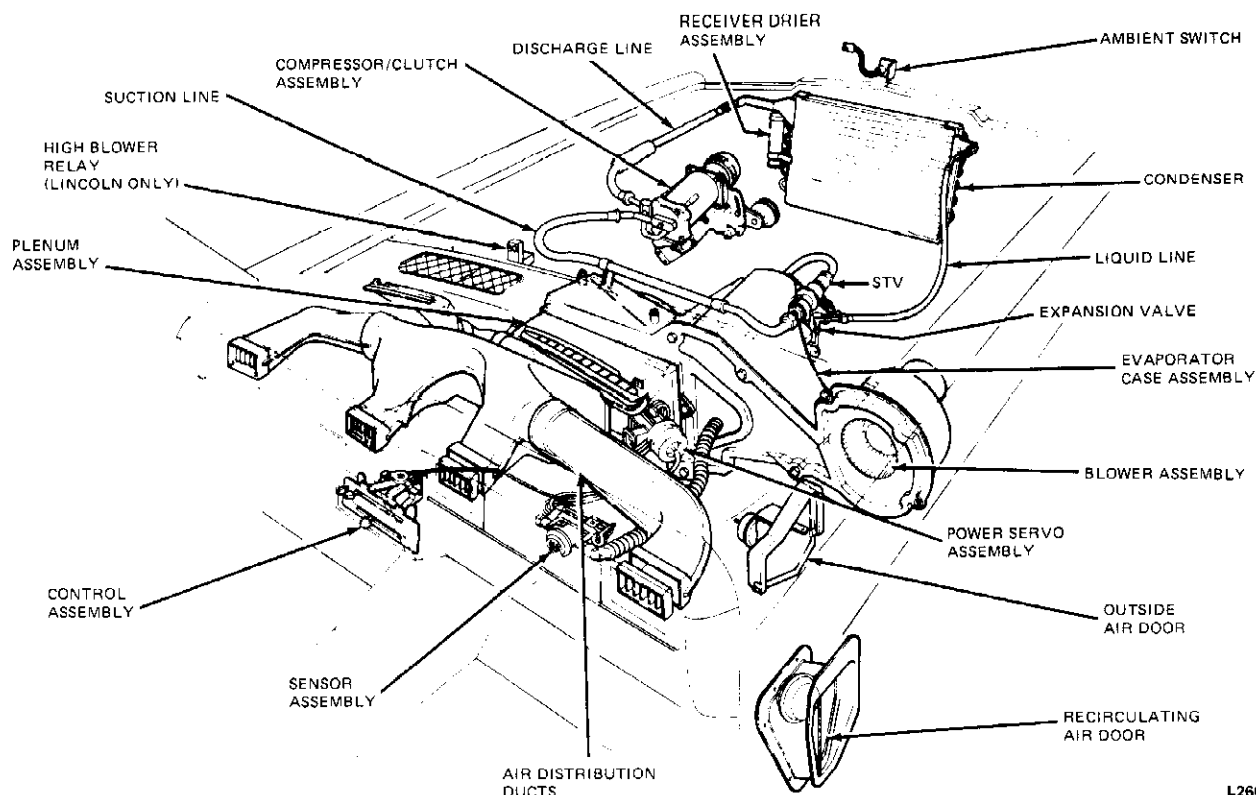
In cold weather, provision is made in the HEAT position of the function lever to delay the operation of the system until engine coolant has warmed enough to minimize the discharge of cold air from the heater outlet. The system will then heat the car to the desired temperature and level out to maintain the pre-set temperature.

During system operation, outside air is drawn from the cowl vent just below the windshield at all times, except during maximum cooling when recirculated air is used.

The system utilizes what is called a "reheat" method to provide conditioned air to the car interior. With this method all air flow from the blower passes through the evaporator core, where it is cooled and dehumidified. Temperature is then regulated by reheating a portion of the cooled dry air and blending it with the remaining cool air to the desired temperature. Temperature blending is automatically varied by the temperature blend door which controls the amount of cooled air that flows through or around the heater core where it is mixed and directed into the distribution plenum. The air is finally directed to the heater ducts, the defroster nozzles, or the instrument panel (A/C) registers according to the selected function lever position.

CONTROL LEVER OPERATION

The Automatic Temperature Control includes a function control lever for OFF, ECONOMY-VENT, A/C, HI-LO, HEAT, DEFOG (▼) and DEFROST that determines the manner in which the system will operate, a calibrated temperature control lever for setting the desired comfort temperature and a blower switch to control the volume of air movement. Each position of the function control lever and blower switch is detented for positive engagement. The blower switch provides four manually selected blower speeds. The switch can be operated in any position to select the desired amount of air flow.



L2609-2A

FIG. 1 ATC System Overall Schematic — 1978 Ford, Mercury and Lincoln Continental

AUTOMATIC TEMPERATURE CONTROL

The electrical and air flow schematics and vacuum charts shown in Figures 2 through 5 may be used in conjunction with the following explanation to clarify system operations:

Temperature control of the ATC system is primarily determined by the modulated vacuum produced by the sensor assembly which controls the servo vacuum motor. Discharge air flow is manually controlled by the control assembly. Temperature control is accomplished by means of a control cable between the control assembly and sensor assembly.

The sensor assembly is basically a bimetal operated vacuum modulator, directly converting air temperature into corresponding values of modulated vacuum. The bimetal senses in-car temperature and is mechanically linked to an internal vacuum modulator to directly control and regulate a vacuum which is proportional to temperature. The bimetal and vacuum modulator are placed within a plastic aspirator. Air is diverted by an air scoop near the high pressure side of the blower (before the evaporator) through a tube to the sensor assembly. The air flows through the aspirator which draws vehicle interior air over the in-car bimetal. This combined air is then exhausted from the sensor underneath the instrument panel where it will not be felt by the passengers or driver.

The modulated vacuum from the sensor is directly connected to the large calibrated vacuum motor portion of the servo assembly. The modulated vacuum controls and positions the blend door attached to the arm of the servo motor assembly. The calibrated vacuum motor moves the blend door to mix various proportions of hot air from the heater core and cold air that has by-passed the heater core. Vehicle air temperatures produce compensating discharge air temperatures, i.e., high vehicle interior temperatures produce high sensor output vacuums which position the blend door to deliver cool discharge air. Low vehicle interior temperatures produce low sensor vacuum levels which cause warm discharge air.

A vacuum diverter valve, a part of the power servo assembly and also attached to the arm of the servo motor, turns off the water valve under maximum cooling conditions, and controls the outside air/recirc door for maximum cooling conditions when the function control lever is in the A/C position.